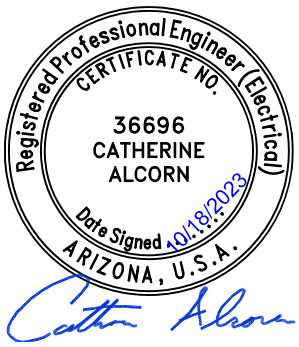
CITY OF PHOENIX, ARIZONA
OFFICE OF THE CITY ENGINEER
DESIGN AND CONSTRUCTION PROCUREMENT

PROJECT SPECIFICATIONS AND CONTRACT DOCUMENTS

AVIATION DEPARTMENT
PHOENIX SKY HARBOR INTERNATIONAL AIRPORT
RENTAL CAR CENTER LED LIGHT RETROFIT
DESIGN-BID-BUILD
PROJECT NO. AV15000073

PROCUREPHX PRODUCT CATEGORY CODE 912000000
RFx 6000001472

AGREEMENT _____



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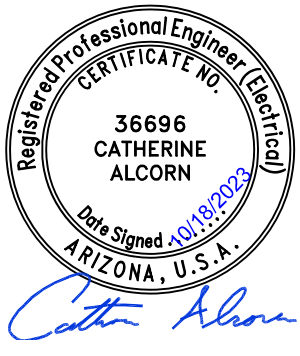
PROJECT NO.: AV15000073



CALL FOR BIDS

CITY OF PHOENIX
AVIATION DEPARTMENT
RENTAL CAR CENTER LED LIGHT RETROFIT
DESIGN-BID-BUILD

PROJECT NO. AV15000073

PROCUREPHX PRODUCT CATEGORY CODE 912000000
RFx 6000001472

BIDS WILL BE DUE: TUESDAY, NOVEMBER 14, 2023 AT 2:00 P.M.
SUBMITTED INTO THE DESIGN AND CONSTRUCTION PROCUREMENT BID BOX LOCATED ON THE 1ST FLOOR LOBBY OF THE PHOENIX CITY HALL BUILDING, 200 W. WASHINGTON STREET, PHOENIX, ARIZONA, 85003

BIDS WILL BE READ: TUESDAY, NOVEMBER 14, 2023 AT 2:00 P.M.
ON 5TH FLOOR, ROOM 5 WEST
PHOENIX CITY HALL
200 W. WASHINGTON STREET
PHOENIX, AZ 85003-1611
***All times are local Phoenix time**

AND

VIA TEAMS VIDEO / PHONE ACCESS
***All times are local Phoenix time**

SCOPE OF WORK

The City of Phoenix is seeking a qualified contractor to provide construction services for the project listed below.

The Rental Car Center LED Light Retrofit project objective is to replace the existing HID and fluorescent lighting throughout the facility with LED fixtures including interior core areas, exterior, walkway, garage (all levels), roadway, small operator parcel parking lots (approximately 325 pole mounted fixtures) and interior art enhancement feature lighting (excluding recent mural lighting installation) at the Phoenix Sky Harbor International Airport Rental Car Center. The new lighting systems will be integrated into the existing wiSCAPE lighting control system manufactured by Hubbell Control Solutions, including as needed relocations and/or additions to the existing wiSCAPE Gateway controllers for a fully functional system.

A Small Business Enterprise goal of 5% has been established for this project.

PRE-BID MEETING

A pre-bid meeting will be held on Thursday, October 26, 2023, at 1:00 p.m., at Phoenix Sky Harbor International Airport Facilities & Services Building, 2nd Floor Conference Rooms A & B, located at 2515 E. Buckeye Road, Phoenix, Arizona. At this meeting, staff will discuss the scope of work, general contract issues and respond to questions from the attendees. As City staff will not be available to respond to individual inquiries regarding the project scope outside of this pre-bid meeting, it is strongly recommended that interested firms send a representative to the pre-bid meeting.

REQUEST FOR BID PACKET

On Thursday, October 19, 2023, the bid packet may be downloaded from the City of Phoenix's eProcurement site at:

https://eprocurement.phoenix.gov/irj/portal

(OR)

the City of Phoenix's "Solicitations" web page as. The web address is:

https://solicitations.phoenix.gov

Firms receiving a copy of the bid packet through any other means are strongly encouraged to download the bid packet from the City webpage.

Firms must be registered in eProcurement https://www.phoenix.gov/finance/vendorsreg as a vendor.

BID OPENING TEAMS MEETING INSTRUCTIONS:

Join on your computer, mobile app or room device

Click here to join the meeting

Meeting ID: 287 516 960 829
Passcode: b9wxfP

GENERAL INFORMATION

The City reserves the right to award the contract to the lowest responsible responsive bidder or all bids will be rejected, as soon as practicable after the date of opening bids.

The City of Phoenix will provide reasonable accommodations for alternate formats of the bid packet by calling Annette Perez at (602) 534-1423 or calling TTY 711. Requests will only be honored if made within the first week of the advertising period. Please allow a minimum of seven calendar days for production.

Questions pertaining to process or contract issues should be directed to Annette Perez at (602) 534-1423 or annette.perez@phoenix.gov.

Jeffrey Barton
City Manager

Eric J. Froberg, PE
City Engineer

Published: Arizona Business Gazette
Date: October 19, 2023
Date: October 26, 2023
District: 8

INFORMATION FOR BIDDERS

1. **102 BIDDING REQUIREMENTS AND CONDITIONS**, Add the following to **MAG and COP Supplement to MAG Section 102 BIDDING REQUIREMENTS AND CONDITIONS**:

INFORMATION FOR BIDDERS

A. **QUESTIONS ON PLANS AND SPECIFICATIONS**

Neither the Engineer nor the City of Phoenix will be held responsible for any oral instructions. Any changes to the plans and specifications will be in the form of an addendum. All Addenda will be posted online within the project folder at the following website:

https://eprocurement.phoenix.gov/irj/portal

OR

https://solicitations.phoenix.gov

For additional information prior to submitting your bid, contact:

Plans, Technical/Special Provisions, Proposal or Specifications:
NAME: Annette Perez, Design and Construction Procurement
ADDRESS: 200 W. Washington Street, 5th Floor, Phoenix, AZ 85003-1611
PHONE: (602) 534-1423 E-MAIL: annette.perez@phoenix.gov

SBE Utilization contact:
Equal Opportunity Department: (602) 262-6790

All questions regarding the plans and specifications must be received (in writing) at a minimum seven calendar days prior to bid opening. Questions received after that time may not be given any consideration.

B. **REQUEST FOR SUBSTITUTIONS**

Paragraph A, B, and C of MAG Section 106.4 are deleted and the following paragraphs substituted:

1. The Engineer will consider written request(s), by a prime bidder only, for substitution(s) which is/are considered equivalent to the item(s) specified in the Contract documents. The written request will be considered only if it is received at least twelve calendar days prior to the established bid date. Notification of acceptable substitutions will be made by addendum issued no fewer than seven calendar days prior to the established bid date. (A.R.S. 34-104)

2. The prime bidder, at his own expense, will furnish the necessary data of substitution and validate that the physical, chemical, and operational qualities of each substitute item is such that this item will fulfill the originally specified required function.

3. The substitution, if approved, will be authorized by a written addendum to the Contract documents and will be made available to all bidders. The bid date and the scheduled completion time will not be affected by any circumstances developing from this substitution.

4. The request will be submitted to Design and Construction Procurement, Attention Annette Perez, 5th Floor, Phoenix City Hall, 200 W. Washington Street, Phoenix, Arizona 85003-1611 or via email to annette.perez@phoenix.gov.

C. **BID BOND**

Bidders must submit a properly completed proposal guarantee in the form of certified check, cashier's check, or surety bond provided, for an amount not less than 10 percent of the total amount bid included in the proposal as a guarantee that the contractor will enter into a contract to perform the proposal in accordance with the plans and specifications. Surety bonds submitted for this project will be provided by a company which has been rated "A- or better for the prior four quarters" by the A.M. Best Company. ***A bid will be deemed non-responsive if not accompanied by this guarantee.***

The surety bond will be executed solely by a surety company or companies holding a certificate of authority to transact surety business in the State of Arizona, issued by the Director of the Department of Insurance pursuant to Title 20, Chapter 2, Article 1. The surety bond will not be executed by an individual surety or sureties even if the requirements of Section 7-101 are satisfied. The certified check, cashier's check, or surety bond will be returned to the contractors whose proposals are not accepted, and to the successful contractor upon the execution of a satisfactory bond and contract.

When providing a Surety Bond, ***failure to provide an "A- or better for the prior four quarters" bond will result in bid rejection.***

D. **LIST OF MAJOR SUBCONTRACTORS AND SUPPLIERS & LIST OF ALL SUBCONTRACTORS AND SUPPLIERS**

A bid will be deemed non-responsive if not accompanied by a properly completed and signed L.O.S.-1 "List of Major Subcontractors and Suppliers" form.

To assist in eliminating the practice of bid shopping on City construction projects, the Bidder shall list all Major Subcontractors and Suppliers to whom the Bidder intends to contract with that are equal to or greater than 5% of the base bid. The list of Major Subcontractors and Suppliers will be provided on the L.O.S.-1 "List of Major Subcontractors" form. Failure to properly complete and sign this form will result in bid rejection. This form is due with the bid.

If substantial evidence exists that bid shopping occurred on this project, the Bidder will be ineligible to bid on City or City-affiliated construction projects for a period of one year.

The list of All Subcontractors and Suppliers shall be provided on the L.O.S.-2 "List of All Subcontractors and Suppliers" form. This form is due three calendar days after bid opening by 5:00 p.m. All bidders will be required to submit the L.O.S.-1 form. The three lowest bidders will be required to submit the L.O.S.-2 form. If the L.O.S.-2 form is not submitted by the post-bid deadline, the Bidder will still be required to submit the document prior to award. If the Bidder fails to submit the required L.O.S.-2 form by the post-bid deadline, the Bidder's bid bond may be placed in jeopardy because the City may make a claim against the Bidder's bid bond for the cost difference between the lowest responsive and responsible Bidder's bid and the next lowest bid (and any additional costs involved in awarding the contract to the next lowest responsive and responsible bidder).

E. **BID SUBMITTAL**

The properly completed bid documents along with the ten percent bid guarantee will be submitted in a sealed envelope. The outside of the envelope will be marked as follows:

Bid of (Firm's Name, Address and Phone Number)_____
For: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
City of Phoenix Project Number: AV15000073

Sealed bids will be submitted to the bid box located on the first floor of the Phoenix City Hall Building, 200 W. Washington Street, Phoenix, Arizona, 85003 prior to the time and date specified for bid opening.

F. BID WITHDRAWALS

MAG Section 102-10, Withdrawal or Revision of Proposal, is hereby deleted and the following paragraph is submitted:

"No bidder may withdraw or revise a proposal after it has been deposited with the City except as provided in Phoenix City Code Chapter 2, Section 190.2. Proposals, read or unread, will not be returned to the bidders until after determination of award has been made.

G. ADDENDA

Acknowledge all addenda; a bid will be deemed non-responsive if all issued addenda for this project are not acknowledged in writing on Page P. -1.

The City of Phoenix will not be responsible for any oral responses or instructions made by any employees or officers of the City of Phoenix regarding bidding instructions, plans, drawings, specifications or contract documents. A verbal reply to an inquiry does not constitute a modification of the Invitation for Bid. Any changes to the plans, drawings and specifications will be in the form of an addendum.

It will be the responsibility of the prospective bidder to determine, prior to the submittal of its bid, if any addenda to the project have been issued by the Design and Construction Procurement. All addenda issued will be acknowledged by the bidder on Page P-1. All addenda (if any) will be available online within each project's folder at the following website:

https://eprocurement.phoenix.gov/irj/portal

OR

https://solicitations.phoenix.gov

The contractors are responsible for ensuring they have all addenda for all projects they are submitting on. Prospective bidders are strongly encouraged to check the Solicitations website in order to ascertain if any addenda have been issued for the project.

H. BID SUBMITTAL CHECKLIST

All firms must be registered in the City's Vendor Management System prior to submitting a bid. For new firms – the City will send an email to your firm with a vendor number within two days of submitting the request. The vendor number needs to be included on the cover of the bid proposal package/envelope. Information on how to register with the City is available at:

https://www.phoenix.gov/finance/vendorsreg

BID SUBMITTAL CHECKLIST

This checklist is provided to remind bidders of several of the required elements of the bid packages. It is not intended to be a comprehensive list of all the contract documents. Bidders are encouraged to review all of the Bid Instructions to determine compliance therein.

- Acknowledge all addenda? (Page P-1)
- Completed all of the Bid Proposal forms? (Pages P-1 to P-8 and P.S.-1)
- Included your Bid Bond (rated A- or better for the prior four quarters) or Guarantee Cashier's Check? (Page S.B.-1)
- Completed SBE Utilization form or a fully documented waiver package? (Page S.B.U.-1)
- Completed List of Major Subcontractors and Suppliers form? (Page L.O.S.-1)
- Completed Letter of Intent to Perform as Subcontractor/Supplier (L.O.I-1)

PLEASE DO NOT SUBMIT THE ENTIRE SPECIFICATION BOOK WHEN SUBMITTING YOUR BID. INCLUDE ONLY THE REQUIRED BIDDING DOCUMENTS.

POST-BID SUBMITTAL CHECKLIST

The three lowest bidders must submit completed contracts documents listed below, no later than three calendar days after bid opening by 5:00 p.m. The documents must be submitted to Design and Construction Procurement, 5th Floor, or can be sent by email to annette.perez@phoenix.gov.

- Completed List of All Subcontractors and Suppliers form (L.O.S.-2)
- Bidders Disclosure Statement? (Pages B.D.S.-1 to 4)
- Submit Affidavit of Identity (if you are a sole proprietor) (Page A.O.I.-1)

PRIOR TO CONTRACT EXECUTION

- Contractor must provide proof of license required to perform the work.
- Verification of Experience Modification Rate (EMR) – the awarded company will be required to provide an EMR verification letter from the insurance company prior to contract execution.

I. PERMITS

CITY RESPONSIBILITY – The City will be responsible for City of Phoenix review and permit(s) fees for building and demolition permits. The City will also pay review fees for grading and drainage, water, sewer, and landscaping. The City will also pay for utility design fees for permanent services.

CONTRACTOR RESPONSIBILITY – The Contractor will be responsible for all other permits and review fees not specifically listed above. The Contractor is responsible for the cost of water meters, water and sewer taps, fire lines and taps, and all water bills on the project meters until the project is accepted. Arrangements for construction water are the Contractor's responsibility.

The Contractor may elect to use a City fire hydrant for its source of construction water only if an existing water service connection is unavailable or inadequate. The Contractor will be required to comply with Phoenix City Code Section 37-13A.

The Contractor is specifically reminded of the need to obtain the necessary environmental permits or file the necessary environmental notices. Copies of these

permits and notices must be provided to the City's Project Manager prior to starting the permitted activity. In the case of Fire Department permits, a copy of the application for permit will also be provided to the Project Manager. This provision does not constitute an assumption by the City of an obligation of any kind for violation of said permit or notice requirements.

J. CANCELLATION OF CONTRACT FOR CONFLICT OF INTEREST

All parties hereto acknowledge that this Agreement is subject to cancellation by the City of Phoenix pursuant to the provisions of Section 38-511, Arizona Revised Statutes.

K. CONTRACTOR'S LICENSE AND PRIVILEGE LICENSE AND CERTIFICATIONS

Prior to bidding on this project, the bidder must possess the correct license to perform the work described in the plans and specifications. Prior to award of the contract, the successful bidder must provide to the Contract Procurement Section its Contractor's License Classification and number, its City of Phoenix Privilege License number and Federal Tax Identification number.

Bidder will submit the Bidder's Disclosure Statement as set forth in Pages B.D.S. - 1 to B.D.S. - 4 within three calendar days of bid opening by 5:00 p.m.

Unless provided otherwise in this solicitation, Bidder will be deemed non-responsive and the bid rejected if Bidder fails to possess the proper Contractor's and Business Licenses at the time of bid or fails to submit a substantially completed Bidder's Disclosure Statement as specified above.

L. TAX LIABILITIES; DISCLOSURE OF CONVICTIONS AND BREACH(S) OF CONTRACT

On or before the award of the contract for this project, the successful bidder will: (i) file all applicable tax returns and will make payment for all applicable State of Arizona and Maricopa County Transaction Taxes (ARS Sec. 41-1305) and City of Phoenix Privilege License Taxes (Phoenix City Code Sec.14-415); (ii) disclose any civil fines, penalties or any criminal convictions, other than for traffic related offenses, for violation of federal, state, county or city laws, rules or regulations including, but not limited to, environmental, OSHA, or labor compliance laws (collectively "Laws") by Bidder, Bidder's directors, managing members, responsible corporate officers or party who will be responsible for overseeing and administering this project (collectively "Bidder"); and (iii) disclose any material breach(s) of an agreement with the City of Phoenix, any termination for cause or any litigation involving the City of Phoenix occurring within the past three calendar years. Unless provided otherwise in this solicitation, the successful bidder will be deemed non-responsible and the bid rejected for any of the following: (i) Bidder's civil or criminal conviction, other than for traffic related offenses, for a violation of Laws within the past three calendar years; (ii) liability or culpability resulting in payment of fines or penalties in the cumulative total amount of $100,000 or greater for a violation of "Laws" within the past three calendar years; (iii) material breach of a City of Phoenix agreement, termination for cause or litigation with the City of Phoenix within the past three calendar years; and (iv) Bidder's failure to disclose the information as required by this provision. Further, after award of contract, in addition to any other remedy, Bidder's failure to remit proper taxes to the City of Phoenix may result in the City withholding payment pursuant to Phoenix City Charter Chapter XVIII, Section 14 until all delinquent taxes, interest, and penalties have been paid.

State and Local Transaction Privilege Taxes:

In accordance with applicable state and local law, transaction privilege taxes may be applicable to this transaction. The state and local transaction privilege (sales) tax burden is on the person who is conducting business in Arizona and the City of Phoenix. The legal liability to remit the tax is on the person conducting business in Arizona. Any failure by the Contractor to collect applicable taxes from the City will not relieve the Contractor from its obligation to remit taxes.

It is the responsibility of the Contractor to determine any applicable taxes. The City will review the price or offer submitted and will not deduct, add or alter pricing based on taxes.

If you have questions regarding tax liability, seek advice from a tax professional prior to submitting a bid. Once the bid is submitted, the Offer is valid for the time specified in this Solicitation, regardless of mistake or omission of tax liability.

If the City finds over payment of a project due to tax consideration that was not due, the Contractor will be liable to the City for that amount, and by contracting with the City agrees to remit any overpayments back to the City for miscalculations on taxes included in a bid price.

For purposes of A.R.S. 42-5075(P), this contract is subject to A.R.S. Title 34.

Tax Indemnification:
Contractor will, and require the same of all subcontractors, pay all federal, state and local taxes applicable to its operation and any persons employed by the Contractor. Contractor will, and require the same of all subcontractors, hold the City harmless from any responsibility for taxes, damages and interest, if applicable, contributions required under federal, and/or state and local laws and regulations and any other costs including transaction privilege taxes, unemployment compensation insurance, Social Security and Worker's Compensation.

Tax Responsibility Qualification:
Contractor may be required to establish, to the satisfaction of City, that all fees and taxes due to the City or the State of Arizona for any License or Transaction Privilege taxes, Use Taxes or similar excise taxes, are currently paid (except for matters under legal protest).

Contractor agrees to a waiver of the confidentiality provisions contained in the City Finance Code and any similar confidentiality provisions contained in Arizona statutes relative to State Transaction Privilege Taxes or Use Taxes.

Contractor agrees to provide written authorization to the City Finance Department and to the Arizona State Department of Revenue to release tax information relative to Arizona Transaction Privilege Taxes or Arizona Use Taxes to assist the Department in evaluating Contractor's qualifications for and compliance with contract for duration of the term of contract.

M. STANDARD SPECIFICATIONS AND DETAILS

Except as otherwise required in these specifications, bid preparation and construction of this project will be in accordance with all applicable Maricopa Association of Governments' (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision, and the City of Phoenix Supplements to the MAG Uniform Standard Specifications and Details, latest revision.

N. PRECEDENCE OF CONTRACT DOCUMENTS

In case of a discrepancy or conflict, the precedence of contract documents is as follows:

1. Change Orders or Supplemental Agreements
2. Addenda
3. Contract Specifications/Special Provisions/Technical Provisions
4. The Plans
5. COP Supplement to MAG Standard Specifications and Details, latest revision
6. MAG Standard Specifications and Details, latest revision

The precedence of any Addenda falls within the category of which it represents.

O. CONFIDENTIALITY OF PLANS & SPECIFICATIONS

Any plans generated for this project must include the following statement in the Title Block on every page: “Per City of Phoenix City Code Chapter 2, Section 2-28, these plans are for official use only and may not be shared with others except as required to fulfill the obligations of Contractor’s contract with the City of Phoenix.”

P. AUDIT AND RECORDS

Records of the Contractor's direct personnel payroll, bond expenses, and reimbursable expenses pertaining to this Project, and records of accounts between the City and Contractor will be kept on the basis of generally accepted accounting principles and must be made available to the City and its auditors for up to five years following Final Acceptance of the Project.

The City, its authorized representative, and/or any federal agency, reserves the right to audit the Contractor's records to verify the accuracy and appropriateness of all cost and pricing data, including data used to negotiate the Contract and any change orders.

The City reserves the right to decrease Contract price and/or payments made on this Contract and/or request reimbursement from the Contractor following final contract payment on this Contract if, upon audit of the Contractor's records, the audit discloses the Contractor has provided false, misleading, or inaccurate cost and pricing data.

The Contractor will include a similar provision in all of its Agreements with subcontractors and suppliers providing services or supplying materials under the Contract Documents to ensure that the City, its authorized representative, and/or the appropriate federal agency has access to the Subcontractor’s and Supplier’s records to verify the accuracy of all cost and pricing data.

The City reserves the right to decrease the Contract price and/or payments made on this Contract and/or request reimbursement from the Contractor following final contract payment on this Contract if the above provision is not included in the Subcontractor’s and Supplier’s contracts, and one or more Subcontractors or Suppliers refuse to allow the City to audit their records to verify the accuracy and appropriateness of cost and pricing data.

If, following an audit of this Contract, the audit discloses the Contractor has provided false, misleading or inaccurate cost and pricing data, and the cost discrepancies exceed 1% of the total Contract billings, the Contractor will be liable for reimbursement of the reasonable, actual cost of the audit.

Q. IMMIGRATION REFORM AND CONTROL ACT

Compliance with Federal Laws Required. Contractor understands and acknowledges the applicability of the Immigration Reform and Control Act of 1986 and the Drug Free Workplace Act to it. Contractor agrees to comply with these Federal Laws in performing under this Agreement and to permit City inspection of its personnel records to verify such compliance.

R. LEGAL WORKER REQUIREMENTS

The City of Phoenix is prohibited by A.R.S. § 41-4401 from awarding a contract to any contractor who fails, or whose subcontractors fail, to comply with A.R.S. § 23-214(A). Therefore, Contractor agrees that:

1. Contractor and each subcontractor it uses warrants their compliance with all federal immigration laws and regulations that relate to their employees and their compliance with § 23-214, subsection A.

2. A breach of a warranty under paragraph 1 will be deemed a material breach of the contract that is subject to penalties up to and including termination of the contract.

3. The City of Phoenix retains the legal right to inspect the papers of any Contractor or subcontractor employee who works on the contract to ensure that the Contractor or subcontractor is complying with the warranty under paragraph 1.

S. CONTRACTOR AND SUBCONTRACTOR WORKER BACKGROUND SCREENING

Contractor agrees that all Contract Workers that Contractor allows to perform work under this Contract shall be subject to background and security checks and screening (Background Screening). Contractor must pay for the cost of all Background Screenings, unless otherwise provided in the Scope of Work. Contractor agrees that Background Screenings required by this Section is necessary to preserve and protect public health, safety, and welfare. The Background Screening requirements set forth in this Section are the minimum requirements for this Contract. The City does not warrant or represent that the minimum requirements are sufficient to protect Contractor from any liability that may arise out of Contractor's work under this Contract or Contractor's failure to comply with this Section. Therefore, in addition to the Background Screening measures set forth below, Contractor and its Contract Workers shall take such other reasonable, prudent, and necessary measures to further preserve and protect public health, safety, and welfare when providing work under this Contract.

As used in this Section, "Contract Worker" means a person performing work for the City, including (1) a person or entity that has a contract with the City, (2) a worker of a person or entity that has a contract with the City, (3) a worker of a subcontractor of a person or entity that has a contract with the City, and (4) a worker of a tenant of the City. (City of Phoenix A.R. 4.45)

Legal Worker Background Check

Pursuant to Arizona Revised Statutes (A.R.S.) § 41-4401, Contractor must verify the legal Arizona worker status of each Contract Worker. Contractor must conduct and all Contract Workers must pass a background check for their real identity and legal name prior to performing any work under this Contract.

City Rights Regarding Security Inquiries

In addition to a Legal Worker Background Check, the City reserves the right to require Contractor to:

- Have a Contract Worker provide fingerprints and execute any document that is necessary to obtain criminal justice information pursuant to A.R.S. § 41-1750(G)(4) or Phoenix City Code § 4-22 or both;

- Act on newly acquired information, whether or not the information should have been previously discovered;

- Unilaterally change its standards and criteria related to the acceptability of Contract Workers; and

- Object, at any time and for any reason, to a Contract Worker performing work under this Contract, including supervision and oversight services.

Contractor Certification

By entering into this Contract, Contractor certifies that Contractor has read the Background Screening requirements and criteria in this Section, understands them, and that all Background Screening information furnished to the City is accurate, complete, and current. A Contract

Worker that is rejected for work under this Contract shall not perform any work under any other contract or engagement Contractor has with the City without the City's prior written approval.

Contractor's Contracts and Subcontracts

Contractor shall include the terms of this Section for Contract Worker Background Screening in all contracts and subcontracts for work performed under this Contract, including supervision and oversight services.

Materiality of Background Screening Requirements and Indemnity

The Background Screening requirements of this Section are material to the City's decision to enter into this Contract. Any breach of this Section by Contractor shall be deemed a material breach of this Contract. In addition to any other indemnification provision in this Contract, Contractor shall defend, indemnify, and hold harmless the City from and against any and all claims, actions, liabilities, damages, losses, and expenses (Claims) arising out of this Background Screening Section, including the Contractor's disqualification of any Contract Worker or the City's failure to enforce this Section.

Continuing Duty and Audit

Contractor's obligation to ensure that all Contract Workers pass a Background Screening pursuant to Section shall continue throughout the entire term of this Contract. Contractor shall immediately notify the City of any change to a Contract Worker's Background Screening. Contractor shall maintain all records and documents related to all Background Screenings and the City reserves the right to audit Contractor's compliance with this Section.

Contract Worker Access Controls and Airport Security Badge Requirements

Contractor shall not allow a Contract Worker to begin work under this Contract until Contractor has completed the Background Screening required by the City and the City has issued the appropriate airport security badge to the Contract Worker. The airport security badge will grant the Contract Worker unescorted access authority only to the area or areas of the Airport that the Contract Worker must enter in order to perform work under this Contract. When a Contract Worker's work in any area ends, the Contract Worker's access authority to that area ends. Any Contract Worker that attempts to enter a restricted area or sterile area, as those terms are defined below, of the Airport without proper authority is an immediate breach of this Contract.

Security Identification Display Area (SIDA) Badge Process

Each Contract Worker that needs unescorted access authority to a restricted or sterile area of the Airport in order to perform work under this Contract must receive a security identification display area (SIDA) badge from the Aviation Department's Public Safety and Security Division's Badging Office. Contractor must make arrangements with the City to have each Contract Worker proceed to the Badging Office for processing. The Badging Office will not issue a SIDA badge until the Contract Worker passes a fingerprint-based criminal history background check (CHRC) required by federal law (49 C.F.R. § 1542.209) and § 4-22(C) of the Phoenix City Code and passes a security threat assessment as mandated by the TSA through a security directive (49 C.F.R. § 1542.303). The Contract Worker shall comply with all requirements of and furnish all information requested by the Badging Office. Contractor shall pay for all fees associated with SIDA badging process, unless otherwise provided in the Scope of Work. Fees will be assessed according to § 4-22(D) of the Phoenix City Code. Current badging procedures and fees are available for review at https://www.skyharbor.com/security/BadgingInformation.

As used in this Section, "restricted area" means the secured area and SIDA area of the Airport. "Secured area" means the part of the Airport in which certain federal security measures are implemented and where airlines enplane and deplane passengers and load baggage. "SIDA area" means the secured area and other areas designated by the Aviation Department, which include air operation areas, ground transportation areas, and the Rental Car Center security doors. "Sterile area" means the part of the Airport that provides passengers access to board aircraft and is controlled by the TSA or the airline by screening of persons and property. See

§ 4-22 of the Phoenix City Code and Rules 05-01 and 05-09 of the Aviation Department Rules and Regulations for a complete definition of the foregoing terms.

Risk-Based Background Check Process

The City has established two levels of risk for Contract Worker background checks: standard risk and maximum risk. If the Scope of Work changes, the City may change the level of risk, which may require Contractor conduct additional investigations and incur additional costs in order to process a background check and obtain the required airport security badge. Contract Workers who receive a SIDA badge are exempt from a standard and maximum risk background check.

A STANDARD RISK BACKGROUND CHECK is required for all non-exempt Contract Workers performing work under this Contract.

As used in this Section, "background check" means the fact-gathering process described in City of Phoenix A.R. 4.45 that is conducted to obtain information regarding a Contract Worker's legal Arizona eligibility, criminal history, driving history, certifications, and other matters that may affect the Contract Worker's ability or fitness to perform work under this Contract.

Before any work is performed under this Contract, Contractor shall provide the City with a list of its Contract Workers.

If any dispute arises related to a background check process or criminal history check information, then Contractor and the affected Contract Worker will resolve the dispute. The City will not get involved in resolving any such dispute.

In making the determination whether information in a background check renders the Contract Worker disqualified, Contractor should be guided by the following principles and guidelines

A. Disqualification should not be based solely on a criminal conviction, unless the conviction related to performance under this Contract.
B. Arrests that did not result in a conviction being entered or charges being filed may not be considered.
C. Not all criminal convictions or other negative information obtained in a background check will disqualify a Contract Worker from working under this Contract.
D. Contractor must evaluate the relevance of the information to the work the Contract Worker will perform under this Contract.
E. Contractor must consider the following factors in determining whether negative background information disqualifies a Contract Worker:
    - Duties of the position
    - Time, nature, and number of negative events and convictions
    - Attempts and extent of rehabilitation efforts
    - The relation between the duties of the position and the nature of the crime committed

The analysis of whether any information in a background check is a potentially disqualifying factor involves looking at the requirements of the Contract, the Scope of Work, where the work will be performed, the need for access to restricted areas, and the type of persons or places the Contract Worker will encounter. Contractor should review the background check results and determine whether the nature of the conviction or crime reported would create a risk to the City based on the Contract's requirements.

For a Contract Worker requiring a standard risk background check potentially disqualifying convictions include a record of theft, identity theft, computer fraud or abuse, burglary, arson,

crimes against property, violent crimes, or other crimes involving dishonesty, or embezzlement. For a Contract Worker requiring a maximum risk background check, potentially disqualifying convictions include a record of child molestation, assault, sexual assault, crimes against a person, public indecency, drug offenses, forgery, theft, burglary, arson, crimes against property, violent crimes, crimes for financial gain, identity theft, computer fraud or abuse, and embezzlement.

If a background check shows that the disposition of an arrest is unknown, then Contractor must determine the disposition of the arrest.

Contractor will obtain a Contract Worker disclosure from each Contract Worker who will perform work under this Contract. Contractor will provide the Contract Worker disclosures to the City upon request. "Contract Worker disclosure" means an affidavit by a Contract Worker disclosing his or her prior criminal record. The Contract Worker disclosure must list all criminal convictions, including the nature of the crime, the date of the conviction, and the location where the crime and conviction occurred. The Contract Worker disclosure also grants to the City the right to review the background check results. (City of Phoenix A.R. 4.45)

In a standard risk background check, Contractor must review the results of the background check and decide if a Contract Worker should be disqualified for work under this Contract. Contractor must engage in whatever due diligence is necessary to make the decision on whether to disqualify a Contract Worker. After Contractor has made its decisions, a list of names of qualified Contract Workers will be provided to the City.

In a maximum risk background check, Contractor must conduct the same review as in a standard risk background check. However, when submitting its list of qualified Contract Workers, Contractor must also submit the results of the background checks to the City for review. After its review, the City will either approve or deny each Contract Worker.

If the City approves a Contract Worker, then the City will notify Contractor of that fact and the Aviation Department will issue the appropriate airport security badge to the Contract Worker.

If the City denies a Contract Worker, then the City will notify Contractor of that fact and Contractor will reevaluate the Contract Worker to determine whether the person should be disqualified. If Contractor believes there are extenuating circumstances that suggest that the Contract Worker should not be disqualified, then Contractor will discuss those circumstances with the City. The City will review the matter and its decision on disqualification is final.

The City may set up a secure folder or drop box for confidential materials related to maximum risk background checks. The City will not keep records related to maximum risk background checks after they are reviewed.
If Contractor is a sole proprietor, Contractor must submit to the City a copy of his or her own background check and a background check for all business partners, member, and employees that will work under this Contract and for whom the background check requirements of City of Phoenix A.R. 4.45 apply.

Contractor shall determine whether a Contract Worker is disqualified from performing work under this Contract.

STANDARD RISK BACKGROUND CHECK

A standard risk background check must be conducted for the term of this Contract or five years, whichever is shorter. Contractor shall conduct a standard risk background check on all Contract Workers whose work under this Contract requires:

- An airport security badge or key for access to City facilities,

- Access to sensitive information, confidential records, personal identifying information, or restricted City information, or
- Unescorted access to City facilities during normal and non-business hours.

"Personal identifying information" is defined by City of Phoenix A.R. 4.45.

Scope of the Standard Risk Background Check
The standard risk background check conducted by Contractor must be based on the real identity and legal name of the Contract Worker and include felony and misdemeanor records checks from any county in the United States, the state of Arizona, and any other jurisdiction where the Contract Worker has lived at any time in the last seven years.

Airport Security Badge Handling Procedures
Contractor will comply with the following airport security badge handling procedures:

Key Access Procedures. If a Contract Worker requires keyed access to enter a City facility, then a separate key will be issued and Contractor must complete a return form and submit it to the City for each key issued.

Stolen or Lost Badges or Keys. Contractor shall immediately report any lost or stolen airport security badge or key to the City. A new airport security badge application or key issue form must be completed and submitted along with payment of the applicable fee prior to issuance of a new airport security badge or key

Return of Badges or Keys. All airport security badges and keys are the property of the City and must be returned to the Badging Office within one business day after the Contract Worker's access to a City facility is no longer required under this Contract. Contractor shall collect a Contract Worker's airport security badge and all keys (1) when the Contract Worker's employment is terminated, (2) when the Contract Worker's services are no longer required at a City facility, or (3) when this Contract terminates, is cancelled, or expires, whichever occurs first.

Employee Identification and Access. Contract Workers must have an airport security badge and some form of verifiable company identification in their possession at all times while working under this Contract, unless otherwise provided in the Scope of Work. Contract Workers are strictly prohibited from entering any area of the Airport that is not authorized by the airport security badge or key issued to them by the Badging Office. The Aviation Department will determine who will have access to the Airport. Contract Workers access authority is only valid during their scheduled hours. Contractor shall provide the City with updates and changes in personnel as they occur.

Badge Fees. Contractor shall pay the airport security badge fees set forth in § 4-11(D) of the Phoenix City Code.

Contractor's Breach
Contractor agrees that the access control, airport security badge, and key requirements in this Section are necessary to preserve and protect public health, safety, and welfare. Therefore, Contractor shall be deemed in immediate breach of this Section upon the occurrence of any of the following:

- A Contract Worker gains access to a City facility or a restricted or secured area of the Airport without the proper airport security badge or key,
- A Contract Worker uses another person's airport security badge or key to gain or attempt to gain access to a City facility or a restricted or secured area of the Airport,

- A Contract Worker begins work under this Contract without passing the appropriate Background Screening and being issued the proper airport security badge or key,
- A Contract Worker or Contractor submits false, incomplete, or misleading Background Screening information or submits any false, incomplete, or misleading information in an attempt to improperly obtain an airport security badge or key,
- Contractor fails to collect and timely return a Contract Worker's airport security badge or key to the City within three days of the (1) date the Contract Worker's employment terminates, (2) the date the Contract Worker is assignment to another City facility, or (3) when this Contract terminates, is cancelled, or expires, whichever occurs first.

Liquidated Damages and Remedies For Breach

In addition to any other remedy available to the City at law or in equity, including the right to terminate this Contract, Contractor shall be liable for and shall pay to the City a stipulated damage in the amount of $1,000.00 for each breach of this Section and for each time a Contract Worker entered a restricted or secured area of the Airport without proper authority. Contractor agrees that the stipulated damage amount is not a penalty but is a reasonable estimate of the actual harm to the City caused by a breach and that the harm was very difficult to estimate at the time this Contract was entered into.

Contractor Certification

Contractor certifies to the City that Contractor has read the foregoing Background Screening requirements and that all Background Screening information Contractor furnished to the City is accurate, complete, and current. Contractor further certifies to the City that Contractor has satisfied all Background Screening requirements and verified the legal worker status of each Contract Worker as required under this Section.

T. LAWFUL PRESENCE REQUIREMENT

Pursuant to A.R.S. §§ 1-501 and 1-502, the City of Phoenix is prohibited from awarding a contract to any natural person who cannot establish that such person is lawfully present in the United States. To establish lawful presence, a person must produce qualifying identification and sign a City-provided affidavit affirming that the identification provided is genuine. This requirement will be imposed at the time of contract award. This requirement does not apply to business organizations such as corporations, partnerships or limited liability companies.

U. LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN (LEED)

If practical, the contractor will provide an easily accessible area to serve the construction site that is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, glass, plastics, metals, and designate an area specifically for construction and demolition waste recycling. The contractor must provide documentation that the materials have been taken to a Maricopa County approved recycling facility.

V. CITY OF PHOENIX EQUAL EMPLOYMENT OPPORTUNITY REQUIREMENT

1. In order to do business with the City, Contractor must comply with Phoenix City Code, 1969, Chapter 18, Article V, as amended, Equal Employment Opportunity Requirements. Contractor will direct any questions in regard to these requirements to the Equal Opportunity Department, (602) 262-6790.

2. Any Contractor in performing under this contract will not discriminate against any worker, employee or applicant, or any member of the public, because of race, color, religion, sex,

national origin, age, or disability nor otherwise commit an unfair employment practice. The Contractor will ensure that applicants are employed, and employees are dealt with during employment without regard to their race, color, religion, sex, national origin, age, or disability and will adhere to a policy to pay equal compensation to men and women who perform jobs that require substantially equal skill, effort, and responsibility, and that are performed within the same establishment under similar working conditions. Such action will include but not be limited to the following: Employment, promotion, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training; including apprenticeship. The Contractor further agrees that this clause will be incorporated in all subcontracts with all labor organizations furnishing skilled, unskilled and union labor, or who may perform any such labor or services in connection with this contract.

If the Contractor employs more than thirty-five employees, the following language will apply as the last paragraph to the clause above:

The Contractor further agrees not to discriminate against any worker, employee or applicant, or any member of the public, because of sexual orientation or gender identity or expression and will ensure that applicants are employed, and employees are dealt with during employment without regard to their sexual orientation or gender identity or expression.

3. *Documentation*. Contractor may be required to provide additional documentation to the Equal Opportunity Department affirming that a nondiscriminatory policy is being utilized.

4. *Monitoring*. The Equal Opportunity Department will monitor the employment policies and practices of suppliers and lessees subject to this article as deemed necessary. The Equal Opportunity Department is authorized to conduct on-site compliance reviews of selected firms, which may include an audit of personnel and payroll records, if necessary.

W. PROTEST PROCEDURES

Any bidder who has any objections to the awarding of a contract to any bidder by the City of Phoenix, pursuant to competitive bidding procedures, will comply with Phoenix City Code Chapter 2, Section 188." A copy of the Protest Policy is also available online at:

https://www.phoenix.gov/streets/procurement-opportunities

X. UTILITY-RELATED CONSTRUCTION DELAY DAMAGES CLAIM PROCEDURES

The following procedure is intended to provide a fair and impartial process for the settlement of construction delay claims associated with unknown or improperly located utility facilities.

The Contractor will immediately notify, in writing, the Project Engineer of any potential utility-related delay claim.

The Contractor will immediately notify the appropriate liaison of the affected utility verbally, followed by a written notification.

The Contractor will coordinate an investigation of the situation with the affected utility and the City's Project Manager. After resolution, the Contractor will provide written notification of the settlement of the claim to all affected parties.

If the affected utility makes a decision to handle negotiations for a claim, their personnel will be responsible for monitoring the project and all negotiations with the Contractor regarding the claim.

The Contractor will determine to document requirements of the affected utility for their acceptance of responsibility for the claims. The Contractor will provide four (4) copies of the required documentation to the utility involved and two (2) copies of this documentation to the Project Engineer. The Contractor will obtain written confirmation from the utility company involved of their documentation requirements.

Y. DATA CONFIDENTIALITY

As used in the Contract, "data" means all information, whether written or verbal, including plans, photographs, studies, investigations, audits, analyses, samples, reports, calculations, internal memos, meeting minutes, data field notes, work product, proposals, correspondence and any other similar documents or information prepared by, obtained by, or transmitted to the Contractor or its subcontractors in the performance of this Contract.

The parties agree that all data, regardless of form, including originals, images, and reproductions, prepared by, obtained by, or transmitted to the Contractor or its subcontractors in connection with the Contractor's or its subcontractor's performance of this Contract is confidential and proprietary information belonging to the City.

Except as specifically provided in this Contract, the Contractor or its subcontractors will not divulge data to any third party without prior written consent of the City. The Contractor or its subcontractors will not use the data for any purposes except to perform the services required under this Contract. These prohibitions will not apply to the following data provided the Contractor or its subcontractors have first given the required notice to the City:

A. Data which was known to the Contractor or its subcontractors prior to its performance under this Contract unless such data was acquired in connection with work performed for the City;

B. Data which was acquired by the Contractor or its subcontractors in its performance under this Contract and which was disclosed to the Contractor or its subcontractors by a third party, who to the best of the Contractor's or its subcontractor's knowledge and belief, had the legal right to make such disclosure and the Contractor or its subcontractors are not otherwise required to hold such data in confidence; or
C. Data which is required to be disclosed by virtue of law, regulation, or court order, to which the Contractor or its subcontractors are subject.

In the event the Contractor or its subcontractors are required or requested to disclose data to a third party, or any other information to which the Contractor or its subcontractors became privy as a result of any other contract with the City, the Contractor will first notify the City as set forth in this section of the request or demand for the data. The Contractor or its subcontractors will give the City sufficient facts so that the City can be given an opportunity to first give its consent or take such action that the City may deem appropriate to protect such data or other information from disclosure.

The Contractor, unless prohibited by law, within ten calendar days after completion of services for a third party on real or personal property owned or leased by the City, the Contractor or its subcontractors will promptly deliver, as set forth in this section, a copy of all data to the City. All data will continue to be subject to the confidentiality agreements of this Contract.

The Contractor or its subcontractors assume all liability for maintaining the confidentiality of the data in its possession and agrees to compensate the City if any of the provisions of this section are violated by the Contractor, its employees, agents or subcontractors. Solely for the purposes of seeking injunctive relief, it is agreed that a breach of this section will be deemed to cause irreparable harm that justifies injunctive relief in court. Contractor agrees that the requirements

of this Section will be incorporated into all subcontracts entered into by Contractor. A violation of this Section may result in immediate termination of this Contract without notice.

Personal Identifying Information-Data Security

Personal identifying information, financial account information, or restricted City information, whether electronic format or hard copy, must be secured and protected at all times. At a minimum, Contractor must encrypt and/or password protects electronic files. This includes data saved to laptop computers, computerized devices or removable storage devices.

When personal identifying information, financial account information, or restricted City information, regardless of its format, is no longer necessary, the information must be redacted or destroyed through appropriate and secure methods that ensure the information cannot be viewed, accessed, or reconstructed.

In the event that data collected or obtained by Contractor or its subcontractors in connection with this Contract is believed to have been compromised, Contractor or its subcontractors will immediately notify the Project Manager and City Engineer. Contractor agrees to reimburse the City for any costs incurred by the City to investigate potential breaches of this data and, where applicable, the cost of notifying individuals who may be impacted by the breach.

Contractor agrees that the requirements of this Section will be incorporated into all subcontracts entered into by Contractor. It is further agreed that a violation of this Section will be deemed to cause irreparable harm that justifies injunctive relief in court. A violation of this Section may result in immediate termination of this Contract without notice.

The obligations of Contractor or its subcontractors under this Section will survive the termination of this Contract.

Z. PROJECT MANAGEMENT INFORMATION SYSTEM (UNIFIER)

The Aviation Department Project Manager may determine that use of UNIFIER will be required during this contract. The following information provides a guideline for utilization. Any questions related to the requirements of UNIFIER should be directed to the AVN Project Manager.

1. The contractor will be required to maintain all project records in electronic format. The City provides an Application Service Provider (ASP) web-based project management database which the contractor will be required to utilize in the fulfillment of the contract requirements. Although this electronic platform does not fulfill this requirement in its entirety, the contractor will be required to utilize this platform as the basis for this work.

2. The contractor can expect to use this ASP to process all primary level tri-partite contract documents related to the design or construction phase of the Project including but not limited to: requests for interpretation/information, potential Change Orders, construction meeting minutes, Submittals, Design Professional's supplemental instructions, and Payment Requests.

3. The contractor will be required to process information into electronic digital form. To fulfill this requirement, the contractor will provide all necessary equipment to perform the functions necessary to generate, convert, store, maintain, connect to web-based ASP and transfer electronic data.

4. The contractor will provide a computerized networked office platform with broadband internet connectivity. Wired or wireless is acceptable. This platform will function well in a web-based environment utilizing an internet browser compatible with the City's UNIFIER ASP system.

UNIFIER training will be provided through the City of Phoenix. Contact information will be provided to the firms under contract, to establish the set up with a log-in and password.

AA. PROJECT STAFFING

Key Personnel: Before starting work, Contractor must submit detailed résumés of key personnel involved in that work for City's approval (which City will not unreasonably withhold). If Contractor later desires to change key personnel involved in that work, Contractor must submit detailed résumés of the new personnel for City's approval (which City will not unreasonably withhold).

Qualified Staff: Contractor must maintain an adequate and competent staff of qualified persons—as City may determine in its sole discretion—during performance of this Master Agreement. If City in its sole discretion determines that any of Contractor's staff is objectionable, Contractor must take prompt corrective action or replace that staff with new personnel, subject to City's approval.

Third-Party Employment Brokers: Contractor and Subcontractors will not utilize a third-party labor broker for any construction worker under this Agreement. The Contractor and Subcontractors must be the employers of record for its construction staff under this Agreement.

BB. NO ISRAEL BOYCOTT

If this Contract is valued at $100,000 or more and requires Contractor (a company engaging in for-profit activity and having ten or more full-time employees) to acquire or dispose of services, supplies, information technology, or construction, then Contractor must certify and agree that it does not and will not boycott goods or services from Israel, pursuant to Title 35, Chapter 2, Article 9 of the Arizona Revised Statutes. Provided that these statutory requirements are applicable, Contractor by entering this Contract now certifies that it is not currently engaged in, and agrees for the duration of the Contract to not engage in, a boycott of goods or services from Israel.

CC. NO FORCED LABOR OF ETHNIC UYGHURS

If this Contract requires Contractor (a company engaging in for-profit activity and having ten or more full-time employees) to acquire or dispose of services, supplies, information technology, goods, or construction, then pursuant to Title 35, Chapter 2, Article 10 of the Arizona Revised Statutes Contractor must certify and agree that it and any contractors, subcontractors, or suppliers it utilizes do not and will not use the forced labor of ethnic Uyghurs in the People's Republic of China or any goods or services produced by such forced labor. Provided these statutory requirements are applicable, Contractor, by entering this Contract, now certifies it is not currently engaged in, and agrees for the duration of the Contract to not engage in, (a) the use of forced labor of ethnic Uyghurs in the People's Republic of China; (b) the use of any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China; or (c) the use of any contractors, subcontractors, or suppliers that use the forced labor or any goods or services produced by the forced labor of ethnic Uyghurs in the People's Republic of China.

DD. COMPLIANCE WITH LAWS

Contractor must comply with all existing and subsequently enacted federal, state and local laws, ordinances and codes, all applicable ADA requirements, regulations that are, or become applicable to this Agreement, and be in general conformance with PROWAG guidance. If a subsequently enacted law imposes substantial additional costs on Contractor, a request for an

amendment may be submitted pursuant to this Agreement. Contractor is also required to certify its compliance with all applicable laws and Contractor must pass along these requirements to its Subcontractors. If any of Contractor's certifications is found to be false, the City may terminate this Agreement or impose other remedies due to the false certification

SUPPLEMENTARY CONDITIONS

1. **103 AWARD AND EXECUTION OF CONTRACT,** Add the following to **Subsection 103.3 AWARD OF CONTRACT**:

Contract award will be made to a responsive and responsible bidder based on the low total base bid or on the low combination of the total base bid and any selected alternate(s), whichever is in the best interest of the City. If unit pricing is required in the proposal, the extensions and additions will be verified to assure correctness. Award will be based on the revised total if any errors are found. Additionally, the Contractor will meet the minimum SBE subcontracting goal set for this contract or have been granted a full or partial waiver of the goal. The City expressly reserves the right to cancel this agreement without recourse or prejudice to Contractor until all parties have executed the agreement in full.

Any bidder that currently contracts with the City must be in good standing for its proposal to be considered responsive. For the purpose of this Invitation to Bid, good standing means compliance with all contractual provisions, including payment of financial obligations.

2. **103 AWARD AND EXECUTION OF CONTRACT**, Add the following to **Subsection 103.5, REQUIREMENT OF CONTRACT BONDS**:

A. PERFORMANCE BOND AND LABOR AND MATERIAL BOND

Prior to the execution of a contract, the successful bidder must provide a performance bond and a labor and material bond, each in an amount equal to the full amount of the contract. Each such bond will be executed by a surety company or companies holding a certificate of authority to transact surety business in the State of Arizona issued by the Director of the Department of Insurance. A copy of the Certificate of Authority will accompany the bonds. The Certificate will have been issued or updated within two years prior to the execution of the Contract. The bonds will be made payable and acceptable to the City of Phoenix. The bonds will be written or countersigned by an authorized representative of the surety who is either a resident of the State of Arizona or whose principal office is maintained in this state, as required by law, and the bonds will have attached thereto a certified copy of Power of Attorney of the signing official. If one Power of Attorney is submitted, it will be for twice the total contract amount. If two Powers of Attorney are submitted, each will be for the total contract amount. Personal or individual bonds are not acceptable. Failure to comply with these provisions will be cause for rejection of the bidder's proposal.

B. BONDING COMPANIES

All bonds submitted for this project will be provided by a company which has been rated “A- or better for the prior four quarters” by the A. M. Best Company. **Failure to provide an "A- or better for the prior four quarters” bond will result in bid rejection.**

3. **103 AWARD AND EXECUTION OF CONTRACT**, **Delete Subsection 103.6, CONTRACTOR’S INSURANCE** in its entirety and substitute the following:

103.6.1 General:
Contractor and subcontractors must procure insurance against claims that may arise from or relate to performance of the work hereunder by Contractor and its agents, representatives, employees and subconsultants. Contractor and subcontractors must maintain that insurance until all of their obligations have been discharged, including any warranty periods under this Contract.

The City in no way warrants that the limits stated in this section are sufficient to protect the Contractor from liabilities that might arise out of the performance of the work under this Contract by the Contractor, its agents, representatives, employees, or subcontractors and Contractor may purchase additional insurance as they determine necessary.

SCOPE AND LIMITS OF INSURANCE - Contractor must provide coverage with limits of liability not less than those stated below. An excess liability policy or umbrella liability policy may be used to meet the liability limits provided that (1) the coverage is written on a "following form" basis, and (2) all terms under each line of coverage below are met.

Commercial General Liability – Occurrence Form

General Aggregate	$2,000,000
Products – Completed Operations Aggregate	$1,000,000
Personal and Advertising Injury	$1,000,000
Each Occurrence	$1,000,000

- The policy must name the City of Phoenix as an additional insured with respect to liability for bodily injury, property damage and personal and advertising injury with respect to premises, ongoing operations, products and completed operations, and liability assumed under an insured contract arising out of the activities performed by, or on behalf of the Contractor, related to this Contract.

- Coverage must include XCU coverage.

- There shall be no endorsement or modification which limits the scope of coverage or the policy limits available to the City of Phoenix as an additional insured.

- City of Phoenix is an additional insured to the full limits of liability purchased by the Contractor.

- The Contractor's insurance coverage must be primary and non-contributory with respect to any insurance or self-insurance carried by the City.

- Contractor's policies must be endorsed to provide an extension of the completed operations coverage for a period of nine years.

Automobile Liability

Bodily injury and property damage coverage for any owned, hired, and non-owned vehicles used in the performance of this Contract.

Combined Single Limit (CSL)	$1,000,000

- The policy must be endorsed to include The City of Phoenix as an additional insured with respect to liability arising out of the activities performed by, or on behalf of the Contractor, related to this contract.

- City of Phoenix is an additional insured to the full limits of liability purchased by the Contractor.

- The Contractor's insurance coverage must be primary and non-contributory with respect to any

insurance or self-insurance carried by the City.

Worker's Compensation and Employers' Liability

Workers' Compensation	Statutory
Employers' Liability	
Each Accident	$100,000
Disease – Each Employee	$100,000
Disease – Policy Limit	$500,000

- Policy must contain a waiver of subrogation against the City of Phoenix.
- This requirement does not apply when a contractor or subcontractor is exempt under A.R.S. §23-902(E), **AND** when such contractor or subcontractor executes the appropriate sole proprietor waiver form.

Builders' Risk Insurance or Installation Floater

Policy must be in an amount equal to the initial Contract Amount plus additional coverage equal to Contract Amount for all subsequent change orders.

- The City of Phoenix, the Contractor and subcontractors, must be named insureds on the policy.
- Special Causes of Loss coverage must be written on a replacement cost basis and must include coverage for soft costs, flood and earth movement.
- Policy must be maintained until whichever of the following must first occur: (1) final payment has been made; or, (2) until no person or entity, other than the City of Phoenix, has an insurable interest in the property required to be covered.
- Policy must be endorsed such that the insurance must not be canceled or lapse because of any partial use or occupancy by the City.
- Policy must provide coverage from the time any covered property becomes the responsibility of the Contractor, and continue without interruption during construction, renovation, or installation, including any time during which the covered property is being transported to the construction installation site, or awaiting installation, whether on or off site.
- Policy must contain a waiver of subrogation against the City of Phoenix.
- Contractor is responsible for the payment of all policy deductibles.

ADDITIONAL INSURANCE REQUIREMENTS:

A. NOTICE OF CANCELLATION

For each insurance policy required by the insurance provisions of this Contract, the Contractor must provide to the City, within five business days of receipt, a notice if a policy is suspended, voided or cancelled for any reason. Such notice must be mailed, emailed, or hand delivered to **Design and Construction Procurement, 200 W. Washington Street, 5th Floor, 85003**.

B. ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers duly licensed or authorized to do business in the state of Arizona and with an "A.M. Best" rating of not less than "B+VI." The City in no way warrants that the required minimum insurer rating is sufficient to protect the Contractor from potential insurer insolvency.

C. VERIFICATION OF COVERAGE

Contractor must furnish the City with certificates of insurance (ACORD form or equivalent approved by the City) as required by this Contract. The certificates for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf.

All certificates and any required endorsements are to be received and approved by the City before work commences. Each insurance policy required by this Contract must be in effect at or prior to commencement of work under this Contract and remain in effect for the duration of the project. Failure to maintain the insurance policies as required by this Contract or to provide evidence of renewal is a material breach of contract.

All certificates required by this Contract must be sent directly to Design and Construction Procurement via email at **str.title34.procure@phoenix.gov**. **The City project number, contract number and project description must be noted on the certificate of insurance**. The City reserves the right to require complete, certified copies of all insurance policies required by this Contract at any time**. DO NOT SEND CERTIFICATES OF INSURANCE TO THE CITY'S RISK MANAGEMENT DIVISION.**

D. SUBCONTRACTORS

Contractor's certificates shall include all subcontractors as additional insureds under its policies **OR** Contractor shall be responsible for ensuring and verifying that all subcontractors have valid and collectable insurance. At any time throughout the life of the contract, the City of Phoenix reserves the right to require proof from the Contractor that its subcontractors have insurance coverage. All subcontractors providing services included under this Contract's Scope of Services are subject to the insurance coverages identified above and must include the City of Phoenix as an additional insured. In certain circumstances, the Contractor may, on behalf of its subcontractors, waive a specific type of coverage or limit of liability where appropriate to the type of work being performed under the subcontract. Contractor assumes liability for all subcontractors with respect to this Contract.

E. APPROVAL

Any modification or variation from the insurance coverages and conditions in this Contract must be documented by an executed contract amendment.

103.6.2 Defense and Indemnification

To the maximum extent allowed by law, including Title 34 A.R.S., Contractor ("Indemnitor") agrees to defend, indemnify, and hold harmless the City of Phoenix and its officers, officials (elected or appointed), agents and employees (and any jurisdiction or agency issuing permits for any work included in the project, and its officers, agents and employees) ("Indemnitee") from any and all claims, actions, liabilities, damages, losses or expenses, (including but not limited to court costs, attorney fees, expert fees, and costs of claim processing, investigation and litigation) of any nature or kind whatsoever ("Losses") caused or alleged to be caused, in whole or in part, by the wrongful, negligent or willful acts, or errors or omissions of Indemnitor or any of its owners, officers, directors, members, managers, agents, employees, or subcontractors (Indemnitor's Agents") arising out of or in connection with this Contract. This defense and indemnity obligation includes holding Indemnitee harmless for any Losses or other amount arising out of or recovered under any state's workers'

compensation law or arising out of the failure of Indemnitor or Indemnitor's Agents to conform to any federal, state or local law, statute, ordinance, rule, regulation, or court decree. Indemnitor's duty to defend Indemnitee accrues immediately at the time a claim is threatened or a claim is made against Indemnitee, whichever is first. Indemnitor's duty to defend exists regardless of whether Indemnitor is ultimately found liable. Indemnitor must indemnify Indemnitee from and against any and all Losses, except where it is proven that those Losses are solely as a result of Indemnitee's own negligent or willful acts or omissions. Indemnitor is responsible for primary loss investigation, defense and judgment costs where this indemnification applies. In consideration of the City's award of this Contract, Indemnitor agrees to waive all rights of subrogation against Indemnitee for losses arising from or related to any work performed by Indemnitor or Indemnitor's Agents for the City of Phoenix under this Contract. The obligations of Indemnitor under this provision survive the termination or expiration of this Contract.

4. **104 SCOPE OF WORK,** Add the following to **Subsection 104.1.2 MAINTENANCE OF TRAFFIC**:

ADA AND ANSI ACCESS OF PREMISES DURING CONSTRUCTION

Contractor will maintain existing ADA and ANSI accessibility requirements during construction activities in an occupied building or facility. ADA and ANSI accessibility requirements will include, but not be limited to, parking, building access, entrances, exits, restrooms, areas of refuge, and emergency exit paths of travel. Contractor will be responsible for the coordination of all work to minimize disruption to building occupants and facilities.

5. **104 SCOPE OF WORK,** Add the following to **Subsection 104.1.4 CLEANUP AND DUST CONTROL**:

The Contractor will use a power pick-up broom as part of the dust control effort. No separate measurement or payment will be made for cleanup or dust control, or for providing a power pick-up broom on the job.

6. **105 CONTROL OF WORK,** Add the following to **Subsection 105.1, AUTHORITY OF THE ENGINEER**:

A. CONTRACT ADMINISTRATION

The definition of "Engineer" will read as follows:

"Engineer": All references to "Engineer" in these contract bid documents, including the MAG Specifications, will mean City Engineer.

B. PRECONSTRUCTION CONFERENCE

After completion of the contract documents, to include bonds, insurance and signatures and prior to the commencement of any work on the project, the Aviation Department, DCS Section, (telephone 602-273-2780), will schedule a Pre-Construction Conference. This will be held at 500 South 24th Street, Phoenix, Arizona.

Construction administration will be provided by City of Phoenix, Aviation Department, Design and Construction Services.

The purpose of this conference is to establish a working relationship between the Contractor, utility firms and various City agencies. The agenda will include critical elements of the work schedule, submittal schedule, cost breakdown of major lump sum items, payment application and processing, coordination with the involved utility firms, emergency telephone numbers for all representatives involved in the course of construction and establishment of the notice to proceed date. The Contractor

will also provide copies of all purchase orders and/or contracts with SBE subcontractors and suppliers used to meet the subcontract goals programmed for this project.

Minimum attendance by the Contractor will be a responsible company/corporate official, who is authorized to execute and sign documents on behalf of the firm, the job superintendent and the Contractor's safety officer.

C. AUTHORIZATION OF THE ENGINEER

The City may, at its discretion and without cause, order the Contractor in writing to stop and suspend work. Immediately after receiving such notice, the Contractor will discontinue advancing the work specified under this Agreement.

Such suspension will not exceed one hundred and eighty (180) consecutive days during the duration of the project.

The Contractor may seek an adjustment of the contract price and time, if the cost or time to perform the work has been adversely impacted by any suspension or stoppage of work by the City.

7. **105 CONTROL OF WORK,** Add the following to **Subsection 105.2 PLANS AND SHOP DRAWINGS**:

The Contractor will submit as many of the required shop drawings and product data submittals at the Pre-Construction meeting as practical and possible. All shop drawings and product data submittals will be submitted sufficiently in advance to allow adequate time for City review(s) and approval. The Contractor will submit early enough to allow enough time for reviews based on the assumption that a submittal may be marked “Revise and Resubmit” or “Rejected”, requiring the Contractor to modify the submittal and resubmit for additional review(s) until acceptance.

A separate transmittal will be used for each specific item type, class of material or equipment for which a submittal is required. Multiple items under one transmittal will only be allowed when the items taken together constitute a complete manufacturer’s package, or are so functionally related that the entire package should be reviewed as a whole. The contractor will submit six (6) hard copies of each shop drawing for review. **Email or FAX submittals will not be accepted.**

The Contractor will allow up to four (4) weeks for City review for each submittal. Some submittals may be simple and straightforward and may not require the full four (4) weeks, but other more complex submittals may take the full four (4) weeks.

8. **105 CONTROL OF WORK**, Delete **Subsection 105.8 CONSTRUCTION STAKES, LINES AND GRADES** and substitute the following

Description

The work under this section will consist of furnishing all materials, personnel and equipment necessary to perform all verification of the accuracy of all points which have been provided by the Engineer.

Included in this work will be all calculations required for the satisfactory completion of the project in conformance with the plans and specifications.

Measurements of all removals and pay quantity items will be the responsibility of the Engineer.

During installation and/or relocation of new water lines, valves, water meters and service connections, fire hydrants, sewer lines, sewer taps, clean outs, manholes, and other similar assets, the Contractor will record the final as-built location and provide additional information related to cost, manufacturer, and model numbers in a form provided by the Engineer.

Traffic control will be in accordance with the requirements of the City of Phoenix Barricade Manual.

The Contractor will keep field notes in bound field books. These books will be available for inspection by City personnel at all times and will become the property of the City of Phoenix upon completion of the project.

Record Drawings

The Contractor shall maintain a record set of plans at the job site. These shall be kept legible and current and shall show all changes or work added in a contrasting, reproducible color. Two weeks prior to issuance of substantial completion, the Contractor shall submit, prior to final inspection, corrected landscape drawings showing the location of all utility services, controller, pipe, valves and wiring. The Engineer shall be the sole judge as to the acceptability of the record plans and receipt of an acceptable set is a pre-requisite for final payment.

Prior to final acceptance, the Contractor will provide a complete as-built set, sealed by a Registered Professional, showing all field modifications and final elevation, stations and offset of the completed improvements. For construction related to sewer, and water facilities, and other utilities, as-built information may be requested at the Engineer prior to completion of as-builts at no additional cost.

9. **105 CONTROL OF WORK,** Add the following to **Subsection 105.15 ACCEPTANCE, paragraph (B) Final Acceptance**:

A. SUBSTANTIAL COMPLETION

The work may be judged substantially complete when all construction, including all applicable ADA requirements, has been completed with the possible exception of final inspection punch list work. The purpose of granting or acknowledging substantial completion is to stop contract time. This is particularly important to the Contractor if contract time is exhausted or nearly so and/or punch list work is anticipated to extend beyond the allotted time. Granting of substantial completion will eliminate the possibility of incurring liquidated damages or additional liquidated damages beyond the substantial completion date, whichever case may apply.

In the event that the Engineer grants substantial completion, the Contractor will have thirty (30) days thereafter to complete punch list work, unless additional time is granted--in writing--by the Engineer. In no case will a Contractor be granted more than thirty (30) days to complete punch list work, unless there are extenuating circumstances such as delay in shipment of a specialized piece of equipment, labor strike, or other circumstances beyond the Contractor's control which would necessitate a further time extension.

B. PENALTY FOR FAILURE TO COMPLETE PUNCH LIST WORK WITHIN SPECIFIED TIME

In the event the Contractor fails to complete the punch list work within thirty (30) days following the contract completion date, or in the case of specialized situations within the additional time allotted by the Engineer, the Contractor may be declared in default, and the Engineer may order the work completed by others.

In the event of default, as described herein, the Engineer will withhold from the Contractor's final payment, an amount equal to at least twice the estimated cost of the remaining work. In addition, the Engineer will withhold the retention deducted from contract progress payments until all punch list work has been satisfactorily completed, whereupon twice the amount of the actual cost of completing the work will be deducted from the Contractor's final payment and the remaining funds, if any, including the contract retention, will be released in accordance with the conditions set forth in contract retention.

C. CONTRACT RETENTION

This project will not be considered complete until all work has been completed, including punch list work. Under no circumstances will a Contractor receive any portion of the legally retained progress payments until the City has granted a final acceptance and/or acknowledged substantial completion. The following conditions will apply to each case:

1. Substantial Completion: The Engineer may reduce outstanding contract retention to not less than one (1) percent of the total contract amount, upon granting substantial completion, if the value of the punch list work is estimated to be less than one (1) percent of the total contract.

2. Project Acceptance: Project acceptance implies that all punch list work is done and the improvements have been accepted by the City. Under these conditions, the retention will be fully released to the Contractor subject only to the signing of the standard claims affidavit and hold harmless clause required for all contracts.

3. Final Release of Contract Retention and/or Release of More Than Ninety (90) Percent of the Contract Funds: Prior to final payment and release of monies retained and/or in the case of substantial completion where the Contractor has requested a reduction in contract retention, the Contractor will be required to sign a claims affidavit agreeing to hold the City harmless from any and all claims arising out of the contract.

10. 107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC, Add the following to **Subsection 107.1, LAWS TO BE OBSERVED, paragraph (C)**:

While every effort has been made to Blue Stake all known utilities, and to research and show on the plans, all existing underground utilities based on the best available information, it will be the Contractor's responsibility to locate and pothole all existing utilities sufficiently in advance of anticipated new underground construction to identify any potential conflicts and allow reasonable time for the Engineer to determine solutions. Any claims for additional compensation or work required due to the Contractor's non-compliance with this provision will not be considered for payment by the City.

11. 107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC, Add the following new paragraphs to **Subsection 107.1, LAWS TO BE OBSERVED**:

(G) FAIR TREATMENT OF WORKERS

The Contractor will keep fully informed of all Federal and State laws, County and City ordinances, regulations, codes and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any way affect the conduct of the work. He will at all times observe and comply with all such laws, ordinances, regulations, codes, orders and decrees; this includes, but is not limited to laws and regulations ensuring fair and equal treatment for all employees and against unfair employment practices, including OSHA and the Fair Labor Standards Act (FLSA). The Contractor will protect and indemnify the Contracting Agency and its

representatives against any claim or liability arising from or based on the violation of such, whether by himself or his employees.

(H) DESERT TORTOISE MITIGATION

As stated in the Arizona Interagency Desert Tortoise Team (AIDTT) Management Plan (1996), if a desert tortoise is found in a project area, activities should be modified to avoid injuring or harming it. If activities cannot be modified, tortoises in harm's way should be moved in accordance with Arizona Game and Fish Department's "Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects", revised October 23, 2007 (or the latest revision), included in these contract provisions. Taking, possession, or harassment of a desert tortoise is prohibited by State law, unless specifically authorized by Arizona Game and Fish Department.

(I) BURROWING OWLS MITIGATION – MIGRATORY BIRD TREATY ACT OF 1918

While no burrowing owls have been seen at the project site, small animal burrows likely used by rodents and cottontail rabbits are present. In the event that burrowing owls are found on the site, the project will comply with the Migratory Bird Treaty Act of 1918 and relocate the birds prior to grading. A contact for relocation of burrowing owls is Bob Fox or Greg Clark of Wild at Heart, 31840 North 45th Street, Cave Creek, AZ 85331, 480-595-5047.

12. **107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC,** Add the following to **Subsection 107.2, PERMITS**:

A. **HAUL PERMIT**

On any project, when the quantity of fill or excavation to be hauled exceeds 10,000 C.Y. or when the duration of the haul is for more than twenty (20) working days, the Contractor will:

1. Obtain approval of the proposed haul route, number of trucks, etc., by the Street Transportation Department, and then;

2. Submit the proposed haul route plan to the Planning and Development Department and pay the appropriate plan-review fee (contact Planning and Development Department at 602-534-5933 for current plan review fee, the cost of which will be considered incidental to the project), and after their approval;

3. Obtain the written haul permit from the Planning and Development Department.

NOTE: Obtaining the haul permit and the approval by Street Transportation does not release the Contractor from strict compliance with MAG Subsection 108.5, Limitation of Operations.

13. **107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC**, Revise the title of **Subsection 107.4 ARCHAEOLOGICAL REPORTS** to **107.4 ARCHAEOLOGICAL MONITORING AND DISCOVERIES**, and add the following:

Archaeological monitoring may be required within the limits of the project during construction. The Contractor must coordinate all ground disturbing work with the archaeologist(s) and provide a current work schedule to facilitate the archaeologist's investigation and monitoring of all ground disturbing work within the area(s) of interest. When archaeological materials are discovered, the Contractor must stop work immediately within a 10-meter zone of the discovery, secure the area, and immediately notify the on-site archaeologist(s) who must

then contact the City Archaeology Office (602-495-0901) or the Street Transportation Environmental Section at 602-534-3747, who will coordinate with the City Archaeology Office. The Contractor must not recommence work in the area of discovery until directed in writing by the City Archaeology Office.

If suspected archaeological materials are discovered during construction without an archaeologist present, the Contractor must stop work immediately within a 10-meter zone of the discovery, secure the area, and immediately notify the City Archaeology Office (602-495-0901). The Contractor must not recommence work in the area of discovery until directed in writing by the City Archaeology Office.

In 1990, the Arizona legislature amended two state laws (Arizona Antiquities Act & State Historic Preservation Act) that protect human burials and associated artifacts on both private and state land. As specified in these laws and rephrased below:

I) A person shall not knowingly excavate in or upon any historic or prehistoric archaeological site, except when acting as a duly authorized agent of an institution or corporation organized for scientific, research or land use planning purposes. [Arizona Revised Statute §41-841(A) - Archaeological Discoveries] Any person, institution or corporation violating any provision of this article is guilty of a class 2 misdemeanor. [A.R.S. §41-846 - Violation]

2) A person who knowingly excavates in violation of A.R.S. §41-841 is guilty of a class 5 felony pursuant to Arizona Criminal Code- Title 13. A second or subsequent violation under this subsection is a class 3 felony. [A.R.S. I 7 .OJ - Excavating Certain Sites].

A class 5 felony carries potential penalties of up to two years in prison. If a City of Phoenix (City) project may impact historic or pre-historic archaeological resources, the guidelines described above must be adhered to. Therefore, no subsurface disturbance activities related to this without having an archaeological consultant on-site prior to and during this project's ground disturbance activities.

The City of Phoenix Office of the City Engineer is requesting that the Project Archaeological Requirements Acknowledgment Form is completed for all City sponsored or managed projects involving ground subsurface disturbance activities in areas that may include archaeological resources, as determined by the City of Phoenix Archaeology Office (CAO). If archaeological monitoring is required on a project, a City Archaeological Monitoring Acknowledgment form will be provided for your review and signature. The guidelines and the provisions in the Terms and Conditions of the Archaeological Monitoring Form must be followed as prescribed on the form and referenced above in this section. Penalties for non-compliance are detailed on the Archaeological Monitoring Form. Failure to comply with the requirements of this acknowledgment form and the City contract may constitute a breach of contract.

14. **107 LEGAL REGULATIONS AND RESPONSIBILITY TO PUBLIC, Modify Subsection 107.8, USE OF EXPLOSIVES** as follows:

Replace the words "Uniform Fire Code" with “Phoenix Fire Code".

15. **108 COMMENCEMENT, PROSECUTION AND PROGRESS** Add the following to **Subsection 108.2, SUBLETTING OF CONTRACT**:

(F) PROMPT PAYMENT

1. **Contractor Payment to Subcontractor or Supplier**

Contractor will pay its subcontractors or suppliers within seven (7) calendar days of receipt of each

progress payment from the City. The Contractor will pay for the amount of work performed or materials supplied by each subcontractor or supplier as accepted and approved by the City with each progress payment. In addition, any reduction of retention by the City to the Contractor will result in a corresponding reduction to subcontractors or suppliers who have performed satisfactory work. Contractor will pay subcontractors or suppliers the reduced retention within fourteen (14) days of the payment of the reduction of the retention to the Contractor. No Contract between Contractor and its subcontractors and suppliers may materially alter the rights of any subcontractor or supplier to receive prompt payment and retention reduction as provided herein. If the Contractor fails to make payments in accordance with these provisions, the City may take any one or more of the following actions and Contractor agrees that the City may take such actions: (1) to hold the Contractor in default under this agreement; (2) withhold future payments including retention until proper payment has been made to subcontractors or suppliers in accordance with these provisions; (3) reject all future bids from the Contractor for a period not to exceed one year from substantial completion date of this project; or (4) terminate agreement.

2. **Alternative Dispute Resolution Between Contractor and Subcontractor or Supplier**

If Contractor's payment to a subcontractor or supplier is in dispute, Contractor and subcontractor or supplier agree to submit the dispute to any one of the following dispute resolution processes within fourteen (14) calendar days from the date that any party involved gives written notice to the other party(ies): (1) binding arbitration; (2) a form of alternative dispute resolution (ADR) agreeable to all parties; or (3) a City of Phoenix facilitated mediation. When disputed claim is resolved through ADR or otherwise, the Contractor and subcontractor or supplier agree to implement the resolution within seven (7) calendar days from the resolution date.

3. **Inspection and Audit**

Contractor, its subcontractors and suppliers will comply with A.R.S. 35-214 and the City will have all rights and remedies to inspect and audit the records and files of Contractor, subcontractor or supplier, as afforded the State of Arizona in accordance with the provisions of A.R.S. Section 35-214.

4. **Non-Waiver**

Should the City fail or delay in exercising or enforcing any right, power, privilege, or remedy under this Section, such failure or delay will not be deemed a waiver, release, or modification of the requirements of this Section or of any of the terms or provisions thereof.

5. **Inclusion of provisions in Subcontracts**

Contractor will include these prompt payment provisions in every subcontract, including procurement of materials and leases of equipment for this Agreement.

6. **No Third Party Benefits or Rights**

Nothing contained in this Agreement is intended to benefit or confer any rights on any person or entity not a party to this Agreement, and no such person or entity, including but not limited to other Contractors, subcontractors or suppliers, may assert any claim, cause of action, or remedy against the City hereunder.

16. **108 COMMENCEMENT, PROSECUTION AND PROGRESS**, Add the following to **Subsection 108.4, CONTRACTOR'S CONSTRUCTION SCHEDULE**:

No later than one (1) week after the Pre-Construction meeting (or one week after the Notice to Proceed date is firmly established), the Contractor will submit to the Engineer, two (2) copies of a detailed Critical Path Model (CPM) chart outlining the detailed progress of all major and critical elements of the project by weeks, from beginning of project to end. The chart will begin at the established Notice to Proceed date and progress on a calendar basis, week by week, to the end of the project.

The Contractor will submit updated CPM charts as required by the Engineer. This will typically be on a monthly basis. The required submittals of updated CPM charts may be less frequent than monthly, if approved by the Engineer.

Neither the City nor the Engineer will accept liability or responsibility for the reasonable or workable nature of the CPM schedules prepared and submitted by the Contractor—that responsibility will remain with the Contractor.

17. **108 COMMENCEMENT, PROSECUTION AND PROGRESS**, Add the following to **Subsection 108.5, LIMITATION OF OPERATIONS**:

A. **WORK HOURS**

Regular working hours will be defined as one 8-1/2 hour shift per day, Monday through Friday, exclusive of City holidays.

Work in excess of regular working hours will be defined as overtime. For overtime which becomes necessary, the Contractor will make a written request to the Engineer at least eight (8) calendar days before the desired overtime. The request will include the duration, dates, times, reason for overtime, and a statement of the consequences if overtime is not approved.

The Contractor will not schedule any overtime work which requires inspection, survey, or material testing without written permission from the Engineer two (2) working days before the proposed overtime work. The Engineer reserves the right to deny the requested overtime. If an overtime request is denied, the Engineer may extend the contract time at no additional cost to the City, including extended overhead costs.

Unscheduled Overtime

Overtime that is not requested and approved in accordance with the above procedure will be defined as unscheduled overtime. All costs (including appropriate overhead) will be paid by the Contractor by deduction from the contract.

Emergency Overtime

An emergency is defined as work required for a situation that is not within the Contractor's control.

With the Engineer's approval, the Contractor will be permitted to work overtime without being responsible for paying the City's costs.

B. **NIGHT WORK**

Any proposed night work will be done in accordance with all City of Phoenix Ordinances. Night work will only be allowed upon submittal and approval of After-Hours Work in the Right-of-Way application.

The Contractor will submit a comprehensive plan at the Preconstruction Conference that details the steps and methods of noise reduction during night working hours. This plan will address, but not be limited to the following: back-up alarms, equipment noise, scheduling of excessively noisy construction phases, and material delivery times. Spotters, in lieu of back-up alarms, may be required at night.

There will be no separate measurement or payment for work related to this item, the cost being considered incidental to the cost of contract items.

18. **108 COMMENCEMENT, PROSECUTION AND PROGRESS**, Add the following to **Subsection 108.10, FORFEITURE AND DEFAULT OF CONTRACT**:

City's Right to Perform and Terminate for Cause

If the City provides the Contractor with a written order to provide adequate maintenance of traffic, adequate cleanup, adequate dust control or to correct deficiencies or damage resulting from abnormal weather conditions, and the Contractor fails to comply in a time frame specified, the City may have work accomplished by other sources at the Contractor's expense.

If Contractor persistently fails to (i) provide a sufficient number of skilled workers, (ii) supply the materials required by the Contract Documents, (iii) comply with applicable Legal Requirements, (iv) timely pay, without cause, Sub-consultants and/or Subcontractors, (v) prosecute the Contract Services with promptness and diligence to ensure that the Contract Services are completed by the Contract Time, as such times may be adjusted, or (vi) perform material obligations under the Contract Documents, then the City, in addition to any other rights and remedies provided in the Contract Documents or by law, will have the rights set forth below.

Upon the occurrence of an event set forth above, City may provide written notice to Contractor that it intends to terminate the Agreement unless the problem cited is cured, or commenced to be cured, within seven (7) days of Contractor's receipt of such notice.

If Contractor fails to cure, or reasonably commence to cure, such problem, then City may give a second written notice to Contractor of its intent to terminate within an additional seven (7) day period.

If Contractor, within such second seven (7) day period, fails to cure, or reasonably commence to cure, such problem, then the City may declare the Agreement terminated for default by providing written notice to Contractor of such declaration.

Upon declaring the Agreement terminated pursuant to the above, City may enter upon the premises and take possession, for the purpose of completing the Work, of all materials, equipment, scaffolds, tools, appliances and other items thereon, which have been purchased or provided for the performance of the Work, all of which Contractor hereby transfers, assigns and sets over to City for such purpose, and to employ any person or persons to complete the Work and provide all of the required labor, services, materials, equipment and other items.

In the event of such termination, Contractor will not be entitled to receive any further payments under the Contract Documents until the Work will be finally completed in accordance with the Contract Documents. At such time, the Contractor will only be entitled to be paid for Work performed and accepted by the City prior to its default.

If City's cost and expense of completing the Work exceeds the unpaid balance of the Contract Price, then Contractor will be obligated to pay the difference to City. Such costs and expense will include not only the cost of completing the Work, but also losses, damages, costs and expense, including attorneys' fees and

expenses, incurred by the City in connection with the re-procurement and defense of claims arising from Contractor's default.

19. **108 COMMENCEMENT, PROSECUTION AND PROGRESS**, Add the following to **Subsection 108.11, TERMINATION OF CONTRACT**:

TERMINATION FOR CONVENIENCE

The Owner for its own convenience has the right for any reason and at any time to terminate the contract and require the Contractor to cease work hereunder. Such termination will be effective at the time and in the manner specified in the notification to the Contractor of the termination. Such termination will be without prejudice to any claims which the Owner may have against the Contractor. In the event of a termination for convenience, the Contractor will be paid only the direct value of its completed work and materials supplied as of the date of termination, and Contractor will not be entitled to anticipated profit or anticipated overhead or any other claimed damages from the Owner, Architect or the Engineer.

If the City is found to have improperly terminated the Agreement for cause or default, the termination will be converted to a termination for convenience in accordance with the provisions of this Agreement.

CANCELLATION OF CONTRACT FOR CONFLICT OF INTEREST

All parties hereto acknowledge that this agreement is subject to cancellation by the City of Phoenix pursuant to the provisions of Section 38-511, Arizona Revised Statutes.

20. **109 MEASUREMENTS AND PAYMENTS,** Add the following to **Subsection 109.4.3, DUE TO EXTRA WORK**:

ALLOWANCE FOR EXTRA WORK

Contract allowance items are provided for the purpose of encumbering funds to cover the costs of possible change order work. The amount of the allowance item is determined by the Engineer and is not subject to individual bid pricing. All bidders will incorporate the amount pre-entered in the bid proposal and will reflect the same in the total amount bid for this project.

This allowance item provides an estimated funding to cover unforeseen changes that may be encountered and corresponding extra work needed to complete the contract per plan. Unforeseen extra work, if any, will be as approved by the Engineer; for example, extension of unit bid prices, negotiated price or time and material, in accordance with MAG Specification Section 109.4 and 109.5.

It will be understood that this allowance item is an estimate only and is based on change order history of similar projects. It will not be utilized without an approved contract change order. It is further understood that authorized extra work, if any, may be less than the allowance item.

21. **109 MEASUREMENTS AND PAYMENTS,** Add the following to **Subsection 109.4 COMPENSATION FOR ALTERATION OF WORK**:

109.4.7 CHANGE ORDERS

Owner reserves the right to decrease adjustments made in any change order if, upon audit of Contractor's records, the audit discloses contractor provided false or inaccurate cost and pricing data in negotiating the change order. In enforcing this provision, the parties will follow the procedure provided in the Federal

Acquisition Regulation (FAR) clause 52.214-27, found in 48 CFR Part 52.

22. **109 MEASUREMENTS AND PAYMENTS**, **Delete Table 109-1** in **Subsection 109.9, DOLLAR VALUE OF MAJOR ITEM**, and substitute the following:

CONTRACT AMOUNT	MAJOR ITEM IS DEFINED AS ANY ITEM EQUAL TO OR GREATER THAN THE FOLLOWING
Up to $1 million	$15,000 or 3%, whichever is greater
$1 million to $3 million	3% of the original contract amount to a maximum of $75,000.00
$3 million to $5 million	2.5% of the original contract amount to a maximum of $90,000.00
Over $5 million	1.5% of the original contract amount to a maximum of $125,000.00

CONTINGENCY ITEMS

Contingency items which fall under the definition of a major item are subject to negotiation if decreased by more than twenty (20) percent.

Contingency items will not increase more than twenty (20) percent without being subject to renegotiation, regardless of the percentage of that item relative to the total contract amount.

23. **109 MEASUREMENTS AND PAYMENTS Subsection 109.7, PAYMENT FOR BOND ISSUE AND BUDGET PROJECTS,** Delete the first three paragraphs in their entirety and replace with the following **Subsection 109.7, PAYMENT FOR BOND ISSUE AND BUDGET PROJECTS**:

A. **PARTIAL PAYMENTS**

The contracting agency will make a partial payment to the Contractor on the basis of an approved estimate prepared by the Engineer or the Contractor for work completed and accepted through the preceding month. The notice to proceed date, which is designated for the specific project involved, will be used as the closing date of each partial pay period. Payment will be made no later than fourteen (14) days after the work is certified and approved. City will review payment requests and make recommendation of approval or denial within seven calendar days.

B. **PAYMENT RETENTION**

At the start of construction, ten percent of all pay requests will be retained by the City to guarantee complete performance of the contract. When the work is fifty percent complete, this amount may be reduced to five percent providing that construction progress and quality of work is acceptable to the City. Any funds which are withheld from the contractor will be paid no later than sixty days after completion of the contract and settlement of all claims.

In lieu of retention, the contractor may provide as a substitute, an assignment of money market accounts, demand deposit accounts, or time certificates of deposit (CDs) from a bank licensed by Arizona, securities guaranteed by the United States, securities of the United States, the State of

Arizona, Arizona counties, Arizona municipalities, Arizona school districts, or shares of savings and loan institutions authorized to transact business in Arizona. These securities are referred to as "Qualified Securities."

Qualified Securities deposited in lieu of retention must be deposited into a separate account with a bank having a branch located in the City of Phoenix and be assigned exclusively for the benefit of the City of Phoenix pursuant to the City's form of escrow and/or deposit agreement.

Escrow Agreement and Deposit Agreement forms may be obtained from the Contract Specialist assigned to the project.


Credit: AGFD

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

Sonoran Desert Tortoise

(Gopherus morafkai)

The purpose of this flyer is to provide City of Phoenix employees and contractors working on City projects with basic knowledge to reduce the risk of impacting Sonoran Desert tortoise.

Legal Status:
The Sonoran Desert tortoise is a Tier 1A Species of Greatest Conservation Need in the State of Arizona, as defined by the Arizona Game and Fish Department (AGFD) and is a Candidate Species under the Endangered Species Act.

Species Description:

- Length: 8-15 inches
- Bottom shell yellowish and not hinged
- Hind limbs stocky and elephantine
- High-domed, brownish shell with a pattern and prominent growth lines
- Flattened forelimbs for digging, covered with conical scales

Where are they found?

- Rocky, steep slopes and lower mountain slopes
- Native desert scrubland
- Between 904 and 4,198 feet in elevation
- Washes and valley bottoms may be used in dispersal

Where are they active?

- Sonoran Desert tortoise spend the bulk of time in burrows, which provide protection from heat and cold
- Emerge from burrows on rocky slopes, desertscrub or grassland to feed, bask and breed, mostly during the monsoon season

How to avoid impacting Sonoran Desert tortoise:

- Scan ahead as you work
- ***If Sonoran Desert tortoise observed, STOP WORK, call the contact below and allow the tortoise to leave under its own power***
- Do NOT pick up or handle the Sonoran Desert tortoise unless the tortoise is in imminent danger. Improper handling can result in tortoise death. If a tortoise must be moved, strictly adhere to the following AGFD guidelines (rev. 9/22/2014): https://s3.amazonaws.com/azgfd-portal-wordpress/PortalImages/files/wildlife/2014%20Tortoise%20handling%20guidelines.pdf.
- When working in Sonoran Desert tortoise habitat, check for tortoises under parked vehicles before driving

Questions? Concerns? Think your project will impact Sonoran Desert tortoise? Contact the City of Phoenix Street Transportation Department, Environmental Services:

Andrea Love 602-495-6718 or via e-mail at <andrea.love@phoenix.gov>
Greta Halle 602-534-6030 or via e-mail at <greta.halle@phoenix.gov>

Sources: US Fish & Wildlife Service-Arizona Ecological Services Field Office, Sonoran Desert Tortoise, Document Library-Document by Species
http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Sonoran%20Tortoise%20RB.pdf
Updated September 10, 2020

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

Western Burrowing Owl

(Athene cunicularia)

The purpose of this flyer is to provide City of Phoenix employees and contractors working on City projects with basic knowledge to reduce the risk of impacting western burrowing owls.

Legal Status:
The western burrowing owl is protected under the Migratory Bird Treaty Act of 1918, as amended. All migratory birds and their parts (including eggs, feathers, and nests) are fully protected. They are also protected under Arizona State Law, Title 17-101, Title 17-235, and Title 17-236.

Species Description:

- Small, ground-dwelling owl (mass of approx. 5 oz.)
- Length: 7.6-9.9 inches, with long legs
- Wingspan: approx. 23 inches
- Round head, lacks ear tufts
- Distinct oval facial ruff, framed by a broad, puffy white eyebrow
- Bright yellow iris

Where are they found?

- Dry, open, short grass, treeless plains
- Human dominated landscapes such as:
  - Golf courses, airports
  - Agricultural fields, vacant lots
- Depends on other animals to construct burrows

Identifying an active burrow

- Western burrowing owls use burrows constructed by ground squirrels, badgers, coyotes, tortoises, etc., or may use pipes, culverts, and ditches.
- They may “decorate” the entrance to a burrow with cow, horse, or dog manure, feathers, vegetation, and trash items
- An active burrow may (not always) have owl excrement (“whitewash”) and/or pellets near the entrance

How to avoid impacting western burrowing owls:

- Scan ahead as you work
- ***If western burrowing owls or potentially active burrows observed, STOP WORK and MOVE at least 100 feet away from the owl or occupied burrow before resuming work***
  - Do not harass or “shoo” the owl away
- If the project cannot avoid or stay outside 100 feet of the owl or active burrow, call contact listed below

Questions? Need to work within 100 feet of a western burrowing owl or active burrow? Contact a City of Phoenix Street Transportation Department Environmental Quality Specialist:

Andrea Love 602-495-6718 or via e-mail at <andrea.love@phoenix.gov>
Greta Halle 602-534-6030 or via e-mail at <greta.halle@phoenix.gov>

Sources: Arizona Department of Transportation Environmental Planning Group Western Burrowing Owl Awareness Flyer
Arizona Game and Fish Department Animal Abstract: Western Burrowing Owl. Heritage Data Management System

Updated November 18, 2019

Credit: DesertUSA.com/animals/cliff-swallow.html

City of Phoenix
STREET TRANSPORTATION DEPARTMENT

Migratory Bird Treaty Act

(Applies to many birds in Phoenix)

The purpose of this flyer is to provide City of Phoenix employees and contractors with basic knowledge to reduce the risk of impacting species protected by the Migratory Bird Treaty Act.

Migratory Bird Treaty Act (MBTA)

Under the Migratory Bird Treaty Act of 1918, as amended, listed birds and their parts (including eggs, feathers, and nests) are fully protected. They are also protected under Arizona State Law, Title 17-101, Title 17-235, and Title 17-236. The MBTA states that it is illegal to:

- Pursue, hunt, take, capture, kill, possess, sell, purchase, barter, import, export, or transport any migratory bird, or any part, nest, or egg of any such bird.
  - 'Take' is defined as to "pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to pursue, hunt, shoot, wound, kill, trap, capture, or collect."

More information regarding the MBTA can be found at:

- http://www.fws.gov/birds/policies-and-regulations/laws-legislations/migratory-bird-treaty-act.php
- https://www.fws.gov/laws/lawsdigest/migtrea.html

Where/When are they active?

- The nests of birds protected by the MBTA can be found in many places, including trees, shrubs, cacti, cattails, on the ground, in holes in the ground and on man-made structures including culverts, bridges, buildings, etc.
- The breeding cycle of most birds in Phoenix occurs between February 1 and August 31, although there are a few species that may nest outside that period. Some birds may be present year-round and others migrate, often during the late summer/early autumn period.

How to avoid impacting birds protected by the MBTA:

- If your project might impact active bird nests/burrows, work with one of the contacts below during the design process to make appropriate arrangements before the project activity begins. Necessary actions may include active nest surveys, seasonal restrictions, or obtaining a project-specific relocation permit from the U.S. Fish and Wildlife Service.
- When actively working, be aware of your surroundings. If you see a nest that appears active (chirping, aggressive or distracting adult bird behavior, eggs present, etc.) **STOP WORK** within 30 feet of the area and call one of the contacts below.

Questions? Work may impact birds protected by the MBTA? Contact a City of Phoenix Street Transportation Department Environmental Quality Specialist:

Andrea Love 602-495-6718 or via e-mail at <andrea.love@phoenix.gov>
Greta Halle 602-534-6030 or via e-mail at <greta.halle@phoenix.gov>

Updated November 18, 2019

SUPPLEMENTAL TERMS AND CONDITIONS TO ALL AIRPORT AGREEMENTS

1. Definitions

1.1 "Airport" means Phoenix Sky Harbor International Airport, Phoenix Deer Valley Airport, and/or Phoenix Goodyear Airport, according to the context of the contract.

1.2 "Contract" means all City of Phoenix Aviation Department contracts, subcontracts, agreements, leases, subleases, licenses, permits, concessions, and other documents, however denominated, that grant or convey a right or privilege on an Airport and to which this Exhibit is attached.

1.3 "Contractor" means all lessees, sublessees, licensees, permittees, consultants, concessionaires and other persons, firms, or corporations exercising a right or privilege on an Airport pursuant to a Contract and includes Contractor's heirs, personal representatives, successors, and assigns.

1.4 "Premises" means the area of an Airport occupied or used by Contractor pursuant to a Contract.

2. Federal Aviation Administration (FAA) Grant Assurances

2.1 Title VI of the Civil Rights Act of 1964 – Compliance with Nondiscrimination Requirements - 49 U.S.C. § 47123 and FAA Order 1400.11

During the performance of this Contract, Contractor agrees as follows:

A. Compliance with Regulations. Contractor will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities (as provided in Section 7 below), as it may be amended from time to time, which is incorporated herein by reference and made a part of this Contract.

B. Nondiscrimination. With regard to the work performed by it under this Contract, Contractor will not discriminate on the grounds of race, color, or national origin in the selection and retention of subcontractors, including procurements of materials and leases of equipment. Contractor will not participate, directly or indirectly, in the discrimination prohibited by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, including employment practices when this Contract covers any activity, project, or program set forth in Appendix B of 49 C.F.R. Part 21.

C. Solicitations for Subcontracts, Including Procurements of

Materials and Equipment. In all solicitations, either by competitive bidding or negotiation, made by Contractor for work to be performed under a subcontract, including procurements of materials or leases of equipment, each potential subcontractor or supplier will be notified by Contractor of Contractor's obligations under this Contract and the Title VI List of Pertinent Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.

D. Information and Reports. The Contractor will provide all information and reports required by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the City of Phoenix or the FAA to be pertinent to ascertain compliance with the Title VI List of Pertinent Nondiscrimination Acts and Authorities and instructions. Where any information required of Contractor is in the exclusive possession of another who fails or refuses to furnish the information, Contractor will so certify to the City of Phoenix or the FAA, as appropriate, and will set forth what efforts Contractor has made to obtain the information.

E. Sanctions for Noncompliance. In the event of Contractor's noncompliance with the nondiscrimination provisions of this Contract, the City of Phoenix will impose such Contract sanctions as it or the FAA may determine to be appropriate, including:

(i) Withholding payments to Contractor under this Contract until Contractor complies, and/or

(ii) Cancelling, terminating, or suspending this Contract, in whole or in part.

F. Covenant Running with the Land. Contractor for itself and its heirs, personal representatives, successors, and assigns, as a part of the consideration for this Contract, hereby covenants and agrees that, in the event facilities are constructed, maintained, or otherwise operated on the property described in this Contract for a purpose for which a FAA activity, facility, or program is extended or for another purpose involving the provision of similar services or benefits, Contractor will maintain and operate such facilities and services in compliance with all requirements imposed by the Nondiscrimination Acts and Regulations listed in the Title VI List of Pertinent Nondiscrimination Acts and Authorities (as may be amended) such that no person on the grounds of race, color, or national origin will be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities. In the event of a breach of any of the above Nondiscrimination covenants, the City of Phoenix will have the right to terminate this Contract and to enter, re-enter and repossess the property and facilities thereon and hold the same as if this Contract had never been made or issued.

G. Incorporation of Provisions. Contractor will include the provisions of paragraphs A through F in every subcontract, including procurements of materials

and leases of equipment, unless exempt by the Title VI List of Pertinent Nondiscrimination Acts and Authorities, the Regulations, and directives issued pursuant thereto. Contractor will take action with respect to any subcontract or procurement as the City of Phoenix or the FAA may direct as a means of enforcing such provisions, including sanctions for noncompliance, provided, however, that if Contractor becomes involved in, or is threatened with litigation by a subcontractor or supplier because of such direction, Contractor may request the City of Phoenix to enter into any litigation to protect the interests of the City of Phoenix. In addition, Contractor may request the United States to enter into the litigation to protect the interests of the United States.

2.2 General Civil Rights Provisions - 49 U.S.C. § 47123

A. Sponsor Contracts. Contractor agrees to comply with pertinent statutes, executive orders, and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability, be excluded from participating in any activity conducted with or benefiting from federal assistance. This provision binds Contractor and subtier contractors from the bid solicitation period through the completion of this Contract. This provision is in addition to that required of Title VI of the Civil Rights Act of 1964.

B. Sponsor Lease Agreements and Transfer Agreements. Contractor agrees to comply with pertinent statutes, executive orders, and such rules as are promulgated to ensure that no person shall, on the grounds of race, creed, color, national origin, sex, age, or disability, be excluded from participating in any activity conducted with or benefiting from federal assistance, including Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. If Contractor transfers its obligations to another, then the transferee is obligated in the same manner as Contractor. This provision obligates Contractor or its transferee for the period during which the property is owned, used, or possessed by Contractor and the City of Phoenix remains obligated to the FAA. This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

2.3 Economic Nondiscrimination - 49 U.S.C. § 47107

In any Contract under which a right or privilege on the Airport is granted to a Contractor to conduct or to engage in any aeronautical activity for furnishing services to the public, Contractor shall:

A. Furnish its services on a reasonable, and not unjustly discriminatory basis to all users of the Airport, and

B. Charge reasonable, and not unjustly discriminatory prices for each unit or services, provided that Contractor may be allowed to make reasonable and non-discriminatory discounts, rebates, or other similar types of price reductions to volume purchasers. Non-compliance with this requirement shall be a material breach of this Contract for which the City of Phoenix shall have the right to terminate this Contract and any estate created herewith without liability therefor or, at the election of the City of Phoenix or the United States shall have the right to judicially enforce said

requirement.

2.4 Disadvantaged Business Enterprise Requirements - 49 C.F.R. Part 26

A. Contract Assurance (§ 26.13). To the extent that this Contract is covered by 49 C.F.R. Part 26, Contractor agrees that this Contract is subject to the requirements of the U.S. Department of Transportation regulations at 49 C.F.R. Part 26. Contractor or its subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this Contract. Contractor shall carry out applicable requirements of 49 C.F.R. Part 26 in the award and administration of DOT-assisted contracts. Failure by Contractor to carry out these requirements is a material breach of this Contract, which may result in the termination of this Contract or such other remedy as the City of Phoenix deems appropriate, which may include (i) withholding monthly progress payments, (ii) assessing sanctions, (iii) liquidated damages, and/or (iv) disqualifying Contractor from future bidding as non-responsible. Contractor agrees to include the foregoing statement in any subsequent contract that it enters into and cause those businesses to similarly include the statement in further agreements.

B. Prompt Payment (§ 26.29). Contractor agrees to pay each subcontractor under this Contract for satisfactory performance of its contract not later than seven (7) days from the receipt of each payment Contractor receives from City of Phoenix. Contractor agrees further to return retainage payments to each subcontractor within seven (7) days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above-referenced time frame may occur only for good cause following written approval of the City of Phoenix. This clause applies to both DBE and non-DBE subcontractors.

2.5 Airport Concessions Disadvantaged Business Enterprise Requirements - 49 C.F.R. Part 23

Contract Assurance (§ 23.9). To the extent that this Contract is a concession agreement covered by 49 C.F.R. Part 23, Contractor agrees that it will not discriminate against any business owner because of the owner's race, color, national origin, or sex in connection with the award or performance of any concession agreement, management contract, or subcontract, purchase or lease agreement, or other agreement covered by 49 C.F.R. Part 23. Contractor agrees to include the above statements in any subsequent concession agreement or contract covered by 49 C.F.R. Part 23 that it enters into and cause those businesses to similarly include the statements in further agreements.

2.6 Miscellaneous

A. Contractor agrees that it will undertake an affirmative action plan in conformance with 14 C.F.R. Part 152, Subpart E (Nondiscrimination in Airport Aid Program), to ensure that no person shall on the grounds of race, creed, color, national origin, or sex be excluded from participating in any employment, contracting, or leasing activities covered in 14 C.F.R. Part 152, Subpart E. Contractor assures that no person will be excluded on such grounds from participating in or receiving the services or

benefits of any program or activity covered by Subpart E. Contractor further agrees that it will require its covered suborganizations to provide assurances to Contractor that they similarly will undertake affirmative action programs and that they will require like assurances from their suborganizations as required by 14 C.F.R. Part 152, Subpart E.

B. City of Phoenix reserves the right to further develop, improve, repair, and alter the Airport and all roadways, parking areas, terminal facilities, landing areas, and taxiways, as it may reasonably see fit, free from any and all liability to Contractor for loss of business or damages of any nature whatsoever to Contractor occasioned during the making of such improvements, repairs, alterations, and additions.

C. The City of Phoenix reserves the right, but is not obligated to Contractor, to maintain and keep in repair the landing area of the Airport and all publicly-owned facilities of the Airport, together with the right to direct and control all activities of Contractor in this regard.

D. Contractor acknowledges that this Contract is subordinate to any existing or future agreement between the City of Phoenix and the United States concerning the development, operation, or maintenance of the Airport. If the FAA or its successors require modifications or changes in the Contract as a condition to obtaining funds for improvements at the Airport or as a requirement of any prior grants, Contractor hereby consents to any and all such modifications and changes as may be reasonably required and agrees that it will adopt any such modifications and changes as part of this Contract.

E. This Contract is subordinate to the reserved right of the City of Phoenix and its successors and assigns to occupy and use for the benefit of the public the airspace above the Premises for the right of flight for the passage of aircraft. This public right of flight includes the right to cause in the airspace any noise inherent in the operation of any aircraft through the airspace or in landing at, taking off from, or operating at an Airport.

F. Contractor agrees to comply with the notification and review requirements, as required by 14 C.F.R. Part 77 (Safe, Efficient Use, and Preservation of the Navigable Airspace), if future construction of a structure is planned for the Premises or a planned modification of a structure on the Premises. Contractor shall submit the required FAA Form 7460-1 (Notice of Proposed Construction or Alteration) and provide documentation showing compliance with the federal requirements. After the FAA has completed the aeron.:1utical study, Contractor shall provide to the City of Phoenix the FAA determination letter on proposed construction and any impact to air navigation. Contractor covenants for itself and its successors and assigns that it will not erect or permit the erection of any structure or permit the growth of any tree on the Premises above the mean sea level elevation for (1) Phoenix Sky Harbor International Airport, 1,134 feet, (2) Phoenix Goodyear Airport, 968 feet, and (3) Phoenix Deer Valley Airport, 1,476 feet. As a remedy for the breach of the covenant, the City of Phoenix reserves the right to enter the Premises and remove the offending structure or cut the offending

tree at Contractor's expense.

G. Contractor, by accepting this Contract, covenants for itself and its successors and assigns, that no use will be made of the Premises that might in any manner interfere with the landing and taking off of aircraft from the Airport or otherwise constitute a hazard to air navigation. As a remedy for the breach of the covenant, the City of Phoenix reserves the right to enter the Premises and abate the interference at Contractor's expense.

H. Contractor agrees that nothing in this Contract may be construed to grant or authorize the granting of an exclusive right within the meaning of 49 U.S.C. § 40103(e) (No exclusive rights at certain facilities).

I. This Contract is subordinate to whatever rights the United States now has or in the future may acquire affecting the control, operation, regulation, and taking-over of the Airport or the exclusive or non-exclusive use of the Airport by the United States during a time of war or national emergency.

J. If this Contract involves construction, Contractor shall carry out the project in accordance with FAA airport design, construction, and equipment standards and specifications current on the date of project approval.

K. Contractor is encouraged to use fuel and energy conservation practices.

3. Immigration Reform and Control Act of 1986 (IRCA)

Contractor agrees that IRCA (Public Law 99-603) applies to it. Contractor shall comply with the provisions of IRCA as it applies to its activities under this Contract and to permit the City of Phoenix to inspect its personnel records to verify its compliance.

4. Conflict of Interest

See Section VII General Conditions, Item 17.

5. Legal Worker Requirements

See Section VII General Conditions, Item 3.

6. City of Phoenix Equal Employment Opportunity Requirement

See Section VII General Conditions, Item 26.

7. Title VI List of Pertinent Nondiscrimination Acts and Authorities

During the performance of this Contract, Contractor agrees to comply with all federal, state, and local nondiscrimination laws, rules, and regulation, including the

following:

A. Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d) (prohibits discrimination on the basis of race, color, or national origin).

B. 49 C.F.R. Part 21 (Nondiscrimination in Federally-Assisted Programs of the Department of Transportation-Effectuation of Title VI of the Civil Rights Act of 1964).

C. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. §§ 4601, *et seq.)* (prohibits unfair treatment of persons displaced or whose property has been acquired because of federal or federal aid programs and projects).

D. Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. §§ 701, *et* seq.), as amended (prohibits discrimination on the basis of disability), and 49 C.F.R. Part 27 (Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance).

E. The Age Discrimination Act of 1975, as amended (42 U.S.C. §§ 6101, *et seq.)* (prohibits discrimination on the basis of age). Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex).

F. The Civil Rights Restoration Act of 1987 (Public Law 100-209) (broadened the scope, coverage, and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975, and Section 504 of the Rehabilitation Act of 1973 by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the federal-aid recipients, sub-recipients, and contractors, whether the programs or activities are federally funded or not).

G. Titles II and Ill of the Americans with Disabilities Act of 1990 (42 U.S.C. §§ 12101, *et seq.),* which prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities as implemented by U.S. Department of Transportation regulations at 49 C.F.R. Part 37 (Transportation Services for Individual with Disabilities) and Part 38 (Americans with Disabilities Act Accessibility Specification for Transportation Vehicles).

H. Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), which ensures nondiscrimination against minority populations by discouraging programs, policies, and activities with disproportionately high and adverse human health or environmental effects on minority and low-income populations.

I. Executive Order 13166 (Improving Access to Services for Persons with Limited English Proficiency) and resulting agency guidance and national origin discrimination includes discrimination because of limited English proficiency (LEP). To

ensure compliance with Title VI, you must take reasonable steps to ensure that LEP persons have meaningful access to your programs (70 Fed. Reg. at 74087 to 74100).

J. Title IX of the Education Amendments of 1972 (20 U.S.C. §§ 1681, *et seq.),* as amended, which prohibits you from discriminating because of sex in education programs or activities.

2068157
Revised 2/1/19

BID PROPOSAL
CITY OF PHOENIX, ARIZONA
OFFICE OF THE CITY ENGINEER
PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit DBB
PROJECT NO.: AV15000073
BOND ISSUE OR BUDGET PROJECT

PROPOSAL to the City Engineer of the City of Phoenix.

In compliance with the Advertisement for Bids, by the City Engineer, the undersigned bidder:

_____

(Print or Type Contractor Name)

Having examined the contract documents, site of work and being familiar with the conditions to be met, hereby submits the following proposal for furnishing the material, equipment, labor and everything necessary for the completion of the work listed and agrees to execute the contract documents and furnish the required bonds and certificates of insurance for the completion of said work, at the locations and for the prices set forth on the inside pages of this form.

Understands that construction of this project will be in accordance with all applicable Maricopa Association of Governments' (MAG) Uniform Standard Specifications and Uniform Standard Details, latest revision and the City of Phoenix Supplements, latest revision to the MAG Uniform Standard Specifications and Details, except as otherwise required by the project plans and specifications.

No proposal may be withdrawn for a period of 50 days after opening without consent of the Contracting Agency through the body or agent duly authorized to accept or reject the proposal except in the case of federally-assisted projects.

Understands that his proposal will be submitted with a proposal guarantee of certified check, cashier's check or surety bond for an amount not less than ten (10) percent of the amount bid, as referenced in the Call for Bids.

Agrees that upon receipt of Notice of Award, from the City of Phoenix, he will execute the contract documents within 10 calendar days.

Work will be completed within 470 calendar days, beginning with the day following the starting date specified in the Notice to Proceed. The time allowed for completion of the work includes lead time for obtaining the necessary materials and/or equipment and approvals.

The bidder will acknowledge all addenda in writing. By writing the addendum number(s) below, the bidder agrees that this proposal is computed with consideration of the specification book(s) plus any addenda.

ADDENDUM NO.	DATE	ADDENDUM NO.	DATE

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
1	Mobilization / Demobilization	LS	1		
2	Phasing/Signage/Traffic Control	LS	1		
3	GPR Scan for Fixture Anchors	EA	6,000		
4	Light Fixture Demo	LS	1		
5	Patch and Repair	LS	1		
6	#12 Conductors for Light Poles and Extended Circuits	LS	1		
7	0 - 10V Low Voltage Conductors	LS	1		
8	CAT - 6 Cabling to Gateways	LS	1		
9	Anchors to Mount Fixtures	EA	13,750		
10	Hangers and Supports for Circuit Extensions	LS	1		
11	Conduit, Raceways, and Cover Plates	LS	1		
12	Lighting Controls/Commissioning	LS	1		
	GARAGE LIGHTING				
13	Lighting Fixture GA KIM PGL8/5R/128L-85/4K8/UNV/WHS/PB22/WIRSC/MOD/BTSSMP/LMO - Pendent Fixture with 10 year Warranty or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	1482		
14	Lighting Fixture GA1(WIR) KIM PGL8/5R/128L-85/4K8/UNV/WHS/WIRSC/PB22 with wiSPACE Occupancy Sensor with 10 Year Warranty or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	700		
15	Lighting Fixture GB (WIR) KIM PGL8/5R/128L-85/4K8/UNV/WHS/WIRSC/PB22 With wiSCAPE Occupancy Sensor with 10 Year Warranty or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	638		
16	Lighting Fixture AI COLUMBIA LCAT22-40LWG-ED 2' x 2' Volumetric Recessed Troffer with Dimming Driver or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	342		
17	Lighting Fixture AJ Columbia LCAT22 - 40LWG-ED-ELL14 2' x 2' Volumetric Recessed Troffer with Dimming Driver - Emergency Fixture with Emergency Battery Pack Installed 1400 Lumens or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	88		
18	Light Fixture GF New Fixture, Round 9.0 Wall LED, SPI EIW102 120 277 1000K - C5, or Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	6		
19	Light Fixture GG New Fixture, Round 9.0 Wall LED on Emergency Circuit, SPI EIW102 120 277 1000K-C5, or Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	3		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
20	Lighting Fixture GJ PARAMOUNT PMVR10SH-UNV-4K-CRI85-21L-BRE-LD-TPS (WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	17		
21	Lighting Fixture GK (WIR) PARAMOUNT PMVR10SO-UNV-4K-CRI85-31L-BRE-LD-TPS-CST220805 with wiSCAPE Occupancy Sensor or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	31		
22	Lighting Fixture GN PARAMOUNT PMVR10SO-UNV-4K-CRI85-31L-WHE-LD-TPS-(WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	1		
23	Lighting Fixture GQ INSIGHT D2/200/40K/SM/UNV/DIM/FINISH/IP66/(WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	38		
24	Lighting Fixture GR INSIGHT D2/200W/40K/SM/UNV/DIM/FINISH/IP66/(WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	4		
25	Lighting Fixture SB WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	5		
26	Demo Existing up lights on Level 3 and Extend Conduit to new locations (See Plans) and install new Fixtures (GA and GB).	EA	533		
27	Spare GA fixtures	EA	22		
28	Spare GB fixtures	EA	6		
29	Spare AI fixtures	EA	4		
30	New Occupancy Censor/Sensor Switch NEM9 - or Equal. NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	18		
31	New Room Controller/Sensor Switch NPP16 - or Equal. NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	9		
32	New PC/ Sensor Switch - PCELL-2WI - or Equal NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	17		
33	New wiScape Lighting Controller - Complete Commissioned and Tested NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	1		
	RAMP LIGHTING				
34	Light Fixture GJ New Fixture, Recessed in Wall Cavity LED, Paramount PMVR10SH-UNV-4K-CRI85-21L-BRE-LD-TPS-(WIR-RMI-IO), or Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	351		
35	Spare GJ fixtures	EA	4		
	LAMP REPLACEMENTS GARAGE BUILDINGS				
36	Lighting Fixture CA VISCOR LHBL-48-LED-8-40K-080L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	258		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
37	Lighting Fixture CB VISCOR LHBL-48-LED-8-40K-040L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	54		
38	Light Fixture CC Lamps Only 1'x4' Linear Strip Surface Mount 24 Watt LED 277 Volt NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	8		
39	Lighting Fixture CD INSIGHT CE LUTRON - MX-MO-40K-AD-*-*-48-REM-Lutron-TW-* REMOTE POWER SUPPLY or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	20		
40	Lighting Fixture CE COLUMBIA LCAT22-40LWG-ED Recessed 2' x 2' Volumetric Recessed Troffer with Dimming Driver or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	16		
41	Lighting Fixture CE1 COLUMBIA LCAT24-40LWG-ED 2' x 4' Recessed Troffer with Dimming Driver or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	6		
42	Lighting Fixture CS COLUMBIA LJT14-40XWG-FS A12125-E 1' x 4' Recessed (Refer to Plan Sheet for additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	184		
43	Lighting Fixture CT ALPHA NU6-RD-XTM19-50LM-35K-(NXW) 6" Recessed Down Light or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	42		
44	Lighting Fixture CV COLUMBIA LJT14-40 HL G-FS A12125-E 1' x 4' Recessed (Refer to Plan Sheet for additional Information Regarding Lamp and Fixture Replacement) or Approved equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	7		
45	Lighting Fixture CW EXO LNC2-48L-15-4K7-3-UNV-*-*-* Surface Wall Pack or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	6		
46	Lighting Fixture CY HUBBELL VTC 5K G U Surface Mount Vaportite or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	4		
47	Lighting Fixture CAC NULITE RW6-6D-06-L35-(NXW) Wall Mounted Linear (Refer to Plan Sheet for Additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	14		
48	Lighting Fixture GM COLUMBIA MPS-4-40-LW-E-U-LCWG4 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	15		
49	Lighting Fixture GN PARAMOUNT PMVR10SO-UNV-4K-CRI85-31L-WHE-LD-TPS-(WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	43		
50	Lighting Fixture GT PARAMOUNT PMVR10SH-UNV-4K-CRI85-x-BRE-LD-TPS-CST220805 (WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	15		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
51	Lighting Fixture GU PARAMOUNT PMVR10SO-UNV-4K-CRI85-31L-WHE-LD-TPS-(WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	2		
52	Lighting Fixture SA WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	3		
53	Lighting Fixture SB WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	16		
54	Lighting Fixture SC WE-EF PFL540-LED-660-4421-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	3		
55	Spare CA Lamps	EA	4		
56	Spare CS Lamps	EA	3		
	LEVEL 4 MEZZANINE				
57	Lighting Fixture CA VISCOR LHBL-48-LED-8-40K-080L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	95		
58	Lighting Fixture CB VISCOR LHBL-48-LED-8-40K-040L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	1		
59	Light Fixture CC Lamps Only 1'x4' Linear Strip Surface Mount 24 Watt LED 277 Volt NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	9		
60	Lighting Fixture CE COLUMBIA LCAT22-40LWG-ED 2' x 2' Volumetric Recessed Troffer with Dimming Driver or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	66		
61	Lighting Fixture CF VISCOR LCOMN-48-LED-8-40K-030L-UNV-P95-(NXW) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	120		
62	Lighting Fixture CG VISCOR LCOMN-24-LED-8-40K-030L-UNV-P95-(NWX) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	19		
63	Lighting Fixture CL1 METEOR RI-110L-408-UNV-STV-ASY-(STD FINISH)-(MOUNTING)-GSV-OUT or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	52		
64	Lighting Fixture CL2 METEOR RI-110L-408-UNV-STV-ASY-(STD FINISH)-(MOUNTING)-GSV-OUT or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	47		
65	Lighting Fixture CM LIGMAN UBE-20001-40W- W40-*-120/277V-DIM-A90891-(NXW) COLUMN Light 9" DIA - 65 DEG OPTIC -40W COB -4000K - DIMMING 0-10V DRIVE or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	10		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
66	Lighting Fixture CN VANTAGE A8VOFLED-U-30-40K-L8060-SGC-(NXW) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	139		
67	Lighting Fixture CPF MELEDY MER-MO-40K-8080-SGC-(NXW) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	148		
68	Lighting Fixture CQF PROSPOT PS6-MO-40K-60-KN-TW or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	112		
69	Lighting Fixture CS COLUMBIA LJT14-40XWG-FS A12125-E 1' x 4' Recessed (Refer to Plan Sheet for additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	67		
70	Lighting Fixture CT ALPHA NU6-RD-XTM19-50LM-35K-(NXW) 6" Recessed Down Light or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	229		
71	Lighting Fixture CAA PRESCOLITE MD8LED-8L-40K-8-8MD-8L-(NXW) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	76		
72	Lighting Fixture CAB VISCOR LCOMN-48-LED-8-40K-040L-UNV-P95-(NXW) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	87		
73	Lighting Fixture CAC NULITE RW6-6D-06-L35-(NXW) Wall Mounted Linear (Refer to Plan Sheet for Additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	3		
74	Lighting Fixture CAD FINELITE S17-LED-VCF-P-4-V-8-35-277-SC or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	98		
75	Lighting Fixture SF-PARAMOUNT PMVR10SH-UNV-4K-CRI85-21L-BRE-LD-TPS-CST220805 (WIR-RMI-IO) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	6		
76	New Occupancy Censor/Sensor Switch NEM9 - or Equal. NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	14		
77	New Room Controller/Sensor Switch NPP16 - or Equal. NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	7		
78	Spare CA lamps	EA	2		
79	Spare CF lamps	EA	2		
80	Spare CQF fixtures	EA	4		
81	Spare CT fixtures	EA	4		
	STREET POLE LIGHTS				
82	Lighting Fixture SA WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	5		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
83	Lighting Fixture SB WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	1		
84	New Gateway Device to communicate with wiScape NOTE: UNIT PRICE = COST OF DEVICE + COST OF INSTALLATION	EA	2		
	FOX ADMIN/MAINTENANCE BUILDINGS				
85	Lighting Fixture AA VISCOR LHBL-48-LED-8-40K-080L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	34		
86	Lighting Fixture AB VISCOR LHBL-48-LED-8-40K-040L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	42		
87	Lighting Fixture AC COLUMBIA LCAT22-40LWG-ED 2' x 2' Volumetric Recessed Troffer with Dimming Driver or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	47		
88	Lighting Fixture CE1 COLUMBIA LCAT24-40LWG-ED or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	4		
89	Lighting Fixture AE COLUMBIA LJT14-40XWG-FS A12125-E 1' x 4' Recessed (Refer to Plan Sheet for additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	53		
90	Lighting Fixture AF ALPHA NU6-RD-XTM19-50LM-35K-(NXW) 6" Recessed Down Light or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	47		
91	Lighting Fixture CV COLUMBIA LJT14-40 HL G-FS A12125-E 1' x 4' Recessed (Refer to Plan Sheet for additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	13		
92	Lighting Fixture CW EXO LNC2-48L-15-4K7-3-UNV-*-*-* Surface Wall Pack or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	82		
93	Lighting Fixture AG NULITE RW6-6D-06-L35-(NXW) Wall Mounted Linear (Refer to Plan Sheet for Additional Information Regarding Lamp and Fixture Replacement) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	7		
94	Lighting Fixture AH KIM PGL8/5R/128L-85/4K8/UNV/WHS/PB22/ - Pendent Fixture with 10 year Warranty or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	15		
95	Lighting Fixture SA WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	30		
96	Lighting Fixture SB WE-EF PFL540-LED-660-4422-(WIR-RME-L) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	11		

CITY OF PHOENIX
BID PROPOSAL
DESIGN-BID-BUILD

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit
PROJECT NO.: AV15000073

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	UNIT PRICE	TOTAL
97	Lighting Fixture SH HUBBELL LSQ-2-55-4K7-UNV-WHT or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	5		
98	Lighting Fixture SJ CIP GTE3501E-150W-196X2W-G4000K-CDV-AC100- or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	32		
99	Lighting Fixture SK CIP GTE3501E-150W-196X2W-G4000K-CDV-AC100-277V-(WIR-RMI-IO / HUBBELL WISCAPE) or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	9		
100	Lighting Fixture TC COLUMBIA LJT14-40XW-G-FS-A12125-E or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	4		
101	Lighting Fixture TH COLUMBIA LCAT22-40LWG-ED or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	1		
102	Lighting Fixture TK VISCOR LHBL-48-LED-8-40K-080L-UNV/KIT00001 or Approved Equal NOTE: UNIT PRICE = COST OF FIXTURE + COST OF INSTALLATION	EA	2		
	ALLOWANCES				
103	Allowance (Owner-Controlled)	JOB	1	$200,000.00	$200,000.00
	BASE BID (ITEMS 1 THROUGH 103 - INCLUSIVE)				

_____& _____/100 DOLLARS

WRITTEN WORDS

Prepared By:

_____
Signature

_____
Name

_____
Position/Title

_____
Firm Name

PROPOSAL SUBMITTAL

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit Design-Bid-Build
PROJECT NO.: AV15000073

THIS PROPOSAL IS SUBMITTED BY _____

a corporation organized under the laws of the State of _____

a partnership consisting of _____

_____

a joint venture consisting of _____

_____

or individual trading as _____

_____

_____

of the City of _____

FIRM _____

ADDRESS _____

CITY _____ STATE ___ ZIP CODE _____

PHONE _____ VENDOR NO. _____

BY _____
Officer and Title (signature)

_____
Officer and Title (print or type)

_____
Date

_____
WITNESS: If Contractor is an individual
(signature)

_____
ATTEST: If Contractor is Corporation or Partnership
(signature and title)

S U R E T Y B O N D

City of Phoenix Project No.: AV15000073

That we, _____, as Principal, (hereinafter called the Principal) and the _____, a corporation duly organized under the laws of the State of _____, as Surety, (hereinafter called the Surety) are held and firmly bound unto the City of Phoenix as Obligee, in the sum of ten (10) percent of the total amount of the bid of Principal, submitted by him to the City of Phoenix for the work described below, for the payment of which sum, well and truly to be made, the said Principal and the said Surety, bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents and in conformance with A.R.S. #34-201.

WHEREAS, the said Principal is herewith submitting its proposal for **Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit Design-Bid-Build**

NOW, THEREFORE, if the City of Phoenix will accept the proposal of the Principal and the Principal will enter into a contract with the City of Phoenix in accordance with the terms of such proposal and give such Bonds and Certificates of Insurance as specified in the Standard Specifications with good and sufficient Surety for the faithful performance of such contract and for the prompt payment of labor and material furnished in the prosecution thereof, or in the event of the failure of the Principal to enter into such contract and give such Bonds and Certificates of Insurance, if the Principal will pay to the City of Phoenix the difference not to exceed the penalty of the bond between the amount specified in the proposal and such larger amount for which the Obligee may in good faith contract with another party to perform the work covered by the proposal, then this obligation will be null and void, otherwise to remain in full force and effect.

Signed and sealed this _____ day of _____ A.D., 2023

_____
Principal

_____
Title

_____
Mailing Address

_____

_____
Surety

_____
WITNESS:

_____

A.M. BEST RATING:

City of Phoenix

Small Business Enterprise Program

SBE – DESIGN BID BUILD (DBB) CONTRACT CLAUSE

PROJECT #: AV15000073 **CONTRACT #:**

PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit

The City of Phoenix Small Business Enterprise Program (SBE) is managed and administered by the Equal Opportunity Department, Contract Compliance Division. Phoenix is one of the fastest growing, multicultural cities in the country and has shown a historical commitment to business diversity. The City strives to advance the economic growth of businesses through its Small Business Enterprise (SBE) Program.

Through a coordinated effort among several city departments, the SBE Program provides SBE certification, procurement opportunities, construction subcontracting utilization, small business management and technical assistance and educational services and networking opportunities.

The Small Business Enterprise (SBE) participation goal for this project is as follows:

SBE Required Goal = 5 %

An annual SBE subcontracting participation goal has been established under this Contract. The Prime Contractor is required to demonstrate good faith efforts to utilize certified SBE firms to achieve this goal during the life of this contract.

For purposes of determining the Contractor's actual SBE utilization during and at the end of the project, the Contractor shall meet or exceed their **Proposed SBE Goal Percentage (as indicated on the Submitter's received SBE Utilization Form with their bid submittal)** for the contract, for ***ALL*** work performed on the project, including any amount paid for contingencies and allowances, and selected alternates. **The Proposed Goal shall meet/or exceed the Required Goal.**

For purposes of calculating the Contractor's "Proposed SBE Goal Percentage" on the Contractor's Statement of Proposed SBE Utilization form, bidders must not propose SBE subcontractors from areas identified on the bid form as contingencies and allowances or proposed alternates. Any SBE participation proposed from these areas will be not counted towards meeting the SBE goal requirement necessary for contract award.

The "Total Bid" shall be defined as the total of all the unit prices, or the lump sum total, including alternates and contingencies and allowances. The "Base Bid" shall be defined as the "Total Bid" minus "all proposed alternates" as determined by the project manager. Any additional dollars paid under this contract, including any selected alternate(s), shall be subject to the **Proposed SBE Goal Percentage** listed on the Contractor's Statement of Proposed SBE Utilization form.

SBE PROGRAM DEFINITIONS

Broker, Packager, Manufacturers' Representative, or Jobber means a firm that is not a manufacturer or regular dealer as defined herein.

Commercially Useful Function (CUF) means that a SBE firm is responsible for execution of the work of the contract and is carrying out its responsibilities by actually performing, managing, and supervising the work involved. A SBE must perform at least 75% of the total cost of its contract with its own work force in order to be determined to be performing a CUF on the contract.

Contract is a written agreement obligating the seller or business enterprise to furnish goods or services as submitted and the Purchaser or Buyer to pay for such goods or services.

Contractor is an individual, partnership, joint venture, corporation or firm that executes a contract with the City to perform services requested by a solicitation or procurement. The Contractor may be direct or through an authorized representative.

Joint Venture (JV) is an association between two or more persons, partnerships, corporations, or any combination thereof, formed to carry on a single business activity. The JV is limited in scope and duration to this contract. The resources, assets and labor of the participants must be combined in an effort to accrue profit.

Manufacturer means a firm that operates or maintains a factory or establishment that produces, on the premises, the materials, supplies, articles, or equipment required under the contract.

Purchaser for purposes of this contract means the City.

Regular Dealer or Supplier means a business that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications are bought, kept in stock, and regularly sold or leased to the public in the usual course of business. The firm must be an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question.

Small Business Enterprise (SBE) means a small business that has been determined to meet the requirements for SBE certification with the City of Phoenix and whose certification is in force at the time of the award of business by the City. A directory of currently certified SBE firm is located at https://phoenix.diversitycompliance.com.

Subcontract a contract at any tier below the prime contract, including purchase orders.

Subcontractor is an individual, partnership, joint venture, corporation or firm that holds a contract at any tier below the prime contract, including purchase orders.

Successful Submitter is a Submitter who has been selected to perform services requested by a solicitation or procurement.

SECTION I. SBE CERTIFIED FIRMS

Only firms certified by the City of Phoenix under Chapter 18, Article VIII of the Phoenix city code are eligible to fulfill the participation goal stated above. A firm's ***certification must be in the trade areas listed on the proposed utilization form and current and in force at the date and time of the bid opening deadline***.

The most current electronic directory of all certified **SBE** firms can be accessed at:
https://phoenix.diversitycompliance.com

If you need to verify certification status, please contact the Equal Opportunity Department at (602) 262-6790 and identify yourself as a prime contractor bidding on this project. Prime contractors should verify that the certifications of the SBE firms are current prior to bid opening. ***If a firm's certification expires and is not renewed prior to the bid-opening deadline, that firm will be ineligible to satisfy the goal.***

SECTION II. SBE BID PROCEDURES

The bid envelope shall contain all information and documents related to the SBE requirements of this section. ***Failure to properly complete the "Contractor's Statement of Proposed SBE Utilization" and "Letter of Intent to Perform as a Subcontractor/Supplier" forms, or submit a fully documented waiver request as described below, will result in bid rejection.*** The required documentation includes:

1. **A Contractor's Statement of Proposed SBE Utilization** - The form shall document the name of each SBE firm that will be awarded a subcontract; services to be performed by each subcontractor; dollar amount to be paid for those services; and the total dollar amount that is being proposed in SBE participation.

2. **A Letter of Intent to Perform as a SBE Subcontractor/Supplier** (required for each SBE subcontractor/supplier proposed) The form shall be completed by the SBE firm that will be awarded the subcontract. The form documents services to be performed by the subcontractor/suppler and the total dollar amount of the subcontract that will be awarded to the SBE. Only the services performed in the area(s) described by the SBE's certification description can be counted towards the SBE goal requirement.

The bidder's proposed utilization of SBE firms to fulfill the participation goal must be submitted on the "Contractor's Statement of Proposed SBE Utilization" form included in the specification packet. Additionally, each of the **SBE** subcontractors/suppliers the bidder is proposing to use to meet the goal requirement on this contract must complete the "Letter of Intent to Perform as an SBE Subcontractor/Supplier" (LOI) form. Both forms must be completed and submitted as part of the bid packet by the bid-opening deadline.

Failure to submit a completed "Contractor's Statement of Proposed SBE Utilization" and signed "Letter of Intent to Perform as an SBE Subcontractor/Supplier" form for each of the proposed SBE firms will result in a bidder being declared non-responsive to the requirements of these specifications and the bid will not be considered. The forms must contain the following:

1. The Certified SBE firm name and the certified trade or services to be performed.
2. The dollar amount of the proposed subcontract to be awarded to each SBE firm.
3. The total dollar amount of all SBE proposed subcontracts.

In instances where an exact dollar amount to be subcontracted with a SBE firm cannot be determined, the bidder shall indicate on Columns 3 and 4 of Part B Section 1 of the "Letter of Intent To Perform as a SBE Subcontractor/Supplier" form the minimum guaranteed hours/units and dollar amount that will be paid to the SBE firm. This situation applies only when a Contractor proposes to utilize a SBE firm that engages in work

related to a broker, supplier or; a bid that is based on a per hour charge as in hauling/trucking or construction site security. Please note that this exception does not permit the Prime contractor to complete or modify any other part of the LOI document. Both, the SBE and the bidder must sign the LOI document prior to bid submittal. By signing the document, the bidder affirms that it has not altered or modified the document in any way other than, if applicable, entering the Unit/Hours and Total Quote Amount in Part B SECTION 1.

If a bidder proposes to utilize a firm not certified by the City of Phoenix and/or not certified in the proposed scope of work at the time of bid, the proposed utilization amount for that firm will be deducted from the total proposed SBE utilization amount used for determining if the bidder is responsive to the requirements of this section. Bidder shall not include any amount the SBE firm has indicated in the LOI document as work it will sublet or is not covered in their certification description in the Contractor's Statement of Proposed SBE Utilization form. Only amounts associated with the work to be performed by the SBE, and indicated in the SBE's certification description, may be counted towards the SBE participation goal requirement of this section.

If the reduced proposed SBE utilization is insufficient to meet the established participation goal required for this contract, and no waiver documentation has been submitted, the bidder shall be determined to be **non-responsive** to the requirements of this section and the bid will not be considered.

A certified SBE firm bidding as a Prime Contractor cannot count the work it will self-perform towards meeting the required SBE subcontracting goal.

A "Letter of Intent to Perform as a Subcontractor/Supplier" will be used in determining compliance with the requirements of this section. **The proposed subcontract dollar amount listed for each SBE firm on the "Contractor's Statement of Proposed SBE Utilization" must match the SBE dollar amount indicated in the boxed areas in Parts C, D or E of the signed "Letter of Intent to Perform as a Subcontractor/Supplier."** Failure to submit a completed LOI document with the SBE's and bidder's signatures shall be determined to be **non-responsive** to the requirements of this section and the bid will not be considered.

SECTION III. IF THE BIDDER IS UNABLE TO MEET THE GOAL

A fully documented waiver request detailing why the bidder has been unable to meet the SBE utilization goal in whole, or in part, and the "good faith" effort of the bidder to obtain SBE participation. In order to be viewed as good faith efforts, a bidder's activities must be consistent with all activities that could reasonably be expected from a bidder who was actively and aggressively seeking to meet the SBE goal. To show proof of having exercised good faith efforts in trying to obtain bids from SBE firms to meet the utilization goals. The following factors are illustrative of those matters that shall be considered when judging whether the bidder made "good faith efforts".

1. A cover letter addressed to the Street Transportation Procurement Section clearly indicating whether a full or partial waiver is being requested, the percentage to be waived, and the reasons the waiver is being sought.
2. If a partial waiver is being requested, a Bidder's Statement of Proposed Utilization listing firms that will satisfy the portion of the goal that will be met must be included with the bid proposal. Additionally, a Letter of Intent to Perform as a Subcontractor/Supplier from each SBE firm that is proposed to be utilized must be included with the bid proposal.
3. Proof of contact with SBE firms, including but not limited to, fax logs, telephone logs, mail receipts, etc, including documentation of the number of times that firms were contacted, the dates of contact, and the name, phone number, fax number, and address of the contact person associated with each SBE firm. Solicitation of SBE subcontractors must be consistent with the solicitation of all subcontractors and must clearly demonstrate that SBE firms had sufficient time to submit an effective response.
4. Copies of the documents submitted to all subcontractors requesting their bid. This should include the scope of work to be bid and performed on the project.

5. Copies of bid responses/quotes from all subcontractors who bid to perform work on the project in the areas that SBE firms were also bidding on, including information as to why SBE bids were not considered.
6. Documentation that shows efforts made to provide assistance to SBE firms in the areas of bonding, insurance, or other contracting requirements.
7. Documentation of attendance at the pre-bid conference held for the project.
8. Documentation of contact made with City personnel seeking assistance in identifying eligible SBE firms for contracting opportunities on the project.

SECTION IV. SBE WAIVER PROCEDURES

Requests for a partial or full waiver of the SBE goal for the project including all Good Faith Documentation shall be submitted as part of the bid packet. The request will be reviewed to ensure compliance with the requirements of this section. If the request is determined to meet the requirements, a waiver hearing will be scheduled and the bidder notified of the date, time, and place of the hearing. All waiver hearings are open to the public. However, only the designated representative for the contractor and City staff may participate in the proceedings.

The contractor requesting the waiver may appear at the hearing to present their request and answer questions from the Waiver Review Committee regarding their submittal. The Committee will consider the information and documentation that was submitted at the time of bid. The bidder may not present additional or new information at the hearing. At the conclusion of the hearing process the Committee will make independent recommendations on the request for waiver. The presiding officer, on behalf of the Committee, will provide a written summary of the Committee's recommendations to the City Manager's designee, the City Engineer. The City Engineer will make the final decision to grant or deny the waiver request. The City Engineer's decisions shall be final. The City will notify the contractor regarding the final decision of the City Engineer.

If a partial or full waiver of the SBE goal is granted to a bidder, the bidder shall be considered to have met the project goals and their bid will be considered responsive to the requirements of this section. If a waiver is denied, the bidder is deemed non-compliant and non-responsive to the requirements of this section and their bid will not be considered.

Failure to submit the Contractor's Statement of Proposed SBE Utilization form and a LOI from each SBE firm proposed OR a fully documented waiver request at the time of bid will be cause to determine the bidder non-responsive to the requirements of this section.

SECTION V. LIMITATION OF THE USE OF SUPPLIERS AND BROKERS TO FULFILL THE SBE GOAL

Proposed expenditures to brokers and suppliers can be used to meet the utilization goal, provided that the combined applicable expenditures do not exceed 25 percent (25%) of the total SBE goal requirement. Contractors may count one hundred percent (100%) of the dollars proposed to be paid to a SBE supplier, and all costs associated with fees and commission to be paid to a SBE broker, up to the 25% limitation.

Supplier (or Wholesaler) is defined as firm that does not directly manufacture the product being supplied and has an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the products in question. A supplier is a firm that owns, operates, or maintains a store, warehouse, or other establishment in which the materials, supplies, articles or equipment of the general character described by the specifications and required under the contract are bought, kept in stock, and regularly sold or leased to the public in the usual course of business.

EXAMPLE: *An SBE goal of 5% has been established on a project where the contractor has submitted a base bid of $1,000,000. This results in a dollar goal of $50,000 to be subcontracted to SBE's. The contractor proposes to contract with a SBE supplier for $100,000. Only $12,500, or 25 percent (25%), may be counted*

towards achievement of the SBE goal for this project. The remaining $37,500 must be achieved through the use of firms that are not suppliers or brokers.

Broker is defined as firm that arranges or expedites services or transactions through the use of individuals not directly employed by the company. Brokers are not regular suppliers. Only costs associated with the fees and commission paid to the certified firm for providing such services may be applied towards the SBE contract goal.

The following defines the expenditures to SBE firms that are NOT subject to the 25% limitation. The following expenditures may be counted in their entirety towards fulfilling 100% of the utilization goal:

1. Expenditures to certified SBE firms that operate and maintain an establishment or factory to produce, on the premises, the materials or supplies purchased for the contract.
2. Expenditures to a certified SBE fabricator that operates and maintains a factory to substantially alter materials or supplies before resale.
3. Expenditures, including fees and commissions, charged to provide bona fide technical and professional personnel recruitment for the contract. The total cost paid that shall be comparable to the industry standards customarily charged for the same or similar services.
4. Expenditures, including fees and commissions, charged for providing bonds and insurance specifically required for the performance of the contract. The total cost shall be comparable to the industry standards charged for the same or similar services.

All SBE firms proposed to participate on this contract opportunity must be SBE certified by the City of Phoenix prior to the date and time of the bid.

Participation on the contract will be calculated based on that portion (dollar value) of the contract that the SBE actually performs with its own forces. This includes the cost of supplies and materials obtained by the SBE for the work on the contract, ***except*** in cases when; it has been determined by the City *not* to be part of the firm's certification description; the SBE is certified as a "placer", "finisher", or "installer" of those materials only, or when the supplies and/or equipment it uses to perform its work is purchased or leased from the Contractor or its affiliate.

Special emphasis and care should be taken to ensure that the following types of participation are handled properly when preparing your bid packet, as failure to correctly calculate the allowable SBE participation in the following areas shall result in your bid being declared non-responsive if the SBE goal requirement is not met:

Fees & Commissions*:* SBE firms that supply a bona fide service for a fee or commission may be counted only to the extent of the fees or commissions charged by the SBE. This includes, but is not limited to, providing professional, technical, consultant, or managerial services, and bonds or insurance specifically required for the performance of a contract. Fees must be reasonable, not excessive, compared to fees customary for similar services.

EXAMPLE: *A* SBE *firm that supplies uniformed officers for security or traffic control may count only the amounts charged as a commission. The hourly amount paid to the officers may not be counted. If the "per hour" bid amount to the prime contractor is $35, and $25 per hour will be paid to the officers, only $10 per hour can be counted towards achieving the* SBE *goal. If the firm or bidder estimates that there will be 200 hours of work bid at a rate of $35 per hour, only $2,000 of the total $7,000 bid could be counted.*

Trucking & Hauling: The amount of a trucking/hauling subcontract that may be counted towards the utilization requirements may be limited. An SBE must itself own and operate at least one fully licensed,

insured, and operational truck that will be used on the contract. In addition, trucks the SBE leases without drivers under a long-term leasing agreement may be considered part of the trucking firm's workforce and

counted in full, provided the leasing agreement(s) is/are for a period of not less than 6 months and; **the leased vehicles have been recorded with the City's Equal Opportunity Department's Certification Office prior to the submittal of the LOI document.**

EXAMPLE: *A* SBE *trucking firm uses seven trucks on a job; two are owned by the* SBE *and five are leased from other firms. If two of the five trucks are leased without drivers and the remaining three are leased with drivers from another firm, then the amount paid to the* SBE *for the services provided by the trucks it owns and the two it leases without drivers and operates with its own employees can be counted in full towards meeting the* SBE *requirements. The Contractor may not count any portion of the amount the SBE receives for the two trucks it leases with drivers towards the* SBE *utilization goal.*

SECTION VI. POST AWARD SBE COMPLIANCE INFORMATION - DBB

Submittal of a bid to the City of Phoenix shall constitute an agreement by the bidder to comply with the SBE utilization requirements of this section should the bidder be awarded a contract. This includes, but is not limited to, the following compliance activities:

1. The contractor shall contract, or attempt to contract, in good faith with all SBE firms listed on the Bidder's Statement of Proposed SBE Utilization form submitted with their bid. The subcontract shall be for an amount that is equal to, or greater than, the total proposed dollar amount listed on the form, with the exception of instances where the City changes a scope of work in the contract that would reduce the available work in the subcontractor's area of performance.
2. The contractor shall not reduce any of the proposed SBE scopes of work or amounts indicated on the Bidder's Statement of Proposed SBE Utilization form without first submitting a Request for Exemption and receiving approval in writing from the City's Equal Opportunity Department (EOD), Contract Compliance Division.
3. The contractor shall notify the City of Phoenix Equal Opportunity Department immediately if any firm listed on the Bidder's Statement of Proposed SBE Utilization form refuses to enter into a subcontract or fails to perform according to the requirements of the subcontract.
4. Any reduction of retention by the City to the contractor shall result in a corresponding reduction to subcontractors or suppliers who have performed satisfactory work. The contractor has 14 days from the date their retention reduction takes effect to reduce retention to the subcontractors.
5. The contractor shall return all retention monies to subcontractors at such time as the work originally proposed by the subcontractor, and expressed in the original subcontract agreement, is complete and the purchaser (City) has accepted the work and paid the prime for the work performed by the subcontractor. Retention shall be paid no later than 30 days after such payment is made by the City.
6. The contractor shall act in good faith to meet the contract SBE utilization goal and provide all necessary documentation to show proof of those efforts as requested by the City.

If for any reason the SBE firm is decertified prior to the execution of a subcontract agreement, the bidder shall find additional SBE participation in the amount equivalent to or greater than that which was originally proposed for the SBE firm. Bidder shall make every good faith effort possible in finding a SBE replacement in the proposed trade area first, before considering SBE participation in other trade areas.

SECTION VII. SUBCONTRACT ASSURANCES

Each contract signed by the Agency and the Successful Bidder and each subcontract signed by the Successful Bidder with a Subcontractor, including Subcontractors with lower tier Subcontractors must include the following assurances verbatim:

Prompt Payment of Subcontractors *The Contractor and Subcontractor shall promptly pay its lower tier subcontractors, sub consultants, or suppliers upon receipt of payment from the City of Phoenix (Agency).*

Progress Payments: In accordance with the Arizona Revised Statues (ARS), Section 34-221(G), the Contractor(s) shall promptly pay its subcontractors, sub consultants, or suppliers within seven (7) calendar days of receipt of each progress payment from the Agency. Any diversion by the Contractor(s) of payments received for work performed on the contract, or failure to reasonably account for the application or use of such payments, constitutes grounds for a declaration of breach of the contract with the Agency.

Retention Payments: If the Agency reduces the Contractor's retention, the Contractor shall correspondingly, within 14 days, reduce the retentions held against the Subcontractors and suppliers that have performed satisfactory work.

Release of Retention: The Contractor(s) shall ensure prompt and full payment of retentions to Subcontractors and suppliers when their work is complete, the Agency has accepted the work, and the Agency has paid the Contractor for the work. The Contractor shall pay each Subcontractor's and supplier's retention no later than 30 days after the Agency pays Contractor for the completed scope of work.

Changes to Subcontracts and Values *The City of Phoenix prohibits Contractor(s) from altering the Contractor's Statement of Proposed SBE Utilization form without receiving prior, written consent from the City. The Equal Opportunity Department must be informed, in writing, and in advance of the following:*

- *Reduction to the scope of work performed by subcontractors working on the contract*
- *Changes in any of the subcontract values resulting in a reduced dollar amount*
- *Replacement and/or release of any subcontractor after contract award*

Contractor(s) and Subcontractor(s) are required to complete a Request for Exemption Form and have the written approval of the Contract Compliance Office prior to taking action on any of the above listed matters related to SBE subcontractors.

In the event that any provision of this subcontract varies from the provisions of the contract or subcontract, the provisions for SBE contract compliance as contained in Administrative Regulation 1.89, Section IX, shall provide definitive guidance.

Disclaimer: *Nothing in this section prevents the Contractor or Subcontractor from enforcing its subcontract with a lower tier Subcontractor or supplier for defective work, late performance, and other claims arising under the Subcontract.*

SECTION VIII. RECORDS and REPORTING REQUIREMENTS

1. **Records**

During performance of the Contract, the Successful Submitter shall keep all records necessary to document the participation of all subcontractors and suppliers. The Successful Submitter shall provide the records to the Agency within 72 hours of the Agency's request and at final completion of the Contract. The Agency will prescribe the form, manner, and content of reports. The required records may include but not limited to:

a) A complete listing of all Subcontractors and suppliers on the project;
b) Each Subcontractor's and supplier's scope performed;
c) The dollar value of all subcontracting work, services, and procurement;
d) Copies of all executed Subcontracts, purchase orders, and invoices: and
e) Copies of all payment documentation.

2. **Reports**

a. The contractor shall participate in all compliance reviews determined necessary by the City. This includes, but is not limited to participating in on-site reviews, providing monthly utilization reports of SBE activity, providing signed copies of subcontracts and/or purchase orders with each SBE listed on the Bidder's Statement of Proposed SBE Utilization form, and complying with any and all requests for information the City deems appropriate for effectively monitoring this contract for compliance with the SBE Program requirements.
b. The contractor shall provide regular, monthly report/audit information that will assist us in effectively monitoring your compliance with the SBE Program requirements. This shall include listing all subcontractors working on the contract and reporting payments into the Certification and Compliance System https://phoenix.diversitycompliance.com. Reporting audits shall include all payments received from the City and payments you have issued to all subcontractors and suppliers. **Copies of the first 2 pages of the Pay Request submittal are required with each report. All Monthly audit reports are to be completed online by the 15th of every month.** (https://phoenix.diversitycompliance.com).
    i. The total of all payments received from the City during the previous month.
    ii. The first two pages of each payment application submitted for those payments.
    iii. All payments made to Subcontractors during the previous month.

Before the Agency processes the Successful Submitter's final payment and/or outstanding retention held against the Successful Submitter, the Successful Submitter shall submit to the Agency a final certification of full and final payment to each Subcontractor in the form prescribed by the Agency. The form must be completed and certified by the Successful Submitter's and each Subcontractor's duly authorized agents.

SECTION IX. PERFORMANCE OF A COMMERCIALLY USEFUL FUNCTION

The prime contractor may count only expenditures to SBE subcontractors that perform a commercially useful function in the work of the contract, as defined in Chapter 18 Article VI of the City Code. A "commercially useful function" constitutes performing real and actual services related to the contract.

SBE subcontractors may enter into second-tier subcontracts consistent with normal industry practices. If an SBE subcontracts greater than twenty-five **(25)** percent of the work of their contract, the SBE subcontractor shall be presumed not to be performing a commercially useful function. In this event, the prime contractor will not be allowed to claim any expenditure to the SBE subcontractor.

SECTION X. FAILURE TO COMPLY WITH THE SBE PROGRAM REQUIREMENTS

If the Equal Opportunity Department determines that the contractor will fail, or has failed, to meet the SBE subcontracting goals, and/or has failed to act in good faith to ensure compliance with the SBE conditions of its contract; it shall deem the contractor "noncompliant" and not in good standing. A noncompliant status shall result in the rejection of all future contract bids or offers for all projects or other procurements with the City until such time that the contractor has cured its breaches and demonstrates that it has faithfully performed its approved SBE utilization plan and all other provisions of this article required to be deemed in good standing. In addition to this action, the City may also exercise its option to impose any or all of the following remedies:

1. Withholding from the contractor ten percent (10%) of all future payments on the involved eligible project until it is determined that the contractor is in compliance;

2. Withholding from the contractor all future payments on the involved project until it is determined that the contractor is in compliance

Failure to cure a non-compliance status within the time frame provided by the City may result in further action, including but not limited to imposing any or all of the following sanctions:

1. Rejection of all future bids or offers from the contractor for any eligible project with the City or any of its departments or divisions for a period of (1) year after substantial completion of the contract.

2. Cancellation of the contract.

City of Phoenix

Small Business Enterprise Program

CONTRACTOR'S STATEMENT OF PROPOSED SBE UTILIZATION (DBB)

PROJECT NUMBER/TITLE: AV15000073 PSHIA Rental Car Center LED Light Retrofit **Required SBE Goal:** 5 %

SBE FIRMS	COMPANY NAME	SERVICES TO BE PROVIDED	SUPPLIER- (YES or NO) May not satisfy more than 25% of the Goal	SBE $ AMOUNT from LOI Tables - Sections C, D, or E	Countable SBE $ Amount (towards proposed goal)

($_____) **-** **($_____)** **-** ($_____) **=** ($_____)
Total Bid **-** **Allowances & Contingencies** **-** **Alternates** **=** **Base Bid**

($_____) ÷ $_____) **X 100 =** _____**% (NO ROUNDING)**
Total Proposed SBE Dollars ÷ **Base Bid** **X 100 =** **Proposed SBE %**

Total Proposed SBE Dollars

$_____

Proposed SBE Percentage must equal or exceed the Required SBE Goal Percentage.

Do **NOT** propose SBE dollars in scopes related to Alternates, Allowances, or Contingencies as part of meeting the required SBE %.

All additional contract dollars, including selected alternates, contingencies, and allowances paid after award of contract, will be subject to the SBE contract goal %.

I hereby certify by signing below the foregoing SBE firms shall be contracted to work on the trades identified above and/or supply material/equipment for this project.

*The information shown above is a **true reflection of the proposed subcontracts**.*

COMPANY NAME: _____ EMAIL: _____ PHONE: _____

NAME : _____ TITLE: _____

SIGNATURE: _____ DATE: _____

City of Phoenix

Small Business Enterprise Program

Letter of Intent (LOI) To Perform as an SBE Subcontractor

(THIS FORM ***MUST*** BE COMPLETED BY THE SBE SUBCONTRACTOR – BOTH SBE SUBCONTRACTOR & PRIME SIGNATURE ARE REQUIRED)

Project Number: AV15000073 Contract #:	**Project Description: PSHIA Rental Car Center LED Light Retrofit**

TO: _____ (Insert Name of Prime Contractor)

FROM: _____ (Insert Name of SBE Firm)

A. The undersigned declares that the firm bidding to perform the work described herein, has been granted certification by the City of Phoenix (COP) as a Small Business Enterprise (SBE) in the area(s) of:

(COP) Certification Description:

B. The undersigned is bidding to perform the following scope(s) of work on the above referenced project:

SECTION 1 - COMPLETE THIS PORTION IF THE SCOPE OF WORK IS BEING BID BY UNIT PRICE OR HOURLY RATE SUPPLIER, BROKER, TRUCKING, HAULING, UNIFORMED OFFICERS MUST USE THIS SECTION			
Scope of Work	**Unit/Hourly Rate**	**# of Units/Hours**	**Total Quote Amount**
			$

SECTION 2 - GENERAL OR SPECIALTY CONSTRUCTION TRADE AREAS MUST USE THIS SECTION	
Scope of Work	**Total Quote Amount**
	$

C. Of the Total Quote Amount reflected in Part B-SECTION 2, the following scope(s) of work with the given amount **will not** be performed by the SBE or **is/are not** covered under the SBE's certification description:

Scope(s) of Work _____ **Amount $**_____

Subtract Amount in Part C above from the Total Quote Amount in Part B-Section 2 =* $_____

* ***Only this amount shall be reflected on the Bidder's Statement of Proposed Utilization.***

D. If trucking services are included in Part B - SECTION 1 above, SBE **MUST** complete the following:

Of the Total Quote Amount noted in part B-Section 1, the SBE affirms that the amount of * $_____ shall be performed by drivers the firm employs, and trucks the SBE owns and leases without drivers.

(*The amount referenced above is transferred from Step 9 of the Worksheet (L.O.I.W.-1). *Only this amount shall be on the Statement of Proposed Utilization)*

E. All subcontractors providing Broker or Traffic Control/Security Services indicated in Part B-SECTION 1 above **MUST Complete the Following:**

Rate of the SBE's fees/commissions _____%; for a Total Amount in fees/commissions of: $_____

The Percentage and Total Amount referenced above is transferred from Steps 2 and 3 of the Worksheet (page L.O.I. W.-1).
Only the Total Amt in fee/commissions shall be reflected on the Bidders Statement of Proposed Utilization.

Should the prime contractor receiving this form be selected for award of the contract, the undersigned affirms that he/she will enter into an agreement to perform the work bid herein.

_____ _____

(SBE Subcontractor Authorized Signature) (Date)

_____ _____

(Print Name and Title) (Phone Number)

By signing this LOI document, the Prime Contractor affirms that it has not altered or modified this document in any way other than, if applicable, entering the Unit/Hours and Total Quote Amount in Part B SECTION 1.

_____ _____

(Prime Contractor Authorized Signature) (Date)

_____ _____

(Print Name and Title) (Phone Number)

City of Phoenix
Small Business Enterprise Program

LETTER OF INTENT TO PERFORM AS A SUBCONTRACTOR/SUPPLIER INSTRUCTIONS AND WORKSHEET - *L.O.I. W.-1*

A Letter of Intent to Perform as a SBE Subcontractor/Supplier (required for each SBE subcontractor/supplier proposed). The form documents services to be performed by the subcontractor/suppler and the total dollar amount of the subcontract that will be awarded to the SBE. Only the services performed in the area(s) described by the SBE's certification description can be counted towards the SBE goal requirement.

Part I. Trucking and Hauling: SBEs should indicate on Part B-Section 1 and Part D, of the LOI form, the information regarding trucks to be used in executing the contract. The City allows the counting of all payments for services provided by trucks which the SBE owns. Trucks which the SBE leases on a long-term basis and are operated with drivers the SBE employs may also be counted in full. The payments for short-term leased trucks, with or without SBE employed drivers cannot be counted.

Only trucks for which leasing agreements have been submitted and approved by EOD as part of the SBE firm's current certification file shall be considered eligible for counting towards the goal.

STEP ONE	STEP TWO	STEP THREE
Value of work expected to be performed by trucks owned by the SBE (2 Trucks)	Value of work expected to be performed by trucks leased (**with drivers**) by the SBE on a long-term basis (2 Trucks)	Combined value of work expected to be performed by other trucking firms and/or trucks leased (**without drivers**) by the SBE (3 Trucks)
$20,000	**$20,000**	**$33,000**

STEP FOUR	STEP FIVE	STEP SIX
Estimated value for services provided by all trucks the SBE will use on the contract. **(Add Steps One, Two, and Three)**	Expected value of work performed by trucks not eligible for counting as SBE participation **(Value in Step Three)**	Total estimated value that can be counted for SBE participation **(Subtract Step Five from Step Four)** **$73,000 - $33,000**
$73,000	**$33,000**	**=$40,000**

Part II. Fees and Commissions: Insert the information from below under Step Three-Commission/Fees Percentage and the Countable Amount for SBE Participation into Part E of the LOI form. This part is applicable for the use of uniformed officers to provide traffic control and security and other services provided at an hourly rate by non-employees of the SBE contractor.

(The following information is provided as a sample only)

STEP ONE		
Total Number of Hours	Per Hour Bid Amount	Calculation Formula: Total Gross Bid Amount
200	**$35**	**200 × $35 = $7,000**

STEP TWO			
Per Hour Bid Amount	Officers Hourly Rate	SBE Firm Commission/Fee	Calculation Formula: Fees/Commissions Percentage
$35	**$25**	**$10**	**(10 / 35) * 100 = 28.57%**

STEP THREE		
Gross Bid Amount (from Step One)	Commission/Fee % (from Step Two)	Calculation Formula: Amount Countable for SBE Participation
$7,000	**28.57%**	**$7,000 × .2857 = $2,000**

Part III. Construction Trade Areas: SBE must indicate in the Scope of Work of Part B-Section 2 of the LOI form, ***all*** scope(s) of work associated with the Total Quote Amount. The SBE must complete Part C of the LOI form by entering the Scope of Work and amount not expected to be performed by the SBE or which is not covered under the SBE's certification description. Subtracting this amount from the Total Quote Amount in Part B-Sect. 2 will result in the portion of work that can be counted as SBE participation.

CITY OF PHOENIX

LIST OF MAJOR SUBCONTRACTORS AND SUPPLIERS

PROJECT NO.: AV15000073 PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit Design-Bid-Build

DESCRIPTION OF WORK OR MATERIALS (CONTRACTOR TO ENTER TRADE/SUPPLIER AREAS)	SELF-PERFORMED BY PRIME CONTRACTOR	SUBCONTRACTOR/ SUPPLIER COMPANY NAME (IF NOT SELF-PERFORMED)	CONTACT PERSON	PHONE NUMBER	DOLLAR VALUE OF WORK OR MATERIALS IN BID
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				

I hereby certify by signing below that the above listed companies will be utilized to perform work on this project for an **equal to or greater than 5% of the base bid**. These companies will not be removed or replaced without prior written approval by the City of Phoenix Project Manager. The City requires that ALL vendors providing work equal to or greater than 5% of the base bid are listed or you will be disqualified. If you are self-performing work, you must still list any suppliers for materials or list any subcontractors with whom you will directly contract.

COMPANY NAME _____ SIGNATURE _____

NAME & TITLE _____ PHONE NUMBER _____ DATE _____

EMAIL ADDRESS _____

CITY OF PHOENIX

LIST OF ALL SUBCONTRACTORS AND SUPPLIERS

PROJECT NO.: AV15000073 PROJECT TITLE: Phoenix Sky Harbor International Airport Rental Car Center LED Light Retrofit Design-Bid-Build

DESCRIPTION OF WORK OR MATERIALS (CONTRACTOR TO ENTER TRADE/SUPPLIER AREAS)	SELF-PERFORMED BY PRIME CONTRACTOR	SUBCONTRACTOR/ SUPPLIER COMPANY NAME (IF NOT SELF-PERFORMED)	CONTACT PERSON	PHONE NUMBER	DOLLAR VALUE OF WORK OR MATERIALS IN BID
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				
	☐YES ☐ NO				

I hereby certify by signing below that the above listed companies will be utilized to perform work on this project. These companies will not be removed or replaced on the project without prior written approval by the City of Phoenix Project Manager. The City requires that ALL vendors providing work are listed or you will be disqualified. If you are self-performing work, you must still list any suppliers for materials or list any subcontractors with whom you will directly contract.

COMPANY NAME _____ SIGNATURE _____

NAME & TITLE _____ PHONE NUMBER _____ DATE _____

EMAIL ADDRESS _____

BIDDER'S DISCLOSURE STATEMENT

Authorized Contact for this Disclosure Statement

Name:_____

Title:_____

E-mail:_____

Phone number:_____

List any EIN, DBA, trade name, or other identity used in the last five years, the state or country where filed, and the status (active or inactive): (if applicable):_____

_____

_____

Business Characteristics

Business entity type – Please check appropriate box and provide additional information:

☐	Corporation	Date of incorporation: _____
☐	Limited Liability Company	Date organized: _____
☐	Limited Liability Partnership	Date of registration: _____
☐	Limited Partnership	Date established: _____
☐	General Partnership	Date established: _____
☐	Sole Proprietor	How many years in business?:_____
☐	Other (explain)	Date Established: _____

Was the business entity formed in the State of Arizona? Yes_____ No_____

If no, indicate jurisdiction where Business Entity was formed: _____

Business License Number and Classification: _____

Business Transaction Privilege License Number: _____

Special Use or other zoning permits required for Bidder's operation and performance of the services under this Agreement:

_____

Is the Business Entity currently registered to do business in Arizona with the Arizona Corporation Commission? Yes_____ No_____ Not required _____ (if sole proprietor or general partnership)

Does the Business Entity have a City of Phoenix business privilege license? Yes_____ No_____ If "no" explain and provide detail such as "not required" or "application in progress" or other reason.

Is the Business Entity publicly traded? Yes_____ No_____

Is the responding Business Entity a Joint Venture? Note: If the Submitting Business entity is a Joint Venture, also submit a questionnaire for each Business Entity comprising the Joint Venture. Yes_____ No_____

Is the Business Entity's Principal Place of Business/Executive office in Phoenix? If "no" does the Business Entity maintain an office in Phoenix? Yes_____ No_____

Provide the address and phone number for the Phoenix office. _____

Is the business certified by Phoenix as a Small Business Enterprise? Yes_____ No_____

Identify Business Entity Officials and principal Owners:

Name(s) _____Title_____Percentage ownership ___%(Enter 0% if not applicable).

Name(s) _____Title_____Percentage ownership ___%(Enter 0% if not applicable).

Name(s) _____Title_____Percentage ownership ___%(Enter 0% if not applicable).

Name(s) _____Title_____Percentage ownership ___%(Enter 0% if not applicable).

Affiliates and Joint Venture Relationships

Does the Business entity have any Affiliates? Yes_____ No_____ Attach additional pages if necessary.

Affiliate name: _____

Affiliate EIN (if available):_____.

Affiliate's primary Business Activity:_____

Explain relationship with Affiliate and indicate percent ownership, if applicable. _____

Are there any Business Entity Officials or Principal Owners that the Business Entity has in common with this Affiliate?_____
Individual's name:_____

Position/Title with Affiliate:_____

Has the Business Entity participated in any joint Ventures within the past three years? Yes_____ No_____
(Attach additional pages if necessary)

Joint Venture Name:_____

Joint venture EIN (if applicable):_____

Identify parties to the Joint Venture:_____

Contract History

Has the Business Entity held any contracts with the city of Phoenix in the last three (3) years? Yes_____ No_____ If "yes" attach a list.

Integrity – Contract Bidding

Within the past three (3) years, has the Business Entity or any Affiliate been suspended or debarred from any government contracting process or been disqualified on any government procurement? Yes_____ No_____

Been subject to a denial or revocation of a government prequalification? Yes_____ No_____

Been denied a contract award or had a bid rejected based upon a finding of a non-responsibility by a government entity? Yes_____ No_____

Agreed to a voluntary exclusion from bidding/contracting with a government entity? Yes_____ No_____

Initiated a request to withdraw a bid submitted to a government entity or made any claim of an error on a bid submitted to a government entity? Yes_____ No_____

Initiated a request to withdraw a bid submitted to a government entity or made any claim of an error on a bid submitted to a government entity? Yes_____ No_____

For each "Yes" answer above, provide an explanation of the issues.

Integrity – Contract Award

Within the past three (3) years has the Business Entity or any Affiliate been suspended, cancelled, or terminated for cause on any government contract? Yes_____ No_____

Been subject to an administrative proceeding or civil action seeking specific performance or restitution in connection with any government contract? Yes_____ No_____

For each "yes" answer, provide an explanation. (Attach explanation on a separate sheet of paper).

Certifications/Licenses

Within the past three (3) years, has the Business Entity or Affiliate had a revocation, suspension, or disbarment of any business or professional permit and/or license? Yes_____ No_____

If “yes” provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the government entity involved, and any remedial or corrective action(s) taken and the current status of the issues.

Legal Proceedings

Within the past three (3) years, has the Business Entity of any Affiliate:

Been the subject of an investigation, whether open or closed, by any government entity for a civil or criminal violation? Yes_____ No_____

Been the subject of an indictment, grant of immunity, judgment or conviction, (including entering into a plea bargain for conduct constituting a crime)? Yes_____ No_____

Received any OSHA citation and Notification of Penalty containing a violation classified as serious or willful? Yes_____ No_____

Had a government entity find a willful prevailing wage or supplemental payment violation? Yes_____ No_____

Been involved in litigation as either a plaintiff or a defendant involving a copyright or patent infringement violation or an anti-trust violation? Yes_____ No_____

Other than previously disclosed, for the past three (3) years:

(i) Been subject to the imposition of a fine or penalty in excess of $1000 imposed by any government as a result of the issuance of citation, summons or notice of violation, or pursuant to any administrative, regulatory, or judicial determination? Yes_____ No_____

(ii) Been charged or convicted of a criminal offense pursuant to any administrative and/or regulatory action taken by any government entity? Yes_____ No_____

If “yes” provide an explanation of the issue(s), the Business Entity involved, the relationship to the submitting Business Entity, relevant dates, the government entity involved, and any remedial or corrective action(s) taken and the current status of the issues.

Leadership Integrity

If the Business Entity is a joint Venture Entity, answer “N/A – Not Applicable” to questions below:

Within the past three (3) years has any individual previously identified, or any other Business Entity Leader not previously identified, or any individual having the authority to sign, execute, or approve bids, proposals, contracts or supporting documentation with the City of Phoenix been subject to:

A sanction imposed relative to any business or professional permit and/or license? Yes_____ No_____

An investigation, whether open or closed, by any government entity for a civil or criminal violation for any business related conduct? Yes_____ No_____

DLB/dlb/828671V3

City of Phoenix

AFFIDAVIT OF IDENTITY

Your completion of this form is required by Arizona state law. A.R.S. §§ 1-501 and -50 only if you are a sole proprietor.

I, _____(print full name exactly as on document), hereby affirm, upon penalty of perjury, that I presented the document marked below to the City of Phoenix, that I am lawfully present in the United States, and that I am the person stated on the document. (*select one category only*)

☐Arizona driver license issued after 1996.
Print first four numbers/letters from license: | | | | |

☐Arizona non-operating identification license.
Print first four numbers/letters: | | | | |

☐ Birth certificate or delayed birth certificate issued in any state, territory or possession of the U.S.
Year of birth: _____; Place of birth: _____

☐ United States Certificate of Birth Abroad.
Year of birth: _____; Place of birth: _____

☐United States Passport.
Print first four numbers/letters on Passport: | | | | |

☐Foreign Passport with United States Visa.
Print first four numbers/letters on Passport: | | | | |
Print first four numbers/letters on Visa: | | | | |

☐I-94 Form with a photograph.
Print first four numbers on I-94: | | | | |

☐USCIS Employment Authorization Document (EAD).
Print first four numbers/letters on EAD: | | | | |
***or* Perm. Resident Card (acceptable alternative):** | | | | |

☐Refugee Travel Document.
Date of issuance: _____; Refugee country: _____

☐U.S. Certificate of Naturalization.
Print first four digits of CIS Reg. No.: | | | | |

☐ U.S. Certificate of Citizenship.
Date of issuance:_____; Place of issuance: _____

☐Tribal Certificate of Indian Blood.
Date of issuance: _____; Name of tribe: _____

☐Tribal or Bureau of Indian Affairs Affidavit of Birth.
Year of birth: _____; Place of birth: _____

Signed: _____ Dated: _____

Electrical Technical Specifications

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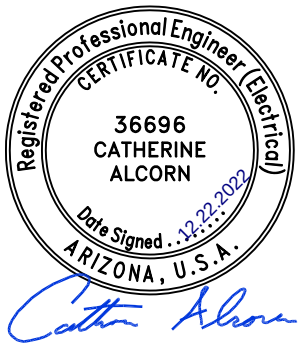

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SECTION 26 05 00 GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. It is the intent of this part of the Contract Documents to cover the work and materials necessary for erecting a complete electrical system, tested and ready for continuous use. The system shall be constructed in accordance with the Contract Documents, and Federal, State, and Local codes and regulations.

1.02 RELATED SECTIONS:

A. The Contractor shall coordinate the work with other trades and furnish and install the equipment in accordance with the manufacturers' requirements.

1.03 GENERAL PROVISIONS:

A. Minimum sizes of equipment, and electrical devices, are indicated but it is not intended to show every offset and fitting, nor every structural or mechanical difficulty that will be encountered during the installation of the work.

B. Work indicated on the Plans is approximately to scale. Actual dimensions and detailed Plans should be followed as closely as field conditions permit. Field verification of scaled dimensions on Plans is governed by field conditions. Installation of systems and equipment is subject to clarifications as indicated in reviewed shop drawings and field coordination.

C. Discrepancies indicated on different Plans, between Plans and actual field conditions, or between Plans and Contract Documents shall be promptly brought to the attention of the Engineer for clarification, prior to purchasing and installing equipment.

D. The alignment of equipment and conduit shall be adjusted to accommodate architectural changes, and coordinate with work of other trades, without extra expense to the Owner.

E. The Contractor shall furnish and install the parts and pieces necessary to the installation of equipment, in accordance with the best practice of the trade, and in conformance with the requirements of these Contract Documents and equipment manufacture's recommendations.

F. Items not specifically mentioned in these Contract Documents, or noted on the Plans, or indicated on reviewed shop drawings, but which are necessary to make a complete working installation, shall be deemed to be included herein.

G. The Contractor shall lay out and install electrical work prior to completion of floors and walls. Furnish and install sleeves and openings through floors and walls, required for installation of conduits. Sleeves shall be rigidly supported and suitably packed, or sealed, to prevent ingress of wet concrete. Spacers shall be installed in order to prevent conduit movement. Dimensions indicated for electrical equipment and their installation are minimum dimensions.

H. The Contractor shall furnish and install inserts and hangers required to support conduits and other electrical equipment. If the inserts, hangers, sleeves, or other mounting hardware are improperly placed, or installed, the Contractor shall do necessary work, at his/her own expense, to rectify the errors.

I. Electrical equipment shall be capable of operating successfully at full-rated load, without failure, at an ambient air temperature of 60 degrees C, and specifically rated for the altitude indicated on the Plans. Electrical

equipment not rated for operation at that temperature shall be provided with air conditioning to meet the manufacturers' operating temperature.

J. If any contradictions, non-homogeneity, or inconsistency appears, the most strict criteria noted and the collective requirements in any and all of the project documents shall apply.

K. The Contractor shall perform necessary saw cutting, core drilling, excavating, removal, shoring, backfilling, and other work required for the proper installation of conduits, whether inside, or outside of the buildings and structures. The Contractor shall repair and patch where demolition has taken place in a manner to match existing original structure.

1.04 REGULATIONS, CODES, AND STANDARDS:

A. Electrical work, including connection to electrical equipment integral with mechanical equipment, shall be performed in accordance with the latest published regulations, codes, and standards, of the following:
1. National Electrical Code (NEC)
2. State and local codes
3. Institute of Electrical and Electronic Engineers (IEEE)
4. American National Standards Institute (ANSI)
5. American Society for Testing and Materials (ASTM)
6. Insulated Cable Engineers Association (ICEA)
7. National Electrical Manufacturers Association (NEMA) Standards
8. Federal Occupational Safety and Health Act (OSHA)
9. National Fire Protection Association (NFPA)

B. When applicable, the material used in the performance of the electrical work shall be listed by the Underwriters' Laboratories, Inc. (UL) for the class of service for which they are intended.

1.05 SUBMITTALS:

A. It is the obligation of the Contractor to organize his/her work, so that a complete electrical, instrumentation, and control system for the facility will be provided, and will be supported by accurate shop and record drawings, and O&M manuals.

B. The Contractor shall submit detailed shop drawings and data prepared and organized by the suppliers. The quantity of submittal sets required shall be as specified in the Contract Documents.

C. The submittals shall be neatly grouped and organized by specification section number, and sub-section. Related information shall be highlighted, and the specific product shall be indicated. All submittals shall be complete and presented in one package. Incomplete submittals will be returned without review. If a portion of the project requires a fast track schedule, that portion only may be submitted earlier under a separate cover letter after securing the Engineer's written permission. The following shall be submitted to the Engineer and returned, reviewed to the Contractor before fabrication is started.
1. A complete list of the equipment and materials, including the manufacturer's name, product specification, descriptive data, technical literature, performance charts, catalog cuts, installation instructions, and spare part recommendations for each different item of equipment specified. The above shall clearly show all the specified requirements as described in the Specifications including but not limited to specific U.L. and NEMA rating, technical capabilities, test result verifications, and acceptance letters.

2. Drawings containing complete wiring and schematic diagrams, control diagrams, and any other details required to demonstrate that the system has been coordinated and will operate as intended. Drawings

shall show proposed layout, anchoring, support, and appurtenances of equipment, and equipment relationship to other parts of the work including clearances for maintenance and operations.

3. Upon Project acceptance, the Contractor shall submit four sets of "Record Drawings" of the electrical, control, and instrumentation, along with step-by-step procedure manuals for the installation, operation start-up, and maintenance of the equipment. Each set shall include installation, operating, troubleshooting, and maintenance and overhaul instructions in complete detail. It shall also include possible breakdowns and repairs, and troubleshooting guides, as well as simplified wiring and control diagrams of the system installed. This shall provide the Owner with comprehensive information on all systems and components to enable operation, service, maintenance and repair. Exploded or other detailed views of all equipment, devices, assemblies, and accessory components shall be included, together with complete parts lists and ordering instructions.

4. Record Drawings:
   a. The Contractor shall maintain a marked up set of Contract Document Plans showing actual installed circuit numbers, conduit sizes, cable tray routing, number of conductors, conductor sizes (larger than #12 AWG), and all other deviations from the design Plans.
   b. Underground conduit and concealed items shall be dimensioned on the Plans from permanent, visible, building features.
   c. The Contractor shall provide actual motor size, starter size, and overload heater size, along with all other protective equipment for all 480 V and 208 V motor circuits as part of the one-line record drawings.
   d. The Contractor shall revise all conductor identification and panel schedules to indicate as-built conditions.

PART 2 - PRODUCTS

2.01 GENERAL MATERIALS AND METHODS:

A. Materials, equipment, and parts comprising any unit, or part thereof, specified or indicated on the Plans, shall be new and unused, of current manufacture, and of highest grade consistent with the state of the art. Damaged materials, equipment, and parts are not considered to be new and unused, and will not be accepted.

B. Field verification of scaled dimensions on Plans is directed, since actual locations, distances, and levels will be governed by actual field conditions. The Contractor shall also review architectural, structural, yard, mechanical, and other Plans, and the accepted electrical and mechanical shop drawings, and shall adjust their work to conform to the conditions indicated therein.

C. The fabricator of major components, such as distribution panelboards, switchgear, and motor control centers, shall also be the manufacturer of the major devices therein.

D. Refer to various Division sections for individual equipment manufacturers. Indicated manufacturers are subject to strict compliance with the specifications and complete project documents. The reference to a particular manufacturer does not relieve the Contractor from conforming to the specified requirements.

2.02 NAMEPLATES:

A. Where indicated elsewhere in these specifications, or on the Plans, the Contractor shall furnish and install nameplates, which shall be black laminate with white letters. The nameplates shall be fastened to the various devices with round head stainless steel screws. Each disconnect means for service, feeder, branch, or equipment conductors, shall have nameplates indicating its purpose.

2.03 SHOP WORK:

A. The assembly of process control panels and/or modifications to equipment assemblies shall be done at a UL approved shop. The entire unit shall be completely assembled and tested prior to shipment to the project site. In addition, owner personnel shall be allowed to inspect the unit(s) prior to job-site shipping. This inspection shall not be construed as final acceptance of unit(s) by the owner.

2.04 LISTED EQUIPMENT ASSEMBLIES:

A. Service Entrance equipment , Switchgear, Switchboards, Panelboards, Control and Distribution Panels, and other factory assembled electrical enclosures shall bear a UL label. Custom built electrical enclosures and control panels shall bear a UL508 label. Where UL listing is not available , CSA or ETL shall be considered during submittal review.

2.05 SUBSTITUTION OF MATERIAL AFTER AWARD OF CONTRACT:

A. Any exceptions to these specifications shall be submitted to the Engineer, with the reasons for requesting such exceptions, with calculations and drawings for redesign of related components, including detailed drawings showing internal and assembly details, with installation instructions. Proposed layout changes showing any modifications or exceptions to related work made necessary by the(se) exception(s), with calculations and drawings showing such modifications or exceptions, shall also be included.

B. Items if material and equipment may be offered (at the Contractor's option) as alternates to specified items. Such offer shall be in writing under Bidder's letterhead.

C. Such alternate proposals shall be accompanied by full descriptive data on the proposed equipment. If alternate material proposals are considered, the Contractor shall submit a list of the proposed alternate substitution items in accordance with the requirements of "Review of Proposed Substitutions".

PART 3 - EXECUTION

3.01 INSTALLATION OF ELECTRICAL EQUIPMENT:

A. Coordinate the installation of electrical equipment with other trades.
   1. Arrange for the building in of equipment during structure construction.
   2. Where equipment cannot be built-in during construction, arrange for sleeves, box-outs, and other openings, as required to allow installation of equipment after structure construction is complete.

B. Verify that equipment will fit support layouts indicated.

C. Equipment Dimensions and Clearances:
   1. Do not use equipment that exceeds the indicated dimensions. Except as approved in writing by the Engineer.
   2. Do not use equipment or arrangements of equipment that reduce required clearances or exceed the space allocation.

D. Install equipment in accordance with the manufacturer's instructions.

E. Equipment Access:
   1. Install equipment so it is readily accessible for operation and maintenance.
   2. Equipment shall not be blocked or concealed.
   3. Do not install electrical equipment such that it interferes with normal maintenance requirements of other equipment.

F. Equipment shall be installed plumb, square and true with the building construction, and shall be securely fastened.

G. Outdoor wall-mounted equipment, and indoor equipment mounted on earth, or water bearing walls, shall be provided with corrosion-resistant spacers to maintain ¼-inch separation between the equipment and the wall.

H. Screen or seal all openings in outdoor equipment to prevent the entrance of rodents and insects.

I. Equipment fabricated from aluminum shall not be imbedded in earth or concrete.

J. Provide all necessary anchoring devices and supports.
   1. Use supports as detailed on the Plans and as specified.
   2. Supports and anchoring devices shall be rated and sized based on dimensions and weights verified from approved equipment submittals.
   3. Hardware shall be stainless steel.
   4. Do not cut, or weld to, building structural members.
   5. Do not mount safety switches and external equipment to other equipment enclosures, unless enclosure mounting surface is properly braced to accept mounting of external equipment.

K. Contractor shall verify exact rough-in location and dimensions for connection to electrical items furnished by others.
   1. Shop drawings shall be obtained from those furnishing the equipment.
   2. Proceeding without proper information may require the Contractor to remove and replace work that does not meet the conditions imposed by the equipment supplied.
   3. Provide sleeves wherever openings are required through new concrete or masonry members. Place sleeves accurately and coordinate locations with the Engineer.
   4. Should any cutting and patching be required on account of failure of the Contractor to coordinate penetrations, such cutting and patching shall be done at the expense of the Contractor.
      a. The Contractor shall not endanger the stability of any structural member by cutting, digging, chasing, or drilling and shall not, at any time, cut or alter the work without the Engineer's written consent.
         1) Provide additional reinforcing if required.
         2) Cutting shall be done neatly using proper tools and methods.
      b. Subsequent patching to restore walls, ceilings, or floors to their original condition shall be done by the Contractor.

L. Provide concrete foundations or pads required for electrical equipment as indicated or specified. Floor-mounted equipment shall be mounted on a 4-inch concrete housekeeping pad. Pad shall be poured on top of the finished floor or slab.

3.02 TEMPORARY POWER:

A. The Contractor shall furnish, install, and maintain, temporary power and lighting systems needed for construction. This temporary system shall include weatherproof panel(s) for the Contractor's main breakers and distribution system. Ground fault interrupting equipment shall be installed. Connections shall be watertight, with wiring done with Type SO portable cable. After construction is completed, the Contractor shall remove temporary power equipment and devices.

3.03 CUTTING AND REPAIRING:

A. Where it becomes necessary to cut into existing work for the purpose of making electrical installations, core drills shall be used for making circular holes. Other demolition methods for cutting or removing shall be reviewed by the Engineer prior to starting the work.

B. The Contractor shall repair damage caused by construction, or demolition work, and restore damaged areas to original condition.

3.04 CORROSION PROTECTION:

A. Wherever dissimilar metals, except conduit and conduit fittings, come in contact, the Contractor shall isolate these metals, as required, with neoprene washers, 9 mil polyethylene tape, or gaskets. Where fastening conduit, electro plated, or equivalent fasteners and stainless steel bolts shall be used.

B. Factory finishes damaged during shipping, or construction, shall be restored to original new condition. Rust shall be removed, and bare metal surfaces shall be primed and painted to match the original surrounding finish.

C. Electrical panels, switchgear, motor control centers, and other electrical equipment, shall be shipped in sealed dust and moisture proof plastic sheet enclosures, and the seal maintained until units are installed. Said units shall be new and free of any dirt, dust, water, grease, rust, damaged parts or components. Relays, starters, circuit breakers, switches, contacts, insulators, mechanisms, and buses shall be free of dust, dirt, oil, moisture, metal shavings, and other debris before testing and energizing.

D. Once equipment is installed, it shall be protected at all times with plastic sheet covers until the area is free of dirt, dust, paint spray, water, and other trades. Heat shall be provided to eliminate condensation.

3.05 COORDINATION OF THE ELECTRICAL SYSTEM:

A. The Contractor shall verify actual equipment, and motor full-load, and locked-rotor current ratings. The necessary minimum equipment, wire, and conduit sizes are indicated on the Plans. If the Contractor furnishes equipment of different ratings, the Contractor shall coordinate the actual current rating of equipment furnished with the branch circuit conductor size, the overcurrent protection, the controller size, the motor starter, and the branch circuit overcurrent protection. The branch circuit conductors shall have a current carrying capacity of not less than 125 percent of the actual full-load current rating.

3.06 TEST:

A. The electrical work shall be free from improper grounds, and from short circuits. The correctness of the wiring shall be verified first by visual comparison of the conductor connections with connection diagrams. Next, individual circuit continuity checks shall be made by using electrical circuit testers. Last, the correctness of the wiring shall be verified by the actual electrical operation of the electrical and mechanical devices. Any deviation from the wiring indicated on the Plans, or accepted Drawings, shall be corrected and indicated on the record drawings.

B. Each conductor shall be identified as required by the Contract Documents. This identification shall be indicated on the record drawings to enable rapid and accurate circuit tracing by maintenance personnel.

3.07 SINGLE LINE DIAGRAMS:

A. Single line diagrams, as indicated on the Drawings, show circuit voltages, circuit protection rating, and other pertinent data. Where conflicts exist on the Drawings, the single line diagrams shall take precedence. Grounding conductors are not necessarily indicated. See grounding requirements specified elsewhere herein.

3.08 LIGHTING FIXTURE BALLAST DISPOSAL:

A. The Contractor shall inspect all ballasts in all light fixtures removed as part of this project and take the actions described below.

B. All ballasts labeled as "NON PCB'S" shall be handled as described in other sections of these specification which describe demolition or salvage materials handling. If the PCB content is not stated on the ballast label, the ballast shall be handled as a PCB ballast.

C. All PCB ballasts shall have the wires clipped off and the ballasts placed in US DOT approved type 17C or type 17H barrels and placed in storage in a location within the building as designated. The Contractor shall provide in typewritten form, a total count of these ballasts and where they are stored.

D. These ballasts are to be removed from the work site by the Contractor.

E. The Contractor shall provide approved PCB absorbent materials to be stored immediately adjacent to the barrel storage area. Do not place loose absorbent material in the barrels.

F. When the ballast demolition is competed and all PCB ballasts are placed in barrels, the Contractor shall notify in writing that demolition is complete. The Contractor shall also provide the name, address and telephone number of at least (1) additional licensed ballast disposal providers. Contractor is responsible for arrangement of pick up and disposal of the PCB ballasts. The cost of disposal of ballast shall be included in the contractors bid.

3.09 LIGHTING FIXTURE LAMP DISPOSAL:

A. The Contractor shall be responsible for the proper removal and recycling of all existing lamps being removed from service in accordance with EPA and State requirements. Lamps shall not be disposed of in any way except as described herein.

B. The Contractor shall be responsible for arranging for recycling of lamps by Lighting Resources, 1545 E Victory St, Phoenix, AZ 85040. The cost for recycling of removed lamps shall be included in the Contractor's bid.

C. The Contractor shall carefully package removed lamps in fiberboard boxes and/or tubes to prevent breakage. The Contractor shall store wasted lamps in a secure area in secondary containment. Both the lamp storage area and individual containers should be labeled as hazardous waste. Store lamps in covered containers to prevent lamps from being broken as a result of other debris being placed on top of them. The Contractor shall supply a commercial grade mercury spill kit at the accumulation site and in work areas in case of accidental breakage.

D. The Contractor shall date all containers that are to be collecting used lamps at the time of the first lamp being placed in the container. Once each container is full it shall be sealed, the number of bulbs contained in each container shall be written on the exterior, and the type of bulbs contained in each container shall be identified on the box.

E. The Contractor shall supply the City of Phoenix, Aviation Department, Environmental Section with all Bill of Ladings pertaining to the disposal of bulbs.

END OF SECTION 26 05 00

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SECTION 26 05 01 BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This section consists of general electrical materials and methods. Electrical materials that are a part of equipment specified under other sections shall meet the requirements of this section, unless part of larger factory-assembled equipment.

1.02 SUBMITTALS:

A. Submit manufacturer's literature for raceways and fittings, boxes, wires and cables, wiring devices, nameplates, legend plates, labels, panelboards, and safety switches, service entrance equipment, control panels and any other electrical component utilized in this project.

1.03 QUALITY ASSURANCE

A. Refer to Section 26 05 00.

1.04 SPARE PARTS:

A. Provide spare components as indicated on plans and elsewhere herein.

PART 2 - PRODUCTS

2.01 BASIC MATERIALS:

A. Electrical safety switches, distribution and control equipment shall be rated for heavy duty service.

B. Wiring devices shall be specifications grade.

2.02 MISCELLANEOUS METAL AND MOUNTING CHANNELS

A. Metal Framing:

1. Unless otherwise shown, mounting channels shall be cold rolled from mild strip steel, 12-gauge, 1-5/8 inches by 1-5/8 inches, with a galvanized finish by Unistrut, Unistrut P-1000, as manufactured by Unistrut, or equal.
2. Screws, bolts, washers and nuts shall be stainless steel. Parts and brackets for assembly of channels shall be hot dipped galvanized.

B. Miscellaneous Metal: Galvanized steel, unless otherwise shown.

2.03 NAMEPLATES, LEGEND PLATES, AND LABELS:

A. Nameplates: Laminated sheet plastic, approximately 1/16 inch-thick, with engraved white letters on a black background, with adhesive backing and mounting screw holes. Stainless steel or brass screws, minimum height of letters, 5/16 inch. Card holders are not acceptable.

B. Legend Plates: Type KN-3 standard legend plates, Square D, or equal.

C. Control Wire Markers: Pressure-sensitive or heat shrink sleeve types, manufactured by W.H. Brady Company, or equal.

PART 3 - EXECUTION

3.01 BASIC MATERIALS:

A. The completed installation shall conform to all applicable federal, state, and local code ordinances and regulations. Contractor shall obtain necessary permits and inspections required by the governing authorities. Work shall be done in a neat, workmanlike, finished and safe manner, according to the latest published N.E.C.A. standards of installation, under competent supervision. Install grounding as required by the National Electrical Code.

3.02 MISCELLANEOUS METAL AND MOUNTING CHANNELS:

A. Install where electrical equipment is to be surface mounted to walls and where indicated on Plans. Where two or more devices are to be installed side by side, support on metal framing, bolt together, and brace as required to form a rigid structure.

B. Clean cuts and welds. Coat unpainted surfaces with cold application zinc galvanizing. Coat cuts and welds on painted surfaces with zinc chromate primer and finish to match existing paint.

3.03 NAMEPLATES, LEGEND PLATES, AND LABELS:

A. Nameplates: Identify panels, switchgear, regulators, load-break junction boxes, disconnect switches, and component enclosures. Fasten nameplates with stainless steel, self-tapping screws or rivets.
   1. Panels: Identify panel number, voltage and amperage of panel bus.
   2. Switchgear: Identify equipment, voltage, amperage and phase and number of wires.
   3. Safety Switches and Relays: Identify equipment controlled and circuits from which they are fed.

B. Legend Plates: Install on selector switches, pushbuttons, pilot lights, starters, and other components.

C. Control Wire Markers: Install at both ends of each control wire interconnecting between such items as control panels, sensors, and control devices, and each end of control wires within control panels, and other such enclosures. Wiring markers shall correspond to control wire numbers on approved wiring diagrams.

END OF SECTION 26 05 01

SECTION 26 05 09 CONDUITS

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. Furnish and install conduits as required, and as shown on the Plans. Materials employed shall be as shown on the Plans.

1.02 SUBMITTALS:

A. Submit product literature including manufacturer part number, model number, material, size, and specifications. Material shall not be installed until the Engineer has reviewed the submittal data.

B. Shop Drawings shall be submitted for review and acceptance showing routing, conduit size, and number and size of wires in each conduit before installation of conduit and any related work.

C. Proposed routing of conduits buried under floor slabs-on-grade.

D. Identify conduit by tag number of equipment served or by circuit schedule number.

E. Proposed routing and details of construction including conduit and rebar embedded in floor slabs, columns, etc. Identify conduit by tag number of equipment served or by circuit schedule number.

F. Proposed location and details of construction for openings in slabs and walls for raceway runs.

G. Refer to Section 26 05 00 for further submittal requirements.

1.03 REFERENCES:

A. American National Standards Institute (ANSI): C80.1, Rigid Steel Conduit - Zinc-Coated, and C80. 3, Electrical Metallic Tubing, Steel Galvanized.

B. National Electric Manufacturers Association (NEMA): RN-1, Polyvinyl-Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit, and FB-1, EMT Conduit Fittings.

C. Underwriters Laboratories Inc. (UL):
1, Flexible Metal Conduit.
6, Rigid Metal Conduit.
360, Liquid-Tight Flexible Steel Conduit.
467, Grounding and Bonding Equipment.
514, Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers, and 514B, EMT fittings.
651, Schedule 40 and 80 Rigid PVC Conduit.
870, Wireways, Auxiliary Gutters, and Associated Fittings.
884, Underfloor Raceways and Fittings.
886, Outlet Boxes and Fittings for Use in Hazardous (Classified) Locations.
797, Electrical Metallic Tubing.

PART 2 - PRODUCTS

2.01 RACEWAYS:

A. Exposed conduit in an unclassified or hazardous area shall be galvanized rigid steel (GRS) unless specifically indicated otherwise on the Plans. Conduits in the corrosive areas shall be PVC coated GRS unless otherwise indicated. Underground and/or concrete encased conduits shall be PVC, unless

otherwise indicated. All wiring, except as otherwise noted, shall be in conduit. Conduit size shall not be less than the National Electrical Code (NEC) size required for the conductors therein and shall not be smaller than 3/4-inch. No underground conduit shall be less than one inch, unless otherwise indicated on Plans.

B. Condulet type fittings shall be Crouse-Hinds, Appleton, or equal with wedge nut covers. All condulets located outdoors or in wet locations shall be weathertight.

C. In unclassified areas, flexible conduit shall be grounding type, weatherproof, corrosion resistant, and watertight.

D. Couplings, connectors, and fittings shall be standard types specifically designed and manufactured for the purpose. They shall be installed to provide a firm mechanical assembly and electrical conductivity throughout.

E. Expansion fittings shall be OZ type AX with jumper for exposed locations and type DX at structural expansion joints, Spring City, or equal. Conduits shall have expansion fittings in accordance with NEC.

F. The conduits and fittings shall be supported per NEC requirements as a minimum.

2.02 GALVANIZED RIGID STEEL (GRS):

A. Conduit and couplings shall be hot-dipped galvanized with zinc coated threads and outer coating of zinc bichromate, in accordance with ANSI C80.1 standards, as manufactured by Jones & Laughlin Steel Corporation, Allied Tube & Conduit Corporation, Triangle PWC, or equal.

B. Steel conduit shall not be buried in earth without concrete encasement and additional corrosion protection. A half lapped rapping of 20 mil PVC based corrosion protection tape shall be used.

2.03 RIGID NONMETALLIC – PVC:

A. Where specifically indicated on the Plans, or elsewhere specified, conduit may be high density Schedule 40, 90 degrees C, heavy-duty PVC. The conduit shall be manufactured from virgin polyvinyl chloride compound which meets ASTM D1784, NEMA TC-2, ANSI C33.91, and UL 651 standards. Smoke emissions shall be limited to less than 6 grams per 100 grams of material tested.

B. Where conduit concrete encasement is indicated on the Plans, conduit supports shall be installed at eight foot intervals. PVC conduit shall be manufactured by Carlon, Triangle Conduit & Cable, or equal.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Conduit runs are schematic only and shall be modified as required to suit field conditions, subject to review and acceptance by the Engineer.

B. Conduit shall run continuously between outlets and shall be provided with junction boxes where connections are made. Couplings, connectors, and fittings shall be acceptable types designed and manufactured for the purpose, and shall provide a firm mechanical assembly, and electrical conductivity throughout.

C. Conduit runs shall be straight and true. Elbows, offsets, and bends shall be uniform and symmetrical. Changes in direction shall be made with long radius bends, or with fittings of the condulet type.

D. Conduit runs in buildings and structures shall be exposed except as specifically noted or accepted by the Engineer.

E. Conduit runs shall not interfere with the proper and safe operation of equipment and shall not block or interfere with ingress or egress, including equipment removal hatches.

F. Exposed conduits shall be securely fastened with clamps, or straps, intended for conduit use. All exposed conduit shall be run on the walls and ceiling only and shall be parallel to the planes of the walls or ceiling. No diagonal runs will be permitted. Flexible conduit shall be used only for short lengths required to facilitate connections between rigid conduit to motors from junction boxes, or control equipment. The maximum length of flexible conduit shall be 3 feet.

G. Conduit runs on water-bearing walls shall be supported one inch away from the wall on an accepted channel. When channel galvanizing, or other coating, is cut or otherwise damaged, it shall be field coated to original condition. No conduit shall be run in water-bearing walls, unless specifically designated otherwise.

H. Conduit shall be thoroughly reamed to remove burrs. IMC or GRS shall be reamed during the treading process, and Rigid Nonmetallic PVC or EMT shall be reamed before applying fittings. A zinc rich cold galvanizing shall be used to restore corrosion protection on field cut threads. Bushings and lock nuts or hubs shall be used at conduit terminations. The total number of bends in any run between pull points shall not exceed 360 degrees. Junction boxes and pull boxes shall be installed at points acceptable to the Engineer. Conduit ends shall be plugged to prevent the entrance of moisture or debris during construction. All spare conduits shall be adequately capped and shall contain a suitable pull string.

I. Joints shall be set up tight. Hangers and fastenings shall be secure, and of a type appropriate in design, and dimensions, for the particular application.

J. Conduit runs shall be cleaned and internally sized (obstruction tested) so that no foreign objects, or obstructions remain in the conduit prior to pulling in conductors.

K. After installation of complete conduit runs 2 inches and larger, conduits shall be snaked with a conduit cleaner equipped with a cylindrical mandrel of a diameter not less than 85 percent of the nominal diameter of the conduit. Conduits through which the mandrel will not pass shall be prepared or replaced.

L. Expansion fittings shall be installed across all expansion joints and at other locations where necessary to compensate for thermal expansion and contraction.

M. Provide trenching, backfill, and compaction for conduits installed underground. Multiple underground conduits shall maintain a 7 ½" separation measured from the center of each conduit for M.V. cable and a 2" separation measured from outside wall to outside wall for low voltage and signal wires, or as otherwise noted on the drawings.

END OF SECTION 26 05 09

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SECTION 26 05 19 600 VOLT CLASS CABLE

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. This section covers the furnishing and installation of 600 Volt Class cables and conductors, terminations and splicing, and pulling lubricants.

1.02 SUBMITTALS:

A. Products shall be submitted in accordance with Section 26 05 00, and elsewhere in the Contract Documents, prior to installation.

1.03 REFERENCES:

A. Insulated Cable Engineers Association/National Electrical Manufacturers Association (ICEA/NEMA):
   1. S-68-516/WC 8, ethylene-propylene rubber-insulated wire and cable for the transmission and distribution of electrical energy.
   2. S-61-402/WC 5, thermoplastic-insulated wire and cable for the transmission and distribution of electrical energy.
   3. S-66-524/WC 7, cross-linked thermosetting-polyethylene-insulated wire and cable for transmission and distribution of electrical energy.

B. Underwriters Laboratory, Inc.
   1. 44, rubber insulated wires and cables.
   2. 83, thermoplastic-insulated wires and cables.
   3. 486A, wire connectors and soldering lugs for use with copper conductors.
   4. 486B, wire connectors for use with aluminum conductors.
   5. 510, insulating tape.

C. National Electric Code

D. Insulated Cable Engineers Association

PART 2 - PRODUCTS

2.01 ACCEPTED MANUFACTURERS:

A. Conductors and Multi Conductor Cables (MCC), subject to compliance with Contract Documents, the following manufacturers are acceptable: American Insulated Wire Corporation, Cablec Corporation, Okonite Company, Southwire Company, or equal.

2.02 CONDUCTORS:

A. Wire sizes shall be American Wire Gauge (AWG) sizes with Class B stranded construction. Number 2 AWG and smaller shall be factory color coded with a separate color for each phase and neutral, which shall be used consistently throughout the system. Larger cables shall be coded by the use of colored tape. Conductors sized No. 1 and larger shall be Type 2, rated for 90 degrees C. All circuit conductors, #6 or smaller shall be "THWN" stranded copper. All other conductors shall be "XHHW" stranded copper.

B. Individual or multiple conductor cables for power, control, and alarm circuits of 480 volts or less shall be insulated for not less than 600 volts and shall have insulation type as indicated on the Plans. "THWN" shall conform to ICEA S-61-402/NEMA WC 5 and UL 83 and "XHHW" shall conform to ICEA S-66-524/NEMA WC 7 and UL 44. Where wire size is not indicated, they shall be of the size required by the NEC, except that no wire external to panels and motor control centers shall be less than No. 12 AWG, unless specifically noted

on the Plans. Panel control wiring shall not be less than No. 14 AWG. Where cable is indicated to be run in cable tray , said cable shall be UL listed for cable tray use.

C. All wiring shall be as indicated on the Plans. Wires shall be new and shall be soft drawn copper with not less than 97 percent conductivity. The wire and cable shall have size, grade of insulation, voltage, and manufacturer's name permanently marked on the outer covering at not more than 2-foot intervals. All wires shall conform to the latest Standards of the ASTM, and ICEA, and shall be tested for their full length by these Standards. Insulation thickness shall be not less than that specified by the National Electrical Code.

2.03 TERMINATIONS AND SPLICES:

A. Cable shall be rated 600 volts. Other parts of cable systems such as splices and terminations shall be rated at not less than 600 volts. Splicing shall join conductors mechanically and electrically to provide a complete circuit prior to installation of insulation.

B. Splices in wires No. 10 AWG and smaller shall be made with an insulated, solderless, pressure type connector, Type I, Class 1, Grade B, Style G, or Type II, Class 1 of FS W-S-610 and conforming to the applicable requirements of UL 486A.

C. Splices in wires No. 8 AWG and larger shall be made with non-insulated, solderless, pressure type connector, Type II, Class 2 of FS W-S-610, conforming to the applicable requirements of UL 486A and UL 486B. They shall then be covered with an insulation and jacket material equivalent to the conductor insulation and jacket.

D. All splices below grade or in wet locations shall be sealed type conforming to ANSI C119.1 or shall be waterproofed by a sealant-filled, thick wall, heat shrinkable, thermosetting tubing or by pouring a thermosetting resin into a mold that surrounds the joined conductors.

E. Conductors, including grounding conductors, of different sizes shall be spliced and then soldered or welded. Splices in wet locations and all splices below grade shall be of the Exothermic type.

2.04 PULLING LUBRICANT:

A. All cables shall be properly coated with pulling compound (Aqua Gel, CRC, or equal) before being pulled into conduits so as to prevent mechanical damage to the cables during installation. “Yellow 77” is not acceptable.

B. Other lubricants to be substituted must be accompanied by a statement from the cable manufacturer as to its acceptable use with the cable being installed.

2.05 IDENTIFICATION:

A. All conductors shall be numbered with "tube sleeve" type tags with heat impressed letters and numbers.

B. Color code all wiring as follows:

1. Lighting and power wiring:

		120/208 VAC	480VAC	24V DC	120 VAC Control/Power
a.	Phase 1	Black	Brown	Blue	Red
b.	Phase 2	Red	Orange		
c.	Phase 3	Blue	Yellow		
d.	Neutrals	White	White		White
e.	Ground	Green	Green		

2. Color code ends of feeder phase conductors only.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. The pulling tension and side-wall pressures, as recommended by the cable manufacturer, shall not be exceeded. Additional pull boxes shall be installed, as required, to meet the cable manufacturer's recommendations.

B. As far as practical, all circuits shall be continuous from origin to termination without splices in intermediate pull boxes. Sufficient slack shall be left at the termination to make proper connections. In no case shall a splice be pulled into the conduit. Conductor splicing shall not be permitted without the Engineer's approval.

C. Install all cables in conduit.

D. Each feeder and branch circuit shall be installed in its own individual conduit unless combining feeder and branch circuits is permitted as defined in the following:
   1. As specifically indicated on the Plans.
   2. For lighting, multiple branch circuits may be installed in a conduit as allowed by the NEC and with the wire ampacity derated in accordance with the requirements of the NEC. Conduit fill shall not exceed the limits established by the NEC.
   3. When field conditions dictate and written permission is obtained from the Engineer.

E. Feeder and branch circuits shall be isolated from each other and from all instrumentation and control circuits.

F. Control circuits shall be isolated from all other feeder, branch and instrumentation circuits, except as noted above.
   1. 12 V DC, 24 V DC and 48 V DC control circuits may be combined in common conduit.
   2. 125 V DC control circuits shall be isolated from all other DC and AC control circuits.
   3. 120 V AC control circuits shall be isolated from all DC control circuits.

G. Make splices only at pull or junction boxes.
   1. Crimp or indenter-type connectors are not allowed, except for control circuits landed on terminal strips.
   2. For wire smaller than #6 AWG: Use insulated conical spring type connectors, or "wire nuts".
   3. For #6 AWG and larger wire: Use solderless lugs and screw type connectors.

END OF SECTION 26 05 19

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SECTION 26 05 26 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:

1. Furnish and install grounding for electrical installation as described in Contract Documents except as excluded below.

B. Related Sections:

1. Section 26 05 01: Common Electrical Requirements.

PART 2 - PRODUCTS

2.1 COMPONENTS

A. Size materials as shown on Drawings and in accordance with applicable codes.

B. Grounding And Bonding Jumper Conductors: Bare copper or with green insulation.

C. Make grounding conductor connections to ground rods and water pipes using approved bolted clamps listed for such use.

D. Service Grounding Connections And Cable Splices:

1. Make by exothermic process.
2. Type One Acceptable Products:
   a. 'Cadweld' by Erico Products Inc, Solon, OH www.erico.com.
   b. 'ThermOweld' by Continental Industries, Omaha, NB www.conind.com.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Grounding conductors and bonding jumper conductors shall be continuous from terminal to terminal without splice. Provide grounding for following.

1. Electrical service, its equipment, and enclosures.
2. Conduits and other conductor enclosures.
3. Neutral or identified conductor of interior wiring system.
4. Main panelboard, power, and lighting panelboards.
5. Non-current-carrying metal parts of fixed equipment such as motors, starter and controller cabinets, instrument cases, and lighting fixtures.

B. Grounding connection to main water supply shall be accessible for inspection and made within six inches of point of entrance of water line to building. Provide bonding jumpers across water meter and valves to assure electrical continuity.

C. Ground identified common conductor of electrical system at secondary side of main transformer supplying building. Ground identified grounded (neutral) conductor of electrical system on supply side of main service disconnect.

D. Pull grounding conductors in non-metallic raceways, in flexible steel conduit exceeding 72 inches in length, and in flexible conduit connecting to mechanical equipment.

E. Provide grounding bushings on all feeder conduit entrances into panelboards and equipment enclosures.

F. Bond conduit grounding bushings to enclosures with minimum #10 AWG conductor.

G. Connect equipment grounds to building system ground.
   1. Use same size equipment grounding conductors as phase conductors up through #10 AWG.
   2. Use NEC Table 250.122 for others unless noted otherwise in Drawings.

H. Run separate insulated grounding cable from each equipment cabinet to electrical panel. Do not use intermediate connections or splices. Affix directly to cabinet.

PART 4 - BASIS OF PAYMENT

4.1 GROUND CABLE

A. Payment for items described in this section will be made as part of payment for the other system components as described in each section containing pay items. See pay items in section 26 0519.

END OF SECTION 26 05 26

SECTION 26 05 29 SUPPORTING DEVICES

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. Supports, anchors, sleeves, and seals, are indicated on the Plans, schedules, and specified in other sections of these Specifications.

B. Types of supports, anchors, sleeves, and seals specified in this section include the following:

1. One-hole Conduit Straps
2. One-Hole Conduit Straps with Clamp Backs
3. Two-Hole Conduit Straps
4. Conduit Hangers
5. I-beam Clamps
6. Channel Clamps
7. Round Steel Rods
8. Drop-in Anchors
9. Wedge Type Anchor Bolts
10. Lead Expansion Anchors
11. Toggle Bolts
12. Wall and Floor Seals
13. Cable Supports
14. U-Channel Strut System
15. Sleeves

1.02 SUBMITTALS:

A. Products shall be submitted in accordance with Section 26 05 00, and elsewhere in the Contract Documents, prior to installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. Acceptable Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following: Abbeon Cal Inc., Ackerman Johnson Fastening Systems Inc., Elcen Metal Products Co., Ideal Industries, Inc., Josyln Mfg and Supply Co., McGraw Edison Co., Rawlplug Co. Inc., Star Expansion Co., U.S. Expansion Bolt Co., Allied Tube and Conduit Corp., B-Line Systems, Inc., Greenfield Mfg Co., Inc., Midland-Ross Corp., O-Z/Gedney Div; General Signal Corp., Power-Strut Div.; Van Huffel Tube Corp., and Unistrut Div; GTE Products Corp., and Robroy Industries.

2.02 GENERAL:

A. Provide supporting devices that comply with manufacturers standard materials, design, and construction, in accordance with published product information, and as required for complete installations, and as specified herein.

2.03 SUPPORTS:

A. Provide supporting devices of types, sizes, and materials indicated, and having the following construction features:

1. One-Hole Conduit Straps: For supporting electrical metallic tubing, and liquidtight flexible conduit; zinc plated steel, stainless steel or galvanized steel; snap-on, heavy duty.

2. One-Hole Conduit Straps with Clamp Backs: For supporting rigid metal conduit, and intermediate metal conduit; cast galvanized steel.
3. Two-Hole Conduit Straps: For supporting electrical metallic tubing, rigid metal conduit, and intermediate metal conduit; zinc plated steel, stainless steel or galvanized steel.
4. Conduit Hangers: For supporting electrical metallic tubing, rigid metal conduit, and intermediate metal conduit; zinc plated steel, stainless steel or galvanized steel.
5. I-Beam Clamps: Electroplated zinc or hot dipped galvanized malleable iron.
6. Channel Clamps: Electroplated zinc or hot dipped galvanized steel.
7. Round Steel Rod: National coarse thread, electroplated.

2.04 ANCHORS:

A. Provide anchors of types, sizes, and materials indicated, with the following construction features:
1. Lead Expansion Anchors: For CMU walls, 1/4”-20 threads, set tool required.
2. Toggle Bolts: Electroplated steel, size as required.
3. Drop-in Anchors: Stainless steel, size as required.
4. Anchor Bolts: Stainless steel, size as required.

2.05 SEALS:

A. Provide seals of types, sizes and materials indicated; with the following construction features:
1. Wall and Floor Seals: Provide factory-assembled watertight wall and floor seals, of types and sized indicated; suitable for sealing around conduit, pipe, or tubing passing through concrete floors and walls. Construct seals with steel sleeves, malleable iron body, neoprene sealing grommets and rings, metal pressure rings, pressure clamps, and cap screws.
2. Conduit sealing bushings shall be manufactured by O-Z/Gedney, Model CSMI, or equal.
3. The conductor sealing bushings shall be manufactured by O-Z/Gedney, Model CSBG, or equal.

2.06 CONDUIT CABLE SUPPORTS:

A. Provide cable supports with insulating wedging plug for non-armored type electrical cables in risers; construct 2" rigid metal conduit; 3-wires, type wire as indicated; construct body of malleable-iron casting with hot-dip galvanized finish.

2.07 U-CHANNEL STRUT SYSTEM:

A. Provide U-channel strut system for supporting electrical equipment, 12-gage, hot-dip galvanized steel, of types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface, with the following fittings that mate and match with U-Channel:
1. Fixture hangers
2. Channel hangers
3. End caps
4. Beam clamps
5. Wiring stud
6. Thin wall conduit clamps
7. Rigid conduit clamps
8. Post Bases
9. U-bolts

2.08 PIPE SLEEVES:

A. Provide pipe sleeves from the following:
1. Steel Pipe: Fabricate from Schedule 40 galvanized steel pipe; remove burrs.

2.09 PVC COATED U-CHANNEL STRUT SYSTEM:

A. Provide PVC Coated U-channel strut system for supporting electrical equipment, 20 mil PVC coated steel of types and sizes indicated, construct with 9/16" dia. holes, 8" o.c. on top surface, with all Stainless Steel hardware, and the following fittings that mate and match with PVC Coated U-Channel:

1. PVC Coated Strut nut
2. PVC Coated Pipe straps
3. Touch up compound (Gray)

2.10 STAINLESS STEEL U-CHANNEL STRUT SYSTEM:

A. Provide Stainless Steel U-channel strut system for supporting electrical equipment, of types and sizes indicated; construct with 9/16" dia. holes, 8" o.c. on top surface, with all stainless steel hardware, and the following stainless steel fittings that mate and match with Stainless Steel U-Channel:

1. Fixture hangers
2. Channel hangers
3. End caps
4. Beam clamps
5. Wiring stud
6. Post bases
7. Rigid conduit clamps
8. U-bolts

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install hangers, anchors, sleeves and seals as indicated, in accordance with manufacturer's written instructions and with recognized industry practices to insure supporting devices comply with requirements. Comply with requirements of NECA and NEC for installation of supporting devices.

B. Coordinate with other electrical work, including raceway and wiring work, as necessary to interface installation of supporting devices with other work.

C. Install hangers, supports, clamps and attachments to support piping properly from building structure. Arrange for grouping of 2 or more parallel runs of conduits to be supported together on channel type hangers where possible. Install supports with spacing indicated and in compliance with NEC requirements.

D. Torque sleeve seal nuts, complying with manufacturer's recommended values. Ensure that sealing grommets expand to form watertight seal.

E. Comply with manufacturer’s recommendations for touch up of field cut ends or damaged PVC coated U-channel and fittings.

F. Apply a cold zinc galvanizing paint to field cut galvanized U-channel strut.

END OF SECTION 26 05 29

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SECTION 26 06 01 ELECTRICAL DEMOLITION

PART 1 - GENERAL

1.01 SCOPE OF WORK

A. Demolition of existing electrical shall be as indicated on the Plans or as indicated elsewhere herein.

B. Demolition information shown on the Plans is based on visual field examination and existing record drawings. The Contractor is responsible for verification of all items indicated or not. All items affected that are not indicated on the plans shall be brought to the Engineer's attention before demolition for direction.

C. The Contractor shall confine demolition work to the item specifically identified on the plans. The Contractor shall be liable for any other damage he may inflict to the existing installations.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Care shall be taken in demolition or removal of items as indicated on plans as being returned to the Owner. The Contractor shall notify the Owner prior to removing existing equipment.

B. Whether indicated on the plans or not, the Contractor shall provide patching material to fill voids where demolition has taken place. Patching materials shall match, as nearly as practical, the existing original structure material for each surface being patched.

PART 3 - EXECUTION

3.01 COORDINATION

A. The Contractor shall verify existing field conditions, measurement, circuitry etc. as indicated on Plans prior to performing any demolition.

B. The Contractor shall verify that abandoned or demolished wiring and electrical equipment serve only abandoned facilities. If demolished or abandoned electrical is necessary for proper operation of facilities to remain in service, the Contractor shall immediately notify the Engineer for direction.

C. Demolition shall not be performed without coordinating with new construction to limit down time and ease of switchover. The Contractor must coordinate with the Engineer and the Owner prior to any demolition.

D. Prior to performing any demolition work, the Contractor shall provide temporary wiring and connections to maintain existing systems in service during construction. Temporary wiring shall conform to the National Electrical Code.

3.02 PERFORMANCE

A. General: The means and methods of performing electrical demolition and removal operations are the sole responsibility of the Contractor. However, equipment used, and methods of demolition and removal will be subject to approval of the Engineer.
   1. Remove exposed abandoned conduit systems, including abandoned conduit systems in false ceilings.
   2. Remove wiring in abandoned conduit systems to source of power supply, where indicated.
   3. In exposed through-structure conduit or foundation locations, cut conduits and foundation below the finished structure surfaces in order to perform adequate surface patching.
   4. Maintain electrical continuity of existing electrical installations which remain active. Modify installations as necessary to maintain continuity and provide adequate access as required by the National Electrical Code.
   5. Extend existing installations using materials and methods compatible with existing electrical installations, and as specified elsewhere herein.
   6. Disconnect and leave in place electrical devices and equipment serving utilization equipment that has been removed or demolished.

B. Cutting: Perform cutting work of existing structure materials by such methods as will prevent extensive damage beyond the immediate area of cutting.

C. Unless otherwise indicated existing, electrical equipment, conduit, wire, etc. indicated for demolition shall be removed and disposed of in a lawful manner, off Site.

D. The Contractor shall move existing electrical equipment required to be returned to the Owner, to locations as directed by the Owner. Care shall be taken to ensure existing electrical equipment being returned to the Owner does not become damaged. The Contractor shall provide a means for storing and or stacking of the returned equipment prior to moving to final location, if necessary.

E. Items Abandoned in Place:
   1. All items to be abandoned in place shall be de-energized.
   2. Connections shown or otherwise indicated as disconnected shall be removed with lugs left in place and with all conduit and cable openings properly plugged and sealed as required by the NEC.
   3. Any abandoned in-place equipment damaged by Contractor shall be repaired and restored to its original condition.

END OF SECTION 26 06 01

SECTION 26 09 23 LIGHTING CONTROL DEVICES

PART I - GENERAL

1.1 RELATED WORK

A. Section 26 0000 - General Electrical Requirements

B. Section 26 5000 – Lighting

1.2 REFERENCE

A. Work under this Section is subject to requirements of Contract Documents including General Conditions, Supplementary Conditions, and sections under Division 01 General Requirements.

1.3 DESCRIPTION OF SYSTEM

A. Section includes automatically operated, PC-based, wireless lighting controls with external signal source and control modules.

B. Provide devices such as wall and ceiling mounted occupancy sensors, ambient light sensors, gateways, front end servers etc., as shown on drawings.

C. Devices of same type shall be from same manufacturer.

D. The lighting control system shall be non-proprietary to a single lighting manufacturer. The lighting control system shall have the flexibility to fully operate under multiple lighting fixture types or manufacturers.

1.4 REFERENCE STANDARDS

A. UL773A Non-Industrial Photoelectric Switches for Lighting Control.

B. UL924 Emergency Lighting and Power Equipment

C. NEMA WD 7 Occupancy Motion Sensors.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings shall include:
   1. Bill of material
   2. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
   3. Outline Drawings: Indicate dimensions, weights, arrangement of components, and clearance and access requirements.
   4. Block Diagram: Show interconnections between components specified in this Section and devices furnished with power distribution system components. Indicate data communication paths and identify networks, data buses, data gateways, concentrators, and other devices to be used. Describe characteristics of network and other data communication lines.
   5. Wiring Diagrams: For power, signal, and control wiring. Coordinate nomenclature and presentation with a block diagram.

C. Coordination Drawings: Submit evidence that lighting controls are compatible with connected monitoring and control devices and systems specified in other Sections.
   1. Show interconnecting signal and control wiring and interfacing devices that prove compatibility of inputs and outputs.
   2. For networked controls, list network protocols and provide statements from manufacturers that input and output devices meet interoperability requirements of the network protocol.

D. Samples: One for each type of device specified, in each color specified upon request.

E. Manufacturer's Installation Instructions:
   1. Indicate application conditions and limitations of use stipulated by product testing agency.
   2. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of product.

F. Test Reports: Indicate field test and inspection procedures and interpret test results and corrective action taken for compliance with specification requirements.

G. Closeout Submittals:
   1. Project Record Documents:
      a. Record actual locations and type of devices.
   2. Operation and Maintenance Data:
      a. Include in manufacturers' packing label warnings and instruction manuals with labeling conditions.
      b. Include source and current prices of replacement parts and supplies.

H. Software and Firmware Operational Documentation:
   1. Software operating and upgrade manuals.
   2. Program Software Backup: On a magnetic media or compact disc, complete with data files.
   3. Device address list.
   4. Printout of software application and graphic screens.

1.6 QUALITY ASSURANCE

A. Obtain devices from one source and by single manufacturer.

B. Factory Assembly:
   1. All devices shall be factory assembled and tested. All system components shall arrive at the job site complete and ready for installation, requiring only the connection of lighting circuits and network terminations.

C. Component Testing:
   1. All system components and assemblies shall be individually tested prior to assembly. Once assembled, all finished products shall be tested for proper operation of all control functions per specifications prior to shipment.

D. NEMA Compliance:
   1. All system components shall comply with all applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.

E. Manufacturer must have a minimum of 10 years of experience manufacturing lighting controls.

F. Regulatory Requirements:

1. Comply with NFPA 70 for components and installation.
2. Furnish products listed and classified by Underwriters Laboratories, Inc., as suitable for purpose specified and indicated.

G. Coordinate lighting control components to form an integrated interconnection of compatible components.
1. Match components and interconnections for optimum performance of lighting control functions.
2. Design display graphics showing building areas controlled; include the status of lighting controls in each area.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store in clean, dry space. Maintain factory unopened packaging until ready for installation.

1.8 WARRANTY

A. Refer to Division 01 and Section 26 0000 – General Electrical Requirements for general warranty requirements.

B. Manufacturer shall provide standard 1 year warranty against defects in materials and workmanship for products specified in this Section. Warranty period shall begin on date of substantial completion.

C. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of lighting controls that fail in materials or workmanship or from transient voltage surges within specified warranty period.
1. Failures include, but are not limited to, the following:
a. Failure of software input/output to execute switching or dimming commands.
b. Failure of modular relays to operate under manual or software commands.
c. Damage of electronic components due to transient voltage surges.
2. Warranty Period: Ten years from date of Substantial Completion.
3. Extended Warranty Period Failure Due to Transient Voltage Surges: Ten years.

1.9 SOFTWARE SERVICE AGREEMENT

A. Technical Support: Beginning with Substantial Completion, provide software support for two years.

B. Upgrade Service: Update software to latest version at Project completion. Install and program software upgrades that become available within two years from date of Substantial Completion. Upgrading software shall include operating system. Upgrade shall include new or revised licenses for use of the software

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers:
1. Exterior Occupancy Sensors: Hubbell
a. Or Owner approved equal
2. Exterior Photocells: Hubbell
a. Or Owner approved equal
3. Timeclocks: Hubbell

a. Or Owner approved equal
4. Gateways: Hubbell
   a. Or Owner approved equal
5. Lighting Control Server: Hubbell
   a. Or Owner approved equal

B. It is the responsibility of Electrical Contractor to ensure devices submitted meet functional intent and design quality standards.

2.2 FABRICATION AND MANUFACTURE

Devices shall be UL listed for loads and voltages as indicated in contract drawings and specifications.

2.3 SYSTEM/NETWORK REQUIREMENTS

A. Expandability: System shall be capable of increasing the number of control functions in the future by 25 percent of current capacity.

B. Performance Requirements: Internal control unit, external sensors, or other control signal sources send a signal to a PC-based network-system control module that processes the signal according to its programming and routes an open or close command to one or more luminaires.

C. System shall consist of wireless, distributed, and intelligent lighting control devices consisting of but not limited to control modules with ON/OFF and 0-10VDC full range dimming capabilities, and system input devices including but not limited to motion sensors, daylight sensors and manual switch stations.

D. Control modules shall be capable of measuring and monitoring the loads they control and report alarms for out of range values.

E. System shall have an architecture that creates a self-organizing and self-healing mesh network infrastructure.

F. System shall use a gateway controller for proper system operation. Each gateway shall support up to 1000 nodes.

G. System shall be self-organizing. The mesh network of devices shall build automatically without the need to manually set device addresses via dials, DIP switches or other means.

H. System shall be self-healing. System shall be capable to accept a failed node without compromising message delivery.

I. System nodes shall comprise user configurable fail safe and fault recovery mechanisms that will execute commands in case of lost communication such as default to photocell on/off control in case of failure or to the execution of internal schedules.

J. System nodes shall be able to maintain accurate date time while powered.

K. System shall be capable of storing diagnostic logs for troubleshooting purposes.

L. System architecture shall facilitate data transmission between each wireless device over the 2.4GHz or 900MHz ISM radio frequency (RF) bands with a supported and outdoor unobstructed

RF range of 1000ft between each radio module.

M. System architecture shall allow for up to 32 hops (levels) of propagation in any direction and from any transmitter.

N. System shall secure all messages. When transmitting over the air, each wireless device shall use the strong and secure AES-128 (Advanced Encryption Standard) security cipher to encrypt and decrypt messages. System input devices shall be to monitor and broadcast changes such as Motion, daylight levels and manual switch input.

O. System shall have an intuitive and easy to use Graphical User Interface (GUI) to configure, control, monitor and schedule individual devices or groups of devices.

P. System shall remain fully functional during the programming process. Lighting control systems that must be taken "OFF LINE" for programming are not acceptable. All programming changes shall take effect immediately as they are programmed.

Q. Available reports shall include, but are not limited to:
   1. List of devices for a given site
   2. List of scenarios for a given group
   3. List of current alarms in the last X hours (the number of hours shall be selectable).
   4. List of alarms history in the last X period (the period shall be selectable with calendar fields).
   5. Energy Log in Report Form
   6. Energy Log in Chart Form
   7. Energy log detailed in report form. This report shall produce a list of each device for a given site with their KWH, KVAH, BURN TIME. The period covered shall be selectable with calendar fields
   8. All reports shall be generated in PDF, XLS or XLSX file formats.

R. System shall provide client-based or web-based applications for accessing the lighting controls network.

S. System shall offer installation tools allowing for automatic GPS location positioning (when outdoor) as well as installation validation while on site.

T. System shall allow both map and architectural (images) views alternative with devices overlaid on either type of views. Maps shall be sourced from multiple free providers.

2.4 WIRELESS RELAY FIXTURE MODULES

A. Internal and External Wireless Relay Modules shall provide universal voltage support from 110V to 480V.

B. External Relay Modules shall utilize the standardized ANSI C136.41-2013 (7 & 5 pin) receptacles.

C. Relay Modules shall be fully programmable and capable of storing and autonomously execute commands and scenarios with the following minimum functionalities. The operating scenarios described below shall reside within each addressable intelligent relays even in case of power outage. Systems which rely on the operator to develop these scenarios using a programming language will not be allowed.

D. Standard on all relay modules:

1. Each node status after returning from Black Out shall be user programmable: with the following options: On – Off – Last Level – user defined including a random delay to execute.
2. Variable Power Up delay, to smooth peak startup demand.
3. Phase-angle and Analog 0-10V dimming relays
4. Ramping parameters (Brighten-Dim-Ramp up-Ramp Down-Night Mode – Ramp to Levels
5. Definition of preset levels (min.: 10) with user configurable transition speed
6. Minimum dimming level, in order to adapt to various brands of dimming drivers (with the option to Stay On or turn off, below a set minimum level)
7. Monitoring, metering, and reporting
8. Shall measure the following parameters:
    a. Power monitoring Voltage
        1) Amperage
        2) Power
        3) Power factor
    b. Cumulative Energy with a 2% accuracy
    c. Cumulative Lamp burn time
    d. Cumulative Ballast/Driver burn time
    e. Number of ON/OFF cycles
9. Alarms (ex: overvoltage, under voltage, over current, under current, low power factor, etc.) Alarms logs shall be stored in nonvolatile memory to allow for on demand subsequent retrievals
10. Time delay functions:
    a. (10) Generic timers with the ability to cascade up to (10) timers
    b. Selectable individually in each module covering 0-65534 seconds (18h).

C. System shall provide repeat capabilities to extend the range beyond normal radio range

2.5 WIRELESS GATEWAY

A. The Wireless Gateway specific capabilities shall meet or exceed the following:
    1. Power loss memory and clock holdup time: minimum of 6 months
        a. Clock: Digital with time, day of week, and date
        b. Automatic leap year compensation.
        c. Programmable Daylight Savings Time and Standard Time adjustment.
    2. Remote Communications
        a. Each Gateway shall support a minimum of two communications ports: a USB port for PLC and/or RF (802.15.4) and an Ethernet port. Either or both may be used for programming, monitoring, and control. The Ethernet port shall allow simultaneous operation of multiple communications access points (Client sessions, Remote Ethernet-PLC modems) to support multiple operator terminals and communications with other building automation systems
        b. All relay changes of state and programmable switch actions shall be communicated over both the local USB/XB network and the Ethernet to support interactive graphics and online status monitoring
    3. Gateway must be fan-less, 1GHz or faster processor, WIFI and Ethernet connectors, autoboot on power up, 1 GB RAM, 500M storage.
    4. Gateway shall provide automatic recovery in case of power failure
    5. Gateway shall support BACnet IP.

2.6 OPERATORS SOFTWARE

A. Graphical User Interface (GUI)

1. Data shall be entered through a simple Graphical User Interface and Multi-lingual software package, independently of the language of the operating system. The operating system shall be Windows 7 or more recent.

B. Activity Logs
   1. Store the last 2 years events including the time and scenarios, commands, or values, indicating which user executed the event or modification

C. Schedules
   1. An unlimited number of schedules may be assigned to individual relays or groups of relays.
   2. Each schedule shall allow an unlimited number of events per day, cloning of schedules shall be possible
   3. Applicable period for individual schedules shall be user-defined, and include concepts of holidays, and special exclusion/inclusion periods
   4. Schedules shall individually be specified to supersede or not Holidays and Special periods.

D. Conditional Scheduling & Execution Engine
   1. System shall be capable of building Conditional Scheduling & Execution rules, based on time of day, occupancy statuses, override keypads triggering Scenarios, etc.
   2. Such Conditional Scheduling & Execution Engine enables the user-definition of flexible rules such as:
      a. Blink Warning
      b. Time Delay Overrides
      c. Preemptive Override
      d. Master Control
      e. Cleaning Scenarios
      f. Automatic Daylight with Occupant Override
   3. System Parameters
   4. Multiple sites may be programmed from a single software interface.
   5. Allow an unlimited number of different user/passwords per site or per system
   6. User defines functions accessible for each password (Add-Edit-Remove – Control – Access rights – Guest/Administrator).

2.7 EXTERIOR OCCUPANCY SENSORS

A. Exterior occupancy sensors shall:
   1. Be a completely self-contained device capable of detecting presence in the controlled range by detecting changes between infrared energy in motion and the background space.
   2. Utilize passive infrared detection technology and a three level Fresnel lens to increase detection density and accuracy of motion detection.
   3. Be capable of mounting vertically or horizontally onto a standard outdoor junction box or integral to exterior luminaires.
   4. Cover up to 35 ft with a field of view of 180 degrees or 52.5 ft with a field of view of 270 degrees.
   5. Have an operating temperature range of -40°F to 130°F.
   6. Be IP66 rated for outdoor applications.
   7. Include a built-in light level sensor, adjustable by the user that will keep lights from turning on during daylight hours.
   8. Have user-adjustable time delay settings, including an override ON option that enables controlled lights to be turned on remotely for the length of the time delay.
   9. Be compatible with all electronic ballasts and LED drivers with no minimum load requirements.

10. Provide continuous dimming control to reduce electric light levels from a minimum of 40% to a maximum of 80% based on area occupancy.

2.8 UL 924 EMERGENCY BYPASS/CONTROL DEVICES

A. UL 924 listed bypass relays shall:
   1. Be UL924 listed and labeled for connection to both normal and emergency lighting power sources.
   2. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
   3. Have normally closed dry contacts rated for switching 120-277 volts, 60 Hz. 20 amploads.
   4. Have integral manual test switch.
   5. Have auxiliary isolated normally closed contact for connection to remote test switch, fire alarm system, or other external system capable of providing a normally closed dry contact closure.
   6. Have status indication for presence of normal and emergency power sources and current operational mode (normal or emergency).
   7. Utilize zero crossing circuitry to protect relay contacts from the damaging effects of inrush current generated by switching electronic ballast loads.
   8. Be forced into the emergency mode upon loss of normal power sense and turn ON the emergency lighting.
   9. Automatically switch emergency lighting ON/OFF as normal lighting is switched. When normal power is not available, the unit shall force and hold emergency lighting ON regardless of the state of any external control device until normal power is restored.

B. Operational temperature range shall be -40°F to 140°F.

C. Device shall have universal mounting; surface, above suspended ceiling or recessed.

2.9 EXTERIOR PHOTOCELLS

A. Photocells shall:
   1. Have universal rated voltage inputs 120-277 VAC, 60 Hz.
   2. Be rated for up to 2,000 watts.
   3. Have cadmium sulfide, 1” diameter cell.
   4. Have SPST normally closed contacts.
   5. Have a minimum delay of 3 minutes to prevent false switching.

B. ON/OFF adjustment shall be done by moving light selector with range from 2 to 50 footcandles.

C. Operational temperature range shall be -40°F to 140°F.

D. Enclosure shall be die cast zinc, gasketed for maximum weatherproofing.

E. Enclosure shall include positioning lug on top.

F. Mounting shall be for 1/2” conduit nipple

G. Mounting shall be for 1/2” conduit nipple.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install devices at heights scheduled, and as indicated on drawings.

B. Install ceiling devices as shown on drawings and as recommended by device manufacturer.

C. Install devices plumb, level with finished surfaces and free from blemishes.

D. Verify device locations prior to rough in.

E. Electrical Contractor shall be responsible for final adjustment and testing of all devices.

3.2 SOFTWARE INSTALLATION

A. Install and program software with initial settings of adjustable values. Provide current licenses for software.

3.3 DEMONSTRATION

A. Engage a factory -authorized service representative to train owner's maintenance personnel to adjust, operate, and maintain lighting controls and software training for PC-based control systems.

3.4 TESTING

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Verify proper location and operation of all devices.

C. Adjust occupancy sensors for a 30 minute time delay or as specified in the construction documents.

D. Adjust occupancy sensor sensitivity such that movement outside range of coverage shall not trigger sensor.

E. Adjust ambient light sensor to maintain illuminance level equal to light level from controlled lighting in the space when no daylight is present or as indicated per drawings. Demonstrate ambient light sensor(s) control lighting as specified.

F. Tests and Inspections:
   1. Verify that the control module features are operational.
   2. Check operation of local override controls.
   3. Test system diagnostics by simulating improper operation of several components.

G. Lighting controls will be considered defective if they do not pass tests and inspections.

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SECTION 26 09 43 DIGITAL NETWORK LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. The lighting control system specified herein shall provide a wireless, distributed, secure, self-organizing and self-healing peer to peer mesh network of fixture control modules, motion sensors, daylight sensors and switch stations for outdoor lighting applications.

B. The system shall be capable of turning lighting loads on/off as well as full range dimming of lights (if lighting load is capable of being dimmed).

C. Wireless devices shall provide both Sink and Source 0-10V control within the module. Dimming shall not be done via a separate or external control module.

D. All wireless devices shall communicate utilizing long range 2.4GHz or 900MHz ISM band. Systems which use other frequencies shall provide documentation insuring range and performances equal to that of the specified system. Wireless devices shall be capable of supporting distances up to 1000'.

E. Wireless devices shall be capable of being installed inside of fixtures or externally. External wireless devices shall utilize the standardized ANSI C136.41-2013 (7 & 5 pin) receptacles. Receptacles that do not meet ANSI standards shall not be supported.

F. Wireless devices shall have a programmable power-up state.

G. Wireless devices shall be capable of supporting 3 digital inputs (e.g. Occupancy Sensor, Photocell, Luxmeter, and Low-voltage Switch) and 2 outputs.

H. Device firmware shall be updateable securely from anywhere via an Internet connection. Firmware updates shall not require a serial or patch cable.

I. System shall be accessible remotely from the local IP network or the Internet. If a wired network connection is not possible, system shall support the use of cellular modems for network connectivity.

J. System shall support non-proprietary mapping services. System shall also support cartography using satellite imagery.

K. Wireless device locations shall use Geographic Coordinates.

L. System shall support enterprise multiple site control via a single user interface.

M. System shall provide optional support for BACnet IP.

N. System shall not require a third-party 24/7 manned network operations center for systems monitoring.

O. The system shall provide a 5-year warranty for all components.

P. Installed system shall be comprised of stand-alone and networked control devices as indicated. System control devices shall include, but are not limited to:

1. Digital Room Controllers
2. UL924 Load Controller
3. Fixture Control Modules
4. Lighting Control Panels
5. Sensors
6. Wall Stations
7. Network Area Controller
8. Network Modules
9. Network Accessories
10. Software Interfaces
11. Conductors and Cabling

1.2 DEFINITIONS

A. AES-128 – Advanced Encryption Standard 128-bit encryption key

B. DHCP – Dynamic Host Configuration Protocol

C. DNS – Domain Name Server

D. FCC – Federal Communications Commission

E. HTTPS – Hypertext Transfer Protocol Secure
F. IC – Industry Canada
G. ISM Band – Industrial, Scientific and Medical radio frequency band
H. RF – Radio Frequency
I. SPST – Single Pole, Single Throw
J. SSL – Secure Sockets Layer
K. TCP/IP – Transmission Control Protocol / Internet Protocol

1.3 SYSTEM DESCRIPTIONS

A. The contractor shall provide and install NX Lighting Controls System as shown on plans and specified herein. NX Lighting Controls System shall be designed and configured to send and receive control, monitoring, operating and maintenance signals and commands wired and or wirelessly to and from networked enabled room controllers, fixture modules, switch stations, occupancy and daylight sensors, lighting control panels and other controls devices.

1.4 SUBMITTALS

A. Prior to fabrication and shipment of lighting control components, manufacturer shall provide submittal documentation for approval.
B. Submittal documentation shall include:
   1. Bill of Material including a list of components to be supplied,
   2. Device specification sheets indicating device features, certifications, dimensions, construction specifications, electrical specifications, wiring diagrams, nomenclature, and related products,
   3. Component schedules: Indicating lighting control device types and locations
   4. Lighting panel schedules,
   5. Wiring diagrams,
   6. Control cable type and routing requirements,
   7. System riser drawings of sufficient detail to indicate relative placement of major system components and the required connections between each,
   8. Contractor Startup Request Form – to be completed prior to factory startup,
   9. Operating and maintenance instructions, manuals and/or videos.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualification: Manufacturer of lighting control devices with minimum five years record of satisfactory manufacturing and support of components comparable to basis of design system.
   1. Approval of Comparable Products: Submit the following at least 10 days prior to submission of a proposal package. Substitution submitted without the below shall be rejected.
      1. Submit line-by-line comparison that describes differences, if any, between each lighting control device specified and those being proposed. Comparison shall include differences in size, quantity, quality, method of control, features and functions, control software functions, and installation requirements.
      2. Product data, including certified independent test data indicating compliance with requirements.
      3. Samples of each component.
      4. Project references: Minimum of 3 installations not less than 3 years old, with Owner and Architect contact information.
      5. Sample warranty.
   2. Substitutions following award of contract are not allowed except as stipulated in Division 01 General Requirements.

B. Factory Assembly: All system components shall arrive at the job site completely pre-wired and ready for installation, requiring only the connection of lighting circuits and network terminations. All connections shall be made to clearly and permanently labeled termination points or by connectorized cable. Systems that required field assembly shall not be acceptable.

C. Component Testing: All system components and assemblies shall be individually tested prior to assembly. Once assembled, all finished products shall be tested for proper operation of all control functions per specifications prior to shipment.

1.6 SYSTEM COMPLIANCE

A. Compliance: Where indicated, individual components shall comply with the following requirements:
   1. NEC Compliance: All system components shall comply with all applicable sections of the National Electrical Code (NEC) NFPA 70 as required.
   2. NEMA Compliance: All system components shall comply with all applicable portions of NEMA standards pertaining to types of electrical equipment and enclosures.
   3. UL Approval: All applicable equipment shall be tested to and listed under UL standard 508, UL standard 916 or UL924 and shall bare labels to indicate compliance. Lighting control relays shall be tested to UL standard 508 for both safety and endurance. Systems listed under ETL or other UL sections shall provide documentation proving compliance with UL standards as listed above.
   4. FCC Emissions: All applicable equipment shall comply with FCC emissions standards specified in Part 15, sub-part j for commercial and residential applications and shall bear labels indicating compliance testing. Equipment that does not meet these standards shall not be acceptable.

1.7 WARRANTY

A. Manufacturer shall warrant the lighting control system components to be free from defects in material and workmanship for a period of five (5) years from the date of the certificate of building occupancy or proof of installation, whichever occurs first ("Warranty Period"). If the certificate of building occupancy is not available or there is no proof of installation, the Warranty Period shall begin with the Product ship date.

B. Manufacturer's warranty shall include the repair or replacement product(s) with the same or a functionally equivalent product(s) or component part(s).

C. Manufacturer shall provide telephone technical support and remote diagnostics where applicable during normal business hours excluding manufacturer holidays.

D. Upon request, Manufacturer shall provide quotation for manufacturer service contract option(s) which include on-site technician visits for service and repair.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer:
   1. Current

B. Basis-of-Design: wiSCAPE Wireless Outdoor Lighting Controls System provided by HLI Solutions, a division of Current, Greenville SC and NX Lighting Controls System manufactured by HLI Solutions, a division of Current, Greenville SC.

2.2 SYSTEM ARCHITECTURE

(EXTERIOR LIGHTING CONTROL SYSTEM)

A. System shall consist of wireless, distributed and intelligent lighting control devices consisting of but not limited to control modules with ON/OFF and 0-10VDC full range dimming capabilities, and system input devices including but not limited to motion sensors, daylight sensors and manual switch stations.
B. Control modules shall be capable of measuring and monitoring the loads they control and report alarms for out of range values.
C. System shall have an architecture that creates a self-organizing and self-healing mesh network infrastructure.
D. Device Firmware and radio firmware shall be upgradable over the air via the gateway without having to go physically on site and without human intervention. During the upgrade process, the device shall continue to operate normally.
E. System shall use a gateway controller for proper system operation. Each gateway shall support up to 1000 nodes.
F. System shall be self-organizing. The mesh network of devices shall build automatically without the need to manually set device addresses via dials, DIP switches or other means.
G. System shall be self-healing. System shall be capable to accept a failed node without compromising message delivery.
H. System nodes shall comprise user configurable fail safe and fault recovery mechanisms that will execute commands in case of lost communication such as default to photocell on/off control in case of failure or to the execution of internal schedules
I. System nodes shall be able to maintain accurate date time while powered
J. Each system nodes shall be capable of storing their Geographic Coordinates in nonvolatile memory
K. System shall be capable of storing diagnostic logs for troubleshooting purposes
L. System architecture shall facilitate data transmission between each wireless device over the 2.4GHz or 900MHz ISM radio frequency (RF) bands with a supported and outdoor unobstructed RF range of 1000ft between each radio module.
M. System architecture shall allow for up to 32 hops (levels) of propagation in any direction and from any transmitter.
N. System shall secure all messages. When transmitting over the air, each wireless device shall use the strong and secure AES-128 (Advanced Encryption Standard) security cipher to encrypt and decrypt messages. System input devices shall be to monitor and broadcast changes such as Motion, daylight levels and manual switch input.
O. System shall be capable of being accessed from a local network or the Internet using wiSCAPE Express or wiSCAPE Enterprise software.
P. System shall have an intuitive and easy to use Graphical User Interface (GUI) to configure, control, monitor and schedule individual devices or groups of devices.
Q. System shall remain fully functional during the programming process. Lighting control systems that must be taken “OFFLINE” for programming are not acceptable. All programming changes shall take effect immediately as they are programmed.
R. System shall belong to the customer and installed on the customer’s own computer infrastructure or can be hosted by a cloud-based service.
S. Available reports shall include, but are not limited to:
    1. List of devices for a given site
    2. List of scenarios for a given group
    3. List of current alarms in the last X hours (the number of hours is selectable). You can select the alarm types that will appear in the report otherwise all alarm types will be displayed by default
    4. List of alarms history in the last X period (the period is selectable with calendar fields). You can select the alarm types that will appear in the report otherwise all alarm types will be displayed by default
    5. Energy Log in Report Form

6. Energy Log in Chart Form
7. Energy log detailed in report form. This report provides a list of each device for a given site with their KWH, KVAH, BURN TIME. The period covered is selectable with calendar fields
8. All reports may be generated in PDF, XLS or XLSX file formats.

T. System shall provide client-based or web-based applications for accessing the lighting controls network.

U. System shall offer installation tools allowing for automatic GPS location positioning (when outdoor) as well as installation validation while on site.

V. System shall allow for additional metadata to be stored and associated to each relay

W. System shall allow both map and architectural (images) views alternative with devices overlaid on either type of views. Maps shall be sourced from multiple free providers.

(INTERIOR LIGHTING CONTROL SYSTEM)

X. System shall consist of wired and/or wireless, distributed intelligent lighting control devices consisting of but not limited to control modules with ON/OFF, full range dimming and CCT control capabilities, and system input devices including but not limited to occupancy/vacancy sensors, daylight sensors and manual switch stations.

Y. System shall provide for automatic self-configuration of system devices. Self-configuration shall be accomplished by the devices themselves and provide for control of lighting prior to system custom configuration and programming. Systems that require configuration prior to use shall be considered unacceptable.

Z. To implement lighting control strategies, the system architecture shall facilitate the association of system input devices to control modules. The system shall use the Area/Zone/Group assignment strategy. The system shall support up to 128 Areas. Each area shall consist of up to 128 Zones and each zone shall consist of up to 16 Groups. Each device may be programmed to participate in one Area and Zone however may belong to one or more of the available 16 Groups within a Zone.

AA. System shall provide time-of-day and astronomical clock scheduling. Each Area/Zone shall support up to 99 scheduled events for use in developing time-of-day or astronomical clock sunrise/sunset automated schedules. Each schedule shall have the ability to turn a group ON or OFF or activate a preset lighting scene at a scheduled time. Schedules shall be day-of-week selectable and may be programmed to activate on any combination of days of the week (Sunday through Saturday) or to activate on a specific date/holiday.

BB. System shall support blink alerts. Relay outputs within the control modules shall be programmable to blink prior to being turned OFF. Blink alert duration time shall be adjustable. Control modules programmed for the blink alert function shall blink the controlled lighting prior to turning OFF to warn occupants of the upcoming OFF event. If an ON command is received during the blink alert time, relay output will be overridden and left ON for the override time. Override time shall be adjustable.

CC. System input devices shall be deployed in a space to monitor and broadcast changes such as occupancy, daylight levels and manual switch input.

DD. System customization and programming shall be performed from a mobile App and/or web-based configuration and system management tools.

EE. System shall have an intuitive and easy to use Graphical User Interface (GUI) to configure, control, monitor and schedule individual devices or groups of devices.

FF. System shall remain fully functional during the programming process. Lighting control systems that must be taken “OFFLINE” for programming are not acceptable. All programming changes shall take effect immediately as they are programmed.

GG. System shall be capable of being accessed from a local network or remotely using any standard Internet browser. System shall not require any special client-side software. Systems which utilize special client-side software shall not be acceptable.

HH. Systems devices shall be capable of communication with each over one or all of the below methods.
1. RS485 multidrop serial network
2. Wireless mesh network

3. Ethernet TCIP network

II. Wired – RS485/Ethernet
   1. System shall provide an Ethernet communication backbone (NX Network) for the connection of control Zones.
   2. System shall utilize the RS485 standard for connection of and communications between Zone Devices.
   3. System shall utilize the RS485 standard for connection of and communications between SmartPORT™ devices (e.g., Sensors, Switches and Accessories) connected within a NX Zone.

JJ. Wireless – Coordinator-less, Self-Organizing/Self-Healing Mesh
   1. System shall have a wireless architecture that utilizes wireless mesh radio technology to create a peer-to-peer, self-organizing and self-healing mesh network infrastructure.
   2. System shall have no single point of failure. A master controller/coordinator or master node shall not be required for proper system operation. All nodes shall be capable of communicating with each other without the need of these types of single point of failure devices. Systems which utilize a master controller/coordinator shall not be acceptable.
   3. System shall be self-organizing. The mesh network of devices shall self-organize automatically without the need to manually set device addresses via dials, DIP switches or other means.
   4. System shall be self-healing. System devices within the mesh network shall automatically reroute messages around a failed device to ensure message delivery.
   5. System architecture shall facilitate data transmission between wireless devices over the 2.4GHz ISM radio frequency (RF) band with a supported RF range of 100ft between wireless devices indoors and 300ft outdoors.
   6. System shall use a wireless mesh radio communication protocol to transmit/receive and negotiate messaging among wireless devices.
   7. System shall utilize spread spectrum frequency hopping to facilitate robust communication and prevent the unauthorized interception of messages over the air and to comply with FCC requirements.
   8. System shall provide the ability to secure messages. When implemented, each device shall use the strong and secure AES-128 (Advanced Encryption Standard) security cipher to encrypt and decrypt messages. System shall also use the secure HTTPS/SSL protocol when users access the system using their Internet browser.

KK. System devices shall be capable of having their firmware updated or upgraded over the air through the wireless mesh network.

2.3 WIRELESS RELAY FIXTURE MODULES

A. Basis of Design Product: wiSCAPE Wireless Lighting Control System, Wireless Relay Fixture Modules.
B. Internal and External Wireless Relay Modules shall provide universal voltage support from 110V to 480V.
C. External Relay Modules shall utilize the standardized ANSI C136.41-2013 (7 & 5 pin) receptacles.
D. Relay Modules shall be capable of controlling fluorescent ballasts (T8 – T5 – T5HO), induction, MH, HPS, LPS, and LED drivers.
E. Relay Modules shall be fully programmable and capable of storing and autonomously execute commands and scenarios with the following minimum functionalities. The operating scenarios described below shall reside within each addressable intelligent relays even in case of power outage. Systems which rely on the operator to develop these scenarios using a programming language will not be allowed.
F. Standard on all relay modules:
   1. Definition of Groups structures (min.: 15 per module – out of 32000)
   2. Definition of Scenarios structures (min.: 100 per module – out of 1000 per group)
   3. A Scenario broadcasted to a group can represent different commands and setting to different relay modules, enabling complex controls scenarios with a single message

4. Each node status after returning from Black Out shall be user programmable: with the following options: On – Off – Last Level – user defined including a random delay to execute.
5. Variable Power Up delay, to smooth peak startup demand
6. Phase-angle and Analog 0-10V dimming relays
7. Ramping parameters (Brighten-Dim-Ramp up-Ramp Down-Night Mode – Ramp to Levels
8. Definition of preset levels (min.: 10) with user configurable transition speed
9. Minimum dimming level, in order to adapt to various brands of dimming ballasts (with the option to Stay On or turn off, below a set minimum level)
10. Monitoring, metering and reporting
11. Shall measure the following parameters:
    1. Power monitoring
        a) Voltage
        b) Amperage
        c) Power
        d) Power factor
    2. Cumulative Energy with a 2% accuracy
    3. Cumulative Lamp burn time
    4. Cumulative Ballast/Driver burn time

Energy and times shall be stored in non-volatile memory on a regular frequency to prevent loss of information in the event of a loss of power

    5. Number of ON/OFF cycles
12. Alarms (ex: overvoltage, under voltage, over current, under current, low power factor, etc.) Alarms logs shall be stored in non-volatile memory to allow for on demand subsequent retrievals
13. Time delay functions:
    1) (10) Generic timers with the ability to cascade up to (10) timers
    2) Selectable individually in each module covering 0-65534 seconds (18h).

G. System shall provide repeat capabilities to extend the range beyond normal radio range.
H. Relays shall provide 6 external connectors: 3 digital inputs (dry contact) (e.g. connection to motion sensors), and 1 Analog input (ex: connection to lux sensors), 2 digital outputs and provide power to the accessories without requiring the use of an external power pack.
I. On detection of Digital contact closed/open, the relay should trigger a programmable Command and/or Scenario.
J. Relays shall provide acknowledgements to the reception of any configuration changes unless if broadcasted to many relays.
K. Distributed Control and Distributed Relay Override
    1. Each addressable intelligent relays and sensor-modules shall be capable of autonomous automatic operation. Operating scenarios discussed above shall not depend on the operation of a central panel or computer.
    2. Furthermore, the distributed relay override keypads and motion sensors shall continue to operate should a clock-module or Gateway fail.
    3. Automatic deactivation during scheduled occupancy.
    4. User may choose when to disable the time delay during the night through the relay's schedule.
L. Full Relay Test Mode
    1. The system shall have the capability to automatically exercise every relay in the entire system using a user-defined schedule, controlled from the front-end Gateway. Each relay will be monitored for status, and the user shall have access to the results of this system-wide test from the computer's screen and/or an historical report.
M. Wireless Relay Modules shall conform to UL-733 & CAN/CSA C22.2 No. 182-2.
N. Wireless Relay Module shall be FCC Certified and IC Certified.

2.4 WIRELESS GATEWAY

A. Basis of Design Product: wiSCAPE Wireless Lighting Control System, Wireless Gateway.
B. Wireless Gateway shall meet or exceed the following:
    1. Power loss memory and clock holdup time: minimum of 6 months
    2. Clock: Digital with time, day of week, and date.
    3. Automatic leap year compensation.
    4. Programmable Daylight Savings Time and Standard Time adjustment.
    5. Remote Communications
        1. Each Gateway shall support a minimum of two communications ports: a USB port for PLC and/or RF (802.15.4) and an Ethernet port. Either or both may be used for programming, monitoring, and control. The Ethernet port shall allow simultaneous operation of multiple communications access points (Client sessions, Remote Ethernet-PLC modems) to support multiple operator terminals and communications with other building automation systems.
        2. All relay changes of state and programmable switch actions shall be communicated over both the local USB/XB network and the Ethernet to support interactive graphics and online status monitoring.
C. Wireless Gateway shall be fan-less, and have 1GHz or faster processor, Ethernet connectors, autoboot on power up, 1 GB RAM, and 500M storage.
D. Wireless Gateway shall be powered by 120VAC 50/60Hz.
E. Wireless Gateway shall provide automatic recovery in case of power failure.
F. Wireless Gateway shall be remotely configurable and upgradable without any on site intervention
G. Wireless Gateway shall accept a Cellular Modem Option.
H. Wireless Gateway shall utilize Linux Debian.
I. Wireless Gateway shall support 3rd-party Building Management Systems via an optional BACnet IP Interface.

2.5 SOFTWARE
A. Basis of Design Product: wiSCAPE Wireless Lighting Control System, wiSCAPE Software
B. Graphical User Interface (GUI)
    1. Data shall be entered through a simple Graphical User Interface. The operating system shall be Windows 10 or more recent.
    2. Geographical mapping of devices on maps or layouts.
C. Software shall be capable of creating device groups, scenarios, schedules (time-based/astronomical).
D. Software shall be able to name devices.
E. Software shall be able to assign devices to groups and scenarios.
F. Software shall be able to configure device parameters.
G. Software shall be able to clone/copy device settings.
H. Software shall be able to control individual devices and groups of devices.
I. Schedules
    1. An unlimited number of schedules may be assigned to individual relays or groups of relays.
    2. Each schedule shall allow an unlimited number of events per day, cloning of schedules shall be possible.
    3. Applicable period for individual schedules shall be user-defined, and include concepts of holidays, and special exclusion/inclusion periods
    4. Schedules shall individually be specified to supersede or not Holidays and Special periods.
    5. Unlimited number of Holidays may be defined
    6. "Spring Ahead" and "Fall Back" Dates for daylight savings time changes shall be automatic.
    7. Conditional Scheduling & Execution Engine
        1. System shall be capable of building Conditional Scheduling & Execution rules, based on time of day, occupancy statuses, override keypads triggering Scenarios, etc.
        2. Such Conditional Scheduling & Execution Engine enables the user-definition of flexible rules such as:

a) Blink Warning
b) Time delay Overrides
c) Preemptive Override
d) Master Control
e) Cleaning Scenarios

J. Software shall be able to program system parameters.
K. Software shall support programming of multiple sites from a single user interface.
L. Software shall allow an unlimited number of different user/passwords per site or per system
M. Software shall be able to create and manage users, user roles, and user rules.
N. Software shall support 3rd party Building Management Systems via a BACnet IP interface:
1. Binary and analog object types
2. Luminaire ON/OFF control
3. Luminaire 0-10V dimming control and feedback
4. Luminaire metering: voltage, current, power, power factor, consumption and lamp burn-time
5. Alarm notifications
6. Run scenarios
7. Set luminaire setpoint levels
8. Run generic timers

2.6 LOW VOLTAGE SWITCH STATIONS

A. Basis of Design Product: Current Low Voltage Switch Stations.
B. System shall support switch stations for manual switching of lighting load(s) within a site.
C. Switches shall be low voltage, momentary switches and shall be available in 1-button, 2-button, and 3-button configurations.
D. Switches shall be available in White, Ivory, Light Almond and Gray.

2.7 LOW VOLTAGE MOTION SENSORS

A. Basis of Design Product: Current Low Voltage Motion Sensors.
B. Motion Sensors shall provide automatic switching of lighting load(s) within an area/zone based on the presence of human activity.
C. Motion Sensors shall not require any manual adjustment at the time of installation or during operation.
D. Motion Sensors shall utilize passive infrared to detect motion.
E. Motion Sensors with passive infrared technology shall monitor PIR background levels and automatically make corresponding adjustments.
F. Motion Sensors with passive infrared technology shall incorporate a dual element pyrometer and 144-element cylindrical Fresnel lens
G. Motion Sensors shall be end or surface mounted (depending on model).

2.8 EXTERNAL PHOTOCELL MODULE

A. Basis of Design Product: wiSCAPE Wireless Lighting Control System, External Photocell Module.
B. External Photocell Module shall provide ON/OFF lighting circuit control with 0-10V full-range dimming based on detected light.
C. External Photocell Module shall be pre-programmed for out-of-the-box photocell operation.
D. External Photocell Module shall utilize bi-directional wireless RF mesh communications.
E. External Photocell Module shall use military-grade AES 128-bit encryption when communicating wirelessly.
F. External Photocell Module shall have a digital input for motion sensor or switch control.
G. External Photocell Module shall support multi-level grouping and multiple scenarios.
H. External Photocell Module shall have adjustable minimum and maximum dimming levels.
I. External Photocell Module shall be capable of utility-grade metering.

2.9 DIGITAL ROOM CONTROLLERS

A. NX Room Controllers

1. Basis of Design Product: NX Lighting Controls System, NX Room Controllers.
2. As indicated and where shown on the plans, install NXRC series Room Controller(s) to control the quantity of lighting and plug loads required.
3. NX Room Controller(s) shall integrate the functionality of connected control components including wall switch stations, occupancy sensors and daylight sensors to provide the required sequence of operation for the space.
4. NX Room Controller(s) and associated room control components shall operate in a totally standalone mode and not require the use of a network, software, computer, or server for local control functions.
5. NX Room Controller(s) shall have an embedded Time Clock and be capable of storing and running up to 99 local schedules. Schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
6. Construction:
    1. NX Room Controller housing shall be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.
    2. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.
    3. Two RJ45 FX Port connectors shall be accessible on the side of the enclosure for expansion of a Zone Segment to allow for an expanded number of Zone Segment devices (e.g., Room Controllers, In-Fixture Modules, and Digital Sensors). Up to 32 controllers and devices can be daisy-chained together.
    4. Two RJ45 SmartPORT™ connectors shall be accessible on the side of the enclosure for the connection of NX room level devices.
    5. Two recessed push buttons and associated LED indicators shall be accessible on the top of the enclosure to provide override, status, setup, and testing functions.
7. Electrical:
    1. NX Room Controller(s) shall have a single power feed and shall be capable of operation at voltages between 120/277/347 volts AC, 50/60 Hz.
    2. One or two output relays (model specific) shall provide for the following load types and ampacity (per relay):
        a) 20A, Tungsten,
        b) 20A, Magnetic Ballast,
        c) 16A, Electronic Ballast,
        d) 1 H.P. Motor @ 120V, ¾ H.P. @ 277V; ½ H.P. @ 347V
    3. Where indicated provide one or two independent 0-10 volt dimming channels (model specific) for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.
    4. Each dimming output shall have a current sinking capacity of at least 30 mA.
    5. NX Room Controller(s) shall be capable of supplying 250 mA of Class 2 auxiliary DC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the room controller's two RJ45 SmartPORT connectors.
    6. NX Room Controller(s) shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.
8. Functional:
    1. Provide an integral pushbutton and LED indicator for each load for status and to allow operation of the relays and dimmers for testing and verification without requiring other control devices to be connected.

2. NX Room Controller(s) shall have a default operation providing an automatic logical sequence of operation for each load as the room control devices are plugged into the SmartPORT connectors.
3. Default operation for occupancy sensors shall be automatic on, automatic off for all loads.
4. Upon connection of a switch, the operation shall automatically change to manual on, automatic off (vacancy) mode for all loads.
5. Provide capability to convert each load independently to automatic on or vacancy mode using only the integral push buttons and LED indicators on the room controller.
6. When in vacancy mode, provide a 30 second grace period after an off during which automatic on shall be temporarily enabled.
7. It shall be possible to connect up to thirty-two (32) room controllers together on the FX Ports using Cat5 patch cables to provide configurations up to 64 switched and dimmed loads operating as a single zone.
8. Provide the following set up and configuration functions without the need for additional devices or software:
    a) Assign/reassign relays for control by wall switch station buttons,
    b) Configure relays for occupancy or vacancy operation,
    c) Assign/reassign dimmers to raise/lower switches,
    d) Assign dimming channels for response to daylight sensor control,
    e) Auto calibrate default daylight sensor sequence of operation,
    f) Save preset scenes.

9. NX Room Controller(s) shall support the following specialty modes:
    1. SpectraSync™ CCT Control
        a) Dimmer channels can be set individually to control CCT via 0-10V.
        b) Scheduling can be implemented to mimic the natural transition of light throughout the course of the day.
        c) Room-based solutions can be implemented to allow occupants to tune color to task.
    2. SpectraClean™
        a) Ability to control SpectraClean enabled fixtures with three different modes for varying applications:
            a) Constant On
            b) Scheduled
            c) Programmed Dosage

2.10 UL924 LOAD CONTROLLER

A. NX UL924 Load Controller

1. Basis of Design Product: NX Lighting Controls System, NX UL924 Load Controller.
2. As indicated and where shown on the plans, install NX UL924 Load Controller to control the quantity of emergency lighting loads required.
3. NX UL924 Load Controller shall meet NFPA Article 700 requirements for emergency lighting.
4. NX UL924 Load Controller and associated room control components shall operate in a totally standalone mode and not require the use of a network, software, computer, or server for local control functions.
5. NX UL924 Load Controller shall provide a remote test button or fire alarm interface.
6. NX UL924 Load Controller shall have an embedded Time Clock and be capable of storing and running up to 99 local schedules. Schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
7. Construction:
    1. NX UL924 Load Controller housing shall be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.

2. The housing and shall include an integral 1/2" chase nipple for external mounting to standard junction box knockout.
3. Two RJ45 FX Port connectors shall be accessible on the side of the enclosure for expansion of a Zone Segment to allow for an expanded number of Zone Segment devices (e.g., Room Controllers, In-Fixture Modules, and Digital Sensors). Up to 32 controllers and devices can be daisy-chained together.
4. Two recessed push buttons and associated LED indicators shall be accessible on the top of the enclosure to provide override, status, setup, and testing functions.

8. Electrical:
   1. NX UL924 Load Controller shall have a single power feed and shall be capable of operation at voltages between 120/277/347 volts AC, 50/60 Hz.
   2. One relay output shall provide the following load types and ampacity:
      a) 20A, Tungsten,
      b) 20A, Magnetic Ballast,
      c) 16A, Electronic Ballast,
      d) 1 H.P. Motor @ 120V, ¾ H.P. @ 277V; ½ H.P. @ 347V.
   3. NX UL924 Load Controller shall provide two independent 0-10 volt dimming channels for full range dimming control of fixtures equipped with compatible dimmable ballast or driver.
   4. Each dimming output shall have a current sinking capacity of at least 30 mA.
   5. NX UL924 Load Controller shall be equipped with power monitoring circuitry capable of measuring and reporting the total connected load for each room controller.
9. Functional:
   1. SmartPORT Functionality:
      a) NX UL924 Load Controller shall automatically recognize connected devices in the Zone Segment.
      b) NX UL924 Load Controller shall function as a standard room controller.
      c) NX UL924 Load Controller's RJ45 CAT5 connection shall be used as a sensing line to standard room controller only and does not support NX room devices.
   2. Emergency Functionality:
      a) NX UL924 Load Controller's RJ45 CAT5 connection shall be used as a sensing line to standard room controller on normal circuit.
      b) Removal of 24VDC on CAT5 connection shall put NX UL924 Load Controller into emergency state.
      c) NX UL924 Load Controller's default emergency state is ON with both dimming channels to 100%
   3. Provide an integral pushbutton and LED indicator for controlled load for status and to allow operation of the relay and dimmers for testing and verification without requiring other control devices to be connected.
   4. Provide the following set up and configuration functions without the need for additional devices or software:
      a) Assign/reassign relays for control by wall switch station buttons,
      b) Configure relays for occupancy or vacancy operation,
      c) Assign/reassign dimmers to raise/lower switches,
      d) Assign dimming channels for response to daylight sensor control,
      e) Save preset scenes.
10. NX UL924 Load Controller shall support the following specialty modes:
    1. SpectraSync™ CCT Control
       a) Dimmer channels can be set individually to control CCT via 0-10V.
       b) Scheduling can be implemented to mimic the natural transition of light throughout the course of the day.

c) Room-based solutions can be implemented to allow occupants to tune color to task.

2. SpectraClean™
   a) Ability to control SpectraClean enabled fixtures with three different modes for varying applications:
      a) Constant On
      b) Scheduled
      c) Programmed Dosage

2.11 FIXTURE MODULES

1. NX In-Fixture Modules
   a) Basis of Design Product: NX Lighting Controls System, NX In-Fixture Modules.
   b) As indicated in the specifications and as shown on the plans, install NXFM series Fixture Control Module enabled fixture(s).
   c) NX In-Fixture Modules shall be designed to install inside the fixture they control.
   d) NX In-Fixture Modules shall consist of a completely distributed intelligent lighting controller capable of functioning completely independently including time based and astronomical scheduling of On/Off and preset events without the need of any coordinator, gateway or master controller. Sensors and switches as well as other NX In-Fixture enabled fixtures shall be capable of being connected directly to the NX In-Fixture Module to create a fully functional lighting control system.
   e) NX In-Fixture Module shall be provided with one SPST relay. Relay shall be supplied with "Zero Cross Switching" control to limit the effects of inrush on the relay contacts.
   f) NX In-Fixture Module shall be compatible with incandescent, magnetic, and electronic lighting loads including LED drivers. NX In-Fixture Module shall include zero arc point switching circuitry and have the following max load ratings:
   g) Construction:
      a) Housing: GSM UL Rated 94 HB Plastic
      b) Mounting: Mounts inside fixture
   h) Electrical:
      a) Line Voltage Versions:
   1) Input: Universal 120-347VAC, 50-60Hz
   2) Output: One or two relay outputs (model specific) shall provide for the following load types and ampacity (per relay):
      a) 10A, 120VAC only Incandescent
      b) 10A, 120-347VAC, Magnetic Ballast
      c) 5A, 120-277VAC, Electronic Ballast
      d) 3A, 347VAC, Electronic Ballast
   3) Surge Withstand: 2000V
   4) Peak Inrush: 160A for 2 ms Max
      b) Low Voltage Versions:
   1) Input: 12-24VDC
      c) NX In-Fixture Modules shall be provided with two 0-10VDC control interfaces for full range dimming control of dimming ballasts and LED drivers. Interface shall be designed to continuously sink 30mA of current.
      d) NX In-Fixture Module 0-10VDC control interfaces shall be configurable for 0-10VDC dimming, dim to off or color temperature control.
   i) Functional:
      a) NX In-Fixture Modules shall be designed to self-configure, automatically to meet energy code requirements as NX sensors and other NX devices are connected.
      b) NX In-Fixture Module shall be designed such that self-configuration takes place automatically without user intervention or commissioning of any kind.

c) NX In-Fixture Modules shall be rated and tested for an operating temperature range of -40° to 185°F [-40° to 85°C].
d) NX In-Fixture Module shall be equipped with a Real Time Clock and integral backup for schedule information. Each module shall support up to 99 schedules. Schedules shall be loaded to the module via the network or locally using the NX Lighting Controls App. Once loaded, schedules shall run autonomously without the need of any coordinator, gateway, or master controller.
e) NX In-Fixture Module shall be capable of having its device firmware updated wirelessly over the air when connected to a NX sensor of via the NX SmartPORT.
f) NX In-Fixture Modules shall be supplied with one momentary pushbutton with LED for manual control and testing. Through the use of this switch, it shall be possible to test the On/Off and dimming functionality of the NX In-Fixture module or completely reset the NX In-Fixture Module to factory defaults without the need to connect any other device or testing equipment.
g) NX In-Fixture Module shall include non-volatile memory for retaining device settings during power outages.

j) NX In-Fixture Module shall be UL Listed to UL916 and Certified to CAN/CSA C22.2 NO 205-M1983.
k) NX In-Fixture Module shall be FCC certified.

2. NX On-Fixture Modules
a) Basis of Design Product: NX Lighting Controls System, NX On-Fixture Module.
b) As indicated in the specifications and as shown on the plans, install NXOFM series wireless On-Fixture Control Module(s).
c) NX On-Fixture modules shall consist of a completely self-contained distributed intelligent wireless lighting controller capable of functioning completely independently including time based and astronomical scheduling of On/Off and preset events without the need of any coordinator, gateway or master controller.
d) NX On-Fixture Module shall be configurable remotely over the air utilizing built in Bluetooth radio an iOS or Android handheld device with the NX Lighting Controls App installed or via NX Wireless Network.
e) NX On-Fixture Module shall be capable of having its device firmware updated wirelessly over utilizing it's built in Bluetooth radio and iOS or Android handheld device with the NX Lighting Controls App installed or via NX Wireless Network.
f) On-Fixture Module shall respond to scheduled events, occupancy/vacancy sensor events and manual switch station events.
g) On-Fixture Module shall monitor and measure energy consumption.
h) On-Fixture Module shall include non-volatile memory for retaining device settings during power outages.
i) NX On-Fixture Modules shall be rated and tested for an operating temperature range of -40° to 185°F [-40° to 85°C].
j) NX On-Fixture Module shall include one SPST relay for On/Off control.
k) NX On-Fixture Modules relay shall be supplied with "Zero Cross Switching" control to limit the effects of inrush on the relay contact.
l) NX On-Fixture Module shall be compatible with incandescent, magnetic, and electronic lighting loads including LED drivers.
m) Construction:
a) Housing: GSM UL Rated 94 HB Plastic
b) Mounting: Standard C136-41 (2013) with 5 or 7 pin twist-lock connector. Compatible with C136-10 sockets.
n) Electrical:
a) Input: 120-480VAC, 50-60Hz

b) Output: Relay output shall provide for the following load types and ampacity:

1) 5A@120-347VAC,
2) 3A@480V

c) Surge Withstand: 2000V
d) Peak Inrush: 160A for 2 ms Max
e) Standby Power (W):

1) 120VAC: 1.2
2) 277VAC: 1.5
3) 347VAC: 1.5
4) 480VAC: 1.3

o) Functional:

a) On-Fixture Module shall include an integrated daylight sensor with a foot candle range as shown below:

1) On level: 1FC to 5FC (Default: 5FC)
2) Off level: 4FC to 15FC (Default: 8FC)

b) NX On-Fixture Modules shall communicate with other NX enabled fixtures and devices via NX Wireless Network with the following characteristics:

1) Robust & reliable IEEE 802.15.4 2.4GHz wireless self-organizing and self-healing mesh network
2) Radio Range: Outdoor: ~1000 ft. (~300m) Note: Range based on clear line of site.
3) Security: AES-128 (Advanced Encryption Standard)

p) NX On-Fixture Module shall include non-volatile memory for retaining device settings during power outages.

q) NX On-Fixture Module shall UL Listed to UL916 and Certified to CAN/CSA C22.2 NO 205-M1983.

r) NX On-Fixture Module shall be FCC certified..

2.12 LIGHTING CONTROL PANELS

1. NX Lighting Control Panels

a) Basis of Design Product: NX Lighting Controls System, NX Lighting Control Panels.
b) As indicated and where shown on the plans, install NX Lighting Control Panels V2 (NXP2 Series).
c) Panel shall be a fully distributed intelligent lighting controller with the ability to function as a stand-alone lighting control panel or as part of an NX networked system.
d) Panel shall provide standard capacities for 8, 16, 24, 32, or 48 relays in each panel with matching number of 0-10v dimming channels.
e) Panel shall be available in custom configurations. Configuration options shall include: panel shipment type (enclosure/interior shipped together, enclosure/interior shipped separately, enclosure only, and interior only), panel size, number of single pole/double pole relays, emergency control option, input voltage and enclosure mount (surface mount or flush mount).
f) Panels shall be factory assembled and tested. No field assembly shall be required.
g) Construction:

a) Panel shall be surface or flush wall mounted in a NEMA1 rated enclosure, based on panel configuration.
b) Panel shall be capable of being shipped with enclosure/interior together, enclosure/interior separately, enclosure only, and interior only in appropriately designed packaging. When enclosure is shipped separately, enclosure shall enable rough-in of all electrical connections prior to receipt of the panel interior.
c) Panel enclosure shall have standard electrical conduit knockouts on the top, the bottom and both sides of the enclosure to allow installation flexibility. Field drilling and cutting for pipe and wire shall not be required.
d) Panel shall provide keyhole mounting holes in the rear of the enclosure.

e) Panel enclosure shall include 6" spacing running the width of the panel at the bottom of the panel to allow for line voltage accessories such as contactors or to provide a "gutter". Space shall be separated from the low voltage area utilizing a removable metal barrier. No knockouts added to the bottom plate of the inner high voltage divider. Exterior enclosure will maintain knockouts on bottom.

f) Panel venting shall conform to NEMA 1 enclosure specifications to contain any local explosion and to protect the working environment.

g) Panel enclosure shall feature removable metal barriers that separate all high-voltage components and wiring (Class 1) from all low-voltage (Class 2) components and wiring.

h) Panel enclosure shall be of welded construction primed and painted with a powder coat finish. Unpainted or galvanized enclosures are not acceptable.

i) Panel cover shall attach to the enclosure with #10-32 x ½" truss head machine screws.

j) Panel cover shall employ "keyhole" style openings for the top two mounting screws to allow the panel's cover to be temporarily hung during installation eliminating the need to completely remove all the mounting screws along with contributing to safety ensuring the cover does not swing if all screws were removed.

1) 8 Relay panel cover – 4 mounting holes: 2 keyhole style slots, 2 slotted style slots
2) 16/32 Relay panel cover – 6 mounting holes: 2 keyhole style slots, 4 slotted style slots
3) 48 Relay panel cover – 8 mounting holes: 2 keyhole style slots, 6 slotted style slots

k) Panel cover shall be sized for either surface or recess mounting of the panel.

l) Panel cover shall have hinged locking door to expose only the low voltage wiring section of the panel.

m) Panel door hinges shall be located on the left side.

n) Panel shall be provided with a factory or field installable panel interior. Panel interior shall contain all controller electronics, power supplies, relays, and other required components. Panel shall arrive at the project site completely pre-wired and requiring only the connection of lighting circuits and network cable. Systems that require field assembly of controllers or chassis inserts are not acceptable

o) Panel interior components shall reside on a framed skeleton. When disconnected from the load circuits and necessary mounting connections, the framed skeleton can be removed taking all the electrical components intact.

p) Panel interior components shall be designed to not become dislodged during shipment.

q) Panel spacing between panel relays shall be suitable for separating any two relays in the panel to meet the NEC requirements for normal and emergency power when a metal divider is installed between relays. A metal plate barrier shall be available to separate relays - two plates per application.

r) Panel relays shall be of the snap-in type and be individually field replaceable.

h) Electrical:

a) Panel shall be supplied with either a 120V/277V, 347V or 480V power supply.

b) Panel power supply shall provide the required capacity for the operation of the panel, relays, controllers, NX Network, SmartPORTs, user interfaces and the maximum number of low voltage and/or data devices that can be connected to each panel.

c) Panel wire connections shall be made to labeled terminal blocks.

d) Panel shall have LED status/failure indicators.

e) Panel shall provide support for Bluetooth programming using the NX Lighting Controls App and the NX Bluetooth Radio Bridge with Clock or a SmartPORT connected NX sensor.

f) Panel shall include two (2) Ethernet ports for connection to the NX Network.

g) Panel shall include four (4) RJ45 NX SmartPORTs for the connection of all NX sensors and switches. SmartPORTs shall be capable of supplying 250 mA of Class 2 auxiliary DC power for use by wall switch stations, occupancy sensors, and daylight sensors connected to the SmartPORT connectors

h) Panel shall have four (4) 3-wire low voltage dry contact inputs. Removable terminal blocks shall be provided to support momentary or maintained closures from building automation systems, fire systems, demand response and security systems as well as other systems or devices including occupancy sensors, daylight sensors, and low voltage switches. Each input shall be individually programmable and provide the ability to initiate any NX switch compatible function or command. (on, off, raise, lower, preset, timed on/off). Each input will provide a connection for sourcing 24V, a common, control and pilot light functionality for low voltage switch stations.

i) Panel shall have two (2) SPDT (NO/NC) dry contact outputs, with removable terminal blocks, to provide a contact closure to signal out to another system that is capable of receiving a NO or NC closure to signal building automation, security or alarm system based on a schedule or a command from an input device (e.g. occupancy sensor, daylight sensor, wall switch station, etc.). Each output will have a contact rating of 24VDC@50mA minimum.

j) Panel shall have an easily accessible, removable coin size battery for maintaining system time during a power loss.

k) Panel shall, after a power loss, retain time for a minimum of 72 hours.

l) Panel time shall be updated when connected to a device utilizing the NX Lighting Controls App or from an NX network time server.

m) Panel shall feature a power sensing circuit and transformer for UL924 operation. Upon detection of loss of power, the panel shall force all relays closed and all dimming channels to full bright. Panel shall maintain this state until normal power is restored. Connected devices will not be powered.

n) Panel shall have a test button on the optional UL924 board to test the UL924 operation.

o) Panel shall have a low voltage remote test switch input on the optional UL924 to test the UL924 operation.

p) Panel shall provide relay/dimmer boards to expand panel capacity from 8 to 48 relay outputs in groups of 8. Relay/dimmer boards shall be completely self-configuring and shall not require manual settings to configure for use within the panel.

q) Panel relay/dimmer boards shall confirm relay presence and status.

r) Panel relay/dimmer boards shall have (8) 0-10V integrated dimming channels, each capable of sinking 50mA.

s) Panel dimming channels shall be software assignable.

t) Panel shall be capable of containing 1 to 48 robust and reliable mechanically latching lighting control relays as indicated on the drawings and schedules as specified herein. Electrically held or non-mechanically latching relays shall not be considered.

u) Panel relays shall be individually UL and CUL listed and shall bear labels indicating compliance. Lighting control relays shall be tested to UL standard 508 for both safety and endurances and bare labels signifying compliance.

v) Panel relays shall have the following load ratings:

1) Single Pole Relays:
   a) General Use: 30A @ 300VAC
   b) Tungsten: 2400W @ 120VAC
   c) Standard Ballast: 20A @ 300VAC
   d) Motor Starting: 1HP @ 110-125VAC; 1½ HP @ 220-277VAC
2) Double Pole Relays:
   a) General Use: 20A @ 480VAC
   b) Tungsten: 2400W @ 120VAC
   c) Standard Ballast: 20A @ 480VAC
   d) Motor Starting: 1HP @ 110-125VAC; 1½ HP at 220-277VAC

w) Panel relays shall be rated for minimum cycle life of 120,000+ operations (60,000+ cycles).

x) Panel relays shall have a Short Circuit Current Rating (SCCR) of 18,000A @ 277VAC.

y) Panel relays shall have a built-in manual override lever & ON/OFF indicator.
z) Panel relays shall be capable of manual activation On or Off with or without power.

i) Functional:
a) Panel shall be of the distributed intelligence type and shall not be dependent on a network connection to execute schedules or perform programmed functions.
b) Panel shall be programmed using the optional NXBTC Bluetooth® radio module with clock and NX Lighting Controls App. When networked, panel configurations shall be performed utilizing the NX Area Controller's web-browser based Graphical User Interface.
c) Panel shall provide the ability to update panel firmware. Firmware update process shall ensure that the complete and correct firmware (e.g. via CRC check) has been downloaded before the panel is flashed with the new firmware.
d) Panel set up and configuration functions shall include (but are not limited to):

1) Assign/reassign relays for control by wall switch station buttons,
2) Configure relays for occupancy or vacancy operation,
3) Assign/reassign dimmers to raise/lower switches,
4) Assign dimming channels for response to daylight sensor control,
5) Assign names to relays/dimmers,
6) Auto calibrate default daylight sensor sequence of operation,
7) Create and save preset scenes,
8) Configure wall switch button types. At a minimum, button types shall include toggle on/off with pilot, preset, on only and off only,
9) Configure up to six zones of daylight harvesting per room with independent set points and time delays,
10) Include or exclude loads from occupancy sensor control,
11) Configure up to 16 load groups per zone,
12) Configure up to 16 preset scenes per zone with independent fade times,
13) Set independent power up conditions for relays and dimmers,
14) Set independent occupied and unoccupied conditions for each relay and dimmer,
15) Adjust dimmer high and low trim points,
16) Manually control lighting loads

e) Panel shall provide the ability to create up to ninety-nine (99) schedules per zone. Each schedule will consist of the following:

1) Event Time – Shall be configured as a specific set "Normal" time (hh:mm am/pm) or as an offset based on one of the following: Before Sunrise, After Sunrise, Before Sunset, After Sunset, Before Open, After Open, Before Close or After Close.
2) Action – Task to be performed: None, Group State, or activation of a Preset.
3) None – No action to perform
4) Group State – The specific relay / dim level / color temp range settings, that the select group(s) of actuators should implement.
5) Presets – The specific preset that should be activated.

f) Panel shall provide the ability to disable a schedule
g) Panel shall provide the ability to delete a schedule

2.13 CONTROLLED RECEPTACLES

A. HCS Controlled Receptacle
1. Basis of Design Product: NX Lighting Controls System, HCSREC Series Controlled Receptacle.
2. Controlled Receptacle shall be capable of controlling other receptacles downstream in the branch circuit.
3. Controlled Receptacle shall be automatically controlled by a low voltage signal from an occupancy sensor or any other type of control capable of performing this task, e.g., time-of-day control device.

4. Controlled Receptacle shall be available in split or fully controlled 15A or 20A models.
5. Controlled Receptacle shall feature permanent NEC 406.3 (E) markings.
6. Controlled Receptacle shall be UL498B SA Listed Receptacles with integral switching that complies with Supplement SA.

2.14 SENSORS

1. NX Smart Sensor Module Passive Infrared, Wireless Occupancy & Daylight Sensor
   a) Basis of Design Product: NX Lighting Controls System, NX Smart Sensor Modules.
   b) As indicated in the specifications and as shown on the plans, install NXSMP series sensor module enabled fixture(s).
   c) NX Smart Sensor Module shall be designed to install directly into or on the fixture housing or lens.
   d) NX Smart Sensor Module shall integrate seamlessly into the NX Network.
   e) NX Smart Sensor Module shall have an RF frequency of 2.4GHz.
   f) NX Smart Sensor Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.
   g) NX Smart Sensor Module Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of human activity.
   h) NX Smart Sensor Module Occupancy/Vacancy sensor shall be microprocessor controlled and utilize IntelliSCOPE™ technology to provide real-time graphical occupancy data.
   i) NX Smart Sensor Module Occupancy/Vacancy sensor shall not require any adjustments of any kind at the time of installation or during operation.
   j) NX Smart Sensor Module Occupancy/Vacancy sensor shall be powered by SmartPORT™ using plenum rated SmartPORT plug and play cables.
   k) NX Smart Sensor Module Occupancy/Vacancy sensor shall have a timer that can be adjusted manually from 1 second to 20 minutes.
   l) NX Smart Sensor Module Occupancy/Vacancy sensor sensitivity shall be adjustable from 1 to 10.
   m) NX Smart Sensor Module Occupancy/Vacancy sensor shall include non-volatile memory for retaining device settings during power outages.
   n) NX Smart Sensor Module Occupancy/Vacancy sensor shall have RED real time motion indicator LED visible from the front of the unit.
   o) NX Smart Sensor Module Occupancy/Vacancy sensor may be programmed for active and inactive times.
   p) NX Smart Sensor Module Occupancy/Vacancy sensor shall be available with the following 360° coverage patterns:
      a) SMI/LMI – 1:1 (mounting height to radius) up to 14 feet
      b) OMNI – 1:1.5 (mounting height to radius) up to 14 feet
      c) LMO – 1:3 (mounting height to radius) up to 16 feet
      d) HMO – 1:1.4 (mounting height to radius) up to 45 feet indoors / 32 feet outdoors
   q) NX Smart Sensor Module daylight sensor shall continually measure the amount of visible light under the lighting fixture to provide continuous On/Off and full range dimming control of fixture or group under its control.
   r) NX Smart Sensor Module daylight sensor shall utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
   s) NX Smart Sensor Module daylight sensor shall have independently programmable ramp up and ramp down times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
   t) NX Smart Sensor Module daylight sensor shall be capable of being programmed for active and inactive times.
   u) NX Smart Sensor Module daylight sensor shall include non-volatile memory for retaining device settings during power outages.

2. NX Smart Sensor Module Dual Technology, Wireless Occupancy & Daylight Ceiling Mount Sensor
   a) Basis of Design Product: NX Lighting Controls System, NX Smart Sensor Modules.
   b) As indicated in the specifications and as shown on the plans, install NXSMDT series sensor modules.
   c) NX Smart Sensor Module DT shall be designed for indoor use only and to mount directly to ceilings.
   d) NX Smart Sensor Module DT shall integrate seamlessly into the NX Network.
   e) NX Smart Sensor Module DT shall have an RF frequency of 2.4GHz.
   f) NX Smart Sensor Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.
   g) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall provide automatic or vacancy switching of lighting load(s) within an area/zone based on the presence of human activity.
   h) NX Smart Sensor Module Occupancy/Vacancy sensor shall be microprocessor controlled and shall have adjustable technology detection modes including Dual Technology (Passive Infrared (PIR) and Ultrasonic (US)), Passive Infrared (PIR) only, and Ultrasonic (US) only.
   i) NX Smart Sensor Module Occupancy/Vacancy sensor shall utilize IntelliSCOPE™ technology to enable fine-tuning of the motion detection technologies using real-time Passive Infrared (PIR) and Ultrasonic (US) graphical occupancy data.
   j) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall be powered by SmartPORT™ using plenum rated SmartPORT plug and play cables.
   k) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have a timer that can be adjusted manually from 1 second to 20 minutes.
   l) NX Smart Sensor Module DT Occupancy/Vacancy sensor sensitivity shall be adjustable from 1 to 10.
   m) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall include non-volatile memory for retaining device settings during power outages.
   n) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have a Red Passive Infrared (PIR) and Green Ultrasonic (US) real time motion indicator LEDs visible from the front of the unit.
   o) NX Smart Sensor Module DT Occupancy/Vacancy sensor may be programmed for active and inactive times.
   p) NX Smart Sensor Module DT Occupancy/Vacancy sensor shall have the following coverage:
      a) 1:2.75 Coverage pattern (mounting height to coverage radius)
      b) Coverage: Adjustable up to 2,000 square feet
      c) Recommended Mounting Height: 8ft (2.44m) with a max mounting height: 12ft (3.66m)
   q) NX Smart Sensor Module DT daylight sensor shall continually measure the amount of visible light under the lighting fixture to provide continuous On/Off and full range dimming control of fixture or group under its control.
   r) NX Smart Sensor Module DT daylight sensor shall utilize a closed loop daylight harvesting algorithm to maintain the required light level in response to changes in daylight.
   s) NX Smart Sensor Module DT daylight sensor shall have independently programmable ramp up and ramp down times to allow the sensor to respond quickly to decrease in daylight and respond more slowly to increase in daylight to minimize the effect of sudden changes in daylight.
   t) NX Smart Sensor Module DT daylight sensor shall be capable of being programmed for active and inactive times.
   u) NX Smart Sensor Module DT daylight sensor shall include non-volatile memory for retaining device settings during power outages.
   v) NX Smart Sensor Module DT shall be available in White, Black and Gray colors.

3. NX Occupancy Sensors, Wired
   a) Basis of Design Product: NX Lighting Controls System, NX Occupancy Sensors.
   b) NX Occupancy Sensors shall be ceiling or wall mounted and use dual technology (ultrasonic and passive infrared), ultrasonic and/or passive infrared (model specific) sensing technology as indicated.

c) NX Occupancy Sensors shall be Class 2 and connect to any room controller SmartPORT using a wiring adaptor and standard Cat5 patch cable.
d) NX Occupancy Sensors shall be microprocessor controlled and utilize IntelliDAPT® technology to optimize sensor behavior to adapt to space conditions and occupant usage patterns and adjust sensitivity and time delay to maximize energy savings and minimize false On and Off events
e) NX Occupancy Sensors shall be self-adaptive and not require manual calibration after installation. Digital circuitry and logic shall automatically adjust the sensitivity and time delay based on learned occupancy patterns and the environment in which the sensor is installed.
f) NX Occupancy Sensors using both ultrasonic and passive infrared (dual technology) shall operate such that detection by both technologies is required to initiate occupancy and continued detection by either technology will maintain occupancy.
g) Up to four NX Occupancy Sensors may be connected to one room controller.

4. NX Occupancy Output Interface
a) Basis of Design Product: NX Lighting Controls System, NXRO Series Occupancy Output Interface Module.
b) NX Occupancy Output Interface shall communicate the occupancy state of an NX control zone to HVAC or other building systems using a contact closure.
c) NX Occupancy Output Interface shall connect to a SmartPORT™ and provide the aggregate occupancy state of the zone as reported by one or more occupancy sensors.
d) NX Occupancy Output Interface shall mount to a standard 4 11/16" junction box.
e) NX Occupancy Output Interface shall have a removable terminal block for input connection.
f) NX Occupancy Output Interface shall be powered by NX SmartPORT.
g) NX Occupancy Output Interface shall support multiple occupancy sensors in a zone.
h) NX Occupancy Output Interface shall feature a low voltage Form-C relay for Normally Closed / Normally Open operation.
i) NX Occupancy Output Interface shall be a low voltage device: 24VDC.

5. NX Daylight Sensor, Wired
a) Basis of Design Product: NX Lighting Controls System, NXDS Series Daylight Sensor.
b) NX Daylight Sensor shall provide ambient light level information to the room controller allowing daylight responsive lighting control.
c) The system shall operate in an open loop sequence of operation reducing the amount of electric light as the quantity of daylight entering the room increases.
d) It shall be possible to configure up to six daylight zones in a room. Each zone shall be programmable to proportionally respond to the light level provided by the daylight sensor.
e) NX Daylight Sensor shall be mounted vertically or horizontally and positioned to provide an unobstructed view of the windows per the manufacturer's directions.
f) NX Daylight Sensor shall be available in indoor and outdoor models.
g) NX Daylight Sensor shall have an architecturally attractive design.
h) NX Daylight Sensor shall have a foot-candle range: 3-6,000FC

6. NX Wall Partition Sensor
a) Basis of Design Product: NX Lighting Controls System, NXWPS Series Wall Partition Sensor.
b) NX Wall Partition Sensor shall automatically signal the NX Lighting Controls System when a moveable partition has been opened or closed. This allows the two adjacent rooms to be combined or separated into individual rooms.
    a) NX controls shall automatically reconfigure to operate in unison when rooms are combined.
    b) NX controls shall automatically reconfigure to operate independently when the rooms are separated.
    c) NX system shall allow for room combine scenarios with up to 16 combinable rooms.

c) NX Wall Partition Sensor shall be a low voltage device: 24VDC.

7. NX Dry Contact Closure Interface
   a) Basis of Design Product: NX Lighting Controls System, NXCI Series Contact Closure Interface.
   b) NX Dry Contact Closure Interface shall enable third-party devices to provide dry contact inputs to the NX Lighting Controls System.
   c) NX Dry Contact Closure Interface shall provide switch activation using contact closures from external devices such as key switches, AV systems, photo-eye sensors or other low voltage Class 2 devices.
   d) NX Dry Contact Closure Interface shall default to On/Off operation and can be programmed to perform alternate functions including:
      a) Toggle On/Off
      b) Preset
      c) Raise
      d) Lower
      e) Timed On
   e) NX Dry Contact Closure Interface shall feature a removable terminal block for input connection.
   f) NX Dry Contact Closure Interface shall feature pilot light output terminals.
   g) NX Dry Contact Closure Interface shall be a low voltage device: 24VDC.

2.15 WALL STATIONS

1. NX SimpleTouch™ Graphic Wall Station
   a) Basis of Design Product: NX Lighting Controls System, NX SimpleTouch Graphic Wall Station.
   b) Graphic Wall Station shall employ a 3.5" resistive LCD-TFT, full-color touch screen with 320x480 screen resolution in portrait orientation.
   c) Graphic Wall Station shall mount to a standard single gang switch box.
   d) Graphic Wall Station shall utilize standard Cat5 cabling for connection to system SmartPORT. Provide two RJ45 ports to allow daisy chain connection with other NX Smart Switches.
   e) Graphic Wall Station shall operate seamlessly with other NX Smart Switches.
   f) Graphic Wall Station shall provide a 4GB microSD card for storing user preferences that include the quantity of controls per screen, function names, screen navigation, home screen selection, and custom screen saver graphic image.
   g) Graphic Wall Station screens can be configured to meet project requirements for control of up to 16 groups, each with provision for On/Off and dimming, up to 16 preset scenes, or CCT color control.
   h) Graphic Wall Station shall be capable of local control within a single space or configured for master control across spaces or building wide.
   i) Graphic Wall Station shall have an optional password access control that will require a secure PIN to access the station.
   j) Graphic Wall Station shall have adjustable screensaver timeout and backlight brightness.
   k) Graphic Wall Station shall be supplied with a white bezel. Optional color change kit shall allow for Ivory, Grey, Light Almond, or Black.

2. NX Smart Switches (Wired)
   a) Basis of Design Product: NX Lighting Controls System, NXSW Series Smart Switches (Wired).
   b) NX Smart Switches (Wired) shall be of the programmable type using standard Cat5 cabling for connection to system SmartPORT™.
   c) NX Smart Switches (Wired) shall have one to six buttons and provide lighting control functions as called out and shown on the plans.
   d) NX Smart Switches (Wired) shall be available with the following specialty versions:
      a) OO: On/Off
      b) ORLO: On/Raise/Lower/Off

c) RL: Raise/Lower
d) TO: Timed-On
e) SS: Scene

e) Construction:
a) Housing: Rugged, high impact, injection molded plastic
b) Mounting: Switches shall be capable of being mounted to single-gang and multi-gang wall boxes and shall be compatible with standard decorator style wall plates.

f) Electrical:
a) Class 2 Low Voltage 24VDC
b) Connection via two (2) RJ-45 SmartPORTs to allow for daisy chain connection of up to eight switches to each SmartPORT.

g) NX Smart Switches (Wired) shall be available in White, Ivory, Light Almond, Gray, Black, and Red.

3. NX Smart Switches (Wireless)
a) Basis of Design Product: NX Lighting Controls System, NXSW Series Smart Switches (Wireless).
b) NX Smart Switches (Wireless) shall be of the programmable type using the NX Lighting Controls App.
c) NX Smart Switches (Wireless) shall have a single rocker switch with two momentary switches and provide lighting control functions as called out and shown on the plans.
d) NX Smart Switches (Wireless) shall be programmable with the following switch functions:
a) On/Off
b) On/Raise
c) Off/Lower
d) Raise
e) Lower
f) Timed-On
g) Scene

e) Construction:
a) Housing: Rugged, high impact, injection molded plastic
b) Mounting: Switches shall be capable of being mounted directly to wall surfaces using provided 3M Command™ Strip, and to single-gang and multi-gang wall boxes and shall be compatible with standard decorator style wall plates (not included).
c) Switches shall include a built-in level to ensure device is mounted properly.

f) Electrical:
a) Class 2 Low Voltage 24VDC
b) 3VDC, 5.4mA
c) Powered using CR2032 battery only

g) NX Smart Switches (Wireless) shall be available in White.

4. NX Audio Visual Interface Module
a) Basis of Design Product: NX Lighting Controls System, NXAVM Series Audio Visual Interface Module.
b) NX Audio Visual Interface Module shall enable third-party systems to digitally interface with an NX Lighting Controls System.
c) NX Audio Visual Interface Module shall provide an ASCII based command set to interface with third-party systems such as Audio-Visual systems to send commands to and receive query status from an NX system.
d) NX Audio Visual Interface Module shall feature a DB9 connector and support RS232 serial communication, providing control and status for a single zone.
e) NX Audio Visual Interface Module shall mount to a standard 4 11/16” junction box.

2.16 NETWORK AREA CONTROLLER

A. NX Area Controller

1. Basis of Design Product: NX Lighting Controls System, NX Area Controller V2 (NXAC2 Series).
2. NX Area Controller shall provide a simple and highly intuitive graphical user interface (GUI) to the NX Lighting Controls System via a personal computer.
3. NX Area Controller shall enable any PC with a standard web-browser to interface with the NX system through a built-in web server.
4. NX Area Controller shall enable system users to easily program, monitor and control (locally or remotely) the functions of the NX system.
5. NX Area Controller shall connect to the NX Network providing communication with the NX Room Controllers, NX Lighting Control Panels, NX SmartPORT™ Modules and other wired NX system components.
6. NX Area Controller shall have the ability to communicate by means of TCP/IP over Ethernet allowing enterprise connectivity between the NX Lighting Controls System and external LAN or WAN networks.
7. NX Area Controller shall be capable of communicating with Building Automation System via an embedded BACnet™ client using the BACnet IP protocol.
8. NX Area Controller shall enable the connection of multiple users simultaneously.
9. NX Area Controller shall enable secure remote connections over a cellular network.
10. NX Area Controller shall have a physical modem switch that can turn off remote cellular and Wi-Fi radios.
11. NX Area Controller shall feature user account/password management.
12. Construction:
    1. Design: Solid State – No moving parts
    2. 7.32” W x 2.6” H x 4.9” D (186mm x 66mm x 126mm)
    3. 2.9 LB (1.21 KG)
    4. Mounting: Wall or DIN rail mounting
    5. Housing Color: Black
13. Electrical:
    1. 100-240VAC, 50/60 Hz (AC Adapter included)
    2. Ethernet 10 base-T via NX Network cable, integral 2-port ethernet hub.
14. Functional:
    1. NX Area Controller shall function as a web server allowing the user interface to be accessible through a standard web browser.
    2. The installation of software shall not be required. At a minimum, the user interface shall provide the following functions:
        a) Automatic discovery of NX system devices
        b) Commissioning of devices into logical Areas and Zones, provide a minimum of 128 areas each with 128 zones
        c) Display the entire system in a logical navigation tree view
        d) Allow the user to name Zones, Groups, Presets, Schedules and individual loads
        e) Set up control functions for system inputs and outputs
        f) Monitor status and override individual relays and dimmers
        g) Set up and download schedules to panels and room controllers
        h) Monitor real-time power use at each room controller

2.17 NETWORK MODULES

1. NX Network Bridge Module
    a) Basis of Design Product: NX Lighting Controls System, NX Network Bridge Module.

b) NX Network Bridge Module shall allow multiple room controller zones to be networked with other NX system devices for whole building administration of lighting control functions.
c) NX Network Bridge Module housing shall measure 5.75" X 3.85" X 1.3"and be constructed of GSM UL rated 94 HB plastic approved for use in a return air plenum.
d) NX Network Bridge Module shall connect to and be powered from a room controller SmartPORT via a standard Cat5 cable.
e) NX Network Bridge Module shall provide RJ-45 ports for in and out connection points for an Ethernet based network.
f) NX Network Bridge Module shall provide a communication link between the room control devices and the NX system Area Controller via an Ethernet based network. At a minimum, the network link shall provide the following functionality through a web browser user interface:
    a) Report the current occupancy status for each lighting control zone
    b) Indicate the status of each relay and dimming channel
    c) Allow reconfiguration of system device input and output parameters
    d) Report the real time power consumption for each Room Controller
    e) Set up daylight harvesting for zones equipped with photocells
    f) Configure and download schedules to panels and Room Controllers

2. NX Network Radio Module
    a) Basis of Design Product: NX Lighting Controls System, NXRM2 Series Radio Module.
    b) NX Network Radio Module shall allow a luminaire equipped with the NXFM In-Fixture Module to be promoted wirelessly from standalone operation to full network participation.
    c) NX Network Radio Module shall plug into the SmartPORT™ connector on the NXFM In-Fixture Module and is mounted through a 1.25” aperture in the luminaire housing.
    d) NX Network Radio Module shall feature a low-profile housing for minimal visual impact.
    e) NX Network Radio Module shall feature an O-ring gasket to provide watertight seal to luminaire housing.
    f) NX Network Radio Module shall have an integrated and compact PCB F antenna and shall not require an external antenna.
    g) NX Network Radio Module shall integrate seamlessly into the NX Network.
    h) NX Network Radio Module shall have an RF frequency of 2.4GHz.
    i) NX Network Radio Module shall include Bluetooth and provide connection to the NX Network using the NX Lighting Controls App.

3. NX Network Interface Module:
    a) Basis of Design Product: NX Lighting Controls System, NXHDI Series Device Network Interface Module.
    b) NX Network Interface Module shall provide network connection and power to accessory components including NX Dry Contact Interface and NX SmartPORT Modules.
    c) NX Network Interface Module shall be discoverable by the NX Area Controller and controllable through web browser interface.
    d) NX Network Interface Module shall repeat network communication signal to extend network length.
    e) NX Network Interface Module shall feature integral link indicators confirming network segment status.
    f) NX Network Interface Module shall feature a power LED indicator confirming presence of accessory DC power on NX Network segment.
    g) NX Network Interface Module shall feature dual RJ45 NX Network input and output jacks to enable module to be inserted anywhere along the NX Network as needed.
    h) Construction:
        a) Extruded and sheet aluminum
        b) Weight: 6 oz (170.1g)

c) Mounting: 1.38” (35mm) DIN rail

i) Electrical:
   a) Input: 24VDC, 800mA max current via NX Network cable
   b) Output: 24VDC power supplied to connected accessory modules

j) NX Network Interface Module shall be Title 24 Compliant.

4. NX SmartPORT Module
   a) Basis of Design Product: NX Lighting Controls System, NX SmartPORT Module.
   b) NX SmartPORT Module shall provide the ability to easily connect smart switch stations, motion detectors, and daylight sensors into the NX network system.
   c) NX SmartPORT Module shall have (4) SmartPORTs each with (2) RJ45 connectors for convenient connection of multiple devices.
   d) Devices connected to the SmartPORT module shall be network visible and configurable to operate with panels and room controllers via the web browser user interface.
   e) NX SmartPORT Module shall be compatible with all NX Smart Switch Stations, NX Occupancy Sensors and NX Daylight Sensor.
   f) NX SmartPORT Module shall feature DIN rail mounting.
   g) NX SmartPORT Module shall be a low voltage device: 24VDC.

5. NX Dry Contact Interface Module
   a) Basis of Design Product: NX Lighting Controls System, NXDCIO Series Dry Contact Interface Module.
   b) NX Dry Contact Interface Module shall provide a simple way to incorporate standard dry contact inputs and outputs into the NX Lighting Controls System.
   c) NX Dry Contact Interface Module shall accommodate dry contact input closures from building automation, fire, security, and many other types of systems.
   d) NX Dry Contact Interface Module shall be programmable from the NX Area Controller.
   e) NX Dry Contact Interface Module shall feature (6) individually programmable dry contact inputs with or without pilots.
   f) NX Dry Contact Interface Module shall accommodate 2 and 3 wire inputs (momentary or maintained).
   g) NX Dry Contact Interface Module shall feature (6) individually programmable Form-C dry contact outputs.
   h) NX Dry Contact Interface Module shall have removable terminal blocks for easy connections.
   i) NX Dry Contact Interface Module shall feature DIN rail mounting.
   j) NX Dry Contact Interface Module shall be a low voltage device: 24VDC.

2.18 NETWORK ACCESSORIES

1. NX Bluetooth® Radio Bridge with Real Time Clock
   a) Basis of Design Product: NX Lighting Controls System, NXBTC Series Bluetooth Radio Controller.
   b) NX Bluetooth Radio Bridge with Real Time Clock shall provide a wireless communication bridge for communications via iOS® or Android™ smart device apps.
   c) NX Bluetooth Radio Bridge with Real Time Clock shall connect to and be powered by an NX SmartPORT™.
   d) NX Bluetooth Radio Bridge with Real Time Clock shall use Bluetooth technology allowing the radio to easily pair with a smart phone or tablet.
   e) NX Bluetooth Radio Bridge with Real Time Clock shall communicate with the NX system for setup and control from a smart device.
   f) NX Bluetooth Radio Bridge with Real Time Clock shall feature a real time clock and allow schedules to be downloaded and run in stand-alone NX Room Controller applications without a network.

g) NX Bluetooth Radio Bridge with Real Time Clock shall provide password protections for user access preventing unauthorized Bluetooth connection of a smart device.
h) NX Bluetooth Radio Bridge with Real Time Clock shall use Bluetooth Version 4.1.
i) NX Bluetooth Radio Bridge with Real Time Clock shall feature an LED status indicator for successful connections.
j) NX Bluetooth Radio Bridge with Real Time Clock shall have a RJ45 plug-in connection to NX SmartPORT.
k) NX Bluetooth Radio Bridge with Real Time Clock shall be a low voltage 24VDC device.
l) NX Bluetooth Radio Bridge with Real Time Clock shall be rated for return air plenum

2. NX Media Converter
   a) Basis of Design Product: NX Lighting Controls System, NXEOF Series Media Converter.
   b) NX Media Converter shall allow a transition from copper based ethernet to fiber.
   c) NX Media Converter shall support 10BASE-T, 100BASE-TX, 100BASE-FX and IEEE 802.3 specifications.
   d) NX Media Converter shall be a multimode converter and support up to 5km distance.
   e) NX Media Converter shall include and RJ45 port that supports full/half-duplex auto-negotiation and MDI/MDIX auto-crossover.
   f) NX Media Converter shall include LED indicators for RJ45 and fiber port status.
   g) NX Media Converter shall include a wall mounting kit.

3. NX Network PoE Switch
   a) Basis of Design Product: NX Lighting Controls System, NXPOE Series PoE Switch/Power Injector.
   b) NX Network PoE Switch shall provide the splitting of the Network network from the NX Area Controller into multiple segments.
   c) NX Network PoE Switch shall provide seven powered RJ45 ports for connection of NX network devices.
   d) NX Network PoE Switch shall provide multiple dimming options including DMX to less than 0.1%.
   e) NX Network PoE Switch shall expand the capacity of the NX Area Controller to 448 bridges suitable for large commercial and architectural interiors.

4. NX Energy Dashboard
   a) Basis of Design Product: NX Lighting Controls System, NX Energy Dashboard.
   b) NX Energy Dashboard shall provide real-time monitoring of energy consumption for the NX Lighting Controls System.
   c) NX Energy Dashboard shall provide monitoring for up to 300 zones.
   d) NX Energy Dashboard shall report out power and energy consumption for a specific, user selected zone.
   e) NX Energy Dashboard shall be able to export out consumption data in .csv format for third party applications.
   f) NX Energy Dashboard shall provide a wide range of reporting & monitoring intervals from less than an hour to multiple years.
   g) NX Energy Dashboard shall be able to manage user rights & permissions to access the dashboard portal.
   h) NX Energy Dashboard shall be able to manage system configuration changes and network settings.
   i) Construction:
      a) NX Energy Dashboard electronics shall be housed in a NEMA 1 polycarbonate enclosure suitable for surface wall mounting.
      b) NX Energy Dashboard enclosure shall measure 13.41"H x 11.41" W x 7.38" D and include a hinged locking door.
      c) NX Energy Dashboard enclosure shall be IP66 rated.

d) NX Energy Dashboard components shall be mounted inside the enclosure on flat panel, 35mm DIN rail.

j) Electrical:
   a) Input: 120-240VAC, 60Hz hard wired supply connection.

k) Networking & Software:
   a) N4 Niagara Operating System.
   b) 10-Base T Ethernet via (2) RJ-45 ports.
   c) (1) Micro USB for serial shell access.
   d) (1) Mini-B USB port
   e) 4GB Internal flash memory for storage

5. NX Forward and Reverse Phase Dimming Converter
   a) Basis of Design Product: NX Lighting Controls System, NX Forward and Reverse Phase Dimmer Converter.
   b) NX Forward and Reverse Phase Dimmer shall auto-sense forward and reverse phase dimming.
   c) NX Forward and Reverse Phase Dimmer shall dim standard 120V or 277V lighting loads.
   d) NX Forward and Reverse Phase Dimmer shall support up to 1300W max load.
   e) NX Forward and Reverse Phase Dimmer shall provide dual 0-10V input and output ports.
   f) NX Forward and Reverse Phase Dimmer shall provide an integrated 6.5ft flexible conduit.
   g) NX Forward and Reverse Phase Dimmer shall be compatible with NX Room Controllers, NX Lighting Control Panels and Low Voltage Dimming Switches.
   h) Construction:
      a) Housing: Anodized aluminum
      b) Size: 4.01" L x 5.52" W x 1.88" H
      c) Complies with requirements for use in a plenum area
      d) Mounting: Surface mount with screws
   i) Electrical:
      a) Input: 120/277VAC, 60Hz – Single feed input connection
      b) Output: 120/277VAC, 60Hz – Single feed output connection
      c) Low Voltage: Class 2, 0-10V Input and output
      d) Max Load Rating:
   1) 120VAC: 700W
   2) 277VAC – 1300W
      e) Min Load Rating: 24W
      f) Standby Power:
   1) 120VAC: 0.75W
   2) 277VAC: 1.87W
      g) Dimming:
   1) Class 2 / Class 1 (NOTE: Installation as Class 1 requires 600 volt insulation on dimming conductors sharing a conduit with line voltage conductors)

2.19 SOFTWARE INTERFACES

A. NX Area Controller Graphical User Interface (GUI):
   1. NX Area Controller GUI shall serve as a primary interface for the networked lighting system, providing communication with lighting control panels, room controllers, fixture modules, and other wired system components and through wireless access point to wireless room controllers and fixture modules.
   2. NX Area Controller GUI shall be accessible via conventional PC web browser through the NXAC Series Area Controller's built-in web server.
   3. NX Area Controller GUI shall enable users to program, monitor, and administer the NX Lighting Controls System from any location without additional software.

4. NX Area Controller GUI shall include an embedded BACnet IP client that is field configurable, enabling integration of the NX Lighting Controls System and a building automation system.

B. NX Lighting Controls App
1. NX Lighting Controls App shall provide Bluetooth® wireless setup and configuration of NX system devices and luminaires equipped with an NX In-Fixture Module and smart sensor.
2. NX Lighting Controls App shall be available in Android and iOS versions for free download from Google Play™ or Apple® App Store.
3. NX Lighting Controls App shall connect to NX devices via NXBTR/NXBTC modules, NXSMP/NXSMP2 sensors and radio modules via Bluetooth BLE.
4. NX Lighting Controls App shall enable easy setup and configuration of NX room devices and NX panels.
5. NX Lighting Controls App shall enable users to create custom schedules and presets.
6. NX Lighting Controls App shall be able to configure SpectraSync™ or SpectraClean™ enabled luminaires.
7. NX Lighting Controls App shall globally discover wireless enabled luminaires and devices.
8. NX Lighting Controls App shall include the IntelliSCOPE™ visual diagnostic tool for real-time calibration and testing of NX digital smart sensors.

2.20 CONDUCTORS AND CABLING

B. Power Supply Side of Remote-Control Power Sources: Comply with network manufacturer's requirements and requirements of Division 26 Section "Low-Voltage Electrical Power Conductors."

PART 3 - EXECUTION

3.1 EXAMINATION
A. Prior to installation, contractor shall examine work area to verify measurements, all wire type and routing requirements, and that commencing installation complies with manufacturer's requirements.
B. Where variations from the general specifications or drawings exist, the contractor shall request a clarification prior to rough in or installation

3.2 INSTALLATION
A. Lighting controls shall be installed in accordance with manufacturer’s instructions, guidelines and submittal documents provided by the lighting control manufacturer.
B. Lighting control system components shall only be installed in spaces that meet the following environmental conditions:
1. Temperature: 32 – 104 deg F (0 - 40 deg C).
2. Relative Humidity: 10 – 90 percent, noncondensing.
C. All stored and installed lighting control system components shall be adequately protected from dust and dirt.

3.3 SYSTEM STARTUP
A. The system manufacturer shall provide a factory authorized field engineer to the project site after installation has been completed and prior to system energization for the purpose of testing and adjustment of the system.

B. Factory field engineer shall test and verify all system functions and ensure proper operation of the system components in accordance with the specifications and on-site conditions. The installing contractor shall notify the system manufacturer in writing that the system is completely wired and ready to be energized

and tested 2 weeks prior to scheduling a field engineer for start-up of the system. Should the field engineer arrive on the job site and find the installation incomplete, the installing contractor shall pay the cost of any future visits by the field engineer required to complete the system start-up.

C. Factory field engineer shall provide a written report of test and outcomes.

3.4 DEMONSTRATION AND TRAINING

A. Factory field engineer shall instruct owner's staff on how to adjust, operate and maintain lighting systems; and provide instruction using the system software.
   1. Allow for up to 4 hours of on-site training on the use and maintenance of the lighting control system to be scheduled at the completion of startup and programming of the system.

3.5 TECHNICAL SUPPORT

A. Manufacturer shall provide reasonable access to factory direct telephone technical support during normal business hours.

END OF SECTION 26 09 43

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SECTION 26 27 16 ENCLOSURES

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. This specification includes enclosures to house electrical controls, instruments, terminal blocks, and serve as junction boxes where shown on the Plans.

1.02 SUBMITTALS:

A. Products shall be submitted in accordance with Section 26 05 00, and elsewhere in the Contract Documents, prior to installation.

1.03 MANUFACTURERS:

A. Enclosures shall be manufactured by Hoffman, Hammond, Tanco, Rittal, or equal.

PART 2 - PRODUCTS

2.01 STEEL:

A. Enclosures shall be fabricated from 14 gauge steel with seams that are continuously welded. Doors shall have full length piano hinges with the door removable by pulling the hinge pin.

B. A rolled lip shall be provided around three sides of the door and around all sides of the enclosure opening. The gasket shall be attached with oil-resistant adhesive and held in place with steel retaining strips. Exterior hardware, such as clamps, screws, and hinge pins, shall be of stainless steel for outdoor installations. A hasp and staple shall be provided for padlocking. Each enclosure shall have a print pocket. All wires entering or leaving the enclosure shall terminate on terminal strips. All wires and terminals shall be clearly identified as specified elsewhere in these specifications.

C. Finish shall be white enamel interior, light grey enamel, ANSI 61 exterior, over phosphatized surfaces. Special finishes and colors shall be furnished for wet locations. Plans should be checked for special conditions.

2.02 NEMA RATING:

A. Unless otherwise indicated on the Plans, enclosures shall be NEMA 12 for indoors, NEMA 4X for corrosive areas, and NEMA 3R for outdoor installations. NEMA 4X enclosures shall be stainless steel. NEMA 4 enclosures shall also be used in wet or wash down areas.

2.03 FIBERGLASS:

A. Enclosures shall be heavy-duty, compression molded, fiberglass reinforced polyester, high impact, heat resistant, NEMA 4X.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Enclosures shall be installed as indicated on the Plans, and according to manufacturer's instructions.

B. Enclosures shall be properly grounded and shall include ground straps connected to hinged doors and accessories.

END OF SECTION 26 27 16

SECTION 26 27 26 OUTLET, SWITCH, PULL AND JUNCTION BOXES

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. This section covers outlets, switches, pulls and junction boxes.

1.02 SUBMITTALS:

A. Products shall be submitted in accordance with Section 26 05 00, and elsewhere in the Contract Documents, prior to installation.

PART 2 – PRODUCTS:

2.01 Subject to compliance with the Contract Documents, the boxes shall be manufactured by Crouse-Hinds, Appleton, Steel City or equal.

2.02 BOXES:

A. Pull and junction boxes for indoor non-classified areas shall be 14 GA, galvanized steel with concentric knockouts on all four sides and flat cover fastened with screws. Boxes shall be NEMA 1 classification and UL listed.

B. Pull and junction boxes for wet areas shall be 14 GA steel with polyester power coating inside and out over phosphatized surfaces with seams continuously welded, ground smooth, no knockouts and stainless steel clamps on four sides and flat cover with oil resistant gasket. Boxes shall be NEMA 4 classification and UL listed.

C. Pull and junction boxes for corrosive areas shall be stainless steel with seams continuously welded, ground smooth, no knockouts, rolled lip around all sides, hinged door, captivated stainless steel door screws, and flat door with oil resistant gasket. Boxes shall be NEMA 4X classification and UL listed.

D. Outlet and switch boxes shall be cadmium plated, cast, ferrous, metal, with threaded hubs and mounting tabs for exposed wiring. For concealed wiring, outlet and switch boxes shall be hot-dip galvanized steel with grounding screws, plaster rings and barriers between switches in boxes with 277 V switches on opposite phases.

PART 3 – EXECUTION

3.01 INSTALLATION:

A. Install boxes in accordance with NEC rules and regulations.

B. Outlet and switch boxes for concealed wiring shall be mounted with manufactured or field fabricated brackets. Mounting brackets shall be submitted to the Engineer for review prior to installation.

END OF SECTION 26 27 26

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SECTION 26 56 00 LIGHTING

PART 1 - GENERAL

1.01 SCOPE OF WORK:

A. The Contractor shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish and install a fully operation lighting system per Contract Drawings and Specifications.

1.02 QUALITY ASSURANCE:

A. Reference Standards:
   1. National Electrical Code (NEC)
   2. UL Standard #57, Electric Lighting Fixtures
   3. Illuminating Engineering Society (IES)
   4. All applicable local lighting ordinances

B. Miscellaneous:
   1. Lamps are identified for each luminaire in the Lighting Fixture Schedule on the Plans.
   2. Lighting fixtures and electrical components:
      a. UL labeled, complete with lamps.
      b. Rated for area classification as indicated.
   3. Location of lighting fixtures on Plans are intended to be used as a guide.
      a. Field conditions may affect actual locations.
      b. Coordinate with other trades to avoid conflicts in mounting of fixtures and other equipment.
   4. The quality standard is established by the fixture listed in the Lighting Fixture Schedule.
      a. This quality standard includes, but is not necessarily limited to construction features, materials of construction, finish, and photometrics.

1.03 SUBMITTALS:

A. The following shall be submitted to the Engineer for review:
   1. Acknowledgment that products submitted meet requirements of standards referenced.
   2. Manufacturer's technical information on products to be used including photometric performance curves for the fixture and ballast data.
   3. Acknowledgment that products submitted are UL or ETL listed.
   4. When general data sheets constitute part of the submittal, identify the products to be used on this project.
   5. Manufacturer's installation instructions.
   6. Identification of fixtures by Lighting Fixture Schedule.
   7. UL nameplate data (Voltage, wattage, etc.).
   8. Finishes, colors, and mounting type.
   9. Pole, fixture, and accessories.
   10. Pole wind loading.
   11. Fixture IES files
   12. LED Luminaire Warranty.

B. Contractor shall submit shop drawings, manufacturer's data sheets, and a complete wiring diagram detailing all connections to the electrical system in accordance with Section 26 05 00, and other requirements of the Contract Documents.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

A. LEDs shall be manufactured by North American/Phillips, Nichia, or equal.

B. Lighting fixtures shall be provided as indicated on the Lighting Fixture Schedule on the Plans.

C. Lighting drivers shall be manufactured by Philips, Advance, Jefferson, Universal, Bodine, Lithonia, or equal.

D. Light poles shall be as indicated on the Plans. pole grounding lug and handhole. Pole foundations shall be as indicated on the Plans.

E. Lighting fixtures shall be manufactured by Hubbell, Kim, Columbia, or approved equal.

F. Manufacturer shall have been in operation for a minimum of 10 years.

2.02 MATERIALS:

A. General:

1. Lamps:
   a. See lighting fixture schedule on Plans for wattage, voltage and number required.
2. All Fixtures:
   a. There shall be no live parts normally exposed to contact.
   b. When intended for use in wet area:
      (1) Mark fixtures "suitable for wet locations."
   c. When intended for use in damp areas:
      (1) Mark fixtures "suitable for damp locations" or "suitable for wet locations."
   d. In wet or damp area, install fixtures so that water cannot enter or accumulate in the wiring compartment, lampholder, or other electrical parts.
   e. Gasket seals: Urethane foam
   f. Diffusers: UV stabilized acrylic plastic
3. Underground wiring:
   a. Provide all wiring runs with separate green grounding conductor.
   b. Ground all pole bases.
4. Pole wiring from base to driver:
   a. No. 12 type XHHW.
   b. Each phase shall be protected by a 30A, 600V, type Tron waterproof fuseholder, Bussman "Limitron" type fuse, size rating 3-times load current.

2.03 FIXTURES:

A. Light Emitting Diode (LED) Fixtures:

1. Drivers for Light emitting Diode (LED) fixtures shall be pole mounted manufactured by Hubbell, http://www.hubbell.com or approved equal.
   a. Type: Solid State
   b. Operates at 50-60Hz with a power factor greater than 95%
   c. 10Kv surge suppression
   d. Power supply shall operate between -40°F to +140°F.
   e. Vibration test to ANSI C136.31-2001 for Roadway Luminaire Vibration.
   f. Salt fog tested to ASTM B117 for a minimum of 1,000 hours.
   g. Intrusion Protection 66
   h. Integral heat sink
   i. Optical system (Full cut-off)

j. Lumen maintenance factor of L94 or better after 60,000 hours in a 40°C ambient environment
k. Manufacturer shall provide a In Situ thermal Report at 50°C
l. Driver case temperature shall not exceed driver manufactures max TC rating while operating in the fixture in a 50°C ambient environment.
m. LED junction temp shall not exceed LED chip manufactures max limit per the LM80 report while operating in the fixture in a 50°C ambient environment.

B. Exterior lighting control:
1. Exterior fixtures shall be controlled by the exitsing Hubbell wiScape system.

C. Interior lighting control:
2. Interior fixtures shall be controlled by the exitsing Hubbell NX system.

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install lamps in all luminaires.

B. Replace all failed LED lamps with new lamps prior to final acceptance by Owner.

C. Provide mounting brackets and/or structural mounting support for fixtures.
1. Do not support fixture from conduit system.
2. Do not support fixture from outlet boxes.

D. Install with approved mounting hardware following manufacturer's recommendations.

E. All penetrations required for installation of pendant mounted fixtures and associated conduit/box supports in garage shall have ground penetrating radar (GPR) scans completed prior to construction.

F. Pole mounted fixtures shall be mounted on concrete poles as indicated on the Plans. All poles shall be bonded to the facility ground system. Poles shall have adequate handholes where indicated.

G. Fixture mounting heights and locations indicated on the Plans are approximate and are subject to revision in the field where necessary to avoid conflicts and obstructions.

H. Spare Parts:
1. Provide 1 for every 100 of each type and rating installed. Furnish at least one of each luminaire family.
2. Provide spare globes and guards, 1 for every 100 of each type
3. Provide 1% spare replaceable LED lamp modules for each primary fixture series type in fixture schedule.
4. Provide spare LED drivers, 1 for every 100 of each primary fixture series
5. Provide 1% spare LED luminaires with non-replaceable lamp modules consisting of entire LED luminaire assembly and driver(s)
6. Provide 10% additional cost of fixture count discrepancies. This should be used for budgetary purposes only with no additional cost to the Owner
7. Spare LED lamp module shall be delivered to Owner in new condition and in original packaging
8. Manufacturer and model numbers shall match those installed in the project

I. Training
   1. Contractor shall provide owner with 3 complete copies of a set of Operations and Maintenance manuals.
      a. All "Approved as Noted" comments shall be corrected/picked-up in this record manual set.
      b. Each manual shall contain specific information pertaining to the equipment that was installed
      c. Each manual shall have
   2. Luminaires cut sheets
   3. Control gear/ballasts/drivers
   4. Lamps Contractor shall provide qualified personnel onsite to provide a minimum of three days of training to Owner's representatives.
   5. Training shall cover luminaire use and maintenance, Architectural lighting system use and Group re-lamping cycles.

3.02 ADJUSTING AND CLEANING:

A. Wipe all lighting fixture reflectors, lenses, lamps, and trims clean after installation and prior to acceptance of Project by Owner.

END OF SECTION 26 56 00