

ENERGY PERFORMANCE AGREEMENT

THIS AGREEMENT is made between the **CITY AND COUNTY OF DENVER**, a home rule and municipal corporation of the State of Colorado (the “**City**”) and **McKinstry Essention, LLC**, with an address of 16025 Table Mountain Parkway, Suite 100, Golden, CO 80401 (the “**Contractor**”), jointly (the “**Parties**”).

WHEREAS, the City and Contractor entered into that certain agreement no. GENRL-201952928-00 dated January 15, 2020 (“**IGA Agreement**”) for the Contractor to perform an investment grade audit (“**IGA**”) pursuant to C.R.S. § 29-12.5-102;

WHEREAS, pursuant to the IGA Agreement, the Contractor provided the City with an analysis and recommendations in the form of an IGA Report and Energy Performance Contracting Project Proposal. Such report and proposal provided estimates of the amounts of Utility Cost Savings and Operation and Maintenance Cost Savings the City will realize if certain energy performance measures are implemented;

WHEREAS, the City has approved the Contractor’s recommendations in the IGA Report and hereby authorizes the Contractor to perform the energy performance measures set forth in **Schedule B**;

WHEREAS, the Contractor has furnished to the City, pursuant to the IGA Report and Energy Performance Contracting Proposal, a bid for the provision of energy saving equipment as a separated and leasable component of the Energy Performance Contracting Proposal with Included Warranties in accordance with the terms, conditions, specification and quotations as provided in the IGA Report and Energy Performance Contracting Proposal;

WHEREAS, the City has determined to accept the bid of the Contractor for the Equipment;

WHEREAS, payment for the Equipment shall be accomplished through an escrow agreement as part of a separate lease-purchase agreement between the City and the Third-Party Lessor, a selected lessor entity;

WHEREAS, the City has also determined to accept the Contractor’s bid for Direct Purchase Equipment, as set forth in **Schedule B**, payment for which shall be accomplished through purchase order no. PO-00107101 dated November 8, 2021 (“**Purchase Order**”); and

WHEREAS, the Parties’ performance of the obligations under this Agreement are subject to the requirements of C.R.S. §§ 29-12.5-101-104.

NOW THEREFORE, in consideration of the promises and mutual benefits from the covenants hereinafter set forth, the Parties agree as follows:

1. DEFINITIONS: The following terms shall be construed and interpreted in this Agreement as follows:

a. **“Adjusted Baseline Energy”** means the energy use of the baseline period, adjusted to a different set of operating conditions.

b. **“American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE)”** means the recognized professional organization with standards and guidelines that may be referenced for additional definitions, procedures, and technical information as necessary in the Scope of Work and the IGA Project Proposal Report.

c. **“Baseline Energy”** means the energy use (units) occurring during the Baseline Period without adjustments.

d. **“Baseline Period”** means the period of time chosen to represent operation of the facility or system before implementation of a Utility Cost Savings Measure or any applicable FIM, as defined herein. This period may be as short as the time required for an instantaneous measurement of a constant quantity, or long enough to reflect one full operating cycle of a system or facility with variable operations.

e. **“Baseline”** means and pertains to the baseline period.

f. **“Business Day”** means any day in which the City is open and conducting business, which shall not include Saturday, Sunday, or any City-observed holidays.

g. **“Colorado Open Records Act (CORA)”** means the Colorado Open Records Act, C.R.S. §§ 24-72-200.1–205.5.

h. **“Commissioning”** means a process for achieving, verifying, and documenting the performance of equipment to meet the operational needs of the facility within the capabilities of the design, and to meet the design documentation and the City’s functional criteria, including preparation of operational personnel. Retro-commissioning is the application of the Commissioning process to existing buildings.

i. **“Compensation”** means the funds payable to the Contractor by the City for the performance of the Contractor’s obligations under this Agreement, including but not limited to, the Project and the M&V Services.

j. **“Contingency Funds”** means City moneys not included in the Fixed Limit of Construction Cost and budgeted in the amount of \$399,903.00, appropriated and encumbered for Project contingency purposes in order that the City may use such moneys to pay to the Contractor, any other contractor through a Separate Contract constituting a portion of the Project Work, or any Third-Party Lessor. Contingency Funds could be used in the event of construction cost budget overage, if the Principal Representative determines to add to or change the Contractor’s Scope of Work, hire a contractor for special services (example-environmental

remediation) or reduce the City's obligation to any Third-Party Lessor, all pursuant to **Article 10.c.** and **Article 10.j.**

k. "Construction" means installation of new equipment/materials, or replacement of existing equipment/materials, including associated startup and staff training.

l. "Construction Commencement Date" means the date the Principal Representative issues a written Notice to Proceed to Commence Construction Phase form.

m. "Construction Documents" means the documents set forth in **Article 10.a.**

n. "Construction Term" means the period of time in which the Contractor shall complete the Project, pursuant to **Article 6.**

o. "Contract Documents" means this Agreement, the Exhibits, the Schedules, and the Construction Documents.

p. "Contractor's Intellectual Property" means any formulas, patterns, devices, secret inventions or processes, copyrights, patents, or other intellectual property purchased, licensed or developed by Contractor prior to or outside of this Agreement or purchased, licensed or developed by Contractor or its Subcontractors as a tool for their use in performing the Services, plus any modifications or enhancements thereto and derivative works based thereon.

q. "Contract Term" means the definition of "Term" set forth in **Article 6.**

r. "Cost-Weighted Average Service Life" means the calculation is based upon the service life of the equipment (ASHRAE Handbook – HVAC Applications or other approved source), the cost of each Utility Cost Savings Measure or FIM (excluding the audit cost), and the total cost of all the measures. The formula is the sum of each measure cost divided by the total cost multiplied by its service life. $\text{Cost-Weighted Average Service Life} = \frac{\sum \text{each measure} \div \text{total cost} \times \text{service life}}$.

s. "Deliverable" means any document, material, data, information, specification or other deliverable that results from or is provided through the Services or that the Contractor is required to deliver to the Principal Representative under this Agreement including the Contract Documents.

t. "Design Documents (DDS)" means documents supplied by the Contractor consisting of drawings, specifications, and other documents that fix and describe the size and character of the entire Project as to architectural, structural, mechanical, and electrical systems, materials, and such other elements as may be appropriate, and include design plans and documentation for each Utility Cost Savings Measure or FIM that may become part of the Project, and as further described in **Article 9.c.**

u. “Direct Purchase Equipment” means the equipment, systems and associated services set forth in **Schedule B**, together and with an and all replacements, repairs, restorations, Modifications and improvements of or to such equipment, which shall be paid for by the City to Contractor through the Purchase Order.

v. “Energy” means electricity (both usage and demand), natural gas, steam, water (potable or non-potable), or any other Utility charged service.

w. “Energy Conservation Measure (ECM)” means and Energy Saving Measure or Utility Cost-Savings Measure as those terms are defined in C.R.S. §§ 29-12.5-101(4), (9). An ECM is an activity or set of activities designed to increase the efficiency (energy, water, or other utility) of a facility, system or piece of equipment. ECMs may also conserve energy without changing efficiency. An ECM may involve one or more of: physical changes to facility equipment, revisions to operating and maintenance procedures, software changes, or new means of training or managing users of the space or operations and maintenance staff. An ECM may be applied as a retrofit to an existing system or facility, or as a modification to a design before construction of a new system or facility. Within this Agreement, Utility Cost- Savings Measures, Energy Saving Measures, Energy Cost-Saving Measures, Energy Conservation Measures (ECMs) and Facility Improvement Measures (FIMs) shall be interchangeable as necessary and may include vehicle fleet operational and fuel cost savings measures.

x. “Energy Cost Savings Contract” is as defined in C.R.S. §§ 29-12.5-101(2.5).

y. “Energy Cost Savings Measure” means a Utility Cost Savings Measure Within this Contract, Utility Cost-Savings Measures, Energy Saving Measures, Energy Cost-Saving Measures, Energy Conservation Measures (ECMs) and Facility Improvement Measures (FIMs) shall be interchangeable as necessary and may include vehicle fleet operational and fuel cost- savings measures.

z. “Energy Performance Contract (EPC)” is as defined in C.R.S. § 29-12.5-101(3).

aa. “Energy Service Company (ESCO)” means the energy service company entity entering into a contract to design and construct the Project with the City. The Energy Service Company may also be referred to as “Contractor” in this Agreement or related exhibits, schedules, attachments, contract modification, or procedural documents.

bb. “Equipment” means the equipment delivered to the Premises to be owned by the Third-Party Lessor and leased to the City, including systems and associated services set forth as “Tangible Goods” in **Schedule B**, including replacements, restorations, Modifications, and improvements of or to such Equipment. Modifications and improvements shall not replace the Equipment specified on **Schedule B** unless and until the City has received permission from the Lessor to allow the Modification or improvement and the City provides notice of authorization to the Contractor. It is understood and agreed that the Equipment and Included

Warranties associated with this Agreement that are being provided to the City hereunder are also routinely provided to nongovernmental customers on the same terms and conditions that were offered to the City and are agreed to by the City in this Agreement.

cc. “**Escrow Agreement**” means the escrow agreement executed by the City, the Third-Party Lessor, and the Escrow Agent, pursuant to which the Escrow Fund is established and administered. Contractor shall be paid for the Equipment portion of this Agreement through the Escrow Agreement.

dd. “**Escrow Fund**” means the fund, if applicable, established under the Escrow Agreement.

ee. “**Escrow Agent**” means the entity set forth in **Article 7.d**.

ff. “**Evaluation**” means the process of examining the Contractor’s Work and rating such Work based on criteria established in this Agreement.

gg. “**Excluded Materials and Activities**” means asbestos, materials containing asbestos, or the existence, use, detection, removal, containment or treatment thereof; or pollutants, hazardous wastes, hazardous materials, or the storage, handling, use, transportation, treatment, or the disposal, discharge, leakage, detection, removal, or containment thereof.

hh. “**Facility**” or “**Facilities**” means any building or utility owned or operated by the City.

ii. “**Facility Improvement Measure (FIMS)**” means an activity or set of activities designed to improve the structural or operational conditions of a facility, system or piece of equipment. A FIM may be an activity associated with an Energy Cost-Savings Measure and funded as part of an EPC. A FIM may be an activity requested by the City, but is not an Energy Cost-Savings Measure, but funds have been budgeted, appropriated and otherwise made available to be included in an EPC. Within this Agreement, Utility Cost-Savings Measures, Energy Saving Measures, Energy Cost-Saving Measures, Energy Conservation Measures (ECMs) and Facility Improvement Measures (FIMs) shall be interchangeable as necessary.

jj. “**Federal Energy Management Program (“FEMP”) Measurement and Verification (M&V) Guidelines**” means the current M&V Guidelines prepared by the U.S. Department of Energy. The FEMP M&V Guidelines contain specific procedures for applying concepts originating in the IPMVP (definition below). The FEMP M&V Guidelines represents a specific application of the IPMVP to EPC projects. It outlines procedures for determining M&V approaches, evaluating M&V plans and reports, and establishing the basis of payment for energy savings during the Agreement. These procedures are intended to be fully compatible and consistent with the IPMVP.

kk. “**Fiscal Year**” means a 12-month period beginning on January 1 of each calendar year and ending on December 31.

ll. “Fixed Limit of Construction Cost (FLCC)” means the total amount to be paid by the City or any Third-Party Lessor to Contractor for Contractor’s satisfactory performance, construction, and installation of all elements of the Work, which shall include, but not be limited to, costs and expenses, permits, performance bonds, materials, labor, auditing, IGA, design, engineering, project construction management costs, commissioning, training, profit, travel expenses, communications, code work, including review, inspection, and compliance unless otherwise noted, and installation of Equipment and Direct Purchase Equipment. The Fixed Limit of Construction Cost is included as a part of the MCP and all costs comprising the Fixed Limit of Construction Cost shall be identified in **Schedule F**, which shall be executed after this Agreement is effective. The Fixed Limit of Construction Cost does not include any Contingency Funds or the M&V Fee.

mm. “Guarantee” means the warranty and guarantee made by the Contractor in **Article 18** hereof that for each year of the Guarantee Period, the Project shall result in annual cost savings equal to or greater than the Guaranteed Annual Cost Savings presented in **Schedule C** which shall be equal to or greater than the City’s annual payments used to repay the project funding, as set forth in C.R.S. § 29-12.5-101(3). Failure to meet the Guaranteed Annual Cost Savings in any year during the Guarantee Period shall result in Contractor directly remunerating the City the dollar amount equal to the cost value of that year’s Guaranteed Annual Cost Savings shortfall. Alternatively, subject to the City’s consent, which shall not be unreasonably withheld, Contractor may implement additional Utility Cost-Savings Measures or FIMs, at no cost to the City, which may generate additional annual cost savings in future years of the Performance Period to offset future Guaranteed Annual Cost Savings shortfall.

nn. “Guarantee Period” means a period of time commencing upon M&V Commencement Date and terminating on the termination of the M&V Term. The Guarantee Period is a mutually agreed to time period after the M&V Commencement Date, during which Guaranteed Annual Cost Savings resulting from the Project are measured and verified by the Contractor set forth in **Schedule D**.

oo. “Guaranteed Annual Cost Savings” means measurable and verifiable aggregate of Guaranteed Annual Utility Cost Savings, Guaranteed Annual Operations and Maintenance Cost Savings guaranteed by Contractor resulting from the Project that shall occur for each year of the Guarantee Period pursuant to **Schedule C**. Guaranteed Annual Utility Cost Savings shall be determined by Contractor’s Measurement and Verification of annual utility unit use reductions and the application of mutually agreed to baseline and escalated utility unit costs for each year of the Guarantee Period as defined in **Schedule C**.

pp. “Guaranteed Annual Operations and Maintenance Cost Savings” means annual cost savings resulting from a verifiable reduction in the City’s operation and maintenance budget.

qq. “**Guaranteed Annual Utility Cost Savings**” means annual Utility Cost Savings resulting from a reduction of usage and the application of the mutually agreed to baseline and escalated utility unit rates as presented in **Schedule C**.

rr. “**IGA Agreement**” means that certain contract no. GENRL-201952928-00 entered into between the Contractor and the City on January 15, 2020 pursuant to C.R.S. § 29-12.5-102 and pursuant to which the Contractor conducted the IGA.

ss. “**Included Warranty**” means the standard and included Equipment warranty which is included by the manufacturer or reseller and which does not require additional purchase price and is transferrable in connection should the Equipment transfer. It does not include extended warranties or other services which are purchased in addition to the purchase price of the Equipment.

tt. “**International Performance Measurement and Verification Protocol (IPMVP)**” means the current document prepared by the Efficiency Valuation Organization on the Effective Date of the IGA Agreement. It is the industry standard for current best practice techniques available for verifying results of energy efficiency, water efficiency, and renewable energy projects associated with the Investment Grade Audit Report and Energy Performance Contract Project Proposal.

uu. “**Investment Grade Audit (IGA)**” means a detailed audit of certain Facilities of the City, including the Premises, conducted by the Contractor or another party pursuant to the IGA Agreement, as provided in C.R.S. and in respect of which the City has received and reviewed the IGA Record of Review from the CEO, which serves as the basis for this Agreement.

vv. “**kW**” means kilowatt.

ww. “**kWh**” means Kilowatt-hour.

xx. “**Lease Purchase Agreement**” means the annually renewable lease purchase agreement entered into by the City, as lessee of the Equipment, and a Third-Party Lessor, as lessor of the Equipment, for the lease and ultimate purchase of the Equipment necessary to implement Utility Cost-Savings Measures and FIMs as a result of Contractor’s work pursuant to this Agreement (constituting the capital project so leased), as authorized pursuant to C.R.S. § 29-12.5-103.

yy. “**Lease Purchase Agreement Term**” means the original term and all renewal terms of any Lease Purchase Agreement of the City for the costs of the Equipment set forth in **Schedule B** to this Agreement.

zz. “**Material Change**” means any change or cumulative changes in or to the Premises, whether structural, operational or otherwise in nature as determined by the City or the Principal Representative, if authorized to do so by the City, and the Contractor, to increase or

decrease Guaranteed Annual Cost Savings, as defined in **oo** above, in accordance with the provisions and procedures set forth in **Schedule B** and is correlated with such change in energy or water usage, and as described in **Article 21**.

aaa. “**Maximum Contract Price (MCP)**” means the maximum amount of total allowable costs under this Agreement, as set forth in **Article 8.d.**, which shall be the total amount paid by the City to Contractor for the Services, the Measurement and Verification Fee, and any Contingency Funds. It is the maximum amount payable to the Contractor by the City pursuant to this Agreement.

bbb. “**Maximum Direct Purchase Equipment Price (MDPEP)**” means the total compensation payable to Contractor for acquiring and delivering the Direct Purchase Equipment, together with applicable systems and warranties associated with such Direct Purchase Equipment, as set forth in **Article 8.g.**, payable to the Contractor through the Purchase Order. The total MDPEP compensation payable directly by the City to Contractor for Direct Purchase Equipment under this Agreement shall not exceed Zero Dollars (\$0.00).

ccc. “**Maximum Equipment Price (MEP)**” means the total compensation payable to Contractor for acquiring and delivering the Equipment, together with applicable Included Warranties associated with such Equipment, as set forth in **Article 8.f.**, payable to the Contractor from the Escrow Fund into which a deposit has been made by the Third-Party Lessor. The total MEP compensation payable directly by the City to Contractor for Equipment under this Agreement shall not exceed Zero Dollars (\$0.00).

ddd. “**Measurement and Verification (M&V)**” means the process of using measurements to reliably determine and verify the actual savings created within buildings, infrastructure, or systems resulting from an energy management program. Savings cannot be directly measured, since they represent the absence of energy use. Instead savings are determined by comparing measured use before and after implementation of a project, making appropriate adjustments for changes in conditions. M&V follows the standards and definitions in the current International Performance Measurement and Verification Protocol (“**IPMVP**”), as may be amended by the Efficiency Valuation Organization on the Effective Date of this contract. The CEO Measurement and Verification Policy may allow alternative verification standards as appropriate for select Utility Cost-Savings Measures or FIMs.

eee. “**M&V Commencement Date**” means the first day of the month following the completion by Contractor and the Principal Representative’s submittal of Notice of Final Acceptance.

fff. “**M&V Fee**” means an annual fee paid to Contractor by the City for Contractor’s satisfactory performance of the M&V Services, as set forth in **Article 17**. The M&V Fee is included as a part of the Maximum Contract Price.

ggg. “**M&V Plan**” defines how savings will be calculated and specifies any ongoing activities that will occur during the Contract Term. The details of the M&V Plan are in **Schedule D**.

hhh. “**M&V Services**” means Services or activities relating to the measurement and verification by Contractor of the efficiency and effectiveness of the Project, pursuant to this Agreement and the CEO Measurement and Verification Policy as applied.

iii. “**M&V Term**” has the meaning as described to it in **Article 17**.

jjj. “**MMBtu**” means 1 Million British thermal unit.

kkk. “**Modification of Equipment**” means a field installable upgrade, feature, addition, accessory or modification to Equipment or Direct Purchase Equipment, which is made by or for the original manufacturer of such Equipment or Direct Purchase Equipment upon review and approval of the City.

lll. “**Modification to the Contract**” means a written (i) amendment to this Contract signed by both parties or (ii) Change Order executed in accordance with **Schedule A**.

mmm. “**One-Year Warranty**” is as defined in **Article 25.b.(3)**.

nnn. “**Open Book Pricing**” means open book pricing as that term is used in **Article 10.h**.

ooo. “**Operation and Maintenance Cost Savings**” as defined in C.R.S. § 29-12.5-101 (4.5), means the measurable decrease in operation and maintenance (O&M) costs that is a direct result of the implementation of one or more Utility Cost-Savings Measures. Such savings shall be calculated in comparison with an established baseline of operation and maintenance costs.

ppp. “**Purchase Order**” means purchase order no. PO-00107101 dated November 8, 2021 used for the purchase of Direct Purchase Equipment.

qqq. “**Premises**” is as set forth in **Article 9.a**.

rrr. “**Project**” means Contractor’s design, acquisition, construction, and installation of the Utility Cost-Savings Measures and FIMs, and all Equipment, Direct Purchase Equipment and Services related thereto, as set forth in **Schedule B** and the Contract Documents, but does not include M&V Services.

sss. “**Rebate**” means moneys used for Contractor’s compensation that are not the moneys of the City or moneys from a Third-Party Lessor, including solar REC’s and utility rebates, all as described in **Schedule B** and on **Schedule G**.

ttt. “**Review**” means the examination by the Principal Representative of the Contractor’s Work to ensure that it is adequate, accurate, correct and in accordance with this Agreement.

uuu. “**Schedule A**” means **Schedule A** to this Agreement, attached hereto as General Conditions of the Agreement.

vvv. “**Schedule B**” means **Schedule B** to this Agreement, attached hereto as EPC Description of Work. The **Schedule B** is developed from information in the EPC Project Proposal. **Schedule B** includes: the final list of facilities that define the Premises, final list of improvements, installed equipment and upgrades. **Schedule B** details the cost for the Work from initial design to the start of the Guarantee Period.

www. “**Services**” means all services performed by Contractor hereunder, including, but not limited to, engineering, design, project management, construction management, design, training, systems, software, software licenses, and M&V Services, and tangible material produced either separately or in conjunction with the Work performed.

xxx. “**Simple Payback**” means the length of time, typically presented in years, required to recover the cost of a measure or project.

yyy. “**Tax Information**” means federal and State of Colorado tax information including, without limitation, federal and State tax returns, return information, and such other tax-related information as may be protected by federal and State law and regulation. Tax Information includes, but is not limited to all information defined as federal tax information in Internal Revenue Service Publication 1075.

zzz. “**Third-Party Lessor**” means a third-party entity entering into a Lease Purchase Agreement, as lessor, with the City, as lessee, for the lease purchase of the Equipment pursuant to this Agreement.

aaaa. “**Utility**” or “**Utilities**” means the water, sewer services, electricity, payments to energy service companies, purchase of energy conservation equipment, and all heating fuels. Utility may include compressed air, chilled water, or other systems or services as agreed to with the City.

bbbb. “**Utility Cost Savings**” means the definition set forth in C.R.S. §29-12.5-101(7).

cccc. “**Utility Cost-Savings Contract**” means an Energy Performance Contract or any other agreement in which Utility Cost Savings are used to pay for services or equipment set forth in C.R.S. § 29-12.5-101(8).

dddd. “**Utility Cost-Savings Measure**” means the definition set forth in C.R.S. § 29-12.5-101(9). Within this Contract, Utility Cost-Savings Measures, Energy Saving Measures,

Energy Cost-Saving Measures, Energy Conservation Measures (ECMs) and Facility Improvement Measures (FIMs) shall be interchangeable as necessary.

eeee. “Work” means the tasks and activities the Contractor is required to perform to fulfill its obligations under this Agreement and **Exhibit A**, including the performance of the Services and delivery of the Equipment and Direct Purchase Equipment.

ffff. “Work Product” means the tangible or intangible results of the Contractor’s Work, including, but not limited to, research, reports, studies, data, photographs, negatives or other finished or unfinished documents, drawings, models, surveys, maps, materials, or work product of any type (but not including software), including drafts. Work Product does not include the Contractor’s Intellectual Property.

Any other term used in this Agreement that is defined in a Schedule shall be construed and interpreted as defined in that Schedule.

2. COORDINATION AND LIAISON: The Contractor shall fully coordinate all services under the Agreement with the Executive Director of General Services (“**Executive Director**”) or, the Executive Director’s Designee. The “Principal Representative” shall be the Executive Director or the City representative designated by the Executive Director to implement this Agreement on the City’s behalf.

3. SERVICES TO BE PERFORMED:

a. As the Executive Director directs, the Contractor shall diligently undertake, perform, and complete all of the services and produce all the deliverables set forth in this Agreement to the City’s satisfaction.

b. The Contractor is ready, willing, and able to provide the services required by this Agreement.

c. The Contractor shall faithfully perform the services in accordance with the standards of care, skill, training, diligence, and judgment provided by highly competent individuals performing services of a similar nature to those described in the Agreement and in accordance with the terms of the Agreement.

d. Contract Phases. This Agreement contains the following phases:

- (1) Funding
- (2) Pre-Construction
- (3) Construction
- (4) Start-up, Commissioning, and Acceptance
- (5) Training
- (6) Measurement and Verification

4. EQUIPMENT/DIRECT PURCHASE EQUIPMENT TO BE DELIVERED:

a. The Contractor shall:

(1) Provide to the City under **Schedule B**, consisting of Equipment and Direct Purchase Equipment, and all Included Warranties, in accordance with the terms, conditions, specifications, and quotations provided in the IGA Report and Energy Performance Contracting Project Proposal. In the event of any other contradiction or inconsistency between this Agreement and **Schedule B or Schedule X**, this Agreement shall control.

(2) Provide delivery, installation, configuration, set-up, training, certification, loading, formatting, and related services for the Equipment and Direct Purchase Equipment.

(3) Provide the Included Warranties.

b. It is understood and agreed that the Equipment and Direct Purchase Equipment, installation, training, and Included Warranties associated with this Agreement that are being provided to the City hereunder are also routinely provided to nongovernmental customers on the same terms and conditions that were offered to the City and are agreed to by the City under this Agreement. In installing the Equipment and Direct Purchase Equipment for the City, Contractor shall be bound by the terms, conditions, requirements, and specifications as listed in **Schedule B**, unless superseded by this Agreement. All Equipment and Direct Purchase Equipment, installation, training, support, maintenance, and Included Warranties shall be provided in accordance with **Schedules B, Q and R**. Changes to the scope of work, offered by Contractor due to technology changes or updates must be approved, in writing, by the Executive Director and will not affect the overall cost of the work.

5. SPECIAL PURCHASING TERMS AND CONDITIONS: In addition to all other terms and condition set forth in this Agreement, the Contractor shall comply with the following special purchasing terms and conditions.

a. The unit price for each item listed in **Schedule B** shall be for the unit of measurement indicated. In case of error in extension of prices, the unit price will govern.

b. All materials, supplies, Equipment, and Direct Purchase Equipment furnished under this Agreement shall comply with the requirements and standards specified in the Williams-Steiger Occupational Safety and Health Act of 1970 (Public Law 91-596) as well as with other applicable federal, state, and local codes.

c. The commitment to provide the Equipment and Direct Purchase Equipment under this Agreement has been arrived at by the Contractor independently and has been submitted without collusion with any other proposer or vendor to the City.

d. Prices quoted shall be F.O.B. Denver, CO delivered to various locations, Denver, Colorado, unloaded and installed.

e. Contractor agrees to bear all risk of loss, injury, or destruction of goods and materials ordered as a result of this Agreement which occur prior to delivery to the City; and such loss, injury, or destruction shall not release the Contractor from any obligation hereunder.

f. Contractor agrees to furnish, upon the written request of the City, any additional information needed to substantiate or clarify the design and/or performance characteristics of the goods that it proposes to furnish.

g. Contractor shall notify the Executive Director of General Services immediately of any occurrence or conditions that interfere with the full performance of this Agreement, and confirm in writing within twenty-four (24) hours.

h. Contractor invoices must include the following:

- (1) City contract control number;
- (2) Items listed individually;
- (3) Unit price, extended and totaled;
- (4) Quantity ordered, back ordered, and shipped;
- (5) Invoice number and date;
- (6) Requesting department name and “ship to” address; and
- (7) Payment terms.

i. Contractor warrants and guarantees to the City that all Equipment, Direct Purchase Equipment, and related materials to be furnished under this Agreement are free from all defects in workmanship and materials. Contractor shall provide a corrective action plan to any Vendor Deficiency/Deviation Report sent by the City and County of Denver within five (5) business days of the date of the Report. Contractor further warrants, guarantees, and agrees to remedy all such defects and to replace at Contractor’s expense and at no expense to the City any or all labor, transportation, part or parts of the Equipment, Direct Purchase Equipment, or related materials to be furnished under this Agreement, which are or become defective due to such defects within twelve (12) months after date of receipt by the City, within ten (10) calendar days after receipt of notification of such defect(s), unless the materials or equipment that are needed to complete the repair have a longer lead time. This warranty/guarantee commitment shall be in addition to any other warranty supplied by the Contractor or otherwise required under this Agreement.

j. Contractor shall be responsible for any and all warranty work, regardless of whether or not manufacturers of the Equipment, Direct Purchase Equipment, or their component parts provide actual warranty coverage. In addition, Contractor shall have or establish a single, local source that will accomplish or coordinate any necessary warranty work. Contractor shall respond to requests for warranty assistance within twenty-four (24) hours.

6. **TERM:** The Agreement will commence on the date set forth on the City’s signature page and will expire on **December 31, 2025** (the “**Term**”). Contractor shall complete

the Work and its other obligations described herein on or before December 31, 2025. The City shall not be liable to compensate Contractor for any Work performed prior to the Effective Date or after the termination of this Contract. The term of this Contract (“**Contract Term**”) shall be divided into three (3) separate components:

a. Planning Term. The “Planning Term” shall commence on the Effective Date, which shall be defined as the date as set forth on the City’s signature page, and upon delivery by the Principal Representative to Contractor of a Notice to Proceed to Commence Design Phase under **Article 8.i.** and terminate upon delivery by the Principal Representative to Contractor of a Notice to Proceed to Commence Construction Phase for the last improvement per the Construction and Installation **Article 10.b.**

b. Construction Term. The “Construction Term” shall commence upon delivery by the Principal Representative to Contractor of a Notice to Proceed to Commence Construction Phase under **Article 10.e.**, and terminate no more than 688 calendar days after the Construction Commencement Date, unless sooner terminated as provided in this Agreement.

c. M&V Term. The “M&V Term” shall begin on the M&V Commencement Date and continue until no later than December 31, 2025. The M&V Term shall terminate pursuant to **Schedule D** unless sooner terminated as provided in this Agreement.

7. FUNDING:

a. City Funds.

(1) MCP Funds. The City will provide all or a portion of the moneys for the MCP required under this Agreement in the amount of set forth in **Article 8.d.** from existing appropriations specifically budgeted, appropriated and encumbered for this purpose as full or partial compensation for the cost of the Project as described in **Schedule B** and indicated on **Schedule G** to be paid to Contractor.

(2) MDPEP Funds. The City will provide the moneys for the MDPEP through the Purchase Order in the amount set forth in **Article 8.g.** from existing appropriations specifically budgeted, appropriated and encumbered for such purpose as compensation for the cost of Direct Purchase Equipment as described in **Schedule B.**

b. Third Party Lessor Funds. The City intends to lease the Equipment required under this Agreement by entering into an annually renewable lease purchase arrangement with a Third-Party Lessor. The total amount of funds that the Third-Party Lessor shall pay into the Escrow Fund to acquire the Equipment is as set forth in **Article 8.f.** Amounts paid for the Equipment by the Third-Party Lessor may not exceed the MEP. The total MEP compensation payable directly by the City to Contractor for the Equipment under this Agreement shall not exceed Zero Dollars (\$0.00).

c. Escrow Account. Any funds provided by a Third-Party Lessor to own the Equipment in order to lease the Equipment to the City shall be deposited into an escrow account established for the purposes of acquiring Equipment. The City and the Third-Party Lessor shall be authorized to direct the Escrow Agent, as described in **Article 7.d.**, to compensate Contractor for the Equipment delivered by Contractor and accepted in writing by the City in accordance with the terms of the Escrow Agreement, **Article 8**, and **Schedule A**, and the Escrow Agent will make payment from the Escrow Fund in accordance with procedures set forth in the Lease Purchase Agreement, this Agreement, and any escrow agreement. Final payment shall be made to Contractor upon the City's submittal of the Notice of Final Acceptance of the Project. Any proceeds from the Escrow Fund shall accrue to the City.

d. Escrow Agent. The Escrow Agent is hereby identified as:

U.S. Bank National Association, as Escrow Agent
 ATTN: Global Corporate Trust Services
 950 17th Street, 5th Floor
 Denver CO 80202
 Telephone: 303-585-4591
 Facsimile: 303-585-4530
 E-mail: kathleen.connelly@usbank.com

With notices also to:

U.S. Bank National Association
 ATTN: Erica Fouks Trust Finance Management
 60 Livingston Ave EP MN WS2N St.
 Paul MN 55107
 Telephone: 651-466-6095
 Facsimile: 866-691-4161
 E-mail: erica.fouks@usbank.com

The Escrow Agent is as provided in the Escrow Agreement between the City, the Lessor, and the Escrow Agent.

8. COMPENSATION AND PAYMENT:

a. Budget. The City and the Third Party Lessor shall collectively pay, and the Contractor shall accept, as the sole compensation for the Work, through this Agreement, the Escrow Agreement, and the Purchase Order, the amounts set forth below:

Cost of Services (MCP) <i>via this Agreement:</i>	\$2,346,783
Cost of Equipment (MEP) <i>via the Escrow Agreement:</i>	\$13,834,597
Cost of Direct Purchase Equipment (MDPEP) <i>via the Purchase Order:</i>	\$735,094
Total Project Value to be Paid to Contractor:	\$16,916,474

b. **Reimbursable Expenses:** There are no reimbursable expenses allowed under the Agreement.

c. **Invoicing:** For services provided pursuant to this Agreement, Contractor shall provide the City with a monthly invoice in a format and with a level of detail acceptable to the City including all supporting documentation required by the City. The City's Prompt Payment Ordinance, §§ 20-107 to 20-118, D.R.M.C., applies to invoicing and payment under this Agreement.

d. **Maximum Contract Price:**

(1) Notwithstanding any other provision of the Agreement, the City's maximum payment obligation will not exceed Two Million Three Hundred Forty-Six Thousand Seven Hundred Eighty-Three Dollars and Zero Cents (**\$2,346,783.00**) (the "**Maximum Contract Price**"). The City is not obligated to execute an Agreement or any amendments for any further services, including any services performed by Contractor beyond that specifically described in **Schedule B**. Any services performed beyond those in **Schedule B** are performed at Contractor's risk and without authorization under the Agreement.

(2) The City's payment obligation, whether direct or contingent, extends only to funds appropriated annually by the Denver City Council, paid into the Treasury of the City, and encumbered for the purpose of the Agreement. The City does not by this Agreement irrevocably pledge present cash reserves for payment or performance in future fiscal years. The Agreement does not and is not intended to create a multiple-fiscal year direct or indirect debt or financial obligation of the City.

e. **Changes to Maximum Contract Price.** The City may decrease the amount available for the services in the MCP with the mutual consent of the Contractor and assuring that the decrease in the MCP does not adversely affect the Contractor's requirement to meet the Guaranteed Annual Cost Savings. A change in the Guaranteed Annual Cost Savings may be considered a Material Change to this Agreement, pursuant to **Article 21**. The decrease in the services in the MCP may be based on the actual costs of labor and materials to the Contractor. The MCP shall not be increased without an amendment to this Agreement.

f. **Lease Purchase Equipment / Maximum Equipment Price.**

(1) It is understood and agreed that, concurrent with this Agreement, the City has elected to enter into the Lease and Acquisition of the Equipment and Warranties, through a separate lease-purchase agreement with the Third-Party Lessor.

(2) The total compensation payable to Contractor for acquiring, installing, and maintaining the Equipment, together with applicable Included Warranties associated with such Equipment, shall not exceed the amount of Thirteen Million Eight Hundred Thirty-Four Thousand Five Hundred Ninety-Seven Dollars (**\$13,834,597.00**) ("**Maximum**

Equipment Price”), payable directly to the Contractor by the Third Party Lessor through the Escrow Agent. Payment for all such Equipment, installation, training, and Included Warranties shall be made by the Third-Party Lessor through the Escrow Agent to Contractor within thirty (30) days of Escrow Agent’s receipt of the corresponding Certificate of Acceptance and an approved Contractor invoice in a total amount not to exceed the MEP as provided by the Acceptance Certificates attached as **Schedule Y**. The Contractor will forward title to the Equipment within twenty-four (24) hours of receiving payment to the Third-Party Lessor at:

JPMorgan Chase Bank, N.A
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Account: Chase Equipment Finance

(3) Contractor warrants that the Equipment, installation, and Included Warranties provided hereunder shall conform to **Schedule B** and to Contractor’s published specifications. In the event that such items provided hereunder do not conform to **Schedule B** or to Contractor’s published specifications, Contractor shall have the opportunity to correct the performance by either: (i) tuning the system or (ii) adding or changing other Equipment, and, to be performed at the sole option of Contractor, at Contractor’s cost. If neither of the actions above correct the performance within thirty (30) days of notification to Contractor by the City, the City shall have, but not be limited to, the remedies afforded under Contractor’s standard Included Warranty which include repair, and replacement, together with other remedies allowed the City by law.

g. **Purchase Order / Maximum Direct Purchase Equipment Price.** The City shall pay Contractor for the Direct Purchase Equipment in the amount of Seven Hundred Thirty-Five Thousand Ninety-Four Dollars and Zero Cents (**\$735,094.00**) (“**Maximum Direct Purchase Equipment Price**”) pursuant to the terms of the Purchase Order.

h. **Payments and Retainage.** The Principal Representative will, or will direct any Escrow Fund Agent, to compensate Contractor for Work done by Contractor pursuant to **Schedule A**. The Principal Representative shall withhold and release retainage amounts pursuant to **Schedule A** and as allowed by applicable law.

i. **Notice to Proceed to Commence Design Phase.** If the City obtains funds from any and all sources in the amount of MCP for the purposes set forth herein, upon terms and conditions satisfactory to the City, in its sole discretion, or obtains funds sufficient for a revised Project scope, price, and Guarantee, the Principal Representative shall deliver to Contractor a Notice to Proceed to Commence Design Phase instructing Contractor to commence with the Pre-Construction Services, as described in **Article 9**.

9. PRE-CONSTRUCTION ACTIVITIES:

a. Premises. The Premises are the Facilities owned or controlled by the City, as initially detailed on the IGA Agreement and finalized in **Schedule B**.

b. Professional Design Services.

(1) Qualifications. Design services shall be performed by properly licensed and qualified architects, engineers and other professionals selected and paid by Contractor, subject to review by the Principal Representative. The professional obligations of such persons shall be undertaken and performed on behalf of Contractor. Nothing contained herein shall create any contractual relationship with the City between Subcontractors, architects, engineers or suppliers. Prior to designating a professional to perform any of these services, Contractor shall submit the name, together with a resume of training and experience in the work of like character and magnitude to the Project being contemplated to the City. All Drawings, Specifications, calculations, certifications and Submittals prepared by such design professionals shall bear the signature and seal of such design professionals and the City shall be entitled to rely upon the adequacy, accuracy and completeness of such design services.

(2) Designation of Professionals. All Work performed by Contractor that constitutes the practice of architecture/engineering shall be performed by properly qualified and licensed professionals employed by Contractor and shall be performed in accordance with applicable Colorado law.

(3) Conflict of Interest. Contractor or subcontractor, not already approved by the City, shall not be engaged to perform Work wherein a conflict of interest exists, as described in **Section 41**.

(4) Pre-construction Meeting. Contractor and its architect and/or engineer may attend pre-construction meetings, as deemed necessary by the Contractor and the Principal Representative and such additional meetings as the Principal Representative may request. All pre-construction meetings shall be scheduled by Contractor with the approval of the Principal Representative.

(5) Minutes. Contractor shall record minutes of all meetings and distribute them to all participants of the meetings within 30 days after each meeting.

c. Design Documents.

(1) Based on the Scope of Work in **Schedule B** the Contractor shall prepare, for the Principal Representative's acceptance, the Design Documents ("DDs"). The DDs may be waived or modified per Utility Cost-Savings Measure or FIM as mutually agreed in writing between the Parties. Such DDs may include the following, where applicable:

A. Analysis of the proposed Work and the structure as such relates to any laws, codes, ordinances, and regulations;

B. As necessary, provide site development Drawings for each proposed Utility Cost-Savings Measure FIM, defining the proposed scope of the Project. Include earthwork, surface development, and utility infrastructure as applicable;

C. Plans in one-line format of the proposed structural, mechanical, and electrical systems as necessary to define size, location and quality of Equipment, materials, and constructions, for each proposed Utility Cost-Savings Measure or FIM;

D. Floor plans including proposed equipment;

E. Cut-sheets and/or samples of proposed materials, equipment and system components;

F. Proposed architectural schedule, HVAC, plumbing and electrical fixture schedules;

G. Specifications, which, identifying conditions of the Agreement, materials, and standards for each proposed Utility Cost-Savings Measure or FIM;

H. Design plans and documentation for each Utility Cost-Savings Measure or FIM that requires a design as agreed to with the Principal Representative;

I. Submittal of final Equipment List, Construction and Installation Schedule, Systems Start-up and Commissioning, Contractor's Maintenance Responsibilities, Political Subdivision's Maintenance Responsibilities, Contractors Training Responsibilities, and the Manifest of Ownership; and

J. Submittal of an updated construction cost estimate as applicable, in substantially the same form as **Schedule F**.

(2) A code review is required to meet the local jurisdiction authority code procedure.

(3) At the completion by Contractor and acceptance by the Principal Representative of the DDs, Contractor shall provide electronic or printed drawings and such other documents as necessary to fully illustrate the Design Development Phase to the Principal Representative. Electronic drawing files should be in a form acceptable to the Principal Representative.

(4) Contractor shall be responsible for ensuring that the DDs, prepared by Contractor are in full compliance with applicable codes, regulations, laws and ordinances, including both technical and administrative provisions thereof. If Contractor deviates from such codes, regulations, law or ordinance, without written authorization from the City's Facilities Management Division, Contractor, shall make such corrections in the Construction Documents as may be necessary for compliance.

(5) The Principal Representative shall notify Contractor of acceptance or denial of the DDs in writing within 10 days of receipt.

10. CONSTRUCTION:

a. Construction Documents. The Construction Documents, if required, shall consist of the following:

- (1) Final Construction Documents reviewed and approved by the Principal Representative in writing for constructability and code compliance;
- (2) All Design Documents applicable to the Project;
- (3) Any appendices, addenda, clarifications and allowances;
- (4) All modifications issued pursuant to this Agreement;
- (5) Construction and Installation Schedule; and
- (6) Finalized Schedule of Values.

b. Construction and Installation Schedule. Contractor shall prepare a Construction and Installation Schedule, which shall provide the timetable for the execution and completion of the Project. Such Construction and Installation Schedule shall be subject to the approval of the Principal Representative, pursuant to **Schedule A**, and shall be consistent with previously issued schedules, not exceed time limits under the Contract Documents and shall provide a schedule for the entire Project, to the extent required by the Contract Documents.

c. Schedule of Values. Contractor shall prepare a schedule of the cost of construction, which shall be delivered to the Principal Representative for approval and which shall be in substantially similar format as the attached **Schedule F**, and which such Contractor-submitted **Schedule F** shall be subject to review and approval by the Principal Representative. The Schedule of Values shall include, without duplication:

- (1) All labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for the proper execution and completion of the Project, whether temporary or permanent, and whether or not incorporated or to be incorporated in the Project;
- (2) The compensation for services and the cost of work provided by Contractor;
- (3) All bond premiums and costs of insurance;

- (4) All Design and drafting Services;
- (5) All other allowable compensable services pursuant to this Agreement as approved by the Principal Representative;
- (6) Contingency Funds if any.

d. Approval and Completion of Construction Documents. Except as otherwise provided in this Section, the Construction Documents shall be subject to final approval by Principal Representative, on behalf of the City, and other reviewing authorities. The Principal Representative or written designee shall review documents submitted by Contractor and shall render decisions pertaining thereto without unreasonable delay. The Principal Representative's approval shall be issued in the form of the Notice to Proceed to Commence Construction Phase.

e. Notice to Proceed to Commence Construction Phase. Upon receipt of Notice to Proceed to Commence Construction Phase, Contractor shall commence the Project, as described in **Article 1**, and **Schedule B**. Notice to Proceed to Commence Construction may be issued per Utility Cost-Savings Measure or FIM.

f. Construction Term. The Construction Term shall commence on the Construction Commencement Date and shall terminate upon the date according to **Article 6** or the date on which:

- (1) Contractor has completed the Project Work;
- (2) Contractor has finalized and delivered to the Principal Representative all necessary, updated, and final documents, including schedules, exhibits, and completed Punch Lists, at the Principal Representative's determination;
- (3) Contractor has delivered to the Principal Representative a Notice of Substantial Completion, which indicates that Contractor has constructed, installed, and commenced operating the Utility Cost-Savings Measures or FIMs specified in **Schedule B**;
- (4) The Principal Representative has inspected and accepted the Project, according to **Article 12** and **Schedule A**, including the design, construction, installation, and operation of the Project and accepted Contractor's submittal of a Notice of Substantial Completion as demonstrated by signing and executing such Notice of Substantial Completion; and
- (5) The Principal Representative, on behalf of the City, has issued a Notice of Final Acceptance.

g. Fixed Limit of Construction Cost. Contractor shall complete the Project and be reimbursed an amount not to exceed the Fixed Limit of Construction Cost. Contractor shall design and construct the Project within the price specified in this **Article 10.g.** and shall furnish all of the labor and materials to perform the Work for the complete and prompt execution of the Project in accordance with the Contract Documents. The Fixed Limit of Construction Cost includes all of Contractor's Project Work responsibilities, including acquisition of plumbing and electrical building permits and conducting code review. The City may unilaterally decrease the amount available for the Fixed Limit of Construction Cost based on the actual costs of labor and materials to Contractor, with the mutual consent of the Contractor, and assuring that the decrease in the FLCC does not adversely affect the Contractor's requirement to meet the Guaranteed Annual Cost Savings. A change in the Guaranteed Annual Cost Savings may be considered a Material Change to this Contract, pursuant to **Article 21**. However, the Fixed Limit of Construction Cost and the Maximum Contract Price shall not be changed without an amendment or change order to this Agreement, in accordance with EPC General Conditions and Fiscal Rules.

h. Cost Reporting. Contractor shall fully disclose all costs as per the Open Book Pricing requirements to the City through Applications for Contractors Payments and in such detail as the City may request. Contractor shall maintain cost accounting records on authorized work performed. Such accounting records shall identify all costs for materials, labor, including all costs of subcontractor's, vendors, and services received during the Term as defined in **Article 6**. Upon request by the Principal Representative, Contractor shall provide the City with a list of hourly rates and position descriptions for labor or services provided by the Contractor and for all subcontractors and vendors and supply information on any other basis as specified by the Principal Representative. The Principal Representative may evaluate all cost through price analysis to compare costs with reasonable criteria such as established catalog and market prices or historical prices to ensure the Contractor's prices are reasonable and acceptable. Upon request by the Principal Representative, Contractor shall provide the Principal Representative complete access to such records at reasonable times and locations. The records shall be consistent with the Schedule of Values, **Schedule F**. Any disputes shall be subject to the terms of this Agreement and **Schedule A**.

i. Progress Meetings. Contractor shall schedule and conduct regular progress meetings at which meetings the Principal Representative and Contractor shall discuss such matters as procedures, progress, schedule, costs, quality control and problems relating to the Project. Contractor shall record and distribute minutes of all such progress construction meetings within 5 business days of the meeting.

j. Contingency Funds. The Principal Representative may authorize the disbursement of Contingency Funds to Contractor through a Contract Change Order, as described in **Schedule A**.

11. CONTRACTOR PERFORMANCE:

a. Performance of Project. Contractor shall perform the Project in accordance with the Contract Documents. Contractor shall construct and install the Project in accordance with the Construction and Installation Schedule. Contractor shall supervise and direct the Project and be solely responsible for all construction means, methods, techniques, sequences, and procedures and for coordinating all portions of the Project under this Agreement, subject to the review and approval of the Principal Representative and the Construction and Installation Schedule. Contractor shall design, construct and install the Utility Cost-Savings Measures or FIMs. Before purchasing any major Equipment or Direct Purchase Equipment not specified within the Construction Documents, Contractor shall consult with, and if necessary, receive the written or electronic approval of the Principal Representative regarding the price, specifications, warranty, and manufacturer of the Equipment and Direct Purchase Equipment.

b. Contractor's Duty of Proper Performance. Contractor shall perform the Project so as to maintain and not degrade the structural integrity of the Premises or its operating systems. Contractor shall provide the Equipment/Direct Purchase Equipment and all Services, and complete all Work contemplated under this Contract with skill and diligence to the satisfaction of the Principal Representative and in strict accordance with the provisions of the Contract Documents.

c. Standards of Comfort. Contractor's performance of the Project shall maintain and provide the standards of heating, cooling, ventilation, hot water supply, and lighting quality as described in **Schedule N**.

d. Security. Contractor shall meet City requirements for security and access to the Premises.

12. START-UP, COMMISSIONING, INSPECTION, AND ACCEPTANCE:

a. Contractor, in conjunction with the City's selected personnel, shall direct the testing of installed utilities, operations, systems, Equipment, and Direct Purchase Equipment for readiness.

b. Systems Startup and Equipment Commissioning. Contractor shall conduct systematic commissioning of all Equipment and Direct Purchase Equipment installed as part of the Work, in accordance with the procedures specified in System Start-up and Commissioning **Schedule Q**, **Schedule A**, any operating parameters of Equipment and Direct Purchase Equipment from Equipment and Direct Purchase Equipment manufacturers, and this Agreement. Contractor agrees that **Schedule Q** shall follow and use as a standard the procedures and protocol for Commissioning located in the document *Commissioning Guidelines for Energy Saving Performance Contracts for the Colorado Energy Office*, provided by the City. Contractor shall test the Project and the Equipment and Direct Purchase Equipment to ensure it is functioning in accordance and compliance with any published Specifications and this Agreement and to determine if modified building systems, subsystems or components are functioning properly within the Project Work. Contractor shall provide notice to the Principal Representative of the

scheduled test(s) and the Principal Representative and/or its designees may be present at any or all such tests.

c. Acceptance by Principal Representative. Contractor's Work shall be subject to acceptance by the Principal Representative pursuant to this Agreement and **Schedule A**.

d. Correction of Deficiencies. Contractor shall correct all deficiencies in the operation of the Project and the Equipment and Direct Purchase Equipment. Prior to Principal Representative acceptance, Contractor shall also provide Principal Representative with reasonably satisfactory documentary evidence that the Equipment/Direct Purchase Equipment installed is the Equipment/Direct Purchase Equipment specified in **Schedule B** and any subsequently necessary and accepted design or construction documents.

e. Inspection and Disputes.

(1) The Principal Representative may inspect the Work provided under this Contract at all reasonable times and places. If any Work does not conform to this Agreement, the Principal Representative may require Contractor to perform the Work again in conformity with this Agreement's requirements, with no additional compensation. When defects in the quality or quantity of Work cannot be corrected by re- performance, the Principal Representative may:

- A.** Require Contractor to take necessary action to ensure that the future performance conforms to Agreement's requirements; and/or
- B.** Equitably reduce the payment due Contractor to reflect the reduced value of the Work performed.

(2) Such remedies in no way limit the remedies available to City in the termination provisions of this Agreement, or remedies otherwise available at law. Disputes under this Agreement shall be subject to the terms of this Agreement and **Schedule A**.

13. ENVIRONMENTAL REQUIREMENTS:

a. Excluded Material and Activities. Pursuant to its performance of the Project, Contractor may encounter, but is not responsible for, any work relating to Excluded Materials and Activities, as defined in **Article 1**. If the City requires continued performance of this Agreement, and the performance of any Project involves any Excluded Materials and Activities, the City shall perform or arrange for the performance of such work and shall bear the sole cost, risk, and responsibility therefore.

b. Discovery of Excluded Materials and Activities.

(1) Notice - Work Stoppage. If Contractor discovers Excluded Materials and Activities, Contractor shall immediately cease work and remove all Contractor

personnel or Subcontractors from the site, and notify the Principal Representative. Contractor shall undertake no further work on the Premises except as authorized by the Principal Representative in writing. Notwithstanding anything in this Agreement to the contrary, any such event of discovery or remediation by the City or Contractor shall not constitute a default. In the event of such stoppage of Work by Contractor, the time for the completion of the Work shall be automatically extended by the amount of time of the work stoppage and any additional costs incurred by Contractor as a result shall be added by Change Order.

(2) Other Hazardous Materials. Contractor shall be responsible for safely handling, installing, and/or disposing of any other hazardous or other materials that it may bring to the Premises.

(3) Polychlorinated Biphenyl (PCB) Ballasts; Mercury Lamps. Contractor is responsible for the proper handling and disposal of Polychlorinated Biphenyl (PCB) Ballasts and Mercury Lamps. Upon discovery of PCB Ballasts and Mercury Lamps, Contractor shall enter into an agreement with an approved PCB ballast disposal contractor who shall provide an informational packet, packing receptacles and instructions, labels and shipping materials, transportation, and recycling or incineration services such materials. All capacitors and asphalt potting compound materials removed from the PCB Ballasts shall be incinerated in a federally approved facility. After proper disposal, a Certificate of Destruction shall be provided by the approved facility to the Principal Representative. Contractor's responsibility shall be for the proper and legal management of any of the PCB Ballasts removed as a result of the Work. Contractor shall enter into an agreement with an approved Mercury Lamp disposal contractor who shall provide approved containers, materials required to label, transportation, recycling or incineration in accordance with EPA requirements, and a copy of the Manifest of Ownership.

(4) Manifests of Ownership. The City will sign a Manifest of Ownership for any PCB Ballasts and Mercury Lamps encountered and removed from the Premises.

14. TRAINING AND FOLLOW-UP ACTIVITIES BY CONTRACTOR:

a. Training. Contractor shall provide training to the Principal Representative and to City personnel regarding operation of all new and upgraded Equipment or Direct Purchase Equipment. Training shall be conducted simultaneously with Project Work and commissioning Work and shall include, but not be limited to, any HVAC equipment installed, controls, utilities, lighting, safety, manufacturer's warranties, and operation and maintenance manuals per **Schedule R** (Contractor Training Responsibilities). All training performed by Contractor shall (i) meet the standards established by the Equipment and Direct Purchase Equipment manufacturers, (ii) be included in the Fixed Limit of Construction Cost and (iii) be completed per **Schedule R**, in order for the Principal Representative to issue a Notice of Final Acceptance of the Project.

b. Emissions Reductions Documentation and Reporting. Contractor shall include information about environmental savings (not any Guaranteed Annual Cost Savings as described in **Article 18**) in each annual report and advise the Principal Representative about opportunities to achieve monetary benefit from such credits.

c. **Application for Certifications.** Contractor shall provide information related to **Schedule B** necessary for the Principal Representative to submit any required Federal, State, Local performance or other applicable Certifications.

15. MALFUNCTIONS AND EMERGENCIES:

a. The Principal Representative will use its best efforts to notify Contractor within 24 hours of the Principal Representative's actual knowledge and occurrence of: (i) any malfunction in the operation of the Equipment and Direct Purchase Equipment or any pre-existing energy related equipment that might materially impact the Guaranteed Annual Cost Savings, (ii) any interruption or alteration to the energy supply to the Premises, or (iii) any alteration or modification in any energy-related equipment or its operation. When the Principal Representative exercises reasonable due diligence in attempting to assess the existence of a malfunction, interruption, or alteration it shall be deemed not at fault in failing to correctly identify any such conditions as having a material impact upon the Guaranteed Annual Cost Savings.

b. If such malfunction, interruption, or alteration occurs during the Contractor's One-Year Warranty period, Contractor shall use commercially reasonable efforts to respond to any such notice within 24 hours of receipt of notice, and shall promptly thereafter proceed with corrective measures. The Principal Representative will provide Contractor with written memorialization of any telephone notice within three business days after the notice was given.

c. Contractor shall provide a written record of all service work performed for each malfunction or emergency. This record shall indicate the reason for the service, description of the problem and the corrective action performed.

d. The City may take reasonable steps to protect the Equipment and Direct Purchase Equipment if, due to an emergency, it is not possible or reasonable to notify Contractor before taking any such actions. The City agrees to maintain the Premises in good repair and to protect and preserve all portions thereof, which may in any way affect the operation or maintenance of the Equipment and Direct Purchase Equipment, all in accordance with the same standard of care the City applies to the Premises generally.

16. OWNERSHIP:

a. Ownership of Documents (Instruments of Service).

(1) Drawings, specifications and other documents, including those in electronic form, prepared by the Contractor's Architect/Engineer and the Contractor's Architect/Engineer's contractors are Instruments of Service for use solely with respect to this Project. The Contractor's Architect/Engineer and the Contractor's Architect/Engineer's contractors shall be deemed the authors and owners of their respective Instruments of Service and shall retain all common law, statutory and other reserved rights, including copyrights.

(2) Upon execution of this EPC and the contract between the Contractor's and the Contractor's Architect/Engineer, the Contractor's Architect/Engineer shall grant to the City a perpetual nonexclusive license to reproduce and use, and permit others to reproduce and use for the City, the Contractor's Architect/Engineer's Instruments of Service solely for the purposes of constructing, using and maintaining the Project for future alterations or additions to the Project. The Contractor's Architect/Engineer shall obtain similar nonexclusive licenses from the Contractor's Architect/Engineer's contractors consistent with this Agreement. If and upon the date the Contractor's Architect/Engineer is adjudged in default, the foregoing license shall be deemed terminated and replaced by a second, nonexclusive license permitting the City to authorize other similarly credentialed design professionals to reproduce and, where permitted by law, to make changes, corrections and additions to the Instruments of Service solely for the purposes of completing, using and maintaining the Project for future alterations or additions to the Project.

(3) Any unilateral use by the City of the Instruments of Service for completing, using, maintaining, adding to or altering the Project or facilities shall be at the City's sole risk and without liability to the Contractor's Architect/Engineer and the Contractor's Architect/Engineers contractors; provided, however, that if the City's unilateral use occurs for completing, using or maintaining the Project as a result of the Contractor's Architect/Engineer's default, nothing in this Article shall be deemed to relieve the Contractor's Architect/Engineer of liability for its own acts or omissions or default.

b. As-Built Drawings/Record Drawings. The Contractor's Architect/Engineer and its contractors shall, upon completion of the Construction Term, receive redline as-built Drawings from any Subcontractors or vendors. These redline changes shall describe the built condition of the Project. This information and all of the incorporated changes directed shall be incorporated by the Contractor's Architect/Engineer and its contractors into a Record Drawings document provided to the City in the form of an electro-media format and a reproducible format as agreed between the parties. The Contractor's Architect/Engineer shall also provide the Principal Representative with the as-built Drawings as received from the Contractor.

c. Ownership of Existing Equipment.

(1) Property owned by the City located at the Premises on the Effective Date shall remain the property of the City even if it is replaced or its operation made unnecessary by Work Contractor performs pursuant to this Agreement. Contractor shall advise the Principal Representative in writing of any equipment and materials to be replaced at the Premises and the Principal Representative shall within 30 days designate in writing to Contractor which equipment and materials should not be disposed of off-site by Contractor.

(2) The Principal Representative shall designate the location and storage for any equipment and materials that it designates to be disposed of by Contractor. Contractor shall dispose of all equipment and materials designated by the Principal Representative as disposable off-site and in accordance with all applicable disposal laws and regulations.

(3) Except as otherwise indicated, Contractor shall not be obligated to dispose of or be responsible for any materials identified in **Article 13**.

17. MEASUREMENT AND VERIFICATION:

a. M&V Plan. Contractor shall provide the M&V Plan as required per the CEO Measurement and Verification Policy. The M&V Plan shall outline the M&V Option for each Utility Cost-Savings Measure or FIM. The Contractor M&V Plan is presented in **Schedule D** per the requirements of **Schedule D**.

b. M&V Services. Contractor shall provide M&V Services and all other services required to be performed by it pursuant to **Schedule D** during the M&V Term. Contractor agrees that **Schedule D** shall follow and use as a standard the procedures and protocol as stated in the CEO Measurement and Verification Policy.

c. Energy Usage Records and Data. The Principal Representative shall furnish, or authorize its utility suppliers to furnish, to Contractor or its designee upon Contractor's written request, all records and data regarding energy, water, or other utilities usage and related maintenance at the Premises no later than 45 days from date of request.

d. M&V Term. The M&V Term is as set forth in **Article 6**. Upon termination of the M&V Term, the City shall have no further liability or responsibility for any further payment to Contractor for M&V Services. Upon termination of the M&V Term the Contractor shall have no further liability or responsibility for any M&V Services or Guarantee.

e. M&V Fee. The City shall pay to Contractor for performance of the M&V Services a maximum not-to-exceed amount as specified in **Schedule D** and shall be included in the MCP. Cost savings to support the fee are guaranteed. The cost is not included in the MEP. At the request of the Principal Representative, additional years of M&V may be added at a negotiated additional cost, and shall not be included in the MCP.

f. Payment. The City shall pay Contractor pursuant to **Article 8**.

g. M&V Information Procedure. Measurement and Verification of Savings shall be verified as outlined in **Schedule D**.

h. Monitoring Equipment. Contractor shall provide all additional necessary equipment required to perform the M&V Services. The Contractor may utilize existing equipment, systems, utility meters if applicable or provide the necessary equipment as described in **Schedule D**.

i. Independent Monitor. The City, at its sole expense, may hire an independent third party monitor to review Contractor's measurement and verification reports,

including verifying the prorated share of the Guarantee in any event of contract termination. The City shall pay the cost of any independent monitoring through a separate contract.

18. GUARANTEE:

a. Guarantee. The Guarantee for the first year of the Guarantee Period is Seven Hundred Twenty-Six Thousand One Hundred Seven Dollars and Zero Cents (\$726,107.00) as indicated on **Schedule C**. Contractor hereby warrants and guarantees that during the Guarantee Period, the Project shall result in annual cost savings equal to or greater than the Guaranteed Annual Cost Savings presented in **Schedule C** which shall be equal to or greater than the City's annual and aggregate payments used to repay the project funding, as provided in **Schedule C** and as set forth in C.R.S. § 29- 12.5-101(3). Failure to meet Guaranteed Annual Cost Savings in any year during the Guarantee Period shall be as defined in **Article 1**. Cost savings in excess of the Guaranteed Annual Cost Savings shall be solely retained by the City.

b. Sufficiency of Savings. Contractor hereby warrants, guarantees, and represents that the Guaranteed Annual Cost Savings is accurately represented in **Schedule C**.

c. Termination. If this Contract is terminated by the City for any reason, the Guarantee shall be cancelled and Contractor shall have no further obligations hereunder, except to guarantee the City the prorated portion of the annual amount of Guarantee up to the date of termination. The prorated portion shall include any Savings incurred prior to the termination date. The Contractor shall have all of the remedies listed in **Article 24** in addition to all other remedies set forth in other sections of this Agreement and **Schedule A**.

19. MODIFICATION, UPGRADE, OR ALTERATIONS OF EQUIPMENT:

a. Modification of Equipment. The City shall not during the Term of this Agreement, without Contractor's prior written approval, which shall not be unreasonably withheld, affix or install any accessory equipment or device on any of the Equipment or Direct Purchase Equipment if such addition changes or impairs the originally intended Savings, functions, value or use of the Equipment or Direct Purchase Equipment.

b. Upgrade or Alteration Operations and Procedures.

(1) During the performance of this Agreement, Contractor may, subject to prior authorization of the City, revise any procedures for the operation of the Equipment/Direct Purchase Equipment or implement other energy saving actions in the Premises, provided that:(a) Contractor complies with the Standards of Comfort, as set forth in this Agreement, and services set forth in **Schedule N**; (b) such modifications or additions to, any other operational changes, or new procedures enable Contractor to achieve a greater amount of energy and cost savings than the Savings, at the Premises; (c) any cost incurred relative to such modifications, additions or other operational changes or new procedures are solely borne by Contractor and paid for with any Contingency Funds; and (d) any such action complies with State, federal and local law and is in the public interest of the City in the City's sole discretion. Any such upgrade or alteration shall not result in any additional cost to the City.

(2) All modifications, additions or replacements of the Equipment or Direct Purchase Equipment, if required due to failure of the Equipment or Direct Purchase Equipment, or other revisions to operating or other procedures shall be described at that time in supplemental Schedules provided to the City for approval; provided that any replacement of the Equipment shall, unless otherwise agreed, be new and shall reduce energy consumption at the Premises more than the Equipment or Direct Purchase Equipment being replaced. Contractor shall update any and all software it owns which is necessary for the operation of the Equipment or Direct Purchase Equipment.

20. LOCATION AND ACCESS: The Principal Representative shall provide access to the Premises for Contractor to perform any function related to this Agreement during regular business hours, or such other reasonable hours requested by Contractor that are acceptable to the Principal Representative. Contractor shall be granted immediate access to make emergency repairs or corrections as Contractor determines are needed. Contractor shall provide a written memorialization within three business days of the access specifying the emergency action taken, the reasons therefore, and the impact on the Premises.

21. MATERIAL CHANGES:

a. A Material Change as defined could be the result of the City not fulfilling its responsibilities as listed in **Article 26** or from actions including to but not limited to one or more of the following:

- (1) manner of use of the Premises by the City;
- (2) occupancy of the Premises;
- (3) modifications, alterations or overrides of the energy management system schedules or hours of operation, set back/start up or holiday schedules;
- (4) facility modifications, renovations, new construction, including the replacement, addition or removal in types and quantities of energy and water consuming equipment, including plug load items, used at the Premises;
- (5) changes in utility provider or utility rate classification; or
- (6) any other conditions other than climate affecting energy or water usage at the Premises.

b. Reported Material Changes; Notice by the City. The Principal Representative shall use commercially reasonable efforts to deliver to Contractor a written notice describing all actual or proposed Material Changes in the Premises or in the operations of the

Premises at least 14 days before any actual or proposed Material Change is implemented or as soon as is practicable after an emergency or other unplanned event. Notice to Contractor of Material Changes which result because of a bona fide emergency or other situation precluding advance notice shall be deemed sufficient if given by the Principal Representative within five business days after the Principal Representative discovers the event constituting the Material Change or receives actual knowledge thereof.

c. Other Adjustments. Contractor shall work with the Principal Representative to investigate, identify and correct any Material Changes that prevent the Savings from being realized. As a result of any such investigation, Contractor and the Principal Representative shall determine what, if any, adjustments to the baseline shall be made in accordance with the provisions set forth in **Schedule B** and **Schedule C**. Any disputes between the City and Contractor concerning any such adjustment shall be resolved in accordance with the provisions of this Agreement and **Schedule A**.

d. Force Majeure. See Yellow Book 1105 § 2.

22. TERMINATION:

a. The City has the right to terminate the Agreement with cause upon written notice effective immediately, and without cause upon thirty (30) days prior written notice to the Contractor. However, nothing gives the Contractor the right to perform services under the Agreement beyond the time when its services become unsatisfactory to the Executive Director.

b. Notwithstanding the preceding paragraph, the City may terminate the Agreement if the Contractor or any of its officers or employees are convicted, plead *nolo contendere*, enter into a formal agreement in which they admit guilt, enter a plea of guilty or otherwise admit culpability to criminal offenses of bribery, kick backs, collusive bidding, bid-rigging, antitrust, fraud, undue influence, theft, racketeering, extortion or any offense of a similar nature in connection with Contractor's business. Termination for the reasons stated in this paragraph is effective upon receipt of notice.

c. Upon termination of the Agreement, with or without cause, the Contractor shall have no claim against the City by reason of, or arising out of, incidental or relating to termination, except for compensation for work duly requested and satisfactorily performed as described in the Agreement.

d. If the Agreement is terminated, the City is entitled to and will take possession of all materials, equipment, tools and facilities it owns that are in the Contractor's possession, custody, or control by whatever method the City deems expedient. The Contractor shall deliver all documents in any form that were prepared under the Agreement and all other items, materials and documents that have been paid for by the City to the City. These documents and materials are the property of the City. The Contractor shall mark all copies of work product that are incomplete at the time of termination "DRAFT-INCOMPLETE".

23. BREACH:

a. Defined. In addition to any Breaches specified in other sections of this Agreement, the failure of either Party to perform any of its material obligations hereunder in whole or in part or in a timely or satisfactory manner may constitute a Breach. The institution of proceedings under any bankruptcy, insolvency, reorganization or similar law, by or against Contractor, or the appointment of a receiver or similar officer for Contractor or any of its property, which is not vacated or fully stayed within 20 days after the institution or occurrence thereof, may also constitute a Breach. Each of the following events or conditions may constitute a Breach by Contractor:

(1) Contractor does not provide the Standards of Comfort and service set forth in **Schedule N** due to failure of Contractor to properly design, install, maintain, repair or adjust the Equipment except that such failure, if corrected or cured within 30 days after written notice by the Principal Representative to Contractor demanding that such failure be cured, shall be deemed cured for purposes of this Agreement;

(2) Any representation or warranty furnished by Contractor in this Contract is false or misleading in any material respect when made;

(3) The existence of any lien or encumbrance upon the Equipment or Direct Purchase Equipment by any subcontractor, laborer or materialman which is not released or otherwise cured within 30 days after notice of said filing;

(4) Any failure by the Contractor to perform or comply with the terms and conditions of this Contract, including Breach of any covenant contained herein except that such failure, if corrected or cured within 30 days after written notice by the Principal Representative to the Contractor demanding that such failure to perform be cured, shall be deemed cured for purposes of this Agreement;

(5) The creation or submittal by Contractor of any data related to this Contract that is intentionally inconsistent or incorrect, or the inability to verify Contractor's reports regarding the Guarantee as determined by any independent third-party monitor retained by the City if such third- party monitor determines that such inability is due to intentional acts of Contractor. Except as provided herein, any creation or submittal by Contractor of any data related to this Contract that is inconsistent, incorrect, or unable to be verified shall be considered a breach and is subject to the cure period discussed herein; or

(6) The Savings is less than the Guaranteed Annual Cost Savings and the Contractor fails to reconcile the difference as provided herein.

b. Notice and Cure Period. In the event of a Breach, notice of such shall be given in writing by the aggrieved Party to the other Party in the manner provided in **Article 42**. If such Breach is not cured within 30 days of receipt of written notice, or if a cure cannot be completed within 30 days, or if cure of the Breach has not begun within 30 days and pursued with

due diligence, the City may exercise any of the remedies set forth in **Article 24**. Notwithstanding anything to the contrary herein, the Principal Representative, in its sole discretion, need not provide advance notice or a cure period and may immediately terminate this Agreement in whole or in part if reasonably necessary to preserve public safety or to prevent immediate public crisis.

24. REMEDIES:

a. Remedies Not Involving Termination. If Contractor is in Breach under any provision of this Agreement, the City, in its sole discretion, may exercise one or more of the following remedies in addition to other remedies available to it:

(1) Suspend Performance. Suspend Contractor's performance with respect to all or any portion of this Agreement pending necessary corrective action as specified by the City without entitling Contractor to an adjustment in price/cost or performance schedule. Contractor shall promptly cease performance and incurring costs in accordance with the directive of the City and the City shall not be liable for costs incurred by Contractor after the suspension of performance under this provision.

(2) Withhold Payment. Withhold payment to Contractor until corrections in Contractor's performance are satisfactorily made and completed.

(3) Deny Payment. Deny payment for those obligations not performed that because to Contractor's actions or inactions, cannot be performed or, if performed, would be of no value to the City; provided, that any denial of payment shall be reasonably related to the value to the City of the obligations not performed.

(4) Removal. Notwithstanding any other provision herein, City may demand immediate removal of any of Contractor's employees, agents, or Subcontractors whom the Principal Representative deems incompetent, careless, insubordinate, unsuitable, or otherwise unacceptable, or whose continued relation to this Agreement is deemed to be contrary to the public interest or the City's best interest.

(5) Intellectual Property. If Contractor infringes on a patent, copyright, trademark, trade secret or other intellectual property right while performing its obligations under this Agreement, Contractor shall, at the City's option **(a)** obtain for the City or Contractor the right to use such products and services; **(b)** replace any Goods, Services, or other product involved with non-infringing products or modify them so that they become non-infringing; or, **(c)** if neither of the foregoing alternatives are reasonably available, remove any infringing Goods, Services, or products and refund the price paid therefore to the City.

b. Termination Prior to M&V Commencement Date. If Contractor is in Breach under any provision of this Agreement, in addition to all other remedies set forth in other sections of this Agreement and **Schedule A**, the City may terminate this entire Agreement or any part of this Agreement as provided herein or pursuant to **Schedule A**. The City may exercise any or all of the remedies available to it, in its sole discretion, concurrently or consecutively. Exercise

by the City of this right shall not be a breach of its obligations hereunder. Contractor shall continue performance of this Contract to the extent not terminated, if any. To the extent specified in any termination notice, Contractor shall complete and deliver to the Principal Representative for the records of the City all Work not cancelled by the termination notice and may incur obligations as are necessary to do so within this Contract's terms. At the sole discretion of the City, Contractor shall assign to the City all of Contractor's right, title, and interest under such terminated orders or subcontracts; provided that Contractor's obligations with respect to Contractor's Intellectual Property are set forth in **Article 51** below. Upon termination, Contractor shall take timely, reasonable and necessary action to protect and preserve property in the possession of Contractor in which the City has an interest. All materials owned by the City in the possession of Contractor shall be immediately returned to the City. All Work Product, at the option of the City, shall be delivered by Contractor to the City and shall become the City's personal property.

c. Termination of M&V Term. Notwithstanding anything to the contrary herein, the City may terminate this Agreement after the first three years of the M&V Term, and if so terminated, Contractor shall have no further obligations hereunder thereafter.

25. REPRESENTATIONS AND WARRANTIES:

a. Representations. Contractor makes the following specific representations and warranties, each of which was relied on by the City in entering into this Contract.

(1) Standard and Manner of Performance. Contractor shall perform its obligations under this Agreement in accordance with the highest standards of care, skill and diligence in Contractor's industry, trade, or profession.

(2) Legal Authority – Contractor Signatory. Contractor warrants that it possesses the legal authority to enter into this Agreement and that it has taken all actions required by its procedures, and by-laws, and/or applicable laws to exercise that authority, and to lawfully authorize its undersigned signatory to execute this Agreement, or any part thereof, and to bind Contractor to its terms. If requested by the City, Contractor shall provide the Principal Representative, for the records of the City, with proof of Contractor's authority to enter into this Agreement within 15 days of receiving such request.

(3) Licenses, Permits, Etc. Contractor represents and warrants that as of the Effective Date it has, and that at all times during the term hereof it shall have and maintain, at its sole expense, all licenses, certifications, approvals, insurance, permits, and other authorizations required by law to perform its obligations hereunder. Contractor warrants that it shall maintain all necessary licenses, certifications, approvals, insurance, permits, and other authorizations required to properly perform this Agreement, without reimbursement by the City or other adjustment in MCP. Additionally, the Contractor shall ensure that all employees, agents and Subcontractors secure and maintain at all times during the term of their employment, agency or subcontract, all license, certifications, permits and other authorizations required to perform their obligations in relation to this Agreement. Contractor, if a foreign corporation or other foreign entity transacting business in the State of Colorado, further warrants that it currently has obtained and

shall maintain any applicable certificate of authority to transact business in the State of Colorado and has designated a registered agent in Colorado to accept service of process. Any revocation, withdrawal or non-renewal of licenses, certifications, approvals, insurance, permits or any such similar requirements necessary for Contractor to properly perform the terms of this Agreement is an Event of Default by Contractor and constitutes grounds for termination of this Agreement. Contractor shall use Subcontractors who are qualified and licensed in the State of Colorado to perform the work so subcontracted pursuant to the terms hereof. The Equipment and Direct Purchase Equipment are or shall be compatible with, or functional with, and or an upgrade to all other Premises mechanical and electrical systems, subsystems, or components with which the Equipment or Direct Purchase Equipment interacts, and that, as installed, neither the Equipment nor Direct Purchase Equipment nor such other systems, subsystems, or components shall materially adversely affect each other as a direct or indirect result of Equipment or Direct Purchase Equipment installation or operation except in cases where that Principal Representative has directed, or approved, Contractor to install such equipment. That Contractor is financially solvent, able to pay its debts as they mature and possesses sufficient working capital to complete the installation and perform its obligations under this Agreement.

b. Warranties. The warranties set forth in this section and such other warranties as may be set forth in this Agreement are a part of the minimum work requirements of this Agreement and all remediation or other actions required by such warranties shall be performed or delivered without additional cost to the City.

(1) Warranties Generally Applicable. In addition to the Warranties provided in **Schedule A**, during the Construction phase, of this Agreement and for a period of one year following the Principal Representative's submission of either the Notice of Substantial Completion or Notice of Partial Substantial Completion for each Utility Cost- Savings Measure or FIM, whichever is longer, Contractor warrants that:

A. The Work shall meet the Specifications set forth in the Contract Documents and be acceptable to the City;

B. There are not any pending suits, claims, or actions of any type with respect to the Equipment, Direct Purchase Equipment, or Work;

C. All Equipment, Direct Purchase Equipment, and Work provided are free and clear of any liens, encumbrances or claims arising by or through Contractor or any party related to Contractor;

D. Contractor will perform all of its obligations in accordance with **Article 11**, Contractor Performance;

E. the Equipment and Direct Purchase Equipment is new, unless otherwise agreed in writing;

F. shall be materially free from defects in materials; and

G. shall function properly.

(2) Equipment and Direct Purchase Equipment. Specific and any material warranties that exceed the Equipment and Direct Purchase Equipment One-Year Warranty period shall be provided directly by the Equipment/Direct Purchase Equipment or material manufacturers and Contractor shall assign such warranties to the City, after the One-Year Warranty period.

(3) Obligations. During the One-Year Warranty period, Contractor shall remedy any defects due to faulty materials and shall pay for, repair and replace any resulting damage to other work or any other resulting damage directly associated with the Work. Only new and not reconditioned parts may be used as a remedy. The Principal Representative shall give written notice to Contractor of observed defects or other Work requiring correction with reasonable promptness. Contractor shall pursue rights and remedies against any Equipment or Direct Purchase Equipment manufacturers under the warranties in the event of Equipment or Direct Purchase Equipment malfunction or improper or defective function, defects in parts, workmanship and performance during the One-Year Warranty period. Contractor shall, during the One-Year Warranty period, notify the Principal Representative whenever defects in Equipment or in Direct Purchase Equipment parts or performance arise that may provide a warranty claim. During the One-Year Warranty period, the cost of any risk of damage or damage to the Equipment or Direct Purchase Equipment and its performance, including damage to property, equipment of the City or the Premises, or Equipment, or Direct Purchase Equipment, due to Contractor's failure to exercise its warranty rights shall be borne solely by Contractor. Notwithstanding the above, nothing in this section shall be construed to abrogate Contractor's duty to perform its other obligations under this Contract. Contractor shall also remedy any deviation from the requirements of the Contract Documents which shall later be discovered within a period of one year from the date of the Notice of Substantial Completion. The Principal Representative shall give Notice of observed defects or other Work requiring correction with reasonable promptness. Such Notice shall be in writing to Contractor.

26. CITY M&V TERM RESPONSIBILITIES: The City is responsible during the M&V Term for:

- a. Hours of operation of the Premises or for any equipment or systems operating at the Premises;
- b. Notifying the Contractor about equipment performance issues as they are noticed;
- c. Permanent changes in the comfort and service parameters set forth in **Schedule N** (Standards of Comfort);
- d. Failure to provide maintenance of and repairs to the Equipment or Direct Purchase Equipment in accordance with **Schedule S** (City's Maintenance Responsibilities); and

e. Providing Contractor the right once a month, with prior notice, to inspect the Premises to determine if the City is complying with appropriate schedules. For the purpose of determining such compliance, the checklist to be set forth at **Schedule S** (City's Maintenance Responsibilities), as completed and recorded by Contractor during its monthly inspections, shall be used to measure and record the compliance of the City. The City shall make the Premises available to Contractor for and during each monthly inspection, and shall have the right to witness each inspection and Contractor's recordation on the checklist. The Principal Representative, on behalf of the City, may complete checklist for the City at the same time. Contractor shall not interfere with any operations of the City during any monthly inspection.

27. STATUS OF CONTRACTOR: The Contractor is an independent Contractor retained to perform professional or technical services for limited periods of time. Neither the Contractor nor any of its employees are employees or officers of the City under Chapter 18 of the Denver Revised Municipal Code, or for any purpose whatsoever.

28. EXAMINATION OF RECORDS: Any authorized agent of the City, including the City Auditor or his or her representative, has the right to access and the right to examine, copy and retain copies, at City's election in paper or electronic form, any pertinent books, documents, papers and records related to Contractor's performance pursuant to this Agreement, provision of any goods or services to the City, and any other transactions related to this Agreement. Contractor shall cooperate with City representatives and City representatives shall be granted access to the foregoing documents and information during reasonable business hours and until the latter of three (3) years after the final payment under the Agreement or expiration of the applicable statute of limitations. When conducting an audit of this Agreement, the City Auditor shall be subject to government auditing standards issued by the United States Government Accountability Office by the Comptroller General of the United States, including with respect to disclosure of information acquired during the course of an audit. No examination of records and audit pursuant to this paragraph shall require Parties to make disclosures in violation of state or federal privacy laws. Parties shall at all times comply with D.R.M.C. 20-276.

29. WHEN RIGHTS AND REMEDIES NOT WAIVED: In no event will any payment or other action by the City constitute or be construed to be a waiver by the City of any breach of covenant or default that may then exist on the part of the Contractor. No payment, other action, or inaction by the City when any breach or default exists will impair or prejudice any right or remedy available to it with respect to any breach or default. No assent, expressed or implied, to any breach of any term of the Agreement constitutes a waiver of any other breach.

30. INSURANCE:

a. **General Conditions:** Contractor agrees to secure, at or before the time of execution of this Agreement, the following insurance covering all operations, goods or services provided pursuant to this Agreement. Contractor shall keep the required insurance coverage in force at all times during the term of the Agreement, including any extension thereof, and during any warranty period. The required insurance shall be underwritten by an insurer licensed or

authorized to do business in Colorado and rated by A.M. Best Company as "A-VIII" or better. Each policy shall require notification to the City in the event any of the required policies be canceled or non-renewed before the expiration date thereof. Such written notice shall be sent to the parties identified in the Notices section of this Agreement. Such notice shall reference the City contract number listed on the signature page of this Agreement. Said notice shall be sent thirty (30) days prior to such cancellation or non-renewal unless due to non-payment of premiums for which notice shall be sent ten (10) days prior. If such written notice is unavailable from the insurer, Contractor shall provide written notice of cancellation, non-renewal and any reduction in coverage to the parties identified in the Notices section by certified mail, return receipt requested within three (3) business days of such notice by its insurer(s) and referencing the City's contract number. Contractor shall be responsible for the payment of any deductible or self-insured retention. The insurance coverages specified in this Agreement are the minimum requirements, and these requirements do not lessen or limit the liability of the Contractor. The Contractor shall maintain, at its own expense, any additional kinds or amounts of insurance that it may deem necessary to cover its obligations and liabilities under this Agreement.

b. Proof of Insurance: Contractor may not commence services or work relating to this Agreement prior to placement of coverages required under this Agreement. Contractor certifies that the certificate of insurance attached as **Exhibit K**, preferably an ACORD form, complies with all insurance requirements of this Agreement. The City requests that the City's contract number be referenced on the certificate of insurance. The City's acceptance of a certificate of insurance or other proof of insurance that does not comply with all insurance requirements set forth in this Agreement shall not act as a waiver of Contractor's breach of this Agreement or of any of the City's rights or remedies under this Agreement. The City's Risk Management Office may require additional proof of insurance, including but not limited to policies and endorsements.

c. Additional Insureds: For Commercial General Liability, Auto Liability and Excess Liability/Umbrella (if required), Contractor and subcontractor's insurer(s) shall include the City and County of Denver, its elected and appointed officials, employees and volunteers as additional insured.

d. Waiver of Subrogation: For all coverages required under this Agreement, Contractor's insurer shall waive subrogation rights against the City.

e. Subcontractors and Subconsultants: Contractor shall confirm and document that all subcontractors and subconsultants (including independent contractors, suppliers or other entities providing goods or services required by this Agreement) procure and maintain coverage as approved by the Contractor and appropriate to their respective primary business risks considering the nature and scope of services provided.

f. Workers' Compensation and Employer's Liability Insurance: Contractor shall maintain the coverage as required by statute for each work location and shall maintain Employer's Liability insurance with limits of \$100,000 per occurrence for each bodily

injury claim, \$100,000 per occurrence for each bodily injury caused by disease claim, and \$500,000 aggregate for all bodily injuries caused by disease claims.

g. Commercial General Liability: Contractor shall maintain a Commercial General Liability insurance policy with minimum limits of \$1,000,000 for each bodily injury and property damage occurrence, \$2,000,000 products and completed operations aggregate (if applicable), and \$2,000,000 policy aggregate.

h. Automobile Liability: Contractor shall maintain Automobile Liability with minimum limits of \$1,000,000 combined single limit applicable to all owned, hired and non-owned vehicles used in performing services under this Agreement.

i. Professional Liability (Errors & Omissions): Contractor shall maintain minimum limits of \$1,000,000 per claim and \$1,000,000 policy aggregate limit. The policy shall be kept in force, or a Tail policy placed, for three (3) years for all contracts except construction contracts for which the policy or Tail shall be kept in place for eight (8) years.

j. Builder's Risk or Installation Floater: Contractor shall maintain limits equal to the completed value of the project. Coverage shall be written on an all risk, replacement cost basis including coverage for soft costs, flood and earth movement, if in a flood or quake zone, and, if applicable, equipment breakdown including testing. The City and County of Denver, Contractor, and subcontractors shall be Additional Named Insureds under the policy. Policy shall remain in force until acceptance of the project by the City.

31. DEFENSE AND INDEMNIFICATION:

a. Contractor hereby agrees to defend, indemnify, reimburse and hold harmless City, its appointed and elected officials, agents and employees for, from and against all liabilities, claims, judgments, suits or demands for damages to persons or property arising out of, resulting from, or relating to the work performed under this Agreement ("Claims"), unless such Claims have been specifically determined by the trier of fact to be the sole negligence or willful misconduct of the City. This indemnity shall be interpreted in the broadest possible manner to indemnify City for any acts or omissions of Contractor or its subcontractors either passive or active, irrespective of fault, including City's concurrent negligence whether active or passive, except for the sole negligence or willful misconduct of City.

b. Contractor's duty to defend and indemnify City shall arise at the time written notice of the Claim is first provided to City regardless of whether Claimant has filed suit on the Claim. Contractor's duty to defend and indemnify City shall arise even if City is the only party sued by claimant and/or claimant alleges that City's negligence or willful misconduct was the sole cause of claimant's damages.

c. Contractor will defend any and all Claims which may be brought or threatened against City and will pay on behalf of City any expenses incurred by reason of such Claims including, but not limited to, court costs and attorney fees incurred in defending and

investigating such Claims or seeking to enforce this indemnity obligation. Such payments on behalf of City shall be in addition to any other legal remedies available to City and shall not be considered City's exclusive remedy.

d. Insurance coverage requirements specified in this Agreement shall in no way lessen or limit the liability of the Contractor under the terms of this indemnification obligation. The Contractor shall obtain, at its own expense, any additional insurance that it deems necessary for the City's protection.

e. This defense and indemnification obligation shall survive the expiration or termination of this Agreement.

32. PAYMENT OF CITY MINIMUM WAGE: The Contractor shall comply with, and agrees to be bound by, all requirements, conditions, and City determinations regarding the City's Minimum Wage Ordinance, Sections 20-82 through 20-84 D.R.M.C., including, but not limited to, the requirement that every covered worker shall be paid no less than the City Minimum Wage in accordance with the foregoing D.R.M.C. Sections. By executing this Agreement, the Contractor expressly acknowledges that the Contractor is aware of the requirements of the City's Minimum Wage Ordinance and that any failure by the Contractor, or any other individual or entity acting subject to this Agreement, to strictly comply with the foregoing D.R.M.C. Sections shall result in the penalties and other remedies authorized therein.

33. PAYMENT OF CITY PREVAILING WAGE: The Contractor shall comply with, and agrees to be bound by, all requirements, conditions and City determinations regarding the Payment of Prevailing Wages Ordinance, Sections 20-76 through 20-79, D.R.M.C. including, but not limited to, the requirement that every covered worker working on a City owned or leased building or on City-owned land shall be paid no less than the prevailing wages and fringe benefits in effect on the date the bid or request for proposal was advertised. In the event a request for bids, or a request for proposal, was not advertised, the Contractor shall pay every covered worker no less than the prevailing wages and fringe benefits in effect on the date funds for the contract were encumbered. Prevailing wage and fringe rates will adjust on the yearly anniversary of the actual date of bid or proposal issuance, if applicable, or the date of the written encumbrance if no bid/proposal issuance date is applicable. Unless expressly provided for in this Agreement, the Contractor will receive no additional compensation for increases in prevailing wages or fringe benefits. The Contractor shall provide the Auditor with a list of all subcontractors providing any services under the contract. The Contractor shall provide the Auditor with electronically-certified payroll records for all covered workers employed under the contract. The Contractor shall prominently post at the work site the current prevailing wage and fringe benefit rates. The posting must inform workers that any complaints regarding the payment of prevailing wages or fringe benefits may be submitted to the Denver Auditor by calling 720-913-5000 or emailing auditor@denvergov.org. If the Contractor fails to pay workers as required by the Prevailing Wage Ordinance, the Contractor will not be paid until documentation of payment satisfactory to the Auditor has been provided. The City may, by written notice, suspend or terminate work if the Contractor fails to pay required wages and fringe benefits.

34. LETTER OF CREDIT, CONSTRUCTION BONDS: Prior to the commencement of construction, Contractor shall deliver to the Executive Director a payment and performance bond on a form approved by the City Attorney's Office, or alternate form of surety, letter of credit or alternate form of assurance acceptable and approved by the City Attorney's Office, in a sum equal to the MCP payable to the City. Said bond shall guarantee prompt and faithful payment by the Contractor directly to the Contractor's contractors and by the Contractor's contractors to all persons supplying labor, materials, team hire, sustenance, provisions, provender, supplies, rental machinery, tools and equipment used directly or indirectly by the said contractor, subcontractor(s) and suppliers in the prosecution of the work provided for in said construction contract and shall protect the City from any liability, losses or damages arising therefrom. All bonds shall be issued by a surety company licensed to transact business in the State of Colorado and satisfactory to and approved by the City. A payment and performance bond, or alternate form of surety, letter of credit or alternate form of assurance shall not be required for the asset management services as outlined in the Exhibits.

35. TAXES, CHARGES AND PENALTIES: The City is not liable for the payment of taxes, late charges or penalties of any nature, except for any additional amounts that the City may be required to pay under the City's prompt payment ordinance D.R.M.C. § 20-107, *et seq.* The Contractor shall promptly pay when due, all taxes, bills, debts and obligations it incurs performing the services under the Agreement and shall not allow any lien, mortgage, judgment or execution to be filed against City property.

36. ASSIGNMENT; SUBCONTRACTING: The Contractor shall not voluntarily or involuntarily assign any of its rights or obligations, or subcontract performance obligations, under this Agreement without obtaining the Executive Director's prior written consent. Any assignment or subcontracting without such consent will be ineffective and void, and will be cause for termination of this Agreement by the City. The Executive Director has sole and absolute discretion whether to consent to any assignment or subcontracting, or to terminate the Agreement because of unauthorized assignment or subcontracting. In the event of any subcontracting or unauthorized assignment: (i) the Contractor shall remain responsible to the City; and (ii) no contractual relationship shall be created between the City and any sub-contractor, subcontractor or assign.

37. INUREMENT: The rights and obligations of the Parties to the Agreement inure to the benefit of and shall be binding upon the Parties and their respective successors and assigns, provided assignments are consented to in accordance with the terms of the Agreement.

38. NO THIRD PARTY BENEFICIARY: Enforcement of the terms of the Agreement and all rights of action relating to enforcement are strictly reserved to the Parties. Nothing contained in the Agreement gives or allows any claim or right of action to any third person or entity. Any person or entity other than the City or the Contractor receiving services or benefits pursuant to the Agreement is an incidental beneficiary only.

39. NO AUTHORITY TO BIND CITY TO CONTRACTS: The Contractor lacks any authority to bind the City on any contractual matters. Final approval of all contractual matters

that purport to obligate the City must be executed by the City in accordance with the City's Charter and the Denver Revised Municipal Code.

40. SEVERABILITY: Except for the provisions of the Agreement requiring appropriation of funds and limiting the total amount payable by the City, if a court of competent jurisdiction finds any provision of the Agreement or any portion of it to be invalid, illegal, or unenforceable, the validity of the remaining portions or provisions will not be affected, if the intent of the Parties can be fulfilled.

41. CONFLICT OF INTEREST:

a. No employee of the City shall have any personal or beneficial interest in the services or property described in the Agreement. The Contractor shall not hire, or contract for services with, any employee or officer of the City that would be in violation of the City's Code of Ethics, D.R.M.C. §2-51, et seq. or the Charter §§ 1.2.8, 1.2.9, and 1.2.12.

b. The Contractor shall not engage in any transaction, activity or conduct that would result in a conflict of interest under the Agreement. The Contractor represents that it has disclosed any and all current or potential conflicts of interest. A conflict of interest shall include transactions, activities or conduct that would affect the judgment, actions or work of the Contractor by placing the Contractor's own interests, or the interests of any party with whom the Contractor has a contractual arrangement, in conflict with those of the City. The City, in its sole discretion, will determine the existence of a conflict of interest and may terminate the Agreement if it determines a conflict exists, after it has given the Contractor written notice describing the conflict.

42. NOTICES: All notices required by the terms of the Agreement must be hand delivered, sent by overnight courier service, mailed by certified mail, return receipt requested, or mailed via United States mail, postage prepaid, if to Contractor at the address first above written, and if to the City at:

Executive Director of General Services or Designee
201 W. Colfax Avenue, Dept. 1110
Denver, CO 80202

With a copy of any such notice to:

Denver City Attorney's Office
1437 Bannock St., Room 353
Denver, Colorado 80202

Notices hand delivered or sent by overnight courier are effective upon delivery. Notices sent by certified mail are effective upon receipt. Notices sent by mail are effective upon deposit with the U.S. Postal Service. The Parties may designate substitute addresses where or persons to whom notices are to be mailed or delivered. However, these substitutions will not become effective until actual receipt of written notification.

43. NO EMPLOYMENT OF A WORKER WITHOUT AUTHORIZATION TO PERFORM WORK UNDER THE AGREEMENT:

a. This Agreement is subject to Division 5 of Article IV of Chapter 20 of the Denver Revised Municipal Code, and any amendments (the “Certification Ordinance”).

b. The Contractor certifies that:

(1) At the time of its execution of this Agreement, it does not knowingly employ or contract with a worker without authorization who will perform work under this Agreement, nor will it knowingly employ or contract with a worker without authorization to perform work under this Agreement in the future.

(2) It will participate in the E-Verify Program, as defined in § 8-17.5-101(3.7), C.R.S., and confirm the employment eligibility of all employees who are newly hired for employment to perform work under this Agreement.

(3) It will not enter into a contract with a subcontractor or subcontractor that fails to certify to the Contractor that it shall not knowingly employ or contract with a worker without authorization to perform work under this Agreement.

(4) It is prohibited from using the E-Verify Program procedures to undertake pre-employment screening of job applicants while performing its obligations under this Agreement, and it is required to comply with any and all federal requirements related to use of the E-Verify Program including, by way of example, all program requirements related to employee notification and preservation of employee rights.

(5) If it obtains actual knowledge that a subcontractor or subcontractor performing work under this Agreement knowingly employs or contracts with a worker without authorization, it will notify such subcontractor or subcontractor and the City within three (3) days. The Contractor shall also terminate such subcontractor or subcontractor if within three (3) days after such notice the subcontractor or subcontractor does not stop employing or contracting with the worker without authorization, unless during the three-day period the subcontractor or subcontractor provides information to establish that the subcontractor or subcontractor has not knowingly employed or contracted with a worker without authorization.

(6) It will comply with a reasonable request made in the course of an investigation by the Colorado Department of Labor and Employment under authority of § 8-17.5-102(5), C.R.S., or the City Auditor, under authority of D.R.M.C. 20-90.3.

c. The Contractor is liable for any violations as provided in the Certification Ordinance. If the Contractor violates any provision of this section or the Certification Ordinance, the City may terminate this Agreement for a breach of the Agreement. If this Agreement is so terminated, the Contractor shall be liable for actual and consequential damages to the City. Any

termination of a contract due to a violation of this section or the Certification Ordinance may also, at the discretion of the City, constitute grounds for disqualifying the Contractor from submitting bids or proposals for future contracts with the City.

44. DISPUTES: All disputes between the City and Contractor arising out of or regarding the Agreement will be resolved by administrative hearing pursuant to the procedure established by D.R.M.C. § 56-106(b)-(f). For the purposes of that administrative procedure, the City official rendering a final determination shall be the Executive Director as defined in this Agreement.

45. GOVERNING LAW; VENUE: The Agreement will be construed and enforced in accordance with applicable federal law, the laws of the State of Colorado, and the Charter, Revised Municipal Code, ordinances, regulations and Executive Orders of the City and County of Denver, which are expressly incorporated into the Agreement. Unless otherwise specified, any reference to statutes, laws, regulations, charter or code provisions, ordinances, executive orders, or related memoranda, includes amendments or supplements to same. Venue for any legal action relating to the Agreement will be in the District Court of the State of Colorado, Second Judicial District (Denver District Court).

46. DIVISION OF SMALL BUSINESS OPPORTUNITY REQUIREMENTS:

a. This Agreement is subject to Article III, Divisions 1 and 3 of Chapter 28, Denver Revised Municipal Code (“D.R.M.C.”), designated as §§ 28-31 to 28-40 and 28-51 to 28-90 (the “MWBE Ordinance”); and any Rules and Regulations promulgated pursuant thereto. The contract goal for MWBE participation established for this Agreement by the Division of Small Business Opportunity (“DSBO”) is 18%.

b. Under § 28-68, D.R.M.C., the Contractor has an ongoing, affirmative obligation to maintain for the duration of this Agreement, at a minimum, compliance with the MWBE participation upon which this Agreement was awarded, unless the City initiates a material modification to the scope of work affecting MWBEs performing on this Agreement through change order, contract amendment, force account, or other modification under § 28-70, D.R.M.C. The Contractor acknowledges that:

(1) If directed by DSBO, the Contractor is required to develop and comply with a Utilization Plan in accordance with § 28-62(b), D.R.M.C. Along with the Utilization Plan requirements, the Contractor must establish and maintain records and submit regular reports, as directed by DSBO, which will allow the City to assess progress in complying with the Utilization Plan and achieving the MWBE participation goal. The Utilization Plan is subject to modification by DSBO.

(2) If change orders or any other contract modifications are issued under the Agreement, the Contractor shall have a continuing obligation to promptly inform DSBO in writing of any agreed upon increase or decrease in the scope of work of such contract, upon any

of the bases under § 28-70, D.R.M.C., regardless of whether such increase or decrease in scope of work has been reduced to writing at the time of notification of the change by the City.

(3) If change orders or other amendments or modifications are issued under the contract that include an increase in the scope of work of this Agreement, whether by amendment, change order, force account or otherwise, which increases the dollar value of the contract, whether or not such change is within the scope of work designated for performance by an MWBE at the time of contract award, such change orders or contract modification shall be promptly submitted to DSBO for notification purposes.

(4) Those amendments, change orders, force accounts or other contract modifications that involve a changed scope of work that cannot be performed by existing project subcontractors are subject to the original contract goal. The Contractor shall satisfy the goal with respect to such changed scope of work by soliciting new MWBEs in accordance with § 28-70, D.R.M.C. The Contractor must also satisfy the requirements under §§ 28-60 and 28-73, D.R.M.C., with regard to changes in scope or participation. The Contractor shall supply to the DSBO Director all required documentation under §§ 28-60, 28-70, and 28-73, D.R.M.C., with respect to the modified dollar value or work under the contract.

(5) If applicable, for contracts of one million dollars (\$1,000,000.00) and over, the Contractor is required to comply with § 28-72, D.R.M.C. regarding prompt payment to MWBEs. Payment to MWBE subcontractors shall be made by no later than thirty-five (35) days after receipt of the MWBE subcontractor's invoice.

(6) Failure to comply with these provisions may subject the Contractor to sanctions set forth in § 28-76 of the MWBE Ordinance.

(7) Should any questions arise regarding specific circumstances, the Contractor should consult the MWBE Ordinance or may contact the Project's designated DSBO representative at (720) 913-1999.

47. COMPLIANCE WITH ALL LAWS: Contractor shall perform or cause to be performed all services in full compliance with all applicable laws, rules, regulations and codes of the United States, the State of Colorado; and with the Charter, ordinances, rules, regulations and Executive Orders of the City and County of Denver.

48. LEGAL AUTHORITY: Contractor represents and warrants that it possesses the legal authority, pursuant to any proper, appropriate and official motion, resolution or action passed or taken, to enter into the Agreement. Each person signing and executing the Agreement on behalf of Contractor represents and warrants that he has been fully authorized by Contractor to execute the Agreement on behalf of Contractor and to validly and legally bind Contractor to all the terms, performances and provisions of the Agreement. The City shall have the right, in its sole discretion, to either temporarily suspend or permanently terminate the Agreement if there is a dispute as to the legal authority of either Contractor or the person signing the Agreement to enter into the Agreement.

49. NO CONSTRUCTION AGAINST DRAFTING PARTY: The Parties and their respective counsel have had the opportunity to review the Agreement, and the Agreement will not be construed against any party merely because any provisions of the Agreement were prepared by a particular party.

50. ORDER OF PRECEDENCE: In the event of any conflicts between the language of the Agreement and the exhibits, the language of the Agreement controls.

51. INTELLECTUAL PROPERTY RIGHTS: Except for Contractor's Intellectual Property, the City and Contractor intend that all property rights to any and all materials, text, logos, documents, booklets, manuals, references, guides, brochures, advertisements, URLs, domain names, music, sketches, web pages, plans, drawings, prints, photographs, specifications, software, data, products, ideas, inventions, and any other work or recorded information created by the Contractor and paid for by the City pursuant to this Agreement, in preliminary or final form and on any media whatsoever (collectively, "Materials"), shall belong to the City. The Contractor shall disclose all such items to the City and shall assign such rights over to the City upon completion of the Project. To the extent permitted by the U.S. Copyright Act, 17 USC § 101, *et seq.*, the Materials are a "work made for hire" and all ownership of copyright in the Materials shall vest in the City at the time the Materials are created. To the extent that the Materials are not a "work made for hire," the Contractor (by this Agreement) sells, assigns and transfers all right, title and interest in and to the Materials to the City, including the right to secure copyright, patent, trademark, and other intellectual property rights throughout the world and to have and to hold such rights in perpetuity.

52. SURVIVAL OF CERTAIN PROVISIONS: The terms of the Agreement and any exhibits and attachments that by reasonable implication contemplate continued performance, rights, or compliance beyond expiration or termination of the Agreement survive the Agreement and will continue to be enforceable. Without limiting the generality of this provision, the Contractor's obligations to provide insurance and to indemnify the City will survive for a period equal to any and all relevant statutes of limitation, plus the time necessary to fully resolve any claims, matters, or actions begun within that period.

53. NO DISCRIMINATION IN EMPLOYMENT: In connection with the performance of work under the Agreement, the Contractor may not refuse to hire, discharge, promote, demote, or discriminate in matters of compensation against any person otherwise qualified, solely because of race, color, religion, national origin, ethnicity, citizenship, immigration status, gender, age, sexual orientation, gender identity, gender expression, marital status, source of income, military status, protective hairstyle, or disability. The Contractor shall insert the foregoing provision in all subcontracts.

54. ADVERTISING AND PUBLIC DISCLOSURE: The Contractor shall not include any reference to the Agreement or to services performed pursuant to the Agreement in any of the Contractor's advertising or public relations materials without first obtaining the written approval of the Executive Director. Any oral presentation or written materials related to services performed under the Agreement will be limited to services that have been accepted by the City.

The Contractor shall notify the Executive Director in advance of the date and time of any presentation. Nothing in this provision precludes the transmittal of any information to City officials.

55. CONFIDENTIAL INFORMATION: Contractor acknowledges and accepts that, in performance of all work under the terms of this Agreement, Contractor may have access to Proprietary Data or confidential information that may be owned or controlled by the City, and that the disclosure of such Proprietary Data or information may be damaging to the City or third parties. Contractor agrees that all Proprietary Data, confidential information or any other data or information provided or otherwise disclosed by the City to Contractor shall be held in confidence and used only in the performance of its obligations under this Agreement. Contractor shall exercise the same standard of care to protect such Proprietary Data and information as a reasonably prudent Contractor would to protect its own proprietary or confidential data. “Proprietary Data” shall mean any materials or information which may be designated or marked “Proprietary” or “Confidential”, or which would not be documents subject to disclosure pursuant to the Colorado Open Records Act or City ordinance and provided or made available to Contractor by the City. Such Proprietary Data may be in hardcopy, printed, digital or electronic format.

56. CITY EXECUTION OF AGREEMENT: The Agreement will not be effective or binding on the City until it has been fully executed by all required signatories of the City and County of Denver, and if required by Charter, approved by the City Council.

57. AGREEMENT AS COMPLETE INTEGRATION-AMENDMENTS: The Agreement is the complete integration of all understandings between the Parties as to the subject matter of the Agreement. No prior, contemporaneous or subsequent addition, deletion, or other modification has any force or effect, unless embodied in the Agreement in writing. No oral representation by any officer or employee of the City at variance with the terms of the Agreement or any written amendment to the Agreement will have any force or effect or bind the City.

58. USE, POSSESSION OR SALE OF ALCOHOL OR DRUGS: Contractor shall cooperate and comply with the provisions of Executive Order 94 and its Attachment A concerning the use, possession or sale of alcohol or drugs. Violation of these provisions or refusal to cooperate with implementation of the policy can result in contract personnel being barred from City facilities and from participating in City operations.

59. ELECTRONIC SIGNATURES AND ELECTRONIC RECORDS: Contractor consents to the use of electronic signatures by the City. The Agreement, and any other documents requiring a signature under the Agreement, may be signed electronically by the City in the manner specified by the City. The Parties agree not to deny the legal effect or enforceability of the Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

60. ORDER OF PRECEDENCE: In the event of a conflict or inconsistency between this Agreement and its Schedules, or attachments, such conflicts or inconsistencies shall be resolved by reference to the documents in the following order of priority:

- a. This provisions of this Agreement
- b. General Conditions of **Schedule A**
- c. Construction Documents (**Section 6(A)**)
- d. The remaining schedules
- e. Any other attachments

List of Schedules

The following Schedules are attached and incorporated by reference herein.

- Schedule A** General Conditions of Energy Performance Contract
- Schedule B** Energy Performance Contract Description of Work
- Schedule C** Guarantee
- Schedule D** Measurement and Verification Services Plan
- Schedule E** Code Compliance Requirements
- Schedule F** Schedule of Values (Initial)
- Schedule G** Projected Financial Cost and Cash Flow Analysis
- Schedule H** Certification that Cost-weighted Average Service Life of Equipment Exceeds Financing Term
- Schedule I** Record of Reviews (as recommended by the Colorado Energy Office)
- Schedule J** *Intentionally Deleted*
- Schedule K** Certificate of Insurance
- Schedule L** *Intentionally Deleted*
- Schedule M** *Intentionally Deleted*
- Schedule N** Standards of Comfort
- Schedule O** *Intentionally Deleted*
- Schedule P** *Intentionally Deleted*
- Schedule Q** System Start-up and Commissioning
- Schedule R** Contractor Training Responsibilities
- Schedule S** Political Subdivision's Maintenance Responsibilities
- Schedule T** Notice of Substantial Completion
- Schedule U** Notice of Final Acceptance
- Schedule V** Owner Acknowledgement Form
- Schedule W** Construction Schedule
- Schedule X** 5 and 15 year Equipment List
- Schedule Y** Acceptance Certificates

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Contract Control Number: GENRL-202161179-[00]
Contractor Name: MCKINSTRY ESSENTION, LLC

IN WITNESS WHEREOF, the parties have set their hands and affixed their seals at Denver, Colorado as of:

SEAL

CITY AND COUNTY OF DENVER:

ATTEST:

By:

APPROVED AS TO FORM:

REGISTERED AND COUNTERSIGNED:

Attorney for the City and County of Denver

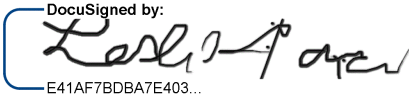
By:

By:

By:

Contract Control Number:
Contractor Name:

GENRL-202161179-[00]
MCKINSTRY ESSENTION, LLC

By:  _____
E41AF7BDBA7E403...

Leslie Larocque
Name: _____
(please print)
Vice President, MTN Region
Title: _____
(please print)

ATTEST: [if required]

By: _____

Name: _____
(please print)

Title: _____
(please print)

SCHEDULE A

GENERAL CONDITIONS

ARTICLE 1. DEFINITIONS

A. CONTRACT DOCUMENTS

The Contract Documents consist of the following, some of which are procedural documents used in the administration and performance of the Agreement:

1. The Energy Performance Contract between the City and Contractor and all its Schedules, and Attachments;
 - 1.1 Contractor's report and Energy Performance Contract Project Proposal Contract, All Exhibits, Addenda, and Clarifications
 - 1.2 Accepted Energy Performance Contract Project Proposal
2. Referenced Titles of The City and County of Denver Department of Aviation and Department of Public Works Standard Specifications for Construction General Conditions (2011 Edition) ("Yellow Book");
3. Performance Bond and Labor and Material Payment Bond;
4. These General Conditions of the Energy Performance Contract (**EPC-GC**) and if applicable, Supplementary General Conditions;
5. Drawings developed by Contractor and accepted by City, prior to the Notice to Proceed to Commence Construction Phase;
6. Change Orders and any Amendments executed pursuant to State law and regulations;
7. Builder's risk insurance certificates of insurance;
8. Liability, workers' compensation and professional liability errors and omissions certificates of insurance;
9. Notice to Proceed to Commence Design Phase;
10. Notice to Proceed to Commence Construction Phase;
11. Notice of Approval of Occupancy/Use
12. Notice of Partial Substantial Completion);
13. Notice of Substantial Completion;
14. Notice of Partial Final Acceptance;
15. Notice of Final Acceptance);
16. Notice of Contractor's Settlement;
17. Application and Certificate for Contractor's Payment; and
18. Other procedural and reporting documents or forms referred to in these General Conditions of the Energy Performance Contract, the Specifications or required by the Principal Representative, including but not necessarily limited to the Pre- Acceptance Checklist form (SBP-05) and the Building Inspection Report (SBP-BIR). A list of the current standard Colorado Energy Office and State Buildings Programs forms applicable to this Contract may be obtained from the Principal Representative on request.

B. DEFINITIONS OF WORDS AND TERMS USED

1. AGREEMENT. The term "Agreement" shall mean the written agreement entered into by the City, and the Contractor for the performance of the Work and payment therefore.
2. CHANGE ORDER. See Yellow Book, Title II, 1101.1
3. COLORADO LABOR. The term "Colorado labor", as provided in C.R.S. § 8-17-101(2)(a), as amended, means any person who is a resident of the state of Colorado, at the time of the public works project, without discrimination as to race, color, creed, sex, sexual orientation, marital status, national origin, ancestry, age, or religion except when sex or age is a bona fide occupational qualification. A resident of the State of Colorado is a person who can provide a valid Colorado driver's license, a valid Colorado state-issued photo identification, or documentation that he or she has resided in Colorado for the last 30 days.
4. CONSULTANT. See Yellow Book, Title 1; 110.
5. DAYS. See Yellow Book, Title 1; 108.
6. DRAWINGS. See Yellow Book, Title 1, 117.

7. EMERGENCY FIELD CHANGE ORDER. See Yellow Book, Title 11; 1102.3.
8. ENERGY SERVICE COMPANY'S ARCHITECT/ENGINEER. The term "Energy Service Company Architect/Engineer" shall mean professionals licensed or registered by the State of Colorado who have contracted with the Energy Service Company with prior approval by the City, or a professional employee of the Energy Service Company, to accomplish the architectural and engineering services necessary for the Work. Nothing in this contract is intended to create a contractual relationship between such professional and the City.
9. ENERGY PERFORMANCE CONTRACT CHANGE ORDER. The EPC Change Order is applicable only to Energy Performance Contracts and only for the original EPC MCP. The term "EPC Change Order" means a written order, signed by a Procurement Officer or other authorized representative of the Principal Representative, directing Contractor to make changes in the Work, in accordance with Article 35E, Changes in the EPC Fixed Limit of Construction Cost.
10. FINAL ACCEPTANCE. See Yellow Book, Title 1; 111.
11. NOTICE. The term "Notice" shall mean any communication in writing from either contracting party to the other by such means of delivery that receipt cannot properly be denied. Notice shall be provided to the person identified to receive it in Article 42 (Energy Performance Contract), Notice Identification, or to such other person as either party identifies in writing to receive Notice or in the absence of the identified party, a principal of the Contractor. Notice by facsimile transmission where proper transmission is evidenced shall be adequate where facsimile numbers are included in Article 42 (Energy Performance Contract). Notwithstanding an email delivery or return receipt, email Notice shall not be adequate. Acknowledgment of receipt of a voice message shall not be deemed to waive the requirement that Notice, where required, shall be in writing.
12. OCCUPANCY. The term "Occupancy" means occupancy taken by the City as owner after the Date of Substantial Completion at a time when a building or other discrete physical portion of the Project is used for the purpose intended. The Date of Occupancy shall be the date of such first use but shall not be prior to the date of execution of the Notice of Approval of Occupancy/Use. Prior to the date of execution of a Notice of Approval of Occupancy/Use, the City shall have no right to occupy and the project may not be considered safe for occupancy/use for the intended use.
13. OWNER. The term "Owner" shall mean the Principal Representative.
14. PRINCIPAL REPRESENTATIVE. The term "Principal Representative" shall be defined, as provided in §24-30-1301(14), C.R.S., and as may be amended, as the Executive Director of General Services, or the Executive Director's designee. The Principal Representative may delegate authority. Contractor shall have the right to inquire regarding the delegated authority of any of the Principal Representative's representatives on the project and shall be provided with a response in writing when requested.
15. PRODUCT DATA. See Yellow Book, Title 1; 113.
16. REASONABLY INFERABLE: The phrase "reasonably inferable" means that if an item or system is either shown or specified, all material and equipment normally furnished with such items or systems and needed to make a complete installation shall be provided whether mentioned or not, omitting only such parts as are specifically excepted, and shall include only components which Contractor could reasonably anticipate based on his or her skill and knowledge using an objective, industry standard, not a subjective standard. This term takes into consideration the normal understanding that not every detail is to be given on the Drawings and Specifications.
17. SAMPLES. The term "Samples" shall mean examples of materials or Work provided to establish the standard by which the Work will be judged.
18. SCHEDULE OF VALUES. The term "Schedule of Values" is defined as the itemized listing of description of the Work. The format shall be the same as Schedule F (similar to the OSA form SC-7.2). Included shall be all costs of the Project, which shall be executed in final form by Contractor and delivered to the City, subject to acceptance by the City, after the Effective Date, and shall include design, material, labor and other costs, and the sum of all, as described in this Contract.
19. SHOP DRAWINGS. See Yellow Book, Title 1; 117.
20. SPECIFICATIONS. The term "Specifications" shall mean the written requirements for the Work to be accomplished.
21. SUBCONSULTANT. The term "Subconsultant" shall mean a person, firm or corporation supplying design/consulting services for the Project. Design and other professionals directly contracted to the

- Contractor are considered subconsultants.
22. SUBCONTRACTOR. See Yellow Book, Title 1; 118.
 23. SUBMITTALS. The term "submittals" means drawings, lists, tables, documents and samples prepared by Contractor to facilitate the progress of the Work as required by these General Conditions or the Drawings and Specifications. They consist of Shop Drawings, Product Data, Samples, and various administrative support documents including but not limited to lists of Subcontractors, construction progress schedules, schedules of values, applications for payment, inspection and test results, requests for information, various document logs, and as-built drawings. Submittals are required by the Contract Documents, but except to the extent expressly specified otherwise are not themselves a part of the Contract Documents.
 24. SUBSTANTIAL COMPLETION. See Yellow Book, Title 1; 119. Substantial Completion will be awarded per Energy Conservation Measure
 25. SURETY. The term "Surety" shall mean any company providing labor and material payment and performance bonds for Contractor as obligor.

ARTICLE 2. EXECUTION, CORRELATION, INTENT OF DOCUMENTS, COMMUNICATION AND COOPERATION

A. EXECUTION

Contractor, within ten (10) days from the Effective Date, as a requirement to execute the Energy Performance Contract, shall be required to furnish:

1. A fully executed Performance and Labor and Material Payment Bonds; and

B. CORRELATION

Upon execution of the Energy Performance Contract, the Contractor represents that Contractor has visited the Premises, has become familiar with local conditions and local requirements under which the Work is to be performed, including the building code programs of the City as implemented by the Principal Representative, and has correlated personal observations with the requirements of the Contract Documents.

C. INTENT OF DOCUMENTS

The Contract Documents are complementary, and what is called for by any one document shall be as binding as if called for by all. The intention of the Contract Documents is to include all labor, materials, equipment and transportation necessary for the proper execution of the Work. Words describing materials or Work which have a well-known technical or trade meaning shall be held to refer to such recognized standards. The Yellow Book is referenced for the specific Titles and Sections only, and any reference to Public Works or the Manager of Public Works shall be replaced with General Services or the Executive Director of General Services.

Where a conflict occurs between or within standards, Specifications or Drawings, which is not resolved by reference to the precedence between the Contract Documents, the more stringent or higher quality requirements shall apply, so long as such more stringent or higher quality requirements are reasonably inferable. The Principal Representative shall decide with the Contractor a mutually agreeable resolution which requirements will provide the best installation. With the exception noted in the following paragraph, the precedence of the Contract Documents is as in the EPC Article 24, General Provisions:

Change Orders and Amendments, if any, to the Contract Documents take precedence over the original Contract Documents. However, notwithstanding any provision in these General Conditions to the contrary, the terms and conditions set forth in the Agreement shall control and take precedence over all other documents included in the Contract Documents.

Unless the context otherwise requires, form numbers in this document are for convenience only. In the event of any conflict between the forms required by name or context and the form required by number, the form required by name or context shall control. The Contractor may obtain State and Colorado Energy Office forms from the Principal Representative upon request.

Nothing contained in the Energy Performance Contract Documents shall create a professional obligation or contractual relationship between the Principal Representative and any third party, including the Contractor's Architect/Engineer.

D. PARTNERING, COMMUNICATIONS AND COOPERATION

In recognition of the fact that conflicts, disagreements and disputes often arise during the performance of energy performance contracts, the Contractor and the Principal Representative aspire to encourage a relationship of open communication and cooperation between the employees and personnel of both, in which the objectives of the Contract may be better achieved and issues resolved in a more fully informed atmosphere.

Contractor and the Principal Representative each agree to assign an individual who shall be fully authorized to negotiate and implement a voluntary partnering plan for the purpose of facilitating open communications between them. Within thirty days (30) of the issuance of the Notice to Proceed to Commence Design Phase, the assigned individuals shall meet to discuss development of an informal agreement to accomplish these goals.

The assigned individuals shall endeavor to reach an informal agreement but shall have no such obligation. Any plans these parties voluntarily agree to implement shall result in no change to the Contract amount, and no costs associated with such plan or its development shall be recoverable under any Contract clause. In addition, no plan developed to facilitate open communication and cooperation shall alter, amend or waive any of the rights or duties of either party under the Contract unless and except by written Amendment to the Contract, nor shall anything in this clause or any subsequently developed partnering plan be deemed to create fiduciary duties between the parties unless expressly agreed in a written Amendment to the Contract. It is also recognized that projects with relatively low Contract values may not justify the expense or special efforts required. In the case of small projects with an initial Fixed Limit of Construction Cost under \$500,000, the requirements of the preceding paragraph shall not apply.

ARTICLE 3. COPIES FURNISHED

The Contractor shall furnish to City the number of copies of Design Documents as specified in the Contract Documents (Article 1.m. of the Agreement), or if no number is specified, all copies reasonably necessary for the execution of the Work.

ARTICLE 4. OWNERSHIP OF DRAWINGS

Refer to Article 16 of the Agreement.

ARTICLE 5. CONTRACTOR'S ARCHITECT/ENGINEER'S STATUS

In case of termination of employment or the death of the Contractor's Architect/Engineer, or the termination of the contract between the Contractor and the project's professional Architectural/Engineering firm, the Contractor will appoint a capable Architect/Engineer or contract with another professional firm, against whom the City makes no reasonable objection, whose status under the Contract shall be the same as that of the former Contractor's Architect/Engineer.

ARTICLE 6. DECISIONS AND JUDGMENTS, ACCESS TO WORK AND INSPECTION

A. DECISIONS

The Contractor shall, within a reasonable time, make decisions on all matters relating to the execution and progress of the Work.

Such decisions by the Contractor shall be promptly forwarded to the Principal Representative. The Principal Representative may consent with such decision by the Contractor or amend/revise such decision at the discretion of the Principal Representative.

B. JUDGMENTS

The City is the judge of the performance required by the Contract Documents as it relates to compliance with the Work and quality of workmanship and materials.

C. ACCESS TO WORK

The Principal Representative and representatives of the City shall at all times have access to the Work. Contractor shall provide proper facilities for such access and for their observations or inspection of the Work.

D. INSPECTION

The Contractor shall at all times allow the Principal Representative or consultants to the Principal Representative to make visits to the Premises to generally observe the progress and quality of the Work to determine in general if the Work is proceeding in accordance with the Contract Documents. Observation may extend to all or any part of the Work and to the preparation, fabrication or manufacture of materials.

If the Agreement, the laws, or ordinances of any public authority require any Work to be specifically tested or approved, Contractor shall give the Principal Representative and appropriate testing agency (if necessary) timely notice of its readiness for observation by the City or inspection by another authority, and if the inspection is by another authority, of the date fixed for such inspection, required certificates of inspection being secured by Contractor. Contractor shall give all required Notices to the Principal Representative or his or her designee for inspections required for the building inspection program. If such Work is found to be not in accordance with the Contract Documents, Contractor shall pay such costs, unless he or she shall show that the defect in the Work was caused by another contractor engaged by the Principal Representative. In that event, the Principal Representative shall pay such cost. In addition, examination of questioned Work may be ordered by the Principal Representative, and if so ordered, the Work must be uncovered by Contractor. If such Work be found in accordance with the Contract Documents during the examination of the work ordered by the Principal Representative, Contractor shall be reimbursed the cost of examination and replacement.

ARTICLE 7. CONTRACTOR'S SUPERINTENDENCE AND SUPERVISION

The Contractor shall employ, and keep present on the Project during its progress, a competent superintendent and any necessary assistants, all satisfactory to the Principal Representative. The superintendent shall not be changed except with the consent of the Principal Representative, unless the superintendent proves to be unsatisfactory to the Contractor or ceases to be in his or her employ. The superintendent shall represent the Contractor in his or her absence and all directions given to the superintendent shall be as binding as if given to the Contractor. Directions received by the superintendent shall be documented by the superintendent and confirmed in writing with the Contractor.

The Contractor shall give efficient supervision to the Work, using his or her best skill and attention. He or she shall carefully study and compare all Drawings, Specifications and other written instructions and shall without delay report any error, inconsistency or omission which he or she may discover in writing to the Principal Representative.

The superintendent shall see that the Work is carried out in accordance with the Contract Documents and in a uniform, thorough and first-class manner in every respect. The Contractor's superintendent shall establish all lines, levels, and marks necessary to facilitate the operations of all concerned in the Contractor's Work. The Contractor shall lay out all work in a manner satisfactory to the Principal Representative making appropriate permanent records for all other parts of the Work.

ARTICLE 8. MATERIALS AND EMPLOYEES

Unless otherwise stipulated, Contractor shall provide and pay for all materials, labor, water, tools, equipment, light, power, transportation and other facilities necessary for the execution and completion of the Work.

Unless otherwise specified, all materials and Equipment shall be new and both workmanship and materials shall be of uniform quality. Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials.

Contractor is fully responsible for all acts and omissions of Contractor's employees and shall at all times enforce strict

discipline and good order among employees on the Premises. Contractor shall not employ on the Work any person reasonably deemed unfit by the Principal Representative or anyone not skilled in the Work assigned to him.

ARTICLE 9. SURVEYS, PERMITS, LAWS, TAXES AND REGULATIONS

A. SURVEYS

The Principal Representative shall furnish all surveys, property lines and benchmarks deemed necessary by the Contractor, unless otherwise specified.

B. PERMITS AND LICENSES

Permits and licenses necessary for the prosecution of the Work shall be secured and paid for by Contractor. The Contractor's employees shall become personally familiar with these local conditions and requirements and shall fully comply with such requirements. Contractor shall obtain and pay for such permits.

Easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the Principal Representative, unless otherwise specified.

C. TAXES

1. REFUND OF SALES AND USE TAXES

Contractor shall pay all local taxes required to be paid, including but not necessarily limited to all sales and use taxes. If requested by the Principal Representative prior to issuance of the Notice to Proceed to Commence Design or directed in the Specifications, Contractor shall maintain records of such payments in respect to the Work, which shall be separate and distinct from all other records maintained by Contractor, and Contractor shall furnish such data as may be necessary to enable City, acting by and through the Principal Representative, to obtain any refunds of such taxes which may be available under the laws, ordinances, rules or regulations applicable to such taxes. When so requested or directed, Contractor shall require Subcontractors to pay all local sales and use taxes required to be paid and to maintain records and furnish Contractor with such data as may be necessary to obtain refunds of the taxes paid by such Subcontractors. No State sales and use taxes are to be paid on material to be used in this Project. On application by the purchaser or seller, the Colorado Department of Revenue shall issue to a Contractor or to a Subcontractor at any tier, a certificate or certificates of exemption per §39-26-114(1)(d), C.R.S., and §39-26-203, C.R.S.

2. FEDERAL TAXES

Contractor shall exclude the amount of any applicable federal excise or manufacturers' taxes from the proposal. The Principal Representative will furnish Contractor, on request, exemption certificates.

D. LAWS AND REGULATIONS

Contractor shall give all notices and comply with all laws, ordinances, rules and regulations, including the laws of the City and County of Denver, bearing on the conduct of the Work as drawn or specified.

Contractor shall bear all costs arising from the performance of Work required by the Drawings or Specifications that Contractor knows to be contrary to such laws, ordinances, rules or regulations.

ARTICLE 10. PROTECTION OF WORK AND PROPERTY

A. GENERAL PROVISIONS

Contractor shall continuously maintain adequate protection of all Work, materials, and protect the property from injury or loss arising in connection with this Contract and adequately protect adjacent property as provided by law and the Contract Documents.

B. SAFETY PRECAUTIONS

Contractor shall take all necessary precautions for the safety of employees on the Project, and shall comply with all applicable provisions of federal, State and municipal safety laws and building codes to prevent accidents or injury to persons on, about or adjacent to the Premises where the Work is being performed. Contractor shall erect and properly

maintain at all times, as required by the conditions and progress of the Work, all necessary safeguards for the protection of workers and the public and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling materials; and he or she shall designate a responsible member of his or her organization on the Project, whose duty shall be the prevention of accidents. The name and position of any person so designated shall be reported to the Principal Representative by Contractor.

The Contractor shall provide all necessary bracing, shoring and tying of all structures, decks and framing to prevent any structural failure of any material which could result in damage to property or the injury or death of persons; take all precautions to insure that no part of any structure of any description is loaded beyond its carrying capacity with anything that will endanger its safety at any time during the Term of this Agreement; and provide for the adequacy and safety of all scaffolding and hoisting equipment. Contractor shall not permit open fires within the building enclosure. Contractor shall construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations and floors, pits and trenches free of water. Contractor shall be solely responsible for all construction means, methods, techniques, sequences and procedures, and for coordinating all portions of the Work, except as otherwise noted.

Contractor shall take due precautions when obstructing sidewalks, streets or other public ways in any manner, and shall provide, erect and maintain barricades, temporary walkways, roadways, trench covers, colored lights or danger signals and any other devices necessary or required to assure the safe passage of pedestrians and automobiles.

C. EMERGENCIES

In an emergency affecting the safety of life or of the Work or of adjoining property, Contractor without special instruction or authorization from the Principal Representative, is hereby permitted to act, at his or her discretion, to prevent such threatened loss or injury; and he or she shall so act, without appeal, if so authorized or instructed.

ARTICLE 11. DRAWINGS AND SPECIFICATIONS ON THE WORK

When applicable, as determined at the sole discretion of the Principal Representative, Contractor shall keep on the Premises a printed or electronic copy of the Contract Documents in good order, including current copies of all Drawings and Specifications for the Work, and any approved Shop Drawings, Product Data or Samples, and as-built drawings. All such documents shall be available to representatives of the City. In addition, Contractor shall keep on the Premises a printed or electronic copy of all approved addenda, Change Orders, EPC Change Orders, and requests for information issued for the Work.

Contractor shall develop procedures to ensure the currency and accuracy of as-built drawings and shall maintain on a current basis a log of requests for information and responses thereto, a Product Data submittal log, and a Sample submittal log to record the status of all necessary and required submittals.

ARTICLE 12. REQUESTS FOR INFORMATION AND SCHEDULES

A. DETAIL DRAWINGS AND INSTRUCTIONS

The Contractor shall furnish additional instructions with reasonable promptness, by means of drawings or otherwise, necessary for the proper execution of the Work. All such drawings and instructions shall be consistent with the Contract Documents and reasonably inferable there from.

The Work shall be executed in conformity with such instructions and Contractor shall do no Work without proper Drawings, Specifications or instructions.

The Contractor and the Principal Representative shall jointly prepare a schedule, subject to change from time to time in accordance with the progress of the Work, fixing the dates at which the various detail drawings and specification that will be required. A schedule shall be prepared, fixing the dates for the beginning of manufacture and installation of materials and for the completion of the various parts of the Work.

B. SCHEDULES

1. DESIGN SCHEDULE

Prior to receiving the Notice to Proceed to Commence Design Phase, the Contractor shall submit a detailed Design Phase Schedule identifying all phases of design, including time identified for the Principal Representative to review and approve design documents and specifications at each design milestone. The Design Phase Schedule shall also identify adequate time for the document coordination between the Contractor and each of its consultants.

2. SUBMITTAL SCHEDULES

Prior to the Notice to Proceed to Commencement of Construction for the first construction phase a schedule shall be prepared by the Contractor fixing the dates for the beginning of manufacture, procure the equipment, and installation of materials for the completion of the various parts of the Work. The schedule shall be subject to change from time to time in accordance with the progress of the Work, and it shall be subject to the review and approval by the Principal Representative. The schedule shall be finalized, prepared and submitted with respect to each of the elements of the Work in time to avoid delay, considering reasonable periods for review, manufacture, procure the equipment and/or installation.

At the time the schedule is prepared, Contractor and Principal Representative shall jointly identify the Product Data and Samples, if any, which the Principal Representative shall receive simultaneously with the Contractor for the purposes of Owner coordination with existing facility standards and systems. Transmittal of Product Data copies to the Principal Representative shall be solely for the convenience of the Principal Representative and shall neither create nor imply responsibility or duty of review by the Principal Representative.

3. SCHEDULE OF VALUES

Prior to the Notice to Proceed to Commence Construction for the first construction phase, the Contractor shall submit to the Principal Representative, for approval, and to the City when specifically requested, a complete itemized Schedule of Values (Schedule F) of the various parts of the Work, as estimated by Contractor, aggregating the total Project price. The Schedule of Values shall be in by ECM/FIM as indicated in the Description of Work (Schedule B) or in such detail as the Principal Representative shall require and be prepared on forms acceptable to the Principal Representative. Contractor shall revise and resubmit the Schedule of Values for approval when, in the opinion of the Principal Representative, such resubmittal is required due to changes or modifications to the Contract Documents.

The total cost of each line item so separately identified shall be consistent with the CEO Cost and Pricing Tool.

The cost of subcontracts shall be incorporated in Schedule of Values, and when requested by the Principal Representative, shall be separately shown as line items.

This Schedule of Values (Schedule F), when approved by the Principal Representative, shall be used in preparing Contractor's applications for payment.

4. CONSTRUCTION SCHEDULES

Prior to the Notice to Proceed to Commence Construction for the first construction phase, the Contractor shall submit to the Principal Representative when specifically requested, on a form acceptable to them, an overall timetable of the construction schedule for the Project. Unless the Supplementary General Conditions or the Specifications allow scheduling with bar charts or other less sophisticated scheduling tools, the Contractor's schedule shall be a critical-path method (CPM) construction schedule. The construction schedule should start with the date of Notice to Proceed to Commence Construction for the first Work phase and include the various Work activities, change order work (when applicable), demonstration of equipment operation when called for in the Specifications, commissioning of installed equipment, post-installation verification activities, testing, closeout, and acceptance and any other steps as agreed to with the Principal Representative. The completion time shall be the time specified in the Contract.

Contractor shall submit monthly updates of the construction schedule. These updates shall reflect Contractor's "Work in place" progress.

When construction phase measurement and verification is required by the Measurement and Verification Plan, Schedule D, the Contractor shall prepare and submit to the Principal Representative a schedule for M&V activities in accordance with Article 14, Samples and Testing, Construction Phase Measurement and Verification.

ARTICLE 13. SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

A. SUBMITTAL PROCESS

Contractor shall check and field-verify all dimensions. Contractor shall check, approve and submit to the Principal Representative in accordance with the schedule described in Article 12, Requests for Information and Schedules, all Shop Drawings, Product Data and Samples required by the Specifications or required for the Work of the various trades. All Drawings and Product Data shall contain identifying nomenclature and each Submittal shall be accompanied by a letter of transmittal identifying in detail all enclosures.

The Principal Representative shall review and comment on the Specifications, Shop Drawings, and Product Data within the time provided in the agreed upon schedule for conformance with information given and the design concept expressed in, or reasonably inferred from, the Contract Documents. The nature of all corrections to be made to the Specifications, Shop Drawings, and Product Data, if any, shall be clearly noted, and the submittals shall be returned to Contractor for such corrections. On resubmitted Specifications, Shop Drawings, Product Data or Samples, Contractor shall direct specific attention in writing on the transmittal cover to revisions on any previously checked submittal. The Principal Representative shall promptly review and comment on, and return, the resubmitted items.

Contractor shall thereafter furnish such other copies in the form approved by the Principal Representative as may be needed for the prosecution of the Work.

B. FABRICATION AND ORDERING

As required by the Work, fabrication shall be started by Contractor only after receiving approved Shop Drawings by the Principal Representative. Materials shall be ordered in accordance with approved Product Data. Work, which is improperly fabricated, whether through incorrect Shop Drawings, faulty workmanship or materials, will not be acceptable.

C. DEVIATIONS FROM DRAWINGS OR SPECIFICATIONS

The review and comments of the Specifications, Shop Drawings, Product Data or Samples by the Principal Representative shall not relieve Contractor from responsibility for deviations from the Drawings or Specifications, nor shall it relieve Contractor from responsibility for errors of any sort in Drawings or Specifications. Review and comments on Specifications, Shop Drawings or Product Data containing identified deviations from the Contract Documents shall not be the basis for a Change Order or a claim based on a change in the scope of the Work unless Notice is given to the Principal Representative in accordance with Articles 29 and 30.

D. CONTRACTOR REPRESENTATIONS

By preparing, approving, and/or submitting Specifications, Shop Drawings, Product Data and Samples, Contractor represents that Contractor has determined and verified all materials, field measurements, and field construction criteria related thereto, and has checked and coordinated the information contained within each submittal with the requirements of the Work, the Project and the Contract Documents and prior reviews and approvals.

ARTICLE 14. SAMPLES AND TESTING

A. SAMPLES

Contractor shall furnish for approval, with such promptness as to cause no delay in his or her Work or in that of any other Contractor, applicable Samples as defined in the Schedule B.

B. TESTING – Construction Phase Measurement and Verification

Additional testing required during construction by the Measurement and Verification Plan, **Schedule D** will be coordinated by the Contractor.

ARTICLE 15. SUBCONTRACTS

A. SUBCONTRACTOR PREQUALIFICATION

Prior to the Notice to Proceed to Commencement of Construction for the first construction phase, the Contractor shall submit to the Principal Representative a complete list of all proposed Subcontractors. The Contractor shall submit to the Principal Representative a complete list of Consultants including the Contractor's Architect/Engineer and the professional Subconsultants. It shall be as complete as possible at the time, showing all known Subcontractors, Consultants and Subconsultants planned for the Work. The list shall be supplemented as other Subcontractors are determined by the Contractor and any such supplemental list shall be submitted to the Principal Representative not less than ten (10) days before the Subcontractor commences Work.

The Contractor's list of all proposed pre-qualified Subcontractors shall include those Subcontractors, if any, which the Contractor indicated in its Investment Grade Audit report, would be employed for specific portions of the Work or if such indication was requested in the Request for Proposal documents issued by the City.

B. SUBCONTRACTOR PROPOSALS

The Contractor shall request and receive proposals from the Subcontractors and subcontracts will be awarded after the proposals are tabulated in a pre-approved format which compares to each Fixed Limit of Construction Cost per Schedule B, as indicated in the finalized Schedule F, and, reviewed by, Contractor, and Principal Representative.

Should Contractor submit a proposal for subcontract Work, the proposal conditions used shall be the same as for all subcontractor proposals. These Contractor proposals for subcontract Work shall be submitted to the Principal Representative twenty-four (24) hours prior to receipt of other subcontractor proposals and be opened with the other proposals.

C. SUBCONTRACTOR FORMS

All subcontracts will be between Contractor and the Subcontractors. The form of subcontracts shall be furnished to the Principal Representative for review and consent as to form, for which consent shall not be unreasonably withheld.

D. SUBCONTRACTOR SUBSTITUTION

The substitution of any Subcontractor listed in the Contractor's proposal shall be justified in writing not less than ten (10) days after the date of the Notice to Proceed with Design and shall be subject to the approval of the Principal Representative. For reasons such as the Subcontractor's refusal to perform as agreed, subsequent unavailability or later discovered proposal errors, or other similar reasons, such substitution may be approved. Contractor shall bear any additional cost incurred by such substitutions.

E. CONTRACTOR RESPONSIBLE FOR SUBCONTRACTORS

The Contractor shall not employ any Subcontractor that the Principal Representative, within ten (10) days after the date of receipt of the Contractor's list of Subcontractors or any supplemental list, objects to in writing as being unacceptable to the Principal Representative.

The Contractor shall be fully responsible to the Principal Representative for the acts and omissions of Subcontractors and of persons either directly or indirectly employed by them. All instructions or orders in respect to work to be done by Subcontractors shall be given to the Contractor.

ARTICLE 16. RELATIONS OF CONTRACTOR AND SUBCONTRACTORS

Contractor agrees to bind each Subcontractor to the terms of these General Conditions and to the requirements of the Drawings and Specifications, and any Addenda thereto, and also all the other Contract Documents and Procedural Documents, as applicable to the Work of such Subcontractor. Contractor further agrees to bind each Subcontractor to those terms of the General Conditions which expressly require that Subcontractors also be bound, including without limitation, the insurance requirements for subcontractors set forth in the Agreement.

Nothing contained in the Contract Documents shall be deemed to create any contractual relationship whatsoever between any Subcontractor and the City acting by and through its Principal Representative.

ARTICLE 17. MUTUAL RESPONSIBILITY OF CONTRACTORS

Should the Contractor cause damage to any separate contractor engaged by the Principal Representative on the Work, the Contractor agrees, upon due Notice, to settle with such separate contractor by agreement, if he or she will so settle. If such separate contractor sues the Principal Representative on account of any damage alleged to have been so sustained, the Principal Representative shall notify the Contractor.

ARTICLE 18. SEPARATE CONTRACTS

The Principal Representative reserves the right to enter into other contracts in connection with the Project or the Contract. The Contractor shall afford other separate contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work and shall properly connect and coordinate his or her Work with theirs. If any part of the Contractor's Work depends, for proper execution or results, upon the Work of any other separate contractor, the Contractor shall inspect and promptly report to the Principal Representative any defects in such Work that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the other separate contractor's Work as fit and proper for the reception of work, except as to defects which may develop in the other separate contractor's Work after the execution of the Contractor's Work.

To ensure the proper execution of subsequent Work, the Contractor shall measure Work already in place and shall at once report to the Principal Representative any discrepancy between the executed Work and the Drawings.

ARTICLE 19. USE OF PREMISES

Contractor shall confine apparatus, the storage of materials and the operations of workmen to limits indicated by law, ordinances, permits and any limits lines shown on the Drawings or defined in the Work. Contractor shall not unreasonably encumber the premises with materials. Contractor shall enforce all of the Principal Representative's instructions and prohibitions regarding, without limitation, such matters as signs, advertisements, fires and smoking.

ARTICLE 20. CUTTING, FITTING OR PATCHING

The Contractor shall do all cutting, fitting or patching of Work that may be required to make its several parts come together properly and fit it to receive or be received by Work of other separate contractors shown upon, or reasonably inferred from, the Drawings and Specifications for the complete structure, and shall provide for such finishes to patched or fitted Work as the Principal Representative may direct. The Contractor shall not endanger any Work by cutting, excavating or otherwise altering the Work and shall not cut or alter the Work of any other separate contractor save with the consent of the Principal Representative.

ARTICLE 21. UTILITIES

A. TEMPORARY UTILITIES

Unless otherwise specifically stated in the Specifications or on the Drawings, the Principal Representative shall be responsible for the placement of all utilities as shown on the Drawings or indicated elsewhere in the Specifications, subject to Contractor's compliance with all statutory or regulatory requirements. When actual conditions deviate from those shown in the Drawings and Specifications, Contractor shall comply with the requirements of Article 31, Differing Premises Conditions. As applicable to the Project, Contractor shall provide and pay for the installation of all temporary utilities required to supply all the power, light and water needed by him or her and other Contractors for their Work associated with the Project and shall install and maintain all such utilities in such manner as to protect the public and workmen and conform with any applicable laws and regulations. Upon completion of the work, he or she shall remove all such temporary utilities from the site, if applicable. Contractor shall pay for all consumption of power, light and water used by him or her and the other Contractors used during the Project as it applies to these temporary utilities, without regard to whether such items are metered by temporary or permanent meters. The Superintendent shall have full authority over all trades and Subcontractors at any tier to prevent waste. The cut-off date on permanent meters shall be either the agreed date of the Notice of Substantial Completion of the Project, whichever shall be the

earlier date.

B. PROTECTION OF EXISTING UTILITIES

Where existing utilities, such as water mains, sanitary sewers, storm sewers, computer networks, and electrical conduits, are shown on the Drawings, Contractor shall be responsible for the protection thereof, without regard to whether any such utilities are to be relocated or removed as a part of the Work. If any utilities are to be moved, the moving must be conducted in such manner as not to cause undue interruption or delay in the operation of the same.

C. CROSSING OF UTILITIES

When new construction crosses highways, railroads, streets, or utilities under the jurisdiction of State, city or other public agency, public utility or private entity, Contractor shall secure proper written permission before executing such new construction. Contractor will be required to furnish a proper release before final acceptance of the Work.

ARTICLE 22. UNSUITABLE CONDITIONS

Contractor shall not work at any time, or permit any work to be done, under any conditions contrary to those recommended by manufacturers or industry standards which are otherwise proper, unsuited for proper execution, safety and performance. Any loss, damage, or increased cost caused by ill-timed Work shall be borne by Contractor unless the timing of such Work shall have been directed by the Principal Representative, and Contractor provided Notice of any additional cost.

ARTICLE 23. TEMPORARY FACILITIES

A. TEMPORARY HEAT

Contractor shall furnish and pay for all the labor, facilities, equipment, fuel and power necessary to supply temporary heating, ventilating and air conditioning, except to the extent otherwise specified in the Scope of Work within Schedule B, and shall be responsible for the installation, operation, maintenance and removal of such facilities and equipment. Unless otherwise specified, the permanent HVAC system shall not be used for temporary heat in whole or in part. If Contractor desires to put the permanent system into use, in whole or in part, Contractor shall set it into operation and furnish the necessary fuel and manpower to safely operate, protect and maintain that HVAC system. Any operation of all or any part of the permanent HVAC system including operation for testing purposes shall not constitute acceptance of the system, nor shall it relieve Contractor of his or her Warranty of the Work from the date of the Notice of Substantial Completion of the entire Project, and if necessary due to prior operation, Contractor shall provide manufacturers' extended warranties from the date of Contractor's use prior to the date of the Notice of Substantial Completion.

B. WEATHER PROTECTION

The Contractor shall, at all times, provide protection against weather, so as to maintain all Work, materials, apparatus and fixtures free from injury or damages. The Contractor shall provide weathertight storage on substantial floors at least six (6) inches off the ground for all materials requiring protection from the weather.

C. DUST PARTITIONS

If the Work involves Work in an occupied existing building, Contractor shall erect and maintain during the progress of the Work, suitable dust-proof temporary partitions, or more permanent partitions as specified, to protect such building and the occupants thereof.

D. BENCHMARKS

Contractor shall maintain any Premises benchmarks provided by the Principal Representative and shall establish any additional benchmarks specified by the Principal Representative as necessary for Contractor to layout the Work and ascertain all grades and levels as needed.

E. SIGN

Contractor shall erect and permit one 4' x 8' sign only at the Premises to identify the Project as specified or directed by the City which shall be maintained in good condition during the life of the Project.

F. SANITARY PROVISION

Contractor shall provide and maintain suitable, clean, temporary sanitary toilet facilities for any and all workmen engaged on the Work, for the entire construction period, in strict compliance with the requirement of all applicable codes, regulations, laws and ordinances, and no other facilities, new or existing, may be used by any person on the Project. When the Project is complete Contractor shall promptly remove them from the Premises, disinfect, and clean or treat the areas as required. If any new construction surfaces in the Project other than the toilet facilities provided for herein are permanently soiled at any time, the entire areas so soiled shall be completely removed from the Project and rebuilt.

ARTICLE 24. CLEANING UP

Contractor shall keep the building and premises free from all surplus material, waste material, dirt and rubbish caused by employees or Work, and at the completion of the Work shall remove all such surplus material, waste material, dirt, and rubbish, as well as all tools, equipment and scaffolding, and shall wash and clean all window glass and plumbing fixtures, perform cleanup and cleaning required by the Specifications and leave all of the Work clean unless more exact requirements are specified.

ARTICLE 25. ROYALTIES AND PATENTS

Contractor shall be responsible for assuring that all rights to use of products and systems have been properly arranged and shall take such action as may be necessary to avoid delay, at no additional charge to the Principal Representative, where such right is challenged during the course of the Work. Contractor shall pay all royalties and license fees required to be paid and shall defend and indemnify the City in accordance with the terms of the Agreement.

ARTICLE 26. CORRECTION OF WORK BEFORE ACCEPTANCE

Contractor shall promptly remove from the premises all Work or materials condemned or declared irreparably defective as failing to conform to the Contract Documents on receipt of written Notice from the Principal Representative. If such materials shall have been incorporated in the Work, or if any unsatisfactory Work is discovered, the Contractor shall promptly replace and re-execute his or her Work in accordance with the requirements of the Contract Documents without expense to the Principal Representative, and shall also bear the expense of making good all work of other contractors destroyed or damaged by the removal or replacement of such defective material or Work.

Should any defective work or material be discovered during the process of construction, or should reasonable doubt arise as to whether certain material or Work is in accordance with the Contract Documents, the value of such defective or questionable material or Work shall not be included in any application for payment, or if previously included, shall be deducted by the Principal Representative from the next application submitted by the Contractor.

If Contractor does not perform repair, correction and replacement of defective Work, in lieu of proceeding by issuance of a Notice of Intent to remove condemned Work as outlined above, the Principal Representative may, not less than seven (7) days after giving the original written Notice of the need to repair, correct, or replace defective Work, deduct all costs and expenses of replacement or correction as instructed by the City from Contractor's next application for payment in addition to the value of the defective Work or material. The Principal Representative may also make an equitable deduction from the Fixed Limit of Construction Cost by unilateral Change Order, in accordance with Article 33, Payments Withheld and Article 35, Changes in The Work.

If the Contractor does not remove such condemned or irreparably defective Work or material within a reasonable time, the Principal Representative may, after giving a second seven- (7) day advance Notice to the Contractor and the Surety, remove them and may store the material at the Contractor's expense. The Principal Representative may accomplish the removal and replacement with its own forces or with another separate contractor. If the Contractor does not pay the expense of such removal and pay all storage charges within ten (10) days thereafter, the Principal Representative may, upon ten (10) days' written Notice, sell such material at auction or at private sale and account for the net proceeds thereof, after deducting all costs and expenses which should have been borne by the Contractor. If the Contractor shall commence and diligently pursue such removal and replacement before the expiration of the

seven- day period, or if the Contractor shall show good cause in conjunction with Schedule showing when the Work will be performed and why such removal of condemned Work should be scheduled for a later date, the Principal Representative shall not proceed to remove or replace the condemned Work.

If the Contractor disagrees with the Notice to remove Work or materials condemned or declared irreparably defective, the Contractor may request facilitated negotiation of the issue and the Principal Representative's right to proceed with removal and to deduct costs and expenses of repair shall be suspended and tolled until such time as the parties meet and negotiate the issue

ARTICLE 27. APPLICATIONS FOR PAYMENTS

A. RETAINAGE WITHHELD

Yellow Book, Title 9; 908-909.

B. RELEASE OF RETAINAGE

Yellow Book, Title 9, 909-911.

ARTICLE 28. PAYMENTS WITHHELD

Yellow Book, Title 9; 909.

ARTICLE 29. CHANGES IN THE WORK

A. CHANGES TO THE EPC FIXED LIMIT OF CONSTRUCTION COST

Yellow Book, Title 11 except 1104 reference Article 35.C.

B. THE VALUE OF CHANGED WORK

Yellow Book, Title 11 except 1104 reference Article 35.C.

C. DETAILED BREAKDOWN

EPC Pricing structure is located in Schedule G, and will be applied to any extra or changed work.

D. HAZARDOUS MATERIALS

The Principal Representative represents that it has undertaken an examination of the site of the Work and has determined that there are no hazardous substances, as defined below, which the Contractor could reasonably encounter in its performance of the Work. In the event the Principal Representative so discovers hazardous substances, the Principal Representative shall render harmless such hazards before the Contractor commences the Work.

In the event the Contractor encounters any materials reasonably believed to be hazardous substances which have not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Principal Representative, in writing. For purposes of this Agreement, "hazardous substances" shall include asbestos, lead, polychlorinated biphenyl (PCB) and any or all of those substances defined as "hazardous substance," "hazardous waste," or "dangerous or extremely hazardous wastes" as those terms are used in the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA), and shall also include materials regulated by the Toxic Substances Control Act (TSCA), the Clean Air Act, the Air Quality Act, the Clean Water Act, and the Occupational Safety and Health Act. The Work in the affected area shall not, therefore, be resumed except by written agreement of the Principal Representative and the Contractor, if in fact materials that are hazardous substances have not been rendered harmless. The Work in the affected area shall be resumed only in the absence of the hazardous substances or when it has been rendered harmless or by written agreement of the Principal Representative and the Contractor.

The Contractor shall not be required to perform Work without consent in any areas where it reasonably believes

hazardous substances that have not been rendered harmless are present.

E. EMERGENCY FIELD CHANGE ORDERED WORK

Yellow Book, Title 11; 1102.3.

ARTICLE 30. CLAIMS

Yellow Book, Title 12.

ARTICLE 31. DIFFERING SITE CONDITIONS

Yellow Book, Title 14; 1401.

ARTICLE 32. DELAYS AND EXTENSIONS OF TIME

Yellow Book, Title 11; 1105 (Extension of Time)

Yellow Book, Title 6 (Liquidated Damages)

Yellow Book, Title 6; 603 (Delay Damages)

ARTICLE 33. RIGHT OF OCCUPANCY

The Principal Representative shall have the right to take possession of and to use any completed or partially completed portions of the Work, even if the time for completing the entire Work or portions of the Work has not expired and even if the Work has not been finally accepted, and Contractor shall fully cooperate with the Principal Representative to allow such possession and use. Such possession and use shall not constitute an acceptance of such portions of the Work but may impact equipment warranty start date.

Prior to any occupancy of the Project, an inspection shall be made by the Principal Representative, the Contractor's Architect/Engineer, and the Contractor. Such inspection shall be made for the purpose of ensuring that the building is secure, protected by operation safety systems as designed, operable exits, power, lighting and HVAC systems, and otherwise ready for the occupancy intended and the Notice of Substantial Completion has been issued for the occupancy intended. The inspection shall also document existing finish conditions to allow assessment of any damage by occupants. Any and all areas so occupied will be subject to a final inspection when the Contractor complies with Article 34, Completion, Final Inspection, Acceptance and Settlement.

ARTICLE 34. COMPLETION, FINAL INSPECTION, ACCEPTANCE AND SETTLEMENT

A. NOTICE OF COMPLETION

Yellow Book, Titles 19 and 20.

B. FINAL INSPECTION

Yellow Book, Title 20; 2001.1.

C. NOTICE OF SUBSTANTIAL COMPLETION

Yellow Book, Titles 19 and 20.

D. NOTICE OF FINAL ACCEPTANCE

Yellow Book, Title 20, 2002.2.

E. SETTLEMENT

Yellow Book, Title 20, 2003.

ARTICLE 35. GENERAL WARRANTY AND CORRECTION OF WORK AFTER ACCEPTANCE

Reference Article 25 of the main agreement.

ARTICLE 36. LIENS

Yellow Book, Title 12.

ARTICLE 37. ONE-YEAR WARRANTIES

A. WARRANTY OF THE WORK

Reference Article 25 of the main agreement.

B. SPECIAL WARRANTIES

In case of Work performed for which product, manufacturers or other special warranties are required by the Specifications, Contractor shall secure the required warranties and deliver copies thereof to the Principal Representative upon completion of the Work.

These products, manufacturers or other special warranties, as such, do not in any way lessen Contractor's responsibilities under the Contract. Whenever warranties are required by the Specifications for a longer period than one year, such longer period shall govern. Administration of such extended warranties may be the responsibility of the specific manufacturer of the product being warranted and not necessarily the Contractor, unless explicitly stated in the Contract Documents.

ARTICLE 38. WARRANTY INSPECTIONS AFTER COMPLETION

Yellow Book, Title 20, 2002-2003.

ARTICLE 39. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Yellow Book, Title 6.

If an amount is indicated immediately below, liquidated damages shall be applicable to this Project as, and to, the extent shown below. Where an amount is indicated below, liquidated damages shall be assessed in accordance with and pursuant to the terms of Article 46, Time Of Completion And Liquidated Damages, in the amounts and as here indicated. The election of liquidated damages shall limit and control the party's right to damages only to the extent noted.

For the inability to use the Project, for each day after the number of calendar days specified in the Contractor's bid for the Project and the Contract for achievement of Substantial Completion, or as specified in this Agreement, until the day that the Project has achieved Substantial Completion and the Notice of Substantial Completion is issued, the Contractor agrees that an amount equal to (\$1,000 per day) shall be assessed against Contractor from amounts due and payable to the Contractor under the Contract, or the Contractor and the Contractor's Surety shall pay to the City such sum for any deficiency, if amounts on account thereof are deducted from remaining amounts due, but amounts remaining are insufficient to cover the entire assessment.

For damages related to or arising from additional administrative, technical, supervisory and professional expenses related to and arising from the extended closeout period, for each day in excess of the number of calendar days specified in the Contractor's bid for the Project and the Agreement to finally complete the Project as defined by the issuance of the Notice of Final Acceptance) after the issuance of the final Notice of Substantial Completion, the Contractor agrees that an amount equal to (\$1,000 per day) shall be assessed against Contractor from amounts due and payable to the Contractor under the Contract, or the Contractor and the Contractor's Surety shall pay to the City such sum for any deficiency, if amounts on account thereof are deducted from remaining amounts due but amounts remaining are insufficient to cover the entire assessment.

ARTICLE 40. DAMAGES

Yellow Book, Title 6.

**ARTICLE 41. CITY'S RIGHT TO DO THE WORK; TEMPORARY SUSPENSION OF WORK; DELAY;
DAMAGES**

A. CITY'S RIGHT TO DO THE WORK

Yellow Book, Title 21.

B. TEMPORARY SUSPENSION OF WORK

Yellow Book, Title 21.

C. DELAY DAMAGES

Yellow Book, Title 6; 603.

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Schedule B: Detailed Scope of Work

EXCLUSIONS AND CLARIFICATIONS

The following exclusions and clarifications apply to all scopes of work.

EQUIPMENT SELECTIONS

The Guaranteed Maximum Price is based on the following scopes of work, exclusions, and clarifications. Some scopes of work reference particular equipment selections. The selections are a basis of design and may change during the design period as needed to accomplish the stated objectives. Final equipment selections may vary from the scopes below.

GENERAL

1. Correction of deficiencies not explicitly listed in the scope of work are not included; if existing equipment or components are reused, repairs to existing equipment or components are not included unless specifically noted in the scopes of work.
2. Refrigerant and equipment that is recovered during demolition will not be returned to the City for salvage or reuse. It is recycled under the scope of work.
3. Demolition work not specified in the scopes of work is excluded.
4. Pricing assumes that Certified Payroll is not required. If required, project contingency can be used to cover any pricing increases due to Certified Payroll.
5. City and County of Denver taxes at 5.91% are included. All other taxes, including state tax, are excluded.
6. This is an outcome-based scope based on preliminary design. McKinstry has included all parts, components, and repairs known to be necessary to meet the stated outcomes. In the event that unforeseen, unknown, or conditions different from the initial audit arise contingency has been included in the project for this purpose. McKinstry will notify the City of the need to use contingency to address these conditions and at its discretion use contingency as needed. Contingency use is not a change order to the contract and is subject to the fee structure, including overhead and profit, described in Schedule G the Energy Performance Contract, Contractor Proposal.
7. Should the City request change orders, they are subject to the fee structure, including overhead and profit, described in Schedule G of the Energy Performance Contract, Contractor Proposal.
8. Contractor shall schedule and conduct (1) warranty walk per CCD Facility Team.
9. All work (less lighting retrofits which are typically done after hours) is scheduled during normal business hours. Any requests to do work after hours may result in additional costs and project contingency can be used to cover these additional costs.
10. Cost allowances are used in this project for scopes where insufficient information was available in the audit stage to fully define the project cost.

Schedule B: Detailed Scope of Work

11. It is understood that Textura will not be required. Textura fees are not included. If required project contingency can be used to cover these additional costs.

EXISTING CONDITIONS

1. It is assumed that the existing utility services are operational and adequately sized to accommodate new equipment.
2. It is assumed that the existing structures is adequate to accommodate new and existing equipment. Preliminary assessments have been performed at sites for new rooftop equipment.
3. Correction of any existing code violations not identified in the scope of work is excluded.
4. It is assumed that existing systems are adequate to meet the building load and in serviceable condition. Repair or replacement of these items not addressed in the scope of work is excluded. Examples of these systems include, but are not limited to: boilers, chillers, cooling towers, heat exchangers, piping, coils, pumps, valves, air handling units, rooftop units, unit ventilators, terminal VAV boxes, unit heaters, exhaust fans, ductwork, diffusers, dampers, and other associated appurtenances.
5. Furnishing or installing any access panels or doors not specifically identified is excluded.
6. Repair of any pre-existing roof or roof deck damage is excluded from this scope.
7. Systems will be drained and refilled as needed using existing isolation and air bleeding as shown on the City provided as-built documentation.
8. McKinstry shall not be responsible for any re-inspection fees or other costs that are a direct result of failed inspections due to other work being performed in or around McKinstry's work that are not explicitly stated in our scope of work.
9. McKinstry is not responsible for delays in start-up, or additional start-ups, that are caused by other contractors outside of McKinstry's scope of work.
10. New ceiling tiles, removal and replacement of ceiling tile grid, and any repairs to existing ceiling tile and grid conditions are excluded.
11. Repair, replacement, or refurbishment of any existing equipment upstream or downstream of the specified equipment in scope shall be excluded unless specifically identified in the construction documents.
12. Missing lens replacement is not included. Lenses only to be replaced if broken or damaged during install
13. It is assumed isolation valves are in working condition. Unless specifically noted in the scope of work replacement of failed isolation valves is excluded.
14. It is assumed that the chimney at Fire Station 24 is functional. This scope does not include chimney inspections or a new chimney liner.

Schedule B: Detailed Scope of Work

15. Chlorine treatment of entire domestic water distribution system is excluded from the steam condensate scope of work as the piping replaced is minimal.
16. Glycol levels on existing systems will be measured prior to construction. After construction glycol will be added to the systems to bring them back up to the measured pre-construction levels.
17. If roofing manufacturer warranty information is not provided to McKinstry, the roof manufacturer warranty may not be upheld after installation.

DESIGN

1. The GMAX documents are assumed to be the 'Design Development' documents and as such the final design deliverables shall follow standards associated with the 'Construction Documents'. The construction documents will not include sections or specifications as neither deliverable is necessary for the scope of work to be performed.
2. Costs are based on design input from the individual maintenance teams and McKinstry design standards and any deviation from these standards at the request of City that require additional costs shall be addressed via the change order process outlined in the EPC contract and Schedule A.
3. Screening and painting of new equipment is excluded.
4. Repair of existing duct leakage and blowouts is excluded.
5. Modifying and/or adding seismic restraint components to existing mechanical equipment and lighting fixtures is excluded.
6. Updating lighting controls to meet current code requirements is excluded.
7. There is no guarantee that post-installation sound levels will not be higher than current levels.
8. BIM (3-D building modeling) is excluded.
9. The City is not considering this project a New Construction Project but a Retrofit Project. Therefore, no specific CCD design/construction standards have been provided, followed in design or included in pricing. If design/construction standards are provided post contract signature any deltas from the current design to the CCD provided design/construction standards will be covered by project contingency.

CONSTRUCTION AND SCHEDULE

1. The construction schedule has been built around a one (1) week turn-around time between the City receiving and responding to each submittal. McKinstry reserves the right to extend construction timelines as required to account for any delays in submittal reviews by the City.
2. The project schedule may be extended by inclement weather.

Schedule B: Detailed Scope of Work

3. It is assumed that McKinstry will have full unrestricted access twenty-four hours a day seven days a week to City buildings during the construction period while adhering to Customer required security protocols.
4. Temporary heating, cooling, and ventilation is excluded from all scope items. It is assumed that McKinstry will not provide services (hot water, heating, cooling, electricity, light, refrigeration) to building tenants during the construction period, providing these services is excluded. The building may not meet the City's comfort standards during the construction periods mentioned above.
5. It is not expected to damage tree roots during crane pick activities. If any crane pick damages tree roots nearby the site, McKinstry will not be responsible for tree replanting or any other remediation to trees.
6. Costs are based on prompt and safe access to all areas necessary to complete these scopes of work.
7. Moving of facility equipment or furniture is excluded. The City is responsible for heavy moving of furniture in offices and other spaces to accommodate work in these spaces as needed.
8. City to provide special inspections as required by the AHJ for all scopes of work.

SCHEDULED SHUT-DOWNS

1. The scopes of work require periodic mechanical and electrical system shutdowns. McKinstry will provide one-week notice of temporary shutdowns. The City and McKinstry will coordinate with relevant stakeholders in a timely fashion to develop a shut-down schedule.
2. The City shall de-energize buildings for electrical shutdowns. McKinstry will verify absence of voltage and perform work. The City shall then re-energize buildings after electrical work. McKinstry shall give (1) weeks' notice prior to shutdowns.

NETWORK CONNECTIVITY & REMOTE ACCESS CLARIFICATIONS

1. Client has requested McKinstry's assistance to provide technical support, services, and/or analysis through the Client's Intelligent Building Management System (BMS) or Building Automation System (BAS) (the "System(s)"). McKinstry's Work requires that Client makes the System(s) accessible via TCP/IP connection, Remote Desktop Protocol (RDP), or other pre-approved method for accessing the System(s) reliably. For clients without existing access using these methods, other options will need to be explored.
2. The City is responsible for providing any network drops required for the scope of work. McKinstry to give at least (2) weeks' notice for when data drops need to be installed. McKinstry must meet all of the Customer's safety and security requirements for network connectivity.
3. The City represents that all facilities and System(s) within the scope of services are pre-existing and have Direct Digital Controls (DDC) that are web-enabled (or other equivalent remote access) to allow

Schedule B: Detailed Scope of Work

for continued remote connectivity for troubleshooting and issue investigation, and these System(s) have capability to deliver alarms via email to external recipients.

4. The above requirements for McKinstry to be able to reliably connect to customer DDC systems through the specified contract performance period.
5. McKinstry Responsibilities
 - a) Set up necessary trends for performance analytics objectives.
 - b) Establish automated export system (if included in scope) using a simple export script to send trend reports to McKinstry FTP site, scheduled to minimize impact on the System(s).
 - c) Maintain all log in credentials in a secure password management system.
6. City Responsibilities:
 - a) Integrity and security of, and access to, all Systems and associated building automation technology components, including hardware and software will be the sole responsibility of the City.
 - b) The City will provide notice to McKinstry prior to upgrades, changes, or modifications to the System(s) and will assume associated costs related to maintaining connectivity to McKinstry monitoring technologies.
 - c) The City will provide and maintain reasonable web-enabled open access network for remote connectivity to Systems for authorized McKinstry personnel and must support external network connectivity. McKinstry relies on the City's knowledge of its own internal network and System(s) to determine the appropriateness of the access granted.
 - d) Connectivity needs to be accessible without the use of Key-FOB's or other VPN client software that may limit or disrupt local connectivity which would interfere with McKinstry's ability to properly setup, tune and diagnose alarms.
 - e) The City will provide secure remote access to dedicated System(s) primary servers, such as Niagara servers, as required by McKinstry. Remote Desktop protocol or other similar methods are typically acceptable. Remote access to the Niagara and JCI servers is required by McKinstry for continuous data upload of raw trend archives to McKinstry's servers. McKinstry requires VPN access to the District's intranet through the contractual performance period.
 - f) The City is solely responsible for safe guarding its Systems, information, networks, data, and associated components. The City acknowledges that McKinstry has no access or knowledge of the City's IT network, System(s) and/or security protocols and has no practical way of monitoring the operational activities of those systems.
 - g) If alarming will be included in the scope of services the City will provide an exchange email account capable of receiving alarms from the System(s) and sending these alarms to external addresses.
 - h) It is assumed that existing network drops will be reused.

Schedule B: Detailed Scope of Work

FIRE/LIFE SAFETY SYSTEM EXCLUSION

1. Testing of the Fire/Life Safety system, modifications to the system/associated components and test and balance of smoke control systems are excluded from scope.
2. Furnishing, installing, or wiring to any combination fire/smoke, fire dampers or smoke dampers is excluded.
3. Any changes to fire and life safety systems not noted in the scopes below, are excluded.
4. Any changes to existing lightning protection systems are excluded.

COMMISSIONING SPECIFIC EXCLUSIONS

Commissioning is provided by McKinstry commissioning staff. Third party commissioning is excluded.

Beyond the components and systems not specifically included in this scope of work, all other components and systems are excluded, including but not limited to the following items:

1. Fire/Life Safety System, except as noted above.
2. Elevators
3. Back-up Generators
4. Electrical services/devices not associated with McKinstry scope items
5. Controls modifications to buildings other than specifically listed in the following scope of work.
6. HVAC equipment not specifically called out in the scope of work

PLUMBING SPECIFIC EXCLUSIONS

Plumbing systems not specifically called out in the scope of work are excluded.

TEST AND BALANCE EXCLUSIONS AND CLARIFICATIONS

Test and Balance work will follow standard TAB or NEBB standards for the specified pieces of equipment called out in the scope below only. Equipment downstream of the specified equipment shall be excluded unless specifically called out in the scope above. An example is control valves and circuit setters downstream of pumping systems being changed per the scope of work. This exclusion is not limited to this example.

PHOTOVOLTAIC CLARIFICATIONS AND EXCLUSIONS

1. McKinstry has shown estimated third-party inverter replacement costs in the project cashflow. The City is responsible for this work being executed.
2. For the installation of PV systems on built up roofs, spudding is excluded.
3. De-installation and re-installation of any PV systems or portions thereof are excluded.

Schedule B: Detailed Scope of Work

4. Project payback is, in part, contingent on renewable energy credits (RECs), incentives from Xcel Energy. McKinstry will make best efforts to capture solar incentives from utility on the City's behalf. In the event the incentives are not available the payback is subject to increase.
5. Costs have been included for standard solar utility grid tie interconnections. Additional engineering studies or upgrades required by Xcel Energy are excluded.
6. Generators are not included for the necessary full building shutdowns for solar PV interconnection.
7. Roof protection underneath solar PV pallets on the roof shall be OSB board or equal equivalent.
8. McKinstry will perform pre-installation roof inspections prior to solar PV installation. The city shall be responsible for correcting any roofing deficiencies found during these inspections prior to construction mobilization.
9. It is assumed that the solar canopies will be complete in one phase. There are no costs included for temporary parking or transportation.
10. It is assumed there are no easements or other encumbrances interfering with the solar canopies at relevant sites.
11. Any fees required by the AHJ for tree removal, replanting and/or mitigation to prepare the site for the solar installation are excluded.
12. Ongoing fees beyond Year 5 for DAS subscriptions are not included in the initial construction cost. Such ongoing fees include both Cell Service and Data Subscription Monitoring fees.
13. Extended Warranties for equipment are excluded.
14. Except as may be noted in the scopes of work, accommodations for Americans with Disabilities Act (ADA) compliance are excluded.
15. Parking canopy decking, gutters, surveillance equipment, and controls/sensors for included under-canopy lighting are excluded.
16. Snow removal is excluded.
17. Favorable soil and subsurface conditions are assumed at parking canopy sites. Any additional costs incurred by poor subsurface conditions requiring de-watering, pre-drilling, slurring, hard-digging, bell/socketed piers, caissons, perched water tables, rebar cages or spread footers are excluded.
18. Aluminum wire is specified for long solar PV electrical runs. EMT conduit is specified for solar PV conduit runs.
19. Painting of exterior solar conduit is excluded.
20. Loss in energy savings due to the items listed below are excluded from the McKinstry savings guarantee:
 - a) Damage from storms, vandalism, and accidents
 - b) Solar monitoring system data collection outages
 - c) Utility loss of power due to utility outage or customer caused outage
 - d) Utility required curtailment of power/energy

Schedule B: Detailed Scope of Work

e) City change in facility load creating change in savings

REVEAL CLARIFICATIONS

Use of the cloud-based Reveal™ software service is provided for the term of this contract and will terminate at its conclusion.

City and County of Denver has requested McKinstry's assistance to provide technical support, service and/or analysis (herein "Work") through a remote connection to the City's intelligent building management system. To provide this Work, the City understands and acknowledges that they will be providing McKinstry with access to the City's network as reasonably required to perform the service.

The use of this access is in accordance with the following disclaimer. By accepting this, the City acknowledges that they are solely responsible for safeguarding the City's own information systems. McKinstry relies on the City's knowledge of their own internal systems to determine the appropriateness of the access granted and to monitor the system as appropriate. McKinstry has no access to or knowledge of the City's networks, systems, and/or security protocols and has no practical way of monitoring the operational activities of the computer systems or network so cannot be held responsible for the performance therein. Specifically, the:

1. City agrees to assume all responsibilities for the operations and security of the network and systems.
2. City acknowledges and agrees that McKinstry cannot warranty and/or guarantee the safety of the network, software, systems, data, data exchange or other information.
3. City acknowledges and agrees that McKinstry will not be responsible for loss of data or loss of use for the network. McKinstry strongly advises that City safeguard critical data by backing up said data prior to any services performed by McKinstry.
4. City acknowledges and understands that Work may be subject to limitations, security risks, delays, and other problems inherent in the use of the internet and electronic communications. McKinstry is not responsible for any delays, delivery failures, security breaches or other damage resulting from such problems. The Work contains technology that is not fault tolerant and is not designed, manufactured, or intended for use in environments or applications in which the failure of the Work could lead to death, personal injury, or severe physical, property or environmental damage.

Should the City wish to end the service prior to the end of the contract they must provide McKinstry with written notice. Upon receipt of the request to terminate McKinstry will discontinue the City's use of the service. The City forfeits any remaining time already paid for, McKinstry will not provide a refund for any time that was invoiced and paid for that the client does not use.

Schedule B: Detailed Scope of Work

Reveal™, AEM, and related sections may be subject to limitations, security risks, delays, and other problems inherent in the use of the internet and electronic communications. McKinstry is not responsible for any delays, delivery failures, security breaches or other damage resulting from such problems. McKinstry cannot warranty and/or guarantee the safety of software, systems, data, the data exchange or other information affected by 3rd parties. The work contains technology that is not fault tolerant and is not designed, manufactured, or intended for use in environments or applications in which the failure of the work could lead to death, personal injury, or severe physical, property or environmental damage. McKinstry does not warrant that the use of the service will be un-interrupted or error free.

As McKinstry does not know of; have the ability to mitigate; or even insure against certain damages, the parties agree that McKinstry will not be responsible for consequential, indirect, incidental or similar damages or losses, including loss of profits or loss of use arising out of or relating to Reveal™ or AEM, whether based in contract or tort or any other theory, even if a party has been advised of the possibility of such damages.

City and County of Denver will: 1) be responsible for all user's compliance with this agreement in conjunction with the user's compliance with the services; 2) be responsible for the accuracy, quality, appropriateness and legality of any of City and County of Denver or their related user content; 3) use commercially reasonable efforts to prevent unauthorized access to or use of the services and notify McKinstry promptly of any such unauthorized access or use; 4) use the services only in accordance with the documentation and acceptable use policies and applicable laws; 5) and be responsible for appropriately obtaining and maintaining all environments or services needed to access and use the service, including but limited to computer hardware, software, network, internet access services, and related network security resources, including preventative maintenance, data security and backups.

City and County of Denver will not: 1) distribute, license, loan, or sell Reveal™ or AEM or other content that is contained or displayed in it; 2) modify, alter, or create any derivative works of the Reveal™ or AEM application; 3) reverse engineer, decompile, decode, decrypt, disassemble, or derive any source code from Reveal™ or AEM; 4) remove, alter, or obscure any copyright, trademark, or other proprietary rights notice on or in the service.

McKinstry will collect, use, and process City and County of Denver data in accordance with McKinstry's Reveal™ Privacy Policy published at https://reveal.mckinstry.com/privacy_policy

The City's general access to the Reveal™ service, or any subsection of, is made pursuant to the Reveal™ Terms of Service published at https://reveal.mckinstry.com/terms_conditions

Schedule B: Detailed Scope of Work

SCOPE OF WORK

PROJECT LOCATIONS

Building Name*	ID	Team	Area (ft ²)	Address
City and County Building	CCB	A	419,387	1431 Bannock St
Denver Municipal Animal Shelter	DAS	A	36,476	1241 W Bayaud Ave
Police Admin Building	PAB	A	149,804	1331 Cherokee St
Police District #3	PD3	B	41,765	1625 S University Blvd
S. Osage Fleet Maintenance - Garage	OFM	B	17,050	2013 S Osage St
Police Academy	POA	C	50,546	8895 Montview Blvd
Police District #2	PD2	C	40,228	3921 Holly St
Police Traffic Operations Bureau	PTO	C	50,546	3375 Park Ave West
S. Cherry Creek Transfer Station	CTS	C	25,646	7300 Cherry Creek S Dr
CPC - Fleet Maintenance - Bldg. 5	FM5	CPC	39,546	1271 W Bayaud Ave, Bldg. 5
Police District #1*	PD1	C	40,131	1311 W 46th Ave
CPC - Gary Price Ops - Bldg. 2	GPO	CPC	29,056	1271 W Bayaud Ave, Bldg. 2
Denver Crime Lab	DCL	D	71,646	1371 Cherokee St
Lindsey-Flanigan Courthouse	LFC	D	318,000	520 W Colfax Ave
Rose Andom Center	RAC	D	46,037	1330 Fox St.
Van Cise-Simonet Detention Ctr	VDC	D	438,411	490 W Colfax Ave
Permit Building	PMB	E	79,208	200 W 14th Ave
The Commons on Champa	CMP	E	45,000	1245 Champa St
Fire Station #2	FS2	FS	24,372	5300 Memphis St
Fire Station #21	FS21	FS	5,791	1580 E Virginia Ave
Fire Station #22	FS22	FS	10,719	3530 S Monaco Pkwy
Fire Station #24	FS24	FS	7,183	2695 S Colorado Blvd
Fire Station #26	FS26	FS	15,758	7934 Martin Luther King Blvd

* Police District #1 added post IGA contract for a single ECM (new roof top chiller)

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SCOPE SUMMARY

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
22.01 - CCD Controls Optimization/RCx	Team A, B, C, CPC, D, E, and Fire Stations	CCD All	Controls optimization, utility dashboard and tracking, on-going RCx	\$610,331	-	-
CCD Controls Optimization/RCx		CCD All		\$610,331	-	-
01.06-CCB Steam Condensate Heat Recovery	Team A	City and County Building	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	\$12,897	\$148,377	-
02.01-CCB Chilled Water Pump Replacement	Team A	City and County Building	Replace existing chilled water pumps and VFDs. This will save electrical energy and reduce maintenance requirements.	\$18,560	\$217,758	-
04.01-CCB BAS Controls Upgrade/Replacement	Team A	City and County Building	Upgrade outdated Siemens APOGEE controls to a BACnet compatible system and install new BACnet compatible controls on remaining standalone air handling units. Integrate new controls with the existing Building Automation System.	\$84,486	\$754,093	-
09.01-CCB Interior LED Lighting Upgrades	Team A	City and County Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$31,522	\$374,635	-
20.01-CCB Rate Analysis	Team A	City and County Building	Investigate the district chilled water utility agreements and negotiate better rates.	-	-	-
01.06-PAB Steam Condensate Heat Recovery	Team A	Police Administration Building PAB	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	\$9,623	\$114,551	-
03.07-PAB MZU to VAV Unit	Team A	Police Administration Building PAB	Convert existing multi-zone unit (MZU) to a variable air volume (VAV) unit to allow for better temperature control and energy savings.	\$10,261	\$130,805	-
04.01-PAB BAS Controls Upgrade/Replacement	Team A	Police Administration Building PAB	Upgrade the existing standalone pneumatic controls and convert to electronic signals through the addition of E-P transducers. Integrate new E-P controls with the existing BAS.	\$72,739	\$793,231	-

Schedule B: Detailed Scope of Work

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
04.02-PAB Occupancy Based HVAC Control	Team A	Police Administration Building PAB	Install occupancy temperature sensors and interlock with fan coil unit control to setback temperatures during unoccupied periods.	\$11,532	\$132,676	-
09.01-PAB Interior LED Lighting Upgrades	Team A	Police Administration Building PAB	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$19,313	\$225,736	-
09.02-PAB Exterior LED Lighting Upgrades	Team A	Police Administration Building PAB	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$4,149	\$48,813	-
20.01-PAB Rate Analysis	Team A	Police Administration Building PAB	Investigate the district chilled water utility agreements and negotiate better rates.	-	-	-
Team A Total		City and County Building, Police Administration Building PAB		\$275,083	\$2,940,675	-
09.01-DAS Interior LED Lighting Upgrades	Team B	Denver Municipal Animal Shelter	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$8,462	\$112,516	-
09.02-DAS Exterior LED Lighting Upgrades	Team B	Denver Municipal Animal Shelter	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$244	\$3,030	-
03.13-PD3 Upgrade Air Cooled Chiller	Team B	Police District #3	Replace air cooled chiller with a high efficiency air cooled chiller, this will replace ASHRAE end of life equipment	\$46,205	\$631,886	-
08.05-PD3 Add VFDs to Building Pumps	Team B	Police District #3	Add variable frequency drives (VFDs) with motor replacements to pumps.	\$9,209	\$109,173	-
09.01-PD3 Interior LED Lighting Upgrades	Team B	Police District #3	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$5,658	\$67,802	-
10.01-PD3 Solar Photovoltaic- Roof	Team B	Police District #3	Surface parking lot canopy solar PV system	\$77,221	\$908,603	-
09.01-OFM Interior LED Lighting Upgrades	Team B	South Osage Fleet Maintenance Garage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,528	\$29,689	-
09.02-OFM Exterior LED Lighting Upgrades	Team B	South Osage Fleet Maintenance Garage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$489	\$6,199	-

Schedule B: Detailed Scope of Work

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
Team B Total		Denver Municipal Animal Shelter, South Osage Fleet Maintenance Garage, Police District #3		\$150,016	\$1,868,898	-
03.04-POA VVT to VAV Unit Replacement	Team C	Denver Police Academy	Current roof top unit is VVT, refurbish existing VVT damper controls to allow better occupant control and comfort. Add zone based occupancy sensor control.	\$28,630	\$392,086	-
04.01-POA BAS Controls Upgrade/ Replacement	Team C	Denver Police Academy	Upgrade/ replace existing BAS controls on HVAC systems. Upgrade to modern controls and best-in-class control sequence	\$22,768	\$138,145	-
09.01-POA Interior LED Lighting Upgrades	Team C	Denver Police Academy	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$4,155	\$50,107	-
09.02-POA Exterior LED Lighting Upgrades	Team C	Denver Police Academy	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$719	\$9,040	-
10.02 - POA Solar Photovoltaic - Canopy	Team C	Denver Police Academy	Surface parking lot canopy solar PV system	\$67,947	\$805,274	-
03.13-PD1 Upgrade Air Cooled Chiller	Team C	Police District 1	Replace roof top air cooled chiller with a new chiller that has a better turndown. Existing chiller on roof is reaching end of life and should be replaced soon	\$52,104	\$699,564	-
08.05-PD1 Add VFDs to Building Pumps	Team C	Police District 1	Add variable frequency drives (VFDs) with motor replacements to pumps.	\$10,689	\$125,456	-
09.01-PD2 Interior LED Lighting Upgrades	Team C	Police District 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$4,485	\$53,819	-
09.02-PD2 Exterior LED Lighting Upgrades	Team C	Police District 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,005	\$25,750	-
10.02-PD2 Solar Photovoltaic - Canopy	Team C	Police District 2	Surface parking lot canopy solar PV systems	\$103,925	\$1,218,836	-
09.01-CTS Interior LED Lighting Upgrades	Team C	South Cherry Creek Transfer Station	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$3,275	\$38,932	-
09.02-CTS Exterior LED Lighting Upgrades	Team C	South Cherry Creek Transfer Station	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$957	\$11,580	-
09.01-PPS Interior LED Lighting Upgrades	Team C	Police Property Storage	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	Included with PTO	-	Included with PTO
09.01-PRC Interior LED Lighting Upgrades	Team C	Parks and Rec Center	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	Included with PTO	-	Included with PTO

Schedule B: Detailed Scope of Work

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
09.01-PTF Interior LED Lighting Upgrades	Team C	Police Training Facility/ Shooting Range	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	Included with PTO	-	Included with PTO
09.02-PPS Exterior LED Lighting Upgrades	Team C	Police Property Storage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	Included with PTO	-	Included with PTO
09.02-PRC Exterior LED Lighting Upgrades	Team C	Parks and Rec Center	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	Included with PTO	-	Included with PTO
09.02-PTF Exterior LED Lighting Upgrades	Team C	Police Training Facility/ Shooting Range	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	Included with PTO	-	Included with PTO
04.02-PTO Occupancy Based HVAC Control	Team C	Police Traffic Operations Bureau	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	\$3,081	-	\$35,451
09.01-PTO Interior LED Lighting Upgrades	Team C	Police Traffic Operations Bureau	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$13,894	-	\$165,776
09.02-PTO Exterior LED Lighting Upgrades	Team C	Police Traffic Operations Bureau	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,699	-	\$31,700
10.01-PTO Solar Photovoltaic- Roof	Team C	Police Traffic Operations Bureau	Roof mounted solar PV system	\$41,662	-	\$497,936
13.01-PTO Air Sealing and Weather Stripping	Team C	Police Traffic Operations Bureau	Add weather stripping and spray foam to better seal building envelope, reduce infiltration and improve occupant comfort	\$14,415	-	\$1,410
13.02-PTO Ceiling and Wall Insulation	Team C	Police Traffic Operations Bureau	Add insulation to ceiling and walls, reduce leakage and improve on temperature control	\$61,686	-	\$2,820

Schedule B: Detailed Scope of Work

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
Team C Total		Police District 1, South Cherry Creek Transfer Station, Police Property Storage, Parks and Rec Center, Police Training Facility/ Shooting Range, Denver Police Academy, Police District 2, Police Traffic Operations Bureau		\$439,093	\$3,568,590	\$735,093
09.01-FM5 Interior LED Lighting Upgrades	Team CPC	Fleet Maintenance Building #5	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$3,225	\$39,223	-
09.02-FM5 Exterior LED Lighting Upgrades	Team CPC	Fleet Maintenance Building #5	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,766	\$35,529	-
10.02-FM5 Solar Photovoltaic - Canopy	Team CPC	Fleet Maintenance Building #5	Flush mount system on existing structural canopy	\$40,772	\$480,338	-
09.01-GPO Interior LED Lighting Upgrades	Team CPC	Gary Price Operations Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	8,343	\$102,945	-
09.02-GPO Exterior LED Lighting Upgrades	Team CPC	Gary Price Operations Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	1,875	\$24,251	-
Team CPC Total		Gary Price Operations Building, Fleet Maintenance Building #5		\$56,980	\$682,287	-
01.06-DCL Steam Condensate Heat Recovery	Team D	Denver Crime Lab	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	\$12,793	\$147,175	-

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ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
09.01-DCL Interior LED Lighting Upgrades	Team D	Denver Crime Lab	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$14,145	\$167,516	-
09.02-DCL Exterior LED Lighting Upgrades	Team D	Denver Crime Lab	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$1,081	\$13,155	-
09.01-LFC Interior LED Lighting Upgrades	Team D	Lindsay-Flanigan Courthouse	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$71,689	\$862,211	-
09.02-LFC Exterior LED Lighting Upgrades	Team D	Lindsay-Flanigan Courthouse	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$1,942	\$23,542	-
20.01-LFC Rate Analysis	Team D	Lindsay-Flanigan Courthouse	Investigate the district chilled water utility agreements and negotiate better rates.	-	-	-
02.12-RAC Chiller Replacement	Team D	Rose Andom Center	Replace roof top air cooled chiller with a new chiller that has a better turndown.	\$49,228	\$667,108	-
04.07-RAC Ventilation Control	Team D	Rose Andom Center	Reconnect the energy recovery ventilator (ERV) enthalpy wheels to their associated VFDs and re-enable heat recovery. Integrate ERV into the control system. Provide full test and balance on outdoor air system.	\$6,376	\$73,976	-
09.01-RAC Interior LED Lighting Upgrades	Team D	Rose Andom Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$5,353	\$65,394	-
09.02-RAC Exterior LED Lighting Upgrades	Team D	Rose Andom Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$626	\$7,692	-
13.01-RAC Air Sealing and Weather Stripping	Team D	Rose Andom Center	Seal crack and gaps in walls and exterior doors	10,914	-	-
09.01-VDC Interior LED Lighting Upgrades	Team D	Van Cise-Simonet Detention Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$52,277	\$620,559	-
09.02-VDC Exterior LED Lighting Upgrades	Team D	Van Cise-Simonet Detention Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,248	\$28,518	-
Team D Total		Rose Andom Center, Denver Crime Lab, Lindsay-Flanigan Courthouse, Van Cise-Simonet Detention Center		\$228,672	\$2,676,846	-

Schedule B: Detailed Scope of Work

ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
04.02-CMP Occupancy Based HVAC Controls	Team E	The Commons on Champa	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	\$6,055	\$69,661	-
09.01-CMP Interior LED Lighting Upgrades	Team E	The Commons on Champa	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$19,662	\$242,408	-
09.02-CMP Exterior LED Lighting Upgrades	Team E	The Commons on Champa	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$284	\$3,556	-
13.04-CMP Replace Single Pane Windows	Team E	The Commons on Champa	Replace single pane windows with high performance double pane windows with vinyl/ fiberglass frames	\$28,617	\$345,463	-
20.01-CMP Rate Analysis	Team E	The Commons on Champa	Investigate the district chilled water utility agreements and negotiate better rates.	-	-	-
04.02-PMB Occupancy Based HVAC Controls	Team E	Permit Building	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	\$5,275	\$60,684	-
09.01-PMB Interior LED Lighting Upgrades	Team E	Permit Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$25,054	\$307,958	-
09.02-PMB Exterior LED Lighting Upgrades	Team E	Permit Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$230	\$2,817	-
20.01-PMB Rate Analysis	Team E	Permit Building	Investigate the district chilled water utility agreements and negotiate better rates.	-	-	-
Team E Total		The Commons on Champa, Permit Building		\$85,175	\$1,032,549	-
09.01-FS2 Interior LED Lighting Upgrades	Team Fire	Fire Station #2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,614	\$30,794	-
09.02-FS2 Exterior LED Lighting Upgrades	Team Fire	Fire Station #2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$543	\$6,911	-
10.01-FS2 Solar Photovoltaic - Roof	Team Fire	Fire Station #2	Roof mounted solar PV systems	\$33,359	\$398,261	-
01.01-FS21 Boiler Replacement	Team Fire	Fire Station #21	Replace end of life boiler with high efficiency boiler capable of staging/modulating to efficiently heat the building during the winter months.	\$27,708	\$320,994	-
09.01-FS21 Interior LED Lighting Upgrades	Team Fire	Fire Station #21	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$1,476	\$17,027	-
09.02-FS21 Exterior LED Lighting Upgrades	Team Fire	Fire Station #21	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$73	\$869	-

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ECM Name and Reference Number	Team	Facility	ECM Description	Cost of Services	Cost of Equipment	Cost of Direct Purchase Equipment
09.01-FS22 Interior LED Lighting Upgrades	Team Fire	Fire Station #22	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$1,117	\$13,397	-
09.02-FS22 Exterior LED Lighting Upgrades	Team Fire	Fire Station #22	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$12	\$145	-
01.02-FS24 Boiler Replacement	Team Fire	Fire Station #24	Replace end of life boiler with high efficiency boiler capable of staging/modulating to efficiently heat the building during the winter months.	\$19,043	\$221,305	-
09.01-FS24 Interior LED Lighting Upgrades	Team Fire	Fire Station #24	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$843	\$10,005	-
09.02-FS24 Exterior LED Lighting Upgrades	Team Fire	Fire Station #24	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$310	\$3,941	-
09.01-FS26 Interior LED Lighting Upgrades	Team Fire	Fire Station #26	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$2,679	\$31,706	-
09.02-FS26 Exterior LED Lighting Upgrades	Team Fire	Fire Station #26	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	\$755	\$9,396	-
Team Fire Total		Fire Station #21, Fire Station #22, Fire Station #24, Fire Station #26, Fire Station #2		\$90,530	\$1,064,752	-
Contingency				\$399,903	-	-
Solar O&M (First Year)				\$11,000	-	-
Total - For All Measures by Category				\$2,346,783	\$13,834,597	\$735,094

GENERAL

The following items, where applicable, apply to all measures.

1. Site altitude: Equipment shall be sized and rated for specified performance at site altitude of 5,600' ASL.
2. Supplemental Documentation: The following documents support this Scope of Work and shall be considered part of the Contractor's requirements. Where discrepancies exist among referenced documents, the more stringent shall apply.

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- a. Owner's Construction Design Guidelines and Specifications
- b. Codes
 - i. 2018 International Building Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - ii. 2018 International Existing Building Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - iii. 2018 International Fire Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - iv. 2018 International Plumbing Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - v. 2018 International Mechanical Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - vi. 2018 International Fuel Gas Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - vii. 2018 International Energy Conservation Code with City of Denver amendments per 2019 Denver Building and Fire Code.
 - viii. 2020 National Electric Code with City of Denver amendments per 2019 Denver Building and Fire Code.
- c. Industry Standards (Latest edition, unless noted otherwise)
 - i. NEBB Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems
 - ii. SMACNA HVAC Duct Construction Standards, Metal and Flexible
 - iii. National Fire Protection Association Standards (NFPA)
- d. McKinstry Standards & Specifications
 - i. Controls Provider Performance Standards
 - ii. TAB Provider Performance Standards
 - iii. BACnet control point naming convention

PRELIMINARY COMMISSIONING PLANS

The following ECMs include commissioning efforts at the end of the implementation phase. The commissioning plan for each ECM will be based on the standard commissioning plan below. Any variations from the standard commissioning plan are described with each individual ECM below.

The following preliminary commissioning plan is designed as a framework from which the final commissioning plan will be developed. The presence of owner personnel may be requested during the commissioning process.

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The McKinstry commissioning team will:

- Review submittals to ensure that controls protocols and system performance align with the energy savings guarantees and design intentions.
- Review and approve control sequences with M&V and energy engineer.
- Review and approve contractor plan for equipment pre-startup and startup activities. Document that Necessary procedures are followed to ensure the integrity and performance of the physical systems.
- Supervise, review, and approve test and balance procedures and reports. Spot check readings as necessary to ensure systems are performing correctly and the final conditions of the systems are properly documented.
- Create and distribute pre-functional test to the various responsible contractors and oversee the execution of the contractor's QA/ QC program.
- Perform functional testing (where applicable) to validate equipment performance and verify that control sequence programming is correct and meets intent.
- Verify the necessary trends are in place within the BAS.
- Analyze trend data to review performance.
- Review, approve, and coordinate contractor training programs with the City. Where necessary the commissioning agent will attend and supplement contractor training sessions with training on system interactions.
- Provide final commissioning report with all findings and supporting documents.

Asset Management Program

The asset management scope is focused on supporting a successful transition from design and construction into operations. We understand that there are significant challenges to managing and integrating new assets into an existing city's infrastructure and management systems, including the following:

- Systems, processes, and resources must be aligned so that the operations of an individual facility match the overall facilities management program.
- Occupancy changes, retrofits, and equipment degradation inevitably test systems in ways any modeling process couldn't anticipate.
- Change and innovation, especially within technology, often outpace the systems and resources in place to operate and maintain these changes.
- Increasingly complex building systems and emerging technologies, while integral to an occupant experience, put strain on building operators and often surpass technical experience, training or abilities.
- Building operators must work across an enormous range of equipment types, system types, and technologies when operating and maintaining MEP assets in a city.

Closing this gap requires a disciplined process and approach to capture critical knowledge and transfer that knowledge to operations staff. Our asset management services will do just that, allowing for an optimized and sustainable transition of all new EPC assets into operations. Additionally,

Schedule B: Detailed Scope of Work

this scope will set the policies, procedures, and templates in place for the city to successfully transition all facilities in the future. A few highlighted benefits of this component of the program include the following:

- Equipment will be accurately documented, equipment will be easily serviced, and asset information will be readily available for the facility operations team.
- Warranties from recent project work will be fully documented and maximized.
- Equipment and systems will be optimized for ongoing performance.
- Some operational practices will successfully transition from reactive maintenance to preventive maintenance practices, resulting in significant operational cost savings.
- Data will be easily located and accessed.
- Successful transfer of data, and critical facility knowledge, will enable the operations team with the right information to correct systems failures or communicate with occupants why the building functions the way it does.

While most teams were interested in this scope, there is a small amount of variation across teams of what is included for asset management support. Below is a summary by team.

Team	Detailed Baseline Analysis	Provide EPC Installed Asset Data	Preventing Maintenance Planning	Install QR tags & Train Staff	Enhanced Warranty Management Support*
Team E	X	X	X	X	X
Team D	✓	✓	✓	✓	✓
Team C	✓	✓	✓	X	✓
Team B	✓	✓	✓	X	✓
Fire	✓	✓	✓	X	✓
CPC	✓	✓	✓	X	✓
Team A	✓	✓	✓	X	✓

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ASSET MANAGEMENT DETAILED SCOPE OF WORK

The following section outlines the proposed scope of work to successfully transition the new EPC assets into operations. In more detail, this proposal is structured around three main scopes of work: asset inventorying, warranty management, and operating procedure development. Prior to completing each scope of work item below, McKinstry will conduct a detailed baseline analysis of operational practices for each team. McKinstry will review the utilization of Infor, shadow the teams, and interview various stakeholders across the city. Through this process, McKinstry will map out what is working well for each team, what areas of support would be valuable to each team, and how existing practices compare to industry best practices. This baseline assessment will set the framework and roadmap for building out the scope items defined below.

I. ASSET INVENTORYING

Asset inventorying is a foundational component of the EPC and is necessary for a successful transition to operations for each team. This section outlines the scope necessary to develop an asset inventory and transition assets to Infor. These steps are outlined below.

a. Develop systems and processes for bringing new assets into Infor

The first step of asset inventorying is to develop systems and processes for bringing new MEP building equipment assets into Infor. This step includes defining location and storage structure standards, asset naming conventions, and asset hierarchies for all new EPC assets. McKinstry will focus on standardizing these items across each team as much as possible to create universal standards for the city, but it will be important to ensure that each team's individual needs are met.

b. Transfer new assets and asset data into Infor

McKinstry will work closely with each maintenance team and the Infor team to transfer all new EPC assets into Infor. These new assets will follow the standards described above and will serve as a pilot for these new processes. McKinstry will continue to work with each team as these standards roll out and adjust as needed.

c. Train the teams to access asset data for maintenance tasks

This scope of work includes installing QR tags for the new EPC assets for Team D as a pilot program for the city. The goal of the tags are to better associate assets in the field with assets in Infor, allow maintenance staff to easily pull up relevant information on an asset when in the field, and to ensure assets are tagged appropriately to work orders to allow for improved analysis and optimization of maintenance activities. For example, with assets tagged appropriately to work orders, the team will be able to determine the total corrective maintenance costs for each asset, the total preventive maintenance costs for each asset, make

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more informed capital planning decisions, and perform a more thorough root cause analysis.

II. ENHANCED WARRANTY MANAGEMENT STANDARDIZATION

The goal of the warranty management standardization scope in this proposal is to help ensure that manufacturer warranties for all new EPC assets are documented, easily accessed, and fully utilized. While McKinstry will include a standard one year GC warranty period where all warranty items route through McKinstry, the scope items below aid in the transition period after 1 year in which each team will still have extended manufacturer warranties available to them. This scope ensures that each team has what they need readily available to fully utilize those additional warranties. This scope includes the following steps:

a. Review existing warranty management system capabilities in Infor and existing warranty management practices

This step focuses on reviewing the existing warranties within Infor to develop a baseline understanding of capabilities. This includes an analysis of which warranties are being documented and how all these warranties are being utilized by staff. This baseline analysis will be compared against industry best practices to develop a more robust set of plans and standards for storing and accessing warranties.

b. Build a warranty management standard

After completing the baseline assessment, McKinstry will work with each team to define a warranty management standard that aids in storage and access of warranty data. This will include improved methods for collecting warranty data, attaching warranty documentation to assets in Infor or another tool, storing the correct information by warranty, and effectively labeling assets on site and in Infor as under warranty. Overall, the goal of these new standards is to ensure maintenance teams are utilizing the manufacturer extended warranties and have the information well tracked and readily available.

c. Train staff in utilizing warranty management standards

Finally, McKinstry will provide training the teams on these new warranty processes. The goal of these trainings is to ensure proper utilization of the warranty management standards and provide the staff with the right tools to manage and operate the system. Additionally, these new warranty standards will be piloted for the new EPC assets. Once these standards are set and prove value for these new assets, they can be utilized by each team for the transition of future projects.

III. OPERATING PROCEDURE DEVELOPMENT

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A core component of a successful transition to sustainable operations is the development and utilization of standard operating procedures (SOPs) and maintenance operating procedures (MOPs). An SOP is defined as a set of detailed instructions for facility personnel to efficiently and successfully perform facility operations. MOPs are operating procedures related to preventive or proactive maintenance that occur on a regular frequency. This scope focuses on developing all recommended MOPs to properly maintain the new EPC assets. Each team will also receive 0-5 SOPs that are required to support the MOPs. For example, if teams do not have a "lockout tag out" or "maintenance shutdown and restart" procedures, McKinstry will provide these along with the MOPs.

a. Finalize the List of Operating Procedures & Operating Procedures Template

McKinstry will work closely with each team to develop a list of operating procedures that will be included in this project. We will also provide an SOP and an MOP template for each team to review, ahead of developing the procedures. The goal with these steps is to ensure that the program is meeting the unique needs of each team, the applicable staff, and the corresponding buildings before developing the procedures.

b. Build out the Operating Procedures

Once the list and templates are finalized, McKinstry will build out each operating procedure, customized for the equipment and systems in place in these buildings. The teams are responsible for completing the safety sections of the procedures and ensuring staff always have the correct personal protective equipment (PPE), complete a hazard assessment, and meet the city's confined space standards and other policies while carrying out procedures.

McKinstry will work closely with the shops to review the list of procedures, the template, and all the procedures to allow for a proper transition. McKinstry will conduct a review process for all necessary stakeholders. The review process will include one session to review the procedures in written form, and a 90% review/training session at a sample unit for each type of procedure.

c. Train Staff on Operating Procedures

As noted above, McKinstry will train the operators and technicians on how to carry out the operating procedures during the 90% review task. These trainings will occur at the unit, and McKinstry will point to each component and explain the steps necessary to carry out the procedure. This step is crucial for ensuring that these operating procedures are successfully implemented and carried out and that procedures are fully reviewed and optimized. While there will be a written review process as noted above, McKinstry anticipates that each team will have additional small changes to the procedures once the training is conducted at the unit. Thus, McKinstry will address any final requested changes from these changes and subsequently turn the procedures over to the Infor team for upload to Infor or another preferred storage solution.

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ASSET MANAGEMENT PROJECT TIMELINE

The asset management component of the EPC will commence at the start of the EPC contract, and it will last one year from project substantial completion. Prior to equipment startup, the project will be focused on the baseline assessment and the building of new standards, templates, and processes. Once equipment start up occurs and the project reaches substantial equipment, McKinstry will continue to work with each team for one year to ensure that these new tools are effectively implemented and adequately support each team. At the completion of that one-year mark, the goal is that each team will utilize these processes moving forward for other construction projects. McKinstry will provide a short summary report at the end of the asset management program that outlines the successes and lessons learned from the process, the benefits of these new tools, and a framework for transition construction projects in the future.

01.02 – FS21 Boiler Replacement

1. Mechanical – Demolish
 - A. Contractor shall be responsible for equipment, materials, accessories, insulation, and other associated requirements called for in the following scope, and as indicated in the above supported documents.
 - B. Isolate, disconnect, and remove (1) boiler, (1) heating water circulation pump, (1) chilled water circulation pump, and (1) three-way changeover valve (see attached reference drawings).
 - 1) Cut back and isolate existing heating water and gas piping to extent needed to facilitate this scope of work.
 - 2) Drain system to extent needed to facilitate this scope of work.
 - C. Demolish and remove existing boiler flue vent through the roof penetration and disconnect from existing hot water heater flue. The existing flue roof penetration shall be reused.
 - D. Demolish existing combustion air louvers (2) to mechanical room. Leave high opening to reuse for hot water heater combustion air.
 - 1) Ensure the water heater flue is disconnected and rerouted to the roof through existing flue penetration. Terminate per manufacturer instructions.
 - E. Properly dispose of existing chilled water and hot water pumps, boiler, expansion tank, backflow preventer, and associated isolation/control valves.
2. Mechanical
 - A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
 - B. All equipment shall be installed in same location as old equipment, and have new house keeping pads installed as referenced in design drawings.
 - C. Furnish & Install Condensing Boiler
 - 1) Furnish and install (1) 652,000 BTU/hr output, 97% efficient, gas-fired condensing boiler.

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- (i) Basis of Design: Lochinvar FTXL 850N, or equivalent. Provide unit with the following:
- New exhaust and combustion air vents
 - (i) Furnish and install new 6" flue vent from boiler up through the existing exhaust terminal in roof. Provide new flashing and seal to be weather tight. Ensure manufacturer flue pitch requirements are met to allow proper drainage of condensate.
 - (ii) Furnish and install new 4" combustion air vent from the existing combustion air intake terminal located in the mechanical room and ducted to the boiler connection. Provide flashing and seal the remainder of the air intake opening to be weather tight. Terminate intake with rain cap and bird screen, or as otherwise recommended by the manufacturer.
 - (iii) Vent material shall be 316L stainless steel or other UL 1738 listed material approved by the manufacturer.
 - Ensure manufacturer minimum clearance requirements are met on all sides of the boiler.
 - Motorized modulation firing with a minimum 15:1 turndown.
 - Include manufacturer start-up of boiler.
 - Provide condensate neutralization system with PVC piping routed to appropriate floor drain in mechanical room. Ensure manufacturer drainage requirements met.
 - Provide and install new boiler isolation valves to meet code requirements.
- D. Furnish & Install Heating Water Circulation Pump
- 1) Furnish and install (1) new heating water circulation pump with an ECM motor.
 - (i) Basis of Design: Bell and Gossett e-60 series in-line pump, or equivalent.
 - (ii) Existing pumps have the following specifications (new pump shall be in-kind):
 - (E) P (Chilled Water): Bell & Gossett Series 60, 15 gpm at 23' head, 1750 rpm, 1/3 hp.
 - (E) P (Heating Hot Water): Bell & Gossett Series 60, 34 gpm at 23' head, 1750 rpm, 1/2 hp.
 - (iii) Furnish and install (1) Bell & Gossett Series e-80 and e-90
 - P-1: e-80, 15 GPM, 23' head, 1578 rpm, 1/2 hp
 - P-2: e-90, 34 GPM, 23' head, 1656 rpm, 1/2 hp
 - (iv) Existing pump isolation valves shall be replaced to meet code requirements.
 - (v) Ensure boiler manufacturer minimum flow requirements are met with pump selection.
- E. Install 3-Way Changeover Valve
- 1) Install new 3-way changeover valve, furnished by controls.
 - 2) Provide piping modifications as required to accommodate new valve size.
- F. Furnish & Install Air Separator
- 1) Furnish and install air separator. Basis of Design: Spirovent VDT-200, or equivalent.
 - (i) Provide unit with the following: 50 gallons per minute capacity.

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- G. Furnish & Install Expansion Tank
- 1) Furnish and install new expansion tank. Basis of Design: Bell & Gossett B-300 bladder tank, or equivalent.
- H. Furnish & Install Unit Heater
- 1) Provide and install new heating water unit heater and two-way heating water control valve with 120V actuator in existing boiler room. Also include a new line voltage thermostat.
 - 2) Basis of Design: Modine HC-18, or equivalent.
- I. Reconnect heating water and gas piping. Provide all piping appurtenances as required.
- 1) Ensure all heating water piping is properly insulated per state codes and install new insulation as needed.
- J. Controls – Demo
- K. Demolish and dispose of all existing control components (including sensors, actuators, controls enclosures, and conduit) not intended to be re-used. Remove pneumatic tubing serving devices removed back to the branch tap from the piping main and cap at that location.
- L. Controls
- 1) Provide all necessary programmable controllers, low voltage wiring to control panels, conduit, sensors, transformers, and actuators for a complete and functioning control system for the boiler.
 - (i) All boiler plant control components shall be new. Replace all sensors and instrumentation.
 - (ii) New boiler shall have self-contained factory controls with BACnet communication capability.
 - (iii) Furnish new 3-way changeover valve to mechanical for install
 - Three-way, 2 position 1-1/2" diverting valve, include DDC actuator with no spring return required.
 - 2) Control strategy:
 - (i) Existing heating water system is a primary, constant volume loop with one heating water pump that circulates water to (6) fan coil units and (1) air handling unit. New heating water system orientation shall remain the same.
 - (ii) Program a heating water reset schedule as follows based on the outside air temperature:
 - OAT = 20°F (adj.), HWST = 180°F (adj.)
 - OAT = 60°F (adj.), HWST = 110°F (adj.)
 - Boiler shall be disabled when OAT > 70°F (adj.)
3. Electrical
- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General circuiting requirements
- 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability, and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor

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- shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
 - 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
- C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.
- D. General Scope: Electrical work to support the replacement of (1) boiler and associated components.
- 1) Metering: Project will result in a net increase in electrical load. 30-day metering data will be required.
 - 2) Reference PDF mark-ups for existing equipment locations.
- E. Demolition:
- 1) Existing boiler is 120V, 12 FLA.
 - (i) Disconnect and safe off power to boiler for demolition.
 - (ii) If applicable, remove existing toggle switch disconnect.
 - (iii) Existing conduit and conductors shall remain for re-use (assumed 3/4"C, 2#12, #12 GND CU.).
 - (iv) Existing 20A/1P breaker in serving panelboard shall remain.
 - 2) Existing pump 'P-1' shall be removed (120V, 1/3 HP).
 - (i) Disconnect and safe off power to pump.
 - (ii) Disconnect and remove existing relay and safety switch serving pump.
 - (iii) Existing conduit and conductors shall remain for re-use (assumed 3/4"C, 2#12, #12 GND CU.).
 - 3) Existing pump 'P-2' shall be removed (120V, 1/2 HP).
 - (i) Disconnect and safe off power to pump.
 - (ii) Disconnect and remove existing relay and safety switch serving pump.
 - (iii) Existing conduit and conductors shall remain for re-use (assumed 3/4"C, 2#12, #12 GND

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CU.).

F. New Work:

- 1) New boiler 'B-1' (Single-point connection, 120V, 15 FLA).
 - (i) Provide and install new toggle switch disconnect for boiler (NEMA 1, 20A/1P).
 - (ii) Extend existing conduit and conductors to new boiler control panel and connect power to unit.
 - (iii) Provide and install new 3/4" conduit from boiler control panel to EPO switch. EPO switch and control wiring by others.
- 2) New pump 'P-1' (120V, 1/2 HP, 9.8 FLA).
 - (i) Provide and install new 20A/1P RIB (relay in a box) rocker switch disconnect for pump.
 - (ii) Extend existing conduit and conductors to new pump and connect power.
- 3) New pump 'P-2' (120V, 1/2 HP, 9.8 FLA).
 - (i) Provide and install new 20A/1P RIB (relay in a box) rocker switch disconnect for pump.
 - (ii) Extend existing conduit and conductors to new pump and connect power.
- 4) New unit heater for boiler room (120V, 1/60 HP)
 - (i) Provide and install new motor rated toggle switch for unit heater (NEMA 1, 15A/1P).
 - (ii) Provide and install new conduit and conductors from nearest 208Y/120V panelboard to unit (3/4", 2#12, #12 GND CU.).
 - a) Provide and install new 20A/1P breaker in panelboard. Breaker AIC rating shall meet the AIC rating of the panelboard.
 - (iii) Provide and install 3/4" conduit from unit heater down to wall mounted thermostat. Thermostat and control wiring by others.

4. Testing, Adjusting and Balancing (TAB)

- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
- C. Provide complete pre-construction test and balance for existing boiler and heating water pump.
- D. Provide complete post-construction waterside test and balance for proposed boiler and heating water pump.

01.02 – FS24 Boiler Replacement

1. Mechanical – Demolish

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated

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requirements called for in the following scope, and as indicated in the above supported documents.

- B. Isolate, disconnect, and remove (1) boiler and (1) heating water circulation pump (see attached reference drawings).
 - 1) Cut back and isolate existing heating water and gas piping to extent needed to facilitate this scope of work.
 - 2) Drain system to extent needed to facilitate this scope of work.
 - C. Demolish and remove existing boiler flue vent to chimney vent. The existing flue vent within chimney and roof penetration shall be reused.
 - D. Demolish, and remove (12"x18") combustion air louver air intake to mechanical room near hot water heater and cap and seal entire opening within window well.
 - E. Demolish duct work connected to existing (22"x30") combustion air louver
 - 1) Leave enough louver free area open to meet combustion air code requirements of 1 sq.in/3,000 BTU/h for the existing to remain atmospheric hot water heater.
 - 2) Remaining space to be used to create a plenum box for attaching new boiler combustion air vent.
 - F. Properly dispose of existing hot water pump, boiler, expansion tank, backflow preventer, and associated isolation/control valves.
2. Mechanical
- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
 - B. All equipment shall be installed in same location as old equipment, and have new house keeping pads installed as referenced in design drawings.
 - C. Furnish & Install Non-Condensing Boiler
 - 1) Furnish and install (1) 873,000 BTU/hr output, 85% efficient, gas-fired non-condensing boiler.
 - (i) Basis of Design: Lochinvar Power-Fin PB-1302, or equivalent. Provide unit with the following:
 - New exhaust and combustion air vents.
 - (i) Furnish and install new 8" flue vent from boiler up through the existing exhaust terminal at the peak of the tower. Ensure manufacturer flue pitch requirements are met to allow proper drainage of condensate. Secure vent as needed.
 - (ii) Furnish and install new 6" combustion air vent from a new intake terminal and ducted to the boiler connection. Secure vent to wall as needed.
 1. Provide new horizontal wall penetration that is sealed weather tight and terminate with rain cap and bird screen, or as otherwise recommended by the manufacturer.
 2. Contractor shall select appropriate location for penetration on the north facing wall of building with design input from McKinstry.
 - (iii) Vent material shall be Type "B".
 - Ensure manufacturer minimum clearance requirements are met on all sides of the boiler.

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- Motorized modulation firing with a minimum 20:1 turndown.
 - Include manufacturer start-up of boiler.
 - Provide condensate neutralization system with PVC piping routed to appropriate floor drain in mechanical room. Ensure manufacturer drainage requirements met.
 - Provide and install new boiler isolation valves to meet code requirements.
- D. Furnish & Install Heating water Circulation Pump
- 1) Furnish and install (1) new heating water circulation pump. See reference drawing for location.
 - (i) Basis of Design: Bell and Gossett e-60 series in-line pump, or equivalent.
 - New pump shall be rated for 60 GPM, 60' head, 1568 rpm, 3 hp, 240V 1PH
 - (ii) Existing pump isolation valves shall be replaced to meet code requirements.
 - (iii) Ensure boiler manufacturer minimum flow requirements are met with pump selection.
- E. Furnish & Install Air Separator
- 1) Furnish and install air separator. Basis of Design: Spirovent VDT-250, or equivalent.
 - (i) Provide unit with the following: 60 gallons per minute capacity.
- F. Furnish & Install Expansion Tank
- 1) Furnish and install new expansion tank. Basis of Design: Bell & Gossett B-200 bladder tank, or equivalent.
- G. Reconnect heating water and gas piping. Provide all piping appurtenances as required.
- 1) Ensure all heating water piping is properly insulated per state codes and install new insulation as needed.
3. Controls-Demo
- A. Demolish and dispose of all existing control components (including sensors, actuators, controls enclosures, and conduit) not intended to be re-used. Remove pneumatic tubing serving devices removed back to the branch tap from the piping main and cap at that location.
 - B. Demo existing outside air lockout and associated wiring.
4. Controls
- 1) Provide all necessary programmable controllers, low voltage wiring to control panels, conduit, sensors, transformers and actuators for a complete and functioning digital controls system for the boiler.
 - (i) All boiler plant control components shall be new. Replace all associated sensors and instrumentation where they already exist.
 - (ii) New boiler shall have self-contained factory controls with BACnet communication capability.
 - (iii) Provide new outside air temperature sensor and wire back to boiler controls.
 - 2) Control strategy:
 - (i) Existing heating water system is a primary, constant volume loop with one heating water pump that circulates water to radiation elements throughout the perimeter. New heating water system orientation shall remain the same.

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(ii) Program a heating water reset schedule as follows based on the outside air temperature:

- OAT = 20°F (adj.), HWST = 180°F (adj.)
- OAT = 60°F (adj.), HWST = 110°F (adj.)
- Boiler shall be disabled when OAT > 70°F (adj.)

5. Electrical

A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

B. General circuiting requirements

- 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
- 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
- 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).

C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.

D. General Scope: Electrical work to support the replacement of (1) boiler and associated components.

- 1) Metering: Project will result in a net increase in electrical load. 30-day metering data will be required.
- 2) Reference PDF mark-ups for existing equipment locations.

E. Demolition:

- 1) Existing boiler is 120V, 12 FLA.
 - (i) Disconnect and safe off power to boiler for demolition.
 - (ii) Remove and dispose of existing toggle switch disconnect.
 - (iii) Existing conduit and conductors shall remain for re-use (assumed 3/4"C, 2#12, #12 GND

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CU.).

(iv) Existing 20A/1P breaker in serving panelboard shall remain.

(v) Disconnect and remove existing EPO wall switch. Retain for re-use.

2) Existing circ. pump shall be removed (120V, 1/2 HP).

(i) Disconnect and safe off power to pump.

(ii) Disconnect and remove existing relay and safety switch serving pump.

(iii) Remove existing conductors back to panel 'A'. Existing conduit shall remain for re-use (assumed 3/4"C).

(iv) Remove (2) poles worth of spare breakers in panel 'A' for new circ. pump.

F. New Work:

1) New boiler 'B-1' (Single-point connection, 120V, 15 FLA).

(i) Provide and install new toggle switch disconnect for boiler (NEMA 1, 20A/1P).

(ii) Extend existing conduit and conductors to new boiler control panel and connect power to unit.

(iii) Install existing EPO switch on interior of boiler room, next to door. Provide and install new 3/4" conduit from boiler control panel to EPO switch. EPO switch and control wiring by others.

2) New circ. pump (240V/1PH, 3 HP, 17 FLA).

(i) Provide and install new 30A/2P motor rated toggle switch disconnect for pump.

(ii) Provide and install new 25A/2P breaker in panel 'A'. Breaker AIC rating shall meet the AIC rating of panelboard.

(iii) Provide new conductors (2#10, #10 GND CU.) in existing 3/4" conduit from panel 'A' to new pump location and connect power.

6. Testing and Balancing (TAB)

A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.

B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.

C. Provide complete pre-construction test and balance for existing boiler and heating water pump.

D. Provide complete post-construction waterside test and balance for proposed boiler and heating water pump.

01.06 – CCB Steam Condensate Heat Recovery

1. Mechanical – Demolish

1) Isolate and drain hydronic lines at domestic water inlet to existing steam domestic water heater.

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Demolish small section of domestic water piping to allow for series install of new heat exchanger.

2. Mechanical

A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.

B. Install New Condensate Pump

1) Furnish and install new condensate receiver and pump

(i) BOD Shipco AC

- Capable of pumping 40 gpm at 12 ft of head and storing 20 gallons of condensate.
- Elevate unit on a metal stand so overflow outlet is above top of existing pipe.

(ii) Isolate condensate lines and drain down as necessary to facilitate installation.

(iii) Tap into condensate line just upstream of existing condensate cooler with new 2" piping and route to condensate receiver inlet.

(iv) Pipe pump discharge to inlet of newly installed heat exchanger.

(v) Furnish and install isolation valves and unions at inlet and outlet of condensate receiver.

(vi) Route vent piping to combine with existing vent piping coming out of condensate cooler.

(vii) Insulate all piping (vent and condensate) and equipment with 1" insulation and label.

Support piping per industry standards.

C. Install new heat exchanger

1) Furnish and install new plate and frame heat exchanger

(i) BOD Alfa Laval AQ2-MDFG

- Capable of 1,755 MBH heat transfer. Stainless steel plates and EPDM gaskets.

2) Pour new 4" housekeeping pad and mount heat exchanger to pad.

D. Connect domestic water side of the heat exchanger in series with and upstream of existing steam domestic water heater. Ensure connection points are downstream of hot water recirculation inlet so water always circulates through heat exchanger.

1) New piping to be 2" copper and insulated with 1" insulation.

2) Install normally closed isolation valve in existing piping to allow maintenance of new heat exchanger without loss of hot water.

E. Route condensate piping from condensate receiver, through heat exchanger, and back to condensate cooler.

1) Condensate piping to be 2" schedule 80 seamless carbon steel and insulated with 1" insulation.

2) Furnish and install 2" 3-way self-acting, diverting temperature regulating control valve with external temperature sensor in condensate piping to bypass heat exchanger and maintain domestic water temperature. BOD Samson 43-3

F. Furnish and install isolation valves, strainers, unions, P/T ports, pressure gauges, and temperature gauges at all four heat exchanger connections. See detail in sketch.

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- G. Furnish and install low point drains and high point vents in domestic and condensate connection lines.
- H. Install valve temperature sensor in domestic water leaving heat exchanger to control three-way valve.
Set temperature setpoint to 120F per manufacturer requirements.
- I. Flush and clean all new piping prior to system startup. Provide bypasses and isolation to avoid flushing heat exchanger.
 - 1) Chlorine treatment is required on domestic piping and domestic side of heat exchanger.
- 3. Controls
 - 1) Not applicable.
- 4. Electrical
 - A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and power distribution system to determine available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
 - 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - C. Furnish and install new 120V circuit to condensate pump from nearest 120V panel with availability. Provide disconnecting means within 50' of pump and clearly label.
- 5. Testing, Adjusting and Balancing (TAB)
 - A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
 - B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
 - C. Provide post construction test and balance for the condensate pump and heat exchanger. Document and provide pressure drops, flow rates, and temperatures at condensate pump and all four connections to heat exchanger.

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01.06 – DCL Steam Condensate Heat Recovery

1. Mechanical – Demolish

- 1) Isolate and drain hydronic lines at domestic water inlet to existing steam domestic water heater.
Demolish small section of domestic water piping to allow for series install of new heat exchanger.

2. Mechanical

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.

B. Install New Condensate Pump

- 1) Furnish and install new condensate receiver and pump

- (i) BOD Shipco AC

- Capable of pumping 40 gpm at 12 ft of head and storing 20 gallons of condensate.
- Elevate unit on a metal stand so overflow outlet is above top of existing pipe.

- (ii) Isolate condensate lines and drain down as necessary to facilitate installation.

- (iii) Tap into condensate line just upstream of existing condensate cooler with new 2" piping and route to condensate receiver inlet.

- (iv) Pipe pump discharge to inlet of newly installed heat exchanger.

- (v) Furnish and install isolation valves and unions at inlet and outlet of condensate receiver.

- (vi) Route vent piping to combine with existing vent piping coming out of condensate cooler.

- (vii) Insulate all piping (vent and condensate) and equipment with 1" insulation and label.

Support piping per industry standards,

C. Install new heat exchanger

- 1) Furnish and install new plate and frame heat exchanger

- (i) BOD Alfa Laval AQ2-MDFG

- Capable of 1,755 MBH heat transfer. Stainless steel plates and EPDM gaskets.

- 2) Pour new 4" housekeeping pad and mount heat exchanger to pad.

- D. Connect domestic water side of the heat exchanger in series with and upstream of existing steam domestic water heater. Ensure connection points are downstream of hot water recirculation inlet so water always circulates through heat exchanger.

- 1) New piping to be 2" copper and insulated with 1" insulation.

- 2) Install normally closed isolation valve in existing piping to allow maintenance of new heat exchanger without loss of hot water.

- E. Route condensate piping from condensate receiver, through heat exchanger, and back to condensate cooler.

- 1) Condensate piping to be 2" schedule 80 seamless carbon steel and insulated with 1" insulation.

- 2) Furnish and install 2" 3-way self-acting, diverting temperature regulating control valve with

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external temperature sensor in condensate piping to bypass heat exchanger and maintain domestic water temperature. BOD Samson 43-3

- F. Furnish and install isolation valves, strainers, unions, P/T ports, pressure gauges, and temperature gauges at all four heat exchanger connections. See detail in sketch.
 - G. Furnish and install low point drains and high point vents in domestic and condensate connection lines.
 - H. Install valve temperature sensor in domestic water leaving heat exchanger to control three-way valve. Set temperature setpoint to 120F per manufacturer requirements.
 - I. Flush and clean all new piping prior to system startup. Provide bypasses and isolation to avoid flushing heat exchanger.
 - 1) Chlorine treatment is required on domestic piping and domestic side of heat exchanger.
4. Controls
- 2) Not applicable.
5. Electrical
- D. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - E. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and power distribution system to determine available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
 - 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - F. Furnish and install new 120V circuit to condensate pump from nearest 120V panel with availability. Provide disconnecting means within 50' of pump and clearly label.
6. Testing, Adjusting and Balancing (TAB)
- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
 - B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.

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- C. Provide post construction test and balance for the condensate pump and heat exchanger. Document and provide pressure drops, flow rates, and temperatures at condensate pump and all four connections to heat exchanger.

01.06 – PAB Steam Condensate Heat Recovery

1. Mechanical – Demolish
 - 1) Isolate and drain hydronic lines at domestic water inlet to existing steam domestic water heater. Demolish small section of domestic water piping to allow for series install of new heat exchanger.
2. Mechanical
 - A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
 - B. Install New Condensate Pump
 - 1) Furnish and install new condensate receiver and pump
 - (i) BOD Shipco AC
 - Capable of pumping 40 gpm at 12 ft of head and storing 20 gallons of condensate.
 - Elevate unit on a metal stand so overflow outlet is above top of existing pipe.
 - (ii) Isolate condensate lines and drain down as necessary to facilitate installation.
 - (iii) Tap into condensate line just upstream of existing condensate cooler with new 2" piping and route to condensate receiver inlet.
 - (iv) Pipe pump discharge to inlet of newly installed heat exchanger.
 - (v) Furnish and install isolation valves and unions at inlet and outlet of condensate receiver.
 - (vi) Route vent piping to combine with existing vent piping coming out of condensate cooler.
 - (vii) Insulate all piping (vent and condensate) and equipment with 1" insulation and label. Support piping per industry standards.
 - C. Install new heat exchanger
 - 1) Furnish and install new plate and frame heat exchanger
 - (i) BOD Alfa Laval AQ2-MDFG
 - Capable of 1,755 MBH heat transfer. Stainless steel plates and EPDM gaskets.
 - 2) Pour new 4" housekeeping pad and mount heat exchanger to pad.
 - D. Connect domestic water side of the heat exchanger in series with and upstream of existing steam domestic water heater. Ensure connection points are downstream of hot water recirculation inlet so water always circulates through heat exchanger.
 - 1) New piping to be 2" copper and insulated with 1" insulation.
 - 2) Install normally closed isolation valve in existing piping to allow maintenance of new heat exchanger without loss of hot water.

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- E. Route condensate piping from condensate receiver, through heat exchanger, and back to condensate cooler.
 - 1) Condensate piping to be 2" schedule 80 seamless carbon steel and insulated with 1" insulation.
 - 2) Furnish and install 2" 3-way self-acting, diverting temperature regulating control valve with external temperature sensor in condensate piping to bypass heat exchanger and maintain domestic water temperature. BOD Samson 43-3
- F. Furnish and install isolation valves, strainers, unions, P/T test ports, pressure gauges, and temperature gauges at all four heat exchanger connections. See detail in sketch.
- G. Furnish and install low point drains and high point vents in domestic and condensate connection lines.
- H. Install valve temperature sensor in domestic water leaving heat exchanger to control three-way valve. Set temperature set point to 120F per manufacturer requirements.
- I. Flush and clean all new piping prior to system startup. Provide bypasses and isolation to avoid flushing heat exchanger.
 - 1) Chlorine treatment is required on domestic piping and domestic side of heat exchanger.
- 6. Electrical
 - A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and power distribution system to determine available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
 - 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - C. Furnish and install new 120V circuit to condensate pump from nearest 120V panel with availability. Provide disconnecting means within 50' of pump and clearly label.
- 7. Testing, Adjusting and Balancing (TAB)
 - A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
 - B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls

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Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.

- C. Provide post construction test and balance for the condensate pump and heat exchanger. Document and provide pressure drops, flow rates, and temperatures at condensate pump and all four connections to heat exchanger.

02.01 – CCB Chilled Water Pumps Replacement

1. Mechanical – Demolish

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
- B. Isolate and drain existing hydronic lines as necessary to complete the scope of work. Pump power disconnection to be completed by electrical.
- C. Demolish and remove (2) existing 75 HP chilled water pumps. Remove and salvage existing motors and return to City & County Building maintenance staff, if desired.
- D. Properly dispose of associated equipment.
- E. Existing curbs/housekeeping pads shall remain in place to be re-used.

2. Mechanical

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
- B. Furnish and Install Chilled Water Pumps
- C. Chilled water pump basis of design: Bell & Gossett series e-1510 model 5GB.
 - 1) Furnish and install (2) new chilled water pumps with the following specifications:
 - a) Base mounted end suction pump
 - b) 1200 gpm of flow at 160 ft of head (system has no propylene glycol)
 - c) Suction diffusers and discharge check valves
 - d) Provide pressure gauges and PT test ports on each side of each pump
 - e) 1800 rpm rated motor speed
 - f) Inverter ready NEMA premium-efficiency motor for variable flow
 - g) Existing chilled water piping shall be reused to extent possible
 - h) Insulate all new fittings, pipe, and pumps to code minimum
- B. Furnish Chilled Water Pump VFDs
 - 1) Furnish (2) variable frequency drives for the chilled water pumps.
 - A. Drives shall be ABB ACH580, or equivalent, with onboard default BACNET card as default option, see below for HP and power connection requirements.
 - B. Provide VFDs to electrical contractor for installation.

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- 1) Contractor shall deliver VFDs to the final location in the pump mechanical room and electrical contractor will mount VFDs in the final location and make final connections.
 - C. Include manufacturer start-up and programming of VFD
- 2) This work shall be done for the following pumps:
 - A. CHWP-1: 75 HP, 208V/3P (FLA to be verified on-site)
 - B. CHWP-2: 75 HP, 208V/3P (FLA to be verified on-site)
3. Controls
 - A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Reference the Control Contractor Performance Specifications for additional requirements.
 - 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
 - 5) Existing building automation systems and graphics shall be used and updated for new functionality.
 - 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
 - C. Disconnect control devices and wiring from the existing chilled water pumps (see list in Mechanical Contractor section), reconnect and reprogram controls integration for the replacement pumps and variable frequency drive.
 - D. Field survey existing pump controllers for spare points. Integrate (2) new chilled water pumps and VFDs into BAS with the following points labeled as hardwired. Provide communication cable from BAS to the VFD on-board BACNET card for information access.
 - 1) Pump start/stop (DO) (hardwired)
 - 2) Pump status (DI) (hardwired)
 - 3) Pump alarm (DI) (hardwired)
 - 4) Pump VFD enable/disable (DO) (hardwired)
 - 5) Pump VFD speed (AO) (hardwired)
 - 6) Pump VFD alarm (DI) (hardwired)

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7) Pump VFD status (DI) (hardwired)

8) Pump VFD kW (AI) (network card)

E. Pump Control Strategy:

1) The chilled water pumps shall operate with a lead/lag configuration. The BAS shall enable the lead chilled water pump when any air handling unit or fan coil unit is proven on and calling for cooling. Lead pump designation shall be rotated weekly (adj.) in accordance with the BAS.

2) Once enabled the pump speed shall be modulated to maintain the calculated remote differential pressure setpoint. The differential pressure setpoint shall reset based on control valve positions.

A. Pump VFD speed shall modulate between a minimum of 50% (adj) and a maximum of 100%.

3) Differential Pressure Reset Sequence:

A. The objective will be to always have one chilled water control valve 80% open, so the pump operates at the lowest speed and pressure possible to satisfy the load. Every 5 minutes (adj.) the chilled water valves will be polled. When at least one chilled water valve is more than 80% open, the BAS shall reset the differential pressure up by 0.5 psi (adj.). When all chilled water valves are 60% (adj.) open or below, the BAS shall reset the differential pressure down by 0.25 psi.

B. The remote differential pressure setpoint shall be maintained between maximum and minimum pressures. The maximum pressure limit is the pressure required to provide full flow to all chilled water valves simultaneously (per TAB). The minimum pressure limit is the pressure correlating to the lowest speed the pump motor can operate at (per manufacturer).

4. Electrical – Demolish

A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

B. Disconnect and safe off power to (2) 75 HP CHW pumps (208V/3P) and their associated variable frequency drives.

1) Pump removal and replacement to be completed by mechanical contractor.

C. Demolish and properly dispose of (2) variable frequency drives associated with the chilled water pumps.

D. Existing conduit, conductors, and breaker shall remain for re-use. Contractor shall survey the condition of these items and report any recommended replacements to McKinstry.

5. Electrical

A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

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B. General circuiting requirements

- 1) Contractor shall survey existing facility drawings and power distribution system to determine available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.

C. Install Chilled Water Pump VFDs & Connect Power

- 1) Install (2) new variable frequency drives with integral disconnects (VFDs to be furnished by mechanical).
 - a) VFDs will be delivered to the final location in the pump mechanical room by the mechanical contractor. Electrical contractor shall mount the VFDs in the final location and make final connections.
 - b) VFD basis of design is ABB ACH580 rated for 75 HP, 208V/3P motors.
- 2) Extend existing conduit and conductors to new VFDs and connect power.
- 3) Provide minimum clearance and working space in front of and above the VFDs per NEC 2020 requirement.

B. Extend existing conduit and conductors to new pumps installed by mechanical contractor and connect power.

6. The electrical disconnect for CHWP-2 can remain in place. Testing, Adjusting and Balancing (TAB)

A. Full pre and post construction test and balance on any equipment touched by this scope.

B. For Pumps with VFD retrofit:

- 1) Provide measurements of the existing pump flow rate and pressure drop prior to construction.
- 2) Provide flow measurements at (2) flow conditions, to be determined by McKinstry commissioning personnel, to correlate against pump performance.

02.12 – RAC Chiller Replacement

1. Mechanical

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.

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- B. Isolate chiller and drain and capture glycol solution for reuse.
 - 1) Existing isolation valves are not located in a location that will allow new chiller piping to be installed. The top 12" of the system will need to be drained to allow for installation.
 - C. Demolish and properly dispose of the existing air-cooled chiller on the roof including all accessories and piping from disconnect location shown in the drawings. Evacuate and properly dispose of refrigerant.
 - 1) All other chilled water plant components (pumps, expansion tank, air separator, etc) are to remain in place.
 - D. Furnish, receive, offload, and provide crane and rigging for new chiller.
 - 1) Install one (1) new air-cooled chiller. BOD: Daikin AGZ150E
 - (i) Capable of 140 tons at 55/45 EWT/LWT, 355 gallons per minute of 30% propylene glycol, and 95F ambient temperature.
 - (ii) 208V/3Ph, two electrical connections, and SCCR Rating of 40 kA or higher.
 - (iii) Condenser fan motors shall be premium efficient with integral VFDs for speed control or electrically commutated.
 - (iv) Chiller shall meet ASHRAE 90.1 efficiency standard and 2018 IECC.
 - (v) Chiller shall be capable of minimum flow 50% of design flow and 30% minimum cooling capacity with at least two independent refrigeration circuits.
 - (vi) BACnet MSTP communication card shall be included.
 - (vii) Provide new structural support plates over double tees with two bolts through flanges on either side.
 - (viii) Chiller shall be supported on eight (8) spring isolators at support plates per manufacturer recommendations.
 - 2) ALTERNATE #1: Provide a chiller capable of all the above requirements and also integral waterside economizing capability. BOD Carrier 30XV160H
 - E. Extend chilled water piping to newly installed chiller. Replace all piping appurtenances associated with the chiller.
 - 1) Furnish and install piping insulation, jacketing, and labeling to match existing outdoor piping.
 - 2) Install piping wells and taps necessary for controls contractor. Coordinate.
 - F. Clean and flush all newly installed piping before startup.
 - G. Fill piping with captured glycol solution. Fill with new glycol and water solution matching existing concentration as necessary.
 - H. Provide any assistance necessary for startup including nitrogen or any other gasses needed.
2. Controls
- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope and supporting documents.

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B. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Reference the Control Contractor Performance Specifications for additional requirements.
- 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
- 5) Existing building automation systems and graphics shall be used and updated for new functionality.
- 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.

C. Furnish and install all programming necessary to operate the systems per the sequence of operations in the design documents.

D. Controls contractor is responsible for low voltage wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.

E. Existing building automation system is a BACnet based Delta controls system. All new controls shall tie into existing system. Update existing graphics accordingly.

F. Chiller control shall be added to the existing chilled water system controller. Confirm availability and programming capability. Furnish and install new controller or I/O expansion module as required.

G. Integrate new chiller into the BAS with MS/TP connection. See drawings for control points and sequences.

3. Electrical

A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

B. General circuiting requirements

- 1) Contractor shall survey existing facility drawings and power distribution system to determine available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits,

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existing components may be reused where in compliance with current NEC.

- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
- C. Electrical panels and disconnects serving mechanical equipment shall comply with the service clearance requirements of the NEC. Furnish and install remote mounted panels and disconnects where required by the NEC.
- D. General Scope: Electrical work to support the replacement of (1) chiller and associated components.
- 1) Metering: Project will result in a net increase in electrical load. 30-day metering or 12-month utility demand data will be required.
 - (i) All panels with net increase in load will need 30-day metering. Equipment tying into main switchboard can use utility demand data instead.
 - 2) Reference PDF mark-ups for existing equipment locations.
- E. Demolition:
- 1) Existing chiller is 208V/3Ph, 660 MCA, 800 MOCP.
 - (i) Disconnect and safe off power to chiller for demolition.
 - (ii) Remove existing NEMA 3R, 800A disconnect.
 - (iii) Remove conductors from existing (2) sets of 3" conduit between 800A disconnect and chiller.
 - (iv) Remove (1) 3" conduit and all conductors between existing junction box and 800A disconnect being removed. Cap and seal 3" knockout in junction box.
 - (v) Existing 800A fused switch in 'MDP-1' serving 'DP-1' and chiller shall remain. 'MDP-1' is located in parking garage.
 - 2) Disconnect and remove existing heat trace from piping to be demolished.
- F. New Work:
- 1) New roof mounted Chiller 'CH-1' (3-point connection, 208V/3Ph, 338 MCA, 450 MOCP, 65 KA SCCR; 208V/3Ph, 351 MCA, 450 MOCP, 65 KA SCCR; 120V, 30 MOCP for controls):
 - (i) Provide and install new 400A/3P circuit breaker in 3rd Floor equipment board 'DP-1'. Breaker AIC rating shall meet the AIC rating of the equipment board.
 - (ii) Provide and install new disconnect switch for chiller module 1 of 2 (NEMA 3R, 400A/3P, heavy duty).
 - (iii) Utilize existing (2) sets of 3" conduit. Provide and install all new conductors for chiller module 1 of 2 (new feed (2) 3"C, 4#3/0, #3 GND CU.) and connect power to module control panel. Provide phenolic label on chiller indicating equipment fed from.
 - (iv) Level 1, Main Electrical Room: Provide and install new 400A/3P fused switch in existing main distribution board 'MDP-1A'. Switch AIC rating shall meet the AIC rating of the equipment board.
 - (v) Provide and install new disconnect switch for chiller module 2 of 2 (NEMA 3R, 400A/3P, heavy

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duty).

(vi) Provide and install new conduit and conductors from 'MDP-1A' to roof for chiller module 2 of 2 ((2) sets of 2"C, 4#3/0 KCMIL, #3 GND CU.) and connect power to module control panel.

Provide phenolic label on chiller indicating equipment fed from.

(vii) If necessary, provide and install new 120V, GFCI, weather-proof service outlet within 25ft for new chiller. Connect to existing circuit serving current rooftop service outlets.

(viii) 120V controls circuit for new chiller: Provide and install new 30A/1P breaker in panel 'D3' located in 3rd floor electrical room. Breaker AIC rating shall meet the AIC rating of the equipment board. Provide and install new conduit and conductors (3/4"C, 2#10, #10 GND CU.) from panel 'D3' up to chiller control panel and connect power.

2) Furnish and install heat trace for exterior piping. BOD: Raychem XL-Trace. Provide controller with output alarm to BAS. BOD: Tracon FPT 130

(i) Coordinate Heat Trace controller power requirements with supplier. Connect to existing or spare circuit in panel 'D3'.

(ii) Field verify final piping lengths.

4. Testing, Adjusting and Balancing (TAB)

A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.

B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.

C. Perform TAB procedures for the following systems/equipment, as specified in spc230593 and as noted below:

1) Provide full post construction TAB on chiller including flow and pressure drop and 3 different load conditions.

5. Training

A. Provide training as required for this FIM.

03.04 – POA VVT to VAV Unit Replacement

1. Mechanical

A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.

B. Existing RTUs System Removal

1) Isolate, disconnect, remove and properly dispose of existing (4) DX cooling, gas heating rooftop

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units.

- 2) Cut back gas piping and condensate drain lines to extent necessary to facilitate the scope of work.
- 3) Disconnect the supply and return ductwork. Existing roof curbs adapter shall be replaced. Existing roof curb shall remain in place.
- 4) Add Alternate: Provide temporary cooling and heating.

C. RTU System Replacement

- 1) Furnish and install (4) replacement rooftop units with DX cooling and gas heating. Design Basis: TRANE YSC. Approved Equal: Carrier.
 - (i) RTU-1 & 2 located on the north wing roof: 12.5ton cooling, min 160MBH gas heating output at altitude; 5,000CFM at 1.50 in wg external static pressure
 - (ii) RTU-3 & 4 located on the west wing roof: 7.5ton cooling, min 133 MBH gas heating output at altitude; 3,000CFM at 1.50 in wg external static pressure
 - (iii) Unit efficiency shall exceed the minimum ASHRAE 90.1-2016.
- 2) Provide the following accessories on the RTUs
 - (i) Curb adapter
 - (ii) Modulating natural gas heat, with high altitude kit
 - (iii) Low-leak outside air dampers
 - (iv) Supply fan with VFD
 - (v) Power exhaust with VFD
 - (vi) Stainless steel or aluminum steel gas heat exchanger
 - (vii) Hail guard
 - (viii) Dirty filter switch
 - (ix) Electrical convenience outlet
 - (x) Open terminal strip for field mounted controller

D. Provide new gas regulator for the RTUs and reconnect gas piping. Provide proper support on gas piping. Reconnect condensate piping with proper trap.

E. Reconnect supply and return ductwork.

F. VVT dampers

- 1) Existing damper shall remain for reuse. Actuators and controls will be upgraded by Controls Contractor.

2. Controls

A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.

B. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine

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available controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.

- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 50% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
 - 4) Reference the Control Contractor Performance Specifications for additional requirements.
- C. Refer to FIM 4.01 – POA BAS Controls Upgrade for controls scope.

3. Electrical

A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

B. General circuiting requirements

- 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability, and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
- 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
- 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
- 8) Prior to installing smoke detectors, contractor shall coordinate with City Police Academy Fire Alarm Contractor and Field Investigate and pre-test the existing smoke detector and fire alarm system to ensure both are functioning properly.

C. Electrical panels and disconnects serving mechanical equipment shall comply with the service

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clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.

D. General Scope: Electrical work to support the replacement of (4) rooftop units and associated components.

1) Metering: Project will result in a net increase in electrical load. 30-day metering or 12-month utility demand data will be required.

2) Reference GMAX Mech drawings for existing equipment locations.

E. Demolition:

1) Roof - (4) existing roof mounted HVAC units

(i) RTU-1 and 2 (Single-point connection, 208V/3PH, 60.6 MCA, 70 MOCP, each)

- Disconnect and safe off power to units for removal.
- Remove existing NEMA 3R, 100A disconnect switch at each unit.
- Remove existing conduit and conductors from units down to serving switchboard.
- Existing 100A/3P fused switches in 600A Main Switchboard shall remain for re-use.
- Safe off existing 120V circuit(s) serving duct smoke detectors. Detectors and circuit shall remain.

(ii) RTU-3 and 4 (Single-point connection, 208V/3PH, 46 MCA, 50 MOCP, each)

- Disconnect and safe off power to units for removal.
- Remove existing NEMA 3R, 60A disconnect switch at each unit.
- Existing conduit and conductors shall remain for re-use (assumed 1"CU, 3#6, #10 GND CU.).
- Existing 60A/3P fused switches in 400A Switchboard shall remain for re-use.
- Safe off existing 120V circuit(s) serving duct smoke detectors. Detectors and circuit shall remain.

F. New Work:

1) Roof - (4) new roof mounted HVAC units

(i) RTU-1 and 2 (Single-point connection, 208V/3PH, 67 MCA, 90 MOCP, 10 KA SCCR, each)

- Provide and install new fused disconnects for each unit (NEMA 3R, 100A/3P, 90A fuses, heavy duty).
- Provide and install new conduit and conductors (1-1/4"CU, 3#3, #8 GND CU., each) from existing 600A Main Switchboard up to each unit and connect power.
- Provide and install new 120V, GFCI, weather-proof service outlet within 25ft of units. Connect to existing circuit serving current rooftop service outlets.
- Coordinate any modifications to existing duct smoke detectors with M.C..

(ii) RTU-3 and 4 (Single-point connection, 208V/3PH, 43 MCA, 50 MOCP, 10 KA SCCR, each)

- Provide and install new fused disconnects for each unit (NEMA 3R, 60A/3P, 50A fuses,

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heavy duty).

- Extend existing conduit conductors (assumed 1"C, 3#6, #10 GND CU.) to new units and connect power.
- Provide and install new 120V, GFCI, weather-proof service outlet within 25ft of units. Connect to existing circuit serving current rooftop service outlets.
- Coordinate any modifications to existing duct smoke detectors with Mechanical Contractor.

4. Testing, Adjusting and Balancing (TAB)

- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems
- C. Perform specified TAB activities for the following systems/equipment and demonstrate to McKinstry Cx engineer:
 - 1) Existing RTU supply, return and outside air flow, static pressure profile, and room diffuser air flows (28 square 4-way diffusers and 35 linear diffusers.)
 - 2) Replacement RTU
 - (i) Follow TAB procedure for the proposed air distribution system with outside, supply and return air flow and pressure measurements on the (4) new RTUs
 - 3) Test and balance air flow at each grille and diffuser served by these systems.

03.07 – PAB MZU to VAV Unit Conversion

1. Mechanical – Demolish

- 1) Isolate, drain, and cut back hydronic lines at MZU coils. Disconnect and remove existing 2" chilled water valve, 2" hot water preheat valve, and 2" primary hot water valve associated with the multizone unit hydronic coils. All valves are 3-way control valves.
- 2) Disconnect and remove the existing pneumatic damper actuators. These pneumatic damper actuators include 1 supply zone, the mixed air, and exhaust air actuators (see drawings for location). Dampers shall remain in place.
- 3) Cut the common shaft linkage rod between each of the individual hot and cold deck dampers in each of the four zones, so the dampers can operate independently. Ensure there is proper bearing support for each damper, and if not notify McKinstry* (see note below in section 3.E).
- 4) Demolish and properly dispose of two (2) existing fan motors for the multizone unit. See below in

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section 3.C.4 for motor sizes & ratings.

5) Properly dispose of associated equipment.

2. Mechanical

A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.

B. Install New HW & CHW Control Valves

1) Isolate chilled water and hot water multizone unit take offs and drain down lines to facilitate installation of new control valves as necessary.

2) Install one (1) two-way 2" chilled water valve and two (2) two-way 2" hot water valves (see drawings for locations). New control valves shall be furnished by controls contractor.

3) Cut and cap bypass leg of three-way valves previously installed.

4) Any equipment without isolation valves and unions shall be provided with valves and unions.

5) Reconnect chilled water and hot water piping and re-insulate as needed.

C. Replace Fan Motors & Furnish Fan VFDs

1) Provide complete inspection to McKinstry of the existing supply and return fans in the multizone unit.

2) Furnish and install two (2) new fan motors that are NEMA premium-efficiency, inverter-ready motors. Basis of Design = Baldor-Reliance (or equivalent). See below for HP and power connection requirements.

3) Furnish two (2) variable frequency drives for the electrical contractor to install. Drives shall be ABB ACH580 (or equivalent) with onboard default BACNET card as default option, see below for HP and power connection requirements.

4) This work shall be completed for the Multizone Unit AC-A6 in the Police Administration Building. The fan power ratings are as follows:

(i) Supply Fan = 7.5HP 480V/3PH and 11 FLA

(ii) Return Fan = 2HP 480V/3PH and 3.3 FLA

D. Install two (2) air flow monitoring/metering stations (furnished by controls). One in 36"x36" common outside air duct to unit, and one in 36"x36" exhaust air duct. Basis of Design = EBTRON HTx104-PE (or equivalent).

E. Add Alternate 1: If it is determined that there is not proper bearing support for the hot deck and cold deck dampers to modulate independently after the linkage is broken or the dampers are not two independent dampers that are interlocked, then the contractor shall furnish and install new dampers with separate linkage and bearing support. Contractor shall verify all existing zone duct sizes.

1) For pricing purposes, assume zones are 24x40, 24x16, 24x16, and 24x14

3. Controls

B. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

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C. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Provide capability to store and archive a minimum of one-year trend data for 40% of control points on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
- 4) Reference the Control Contractor Performance Specifications for additional requirements.

D. Demolition

- 1) Demolish and dispose of all existing control components (including sensors, actuators, controls enclosures, and conduit) not intended to be re-used.
- 2) Remove pneumatic tubing serving control valves and damper actuators back to the branch tap from the piping main and cap at that location. Where tubing is routed within walls, demo to the wall penetration and cap at that point if removal from wall is not practical.
- 3) Remove four (4) existing thermostats in space.

E. Controls contractor is responsible for all low voltage wiring and all required 120 V for control panels. Controls shall be responsible for providing its own transformers and 120 V power.

F. McKinstry approved naming convention shall be used for all BACnet Object Names.

G. Existing building automation systems and graphics shall be used and updated for new functionality.

H. Furnish and install all programming necessary to operate the multizone unit per the Design Intent set forth by McKinstry.

I. Provide all necessary programmable controllers, low voltage wiring to control panels, conduit, sensors, transformers and actuators for a complete and functioning digital controls system for the multizone unit.

J. Provide onsite CX support as required by McKinstry CX agent for Point to Point and Functional Performance testing.

K. Integrate DDC Controls with existing Delta BAS

- 1) Multizone unit controls have already been upgraded to DDC (except for the control valves and three remaining dampers). Contractor shall integrate existing DDC controls with the building automation system.
- 2) Furnish and install static pressure sensor for the discharge air upstream of the deck dampers in each zone duct if one does not currently exist. Verify sensor is in a viable location and move if necessary. A total of 4 sensors.
- 3) Furnish and install four (4) dedicated zone level temperature sensors with integral occupancy

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sensors (one in each zone) where thermostats were demolished. Patch wall opening as required.

- 4) Furnish and install (4) space CO2 sensors (one in each zone) and route back to the AHU control panel. Basis of design = Telaire T8100 (or equivalent).
- 5) Furnish two air flow metering stations (each for 36'x36" duct) to mechanical for install and wire to unit controller. BOD EBTRON HTx104-PE.
- 6) Integrate new fan VFDs and DDC controls into the Delta building automation system with the following points.
 - (a) Four (4) static pressure sensor (AI)
 - (b) Eight (8) zone damper commands (AO)
 - (c) Eight (8) zone damper positions (AI)
 - (d) Four (4) zone temperature sensors (AI)
 - (e) Hot deck temperature (AI)
 - (f) Cold deck temperature (AI)
 - (g) Chilled water control valve command (AO)
 - (h) Chilled water control valve position (AI)
 - (i) Hot water control valve command (AO)
 - (j) Hot water control valve position (AI)
 - (k) Pre-heat control valve command (AO)
 - (l) Pre-heat control valve position (AI)
 - (m) Supply fan VFD enable/disable (DO)
 - (n) Supply fan VFD speed (AO)
 - (o) Supply fan VFD alarm (DI)
 - (p) Supply fan VFD status (DI)
 - (q) Supply fan VFD kW (AI)
 - (r) Return fan VFD enable/disable (DO)
 - (s) Return fan VFD speed (AO)
 - (t) Return fan VFD alarm (DI)
 - (u) Return fan VFD status (DI)
 - (v) Return fan VFD kW (AI)
 - (w) Outside air flow (AI)
 - (x) Exhaust air flow (AI)
 - (y) Exhaust air damper command (AO)
 - (z) Exhaust air damper position (AI)
 - (aa) Mixed air damper command (AO)
 - (bb) Mixed air damper position (AI)
- 7) Provide communication cable from BAS to the VFD on-board BACNET card for information access.
- 8) Air handler control sequence:

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- (i) Air handling unit AC-A6 shall have fan speed and mixing damper control modified to serve ventilation air and provide heating/cooling to (4) zones on the 1st floor. The outside air damper shall modulate in concert with the return air and exhaust air dampers to meet a space CO₂ setpoint of 800ppm (adj.). The supply and return fans shall be enabled based on occupancy conditions and modulate VFD speed to maintain the supply air duct static pressure (adj. setpoint TBD). The CHW and HW control valves will modulate to maintain the SA temperature setpoint. The SA temperature setpoint shall reset based on outside air temperature as follows:
 - (a) If OAT ≤ 55°F, then cold deck SAT SP = 60°F (adj.)
 - (b) If OAT ≥ 65°F, then cold deck SAT SP = 55°F (adj.)
 - (c) If OAT ≤ 45°F, then hot deck SAT SP = 95°F (adj.)
 - (d) If OAT ≥ 70°F, then hot deck SAT SP = 70°F (adj.)

L. Furnish and Install Electronic Damper Actuators

- 1) Remove any E-P transducers and replace existing pneumatic damper actuators with electronic actuators. The new electronic actuators shall match the existing electronic damper actuators. Basis of Design = Belimo.
- 2) Design intent is to have all existing pneumatic damper actuators replaced and hot deck and cold deck dampers separated to operate independently. Mechanical contractor shall break linkages between deck dampers, controls contractor to install new actuators on uncontrolled deck dampers.
- 3) Furnish and install the following new damper actuators to replace the pneumatic damper actuators:
 - (i) One (1) replacement electronic zone control damper actuator to fit a damper size of 24" x 40"
 - (ii) One (1) replacement electronic exhaust air damper actuator to fit a damper size of 34" x 48"
 - (iii) One (1) replacement electronic mixing air damper actuator to fit two linked dampers of 36" x 36" each
 - (iv) One (1) new electronic zone control damper actuator to fit a damper size of 24" x 16"
 - (v) One (1) new electronic zone control damper actuator to fit a damper size of 24" x 16"
 - (vi) One (1) new electronic zone control damper actuator to fit a damper size of 24" x 14"

M. Furnish Control Valves

- 1) Furnish new control valves to mechanical contractor for installation. Include two (2) 2" two-way hot water control valves and one (1) 2" two-way chilled water control valve. Basis of Design = Belimo.

4. Electrical

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and power distribution system to determine

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available space and capacity to support this scope of work. If existing space or capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.

- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.

C. Install VFDs for Fans

- 1) Disconnect power from the two (2) existing fan motors listed in section 3.C.4 of the mechanical scope to allow for removal and replacement by mechanical.
- 2) Remove motor starters for the fans and install two (2) variable frequency drives. The power ratings for the existing motors are as follows:
 - (i) Supply Fan = 7.5HP 480V/3PH and 11 FLA
 - (ii) Return Fan = 2HP 480V/3PH and 3.3 FLA
- 3) Provide minimum clearance and working space in front of and above the VFD per NEC 2020 requirement.

5. Testing, Adjusting and Balancing (TAB)

- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
- C. Balance minimum OA for multizone unit at three different fan speeds.
- D. Tune supply air pressure setpoint so all zones get design flow.
- E. Perform TAB procedures for the following systems/equipment, as specified in spc230593 and as noted below:
 - 1) Provide preconstruction test and balance for the following items:
 - (i) Airflows (OA, minimum OA, SA, RA), supply & return fan pressure drop, hot water flow rate, pre-heat hot water flow rate, and chilled water flow rate at full flow.
 - (ii) Provide flow measurements for each of the four (4) zones at full flow.
 - 2) Provide post construction test and balance for the following items:

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- (i) Airflows (OA, minimum OA, SA, RA), supply & return fan pressure drop, hot water flow rate, pre-heat hot water flow rate, and chilled water flow rate at three different flow conditions.
- (ii) Provide flow measurements for each of the four (4) zones at three flow conditions.

03.13 – PD1 Air Cooled Chiller Replacement

1. Mechanical

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
- B. Existing Air-Cooled Chiller Removal
 - 1) Sample existing chilled water chemical content with full spectrum analysis and notify McKinstry if flushing is required.
 - 2) Isolate, drain, disconnect, remove and properly dispose of existing (1) air cooled chiller. Cut back chilled water supply and return lines with insulation, pipe fitting and appurtenances to extent necessary to facilitate the scope of work. Remove existing isolation valves. Additional drain down will be required that includes piping on the second floor that is at higher hydraulic point than the drain down point. Cap chilled water piping at roof opening and prepare for future connection.
 - 3) Evacuate and properly dispose of refrigerant. Salvage drained glycol solution for reuse.
 - 4) Existing chiller concrete sleepers and wire mesh guard in between sleepers shall remain.
- C. New Air-Cooled Chiller Replacement
 - 1) Provide (1) air cooled chiller (Basis of Design: Trane). The air-cooled chiller shall include the following:
 - (i) Single point 460V/3phase, factory mounted disconnect.
 - (ii) Minimum performance shall exceed IECC 2018 requirement
 - (iii) Minimum load control down to 25% and (2) refrigerant circuits
 - (iv) Integral strainer and flow switch and chilled water supply and return temperature sensors
 - (v) Evaporator heat trace furnished by manufacturer
 - (vi) BACNET MS/TP communications card with remote start/stop option
 - (vii) Lower wire mesh guards
 - 2) Site coordinate with existing chilled water connections and unit mounting. Add additional concrete sleepers with sheet metal and flashing to accommodate the new chiller. Ensure proper center of gravity support. Extend wire mesh around the new sleepers added.
 - 3) Reconnect to existing chilled water supply and return piping with new 4" isolation valves as shown on drawings. Provide propylene glycol to bring the entire system to the existing glycol solution concentration level. Notify McKinstry if the existing glycol solution level is not meeting 35%.
 - 4) Furnish and install piping insulation, jacketing, and labeling.

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2. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.
- B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine available controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 40% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
 - 4) Reference the Control Contractor Performance Specifications for additional requirements.
- C. Disconnect control wiring/tubing from existing chiller.
- D. Provide chilled water supply and return temperature sensors and connect to existing Siemens BAS chilled water plant terminal controller.
- E. Provide BAS integration for the proposed air-cooled chiller with BACnet MS/TP. Existing control sequence and control points on CHWS/R temperatures shall remain. Refer to P&ID diagram.
- F. Reference controls P&ID diagram for proposed control points.

3. Electrical

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability, and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
 - 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.

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- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
 - 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
- C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.
- D. General Scope: Electrical work to support the replacement of (1) roof top chiller and associated components.
- 1) Metering: Project will result in a net reduction in electrical load. 30-day metering or 12-month utility demand data will not be required.
 - 2) Reference GMAX drawings for existing equipment locations.
- E. Demolition:
- 1) Existing roof mounted chiller is 480V/3Ph, 235 MCA, 300 MOCP.
 - (i) Disconnect and safe off power to chiller for demolition.
 - (ii) Existing NEMA 3R, 400A/3P disconnect shall remain for re-use.
 - (iii) Existing conduit and conductors shall remain for re-use (2-1/2" C, 3#250, #3 GND CU.).
 - (iv) Existing breaker in serving switchboard 'MDS' (1st Floor, Elec 145) shall remain.
 - (v) Disconnect existing 120V controls/ lighting circuit for chiller (panel 'L1M', 1st Floor, Mech 146).
Retain existing conduit and conductors for re-use.
 - (vi) Disconnect and remove existing 120V heat trace controller (panel 'L2A', 2nd Floor, Elec 229).
Retain existing conduit and conductors for re-use.
- F. New Work:
- 1) New roof mounted chiller 'CH-1' (Single-point connection, 480V/3Ph, 215 MCA, 300 MOCP, 30 KA SCCR).
 - (i) Provide and install new 300A fuses in existing NEMA 3R disconnect switch serving chiller.
 - (ii) Extend existing conduit and conductors to new chiller (2-1/2" C, 3#250, #3 GND CU.) and connect power to unit.
 - (iii) Field verify existing 120V, GFCI, weather-proof service outlet within 25ft of unit.
 - 2) Furnish and install heat trace for exterior piping. BOD: Raychem. Provide controller with output alarm to BAS.
 - (i) Coordinate power requirements for Heat Trace controller with supplier. Connect to existing 20A circuit in panel 'L2A' (2nd Floor, Elec 229).

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(ii) Field verify final piping lengths.

4. Testing, Adjusting and Balancing (TAB)

1) Not applicable. Refer to TAB scope specified in 08.05- PD3 Add VFD to Building Pumps.

03.13 – PD3 Air Cooled Chiller Replacement

1. Mechanical

A. Contractor shall be responsible for equipment, materials, accessories, insulation, and other associated requirements called for in the following scope, and as indicated in the above supported documents.

B. Existing Air-Cooled Chiller Removal

- 1) Isolate, drain, disconnect, remove and properly dispose of existing (1) air cooled chiller. Cut back chilled water supply and return lines to extent necessary to facilitate the scope of work. Remove existing isolation valves and associated chilled water supply and return piping, fitting and insulation jacket above roof. Additional drain down will be required that includes piping on the second floor that is at higher hydraulic point than the drain down point. Cap chilled water piping at roof opening and prepare for future connection.
- 2) Evacuate and properly dispose of refrigerant. Salvage drained glycol solution for reuse.
- 3) Existing chiller housekeeping pad shall remain.
- 4) No temporary cooling is required without adequate roof clearance.

C. New Air-Cooled Chiller Replacement

(i) Furnish, receive, offload, and provide crane and rigging for the new chiller.

(ii) Provide (1) air cooled chiller (Basis of Design: Trane). Refer to GMAX drawing M001 for schedule. The air-cooled chiller shall include the following:

- Single point 460V/3phase, factory mounted disconnect.
- Minimum performance shall exceed minimum IECC 2018 requirement
- Minimum load control down to 25% and (2) refrigerant circuits
- Integral strainer and flow switch and chilled water supply and return temperature sensors
- Evaporator heat trace furnished by manufacturer
- BACNET MS/TP communications card with remote start/stop option
- Low ambient kit down to -4°F cooling operation
- Convenience outlet
- Lower wire mesh guards
- Hail Guards

(iii) Site coordinate with existing chilled water connections and unit clearance prior to equipment purchase and installation. Extend existing concrete pad as dimensioned on the drawing for the new chiller.

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- (iv) Reconnect to existing chilled water supply and return piping with new isolation valves as shown on drawings. Provide hydronic system flush, fill, and chemical treatment for the existing drained down and newly installed piping. Provide propylene glycol to bring the entire system to the existing glycol solution concentration level. Notify McKinstry if the existing glycol solution level is not meeting 35%.
- (v) Properly insulate and support the new chilled water piping on roof as specified on drawings.

2. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.
- B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine available controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 40% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
 - 4) Reference the Control Contractor Performance Specifications for additional requirements.
- C. Disconnect control wiring/tubing from existing chiller.
- D. Provide chilled water supply and return temperature sensors and connect to existing Siemens chilled water plant terminal controller.
- E. Provide BAS integration for the proposed air-cooled chiller with BACnet MS/TP. Existing control sequence and control points on CHWS/R temperatures shall remain. Refer to P&ID diagram to be provided at GMAX.
- F. Reference controls P&ID diagram for proposed control points to be provided by GMAX.

3. Electrical

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability, and load capacity to support this scope of work. If

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- existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
 - 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
- C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.
- D. General Scope: Electrical work to support the replacement of (1) chiller and associated components.
- 1) Metering: Project will result in a net reduction in electrical load. 30-day metering or 12-month utility demand data will not be required.
- E. Demolition:
- 1) Reference GMAX mechanical plans for existing equipment locations.
 - 2) Existing roof mounted chiller is 480V/3Ph, 290 MCA, 400 MOCP.
 - (i) Disconnect and safe off power to chiller for demolition.
 - (ii) Existing conduit and conductors shall remain for re-use (3-1/2"C, 4#350, #3 GND CU.).
 - (iii) Existing 400A/3P breaker in Main Distribution Board 'MDS' shall remain.
- F. New Work:
- 1) Reference GMAX mechanical plans for existing equipment locations.
 - 2) New roof mounted chiller 'CH-1' (Single-point connection, 480V/3Ph, 251 MCA, 400 MOCP, 30 KA SCCR).
 - (i) Provide and install new fused disconnect for chiller (NEMA 3R, 400A, 300A fuses, heavy duty).
 - (ii) Extend existing conduit and conductors to new chiller (3-1/2"C, 4#350, #3 GND CU.) and connect power to unit.
 - 3) Furnish and install heat trace for exterior piping. BOD: Raychem. Provide controller with output alarm to BAS.
 - (i) Coordinate Heat Trace controller power requirements with supplier. Connect to existing or

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spare circuit in panelboard 'L2A'.

(ii) Field verify final piping lengths.

4. Testing, Adjusting and Balancing (TAB)

Not applicable. Refer to TAB scope specified in 08.05- PD3 Add VFD to Building Pumps.

04.01 – CCB BAS Controls Upgrade/Replacement

1. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Provide capability to store and archive a minimum of one-year trend data for 40% of control points on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
 - 4) Reference the Control Contractor Performance Specifications for additional requirements.
- C. Demolition
 - 1) Demolish and dispose of all existing control components (including wiring, sensors, actuators, controls enclosures, and conduit) not intended to be re-used.
 - 2) Demolish existing stand-alone thermostats and their associated components for fan coil unit temperature control.
 - a) Provide baseplates to cover existing wall openings where thermostats were removed as needed.
 - b) Patch and touch up paint for wall if applicable.
 - 3) Existing air compressor shall remain as-is.
 - 4) Properly dispose of associated equipment following customer guidelines for E-Waste.
- D. Connect all new controllers to existing Siemens Desigo Building Automation System front end if reusing, otherwise demo system.
- E. If ethernet drops are required, the City & County of Denver staff shall provide them. Coordinate for locations.

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- F. Provide all necessary programmable controllers, control panels, conduit, sensors, transformers and actuators for a complete and functioning controls system.
 - 1) Provide enough controller I/O for 15% expansion capacity.
- G. All controllers shall be native BACnet and BTL listed.
- H. All BACnet IP and BACnet MSTP devices shall be discoverable by supervisor.
- I. McKinstry and City and County of Denver approved naming convention shall be used for all BACnet Object Names.
- J. Provide onsite CX support as required by McKinstry CX agent for Point to Point and Functional Performance testing.
 - 1) The Controls Contractor shall have a pre-CX plan to ensure the system is ready for final McKinstry CX work.
- K. Provide all low voltage wiring and all required 120 V power for control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- L. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- M. Provide all necessary programmable controllers, low voltage wiring to control panels, conduit, sensors, transformers, and actuators for a complete and functioning controls system.
 - 1) Provide enough controller I/O for 15% expansion capacity.
- N. Provide all temperature sensors, switches, pressure sensors, actuators and other components as required for a complete controls system.
- O. Existing DDC system served by Siemens APOGEE controllers as well as standalone controls for some HVAC equipment. Replace or convert the existing controls to be BACnet compatible DDC controls following the three pricing options listed below.
- P. If reusing the existing control system, integrate all new DDC controls and sensors with the existing Building Automation System. Update the graphical user interface, automation management, scheduling, and programming of all networked devices to meet the design intent of McKinstry.
 - 1) Controls contractor can reuse any existing hardware, but it needs to be functional. Provide a detailed list to McKinstry of what will be reused and what will be replaced for each option listed below.
- Q. If replacing the control system, provide a web-based application software for graphical user interface, automation management, scheduling, and programming of all networked devices. Application software shall be capable of access by multiple users one of which shall be accessible via an outside network. Provide programming and implementation for this project to meet the design intent of McKinstry.
- R. Pricing Options: Contractor shall price out the following three options in their bid.
 - 1) Base Case (INCLUDED IN FINAL SCOPE): Convert or replace all existing equipment on the Siemens Desigo BAS to be BACnet compatible and integrate into the BAS.
 - a) Heating Water System:
 - (a) Two (2) Heating Water Pumps with VFDs
 - (i) Integrate factory provided VFD BACnet controller, if available

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- (ii) Include the following control points:
 - a. Pump Status (DI)
 - b. Pump Enable (DO)
 - c. Pump Speed (AO)
 - d. Pump Alarm (AO)
 - (b) Loop differential pressure sensor signal – reuse existing sensor
 - (c) For two (2) hot water heat exchangers reuse the existing control valves & actuators:
 - (i) Water side control valve
 - (ii) Steam side control valve
 - (d) Replace the following temperature sensors:
 - (i) Heating water supply/return temperature sensors
 - (ii) Domestic heating water supply/return temperature sensors
- b) Chilled Water System:
 - (a) Two (2) Chilled Water Pumps with VFDs
 - (i) Integrate factory provided VFD BACnet controller, if available
 - (ii) Include the following points:
 - 1. Pump Enable (DO)
 - 2. Pump Speed (AO)
 - 3. Pump Status (DI)
 - 4. Pump Alarm (AO)
 - (b) Loop differential pressure sensor signal – reuse existing sensor
 - (c) Replace the following temperature sensors:
 - (i) Chilled water supply/return temperature sensors
 - c) Twenty (20) Air Handling Units with Hot Water & Chilled Water Coils
 - (a) Eighteen (18) economizer damper actuators – reuse the existing actuators
 - (i) Note: The remaining two units do not have OSA damper actuators.
 - (b) Replace the following temperature sensors:
 - (i) Twenty (20) return air temperature sensors
 - (ii) Twenty (20) mixed air temperature sensors
 - (iii) Twenty (20) supply air temperature sensors
 - (iv) Space temperature sensors
 - (c) Twenty (20) hot water control valves – reuse existing valves and actuators
 - (i) Note: Fifteen (15) of these hot water coils also have coil pumps
 - (d) Twenty (20) chilled water control valves – reuse existing valves and actuators
 - (i) Note: One (1) of the chilled water coils has a coil pump
 - (e) Low limit temperature switches – replace existing temperature switches
 - (f) Include the following control points:
 - (i) Economizer damper actuator position/command (AI/AO)
 - (ii) Supply fan status/enable (DI/DO)
 - (iii) Fan VFD speed (AO) - *only applicable for 2 AHUs*
 - (iv) Return air temperature (AI)
 - (v) Mixed air temperature (AI)
 - (vi) Supply air temperature (AI)
 - (vii) Hot water control valve position/command (AI/AO)
 - (viii) Chilled water control valve position/command (AI/AO)
 - (ix) Coil circulation pump status/enable (DI/DO) – *only applicable for 16 coils*
 - (x) Space temperature (AI)

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- d) One (1) Chilled Water Air Handling Unit
 - (a) Replace the following temperature sensors:
 - (i) One (1) return air temperature sensor
 - (ii) One (1) mixed air temperature sensor
 - (iii) One (1) supply air temperature sensor
 - (iv) Space temperature sensors
 - (b) One (1) chilled water control valve – reuse existing valve and actuator
 - (c) Include the following control points:
 - (i) Supply fan status/enable (DI/DO)
 - (ii) Return air temperature (AI)
 - (iii) Mixed air temperature (AI)
 - (iv) Supply air temperature (AI)
 - (v) Chilled water control valve position/command (AI/AO)
 - (vi) Space temperature (AI)
- e) Four (4) Variable Volume Exhaust Fans
 - (a) Building static pressure sensor – replace sensor
 - (b) Include the following control points:
 - (i) Exhaust fan status/enable (DI/DO)
 - (ii) Exhaust fan speed (AO)
 - (iii) Exhaust fan alarm (AO)
 - (iv) Building static pressure (AI)
- f) Ten (10) Constant Volume Exhaust Fans
 - (a) Include the following control points:
 - (i) Exhaust fan status/enable (DI/DO)
- g) Three (3) Radiant Heating Zones
 - (a) Space temperature sensors – replace sensors
 - (b) Hot water control valves – reuse existing valves & actuators
- h) Four (4) Computer Room Air Conditioning (CRAC) Units
 - (a) Space temperature sensors – replace sensors
 - (i) Monitor room temperature for BAS alarming
- i) One Hundred Twenty-Six (126) 4-Pipe Fan Coil Units (assuming all 1st floor FCUs are DDC)
 - (a) (126) Hot water control valves – reuse existing valves & actuators
 - (b) (126) Chilled water control valves – reuse existing valves & actuators
 - (c) (126) Discharge air temperature sensors – replace sensors
 - (d) Space temperature sensors – replace sensors
 - (e) Include the following control points:
 - (i) Fan status/enable (DI/DO)
 - (ii) Hot water control valve position/command (AI/AO)
 - (iii) Chilled water control valve position/command (AI/AO)
 - (iv) Discharge air temperature (AI)
 - (v) Space temperature (AI)
- 2) Add Alternate #1 (INCLUDED IN FINAL SCOPE): Convert remaining air handling units from standalone controls to BACnet compatible controls and integrate into the BAS.
 - a) Five (5) Air Handling Units with Hot Water & Chilled Water Coils
 - (a) One (1) economizer damper actuator – reuse the existing actuator
 - (i) Note: The remaining units do not have OSA damper actuators.
 - (b) Replace the following temperature sensors:

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- (i) Five (5) return air temperature sensors
- (ii) Five (5) mixed air temperature sensors
- (iii) Five (5) supply air temperature sensors
- (iv) Space temperature sensors
- (c) Five (5) hot water control valves – reuse existing valves and actuators
- (d) Five (5) chilled water control valves – reuse existing valves and actuators
- (e) Low limit temperature switches – replace existing temperature switches
- (f) Include the following control points:
 - (i) Economizer damper actuator position/command (AI/AO) – *only applicable for 1 unit*
 - (ii) Supply fan status/enable (DI/DO)
 - (iii) Return air temperature (AI)
 - (iv) Mixed air temperature (AI)
 - (v) Supply air temperature (AI)
 - (vi) Hot water control valve position/command (AI/AO)
 - (vii) Chilled water control valve position/command (AI/AO)
 - (viii) Space temperature (AI)
- b) Seven (7) Chilled Water Air Handling Units
 - (a) One (1) economizer damper actuator – reuse the existing actuator
 - (i) Note: The remaining units do not have OSA damper actuators.
 - (b) Replace the following temperature sensors:
 - (i) Seven (7) return air temperature sensors
 - (ii) Seven (7) mixed air temperature sensors
 - (iii) Seven (7) supply air temperature sensors
 - (iv) Space temperature sensors
 - (c) Seven (7) chilled water control valves – reuse existing valves and actuators
 - (i) Note: Two (2) of these chilled water coils have coil pumps
 - (d) Include the following control points:
 - (i) Economizer damper actuator position/command (AI/AO) – *only applicable for 1 unit*
 - (ii) Supply fan status/enable (DI/DO)
 - (iii) Return air temperature (AI)
 - (iv) Mixed air temperature (AI)
 - (v) Supply air temperature (AI)
 - (vi) Chilled water control valve position/command (AI/AO)
 - (vii) Coil circulation pump status/enable (DI/DO) – *only applicable for 2 coils*
 - (viii) Space temperature (AI)
- c) One (1) DX Cooling Air Handling Unit Serving Mayor’s Office
 - (a) One (1) economizer damper actuator – reuse the existing actuator
 - (b) Replace the following temperature sensors:
 - (i) Return air temperature sensor
 - (ii) Mixed air temperature sensor
 - (iii) Supply air temperature sensor
 - (iv) Space temperature sensor
 - (c) Include the following control points:
 - (i) Economizer damper actuator position/command (AI/AO)
 - (ii) Supply fan status/enable (DI/DO)
 - (iii) Return air temperature (AI)
 - (iv) Mixed air temperature (AI)

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(v) Supply air temperature (AI)

(vi) Space temperature (AI)

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Table 1: Primary Air Handling Equipment In-Scope

Unit Name	Level on Floor Plan	Hot Water Line	HW Control Valve	Chilled Water Line	CHW Control Valve	Coil Pump?	Outside Air?	Outside Air Actuator?	On Existing Siemens BAS?
(558) Fan Coil Units	Varies	3/4"	2-way	3/4"	2-way	No	No	No	Yes, 1st Floor
AHU-030	Basement	No	No	1/2"	2-way	No	No	No	No
AHU-015	Basement	No	No	1-3/4"	2-way	Yes, on CHW coil	No	No	No
AHU-016	Basement	No	No	1-3/4"	2-way	Yes, on CHW coil	Yes	Yes	No
AHU-02	Basement	1/2"	2-way	1/2"	2-way	No	No	No	No
AHU-028	Basement	No	No	3/4"	2-way	No	Disconnected	No	No
AHU-023	Basement	No	No	1/2"	2 way	No	No	No	No
AHU-029	Basement	3/4"	2-way	1"	2-way	No	Yes	No	Yes
AHU-19	Basement	No	No	1-3/4"	2-way 1-1/2" Valve	No	Yes	No	Yes
AHU-018	Basement	No	No	1-1/2"	2-way	No	Yes	Disconnected	No
AHU-020H	Basement	1-3/4"	2-way	1-3/4"	2 way	No	Yes	Yes	Yes
AHU-027	Basement	3/4"	2-way	3/4"	2-way	No	No	No	No
AHU-RM10	Basement	2-1/2"	2-way	2-1/2"	2-way	Yes, on HW & CHW coils	Yes	Yes	Yes
AHU-009H	Basement	no	no	1-1/2"	2-way	No	Yes	No	No
AHU-17	Basement	1-3/4"	2-way	1-3/4"	2-way	No	Yes	Yes	No
AHU-024	Basement	TBD	2-way	TBD	2-way	No	No	No	No
AHU-025	Basement	TBD	2-way	TBD	2-way	No	No	No	No
AHU-18	2	2-1/2"	2-way	2-1/2"	2-way	No	Yes	Yes	Yes
AHU-14	3	1-1/2"	2-way 1/2" Valve	1-1/4"	2-way	No	Yes	Yes	Yes
AHU-13	3	1-1/2"	2-way 1/2" Valve	1-1/4"	2-way	No	Yes	Yes	Yes
Mayor's AHU	4	No	No	No (DX)	No (DX)	No	Yes	Yes	No
AHU-10	5	2-1/2"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-9	5	3"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-8	5	2-1/2"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-5	5	2-1/2"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-7	5	2-1/2"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-6	5	3"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-11	5	3"	3-way 1-1/2" Valve	2-1/2"	2-way 2" Valve	Yes, on HW coil	Yes	Yes	Yes
AHU-1	5	3"	3-way 1-1/2" Valve	2-1/2"	2-way 2" Valve	Yes, on HW coil	Yes	Yes	Yes
AHU-12	5	2-1/2"	3-way	2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-4	5	2"	3-way 1-1/2" Valve	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes

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AHU-3	5	2"	3-way	2-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-2	5	2-1/2"	3-way 1-1/2" Valve	2-1/2"	2-way 2" Valve	Yes, on HW coil	Yes	Yes	Yes
AHU-15	5	1-1/2"	3-way	1-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes
AHU-16	5	1-1/2"	3-way	1-1/2"	2-way	Yes, on HW coil	Yes	Yes	Yes

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2. Testing, Adjusting and Balancing (TAB)

- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
 - 1) Contractor shall use McKinstry Specification 230593 – Testing, Adjusting, and Balancing for HVAC as a guide for all TAB activities.
- B. Test and Balance scope shall include, but is not limited to the following items:
 - 1) Provide pre and post construction test and balance for the following items related to the air handling units:
 - a) Balance minimum OA for all air handling units with outside air damper actuators and ensure economizing capabilities are functioning correctly.
 - b) Airflows (OA, SA, RA), supply & return fan pressure drop, hot water flow rate, and chilled water flow rate.
 - c) Provide flow measurements for each unit at two (2) flow conditions, to be determined by McKinstry commissioning personnel, to correlate against fan performance.

3. Training

Provide training as required for this FIM.

04.01 – PAB BAS Controls Upgrade / Replacement

1. Mechanical

- A. Note: Control valves that are found to be non-operational will be replaced as needed on a case-by-case basis. Maximum numbers of valves that will be replaced under this project is 70.

2. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
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Schedule B: Detailed Scope of Work

- 3) Provide capability to store and archive a minimum of one-year trend data for 40% of control points on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
 - 4) Reference the Control Contractor Performance Specifications for additional requirements.
- C. Demolition
- 1) Demolish and dispose of all existing control components (including transducers, wiring, sensors, actuators, controls enclosures, and conduit) not intended to be re-used.
 - a) Note: There are existing E-P transducers serving the fan coil units throughout the building except for the second floor. Any of these transducers that are not reusable will need to be demolished and replaced.
 - 2) Demolish existing stand-alone wireless thermostats and pneumatic thermostats as well as their associated components for zone temperature control.
 - b) Provide baseplates to cover existing wall openings where thermostats were removed. Leave some wall openings in place where new zone controllers are to be installed.
 - c) Patch and touch up paint for wall if applicable.
- D. If ethernet drops are required, the City & County of Denver staff shall provide them. Coordinate for locations.
- E. Provide all necessary programmable controllers, control panels, conduit, sensors, transformers and actuators for a complete and functioning controls system.
- F. Provide onsite CX support as required by McKinstry CX agent for Point to Point and Functional Performance testing.
- G. Low Voltage Wiring and all required 120 V for control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- H. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- I. Furnish & Install New E-P Transducers:
- 1) Convert existing pneumatic control valve actuators to use electronic control signals through the installation of electronic-pneumatic (E-P) switches for the fan coil units and duct coil units. The scope of this upgrade shall include the following:
 - a) The one hundred and eighteen (118) perimeter zones served by three hundred and fifteen (315) existing 4-pipe fan coil units (see floor plan markups). The thermostat control of the fan coil units is grouped by zone, so only (118) E-P transducers shall be required.
 - b) Five (5) duct cooling coils located on the 1st and 2nd floors (see floor plan markups)
 - c) Six (6) duct heating coils located on the 1st and 2nd floors (see floor plan markups).
 - 2) Contractor shall verify that existing pneumatic air branch lines running from the main line to each control valve in-scope is in good condition and provides the required air pressure to each valve for heating and cooling modes. They shall replace and/or repair any existing air branch lines as needed to ensure all fan coil unit and duct coil control valves can operate to meet the space load.

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- d) Assume all control valves are in working order for this scope of work (valve replacements will be handled separately as needed).
- 3) Connect all new E-P transducers to existing Delta Building Automation System front end. This shall also include the addition of new BAS points for zone temperature and valve commands for the equipment in-scope.
- 4) Provide new zone temperature sensors and occupancy sensors as required for a complete system.
- 5) Note: The following units are excluded from the upgrade since they are already integrated into the existing Delta Building Automation System:
 - a) (2) Primary air conditioning units (4 supply & 4 return fans) in the penthouse
 - b) (2) Building chilled water pumps
 - c) (2) Building hot water pumps
 - d) Steam system valves
 - e) Heat exchangers for steam to hot water conversion
 - f) (7) Fan coil units that are integrated into the BAS.
 - g) Radiation element system on the 1st floor
 - h) Multizone unit (this is included in the FIM #45127 controls scope)
- 6) The following photos demonstrate the typical coil layout of all fan coil units in-scope for E-P transducers:

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Figure 1: Typical Fan Coil Unit



Figure 2: Typical CHW Valve



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Figure 3: Typical HW Valve



- J. Integrate all new E-P transducers and sensors listed above with the existing Delta Building Automation System.
- K. Update the graphical user interface, automation management, scheduling, and programming of all networked devices to meet the design intent of McKinstry.
- 3. Testing, Adjusting and Balancing (TAB)
 - A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities.
 - B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls
 - C. Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
 - D. Provide pre and post construction test and balance for the following items related to the fan coil units:
 - 1) Hot water flow rate, chilled water flow rate, and control valve function.
 - 2) Provide flow measurements for each coil at two (2) flow conditions, to be determined by McKinstry commissioning personnel, to correlate against performance.
 - E. Provide pre and post construction test and balance for the following items related to the duct coils:
 - 1) Hot water flow rate, chilled water flow rate, and control valve function.

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04.01 – POA BAS Controls Upgrade/Replacement

1. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.
- B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine available controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 40% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
- C. Provide all necessary programmable controllers, control panels, conduit, sensors, transformers, and actuators for a complete and functioning controls system.
 - 1) Provide enough controller I/O for 15% expansion capacity.
- D. Provide onsite CX support as required by McKinstry CX agent for Point to Point and Functional Performance testing.
- E. Low Voltage Wiring and all required 120 V for control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- F. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- G. Demolition Work:
 - 1) Demolish and dispose of all existing dated Honeywell control components. This includes but not limited to: thermistors, duct sensors, controllers at the existing VVT dampers actuators and RTUs. Local programmable thermostats controlling fan coil units, RTU-3&4, make up air heating unit, evaporative coolers and unit heaters shall also be removed unless indicated on the drawings as remaining. Patch openings or provide cover plate if required for clean finish.
- H. BAS Controls Upgrade:
 - 1) A wireless network communication shall be provided with the following components:
 - a) BACnet IP wireless communication gateway (Design Basis: Trane Tracer SC+ System Controller) with Zigbee wireless network (Design Basis: Trane Air-Fi WCI Zigbee wireless)
 - b) Compatible wireless RTU and terminal equipment controllers and network thermostats.

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Coordinate with City IT department on Ethernet cable drop location.

c) Ensure adequate signal strength and latency and add repeaters as necessary.

2) Control points shall include the following:

Point Names	AO	AI	DO	DI	Network	Virtual Pt
Outside air temperature		1				
Mixed Air Damper Position (% Open)	4					
Economizer Temperature Setpoint						4
Economizer Status		4				
RTU Power Exhaust Start/Stop			4			
RTU Power Exhaust Status				4		
RTU Power Exhaust Alarm				4		
RTU Power Exhaust VFD Speed Command	4					
Building Pressure sensor		2				
RTU Supply Fan Start/Stop			4			
RTU Supply Fan Status				4		
RTU Supply Fan Alarm				4		
RTU Supply Fan VFD Speed Command	4					
RTU Return Air Temperature		4				
RTU Mixed Air Temperature		4				
RTU Discharge Air Temperature		4				
RTU Discharge Air Temperature Setpoint						4
RTU Freezestat Alarm				4		
RTU Filter Alarm				4		
RTU Cooling Enable			4			
RTU Cooling Status				4		
RTU Cooling Output		4				
RTU Furnace Enable			4			
RTU Heating Status						4
RTU Heating Output		4				4

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Point Names	AO	AI	DO	DI	Network	Virtual Pt
VVT Damper Command	14*					
Duct Static Pressure Setpoint						2
Duct Static Pressure		2				
Space Temperature		21				
Space Temperature Setpoint						21
Space CO2 sensor for RTU-1		2				
Evaporative Cooler Cooling Enable			4			
Evaporative Cooler Cooling Status				4		
Evaporative Cooler Fan Enable			4			
Evaporative Cooler Fan Status				4		
Evaporative Cooler Spray Pump Enable			4			
Evaporative Cooler Spray Pump Status				4		
Evaporative Cooler Fill and Down Enable			4			
Training Camp Relief Damper Command	8					
Training Camp space pressure		1				

*Number does not include the 2 VVT bypass dampers that shall be locked closed.

Test and Balance:

- 1) Not applicable. Refer to 03.04- POA VVT to VAV Replacement Scope.

04.02 – CMP Occupancy Based HVAC Controls

2. Controls

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.

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- 3) Reference the Control Contractor Performance Specifications for additional requirements.
- 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
- 5) Existing building automation systems and graphics shall be used and updated for new functionality.
- 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
- C. Demolition
 - 1) Demolish and dispose of all existing control components not intended to be re-used.
- D. Low Voltage Wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- E. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- F. Contractor shall integrate (84) lighting occupancy sensors to be installed by the lighting contractor into the Building Automation System via the VAV controller to communicate with the existing HVAC system and zone temperature controls.
 - 1) This shall be completed for all (84) Variable air volume and Fan Powered Box zones as shown on the schedule and floor plans provided by McKinstry.
 - 2) Update Building Automation Control System with Graphics to show occupancy in space
 - 3) Program zone temperature setpoints as follows for occupied and unoccupied hours with an intermediary condition that will be maintained for 1-hour (adj.) after a space is scheduled to go into unoccupied mode. Existing sequence of operations outside of occupancy and zone setpoint to remain in place.

04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	A	Unoccupied Temperature Setpoint	Occ Cool: 73F, Occ Heat: 69F Unocc Cool: 80F Unocc Heat: 60F	Occ Cool: 73F, Occ Heat: 69F Unocc Cool 80F Unocc Heat 60F Unocc Cool setback: 75F Unocc Heat setback: 67F
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04.02 – PAB Occupancy Based HVAC Controls

- 1. Mechanical
 - A. Not applicable.
- 2. Controls
 - G. Contractor shall be responsible for equipment, materials, accessories, and other associated

Schedule B: Detailed Scope of Work

requirements called for in the following scope, and as indicated in the above supporting documents.

H. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Reference the Control Contractor Performance Specifications for additional requirements.
- 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
- 5) Existing building automation systems and graphics shall be used and updated for new functionality.
- 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.

I. Demolition

- 1) Demolish and dispose of all existing control components not intended to be re-used.

J. Low Voltage Wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.

K. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.

L. Furnish and install space temperature sensors with integral occupancy sensors for the following HVAC equipment:

- 1) (315) Fan coil units located throughout the perimeter spaces in the building on floor 1-5. *Note: There are only 118 unique perimeter zones served by the 4-pipe fan coil units (see floor plan markups).*
- 2) (1) Baseboard heating system on the 6th floor. *Note: The 6th floor is currently demolished and unoccupied.*
- 3) (32) Radiation heating elements on the 1st floor. *Note: There are only 15 unique perimeter zones served by the radiation elements (see floor plan markups).*

M. Program temperature control sequences for each zone with the following settings for occupied and unoccupied hours along with an intermediary condition that will be maintained for 1-hour (adj.) after a space is scheduled to go into unoccupied mode.

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04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	A	Unoccupied Temperature Setpoint	Occ/ Unocc Cool: 74F Occ/ Unocc Heat: 72F	Occ Cool: 74F Occ Heat: 72F Unocc Cool: 78F Unocc Cool Setback: 76F Unocc Heat: 68F Unocc Heat Setback: 70F
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- 1) The Contractor shall locate the existing fan coil unit and/or air handling unit control panels and the associated spare points for the occupancy sensor connections.
- 2) The following hardwired points via BACnet router shall be provided on each unit/space:
 - (i) Space Occupancy Condition (DI)
 - (ii) Space Temperature (AI)
 - (iii) Space Temperature Setpoint (AI)
6. Electrical
 - A. Not applicable
7. Structural
 - A. Not applicable.
8. Architectural
 - A. Not applicable.
9. Specialty
 - A. Not applicable.
10. Testing, Adjusting and Balancing (TAB)
 - A. Not applicable.
11. Commissioning
 - A. Not applicable.
12. Demolition and Removal
 - A. Not applicable.
13. Allotments

Not applicable.

04.02 – PMB Occupancy Based HVAC Controls

1. Mechanical
 - A. Not applicable.
2. Controls
 - N. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - O. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment,

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- software, graphics and programming upgrades.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Reference the Control Contractor Performance Specifications for additional requirements.
 - 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
 - 5) Existing building automation systems and graphics shall be used and updated for new functionality.
 - 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
- P. Demolition
- 1) Demolish and dispose of all existing control components not intended to be re-used.
- Q. Low Voltage Wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- R. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- S. Contractor shall integrate (99) lighting occupancy sensors to be installed by the lighting contractor into the Building Automation System via the VAV controller to communicate with the existing HVAC system and zone temperature controls.
- 1) This shall be completed for all terminal box variable air volume zones as shown on the schedule and floor plans provided by McKinstry.
 - 2) Program temperature zone setpoints as follows for occupied and unoccupied with an intermediary condition that will be maintained for 1-hour (adj.) after a space is scheduled to go into unoccupied mode. Existing sequence of operations outside of occupancy and zone setpoint to remain in place.

04.02-PMB Occupancy Based HVAC Controls	Permit Building	A	Unoccupied Temperature Setpoint	Occ Heat: 72F Occ Cool: 74F Unocc. Cool: 80F Unocc. Heat: 65F	Occ Cool: 74F Unocc. Cool: 80F Occ Heat: 72F Unocc. Heat: 65F Unocc. Cool setback: 76F Unocc. Heat setback: 70F
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04.02 – PTO Occupancy Based HVAC Controls

1. Mechanical
 - A. Not applicable.

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2. Controls

- T. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
- U. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
 - 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
 - 3) Reference the Control Contractor Performance Specifications for additional requirements.
 - 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
 - 5) Existing building automation systems and graphics shall be used and updated for new functionality.
 - 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.
- V. Demolition
 - 1) Demolish and dispose of all existing control components
- W. Low Voltage Wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.
- X. Furnish and install all programming necessary to operate the systems per the Design Intent set forth by McKinstry.
- Y. Contractor shall integrate (42) lighting occupancy sensors to be installed by the lighting contractor into the Building Automation System via the VAV controller to communicate with the existing HVAC system and zone temperature controls.
 - 1) This shall be completed for all (42) Variable Air Volume zones as shown on the schedule and Floor Plans provided by McKinstry.
 - 2) Update Mechanical Building Automation System Graphics to show Occupancy in Zones
 - 3) Program zone temperature setpoints as follows for occupied and unoccupied hours with an intermediary condition that will be maintained for 1-hour (adj.) after a space is scheduled to go into unoccupied mode. Existing sequences of operations outside of occupancy and zone setpoint to remain in place.

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04.02-PTO Occupancy Based HVAC Control	Police Traffic Operations Bureau	A	Unoccupied Temperature Setpoint	Occ Cool: 75F, Occ Heat: 72F Unocc Cool: 80F Unocc Heat: 70	Occ Cool: 75F Unocc Cool 80F Occ Heat 72F Unocc Heat 70 F Unocc Cool setback: 77F Unocc Heat setback: 68F
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- 4) The Contractor shall locate the existing fan coil unit and/or air handling unit control panels and the associated spare points for the occupancy sensor connections.

04.07 – RAC Ventilation Control

1. Mechanical

A. Not applicable.

2. Controls

A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.

B. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine necessary controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Reference the Control Contractor Performance Specifications for additional requirements.
- 4) McKinstry approved naming convention shall be used for all BACnet Object Names.
- 5) Existing building automation systems and graphics shall be used and updated for new functionality.
- 6) Provide capability to store and archive a minimum of one-year trend data for the new points provided on a 15-minute interval. Provide equipment level graphics for all new equipment added to the new control system.

C. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

D. Furnish and install all programming necessary to operate the systems.

E. Controls contractor is responsible for all low voltage wiring and all required 120 V control panels. Controls shall be responsible for providing its own transformers and 120 V power.

F. Two energy recovery units on roof shall be modified to vary supply fan speed based on duct static pressure.

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- 1) Furnish and install two duct static pressure sensors. One in each main duct at basement level.
Wire directly back to energy recovery unit controller.
 - 2) Modify packaged controls to vary fan speed to meet duct static pressure set point as determined by balancer.
 - (i) The package controller appears to have BACnet capability. Integrate existing controller into the BAS to provide the fan speed control. Integrate all other available points from the factory controller into the BAS
 - (ii) Update all graphics associated with this unit to monitor all available points including but not limited to
 - ERV enable/disable
 - Supply fan start/stop
 - Supply fan speed
 - return fan start/ stop
 - return fan speed
 - chilled water valve position
 - hot water valve position
 - heat recovery wheel enable/disable
 - discharge air temperature and humidity
 - return air temperature and humidity
 - Exhaust air temperature and humidity after the wheel
 - Supply air temperature and humidity before and after the wheel
 3. Electrical
 - A. Reconnect ERV enthalpy wheels to the existing enthalpy wheel VFD in each ERV.
 4. Testing, Adjusting and Balancing (TAB)
 - A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
 - B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls Contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems.
 - C. Perform TAB procedures for the following systems/equipment, as specified in spc230593 and as noted below:
 - 1) Provide full pre and post construction TAB at each ventilation air duct termination and on the energy recovery units at three different damper conditions. 100% of dampers open, 70% of dampers open, and 40% of dampers open.
 5. Allotments
-

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- A. Not applicable
- 6. Training
 - B. Provide training as required for this FIM.

08.05 – PD1 Replace Chilled Water Pumps and Add VFDs

- 1. Mechanical
 - A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
 - B. Existing Chilled Water Pumps Removal
 - 1) Isolate, drain, disconnect, remove and properly dispose of existing (2) chilled water pumps located in the main mechanical room. Cut back chilled water supply and return lines to extent necessary to facilitate the scope of work.
 - 2) Existing pump house keep pads shall remain.
 - C. New Chilled Water Pumps Replacement
 - 1) Provide (2) chilled water pumps (Basis of Design: Bell & Gossett). Refer to GMAX drawing M001 for schedule. Chilled water pumps shall meet the following:
 - (i) Flow rate: 167gpm, Head: 100ft, PLEV 60.6%, 460V/3PH/10HP
 - (ii) Pump motor shall be NEMA premium-efficiency inverter-ready
 - 2) Furnish (2) variable frequency drives with integral disconnect (Basis of Design: ABB ACH-580 with integral disconnect (on board BACnet card shall be default option))
 - 3) Field coordinate and refer to Pump detail on GMAX drawing M001 and provide fitting and piping as necessary. Properly align pump suction and discharge piping and field adjust as necessary. Properly align the pump motor and shaft.
 - 4) Provide propylene glycol to fill the system to the existing glycol solution concentration level. Notify McKinstry if the existing glycol solution level is not meeting 35%.
- 2. Controls
 - A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other associated requirements called for in the following scope.
 - B. General requirements
 - 1) Contractor shall survey existing facility controls as-builts and installed system to determine available controller capacity to support this scope of work. Include all necessary equipment, I/O modules, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.

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- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 50% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
- 4) Reference the Control Contractor Performance Specifications for additional requirements.

C. CWP-1&2 VFD Controls:

- 1) Integrate new pump VFD into existing Siemens BAS with the following points labeled as hardwired. Provide MS/TP wire from BAS field controller(s) to the VFD on-board BACNET card for information access. For each VFD furnished by Mechanical Contractors on CWP-1&2, the following points are required:
 - (i) Pump start/stop (hardwired)
 - (ii) Pump status (hardwired)
 - (iii) Pump VFD speed (AO) (hardwired)
 - (iv) Pump VFD alarm (hardwired)
 - (v) pump VFD kW (network card)
 - (vi) Fan or pump VFD speed (AI) (network card)
- 2) CWP-1&2 VFD control sequence:
 - (i) The two chilled water pumps shall work in parallel as the existing condition. Pump VFDs shall modulate to maintain a design loop delta T of 14°F. If there is any AHU cooling valve is commanded 90% (adj.) open and is still calling for cooling, pump VFD shall ramp up speed in 10 mins (adj) to until the critical AHU cooling valve closes down to 80% (adj.). Once the all AHU cooling valves are less than 90% open, pump VFD shall be reset back to control to maintain the design loop delta T temperature. Minimum chilled water pump VFD shall not go down below 77% (corresponding to chiller min flow rate) at rate of ramp down at 10% per minute.

D. Reference controls P&ID diagram for proposed control points to be provided in GMAX drawing set.

3. Electrical

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.
 - B. General circuiting requirements
 - 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability, and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
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- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
 - 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.
 - 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
 - 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
 - 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
 - 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
 - 8) Contractor shall be responsible to provide 20A/120V convenience outlet within 20' 0" of the mechanical equipment per code if an existing outlet serving this purpose does not exist.
- C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.
- D. General Scope: Electrical work to support the replacement of combination magnetic motor starters serving pumps 'CWP-1' and 'CWP-2' with VFD's.
- 1) Metering: Project will result in no change in electrical load. 30-day metering or 12-month utility demand data will not be required.
 - 2) Reference GMAX drawings for existing equipment locations.
- E. Demolition:
- 1) Existing pumps 'CWP-1' and 'CWP-2' shall remain (480V/3PH, 10 HP).
 - (i) Disconnect and safe off power to pumps from serving panelboard 'H1M' (1st Floor, Mech 146).
 - (ii) Disconnect and remove existing combination magnetic motor starters for each pump.
 - (iii) Existing conduit and conductors shall remain for re-use.
- F. New Work:
- 1) Existing pumps 'CWP-1' and 'CWP-2' (480V/3PH, 10 HP).
 - (i) Install new VFD's provided by others.
 - (ii) Extend existing conduit and conductors to VFD's and connect power.
4. Testing, Adjusting and Balancing (TAB)
- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities. Report to McKinstry's Construction Manager for field conditions that might impede the performance of this work.
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- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls contractors, for the appropriate timing and extent of this work, and for required interface with Mechanical and Control systems
- C. Perform specified pre and post TAB activities for the following systems/equipment and demonstrate to McKinstry Cx engineer.
 - 1) Provide measurements of the existing chiller flow and pressure drop prior to construction. Provide measurements of the existing CWP-1&2 flow and pressure differential, as well as zero flow (dead head) pressure reading prior to construction.
 - 2) Provide full pre and post construction TAB on chiller CH-1 and chilled water pumps CWP-1&2 including flow and pressure drop and 2 different operating conditions: Max (100%) and Min (77%) flows.

08.05 – PD3 Replace Chilled Water Pumps and Add VFDs

1. Mechanical

- A. Contractor shall be responsible for equipment, materials, accessories, insulation and other associated requirements called for in the following scope, and as indicated in the above supported documents.
- B. Existing Chilled Water Pumps Removal
 - 1) Isolate, drain, disconnect, remove and properly dispose of existing (2) chilled water pumps located in the main mechanical room. Cut back chilled water supply and return lines to extent necessary to facilitate the scope of work.
 - 2) Existing pump house keep pads shall remain.
- C. New Chilled Water Pumps Replacement
 - 1) Provide (2) chilled water pumps (Basis of Design: Bell & Gossett). Refer to GMAX drawing M001 for schedule. Chilled water pumps shall meet the following:
 - (i) Flow rate: 211.2gpm, Head: 68ft, PLEV 68.9%, 460V/3PH/7.5HP
 - (ii) Pump motor shall be NEMA premium-efficiency inverter-ready
 - 2) Furnish (2) variable frequency drives with integral disconnect (Basis of Design: ABB ACH-580 with integral disconnect (on board BACnet card shall be default option))
 - 3) Field coordinate and refer to Pump detail on GMAX drawing M001 and provide fitting and piping as necessary. Properly align pump suction and discharge piping and field adjust as necessary. Properly align the pump motor and shaft.
 - 4)

2. Controls

- A. Contractor shall be responsible for all equipment, materials, accessories, programming, and other

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associated requirements called for in the following scope.

B. General requirements

- 1) Contractor shall survey existing facility controls as-builts and installed system to determine available controller capacity to support this scope of work. Include all necessary equipment, software, graphics and programming upgrades. This includes low voltage wiring and controls associated line voltage wiring with associated transformers. Install transformers in separate enclosure from the controller enclosures.
- 2) For proposed control points, Contractor shall furnish and install devices, conduit, conductors, and related accessories.
- 3) Provide capability to store and archive a minimum of one-year trend data for a minimum of 40% of the points on a 15-minute interval. Provide equipment level graphics for all new equipment or equipment with refurbished controllers added to the new control system.
- 4) Reference the Control Contractor Performance Specifications for additional requirements.
- 5) Integrate new chilled water pumps controls into BAS with the following points labeled as hardwired. Provide new I/O expansion as needed. Provide communication cable from BAS to the pump VFD on-board BACNET card for information access. The following control points shall be provided for CWP-1&2:
 - (i) Pump enable/disable (hardwired)
 - (ii) Pump VFD speed (AO) (hardwired)
 - (iii) Pump alarm (hardwired)
 - (iv) Pump status (hardwired)
 - (v) pump VFD kW (network card)
 - (vi) pump VFD speed (AI) (network card)
 - (vii) The two chilled water pumps shall work in parallel as the existing condition. Pump VFDs shall modulate to maintain a design loop delta T of 14°F. If there is any AHU cooling valve is commanded 90% (adj.) open and is still calling for cooling, pump VFD shall ramp up speed in 10 mins (adj) to until the critical AHU cooling valve closes down to 80% (adj.). Once the all AHU cooling valves are less than 90% open, pump VFD shall be reset back to control to maintain the design loop delta T temperature. Minimum chilled water pump VFD shall not go down below 72% (corresponding to chiller min flow rate) at rate of ramp down at 10% per minute.

C. Reference controls P&ID diagram for proposed control points to be provided in GMAX drawing set.

3. Electrical

- A. Contractor shall be responsible for equipment, materials, accessories, and other associated requirements called for in the following scope, and as indicated in the above supporting documents.

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B. General circuiting requirements

- 1) Contractor shall survey existing facility drawings and facility power distribution system to determine available space, constructability and load capacity to support this scope of work. If existing space or load capacity is insufficient to meet the requirements of the scope, Contractor shall immediately notify McKinstry.
- 2) For power circuits indicated as being removed, Contractor shall remove conductors back to the associated panel, and shall remove associated starters, disconnects, and other devices. Conduit shall be cut back to within 3" of room penetration.
- 3) For new power circuits, Contractor shall furnish and install overcurrent protection, conduit conductors, starter, disconnect, and related accessories all in compliance with NEC.
- 4) Where power circuits indicated as being removed meet the requirements for new power circuits, existing components may be reused where in compliance with current NEC.
- 5) Unless otherwise specified, similar loads may be combined on a common circuit as permitted by current NEC.
- 6) Contractor shall circuit all new devices under this scope of work to the nearest available panelboard with enough load capacity to accommodate new added loads.
- 7) Contractor shall evaluate feeders for reuse (if the new equipment is in the same location).
- 8) Contractor shall be responsible to provide 20A/120V convenience outlet within 20' 0" of the mechanical equipment per code if an existing outlet serving this purpose does not exist.

C. Electrical panels, disconnects, control panels, VFDs, serving mechanical equipment shall be installed to comply with clearance requirements of the NEC. Provide remote mounted panels and disconnects where required by the NEC.

D. Install VFDs for Pumps – CWP-1&2

- 1) Existing pumps 'CWP-1' and 'CWP-2' shall be removed (480V/3PH, 5 HP).
 - (i) Disconnect and safe off power to pumps from served from panelboard 'H1M'.
 - (ii) Disconnect and remove existing magnetic motor starters and disconnect switches serving pumps.
 - (iii) Existing conduit and conductors shall remain for re-use.
- 2) New pumps 'CWP-1' and 'CWP-2' (480V/3PH, 7.5 HP).
 - (i) Install new VFD's provided by others.
 - (ii) Extend existing conduit and conductors to new pumps and VFD's and connect power.

4. Testing, Adjusting and Balancing (TAB)

- A. Contractor shall review this scope of work and inspect field conditions to develop a work plan prior to commencement of TAB activities.
- B. Coordinate with McKinstry's Construction and Commissioning personnel, and Mechanical and Controls contractors, for the appropriate timing and extent of this work, and for required interface with

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Mechanical and Control systems

- C. Perform specified pre and post TAB activities for the following systems/equipment:
- 1) Provide measurements of the existing chiller flow and pressure drop prior to construction. Provide measurements of the existing CWP-1&2 flow and pressure differential, as well as zero flow (dead head) pressure reading prior to construction.
 - 2) Provide full pre and post construction TAB on chiller CH-1 and chilled water pumps CWP-1&2 including flow and pressure drop and 2 different operating conditions: Max (100%) and Min (72%) flows.

09.0 – Interior and Exterior LED Lighting Upgrades

SEE APPENDIX F for line by line scope.

10.0 – Solar PV Systems

OVERVIEW

Engineer, procure, construct, commission and monitor solar PV systems at the site listed below and convert building with new solar PV installation to Xcel SPVTOU Rate Schedule B.

- A. Construct an electrically complete solar photovoltaic system, interconnected to the Xcel Energy utility grid; basis of design:
- 1) Module: Jinko JKM405M-72HL-TV 405W monofacial modules, or approved equal.
 - 2) String Inverter: CPS (Chint Power Systems), SCA, or approved equal.
 - 3) Rapid shut down (Rooftop Systems only): Tigo, TS4, or approved equal.
 - 4) Racking (Flat Roof Mount): Panel Claw, clawFR, or approved equal.
 - 5) Parking Canopy:
 - a. Titan double-cantilever solar canopy structures, or approved equivalent
 - b. Five – seven (5-7) degree tilt
 - c. Minimum ten foot, six inch (10'-6") clear span
 - d. Snowguards at bottom edge of array are included
 - e. Excepting snowguards, no decking, gutters, or other water management features are included
 - f. Pricing assumes concrete pier foundations at 30" diameter and 10' depth.
- B. The system shall include:
- 1) DC & AC cabling and conduit.
 - 2) DC & AC system disconnects.

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- 3) DC & AC bonding and grounding.
 - 4) Inverters, inverter fuses, transformer (as needed), grounding transformer, rapid shutdown equipment.
 - 5) Installation of data acquisition system (DAS).
 - 6) Integration of data connection to data acquisition system assumed to be via an A12 provided LAN (local access network) port.
 - 7) System commissioning
- C. Roofing and connections include:
- 1) Pre-installation and post-installation roof deck inspection.
 - 2) Structural analysis of roof system to ensure it can accommodate the proposed system.
 - 3) Protective membrane slip sheets and mechanical attachments (as needed).
 - 4) Flash and seal all mechanical roof attachments and roof penetrations.
 - 5) Spudding is excluded from built-up roofs.
- D. Mounting structure shall comply with UL2703.
- E. Please see Solar PV Exclusions in the exclusions & clarifications section earlier in this schedule.

Project Site List:

Site	Address	PV Array Size (kW dc)	System Application
CPC - Fleet Maintenance - BLDG 5	1271 W Bayaud Ave, Denver	69.7	PV on Existing Parking Canopy
Fire Station #2	5300 Memphis St, Denver	104.6	Flush Roof
Police Traffic Operations	3375 Park Ave, Denver	97.6	Flat Roof
Police Academy	8895 Montview Blvd., Denver	110.0	New Parking Canopy
Police District #2	3921 Holly Street, Denver	209.1	New Parking Canopy
Police District #3	1625 S University Blvd, Denver	181.2	New Parking Canopy
Total		772.2 kW	

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New PV on existing canopy - CPC Fleet Maintenance Bldg 5



Rooftop PV - Fire Station #2

Schedule B: Detailed Scope of Work



Additional PV - Police Traffic Ops Complex Bldgs



New Parking Canopy with PV - Police Academy

Schedule B: Detailed Scope of Work



New Parking Canopies with PV - PD#2 HQ



New Parking Canopies with PV - PD#3 HQ

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GENERAL REQUIREMENTS

- Install and wire electrical components and interconnect the system in accordance with NEC, Owner and XCEL requirements.
- Complete site restoration and restore areas of disturbance to their original condition.
- Coordinate with XCEL to ensure installation compliance.
- MCKINSTRY will use NEC and implement NETA ATS testing standards for all voltages above 120VAC.
- MCKINSTRY is responsible for properly documenting the results of each Pre-Functional test.
- MCKINSTRY will review the proposed test procedure and final format Failure to properly complete and thoroughly document commissioning tests will prevent both substantial and final completion payments.
- MCKINSTRY will provide on-site commissioning support to adjust or corrections identified by commissioning agent.

DC INSTALL

Wire all modules per Issued for Construction (IFC) drawing set and applicable module installation manuals provided by module manufacturer.

DC wire management to comply with the following requirements.

- DC conductors to be properly routed to avoid sharp edges, rough surfaces, overly tight bending radii, moving parts of racking systems, direct exposure to sunlight, sagging wires, or mis-sized cable clips.
- DC conductors to be supported by stainless steel wire clips, UV-stabilized composite wire clips, UV-stabilized wire ties or a cable tray. Nylon zip ties are NOT acceptable.
- DC wire management to comply with NEC 2020 Article 690.31(C)(1) regardless of the applicable AHJ code cycle. NEC 2020 Article 690.31(C)(1): Exposed cables to be supported and secured at intervals not to exceed 600mm (24 in.) by cable ties, straps, hangers or similar fittings listed and identified for securement and support in outdoor locations. PV wire or cable to be permitted in all locations where RHW-2 is permitted. Exception: PV Systems meeting the requirements of 691.4 to be permitted to have support and securement intervals as defined in the engineered design.

DC module connectors to match the connector specification of the PV module specified for the project(s). McKinstry to confirm which module connectors to use prior to procurement. DC bonding and grounding required by the local utility, AHJ adopted codes, and racking.

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MLPE/RSD INSTALL

MCKINSTRY to install any Module Level Power Electronics (MLPEs) or Rapid Shutdown Units (RSDs) per Issued for Construction (IFC) drawing set and applicable manufacturer installation manuals.

AC INSTALL

- MCKINSTRY to provide all conductors and conduit required to interconnect the system in accordance with XCEL and NEC standards. Any material changes or deviations from the Issued For Construction (IFC) drawings will be approved by McKinstry prior to installation.
- MCKINSTRY to install Inverters with correctly sized inverter fuses and AC combiners.
- Wire all inverters per Issued for Construction (IFC) drawing set and inverter manufacturer installation manuals.
- All MPPTs to be properly balanced according to inverter manufacturer installation manuals.
- MCKINSTRY to provide the required meter housing(s) for project metering in accordance with local utility standards.
- MCKINSTRY to provide AC system disconnects as required by the local utility and AHJ adopted codes.
- MCKINSTRY to provide Arc Flash labels, equipment labels, and safety labels per NEC requirements. Arc Flash study details will be provided by design engineers.

BORING/TRENCHING (IF NEEDED)

- MCKINSTRY to complete trenching, directional boring, and required backfill to provide an electrically complete solar photovoltaic system, interconnected to the utility grid.
- Install AC trenching. Depth, width, depth flagging, and utility inspections to be installed/completed in accordance with XCEL standards.
- Install DC trenching. Depth, width, depth flagging, and utility inspections to be installed/completed in accordance with XCEL standards.
- Communication trenching depth, size, depth flagging, and inspections to be installed/completed in accordance with McKinstry and XCEL standards.
- MCKINSTRY to complete trenching and/or boring plan for approval prior to excavating ground.
- MCKINSTRY to repair/restore trenched areas as needed. McKinstry to restore disturbed areas to their original condition.
- Spare trenches to be installed in accordance with XCEL standards.

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TRANSFORMERS (IF APPLICABLE)

- MCKINSTRY to provide any transformers required by the Issued for Construction (IFC) drawing set.
- Transformers and/or grounding transformers to be installed in accordance with XCEL standards and AHJ codes.
- MCKINSTRY to be responsible for the housekeeping pad structural engineering design if equipment is greater than 400lbs per IBC 1708.5. Other exemptions may apply.

DAS (DATA ACQUISITION SYSTEM)

- Installation of data acquisition system (DAS) including conduit, metering, CT's, data logger, communications cabling, and weather station components (pyranometers, back of panel temperature sensor, and ambient temperature sensors to be installed per manufacturer manuals)
- MCKINSTRY to install seal tight data acquisition system (DAS) conduit.
- Any splices made between RS485 data connections to use gel crimp wire connectors. RS485 cable should be Belden 3106A or similar. McKinstry to read and understand the following documents prior to mobilization.

MODULE INSTALL

- MCKINSTRY to install all modules per Issued for Construction (IFC) drawing set and applicable manufacturer installation manuals.
- MCKINSTRY is responsible for installation of solar modules and associated module installation hardware, including module bonding inherent within all module mounting hardware, as specified in Issued for Construction documents.
- MCKINSTRY is responsible for replacing solar modules broken during installation at their expense.
- MCKINSTRY is required to handle solar modules with extreme care, including, but not limited to: not sitting, walking or stepping on modules, not resting modules on helmet while transporting, unpacking and transporting modules per manufacturer requirements, and all other reasonable precautions.
- MCKINSTRY is responsible for daily spot inspections to array during installation to ensure modules are attached to racking system appropriately and securely, including any associated temporary installation requirements.

RACKING INSTALL

- MCKINSTRY to provide all racking material identified in the Material Scope Responsibility Matrix.
- MCKINSTRY to provide all miscellaneous mounting structure material not specifically shown in the

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Material Scope Responsibility Matrix required to construct a code compliant, structurally erected solar mounting system, as specified in Issued for Construction documents.

- MCKINSTRY to install racking, ballast blocks, anchor hardware (mechanical attachments / standing seam clips), protective membrane slip sheets, and per Issued for Construction drawings.
- MCKINSTRY to install mounting structure row spacing and module tilt installed per Issued for Construction drawings.
- MCKINSTRY to approve of a roof deck warranty maintenance plan that adheres to the roof deck warranty maintenance requirements. Warranty maintenance requirements to be received from McKinstry's Construction Manager prior to commencement of any rooftop solar construction.
- MCKINSTRY to provide pre-installation and post-installation roof deck inspection by a certified roofing installer of the specific roof manufacturer installed on each applicable roof deck.
- MCKINSTRY to also provide, as required, protective membrane slip sheets and installation of approved mechanical attachments.
- MCKINSTRY will hire a certified roofing installer of the specific roof manufacturer installed on each applicable roof deck for the scope of flashing/sealing all mechanical roof attachments and roof penetrations. Installation must follow current roof warranty holder requirements.
- MCKINSTRY is responsible for handling and loading material on rooftops, as per structural engineering loading plan. Structural engineering loading plan will be provided by McKinstry.

Mounting structure will comply with UL2703 and be approved by McKinstry prior to installation.

CANOPY INSTALL

- MCKINSTRY to furnish and install all carport foundations, steel structure, columns, beams, racking and hardware as well as new under canopy lighting fixtures.
- MCKINSTRY will restore site asphalt to original condition

CLOSE OUT

MCKINSTRY will provide a "Close Out Package" that includes the following documents: (All documents to be provided in digital format).

- Pre-Functional commissioning test results.
- Equipment list of AC/DC equipment with installation date, warranty period, serial number and any manufacturer IOM manuals, including product data sheets.
- Issued for Construction (IFC) drawing redlines.

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- String Wiring Diagram with the string # and inverter # listed for each string.
- DAS Communication cable routing diagram.
- Copies of passed inspection documents from the AHJ or utility, as applicable.
- MCKINSTRY will be responsible for repairing any issues documented on the Punchlist. Failure to properly complete and thoroughly document corrected Punchlist items will prevent final completion payment.

TRAINING

MCKINSTRY will provide a maximum of 4 hours of on-site training to key facility personnel. McKinstry targets this would be a one-time training (per CCD Facility Team) held at a single location (per Team) and shared with any facility personnel who can attend from their facility.

OPERATIONS & MAINTENANCE (O&M) SERVICES

O&M services are included in the project price for 1 (one) year from final completion of the individual PV systems. At that point, O&M activities must be continued so as to ensure reliable operation of the PV systems, either by CCD staff or a 3rd party.

Definitions:

The following defined terms are used throughout section.

- **Corrective Maintenance (CM)** – Actions and/or techniques taken to correct failures, breakdowns, malfunctions, anomalies, or damages detected during inspections, or through monitoring or alarming. Corrective maintenance addresses unplanned equipment breakdowns by troubleshooting, repairing, or replacing defective equipment. It covers all activities by the O&M team to restore a PV system to its expected performance.
- **Extraordinary Maintenance (EM)** – Any activity(s) or action(s) required in the case of major unpredictable events, such as Force Majeure or serial defects, that are considered outside the normal course of business.
- **Predictive Maintenance (PdM)** – A condition-based maintenance strategy that analyzes and evaluates system degradation and potential faults and failures. This allows the operations and maintenance team to prioritize scheduled maintenance activities, optimize resources and increase system performance.
- **Preventative Maintenance (PM)** – Scheduled inspection(s) and servicing of equipment to prevent breakdowns and unnecessary production losses. These take place annually according to a specific maintenance plan and schedule dependent on the equipment installed onsite. Preventative

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Maintenance is the foundation of a complete solar O&M program.

- **Warranty Management (WM)** – The activity that manages all equipment under warranty at the time of service with the objective of reducing costs, coordinating repairs, and facilitating any required paperwork such as Return Merchandise Authorization (RMA) receipts.

Scope of Work*:

O&M STRATEGY	SERVICES	FREQUENCY	SCOPE INCLUSION?
Asset Management	Performance Monitoring & Reporting	Annual	No – 3 years in M&V Contract
	OEM Warranty Support Claim	As Needed	Yes – 1 year
	Data Monitoring Subscription Renewal	Every 5 yrs	No
Operations	Daily Alert & Alarm Monitoring	-	Yes – 1 year
	Remote Diagnostics	As Needed	No
Preventative Maintenance (PM)	Site Inspection (Annual)	Annual	Yes – 1 year
	Performance Verification	Annual	No – 3 years in M&V Contract
	MV Transformer Service	Annual	[N/A]
Corrective Maintenance (CM)	Minor Corrective Maintenance Issues	Annual	Yes – 1 year
	Corrective Maintenance Response*	As Needed	Yes – 1 year
	Warranty Equipment Repair/Replacement	As Needed	Yes – 1 year
Additional Services	Roof Inspection (Full Roof)	Every 5 yrs	No
	Panel Cleaning	As Needed	No
	Vegetation Management	As Needed	No
	Pest Control	As Needed	No

* see exclusions below

Preventative Maintenance Standard Deliverables:

- **Annually**
 - Site Inspection Report
 - Performance Verification Results

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- **As Needed**
 - Corrective Maintenance Service Order Report

Clarifications & Assumptions:

1. The scope of work is based on regular working days within standard hours. Any hours billed outside this timeframe will be charged overtime.
2. The O&M Plan does not include Extraordinary Maintenance activities
3. The Corrective Maintenance scope of work outlined may at times require a contractor to perform the work. If this is required, McKinstry will manage and provide supervision of the work being performed.
4. Customer must provide uninterrupted access the DAS connections to McKinstry to complete this scope of work. For any LAN based DAS connections, the scope of work excludes truck rolls to re-establish connectivity. Any additional remobilizations will be billed at Time & Material rates.

Asset Management:

Performance Monitoring & Reporting (Excluded – Year 1-3 Included In M&V)

- Overall monitoring of the energy generation and weather data to verify system performance meets production expectations based on actual weather conditions. Normally these production expectations are outlined in the contract as a production or energy guarantee. This includes periodic reports to the asset owner verifying the system is performing as expected.
- In Energy Savings Performance Contracts (ESPCs), this specific scope of work item is normally covered under the Measurement & Verification (M&V) agreement.

OEM Warranty claim support (1 year)

- If equipment warranties are still intact at the time of service, McKinstry will assess equipment warranties, interface with original equipment manufacturers (OEM) and facilitate any paperwork involving warranty claims to facilitate the necessary repair.

Operations:

Daily Alert & Alarm Monitoring (1 Year)

- Remote supervision of the PV system's Data Acquisition System daily to ensure there are no active alerts and/or alarms that require immediate attention. If an alarm and/or alert requires immediate attention the customer will be notified. With customer approval a technician will be dispatched as part of the Corrective Maintenance strategy.
- 24hr automatic alarms will be set during the Commissioning phase to alert any system underperformance, equipment or communication failures.

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Remote Diagnostics (Included Via Warranty Support Services)

- Remote diagnostics of any alerts and/or alarms using advanced communications and controls that may be impacting system performance. For example, our technicians can remotely upgrade inverter firmware, change inverter parameter settings, or reset the inverters in case a of fault – all without having to move from their desk.

Preventative Maintenance (PM)

Site Inspection (1 year)

- Visual verification of all system components and ensure system is installed per drawings and specifications.
- The visual inspection includes a review of the roofing conditions within the bounds of the solar installation.
- A sample set of all solar racking system points of contact with the roof will be inspected including the mechanical attachment seams and racking feet (including slip sheets if applicable). Sample set shall be 2-5% of all mechanical attachments and racking feet.
- Inspection will be performed annually, with an Inspection or PM report provided upon completion.
- Inspection report shall include any issues or recommendations that should be performed as part of a Corrective Maintenance service.

Performance Verification:

See Measurement & Verification Plan (Appendix B)

Medium Voltage (Mv) Transformer Service (Not Applicable)

Corrective Maintenance (CM):

Minor Corrective Maintenance Issues

- Minor corrective maintenance issues will be immediately attended to if the work can be completed within the allotted time for the scheduled site inspection. For example, if there is a dirty inverter filter the technician onsite will resolve this issue while onsite during the annual Site Inspection.

Corrective Maintenance Response

- Corrective Maintenance is included with exclusions listed below.
- McKinstry will dispatch a technician with customer approval to attend to any major alarms and/or alerts on an as needed basis. Following any dispatch, a service report will be provided to the customer.

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- McKinstry will troubleshoot equipment onsite as needed to determine the root cause of the fault or failure.
- Services could include:
 - DC and AC Current and/or Voltage Measurements
 - Thermal Imaging
- Deliverables include:
 - Service report summarizing the visit's results, any actions taken onsite, and any follow up actions required to return the system to its expected operation.
 - Service report will include any troubleshooting or testing results performed on the service dispatch.

Warranty Equipment Repair/Replacement:

After dispatching a technician to investigate and/or troubleshoot a fault or failure, specific equipment may be determined to require replacement. This can be site specific depending on system components. McKinstry will not replace any equipment without the consent and/or approval of the customer. This scope can include but is not limited to:

- Inverter component repair (i.e. the inverter fan) or full replacement
- Module replacement

Additional Services: n/a

Exclusions:

- Damage caused by lightning
- Damage caused by hail
- Damage caused by vandalism
- Full Roof Inspections
- Panel Cleaning
- Vegetation Management
- Pest Control
- Cell service (if needed) renewal
- Data monitoring subscription renewal

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- Any labor associated with warranty replacements after 1 year from final completion of the individual PV systems

13.01 – PTO Air Sealing and Weather Stripping

1. General

- A. Contractor shall be responsible for equipment, materials, accessories, insulation, and other associated requirements called for in the following scope and as indicated in the above supporting documents.
- B. Roof wall joint should be sprayed with two-part foam to prevent air loss. Exterior doors should be sealed to prevent air loss.
 - 1) Ext. doors to be weather sealed (7)
 - 2) Roof/wall joint to be sealed with 2 part foam (475 ft)
- C. Contractor shall move or find a way to work around any existing equipment installed on the wall in-scope before beginning this work. This includes but is not limited to lighting, thermostats, fire alarms, etc. Any items that are temporarily moved shall be reinstalled in their original location.

13.02 - PTO Ceiling and Wall Insulation

1. General

- A. Contractor shall be responsible for equipment, materials, accessories, insulation, and other associated requirements called for in the following scope and as indicated in the above supporting documents.
- B. Fur exposed parts of existing N, E, and W exterior walls in-scope with 4" metal studs, with R15 batt insulation, and 5/8" gypsum board to match the existing wall's energy performance
 - 1) Approximately 4,000 square feet (480' x 8.5') of wall to be furnished with new studs, insulation, and gypsum board. Refer to the attached reference drawings for the location of the wall.
 - 2) Installed wall shall match existing wall assembly insulation value. Contractor to verify. See reference drawings for wall assembly notes.
- C. Contractor shall move or find a way to work around any existing equipment installed on the wall in-scope before beginning this work. This includes but is not limited to lighting, thermostats, fire alarms, etc. Any items that are temporarily moved shall be reinstalled in their original location.
- D. Paint new gypsum board to match the color of other interior walls in the facility.

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13.04 – CMP Window Replacements

1. General

- A. Contractor shall be responsible for equipment, materials, accessories, insulation, and other associated requirements called for in the following scope and as indicated in the above supporting documents.
- B. Furnish and install new windows on west wall area as indicated in attached drawings.
 - 1) BOD: Pella Impervia Fiberglass
 - a) Commercial, double pane, fiberglass framed, single hung, low e, U-value min=0.38, SHGC=0.38
 - 2) Install per manufacturers installation recommendations and ensure to paint and patch surrounding interior and exterior walls/masonry as well as trim.
 - 3) Deinstall and reinstall any existing blinds
 - 4) Tinting to be determined upon site inspection and verified by customer
 - 5) Window Type Count
 - a) Building's third floor
 - (i) (28) Type A, (13) Type B, (2) Type C, (2) Type D
 - 6) Window dimensions to be verified upon site inspection prior to install.

20.01 – Rate Analysis

The following rate changes will reduce chilled water (CHW) costs to the City and County of Denver by reducing the contracted peak chilled water capacity (measured and billed in tons) values at the following sites. **CCD will be responsible for submitting the formal request to Xcel to make these changes.**

1. **Lindsey Flanigan Courthouse / Van Cise Detention Center:** Request to lower contracted CHW capacity 10%, so from 2100 tons to 1890 tons. Note that recent maximum demands are around 1,000 tons so appear to have room to move contracted amount down.
2. **Permit Bldg:** Request to lower contracted CHW capacity 10%, so from 150 tons to 135 tons. Note that recent maximum demands are around 80 tons so appear to have room to move contracted amount down.
3. **CCB & PAB/PADF:** Request to lower contracted CHW capacity 10%, so from 400 tons to 360 tons for the City and County Bldg, and 350 to 315 for the Police Administration Bldg. Note that recent max demands are around 360 and 135 tons respectively so appear to have room to move contracted amount down.

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- 4. 1245 Champa:** Request to lower contracted CHW capacity 10%, so from 165 tons to 149 tons. Note that recent max demands are around 100 tons so appear to have room to move contracted amount down.

22.01 – PowerED

CCD PowerED/ Controls Optimization/RCx is a systematic building efficiency and energy awareness program that helps clients achieve their environmental and fiscal goals with guaranteed results. It goes beyond typical energy services to engage the staff and users within your facilities, prompting them to take action to conserve resources.

McKinstry will provide powerED services for a 3-year program term (including an initial 90-day launch term) at 22 client facilities. powerED will commence after substantial construction completion, although with client approval can begin before substantial completion. The occupant engagement program or “People” module will only be implemented in the 6 sites with an asterisk below. Sites included in this FIM are:

- The Commons on Champa*
- City and County Building*
- Fleet Maintenance Building #5*
- Gary Price Operations Building*
- Denver Crime Lab
- Denver Municipal Animal Shelter
- Fire Station 2
- Fire Station #21
- Fire Station #22
- Fire Station #24
- Fire Station #26
- Lindsay-Flanigan Courthouse
- Police Administration Building PAB*
- Police Traffic Operations Bureau
- Permit Building*
- Denver Police Academy
- Police District #2
- Police District #3
- Rose Andom Center

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- South Cherry Creek Transfer Station
- South Osage Fleet Maintenance Garage
- Van Cise-Simonet Detention Center

McKinstry is dedicated to providing the most value-driven, flexible, and innovative solution through powerED. Using a highly collaborative approach, we provide three key elements of focus: People, Process, and Performance. The resources and activities associated with each of the three powerED modules are described here as the scope of work for this FIM. Each of these elements will be introduced over a 3-year period at 22 client facilities. McKinstry proposes to perform the following tasks:

PEOPLE MODULE

Energy savings are maximized when individuals take responsibility for energy efficiency. The primary goal of the People module is to eliminate waste and reduce energy use through energy awareness and behavior change. The powerED program offers strategies that encourage everyone in your facilities to get involved. We will work together to coordinate and deploy a campaign that will call people into action through the powerED program's interactive People.Power.Planet web platform. Additionally, a visual campaign including posters, stickers, signs, checklists, energy messages, and other communications will be deployed to engage occupants both online and off. The People module will be implemented at: City & County Building, The Commons on Champa, Gary Price Operations Building, Fleet Maintenance Building #5, Police Administration Building PAB and Permit Building. McKinstry will provide CCD with the following implementation resources for the People module:

POWERED Program Manager

McKinstry's powerED Program Manager will act as the account manager for CCD and will facilitate implementation of the powerED program. McKinstry's People module responsibilities are to:

- Provide overall planning, management, and communication of the powerED program
- Increase visibility of energy efficiency and sustainability initiatives and benefits among occupants
- Provide activities, challenges, and calls to action to inspire building occupants to reduce waste and conserve energy
- Interact with a diverse body of stakeholders throughout the program including client-level stakeholders, building contacts, and program volunteer leaders
- Lead a client-level Steering Committee to drive program planning, engagement, and procedures
- Provide training and support for the occupant engagement web platform, peoplepowerplanet.com
- Provide communication materials, resources, and rewards to facilitate engagement
- Communicate and promote success

KEY PEOPLE Module INITIATIVES

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Planning

McKinstry's support team will facilitate planning sessions and program development with key stakeholders to ensure expectations are met and success is achieved. Throughout the planning process, we will provide clear communication about methods for efficient program execution.

Buy-In & Commitment

Energy savings cannot be realized without commitment from building occupants. The powerED Program Manager will work with CCD to identify program stakeholders and leaders. These individuals will support the program through a broad-based client-level Steering Committee. Program leaders will be selected at various levels across your organization to foster overall support and commitment throughout your facilities. The powerED Program Manager obtains program buy-in from participants through group presentations and one-on-one stakeholder meetings to garner commitment for the program initiatives.

Steering Committee

McKinstry's Program Manager will facilitate the formation of a client-level Steering Committee that will guide the program efforts. This team should possess high-level decision-making capabilities as well as the ability to communicate and support implementation strategies. Steering Committee members should represent a cross-section of leadership in the organizations and community.

Campaign & Communications

The powerED program is based on the proven social science theories of behavioral change. With demonstrated success, powerED engages individuals through education, communication, and competition – much of which is facilitated through the program's interactive People.Power.Planet website and associated campaign. Through peoplepowerplanet.com, visitors are equipped with the knowledge, tools, inspiration, and support to take action and adopt new habits towards energy efficiency. The People.Power.Planet website, recipient of a Platinum MarCom Award, allows individuals to see directly how their actions and the actions of others can help to reduce their energy use.

Progress data is displayed for the organization and each participating facility via the People.Power.Planet website. The website provides a singular platform for building occupants to learn about energy and sustainability initiatives within their organization, as well as take action to improve their energy habits. Participants create an individual login that allows them to report action, track results, earn rewards, view progress, and learn more. Each participant participates as part of their department team (e.g. Public Safety, Finance, Transportation, etc.), and is able to track energy progress of each participating facility in the program. Furthermore, CCD can create individual pages on the website referred to as "Local Leaders" to highlight and communicate about various energy or sustainability initiatives (e.g. Bike Share Program, Energy Performance Contracting Project, Recycling Club, etc.). Key features of the People.Power.Planet website and campaign include:

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1. Individual account creation on peoplepowerplanet.com that allows participants to earn points, track progress, and work on various energy efficiency targets each year.
2. Real-life rewards tied to participation and engagement of departmental teams.
3. Communication of CCD energy and sustainability initiatives in a single online location that can be updated dynamically with news, announcements, and contact information.
4. Energy reduction tools and resources including facility operational best practices, building shutdown checklists, occupant energy audit guides, and engaging activities.

The Program Manager will work with CCD to identify program leaders to lead activities and participation within their department or facility. The website provides a singular comprehensive platform for CCD staff to report actions, track results, learn best practices, and communicate with other participants in the program.

Key CCD People Module Responsibilities

McKinstry's powerED Program Manager will act as the account manager for CCD and will facilitate occupant engagement through the deployment of the People module. To ensure successful program delivery, CCD will support the implementation of this module by:

- Identifying and maintaining a single point of contact to manage and oversee the overall program
- Identifying and inviting key stakeholders to participate on the powerED Steering Committee; filling Steering Committee vacancies as needed
- Working with other stakeholders to identify and maintain program leaders at each participating site and/or within each participating team throughout the program
- Uploading regular content (including announcements, photos, and videos) to peoplepowerplanet.com
- Assisting in the distribution of program communications
- Assisting in the distribution of electronic and printed program materials (e.g. posters, checklists, brochures, etc.)
- Facilitating broad engagement in the People.Power.Planet campaign and website
- Establishing a process for providing key program updates to CCD leadership
- Providing overall support, enthusiasm, and leadership for the program

PROCESS MODULE

McKinstry will provide an on-site engineer to work with your building operations staff to investigate and report results for low- and no-cost energy savings opportunities. Our powerED engineer will take a serious look at your facilities and the potential for efficiency improvements. By gathering basic information about your systems, resources and utility use, we will estimate the range of potential for energy efficiency opportunities, cost savings, and operational benefits. Along the way, we will solicit your ideas and input on

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occupancy, systems, and scheduling to better understand the dynamics of your energy and resource use.

Included in the Process module is the monitoring and analysis of building automation data, which is used to monitor the ongoing performance of any controls modifications implemented as part of the ESPC project. The building analytics scope tracks KPIs that can be monitored and read through the building automation system points and provides automated alerts to McKinstry engineers if any KPIs that are out of range. As part of powerED, the McKinstry engineer will interpret the alerts (fault detection) and provide root cause analysis (diagnostics) and recommendations on any issues.

POWERED engineer

McKinstry's powerED engineer for the Process module will provide on-site technical expertise with a primary focus on identifying low- and no-cost opportunities to save energy, reduce water consumption, drive operational or maintenance savings, or otherwise improve the operations of facilities. Throughout this process, the engineer will engage your building operators and offer advice and education on various energy savings strategies. Their primary objectives are to:

- Collaborate with building operators; identify operator team deficiencies and provide ongoing training and support as needed
- Identify low- and no-cost savings opportunities to better improve the overall function and performance of CCD facilities
- Investigate opportunities and providing best practice recommendations
- Continually monitor energy use and resource conservation practices and provide feedback in timely intervals to the key stakeholders at CCD
- Assist in development and implementation of an energy policy or building guidelines
- Provide ongoing commissioning, building monitoring, and analysis of building systems to identify behavioral, operational, and maintenance strategies critical to energy savings
- Review building trends and operational analytics to identify areas for improvement
- Assist CCD in understanding and communicating ongoing performance data, results, and progress
- Deliver building automation monitoring and analytics, including interpreting automated alerts and provide root cause analysis and recommendations on any issues

KEY PROCESS Module INITIATIVES

Building Interviews

The operational process begins with identification of low- and no-cost operations and maintenance opportunities to develop a baseline of where your organization is culturally and operationally today. McKinstry's powerED engineer will conduct interviews with maintenance and operations staff and building occupants to assess existing conditions for each facility.

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Site Assessments

McKinstry's powerED engineer will conduct a systems, operational, and occupancy assessment on each facility during both occupied and unoccupied times. McKinstry will apply a systematic process of assessing each of your facilities to identify behavioral, operations, and maintenance strategies critical to energy savings. We will focus on investigating energy intensive systems, controls, and operational characteristics – identifying and documenting energy saving opportunities specific to each facility.

Best Practice Recommendations

McKinstry will provide ongoing facility recommendations that include an outline of existing conditions and recommendations for improvement. The powerED engineer will provide documentation of best practice recommendations for each facility, including site-specific strategies and recommended actions for implementation. Key stakeholders can rely on these recommendations as a foundation for developing action plans for energy savings measures.

Implementation Process Development

McKinstry will work with you to develop processes for incorporating site-specific recommendations. In some cases, these solutions will be small control changes or settings changes that can be done immediately. In more complex measures, it may require additional services for cost evaluation or engineering assistance. In all cases, an implementation approach will be identified for incorporation into your facility action plans.

Building Automation Monitoring & Analytics

McKinstry will utilize your existing building automation systems and implement a data interchange tool which allows the secure automated export of building automation system and metering data to McKinstry on an ongoing basis. Priority will be given for data-streaming and analytics analysis will be deployed where savings opportunity is most likely to be found. McKinstry will deploy system models and predictive analytics routines to provide automated ongoing analysis of building systems operation. The data analytic system will be modeled and programmed to proactively notify both McKinstry and applicable designated client staff when system operation does not match the implementation plan goals and standards. Specific tasks will include:

- Data set up and transfer to McKinstry cloud-based servers
- Necessary point mapping and tagging to specific client mechanical and electrical systems
- Development of engineering analytics that will allow for continuous monitoring of incoming data and identification of potential areas of opportunity
- Interpreting automated alerts and providing root cause analysis with recommendations to client
- Reviewing trends and operational analytics to identify areas of improvement

In addition to the high-level overview of the analytics, McKinstry's Reveal™ dashboard provides the ability

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to dive into individual analytics for a selected time frame and perform analysis of the points involved in that analytic. This provides an additional ability to understand what is causing the faults and begin to develop solutions to address the root cause of the issue. See Performance section below for more details.

Training

McKinstry will collaborate with your building operators and identify team deficiencies or training opportunities. McKinstry will provide training as appropriate to support energy-efficiency efforts within facilities. Training is considered on a case-by-case basis and could include educational lectures, hands-on training, functional testing, BAS training, etc. CCD will ensure availability and support for McKinstry trainings to staff.

Policy and Guidelines

McKinstry can assist in development of an energy policy and operations guideline at the direction of CCD. This policy provides guidelines for facility operation and maintenance, and adherence to it will result in significant energy savings throughout your facilities. This policy is designed to clarify expectations and provide direction for building use and desired occupant behavior. The policy is a written record of your mission, goals, procedures, and standards.

Building Improvements & Implementation of Recommendations

Throughout the implementation of powerED, McKinstry will identify ongoing operational opportunities to decrease energy consumption. The proposed operating criteria, deficiency resolutions, or other operational or maintenance recommendations will be provided to the CCD on an ongoing basis or at the minimum, quarterly. Maintenance repairs, setpoint changes, and alterations to systems will be performed by CCD with coordination and assistance from McKinstry. CCD is responsible for covering all associated costs for materials, equipment, labor, or third-party contractors. **Note that this project has a \$50,000 cost allowance included for implementing identified scope or upgrades (by McKinstry or others) outside of what is already included in the EPC scope.** Opportunities identified by McKinstry will focus on deficiencies (in the realm of standard equipment repair), not capital improvement measures. Systems must be operated per the proposed criteria to ensure energy cost savings are realized. CCD acknowledges their responsibility to ensure that these criteria are maintained, and associated energy savings are realized.

Key CCD Process Module Responsibilities

McKinstry's powerED engineer will facilitate the Process Module tasks and delivery for CCD. To ensure successful program delivery, CCD will support the implementation of this module by:

- Identifying and maintaining a single point of contact on the CCD facilities team to interface with the Process Module
- Reviewing, managing, and discussing recommendations provided by McKinstry on a regular basis

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- Operating systems per the proposed criteria provided by McKinstry
- Implementing recommendations made by McKinstry, as feasible, including funding any equipment, materials, labor, or external contractors required to implement recommendations
- Facilitating communication, training, and collaborative work time for McKinstry with other building staff (custodians, maintenance team, HVAC technician, facilities team, etc.) as needed
- Providing the McKinstry engineer with appropriate building access for site assessments, including after-hours access and remote access to the Building Automation System
- Implementing comprehensive building shutdowns over facility breaks and holidays, utilizing McKinstry guidelines and trainings
- Providing energy savings suggestions and insight into facility energy use
- Providing overall support, enthusiasm, and leadership for the program
- Ensuring ongoing implementation and maintenance of changes implemented
- Providing remote access to the building automation systems while the powerED service is in place
- Sharing building automation and utility data information with McKinstry while the powerED service is in place

PERFORMANCE MODULE

As the adage goes, “You can’t manage what you don’t measure.” Our performance elements are fundamentally based on the ability to analyze, report, and proactively manage utility use and operational performance through McKinstry’s Reveal™ dashboard.

Reveal™ is a cloud-based facility management technology for building performance optimization. Through an online portal that is unique to every client, this technology aggregates data from various building operation sources and provides powerful visualizations for facility managers, operators, and executives to drive critical decisions for performance. Specifically, Reveal™ integrates utility bill, building meter, building automation system, building asset inventory, renewables, and weather data. It tracks facility performance using client-specific fault detection and diagnostics (FDD), KPIs and normalized baseline comparison. The result is a complete view of client facility optimization by facility operators, managers and all levels of an organization to inform operation, management decisions and the ability to effectively communicate strategy and results.

The following section highlights the various Reveal pages that will be deployed as part of the powerED program and the process to acquire and maintain the data displayed. Quarterly or as-requested performance reports and meetings will review highlights and updates by activity and overall program performance as well as the plan for the upcoming quarter.

OVERVIEW

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The Reveal™ Overview section includes a map of facilities with key metrics and summary information that provides a snapshot of overall facility performance to quickly start prioritizing efforts. Overview section features include the following:

- Access is configurable on a per user basis allowing information, end user access, and other details to be same or different for all users
- Fully adjustable time range for analysis - user can select days, weeks, months years or custom range for analysis
- Adjustable by facility type and individual facilities
- Side bar includes highlights by individual facility for easy navigation and display on facility digital boards
- Chart view displays metric selected for facilities selected over time period selected
- A drop-down menu that filters data metrics displayed including:
 - Energy use index (EUI)
 - Energy cost index (ECI)
 - Savings (cost avoidance)
 - ENERGY STAR score
 - Percent savings (electric, gas, water, energy)
 - Carbon reduction
 - Aggregated fault hours by facility
 - Other custom metrics: savings/sq ft, electricity/sq ft, gas/sq ft, kBtu/occupant

UTILITIES

Your utility bill is the starting point for measuring utility use in your facilities and quantifying the effectiveness of your facility and energy management programs. In order to deploy the **Reveal™ Utilities**, McKinstry tracks your utilities through utility bill data collection and bill entry including consumption and associated charges.

The following services will be provided by McKinstry:

1. **Account Set-Up and Data Entry:** McKinstry will create a customized utility tracking process to collect your facility, account, and meter information. McKinstry will also enter historical utility data as needed.
2. **Ongoing Data Collection:** McKinstry will setup a feed of current utility data to update the data as it becomes available. Your organization will provide the appropriate permissions to allow McKinstry to coordinate with your utilities directly thus ensuring minimal effort is required.

Schedule B: Detailed Scope of Work

3. **Bill Data Error Checking:** McKinstry will review all collected bill data and will flag any unusual data points for review with you to ensure that billing errors are identified and notify the utility of any suspected errors.
4. **Interval Data Collection:** If made available through your utilities or separate meters, interval data will be imported and stored in our data base to enable the visualization of more granular time frames down to 15-minute intervals where available.
5. **Data Visualization:** The data will be displayed on **Reveal™ Utilities** and includes the following:
 - Fully adjustable time range for analysis - user can select days, weeks, months years or custom range for analysis
 - Adjustable by facility type and individual facilities
 - Data for any chart can be downloaded directly from the section in .CSV format
 - Cost information by utility type
 - Total monthly cost by utility type
 - Monthly sub-source costs by utility type (i.e. domestic water, irrigation water, sewer, stormwater)
 - Site cost comparisons for given time range
 - Summary of costs by utility type for given time range
 - Consumption by utility units
 - Total monthly consumption by utility type
 - Year-over-year consumption comparison by utility type
 - Site consumption comparison by utility type
 - Interval data for each utility (where data is available)
6. McKinstry will collect and visualize data for the following utilities:

RENEWABLES

Schedule B: Detailed Scope of Work

The **Reveal™ Renewables** section includes solar PV data tracking for all sites. McKinstry will acquire solar data from your utility, through submeters, or directly exported through technology on your systems for direct upload to Reveal™.

Reveal™ Renewables displays the following:

- Average daily solar production of one site or aggregated across multiple sites
- Real-time and historical production based on sites selected over time period selected
- Actual versus predicted production calculated using system capacity, expected performance, and weather
- Breakdown of facility site energy source - grid energy consumption versus renewable energy consumption
- Calculated equivalencies to measure impact of renewable energy production

INSIGHTS

Savings

Savings reporting is a great way to demonstrate and communicate progress on energy and facility management efforts. Utilities savings are tracked through comparison to an adjusted baseline on the **Reveal™ Savings** sub-section. McKinstry will establish a base year including utility usage and costs for a 12-month period. We will review data and validate it for accuracy, and corresponding weather data will be applied. We will work with you to identify significant impacts in utility consumption during the base year for the purpose of calculating adjustments for load changes, including implementation of the other applicable scopes of work, addition of equipment, or changes in occupancy or operating practices.

Information displayed on **Reveal™ Savings** includes:

- Actual values compared to baseline (utilities usage and cost avoidance)
- Savings trend over time for sites and time period selected
- Savings by site comparison

Analytics

Fault Detection & Diagnostics

Schedule B: Detailed Scope of Work

Often, fault detection through a building automation system can be overwhelming and provide little value if the data isn't prioritized based on current building optimization needs. McKinstry will utilize your existing building automation systems and implement a data interchange tool which allows the secure automated export of building automation system and metering data to McKinstry on an ongoing basis. Priority will be given for data-streaming and analytics analysis to be deployed where savings opportunity is most likely to be found. McKinstry will deploy system models and predictive analytics routines to provide automated ongoing analysis of building systems operation. The data analytic system will be modeled and programmed to proactively notify both McKinstry and applicable designated client staff when system operation does not match the implementation plan goals and standards. Specific tasks will include:

1. Data set up and transfer to McKinstry cloud-based servers.
2. Necessary data mapping to specific client mechanical and electrical systems.
3. Development of engineering analytics that will allow for continuous monitoring of incoming data and identification of potential areas of opportunity.

In addition to the high-level overview of the analytics, the dashboard provides the ability to dive into individual analytics for a selected time frame and perform analysis of the points involved in that analytic. This gives the user an additional ability to understand what is causing the faults and begin to develop solutions to address the root cause of the issue.

Analytics results displayed on **Reveal™ Analytics** includes the following:

- Total fault hours (defined as the number of hours a system is in fault) based on the current building, equipment, fault category, and time period selected
- Summary results including sum of fault hours out of total possible
- Fault hours by frequency and type
- Easy to understand on-screen graphic of all faults for tracked systems.

Opportunities

The **Reveal™ Opportunities** section provides the ability to easily view the current status of issues/opportunities for improvement, details associated with each issue, estimated savings, and the root cause. The opportunities

Schedule B: Detailed Scope of Work

section is a great way to review and collaborate on current facility, operations, and energy management opportunities.

Reveal™ Opportunities displays the following information:

- Root cause summary of all opportunities
- Estimated net savings associated with implementing all identified opportunities
- Percent of opportunities implemented
- Issue score calculated from savings impact and feasibility
- Opportunities list that can be filtered and sorted by facility, opportunity type, date created, issue score and priority

KEY PERFORMANCE INDICATORS (KPIs)

The **Reveal™ KPIs** section tracks performance in key areas by comparing actual values to an ideal range or target. KPIs can be developed on any data point and target ranges can be static or based on variables such as outdoor air temperature. **Reveal™ KPIs** allows users to quickly identify which KPIs are performing well and which may need attention across multiple systems and facilities.

Key CCD Performance Module Responsibilities

McKinstry's powerED performance support team will provide measurement and verification of energy savings and cost avoidance. To ensure successful program delivery, CCD will support the implementation of this module by:

- Identifying and maintaining a single point of contact to review performance data and communicate important information to other stakeholders, including the facilities team
- Facilitating the initial utility bill and BAS data-flow set-up and ongoing access
- Setting up additional trends and archiving on points in the BAS necessary for the analytics
- Allowing McKinstry to modify BAS server to export BAS trend data to a secure external FTP site
- Maintaining data feeds and assist with data collection issues where applicable
- Assisting with Reveal™ access to relevant stakeholders/users (up to 15 users)
- Reviewing Performance data and results via Reveal™ on a monthly basis
- Assisting McKinstry in investigating any data anomalies or alerts
- Providing overall support, enthusiasm, and leadership for the program

powerED Guarantee Overview and Accounting

Schedule B: Detailed Scope of Work

McKinstry is guaranteeing savings associated with reduced energy and operational savings opportunities identified through the powerED program.

Measure: "Measure" refers to any savings opportunity identified through the powerED program by McKinstry. A measure could consist of improved operational practices, system alterations, deficiency resolutions, maintenance savings, etc.

Baseline: "Baseline" refers to the existing operating characteristics that were used to calculate cost savings. In general, all parties acknowledge the baseline associated with any specific measure has been derived from the following sources:

1. Actual operating information gathered through field observation, measurement, data loggers, automation system trends, and interviews with CCD personnel.
2. CCD provided information concerning stipulated factors such as operational expenditures.
3. In some instances, a modified baseline may have been developed to address areas whereby pre-retrofit conditions do not reflect a system that is operating per current code or what CCD may deem as normal operation.

Proposed: Throughout the implementation of powerED, McKinstry will identify measures to decrease energy consumption or otherwise reduce operating costs. The proposed operational standards, deficiency resolutions, or other operational or maintenance recommendations will be provided to CCD on an ongoing basis or at the minimum, quarterly. McKinstry will work with CCD to determine building operational changes that will improve the efficiency of the building. Maintenance repairs, setpoint changes, and alterations to systems will be performed by CCD with some coordination and assistance from McKinstry. Systems must be operated per the proposed criteria to ensure energy cost savings are realized. CCD acknowledges their responsibility to ensure that these criteria are maintained, and associated energy savings are realized. Energy Savings Guarantees are further predicated on CCD maintaining their responsibilities as provided in the powerED Scope of Work.

Accounting

All operational, maintenance, and energy costs avoided by CCD from any steps taken by McKinstry in the facilities will be included in the Verified Savings for each year. If, during the powerED implementation period, additional measures are identified and implemented that generate additional energy, maintenance, and operational savings, these savings may be included in the Verified Savings after the Performance Commencement Date.

If McKinstry identifies a measure that reduces operational cost with minimal initial implementation cost or minimal operational impact to CCD, and CCD declines to implement the measure without reasonable cause within (60) days of notification, then the operational cost reduction associated with the measure will be

Schedule B: Detailed Scope of Work

stipulated and added to the Verified Savings on an annual basis. McKinstry acknowledges there may be instances where CCD and McKinstry agree to evaluate a measure and find that it creates unforeseen issues or does not produce the intended results. In such cases and upon mutual agreement between CCD and McKinstry, the measure may be reversed and would not be counted towards Verified Savings.

As an example, McKinstry may identify an opportunity to shut off an RTU supply fan during a break when the space is unoccupied. An example of a "reasonable" cause to decline to implement this measure would be that the classroom served by the RTU is actually utilized during the break for an educational program. An example of an "unreasonable" cause would be CCD declining to change the HVAC schedule to accommodate just the possibility of an occupant using the space at some point over the break.

McKinstry will calculate the savings impact of recommendations made to CCD. All operational, maintenance, water costs, and energy costs avoided by CCD from any steps taken by McKinstry in the facilities will be included in the Verified Savings for each year. For measures with savings estimated equal to or greater than (See Appendix B), actual kW and kWh rates will be used to calculate savings and a measure-specific Measurement and Verification (M&V) plan will be created and executed. For measures with savings estimated at less than (See Appendix B), a blended rate will be used to calculate savings from the baseline to the proposed state using a one-time basic savings calculation (refer to rates listed in Appendix B); no M&V will be performed. Measures that are based primarily on demand savings, regardless of their estimated dollar savings, will use actual kW and kWh rates to calculate savings. Rate escalation will be applied. The threshold has been established to provide the most valuable and cost-effective M&V, with the understanding that a lower threshold adds increased cost for additional M&V activities while not necessarily providing additional value.

CCD understands that the Performance module dashboard will not serve as an M&V tool for guarantee accounting. The Performance module dashboard typically has a different baseline and start date than the M&V analysis and does not account for other savings related to operations and maintenance or demand savings. The dashboard shall be used only to provide a high-level understanding of building performance over time.

Notifications

McKinstry shall notify CCD as soon as possible of any deficiencies found during the course of trend logging and/or site visits. McKinstry shall review new and ongoing recommendations with CCD quarterly.

CCD will notify McKinstry in writing within thirty (30) calendar days of:

- a. Any measures provided to CCD but not implemented, with the CCD justification of cause for declining to implement

Schedule B: Detailed Scope of Work

- b. Any material changes to energy consuming or regulating equipment, operating schedules, business/services conducted, occupancy, or hours of operation
- c. Any malfunctions, failures and related changes in energy consuming or regulating equipment
- d. Any damage to, destruction of, or condemnation of the Work
- e. Executed preventive maintenance and repair records

EPC SCHEDULE C GUARANTEE

ESCO guarantees that the Project shall result in Guaranteed Annual Cost Savings to the City, as indicated, for each year of the Guarantee Period, as presented in the following **Table C1**.

Table C1: Guaranteed Annual Cost Savings based on 2023 Utility Rates

Year	Annual Utility Cost Savings*	Annual O&M Cost Savings***	Annual Solar PV Cost Savings	Annual Solar Performance Incentive Savings	Annual Total Cost Savings
1	\$618,577**	\$0	\$67,846	\$39,684	\$726,107
2	\$726,866	\$0	\$69,127	\$39,486	\$835,479
3	\$746,400	\$0	\$70,432	\$39,288	\$856,120

* Electric (non PV), natural gas, district chilled water, district steam

**note that yr 1 guarantee utility savings are reduced due to Active Energy Management savings coming online over the course of the first performance year (as shown in the cash flow)

*** declined per the request of CCD – savings will accrue to individual CCD Facility teams

EPC SCHEDULE C GUARANTEE

Table C2: Baseline Rates and Annual Escalation Rates:

Provider	Rate	Service	Service Type	Unit	\$/unit
Xcel	Xcel Secondary General (SG)	Electricity Demand	Summer	kW	\$ 23.19
Xcel	Xcel Secondary General (SG)	Electricity Demand	Winter	kW	\$ 18.68
Xcel	Xcel Secondary General (SG)	Electricity	Summer	kWh	\$ 0.03586
Xcel	Xcel Secondary General (SG)	Electricity	Winter	kWh	\$ 0.03803
Xcel	Xcel SPV-TOU Section B	Electricity Demand	Summer	kW	\$ 12.75
Xcel	Xcel SPV-TOU Section B	Electricity Demand	Winter	kW	\$ 10.82
Xcel	Xcel SPV-TOU Section B	Electricity	On Peak kWh	kWh	\$ 0.15411
Xcel	Xcel SPV-TOU Section B	Electricity	Off Peak kWh	kWh	\$ 0.05057
Xcel	Xcel Small Commercial (CSG)	Gas	Summer	therm	\$ 0.40867
Xcel	Xcel Small Commercial (CSG)	Gas	Winter	therm	\$ 0.42006
Xcel	Xcel Large Commercial (CLG)	Gas Capacity	Summer	therm	\$ 0.88662
Xcel	Xcel Large Commercial (CLG)	Gas	Summer	therm	\$ 0.30509
Xcel	Xcel Large Commercial (CLG)	Gas Capacity	Winter	therm	\$ 0.88213
Xcel	Xcel Large Commercial (CLG)	Gas	Winter	therm	\$ 0.31254
Xcel	nTherm Transport Gas Large	Gas	Transport	therm	\$ 0.28797
Xcel	nTherm Transport Gas Small	Gas	Transport	therm	\$ 0.38825
Xcel	Xcel Schedule H Steam Demand	Steam Demand	Demand	Mlb	\$ 84.72
Xcel	Xcel Schedule H Steam Consumption	Steam Consumption	Steam	Mlb	\$ 17.29
Xcel	Xcel CHW Consumption (CMP)*	Chilled Water Consumption	Chilled Water	ton/hr	\$ 0.1421
Xcel	Xcel CHW Contracted Demand (CMP)*	Chilled Water Demand	Chilled Water	ton	\$ 7.0020
Xcel	Xcel CHW Consumption (CCB, LFC, PAB, VDC)*	Chilled Water Consumption	Chilled Water	ton/hr	\$ 0.1423
Xcel	Xcel CHW Contracted Demand (CCB, LFC, PAB, VDC)*	Chilled Water Demand	Chilled Water	ton	\$ 7.0030
Xcel	Xcel CHW Consumption (PMB)*	Chilled Water Consumption	Chilled Water	ton/hr	\$ 0.1440
Xcel	Xcel CHW Contracted Demand (DCL, PMB)*	Chilled Water Demand	Chilled Water	ton	\$ 7.6300
Xcel	Xcel CHW Consumption (DCL)*	Chilled Water Consumption	Chilled Water	ton/hr	\$ 0.12590

Escalation rates utilized for this project are as follows:

- **Electricity** - an electricity annual escalation of 2.4% was used.
- **Natural gas** - a natural gas annual escalation of 4.5% was used.
- **Chilled Water** - a district chilled water annual escalation of 2.4% was used.
- **Steam** - a district steam annual escalation of 4.5% was used.
- **Water & Sewer** - a water and sewer annual escalation rate of n/a was used (no water conservation scope).
- **Maintenance** – a maintenance cost savings escalation rate of n/a was used (no savings claimed).
- **Solar PV annual O&M service cost** - an annual PV O&M escalation rate of 2.0 % was used.
- **Solar PV annual power output degradation** - an annual PV system power output degradation rate of 0.5% was used.

EPC SCHEDULE C GUARANTEE

Table C3: Utility Rates by Buildings:

Utility Rate Schedule Summary														
Facility	Team	Baseline Electric Rate Schedules		Proposed Electric Rate Schedules (for Solar PV scope) *		Gas Rate Schedules				Steam Rate Schedule		CHW Rate Schedule		
		Xcel Secondary General (SG) Demand Rate	Xcel Secondary General (SG) Electricity Rate	Xcel SPV-TOU Section B Demand Rate	Xcel SPV-TOU Section B Electricity Rate	Xcel Small Commercial (CSG) Gate Rate	Xcel Large Commercial (CLG) Gas Rate	nTherm Transport Gas Large Rate	nTherm Transport Gas Small Rate	Xcel Schedule H Steam Demand Rate	Xcel Schedule H Steam Consumption Rate	Xcel CHW Consumption Rate	Xcel CHW Contracted Demand Rate	
The Commons on Champa	CMP	E	x	x	-	-	x	-	-	-	x	x	x	x
City and County Building	CCB	A	x	x	-	-	-	-	-	-	x	x	x	x
CPC - Fleet Maint - Bldg 5	FM5	CPC	x	x	x	x	-	-	x	-	-	-	-	-
CPC - Gary Price Ops - Bldg 2	GPO	CPC	x	x	-	-	-	-	-	x	-	-	-	-
Denver Crime Lab	DCL	D	x	x	-	-	-	-	-	-	x	x	x	x
Denver Municipal Animal Shelter	DAS	A	x	x	-	-	-	x	-	-	-	-	-	-
Fire Station #2	FS2	FS	x	x	x	x	x	-	-	-	-	-	-	-
Fire Station #21	FS21	FS	x	x	-	-	x	-	-	-	-	-	-	-
Fire Station #22	FS22	FS	x	x	-	-	x	-	-	-	-	-	-	-
Fire Station #24	FS24	FS	x	x	-	-	x	-	-	-	-	-	-	-
Fire Station #26	FS26	FS	x	x	-	-	x	-	-	-	-	-	-	-
Lindsey-Flanigan Courthouse	LFC	D	x	x	-	-	-	-	-	-	x	x	x	x
Police Admin Building	PAB	A	x	x	-	-	-	-	-	-	x	x	x	x
Police Traffic Operations Bureau	PTO	C	x	x	x	x	-	-	-	x	-	-	-	-
Permit Building	PMB	E	x	x	-	-	-	-	-	-	x	x	x	x
Police Academy	POA	C	x	x	x	x	x	-	-	-	-	-	-	-
Police District #2	PD2	C	x	x	x	x	x	-	-	-	-	-	-	-
Police District #3	PD3	B	x	x	x	x	x	-	-	-	-	-	-	-
Rose Amond Center	RAC	D	x	x	-	-	x	-	-	-	-	-	-	-
S. Cherry Creek Transfer Station	CTS	C	x	x	-	-	x	-	-	-	-	-	-	-
S. Osage Fleet Maint - Garage	OFM	B	x	x	-	-	x	-	-	-	-	-	-	-
Van Cise-Simonet Detention Ctr	VDC	D	x	x	-	-	x	-	-	-	x	x	x	x

EPC SCHEDULE C GUARANTEE

Table C4: Proposed Unit Savings and Guaranteed Annual Cost Savings for Project (Year 2021 Utility Rates) by ECM

ECM Name and Reference Number	Facility	ECM Description	Electricity [kWh]	Electricity [kW]	Gas [Therms]	Steam [Mlbs]	Purchased Chilled Water [MMBTU]	Electricity [\$]	Electric Demand [\$]	Xcel REC Payments [\$]	Gas [\$]	Steam [\$]	Purchased Chilled Water [\$]	Annual Savings [\$]
22.01 - CCD Controls Optimization/RCx (FIRST YR VALUES)	CCD All	Controls optimization, utility dashboard and tracking, on-going RCx	1,366,231	0	16,279	1,134	1,279	\$50,387	\$0	\$0	\$4,910	\$18,839	\$15,167	\$89,302
22.01 - CCD Controls Optimization/RCx (2 nd + YR VALUES)	CCD All	Controls optimization, utility dashboard and tracking, on-going RCx	2,732,462	0	32,557	2,267	2,558	\$100,773	\$0	\$0	\$9,819	\$37,678	\$30,334	\$178,604
CCD Controls Optimization/RCx	CCD All		2,732,462	0	32,557	2,267	2,558	\$100,773	\$0	\$0	\$9,819	\$37,678	\$30,334	\$89,302/\$178,604
01.06-CCB Steam Condensate Heat Recovery	City and County Building	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	-3,032	0	0	323.1	0	(\$115)	\$0	\$0	\$0	\$5,370	\$0	\$5,255
01.06-PAB Steam Condensate Heat Recovery	Police Administration Building PAB	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	-3,032	0	0	310.5	0	(\$115)	\$0	\$0	\$0	\$5,161	\$0	\$5,045
02.01-CCB Chilled Water Pump Replacement	City and County Building	Replace existing chilled water pumps and VFDs. This will save electrical energy and reduce maintenance requirements.	43,014	60	0	0	0	\$1,604	\$1,216	\$0	\$0	\$0	\$0	\$2,820
03.07-PAB MZU to VAV Unit	Police Administration Building PAB	Convert existing multizone unit (MZU) to a variable air volume (VAV) unit to allow for better temperature control and energy savings.	16,548	23	0	401	498	\$617	\$466	\$0	\$0	\$6,665	\$5,905	\$13,653
04.01-CCB BAS Controls Upgrade/ Replacement	City and County Building	Upgrade outdated Siemens APOGEE controls to a BACnet compatible system and install new BACnet compatible controls on remaining standalone air handling units. Integrate new controls with the existing Building Automation System.	290,003	0	0	156.6	1,739	\$10,982	\$0	\$0	\$0	\$2,603	\$20,619	\$34,204
04.01-PAB BAS Controls Upgrade/ Replacement	Police Administration Building PAB	Upgrade the existing standalone pneumatic controls and convert to electronic signals through the addition of E-P transducers. Integrate new E-P controls with the existing BAS.	267,399	223.2	0	192.6	956	\$10,005	\$4,169	\$0	\$0	\$3,201	\$11,334	\$28,710
04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	Install occupancy temperature sensors and interlock with fan coil unit control to setback temperatures during unoccupied periods.	3,332	0	0	470.7	66	\$125	\$0	\$0	\$0	\$7,823	\$779	\$8,727
09.01-CCB Interior LED Lighting Upgrades	City and County Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	372,059	1,161	0	-57.12	123	\$13,880	\$23,439	\$0	\$0	(\$949)	\$1,464	\$37,834
09.01-PAB Interior LED Lighting Upgrades	Police Administration Building PAB	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	392,225	741.86	0	-60.18	130	\$14,633	\$14,972	\$0	\$0	(\$1,000)	\$1,546	\$30,150
09.02-CCB Exterior LED Lighting Upgrades*	City and County Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.02-PAB Exterior LED Lighting Upgrades	Police Administration Building PAB	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	80,068	105.84	0	0	0	\$3,045	\$1,977	\$0	\$0	\$0	\$0	\$5,022

EPC SCHEDULE C GUARANTEE

ECM Name and Reference Number	Facility	ECM Description	Electricity [kWh]	Electricity	Gas	Steam	Purchased Chilled Water	Electricity [\$]	Electric Demand	Xcel REC Payments	Gas	Steam	Purchased Chilled Water	Annual Savings [\$]
20.01-CCB Rate Analysis	City and County Building	Investigate the district chilled water utility agreements and negotiate better rates.	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$3,362	\$3,362
20.01-PAB Rate Analysis	Police Administration Building PAB	Investigate the district chilled water utility agreements and negotiate better rates.	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$2,941	\$2,941
Team A Total	City and County Building, Police Administration Building PAB		1,458,584	2,315	0	1,737	3,512	\$54,661	\$46,238	\$0	\$0	\$28,872	\$47,951	\$177,722
03.13-PD3 Upgrade Air Cooled Chiller	Police District #3	Replace air cooled chiller with a high efficiency air cooled chiller, this will replace ASHRAE end of life equipment	25,568	141	0	0	0	\$2,296	\$1,711	\$0	\$0	\$0	\$0	\$4,007
08.05-PD3 Add VFDs to Building Pumps	Police District #3	Add variable frequency drives (VFDs) with motor replacements to pumps.	349	0	0	0	0	\$28	\$0	\$0	\$0	\$0	\$0	\$28
09.01-DAS Interior LED Lighting Upgrades	Denver Municipal Animal Shelter	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	37,427	139	-106	0	0	\$1,393	\$2,807	\$0	(\$32)	\$0	\$0	\$4,168
09.01-OFM Interior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	55,534	80	-179	0	0	\$2,072	\$1,620	\$0	(\$78)	\$0	\$0	\$3,615
09.01-PD3 Interior LED Lighting Upgrades	Police District #3	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	88,617	180	-271	0	0	\$5,804	\$2,066	\$0	(\$118)	\$0	\$0	\$7,753
09.02-DAS Exterior LED Lighting Upgrades	Denver Municipal Animal Shelter	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	2,292	0	0	0	0	\$87	\$0	\$0	\$0	\$0	\$0	\$87
09.02-OFM Exterior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	14,959	0	0	0	0	\$569	\$0	\$0	\$0	\$0	\$0	\$569
09.02-PD3 Exterior LED Lighting Upgrades*	Police District #3	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
10.01-PD3 Solar Photovoltaic- Roof	Police District #3	Surface parking lot canopy solar system	249,338	0	0	0	0	\$12,305	\$0	\$9,350	\$0	\$0	\$0	\$21,655
Team B Total	Denver Municipal Animal Shelter, South Osage Fleet Maintenance Garage, Police District #3		474,083	541	-556	0	0	\$24,555	\$8,205	\$9,350	(\$228)	\$0	\$0	\$41,882
03.04-POA VVT to VAV Unit Replacement	Denver Police Academy	Current roof top unit is VVT, refurbish existing VVT damper controls to allow better occupant control and comfort. Add zone-based occupancy sensor control.	4,683	45	332	0	0	\$479	\$539	\$0	\$144	\$0	\$0	\$1,163
03.13-PD1 Upgrade Air Cooled Chiller	Police District 1	Replace roof top air cooled chiller with a new chiller that has a better turndown. Existing chiller on roof is reaching end of life and should be replaced soon	37,205	189	0	0	0	\$1,345	\$4,027	\$0	\$0	\$0	\$0	\$5,372
04.01-POA BAS Controls Upgrade/ Replacement	Denver Police Academy	Upgrade/ replace existing BAS controls on HVAC systems. Upgrade to modern controls and best-in-class control sequence	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
04.02-PTO Occupancy Based HVAC Control	Police Traffic Operations Bureau	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	7,967	0	549.9	0	0	\$489	\$0	\$0	\$213	\$0	\$0	\$702
08.05-PD1 Add VFDs to Building Pumps	Police District 1	Add variable frequency drives (VFDs) with motor replacements to pumps.	923	0	0	0	0	\$33	\$0	\$0	\$0	\$0	\$0	\$33
09.01-CTS Interior LED Lighting Upgrades	South Cherry Creek Transfer Station	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	47,813	100.94	-154.02	0	0	\$1,784	\$2,036	\$0	(\$67)	\$0	\$0	\$3,753
09.01-PD2 Interior LED Lighting Upgrades	Police District 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	81,013	162.68	-257.04	0	0	\$5,306	\$1,864	\$0	(\$112)	\$0	\$0	\$7,059
09.01-POA Interior LED Lighting Upgrades	Denver Police Academy	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	69,422	117.6	-218.28	0	0	\$4,904	\$1,348	\$0	(\$95)	\$0	\$0	\$6,157
09.01-PPS Interior LED Lighting Upgrades**	Police Property Storage	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

EPC SCHEDULE C GUARANTEE

ECM Name and Reference Number	Facility	ECM Description	Electricity [kWh]	Electricity	Gas	Steam	Purchased Chilled Water	Electricity [\$]	Electric Demand	Xcel REC Payments	Gas	Steam	Purchased Chilled Water	Annual Savings [\$]
09.01-PRC Interior LED Lighting Upgrades**	Parks and Rec Center	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.01-PTF Interior LED Lighting Upgrades**	Police Training Facility/ Shooting Range	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.01-PTO Interior LED Lighting Upgrades**	Police Traffic Operations Bureau	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	137,149	258.72	-526.32	0	0	\$9,145	\$2,966	\$0	(\$204)	\$0	\$0	\$11,906
09.02-CTS Exterior LED Lighting Upgrades	South Cherry Creek Transfer Station	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	8,402	0	0	0	0	\$320	\$0	\$0	\$0	\$0	\$0	\$320
09.02-PD2 Exterior LED Lighting Upgrades	Police District 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	25,415	0	0	0	0	\$1,285	\$0	\$0	\$0	\$0	\$0	\$1,285
09.02-POA Exterior LED Lighting Upgrades	Denver Police Academy	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	9,508	0	0	0	0	\$481	\$0	\$0	\$0	\$0	\$0	\$481
09.02-PPS Exterior LED Lighting Upgrades**	Police Property Storage	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.02-PRC Exterior LED Lighting Upgrades**	Parks and Rec Center	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.02-PTF Exterior LED Lighting Upgrades**	Police Training Facility/ Shooting Range	Replace existing non-LED lamps/fixtures with new LED Lamps/fixtures	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
09.02-PTO Exterior LED Lighting Upgrades**	Police Traffic Operations Bureau	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	37,322	0	0	0	0	\$1,887	\$0	\$0	\$0	\$0	\$0	\$1,887
10.02 - POA Solar Photovoltaic - Canopy	Denver Police Academy	Surface parking lot canopy solar system	161,131	0	0	0	0	\$13,191	\$0	\$6,042	\$0	\$0	\$0	\$19,233
10.01-PTO Solar Photovoltaic- Roof	Police Traffic Operations Bureau	Roof mounted solar PV system	136,799	0	0	0	0	\$8,892	\$0	\$5,130	\$0	\$0	\$0	\$14,022
10.02-PD2 Solar Photovoltaic - Canopy	Police District 2	Surface parking lot canopy solar PV system	282,910	0	0	0	0	\$15,378	\$0	\$10,609	\$0	\$0	\$0	\$25,987
13.01-PTO Air Sealing and Weather Stripping	Police Traffic Operations Bureau	Add weather stripping and spray foam to better seal building envelope, reduce infiltration and improve occupant comfort	2,606	0	1,329	0	0	\$153	\$0	\$0	\$516	\$0	\$0	\$669
13.02-PTO Ceiling and Wall Insulation	Police Traffic Operations Bureau	Add insulation to ceiling and walls, reduce leakage and improve on temperature control	2,163	0	5,120	0	0	\$127	\$0	\$0	\$1,988	\$0	\$0	\$2,115
Team C Total	Police District 1, South Cherry Creek Transfer Station, Police Property Storage, Parks and Rec Center, Police Training Facility/ Shooting Range, Denver Police Academy , Police District 2, Police Traffic Operations Bureau		1,052,431	874	6,175	0	0	\$65,199	\$12,780	\$21,782	\$2,384	\$0	\$0	\$102,145
09.01-FM5 Interior LED Lighting Upgrades	Fleet Maintenance Building #5	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	47,456	71	-136	0	0	\$2,952	\$809	\$0	(\$39)	\$0	\$0	\$3,722
09.01-GPO Interior LED Lighting Upgrades	Gary Price Operations Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	54,346	121	-155	0	0	\$2,027	\$2,433	\$0	(\$60)	\$0	\$0	\$4,400
09.02-FM5 Exterior LED Lighting Upgrades	Fleet Maintenance Building #5	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	45,491	0	0	0	0	\$2,300	\$0	\$0	\$0	\$0	\$0	\$2,300
09.02-GPO Exterior LED Lighting Upgrades	Gary Price Operations Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	31,506	0	0	0	0	\$1,198	\$0	\$0	\$0	\$0	\$0	\$1,198
10.02-FM5 Solar Photovoltaic - Canopy	Fleet Maintenance Building #5	Flush mount system on existing structural canopy	94,701	0	0	0	0	\$9,044	\$0	\$3,551	\$0	\$0	\$0	\$12,595
Team CPC Total	Gary Price Operations Building, Fleet Maintenance Building #5		273,499	191	-291	0	0	\$17,522	\$3,242	\$3,551	(\$99)	\$0	\$0	\$24,215

EPC SCHEDULE C GUARANTEE

ECM Name and Reference Number	Facility	ECM Description	Electricity [kWh]	Electricity	Gas	Steam	Purchased Chilled Water	Electricity [\$]	Electric Demand	Xcel REC Payments	Gas	Steam	Purchased Chilled Water	Annual Savings [\$]
01.06-DCL Steam Condensate Heat Recovery	Denver Crime Lab	Recover heat from steam condensate and repurpose in heat exchanger to preheat domestic hot water tank. This will help offset steam consumption and reduce the amount of domestic water being used to temper the condensate before it is discharged.	-2,021	0	0	298	0	(\$77)	\$0	\$0	\$0	\$4,951	\$0	\$4,874
02.12-RAC Chiller Replacement	Rose Aodom Center	Replace roof top air cooled chiller with a new chiller that has a better turndown.	37,709	254	0	0	0	\$1,375	\$5,281	\$0	\$0	\$0	\$0	\$6,657
04.07-RAC Ventilation Control	Rose Aodom Center	Reconnect the energy recovery ventilator (ERV) enthalpy wheels to their associated VFDs and re-enable heat recovery.	-5,651	33.3	5,809	0	0	(\$227)	\$910	\$0	\$2,527	\$0	\$0	\$3,210
09.01-DCL Interior LED Lighting Upgrades	Denver Crime Lab	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	184,488	387.1	0	-29	62	\$6,883	\$7,814	\$0	\$0	(\$475)	\$648	\$14,870
09.01-LFC Interior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	575,531	1,914	0	-89	191	\$21,471	\$38,630	\$0	\$0	(\$1,475)	\$2,266	\$60,892
09.01-RAC Interior LED Lighting Upgrades	Rose Aodom Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	31,575	145.04	-84.66	0	0	\$1,175	\$2,926	\$0	(\$37)	\$0	\$0	\$4,064
09.01-VDC Interior LED Lighting Upgrades	Van Cise-Simonet Detention Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	958,277	1,674	0	-148	319	\$35,750	\$33,782	\$0	\$0	(\$2,458)	\$3,777	\$70,851
09.02-DCL Exterior LED Lighting Upgrades	Denver Crime Lab	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	8,525	0	0	0	0	\$324	\$0	\$0	\$0	\$0	\$0	\$324
09.02-LFC Exterior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	50,494	10.78	0	0	0	\$1,920	\$201	\$0	\$0	\$0	\$0	\$2,122
09.02-RAC Exterior LED Lighting Upgrades	Rose Aodom Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	13,876	5.88	0	0	0	\$528	\$110	\$0	\$0	\$0	\$0	\$638
09.02-VDC Exterior LED Lighting Upgrades	Van Cise-Simonet Detention Center	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	9,988	0	0	0	0	\$380	\$0	\$0	\$0	\$0	\$0	\$380
13.01-RAC Air Sealing and Weather Stripping	Rose Aodom Center	Seal crack and gaps in wall and exterior doors	-990	3	1,584	0	0	(\$38)	\$79	\$0	\$689	\$0	\$0	\$730
20.01-LFC Rate Analysis	Lindsay-Flanigan Courthouse	Investigate the district chilled water utility agreements and negotiate better rates.	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$17,645	\$17,645
Team D Total	Rose Aodom Center, Denver Crime Lab, Lindsay-Flanigan Courthouse, Van Cise-Simonet Detention Center		1,861,801	4,427	7,308	33	571	\$69,465	\$89,734	\$0	\$3,179	\$543	\$24,336	\$187,259
04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	18,473	0	0	126	82.8	\$667	\$0	\$0	\$0	\$2,094	\$980	\$3,742
04.02-PMB Occupancy Based HVAC Controls	Permit Building	Where new lighting occupancy sensors are installed, interlock with HVAC system serving that area to setback during unoccupied periods	5,377	0	0	128.7	61.2	\$204	\$0	\$0	\$0	\$2,139	\$734	\$3,078
09.01-CMP Interior LED Lighting Upgrades	The Commons on Champa	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	137,731	270	0	-35.7	164.64	\$5,138	\$5,441	\$0	\$0	(\$593)	\$1,950	\$11,935
09.01-PMB Interior LED Lighting Upgrades	Permit Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	113,001	475	0	-29.58	254.8	\$4,216	\$9,595	\$0	\$0	(\$492)	\$3,058	\$16,376
09.02-CMP Exterior LED Lighting Upgrades	The Commons on Champa	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	7,889	0	0	0	0	\$300	\$0	\$0	\$0	\$0	\$0	\$300
09.02-PMB Exterior LED Lighting Upgrades	Permit Building	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	9,387	0	0	0	0	\$357	\$0	\$0	\$0	\$0	\$0	\$357
13.04-CMP Replace Single Pane Windows	The Commons on Champa	Replace single pane windows with high performance double pane windows with vinyl/ fiberglass frames	17,986	-6	0	100	25	\$680	(\$130)	\$0	\$0	\$1,662	\$296	\$2,508
20.01-CMP Rate Analysis	The Commons on Champa	Investigate the district chilled water utility agreements and negotiate better rates.	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$1,385	\$1,385

EPC SCHEDULE C GUARANTEE

ECM Name and Reference Number	Facility	ECM Description	Electricity [kWh]	Electricity	Gas	Steam	Purchased Chilled Water	Electricity [\$]	Electric Demand	Xcel REC Payments	Gas	Steam	Purchased Chilled Water	Annual Savings [\$]
20.01-PMB Rate Analysis	Permit Building	Investigate the district chilled water utility agreements and negotiate better rates.	0	0	0	0	0	\$0	\$0	\$0	\$0	\$0	\$1,374	\$1,374
Team E Total	The Commons on Champa, Permit Building		309,844	739	0	289	588	\$11,562	\$14,905	\$0	\$0	\$4,810	\$9,778	\$41,055
01.01-FS21 Boiler Replacement	Fire Station #21	Replace end of life boiler with high efficiency boiler capable of staging/modulating to efficiently heat the building during the winter months.	0	0	461	0	0	\$0	\$0	\$0	\$201	\$0	\$0	\$201
01.02-FS24 Boiler Replacement	Fire Station #24	Replace end of life boiler with high efficiency boiler capable of staging/modulating to efficiently heat the building during the winter months.	0	0	415	0	0	\$0	\$0	\$0	\$181	\$0	\$0	\$181
09.01-FS2 Interior LED Lighting Upgrades	Fire Station 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	37,720	83	-115	0	0	\$2,471	\$954	\$0	(\$50)	\$0	\$0	\$3,375
09.01-FS21 Interior LED Lighting Upgrades	Fire Station #21	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	13,415	18	-41	0	0	\$500	\$356	\$0	(\$18)	\$0	\$0	\$838
09.01-FS22 Interior LED Lighting Upgrades	Fire Station #22	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	30,416	53	-94	0	0	\$1,133	\$1,068	\$0	(\$41)	\$0	\$0	\$2,160
09.01-FS24 Interior LED Lighting Upgrades	Fire Station #24	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	16,661	33	-51	0	0	\$620	\$671	\$0	(\$22)	\$0	\$0	\$1,269
09.01-FS26 Interior LED Lighting Upgrades	Fire Station #26	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	31,235	73	-95	0	0	\$1,163	\$1,465	\$0	(\$41)	\$0	\$0	\$2,587
09.02-FS2 Exterior LED Lighting Upgrades	Fire Station 2	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	6,310	0	0	0	0	\$319	\$0	\$0	\$0	\$0	\$0	\$319
09.02-FS21 Exterior LED Lighting Upgrades	Fire Station #21	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	411.6	0	0	0	0	\$16	\$0	\$0	\$0	\$0	\$0	\$16
09.02-FS22 Exterior LED Lighting Upgrades	Fire Station #22	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	510.58	0	0	0	0	\$19	\$0	\$0	\$0	\$0	\$0	\$19
09.02-FS24 Exterior LED Lighting Upgrades	Fire Station #24	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	10,130	0	0	0	0	\$385	\$0	\$0	\$0	\$0	\$0	\$385
09.02-FS26 Exterior LED Lighting Upgrades	Fire Station #26	Replace existing non-LED lamps/ fixtures with new LED lamps/ fixtures	19,393	0	0	0	0	\$738	\$0	\$0	\$0	\$0	\$0	\$738
10.01-FS2 Solar Photovoltaic - Roof	Fire Station 2	Roof mounted solar PV systems	133,360	0	0	0	0	\$9,036	\$0	\$5,001	\$0	\$0	\$0	\$14,037
Team Fire Total	Fire Station #21, Fire Station #22, Fire Station #24, Fire Station #26, Fire Station 2		299,563	260	480	0	0	\$16,399	\$4,515	\$5,001	\$209	\$0	\$0	\$26,125
Total - For All Measures 1st yr. (2021 Utility Rate basis)**			7,096,037	9,346	29,395	3,192	5,951	\$309,749	\$179,618	\$39,684	\$10,354	\$53,064	\$97,231	\$689,700
1st Yr 2023 Utility Rate Basis (Matches yr1 of proforma)***			7,096,037	9,346	29,395	3,192	5,951	\$324,259	\$188,031	\$39,684	\$11,759	\$59,682	\$102,691	\$726,107

* The City & County Building and Police District #3 exterior lights are all LED already, so they were excluded from the lighting upgrade.

** No utility escalators applied.

*** With 2 years of escalators applied.

EPC Schedule D: Measurement and Verification Plan

Measurement and Verification Plan

“M&V Services” means Services or activities relating to the measurement and verification by the ESCO of the efficiency and effectiveness of the Project, pursuant to this EPC Contract and the CEO Measurement and Verification Policy as applied.

This schedule shall use the following documents as a standard for presentation and reporting purposes.

EPC M&V Policy: Should the City wish to extend M&V services beyond the Guarantee Period per the M&V Term definition, the future additional annual costs to the City are presented in the table below. If the extended M&V costs beyond the Guarantee Period are not included in the Maximum Contract Price, they will be funded separately by the City.

Year	Guaranteed Annual Cost Savings (2023 Utility Rates)	Annual Cost for M&V Services (Total)	M&V Cost Percent of Guaranteed Annual Savings
1	\$726,107	\$72,600	10.0%
2	\$835,479	\$41,837	5.0%
3	\$856,120	\$42,835	5.0%

1. INTRODUCTION TO M&V CONCEPTS

M&V is the process of quantifying the energy and cost savings resulting from improvements in energy-consuming systems. The effort required and rigor achieved should be commensurate with the project capital investment and savings risk. Energy and cost reductions are compared to a historical baseline. Savings are determined by comparing the energy use before and after the installation of ECMs.

The “before” case is called the baseline. The “after” case is referred to as the post-installation or performance period.

$$\text{Energy Savings} = \text{Baseline Model Energy Use} - \text{Performance Period Energy Use}$$

2. IPMVP M&V OPTIONS

The International Performance Measurement and Verification Protocol (IPMVP) is a guidance document that provides a conceptual framework for measuring, computing, and reporting savings achieved by energy or water efficiency projects at facilities. It defines key terms and outlines issues that must be considered in developing an M&V plan. Developed through a collaborative effort involving industry, government, financial, and other organizations, the IPMVP serves as the framework for M&V procedures. It provides four M&V options: Options A, B, C, and D. These categories are divided into two general types: retrofit isolation and whole facility. Retrofit isolation methods consider only the affected equipment or system independent of the rest of the facility. Whole facility methods consider the total energy use and de-emphasize specific equipment performance.

EPC Schedule D: Measurement and Verification Plan

M&V Option	Description	Considerations
Option A	Retrofit Isolation with KEY Parameter Measurement	<ul style="list-style-type: none"> • Focus on performance of individual energy saving measure • Short term measurements on one or two KEY parameters • Intent is validation of savings calculations
Option B	Retrofit Isolation with ALL Parameter Measurement OR Sub-metering of energy use	<ul style="list-style-type: none"> • Focus on performance of individual energy saving measure • Measure ALL key parameters to calculate annual energy use OR • Directly sub-meter and measure energy use of an individual system
Option C	Whole Facility / Utility Meter Comparison	<ul style="list-style-type: none"> • Focus on metered utility use associated with the whole facility • Extensive tracking of ALL factors pre & post impacting facility energy use • Calculations to adjust baseline for owner directed load, operational or equipment changes • Not appropriate for small utility savings (<20%)
Option D	Whole Facility Calibrated Simulation	<ul style="list-style-type: none"> • Focus on metered utility uses of the whole facility • Savings based on a detailed, calibrated, whole building energy model • Proposed savings highly dependent on energy model, inputs, calibration • Mostly appropriate for new buildings or major retrofits
Stipulated	Calculated Savings	<ul style="list-style-type: none"> • Measures having high certainty of savings • M&V cost would be a high percentage of savings • Savings is mostly contingent on owner's use or operation

Reference:

*M&V Guidelines: Measurement and Verification for Federal Energy Projects Version 4.0
Prepared for the U.S. Department of Energy Federal Energy Management Program*

EPC Schedule D: Measurement and Verification Plan

OPTION A

Option A is a retrofit isolation approach designed for projects in which the potential to generate savings must be verified, but the actual savings can be determined from short-term data collection & measurement, engineering calculations, and stipulated factors. The approach is intended for retrofits where key performance factors (e.g. end-use capacity, demand, power) or operational factors (lighting operational hours, cooling ton-hours) can be spot or short term measured during the baseline and post installation periods. Any factor not measured is estimated based on assumptions, analysis of historical data, or manufacturer data. Post installation energy use, equipment performance and usage are generally not measured throughout the term of the contract.

The intent of Option A is to verify performance through pre- and post-retrofit measurements. Usage factors can be measured or stipulated based upon engineering estimates, operating schedules, operator logs, typical weather data, or other documented information sources. More extensive measurements are generally only made once post-retrofit. Thereafter, inspections and short term measurements are conducted to verify that the 'potential to perform' exists. As long as the 'potential to perform' is verified, the savings are as originally claimed and should not vary over the contract term.

Option A methods are appropriate for less complex measures for which performance and operational characteristics are well understood and are unlikely to change. An Option A approach can also be suitable when the value of the measure's cost savings is low. Examples of projects where Option A may be appropriate include one-for-one lighting replacement measures, high efficiency motors with constant loads, or measures with a small percentage of overall cost savings.

OPTION B

Option B is a retrofit isolation or system-level approach similar to Option A but involves the measurement of all relevant parameters. Measurements of performance and operational factors provide long-term persistence data on the energy use of the equipment or system. Measurements may be short-term, periodic, or continuous.

This method is intended for retrofits with performance factors and operational factors that can be measured at the component or system level. Short-term periodic measurements can be used when variations in the measured factor are small, and may be sufficient to characterize the baseline. Continuous monitoring information can be used to improve or optimize the operation of the equipment over time, thereby improving the performance of the retrofit. This approach provides the greatest accuracy in the calculation of savings.

The intent of Option B is to verify performance periodically or continuously with long-term measurements.

3. GENERAL APPROACH TO M&V

All guaranteed savings calculations and assumptions for this project were reviewed and agreed to by City staff and/ or a third party expert reviewer during the Investment Grade Audit. At that time, McKinstry had provided all calculations and supporting information including all trend data used to develop the basis of these calculations. The general approach to verifying savings is to ensure that the proposed changes to Key Performance Indicators (KPIs), the levers which drive savings, have been implemented or to update these calculations based on as-measured data during the annual M&V process. McKinstry will take a tiered approach to M&V execution. **Tier I** will be used for those measures for which a utility bill calibrated full building energy simulation was developed. **Tier II** will be used for savings derived by modelling individual systems.

The level of effort for each tier is informed by balancing the confidence in the persistence of savings and the cost effectiveness of activities.

EPC Schedule D: Measurement and Verification Plan

	Tier I	Tier II
Definition	Annual Verification	One-time Measurement and Annual Verification
Intent	Verify that changes to KPIs persist to demonstrate that proposed savings are achieved. In the event that KPIs deviate from those prescribed, the energy model can be updated with performance period operation to reflect actual performance period savings.	Evaluate performance by measuring KPIs pre and post retrofit. Update models with measured values to reflect actual performance period savings.
Post-Install Activities	Record the final constructed and commissioned conditions of KPIs, as observed via the BAS and Functional Performance Testing (FPT); update models as necessary.	Measure KPIs pre and post retrofit. Review as-built documentation for KPIs of all installed systems and update savings according to as-built/commissioned conditions.
Post-Acceptance Activities	Review trends of KPIs to ensure that savings persist; update models as necessary.	City staff will be interviewed to verify operation, such that savings persist.
Frequency and Duration	While data will be collected continuously from the BAS, actual review of trends for M&V purposes will take place once during the performance period. KPIs will be trended for a minimum of four weeks to sufficiently demonstrate consistent operation.	One time pre/post measurements during the Post-Install Process. One time, on-site inspection during Performance Year One, only. For subsequent years, City staff will be interviewed to confirm functionality.
Sampling Plan	KPIs will be observed at a directed sample of units, in a directed sample of facilities, selected to represent a substantive proportion of the total ECM savings. A sample to include the largest units at the facilities with the greater apportionment of ECM savings will be selected to demonstrate that ECM savings are achieved. Additional samples will be collected should an unsatisfactory variation be found in the original sample	KPIs will be measured on a sample of the most common population types. For less common population types, KPIs measurements will be based on a table of manufacturers' data. The measured population types will represent more than 75% of ECM savings. For each population, the number of samples measured will be sufficient to achieve 20% precision at an 80% confidence; the assumed coefficient of variation (C_v) is 0.5. Additional samples will be collected if the C_v of the original sample exceeds 0.5.

EPC Schedule D: Measurement and Verification Plan

4. KPI MATRIX

ECM Name	Facilities	M&V Option	Key Performance Indicators	Baseline Values	Proposed Values	M&V Approach
01.02-FS24 Boiler Replacement	Fire Station #21	N/A	Boiler efficiency	0.77	0.85	stipulated
01.01-FS21 Boiler Replacement	Fire Station #24	N/A	Boiler efficiency	0.77	0.91	stipulated
01.06-CCB Steam Condensate Heat Recovery	City and County Building	Stipulated	Condensate heat recovery addition	Condensate drains to sewage	Condensate is recovered through heat exchanger	Stipulated
01.06-DCL Steam Condensate Heat Recovery	Denver Crime Lab	Stipulated	Condensate heat recovery addition	Condensate drains to sewage	Condensate is recovered through heat exchanger	Stipulated
01.06-PAB Steam Condensate Heat Recovery	Police Administration Building PAB	Stipulated	Condensate heat recovery addition	Condensate drains to sewage	Condensate is recovered through heat exchanger	Stipulated
02.01-CCB Chilled Water Pump Replacement	City and County Building	N/A	Pump efficiency	0.83	0.84	stipulated
		N/A	Motor efficiency	0.85	0.95	stipulated
02.12-RAC Chiller Replacement	Rose Andom Center	N/A	chiller efficiency	9.0 EER	15.6 EER	stipulated
03.01-PD3 Split System Addition	Police District #3	stipulated	Split system installation	No split system	split system installed	stipulated
03.04-POA VVT to VAV Unit Replacement	Denver Police Academy	N/A	Damper Control	fixed position	based on occ sensor	Stipulated
		N/A	RTU 1 only: SAT reset	No Reset	SAT resets at 75F	
03.07-PAB MZU to VAV Unit	Police Administration Building PAB	Stipulated	Hot deck/Cold deck control	Hot deck and cold deck linked, constant volume of supply air	Hot deck and cold deck operate independently, variable volume of supply air	Stipulated
		Stipulated	VFD	Constant speed	Fan speed modulates	
03.13 All Upgrade Air Cooled Chiller	Police District 1, #3	Stipulated	Tons of Cooling	140	130	Stipulated
		Stipulated	EER	10.2 BTU/Watt	16.3 BTU/Watt	
04.01-CCB BAS Controls Upgrade/ Replacement	City and County Building	A	Economizing	Economize when OAT is between 68F-60F	Economize when OAT is between 70F-50F	Tier I
		A	unoccupied setback hours	6 hours/night on weekdays	9 hours/night on weekdays	
04.01-PAB BAS Controls Upgrade/ Replacement	Police Administration Building PAB	A	Economizing	AHU economizing not operating	Economize when OAT is between 70F-50F	Tier I
		A	AHU fan speed control	AHU minimum fan speed = 80%	AHU minimum fan speed = 60%	
04.01-POA BAS Controls Upgrade/ Replacement	Denver Police Academy	stipulated	Air supply	Constant volume	Variable volume	Stipulated

EPC Schedule D: Measurement and Verification Plan

ECM Name	Facilities	M&V Option	Key Performance Indicators	Baseline Values	Proposed Values	M&V Approach
04.02-PTO Occupancy Based HVAC Control	Police Traffic Operations Bureau	A	Unoccupied Temperature Setpoint	Occ Cool: 75F, Occ Heat: 72F Unocc Cool: 80F Unocc Heat: 70	Occ Cool: 75F Unocc Cool 80F Occ Heat 72F Unocc Heat 70 F Unocc Cool setback: 77F Unocc Heat setback: 68F	Tier I
04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	A	Unoccupied Temperature Setpoint	Occ/Unocc Cool: 74F Occ/Unocc Heat: 72F	Occ Cool: 74F Occ Heat: 72F Unocc Cool: 78F Unocc Cool Setback: 76F Unocc Heat: 68F Unocc Heat Setback: 70F	Tier I
04.02-PMB Occupancy Based HVAC Controls	Permit Building	A	Unoccupied Temperature Setpoint	Occ Heat: 72F Occ Cool: 74F Unocc Cool: 80F Unocc Heat: 65F	Occ Cool: 74F Unocc Cool: 80F Occ Heat: 72F Unocc Heat: 65F Unocc Cool setback: 76F Unocc Heat setback: 70F	Tier I
04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	A	Unoccupied Temperature Setpoint	Occ Cool: 73F, Occ Heat: 69F Unocc Cool: 80F Unocc Heat: 60F	Occ Cool: 73F, Occ Heat: 69F Unocc Cool 80F Unocc Heat 60F Unocc Cool setback: 75F Unocc Heat setback: 67F	Tier I
04.07-RAC Ventilation Control	Rose Andom Center	A	RAC: ERV energy recovery wheel heat recovery	disabled	enabled	Tier II
		A	RAC: ERV fan speed control	Constant speed	Fan speed modulates	
08.05 All Add VFDS to Building Pumps	Stipulated	Stipulate	VFD installation	Constant speed	Variable speed	Stipulated
08.05-PD1 Add VFDs to Building Pumps	Police District 1	Stipulated	VFD installation	Constant speed	Variable speed	Stipulated
08.05-PD3 Add VFDs to Building Pumps	Police District #3	Stipulated	VFD installation	Constant speed	Variable speed	Stipulated

EPC Schedule D: Measurement and Verification Plan

ECM Name	Facilities	M&V Option	Key Performance Indicators	Baseline Values	Proposed Values	M&V Approach
09.01-All Interior LED Lighting Upgrades	All in scope	A	Wattage	Refer to Audit	Refer to Audit	Tier II
		N/A	Burn hours	Refer to Audit	Refer to Audit	Stipulated
		N/A	Quantity	Refer to Audit	Refer to Audit	Stipulated
09.02-All Exterior LED Lighting Upgrades	All in scope	A	Wattage	Refer to Audit	Refer to Audit	Tier II
		N/A	Burn hours	Refer to Audit	Refer to Audit	Stipulated
		N/A	Quantity	Refer to Audit	Refer to Audit	Stipulated
10.01-FS2 Solar Photovoltaic - Roof	Fire Station 2	B	Weather adjusted kWh production	0 kWh	133,360 kWh	N/A
10.01-POA Solar Photovoltaic-Canopy	Denver Police Academy	B	Weather adjusted kWh production	0 kWh	161,131 kWh	N/A
10.01-PD3 Solar Photovoltaic-Roof	Police District #3	B	Weather adjusted kWh production	0 kWh	249,338 kWh	N/A
10.01-PTF Solar Photovoltaic-Roof	Police Traffic Operations Bureau	B	Weather adjusted kWh production	0 kWh	136,799 kWh	N/A
10.02-FM5 Solar Photovoltaic - Canopy	Fleet Maintenance Building #5	B	Weather adjusted kWh production	0 kWh	94,701 kWh	N/A
10.02-PD2 Solar Photovoltaic - Canopy	Police District 2	B	Weather adjusted kWh production	0 kWh	282,910 kWh	N/A
13.01-PTO Air Sealing and Weather Stripping	Police Traffic Operations Bureau	Stipulated	Door parameter leakage sealed	0 ft	140 ft around doors sealed	Stipulated
		Stipulated	Roof/wall connection leakage sealed	0 ft	475 ft around roof/wall connection sealed	
13.01-RAC Air Sealing and Weather Stripping	Rose Andom Center	Stipulated	Doors' leakage sealed	0	27 exterior & interior doors	Stipulated
		Stipulated	Wall leakage sealed	0	Side wall of 2nd floor storage room sealed	
13.02-PTO Ceiling and Wall Insulation	Police Traffic Operations Bureau	Stipulated	Wall insulation R-Value	1.96 exposed concrete block	21.11 insulated wall	Stipulated
13.04-CMP Replace Single Pane Windows	The Commons on Champa	Stipulated	Window U-value	Single pane, 0.535	Double pane, 0.38	Stipulated
		Stipulated	SHGC	Single pane, 0.59	Double pane, 0.45	

EPC Schedule D: Measurement and Verification Plan

ECM Name	Facilities	M&V Option	Key Performance Indicators	Baseline Values	Proposed Values	M&V Approach
20.01-CCB Rate Analysis	City and County Building	A	CHW monthly demand reservation fee	400 tons/month contracted	360 tons/month contracted	Tier II
20.01-CMP Rate Analysis	The Commons on Champa	A	CHW monthly demand reservation fee	165 tons/month contracted	149 tons/month contracted	Tier II
20.01-LFC & VDC Rate Analysis	Lindsay-Flanigan Courthouse & Van Cise-Simonet Detention Center	A	CHW monthly demand reservation fee	2100 tons/month contracted (shared between Courthouse and Detention Center)	1890 tons/month contracted	Tier II
20.01-PAB Rate Analysis	Police Administration Building PAB	A	CHW monthly demand reservation fee	350 tons/month contracted	315 tons/month contracted	Tier II
20.01-PMB Rate Analysis	Permit Building	A	CHW monthly demand reservation fee	150 tons/month contracted	135 tons/month contracted	Tier II
22.01 Controls Optimization/RCx	CCD all	TBD	Operational changes	To be determined as measures are identified	To be determined as measures are identified	TBD

EPC Schedule D: Measurement and Verification Plan

5. powerED SUPPLEMENT

During construction and throughout the performance periods, the energy, water, and cost savings impact of each specific measure identified as an element of the powerED program will be documented. Savings potential will be quantified via industry accepted calculation methodology.

SAVINGS THRESHOLD

Measures that are implemented with an annual savings potential less than **\$17,000** will be verified via one-time pre- and post-measurements of the identified KPIs. In coordination with the City, an M&V plan with a fully documented baseline, sufficient modelling, and periodic measurement of KPIs will be created and executed for implemented measures with a savings potential greater than **\$17,000**.

The **\$17,000** threshold has been established to provide the most valuable and cost effective M&V, with the understanding that a lower threshold adds increased cost for additional M&V activities while not necessarily providing additional value. Generally, measures with well understood savings and lower savings potential should require a one-time measurement of KPIs, while those with greater savings merit more detailed M&V efforts.

UTILITY RATES FOR POWERED SAVINGS

Natural gas, propane, water, and sewer savings will be calculated using the contractual utility rates for each facility. For measures with savings estimated below the threshold, a blended rate of **\$0.11/kWh** will be used to quantify electricity and demand savings. For measures with savings equal to or above the threshold, the contractual electricity and demand rates will be applied.

Measure Savings	Electricity (kWh)	Natural Gas (Therms)	Steam (Mb)	Chilled Water (Ton/hr)
Below threshold	\$0.11	\$0.35	\$17.29	0.14
Equal to or above threshold	See section 2.1 Baseline Energy Use in IGA			

All applicable utility rates will be escalated by the agreed upon escalation rates starting in Year 2.

6. SAMPLING PLAN

LIGHTING

Lighting follows 80/20 sampling plan where measurements are taken at a 20% precision level with 80% confidence level. The baseline and proposed wattage readings are based on total project savings percentage, combining for the top 75% of the savings contribution load. The following table shows the pre-construction and post-construction fixtures and their respective kW readings. The sample size is based on the fixture's population size.

EPC Schedule D: Measurement and Verification Plan

Pre Construction Fixture Type	Existing kW	Sample Size	Post Construction Fixture Type	Proposed kW	Sample Size
F T8 F32-32W-48" NLO- 2L	446.34	11	RET-2xLEDT4FT-DW	145.84	11
F T8 F32-28W-48" NLO- 2L	127.78	11	RET/1x100LEDSI/Mogul Base Bypass (PAR)_DET_CTR	13.80	11
F T8 F32-32W-48" NLO- 3L	134.39	11	RET-1X20_LEDT4FT_T5	15.72	10
F T8 F32-32W-48" NLO- 4L	88.82	11	IN/1x150LEDF_SB	7.50	10
F T8 F32-32W-48" NLO- 1L	121.38	11	Lamp/1x25LEDSI/A21	2.25	11
F T5 45.8" 54W- 1L	57.54	11	RET-2xLEDT4FT_T5-DRIVER	7.62	11
MH Mogul 150W- 1L	36.86	11	LAMP-1x9LEDSI-A19	4.17	11
MH Mogul 250W- 1L	32.75	11	RET-2XLEDT8FT-DW	6.50	11
MH Mogul 175W- 1L	25.80	11	LAMP/1x15LEDPLV_Omni	4.48	11
MH Mogul 400W- 1L	26.56	10			
F T5 45.8" 54W- 2L	42.01	11			
CFL SI MED 32W- 1L	21.92	11			
F T8 F32-32W-48" RLO- 4L	23.36	11			

7. CITY O&M REPORTING RESPONSIBILITIES

Refer to Article 21 of the Agreement – Material Changes

8. SCHEDULE OF VERIFICATION REPORTING ACTIVITIES

Item	Submission Timeline	Customer Review and Acceptance Period
Post-Installation Report	60 to 90 days after Completion	30 days
Annual Report	60 to 90 days after conclusion of performance period	30 days

9. CALIBRATION SUPPLEMENT

The analysis of some KPIs will require data collected using the existing BAS systems. The calibration maintenance of measuring and metering devices that are elements of these systems are the responsibility of the City. McKinstry will provide details of equipment make, model, and calibration for all other devices used as an element of the M&V process.

10. REFERENCES

Item	Location

EPC Schedule D: Measurement and Verification Plan

ECM Scope and Description	IGA Appendix D/ EPC Schedule B
ECM Proposed Annual Savings	IGA Report Section 3/ EPC Schedule G
Schedule of Values	EPC Schedule F
Customer Maintenance Responsibilities	EPC Schedule S

EPC Schedule D: Measurement and Verification Plan

11. M&V REPORT CONTENT & FORMAT

(I) EXECUTIVE SUMMARY

- 1) Project Summary
- 2) Summary Of Guaranteed And Verified Utility Cost Savings
- 3) Comparison Of Guaranteed And Verified Savings By ECM By Utility Type
- 4) Summary Of Observations, Issues, And Recommendations
- 5) Brief ECM Descriptions
- 6) M&V Approach

(II) DETAILED M&V SECTIONS – BY INDIVIDUAL ECM

- 1) Brief ECM Descriptions
- 2) M&V Activities Overview
 - A) M&V Plan Overview
 - B) Summary Of Sampling Plan
 - C) Table Of KPI Measurements
- 2) Observations, Issues, and Recommendations
- 3) Verified Savings Calculation And Methodology
 - A) Calculation And Methodology Summary
 - B) Guarantee Factor Details
 - C) Summary Of Guaranteed And Verified Savings For Performance Year

(II) APPENDICES

- 1) Supporting Documentation
 - A) Testing Data, Trend Charts, And Analysis
 - B) Bas Screen Captures
 - C) Site Visit Photos
- 2) Utility Rates

EPC Schedule D: Measurement and Verification Plan

12. RISK, RESPONSIBILITY AND PERFORMANCE MATRIX

RESPONSIBILITY/DESCRIPTION	CONTRACTOR PROPOSED APPROACH
1. Financial	
<p>M&V confidence: The City assumes the responsibility to determine the confidence that it desires to have in the M&V program and energy savings determinations. The desired confidence will be reflected in the resources required for the M&V program, and the ESCO must consider the requirement prior to submittal of the final proposal. Clarify how project savings are being verified (e.g., equipment performance, operational factors, energy use) and the impact on M&V costs.</p>	<p>McKinstry's approach to the application of M&V will be to verify the performance of the installed ECMs. The M&V Plan details the steps taken in the verification process. The approach to M&V on each ECM is matched with the level of savings and the implementation complexity of the ECM. As applicable, equipment performance is measured and operational factors are tracked through the BAS data for buildings that are applicable.</p>
<p>Energy Related Cost Savings: The City and the contractor may agree that the project will include savings from <i>recurring</i> and/or <i>one-time</i> costs. This may include one-time savings from avoided expenditures for projects that were appropriated but will no longer be necessary. Including one-time cost savings before the money has been appropriated may involve some risk to the Institution. Recurring savings generally result from reduced O&M expenses or reduced water consumption. These O&M and water savings must be based on actual spending reductions. Clarify sources of non-energy cost savings and how they will be verified.</p>	<p>No one-time cost avoidances are included in the project financials. Non-energy cost savings include a 10% reduction in the monthly contracted chilled water capacity at facilities subscribed to district chilled water. O&M expense savings have not been included in the project per the request of the City.</p>
<p>Delays: Both the contractor and the City can cause delays. Failure to implement a viable project in a timely manner costs the Institution in the form of lost savings, and can add cost to the project (e.g., construction interest, re-mobilization). Clarify schedule and how delays will be handled.</p>	<p>McKinstry has mitigated this risk by providing ample schedule contingency within the construction schedule. This risk is further mitigated by not taking construction-period savings into account in the pro forma. Construction-period savings will be a reality and will provide a buffer for any potential schedule extensions.</p>
<p>Major changes in facility: The City controls major changes in facility use, including closure. Clarify responsibilities in the event of a premature facility closure, loss of funding, or other major change.</p>	<p>In the case of facility closure, loss of funding, or other major changes, McKinstry and the City will have open discussions of ECM reduction, modification, or removal. In the event of major changes in facility use, the energy savings will be calculated based on the baseline and proposed conditions as contained in M&V Plan.</p>

EPC Schedule D: Measurement and Verification Plan

RESPONSIBILITY/DESCRIPTION	CONTRACTOR PROPOSED APPROACH															
<p>2. Operational</p> <p>Operating hours: The City generally has control over operating hours. Increases and decreases in operating hours can show up as increases or decreases in “savings” depending on the M&V method (e.g., operating hours multiplied by improved efficiency of equipment vs. whole-building/utility bill analysis). Clarify whether operating hours are to be measured or stipulated and what the impact will be if they change. If the operating hours are stipulated, the baseline should be carefully documented and agreed to by both parties.</p>	<p>Detailed operating hour baselines have been developed; the values were presented to the City in the IGA to identify the acceptable values to be used in the savings calculations.</p> <p>Savings will be verified at the originally proposed hours regardless of future changes. If operating hours do change, McKinstry may recalculate savings at its discretion to demonstrate the impact of the change.</p> <p>The application of the operating hours varies by type of measures proposed, magnitude of savings, and potential for impact on the overall savings. Operating hours are applied as follows:</p> <table border="1"> <thead> <tr> <th>Measure Category</th> <th>Baseline</th> <th>Post-Install</th> </tr> </thead> <tbody> <tr> <td>Lighting</td> <td>Measured kW, stipulated hours</td> <td>Measured</td> </tr> <tr> <td>Schedule Changes</td> <td>On-site observations, staff interviews</td> <td>Measured</td> </tr> <tr> <td>Equipment Replacement</td> <td>On-site observations, Utility Data</td> <td>Agreed Upon</td> </tr> <tr> <td>General Facility Operating Hours</td> <td>Staff Interviews, Published Schedules</td> <td>Agreed Upon</td> </tr> </tbody> </table> <p>If equipment loads do change, McKinstry may recalculate savings at its discretion to demonstrate the impact of the change.</p>	Measure Category	Baseline	Post-Install	Lighting	Measured kW, stipulated hours	Measured	Schedule Changes	On-site observations, staff interviews	Measured	Equipment Replacement	On-site observations, Utility Data	Agreed Upon	General Facility Operating Hours	Staff Interviews, Published Schedules	Agreed Upon
Measure Category	Baseline	Post-Install														
Lighting	Measured kW, stipulated hours	Measured														
Schedule Changes	On-site observations, staff interviews	Measured														
Equipment Replacement	On-site observations, Utility Data	Agreed Upon														
General Facility Operating Hours	Staff Interviews, Published Schedules	Agreed Upon														
<p>Load: Equipment loads can change over time. The City generally has control over hours of operation, conditioned floor area, intensity of use (e.g., changes in occupancy or level of automation). Changes in load can show up as increases or decreases in “savings” depending on the M&V method. Clarify whether equipment loads are to be measured or stipulated and what the impact will be if they change. If the equipment loads are stipulated, the baseline should be carefully documented and agreed to by both parties.</p>	<p>All savings calculations assume that the equipment loads are constant for the duration of the project's performance period. The City assumes all risk and responsibility to manage the equipment loads at or below the baseline conditions documented in individual savings calculations. If actual equipment loads, as defined in the M&V plan, are higher than baseline values, all savings will be capped at the baseline load conditions. If equipment load is lower than baseline, all savings will be capped at baseline load conditions, as the facility now has the potential to increase the loads to the baseline values without impact on the actual savings.</p>															
<p>Weather: A number of energy efficiency measures are affected by weather. Neither the contractor nor the Institution has control over the weather. Should the Institution agree to accept risk for weather fluctuations, it shall be contingent upon aggregate payments not exceeding aggregate savings. Clearly specify how weather corrections will be performed.</p>	<p>Savings calculations for ECM 04.0X HVAC Controls are based on Typical Meteorological Year (TMY) weather files for the weather station closest to the site or the local airport. All post-install calculations will continue to use the TMY weather files as applicable. Interactive heating and cooling effects for ECM 09.01-Lighting Upgrades and ECM 09.02 are based on published ASHRAE “Fraction of Annual Lighting Heat to Cooling and Heating” values. McKinstry will not perform a facility level weather regression of the utility bills.</p> <p>Solar M&V and Weather Normalization</p> <p>The production of solar arrays is highly dependent upon the available solar irradiance and other weather factors of which neither McKinstry nor the City has control. Savings calculations for ECM 10.XX are based on Typical Meteorological Year (TMY) weather files that are the best statistical fit for a specific project site. The guaranteed solar production in kWh/kW and the associated dollar savings represent the estimated performance from a TMY based energy production model with a guarantee factor applied. Utilizing project site integrated data acquisition systems that include weather station components, McKinstry will monitor the relevant weather parameters in order to normalize the verified solar production for <u>estimated</u> generation, adjusting for other non-routine procedures as necessary; i.e. system down time events caused by non-weather-related issues. The verified savings for a performance period will be reported as the actual solar production adjusted to reflect the typical weather conditions for the year. Neither McKinstry nor the City shall be penalized or credited for weather conditions that deviate from the estimated TMY conditions that result in excess or insufficient availability of solar irradiance, weather parameters, or other non-weather-related issues.</p>															

EPC Schedule D: Measurement and Verification Plan

<p>User participation: Many facility improvement measures require user participation to generate savings (e.g., control settings). The savings can be variable and the contractor may be unwilling to invest in these measures. Clarify what degree of user participation is needed and utilize monitoring and training to mitigate risk. If performance is stipulated, document and review assumptions carefully and consider M&V to confirm the capacity to save (e.g., confirm that the controls are functioning properly).</p>	<p>City maintenance of proper time schedules, set-points, and programming of controls is required. For ECMs proposed, routine maintenance requirements for any new systems will be identified and documented. To ensure the City understands the risk, McKinstry will provide training, videotaping, and operating guides. McKinstry may review operating logs on a periodic basis during the performance period. City maintenance of trends, trend export, and access to automation systems is required for execution of the M&V Plan.</p>
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3. Performance	
<p>Equipment performance: The contractor has control over the selection of equipment and is responsible for its proper installation, commissioning, and performance. The contractor has responsibility to demonstrate that the new improvements meet expected performance levels including specified equipment capacity, standards of service, and efficiency. Clarify who is responsible for initial and long-term performance, how it will be verified, and what will be done if performance does not meet expectations.</p>	<p>McKinstry will select major equipment that will have life expectancy that meets or exceeds the contract term, is based on the requirements of the City, facility needs, and provides enhancement of the operation and savings of the ECMs. McKinstry will perform periodic checks to ensure that performance does not degrade impacting savings, and verify routine preventive maintenance (PM) is performed by the City in accordance with industry and OEM specifications and per subsection C below. If in a case of equipment non-performance, McKinstry may contact the OEM for required repairs to return equipment to OEM performance standards or replace to remedy performance deficiencies. McKinstry will secure long-term warranties from equipment manufacturers if warranted, and will also ensure these warranties are transferrable to the City at project acceptance.</p>
<p>Operations: Performance of the day-to-day operations activities is negotiable and can impact performance. However, the contractor bears the ultimate risk regardless of which party performs the activity. Clarify which party will perform equipment operations, the implications of equipment control, how changes in operating procedures will be handled, and how proper operations will be assured.</p>	<p>McKinstry has assumed the City will maintain operation of all ECMs. McKinstry will be responsible for equipment performance regardless of who performs the O&M tasks. McKinstry will provide operating and PM guidelines and initial training to ensure that the systems are operated and maintained per OEM required guidelines that will ensure savings are retained.</p>
<p>Preventive Maintenance: Performance of day-to-day maintenance activities is negotiable and can impact performance. However, the contractor bears the ultimate risk regardless of which party performs the activity. Clarify how long-term preventive maintenance will be assured, especially if the party responsible for long-term performance is not responsible for maintenance (e.g., contractor provides maintenance checklist and reporting frequency). Clarify who is responsible for performing long-term preventive maintenance to maintain operational performance throughout the contract term. Clarify what will be done if inadequate preventive maintenance impacts performance.</p>	<p>McKinstry will provide all necessary training on the maintenance requirements of the equipment for operation by the City. Should the maintenance requirements be inadequate, McKinstry will notify the City immediately and will work with the City to determine the best approach to ensure proper maintenance practices are adhered to in accordance with prescribed practices by McKinstry and/or OEM specifications.</p>
<p>Equipment Repair and Replacement: Performance of day-to-day repair and replacement of contractor-installed equipment is negotiable; however, it is often tied to project performance. The contractor bears the ultimate risk regardless of which party performs the activity. Clarify who is responsible for performing replacement of failed components or equipment replacement throughout the term of the contract. Specifically address potential impacts on performance due to equipment failure. Specify expected equipment life and warranties for all installed equipment. Discuss replacement responsibility when equipment life is shorter than the term of the contract.</p>	<p>Refer to Maintenance & Warranty Coordination Matrix in Schedule W.</p>

EPC SCHEDULE E CODE COMPLIANCE REQUIREMENTS

Code Compliance Requirement

It is the intent of this schedule to initially determine the requirements for code review, construction permits, and the cost for said items with the building official and the code authority. An EPC project might include replacement of existing systems; it is not within the ESCO's or Principal Representative's authority to waive any code compliance or local permit requirements. The code official should be contacted after the list of recommended measures is developed to confirm the requirements and the potential cost of code work. While the code review agents are expected to conduct their work with due diligence, this in no way relieves the ESCO and any contractors from their obligations to design and construct the project in conformance with the adopted codes nor is it intended to transfer any duties, obligations, or liabilities of the design and construction teams to the code review agents.

Below is an example of a table to indicate code compliance requirements and cost. The total cost is indicated on EPC Schedule F.

FIM Name	Facility	Code required (Y/N)	Documentation review cost (\$)	Field inspection/permit cost (\$)
01.01-FS21 Boiler Replacement	Fire Station #21	Y	\$3,404	Included in subcontractors costs
01.02-FS24 Boiler Replacement	Fire Station #24	Y	\$2,539	Included in subcontractors costs
01.06-CCB Steam Condensate Heat Recovery	City and County Building	Y	\$1,909	Included in subcontractors costs
01.06-DCL Steam Condensate Heat Recovery	Denver Crime Lab	Y	\$1,900	Included in subcontractors costs
01.06-PAB Steam Condensate Heat Recovery	Police Administration Building PAB	Y	\$1,657	Included in subcontractors costs
02.01-CCB Chilled Water Pump Replacement	City and County Building	Y	\$2,513	Included in subcontractors costs
02.12-RAC Chiller Replacement	Rose Andom Center	Y	\$5,556	Included in subcontractors costs
03.04-POA VVT to VAV Unit Replacement	Denver Police Academy	Y	\$3,647	Included in subcontractors costs
03.07-PAB MZU to VAV Unit	Police Administration Building PAB	Y	\$1,757	Included in subcontractors costs
03.13-PD1 Upgrade Air Cooled Chiller	Police District 1	Y	\$5,670	Included in subcontractors costs
03.13-PD3 Upgrade Air Cooled Chiller	Police District #3	Y	\$5,121	Included in subcontractors costs
04.01-CCB BAS Controls Upgrade/ Replacement	City and County Building	N	N/A	N/A
04.01-PAB BAS Controls Upgrade/ Replacement	Police Administration Building PAB	N	N/A	N/A
04.01-POA BAS Controls Upgrade/ Replacement	Denver Police Academy	N	N/A	N/A
04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	N	N/A	N/A

FIM Name	Facility	Code required (Y/N)	Documentation review cost (\$)	Field inspection/permit cost (\$)
04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	N	N/A	N/A
04.02-PMB Occupancy Based HVAC Controls	Permit Building	N	N/A	N/A
04.02-PTO Occupancy Based HVAC Control	Police Traffic Operations Bureau	N	N/A	N/A
04.07-RAC Ventilation Control	Rose Andom Center	Y	\$1,298	Included in subcontractors costs
08.05-PD1 Add VFDs to Building Pumps	Police District 1	Y	\$1,774	Included in subcontractors costs
08.05-PD3 Add VFDs to Building Pumps	Police District #3	Y	\$1,573	Included in subcontractors costs
09.01-CCB Interior LED Lighting Upgrades	City and County Building	N	N/A	N/A
09.01-CMP Interior LED Lighting Upgrades	The Commons on Champa	N	N/A	N/A
09.01-CTS Interior LED Lighting Upgrades	South Cherry Creek Transfer Station	N	N/A	N/A
09.01-DAS Interior LED Lighting Upgrades	Denver Municipal Animal Shelter	N	N/A	N/A
09.01-DCL Interior LED Lighting Upgrades	Denver Crime Lab	N	N/A	N/A
09.01-FM5 Interior LED Lighting Upgrades	Fleet Maintenance Building #5	N	N/A	N/A
09.01-FS2 Interior LED Lighting Upgrades	Fire Station 2	N	N/A	N/A
09.01-FS21 Interior LED Lighting Upgrades	Fire Station #21	N	N/A	N/A
09.01-FS22 Interior LED Lighting Upgrades	Fire Station #22	N	N/A	N/A
09.01-FS24 Interior LED Lighting Upgrades	Fire Station #24	N	N/A	N/A
09.01-FS26 Interior LED Lighting Upgrades	Fire Station #26	N	N/A	N/A
09.01-GPO Interior LED Lighting Upgrades	Gary Price Operations Building	N	N/A	N/A
09.01-LFC Interior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	N	N/A	N/A
09.01-OFM Interior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	N	N/A	N/A
09.01-PAB Interior LED Lighting Upgrades	Police Administration Building PAB	N	N/A	N/A
09.01-PD2 Interior LED Lighting Upgrades	Police District 2	N	N/A	N/A
09.01-PD3 Interior LED Lighting Upgrades	Police District #3	N	N/A	N/A
09.01-PMB Interior LED Lighting Upgrades	Permit Building	N	N/A	N/A
09.01-POA Interior LED Lighting Upgrades	Denver Police Academy	N	N/A	N/A
09.01-PPS Interior LED Lighting Upgrades	Police Property Storage	N	N/A	N/A
09.01-PRC Interior LED Lighting Upgrades	Parks and Rec Center	N	N/A	N/A
09.01-PTF Interior LED Lighting Upgrades	Police Training Facility/ Shooting Range	N	N/A	N/A

FIM Name	Facility	Code required (Y/N)	Documentation review cost (\$)	Field inspection/permit cost (\$)
09.01-PTO Interior LED Lighting Upgrades	Police Traffic Operations Bureau	N	N/A	N/A
09.01-RAC Interior LED Lighting Upgrades	Rose Andom Center	N	N/A	N/A
09.01-VDC Interior LED Lighting Upgrades	Van Cise-Simonet Detention Center	N	N/A	N/A
09.02-CCB Exterior LED Lighting Upgrades	City and County Building	N	N/A	N/A
09.02-CMP Exterior LED Lighting Upgrades	The Commons on Champa	N	N/A	N/A
09.02-CTS Exterior LED Lighting Upgrades	South Cherry Creek Transfer Station	N	N/A	N/A
09.02-DAS Exterior LED Lighting Upgrades	Denver Municipal Animal Shelter	N	N/A	N/A
09.02-DCL Exterior LED Lighting Upgrades	Denver Crime Lab	N	N/A	N/A
09.02-FM5 Exterior LED Lighting Upgrades	Fleet Maintenance Building #5	N	N/A	N/A
09.02-FS2 Exterior LED Lighting Upgrades	Fire Station 2	N	N/A	N/A
09.02-FS21 Exterior LED Lighting Upgrades	Fire Station #21	N	N/A	N/A
09.02-FS22 Exterior LED Lighting Upgrades	Fire Station #22	N	N/A	N/A
09.02-FS24 Exterior LED Lighting Upgrades	Fire Station #24	N	N/A	N/A
09.02-FS26 Exterior LED Lighting Upgrades	Fire Station #26	N	N/A	N/A
09.02-GPO Exterior LED Lighting Upgrades	Gary Price Operations Building	N	N/A	N/A
09.02-LFC Exterior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	N	N/A	N/A
09.02-OFM Exterior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	N	N/A	N/A
09.02-PAB Exterior LED Lighting Upgrades	Police Administration Building PAB	N	N/A	N/A
09.02-PD2 Exterior LED Lighting Upgrades	Police District 2	N	N/A	N/A
09.02-PD3 Exterior LED Lighting Upgrades	Police District #3	N	N/A	N/A
09.02-PMB Exterior LED Lighting Upgrades	Permit Building	N	N/A	N/A
09.02-POA Exterior LED Lighting Upgrades	Denver Police Academy	N	N/A	N/A
09.02-PPS Exterior LED Lighting Upgrades	Police Property Storage	N	N/A	N/A
09.02-PRC Exterior LED Lighting Upgrades	Parks and Rec Center	N	N/A	N/A
09.02-PTF Exterior LED Lighting Upgrades	Police Training Facility/ Shooting Range	N	N/A	N/A
09.02-PTO Exterior LED Lighting Upgrades	Police Traffic Operations Bureau	N	N/A	N/A
09.02-RAC Exterior LED Lighting Upgrades	Rose Andom Center	N	N/A	N/A
09.02-VDC Exterior LED Lighting Upgrades	Van Cise-Simonet Detention Center	N	N/A	N/A
10.01-FS2 Solar Photovoltaic - Roof	Fire Station 2	Y	\$50	Included in subcontractors costs

FIM Name	Facility	Code required (Y/N)	Documentation review cost (\$)	Field inspection/permit cost (\$)
10.01-PD3 Solar Photovoltaic- Roof	Police District #3	Y	\$50	Included in subcontractors costs
10.01-PTO Solar Photovoltaic- Roof	Police Traffic Operations Bureau	Y	\$50	Included in subcontractors costs
10.02 - POA Solar Photovoltaic - Canopy*	Denver Police Academy	Y	\$50	Included in subcontractors costs
10.02-FM5 Solar Photovoltaic - Canopy*	Fleet Maintenance Building #5	Y	\$50	Included in subcontractors costs
10.02-PD2 Solar Photovoltaic - Canopy*	Police District 2	Y	\$50	Included in subcontractors costs
13.01-PTO Air Sealing and Weather Stripping	Police Traffic Operations Bureau	N	N/A	N/A
13.01-RAC Air Sealing and Weather Stripping	Rose Andom Center	N	N/A	N/A
13.02-PTO Ceiling and Wall Insulation	Police Traffic Operations Bureau	N	N/A	N/A
13.04-CMP Replace Single Pane Windows	The Commons on Champa	Y	\$3,807	Included in subcontractors costs
20.01-CCB Rate Analysis	City and County Building	N	N/A	N/A
20.01-CMP Rate Analysis	The Commons on Champa	N	N/A	N/A
20.01-LFC Rate Analysis	Lindsay-Flanigan Courthouse	N	N/A	N/A
20.01-PAB Rate Analysis	Police Administration Building PAB	N	N/A	N/A
20.01-PMB Rate Analysis	Permit Building	N	N/A	N/A
22.01 - CCD Controls Optimization/RCx	CCD All	N	N/A	N/A
Total - For All Measures*			\$44,425	N/A

EPC Schedule F: Schedule of Values

APPLICATION AND CERTIFICATION FOR PAYMENT

AIA DOCUMENT G702

PAGE 1 OF 5 PAGES

TO OWNER: CITY AND COUNTY OF DENVER

APPLICATION NO: 0

Distribution to:

PERIOD FROM: 01/00/00

OWNER

PERIOD TO: 01/00/00

ARCHITECT

CITY AND COUNTY OF DENVER PROJECT #:

Financed Scope

CONTRACTOR

FROM CONTRACTOR:

McKINSTRY PROJECT #:

MCKINSTRY ESSENTION, LLC

5005 3RD AVE S

SEATTLE, WA 98134

CONTRACT DATE:

INVOICE NO:

DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract Continuation Sheet, AIA Document G703, is attached.

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

1. ORIGINAL CONTRACT SUM	\$	<u>13,834,597.00</u>
2. Net change by Change Orders	\$	<u>0.00</u>
3. CONTRACT SUM TO DATE (Line 1 + 2)	\$	<u>13,834,597.00</u>
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$	<u>0.00</u>
5. RETAINAGE:		
a. <u>5</u> of Completed Work (Column D + E on G703)	\$	<u>0.00</u>
b. <u>5</u> % of Stored Material (Column F on G703)		<u>0.00</u>
Total Retainage (Lines 5a + 5b or Total in Column I of G703)	\$	<u>0.00</u>
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$	<u>0.00</u>
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$	<u>0.00</u>
8. CURRENT PAYMENT DUE	\$	<u>0.00</u>
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$	<u>13,834,597.00</u>

CONTRACTOR:

By: _____ Date: _____

State of: Washington County of: King
 Subscribed and sworn to before me this _____ day of _____
 Notary Public:
 My Commission expires:

OWNERS'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Owner certifies to the best of the Owners's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED

AMOUNT CERTIFIED \$ 0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

OWNER:

By: _____ Date: _____

This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES by Change Order	\$0.00	

Users may obtain validation of this document by requesting a completed AIA Document D401 - Certification of Document's Authenticity from the Licensee.

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 1

AIA DOCUMENT G703

PAGE 2 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO:
APPLICATION DATE:

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: PERIOD TO:

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO:

CITY AND COUNTY OF DENVER PROJECT NO: Financed Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G ÷ C)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)		
City and County Building											
1	01.06-CCB Steam Condensate Heat Recovery	\$148,377		\$148,377		\$0.00				\$148,377	\$0.00
2	02.01-CCB Chilled Water Pump Replacement	\$217,758		\$217,758		\$0.00				\$217,758	\$0.00
3	04.01-CCB BAS Controls Upgrade/ Replacement	\$754,093		\$754,093		\$0.00				\$754,093	\$0.00
4	09.01-CCB Interior LED Lighting Upgrades	\$374,635		\$374,635		\$0.00				\$374,635	\$0.00
Police Administration Building											
5	01.06-PAB Steam Condensate Heat Recovery	\$114,551		\$114,551		\$0.00				\$114,551	\$0.00
6	03.07-PAB MZU to VAV Unit	\$130,805		\$130,805		\$0.00				\$130,805	\$0.00
7	04.01-PAB BAS Controls Upgrade/ Replacement	\$793,231		\$793,231		\$0.00				\$793,231	\$0.00
8	04.02-PAB Occupancy Based HVAC Control	\$132,676		\$132,676		\$0.00				\$132,676	\$0.00
9	09.01-PAB Interior LED Lighting Upgrades	\$225,736		\$225,736		\$0.00				\$225,736	\$0.00
10	09.02-CCB Exterior LED Lighting Upgrades	\$48,813		\$48,813		\$0.00				\$48,813	\$0.00
Denver Municipal Animal Shelter											
11	09.01-DAS Interior LED Lighting Upgrades	\$112,516		\$112,516		\$0.00				\$112,516	\$0.00
12	09.02-DAS Exterior LED Lighting Upgrades	\$3,030		\$3,030		\$0.00				\$3,030	\$0.00
Police District #3											
13	03.13-PD3 Upgrade Air Cooled Chiller	\$631,886		\$631,886		\$0.00				\$631,886	\$0.00
14	08.05-PD3 Add VFDs to Building Pumps	\$109,173		\$109,173		\$0.00				\$109,173	\$0.00
15	09.01-PD3 Interior LED Lighting Upgrades	\$67,802		\$67,802		\$0.00				\$67,802	\$0.00
16	10.01-PD3 Solar Photovoltaic - Canopy	\$908,603		\$908,603		\$0.00				\$908,603	\$0.00
South Osage Fleet Maintenance Garage											
17	09.01-FS26 Interior LED Lighting Upgrades	\$29,689		\$29,689		\$0.00				\$29,689	\$0.00
18	09.02-FS26 Exterior LED Lighting Upgrades	\$6,199		\$6,199		\$0.00				\$6,199	\$0.00
Continuation Sheet 2 Totals		\$4,578,723		\$4,578,723						\$4,578,723	
Continuation Sheet 3 Totals		\$3,817,515		\$3,817,515						\$3,817,515	
Continuation Sheet 4 totals		\$628,786		\$628,786						\$628,786	
GRAND TOTALS ALL CONTINUATION SHEETS		\$13,834,597		\$13,834,597						\$13,834,597	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 2

AIA DOCUMENT G703

PAGE 3 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0
APPLICATION DATE: 1/0/00

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 1/0/00

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 1/0/00

CITY AND COUNTY OF DENVER PROJECT NO: Financed Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		G TOTAL COMPLETED AND STORED TO DATE (D+E+F)	G % (G ÷ C)		
Denver Police Academy											
19	03.04-POA VVT to VAV Unit Replacement	\$392,086		\$392,086		\$0.00				\$392,086	\$0.00
20	04.01-POA BAS Controls Upgrade/ Replacement	\$138,145		\$138,145		\$0.00				\$138,145	\$0.00
21	09.01-POA Interior LED Lighting Upgrades	\$50,107		\$50,107		\$0.00				\$50,107	\$0.00
22	09.02-POA Exterior LED Lighting Upgrades	\$9,040		\$9,040		\$0.00				\$9,040	\$0.00
23	10.02 - POA Solar Photovoltaic - Canopy	\$805,274		\$805,274		\$0.00				\$805,274	\$0.00
Police District #1											
24	03.13-PD1 Upgrade Air Cooled Chiller	\$699,564		\$699,564		\$0.00				\$699,564	\$0.00
25	08.05-PD1 Add VFDs to Building Pumps	\$125,456		\$125,456		\$0.00				\$125,456	\$0.00
Police District #2											
26	09.01-PD2 Interior LED Lighting Upgrades	\$53,819		\$53,819		\$0.00				\$53,819	\$0.00
27	09.02-PD2 Exterior LED Lighting Upgrades	\$25,750		\$25,750		\$0.00				\$25,750	\$0.00
28	10.02-PD2 Solar Photovoltaic - Canopy	\$1,218,836		\$1,218,836		\$0.00				\$1,218,836	\$0.00
South Cherry Creek Transfer Station											
29	09.01-CTS Interior LED Lighting Upgrades	\$38,932		\$38,932		\$0.00				\$38,932	\$0.00
30	09.02-CTS Exterior LED Lighting Upgrades	\$11,580		\$11,580		\$0.00				\$11,580	\$0.00
Fleet Maintenance Building 5											
31	09.01-FM5 Interior LED Lighting Upgrades	\$39,223		\$39,223		\$0.00				\$39,223	\$0.00
32	09.02-FM5 Exterior LED Lighting Upgrades	\$35,529		\$35,529		\$0.00				\$35,529	\$0.00
33	10.02-FM5 Solar Photovoltaic - Canopy	\$480,338		\$480,338		\$0.00				\$480,338	\$0.00
Gary Price Operations Building 2											
34	09.01-GPO Interior LED Lighting Upgrades	\$102,945		\$102,945		\$0.00				\$102,945	\$0.00
35	09.02-GPO Exterior LED Lighting Upgrades	\$24,251		\$24,251		\$0.00				\$24,251	\$0.00
Denver Crime Lab											
36	01.06-DCL Steam Condensate Heat Recovery	\$147,175		\$147,175		\$0.00				\$147,175	\$0.00
37	09.01-DCL Interior LED Lighting Upgrades	\$167,516		\$167,516		\$0.00				\$167,516	\$0.00
38	09.02-DCL Exterior LED Lighting Upgrades	\$13,155		\$13,155		\$0.00				\$13,155	\$0.00
PAGE TOTALS		\$4,578,723		\$4,578,723						\$4,578,723	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 3

AIA DOCUMENT G703

PAGE 4 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0

APPLICATION DATE: 0

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 0

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 0

CITY AND COUNTY OF DENVER PROJECT NO: Financed Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G ÷ C)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)		
Lindsey-Flanigan Courthouse											
39	09.01-LFC Interior LED Lighting Upgrades	\$862,211		\$862,211		\$0.00				\$862,211	\$0.00
40	09.02-LFC Exterior LED Lighting Upgrades	\$23,542		\$23,542		\$0.00				\$23,542	\$0.00
Rose Andom Center											
41	02.12-RAC Chiller Replacement	\$667,108		\$667,108		\$0.00				\$667,108	\$0.00
42	04.07-RAC Ventilation Control	\$73,976		\$73,976		\$0.00				\$73,976	\$0.00
43	09.01-RAC Interior LED Lighting Upgrades	\$65,394		\$65,394		\$0.00				\$65,394	\$0.00
44	09.02-RAC Exterior LED Lighting Upgrades	\$7,692		\$7,692		\$0.00				\$7,692	\$0.00
Van Cise-Simonet Detention Center											
45	09.01-VDC Interior LED Lighting Upgrades	\$620,559		\$620,559		\$0.00				\$620,559	\$0.00
46	09.02-VDC Exterior LED Lighting Upgrades	\$28,518		\$28,518		\$0.00				\$28,518	\$0.00
The Commons on Champa											
47	04.02-CMP Occupancy Based HVAC Controls	\$69,661		\$69,661		\$0.00				\$69,661	\$0.00
48	09.01-CMP Interior LED Lighting Upgrades	\$242,408		\$242,408		\$0.00				\$242,408	\$0.00
49	09.02-CMP Exterior LED Lighting Upgrades	\$3,556		\$3,556		\$0.00				\$3,556	\$0.00
50	13.04-CMP Replace Single Pane Windows	\$345,463		\$345,463		\$0.00				\$345,463	\$0.00
Permit Building											
51	04.02-PMB Occupancy Based HVAC Controls	\$60,684		\$60,684		\$0.00				\$60,684	\$0.00
52	09.01-PMB Interior LED Lighting Upgrades	\$307,958		\$307,958		\$0.00				\$307,958	\$0.00
53	09.02-PMB Exterior LED Lighting Upgrades	\$2,817		\$2,817		\$0.00				\$2,817	\$0.00
Fire Station #2											
54	09.01-FS2 Interior LED Lighting Upgrades	\$30,794		\$30,794		\$0.00				\$30,794	\$0.00
55	09.02-FS2 Exterior LED Lighting Upgrades	\$6,911		\$6,911		\$0.00				\$6,911	\$0.00
56	10.01-FS2 Solar Photovoltaic - Roof	\$398,261		\$398,261		\$0.00				\$398,261	\$0.00
PAGE TOTALS		\$3,817,515		\$3,817,515						\$3,817,515	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 4

AIA DOCUMENT G703

PAGE 5 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0

APPLICATION DATE: 0

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 0

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 0

CITY AND COUNTY OF DENVER PROJECT NO: Financed Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G ÷ C)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)		
Fire Station #21											
57	01.01-FS21 Boiler Replacement	\$320,994		\$320,994		\$0.00				\$320,994.16	\$0.00
58	09.01-FS21 Interior LED Lighting Upgrades	\$17,027		\$17,027		\$0.00				\$17,027.21	\$0.00
59	09.02-FS21 Exterior LED Lighting Upgrades	\$869		\$869		\$0.00				\$868.59	\$0.00
Fire Station #22											
60	09.01-FS22 Interior LED Lighting Upgrades	\$13,397		\$13,397		\$0.00				\$13,397.04	\$0.00
61	09.02-FS22 Exterior LED Lighting Upgrades	\$145		\$145		\$0.00				\$145.48	\$0.00
Fire Station #24											
62	01.02-FS24 Boiler Replacement	\$221,305		\$221,305		\$0.00				\$221,304.98	\$0.00
63	09.01-FS24 Interior LED Lighting Upgrades	\$10,005		\$10,005		\$0.00				\$10,005.19	\$0.00
64	09.02-FS24 Exterior LED Lighting Upgrades	\$3,941		\$3,941		\$0.00				\$3,941.35	\$0.00
Fire Station #26											
65	09.01-FS26 Interior LED Lighting Upgrades	\$31,706		\$31,706		\$0.00				\$31,706.05	\$0.00
66	09.02-FS26 Exterior LED Lighting Upgrades	\$9,396		\$9,396		\$0.00				\$9,395.91	\$0.00
PAGE TOTALS		\$628,786		\$628,786						\$628,786	

EPC Schedule F: Schedule of Values

APPLICATION AND CERTIFICATION FOR PAYMENT

AIA DOCUMENT G702

PAGE 1 OF 5 PAGES

TO OWNER: CITY AND COUNTY OF DENVER APPLICATION NO: 0
 PERIOD FROM: 01/00/00
 PERIOD TO: 01/00/00
 CITY AND COUNTY OF DENVER PROJECT #: Cash Scope
 FROM CONTRACTOR: MCKINSTRY PROJECT #:
 MCKINSTRY ESSENTION, LLC
 5005 3RD AVE S CONTRACT DATE:
 SEATTLE, WA 98134

Distribution to:
 OWNER
 ARCHITECT
 CONTRACTOR

 INVOICE NO:
 DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract Continuation Sheet, AIA Document G703, is attached.

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

1. ORIGINAL CONTRACT SUM	\$	<u>2,346,783.00</u>
2. Net change by Change Orders	\$	<u>0.00</u>
3. CONTRACT SUM TO DATE (Line 1 + 2)	\$	<u>2,346,783.00</u>
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$	<u>0.00</u>
5. RETAINAGE:		
a. <u>5</u> of Completed Work (Column D + E on G703)	\$	<u>0.00</u>
b. <u>5</u> % of Stored Material (Column F on G703)		<u>0.00</u>
Total Retainage (Lines 5a + 5b or Total in Column I of G703)	\$	<u>0.00</u>
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$	<u>0.00</u>
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$	<u>0.00</u>
8. CURRENT PAYMENT DUE	\$	<u>0.00</u>
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$	<u>2,346,783.00</u>

CONTRACTOR:
 By: _____ Date: _____
 State of: Washington County of: King
 Subscribed and sworn to before me this _____ day of _____
 Notary Public:
 My Commission expires:

OWNERS'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Owner certifies to the best of the Owners's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED

AMOUNT CERTIFIED \$ 0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

OWNER:
 By: _____ Date: _____
 This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES by Change Order	\$0.00	

Users may obtain validation of this document by requesting a completed AIA Document D401 - Certification of Document's Authenticity from the Licensee.

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 1

AIA DOCUMENT G703

PAGE 2 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO:
APPLICATION DATE:

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: PERIOD TO:

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO:

CITY AND COUNTY OF DENVER PROJECT NO: Cash Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	E WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	D THIS PERIOD		G TOTAL COMPLETED AND STORED TO DATE (D+E+F)	G % (G ÷ C)		
	City and County Building										
1	01.06-CCB Steam Condensate Heat Recovery	\$12,897		\$12,897		\$0.00				\$12,897	\$0.00
2	02.01-CCB Chilled Water Pump Replacement	\$18,560		\$18,560		\$0.00				\$18,560	\$0.00
3	04.01-CCB BAS Controls Upgrade/ Replacement	\$84,486		\$84,486		\$0.00				\$84,486	\$0.00
4	09.01-CCB Interior LED Lighting Upgrades	\$31,522		\$31,522		\$0.00				\$31,522	\$0.00
5	09.02-CCB Exterior LED Lighting Upgrades	\$4,149		\$4,149		\$0.00				\$4,149	\$0.00
	Police Administration Building										
6	01.06-PAB Steam Condensate Heat Recovery	\$9,623		\$9,623		\$0.00				\$9,623	\$0.00
7	03.07-PAB MZU to VAV Unit	\$10,261		\$10,261		\$0.00				\$10,261	\$0.00
8	04.01-PAB BAS Controls Upgrade/ Replacement	\$72,739		\$72,739		\$0.00				\$72,739	\$0.00
9	04.02-PAB Occupancy Based HVAC Control	\$11,532		\$11,532		\$0.00				\$11,532	\$0.00
10	09.01-PAB Interior LED Lighting Upgrades	\$19,313		\$19,313		\$0.00				\$19,313	\$0.00
	Denver Municipal Animal Shelter										
11	09.01-DAS Interior LED Lighting Upgrades	\$8,462		\$8,462		\$0.00				\$8,462	\$0.00
12	09.02-DAS Exterior LED Lighting Upgrades	\$244		\$244		\$0.00				\$244	\$0.00
	Police District #3										
13	03.13-PD3 Upgrade Air Cooled Chiller	\$46,205		\$46,205		\$0.00				\$46,205	\$0.00
14	08.05-PD3 Add VFDs to Building Pumps	\$9,209		\$9,209		\$0.00				\$9,209	\$0.00
15	09.01-PD3 Interior LED Lighting Upgrades	\$5,658		\$5,658		\$0.00				\$5,658	\$0.00
16	10.01-PD3 Solar Photovoltaic - Canopy	\$77,221		\$77,221		\$0.00				\$77,221	\$0.00
	South Osage Fleet Maintenance Garage										
17	09.01-FS26 Interior LED Lighting Upgrades	\$2,528		\$2,528		\$0.00				\$2,528	\$0.00
18	09.02-FS26 Exterior LED Lighting Upgrades	\$489		\$489		\$0.00				\$489	\$0.00
	Continuation Sheet 2 Totals	\$485,855		\$485,855						\$485,855	
	Continuation Sheet 3 Totals	\$324,065		\$324,065						\$324,065	
	Continuation Sheet 4 totals	\$1,111,764		\$1,111,764						\$1,111,764	
GRAND TOTALS ALL CONTINUATION SHEETS		\$2,346,783		\$2,346,783						\$2,346,783	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 2

AIA DOCUMENT G703

PAGE 3 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0

APPLICATION DATE: 0

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 0

Use Column 1 on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 0

CITY AND COUNTY OF DENVER PROJECT NO: Cash Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D+E+F)		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G + C)			
	Park Avenue Police Traffic Operations										
19	04.02-PTO Occupancy Based HVAC Control	\$3,081		\$3,081		\$0.00				\$3,081	\$0.00
20	09.01-PTO Interior LED Lighting Upgrades	\$13,894		\$13,894		\$0.00				\$13,894	\$0.00
21	09.02-PTO Exterior LED Lighting Upgrades	\$2,699		\$2,699		\$0.00				\$2,699	\$0.00
22	10.01-PTO Solar Photovoltaic- Roof	\$41,662		\$41,662		\$0.00				\$41,662	\$0.00
23	13.01-PTO Air Sealing and Weather Stripping	\$14,415		\$14,415		\$0.00				\$14,415	\$0.00
	13.02-PTO Ceiling and Wall Insulation	\$61,686		\$61,686		\$0.00				\$61,686	\$0.00
	Denver Police Academy										
24	03.04-POA VVT to VAV Unit Replacement	\$28,630		\$28,630		\$0.00				\$28,630	\$0.00
25	04.01-POA BAS Controls Upgrade/ Replacement	\$22,768		\$22,768		\$0.00				\$22,768	\$0.00
26	09.01-POA Interior LED Lighting Upgrades	\$4,155		\$4,155		\$0.00				\$4,155	\$0.00
27	09.02-POA Exterior LED Lighting Upgrades	\$719		\$719		\$0.00				\$719	\$0.00
28	10.02 - POA Solar Photovoltaic - Canopy	\$67,947		\$67,947		\$0.00				\$67,947	\$0.00
	Police District #1										
29	03.13-PD1 Upgrade Air Cooled Chiller	\$52,104		\$52,104		\$0.00				\$52,104	\$0.00
30	08.05-PD1 Add VFDs to Building Pumps	\$10,689		\$10,689		\$0.00				\$10,689	\$0.00
	Police District #2										
31	09.01-PD2 Interior LED Lighting Upgrades	\$4,485		\$4,485		\$0.00				\$4,485	\$0.00
32	09.02-PD2 Exterior LED Lighting Upgrades	\$2,005		\$2,005		\$0.00				\$2,005	\$0.00
33	10.02-PD2 Solar Photovoltaic - Canopy	\$103,925		\$103,925		\$0.00				\$103,925	\$0.00
	South Cherry Creek Transfer Station										
34	09.01-CTS Interior LED Lighting Upgrades	\$3,275		\$3,275		\$0.00				\$3,275	\$0.00
35	09.02-CTS Exterior LED Lighting Upgrades	\$957		\$957		\$0.00				\$957	\$0.00
	Fleet Maintenance Building 5										
36	09.01-FM5 Interior LED Lighting Upgrades	\$3,225		\$3,225		\$0.00				\$3,225	\$0.00
37	09.02-FM5 Exterior LED Lighting Upgrades	\$2,766		\$2,766		\$0.00				\$2,766	\$0.00
38	10.02-FM5 Solar Photovoltaic - Canopy	\$40,772		\$40,772		\$0.00				\$40,772	\$0.00
PAGE TOTALS		\$485,855		\$485,855						\$485,855	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 3

AIA DOCUMENT G703

PAGE 4 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0

APPLICATION DATE: 0

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 0

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 0

CITY AND COUNTY OF DENVER PROJECT NO: Cash Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	D REVISED SCHEDULE OF VALUES	E WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		G TOTAL COMPLETED AND STORED TO DATE (D+E+F)	G % (G ÷ C)		
Gary Price Operations Building 2											
39	09.01-GPO Interior LED Lighting Upgrades	\$ 8,343		\$8,343		\$0.00				\$8,343	\$0.00
40	09.02-GPO Exterior LED Lighting Upgrades	\$ 1,875		\$1,875		\$0.00				\$1,875	\$0.00
				\$0		\$0.00					\$0.00
Denver Crime Lab											
41	01.06-DCL Steam Condensate Heat Recovery	\$ 12,793		\$12,793		\$0.00				\$12,793	\$0.00
42	09.01-DCL Interior LED Lighting Upgrades	\$ 14,145		\$14,145		\$0.00				\$14,145	\$0.00
43	09.02-DCL Exterior LED Lighting Upgrades	\$ 1,081		\$1,081		\$0.00				\$1,081	\$0.00
44				\$0		\$0.00					\$0.00
Lindsey-Flanigan Courthouse											
45	09.01-LFC Interior LED Lighting Upgrades	\$71,689		\$71,689		\$0.00				\$71,689	\$0.00
46	09.02-LFC Exterior LED Lighting Upgrades	\$1,942		\$1,942		\$0.00				\$1,942	\$0.00
				\$0		\$0.00					\$0.00
Rose Andom Center											
47	02.12-RAC Chiller Replacement	\$49,228		\$49,228		\$0.00				\$49,228	\$0.00
48	04.07-RAC Ventilation Control	\$6,376		\$6,376		\$0.00				\$6,376	\$0.00
49	09.01-RAC Interior LED Lighting Upgrades	\$5,353		\$5,353		\$0.00				\$5,353	\$0.00
50	09.02-RAC Exterior LED Lighting Upgrades	\$626		\$626		\$0.00				\$626	\$0.00
51	13.01-RAC Air Sealing and Weather Stripping	\$10,914		\$10,914		\$0.00				\$10,914	\$0.00
				\$0		\$0.00					\$0.00
Van Cise-Simonet Detention Center											
52	09.01-VDC Interior LED Lighting Upgrades	\$52,277		\$52,277		\$0.00				\$52,277	\$0.00
53	09.02-VDC Exterior LED Lighting Upgrades	\$2,248		\$2,248		\$0.00				\$2,248	\$0.00
				\$0		\$0.00					\$0.00
The Commons on Champa											
54	04.02-CMP Occupancy Based HVAC Controls	\$6,055		\$6,055		\$0.00				\$6,055	\$0.00
55	09.01-CMP Interior LED Lighting Upgrades	\$19,662		\$19,662		\$0.00				\$19,662	\$0.00
56	09.02-CMP Exterior LED Lighting Upgrades	\$284		\$284		\$0.00				\$284	\$0.00
57	13.04-CMP Replace Single Pane Windows	\$28,617		\$28,617		\$0.00				\$28,617	\$0.00
				\$0		\$0.00					\$0.00
Permit Building											
58	04.02-PMB Occupancy Based HVAC Controls	\$5,275		\$5,275		\$0.00				\$5,275	\$0.00
59	09.01-PMB Interior LED Lighting Upgrades	\$25,054		\$25,054		\$0.00				\$25,054	\$0.00
60	09.02-PMB Exterior LED Lighting Upgrades	\$230		\$230		\$0.00				\$230	\$0.00
PAGE TOTALS		\$324,065		\$324,065						\$324,065	

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 4

AIA DOCUMENT G703

PAGE 5 OF 5

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

APPLICATION NO: 0

APPLICATION DATE: 0

In tabulations below, amounts are stated to the nearest dollar.

PERIOD FROM: 1/0/00 PERIOD TO: 0

Use Column I on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO: 0

CITY AND COUNTY OF DENVER PROJECT NO: Cash Scope

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	D REVISED SCHEDULE OF VALUES	E WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)		
Fire Station #2											
61	09.01-FS2 Interior LED Lighting Upgrades	\$2,614		\$2,614		\$0.00				\$2,613.85	\$0.00
62	09.02-FS2 Exterior LED Lighting Upgrades	\$543		\$543		\$0.00				\$542.68	\$0.00
	10.01-FS2 Solar Photovoltaic - Roof	\$33,359		\$33,359		\$0.00				\$33,359.44	\$0.00
Fire Station #21											
63	01.01-FS21 Boiler Replacement	\$27,708		\$27,708		\$0.00				\$27,707.76	\$0.00
64	09.01-FS21 Interior LED Lighting Upgrades	\$1,476		\$1,476		\$0.00				\$1,475.79	\$0.00
65	09.02-FS21 Exterior LED Lighting Upgrades	\$73		\$73		\$0.00				\$73.41	\$0.00
Fire Station #22											
66	09.01-FS22 Interior LED Lighting Upgrades	\$1,117		\$1,117		\$0.00				\$1,116.96	\$0.00
67	09.02-FS22 Exterior LED Lighting Upgrades	\$12		\$12		\$0.00				\$11.52	\$0.00
Fire Station #24											
68	01.02-FS24 Boiler Replacement	\$19,043		\$19,043		\$0.00				\$19,042.50	\$0.00
69	09.01-FS24 Interior LED Lighting Upgrades	\$843		\$843		\$0.00				\$842.81	\$0.00
70	09.02-FS24 Exterior LED Lighting Upgrades	\$310		\$310		\$0.00				\$309.65	\$0.00
Fire Station #26											
71	09.01-FS26 Interior LED Lighting Upgrades	\$2,679		\$2,679		\$0.00				\$2,678.95	\$0.00
72	09.02-FS26 Exterior LED Lighting Upgrades	\$755		\$755		\$0.00				\$755.09	\$0.00
73	Solar O&M	\$11,000		\$11,000		\$0.00				\$11,000.00	\$0.00
74	CCD Controls Optimization/RCx	\$610,331		\$610,331		\$0.00				\$610,331.00	\$0.00
75	Contingency	\$399,903		\$399,903		\$0.00				\$399,903.00	\$0.00
PAGE TOTALS		\$1,111,764		\$1,111,764						\$1,111,764	

EPC Schedule F: Schedule of Values

APPLICATION AND CERTIFICATION FOR PAYMENT

AIA DOCUMENT G702

PAGE 1 OF 2 PAGES

TO OWNER: CITY AND COUNTY OF DENVER APPLICATION NO: 0
 PERIOD FROM: 01/00/00
 PERIOD TO: 01/00/00
 CITY AND COUNTY OF DENVER PO #:
 FROM CONTRACTOR: MCKINSTRY PROJECT #:
 MCKINSTRY ESSENTION, LLC
 5005 3RD AVE S CONTRACT DATE:
 SEATTLE, WA 98134

Distribution to:
 OWNER
 ARCHITECT
 CONTRACTOR

 INVOICE NO:
 DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract Continuation Sheet, AIA Document G703, is attached.

The undersigned Contractor certifies that to the best of the Contractor's knowledge, information and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the Contractor for Work for which previous Certificates for Payment were issued and payments received from the Owner, and that current payment shown herein is now due.

1. ORIGINAL CONTRACT SUM	\$	<u>735,094.00</u>
2. Net change by Change Orders	\$	<u>0.00</u>
3. CONTRACT SUM TO DATE (Line 1 + 2)	\$	<u>735,094.00</u>
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)	\$	<u>0.00</u>
5. RETAINAGE:		
a. <u>5</u> of Completed Work (Column D + E on G703)	\$	<u>0.00</u>
b. <u>5</u> % of Stored Material (Column F on G703)		<u>0.00</u>
Total Retainage (Lines 5a + 5b or Total in Column I of G703)	\$	<u>0.00</u>
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)	\$	<u>0.00</u>
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)	\$	<u>0.00</u>
8. CURRENT PAYMENT DUE	\$	<u>0.00</u>
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	\$	<u>735,094.00</u>

CONTRACTOR:
 By: _____ Date: _____
 State of: Washington County of: King
 Subscribed and sworn to before me this _____ day of _____
 Notary Public:
 My Commission expires:

OWNERS'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Owner certifies to the best of the Owners's knowledge, information and belief the Work has progressed as indicated, the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED

AMOUNT CERTIFIED \$ 0.00

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and on the Continuation Sheet that are changed to conform with the amount certified.)

OWNER:
 By: _____ Date: _____
 This Certificate is not negotiable. The AMOUNT CERTIFIED is payable only to the Contractor named herein. Issuance, payment and acceptance of payment are without prejudice to any rights of the Owner or Contractor under this Contract.

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner	\$0.00	\$0.00
Total approved this Month	\$0.00	\$0.00
TOTALS	\$0.00	\$0.00
NET CHANGES by Change Order	\$0.00	

Users may obtain validation of this document by requesting a completed AIA Document D401 - Certification of Document's Authenticity from the Licensee.

EPC Schedule F: Schedule of Values

CONTINUATION SHEET 1

AIA DOCUMENT G703

PAGE 2 OF 2

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing Contractor's signed certification is attached.

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APPLICATION DATE:

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PERIOD TO:

Use Column 1 on Contracts where variable retainage for line items may apply.

MCKINSTRY JOB NO:

CITY AND COUNTY OF DENVER PO NO: 0

A ITEM NO.	B DESCRIPTION OF WORK	C SCHEDULED VALUE	C CHANGE ORDERS	C REVISED SCHEDULE OF VALUES	D WORK COMPLETED		F MATERIALS PRESENTLY STORED (NOT IN D OR E)	G TOTAL COMPLETED AND STORED TO DATE (D+E+F)		H BALANCE TO FINISH (C - G)	I RETAINAGE (IF VARIABLE RATE)
					D FROM PREVIOUS APPLICATION (D + E)	E THIS PERIOD		% (G + C)	% (G + C)		
	Park Avenue Police Traffic Operations										
1	04.02-PTO Occupancy Based HVAC Control	\$35,451		\$35,451		\$0.00				\$35,451	\$0.00
2	09.01-PTO Interior LED Lighting Upgrades	\$165,776		\$165,776		\$0.00				\$165,776	\$0.00
3	09.02-PTO Exterior LED Lighting Upgrades	\$31,700		\$31,700		\$0.00				\$31,700	\$0.00
4	10.01-PTO Solar Photovoltaic- Roof	\$497,936		\$497,936		\$0.00				\$497,936	\$0.00
5	13.01-PTO Air Sealing and Weather Stripping	\$1,410		\$1,410		\$0.00				\$1,410	\$0.00
6	13.02-PTO Ceiling and Wall Insulation	\$2,820		\$2,820		\$0.00				\$2,820	\$0.00
PAGE TOTALS		\$735,094		\$735,094						\$735,094	

Solar Installation Type Ballasted Flat Roof
PW Classification Category Building

Source <https://www.denverauditor.org/denverlabor/prevailingwage/>

Task Name	Classification	Wage Regular Rate	Rate	Fringe	Total	Notes
Racking - assemble and install rails, ballast blocks	Carpenter - Excludes		\$ 21.09	\$ 6.31	\$ 27.40	
Racking - install roof penetrations, mechanical attachments, flashing, roof repair	Carpenter - Excludes		\$ 21.09	\$ 6.31	\$ 27.40	
Modules - install modules onto racking	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - DC wiring installation: module wiring, wire management, conductor, terminations	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - inverter installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - AC wiring installation: conduits, pull boxes, conductors, terminations	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - bonding and grounding installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - panelboard, transformers, disconnect, protection installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - pre-functional tests	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - SCADA component installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Functional testing and commissioning	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Jobsite Setup	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Racking - mark layout on roof	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Racking - materials and ballast unload	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Racking - materials lift to roof, stage on roof	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Modules - unload	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Modules - lift to roof and stage	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Trenching - hand excavation	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Trenching - mark out trenching runs	Laborer - Concrete Saw		\$ 13.89	\$ -	\$ 13.89	
Trenching - asphalt/concrete sawing	Laborer - Concrete Saw		\$ 13.89	\$ -	\$ 13.89	
Trenching - repair pavement	Laborer - Concrete Saw		\$ 13.89	\$ -	\$ 13.89	
Boom lift to lift/stage racking and modules to roof	Operator: Backhoe/Excavator/Trackhoe		\$ 20.78	\$ 5.78	\$ 26.56	No forklift or boom fork listed for Building category
Trenching - backhoe operation	Operator: Backhoe/Excavator/Trackhoe		\$ 20.78	\$ 5.78	\$ 26.56	
Crane picks to lift/stage racking and modules to roof	Power Equipment Operator (Crane <50 tons)		\$ 28.40	\$ 10.70	\$ 39.10	

Solar Installation Type Pitched Roof, Flush Mounted
PW Classification Category Building
Source <https://www.denverauditor.org/denverlabor/prevailingwage/>

Task Name	Classification	Wage Regular Rate	Rate	Fringe	Total	Notes
Racking - secure fasteners to roof standing seams	Carpenter - Excludes		\$ 21.09	\$ 6.31	\$ 27.40	
Racking - attach rail supports to fasteners, and rails to supports	Carpenter - Excludes		\$ 21.09	\$ 6.31	\$ 27.40	
Modules - install modules onto rails	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - DC wiring installation: module wiring, wire management, conductor, terminations	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - inverter installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - AC wiring installation: conduits, pull boxes, conductors, terminations	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - bonding and grounding installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - panelboard, transformers, disconnect, protection installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - pre-functional tests	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Electrical - SCADA component installation	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Functional testing and commissioning	Electrician		\$ 38.00	\$ 16.97	\$ 54.97	
Jobsite Setup	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Racking - mark layout on roof	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Racking - materials unload and stage	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Modules - unload and stage	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Trenching - hand exaction	Laborer - Common or General		\$ 14.49	\$ 5.22	\$ 19.71	
Trenching - mark out trenching runs	Laborer - Concrete Saw		\$ 13.89	-	\$ 13.89	
Trenching - asphalt/concrete sawing	Laborer - Concrete Saw		\$ 13.89	-	\$ 13.89	
Trenching - repair pavement	Laborer - Concrete Saw		\$ 13.89	-	\$ 13.89	
Lift racking and modules to roof	Operator: Backhoe/Excavator/Trackhoe		\$ 20.78	\$ 5.78	\$ 26.56	No forklift or boom fork listed for Building category
Trenching - backhoe operation	Operator: Backhoe/Excavator/Trackhoe		\$ 20.78	\$ 5.78	\$ 26.56	

Solar Installation Type Carport on Surface Parking Lot (Single and Double Tee type)

PW Classification Category Highway

Source <https://www.denverauditor.org/denverlabor/prevailingwage/>

Task Name	Classification	Wage Regular Rate	Rate	Fringe	Total	Notes
Carport foundation - encase columns in concrete	Cement Mason/Concrete Finisher		\$ 20.18	\$ 5.75	\$ 25.93	
Modules - lift and attach to carport purlins	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - DC wiring installation: module wiring, wire management, conductor, terminations	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - inverter installation	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - AC wiring installation: conduits, pull boxes, conductors, terminations	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - bonding and grounding installation	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - panelboard, transformers, disconnect, protection installation	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - pre-functional tests	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Electrical - SCADA component installation	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Functional testing and commissioning	Electrician		\$ 35.13	\$ 6.83	\$ 41.96	
Carport foundation - set steel columns in borings	Ironworker - Structural		\$ 18.22	\$ 6.01	\$ 24.23	
Carport assembly - attach beams to columns, purlins to beams, attach snow guards	Ironworker - Structural		\$ 18.22	\$ 6.01	\$ 24.23	
Jobsite Setup	Laborer - Common or General		\$ 16.76	\$ 6.77	\$ 23.53	
Carport foundation - mark column layout	Laborer - Common or General		\$ 16.76	\$ 6.77	\$ 23.53	
Modules - unload and stage	Laborer - Common or General		\$ 16.76	\$ 6.77	\$ 23.53	
Trenching - mark out trenching runs	Laborer - Common or General		\$ 16.76	\$ 6.77	\$ 23.53	
Trenching - asphalt sawing	Laborer - Common or General		\$ 16.76	\$ 6.77	\$ 23.53	
Trenching - repair pavement	Laborer - Concrete Saw		\$ 16.29	\$ 6.14	\$ 22.43	
Trenching - backhoe operation	Power Equipment Operator - Backhoe		\$ 28.25	\$ 10.70	\$ 38.95	
Carport foundation - drill foundation bores	Power Equipment Operator - Drill Rig <Watson 2500 or similar		\$ 28.25	\$ 10.70	\$ 38.95	
Carport assembly - boom lift operator	Power Equipment Operator - Forklift		\$ 15.91	\$ 4.68	\$ 20.59	
Carport foundation - core asphalt for foundation borings	Power Equipment Operator - Skid Loader		\$ 15.37	\$ 4.28	\$ 19.65	If run off of skid steer equipment
Carport foundation - drill foundation bores	Power Equipment Operator - Skid Loader		\$ 15.37	\$ 4.28	\$ 19.65	If run off of skid steer equipment



16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403
 303.215.4040
 McKinstry.com

McKinstry 2022 Labor Rates

COMMISSIONING

Commissioning Technician.....	\$118.00	/Hr
Commissioning Engineer.....	\$149.00	/Hr
Sr. Commissioning Engineer.....	\$180.00	/Hr
Commissioning Lead.....	\$185.00	/Hr
Program Manager.....	\$191.00	/Hr
Sr. Program Manager.....	\$206.00	/Hr
Commissioning Manager.....	\$216.00	/Hr

BUILDING ENERGY ANALYSIS & DESIGN

Design Engineer.....	\$113.00	/Hr
Building Energy Analyst I.....	\$113.00	/Hr
Building Energy Analyst II.....	\$144.00	/Hr
Building Energy Engineer.....	\$144.00	/Hr
Sr. Building Energy Engineer.....	\$175.00	/Hr
Lead Design Engineer.....	\$185.00	/Hr
Program Manager - Energy/Design.....	\$185.00	/Hr
Sr. Program Manager - Energy/Design.....	\$216.00	/Hr
Sr. Design Engineer.....	\$227.00	/Hr
Engineering Manager.....	\$288.00	/Hr
Director of Engineering.....	\$288.00	/Hr

FACILITY ASSESSMENT

Facility Assessment Specialist.....	\$118.00	/Hr
Facility Assessment Consultant.....	\$149.00	/Hr
Sr. Facility Assessment Consultants.....	\$180.00	/Hr
Program Manager.....	\$191.00	/Hr
Sr. Program Manager.....	\$206.00	/Hr

CONSTRUCTION

Construction Project Coordinator.....	\$103.00	/Hr
Construction Project Engineer.....	\$124.00	/Hr
Sr. Construction Project Engineer.....	\$144.00	/Hr
Superintendent.....	\$165.00	/Hr
Project Manager - Construction.....	\$165.00	/Hr
Sr. Superintendent.....	\$196.00	/Hr
Sr. Project Manager - Construction.....	\$196.00	/Hr
Operations Manager - Construction.....	\$247.00	/Hr



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McKinstry 2022 Labor Rates

OPERATIONS, ADMINISTRATION & SUPPORT SERVICES

Business Operations Coordinator.....	\$103.00	/Hr
Lead Operations Specialist.....	\$118.00	/Hr
Associate Account Executive.....	\$134.00	/Hr
Safety Engineer.....	\$144.00	/Hr
Lead Operations Specialist.....	\$155.00	/Hr
Building Data Engineer.....	\$175.00	/Hr
Safety Program Manager.....	\$196.00	/Hr
Technology Solutions Engineer.....	\$196.00	/Hr
Account Executive.....	\$206.00	/Hr
Sr. Account Executive.....	\$227.00	/Hr
Director of Regional Operations.....	\$247.00	/Hr
Regional Director.....	\$258.00	/Hr
Business Unit Manager.....	\$309.00	/Hr
Business Development Director.....	\$319.00	/Hr

RENEWABLES

Energy Engineer - Renewables.....	\$144.00	/Hr
Superintendent - Renewables.....	\$165.00	/Hr
Sr. Energy Engineer - Renewables.....	\$185.00	/Hr
Construction Manager- Renewables.....	\$196.00	/Hr
Energy Operations Leader - Renewables.....	\$227.00	/Hr
Project Director, Project Development - Renewables.....	\$242.00	/Hr
Regional Director - Renewables.....	\$258.00	/Hr

EPC Schedule G: Proposed Financial Cost and Cash Flow Analysis

Table 1 – Project General Inputs and Representative Cash Flow

City and County of Denver EPC

Project Pro Forma (Representative Financial Performance of EPC Project)



General Inputs	
EPC Program Total	\$ 16,916,474
3rd Party Fee (%)	0.0%
3rd Party Fee (\$)	-
Initial Customer Capital* (PO & Cash Amounts)	\$ 3,081,877
Incentives (Applied to Yr 1 savings -> payment)**	\$ 244,032
Constr. Period Int. (Capitalized)	-
Financed Cost	\$ 13,834,597
Years of Analysis	30
Finance Term (Yrs)	15
Payment Type	Fixed
Indicative Interest Rate	1.60%

Annual Savings (2023 basis)	
Baseline Utility Spend	\$4,434,308
Electric (non-PV)	\$494,832
Electric (PV Production & Rate Switch)	\$67,846
Electric (PV RECs)	\$39,684
Years of non-PV Energy Savings	15
Natural Gas	\$16,668
Steam	\$78,520
Chilled Water	\$117,858
O&M	\$0

Service Costs	
PV Annual O&M Cost (Yr 2) ***	(\$10,330)
PV Data Acquisition System (\$/term)	(\$4,200)
PV Data Acquisition System Term (years)	5

Escalation Rates	
Electric Utility Cost	2.4%
Natural Gas	4.5%
Steam	4.5%
Chilled water	2.4%
Annual PV Savings Degradation	0.5%
O&M Cost Savings	2.0%
PV Annual O&M Cost	2.0%
PV Inverter Replacement Cost (Equipment)	-1.0%
PV Data Acquisition System Cost	2.0%
O&M Savings Last Year	18

Measurement & Verification	
Year 1 M&V Cost	\$72,600
Year 2 M&V Cost	\$41,837
Year 3 M&V Cost	\$42,835
3rd Party Fee (%)	0.0%
M&V End Year	3
Maintenance Service Cost	\$0

PV Specific	
REC Value (\$/kWh-year)	\$0.0375
REC End Year	20
DC kW Installed Total	794.6
DC kW Roof Mounted	97.6
Inverter Material Replacement Cost (2020)	(\$49,265)
Estimated Inverter Replacement Interval	13
Yrs of 3rd Party PV O&M *	30

powerED savings	
powerED measure name	22.01 - CCD PowerED
First Year powerED savings %	50%
Electric	\$100,773
Natural Gas	\$9,819
Steam	\$37,678
Chilled Water	\$30,334

Confidential and Proprietary

Year 2023 Start	Annual Savings							Solar Maintenance				M&V Cost	Total Annual Savings Less M&V & Maintenance	Cash Flow Analysis					
	Electric (non-PV)	RECs	Electric (PV Production)	Nat Gas	Steam	Chilled Water	Total Utility Savings	PV Service Contract***	PV Inverter Replacement (/by)	PV DAS Subscription (/by)	PV DE/RE-Install****			Total Savings	Interest	Principal	Total Payment	Loan Balance	Annual Cash Flow
0	\$322,229	\$0	\$53,765		(\$7,442)	\$41,415	\$409,967	\$0	\$0	\$0	\$0	\$409,967	\$0	\$409,967	\$0	\$0	\$0	\$13,834,597	\$0
1	\$444,445	\$39,684	\$67,846	\$11,759	\$59,682	\$102,691	\$726,107	\$0	\$0	\$0	\$0	\$970,139	(\$72,600)	\$897,539	(\$221,354)	(\$823,377)	(\$1,044,730)	\$12,601,253	(\$147,191)
2	\$506,708	\$39,486	\$69,127	\$17,418	\$82,054	\$120,686	\$835,479	(\$11,181)	\$0	\$0	\$0	\$824,298	(\$41,837)	\$782,460	(\$208,180)	(\$836,551)	(\$1,044,730)	\$11,764,703	(\$262,270)
3	\$518,869	\$39,288	\$70,432	\$18,202	\$85,746	\$123,583	\$856,120	(\$11,405)	\$0	\$0	\$0	\$844,715	(\$42,835)	\$801,880	(\$194,795)	(\$849,935)	(\$1,044,730)	\$10,914,767	(\$242,850)
4	\$531,322	\$39,092	\$71,762	\$19,021	\$89,605	\$126,549	\$877,350	(\$11,633)	\$0	\$0	\$0	\$865,717	\$0	\$865,717	(\$181,196)	(\$863,534)	(\$1,044,730)	\$10,051,233	(\$179,013)
5	\$544,073	\$38,896	\$73,117	\$19,877	\$93,637	\$129,586	\$899,187	(\$11,866)	\$0	(\$4,637)	\$0	\$882,684	\$0	\$882,684	(\$167,379)	(\$877,351)	(\$1,044,730)	\$9,173,882	(\$162,046)
6	\$557,131	\$38,702	\$74,497	\$20,772	\$97,851	\$132,696	\$921,649	(\$12,103)	\$0	\$0	\$0	\$909,546	\$0	\$909,546	(\$153,342)	(\$891,388)	(\$1,044,730)	\$8,282,494	(\$135,185)
7	\$570,502	\$38,508	\$75,904	\$21,707	\$102,254	\$135,881	\$944,755	(\$12,345)	\$0	\$0	\$0	\$932,410	\$0	\$932,410	(\$139,079)	(\$905,651)	(\$1,044,730)	\$7,376,843	(\$112,320)
8	\$584,194	\$38,316	\$77,337	\$22,683	\$106,855	\$139,142	\$968,527	(\$12,592)	\$0	\$0	\$0	\$955,935	\$0	\$955,935	(\$124,589)	(\$920,141)	(\$1,044,730)	\$6,456,702	(\$88,795)
9	\$598,215	\$38,124	\$78,797	\$23,704	\$111,664	\$142,481	\$992,985	(\$12,844)	\$0	\$0	\$0	\$980,141	\$0	\$980,141	(\$109,867)	(\$934,863)	(\$1,044,730)	\$5,521,839	(\$64,589)
10	\$612,572	\$37,933	\$80,285	\$24,771	\$116,689	\$145,901	\$1,018,151	(\$13,101)	\$0	(\$5,120)	\$0	\$999,930	\$0	\$999,930	(\$94,909)	(\$949,821)	(\$1,044,730)	\$4,572,018	(\$44,800)
11	\$627,274	\$37,744	\$81,800	\$25,886	\$121,940	\$149,402	\$1,044,046	(\$13,363)	\$0	\$0	\$0	\$1,030,683	\$0	\$1,030,683	(\$79,712)	(\$965,018)	(\$1,044,730)	\$3,606,999	(\$14,047)
12	\$642,329	\$37,555	\$83,345	\$27,050	\$127,427	\$152,988	\$1,070,694	(\$13,630)	\$0	\$0	\$0	\$1,057,064	\$0	\$1,057,064	(\$64,271)	(\$980,459)	(\$1,044,730)	\$2,626,541	\$12,334
13	\$657,744	\$37,367	\$84,918	\$28,268	\$133,161	\$156,660	\$1,098,119	(\$13,903)	(\$43,231)	\$0	\$0	\$1,040,985	\$0	\$1,040,985	(\$48,584)	(\$996,146)	(\$1,044,730)	\$1,630,395	(\$3,745)
14	\$673,530	\$37,180	\$86,521	\$29,540	\$139,153	\$160,419	\$1,126,345	(\$14,181)	\$0	\$0	\$0	\$1,112,164	\$0	\$1,112,164	(\$32,646)	(\$1,012,084)	(\$1,044,730)	\$618,310	\$67,434
15	\$689,695	\$36,995	\$88,155	\$30,869	\$145,415	\$164,270	\$1,155,399	(\$14,464)	\$0	(\$5,653)	(\$76,655)	\$1,058,627	\$0	\$1,058,627	(\$16,452)	(\$1,028,278)	(\$1,044,730)	(\$409,967)	\$13,897
16		\$36,810	\$89,819				\$126,629	(\$14,753)	\$0	\$0	\$0	\$111,876	\$0	\$111,876	\$0	\$0	\$0	\$0	\$111,876
17		\$36,626	\$91,515				\$128,141	(\$15,049)	\$0	\$0	\$0	\$113,092	\$0	\$113,092	\$0	\$0	\$0	\$0	\$113,092
18		\$36,442	\$93,243				\$129,685	(\$15,350)	\$0	\$0	\$0	\$114,336	\$0	\$114,336	\$0	\$0	\$0	\$0	\$114,336
19		\$36,260	\$95,003				\$131,264	(\$15,657)	\$0	\$0	\$0	\$115,607	\$0	\$115,607	\$0	\$0	\$0	\$0	\$115,607
20		\$36,079	\$96,797				\$132,876	(\$15,970)	\$0	(\$6,241)	\$0	\$110,665	\$0	\$110,665	\$0	\$0	\$0	\$0	\$110,665
21			\$98,625				\$98,625	(\$16,289)	\$0	\$0	\$0	\$82,336	\$0	\$82,336	\$0	\$0	\$0	\$0	\$82,336
22			\$100,487				\$100,487	(\$16,615)	\$0	\$0	\$0	\$83,872	\$0	\$83,872	\$0	\$0	\$0	\$0	\$83,872
23			\$102,384				\$102,384	(\$16,947)	\$0	\$0	\$0	\$85,437	\$0	\$85,437	\$0	\$0	\$0	\$0	\$85,437
24			\$104,317				\$104,317	(\$17,286)	\$0	\$0	\$0	\$87,031	\$0	\$87,031	\$0	\$0	\$0	\$0	\$87,031
25			\$106,286				\$106,286	(\$17,632)	\$0	(\$6,891)	\$0	\$81,764	\$0	\$81,764	\$0	\$0	\$0	\$0	\$81,764
26			\$108,293				\$108,293	(\$17,984)	(\$37,936)	\$0	\$0	\$52,372	\$0	\$52,372	\$0	\$0	\$0	\$0	\$52,372
27			\$110,338				\$110,338	(\$18,344)	\$0	\$0	\$0	\$91,993	\$0	\$91,993	\$0	\$0	\$0	\$0	\$91,993
28			\$112,421				\$112,421	(\$18,711)	\$0	\$0	\$0	\$93,710	\$0	\$93,710	\$0	\$0	\$0	\$0	\$93,710
29			\$114,543				\$114,543	(\$19,085)	\$0	\$0	\$0	\$95,458	\$0	\$95,458	\$0	\$0	\$0	\$0	\$95,458
30			\$116,706				\$116,706	(\$19,467)	\$0	(\$7,608)	\$0	\$89,631	\$0	\$89,631	\$0	\$0	\$0	\$0	\$89,631
Totals	\$8,758,605	\$757,087	\$2,704,619	\$341,527	\$1,613,132	\$2,082,933	\$16,257,904	(\$433,748)	(\$81,168)	(\$36,149)	(\$76,655)	\$15,874,217	(\$157,273)	\$15,716,944	(\$1,836,354)	(\$13,834,597)	(\$15,670,951)	\$94,788,012	\$45,993

Notes:
 * Includes investment grade audit fee
 ** Xcel energy incentives are contingent on final approval. Amounts shown are for reference only.
 *** Yr 1 PV O&M included in EPC Cost, yrs 2+ by others
 **** By Others (CCD Responsibility)
 Yr 0 (construction period) energy savings are estimated only
 Total payment in year 1 includes construction period savings

EPC Schedule G: Proposed Financial Cost and Cash Flow Analysis

Table 2 – Overall Project Costing Detail (Combined)

Cost of Services:	\$2,346,783
Cost of Equipment:	\$13,834,597
Cost of Purchase Order:	\$735,094
Total Project Value to be Paid to Contractor:	\$16,916,474

Table 3 – Project Costing Percentages (CEO Costing Template)

A. Technical Energy Audit				
B.	Total Facility Area	(Gross Square Footage)	1,942,863	Per TEA Contract
C.	\$ / SqFt		\$ 0.200	Per TEA Contract
D.				
E. Implementation Costs		Actual % of Total Project Cost	% Maximum Per TEA Contract	
F.	Pre-Construction Costs			
G.	Design and Engineering		7.8%	8.0%
H.	Pre-Construction Services		2.9%	3.0%
I.	Other Pre-Construction Costs		2.9%	3.0%
J.				
K.	Construction Costs			
L.				-
O.	Construction Management		7.0%	7.0%
P.	Project Engineering		1.9%	2.0%
Q.	General Conditions		1.5%	1.5%
R.	Construction Completion		4.0%	4.0%
S.	Other Construction Costs		4.0%	4.0%
T.				
U. Estimated Project Amount				
V.	Profit		10.0%	10.0%
W.	Contingency		3.0%	4.0%

SCHEDULE H

Certification that Cost-weighted Average Service Life of Equipment Exceeds Financing Term

ECM Name and Reference Number	Facility	Cost of Equipment	Service Life	Weighted Service Life Value
01.01-FS21 Boiler Replacement	Fire Station #21	\$320,994	25	0.580
01.02-FS24 Boiler Replacement	Fire Station #24	\$221,305	25	0.400
01.06-CCB Steam Condensate Heat Recovery	City and County Building	\$148,377	22	0.236
01.06-DCL Steam Condensate Heat Recovery	Denver Crime Lab	\$147,175	22	0.234
01.06-PAB Steam Condensate Heat Recovery	Police Administration Building PAB	\$114,551	22	0.182
02.01-CCB Chilled Water Pump Replacement	City and County Building	\$217,758	20	0.315
02.12-RAC Chiller Replacement	Rose Andom Center	\$667,108	23	1.109
03.04-POA VVT to VAV Unit Replacement	Denver Police Academy	\$392,086	15	0.425
03.07-PAB MZU to VAV Unit	Police Administration Building PAB	\$130,805	15	0.142
03.13-PD1 Upgrade Air Cooled Chiller	Police District 1	\$699,564	23	1.163
03.13-PD3 Upgrade Air Cooled Chiller	Police District #3	\$631,886	23	1.051
04.01-CCB BAS Controls Upgrade/ Replacement	City and County Building	\$754,093	15	0.818
04.01-PAB BAS Controls Upgrade/ Replacement	Police Administration Building PAB	\$793,231	15	0.860
04.01-POA BAS Controls Upgrade/ Replacement	Denver Police Academy	\$138,145	15	0.150
04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	\$69,661	15	0.076
04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	\$132,676	15	0.144
04.02-PMB Occupancy Based HVAC Controls	Permit Building	\$60,684	15	0.066
04.07-RAC Ventilation Control	Rose Andom Center	\$73,976	17.5	0.094
08.05-PD1 Add VFDs to Building Pumps	Police District 1	\$125,456	12	0.109
08.05-PD3 Add VFDs to Building Pumps	Police District #3	\$109,173	12	0.095
09.01-CCB Interior LED Lighting Upgrades	City and County Building	\$374,635	20	0.542
09.01-CMP Interior LED Lighting Upgrades	The Commons on Champa	\$242,408	20	0.350
09.01-CTS Interior LED Lighting Upgrades	South Cherry Creek Transfer Station	\$38,932	12	0.034
09.01-DAS Interior LED Lighting Upgrades	Denver Municipal Animal Shelter	\$112,516	12	0.098
09.01-DCL Interior LED Lighting Upgrades	Denver Crime Lab	\$167,516	12	0.145
09.01-FM5 Interior LED Lighting Upgrades	Fleet Maintenance Building #5	\$39,223	12	0.034
09.01-FS2 Interior LED Lighting Upgrades	Fire Station #2	\$30,794	12	0.027
09.01-FS21 Interior LED Lighting Upgrades	Fire Station #21	\$17,027	12	0.015
09.01-FS22 Interior LED Lighting Upgrades	Fire Station #22	\$13,397	12	0.012
09.01-FS24 Interior LED Lighting Upgrades	Fire Station #24	\$10,005	12	0.009
09.01-FS26 Interior LED Lighting Upgrades	Fire Station #26	\$31,706	12	0.028
09.01-GPO Interior LED Lighting Upgrades	Gary Price Operations Building	\$102,945	12	0.089
09.01-LFC Interior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	\$862,211	12	0.748
09.01-OFM Interior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	\$29,689	12	0.026
09.01-PAB Interior LED Lighting Upgrades	Police Administration Building PAB	\$225,736	12	0.196
09.01-PD2 Interior LED Lighting Upgrades	Police District 2	\$53,819	12	0.047
09.01-PD3 Interior LED Lighting Upgrades	Police District #3	\$67,802	12	0.059
09.01-PMB Interior LED Lighting Upgrades	Permit Building	\$307,958	12	0.267
09.01-POA Interior LED Lighting Upgrades	Denver Police Academy	\$50,107	12	0.043
09.01-RAC Interior LED Lighting Upgrades	Rose Andom Center	\$65,394	12	0.057
09.01-VDC Interior LED Lighting Upgrades	Van Cise-Simonet Detention Center	\$620,559	12	0.538
09.02-CMP Exterior LED Lighting Upgrades	The Commons on Champa	\$3,556	12	0.003
09.02-CTS Exterior LED Lighting Upgrades	South Cherry Creek Transfer Station	\$11,580	12	0.010
09.02-DAS Exterior LED Lighting Upgrades	Denver Municipal Animal Shelter	\$3,030	12	0.003
09.02-DCL Exterior LED Lighting Upgrades	Denver Crime Lab	\$13,155	12	0.011
09.02-FM5 Exterior LED Lighting Upgrades	Fleet Maintenance Building #5	\$35,529	12	0.031
09.02-FS2 Exterior LED Lighting Upgrades	Fire Station #2	\$6,911	12	0.006
09.02-FS21 Exterior LED Lighting Upgrades	Fire Station #21	\$869	12	0.001
09.02-FS22 Exterior LED Lighting Upgrades	Fire Station #22	\$145	12	0.000
09.02-FS24 Exterior LED Lighting Upgrades	Fire Station #24	\$3,941	12	0.003
09.02-FS26 Exterior LED Lighting Upgrades	Fire Station #26	\$9,396	12	0.008
09.02-GPO Exterior LED Lighting Upgrades	Gary Price Operations Building	\$24,251	12	0.021
09.02-LFC Exterior LED Lighting Upgrades	Lindsay-Flanigan Courthouse	\$23,542	12	0.020
09.02-OFM Exterior LED Lighting Upgrades	South Osage Fleet Maintenance Garage	\$6,199	12	0.005
09.02-PAB Exterior LED Lighting Upgrades	Police Administration Building PAB	\$48,813	12	0.042
09.02-PD2 Exterior LED Lighting Upgrades	Police District 2	\$25,750	12	0.022
09.02-PMB Exterior LED Lighting Upgrades	Permit Building	\$2,817	12	0.002
09.02-POA Exterior LED Lighting Upgrades	Denver Police Academy	\$9,040	12	0.008
09.02-RAC Exterior LED Lighting Upgrades	Rose Andom Center	\$7,692	12	0.007
09.02-VDC Exterior LED Lighting Upgrades	Van Cise-Simonet Detention Center	\$28,518	12	0.025
10.01-FS2 Solar Photovoltaic - Roof	Fire Station #2	\$398,261	30	0.864
10.01-PD3 Solar Photovoltaic- Roof	Police District #3	\$908,603	30	1.970
10.02 - POA Solar Photovoltaic - Canopy	Denver Police Academy	\$805,274	30	1.746
10.02-FM5 Solar Photovoltaic - Canopy	Fleet Maintenance Building #5	\$480,338	30	1.042
10.02-PD2 Solar Photovoltaic - Canopy	Police District 2	\$1,218,836	30	2.643
13.04-CMP Replace Single Pane Windows	The Commons on Champa	\$345,463	40	0.999
Total - For All Measures by Category		\$13,834,597		21.1

SCHEDULE H**Certification that Cost-weighted Average Service Life of Equipment Exceeds Financing Term**

Notes
(1) Using Schedule B Cost values for equipment to be financed
(2) Service Life (indicate source of service life by ECM on the following table). See IGA Section 3 of the main report body.
(3) Total of ECM/FIM Individual Average Service Life Values <i>Formula: Cost-Weighted Average Service Life = $\sum((\text{each ECM cost} \times \text{service life}) \div \text{total construction cost})$</i>
(4) Financing Agreement Term from final Principal Representative financing documents (Section 24-30-2001(1)(d), C.R.S. states that the maximum term of the payments shall be less than the Cost-Weighted Average Useful (<i>service</i>) Life of utility cost-savings equipment for which the contract is made, not to exceed 25 years)

EPC SCHEDULE I RECORD OF REVIEWS (LOCAL GOVERNMENTS)

INVESTMENT GRADE AUDIT CONTRACT (this review shall be completed by a CEPCP member and the Principal Representative of the City)

The IGA Contract review establishes:

- Confirmation that the CEPCP-provided IGA contract and exhibits are being used
- Scope of Work (IGA Schedule B) if modified, was only modified within the generally historically allowed changes with approval of the client, the CEPCP reviewer, and OSA as applicable.
- ESCO cost and pricing elements are within the boundaries of the EPC base agreement contract with CEPCP program; and
- No additions, subtractions, or changes have been made to the IGA contract without notifying and receiving approval from the Principal Representative, the CEPCP reviewer, and OSA as applicable.

CEPCP Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____

City Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____

INVESTMENT GRADE AUDIT REPORT AND PROJECT PROPOSAL (This review shall be completed by a CEPCP member, the Principal Representative, and, as necessary, OSA, prior to finalizing the EPC Project Proposal for an EPC contract)

IGA report review addressed the following:

- IGA has met the minimum requirements as outlined in the CEPCP IGA Schedule B, Scope of Work;
- Verifies compliance with all applicable legislation for state governments;
- Reviews existing operational assumptions and adds notes as necessary to the Principal Representative and ESCO verifying assumptions are confirmed by the Principal Representative;
- Confirms that adequate technical details follow appropriate methodologies and assumptions used to calculate savings (utility usage reduction) for each Utility Cost Savings Measure or FIM;
- Confirms costs document: engineering/design costs, contractor/vendor estimates, fees, estimated code compliance cost, etc.
- Principal Representative confirms that any operation and/or maintenance (O&M) savings proposed by the ESCO are acceptable. The sufficiency of O&M savings are not reviewed by the CEPCP;
 - Principal Representative Signature _____
 - Date: _____
- Principal Representative confirms that presented operations, schedules, set points, etc. are acceptable.
 - Principal Representative Signature _____
 - Date: _____
- Principal Representative confirms commissioning, M&V plans, and any non-verified calculated savings, are in compliance with the CEPCP and that the Principal Representative understands and accepts these items and schedules.

EPC SCHEDULE I RECORD OF REVIEWS (LOCAL GOVERNMENTS)

- Principal Representative Signature _____
- Date: _____
- Principal Representative confirms, when applicable, the Principal Representative’s annual or one-time monetary contributions are included in the financial performance schedule. The sufficiency of such contributions is not reviewed by the CEPCP.
 - Principal Representative Signature _____
 - Date: _____
- Principal Representative confirms acceptance of presented annual utility and inflation escalation rates.
 - Principal Representative Signature _____
 - Date: _____

CEPCP Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____

Principal Representative Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____

ENERGY PERFORMANCE CONTRACT (this shall be completed by a CEPCP member, the Principal Representative, and as necessary, OSA, prior to the ESCO signing the contract)

The EPC review establishes the following:

- Confirms that the CEPCP provided EPC contract and schedules are being used;
- ESCO cost and pricing elements are within the boundaries of their EPC base agreement contract with CEPCP;
- No additions, subtractions, or changes have been made to the contract without notifying and receiving approval from the Principal Representative, the CEPCP reviewer, a Principal Representative legal review, and Principal Representative Controller (or equivalent);
- If modified, all modifications, updates, additions to the schedules and exhibits are within the generally historically allowed changes. All changes are tracked until accepted by CEPCP reviewer and OSA as applicable; and
- Confirms the pro-forma schedule includes all known Principal Representative funds, utility rebates, other grant funds, and all potential cost through the length of the loan.

CEPCP Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____

Principal Representative Reviewer: _____ Date Completed: _____
 Reviewers Comments: _____



CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY)

11/15/2021

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Hub International Northwest LLC PO Box 3018 Bothell, WA 98041	CONTACT NAME: PHONE (A/C, No, Ext): (425) 489-4500 FAX (A/C, No): (425) 485-8489 E-MAIL ADDRESS: now.info@hubinternational.com
INSURER(S) AFFORDING COVERAGE	
INSURED	NAIC #
McKinstry Essention, LLC 5005 3rd Ave South Seattle, WA 98134	INSURER A : The Travelers Indemnity Company 25658 INSURER B : Travelers Property Casualty Company of America 25674 INSURER C : Standard Fire Insurance Company 19070 INSURER D : Steadfast Insurance Company 26387 INSURER E : INSURER F :

COVERAGES

CERTIFICATE NUMBER:

REVISION NUMBER:

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS
A	<input checked="" type="checkbox"/> COMMERCIAL GENERAL LIABILITY CLAIMS-MADE <input checked="" type="checkbox"/> OCCUR <input checked="" type="checkbox"/> WA Stop Gap GEN'L AGGREGATE LIMIT APPLIES PER: <input type="checkbox"/> POLICY <input checked="" type="checkbox"/> PROJECT <input type="checkbox"/> LOC OTHER:	X	X	VTC2KCO5643B901IND21	1/31/2021	1/31/2022	EACH OCCURRENCE \$ 2,000,000 DAMAGE TO RENTED PREMISES (Ea occurrence) \$ 300,000 MED EXP (Any one person) \$ 10,000 PERSONAL & ADV INJURY \$ 2,000,000 GENERAL AGGREGATE \$ 4,000,000 PRODUCTS - COMP/OP AGG \$ 4,000,000 \$
B	<input checked="" type="checkbox"/> AUTOMOBILE LIABILITY <input type="checkbox"/> ANY AUTO OWNED AUTOS ONLY <input type="checkbox"/> SCHEDULED AUTOS <input type="checkbox"/> HIRED AUTOS ONLY <input type="checkbox"/> NON-OWNED AUTOS ONLY			VTC2J-CAP-5643B913-TIL-21	1/31/2021	1/31/2022	COMBINED SINGLE LIMIT (Ea accident) \$ 2,000,000 BODILY INJURY (Per person) \$ BODILY INJURY (Per accident) \$ PROPERTY DAMAGE (Per accident) \$ \$
	<input type="checkbox"/> UMBRELLA LIAB <input type="checkbox"/> OCCUR <input type="checkbox"/> EXCESS LIAB <input type="checkbox"/> CLAIMS-MADE DED RETENTION \$						EACH OCCURRENCE \$ AGGREGATE \$ \$
C	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) <input checked="" type="checkbox"/> Y / <input checked="" type="checkbox"/> N If yes, describe under DESCRIPTION OF OPERATIONS below		N/A	X 6899Y8019	10/1/2021	10/1/2022	<input checked="" type="checkbox"/> PER STATUTE <input type="checkbox"/> OTH-ER E.L. EACH ACCIDENT \$ 1,000,000 E.L. DISEASE - EA EMPLOYEE \$ 1,000,000 E.L. DISEASE - POLICY LIMIT \$ 1,000,000
D	PROFESSIONAL LIAB			EOC673879408	1/31/2021	1/31/2022	OCC/AGG: \$ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

City and County of Denver are included as Additional Insured, coverage is primary and non-contributory and waiver of subrogation applies per the attached forms/endorsements.

CERTIFICATE HOLDER

CANCELLATION

City and County of Denver
 201 W Colfax Ave
 Denver, CO 80202

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY**BLANKET ADDITIONAL INSURED
(CONTRACTORS)**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

1. WHO IS AN INSURED – (Section II) is amended to include any person or organization that you agree in a "written contract requiring insurance" to include as an additional insured on this Coverage Part, but:
 - a) Only with respect to liability for "bodily injury", "property damage" or "personal injury"; and
 - b) If, and only to the extent that, the injury or damage is caused by acts or omissions of you or your subcontractor in the performance of "your work" to which the "written contract requiring insurance" applies. The person or organization does not qualify as an additional insured with respect to the independent acts or omissions of such person or organization.
2. The insurance provided to the additional insured by this endorsement is limited as follows:
 - a) In the event that the Limits of Insurance of this Coverage Part shown in the Declarations exceed the limits of liability required by the "written contract requiring insurance", the insurance provided to the additional insured shall be limited to the limits of liability required by that "written contract requiring insurance". This endorsement shall not increase the limits of insurance described in Section III – Limits Of Insurance.
 - b) The insurance provided to the additional insured does not apply to "bodily injury", "property damage" or "personal injury" arising out of the rendering of, or failure to render, any professional architectural, engineering or surveying services, including:
 - i. The preparing, approving, or failing to prepare or approve, maps, shop drawings, opinions, reports, surveys, field orders or change orders, or the preparing, approving, or failing to prepare or approve, drawings and specifications; and
 - ii. Supervisory, inspection, architectural or engineering activities.
3. The insurance provided to the additional insured by this endorsement is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured for a loss we cover under this endorsement. However, if the "written contract requiring insurance" specifically requires that this insurance apply on a primary basis or a primary and non-contributory basis, this insurance is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured for such loss, and we will not share with that "other insurance". But the insurance provided to the additional insured by this endorsement still is excess over any valid and collectible "other insurance", whether primary, excess, contingent or on any other basis, that is available to the additional insured when that person or organization is an additional insured under such "other insurance".
4. As a condition of coverage provided to the additional insured by this endorsement:
 - a) The additional insured must give us written notice as soon as practicable of an "occurrence" or an offense which may result in a claim. To the extent possible, such notice should include:
 - c) The insurance provided to the additional insured does not apply to "bodily injury" or "property damage" caused by "your work" and included in the "products-completed operations hazard" unless the "written contract requiring insurance" specifically requires you to provide such coverage for that additional insured, and then the insurance provided to the additional insured applies only to such "bodily injury" or "property damage" that occurs before the end of the period of time for which the "written contract requiring insurance" requires you to provide such coverage or the end of the policy period, whichever is earlier.

COMMERCIAL GENERAL LIABILITY

- i. How, when and where the "occurrence" or offense took place;
 - ii. The names and addresses of any injured persons and witnesses; and
 - iii. The nature and location of any injury or damage arising out of the "occurrence" or offense.
- b) If a claim is made or "suit" is brought against the additional insured, the additional insured must:
- i. Immediately record the specifics of the claim or "suit" and the date received; and
 - ii. Notify us as soon as practicable.
- The additional insured must see to it that we receive written notice of the claim or "suit" as soon as practicable.
- c) The additional insured must immediately send us copies of all legal papers received in connection with the claim or "suit", cooperate with us in the investigation or settlement of the claim or defense against the "suit", and otherwise comply with all policy conditions.
- d) The additional insured must tender the defense and indemnity of any claim or "suit" to

any provider of "other insurance" which would cover the additional insured for a loss we cover under this endorsement. However, this condition does not affect whether the insurance provided to the additional insured by this endorsement is primary to "other insurance" available to the additional insured which covers that person or organization as a named insured as described in paragraph 3. above.

5. The following definition is added to SECTION V. – DEFINITIONS:

"Written contract requiring insurance" means that part of any written contract or agreement under which you are required to include a person or organization as an additional insured on this Coverage Part, provided that the "bodily injury" and "property damage" occurs and the "personal injury" is caused by an offense committed:

- a. After the signing and execution of the contract or agreement by you;
- b. While that part of the contract or agreement is in effect; and
- c. Before the end of the policy period.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**OTHER INSURANCE – DESIGNATED ADDITIONAL
INSUREDS – PRIMARY WITH RESPECT TO CERTAIN
OTHER INSURANCE**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE OF DESIGNATED ADDITIONAL INSUREDS

Any person or organization that qualifies as an additional insured under such other endorsement to this Coverage Part, if you agree in a written contract to include such person or organization as an additional insured on this Coverage Part and such written contract:

- a. Specifically requires that this insurance apply on a primary basis or a primary and non-contributory basis; and
- b. Was signed and executed by you before, and is in effect when, the "bodily injury" or "property damage" occurs or the "personal injury" or "advertising injury" offense is committed

PROVISIONS

The following is added to Paragraph 4.a., **Primary Insurance**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

The insurance afforded under this Coverage Part to any additional insured shown in the Schedule Of

Designated Additional Insureds is primary to any of the other insurance, whether primary, excess, contingent or on any other basis, that is available to such additional insured which covers such additional insured as a named insured, and we will not share with that other insurance.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

XTEND ENDORSEMENT FOR CONTRACTORS

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

GENERAL DESCRIPTION OF COVERAGE – This endorsement broadens coverage. However, coverage for any injury, damage or medical expenses described in any of the provisions of this endorsement may be excluded or limited by another endorsement to this Coverage Part, and these coverage broadening provisions do not apply to the extent that coverage is excluded or limited by such an endorsement. The following listing is a general coverage description only. Read all the provisions of this endorsement and the rest of your policy carefully to determine rights, duties, and what is and is not covered.

- | | |
|---|---|
| <ul style="list-style-type: none"> A. Who Is An Insured – Unnamed Subsidiaries B. Blanket Additional Insured – Governmental Entities – Permits Or Authorizations Relating To Operations | <ul style="list-style-type: none"> C. Incidental Medical Malpractice D. Blanket Waiver Of Subrogation E. Contractual Liability – Railroads F. Damage To Premises Rented To You |
|---|---|

PROVISIONS

A. WHO IS AN INSURED – UNNAMED SUBSIDIARIES

The following is added to **SECTION II – WHO IS AN INSURED**:

Any of your subsidiaries, other than a partnership, joint venture or limited liability company, that is not shown as a Named Insured in the Declarations is a Named Insured if:

- a. You are the sole owner of, or maintain an ownership interest of more than 50% in, such subsidiary on the first day of the policy period; and
- b. Such subsidiary is not an insured under similar other insurance.

No such subsidiary is an insured for "bodily injury" or "property damage" that occurred, or "personal and advertising injury" caused by an offense committed:

- a. Before you maintained an ownership interest of more than 50% in such subsidiary; or
- b. After the date, if any, during the policy period that you no longer maintain an ownership interest of more than 50% in such subsidiary.

For purposes of Paragraph 1. of Section II – Who Is An Insured, each such subsidiary will be deemed to be designated in the Declarations as:

- a. An organization other than a partnership, joint venture or limited liability company; or

- b. A trust;

as indicated in its name or the documents that govern its structure.

B. BLANKET ADDITIONAL INSURED – GOVERNMENTAL ENTITIES – PERMITS OR AUTHORIZATIONS RELATING TO OPERATIONS

The following is added to **SECTION II – WHO IS AN INSURED**:

Any governmental entity that has issued a permit or authorization with respect to operations performed by you or on your behalf and that you are required by any ordinance, law, building code or written contract or agreement to include as an additional insured on this Coverage Part is an insured, but only with respect to liability for "bodily injury", "property damage" or "personal and advertising injury" arising out of such operations.

The insurance provided to such governmental entity does not apply to:

- a. Any "bodily injury", "property damage" or "personal and advertising injury" arising out of operations performed for the governmental entity; or
- b. Any "bodily injury" or "property damage" included in the "products-completed operations hazard".

COMMERCIAL GENERAL LIABILITY

C. INCIDENTAL MEDICAL MALPRACTICE

1. The following replaces Paragraph **b.** of the definition of "occurrence" in the **DEFINITIONS** Section:

b. An act or omission committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to a person, unless you are in the business or occupation of providing professional health care services.

2. The following replaces the last paragraph of Paragraph **2.a.(1)** of **SECTION II – WHO IS AN INSURED**:

Unless you are in the business or occupation of providing professional health care services, Paragraphs **(1)(a)**, **(b)**, **(c)** and **(d)** above do not apply to "bodily injury" arising out of providing or failing to provide:

(a) "Incidental medical services" by any of your "employees" who is a nurse, nurse assistant, emergency medical technician or paramedic; or

(b) First aid or "Good Samaritan services" by any of your "employees" or "volunteer workers", other than an employed or volunteer doctor. Any such "employees" or "volunteer workers" providing or failing to provide first aid or "Good Samaritan services" during their work hours for you will be deemed to be acting within the scope of their employment by you or performing duties related to the conduct of your business.

3. The following replaces the last sentence of Paragraph **5.** of **SECTION III – LIMITS OF INSURANCE**:

For the purposes of determining the applicable Each Occurrence Limit, all related acts or omissions committed in providing or failing to provide "incidental medical services", first aid or "Good Samaritan services" to any one person will be deemed to be one "occurrence".

4. The following exclusion is added to Paragraph **2.**, **Exclusions**, of **SECTION I – COVERAGES – COVERAGE A – BODILY INJURY AND PROPERTY DAMAGE LIABILITY**:

Sale Of Pharmaceuticals

"Bodily injury" or "property damage" arising out of the violation of a penal statute or ordinance relating to the sale of

pharmaceuticals committed by, or with the knowledge or consent of, the insured.

5. The following is added to the **DEFINITIONS** Section:

"Incidental medical services" means:

a. Medical, surgical, dental, laboratory, x-ray or nursing service or treatment, advice or instruction, or the related furnishing of food or beverages; or

b. The furnishing or dispensing of drugs or medical, dental, or surgical supplies or appliances.

6. The following is added to Paragraph **4.b.**, **Excess Insurance**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

This insurance is excess over any valid and collectible other insurance, whether primary, excess, contingent or on any other basis, that is available to any of your "employees" for "bodily injury" that arises out of providing or failing to provide "incidental medical services" to any person to the extent not subject to Paragraph **2.a.(1)** of Section II – Who Is An Insured.

D. BLANKET WAIVER OF SUBROGATION

The following is added to Paragraph **8.**, **Transfer Of Rights Of Recovery Against Others To Us**, of **SECTION IV – COMMERCIAL GENERAL LIABILITY CONDITIONS**:

If the insured has agreed in a contract or agreement to waive that insured's right of recovery against any person or organization, we waive our right of recovery against such person or organization, but only for payments we make because of:

a. "Bodily injury" or "property damage" that occurs; or

b. "Personal and advertising injury" caused by an offense that is committed;

subsequent to the execution of the contract or agreement.

E. CONTRACTUAL LIABILITY – RAILROADS

1. The following replaces Paragraph **c.** of the definition of "insured contract" in the **DEFINITIONS** Section:

c. Any easement or license agreement;

COMMERCIAL GENERAL LIABILITY

2. Paragraph **f.(1)** of the definition of "insured contract" in the **DEFINITIONS** Section is deleted.

F. DAMAGE TO PREMISES RENTED TO YOU

The following replaces the definition of "premises damage" in the **DEFINITIONS** Section:

"Premises damage" means "property damage" to:

- a. Any premises while rented to you or temporarily occupied by you with permission of the owner; or
- b. The contents of any premises while such premises is rented to you, if you rent such premises for a period of seven or fewer consecutive days.

THIS ENDORSEMENT CHANGES THE POLICY. PLEASE READ IT CAREFULLY.

**TOTAL AGGREGATE LIMIT OTHER THAN PROJECTS
AND DESIGNATED PROJECT AND LOCATION
AGGREGATE LIMITS**

This endorsement modifies insurance provided under the following:

COMMERCIAL GENERAL LIABILITY COVERAGE PART

SCHEDULE – LIMITS OF INSURANCE AND DESIGNATED PROJECTS AND LOCATIONS

LIMITS OF INSURANCE

Total Aggregate Limit (Other Than Projects and Products-Completed Operations)	\$ 25,000,000
Designated Location Aggregate Limit (Other Than Products-Completed Operations)	\$ 4,000,000
Designated Project Aggregate Limit (Other Than Products-Completed Operations)	\$ 4,000,000
General Aggregate Limit (Other Than Products-Completed Operations)	\$ 4,000,000

Designated Projects:

Each "project" away from premises owned by or rented to you
Designated Locations: Each premises owned by or rented to you

Designated Locations:

Each premises owned by or rented to you

PROVISIONS

- | | |
|--|---|
| <ol style="list-style-type: none"> The General Aggregate Limit (Other Than Products-Completed Operations) shown in the Declarations is replaced by the Limits of Insurance shown in the Schedule – Limits Of Insurance And Designated Projects And Locations. The following replaces Paragraph 1. of SECTION III – LIMITS OF INSURANCE: | <ol style="list-style-type: none"> The Limits of Insurance shown in the Declarations or the Schedule – Limits Of Insurance And Designated Projects And Locations, whichever apply, and the rules below fix the most we will pay regardless of the number of: <ol style="list-style-type: none"> Insureds; Claims made or "suits" brought; |
|--|---|

COMMERCIAL GENERAL LIABILITY

- c. Persons or organizations making claims or bringing "suits"; or
 - d. "Projects" or "locations".
3. The following replaces Paragraph 2. of **SECTION III – LIMITS OF INSURANCE:**
2. a. The Total Aggregate Limit shown in the Schedule – Limits Of Insurance And Designated Projects And Locations is the most we will pay for the sum of all amounts under the Designated Location Aggregate Limit and all amounts under the General Aggregate Limit. This includes:
- (1) Damages under Coverage A, except damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard";
 - (2) Damages under Coverage B; and
 - (3) Medical expenses under Coverage C.
- b. The Designated Project Aggregate Limit shown in the Schedule – Limits Of Insurance And Designated Projects And Locations applies and is further subject to all of the following provisions:
- (1) The Designated Project Aggregate Limit is the most we will pay for the sum of:
 - (a) Damages under Coverage A because of "bodily injury" and "property damage" caused by "occurrences"; and
 - (b) Medical expenses under Coverage C for "bodily injury" caused by accidents;
 that can be attributed only to operations at a single "project".
 - (2) The Designated Project Aggregate Limit applies separately to each "project".
 - (3) The Designated Project Aggregate Limit does not apply to damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard". Instead, the Products-Completed Operations Aggregate Limit described in Paragraph 3. below applies to such damages.
 - (4) The Designated Project Aggregate Limit does not apply to damages
- under Coverage B. Instead, the General Aggregate Limit described in Paragraph 2.d. below applies to such damages.
- (5) Any payments made for damages or medical expenses to which the Designated Project Aggregate Limit applies will reduce the Designated Project Aggregate Limit for the applicable "project". Such payments will not reduce the Total Aggregate Limit, the General Aggregate Limit described in Paragraph 2.d. below, the Designated Project Aggregate Limit for any other "project" or the Designated Location Aggregate Limit.
- c. Subject to the Total Aggregate Limit described in Paragraph 2.a. above, the Designated Location Aggregate Limit shown in the Schedule – Limits Of Insurance And Designated Projects And Locations applies and is further subject to all of the following provisions:
- (1) The Designated Location Aggregate Limit is the most we will pay for the sum of:
 - (a) Damages under Coverage A because of "bodily injury" and "property damage" caused by "occurrences"; and
 - (b) Medical expenses under Coverage C for "bodily injury" caused by accidents;
 that can be attributed only to operations at a single "location".
 - (2) The Designated Location Aggregate Limit applies separately to each "location".
 - (3) The Designated Location Aggregate Limit does not apply to damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard". Instead, the Products-Completed Operations Aggregate Limit described in Paragraph 3. below applies to such damages.
 - (4) The Designated Location Aggregate Limit does not apply to damages ssunder Coverage B. Instead, the General Aggregate Limit described in

Paragraph **2.d.** below applies to such damages.

- (5) Any payments made for damages or medical expenses to which the Designated Location Aggregate Limit applies will reduce:

- (a) The Total Aggregate Limit; and
 (b) The Designated Location Aggregate Limit for the applicable "location".

Such payments will not reduce the General Aggregate Limit described in Paragraph **2.d.** below, the Designated Project Aggregate Limit or the Designated Location Aggregate Limit for any other "location".

- d. Subject to the Total Aggregate Limit described in Paragraph **2.a.** above, the General Aggregate Limit shown in the Schedule – Limits Of Insurance And Designated Projects And Locations applies and is further subject to all of the following provisions:

- (1) The General Aggregate Limit is the most we will pay for the sum of:

- (a) Damages under Coverage **A** because of "bodily injury" and "property damage" caused by "occurrences", and medical expenses under Coverage **C** for "bodily injury" caused by accidents, that cannot be attributed only to operations at a single "project" or a single "location"; and
 (b) Damages under Coverage **B**.

- (2) The General Aggregate Limit does not apply to damages for "bodily injury" or "property damage" included in the "products-completed operations hazard". Instead, the Products-Completed Operations Aggregate Limit described in Paragraph **3.** below applies to such damages.

- (3) Any payments made for damages or medical expenses to which the

General Aggregate Limit applies will reduce:

- (a) The Total Aggregate Limit; and
 (b) The General Aggregate Limit.

Such payments will not reduce the Designated Project Aggregate Limit for any "project" or the Designated Location Aggregate Limit for any "location".

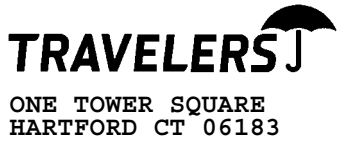
4. The following replaces Paragraph **3.** of **SECTION III – LIMITS OF INSURANCE:**

3. The Products-Completed Operations Aggregate Limit shown in the Declarations is the most we will pay under Coverage **A** for damages because of "bodily injury" or "property damage" included in the "products-completed operations hazard". Any payments made for such damages will not reduce the Total Aggregate Limit, the General Aggregate Limit, the Designated Project Aggregate Limit for any "project" or the Designated Location Aggregate Limit for any "location".

5. The following is added to the **DEFINITIONS** Section:

"Location" means any designated location shown in the Schedule – Limits Of Insurance And Designated Projects and Locations that is owned by or rented to you. For the purposes of determining the applicable aggregate limit of insurance, each "location" that includes a premises involving the same or connecting lots, or premises whose connection is interrupted only by a street, roadway or waterway, or by a right-of-way of a railroad, will be considered a single "location".

"Project" means any designated project shown in the Schedule – Limits Of Insurance And Designated Projects And Locations that is away from premises owned by or rented to you and at which you are performing operations pursuant to a contract or agreement. For the purposes of determining the applicable aggregate limit of insurance, each "project" that includes a premises involving the same or connecting lots, or premises whose connection is interrupted only by a street, roadway or waterway, or by a right-of-way of a railroad, will be considered a single "project".



**WORKERS COMPENSATION
AND
EMPLOYERS LIABILITY POLICY**

ENDORSEMENT WC 00 03 13 (00) - 001

POLICY NUMBER: UB-9K158609-21-25-G

WAIVER OF OUR RIGHT TO RECOVER FROM OTHERS ENDORSEMENT

We have the right to recover our payments from anyone liable for an injury covered by this policy. We will not enforce our right against the person or organization named in the Schedule. (This agreement applies only to the extent that you perform work under a written contract that requires you to obtain this agreement from us.)

This agreement shall not operate directly or indirectly to benefit any one not named in the Schedule.

SCHEDULE

DESIGNATED PERSON:

DESIGNATED ORGANIZATION:

ANY PERSON OR ORGANIZATION FOR WHICH THE INSURED HAS AGREED
BY WRITTEN CONTRACT EXECUTED PRIOR TO LOSS TO FURNISH THIS
WAIVER.

Any person or organization for which the employer has agreed by written contract, executed prior to loss, may execute a waiver of subrogation. However, for purposes of work performed by the employer in Missouri, this waiver of subrogation does not apply to any construction group of classifications as designated by the waiver of right to recover from others (subrogation) rule in our manual.

EPC SCHEDULE N: STANDARDS OF COMFORT

Existing occupied thermal comfort conditions will be maintained. The facility improvement measures listed do not impact existing occupied space thermostat setpoints.

Unoccupied space thermostat set points and HVAC equipment operating schedules may be modified.

The City acknowledges that Controls Optimization/RCx savings and Occupancy Based HVAC Controls involve occupied and unoccupied setpoint changes during heating and cooling seasons to realize energy savings. These generic setpoints are:

- Occupied/unoccupied during occupied time/unoccupied heating: 70F/68F/60F
- Occupied/unoccupied during occupied time/unoccupied cooling: 74F/78F/90F

These setpoints are based on typical office facility best practices and building’s occupants were not involved in these decisions. Occupant requests to change will impact the total energy savings realized.

For specific sites affected by specific controls related ECMs, temperature setpoints are as follows:

1. CMP (Commons on Champa)

04.02-CMP Occupancy Based HVAC Controls	The Commons on Champa	A	Unoccupied Temperature Setpoint	Occ Cool: 73F, Occ Heat: 69F Unocc Cool: 80F Unocc Heat: 60F	Occ Cool: 73F, Occ Heat: 69F Unocc Cool 80F Unocc Heat 60F Unocc Cool setback: 75F Unocc Heat setback: 67F
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2. PAB (Police Administration Bldg)

04.02-PAB Occupancy Based HVAC Control	Police Administration Building PAB	A	Unoccupied Temperature Setpoint	Occ/ Unocc Cool: 74F Occ/ Unocc Heat: 72F	Occ Cool: 74F Occ Heat: 72F Unocc Cool: 78F Unocc Cool Setback: 76F Unocc Heat: 68F Unocc Heat Setback: 70F
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3. PMB (Permit Bldg)

04.02-PMB Occupancy Based HVAC Controls	Permit Building	A	Unoccupied Temperature Setpoint	Occ Heat: 72F Occ Cool: 74F Unocc Cool: 80F Unocc Heat: 65F	Occ Cool: 74F Unocc Cool: 80F Occ Heat: 72F Unocc Heat: 65F Unocc Cool setback: 76F Unocc Heat setback: 70F
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4. PTO (Police Traffic Operations)

04.02-PTO Occupancy Based HVAC Control	Police Traffic Operations Bureau	A	Unoccupied Temperature Setpoint	Occ Cool: 75F, Occ Heat: 72F Unocc Cool: 80F Unocc Heat: 70	Occ Cool: 75F Unocc Cool 80F Occ Heat 72F Unocc Heat 70 F Unocc Cool setback: 77F Unocc Heat setback: 68F
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The light levels will change in areas where lighting scope is present. The Customer agrees to the following light level design approaches:

- In locations where the current light levels exceed recommended light levels, the design seeks to reduce light levels to meet the target light levels.
- In situations where the current light levels are below recommended light levels the design seeks to maintain current light levels

Target light levels are defined by requirements described in illuminating Engineering Society (IES) Lighting Handbook.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

The commissioning plan for each ECM (Energy Conservation Measure) will be based on the standard commissioning plan below. Any variations from the standard commissioning plan are described with each individual ECM below.

A. STANDARD START-UP PLAN

Field supervision of contractor startup of new equipment with manufacturer's representatives participation as needed. The presence of owner personnel may be requested during the commissioning process.

B. STANDARD COMMISSIONING PLAN

The commissioning plan for each ECM will be based on the standard commissioning plan below. Any variations from the standard commissioning plan are described with each individual FIM below.

The following preliminary commissioning plan is designed as a framework from which the final commissioning plan will be developed. The presence of owner personnel may be requested during the commissioning process.

The commissioning agent will:

- Review submittals to ensure that controls protocols and system performance align with the energy savings guarantees and design intentions.
- Review and approve control sequences with M&V and energy engineer.
- Review and approve contractor plans for equipment pre-startup and startup activities. Document that necessary procedures are followed to ensure the integrity and performance of the physical systems.
- Review and approve test and balance procedures and reports. Spot check readings as necessary to ensure systems are performing correctly and the final conditions of the systems are properly documented.
- Create and distribute pre-functional test to the various responsible contractors and oversee the execution of the contractor's QA/ QC program.
- Perform functional testing to validate equipment performance and verify that control sequence programming is correct and meets intent.
- Verify the necessary trends are in place within the BAS.
- Analyze trend data to review performance.
- Review, approve and coordinate contractor training programs with the Customer. Where necessary the commissioning agent will attend and supplement contractor training sessions with training on system interactions.
- Provide final commissioning report with all findings and supporting documents.

C. ECM SPECIFIC COMMISSIONING PLANS

1. TEAM A: Building ECMs

1.1.1. ECM 01.06: CCB & PAB STEAM CONDENSATE HEAT RECOVERY

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning agent will review heating system sequence of operations and schedules as well as domestic hot water setpoints to verify the new equipment control is optimized. The condensate heat recovery will be standalone and not integrated into the BAS.

1.1.2. ECM 02.01: CCB CHILLED WATER PUMP REPLACEMENT

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

agent will review the chilled water pump control sequence of operations, pump curve operational point, schedules and setpoints to verify the new pump operation and speed control is optimized.

1.1.3. ECM 03.07: PAB MZU TO VAV UNIT

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify the new variable air volume system control is optimized and that zones are achieving the desired temperature setpoints.

1.1.4. ECM 04.01: CCB BAS CONTROLS UPGRADE/REPLACEMENT

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify all BACnet HVAC equipment control is optimized.

1.1.5. ECM 04.01: PAB BAS CONTROLS UPGRADE/REPLACEMENT

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify all HVAC equipment integrated onto the BAS is optimized.

1.1.6. ECM 04.02: PAB OCCUPANCY BASED HVAC CONTROL

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the fan coil unit operation is optimized.

1.1.7. ECM 09.01/9.02: CCB & PAB INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system.
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified.
- Provide final commissioning report with all findings and supporting documents.

2. TEAM B: BUILDING ECMS

2.1.1. ECM 03.13: PD3 UPGRADE AIR COOLED CHILLER

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the new chiller operation is optimized.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

2.1.2. ECM 08.05: PD3 ADD VFDS TO BUILDING PUMPS

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the pump operation is optimized.

2.1.3. ECM 09.01: DAS, OFM, AND PD3 INTERIOR AND EXTERIOR LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

2.1.4. ECM 10.01 PD3 SOLAR PHOTOVOLTAIC - CANOPY

Preliminary Commissioning Plan: Commissioning for Solar PV systems affects the following components:

- Structural racking components
- Electrical equipment and systems
- Data Acquisition System

Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

3. TEAM C: BUILDING ECMS

3.1.1. ECM 03.04: POA VVT TO VAV UNIT REPLACEMENT

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the new rooftop unit operation is optimized.

3.1.2. ECM 03.13: PD1 UPGRADE AIR COOLED CHILLER

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the new chiller operation is optimized.

3.1.3. ECM 04.01: POA BUILDING AUTOMATION SYSTEM (BAS) CONTROLS UPGRADE/ REPLACEMENT

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the BAS operation is optimized.

3.1.4. ECM 04.02: PTO OCCUPANCY BASED HVAC CONTROL

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the HVAC operation is optimized.

3.1.5. ECM 08.05: PD1 ADD VFDS TO BUILDING PUMPS

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the pump operation is optimized.

3.1.6. ECM 09.01/02 CTS, PD2, POA, AND PTO INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

3.1.7. ECM 10.01 POA SOLAR PHOTOVOLTAIC CANOPY

Preliminary Commissioning Plan: Commissioning for Solar PV systems affects the following components:

- Structural racking components
- Electrical equipment and systems
- Data Acquisition System

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

3.1.8. ECM 10.01 PTO SOLAR PHOTOVOLTAIC ROOF

Preliminary Commissioning Plan: Commissioning for Solar PV systems affects the following components:

- Structural racking components
- Electrical equipment and systems
- Data Acquisition System

Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

3.1.9. ECM 10.02 PD2 SOLAR PHOTOVOLTAIC - CANOPY

Preliminary Commissioning Plan: Commissioning for Solar PV systems affects the following components:

- Structural racking components
- Electrical equipment and systems
- Data Acquisition System

Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

4. TEAM D: BUILDING ECMS

4.1.1. ECM 01.06-DCL STEAM CONDENSATE HEAT RECOVERY

Preliminary Commissioning Plan: In addition to the standard Commissioning Plan, the commissioning agent will review heating system sequence of operations and schedules as well as domestic hot water setpoints to verify the new equipment control is optimized. The condensate heat recovery will be standalone and not integrated into the BAS.

4.1.2. ECM 02.12 RAC CHILLER REPLACEMENT

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the new chiller operation is optimized.

4.1.3. ECM 04.07-RAC VENTILATION CONTROL

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the ERV enthalpy wheel operation is optimized.

4.1.4. ECM 09.01/02 DCL, LFC, RAC AND VDC INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

5. TEAM E: BUILDING ECMS

5.1.1. ECM 04.02 CMP AND PMB OCCUPANCY BASED HVAC CONTROLS

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will review sequence of operations, schedules and setpoints to verify that the HVAC operation is optimized.

5.1.2. ECM 09.01/09.02 CMP AND PMB INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

EPC SCHEDULE Q: START UP AND COMMISSIONING PLAN

6. FIRE STATIONS: BUILDING ECMS

6.1.1. ECM 01.01: FS21 BOILER REPLACEMENT

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will verify pre and post pump flows.

6.1.2. ECM 01.02: FS24 BOILER REPLACEMENT

Preliminary Commissioning Plan: In addition to the Standard Commissioning Plan, the commissioning agent will verify pre and post pump flows.

6.1.3. ECM 09.01/09.02: FS2, FS21, FS22, FS24 AND FS26 INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

6.1.4. ECM 10.01: FS2 SOLAR PHOTOVOLTAIC - ROOF

Preliminary Commissioning Plan: Commissioning for Solar PV systems affects the following components:

- Structural racking components
- Electrical equipment and systems
- Data Acquisition System

Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

EPC SCHEDULE Q: SYSTEM START-UP AND COMMISSIONING

7. CPC: BUILDING ECMS

7.1.1. ECM 09.01/09.02: GPO AND FM5 INTERIOR AND EXTERIOR LED LIGHTING UPGRADES

Preliminary Commissioning Plan: Due to the straightforward nature of this ECM, inspections will be completed on a representative sample of fixtures. Most lighting inspections will be performed by a McKinstry Site Superintendent.

The energy savings for this ECM are based on a reduction in installed lighting power and the final commissioning plan will be focused on confirming that these improvements are achieved. The commissioning agent will:

- Review equipment and controls submittals to determine if performance criteria specified will be met
- Develop and perform functional performance tests (FPTs) to test the performance of the installed lighting control system
- Provide a McKinstry Site Superintendent with the appropriate guidelines for spaces to review to ensure that an acceptable representative sample (per FEMP 80/20) of new lighting installed is reviewed. Refer Typically, a minimum of the top 20% energy saving line items will be visually verified
- Provide final commissioning report with all findings and supporting documents.

7.1.2. 10.02-FM5 SOLAR PHOTOVOLTAIC - ROOF

Preliminary Commissioning Plan: Commissioning for Solar PV systems follows the standard commissioning process. Of significant note is that functional testing is accomplished as an entire system comparing available solar energy to the electrical production of the inverter. The angles, ambient temperature and industry standard numbers for reflectance and emittance are utilized to validate that the installed system can produce the designed power density.

EPC SCHEDULE R: CONTRACTOR TRAINING RESPONSIBILITIES

The Customer shall determine all attendees at the following trainings. The trainings will be based on the Contractor's experience and the Customer's needs. The trainings will include use and maintenance of the installed equipment per the manufacturer's recommendations. The trainings will include the warranty process. The Customer shall approve the final agenda for each training.

Training agenda and topics shall be developed by McKinstry and will include a review of sequences of operation, proper equipment operation, diagnosing and troubleshooting equipment failures, and preventive maintenance. McKinstry and the Owner shall approve the final training agenda. The training shall include a total of 40 hours of onsite training sessions that are divided among the installed FIMs where training is applicable, which will be recorded with audio and video at the Owner's request.

EPC SCHEDULE S: CUSTOMER MAINTENANCE RESPONSIBILITIES

The City shall provide the following services as part of this Agreement.

1. Maintain all equipment per manufacturers' recommendations.
2. Maintain active and updated maintenance logs for all equipment. Logs shall be kept for a minimum of the warranty period and must be provided to Contractor upon request in either electronic or hard copy format.
3. Maintain all sequence of operations and performance criteria related to installed systems as proposed and designed. This shall include but not be limited to making adjustments to occupancy schedules based upon City calendars, taking into account holidays, scheduled shutdowns, etc. The City shall maintain schedules to minimize equipment operation.
4. Upon request of Contractor, provide Contractor with copies of actual monthly utility billing information on a monthly basis for the duration of this contract. This includes utility bills for electric and natural gas usage. The associated facilities where utility information shall be provided include all meters providing direct or indirect service to all buildings included in this project.
5. Provide Contractor continuous full access to Energy Management and Control Systems for the purpose of collecting and trending data over time as required for performance verification.
6. The City shall notify Contractor in writing with regard to any changes or alterations to buildings that will affect energy usage. This notification must be provided within one month of the change. This includes occupancy or use changes, computer load or other load changes, scheduling changes, and sequence of operations changes.

It is the Contractor's responsibility for routine maintenance of equipment installed as part of this contract until the date of the Notice of Substantial Completion or the date of any Notice of Partial Substantial Completion. Contractor is not responsible for any maintenance on existing equipment or the systems they are connected to. The City shall be responsible for all maintenance activities subsequent to execution of either the Notice of Substantial Completion or the date of any Notice of Partial Substantial Completion

In addition to the maintenance responsibilities described above, the City shall maintain a log of all maintenance activities as described in the maintenance checklist provided with the O&M manuals.

See Schedule B for details on what services McKinstry will provide in terms of Solar PV operations and maintenance for the first 1 year after substantial completion of the PV systems. Anything not contained in Schedule A will be the responsibility of the City, as will all operations and maintenance activities starting in year 2.

**Schedule T:
Notice of Substantial Completion**

Notice of Substantial Completion (per ECM / FIM)

Date of Notice _____

Local Government Entity: _____

Contractor: _____

Contract Name / #: _____

Notice is hereby given that **the City and County of Denver** accepts the installed equipment for ECM / FIM _____ and establishes a warranty period start date of _____.

City and County of Denver

By _____

Title _____

Date _____

When completely executed, this form is to be sent by certified mail to the Contractor by **City and County of Denver**.

Schedule U
Notice of Final Acceptance

Notice of Final Acceptance

Date of Notice _____

Local Government Entity: _____

Contractor: _____

Contract Name / #: _____

Notice is hereby given that **City and County of Denver** accepts the Project and establishes a Performance Commencement Date of _____.

City and County of Denver

By _____

Title _____

Date _____

When completely executed, this form is to be sent by certified mail to the Contractor by **City and County of Denver**.

EPC SCHEDULE V: Owner Acknowledgement Form

The City and the Contractor Acknowledge the following.

Item
This report has been distributed and reviewed by staff, owners, and all other applicable parties that may be responsible for implementing or maintaining elements of specific facility improvement measures.
This report has been reviewed by key decision makers and their comments (if any) have been compiled and provided to McKinstry.
The City has reviewed the exclusions and clarifications in the IGA Report and the Energy Savings Performance Contract. The City acknowledges that McKinstry is not responsible for any equipment, operations, nor deficiencies not explicitly covered under this scope of work.
The City acknowledges for sites where roofing manufacturer warranty information is not provided to McKinstry; the roof manufacturer warranty may not be upheld after the solar PV installation.
The City agrees to the renewable energy credits for the solar photovoltaic systems being purchased by Xcel Energy in return for receiving monetary credit for solar production from Xcel Energy.
The City acknowledges that no City and County of Denver design standards were provided to McKinstry.
The city acknowledges that it will be responsible for labor costs to replace solar photovoltaic inverters that fail outside of the McKinstry's one-year warranty and O&M period.
The City agrees to be billed for material stored offsite in insured bonded warehouse.
The City acknowledges that this project is not considered a construction project but is retrofit project and therefore does not follow the City's standard construction project process and requirements.
The City agrees that certified payroll will not be required for this project, and that no 3 rd party billing systems (e.g. Textura) are required.
The City acknowledges that the lighting runtime hours for each building have been stipulated and the City agrees to these stipulated hours.
The City acknowledges that light levels will change in areas where lighting scope is present. The City agrees to the following light level design approaches: <ul style="list-style-type: none"> • The proposed design approach seeks to achieve maximum energy savings with a fiscally responsible project cost. In most areas, the design focus on one-for-one retrofit is to provide the comparable lighting levels to the existing system when it is in a usable state. • Owner acknowledges that some lighting areas and fixtures are not included in the scope. These include luminaires/exit signs that were already LED, and other items that were not fiscally responsible to include. • Light levels may be constrained by existing fixture types and their layout and configuration (spacing & orientation). Since the lighting project is based on retrofitting existing fixtures, it may not be possible to meet the exact target uniformity values in all spaces. • McKinstry will meet or exceed current light levels. If the space is under-lit due to an inadequate amount of fixtures from initial design, and which requires adding fixtures, adding circuits, reconfiguration or new construction, this will be brought to the attention of the City.

EPC SCHEDULE V: Owner Acknowledgement Form

Item
The city acknowledges that light fixture lenses will not be replaced as part of the lighting retrofit except for where it is specifically called out in the scope of work document or due to damage caused by McKinstry.
The M&V Plan established for each FIM has been reviewed and accepted as the means by which guaranteed savings will be evaluated.
The City acknowledges that it has read and agree to the Controls Optimization/RCx scope and accounting plan which is included in Schedule B (Detailed Scope of Work). The City acknowledges its responsibility to implement all energy-saving opportunities identified through Controls Optimization/RCx and fund any associated costs. Controls Optimization/RCx guaranteed savings are predicated on the City maintaining their responsibilities as provided in the Controls Optimization/RCx Scope of Work.
The City acknowledges that the schedules referenced in the IGA report are based on conversations with the City and that the building's occupants were not involved in these decisions. Occupant requests to change will impact the total energy savings realized.
The City agrees to provide network data drops as required for the solar photo-voltaic system and BAS upgrades.
The City acknowledges that all costs for work to be done for this project is based on standard day time working hours except for lighting retrofits which are typically performed after hours.
<p>The City acknowledges that Controls Optimization/RCx savings and Occupancy Based HVAC Control involve occupied and unoccupied setpoint changes during heating and cooling seasons to realize energy savings. These setpoints are:</p> <ul style="list-style-type: none"> • Occupied/unoccupied during occupied time/unoccupied heating: 70F/68F/60F • Occupied/unoccupied during occupied time/unoccupied cooling: 74F/78F/90F <p>These setpoints are based on typical office facility best practices and building's occupants were not involved in these decisions. Occupant requests to change will impact the total energy savings realized.</p>
<p>The City acknowledges that in order to provide the Controls Optimization/RCx scope and provide Measurement and Verification services that McKinstry requires the following for the duration of the performance period:</p> <ul style="list-style-type: none"> • Onsite access to building automation systems controlling the HVAC systems in all City buildings and continuous data upload of raw trend archives to a local McKinstry server. The cost for setting up trends once for M&V has been included in the project.
Consistent with past practices by the City, the City acknowledges that new PV installations will not include spudding on built up roofs.
The City acknowledges that PV O&M costs used in the project must be provided for by the maintenance budget for the life of those savings. Such funds will be used to pay any obligations clearly called out as maintenance savings and ongoing costs in the project cash flow.
The City acknowledges that steam, chilled water, gas and electric utility escalation rates and maintenance escalation rates must be budgeted for the life of the project. Such funds will be used to pay any obligations in the project cash flow. The project uses escalation rates of: 2.4% for electricity rates, 4.5% for natural gas rates, 2.4% for chilled water, 4.5% for steam, -0.5% for annual PV system power output degradation.
<p>The City agrees to notify McKinstry immediately of any major changes to the operation of any facilities involved within this project. Examples of these changes include:</p> <ul style="list-style-type: none"> • Changes to facility operation hours • Additions / Remodels • Changes in Space Type • Major changes to building occupancy • Major changes to facility use / activities • Major changes to facility equipment

EPC SCHEDULE V: Owner Acknowledgement Form

Item
The City acknowledges that McKinstry is not responsible for any equipment, operations, or deficiencies not explicitly covered under this agreement. McKinstry is available to consult on this work under a separate contract to be agreed upon at the time service is required.
City agrees to have a staff member present during commissioning related tasks and equipment start-ups.
Design basis for all PV carports is for a maximum vehicle height of 10' 6"

City and County of Denver
 Preliminary Construction Schedule

ID	Task Name	Duration	Start	Finish	Quarter																							
					Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
1	City and County of Denver EPC	662 days	Tue 6/1/21	Fri 12/29/23	[Gantt Bar]																							
2	Executed EPC Contract	0 days	Mon 12/13/21	Mon 12/13/21	[Gantt Bar]																							
3	Design	344 days	Tue 6/1/21	Fri 10/7/22	[Gantt Bar]																							
4	MEC Design	207 days	Tue 6/1/21	Fri 3/25/22	[Gantt Bar]																							
14	Permit Review MEC	209 days	Mon 12/13/21	Fri 10/7/22	[Gantt Bar]																							
23	Solar PV Design	104 days	Fri 10/8/21	Wed 3/9/22	[Gantt Bar]																							
27	Permit Review Solar	90 days	Mon 12/13/21	Wed 4/20/22	[Gantt Bar]																							
31	Subcontract Administration	22 days	Mon 12/6/21	Thu 1/6/22	[Gantt Bar]																							
34	Equipment	461 days	Tue 8/24/21	Wed 6/14/23	[Gantt Bar]																							
35	Diakin Chiller (RAC)	28 days	Tue 8/24/21	Fri 10/1/21	[Gantt Bar]																							
39	Trane Chillers (PD1, PD3)	33 days	Tue 8/24/21	Fri 10/8/21	[Gantt Bar]																							
43	Submittals Received (Long Lead)	5 days	Wed 12/15/21	Tue 12/21/21	[Gantt Bar]																							
44	Submittal Review (Long Lead)	10 days	Wed 12/22/21	Thu 1/6/22	[Gantt Bar]																							
45	Lighting Submittal Review	15 days	Mon 12/13/21	Tue 1/4/22	[Gantt Bar]																							
46	Submittals Received	10 days	Mon 12/13/21	Mon 12/27/21	[Gantt Bar]																							
47	Submittals Reviewed	15 days	Tue 12/28/21	Wed 1/19/22	[Gantt Bar]																							
48	POA Submittals	20 days	Thu 11/11/21	Fri 12/10/21	[Gantt Bar]																							
49	PD3/RAC Submittals	15 days	Wed 12/15/21	Thu 1/6/22	[Gantt Bar]																							
50	FS21/FS24 Submittals	15 days	Mon 1/31/22	Fri 2/18/22	[Gantt Bar]																							
51	Procurement	385 days	Mon 12/13/21	Wed 6/14/23	[Gantt Bar]																							
52	Diakin Chiller	15 wks	Mon 12/13/21	Wed 3/30/22	[Gantt Bar]																							
53	Trane Chillers	12 wks	Mon 12/13/21	Wed 3/9/22	[Gantt Bar]																							
54	Boilers	14 wks	Mon 2/21/22	Fri 5/27/22	[Gantt Bar]																							
55	RTUS/Roof Structural Steel	16 wks	Mon 12/13/21	Wed 4/6/22	[Gantt Bar]																							
56	VFDs/Pumps/Smaller Equipment	9 wks	Thu 1/20/22	Wed 3/23/22	[Gantt Bar]																							
57	3-way control valves	12 wks	Fri 1/7/22	Fri 4/1/22	[Gantt Bar]																							
58	Modules	1 mon	Fri 1/7/22	Fri 2/4/22	[Gantt Bar]																							
59	PanelClaw Racking	8 wks	Fri 1/7/22	Fri 3/4/22	[Gantt Bar]																							
60	IronRidge Racking	8 wks	Fri 1/7/22	Fri 3/4/22	[Gantt Bar]																							
61	Tigo	9 wks	Fri 1/7/22	Fri 3/11/22	[Gantt Bar]																							
62	Inverters	8 wks	Fri 1/7/22	Fri 3/4/22	[Gantt Bar]																							
63	Lighting Audited Buildings	10 wks	Fri 1/7/22	Fri 3/18/22	[Gantt Bar]																							
64	Lighting Confirm Audit Buildings	10 wks	Mon 2/7/22	Mon 4/18/22	[Gantt Bar]																							
65	Windows	14 wks	Thu 1/20/22	Wed 4/27/22	[Gantt Bar]																							
66	Possible Material Delays	90 days	Thu 2/9/23	Wed 6/14/23	[Gantt Bar]																							
67	Construction	662 days	Tue 6/1/21	Fri 12/29/23	[Gantt Bar]																							
68	MEC	430 days	Tue 6/1/21	Wed 2/8/23	[Gantt Bar]																							
69	City and County Building	225 days	Thu 3/24/22	Wed 2/8/23	[Gantt Bar]																							
73	Police Administration Building	180 days	Thu 3/24/22	Wed 12/7/22	[Gantt Bar]																							
78	Rose Andom	204 days	Thu 3/10/22	Tue 12/27/22	[Gantt Bar]																							
82	Denver Crime Lab	20 days	Fri 9/2/22	Fri 9/30/22	[Gantt Bar]																							
83	Denver Police Academy	80 days	Thu 3/24/22	Fri 7/15/22	[Gantt Bar]																							
86	Police District 1	60 days	Mon 10/3/22	Tue 12/27/22	[Gantt Bar]																							
87	Police Traffic Ops	74 days	Tue 3/8/22	Mon 6/20/22	[Gantt Bar]																							
90	Police District 3	60 days	Mon 10/3/22	Tue 12/27/22	[Gantt Bar]																							
92	Fire Station 21	40 days	Tue 6/1/21	Tue 7/27/21	[Gantt Bar]																							

Schedule W

City and County of Denver
Preliminary Construction Schedule

ID	Task Name	Duration	Start	Finish	Quarter																							
					Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
93	Fire Station 24	40 days	Wed 7/28/21	Wed 9/22/21	standard																							
94	The Commons on Champa	46.5 days	Tue 7/5/22	Thu 9/8/22																								
97	Permit Building (OBC)	40 days	Mon 5/16/22	Wed 7/13/22																								
98	Solar	195 days	Mon 3/14/22	Fri 12/16/22																								
99	Fire Station 2	6 wks	Mon 3/14/22	Fri 4/22/22																								
100	Police Traffic Ops	6 wks	Mon 4/25/22	Mon 6/6/22																								
101	Denver Police Academy Mounting	5 wks	Mon 5/2/22	Mon 6/6/22																								
102	Denver Police Academy Electrical	6 wks	Tue 6/7/22	Tue 7/19/22																								
103	Police District 2 Mounting	5 wks	Tue 6/7/22	Tue 7/12/22																								
104	Police District 2 Electrical	6 wks	Wed 7/20/22	Tue 8/30/22																								
105	Police District 3	11 wks	Wed 7/13/22	Wed 9/28/22																								
106	CPC Fleet Maintenance	5 wks	Thu 9/29/22	Wed 11/2/22																								
107	Weather Delay	30 days	Thu 11/3/22	Fri 12/16/22																								
108	Lighting	182 days	Tue 12/28/21	Wed 9/14/22																								
109	Final Audits	22.5 days	Tue 12/28/21	Mon 1/31/22																								
118	Crew 1	110.5 days	Mon 3/21/22	Wed 8/24/22																								
119	City and County Building	1 mon	Mon 3/21/22	Fri 4/15/22																								
120	Permit Building	1 mon	Mon 4/18/22	Mon 5/16/22																								
121	Police District 3	2 wks	Mon 5/16/22	Tue 5/31/22																								
122	Fleet Maintenance 5	1 wk	Tue 5/31/22	Tue 6/7/22																								
123	Gary Price Operations Building	1 wk	Tue 6/7/22	Tue 6/14/22																								
124	S. Cherry Creek Transfer	2 wks	Tue 6/14/22	Tue 6/28/22																								
125	Fire Station 26	1 wk	Tue 6/28/22	Wed 7/6/22																								
126	Fire Station 2	1 wk	Wed 7/6/22	Wed 7/13/22																								
127	Fire Station 24	1 wk	Wed 7/13/22	Wed 7/20/22																								
128	Rose Andom	2 wks	Wed 7/20/22	Wed 8/3/22																								
129	Denver Crime Lab	3 wks	Wed 8/3/22	Wed 8/24/22																								
130	Crew 2	125 days	Mon 3/21/22	Wed 9/14/22																								
131	The Commons on Champa	3 wks	Mon 3/21/22	Fri 4/8/22																								
132	Police Traffic Ops	2 wks	Mon 4/11/22	Fri 4/22/22																								
133	Denver Municipal Animal Shelter	2 wks	Mon 4/25/22	Fri 5/6/22																								
134	Lindsay-Flanigan	1 mon	Mon 5/9/22	Mon 6/6/22																								
135	Police Administration Building	3 wks	Tue 6/7/22	Mon 6/27/22																								
136	South Osage Fleet Maintenance	1 wk	Tue 6/28/22	Tue 7/5/22																								
137	Denver Police Academy	2 wks	Wed 7/6/22	Tue 7/19/22																								
138	Police District 2	2 wks	Wed 7/20/22	Tue 8/2/22																								
139	Fire Station 21	1 wk	Wed 8/3/22	Tue 8/9/22																								
140	Fire Station 22	1 wk	Wed 8/10/22	Tue 8/16/22																								
141	Van Cise-Simonet Detention Center	1 mon	Wed 8/17/22	Wed 9/14/22																								
142	CCD Site Schedule Coordination Allowance	99 days	Thu 6/15/23	Tue 10/31/23																								
143	Closeout	43 days	Tue 10/31/23	Fri 12/29/23																								
144	All FIMs Substantially Complete	0 days	Tue 10/31/23	Tue 10/31/23																								
145	Owner Training Complete	15 days	Wed 11/1/23	Tue 11/21/23																								
146	Closeout Documentation Complete	28 days	Wed 11/22/23	Fri 12/29/23																								
147	Final Acceptance	0 days	Fri 12/29/23	Fri 12/29/23																								
148	Seasonal Work Windows	339 days	Tue 6/1/21	Fri 9/30/22																								

SCHEDULE X

5 and 15 Year List

Summary:

	McKinstry
5-Year	\$ 3,395,168.62
15-Year	\$ 10,439,427.97
	<u>\$ 13,834,596.59</u>

Facility Improvement Measure/ Energy Conservation Measure		Tangible Good Cost	Useful Life
		\$	yrs.
09.01-CCB Interior LED Lighting Upgrades	City and County Building	\$ 374,634.98	12.5
09.01-PAB Interior LED Lighting Upgrades	Police Admin Building	\$ 225,736.07	12.5
09.01-DAS Interior LED Lighting Upgrades	Denver Municipal Animal Shelter	\$ 112,516.18	12.5
09.01-OFM Interior LED Lighting Upgrades	S. Osage Fleet Maint - Garage	\$ 29,689.28	12.5
09.01-POA Interior LED Lighting Upgrades	Police Academy	\$ 50,107.42	12.5
09.01-PD2 Interior LED Lighting Upgrades	Police District #2	\$ 53,819.46	12.5
09.01-CTS Interior LED Lighting Upgrades	S. Cherry Creek Transfer Station	\$ 38,931.63	12.5
09.01-FM5 Interior LED Lighting Upgrades	Fleet Maint - Bldg 5	\$ 39,223.33	12.5
09.01-GPO Interior LED Lighting Upgrades	Gary Price Ops - Bldg 2	\$ 102,944.78	12.5
09.01-DCL Interior LED Lighting Upgrades	Denver Crime Lab	\$ 167,515.64	12.5
09.01-LFC Interior LED Lighting Upgrades	Lindsey-Flanigan Courthouse	\$ 862,210.85	12.5
09.01-RAC Interior LED Lighting Upgrades	Rose Andom Center	\$ 63,983.58	12.5
09.01-VDC Interior LED Lighting Upgrades	Van Cise-Simonet Detention Ctr	\$ 620,558.93	12.5
09.01-CMP Interior LED Lighting Upgrades	1245 Champa St	\$ 242,408.40	12.5
09.01-PMB Interior LED Lighting Upgrades	Permit Building	\$ 307,958.43	12.5
09.01-FS2 Interior LED Lighting Upgrades	Fire Station #2	\$ 30,794.15	12.5
09.01-FS21 Interior LED Lighting Upgrades	Fire Station #21	\$ 17,027.21	12.5
09.01-FS22 Interior LED Lighting Upgrades	Fire Station #22	\$ 13,397.04	12.5
09.01-FS24 Interior LED Lighting Upgrades	Fire Station #24	\$ 10,005.19	12.5
09.01-FS26 Interior LED Lighting Upgrades	Fire Station #26	\$ 31,706.05	12.5
		\$ 3,395,168.62	

McKinstry

Facility Improvement Measure/ Energy Conservation Measure		Tangible Good	Useful
		Cost	Life
		\$	yrs.
13.04-CMP Replace Single Pane Windows	1245 Champa St	\$ 345,463.16	50.0
10.01-PD3 Solar Photovoltaic - Canopy	Police District #3	\$ 908,603.01	35.0
10.02-POA Solar Photovoltaic - Canopy	Police Academy	\$ 805,274.33	35.0
10.02-PD2 Solar Photovoltaic - Canopy	Police District #2	\$ 1,218,835.92	35.0
10.02-FM5 Solar Photovoltaic - Canopy	Fleet Maint - Bldg 5	\$ 480,338.29	35.0
10.01-FS2 Solar Photovoltaic - Roof	Fire Station #2	\$ 398,260.56	30.0
03.07-PAB MZU to VAV Unit	Police Admin Building	\$ 130,805.22	25.0
03.04-POA VVT to VAV Unit Replacement	Police Academy	\$ 392,085.92	25.0
01.01-FS21 Boiler Replacement	Fire Station #21	\$ 320,994.16	25.0
01.02-FS24 Boiler Replacement	Fire Station #24	\$ 221,304.98	25.0
03.13-PD3 Upgrade Air Cooled Chiller	Police District #3	\$ 631,886.48	23.0
03.13-PD1 Upgrade Air Cooled Chiller	Police District #1	\$ 699,563.67	23.0
02.12-RAC Chiller Replacement	Rose Andom Center	\$ 667,108.46	23.0
01.06-CCB Steam Condensate Heat Recovery	City and County Building	\$ 148,376.75	22.0
01.06-PAB Steam Condensate Heat Recovery	Police Admin Building	\$ 114,551.01	22.0
01.06-DCL Steam Condensate Heat Recovery	Denver Crime Lab	\$ 147,175.19	22.0
02.01-CCB Chilled Water Pump Replacement	City and County Building	\$ 217,757.68	20.0
08.05-PD3 Add VFDs to Building Pumps	Police District #3	\$ 109,172.76	20.0
08.05-PD1 Add VFDs to Building Pumps	Police District #1	\$ 125,456.38	20.0
22.01-CCD Controls Optimization/RcX	All Buildings	\$ -	16.0
04.07-RAC Ventilation Control	Rose Andom Center	\$ 73,975.91	16.0
09.02-CCB Exterior LED Lighting Upgrades	City and County Building	\$ 48,813.26	15.4
09.02-DAS Exterior LED Lighting Upgrades	Denver Municipal Animal Shelter	\$ 3,029.69	15.4
09.01-PD3 Interior LED Lighting Upgrades	Police District #3	\$ 67,801.97	15.4
09.02-OFM Exterior LED Lighting Upgrades	S. Osage Fleet Maint - Garage	\$ 6,198.58	15.4
09.02-POA Exterior LED Lighting Upgrades	Police Academy	\$ 9,040.22	15.4
09.02-PD2 Exterior LED Lighting Upgrades	Police District #2	\$ 25,750.37	15.4
09.02-CTS Exterior LED Lighting Upgrades	S. Cherry Creek Transfer Station	\$ 11,579.83	15.4
09.02-FM5 Exterior LED Lighting Upgrades	Fleet Maint - Bldg 5	\$ 35,529.44	15.4
09.02-GPO Exterior LED Lighting Upgrades	Gary Price Ops - Bldg 2	\$ 24,251.32	15.4
09.02-DCL Exterior LED Lighting Upgrades	Denver Crime Lab	\$ 13,155.43	15.4
09.02-LFC Exterior LED Lighting Upgrades	Lindsey-Flanigan Courthouse	\$ 23,542.38	15.4
09.02-RAC Exterior LED Lighting Upgrades	Rose Andom Center	\$ 7,692.15	15.4
09.02-VDC Exterior LED Lighting Upgrades	Van Cise-Simonet Detention Ctr	\$ 28,517.93	15.4
09.02-CMP Exterior LED Lighting Upgrades	1245 Champa St	\$ 3,556.10	15.4
09.02-PMB Exterior LED Lighting Upgrades	Permit Building	\$ 2,817.32	15.4
09.02-FS2 Exterior LED Lighting Upgrades	Fire Station #2	\$ 6,911.32	15.4
09.02-FS21 Exterior LED Lighting Upgrades	Fire Station #21	\$ 868.59	15.4
09.02-FS22 Exterior LED Lighting Upgrades	Fire Station #22	\$ 145.48	15.4
09.02-FS24 Exterior LED Lighting Upgrades	Fire Station #24	\$ 3,941.35	15.4
09.02-FS26 Exterior LED Lighting Upgrades	Fire Station #26	\$ 9,395.91	15.4
04.01-CCB BAS Controls Replacement	City and County Building	\$ 754,093.19	15.0
04.01-PAB BAS Controls Upgrade/ Replacement	Police Admin Building	\$ 793,231.03	15.0
04.02-PAB Occupancy Based HVAC Control	Police Admin Building	\$ 132,675.54	15.0
04.01-POA BAS Controls Upgrade/ Replacement	Police Academy	\$ 138,144.62	15.0
13.01-RAC Air Sealing and Weather Stripping	Rose Andom Center	\$ 1,410.00	15.0
04.02-CMP Occupancy Based HVAC Controls	1245 Champa St	\$ 69,660.91	15.0
04.02-PMB Occupancy Based HVAC Controls	Permit Building	\$ 60,684.19	15.0
		\$ 10,439,427.97	

SCHEDULE Y

**FORM OF ACCEPTANCE CERTIFICATE NO. 1 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 1, McKinstry Month 0,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 0 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million Two Hundred Seventy Eight Thousand Three Hundred Eighty Two Dollars and Sixty Three Cents (\$1,278,382.63)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 0 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis

of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 0 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 2 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 2, McKinstry Month 1,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 1 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million One Hundred Thirty Thousand Six Hundred Forty Eight Dollars and Fifty Seven Cents (\$1,130,648.57)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed Items described for McKinstry Month 1 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed Items described for McKinstry Month 1 in Exhibit A to the Lease. Pursuant to paragraph 4 of the

Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 3 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 3, McKinstry Month 2,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 2 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Eight Hundred Seventeen Thousand Two Hundred Forty Four Dollars and Twenty Four Cents (\$8 17,244.24)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 2 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 2 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
 16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 4 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 4, McKinstry Month 3,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 3 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum **Nine Hundred Fifty Two Thousand Seven Hundred Sixty Eight Dollars and Seventy Eight Cents (\$952,768.78)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 3 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 3 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 5 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 5, McKinstry Month 4,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 4 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million Five Hundred Five Thousand Five Hundred Seven Dollars and Forty Four Cents (\$1,505,507.44)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 4 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 4 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
 16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 6 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 6, McKinstry Month 5,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 5 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million One Hundred Twenty Three Thousand Fifty Nine Dollars and Ninety One Cents (\$1,123,059.91)** in payment of all of the cost of the acquisition, delivery, and testing of Equipment listed at Items described for McKinstry Month 5 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 5 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
 16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 7 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 7, McKinstry Month 6,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 6 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million Sixty One Thousand Two Hundred Sixteen Dollars and Nineteen Cents (\$1,061,216.19)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 6 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 6 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 8 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 8, McKinstry Month 7,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 7 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million Five Hundred Thirty Thousand Four Hundred Twenty Four Dollars and Forty Cents (\$1,530,424.40)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 7 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 7 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 9 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 9, McKinstry Month 8,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 8 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **One Million Five Hundred Thirty Two Thousand Seven Hundred Fifty One Dollars and Sixty Five Cents (\$1,532,751.65)** in payment of all of the cost of the acquisition, delivery, and testing of Equipment listed at Items described for McKinstry Month 8 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 8 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance

that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 10 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 10, McKinstry Month 9,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 9 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Five Hundred Fifty Six Thousand Three Hundred Thirty One Dollars and Seventy Five Cents (\$556,331.75)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 9 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 9 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 11 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 11, McKinstry Month 10,
December 13, 202__ Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 10 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Seven Hundred Fifty Four Thousand Seventy Nine Dollars and Fifty Two Cents (\$754,079.52)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 10 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 10 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 12 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 12, McKinstry Month 11,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 11 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Eight Hundred Five Thousand Nine Hundred Twenty Two Dollars and Eighty Two Cents (\$805,922.82)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 11 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 11 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has

been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 13 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 13, McKinstry Month 12,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 12 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Five Hundred Twenty Four Thousand Five Hundred Nine Dollars and Eighty Six Cents (\$524,509.86)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 12 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 12 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 14 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 14, McKinstry Month 13,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 13 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Two Hundred Thirty Thousand Eight Hundred Two Dollars and Thirty Five Cents (\$230,802.35)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 13 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 13 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
 16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

_JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 15 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 15, McKinstry Month 14,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 14 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Fifteen Thousand Four Hundred Seventy Three Dollars and Twenty Four Cents (\$15,473.24)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 14 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 14 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been made.

Payee: McKinstry, Inc.
16025 Table Mountain Parkway, Suite 100
Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____

**FORM OF ACCEPTANCE CERTIFICATE NO. 16 of 20
FOR ENERGY SERVICES EQUIPMENT
Appendix A Item 16, McKinstry Month 15,
December 13, 2021 Equipment Lease Purchase Agreement**

Re: Equipment Lease Purchase Agreement (the "Lease") dated December 13, 2021 between JPMorgan Chase Bank, N.A., as Lessor, and the City and County of Denver, Colorado (the "City"), as Lessee.

To: JPMorgan Chase Bank, N.A.
1111 Polaris Parkway, Suite 4N
Mail Suite OH1-1085
Columbus, Ohio 43240
Attn: Operations Managers
Phone: 1-800-678-2601
E-mail: cefi.escrow.disbursement.request@jpmchase.com

and

U.S. Bank National Association
Attn: Erica Fouks, Trust Finance Management,
60 Livingston Avenue, EP-MN-WS3T
St. Paul, MN 55107-2292
E-mail: Erica.Fouks@usabank.com

In accordance with the Lease and a related Escrow Agreement, the undersigned City Representative hereby certifies and represents to, and agrees with the Lessor as follows:

- (1) The Equipment described in the Lease at Exhibit A as Items described for McKinstry Month 15 have been delivered, installed, tested and accepted on the date hereof.
- (2) The City has conducted such inspection and testing of this Equipment as it deems necessary and appropriate and hereby acknowledges that it accepts this Equipment for all purposes.
- (3) No event or condition that constitutes, or with notice or lapse of time, or both, would constitute, an Event of Default (as defined in the Lease) exists at the date hereof.
- (4) The Lessor is hereby requested to approve the payment of, and the Escrow Agent is hereby requested to pay, the Vendor designated below as Payee, the sum of **Fifteen Thousand Four Hundred Seventy Three Dollars and Twenty Four Cents (\$15,473.24)** in payment of all of the cost of the acquisition, delivery, and testing of the Equipment listed at Items described for McKinstry Month 15 on Exhibit A to the Lease. Such amount is due and payable under the invoice of the Payee attached hereto with respect to the cost of the acquisition, delivery, installation and testing of the Equipment and has not formed the basis of any prior request for payment. The Equipment for which this payment is to be made is all of the "Equipment" listed at Items described for McKinstry Month 15 in Exhibit A to the Lease. Pursuant to paragraph 4 of the Escrow Agreement, the Escrow Agent is to notify the Manager of Finance that this payment has been

made.

Payee: McKinstry, Inc.
 16025 Table Mountain Parkway, Suite 100
 Golden, CO 80403

Payee's Federal ID Number: _____

(5) If all Acceptance Certificates have been completed with the processing of this Acceptance Certificate, then coincident with the payment of the Vendor pursuant to (4) above, the Escrow Agent is hereby directed to pay all amounts remaining in the Acquisition Fund in accordance with paragraph 4 of the Escrow Agreement.

City and County of Denver, Colorado, as Lessee

By: _____
Manager of General Services
(as City Representative under the Lease)

Acceptance Date: _____

APPROVED:

JPMorgan Chase Bank, N.A., as Lessor

By: _____

Title: _____