PART VI

CONTRACT AGREEMENT

THIS AGREEMENT, made on the 7th day of February, 20 24, by and between **Lexington-Fayette Urban County Government**, acting herein called "OWNER" and **Swift Roofing of E-town Inc.**, doing business as a corporation located in the City of Elizabethtown, County of Hardin, and State of Kentucky, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of one million one hundred thirty-nine thousand six hundred forty Dollars and No Cents ($1,139,640.00) quoted in the proposal by the CONTRACTOR, dated February 7, 2024, hereby agree to commence and complete the construction described as follows:

1. SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefore as prepared by Patrick D. Murphy Architects for the **Government Center Annex and Police Headquarters Roof Replacement** project.

2. TIME OF COMPLETION

The time estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as two hundred ten (210) calendar days to substantial completion and thirty (30) additional calendar days to final completion, for a total of two hundred forty (240) calendar days. The time shall begin in accordance with the Notice to Proceed provided by OWNER.

3. ISSUANCE OF WORK ORDERS

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined after consultation between the CONTRACTOR and the OWNER.

4. THE CONTRACT SUM

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Contract, as quoted in the proposal, subject to any additions and deductions, as provided therein.

5. PROGRESS PAYMENTS

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, less the aggregate of previous payments.

6. ACCEPTANCE AND FINAL PAYMENT

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

Before issuance of final certificate, the CONTRACTOR shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the Work has been paid.

If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the CONTRACTOR, the OWNER shall without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

7. THE CONTRACT DOCUMENTS

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, any and all Addenda, and Proposal, Ion Wave Q&A, and Plan Drawings form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

8. EXTRA WORK

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

9. THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS):

SPECIFICATIONS

SECTION NO.	TITLE
I	Advertisement for Bids
II	Information for Bidders
III	Form of Proposal
IV	General Conditions
V	Special Conditions
VI	Contract Agreement
VII	Performance and Payment Bonds
VIII	Addenda
IX	Technical Specifications and Drawings

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

ATTEST:

Deputy Clerk of the Urban County Council

(Witness)

(Seal)

(Secretary)*

(Witness)

Lexington-Fayette Urban County Government.
Lexington, Kentucky
(Owner)

BY: Linda Gorton
MAYOR

Mayor
(Title)

Swift Roofing of E-Town, Inc.
(Contractor)

BY: Greg Swift

President
(Title)

108 S Park Cir. Elizabethtown, KY 42701
(Address and Zip Code)

IMPORTANT: *Strike out any non-applicable terms.

Secretary of the Owner should attest. If the CONTRACTOR is corporation, Secretary should attest. Give proper title of each person-executing Contract.

GREAT AMERICAN INSURANCE COMPANY®

Administrative Office: 301 E 4TH STREET • CINCINNATI, OHIO 45202 • 513-369-5000 • FAX 513-723-2740

The number of persons authorized by this power of attorney is not more than TWELVE

No. 0 21513

POWER OF ATTORNEY

KNOW ALL MEN BY THESE PRESENTS: That the GREAT AMERICAN INSURANCE COMPANY, a corporation organized and existing under and by virtue of the laws of the State of Ohio, does hereby nominate, constitute and appoint the person or persons named below, each individually if more than one is named, its true and lawful attorney-in-fact, for it and in its name, place and stead to execute on behalf of the said Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; provided that the liability of the said Company on any such bond, undertaking or contract of suretyship executed under this authority shall not exceed the limit stated below.

Name		Address	Limit of Power
WILLIAM A. KANTLEHNER,III	ANDREA CORTES	ALL OF	ALL
THOMAS J. MITCHELL	WILLIAM A. KANTLEHNER,IV	LOUISVILLE, KENTUCKY	$100,000,000
RYAN P. MITCHELL	ELIZABETH DAWSON		
DIANE L. PHELPS	ADAM TERRY		
CHRISTOPHER E. VON ALLMEN	ANDREW O. MUCCI		
ANDREW G. WINDHORST, JR.	KEVIN H. BOWLING		

This Power of Attorney revokes all previous powers issued on behalf of the attorney(s)-in-fact named above.

IN WITNESS WHEREOF the GREAT AMERICAN INSURANCE COMPANY has caused these presents to be signed and attested by its appropriate officers and its corporate seal hereunto affixed this 23RD day of JANUARY , 2023 .

Attest

GREAT AMERICAN INSURANCE COMPANY

Assistant Secretary

Divisional Senior Vice President

MARK VICARIO (877-377-2405)

STATE OF OHIO, COUNTY OF HAMILTON - ss:

On this 23RD day of JANUARY , 2023 , before me personally appeared MARK VICARIO, to me known, being duly sworn, deposes and says that he resides in Cincinnati, Ohio, that he is a Divisional Senior Vice President of the Bond Division of Great American Insurance Company, the Company described in and which executed the above instrument; that he knows the seal of the said Company; that the seal affixed to the said instrument is such corporate seal; that it was so affixed by authority of his office under the By-Laws of said Company, and that he signed his name thereto by like authority.

SUSAN A KOHORST
Notary Public
State of Ohio
My Comm. Expires
May 18, 2025

This Power of Attorney is granted by authority of the following resolutions adopted by the Board of Directors of Great American Insurance Company by unanimous written consent dated June 9, 2008.

RESOLVED: That the Divisional President, the several Divisional Senior Vice Presidents, Divisional Vice Presidents and Divisonal Assistant Vice Presidents, or any one of them, be and hereby is authorized, from time to time, to appoint one or more Attorneys-in-Fact to execute on behalf of the Company, as surety, any and all bonds, undertakings and contracts of suretyship, or other written obligations in the nature thereof; to prescribe their respective duties and the respective limits of their authority; and to revoke any such appointment at any time.

RESOLVED FURTHER: That the Company seal and the signature of any of the aforesaid officers and any Secretary or Assistant Secretary of the Company may be affixed by facsimile to any power of attorney or certificate of either given for the execution of any bond, undertaking, contract of suretyship, or other written obligation in the nature thereof, such signature and seal when so used being hereby adopted by the Company as the original signature of such officer and the original seal of the Company, to be valid and binding upon the Company with the same force and effect as though manually affixed.

CERTIFICATION

I, STEPHEN C. BERAHA, Assistant Secretary of Great American Insurance Company, do hereby certify that the foregoing Power of Attorney and the Resolutions of the Board of Directors of June 9, 2008 have not been revoked and are now in full force and effect.

Signed and sealed this 7th day of February , 2024 .

Assistant Secretary

S1029AH (03/20)

PART VII

PERFORMANCE BOND

Bond No. 3850891

KNOW ALL MEN BY THESE PRESENTS, that

Swift Roofing of E'Town, Inc.
(Name of CONTRACTOR)

108 South Park Circle, Elizabethtown, KY 42701
(Address of CONTRACTOR)

a Corporation, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and Great American Insurance Company
(Name of Surety)

301 E. 4th Street, Cincinnati, OH 45202
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

hereinafter called "OWNER" in the penal sum of: One million one hundred thirty nine thousand six hundred forty and 00/100 Dollars, ($ 1,139,640.00), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for Government Center Annex and Police Headquarters Roof Replacement in accordance with drawings and specifications prepared by: **(the Engineer)** which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever, Principal shall be, and declared by OWNER to be in default under the Contract, the OWNER having performed OWNER'S obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

(1) Complete the Contract in accordance with its terms and conditions or

(2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the OWNER elects, upon determination by the OWNER and Surety jointly of the lowest responsible bidder, arrange for a Contract between such bidder and OWNER, and make available as Work progresses (even though there may be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract Price", as used in this paragraph shall mean the total amount payable by OWNER to Principal under the Contract and any amendments thereto, less the amount properly paid by OWNER to Principal.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREOF, this instrument is executed in 3 (three) (number) each one of which shall be deemed an original, this the 7th day of February, 20 24.

ATTEST:

(Principal) Secretary

Swift Roofing of E'Town, Inc.
Principal

BY: (s)

108 South Park Circle
(Address)
Elizabethtown, KY 42701

Witness as to Principal

108 South Park Circle
(Address)
Elizabethtown, Ky 42701

Great American Insurance Company
Surety

BY:
Andrew G. Windhorst, Jr., Attorney-in-Fact

301 E. 4th Street
(Address)
Cincinnati, OH 45202

ATTEST:

(Surety) Secretary Elizabeth Dawson

(SEAL)

Witness as to Surety Kevin H. Bowling
1601 Alliant Avenue
(Address)
Louisville, KY 40299

TITLE: Andrew G. Windhorst, Jr., Attorney-In-Fact
Surety

BY:

TITLE: Kevin H. Bowling, Attorney-In-Fact

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

PART VII

PAYMENT BOND Bond No. 3850891

KNOW ALL MEN BY THESE PRESENT: that

Swift Roofing of E'Town, Inc.

(Name of Contractor)

108 South Park Circle, Elizabethtown, KY 42701

(Address of Contractor)

a Corporation, hereinafter

(Corporation, Partnership or Individual)

called Principal, and Great American Insurance Company

(Name of Surety)

301 E. 4th Street, Cincinnati, OH 45202

(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called OWNER, for the use and benefit of claimants as hereinafter defined, in the amount of One million one hundred thirty nine thousand six hundred forty and 00/100 Dollars ($ 1,139,640.00) the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for Government Center Annex and Police Headquarters Roof Replacement in accordance with drawings and specifications prepared by: (the Engineer) which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:

   (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

   (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

   (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in 3 (three) (number) counterparts, each one of which shall be deemed an original, this the 7th day of February, 20 24.

ATTEST:

(Principal) Secretary

(SEAL)

Swift Roofing of E'Town, Inc.
(Principal)

BY: (s)

108 South Park Circle
(Address)
Elizabethtown, KY 42701

(Witness to Principal)

108 SOUTH PARK CIRCLE
(Address)
ELIZABETHTOWN, KY 42701

Great American Insurance Company
(Surety)

ATTEST:

BY:
(Attorney-in-Fact) Andrew G. Windhorst, Jr.

(Surety) Secretary Elizabeth Dawson

(SEAL)

Witness as to Surety Kevin H. Bowling
1601 Alliant Avenue
(Address)
Louisville, KY 40299

301 E. 4th Street
(Address)
Cincinnati, OH 45202

Andrew G. Windhorst, Jr., Attorney-in-Fact

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

END OF SECTION

CONTRACT DOCUMENTS
AND
SPECIFICATIONS

DEPARTMENT OF GENERAL SERVICES

FOR

Government Center Annex and Police Headquarters Roof Replacement

Bid No. 1-2024

Prepared by: Patrick D. Murphy Architects

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PART 1

ADVERTISEMENT FOR BIDS

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PART 1

ADVERTISEMENT FOR BIDS

1. INVITATION

Sealed proposals for the **Government Center Annex and Police Headquarters Roof Replacement** will be received by the Lexington-Fayette Urban County Government (LFUCG) via Ion Wave until 2:00 p.m., local time, **January 31, 2024**, for furnishing all labor and/or materials and performing all work as set forth by this advertisement, Ion Wave Q&A, conditions (general and special), specifications, and/or the drawings prepared by Patrick D. Murphy Architects. for Lexington-Fayette Urban County Government. Immediately following the scheduled closing time for reception of bids, all proposals which have been submitted in accordance with the above will be opened electronically and a bid tab sheet will be posted via Ion Wave.

LFUCG will only be accepting bids on-line through Ion Wave for this solicitation. Base bid and alternate totals (if required) should be provided on the appropriate line items tab on Ion Wave. Submissions without line item totals (if required) may be rejected and deemed non-responsive. All forms normally provided with bid submission should be downloaded from Ion Wave, filled out and attached with bid submission. A copy of bid bond must be included with submission. THESE INSTRUCTIONS SUPERCEDE ALL OTHER BID SUBMISSION INSTRUCTIONS PROVIDED IN THIS PACKAGE. PLEASE SUBMIT ALL QUESTIONS VIA THE Q&A MODULE ON ION WAVE.

2. DESCRIPTION OF WORK

Consisting of the construction and/or furnishing of items as listed in the Bid Schedule beginning on page P-6, Part III, Form of Proposal, of this document, for the Government Center Annex and Police Headquarters Roof Replacement, Lexington-Fayette County, Kentucky.

Specs and drawings are available on Ion Wave only.

3. OBTAINING PLANS, SPECIFICATIONS, AND BID DOCUMENTS

Plans, Specifications, and Contract Documents shall be obtained from Ion Wave (LFUCG's electronic bidding system). Ion Wave can be accessed at https://lexingtonky.ionwave.net

4. METHOD OF RECEIVING BIDS

Bids will be received from Prime Contracting firms on a **Lump Sum** for total Project. Bidder must include a price for all bid items to be considered. **Bids shall be submitted in the manner and subject to the conditions as set forth and described in the Information for Bidders and Special Conditions.**

Bids/proposals should be submitted online via Ion Wave.

5. METHOD OF AWARD

The Contract, if awarded, will be to the lowest responsive and responsible bidder for the total project whose qualifications indicate the award will be in the best interest of the OWNER and whose bid/proposal complies with all the prescribed requirements. No Notice of Award will be given until the OWNER has concluded such investigation as deemed necessary to establish the responsibility, qualifications and financial ability of Bidders to do the work in accordance with the Contract Documents to the satisfaction of the OWNER within the time prescribed. The OWNER reserves the right to reject the Bid of any Bidder who does not pass such investigation to the OWNER's satisfaction. The OWNER reserves the right to reject the Bid of any Bidder that is deemed to be unbalanced or front loaded. In analyzing Bids, the OWNER may take into consideration alternate and unit prices, if requested by the Bid forms.

6. BID WITHDRAWAL

No bidder may withdraw his bid for a period of ninety (90) calendar days after the closing date for receipt of bids. Errors and omissions will not be cause for withdrawal of bid without forfeit of bid bond.

7. BID SECURITY

If the bid is $50,000 or greater, bid shall be accompanied by a certified check or bid bond payable to the Lexington-Fayette Urban County Government in an amount not less than Five Percent (5%) of the base bid. Bid bond shall be executed by a Surety Company authorized to do business in the Commonwealth of Kentucky and countersigned by a licensed Kentucky Resident Agent, representing the Surety Company. Bid Bonds are not required for bids under $50,000. A cashier's check or irrevocable letter of credit is an acceptable form of bid security.

8. SUBMISSION OF BIDS

CONTRACTORS shall submit their bids via Ion Wave not later than 2:00 p.m. local time, **January 31, 2024**. Bid submittals and bid tab sheet will be immediately available after bid opening.

9. RIGHT TO REJECT

The Lexington-Fayette Urban County Government reserves the right to reject any and all bids and to waive all informalities and/or technicalities where the best interest of the Lexington-Fayette Urban County Government may be served.

10. NOTIFICATION TO THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT FOR AFFIRMATIVE ACTION PLAN AND CURRENT WORKFORCE

The successful bidder must submit the following to the Lexington-Fayette Urban County Government:

1. Affirmative Action Plan for his/her firm.
2. Current Workforce Analysis Form

Failure to submit this as required herein may result in disqualification of the Bidder from the award of the contract.

11. NOTICE CONCERNING MWDBE and Veteran Goals

Notice of requirement for Affirmative Action to ensure Equal Employment Opportunities and Disadvantaged Business Enterprises (DBE) Contract participation. Disadvantaged Business Enterprises (DBE) consists of Minority-Owned Business Enterprises (MBE) and Woman-Owned Business Enterprises (WBE).

The Lexington-Fayette Urban County Government has set a goal that not less than ten percent (10%) of the total value of this Contract be subcontracted to Disadvantaged Business Enterprises, which is made up of MBEs and WBEs, and set a goal that not less than three percent (3%) of the total value of this Contract be subcontracted to Veteran-Owned Small Businesses. The goals for the utilization of Disadvantaged Business Enterprises and Veteran-Owned Small Businesses as subcontractors are recommended goals. Contractor(s) who fail to meet such goals will be expected to provide written explanations to the Director of the Division of Purchasing of efforts they have made to accomplish the recommended goal, and the extent to which they are successful in accomplishing the recommended goal will be a consideration in the procurement process. Depending on the funding source, other DBE goals may apply.

For assistance in locating Disadvantaged Business Enterprise and Veteran-Owned Small

Businesses as Subcontractors contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, 3rd Floor, Room 338
Lexington, Kentucky 40507
859-258-3323
smiller@lexingtonky.gov

12. AMERICAN RESCUE PLAN ACT

AMENDMENT 1 —
CERTIFICATION OF COMPLIANCE FOR EXPENDITURES USING FEDERAL FUNDS, INCLUDING THE AMERICAN RESCUE PLAN ACT

The Lexington-Fayette Urban County Government ("LFUCG") may use Federal funding to pay for the goods and/or services that are the subject matter of this bid. That Federal funding may include funds received by LFUCG under the American Rescue Plan Act of 2021. Expenditures using Federal funds require evidence of the contractor's compliance with Federal law. Therefore, by the signature below of an authorized company representative, you certify that the information below is understood, agreed, and correct. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

The bidder (hereafter "bidder," or "contractor") agrees and understands that in addition to all conditions stated within the attached bid documents, the following conditions will also apply to any Agreement entered between bidder and LFUCG, if LFUCG uses Federal funds, including but not limited to funding received by LFUCG under the American Rescue Plan Act ("ARPA"), toward payment of goods and/or services referenced in this bid. The bidder also agrees and understands that if there is a conflict between the terms included elsewhere in this Request for Proposal and the terms of this Amendment 1, then the terms of Amendment 1 shall control. The bidder further certifies that it can and will comply with these conditions, if this bid is accepted and an Agreement is executed:

1. Any Agreement executed as a result of acceptance of this bid may be governed in accordance with 2 CFR Part 200 and all other applicable Federal law and regulations and guidance issued by the U.S. Department of the Treasury.

2. Pursuant to 24 CFR § 85.43, any Agreement executed as a result of acceptance of this bid can be terminated if the contractor fails to comply with any term of the award. This Agreement may be terminated for convenience in accordance with 24 CFR § 85.44 upon written notice by LFUCG. Either party may terminate this Agreement with thirty (30) days written notice to the other party, in which case the Agreement shall terminate on the thirtieth day. In the event of termination, the contractor shall

be entitled to that portion of total compensation due under this Agreement as the services rendered bears to the services required. However, if LFUCG suspects a breach of the terms of the Agreement and/or that the contractor is violating the terms of any applicable law governing the use of Federal funds, LFUCG may suspend the contractor's ability to receive payment by giving thirty (30) days' advance written notice. Further, either party may terminate this Agreement for cause shown with thirty (30) days written notice, which shall explain the party's cause for the termination. If the parties do not reach a settlement before the end of the 30 days, then the Agreement shall terminate on the thirtieth day. In the event of a breach, LFUCG reserves the right to pursue any and all applicable legal, equitable, and/or administrative remedies against the contractor.

3. The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, sexual orientation, gender identity, or national origin. The contractor will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, or national origin. Such action shall include, but not be limited to the following:

(1) Employment, upgrading, 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 agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided setting forth the provisions of this nondiscrimination clause.
(2) The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, sexual orientation, gender identity, or national origin.
(3) The contractor will not discharge or in any other manner discriminate against any employee or applicant for employment because such employee or applicant has inquired about, discussed, or disclosed the compensation of the employee or applicant or another employee or applicant. This provision shall not apply to instances in which an employee who has access to the compensation information of other employees or applicants as a part of such employee's essential job functions discloses the compensation of such other employees or applicants to individuals who do not otherwise have access to such information, unless such disclosure is in response to a formal complaint or charge, in furtherance of an investigation, proceeding, hearing, or action, including an investigation conducted by the employer, or is consistent with the contractor's legal duty to furnish information.
(4) The contractor will send to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding a notice to be provided advising the said labor union or workers' representatives of the contractor's commitments under this section and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
(5) The contractor will comply with all provisions of Executive Order 11246 of September 24, 1965, and of the rules, regulations, and relevant orders of the Secretary of Labor.
(6) The contractor will furnish all information and reports required by Executive Order 11246 of September 24, 1965, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto, and will permit access to his books, records, and accounts by the

administering agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(7) In the event of the contractor's noncompliance with the nondiscrimination clauses of this contract or with any of the said rules, regulations, or orders, this contract may be canceled, terminated, or suspended in whole or in part, and the contractor may be declared ineligible for further government contracts or federally assisted construction contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(8) The contractor will include the portion of the sentence immediately preceding paragraph (1) and the provisions of paragraphs (1) through (8) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each subcontractor or vendor. The contractor will take such action with respect to any subcontract or purchase order as the administering agency may direct as a means of enforcing such provisions, including sanctions for noncompliance.

Provided, however, that in the event a contractor becomes involved in or is threatened with litigation with a subcontractor or vendor as a result of such direction by the administering agency, the contractor may request the United States to enter into such litigation to protect the interests of the United States.

4. If fulfillment of the contract requires the contractor to employ mechanic's or laborers, the contractor further agrees that it can and will comply with the following:

(1) Overtime requirements: No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such a workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such a workweek.

(2) Violation: liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (1) of this section, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory) for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this section.

(3) Withholding for unpaid wages and liquidated damages. LFUCG shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work

Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower-tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower-tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this section.

5. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Act, as amended, 42 U.S.C. § 7401 et seq.

6. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.

7. The contractor shall include these requirements in numerical paragraphs 5 and 6 in each subcontract exceeding $100,000 financed in whole or in part with Federal funding.

8. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

9. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency Regional Office.

10. The contractor shall include these requirements in numerical paragraphs 8 and 9 in each subcontract exceeding $100,000 financed in whole or in part with Federal funds.

11. The contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Federal Water Pollution Control Act, as amended, 33 U.S.C. § 1251 et seq.

12. The contractor shall report each violation to LFUCG and understands and agrees that LFUCG will, in turn, report each violation as required to assure notification to the Treasury Department and the appropriate Environmental Protection Agency regional office.

13. The contractor shall include these requirements in numerical paragraphs 11 and 12 in each subcontract exceeding $100,000 financed in whole or in part with American Rescue Plan Act funds.

14. The contractor shall include this language in any subcontract it executes to fulfill the terms of this bid: "the sub-grantee, contractor, subcontractor, successor, transferee, and assignee shall comply with Title VI of the Civil Rights Act of 1964, which prohibits recipients of federal financial assistance from excluding from a program or activity, denying benefits of, or otherwise discriminating against a person on the basis of race, color, or national origin (42 U.S.C. § 2000d et seq.), as implemented by

the Department of the Treasury's Title VI regulations, 31 CFR Part 22, which are herein incorporated by reference and made a part of this contract (or agreement). Title VI also includes protection to persons with 'Limited English Proficiency' in any program or activity receiving federal financial assistance, 42 U.S.C. § 2000d et seq., as implemented by the Department of the Treasury's Title VI regulations, 31 CFR Part 22, and herein incorporated by reference and made a part of this contract or agreement."

15. Contractors who apply or bid for an award of $100,000 or more shall file the required certification that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency. Each tier certifies to the tier above that it will not and has not used federal appropriated funds to pay any person or organization for influencing or attempting to influence an officer or employee of any agency, a member of Congress, officer or employee of Congress, or an employee of a member of Congress in connection with obtaining any federal contract, grant, or any other award covered by 31 U.S.C. § 1352. Each tier shall also disclose any lobbying with non-federal funds that takes place in connection with obtaining any federal award. Such disclosures are forwarded from tier to tier, up to the recipient. The required certification is included here:

a. The undersigned certifies, to the best of his or her knowledge and belief, that:
   (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
   (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
   (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify and disclose accordingly.

b. This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

16. The contractor acknowledges and certifies that it has not been debarred or suspended and further acknowledges and agrees that it must comply with regulations regarding debarred or suspended entities in accordance with 24 CFR § 570.489(l). Funds may not be provided to excluded or disqualified persons.

17. The contractor agrees and certifies that to the greatest extent practicable, it will prefer the purchase, acquisition, and use of all applicable goods, products or materials produced in the United States, in conformity with 2 CFR 200.322 and/or section 70914 of Public Law No. 117-58, §§ 70901-52, also known as the Infrastructure Investment and Jobs Act, whichever is applicable.

18. The contractor agrees and certifies that all activities performed pursuant to any Agreement entered as a result of the contractor's bid, and all goods and services procured under that Agreement, shall comply with 2 C.F.R. § 200.216 (Prohibition on certain telecommunications and video surveillance services and equipment) and 2 C.F.R. 200 § 200..323 (Procurement of recovered materials), to the extent either section is applicable.

19. If this bid involves construction work for a project totaling $10 million or more, then the contractor further agrees that all laborers and mechanics, etc., employed in the construction of the public facility project assisted with funds provided under this Agreement, whether employed by contractor, or contractor's contractors, or subcontractors, shall be paid wages complying with the Davis-Bacon Act (40 U.S.C. 3141-3144). Contractor agrees that all of contractor's contractors and subcontractors will pay laborers and mechanics the prevailing wage as determined by the Secretary of Labor and that said laborers and mechanics will be paid not less than once a week. The contractor agrees to comply with the Copeland Anti- Kick Back Act (18 U.S.C. § 874) and its implementing regulations of the U.S. Department of Labor at 29 CFR part 3 and part 5. The contractor further agrees to comply with the applicable provisions of the Contract Work Hours and Safety Standards Act (40 U.S.C. Section 327-333), and the applicable provisions of the Fair Labor Standards Act of 1938, as amended (29 U.S.C. et seq.). Contractor further agrees that it will report all suspected or reported violations of any of the laws identified in this paragraph to LFUCG.

_____ _____

Signature Date

13. PRE-BID CONFERENCE

A pre-bid conference is scheduled for January 17, 2024, 1:00 p.m. at 150 E Main St, 3rd Floor Conference Room, Lexington, KY.

END OF SECTION

PART II

INFORMATION FOR BIDDERS

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PART II

INFORMATION FOR BIDDERS

1. RECEIPT AND OPENING OF BIDS

The Lexington-Fayette Urban County Government (herein called the OWNER) invites bids from firms on the project described in the Advertisement for Bids. The OWNER will receive bids via Ion Wave, at the time and in the manner set forth in the Advertisement for Bids, and the Bids. The OWNER may consider informal any bid not prepared and submitted in accordance with the provisions hereof and may waive any informalities or reject any and all bids. Any bid may be withdrawn prior to the scheduled time for the opening of bids or authorized postponement thereof. Any bid received after the time and date specified shall not be considered. No bidder may withdraw a bid within 120 days after the actual time and date of the bid opening, but OWNER may, in its sole discretion, release any bid and return the Bid Security prior to that date.

The Lexington-Fayette Urban County Government assumes no responsibility for bids that are not delivered as indicated above.

2. PREPARATION OF BID

The bid must be submitted with the entire proposal and include all pages. All blank spaces for the bid prices must be filled in, either in ink or typewritten, for both unit prices and extensions. Totals for each bid item must be added to show the total amount of the bid.

3. REQUIRED BONDS

The bonds required for this project are bid bond and performance and payment bond.

4. SUBCONTRACTS

The bidder is specifically advised that any person, firm, or other party to whom it is proposed to award a subcontract under this Contract must be acceptable to the OWNER. All proposed subcontractors must be identified on the Form of Proposal. Prior to the award of Contract, the OWNER or the OWNER'S representative will advise the CONTRACTOR of the acceptance and approval thereof or of any action necessary to be taken. Should any Subcontractor be rejected by the OWNER, the CONTRACTOR shall present a new name and/or firm to the OWNER at no change in the Contract Price.

5. QUALIFICATION OF BIDDER

The OWNER may make such investigations as the OWNER deems necessary to determine the ability of the bidder to perform the Work, and the bidder shall furnish to the OWNER all such information and data for this purpose as the OWNER may request.

The OWNER reserves the right to reject any bid if the evidence submitted by, or investigation of, such bidder fails to satisfy the OWNER that such bidder is properly qualified to carry out the obligations of the Contract and to complete the Work contemplated therein. Conditional bids will not be accepted.

In evaluating Bids, OWNER shall consider the qualifications of the BIDDERS, whether or not the Bids comply with the prescribed requirements, and alternatives and unit prices, as requested. OWNER may consider maintenance requirements, performance data, and disruption or damage to private property. It is OWNER'S intent to accept alternatives by the bid forms, in the order in which they are listed in the Bid Form but OWNER may accept or decline them in order or combination. The contract, if awarded, will be awarded to the lowest responsive and qualified, responsible BIDDER based upon OWNER'S evaluation which indicates that the award will be in the best interest of OWNER and the general public.

In the event there is any question as to the bidder's qualifications and ability to complete the work, a final determination will be made in accordance with a fair evaluation by the Urban County Government of the above listed elements.

A. If the OWNER requires filling out a detailed financial statement, the bidder may provide its current certified financial statement(s) for the required time interval.

B. Corporate firms are required to be registered with the Office of the Secretary of State, Commonwealth of Kentucky.

C. Documents Required of CONTRACTOR - (1) A sworn statement signed by the President or owner of the Company regarding all current work in progress anywhere; (2) A document showing the percent of completion of each project and the total worth of each project; and (3) Documentation showing the percentage of the DBE employment levels on each project of the Bidder's current work force, and DBE participation levels for Subcontractors.

D. Optional OWNER Requirements - The OWNER, at its discretion, may require the BIDDER/CONTRACTOR to provide: (1) A current detailed financial statement for a period including up to 3 prior years. (2) Financial security or insurance in amounts and kinds acceptable to the OWNER to meet the financial responsibility requirements for the CONTRACTOR to indemnify the OWNER. (3) Additional information and/or DBE work force data, as well as DBE participation data.

Each bidder agrees to waive any claim it has or may have against the Owner and their respective employees, arising out of or in connection with the administration, evaluation, or recommendation of any bid.

6. BID SECURITY

A. Each bid must be accompanied by a bid bond prepared on a Form of Bid Bond and attached hereto, duly executed by the bidder as principal and having as surety thereon a surety company approved by the OWNER, in the amount of 5% of the bid. Such bid bond will be returned to the unsuccessful bidder(s) only upon written request to the Director of Procurement within seven (7) days of opening of bids. Bid bond shall be made payable to the Lexington-Fayette Urban County Government. Bid security is not required for projects under $50,000.

B. Bonds shall be placed with an agent licensed in Kentucky with surety authorized to do business within the state. When the premium is paid for such coverage, the full commission payable shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

7. LIQUIDATED DAMAGES FOR FAILURE TO ENTER INTO CONTRACT

The successful bidder, upon his failure or refusal to execute and deliver the Contract and bonds required within ten (10) days after he has received notice of the acceptance of his bid, shall forfeit to the OWNER, as liquidated damages for such failure or refusal, the security deposited with his bid.

8. TIME OF COMPLETION AND LIQUIDATED DAMAGES

Bidder must agree to commence work on or before a date to be specified in a written "Notice to Proceed" from the OWNER and to fully complete the Project within the time as specified in the Contract. Bidder must agree also to pay **$500.00** per calendar day thereafter deadline for substantial completion and **$250.00** per calendar day thereafter deadline for final completion.

9. EXAMINATION OF CONTRACT DOCUMENTS AND SITE

A. It is the responsibility of each Bidder before submitting a Bid, to (a) examine the Contract Documents thoroughly, (b) visit the site(s) to become familiar with local conditions that may affect cost, progress, performance or furnishing of the work, (c) consider Federal, State and Local laws and regulations that may affect cost, progress, performance or furnishing of the work, (d) study and carefully correlate Bidder's observations with the Contract Documents, and (e) notify Owner of all conflicts, errors or discrepancies in the Contract Documents.

B. Bidders should examine the requirements of Section 4 of the General Conditions for information pertaining to subsurface conditions, underground structures, underground facilities, and availability of lands, easements, and rights-of-way. The completeness of data, presented in the Contract Documents, pertaining to subsurface conditions, underground structures, and underground facilities for the

purposes of bidding or construction is not assured. The Bidder will, at Bidder's own expense, make or obtain any additional examinations, investigations, explorations, tests and studies and obtain any additional information and data which pertain to the physical conditions (surface and subsurface) which may affect cost, progress, performance or furnishing of the Work and which Bidder deems necessary to determine its Bid for performing and furnishing the Work in accordance with the time, price, and other terms and conditions of the Contract Documents. On request in advance, OWNER will provide access to the site to conduct such explorations and tests as each Bidder deems necessary for submission of a bid. Bidder shall fill all holes, clean up and restore the site to its former condition upon completion of such explorations.

C. The submission of a Bid will constitute an incontrovertible representation by the Bidder that Bidder has complied with every requirement of this paragraph; that without exception the Bid is premised upon furnishing and performing the Work required by the Contract Documents and such means, methods, techniques, sequences or procedures of construction as may be indicated in or required by the Contract Documents; and that the Contract Documents are sufficient in scope and detail to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.

10. ADDENDA AND INTERPRETATIONS

No interpretation of the meaning of the Contract Documents will be made to any bidder orally. Every request for such interpretation should be in writing addressed to the Director of Procurement, who in turn will have an addendum issued under signature of the Project Manager for the Lexington-Fayette Urban County Government, and to be given consideration must be received at least seven (7) days prior to the date fixed for the opening of bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the specifications which, if issued, will be mailed by certified mail with return receipt requested, faxed or emailed to all prospective bidders. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the Contract Documents.

11. SECURITY FOR FAITHFUL PERFORMANCE

A. Simultaneously with his delivery of the executed Contracts, the CONTRACTOR shall furnish a surety bond or bonds as security for the faithful performance of this Contract and for payment of all persons performing labor on the Project under this Contract and furnishing materials in connection with this Contract, as specified in the General Conditions. The surety on such bond or bonds shall be a duly authorized surety company satisfactory to the OWNER and authorized to do business in the Commonwealth of Kentucky.

B. All bonds required by this Contract and laws of this State shall be placed with agents licensed in the State of Kentucky. When the premium is paid for such coverages, the full commission shall be paid to such local agent who shall not divide such commission with any person other than a duly licensed resident local agent.

C. **Contractor shall use standard Performance and Payment Bond forms such as documents provided with this contract book or AIA form A312-1984 (or later).**

12. POWER OF ATTORNEY

Attorney-in-fact who signs bid bonds or contract bonds must file with each bond a certified and effectively dated copy of their power of attorney.

13. TAXES AND WORKMEN'S COMPENSATION

The CONTRACTOR and subcontractor will be required to accept liability for payment of all payroll taxes, sales and use tax, and all other taxes or deductions required by local, state or federal law. Each shall carry Workmen's Compensation Insurance to the full amounts as required by Statutes and shall include the cost of all foregoing items in the proposal. The CONTRACTOR will not otherwise be reimbursed or compensated for such tax payments. The CONTRACTOR is urged to ascertain at his own risk his actual tax liability in connection with the execution or performance of his Contract.

14. LAWS AND REGULATIONS

The bidder's attention is directed to the fact that all applicable state laws, municipal ordinances, and the rules and regulations of all authorities having jurisdiction over construction of the Project shall apply to the Contract throughout, and they will be deemed to be included in the contract, the same as though herein written out in full.

15. EROSION AND SEDIMENT CONTROL AND PERMITS

The CONTRACTOR and Subcontractors performing work on projects on behalf of the OWNER shall also comply with all applicable federal, state, and local environmental regulations and all requirements and conditions set forth in "special" permits including but not limited to Corp of Engineers 404 permits, 401 Water Quality Certifications, Stream Crossing and Floodplain Encroachment Permits as described in Part 4 General Conditions Paragraph 5.17.

16. PREVAILING WAGE LAW AND MINIMUM HOURLY RATES

Federal wage rates and regulations, if required for this Project, will be as described in the Special Conditions.

17. AFFIRMATIVE ACTION PLAN

The successful Bidder must submit the entire proposal with their bid, the following items to the Urban County Government:

1. Certification of Bid Proposal/DBE – see Part III
2. KYTC DBE Provisions – see Part III
3. DBE Subcontractor Bidders List – see Part III

A Work Force Analysis Form shall be submitted for each Contract. Failure to submit any of these items as required herein may result in disqualification of the Bidder from award of the Contract.

18. CONTRACT TIME

The number of calendar days within which the Work is to be substantially completed and ready for final payment (the Contract Time) is set forth in the Contract Agreement.

19. SUBSTITUTE OR "APPROVED EQUAL" ITEMS

The Contract, if awarded, will be on the basis of materials and equipment described in the Drawings or specified in the Specifications without consideration of possible substitute or "approved equal" items. Whenever it is indicated in the Drawings or specified in the Specifications that a substitute or "approved equal" item of material or equipment may be furnished or used by the CONTRACTOR if acceptable to the OWNER, application for such acceptance will not be considered by the OWNER until after the effective date of the Agreement. The procedure for submission of any such application by the CONTRACTOR and consideration by the OWNER is set forth in the General Conditions.

20. ALTERNATE BIDS

Bidders shall submit alternate bids/proposals only if and when such alternate bids/proposals have been specifically requested in an Invitation for Bids. If alternate bids/proposals are requested in an Invitation for Bids, the form of submission of such alternate bid and the conditions under which such alternate bids will be considered for award of a contract will be established in the Invitation.

Any Bidder who submits a bid incorporating an alternate proposal when alternate bids/proposals have not been requested in the Invitation for Bids shall have his/her bid rejected as non-responsive.

Any Bidder who submits a bid incorporating two (2) or more prices for an item or groups of items (unless such method of pricing is requested in the Invitation for Bids), or which imposes conditions for acceptance other than those established in the Invitation for Bids, shall have their bid rejected as non-responsive.

21. SIGNING OF AGREEMENT

When OWNER gives a Notice of Award to the successful Bidder, it will be accompanied by the required number of unsigned counterparts of the Agreement with all other written Contract Documents attached. Within ten days thereafter, CONTRACTOR shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER with the required Bonds, Certificate of Insurance, and Power of Attorney. The OWNER will deliver one fully signed counterpart to CONTRACTOR at such time as it has been signed by the Mayor.

22. ASSISTANCE TO BE OFFERED TO DISADVANTAGED BUSINESS ENTERPRISE (MWDBE) CONTRACTORS AND VETERAN OWNED SMALL BUSINESSES

A. Outreach for MWDBE(s) and Veteran Owned Small Businesses (VOSB)

The Lexington-Fayette Urban County Government (LFUCG) maintains a database of MWDBE contractors and Veteran Owned Small Businesses. When a LFUCG construction project is advertised for bidding, notices are sent to companies registered at https://lexingtonky.ionwave.net. The notices describe the project and indicate the deadline for submitting bids.

If you wish to be added to the LFUCG MWDBE contractor database, please contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

B. Bid Bond Assistance for MWDBE(s)

For those MWDBE contractors who wish to bid on LFUCG project, bid bond assistance is available. This bid bond assistance is in the form of a "Letter of Certification" which is accepted by the LFUCG's Division of Purchasing, in lieu of a bid bond. The "Letter of Certification" must be included in the bid package when it is submitted to the Division of Purchasing. The "Letter of Certification" will reference the specific project for which the bid is being submitted, and the time and date on which the bid is due. Bid bond assistance must be requested from the Lexington-Fayette Urban County Government's Division of Procurement.

C. Eligibility for Bid Bond Assistance for MWDBE(s)

In order to be eligible for any Bid bonding assistance, a MWDBE construction company must be owned or controlled at the level of 51% or more by a member or members of a minority group or females. Prior to receiving assistance, a statement providing evidence of ownership and control of the company by a member or members of a minority group or females must be signed by the Owner or corporate officer and by an attorney or accountant submitted to:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

D. MWDBE and Veteran Subcontractors

The LFUCG will, upon request, assist prime contractors in the procurement of eligible DBE subcontractors in an effort to achieve a 10% minimum MWDBE and a 3% minimum Veteran goal.

For a list of eligible subcontractors, please contact:

Sherita Miller, Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street, Room 338
Lexington, Kentucky 40507
smiller@lexingtonky.gov

23. LFUCG NON-APPROPRIATION CLAUSE

Contractor acknowledges that the LFUCG is a governmental entity, and the contract validity is based upon the availability of public funding under the authority of its statutory mandate.

In the event that public funds are unavailable and not appropriated for the performance of the LFUCG's obligations under this contract, then this contract shall automatically expire without penalty to the LFUCG thirty (30) days after written notice to Contractor of the unavailability and non-appropriation of public funds. It is expressly agreed that the LFUCG shall not activate this non-appropriation provision for its convenience or to circumvent the requirements of this contract, but only as an emergency fiscal measure during a substantial fiscal crisis, which affects generally its governmental operations.

In the event of a change in the LFUCG's statutory authority, mandate and mandated functions, by state and federal legislative or regulatory action, which adversely affects the LFUCG's authority to continue its obligations under this contract, then this contract shall automatically terminate without penalty to the LFUCG upon written notice to Contractor of such limitation or change in the LFUCG's legal authority.

END OF SECTION

PART III

FORM OF PROPOSAL

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PART III

Invitation to Bid No. 1-2024

Government Center Annex and Police Headquarters Roof Replacement

1. FORM OF PROPOSAL

Place: Lexington, Kentucky

Date: _____

The following Form of Proposal shall be followed exactly in submitting a proposal for this Work.

This Proposal Submitted by _____

_____
(Name and Address of Bidding Contractor)

(Hereinafter called "Bidder"), organized and existing under the laws of the State of _____, doing business as _____ "a corporation," "a partnership", or an "individual" as applicable.

To: Lexington-Fayette Urban County Government
(Hereinafter called "OWNER")
Office of the Director of Purchasing
200 East Main Street, 3rd Floor
Lexington, KY 40507

Gentlemen:

The Bidder, in compliance with your Invitation for Bids for the **Government Center Annex and Police Headquarters Roof Replacement** having examined the Plans and Specifications with related documents, having examined the site for proposed Work, and being familiar with all of the conditions surrounding the construction of the proposed Project, including the availability of materials and labor, hereby proposes to furnish all labor, materials, and supplies, and to construct the Project in accordance with the Contract Documents, within the time set forth therein, and at the lump sum and/or unit prices stated hereinafter. These prices are to cover all expenses incurred in performing the Work required under the Contract Documents, of which this proposal is a part.

The Bidder hereby acknowledges receipt of the following addenda:

Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____
Addendum No. _____ Date _____

Insert above the number and the date of any Addendum issued and received. If none has been issued and received, the word "NONE" should be inserted.

2. LEGAL STATUS OF BIDDER

Bidder _____

Date _____

* 1. A corporation duly organized and doing business under the laws of the State of _____, for whom _____, bearing the official title of _____, whose signature is affixed to this Bid/Proposal, is duly authorized to execute contracts.

* 2. A Partnership, all of the members of which, with addresses are: (Designate general partners as such)

_____

_____

_____

_____

_____

* 3. An individual, whose signature is affixed to this Bid/Proposal (please print name)

_____

_____

*(The Bidder shall fill out the appropriate form and strike out the other two.)

3. BIDDERS AFFIDAVIT

Comes the Affiant, _____, and after being first duly sworn, states under penalty of perjury as follows:

1. His/her name is _____ and he/she is the individual submitting the bid or is the authorized representative of

_____, the entity submitting the bid (hereinafter referred to as "Bidder").

2. Bidder will pay all taxes and fees, which are owed to the Lexington-Fayette Urban County Government at the time the bid is submitted, prior to award of the contract and will maintain a "current" status in regard to those taxes and fees during the life of the contract.

3. Bidder will obtain a Lexington-Fayette Urban County Government business license, if applicable, prior to award of the contract.

4. Bidder has authorized the Division of Procurement to verify the above-mentioned information with the Division of Revenue and to disclose to the Urban County Council that taxes and/or fees are delinquent or that a business license has not been obtained.

5. Bidder has not knowingly violated any provision of Chapter 25 of the Lexington-Fayette Urban County Government Code of Ordinances, known as the "Ethics Act."

6. Bidder acknowledges that "knowingly" for purposes of this Affidavit means, with respect to conduct or to circumstances described by a statute or ordinance defining an offense, that a person is aware or should have been aware that his conduct is of that nature or that the circumstance exists.

_____ _____
Signature Printed Name

_____ _____
Title Date

Company Name _____

Address _____

Subscribed and sworn to before me by _____
(Affiant)

_____
(Title)

of _____ this_____day of_____, 20_____.
(Company Name)

_____
Notary Public
[seal of notary] My commission expires: _____

4. BID SCHEDULE – SCHEDULE OF VALUES

The Bidder agrees to perform all the Work described in the Specifications and shown on the Plans for the following proposed lump sum and/or unit prices, if applicable, which shall include the furnishing of all labor, materials, supplies, equipment and/or vehicle usage, services, all items of cost, overhead, taxes (federal, state, local), and profit for the Contractor and any Subcontractor involved, within the time set forth herein. If unit prices are applicable, Bidder must make the extensions and additions showing the total amount of bid.

Form of proposal must include unit bid prices written in words, unit price written in numbers and total amount bid (unit price x quantity) per line item OR bid may be considered non-responsive. In case of price discrepancy, unit bid price written in words will prevail followed by unit price written in numbers then total amount bid per line item.

If a discrepancy between the unit price and the item total exists, the unit price prevails except: If the unit price is illegible, omitted, or the same as the item total, item total prevails and the unit price is the quotient of the item total and the quantity.

If the unit price and the item total are illegible or are omitted, the bid may be determined nonresponsive. If a lump sum total price is illegible or is omitted, the bid may be determined nonresponsive.

For a unit price based bid, the sum of the item totals is the bid amount the Division uses for bid comparison.

The LFUCG's decision on the bid amount is final.

Enter lump sum pricing in the line items tab in IonWave. Page P-8 must be fully signed and executed and included with bid or bid will be considered unresponsive.

BID ITEM	ITEM	UNIT	QUANTITY
1	Government Center Annex and Police Headquarters Roof Replacement, as per specs.	LS	1

LIST OF UNIT PRICES

The following List of Unit Prices is required by the Owner to be completely executed and submitted with each Bidder's Proposal. Each unit price shall include the furnishing of all labor, materials, supplies and services, and shall include all items of cost, overhead and profit for the Contractor and any Sub-Contractors involved, and shall be used uniformly, without modification, for either additions or deductions from the Bid. These unit prices as established shall also be used to determine the equitable adjustment of the Contract Price in connection with changes, or extra work performed under the Contract. The "Rules of Measurement" set forth in the Special Conditions shall govern where volume units are concerned.

ITEM DESCRIPTION	UNIT	UNIT PRICE
1. Steel Roof Deck Repair	SF	
2. Steel Roof Deck Replacement	SF	
3. Concrete Deck Repair	SF	
4. 2x6 Wood Blocking	LF	
5. 2x8 Wood Blocking	LF	
6. 2x10 Wood Blocking	LF	
7. 1/4"/ft. Tapered Polyiso Insulation	SF	

Submitted by:

_____
Firm

_____
Address

_____
City, State & Zip

Bid must be signed:
(original signature)

_____
Signature of Authorized Company Representative – Title

_____
Representative/s Name (Typed or Printed)

_____
Area Code – Phone –Fax #

_____
E-Mail Address

OFFICIAL ADDRESS:

_____

_____

_____

_____ (Seal if Bid is by Corporation)

By signing this form you agree to ALL terms, conditions, and associated forms in this bid package

5. STATEMENT OF BIDDER'S QUALIFICATIONS

The following statement of the Bidder's qualifications is required to be filled in, executed, and submitted with the Proposal:

1. Name of Bidder: _____

2. Permanent Place of Business: _____

3. When Organized: _____

4. Where Incorporated: _____

5. Construction Plant and Equipment Available for this Project:

_____

_____

_____

_____

_____

_____

(Attach Separate Sheet If Necessary)

6. Financial Condition:

If specifically requested by the OWNER, the apparent low Bidder is required to submit its latest three (3) years audited financial statements to the OWNER'S Division of Procurement within seven (7) calendar days following the bid opening.

7. In the event the Contract is awarded to the undersigned, surety bonds will be furnished by:

_____(Surety)

Signed: _____(Representative of Surety)

8. The following is a list of similar projects performed by the Bidder: (Attach separate sheet if necessary).

NAME	LOCATION	CONTRACT SUM

9. The Bidder has now under contract and bonded the following projects:

NAME	LOCATION	CONTRACT SUM

10. List Key Bidder Personnel who will work on this Project.

NAME	POSITION DESCRIPTION	NO. OF YEARS WITH BIDDER

11. DBE Participation on current bonded projects under contract:

SUBCONTRACTORS (LIST)	PROJECT (SPECIFIC TYPE)	DBE	% of WORK

(USE ADDITIONAL SHEETS IF NECESSARY)

12. We acknowledge that, if we are the apparent low Bidder, we will submit to the OWNER within 7 calendar days following the Bid Opening, a sworn statement on the OWNER'S form regarding all current work on hand and under contract, and a statement on the OWNER'S form of the experience of our officers, office management and field management personnel. Additionally, if requested by the OWNER, we will within 7 days following the request submit audited financial statements and loss history for insurance claims for the 3 most recent years (or a lesser period stipulated by the OWNER)—all in accordance with the Bid Documents.

Respectfully submitted:

_____
(Name of Contracting Firm)

BY: _____

TITLE: _____

DATE _____

6. LIST OF PROPOSED SUBCONTRACTORS

The following list of proposed subcontractors is required by the OWNER to be executed, completed and submitted with the BIDDER'S FORM OF PROPOSAL. All subcontractors are subject to approval of the Lexington-Fayette Urban County Government. Failure to submit this list completely filled out may be cause for rejection of bid.

BRANCH OF WORK-LIST	DBE Work	% of EACH MAJOR ITEM

LIST OF MATERIALS/ SUPPLIERS

Bidders are hereby advised that this list must be complete and submitted with the Bid. Cut sheets for all mechanical system must be included with bid submittal.

Listing "as per plans and specifications", will not be considered as sufficient identification. Where more than one "Make or Brand" is listed for any one item, the Owner has the right to select the one to be used.

Item	Brand Name, Manufacturer and/or Supplier

7. Lexington-Fayette Urban County Government
MWDBE PARTICIPATION GOALS

A. GENERAL

1) The LFUCG request all potential contractors to make a concerted effort to include Minority-Owned (MBE), Woman-Owned (WBE), Disadvantaged (DBE) Business Enterprises and Veteran-Owned Small Businesses (VOSB) as subcontractors or suppliers in their bids.

2) Toward that end, the LFUCG has established 10% of total procurement costs as a Goal for participation of Minority-Owned, Woman-Owned and Disadvantaged Businesses on this contract.

3) **It is therefore a request of each Bidder to include in its bid, the same goal (10%) for MWDBE participation and other requirements as outlined in this section.**

4) The LFUCG has also established a 3% of total procurement costs as a Goal for participation for of Veteran-Owned Businesses.

5) **It is therefore a request of each Bidder to include in its bid, the same goal (3%) for Veteran-Owned participation and other requirements as outlined in this section.**

B. PROCEDURES

1) The successful bidder will be required to report to the LFUCG, the dollar amounts of all payments submitted to Minority-Owned, Woman-Owned or Veteran-Owned subcontractors and suppliers for work done or materials purchased for this contract. (See Subcontractor Monthly Payment Report)

2) Replacement of a Minority-Owned, Woman-Owned or Veteran-Owned subcontractor or supplier listed in the original submittal must be requested in writing and must be accompanied by documentation of Good Faith Efforts to replace the subcontractor / supplier with another MWDBE Firm; this is subject to approval by the LFUCG. (See LFUCG MWDBE Substitution Form)

3) For assistance in identifying qualified, certified businesses to solicit for potential contracting opportunities, bidders may contact:

   a) The Lexington-Fayette Urban County Government, Division of Procurement (859-258-3320)

4) The LFUCG will make every effort to notify interested MWDBE and Veteran-Owned subcontractors and suppliers of each Bid Package, including information on the scope of work, the pre-bid meeting time and location, the bid date, and all other pertinent information regarding the project.

C. DEFINITIONS

1) A Minority-Owned Business Enterprise (MBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by persons of African American, Hispanic, Asian, Pacific Islander, American Indian or Alaskan Native Heritage.

2) A Woman-Owned Business Enterprise (WBE) is defined as a business which is certified as

being at least 51% owned, managed and controlled by one or more women.

3) A Disadvantaged Business (DBE) is defined as a business which is certified as being at least 51% owned, managed and controlled by a person(s) that are economically and socially disadvantaged.

4) A Veteran-Owned Small Business (VOSB) is defined as a business which is certified as being at least 51% owned, managed and controlled by a veteran and/or a service disabled veteran.

5) Good Faith Efforts are efforts that, given all relevant circumstances, a bidder or proposer actively and aggressively seeking to meet the goals, can reasonably be expected to make. In evaluating good faith efforts made toward achieving the goals, whether the bidder or proposer has performed the efforts outlined in the Obligations of Bidder for Good Faith Efforts outlined in this document will be considered, along with any other relevant factors.

D. OBLIGATION OF BIDDER FOR GOOD FAITH EFFORTS

1) **The bidder shall make a Good Faith Effort to achieve the Participation Goal for MWDBE and Veteran-Owned subcontractors/suppliers. The failure to meet the goal shall not necessarily be cause for disqualification of the bidder; however, bidders not meeting the goal are required to furnish with their bids written documentation of their Good Faith Efforts to do so.**

2) Award of Contract shall be conditioned upon satisfaction of the requirements set forth herein.

3) The Form of Proposal includes a section entitled "MWDBE Participation Form". The applicable information must be completed and submitted as outlined below.

4) **Failure to submit this information as requested may be cause for rejection of bid or delay in contract award.**

E. DOCUMENTATION REQUIRED FOR GOOD FAITH EFFORTS

1) Bidders reaching the Goal are required to submit only the MWDBE Participation Form." The form must be fully completed including names and telephone number of participating MWDBE firm(s); type of work to be performed; estimated value of the contract and value expressed as a percentage of the total Lump Sum Bid Price. The form must be signed and dated, and is to be submitted with the bid.

2) Bidders not reaching the Goal must submit the "MWDBE Participation Form", the "Quote Summary Form" and a written statement documenting their Good Faith Effort to do so. If bid includes no MWDBE and/or Veteran participation, bidder shall enter "None" on the subcontractor / supplier form). In addition, the bidder must submit written proof of their Good Faith Efforts to meet the Participation Goal:

   a. Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission

of bids to allow MWDBE firms and Veteran-Owned businesses to participate.

b. Included documentation of advertising in the above publications with the bidders good faith efforts package

c. Attended LFUCG Procurement Economic Inclusion Outreach event

d. Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned businesses of subcontracting opportunities

e. Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses.

f. Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

g. Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

h. Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs and/or Veteran-Owned businesses soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

i. Followed up initial solicitations by contacting MWDBEs and Veteran-Owned Businesses to determine their level of interest.

j. Provided the interested MWBDE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

k. Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation, even when the prime contractor may otherwise perform these work items with its own workforce

l. Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

m. Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

n. Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

o. Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

p. Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

q. Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE and Veteran participation.

Note: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to review by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

MINORITY BUSINESS ENTERPRISE PROGRAM

Sherita Miller, MPA
Minority Business Enterprise Liaison
Division of Procurement
Lexington-Fayette Urban County Government
200 East Main Street
Lexington, KY 40507
smiller@lexingtonky.gov
859-258-3323

OUR MISSION: The mission of the Minority Business Enterprise Program is to facilitate the full participation of minority and women owned businesses in the procurement process and to promote economic inclusion as a business imperative essential to the long term economic viability of Lexington-Fayette Urban County Government.

To that end the city council adopted and implemented Resolution 484-2017 – A Certified Minority, Women and Disadvantaged Business Enterprise ten percent (10%) minimum goal and a three (3%) minimum goal for Certified Veteran-Owned Small Businesses and Certified Service Disabled Veteran – Owned Businesses for government contracts.

The resolution states the following definitions shall be used for the purposes of reaching these goals (a full copy is available in Procurement):

Certified Disadvantaged Business Enterprise (DBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a person(s) who is socially and economically disadvantaged as define by 49 CFR subpart 26.*

Certified Minority Business Enterprise (MBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by an ethnic minority (i.e. African American, Asian American/Pacific Islander, Hispanic Islander, Native American/Native Alaskan Indian) as defined in federal law or regulation as it may be amended from time-to-time.*

Certified Women Business Enterprise (WBE) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a woman.*

Certified Veteran-Owned Small Business (VOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.*

Certified Service Disabled Veteran Owned Small Business (SDVOSB) *– a business in which at least fifty-one percent (51%) is owned, managed and controlled by a disabled veteran who served on active duty with the U.S. Army, Air Force, Navy, Marines or Coast Guard.*

The term "Certified" shall mean the business is appropriately certified, licensed, verified, or validated by an organization or entity recognized by the Division of Purchasing as having the appropriate credentials to make a determination as to the status of the business.

To comply with Resolution 484-2017, prime contractors and minority, women and veteran owned businesses must

enroll in the new Diverse Business Management Compliance system, https://lexingtonky.diversitycompliance.com/

We have compiled the list below to help you locate certified MBE, WBE and DBE certified businesses. Below is a listing of contacts for LFUCG Certified MWDBEs and Veteran-Owned Small Businesses in (https://lexingtonky.ionwave.net)

Business	Contact	Email Address	Phone
LFUCG	Sherita Miller	smiller@lexingtonky.gov	859-258-3323
Commerce Lexington – Minority Business Development	Tyrone Tyra	ttyra@commercelexington.com	859-226-1625
Tri-State Minority Supplier Diversity Council	Susan Marston	smarston@tsmsdc.com	502-365-9762
Small Business Development Council	Shawn Rogers UK SBDC	shawn.rogers@uky.edu	859-257-7666
Community Ventures Corporation	Phyllis Alcorn	palcorn@cvky.org	859-231-0054
KY Transportation Cabinet (KYTC)	Melvin Bynes	Melvin.bynes2@ky.gov	502-564-3601
KYTC Pre-Qualification	Shella Eagle	Shella.Eagle@ky.gov	502-782-4815
Ohio River Valley Women's Business Council (WBENC)	Sheila Mixon	smixon@orvwbc.org	513-487-6537
Kentucky MWBE Certification Program	Yvette Smith, Kentucky Finance Cabinet	Yvette.Smith@ky.gov	502-564-8099
National Women Business Owner's Council (NWBOC)	Janet Harris-Lange	janet@nwboc.org	800-675-5066
Small Business Administration	Robert Coffey	robertcoffey@sba.gov	502-582-5971
LaVoz de Kentucky	Andres Cruz	lavozdeky@yahoo.com	859-621-2106
The Key News Journal	Patrice Muhammad	production@keynewsjournal.com	859-685-8488

LFUCG MWDBE PARTICIPATION FORM
Bid/RFP/Quote Reference #_____

The MWDBE and/or veteran subcontractors listed have agreed to participate on this Bid/RFP/Quote. If any substitution is made or the total value of the work is changed prior to or after the job is in progress, it is understood that those substitutions must be submitted to Procurement for approval immediately. **Failure to submit a completed form may cause rejection of the bid.**

MWDBE Company, Name, Address, Phone, Email	MBE WBE or DBE	Work to be Performed	Total Dollar Value of the Work	% Value of Total Contract
1.				
2.				
3.				
4.				

The undersigned company representative submits the above list of MWDBE firms to be used in accomplishing the work contained in this Bid/RFP/Quote. Any misrepresentation may result in the termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Company **Company Representative**

Date **Title**

LFUCG MWDBE SUBSTITUTION FORM
Bid/RFP/Quote Reference #_____

The substituted MWDBE and/or veteran subcontractors listed below have agreed to participate on this Bid/RFP/Quote. These substitutions were made prior to or after the job was in progress. These substitutions were made for reasons stated below and are now being submitted to Procurement for approval. By the authorized signature of a representative of our company, we understand that this information will be entered into our file for this project.

SUBSTITUTED MWDBE Company Name, Address, Phone, Email	MWDBE Formally Contracted/ Name, Address, Phone, Email	Work to Be Performed	Reason for the Substitution	Total Dollar Value of the Work	% Value of Total Contract
1.					
2.					
3.					
4.					

The undersigned acknowledges that any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and false claims.

Company **Company Representative**

Date **Title**

MWDBE QUOTE SUMMARY FORM

Bid/RFP/Quote Reference #_____

The undersigned acknowledges that the minority and/or veteran subcontractors listed on this form did submit a quote to participate on this project. Failure to submit this form may cause rejection of the bid.

Company Name	Contact Person
Address/Phone/Email	Bid Package / Bid Date

MWDBE Company Addres	Contact Person	Contact Information (work phone, Email, cell)	Date Contacted	Services to be performed	Method of Communication (email, phone meeting, ad, event etc)	Total dollars $$ Do Not Leave Blank (Attach Documentation)	MBE * AA HA AS NA Female	Veteran

(MBE designation / AA=African American / HA= Hispanic American/AS = Asian American/Pacific Islander/ NA= Native American)

The undersigned acknowledges that all information is accurate. Any misrepresentation may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Company _____ **Company Representative** _____

Date _____ **Title** _____

LFUCG SUBCONTRACTOR MONTHLY PAYMENT REPORT

The LFUCG has a 10% goal plan adopted by city council to increase the participation of minority and women owned businesses in the procurement process. The LFUCG also has a 3% goal plan adopted by cited council to increase the participation of veteran owned businesses in the procurement process. In order to measure that goal LFUCG will track spending with MWDBE and Veteran contractors on a monthly basis. By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentation may result in termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims. Please submit this form monthly to the Division of Procurement/ 200 East Main Street / Room 338 / Lexington, KY 40507.

Bid/RFP/Quote #_____

Total Contract Amount Awarded to Prime Contractor for this Project_____

Project Name/ Contract #	Work Period/ From: To:
Company Name:	Address:
Federal Tax ID:	Contact Person:

Subcontractor Vendor ID (name, address, phone, email	Description of Work	Total Subcontract Amount	% of Total Contract Awarded to Prime for this Project	Total Amount Paid for this Period	Purchase Order number for subcontractor work (please attach PO)	Scheduled Project Start Date	Scheduled Project End Date

By the signature below of an authorized company representative, you certify that the information is correct, and that each of the representations set forth below is true. Any misrepresentations may result in the termination of the contract and/or prosecution under applicable Federal and State laws concerning false statements and false claims.

Company _____ **Company Representative** _____

Date _____ **Title** _____

LFUCG STATEMENT OF GOOD FAITH EFFORTS
Bid/RFP/Quote #_____

By the signature below of an authorized company representative, we certify that we have utilized the following Good Faith Efforts to obtain the maximum participation by MWDBE and Veteran-Owned business enterprises on the project and can supply the appropriate documentation.

_____ Advertised opportunities to participate in the contract in at least two (2) publications of general circulation media; trade and professional association publications; small and minority business or trade publications; and publications or trades targeting minority, women and disadvantaged businesses not less than fifteen (15) days prior to the deadline for submission of bids to allow MWDBE firms and Veteran-Owned businesses to participate.

_____ Included documentation of advertising in the above publications with the bidders good faith efforts package

_____ Attended LFUCG Procurement Economic Inclusion Outreach event

_____ Attended pre-bid meetings that were scheduled by LFUCG to inform MWDBEs and/or Veteran-Owned Businesses of subcontracting opportunities

_____ Sponsored Economic Inclusion event to provide networking opportunities for prime contractors and MWDBE firms and Veteran-Owned businesses

_____ Requested a list of MWDBE and/or Veteran subcontractors or suppliers from LFUCG and showed evidence of contacting the companies on the list(s).

_____ Contacted organizations that work with MWDBE companies for assistance in finding certified MWBDE firms and Veteran-Owned businesses to work on this project. Those contacted and their responses should be a part of the bidder's good faith efforts documentation.

_____Sent written notices, by certified mail, email or facsimile, to qualified, certified MWDBEs soliciting their participation in the contract not less than seven (7) days prior to the deadline for submission of bids to allow them to participate effectively.

_____ Followed up initial solicitations by contacting MWDBEs and Veteran-Owned businesses to determine their level of interest.

_____ Provided the interested MWBDE firm and/or Veteran-Owned business with adequate and timely information about the plans, specifications, and requirements of the contract.

_____ Selected portions of the work to be performed by MWDBE firms and/or Veteran-Owned businesses in order to increase the likelihood of meeting the contract goals. This includes, where appropriate, breaking out contract work items into economically feasible units to facilitate MWDBE and Veteran participation,

even when the prime contractor may otherwise perform these work items with its own workforce

_____ Negotiated in good faith with interested MWDBE firms and Veteran-Owned businesses not rejecting them as unqualified without sound reasons based on a thorough investigation of their capabilities. Any rejection should be so noted in writing with a description as to why an agreement could not be reached.

_____ Included documentation of quotations received from interested MWDBE firms and Veteran-Owned businesses which were not used due to uncompetitive pricing or were rejected as unacceptable and/or copies of responses from firms indicating that they would not be submitting a bid.

_____ Bidder has to submit sound reasons why the quotations were considered unacceptable. The fact that the bidder has the ability and/or desire to perform the contract work with its own forces will not be considered a sound reason for rejecting a MWDBE and/or Veteran-Owned business's quote. Nothing in this provision shall be construed to require the bidder to accept unreasonable quotes in order to satisfy MWDBE and Veteran goals.

_____ Made an effort to offer assistance to or refer interested MWDBE firms and Veteran-Owned businesses to obtain the necessary equipment, supplies, materials, insurance and/or bonding to satisfy the work requirements of the bid proposal

_____Made efforts to expand the search for MWBE firms and Veteran-Owned businesses beyond the usual geographic boundaries.

_____ Other--any other evidence that the bidder submits which may show that the bidder has made reasonable good faith efforts to include MWDBE **and Veteran participation.**

NOTE: Failure to submit any of the documentation requested in this section may be cause for rejection of bid. Bidders may include any other documentation deemed relevant to this requirement which is subject to approval by the MBE Liaison. Documentation of Good Faith Efforts must be submitted with the Bid, if the participation Goal is not met.

The undersigned acknowledges that all information is accurate. Any misrepresentations may result in termination of the contract and/or be subject to applicable Federal and State laws concerning false statements and claims.

Company	**Company Representative**
Date	**Title**

8. AUTHENTICATION OF BID AND STATEMENT OF NON-COLLUSION, NON-CONFLICT OF INTEREST

I hereby swear (or affirm) under the penalty for false swearing:

1. That I am the Bidder (if the Bidder is an individual), a partner of the Bidder (if the Bidder is a partnership), or an officer or employee of the bidding corporation having authority to sign on its behalf (if the Bidder is a corporation);

2. That the attached bid has been arrived at by the Bidder independently, and has been submitted without collusion with, and without any agreement, understanding or planned common course of action, with any other contractor, vendor of materials, supplies, equipment or services described in the Invitation to Bid, designed to limit independent bidding or competition;

3. That the contents of the bid or bids have not been communicated by the Bidder or its employees or agents to any person not an employee or agent of the Bidder or its surety on any bond furnished, with the bid or bids, and will not be communicated to any such person, prior to the official opening of the bid or bids;

4. That the Bidder is legally entitled to enter into the contracts with the Lexington-Fayette Urban County Government, and is not in violation of any prohibited conflict of interest;

5. (Applicable to corporation only) That as a foreign corporation, we are registered with the Secretary of State, Commonwealth of Kentucky, and authorized to do business in the State _____ or, that as a domestic corporation, we are in good standing with the Secretary of State, Commonwealth of Kentucky _____. Check the statement applicable.

6. This offer is for 60 calendar days from the date this bid is opened. In submitting the above, it is expressly agreed that, upon proper acceptance by the Lexington-Fayette Urban County Government of any or all items bid above, a contract shall thereby be created with respect to the items accepted.

7. That I have fully informed myself regarding the accuracy of the statements made in this statement.

8. That I certify that Subcontractors have not and will not be awarded to any firm(s) that have been debarred from noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

9. STATEMENT OF EXPERIENCE

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

_____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

_____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

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NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

_____

NAME OF INDIVIDUAL: _____

POSITION/TITLE: _____

STATEMENT OF EXPERIENCE: _____

_____

_____

* Include all officers, office management's, Affirmative Action officials, and field management personnel. (Attach separate sheets if necessary.)

10. EQUAL OPPORTUNITY AGREEMENT

Standard Title VI Assurance

The Lexington Fayette-Urban County Government, (hereinafter referred to as the "Recipient") hereby agrees that as a condition to receiving any Federal financial assistance from the U.S. Department of Transportation, it will comply with Title VI of the Civil Rights Act of 1964, 78Stat.252, 42 U.S.C. 2000d-4 (hereinafter referred to as the "Act"), and all requirements imposed by or pursuant to Title 49, Code of Federal Regulations, U.S. Department of Transportation, Subtitle A, Office of the Secretary, (49 CFR, Part 21) Nondiscrimination in Federally Assisted Program of the Department of Transportation – Effectuation of Title VI of the Civil Rights Act of 1964 (hereinafter referred to as the "Regulations") and other pertinent directives, no person in the United States shall, on the grounds of race, color, national origin, sex, age (over 40), religion, sexual orientation, gender identity, veteran status, or disability be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity for which the Recipient receives Federal financial assistance from the U.S. Department of Transportation, including the Federal Highway Administration, and hereby gives assurance that will promptly take any necessary measures to effectuate this agreement. This assurance is required by subsection 21.7(a) (1) of the Regulations.

The Law

* Title VII of the Civil Rights Act of 1964 (amended 1972) states that it is unlawful for an employer to discriminate in employment because of race, color, religion, sex, age (40-70 years) or national origin.
* Executive Order No. 11246 on Nondiscrimination under Federal contract prohibits employment discrimination by contractor and subcontractor doing business with the Federal Government or recipients of Federal funds. This order was later amended by Executive Order No. 11375 to prohibit discrimination on the basis of sex.
* Section 503 of the Rehabilitation Act of 1973 States:

  The Contractor will not discriminate against any employee or applicant for employment because of physical or mental handicap.
* Section 2012 of the Vietnam Era Veterans Readjustment Act of 1973 requires Affirmative Action on behalf of disabled veterans and veterans of the Vietnam Era by contractors having Federal Contracts.
* Section 206 (A) of Executive Order 12086, Consolidation of Contract Compliance Functions for Equal Employment Opportunity, states:

  The Secretary of Labor may investigate the employment practices of any Government contractor or sub-contractor to determine whether or not the contractual provisions specified in Section 202 of this order have been violated.

The Lexington-Fayette Urban County Government practices Equal Opportunity in recruiting, hiring and promoting. It is the Government's intent to affirmatively provide employment opportunities for those individuals who have previously not been allowed to enter into the mainstream of society. Because of its importance to the local Government, this policy carries the full endorsement of the Mayor, Commissioners, Directors, and all supervisory personnel. In

following this commitment to Equal Employment Opportunity and because the Government is the benefactor of the Federal funds, it is both against the Urban County Government policy and illegal for the Government to let contracts to companies which knowingly or unknowingly practice discrimination in their employment practices. Violation of the above mentioned ordinances may cause a contract to be canceled and the contractor may be declared ineligible for future consideration.

Please sign this statement in the appropriate space acknowledging that you have read and understand the provisions contained herein. Return this document as part of your application packet.

Bidders

I/We agree to comply with the Civil Rights Laws listed above that govern employment rights of minorities, women, Vietnam veterans, handicapped, and aged persons.

Signature _____ Name of Business _____

The Entity (regardless of whether construction contractor, non-construction contractor or supplier) agrees to provide equal opportunity in employment for all qualified persons, to prohibit discrimination in employment because of race, color, religion, sex (including pregnancy, sexual orientation or gender identity), national origin, disability, age, genetic information, political affiliation, or veteran status, and to promote equal employment through a positive, continuing program from itself and each of its sub-contracting agents. This program of equal employment opportunity shall apply to every aspect of its employment policies and practices.

The Kentucky equal Employment Opportunity Act of 1978 (KRS 45.560-45.640) requires that any count, city, town, school district, water district, hospital district, or other political subdivision of the state shall include in directly or indirectly publicly funded contracts for supplies, materials, services, or equipment hereinafter entered into the following provisions:

During the performance of this contract, the contractor agrees as follows:

(1) The contractor will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age or national origin;

(2) The contractor will state in all solicitations or advertisements for employees placed by or on behalf of the contractors that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age or national origin;

(3) The contract will post notices in conspicuous places, available to employees and applicants for employment, setting forth the provisions of the non-discrimination clauses required by this section; and

(4) The contractor will send a notice to each labor union or representative of workers with which he has a collective bargaining agreement or other contract or understanding advising the

labor union or workers' representative of the contractor's commitments under the nondiscrimination clauses.

The Act further provides:

KRS 45.610. Hiring minorities – Information required

(1) For the length of the contract, each contractor shall hire minorities from other sources within the drawing area, should the union with which he has collective bargaining agreements be unwilling to supply sufficient minorities to satisfy the agreed upon goals and timetable.

(2) Each contractor shall, for the length of the contract, furnish such information as required by KRS 45.560 to KRS 45.640 and by such rules, regulations and orders issued pursuant thereto and will permit access to all books and records pertaining to his employment practices and work sites by the contracting agency and the department for purposes of investigation to ascertain compliance with KRS 45.560 to 45.640 and such rules, regulations and orders issued pursuant thereto.

KRS 45.620. Action against contractor – Hiring of minority contractor or subcontractor

(1) If any contractor is found by the department to have engaged in an unlawful practice under this chapter during the course of performing under a contract or subcontract covered under KRS 45.560 to 45.640, the department shall so certify to the contracting agency and such certification shall be binding upon the contracting agency unless it is reversed in the course of judicial review.

(2) If the contractor is found to have committed an unlawful practice under KRS 45.560 to 45.640, the contracting agency may cancel or terminate the contract, conditioned upon a program for future compliance approved by the contracting agency and the department. The contracting agency may declare such a contractor ineligible to bid on further contracts with that agency until such time as the contractor complies in full with the requirements of KRS 45.560 – 45.640.

(3) The equal employment provisions of KRS 45.560 to 45.640 may be met in part by a contractor by subcontracting to a minority contractor or subcontractor. For the provisions of KRS 45.560 to 45.640, a minority contractor or subcontractor shall mean a business that is owned and controlled by one or more persons disadvantaged by racial or ethnic circumstances.

KRS 45.630 Termination of existing employee not required, when

Any provision of KRS 45.560 to 45.640 notwithstanding, no contractor shall be required to terminate an existing employee upon proof that that employee was employed prior to the date of the contract.

KRS 45.640 Minimum skills

Nothing in KRS 45.560 to 45.640 shall require a contractor to hire anyone who fails to demonstrate the minimum skills required to perform a particular job.

It is recommended that all of the provisions quoted above to be included as special conditions in each contract. In the case of a contract exceeding $250,000, the contractor is required to furnish evidence that his work-force in Kentucky is representative of the available work-force in the area from which he draws employees, or to supply an Affirmative Action plan which will achieve such representation during the life of the contract.

11. EQUAL EMPLOYMENT OPPORTUNITY AFFIRMATIVE ACTION POLICY

It is the policy of _____

to assure that all applicants for employment and all employees are treated on a fair and equitable basis without regard to their race, religion, sex, color, handicap, natural origin or age.

Such action shall include employment, promotion, demotion, recruitment or recruitment advertising, layoff or termination, rates of pay and other forms of compensation, and selection for training, whether apprenticeship and/or on-the-job-training.

Furthermore, this company agrees to make special recruitment efforts to hire the protected class whenever feasible. This company also agrees to adhere to all applicable federal, state, and local laws relating to Equal Employment Opportunity for all individuals.

12. WORKFORCE ANALYSIS FORM

Name of Organization: _____

Categories	Total	White (Not Hispanic or Latino)		Hispanic or Latino		Black or African-American (Not Hispanic or Latino		Native Hawaiian and Other Pacific Islander (Not Hispanic or		Asian (Not Hispanic or Latino		American Indian or Alaskan Native (not Hispanic or Latino		Two or more races (Not Hispanic or Latino		Total	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
Administrators																	
Professionals																	
Superintendents																	
Supervisors																	
Foremen																	
Technicians																	
Protective Service																	
Para-Professionals																	
Office/Clerical																	
Skilled Craft																	
Service/Maintenance																	
Total:																	

Prepared by: _____

(Name and Title)

Date: _____/_____/_____

Revised 2015-Dec-15

13. EVIDENCE OF INSURABILITY

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT CONSTRUCTION PROJECT
(Use separate form for each Agency or Brokerage agreeing to provide coverage)

Names Insured: _____ Employee ID: _____

Address: _____ Phone: _____

Project to be insured: _____

In lieu of obtaining certificates of insurance at this time, the undersigned agrees to provide the above Named Insured with the minimum coverage listed below. These are outlined in the Insurance and Risk Management of Part V (Special Conditions), including all requirements, and conditions:

Section Items	Coverage	Minimum Limits and Policy Requirements	Limits Provided To Insured	Name of Insurer	A.M. Best's Code	Rating
SC-2 – see provisions	CGL	$1,000,000 per occ. And $2,000,000 aggregate	$			
SC-2 – see provisions	AUTO	$1,000,000/per occ.	$			
SC-2 – see provisions	WC	Statutory w/endorsement as noted	$			
SC-2 – see provisions	EXC	$5,000,000 per occ.	$			

Section 2 includes required provisions, statements regarding insurance requirements, and the undersigned agrees to abide by all provisions for the coverage's checked above unless stated otherwise when submitting.

Agency or Brokerage

Name of Authorized Representative

Street Address

Title

City State Zip

Authorized Signature

Telephone Number

Date

NOTE: Authorized signatures may be the agent's if agent has placed insurance through an agency agreement with the insurer. If insurance is brokered, authorized signature must be that of authorized representative of insurer.

IMPORTANT: Contract may not be awarded if a completed and signed copy of this form for all coverage's listed above is not provided with the bid.

14. DEBARRED FIRMS

PROJECT NAME: _____

BID NUMBER: _____

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
LEXINGTON, KY

All prime Contractors shall certify that Subcontractors have not and will not be awarded to any firms that has been debarred for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 As Amended, Executive Order 11246 As Amended or any other Federal Law.

All bidders shall complete the attached certification in duplicate and submit both copies to the Owner with the bid proposal. The Owner (grantee) shall transmit one copy to the Lexington-Fayette Urban County Government, Division of Community Development, within fourteen (14) days after bid opening.

The undersigned hereby certifies that the firm of _____ has not and will not award a subcontract, in connection with any contract award to it as the result of this bid, to any firm that has been debarred for noncompliance with the Federal labor Standards, Title VI of the civil Rights Act of 1964, Executive Order 11246 as amended or any Federal Law.

_____
Name of Firm Submitting Bid

_____
Signature of Authorized Official

_____
Title

_____
Date

15. DEBARMENT CERTIFICATION

All contractors/subcontractors shall complete the following certification and submit it with the bid proposal.

The contractor/subcontractor certifies in accordance with Executive Order 12549 (Debarment and Suspension 2/18/86) that to the best of its knowledge and belief, that it and its principals:

1) Are not presently debarred, suspended, proposed for debarment, declared negligible, or voluntarily excluded from covered transactions or contract by any Federal department or agency for noncompliance with the Federal Labor Standards, Title VI of the Civil Rights Act of 1964 as amended, Executive Order 11246 as amended or any other Federal law;

   a) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

   b) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(a) of this certification; and

   c) Have not within a three year period preceding this bid has one or more public (Federal, State or local) transactions or contracts terminated for cause or default.

2) Where the contractor is unable to certify to any of the statements in this certification, such prospective contractors shall attach an explanation to this certification form.

Firm Name: _____

Project: _____

Printed Name and Title of Authorized Representative: _____

Signature: _____

Date: _____

END OF SECTION

PART IV

GENERAL CONDITIONS

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END OF SECTION

PART IV

GENERAL CONDITIONS

1. DEFINITIONS

Wherever used in these General Conditions or the other Contract Documents, the following terms have the meanings indicated which are applicable to both the singular and plural thereof.

1.1 Addenda
Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bid Documents or the Contract Documents.

1.2 Agreement
The written agreement between OWNER and CONTRACTOR covering the Work to be performed; other Contract Documents are attached to the Agreement and made a part thereof as provided therein.

1.3 Application for Payment
The form accepted by CONSULTANT which is to be used by CONTRACTOR in requesting progress or final payments and which is to include such supporting documentation as is required by the Contract Documents.

1.4 Bid
The offer or proposal of the Bidder submitted on the prescribed form setting forth the prices for the Work to be performed.

1.5 Bidder
An individual, partnership, or corporation, who submit a Bid for a prime contract with the OWNER, for the Work described in the proposed Contract Documents.

1.6 Bonds
Bid, performance and payment bonds and other instruments of security.

1.7 Calendar Day
A calendar day of twenty-four hours measured from midnight to the next midnight shall constitute a day.

1.8 Change Order
A document recommended by CONSULTANT, which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion or revision in the Work, or an adjustment in the Contract Price or the Contract Time, issued on or after the Effective Date of the Agreement.

1.9 Contract Documents
The Advertisement for Bidders, Information for Bidders, Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR'S Bid (including documentation accompanying the Bid and any post-bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Bonds, these General Conditions, the Special Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all amendments, modifications and supplements.

1.10 Contract Unit Price
The monies payable by OWNER to CONTRACTOR under the Contract Documents as stated in the Agreement. Unit Prices are to be firm for the term of this Contract.

1.11 Contract Time
The number of consecutive calendar days between the date of issuance of the Notice to Proceed and the contract completion date.

1.12 CONTRACTOR
The person, firm or corporation with whom OWNER has entered into the Agreement.

1.13 Defective
An adjective which when modifying the word Work refers to Work that is unsatisfactory, faulty or deficient, or does not conform to the Contract Documents, or does not meet the requirements of any inspection, reference standard, test or approval referred to in the Contract Documents, or has been damaged prior to CONSULTANT'S recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER).

1.14 Drawings
The drawings which show the character and scope of the Work to be performed and which have been prepared or approved by CONSULTANT and are referred to in the Contract Documents.

1.15 Effective Date of the Agreement
The date indicated in the Agreement on which it becomes effective.

1.16 CONSULTANT
The Lexington-Fayette Urban County Government or its authorized representative.

1.17 Field Order
A documented order issued by CONSULTANT which orders minor changes in the Work, but which does not involve a change in the Contract Price or the Contract Time.

1.18 Giving Notice
Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.

1.19 Laws and Regulations
Laws, rules, regulations, ordinances, codes and/or orders.

1.20 Notice of Award
The written notice by OWNER to the apparent successful bidder stating that upon compliance by the apparent successful bidder with the conditions enumerated therein, within the time specified, OWNER will sign and deliver the Agreement.

1.21 Notice to Proceed
A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Time will commence to run and on which CONTRACTOR shall start to perform CONTRACTOR'S obligations under the Contract Documents.

1.22 OWNER
The Lexington-Fayette Urban County Government.

1.23 Partial Utilization
Placing a portion of the Work in service for the purpose for which it is intended (or related purpose) before reaching Completion for all the Work.

1.24 Project
The total construction of which the Work to be provided under the Contract Documents may be the whole, or a part as indicated elsewhere in the Contract Documents.

1.25 Inspector
The authorized representative who is assigned to the site or any part thereof.

1.26 Shop Drawings
All drawings, diagrams, illustrations, schedules and other data which are specifically prepared by or for CONTRACTOR to illustrate some portion of the Work and all illustrations, brochures, standard schedules, performance charts, instructions, diagrams and other information prepared by a Supplier and submitted by CONTRACTOR to illustrate material or equipment for some portion of the Work.

1.27 Specifications
Those portions of the Contract Documents consisting of written technical descriptions of materials, equipment, construction systems, standards and

workmanship as applied to the Work and certain administrative details applicable thereto.

1.28 Standard Specifications
The "Standard Specifications for Road and Bridge Construction", Transportation Cabinet, Department of Highways, Commonwealth of Kentucky, current edition. MUTCD shall refer to the "Manual of Uniform Traffic Control Devices.

1.29 Subcontractor
An individual, firm or corporation having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the site.

1.30 Special Conditions
The part of the Contract Documents which amends or supplements these General Conditions.

1.31 Supplier
A manufacturer, fabricator, supplier, distributor, materialman or vendor.

1.32 Underground Facilities
All pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels or other such facilities or attachments, and any encasements containing such facilities which have been installed underground to furnish any of the following services or materials: electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, sewage and drainage removal, traffic or other control systems or water.

1.33 Unit Price Work
An amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement.

1.34 Work
The entire completed construction or the various separately identifiable parts thereof required to be furnished under the Contract Documents. Work is the result of performing services, furnishing labor and furnishing and incorporating materials and equipment into the construction, all as required by the Contract Documents.

1.35 Time Period
When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.

2. PRELIMINARY MATTERS

2.1 Delivery of Bonds
When the CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER, such Bonds, Insurance Certificate, and Power of Attorney as CONTRACTOR may be required to furnish.

2.2 Commencement of Contract Time; Notice to Proceed
The Contract Time will commence to run on the day specified in the Notice to Proceed.

2.3 Starting the Project
CONTRACTOR shall start to perform the Work on the date when the Contract Time commences to run, but no Work shall be done at the site prior to the date on which the Contract Time commences to run.

2.4 Before Starting Construction
Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures shown thereon and all applicable field measurements. CONTRACTOR shall promptly report in writing to CONSULTANT any conflict, error or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from CONSULTANT before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or CONSULTANT for failure to report any conflict, error or discrepancy in the Contract Documents, unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

2.5 Submittal of Schedules
Within ten days after the effective date of the Agreement (unless otherwise specified) CONTRACTOR shall submit to CONSULTANT for review:

2.5.1 an estimated progress schedule indicating the starting and completion dates of the various stages of the Work;

2.5.2 a preliminary schedule of Shop Drawing submissions; and

2.5.3 a preliminary schedule of values for all of the Work which will include quantities and prices of items aggregating the Contract Price and will subdivide the Work into costs per labor and materials by specification section to serve as the basis for progress payments during construction. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work which will be confirmed in writing by CONTRACTOR at the time of submission. Schedule of values shall be submitted on AIA G702/703 forms, or approved equal.

2.6 Preconstruction Conference

Before CONTRACTOR starts the Work at the proposed site, a conference attended by CONTRACTOR, CONSULTANT, EEO-Affirmative Action Officer, and other appropriate parties will be held to discuss the following issues: (1) The scheduling of the Work to be completed; (2) The procedures for handling shop drawings and other submittals; (3) The processing of applications for payment; (4) The establishment of an understanding among the involved parties in regard to the proposed project; (5) The establishment of procedures for effectively implementing the LFUCG's 10% minimum DBE goals; and (6) Requirement for Mechanic's Lien on Partial Applications for Payment.

2.7 Finalizing Schedules

At least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, CONSULTANT and others as appropriate will be held to finalize the schedules submitted in accordance with paragraph 2.6. The finalized progress schedule will be acceptable to CONSULTANT as providing orderly progression of the Work to completion within the Contract Time, but such acceptance will neither impose on CONSULTANT responsibility for the progress or scheduling of the Work nor relieve CONTRACTOR from full responsibility thereof. The finalized schedule of Shop Drawing submissions will be acceptable to CONSULTANT as providing a workable arrangement for processing the submissions. The finalized schedule of values will be acceptable to CONSULTANT as to form and substance.

3. CONTRACT DOCUMENTS: INTENT, CONFLICTS, AMENDING AND REUSE

3.1 General

The Contract Documents comprise the entire agreement between OWNER and CONTRACTOR concerning the Work. The Contract Documents are complementary; what is called for by one is as binding as if called for by all. The Contract Documents will be construed in accordance with the law of the place of the Project.

3.2 Intent

It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any Work, materials or equipment that may reasonably be inferred from the Contract Documents as being required to produce the intended result will be supplied whether or not specifically called for. When words which have a well-known technical or trade meaning are used to describe Work, materials or equipment such words shall be interpreted in accordance with that meaning. Reference to standard specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the latest standard specification, manual, code or laws or regulations in effect at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no

Bids), except as may be otherwise specifically stated. However, no provision of any referenced standard specification, manual or code (whether or not specifically incorporated by reference in the Contract Documents) shall be effective to change the duties and responsibilities of OWNER, CONTRACTOR or CONSULTANT, or any of their consultants, agents or employees from those set forth in the Contract Documents, nor shall it be effective to assign to CONSULTANT, or any of CONSULTANT'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4. Clarifications and interpretations of the Contract Documents shall be issued by CONSULTANT as provided in paragraph 8.4.

3.3 Conflicts

If, during the performance of the Work, CONTRACTOR finds a conflict, error or discrepancy in the Contract Documents, CONTRACTOR shall so report to CONSULTANT in writing at once and before proceeding with the Work affected thereby shall obtain a written interpretation or clarification from CONSULTANT; however, CONTRACTOR shall not be liable to OWNER or CONSULTANT for failure to report any conflict, error or discrepancy in the Contract Documents unless CONTRACTOR had actual knowledge thereof or should reasonably have known thereof.

In resolving such conflicts, errors and discrepancies, the documents shall be given precedence in the following order:

1. Agreement
2. Field and Change Orders
3. Addenda
4. Special Conditions
5. Instruction to Bidders
6. General Conditions
7. Specifications and Drawings

Figure dimension on drawings shall govern over scale dimensions and detailed Drawings shall govern over general Drawings.

3.4 Amending and Supplementing Contract Documents

The Contract Documents may be amended to provide for additions, deletions and revisions in the Work or to modify the terms and conditions thereof by means of a Change Order or a Field Order. Contract Price and Contract Time may only be changed by a Change Order.

3.5 Reuse of Documents

Neither CONTRACTOR nor any Subcontractor or Supplier or other person or organization performing or furnishing any of the Work under a direct or indirect contract with OWNER shall have or acquire any title to or ownership rights in any

of the Drawings, Specifications or other documents (or copies of any thereof) prepared by or bearing the seal of CONSULTANT; and they shall not reuse any of them on extensions of the Project or any other project without written consent of OWNER and CONSULTANT and specific written verification or adaptation by CONSULTANT.

4. AVAILABILITY OF LANDS; PHYSICAL CONDITIONS, REFERENCE POINTS

4.1 Availability of Lands

OWNER shall furnish, as indicated in the Contract Documents, the lands upon which the Work is to be performed, rights-of-way and easements for access thereto, and such other lands which are designated for the use of CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities will be obtained and paid for by OWNER, unless otherwise provided in the Contract Documents. If CONTRACTOR believes that any delay in OWNER'S furnishing these lands, rights-of-way or easements entitles CONTRACTOR to an extension of the Contract Time, CONTRACTOR may make a claim therefor as provided in Article 11. CONSULTANT shall determine if the claim is legitimate or not. CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.

4.2 Physical Conditions

4.2.1 Explorations and Reports

Reference is made to the Special Conditions for identification of those reports of explorations and tests of subsurface conditions at the site that have been utilized by CONSULTANT in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such reports, but not upon non-technical data, interpretations or opinions contained therein or for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to subsurface conditions at the site.

4.2.2 Existing Structures

Reference is made to the Special Conditions for identification of those drawings of physical conditions in or relating to existing surface and subsurface structures (except Underground Facilities referred to in paragraph 4.3 which are at or contiguous to the site that have been utilized by CONSULTANT in preparation of the Contract Documents. CONTRACTOR may rely upon the accuracy of the technical data contained in such drawings, but not for the completeness thereof for CONTRACTOR'S purposes. Except as indicated in the immediately preceding sentence and in paragraph 4.2.6, CONTRACTOR shall have full responsibility with respect to physical conditions in or relating to such structures.

4.2.3 Report of Differing Conditions

If CONTRACTOR believes that:

4.2.3.1 any technical data on which CONTRACTOR is entitled to rely as provided in paragraphs 4.2.1 and 4.2.2 is inaccurate, or

4.2.3.2 any physical conditions uncovered or revealed at the site differ materially from that indicated, reflected or referred to in the Contract Documents,

CONTRACTOR shall, promptly after becoming aware thereof and before performing and WORK in connection therewith (except in an emergency) notify OWNER and CONSULTANT in writing about the inaccuracy or difference.

4.2.4 CONSULTANT'S Review

CONSULTANT will promptly review the pertinent conditions, determine the necessity of obtaining additional explorations or tests with respect thereto and advise CONTRACTOR of CONSULTANT'S findings and conclusions.

4.2.5 Possible Document Change

If CONSULTANT concludes that there is a material error in the Contract Documents or that because of newly discovered conditions a change I the Contract Documents is required, a Change Order will be issued as provided in Article 10 to reflect and document the consequences of the inaccuracy or difference.

4.2.6 Possible Price and Time Adjustments

In each such case, an increase or decrease in the Contract Price or an extension or shortening of the Contract Time, or any combination thereof, will be allowable to the extent that they are attributable to any such inaccuracy or difference.

4.3 Physical Conditions-Underground Facilities

4.3.1 Shown or Indicated

The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the site is based on information and data furnished to OWNER or CONSULTANT by the owners of such underground facilities or by others. Unless it is otherwise expressly provided in the Special Conditions:

4.3.1.1 OWNER and CONSULTANT shall not be responsible for the accuracy or completeness of any such information or data; and,

4.2.1.2 CONTRACTOR shall have full responsibility for reviewing and checking all such information and data; for locating all underground facilities shown or indicated in the Contract Documents; for coordination of the Work with the owners of such underground facilities during construction;

and for the safety and protection thereof and repairing any damage thereto resulting from the Work, the cost of all of which will be considered as having been included in the Contract Price.

4.3.2 Not Shown or Indicated

If an underground facility is uncovered or revealed at or contiguous to the site which was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of, CONTRACTOR shall, promptly after becoming aware thereof and before performing any Work affected thereby (except in an emergency), identify the owner of such Underground Facility and give written notice thereof to that owner and to OWNER and CONSULTANT. CONSULTANT will promptly review the underground facility to determine the extent to which the Contract Documents should be modified to reflect and document the consequences of the existence of the Underground Facility, and the Contract Documents will be amended or supplemented to the extent necessary. During such time, CONTRACTOR shall be responsible for the safety and protection of such underground facility. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, to the extent that they are attributable to the existence of any underground facility that was not shown or indicated in the Contract Documents and which CONTRACTOR could not reasonably have been expected to be aware of.

4.4 Reference Points

OWNER shall provide engineering surveys to establish reference points for construction which in CONSULTANT'S judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work (unless otherwise specified), shall protect and preserve the established reference points and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to CONSULTANT whenever any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points by a Registered Land Surveyor.

5. CONTRACTOR'S RESPONSIBILITIES

5.1 Supervision

CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall assure that all CONTRACTOR personnel (including subcontractors, etc.) conduct themselves in a courteous and respectful manner toward the CONSULTANT and the general public. CONTRACTOR shall keep at the Project Site during the progress of the Work a competent project manager/superintendent and all necessary assistants, all of whom shall be

satisfactory to OWNER. OWNER reserves the right to reject CONTRACTOR'S construction superintendent and project management personnel if they are unsatisfactory to OWNER and upon such rejection CONTRACTOR shall designate and provide competent successors. Failure to comply with this condition of the Contract will result in immediate suspension of the Work. Following a review by the Commissioner of Public Works, the Contract may be terminated (see GC section 14). CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of others in the design or selection of a specific means, method, technique, sequence or procedure of construction which is indicated in and required by the Contract Documents. CONTRACTOR shall be responsible to see that the finished Work complies accurately with the Contract Documents.

5.2 Superintendence

CONTRACTOR shall keep on the Work at all times during its progress a competent resident superintendent, who shall not be replaced without written notice to OWNER and CONSULTANT except under extraordinary circumstances. The superintendent will be CONTRACTOR'S representative at the site and shall have authority to act on behalf of CONTRACTOR. All communications given to the superintendent shall be as binding as if given to CONTRACTOR.

5.3 Labor

CONTRACTOR shall provide competent, suitably qualified personnel to survey and lay out the Work and perform construction as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the site. OWNER reserves the right to require CONTRACTOR to remove from the Project any of it's personnel, or subcontractor's personnel for violating LFUCG Policies, Rules or Regulations. Except in connection with the safety or protection of persons or the Work or property at the site or adjacent thereto, and except as otherwise indicated in the Contract Documents, all Work at the site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday or any legal holiday without OWNER'S written consent given after prior written notice to CONSULTANT.

5.4 Start-Up and Completion of Work

Unless otherwise specified, CONTRACTOR shall furnish and assume full responsibility for all materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities and all other facilities and incidentals necessary for the furnishing, performance, testing, start-up and completion of the Work.

5.5 Materials and Equipment

All materials and equipment shall be of good quality and new, except as otherwise provided in the Contract Documents. If required by CONSULTANT,

CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the kind and quality of materials and equipment. All materials and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned in accordance with the instructions of the applicable supplier except as otherwise provided in the Contract Documents; but no provision of any such instructions will be effective to assign to CONSULTANT, or any of CONSULTANT'S consultants, agents or employees, any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

5.5.1 Not Clearly Specified or Indicated

In all instances where materials specified are obtainable in different sizes, weights, trade grades, qualities or finishes, etc., whose weights, trade grades, qualities or finishes, etc., are not clearly specified or indicated on the Drawings, the CONTRACTOR shall notify the CONSULTANT of all such instances at least five (5) days in advance of receiving the proposals. The CONSULTANT will then determine which size, weight, trade grade, quality, finish, etc., is required.

5.5.2 Coordination of Work

The CONTRACTOR shall see that for his own Work and for the work of each subcontractor, proper templates and patterns necessary for the coordination of the various parts of the Work are prepared. The CONTRACTOR shall furnish or require the Subcontractor to furnish such duplicates as will enable the Subcontractors to fit together and execute fully their respective portions of the Work.

5.6 Adjusting Progress Schedule

CONTRACTOR shall submit to CONSULTANT for acceptance (to the extent indicated in paragraph 2.8) adjustments in the progress schedule to reflect the impact thereon of new developments; these will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the Contract Documents applicable thereto.

5.7 Substitutes or "Or-Equal" Items

5.7.1 General

Whenever materials or equipment are specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular supplier, the naming of the item is intended to establish the type, function, and quality required. Unless the name is followed by words indicating that no substitution is permitted, materials or equipment of other Suppliers may be accepted by OWNER/CONSULTANT if sufficient information is submitted by CONTRACTOR to allow OWNER/CONSULTANT to determine that the material or equipment

proposed is equivalent or equal to that named. The procedure for review by OWNER/CONSULTANT will include the following. Requests for review of substitute items of material and equipment will not be accepted by OWNER/CONSULTANT from anyone, other than CONTRACTOR. If CONTRACTOR wishes to furnish or use a substitute item of material or equipment, CONTRACTOR shall make written application to OWNER/CONSULTANT for acceptance thereof, certifying that the proposed substitute will perform adequately the functions and achieve the results called for by the general design, be similar and of equal substance to that specified and be suited to the same use as that specified. The application will state that the evaluation and acceptance of the proposed substitute will not prejudice CONTRACTOR'S achievement of completion on time, whether or not acceptance of the substitute for use in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute and whether or not incorporation or use of the substitute in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute from that specified will be identified in the application and available maintenance, repair and replacement service will be indicated. The application will also contain an itemized estimate of all costs that will result directly or indirectly from acceptance of such substitute, including costs of redesign and claims of other contractors affected by the resulting change, all of which shall be considered by OWNER/CONSULTANT in evaluating the proposed substitute. OWNER/CONSULTANT may require CONTRACTOR to furnish at CONTRACTOR'S expense additional data about the proposed substitute.

5.7.2 Substitutes

If a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, sequence, technique or procedure of construction acceptable to OWNER/CONSULTANT, if CONTRACTOR submits sufficient information to allow OWNER/CONSULTANT to determine that the substitute proposed is equivalent to that indicated or required by the Contract Documents. The procedure for review by OWNER/CONSULTANT will be similar to that provided in paragraph 5.7.1 as applied by OWNER/CONSULTANT.

5.7.3 OWNER/CONSULTANT'S Approval

OWNER/CONSULTANT will be allowed a reasonable time within which to evaluate each proposed substitute. OWNER/CONSULTANT will be the sole judge of acceptability, and no substitute will be ordered, installed or utilized without OWNER/CONSULTANT'S prior written acceptance which will be evidenced by either a Change Order or an approved Shop Drawing. OWNER may require CONTRACTOR to furnish at

CONTRACTOR'S expense a special performance guarantee or other surety with respect to any substitute. OWNER/CONSULTANT will record time required by OWNER/CONSULTANT and OWNER/CONSULTANT'S consultants in evaluating substitutions proposed by CONTRACTOR and in making changes in the Contract Documents occasioned thereby. Whether or not OWNER/CONSULTANT accepts a proposed substitute, CONTRACTOR shall reimburse OWNER for the charges of OWNER/CONSULTANT and OWNER/CONSULTANT'S consultants for evaluating each proposed substitute.

5.8 Subcontractors, Suppliers, and Others

5.8.1 Acceptable to CONSULTANT

CONTRACTOR shall not employ any Subcontractor, Supplier or other person or organization (including those acceptable to OWNER and CONSULTANT as indicated in paragraph 5.8.2), whether initially or as a substitute, against whom OWNER or CONSULTANT may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier or other person or organization to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.

5.8.2 Objection After Due Investigation

If the Contract Documents require the identity of certain Subcontractors, Suppliers or other persons or organizations (including those who are to furnish the principal items of materials and equipment) to be submitted to OWNER in advance of the specified date prior to the Effective Date of the Agreement for acceptance by OWNER and CONSULTANT and if CONTRACTOR has submitted a list thereof, OWNER'S or CONSULTANT'S acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the bidding documents or the Contract Documents) of any such Subcontractor, Supplier or other person or organization so identified may be revoked on the basis of reasonable objection after due investigation, in which case CONTRACTOR shall submit an acceptable substitute. No acceptance by OWNER or CONSULTANT of any such Subcontractor, Supplier or other person or organization shall constitute a waiver of any right of OWNER or CONSULTANT to reject defective Work.

5.8.3 Contractor Responsible for Acts of Subcontractors

The CONTRACTOR shall perform on the site, and with its own organization, work equivalent to at least fifty (50) percent of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the CONTRACTOR requests a reduction and the Urban County

project manager determines that the reduction would be to the advantage of the Urban County Government.

The CONTRACTOR shall, at the time he submits his proposal for the Contract, notify the OWNER in writing of the names of Subcontractors proposed for the Work. He shall not employ any Subcontractor without the prior written approval of the OWNER.

CONTRACTOR shall be fully responsible to OWNER and CONSULTANT for all acts and omissions of the Subcontractors, Suppliers and other persons and organizations performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR just as CONTRACTOR is responsible for CONTRACTOR'S own acts and omissions. Nothing in the Contract Documents shall create any contractual relationship between OWNER or CONSULTANT and any such Subcontractor, Supplier or other person or organization, nor shall it create any obligation on the part of OWNER or CONSULTANT to pay or to see to the payment of any moneys due any such Subcontractor, Supplier or other person or organization except as may otherwise be required by Laws and Regulations.

5.8.4 Division of Specifications

The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.

5.8.5 Agreement Between Contractor and Subcontractors

All Work performed for CONTRACTOR by a Subcontractor will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor which specifically binds the Subcontractor to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and CONSULTANT.

5.8.6 Statements and Comments by CONTRACTOR

Neither the CONTRACTOR, his employees, nor his subcontractors shall at any time make any statement or comment as to the project scope, nature, intention, design, or construction method to any third party or parties without the explicit written consent of the OWNER.

Any third party requesting such information shall be referred to the OWNER or his representative.

Should there be any change from the original intent of the project as a result of any statement or comment by the contractor, his employees or subcontractors, contractor shall be held liable for any change in the scope,

nature, design, or construction method and shall bear the full cost for the previously mentioned changes.

5.9 Patent Fees and Royalties

CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product or device which is the subject of patent rights or copyrights held by others.

5.10 Permits

Unless otherwise provided in the Special conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work, which are applicable at the time of opening of Bids, or if there are no Bids on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto such as plant investment fees.

5.11 Laws and Regulations

5.11.1 CONTRACTOR to Comply

CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor CONSULTANT shall be responsible for monitoring CONTRACTOR'S compliance with any Laws and Regulations.

5.11.2 Specifications and Drawings at Variance

If CONTRACTOR observes that the Specifications or Drawings are at variance with any Laws or Regulations, CONTRACTOR shall give CONSULTANT prompt written notice thereof, and any necessary changes will be authorized by one of the methods indicated in paragraph 3.4. If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to such Laws, or Regulations, and without such notice to CONSULTANT, CONTRACTOR shall bear all costs arising therefrom; however, it shall not be CONTRACTOR'S primary responsibility to make certain that the Specifications and Drawings are in accordance with such Laws and Regulations.

Any party, firm or individual submitting a proposal pursuant to invitation must have paid all taxes owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, and must maintain a "current" status in regard to those taxes throughout the Contract. If applicable, business must be licensed in Fayette County.

5.12 Taxes

CONTRACTOR shall pay all sales, consumer, use and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work. Any party, firm or individual submitting a proposal pursuant to invitation must have paid all taxes owed to the Lexington-Fayette Urban County Government at the time the proposal is submitted, and must maintain a "current" status in regard to those taxes throughout the Contract. If applicable, business must be licensed in Fayette County.

5.13 Use of Premises

5.13.1 Project Site

CONTRACTOR shall confine construction equipment, the storage of materials and equipment and the operations of workers to the staging areas or work site areas identified in and permitted by the Contract Documents and other land and areas permitted by Laws and Regulations, rights-of-way, permits and easements, and shall not unreasonably encumber the premises with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof or of any land or areas contiguous thereto, resulting from the performance of the Work. Should any claim be made against OWNER or CONSULTANT by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly attempt to settle with such other party by agreement or otherwise resolve the claim by arbitration or at law. CONTRACTOR shall, to the fullest extent permitted by Laws and Regulations, indemnify and hold OWNER and CONSULTANT harmless from and against all claims, damages, losses and expenses (including, but not limited to, fees of engineers, architects, attorneys and other professionals and court and arbitration costs) arising directly, indirectly or consequentially out of any action, legal or equitable, brought by any such other party against OWNER or CONSULTANT to the extent based on a claim arising out of CONTRACTOR'S performance of the Work.

5.13.2 Clean UP

During the progress of the Work, CONTRACTOR shall keep the premises free from accumulations of waste materials, rubbish and other debris resulting from the Work. At the completion of the Work, CONTRACTOR shall remove all waste materials, rubbish and debris from and about the premises as well as all tools, appliances, construction equipment and machinery, and surplus materials, and shall leave the site clean and ready for occupancy by OWNER. CONTRACTOR shall restore to original condition all property not designated for alteration by the Contract Documents.

5.13.1 Loading of Structures

CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.

5.14 Record Drawings

CONTRACTOR shall maintain in a safe place at the site one record copy of all Drawings, Specifications, Addenda, Change Orders, Field Orders and written interpretations and clarifications (issued pursuant to paragraph 9.4) in good order and annotated to show all changes made during construction. These record documents together with all approved samples and a counterpart of all approved Shop Drawings will be available to CONSULTANT for reference. Upon completion of the Work, these record documents, samples and Shop Drawings will be delivered to CONSULTANT for OWNER.

5.15 Shop Drawings and Samples

5.15.1 Shop Drawing Submittals

After checking and verifying all field measurements and after complying with applicable procedures specified, CONTRACTOR shall submit to CONSULTANT for review and approval in accordance with the accepted schedule of Shop Drawing submissions (see paragraph 2.8), or for other appropriate action if so indicated in the Special Conditions, five copies (unless otherwise specified) of all Shop Drawings, which will bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission. All submissions will be identified as CONSULTANT may require. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable CONSULTANT to review the information as required.

5.15.2 Sample Submittals

CONTRACTOR shall also submit to CONSULTANT for review and approval with such promptness as to cause no delay in Work, all samples required by the Contract Documents. All samples will have been checked by and accompanied by a specific written indication that CONTRACTOR has satisfied CONTRACTOR'S responsibilities under the Contract Documents with respect to the review of the submission and will be identified clearly as to material, Supplier, pertinent data such as catalog numbers and the use for which intended.

5.15.3 Review by CONTRACTOR

Before submission of each Shop Drawing or sample CONTRACTOR shall have determined and verified all quantities, dimensions, specified

performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto and reviewed or coordinated each Shop Drawing or sample with other Shop Drawings and samples and with the requirements of the Work and the Contract Documents.

5.15.4 Notice of Variation

At the time of each submission, CONTRACTOR shall give CONSULTANT specific written notice of each variation that the Shop Drawings or samples may have from the requirements of the Contract Documents, and, in addition, shall cause a specific notation to be made on each Shop Drawing submitted to CONSULTANT for review and approval of each such variation.

5.15.5 CONSULTANT'S Approval

CONSULTANT will review and approve with reasonable promptness Shop Drawings and samples, but CONSULTANT'S review and approval will be only for conformance with the design concept of the Project and for compliance with the information given in the Contract Documents and shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions. CONTRACTOR shall make corrections required by CONSULTANT, and shall return the required number of corrected copies of Shop Drawings and submit, as required, new samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by CONSULTANT on previous submittals.

5.15.6 Responsibility for Errors and Omissions

CONSULTANT'S review and approval of Shop Drawings or samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called CONSULTANT'S attention to each such variation at the time of submission as required by paragraph 5.15.4 and CONSULTANT has given written approval of each such variation by a specific written notation thereof incorporated in or accompanying the Shop Drawing or sample approval; nor will any approval by CONSULTANT relieve CONTRACTOR from responsibility for errors or omissions in the Shop Drawings or from responsibility for having complied with the provisions of paragraph 5.15.3.

5.15.7 Cost of Related Work

Where a Shop or sample is required by the Specifications, any related Work performed prior to CONSULTANT'S review and approval of the pertinent submission will be the sole expense and responsibility of CONTRACTOR.

5.16 Continuing the Work

CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolutions of any disputes or disagreements, except as permitted by paragraph 14.5 or as CONTRACTOR and OWNER may otherwise agree in writing.

5.17 Erosion and Sediment Control

5.17.1 General Environmental Requirements

The CONTRACTOR and Subcontractors performing work on projects on behalf of the OWNER shall comply with all applicable federal, state, and local environmental regulations and all requirements and conditions set forth in "special" permits including but not limited to Corp of Engineers 404 permits, 401 Water Quality Certifications, Stream Crossing and Floodplain Encroachment Permits.

Any fines or penalties resulting from the failure to comply with the terms of the federal, state or local permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

5.17.2 Stormwater Pollution Prevention

A. The CONTRACTOR shall exercise due care to prevent or minimize any damage to any stream or wetland from pollution by debris, sediment or other material. The operation of equipment and/or materials in a jurisdictional wetland is expressly prohibited. Water that has been used for washing or processing, or that contains oils, sediments or other pollutants shall not be discharged from the job site. Such waters shall be collected and properly disposed of by the CONTRACTOR in accordance with applicable local, state and federal law.

B. The CONTRACTOR is solely responsible for securing all required state and local permits associated with stormwater discharges from the project including, but not necessarily limited to the KY Notice of Intent to Disturb (NOI) for Coverage of Storm Water Discharges Associated with Construction Activities under the KPDES Storm Water General Permit KYR100000 and the LFUCG, Land Disturbance Permit. Permit application preparation and all required documentation are the responsibility of the CONTRACTOR. The CONTRACTOR is solely responsible for maintaining compliance with the stormwater pollution prevention plan or erosion and sediment control plan and ensuring the following:

a. That the Stormwater Pollution Prevention Plan (SWPPP) or erosion control plan is current and available for review on site;

b. That any and all stormwater inspection reports required by the permit are conducted by qualified personnel and are available for review onsite; and

c. That all best management practices (BMPs) are adequately maintained and effective at controlling erosion and preventing sediment from leaving the site.

C. The CONTRACTOR shall provide the necessary equipment and personnel to perform any and all emergency measures that may be required to contain any spillage or leakage and to remove materials, soils or liquids that become contaminated. The collected spill material shall be properly disposed at the CONTRACTOR's expense.

D. Upon completion of the work and with the concurrence of the OWNER, the CONTRACTOR must file a Notice of Termination (NOT) of Coverage Under the KPDES General Permit for Storm Water Discharges Associated with Construction Activity with the appropriate local and state authorities.

E. Any fines or penalties resulting from the failure to comply with the terms of the state or local stormwater permits or perform necessary corrective action are solely the obligation of the CONTRACTOR.

6. OTHER WORK

6.1 Related Work at Site

OWNER may perform other work related to the Project at the site by OWNER'S own forces, have other work performed by utility owners or let other direct contracts therefor which shall contain General Conditions similar to these. If the fact that such other work is to be performed was not noted in the Contract Documents, written notice thereof will be given to CONTRACTOR prior to starting any such other work; and, if such performance will involve additional expense to CONTRACTOR or requires additional time, a Change Order to the Contract will be negotiated.

6.2 Other Contractors or Utility Owners

CONTRACTOR shall afford each utility owner and other contractor who is a party to such a direct contract (or OWNER, if OWNER is performing the additional work with OWNER'S employees) proper and safe access to the site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such work, and shall properly connect and coordinate the Work with theirs. CONTRACTOR shall do all cutting, fitting and patching of the Work that may be required to make its several parts come together properly and integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating or otherwise altering their work and will only cut or alter their work with the written consent of CONSULTANT and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the

benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.

6.3 Delays Caused by Others
If any part of CONTRACTOR'S Work depends for proper execution or results upon the work of any such other contractor or utility owner (or OWNER), CONTRACTOR shall inspect and promptly report to CONSULTANT in writing any delays, defects or deficiencies in such work that render it unavailable or unsuitable for such proper execution and results. CONTRACTOR'S failure so to report will constitute an acceptance of the other work as fit and proper for integration with CONTRACTOR'S Work except for latent or non-apparent defects and deficiencies in the other work.

6.4 Coordination
If OWNER contracts with others for the performance of other work on the Project at the site, the person or organization who will have authority and responsibility for coordination of the activities among the various prime contractors will be identified in the Special Conditions, and the specific matters to be covered by such authority and responsibility will be itemized, and the extent of such authority and responsibilities will be provided, in the Special Conditions.

7. OWNER'S RESPONSIBILITIES

7.1 Communications
OWNER shall issue all communications to CONTRACTOR through CONSULTANT.

7.2 Data and Payments
OWNER shall furnish the data required of OWNER under the Contract Documents promptly after they are due.

7.3 Lands, Easements, and Surveys
OWNER'S duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.1 and 4.4. Paragraph 4.2 refers to OWNER'S identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions at the site and in existing structures which have been utilized by CONSULTANT in preparing the Drawings and Specifications.

7.4 Change Orders
OWNER is obligated to execute Change Orders as indicated in paragraph 9.4.

7.5 Inspections, Tests and Approvals
OWNER'S responsibility in respect to certain inspections, tests and approvals is set forth in paragraph 13.3.

7.6 Stop or Suspend Work
In connection with OWNER'S right to stop Work or suspend Work, see paragraph 12.4 and 14.1 Paragraph 14.2 deals with OWNER'S rights to terminate services of CONTRACTOR under certain circumstances.

8. CONSULTANT'S STATUS DURING CONSTRUCTION

8.1 OWNER'S Representative
CONSULTANT will be OWNER'S representative during the construction period. The duties and responsibilities and the limitations of authority of CONSULTANT as OWNER'S representative during construction are set forth in the Contract Documents and shall not be extended without written consent of OWNER and CONSULTANT.

8.2 Visits to Site
CONSULTANT will make visits to the site at intervals appropriate to the various stages of construction to observe the progress and quality of the executed Work and to determine, in general, if the Work is proceeding in accordance with the Contract Documents. CONSULTANT will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. CONSULTANT'S efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform to the Contract Documents. On the basis of such visits and on-site observations, CONSULTANT will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defects and deficiencies in the Work.

8.3 Project Representation
CONSULTANT will provide an Inspector to assist CONSULTANT in observing the performance of the Work. If OWNER designates another agent to represent OWNER at the site who is not CONSULTANT'S agent or employee, the duties, responsibilities and limitations of authority of such other person will be as provided in the Special Conditions.

8.4 Clarifications and Interpretations
CONSULTANT will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents (in the form of Drawings or otherwise) as CONSULTANT may determine necessary, which shall be consistent with or reasonably inferable from the overall intent of the Contract Documents.

8.5 Authorized Variations in Work
CONSULTANT may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Time and are consistent with the overall intent of the Contract Documents. These may be accomplished by a Field Order.

8.6 Rejecting Defective Work
CONSULTANT will have authority to disapprove or reject Work which CONSULTANT believes to be defective, and will also have authority to require special inspection or testing of the Work as provided in paragraph 12.3, whether or not the Work is fabricated, installed or completed.

8.7 Shop Drawings
In connection with CONSULTANT'S responsibility for Shop Drawings and samples, see paragraphs 5.15.1 through 5.16 inclusive.

8.8 Change Orders
In connection with CONSULTANT'S responsibilities as to Change Orders, see Articles 10, 11 and 12.

8.9 Payments
In connection with CONSULTANT'S responsibilities with respect to Applications for Payment, etc., see Article 13.

8.10 Determinations for Unit Prices
CONSULTANT will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR.

CONSULTANT will review with CONTRACTOR CONSULTANT'S preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise).

8.11 Decision on Disputes
CONSULTANT will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work or the interpretation of the requirements of the Contract Documents pertaining to the performance and furnishing of the Work and claims under Articles 10 and 11 in respect of changes in the Contract Price or Contract Time will be referred initially to CONSULTANT in writing with a request for a formal decision in accordance with this paragraph, which CONSULTANT will render in writing within a reasonable time. Written notice of each such claim, dispute and other matter will be delivered to CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise thereto, and written supporting data will be submitted to CONSULTANT within sixty days after such occurrence unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim.

8.12 Limitations on CONSULTANT's Responsibilities

8.12.1 CONTRACTOR, Supplier, or Surety

Neither CONSULTANTS authority to act under this Article 8 or elsewhere in the Contract Documents nor any decision made by CONSULTANT in good faith either to exercise or not exercise such authority shall give rise to any duty or responsibility of CONSULTANT to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization performing any of the Work, or to any surety for any of them.

8.12.2 To Evaluate the Work

Whenever in the Contract Documents the terms "as ordered", "as directed", "as required", "as allowed", "as approved" or terms of like effect or import are used, or the adjectives "reasonable", "suitable", "acceptable", "proper", or "satisfactory" or adjectives or like "effect" or "import" are used to describe a requirement, direction, review or judgment of CONSULTANT as to the Work, it is intended that such requirement, direction, review or judgment will be solely to evaluate the Work for compliance with the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign CONSULTANT any duty or authority to supervise or direct the furnishing or performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 8.12.3 or 8.12.4.

8.12.3 CONTRACTOR'S Means, Methods, Etc.

CONSULTANT will not be responsible for CONTRACTOR'S means, methods, techniques, sequences or procedures of construction, or the safety precautions and programs incident thereto, and CONSULTANT will not be responsible for CONTRACTOR'S failure to perform or furnish the Work in accordance with the Contract Documents.

8.12.4 Acts of Omissions of CONTRACTOR

CONSULTANT will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other person or organization performing or furnishing any of the Work.

9. CHANGES IN THE WORK

9.1 OWNER May Order Change
Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions or revisions in the Work; these will be authorized by a Change Order. Upon receipt of such notice, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).

9.2 Claims
Claims for an increase or decrease in the Contract Price or an extension or shortening or the Contract Time that should be allowed as a result of a Change Order will be settled as provided for in Article 10 or Article 11.

9.3 Work Not in Contract Documents
CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Time with respect to any Work performed that is not required by the Contract Documents as amended, modified and supplemented as provided in paragraph 3.4, except in the case of an emergency and except in the case of uncovering Work as provided in paragraph 12.3.4.

9.4 Change Orders
OWNER and CONTRACTOR shall execute appropriate Change Orders covering:

9.4.1 changes in the Work which are ordered by OWNER pursuant to paragraph 9.1, are required because of acceptance of defective Work under paragraph 12.7 or corrective defective Work under paragraph 12.8, or are agreed to by the parties;

9.4.2 changes in the Contract Price or Contract Time which are agreed to by the parties; and

9.4.3 changes in the Contract Price or Contract Time which embody the substance of any written decision rendered by CONSULTANT pursuant to paragraph 8.11; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and REGULATIONS, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 5.16.

9.5 Notice of Change
If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Time) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR'S responsibility, and the amount of each applicable Bond will be adjusted accordingly.

10. CHANGE OF CONTRACT PRICE

10.1 Total Compensation
The Contract Price constitutes the total compensation (subject to authorized adjustments) payable to CONTRACTOR for performing the Work. All duties, responsibilities and obligations assigned to or undertaken by CONTRACTOR shall be at his expense without change in the Contract Price.

10.2 Claim for Increase or Decrease in Price

The Contract Price may only be changed by a Change Order. Any claim for an increase or decrease in the Contract Price shall be based on written notice delivered by the CONTRACTOR to the CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the amount of the claim with supporting data shall be delivered within sixty days after such occurrence (unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by CONTRACTOR'S written statement that the amount claimed covers all known amounts (direct, indirect, and consequential) to which the CONTRACTOR is entitled as a result of the occurrence of said event.

10.3 Value of Work
The value of any Work covered by a Change Order or of any claim for an increase or decrease in the Contract Price shall be determined in one of the following ways:

10.3.1 Unit Prices
Where the Work involved is covered by unit prices contained in the Contract Documents, by application of unit prices to the quantities of the items involved (subject to the provisions of paragraphs 10.9.1. through 10.9.3, inclusive).

10.3.2 Lump Sum
By mutual acceptance of a lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 10.6.2.1).

10.3.3 Cost Plus Fee
On the basis of the Cost of the Work (determined as provided in paragraphs 10.4 and 10.5) plus a CONTRACTOR'S fee for overhead and profit (determined as provided in paragraphs 10.6 and 10.7).

10.4 Cost of the Work
The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project; shall include only the following items; and shall not include any of the costs itemized in paragraph 10.5:

10.4.1 Payroll Costs
Payroll costs for employees in the direct employ of CONTRACTOR in the performance of the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits which shall include social security contributions,

unemployment, excise and payroll taxes, workers' or workmen's compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. Such employees shall include superintendents and foremen at the site. The expenses of performing Work after regular working hours, on Saturday, Sunday or legal holidays, shall be included in the above to the extent authorized by OWNER.

10.4.2 Materials and Equipment Costs

Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and all returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.

10.4.3 Subcontractor Costs

Payments made by CONTRACTOR to the Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from Subcontractors acceptable to CONTRACTOR and shall deliver such bids to OWNER who will then determine, with the advice of CONSULTANT, which bids will be accepted. If a subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work Plus a Fee, the Subcontractor's Cost of the Work shall be determined in the same manner as CONTRACTOR'S Cost of the Work. All subcontracts shall be subject to the other provisions of the Contract Documents insofar as applicable.

10.4.4 Special Consultant Costs

Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys and accountants) employed for services specifically related to the Work.

10.4.5 Supplemental Costs

10.4.5.1 The proportion of necessary transportation, travel and subsistence expenses of CONTRACTOR'S employees incurred in discharge of duties connected with the Work.

10.4.5.2 Cost, including transportation and maintenance, of all materials, supplies, equipment,

machinery, appliances, office and temporary facilities at the site and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost less market value of such items used but not consumed which remain the property of CONTRACTOR.

10.4.5.3 Rentals of all construction equipment and machinery and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of CONSULTANT, and the costs of transportation, loading, unloading, installation, dismantling and removal shall be in accordance with terms of said rental agreements. The rental of any such equipment, machinery or parts shall cease when the use thereof is no longer necessary for the Work.

10.4.5.4 Sales, consumer, use or similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.

10.4.5.5 Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.

10.4.5.6 Losses and damages (and related expenses), not compensated by insurance or otherwise, to the Work or otherwise sustained by CONTRACTOR in connection with the performance and furnishing of the Work (except losses and damages within the deductible amounts of property insurance established by OWNER), provided they have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR'S fee. If, however, any such loss or damage requires reconstruction and CONTRACTOR is placed in charge thereof, CONTRACTOR shall be paid a fee proportionate to that stated in paragraph 10.6.2 for services.

10.4.5.7 The cost of utilities, fuel and sanitary facilities at the site.

10.4.5.8 Minor expenses such as telegrams, long distance telephone calls, telephone service at the site, expressage and similar petty cash items in connection with the Work.

10.4.5.9 Cost of premiums for additional Bonds and insurance required because of changes in the Work and premiums for property insurance coverage within the limits of the deductible amounts established by OWNER.

10.5 Not to Be Included in Cost of the Work
The term Cost of the Work shall not include any of the following:

10.5.1 Costs of Officers and Executives
Payroll costs and other compensation of CONTRACTOR'S officers, executives, principals (of partnership and sole proprietorships), general managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expeditors, timekeepers, clerks and other personnel employed by CONTRACTOR whether at the site or in CONTRACTOR'S principal or a branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 10.4.1 or specifically covered by paragraph 10.4.4 - all of which are to be considered administrative costs covered by the CONTRACTOR'S fee.

10.5.2 Principal Office
Expenses of CONTRACTOR'S principal and branch offices other than CONTRACTOR'S office at the site.

10.5.3 Capital Expense
Any part of CONTRACTOR'S capital expenses, including interest on CONTRACTOR'S capital employed for the Work and charges against CONTRACTOR for delinquent payments.

10.5.4 Bonds and Insurance
Cost of premiums for all Bonds and for all insurance whether or not CONTRACTOR is required by the Contract Documents to purchase and maintain the same (except for the cost of premiums covered by subparagraph 10.4.5.9 above).

10.5.5 Costs Due to Negligence
Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied and making good any damage to property.

10.5.6 Other Costs
Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraph 10.4.

10.6 Contractor's Fee
The CONTRACTOR'S Fee allowed to CONTRACTOR for overhead and profit shall be determined as follows:

10.6.1 a mutually acceptable fixed fee; or if none can be agreed upon,

10.6.2 a fee based on the following percentages of the various portions of the Cost of the Work:

10.6.2.1 for costs incurred under paragraphs 10.4.1 and 10.4.2, the CONTRACTOR'S fee shall be fifteen percent;

10.6.2.2 for costs incurred under paragraph 10.4.3, the CONTRACTOR'S fee shall be five percent; and if a subcontract is on the basis of Cost of the Work Plus a fee, the maximum allowable to CONTRACTOR on account of overhead and profit of all Subcontractors shall be fifteen percent;

10.6.2.3 no fee shall be payable on the basis of costs itemized under paragraphs 10.4.4, 10.4.5 and 10.5;

10.6.2.4 the amount of credit to be allowed by CONTRACTOR to OWNER for any such change which results in a net decrease in cost will be the amount of the actual net decrease plus a deduction in CONTRACTOR'S Fee by an amount equal to ten percent of the net decrease; and

10.6.2.5 when both additions and credits are involved in any one change, the adjustment in CONTRACTOR'S fee shall be computed on the basis of the net change in accordance with paragraphs 10.6.2.1 through 10.6.2.4, inclusive.

10.7 Itemized Cost Breakdown
Whenever the cost of any Work is to be determined pursuant to paragraph 10.4 or 10.5, CONTRACTOR will submit in form acceptable to CONSULTANT an itemized cost breakdown together with supporting data.

10.8 Cash Allowances
It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be done by such Subcontractors or Suppliers and for such sums within

the limit of the allowances as may be acceptable to CONSULTANT, CONTRACTOR agrees that:

10.8.1 Materials and Equipment
The allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the site, and all applicable taxes; and

10.8.2 Other Costs
CONTRACTOR'S costs for unloading and handling on the site, labor, installation costs, overhead, profit and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances. No demand for additional payment on account of any thereof will be valid.

10.8.3 Change Order
Prior to final payment, an appropriate Change Order will be issued as recommended by CONSULTANT to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.

10.9 Unit Price Work

10.9.1 General
Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the established unit prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by CONSULTANT in accordance with Paragraph 8.10.

10.9.2 Overhead and Profit
Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR'S overhead and profit for each separately identified item.

10.9.3 Claim for Increase in Unit Price
Where the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement and there is no corresponding adjustment with respect to any other item of Work and if CONTRACTOR believes that CONTRACTOR has incurred additional

expense as a result thereof, CONTRACTOR may make a claim for an increase in the Contract Price in accordance with Article 10.

11. CHANGE OF CONTRACT TIME

11.1 Change Order
The Contract Time may only be changed by a Change Order. Any claim for an extension or shortening of the Contract Time shall be based on written notice delivered to CONSULTANT promptly (but in no event later than thirty days) after the occurrence of the event giving rise to the claim and stating the general nature of the claim. Notice of the extent of the claim with supporting data shall be delivered within sixty days after such occurrence (unless CONSULTANT allows an additional period of time to ascertain more accurate data in support of the claim) and shall be accompanied by the claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant has reason to believe it is entitled as a result of the occurrence of said event. All claims for adjustment in the Contract Time shall be determined by CONSULTANT in accordance with paragraph 8.11. No claim for an adjustment in the Contract Time will be valid if not submitted in accordance with the requirements of this paragraph 11.1.

11.2 Justification for Time Extensions
The Contract Time will be extended in an amount equal to time lost due to delays beyond the control of CONTRACTOR if a claim is made therefore as provided in paragraph 11.1. Such delays shall include, but not be limited to, acts or neglect by OWNER or others performing additional work as contemplated by Article 6, or to fires, floods, labor disputes, epidemics, abnormal weather conditions or acts of God.

11.3 Time Limits
All time limits stated in the Contract Documents are of the essence of the Agreement. The provisions of this Article 11 shall not exclude recovery for damages (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court costs) for delay by either party.

12. WARRANTY AND GUARANTEE; TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

12.1 Warranty and Guarantee
CONTRACTOR warrants and guarantees to OWNER and CONSULTANT that all Work will be in accordance with the Contract Documents and will not be defective. All defective Work, whether or not in place, may be rejected, corrected or accepted as provided in this Article 12.

12.2 Access to Work
CONSULTANT and CONSULTANT'S representatives, other representatives of OWNER, testing agencies and governmental agencies with jurisdictional interests

will have access to the Work at reasonable times for their observation, inspecting and testing. CONTRACTOR shall provide proper and safe conditions for such access.

12.3 Tests and Inspections

12.3.1 Timely Notice
CONTRACTOR shall give CONSULTANT timely notice of readiness of the Work for all required inspections, tests or approvals.

12.3.2 Requirements and Responsibilities
The CONSULTANT may require such inspection and testing during the course of the Work as he/she deems necessary to ascertain and assure the integrity and acceptable quality of the materials incorporated and the work performed. Inspection presence may be either full-time or intermittent, and neither the presence nor absence at any time of the CONSULTANT or the INSPECTOR shall relieve the CONTRACTOR of sole responsibility for the acceptability and integrity of the Work or any part thereof.

The costs of sampling, testing, and inspection on-site to ascertain acceptability of the Work and materials will be borne by the OWNER except as otherwise provided. The OWNER will select a testing laboratory to perform such sampling and testing. Sampling and/or testing required by the CONTRACTOR or necessitated by failure of Work or materials to meet the above acceptability test shall be at the expense of the CONTRACTOR.

Inspection services may be performed by the employees of the OWNER or by others selected or designated by the OWNER or the CONSULTANT.

Sampling and/or testing required for manufacturing quality and/or process control, for certification that raw mineral materials or manufactured products are the quality specified in the contract, or to assure the acceptability for incorporation into the Work shall be borne by the CONTRACTOR or the material supplier.

Cost for inspection, sampling, testing, and approvals required by the laws or regulations of any public body having competent jurisdiction shall be borne by the CONTRACTOR or the material supplier.

Sampling and testing will be in accord with pertinent codes and regulations and with appropriate standards of the American Society of Testing Materials or other specified standards.

12.3.3 On-Site Construction Test and Other Testing
All inspections, tests or approvals other than those required by Laws or Regulations of any public body having jurisdiction shall be performed by

organizations acceptable to OWNER and CONTRACTOR (or by CONSULTANT if so specified).

12.3.4 Covered Work
If any Work (including the work of others) that is to be inspected, tested or approved is covered without written concurrence of CONSULTANT, it must, if requested by CONSULTANT, be uncovered for observation. Such uncovering shall be at CONTRACTOR'S expense unless CONTRACTOR has given CONSULTANT timely notice of CONTRACTOR'S intention to cover the same and CONSULTANT has not acted with reasonable promptness in response to such notice.

12.3.5 CONTRACTOR'S Obligation
Neither observations by CONSULTANT nor inspections, tests or approvals by others shall relieve CONTRACTOR from CONTRACTOR'S obligations to perform the Work in accordance with the Contract Documents.

12.4 OWNER May Stop the Work
If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to furnish or perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR or any other party.

12.5 Correction or Removal of Defective Work
If required by CONSULTANT, CONTRACTOR shall promptly, as directed, either correct all defective Work, whether or not fabricated, installed or completed, or, if the Work has been rejected by CONSULTANT, remove it from the site and replace it with non-defective Work. CONTRACTOR shall bear all direct, indirect and consequential costs of such correction or removal (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) made necessary thereby.

12.6 One Year Correction Period
If within one year after the date of Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract Documents, any Work is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER'S written instructions, either correct such defective Work, or, if it has been rejected by OWNER, remove it from the site and replace it with non-defective Work. If CONTRACTOR does not promptly comply with the terms of such instructions, or in

an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or the rejected Work removed and replaced, and all direct, indirect and consequential costs of such removal and replacement (including but not limited to fees and charges of engineers, architects, attorneys and other professionals) will be paid by CONTRACTOR. In special circumstances where a particular item of equipment is placed in continuous service before Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Change Order.

12.7 Acceptance of Defective Work

If, instead of requiring correction or removal and replacement of defective Work, OWNER prefers to accept it, OWNER may do so. CONTRACTOR shall bear all direct, indirect and consequential costs attributable to OWNER'S evaluation of and determination to accept such defective Work (such costs to be approved by CONSULTANT as to reasonableness and to include but not be limited to fees and charges of engineers, architects, attorneys and other professionals).

12.8 OWNER May Correct Defective Work

If CONTRACTOR fails within a reasonable time after written notice of CONSULTANT to proceed to correct and to correct defective Work or to remove and replace rejected Work as required by CONSULTANT in accordance with paragraph 12.5, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days' written notice to CONTRACTOR, correct and remedy any such deficiency. In exercising the rights and remedies under this paragraph OWNER shall proceed expeditiously. To the extent necessary to complete corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the site, take possession of all or part of the Work, and suspend CONTRACTOR'S services related thereto, take possession of CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER'S representatives, agents and employees such access to the site as may be necessary to enable OWNER to exercise the rights and remedies under this paragraph. All direct, indirect and consequential costs of OWNER in exercising such rights and remedies will be charged against CONTRACTOR in an amount approved as to reasonableness by CONSULTANT, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. Such direct, indirect and consequential costs will include but not be limited to fees and charges of engineers, architects, attorneys and other professionals, all court costs and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of CONTRACTOR'S defective Work. CONTRACTOR shall not be allowed an extension of the Contract Time because of any delay in performance of

the Work attributable to the exercise by OWNER of OWNER'S rights and remedies hereunder.

13. PAYMENTS TO CONTRACTOR AND COMPLETION

13.1 Schedule of Values

The schedule of values established as provided in paragraph 2.8 will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to CONSULTANT. Progress payments on account of Unit Price Work will be based on the number of units completed.

13.2 Application for Progress Payment

At least ten days before each progress payment is scheduled (but not more often than once a month), CONTRACTOR shall submit to CONSULTANT for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice or other documentation warranting that OWNER has received the materials and equipment free and clear of all liens, charges, security interests and encumbrances (which are hereinafter in these General Conditions referred to as "Liens") and evidence that the materials and equipment are covered by appropriate property insurance and other arrangements to protect OWNER'S interest therein, all of which will be satisfactory to OWNER. OWNER shall, within thirty (30) calendar days of presentation to him of an approved Application for Payment, pay CONTRACTOR the amount approved by CONSULTANT. Monthly progress payments shall be ninety (90) percent of the sum obtained by applying the respective bid unit prices to the approved estimated quantities of work completed by the Contractor during the preceding month. The remaining ten (10) percent will be held by the Owner, as retainage. At such time as the CONSULTANT deems appropriate - based on the quality of work performed, progress of cleanup, and other pertinent factors - the rate of retainage, or the total amount retained, may be reduced; although, any reduction in retainage, below the ten (10) percent level, is made solely at the CONSULTANT's discretion. All remaining retainage held will be included in the final payment to the Contractor.

13.2.1 Waivers of Mechanic's Lien

With each Application for Payment OWNER may require CONTRACTOR to submit waivers of mechanic's lien from entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment.

13.2.1.1 Requirement for waivers of Mechanic's Lien on Partial Applications for Payment will be determined and communicated at the Preconstruction Conference.

13.2.1.2 Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.

13.2.1.3 When an application shows completion of an item, submit conditional final or full waivers.

13.2.1.4 Owner reserves the right to designate which entities involved in the Work must submit waivers.

13.2.1.5 Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

13.3 CONTRACTOR'S Warranty of Title

CONTRACTOR warrants and guarantees that title to all Work, materials and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.

13.4 Review of Applications for Progress Payment

13.4.1 Submission of Application for Payment

CONSULTANT will, after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER, or return the Application to CONTRACTOR indicating in writing CONSULTANT'S reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.

13.4.2 CONSULTANT'S Recommendation

CONSULTANT may refuse to recommend the whole or any part of any payment, if, in CONSULTANT'S opinion, it would be incorrect to make such representations to OWNER. CONSULTANT may also refuse to recommend any such payment, or, because of subsequently discovered evidence or the results of subsequent inspections or tests, nullify any such payment previously recommended, to such extent as may be necessary in CONSULTANT'S opinion to protect OWNER from loss because:

13.4.2.1 the Work is defective, or completed Work has been damaged requiring correction or replacement;

13.4.2.2 the Contract Price has been reduced by Written Amendment or Change Order;

13.4.2.3 OWNER has been required to correct defective Work or complete Work in accordance with paragraph 12.8; or

13.4.2.4 of CONSULTANT's actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.2.1 through 14.2.9 inclusive.

13.5 Partial Utilization

OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and has been completed. If CONTRACTOR agrees, CONTRACTOR will certify to OWNER that said part of the Work is complete and request that a Certificate of Completion be issued for that part of the Work.

13.6 Final Inspection

Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, CONSULTANT will make a final inspection with CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to remedy such deficiencies.

13.7 Final Application for Payment

After CONTRACTOR has completed all such corrections to the satisfaction of CONSULTANT and delivered all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, marked-up record documents (as provided in paragraph 5.14) and other documents - all as required by the Contract Documents, and after CONSULTANT has indicated that the Work is acceptable (subject to the provisions of paragraph 13.10), CONTRACTOR may make application for final payment following the procedure for progress payments. The final Application for Payment shall be accompanied by all documentation called for in the Contract Documents, together with complete and legally effective releases or waivers (satisfactory to OWNER) of all Liens arising out of or filed in connection with the Work. In lieu thereof and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full; an affidavit of CONTRACTOR that the releases and receipts include all labor, services, material and equipment for which a Lien could be filed, and that all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER'S property might in any way be responsible, have been paid or otherwise satisfied; and consent of the surety, if any, to final payment. If any Subcontractor or Supplier fails to

furnish a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.

13.8 Final Payment and Acceptance

13.8.1 CONSULTANT'S Approval

If, on the basis of CONSULTANT'S observation of the Work during construction and final inspection, and CONSULTANT'S review of the final Application for Payment and accompanying documentation - all as required by the Contract Documents, CONSULTANT is satisfied that the Work has been completed and CONTRACTOR'S other obligations under the Contract Documents have been fulfilled, CONSULTANT will, after receipt of the final Application for Payment, indicate in writing CONSULTANT'S recommendation of payment and present the Application to OWNER for payment. Thereupon CONSULTANT will give written notice to OWNER and CONTRACTOR that the Work is acceptable, subject to the provisions of paragraph 13.10. Otherwise, CONSULTANT will return the Application to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application.

13.8.2 Delay in Completion of Work

If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, OWNER shall, upon receipt of CONTRACTOR'S final Application for Payment and recommendation of CONSULTANT, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 10 of Part II, Information for Bidders, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to CONSULTANT with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

13.9 CONTRACTOR'S Continuing Obligation

CONTRACTOR'S obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. Neither recommendation of any progress or final payment by CONSULTANT, nor the issuance of a certificate of Completion, nor any payment by OWNER to CONTRACTOR under the Contract Documents, nor any use or occupancy of the Work or any part thereof by OWNER, nor any act of acceptance by OWNER nor any failure to do so, nor any review and approval of a Shop Drawing or sample submission, nor any correction of defective Work by OWNER will constitute an acceptance of Work not in accordance with the Contract Documents or a release of CONTRACTOR'S obligation to perform the

Work in accordance with the Contract Documents (except as provided in paragraph 13.10).

13.10 Waiver of Claims

The making and acceptance of final payment will constitute:

13.10.1 a waiver of all claims by OWNER against CONTRACTOR, except claims arising from unsettled Liens, from defective Work appearing after final inspection or from failure to comply with the Contract Documents or the terms of any special guarantees specified therein; however, it will not constitute a waiver by OWNER of any rights in respect of CONTRACTOR'S continuing obligations under the Contract Documents; and

13.10.2 a waiver of all claims by CONTRACTOR against OWNER other than those previously made in writing and still unsettled.

14. SUSPENSION OF WORK AND TERMINATION

14.1 OWNER May Suspend Work

OWNER may, at any time and without cause, suspend the Work or any portion thereof for a period of not more than ninety days by notice in writing to CONTRACTOR and CONSULTANT which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to any suspension if CONTRACTOR makes an approved claim therefor as provided in Articles 10 and 11.

14.2 OWNER May Terminate

The OWNER may terminate the Work upon the occurrence of any one or more of the following events:

14.2.1 if CONTRACTOR commences a voluntary case under any chapter of the Bankruptcy Code (Title 11, United States Code), as now or hereafter in effect, or if CONTRACTOR takes any equivalent or similar action by filing a petition or otherwise under any other federal or state law in effect at such time relating to the bankruptcy or insolvency;

14.2.2 if a petition is filed against CONTRACTOR under any chapter of the Bankruptcy Code as now or hereafter in effect at the time of filing, or if a petition is filed seeking any such equivalent or similar relief against CONTRACTOR under any other federal or state law in effect at the time relating to bankruptcy or insolvency;

14.2.3 if CONTRACTOR makes a general assignment for the benefit of creditors;

14.2.4 if a trustee, receiver, custodian or agent of CONTRACTOR is appointed under applicable law or under contract, whose appointment or authority to take charge of property of CONTRACTOR is for the purpose of enforcing a Lien against such property or for the purpose of general administration of such property for the benefit of CONTRACTOR'S creditors;

14.2.5 if CONTRACTOR admits in writing an inability to pay its debts generally as they become due;

14.2.6 if CONTRACTOR persistently fails to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.8 as revised from time to time);

14.2.7 if CONTRACTOR disregards Laws or Regulations of any public body having jurisdiction;

14.2.8 if CONTRACTOR disregards the authority of CONSULTANT, or

14.2.9 if CONTRACTOR otherwise violates in any substantial way any provisions of the Contract Documents;

OWNER may, after giving CONTRACTOR (and the surety) seven days' written notice and to the extent permitted by Laws and Regulations, terminate the services of CONTRACTOR, exclude CONTRACTOR from the site and take possession of the Work and of all CONTRACTOR'S tools, appliances, construction equipment and machinery at the site and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds the direct, indirect and consequential costs of completing the Work (including but not limited to fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs) such excess will be paid to CONTRACTOR. If such costs exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such costs incurred by OWNER will be approved as to reasonableness by CONSULTANT and incorporated in a Change Order,

but when exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.

14.2.10 If safety violations are observed and brought to the Contractors attention and Contractor fails to take immediate corrective measures any repeat of similar safety violations, Owner will order an immediate termination of contract. Note: it is the Contractor's responsibility to know proper safety measures as they pertain to construction and OSHA.

14.2.11 This contract may be canceled by either party thirty (30) days after delivery by canceling party of written notice of intent to cancel to the other contracting party.

14.2.12 This contract may be canceled by the Lexington-Fayette Urban County Government if it is determined that the Bidder has failed to perform under the terms of this agreement, such cancellation to be effective upon receipt of written notice of cancellation by the Bidder.

14.3 CONTRACTOR'S Services Terminated

Where CONTRACTOR'S services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.

14.4 Payment After Termination

Upon seven days' written notice to CONTRACTOR, OWNER may, without cause and without prejudice to any other right or remedy, elect to abandon the Work and terminate the Agreement. In such case, CONTRACTOR shall be paid for all Work executed and any expense sustained plus reasonable termination expenses, which will include, but not be limited to, direct, indirect and consequential costs (including, but not limited to, fees and charges of engineers, architects, attorneys and other professionals and court and arbitration costs).

14.5 CONTRACTOR May Stop Work or Terminate

If, through no act or fault of CONTRACTOR, the Work is suspended for a period of more than ninety days by OWNER or under an order of court or other public authority, or CONSULTANT fails to act on any Application for Payment within sixty days after it is submitted, or OWNER fails for sixty days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days' written notice to OWNER and CONSULTANT, terminate the Agreement and recover from OWNER payment for all Work executed and any expense sustained plus reasonable termination expenses. In addition and in lieu of terminating the Agreement, if CONSULTANT has failed to act on an Application for Payment or OWNER has failed to make any payment as aforesaid, CONTRACTOR may upon seven days' written notice to OWNER and

CONSULTANT stop the Work until payment of all amounts then due. The provisions of this paragraph shall not relieve CONTRACTOR of the obligations under paragraph 5.16 to carry on the Work in accordance with the progress schedule and without delay during disputes and disagreements with OWNER.

15. MISCELLANEOUS

15.1 Claims for Injury or Damage
Should OWNER or CONTRACTOR suffer injury or damage to person or property because of any error, omission or act of the other party or of any of the other party's employees or agents or others for whose acts the other party is legally liable, claim will be made in writing to the other party within a reasonable time of the first observance of such injury or damage. The provisions of this paragraph 15.1 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitations or repose.

15.2 Non-Discrimination in Employment
The CONTRACTOR shall comply with the following requirements prohibiting discrimination:

15.2.1 That no person (as defined in KRS 344.010) shall bid on Lexington-Fayette Urban County Government construction projects, or bid to furnish materials or supplies to the Lexington-Fayette Urban County Government, if, within six months prior to the time of opening of bids, said person shall have been found, by declamatory judgment action in Fayette Circuit Court, to be presently engaging in an unlawful practice, as hereinafter defined. Such declamatory judgment action may be brought by an aggrieved individual or upon an allegation that an effort at conciliation pursuant to KRS 344.200 has been attempted and failed, by the Lexington-Fayette County Human Rights Commission.

15.2.2 That it is an unlawful practice for an employer:

15.2.2.1 to fail or refuse to hire, or to discharge any individual or otherwise to discriminate against an individual, with respect to his compensation, terms, conditions, or privileges of employment, because of such individual's race, color, religion, sex, age, or national origin; or

15.2.2.2 to limit, segregate or classify his employees in any way which would deprive or tend to deprive an individual of employment opportunities or otherwise adversely affect his status as an employee because of such individual's sex, race, color, religion, age, or national origin.

15.2.3 That it is an unlawful practice for an employer, labor organization, or joint-labor management committee controlling apprenticeship or other training or retraining, including on-the-job training programs to discriminate against an individual because of his race, color, religion, sex, age, or national origin in admission to, or employment in, any program established to provide apprenticeship or other training.

15.2.4 That a copy of this Ordinance shall be furnished all suppliers and made a part of all bid specifications.

15.2.5 This Ordinance shall take effect after it is signed, published and recorded, as required by law.

15.3 Temporary Street Closing or Blockage
The CONTRACTOR will notify the CONSULTANT at least 72 hours prior to making any temporary street closing or blockage. This will permit orderly notification to all concerned public agencies. Specific details and restrictions on street closure or blockage are contained in the Special Conditions.

15.4 Percentage of Work Performed by prime CONTRACTOR
The CONTRACTOR shall perform on site, and with its own organization, Work equivalent to at least fifty (50%) percent of the total amount of Work to be performed under the Contract. This percentage may be reduced by a supplemental agreement to this Contract if, during performing the Work, the CONTRACTOR requests a reduction and the CONSULTANT determines that the reduction would be to the advantage of the OWNER.

15.5 Clean-up
Cleanup shall progress, to the greatest degree practicable, throughout the course of the Work. The Work will not be considered as completed, and final payment will not be made, until the right-of-way and all ground occupied or affected by the Contractor in connection with the Work has been cleared of all rubbish, equipment, excess materials, temporary structures, and weeds. Rubbish and all waste materials of whatever nature shall be disposed of, off of the project site, in an acceptable manner. All property, both public and private, which has been damaged in the prosecution of the Work, shall be restored in an acceptable manner. All areas shall be draining, and all drainage ways shall be left unobstructed, and in such a condition that drift will not collect or scour be induced.

15.6 General
The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto, and, in particular but without limitation, the warranties, guarantees and obligations imposed upon CONTRACTOR by paragraphs 12.1, 12.3.5, 13.3, and 15.2 and all of the rights and remedies available to OWNER and CONSULTANT thereunder, are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies

available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right and remedy to which they apply. All representations, warranties and guarantees made in the Contract Documents will survive final payment and termination or completion of the Agreement.

15.7 Debris Disposal

For all LFUCG projects any trash, construction demolition debris, yard waste, dirt or debris of any kind that is removed from the project site must be disposed of in accordance with local, state, and federal regulations. The disposal site or facility must be approved in advance by the LFUCG and disposal documentation is required. The Contractor will be responsible for payment of any fines associated with improper disposal of material removed from the project site.

END OF SECTION

PART V
SPECIAL CONDITIONS
INDEX

1 BLASTING

2 RISK MANAGEMENT PROVISIONS – INSURANCE AND INDEMNIFICATION

3 WAGE SCALE

4 WEATHER RELATED DELAYS

1. **BLASTING** – not applicable.

2. **RISK MANAGEMENT PROVISIONS**
INSURANCE AND INDEMNIFICATION

INDEMNIFICATION AND HOLD HARMLESS PROVISION

(1) It is understood and agreed by the parties that Contractor hereby assumes the entire responsibility and liability for any and all damages to persons or property caused by or resulting from or arising out of any act or omission on the part of Contractor or its employees, agents, servants, owners, principals, licensees, assigns or subcontractors of any tier (hereinafter "CONTRACTOR") under or in connection with this agreement and/or the provision of goods or services and the performance or failure to perform any work required thereby.

(2) CONTRACTOR shall indemnify, save, hold harmless and defend the Lexington-Fayette Urban County Government and its elected and appointed officials, employees, agents, volunteers, and successors in interest (hereinafter "LFUCG") from and against all liability, damages, and losses, including but not limited to, demands, claims, obligations, causes of action, judgments, penalties, fines, liens, costs, expenses, interest, defense costs and reasonable attorney's fees that are in any way incidental to or connected with, or that arise or are alleged to have arisen, directly or indirectly, from or by CONTRACTOR's performance or breach of the agreement and/or the provision of goods or services provided that: (a) it is attributable to personal injury, bodily injury, sickness, or death, or to injury to or destruction of property (including the loss of use resulting therefrom), or to or from the negligent acts, errors or omissions or willful misconduct of the CONTRACTOR; and (b) not caused solely by the active negligence or willful misconduct of LFUCG.

(3) In the event LFUCG is alleged to be liable based upon the above, CONTRACTOR shall defend such allegations and shall bear all costs, fees and expenses of such defense, including but not limited to, all reasonable attorneys' fees and expenses, court costs, and expert witness fees and expenses, using attorneys approved in writing by LFUCG, which approval shall not be unreasonably withheld.

(4) These provisions shall in no way be limited by any financial responsibility or insurance requirements, and shall survive the termination of this agreement.

(5) LFUCG is a political subdivision of the Commonwealth of Kentucky. CONTRACTOR acknowledges and agrees that LFUCG is unable to provide indemnity or otherwise save, hold harmless, or defend the CONTRACTOR in any manner.

FINANCIAL RESPONSIBILITY

BIDDER/CONTRACTOR understands and agrees that it shall, prior to final acceptance of its bid and the commencement of any work, demonstrate the ability to assure compliance with the above Indemnity provisions and these other risk management provisions.

INSURANCE REQUIREMENTS

YOUR ATTENTION IS DIRECTED TO THE INSURANCE REQUIREMENTS BELOW, AAND YOU MAY NEED TO CONFER WITH YOUR INSURANCE AGENTS, BROKERS, OR CARRIERS TO DETERMINE IN ADVANCE OF SUBMISSION OF A RESPONSE THE AVAILABILITY OF THE INSURANCE COVERAGES AND ENDORSEMENTS REQUIRED HEREIN. IF YOU FAIL TO COMPLY WITH THE INSURANCE REQUIREMENTS BELOW, YOU MAY BE DISQUALIFIED FROM AWARD OF THE CONTRACT.

Required Insurance Coverage

BIDDER/CONTRACTOR shall procure and maintain for the duration of this contract the following or equivalent insurance policies at no less than the limits shown below and cause its subcontractors to maintain similar insurance with limits acceptable to LFUCG in order to protect LFUCG against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by CONTRACTOR. The cost of such insurance shall be included in any bid:

Coverage	**Limits**
General Liability	$1 million per occurrence, $2 million aggregate
Commercial Automobile Liability	$1 million per occurrence
Worker's Compensation	Statutory
Employer's Liability	$100,000.00
Excess/Umbrella Liability	$5 million per occurrence

The policies above shall contain the following conditions:

a. All Certificates of Insurance forms used by the insurance carrier shall be properly filed and approved by the Department of Insurance for the Commonwealth of Kentucky (DOI). LFUCG shall be named as an additional insured in the General Liability Policy and Commercial Automobile Liability Policy using the Kentucky DOI approved forms.

b. The General Liability Policy shall be primary to any insurance or self-insurance retained by LFUCG.

c. The General Liability Policy shall include a Products and Completed Operations endorsement or Premises and Operations Liability endorsement unless it is deemed not to apply by LFUCG.

d. LFUCG shall be provided at least 30 days advance written notice via certified mail, return receipt requested, in the event any of the required policies are canceled or non-renewed.

e. Said coverage shall be written by insurers acceptable to LFUCG and shall be in a form acceptable to LFUCG. Insurance placed with insurers with a rating classification of no less than Excellent (A or A-) and a financial size category of no less than VIII, as defined by the most current Best's Key Rating Guide shall be deemed automatically acceptable.

Renewals

After insurance has been approved by LFUCG, evidence of renewal of an expiring policy must be submitted to LFUCG, and may be submitted on a manually signed renewal endorsement form. If the policy or carrier has changed, however, new evidence of coverage must be submitted in accordance with these Insurance Requirements.

Deductibles and Self-Insured Programs

IF YOU INTEND TO SUBMIT A SELF-INSURANCE PLAN IT MUST BE FORWARDED TO LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, DIVISION OF RISK MANAGEMENT, 200 EAST MAIN STREET, LEXINGTON, KENTUCKY 40507 NO LATER THAN A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO THE RESPONSE DATE. Self-insurance programs, deductibles, and self-insured retentions in insurance policies are subject to separate approval by Lexington-Fayette Urban County Government's Division of Risk Management, upon review of evidence of BIDDER/CONTRACTOR's financial capacity to respond to claims. Any such programs or retentions must provide LFUCG with at least the same protection from liability and defense of suits as would be afforded by first-dollar insurance coverage. If BIDDER/CONTRACTOR satisfies any portion of the insurance requirements through deductibles, self-insurance programs, or self-insured retentions, BIDDER/CONTRACTOR agrees to provide Lexington-Fayette Urban County Government, Division of Risk Management, the following data prior to the final acceptance of bid and the commencement of any work:

a. Latest audited financial statement, including auditor's notes.

b. Any records of any self-insured trust fund plan or policy and related accounting statements.

c. Actuarial funding reports or retained losses.

d. Risk Management Manual or a description of the self-insurance and risk management program.

e. A claim loss run summary for the previous five (5) years.

f. Self-Insured Associations will be considered.

Safety and Loss Control

CONTRACTOR shall comply with all applicable federal, state, and local safety standards related to the performance of its works or services under this Agreement and take necessary action to protect the life, health and safety and property of all of its personnel on the job site, the public, and LFUCG.

Verification of Coverage

BIDDER/CONTRACTOR agrees to furnish LFUCG with all applicable Certificates of Insurance signed by a person authorized by the insurer to bind coverage on its behalf prior to final award, and if requested, shall provide LFUCG copies of all insurance policies, including all endorsements.

Right to Review, Audit and Inspect

CONTRACTOR understands and agrees that LFUCG may review, audit and inspect any and all of its records and operations to insure compliance with these Insurance Requirements.

DEFAULT

BIDDER/CONTRACTOR understands and agrees that the failure to comply with any of these insurance, safety, or loss control provisions shall constitute default and that LFUCG may elect at its option any single remedy or penalty or any combination of remedies and penalties, as available, including but not limited to purchasing insurance and charging BIDDER/CONTRACTOR for any such insurance premiums purchased, or suspending or terminating the work.

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3. WAGE SCALES – NOT APPLICABLE.

4. WEATHER RELATED DELAYS

A. The Project Completion date shall be established with the understanding that no extension of time will be granted for weather related delays that are within the average temperature or number of rain or snow days within a particular month. The average weather conditions shall be established by referencing the records of the National Oceanic and Atmospheric Administration (NOAA) and as defined herein.

B. Extensions of inclement weather shall be granted only when the work affected must be on schedule at the time of delay. No time will be granted for work which is behind schedule in excess of the actual delay caused by the weather, assuming the work had been on schedule.

C. Time granted for weather delays shall be requested on a monthly basis.

D. The weather experienced at the project site during the contract period must be found to be unusually severe, that is more severe than the adverse weather anticipated for the project location during any given month. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the contractor.

E. The anticipated adverse weather delays shall be based on the National Oceanic and Atmospheric Administration (NOAA) climatography ten year average for the Lexington Bluegrass Airport KY US location. The Mean Number of Days of daily precipitation using >= 0.10 will determine the base line for monthly anticipated adverse weather evaluations. The contractor's progress schedule must reflect these anticipated adverse weather delays in all weather dependent activities. Upon acknowledgement of the Notice to Proceed (NTP) and continuing throughout the contract, the contractor will record the occurrence of actual adverse weather and resultant impact to normally scheduled work. Actual adverse weather delay days must prevent work on critical path activities for 50 percent or more of the contractor's scheduled work date. The number of actual adverse weather delay days shall be calculated chronologically from the first to the last day of each month, and be recorded as full days. The number of actual adverse weather days greater than the number of anticipated adverse weather days, listed above, shall be the number of unusually severe weather days for the purposes of any contract extensions (actual adverse weather days - anticipated adverse weather days = unusually severe weather days.)

F. Definitions:

1. "Unusually severe weather" - weather that is more severe than the adverse weather anticipated for the season or location involved.
2. "Adverse weather" - atmospheric conditions at a definite time and place that are unfavorable to construction activities.

END OF SECTION

PART VI

CONTRACT AGREEMENT

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PART VI

CONTRACT AGREEMENT

THIS AGREEMENT, made on the _____ day of _____, 20____, by and between **Lexington-Fayette Urban County Government**, acting herein called "OWNER" and _____ **(bidder's name)** _____, doing business as *(an individual) (a partnership) (a corporation) located in the City of _____, County of _____, and State of _____, hereinafter called "CONTRACTOR."

WITNESSETH: That the CONTRACTOR and the OWNER in consideration of _____ Dollars and _____ Cents ($_____) quoted in the proposal by the CONTRACTOR, dated _____, hereby agree to commence and complete the construction described as follows:

1. SCOPE OF WORK

The CONTRACTOR shall furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said project in accordance with the conditions and prices stated in the Proposal, the General Conditions, and the Special Conditions of the Contract, the Specifications and Contract Documents therefore as prepared by Patrick D. Murphy Architects for the **Government Center Annex and Police Headquarters Roof Replacement** project.

2. TIME OF COMPLETION

The time estimated and authorized by the OWNER for the proper execution of the Work by the Contract, in full, is hereby fixed as two hundred ten (210) calendar days to substantial completion and thirty (30) additional calendar days to final completion, for a total of two hundred forty (240) calendar days. The time shall begin in accordance with the Notice to Proceed provided by OWNER.

3. ISSUANCE OF WORK ORDERS

Notice to begin Work will be given in whole or for part of the Work as determined by the OWNER pending the availability of funds. The order of construction will be as determined after consultation between the CONTRACTOR and the OWNER.

4. THE CONTRACT SUM

The OWNER agrees to pay the CONTRACTOR in current funds for the performance of the Contract, as quoted in the proposal, subject to any additions and deductions, as provided therein.

5. PROGRESS PAYMENTS

The OWNER shall make payments on account of the Contract, as provided in accordance with the General Conditions, less the aggregate of previous payments.

6. ACCEPTANCE AND FINAL PAYMENT

Final payment shall be due within ninety (90) days after completion of the Work, provided the Work be then fully completed and the Contract fully accepted.

Before issuance of final certificate, the CONTRACTOR shall submit evidence satisfactory to the Owner that all payrolls, material bills, and other indebtedness connected with the Work has been paid.

If, after the Work has been substantially completed, full completion thereof is materially delayed through no fault of the CONTRACTOR, the OWNER shall without terminating the Contract, make payment of the balance due for that portion of the Work fully completed and accepted. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of claims.

7. THE CONTRACT DOCUMENTS

The Advertisement for Bids, Information for Bidders, the General Conditions, Performance and Payment Bonds, Contract Agreement, Special Conditions, Technical Specifications, any and all Addenda, and Proposal, Ion Wave Q&A, and Plan Drawings form the Contract, and they are fully a part of the Contract as if hereto attached or herein repeated.

8. EXTRA WORK

The OWNER, without invalidating the Contract, may order extra work or make changes by altering, adding to or deducting from the Work, the Contract Sum being adjusted accordingly. All such Work shall be executed and paid for in accordance with the General Conditions, which is a part of this Contract.

9. THE FOLLOWING IS AN ENUMERATION OF THE SPECIFICATIONS AND DRAWINGS (CONTRACT DOCUMENTS):

SPECIFICATIONS

SECTION NO.	TITLE
I	Advertisement for Bids
II	Information for Bidders
III	Form of Proposal
IV	General Conditions
V	Special Conditions
VI	Contract Agreement
VII	Performance and Payment Bonds
VIII	Addenda
IX	Technical Specifications and Drawings

IN WITNESSETH WHEREOF, the parties hereto have executed this Contract as of the date and year above written.

(Seal)

Lexington-Fayette Urban County Government.
Lexington, Kentucky
(Owner)

ATTEST:

BY: _____
MAYOR

_____
Clerk of the Urban County Council

_____
(Witness)

_____
(Title)

(Seal)

_____
(Contractor)

_____
(Secretary)*

BY: _____

_____
(Witness)

_____
(Title)

_____
(Address and Zip Code)

IMPORTANT: *Strike out any non-applicable terms.

Secretary of the Owner should attest. If the CONTRACTOR is corporation, Secretary should attest. Give proper title of each person-executing Contract.

PART VII

PERFORMANCE AND PAYMENT BONDS

1. PERFORMANCE BOND
2. PAYMENT BOND

PART VII

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS, that

_____
(Name of CONTRACTOR)

_____
(Address of CONTRACTOR)

a _____, hereinafter
(Corporation, Partnership, or Individual)

called Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

hereinafter called "OWNER" in the penal sum of: _____ Dollars, ($_____), for the payment of whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for _____**(project name)**_____ in accordance with drawings and specifications prepared by: _____**(the Engineer)**_____ which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly and faithfully perform said Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

The Surety hereby waives notice of any alteration or extension of time made by the OWNER.

Whenever, Principal shall be, and declared by OWNER to be in default under the Contract, the OWNER having performed OWNER'S obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

(1) Complete the Contract in accordance with its terms and conditions or

(2) Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsible bidder, or if the OWNER elects, upon determination by the OWNER and Surety jointly of the lowest responsible bidder, arrange for a Contract between such bidder and OWNER, and make available as Work progresses (even though there may be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof. The term "balance of the Contract Price", as used in this paragraph shall mean the total amount payable by OWNER to Principal under the Contract and any amendments thereto, less the amount properly paid by OWNER to Principal.

Any suit under this bond must be instituted before the expiration of two (2) years from the date on which final payment under the Contract falls due.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the heirs, executors, administrators or successors of OWNER.

IN WITNESS WHEREOF, this instrument is executed in _____ each one of which shall be
(number)
deemed an original, this the _____ day of _____, 20_____.

ATTEST:

_____
Principal

_____
(Principal) Secretary

BY: _____(s)

_____
(Address)

_____

_____
Witness as to Principal

_____
(Address)

_____

_____
Surety

ATTEST: BY: _____
Attorney-in-Fact

_____ _____
(Surety) Secretary (Address)

_____

(SEAL)

_____
Witness as to Surety

_____
(Address)

_____ TITLE: _____
Surety

_____

_____ BY: _____

TITLE: _____

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

PART VII

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT: that

_____
(Name of Contractor)

_____
(Address of Contractor)

a _____, hereinafter
(Corporation, Partnership or Individual)

called Principal, and _____
(Name of Surety)

_____
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto:

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
200 East Main Street, Third Floor
Lexington, Kentucky 40507

Obligee, hereinafter called OWNER, for the use and benefit of claimants as hereinafter defined, in the amount of _____ Dollars ($_____) the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal by written agreement is entering into a Contract with OWNER for **(project name)** in accordance with drawings and specifications prepared by: **(the Engineer)** which Contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if Principal shall promptly make payment to all claimants as hereinafter defined for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions.

1. A claimant is defined as one having a direct contract with the Principal or with a Subcontractor of the Principal for labor, material, or both, used or reasonably required for use in the performance of the Contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

2. The above named Principal and Surety hereby jointly and severally agree with the OWNER that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The OWNER shall not be liable for the payment of any costs or expenses of any such suit.

3. No suit or action shall be commenced hereunder by any claimant:

   (a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the OWNER, or the Surety above named, within ninety (90) days after such claimant did or performed the last of the Work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the Work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, OWNER, or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

   (b) After the expiration of one (1) year following the date on which Principal ceased Work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

   (c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

4. The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against aid improvement, whether or not claim for the amount of such lien be presented under and against this bond.

IN WITNESS WHEREOF, this instrument is executed in _____ (number) counterparts, each one of which shall be deemed an original, this the _____ day of _____, 20_____.

ATTEST:

_____
(Principal) Secretary

_____
(Principal)

(SEAL)

BY: _____(s)

_____
(Address)

_____
(Witness to Principal)

_____
(Address)

_____

_____
(Surety)

ATTEST:

BY: _____
(Attorney-in-Fact)

_____
(Surety) Secretary

(SEAL)

_____
Witness as to Surety

_____
(Address)

_____

_____
(Address)

NOTE: The number of executed counterparts of the bond shall coincide with the number of executed counterparts of the Contract.

END OF SECTION

PART VIII

ADDENDA

All addenda issued during the bidding of the Project will be reproduced in the signed Contract Documents, on the pages following this heading sheet.

Addendum Number	Title	Date
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____
5.	_____	_____

IX. TECHNICAL SPECIFICATIONS

ROOF REPLACEMENTS

GOVERNMENT CENTER ANNEX & POLICE HQ

163 WEST MAIN STREET &
150 WEST MAIN STREET
LEXINGTON, KENTUCKY 40507

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT
DEPARTMENT OF GENERAL SERVICES
200 EAST MAIN STREET, 4TH. FLOOR
LEXINGTON, KENTUCKY

November 8, 2023

BID NO. 01-2024

ARCHITECT:

PATRICK D. MURPHY COMPANY, INC. ARCHITECTS
4606 ILLINOIS AVENUE
P. O. BOX 20835 (40250-0835)
LOUISVILLE, KENTUCKY 40213
Office 502-454-5632 Fax 502-454-4650

DOCUMENT 000110 -TABLE OF CONTENTS

Section	Title	
000110	Table of Contents	Police HQ and Government Annex
DIVISION 1 - GENERAL REQUIREMENTS		
011000	Summary	Police HQ and Government Annex
	Appendix A: Lexington Bluegrass AP Climatography Data	
012500	Substitution Procedures	Police HQ and Government Annex
	Substitution Request Form	Police HQ and Government Annex
013100	Project Management and Coordination	Police HQ and Government Annex
013200	Construction Progress Documentation	Police HQ and Government Annex
013233	Photographic Documentation	Police HQ and Government Annex
013300	Submittal Procedures	Police HQ and Government Annex
014000	Quality Requirements	Police HQ and Government Annex
014200	References	Police HQ and Government Annex
015000	Temporary Facilities and Controls	Police HQ and Government Annex
016000	Product Requirements	Police HQ and Government Annex
DIVISION 2 - SITE CONSTRUCTION		
024119	Selective Demolition	Police HQ and Government Annex
DIVISION 3 – CONCRETE		
030130	Maintenance of Cast-in-Place Concrete	Police HQ
DIVISION 4 – MASONRY (Not Used)		
DIVISION 5 – METALS		
053100	Steel Decking	Government Annex
055000	Metal Fabrications	Police HQ and Government Annex
055119	Metal Grating Stairs	Police HQ
DIVISION 6 - WOOD AND PLASTICS		
061053	Miscellaneous Rough Carpentry	Police HQ and Government Annex
DIVISION 7 - THERMAL AND MOISTURE PROTECTION		
070150	Preparation for Reroofing	Police HQ and Government Annex
075216	SBS Modified Bituminous Membrane Roofing	Police HQ and Government Annex
	Report of Roof System Design Wind-load Analysis, Government Center Annex Roof J.	
	Report of Roof System Design Wind-load Analysis, Government Center Annex Roof K.	

075419 Polyvinyl-Chloride (PVC) Roofing ..... Police Headquarters, Roof 'D' only
Report of Roof System Design Wind-load Analysis, Police HQ Roofs A, B, and E.
Report of Roof System Design Wind-load Analysis, Police HQ Roof D.
Report of Roof System Design Wind-load Analysis, Police HQ Roof F.
076200.13 Sheet Metal Flashing and Trim ..... Police HQ and Government Annex.
076200.15 Sheet Metal Flashing and Trim ..... Police Headquarters, Roof 'D' only
079200 Joint Sealants ..... Police HQ and Government Annex.

DIVISION 8 - OPENINGS

089119 Fixed Louvers ..... Police HQ and Government Annex.

DIVISION 9 – FINISHES

099100 Painting ..... Police HQ and Government Annex.

DIVISION 10 - SPECIALTIES (Not Used)

DIVISION 11 - EQUIPMENT (Not Used)

DIVISION 12 - FURNISHINGS (Not Used)

DIVISIONS 13 - SPECIAL CONSTRUCTION (Not Used)

DIVISIONS 14 - CONVEYING EQUIPMENT (Not Used)

END OF DOCUMENT 000110

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Access to site.
4. Coordination with occupants.
5. Work restrictions.
6. Specification and Drawing conventions.
7. Miscellaneous provisions.

1.2 PROJECT INFORMATION

A. Project Identification: Pike County Maintenance Buildings: Roof Overlay.

1. Project Location: 5078 Kentucky Route 1428, Allen, Kentucky 41601.
2. Account No.: 609-C8ED-Z001-73.

B. Owner: Commonwealth of Kentucky.

1. Owner's Representative: Carl Kratzer, Division of Engineering and Contract Administration, direct number 502-782-0374, email carl.kratzer@ky.gov.

C. Architect: Patrick D. Murphy Co., Inc. Architects, 4606 Illinois Avenue, Louisville, Kentucky 40213, 502-454-5632 fax 502-454-4650.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents and consists of the following:

1. Selective Demolition, as indicated on Drawings, at both the Police Headquarters and the Government Annex Roofs:

a. Remove existing membrane roofing system down to exposed existing deck.
b. Remove existing flashing.
c. Remove existing roof edge metal trim.
d. Remove existing roof drains.
e. Disposal of demolition waste materials.

2. Install New Roofing System Over Existing Metal Deck of Government Annex Roof:

a. Mechanically attach base layer of 2.2" polyisocyanurate insulation to metal deck.
b. Adhere base layer of 2.2" polyisocyanurate insulation to existing metal decking with cold-applied asphalt adhesive.
c. Install second layer of 2.2" polyisocyanurate insulation with cold-applied asphalt adhesive.
d. Install tapered polyisocyanurate crickets and saddles, with cold-applied asphalt adhesive.
e. Install one layer of cover board with cold-applied asphalt adhesive.
f. Install one ply of smooth surface SBS modified bitumen fiberglass mat base sheet with cold-applied asphalt adhesive.
g. Install replacement roof drains.
h. Install one ply of granule surfaced SBS modified bitumen cap sheet with cold-applied asphalt adhesive.
i. Adhere foil faced modified flashings at walls and curbs.
j. Install top sheet of flashing with an aluminum foil facer.

3. Install New Roofing System Over Existing Concrete Deck of Police Headquarters, excluding Roof 'D':

a. Apply primer to existing concrete deck.
b. Adhere base layer of 2.2" polyisocyanurate insulation to existing concrete deck with cold-applied asphalt adhesive.
c. Install second layer of 2.2" polyisocyanurate insulation with cold-applied asphalt adhesive.
d. Install tapered polyisocyanurate crickets and saddles, with cold-applied asphalt adhesive.
e. Install one layer of cover board with cold-applied asphalt adhesive.
f. Install one ply of smooth surface SBS modified bitumen fiberglass mat base sheet with cold-applied asphalt adhesive.
g. Install replacement roof drains.
h. Install one ply of granule surfaced SBS modified bitumen cap sheet with cold-applied asphalt adhesive.
i. Adhere foil faced modified flashings at walls and curbs.
j. Install top sheet of flashing with an aluminum foil facer.

4. Install New Roofing System Overlay of Police Headquarters Roof 'D':

a. The following is a general outline of work to be performed:

1) Install wood blocking as required indicated on Drawings, as recommended by roofing system manufacturer, as required to comply with Performance Requirements, and as needed to align with top of insulation.
2) Installed flute filler insulation as per manufacturer recommendations.
3) Install cover board insulation and mechanically fasten according to manufacturer's recommendation.
4) Using Induction Fastening System, mechanically fasten PVC roof membrane according to manufacturer's recommendations.
5) Install flashings and metal components to the roof system.

B. Type of Contract:

1. Project will be constructed under a single prime contract.

1.4 ACCESS TO SITE

A. General: Contractor shall have limited use of Project site for construction operations as indicated on Drawings by the Contract limits and as indicated by requirements of this Section.

B. Use of Site: Limit use of Project site to areas within the Contract limits indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.

1. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or for storage of materials.

a. Schedule deliveries to minimize use of driveways and entrances by construction operations.
b. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. Use of Existing Building: Maintain existing building in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect building and its occupants during construction period.

D. Condition of Existing Building: Maintain portions of existing building affected by construction operations in a weathertight condition throughout construction period.

1. Repair damage to Owner's material property, including site work and landscaping, caused by construction operations to original condition at no additional cost to the Owner.

1.5 COORDINATION WITH OCCUPANTS

A. Full Owner Occupancy: Owner will occupy site and existing building(s) during entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's day-to-day operations. Maintain existing exits unless otherwise indicated.

1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from Owner and approval of authorities having jurisdiction.
2. Notify Owner not less than 72 hours in advance of activities that will affect Owner's operations.

1.6 WEATHER DELAYS

A. For the purpose of calculating claims for Weather Delays, the weather data from the U.S. Department of Commerce, NOAA, Climate Data collected from the LEXINGTON BLUEGRASS AP, KY US USW00093820 Station in the attached appendix immediately following this section will the establish expected typical weather.

1.7 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.

1. Comply with limitations on use of public streets and with other requirements of authorities having jurisdiction.

B. On-Site Work Hours: Work shall be performed on this existing building as follows:

1. Monday through Friday, 7:30am-5:00pm, unless otherwise indicated by Owner.

a. This will be covered during Pre-Bid Conference.

2. Weekend Hours: Verify with Owner.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:

1. Notify Architect and Owner not less than 2-days in advance of proposed utility interruptions.
2. Obtain Architect's and Owner's written permission before proceeding with utility interruptions.

1.8 SPECIFICATION AND DRAWING CONVENTIONS

A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

Government Center Annex & Police Headquarters Roof Replacements
Lexington-Fayette Urban County Government
Lexington, Kentucky RFP# 01-2023

C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:

1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 011000

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 980 ft. Lat: 38.0408° N Lon: -84.6058° W
Station: **LEXINGTON BLUEGRASS AP, KY US USW00093820**

Summary of Monthly Normals
1991-2020
Generated on 12/21/2022

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Temperature (°F)

	Mean						Cooling Degree Days Base (above)						Heating Degree Days Base (above)				Mean Number of Days					
Month	Daily Max	Daily Min	Mean	Long Term Max Std Dev	Long Term Min Std Dev	Long Term Avg Std Dev	55	57	60	65	70	72	55	57	60	65	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
01	42.3	25.4	33.9	4.5	4.8	4.5	4.6	2.4	0.7	0.0	0.0	0.0	660.1	719.8	811.2	965.5	0.0	0.0	8.9	7.6	22.7	0.6
02	46.8	28.3	37.5	5.2	4.6	4.9	7.5	4.8	2.2	0.4	0.0	0.0	496.1	549.4	630.7	786.9	0.0	0.0	11.6	4.7	19.2	0.2
03	56.1	35.8	45.9	4.4	3.8	4.0	40.0	28.5	15.4	3.5	0.3	0.0	320.5	371.0	450.9	594.0	0.0	0.0	20.6	0.9	13.1	0.0
04	67.2	45.2	56.2	3.2	3.1	3.0	138.1	106.6	67.0	23.2	4.2	1.5	102.1	130.6	181.0	287.2	0.0	0.0	28.3	0.0	2.9	0.0
05	75.8	55.0	65.4	3.4	3.5	3.3	335.3	281.5	207.8	108.5	39.9	21.8	12.9	21.1	40.4	96.1	0.0	0.3	31.0	0.0	0.1	0.0
06	83.8	62.8	73.3	2.3	1.9	1.9	549.0	489.1	400.0	257.0	130.8	89.1	0.0	0.1	1.1	8.0	0.1	4.1	30.0	0.0	0.0	0.0
07	86.9	66.5	76.7	2.8	1.9	2.2	672.6	610.6	517.6	362.9	212.4	157.4	0.0	0.0	0.0	0.2	0.2	9.1	31.0	0.0	0.0	0.0
08	86.2	65.2	75.7	2.9	2.4	2.4	641.6	579.6	486.7	332.8	186.9	135.9	0.0	0.0	0.1	1.2	0.1	7.7	31.0	0.0	0.0	0.0
09	80.2	58.1	69.1	3.9	2.8	3.1	427.8	370.8	288.0	166.2	75.2	49.4	3.4	6.4	13.6	41.8	0.0	3.7	30.0	0.0	0.0	0.0
10	68.6	47.0	57.8	2.9	2.3	2.3	161.3	126.4	82.8	32.6	9.5	5.5	74.6	101.7	151.1	255.8	0.0	0.2	29.8	0.0	1.6	0.0
11	55.8	36.4	46.1	4.4	3.3	3.7	30.5	19.8	9.4	1.8	0.1	0.0	297.4	346.8	426.3	568.7	0.0	0.0	20.7	0.3	11.0	0.0
12	45.9	29.6	37.8	4.8	4.4	4.5	6.9	3.8	1.3	0.2	0.0	0.0	541.6	600.5	691.0	844.8	0.0	0.0	11.3	4.4	19.3	0.0
Summary	66.3	46.3	56.3	3.7	3.2	3.3	3015	2624	2079	1289	659	461	2509	2847	3397	4432	0.4	25.1	284.2	17.9	89.9	0.8

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 980 ft. Lat: 38.0408° N Lon: -84.6058° W
Station: **LEXINGTON BLUEGRASS AP, KY US USW00093820**

Summary of Monthly Normals 1991-2020

Generated on 12/21/2022

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Precipitation (in.)

	Totals	Mean Number of Days				Precipitation Probabilities Probability that precipitation will be equal to or less than the indicated amount		
	Means	Daily Precipitation				Monthly Precipitation vs. Probability Levels		
Month	Mean	>= 0.01	>= 0.10	>= 0.50	>= 1.00	0.25	0.50	0.75
01	3.42	12.6	6.7	2.3	0.7	2.39	3.57	4.40
02	3.64	11.6	6.9	2.4	0.9	2.24	3.24	4.67
03	4.48	12.8	8.0	3.0	1.1	3.28	3.85	5.23
04	4.42	12.8	7.9	3.1	0.9	2.86	4.23	4.91
05	5.44	12.6	8.6	3.7	1.4	3.78	5.28	6.48
06	4.96	11.7	7.8	3.5	1.1	3.00	4.82	5.74
07	5.12	10.7	7.7	3.5	1.7	3.36	4.95	6.31
08	3.71	9.6	6.6	2.4	0.7	2.37	3.61	4.68
09	3.42	7.7	5.1	2.2	1.1	1.47	2.88	4.89
10	3.66	9.2	5.5	2.5	0.9	1.66	3.55	5.77
11	3.37	10.3	6.1	2.5	0.7	1.98	2.82	4.71
12	4.20	12.6	7.6	3.1	0.9	2.76	3.81	5.88
Summary	49.84	134.2	84.5	34.2	12.1	31.15	46.61	63.67

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

U.S. Department of Commerce
National Oceanic & Atmospheric Administration
National Environmental Satellite, Data, and Information Service
Current Location: Elev: 980 ft. Lat: 38.0408° N Lon: -84.6058° W
Station: **LEXINGTON BLUEGRASS AP, KY US USW00093820**

Summary of Monthly Normals 1991-2020

Generated on 12/21/2022

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Snow (in.)

	Totals	Mean Number of Days									Snow Probabilities Probability that snow will be equal to or less than the indicated amount		
	Means	Snowfall >= Thresholds					Snow Depth >= Thresholds				Monthly Snow vs. Probability Levels Values derived from the incomplete gamma distribution		
Month	Snowfall Mean	0.01	1.0	3.0	5.00	10.00	1	3	5	10	.25	.50	.75
01	4.70	4.5	1.3	0.5	0.1	0.0	4.1	1.7	0.6	0.2	1.20	3.10	6.30
02	4.50	3.8	1.2	0.4	0.1	0.1	4.0	1.5	0.6	0.2	0.80	3.20	5.70
03	2.80	1.7	0.7	0.3	0.2	0.0	1.5	0.5	0.2	0.1	0.00	0.60	4.40
04	0.20	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
05	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
06	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
07	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
08	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
09	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
10	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.00	0.00
11	0.40	0.7	0.2	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.00	0.00	0.40
12	1.90	2.5	0.6	0.0	0.0	0.0	2.0	0.4	0.0	0.0	0.10	0.60	2.70
Summary	14.5	13.4	4.0	1.2	0.4	0.1	11.9	4.1	1.4	0.5	2.1	7.5	19.5

Empty or blank cells indicate data is missing or insufficient occurrences to compute value

U.S. Department of Commerce
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Summary of Monthly Normals 1991-2020

Generated on 12/21/2022

National Centers for Environmental Information
151 Patton Avenue
Asheville, North Carolina 28801

Growing Degree Units (Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	68.4	94.1	243.8	491.6	787.4	998.8	1137.5	1106.5	874.3	553.8	233.7	98.6
45	32.3	48.3	149.4	355.1	632.8	848.9	982.6	951.6	724.4	406.3	138.3	49.0
50	14.0	21.4	81.7	234.7	479.9	698.9	827.6	796.6	574.9	271.6	71.4	20.4
55	4.6	7.5	40.0	138.1	335.3	549.0	672.6	641.6	427.8	161.3	30.5	6.9
60	0.7	2.2	15.4	67.0	207.8	400.0	517.6	486.7	288.0	82.8	9.4	1.3
Growing Degree Units for Corn (Monthly)												
50/86	34.9	55.1	141.7	294.1	499.2	678.9	787.6	760.8	568.9	328.3	127.2	47.6

Growing Degree Units (Accumulated Monthly)												
Base	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
40	68	162	406	898	1685	2684	3822	4928	5802	6356	6590	6689
45	32	81	230	585	1218	2067	3049	4001	4725	5132	5270	5319
50	14	35	117	352	832	1531	2358	3155	3730	4001	4073	4093
55	5	12	52	190	526	1074	1747	2389	2816	2978	3008	3015
60	1	3	18	85	293	693	1211	1697	1985	2068	2078	2079
Growing Degree Units for Corn (Monthly Accumulated)												
50/86	35	90	232	526	1025	1704	2492	3252	3821	4150	4277	4324

Note: For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86.
Empty or blank cells indicate data is missing or insufficient occurrences to compute value.

SECTION 012500 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1.2 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form attached, immediately following this Section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section.

1) Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated.
2) Simply stating "Meets Specifications" or using similarly vague language without providing detail comparison may be cause for rejection.
3) Indicate deviations, if any, from the Work specified.

a) Failure to indicate deviation which exist, may be cause for rejection.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

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1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
b. Substitution request is fully documented and properly submitted.
c. Requested substitution will not adversely affect Contractor's construction schedule.
d. Requested substitution has received necessary approvals of authorities having jurisdiction.
e. Requested substitution is compatible with other portions of the Work.
f. Requested substitution has been coordinated with other portions of the Work.
g. Requested substitution provides specified warranty.
h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
b. Requested substitution does not require extensive revisions to the Contract Documents.
c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
d. Substitution request is fully documented and properly submitted.
e. Requested substitution will not adversely affect Contractor's construction schedule.
f. Requested substitution has received necessary approvals of authorities having jurisdiction.
g. Requested substitution is compatible with other portions of the Work.
h. Requested substitution has been coordinated with other portions of the Work.
i. Requested substitution provides specified warranty.

j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012500

Project: **<insert project title>**
<insert project location>

To: **<insert Architects name>**
<insert Architects Co. name>
<insert street address>
<insert city, state, zip>

Substitution Request No.: _____
From: _____
Date: _____
Project No.: **<insert project number>**

Specification Section No. _____ **Title:** _____

Proposed Substitution: _____
Manufacturer: _____
Address: _____ Phone No.: _____
_____ Website: _____

Trade Name: _____ Model No. _____:

Installer: _____
Address: _____ Phone No.: _____
_____

History: ☐ New Product ☐ 2 –5 years ☐ 5 – 10 years ☐ More than 10 years
Differences between proposed substitution and specified product:
(*Required: Provide specific information and supporting data*)
_____
_____

Reason for not providing specified item (*Required*)**:**
☐ Specified item no long available ☐ Proposed item offers cost savings to Owner
☐ Proposed item LEED compliant ☐ Proposed item offers higher quality at same or lesser cost
☐ Proposed item offers better warranty/guarantee ☐ Other Explain: _____
_____
_____

Proposed Substitution affects other parts of the Work, other Contractors, other Trades, or other Work by Owner: ☐ No ☐ Yes Explain: _____
_____
_____

Savings to Owner for accepting substitution: _____ ($ _____)
Proposed substitution changes Contract Time: ☐ No ☐ Yes; ☐ Add ☐ Deduct _____ days

Supporting Data Attached (*Required: Provide detailed information demonstrating compliance with specifications*):
☐ **Attached point by point comparative data.**
(*Required: Highlight items on data provided that verify compliance with specifications requirements.*)
☐ Product Data ☐ Drawings ☐ Tests ☐ Reports
☐ Samples ☐ Schedule ☐ Manufacturer's Letter ☐ _____

Undersigned Certifies:

1. Proposed substitution has been fully investigated and determined to be equal to or superior in all salient characteristic requirements specified.
2. Warranty/guarantee for proposed substitution complies with specification requirements.
3. Maintenance service and source of replacement parts for proposed substitution complies with specification requirements.
4. Proposed substitution will not adversely affect or delay Construction Schedule.
5. Cost data as stated above is complete.
6. Claims for additional costs that may subsequently become apparent related to accepted substitution are hereby waived.
7. Proposed substitution does not affect dimensional and functional clearance requirements.
8. Coordination, installation, and changes in the Work required by acceptance of this substitution will be thorough and complete.

Submitted by: _____
Signed: _____ Date: _____

Firm: _____
Address: _____ Phone No.: _____
_____

Attachments (*attach additional information if this form does not provide adequate space to respond*):

_____
_____

Instructions:

1. A response to all requested information on this Substitution Request Form is required.
2. Where information requested does not apply, respond by indicating "Not Applicable" or "N/A."
3. Items indicated as "Required" shall not contain a response of "Not Applicable" or "N/A."
4. Provide attached sheets with further explanation if space available is not adequate for response.
5. Additional data supporting the responses is required.
6. Should this Substitution Request Form be incomplete, contain inaccurate information, or have inadequate supporting data; it will be rejected.

Architect's Review and Action (The following will be completed by Architect)

☐ Substitution will be approved by Addendum (*prior to bid*) or after Contract is sign by Change Order, Construction Change Directive, or Architect's Supplemental Instructions.
- ☐ And as noted on this form.
- ☐ Make submittals according to requirements of Section 013300 "Submittal Procedures."

☐ Substitution Rejected – Use specified materials.
- ☐ Received too late.
- ☐ Information incomplete – Note markings.
- ☐ Information incorrect – Note markings.

Signed: _____ Date: _____

Additional Comments ☐ A/E ☐ Contractor ☐ Subcontractor ☐ Manufacturer ☐ Supplier

_____
_____

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SECTION 013100 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. RFIs.
3. Digital project management procedures.
4. Project meetings.

1.2 INFORMATIONAL SUBMITTALS

A. Key Personnel Names: Within 7 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, in web-based Project software directory, and by each temporary telephone.

a. Keep list current at all times.

1.3 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to

avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.

1.4 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.

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D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 7 working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log weekly. Software log with not less than the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within seven days if Contractor disagrees with response.

1.5 DIGITAL PROJECT MANAGEMENT PROCEDURES

A. Architect's Data Files Not Available: Architect will not provide Architect's CAD drawing digital data files for Contractor's use during construction.

B. Web-Based Project Management: Use Owner's web-based Project software site for purposes of hosting and managing Project communication and documentation until Final Completion.

1. Comply with requirements of "General Conditions of the Contract for Construction."

C. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.6 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of 10 working days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within 3 days of the meeting.

B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 10 days after execution of the Agreement. Conduct the meeting to review responsibilities and personnel assignments.

1. Attendees: Authorized representatives of Owner Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Tentative construction schedule.
b. Phasing.
c. Critical work sequencing and long lead items.
d. Designation of key personnel and their duties.
e. Procedures for processing field decisions and Change Orders.
f. Procedures for processing Applications for Payment.
g. Distribution of the Contract Documents.
h. Submittal procedures.
i. Preparation of Record Documents.
j. Use of the premises.
k. Working hours.
l. Responsibility for temporary facilities and controls.
m. Parking availability.
n. Office, work, and storage areas.
o. Equipment deliveries and priorities.
p. First aid.
q. Security.

r. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals.
h. Possible conflicts.
i. Compatibility requirements.
j. Time schedules.
k. Weather limitations.
l. Manufacturer's written instructions.
m. Warranty requirements.
n. Compatibility of materials.
o. Acceptability of substrates.
p. Temporary facilities and controls.
q. Space and access limitations.
r. Regulations of authorities having jurisdiction.
s. Testing and inspecting requirements.
t. Installation procedures.
u. Required performance results.
v. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: Conduct progress meetings at regular intervals.

1. Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

   a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
   b. Review present and future needs of each entity present, including the following:

      1) Interface requirements.
      2) Sequence of operations.
      3) Status of submittals.
      4) Deliveries.
      5) Off-site fabrication.
      6) Access.
      7) Site use.
      8) Temporary facilities and controls.
      9) Work hours.
      10) Hazards and risks.
      11) Progress cleaning.
      12) Quality and work standards.
      13) Field observations.
      14) Status of RFIs.
      15) Status of Change Orders.
      16) Documentation of information for payment requests.

3. Minutes: Distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

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SECTION 013200 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

   1. Contractor's Construction Schedule.
   2. Daily construction reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

   1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
   2. Predecessor Activity: An activity that precedes another activity in the network.
   3. Successor Activity: An activity that follows another activity in the network.

B. Event: The starting or ending point of an activity.

C. Major Area: A story of construction, a separate building, or a similar significant construction element.

D. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.3 INFORMATIONAL SUBMITTALS

A. Submittal Schedule: Comply with requirements of Section 013300 "Submittal Procedures."

B. Format for Submittals: Submit required submittals in the following format:

   1. PDF file.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

   1. Submit a working digital copy of schedule, using software indicated on CD-ROM, and labeled to comply with requirements for submittals.

      a. Include type of schedule (Initial or Updated) and date on label.

D. Daily Construction Reports: Submit at weekly intervals.

E. Unusual Event Reports: Submit at time of unusual event.

F. Qualification Data: For scheduling consultant.

1.4 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors.

B. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Procedures: Comply with Associated General Contractors of America's (AGC) "Construction Planning & Scheduling."

B. Time Frame: Extend schedule from date established for the Notice of Award to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
2. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
4. Work Restrictions: Show the effect of the following items on the schedule:

a. Coordination with existing construction.
b. Limitations of continued occupancies.
c. Uninterruptible services.
d. Partial occupancy before Substantial Completion.

e. Use-of-premises restrictions.
f. Provisions for future construction.
g. Seasonal variations.
h. Environmental control.

D. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

E. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.1 PRELIMINARY CONSTRUCTION SCHEDULE

A. Gantt-Chart Schedule: Submit preliminary horizontal bar-chart-type construction schedule within 7 days of date established for the Notice of Award.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for the entire time of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.

1.1 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within the time period complying with the "General Conditions of the Contract for Construction."

1. Base schedule on the preliminary construction schedule and additional information received since the start of Project.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1. For construction activities that require three months or longer to complete, indicate an estimated completion percentage in 10 percent increments within time bar.

1.2 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. Approximate count of personnel at Project site.
3. Equipment at Project site.
4. Material deliveries.
5. High and low temperatures and general weather conditions, including presence of rain or snow.
6. Accidents.
7. Meetings and significant decisions.
8. Unusual events.
9. Stoppages, delays, shortages, and losses.
10. Meter readings and similar recordings.
11. Emergency procedures.
12. Orders and requests of authorities having jurisdiction.
13. Change Orders received and implemented.
14. Services connected and disconnected.
15. Equipment or system tests and startups.
16. Partial completions and occupancies.
17. Substantial Completions authorized.

B. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

1. Submit unusual event reports directly to Owner within one day(s) of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

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SECTION 013233 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Preconstruction photographs.
2. Periodic construction photographs.
3. Final completion construction photographs.

1.2 INFORMATIONAL SUBMITTALS

A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.

B. Digital Photographs: Submit image files within 3 days of taking photographs.

1. Submit photos on CD-ROM or thumb-drive. Include copy of key plan indicating each photograph's location and direction.
2. Identification: Provide the following information with each image description in file metadata tag:

a. Name of Project.
b. Name and contact information for photographer.
c. Name of Architect.
d. Name of Contractor.
e. Date photograph was taken.
f. Description of location, vantage point, and direction.
g. Unique sequential identifier keyed to accompanying key plan.

1.3 FORMATS AND MEDIA

A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels, and at an image resolution of not less than 3200 by 2400 pixels.

1. Use flash in low light levels or backlit conditions.

B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

C. File Names: Name media files with date, Project area, and sequential numbering suffix.

1.4 CONSTRUCTION PHOTOGRAPHS

A. General: Take photographs with maximum depth of field and in focus.

1. Maintain key plan with each set of construction photographs that identifies each photographic location.

B. Preconstruction Photographs: Before starting construction, take photographs of Project site and surrounding properties, including existing items to remain during construction, from different vantage points, as directed by Architect.

1. Flag construction limits before taking construction photographs.
2. Take 20 photographs to show existing conditions adjacent to property before starting the Work.
3. Take 20 photographs of existing buildings either on or adjoining property to accurately record physical conditions at start of construction.
4. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.

C. Periodic Construction Photographs: Take 20 photographs weekly and coinciding with the cutoff date associated with each Application for Payment.

1. Select vantage points to show status of construction and progress since last photographs were taken.

D. Final Completion Construction Photographs: Take 20 photographs after date of Substantial Completion for submission as Project Record Documents. Architect will inform photographer of desired vantage points.

E. Additional Photographs: Architect may request photographs in addition to periodic photographs specified. Additional photographs will be paid for by Change Order and are not included in the Contract Sum.

1. Three days' notice will be given, where feasible.
2. In emergency situations, take additional photographs within 24 hours of request.
3. Circumstances that could require additional photographs include, but are not limited to, the following:

a. Special events planned at Project site.
b. Immediate follow-up when on-site events result in construction damage or losses.
c. Photographs to be taken at fabrication locations away from Project site. These photographs are not subject to unit prices or unit-cost allowances.
d. Substantial Completion of a major phase or component of the Work.
e. Extra record photographs at time of final acceptance.
f. Owner's request for special publicity photographs.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013233

SECTION 013300 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Submittal schedule requirements.
2. Administrative and procedural requirements for submittals.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.3 SUBMITTAL SCHEDULE

A. Submittal Schedule: Submit, as an action submittal, a list of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

3. Format: Arrange the following information in a tabular format:

a. Scheduled date for first submittal.

b. Specification Section number and title.
c. Submittal Category: Action; informational.
d. Name of subcontractor.
e. Description of the Work covered.
f. Scheduled date for Architect's final release or approval.
g. Scheduled date of fabrication.

1.4 SUBMITTAL FORMATS

A. Submittal Information: Include the following information in each submittal:

1. Project name.
2. Date.
3. Name of Architect.
4. Name of Contractor.
5. Name of firm or entity that prepared submittal.
6. Names of subcontractor, manufacturer, and supplier.
7. Unique submittal number, including revision identifier. Include Specification Section number with sequential number (e.g., 061000.01).

a. Resubmittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

8. Number and title of Specification Section, with paragraph number and generic name for each of multiple items.
9. Drawing number and detail references, as appropriate.
10. Location(s) where product is to be installed, as appropriate.
11. Other necessary identification.

B. Options: Identify options requiring selection by Architect.

C. Deviations and Additional Information: On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Architect on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet.

D. Submittals for Web-Based Project Software: Prepare submittals as PDF files, or other format indicated by Project software website.

1. Transmittal for Submittals: Assemble each submittal individually and appropriately for transmittal and handling, including the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Name and address of Architect.
f. Name of Contractor.

g. Name of firm or entity that prepared submittal.
h. Names of subcontractor, manufacturer, and supplier.
i. Category and type of submittal.
j. Submittal purpose and description.
k. Specification Section number and title.
l. Specification paragraph number or drawing designation and generic name for each of multiple items.
m. Drawing number and detail references, as appropriate.
n. Indication of full or partial submittal.
o. Transmittal number, numbered consecutively.
p. Submittal and transmittal distribution record.
q. Remarks.
r. Signature of transmitter.

1.5 SUBMITTAL PROCEDURES

A. Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

B. Deliver submittals in the following format:

1. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.

C. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of submittals for related parts of the Work specified in different Sections so processing will not be delayed because of need to review submittals concurrently for coordination.

a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

D. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including resubmittals.

1. Initial Review: Allow 15 days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.

2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow 15 days for review of each resubmittal.

E. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with approval notation from Architect's action stamp.

F. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

G. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Architect's action stamp.

1.6 SUBMITTAL REQUIREMENTS

A. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are unsuitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

a. Manufacturer's catalog cuts.
b. Manufacturer's product specifications.
c. Standard color charts.
d. Statement of compliance with specified referenced standards.
e. Notation of coordination requirements.
f. Availability and delivery time information.

4. Submit Product Data before Shop Drawings, and before or concurrent with Samples.

B. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

a. Identification of products.
b. Schedules.
c. Compliance with specified standards.
d. Notation of coordination requirements.
e. Notation of dimensions established by field measurement.

f. Relationship and attachment to adjoining construction clearly indicated.
g. Seal and signature of professional engineer if specified.

C. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other materials.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Permanently attach label on unexposed side of Samples that includes the following:

a. Project name and submittal number.
b. Generic description of Sample.
c. Product name and name of manufacturer.
d. Sample source.
e. Number and title of applicable Specification Section.
f. Specification paragraph number and generic name of each item.

3. Web-Based Project Software: Prepare submittals in PDF form, and upload to web-based Project software website. Enter required data in web-based software site to fully identify submittal.
4. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

a. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

5. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Number of Samples: Submit 3 full sets of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return submittal with options selected.

6. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Number of Samples: Submit 3 sets of Samples. Architect will retain 2 Sample sets; remainder will be returned. Mark up and retain one returned Sample set as a project record Sample.

D. Product Schedule: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product indicated in the Contract Documents or assigned by Contractor if none is indicated.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.

E. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."

F. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."

G. Application for Payment and Schedule of Values: Comply with requirements specified in the General Conditions of the Contract for Construction.

H. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in the General Conditions of the Contract for Construction.

I. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

J. Certificates:

1. Certificates and Certifications Submittals: Submit a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity. Provide a notarized signature where indicated.
2. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
3. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
4. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
5. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

K. Test and Research Reports:

1. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
2. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

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3. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
4. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

1.7 CONTRACTOR'S REVIEW

A. Action Submittals and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Contractor's Approval: Indicate Contractor's approval for each submittal with a uniform approval stamp. Include name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

1. Architect will not review submittals received from Contractor that do not have Contractor's review and approval.

1.8 ARCHITECT'S REVIEW

A. Action Submittals: Architect will review each submittal, indicate corrections or revisions required, and return it.

1. Submittals by Web-Based Project Software: Architect will indicate, on Project software website, the appropriate action.

B. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

C. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

D. Incomplete submittals are unacceptable, will be considered nonresponsive, and will be returned for resubmittal without review.

E. Architect will return without review submittals received from sources other than Contractor.

F. Submittals not required by the Contract Documents will be returned by Architect without action.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013300

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.

1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of 5 previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

D. Source Quality-Control Tests: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

E. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

F. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.3 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for direction before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.4 INFORMATIONAL SUBMITTALS

A. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

C. Reports: Prepare and submit certified written reports and documents as specified.

D. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

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1.5 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Dates and locations of samples and tests or inspections.
4. Names of individuals making tests and inspections.
5. Description of the Work and test and inspection method.
6. Identification of product and Specification Section.
7. Complete test or inspection data.
8. Test and inspection results and an interpretation of test results.
9. Record of temperature and weather conditions at time of sample taking and testing and inspection.
10. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
11. Name and signature of laboratory inspector.
12. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, telephone number, and email address of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

1.6 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

D. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

E. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

F. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.7 QUALITY CONTROL

A. Owner Responsibilities: Owner will engage a qualified testing agency to perform these services.

1. Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Payment for these services will be made according to the requirements of the "General Conditions of the Contract for Construction."
3. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and the Contract Sum will be adjusted by Change Order.

B. Contractor Responsibilities: Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.

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2. Notify Manufacturers Technical Representative at least 7-days in advance of time when Work that requires testing or inspecting will be performed
3. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
4. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Associated Contractor Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

I. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's Construction Schedule. Update as the Work progresses.

1. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes.
2. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible.
3. Comply with the requirements of the "General Conditions of the Contract for Construction."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org.
9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
11. AF&PA - American Forest & Paper Association; www.afandpa.org.
12. AGA - American Gas Association; www.aga.org.
13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
15. AI - Asphalt Institute; www.asphaltinstitute.org.
16. AIA - American Institute of Architects (The); www.aia.org.
17. AISC - American Institute of Steel Construction; www.aisc.org.
18. AISI - American Iron and Steel Institute; www.steel.org.
19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
21. ANSI - American National Standards Institute; www.ansi.org.
22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
23. APA - APA - The Engineered Wood Association; www.apawood.org.
24. APA - Architectural Precast Association; www.archprecast.org.
25. API - American Petroleum Institute; www.api.org.
26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
27. ARI - American Refrigeration Institute; (See AHRI).
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASCE - American Society of Civil Engineers; www.asce.org.
30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).
31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.

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32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWPA - American Wood Protection Association; www.awpa.com.
40. AWS - American Welding Society; www.aws.org.
41. AWWA - American Water Works Association; www.awwa.org.
42. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
43. BIA - Brick Industry Association (The); www.gobrick.com.
44. BICSI - BICSI, Inc.; www.bicsi.org.
45. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
46. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
47. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
48. CDA - Copper Development Association; www.copper.org.
49. CEA - Consumer Electronics Association; www.ce.org.
50. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
51. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
52. CGA - Compressed Gas Association; www.cganet.com.
53. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
54. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
55. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
56. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
57. CPA - Composite Panel Association; www.pbmdf.com.
58. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
59. CRRC - Cool Roof Rating Council; www.coolroofs.org.
60. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
61. CSA - CSA Group; www.csagroup.com.
62. CSA - CSA International; www.csa-international.org.
63. CSI - Construction Specifications Institute (The); www.csinet.org.
64. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
65. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
66. CWC - Composite Wood Council; (See CPA).
67. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
68. DHI - Door and Hardware Institute; www.dhi.org.
69. ECA - Electronic Components Association; (See ECIA).
70. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
71. ECIA - Electronic Components Industry Association; www.eciaonline.org.
72. EIA - Electronic Industries Alliance; (See TIA).
73. EIMA - EIFS Industry Members Association; www.eima.com.
74. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
75. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
76. ESTA - Entertainment Services and Technology Association; (See PLASA).
77. ETL - Intertek (See Intertek); www.intertek.com.
78. EVO - Efficiency Valuation Organization; www.evo-world.org.

79. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
80. FM Approvals - FM Approvals LLC; www.fmglobal.com.
81. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
82. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridaroof.com.
83. FSA - Fluid Sealing Association; www.fluidsealing.com.
84. FSC - Forest Stewardship Council U.S.; www.fscus.org.
85. GA - Gypsum Association; www.gypsum.org.
86. GANA - Glass Association of North America; www.glasswebsite.com.
87. GS - Green Seal; www.greenseal.org.
88. HI - Hydraulic Institute; www.pumps.org.
89. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
90. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
91. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
92. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
93. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
94. IAS - International Accreditation Service; www.iasonline.org.
95. ICBO - International Conference of Building Officials; (See ICC).
96. ICC - International Code Council; www.iccsafe.org.
97. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
98. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
99. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
100. IEC - International Electrotechnical Commission; www.iec.ch.
101. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
102. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
103. IESNA - Illuminating Engineering Society of North America; (See IES).
104. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
105. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
106. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
107. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
108. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
109. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
110. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).
111. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
112. ISO - International Organization for Standardization; www.iso.org.
113. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
114. ITU - International Telecommunication Union; www.itu.int/home.
115. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
116. LMA - Laminating Materials Association; (See CPA).
117. LPI - Lightning Protection Institute; www.lightning.org.
118. MBMA - Metal Building Manufacturers Association; www.mbma.com.
119. MCA - Metal Construction Association; www.metalconstruction.org.
120. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
121. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
122. MHIA - Material Handling Industry of America; www.mhia.org.

123. MIA - Marble Institute of America; www.marble-institute.com.
124. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
125. MPI - Master Painters Institute; www.paintinfo.com.
126. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
127. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
128. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
129. NADCA - National Air Duct Cleaners Association; www.nadca.com.
130. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
131. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
132. NBI - New Buildings Institute; www.newbuildings.org.
133. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
134. NCMA - National Concrete Masonry Association; www.ncma.org.
135. NEBB - National Environmental Balancing Bureau; www.nebb.org.
136. NECA - National Electrical Contractors Association; www.necanet.org.
137. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
138. NEMA - National Electrical Manufacturers Association; www.nema.org.
139. NETA - InterNational Electrical Testing Association; www.netaworld.org.
140. NFHS - National Federation of State High School Associations; www.nfhs.org.
141. NFPA - National Fire Protection Association; www.nfpa.org.
142. NFPA - NFPA International; (See NFPA).
143. NFRC - National Fenestration Rating Council; www.nfrc.org.
144. NHLA - National Hardwood Lumber Association; www.nhla.com.
145. NLGA - National Lumber Grades Authority; www.nlga.org.
146. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
147. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
148. NRCA - National Roofing Contractors Association; www.nrca.net.
149. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
150. NSF - NSF International; www.nsf.org.
151. NSPE - National Society of Professional Engineers; www.nspe.org.
152. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
153. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
154. NWFA - National Wood Flooring Association; www.nwfa.org.
155. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
156. PDI - Plumbing & Drainage Institute; www.pdionline.org.
157. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); www.plasa.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; www.redwoodinspection.com.
161. SAE - SAE International; www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
167. SIA - Security Industry Association; www.siaonline.org.

168. SJI - Steel Joist Institute; www.steeljoist.org.
169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
178. STI - Steel Tank Institute; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
184. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
185. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
186. TMS - The Masonry Society; www.masonrysociety.org.
187. TPI - Truss Plate Institute; www.tpinst.org.
188. TPI - Turfgrass Producers International; www.turfgrasssod.org.
189. TRI - Tile Roofing Institute; www.tileroofing.org.
190. UL - Underwriters Laboratories Inc.; www.ul.com.
191. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
192. USAV - USA Volleyball; www.usavolleyball.org.
193. USGBC - U.S. Green Building Council; www.usgbc.org.
194. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
195. WA - Wallcoverings Association; www.wallcoverings.org.
196. WASTEC - Waste Equipment Technology Association; www.wastec.org.
197. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
198. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
199. WDMA - Window & Door Manufacturers Association; www.wdma.com.
200. WI - Woodwork Institute; www.wicnet.org.
201. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
202. WWPA - Western Wood Products Association; www.wwpa.org.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. ICC - International Code Council; www.iccsafe.org.
2. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FG - Federal Government Publications; www.gpo.gov/fdsys.
8. GSA - General Services Administration; www.gsa.gov.
9. HUD - Department of Housing and Urban Development; www.hud.gov.
10. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
11. OSHA - Occupational Safety & Health Administration; www.osha.gov.
12. SD - Department of State; www.state.gov.
13. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
14. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
15. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
16. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.
3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services; www.quicksearch.dla.mil.
    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. HBC; Kentucky Department of Housing, Buildings and Construction; http://dhbc.ky.gov.
2. KBC; Kentucky Building Code.
3. KHC; Kentucky Heritage Council; https://heritage.ky.gov.
4. KHC; Kentucky Housing Corporation; http://www.kyhousing.org.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.3 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its

use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Portable Chain-Link Fencing: Minimum 2-inch, 0.148-inch-thick, galvanized-steel, chain-link fabric fencing; 4 feet high with galvanized-steel pipe posts; minimum 2-3/8-inch-OD line posts and 2-7/8-inch-OD corner and pull posts, with 1-5/8-inch-OD top and bottom rails. Provide concrete or galvanized-steel bases for supporting posts.

1. Line Posts Maximum Spacing: 8'-0" on center.
2. Provide gate(s) with ability to pad lock as required for security and access.
3. Provide the following warning signs on the fence:

a. "Caution – Work Area."
b. "Over head work in progress."
c. "No Admittance – Work Area."

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Owner, if necessary, will provide an office space.

2.3 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

1. Provide a minimum of one fire extinguisher with a 10B rating within 50 feet, at each location where work is being performed and where equipment is being used.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

B. Water Service: Connect to Owner's existing water service facilities. Clean and maintain water service facilities in a condition acceptable to Owner. At Substantial Completion, restore these facilities to condition existing before initial use.

C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities will not be permitted.

D. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

E. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

F. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.

1. Use of cellular / digital phone with local phone number is permitted.
2. At each telephone, post a list of important telephone numbers.

a. Police and fire departments.
b. Ambulance service.
c. Contractor's home office.
d. Contractor's emergency after-hours telephone number.
e. Architect's office.
f. Owner's office.
g. Principal subcontractors' field and home offices.

3. Provide superintendent with cellular telephone or portable two-way radio for use when away from field office.

G. Electronic Communication Service: If available from Owners existing system. Provide temporary electronic communication service, including electronic mail, in common-use facilities.

1. Provide DSL or T-1 line in primary field office if required for the project.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Architect schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial

Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Owner will provide limited parking for contractor or their employees.

D. Project Signs: Provide Project signs as indicated. Unauthorized signs are not permitted.

1. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.

a. Provide temporary, directional signs for construction personnel and visitors.

2. Maintain and touch up signs so they are legible at all times.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

F. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1. Comply with work restrictions specified in Section 011000 "Summary."

B. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

C. Temporary Fencing: Before construction operations begin, furnish and install temporary fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: Install around set up areas and storage areas.

D. Barricades, and Warning Signs: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs.

E. Take down and securely store ladders at the end of each work day.

F. Barricaded off kettles at all times.

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G. Keeping walking traffic away from operations.

3.5 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements of "General Conditions of the Contract for Construction."

END OF SECTION 015000

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.2 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility, except that products consisting of recycled-content materials are allowed, unless explicitly stated otherwise. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved by Architect through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification.

C. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

D. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications. Submit a comparable product request, if applicable.

1.3 ACTION SUBMITTALS

A. Product Schedule: Submit a list, in tabular from, showing specified products. Include generic names of products required. Include manufacturer's name and proprietary product names for each product.

1. Coordinate product list with Contractor's Construction Schedule and the Submittals Schedule.
2. Form: Tabulate information for each product under the following column headings:

a. Specification Section number and title.
b. Generic name used in the Contract Documents.
c. Proprietary name, model number, and similar designations.
d. Manufacturer's name and address.
e. Supplier's name and address.
f. Installer's name and address.
g. Projected delivery date or time span of delivery period.
h. Identification of items that require early submittal approval for scheduled delivery date.

3. Architect's Action: Architect will respond in writing to Contractor within 15-days of receipt of completed product list. Architect's response will include a list of unacceptable product selections and a brief explanation of reasons for this action. Architect's response, or lack of response, does not constitute a waiver of requirement to comply with the Contract Documents.

B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use CSI Form 13.1A.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section.

1) Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated.
2) Simply stating "Meets Specifications" or using similarly vague language without providing detail comparison may be cause for rejection.
3) Indicate deviations, if any, from the Work specified.

a) Failure to indicate deviation which exist, may be cause for rejection.

d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

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e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-ES.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

C. Comparable Product Request Submittal: Submit request for consideration of each comparable product. Identify basis-of-design product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within 7 days of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or 7 days of receipt of additional information or documentation, whichever is later.

a. Form of Architect's Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

D. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 013300 "Submittal Procedures." Show compliance with requirements.

1.4 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store cementitious products and materials on elevated platforms.
5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
7. Protect stored products from damage and liquids from freezing.

1.6 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

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1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements of "General Conditions of the Contract for Construction."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term "match sample," sample to be matched is Architect's.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
7. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Evaluation of "or equal" product status is by the Architect, whose determination is final.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase: "Subject to compliance with requirements, provide the following: ..."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole manufacturer/source may be indicated by the phrase: "Subject to compliance with requirements, provide products by the following: ..."

3. available manufacturers and products, provide one of the products listed, or an unnamed product, which complies with requirements.

    a. Non-limited list of products is indicated by the phrase: "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following: ..."

4. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

    a. Limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, provide products by one of the following: ..."

5. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed, or a product by an unnamed manufacturer, which complies with requirements.

    a. Non-limited list of manufacturers is indicated by the phrase: "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following: ..."

6. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

    a. For approval of products by unnamed manufacturers, comply with requirements of "General Conditions of the Contract for Construction" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

    1. If no product available within specified category matches and complies with other specified requirements, comply with requirements of "General Conditions of the Contract for Construction" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

    1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.

        a. Detailed comparison of significant qualities of proposed product with those named in the Specifications.
        b. Significant product qualities include attributes such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.

    2. Evidence that proposed product provides specified warranty.
    3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
    4. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 016000

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

C. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

D. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

E. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

F. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

G. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

H. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

I. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

J. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

K. "Provide": Furnish and install, complete and ready for the intended use.

L. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

M. "Remove": Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

N. "Collection Zone": Area set aside for accumulation of demolition and construction waste and debris to protect people, buildings, individual trees, groups of trees, shrubs, or other vegetation during demolition and construction.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Arrange selective demolition schedule so as not to interfere with Owner's operations.

B. Sequencing:

1. Owner will conduct salvage operations before demolition begins to remove materials Owner chooses to retain.

C. Scheduling:

1. Schedule Work to coincide with new construction.
2. Cooperate with Owner in scheduling noisy operations and waste removal that may impact Owners operation.

D. Predemolition Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Photographs: Provide photographs documenting existing damaged plywood roof sheathing and wood trim to be removed.

1.6 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

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1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's building manager's and other tenants' on-site operations are uninterrupted.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. Hazardous materials will be removed by Owner before start of the Work.
2. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1.8 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 MATERIALS

A. Plastic Fencing: Plastic Collection Zone fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a

minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 96 inches apart

1. Height: 48 inches.
2. Color: High-visibility orange, nonfading.

PART 3 - EXECUTION

3.1 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
2. Protect existing construction and other existing finish work that are to remain or that are exposed during selective demolition operations.
3. Protect existing grounds and landscaping from damage.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion

D. Remove temporary barricades and protections where hazards no longer exist.

3.2 SUMMARY OF WORK

A. The following is a general outline of roof work to be performed:

1. Remove existing membrane roofing system down to exposed existing deck.
2. Remove existing flashing.
3. Remove existing roof edge metal trim.
4. Remove existing roof drains.
5. Disposal of demolition waste materials.

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3.3 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated on Drawings. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches.
4. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, roofs, or framing.
6. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

1. Coordinate selective demolition with the work specified in the following sections:

a. Section 030130 "Maintenance of Cast-in-Place Concrete."
b. Section 053100 "Steel Decking."
c. Section 061053 "Miscellaneous Rough Carpentry."
d. Section 070150.19 "Preparation for Reroofing."
e. Sections 076200 "Sheet Metal Flashing and Trim."

f. Section 079200 "Joint Sealants."

2. Remove existing roof membrane down to roof deck, including flashings, copings, roof edge metal trim, and roof accessories.

   a. Remove existing roofing system, including insulation and underlayment, down to existing decking.

3. Removed substrate where indicated on Drawings and where existing substrate has been damaged.
4. Remove flashings and roof accessories.

3.5 COLLECTION ZONES

A. Collection-Zone Fencing: Install collection-zone fencing along edges of collection zones before materials and equipment are brought on the site and before demolition operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

   1. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.

B. Place tarps over ground area within collection zones where demolition and construction debris and waste will be collected.

   1. On a daily basis remove demolition and construction debris and waste from grounds and landscaped areas.
   2. Do not allow tarps and large objects related to demolition to cover vegetation areas for more than 1 day.
   3. Do not place tarps and large objects related to demolition over the same vegetation areas that were previously covered until that area has remained uncovered for at least 24 hours.

C. Maintain collection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

   1. Do not remove collection-zone fencing, even temporarily, to allow deliveries or equipment access through the collection zone.
   2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

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3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

   1. Do not allow demolished materials to accumulate on-site.
   2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.

END OF SECTION 024119

SECTION 030130 - MAINTENANCE OF CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Removal of deteriorated cast-in-place concrete and subsequent replacement and patching.

1.2 UNIT PRICES

A. Work of this Section is affected by existing cast-in-place concrete unit price and the patching and repair of existing deteriorated existing cast-in-place concrete roof deck unit price.

B. Work of this Section is affected by unit prices specified in Section 010000 "Special Conditions."

C. General: Unit prices include the cost of preparing existing construction to receive the work indicated.

1.3 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

F. "Provide": Furnish and install, complete and ready for the intended use.

G. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

H. "Collection Zone": Area set aside for accumulation of demolition and construction waste and debris to protect people, buildings, individual trees, groups of trees, shrubs, or other vegetation during demolition and construction.

I. "Vegetation": Trees, shrubs, groundcovers, grass, and other plants.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review methods and procedures related to concrete maintenance including, but not limited to, the following:

a. Materials, material application, sequencing, tolerances, and required clearances.
b. Quality-control program.
c. Coordination with building occupants.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Concrete Damage Report.

1.6 INFORMATIONAL SUBMITTALS

A. Material certificates.

B. Product test reports.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with manufacturer's written instructions for minimum and maximum temperature requirements and other conditions for storage.

B. Store cementitious materials off the ground, under cover, and in a dry location.

C. Store aggregates covered and in a dry location; maintain grading and other required characteristics and prevent contamination.

1.8 FIELD CONDITIONS

A. Cold-Weather Requirements for Cementitious Materials: Do not apply unless concrete-surface and air temperatures are above 40 deg F and will remain so for at least 48 hours after completion of Work.

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B. Hot-Weather Requirements for Cementitious Materials: Protect repair work when temperature and humidity conditions produce excessive evaporation of water from patching materials. Provide artificial shade and wind breaks, and use cooled materials as required. Do not apply to substrates with temperatures of 90 deg F and above.

PART 2 - PRODUCTS

2.1 PATCHING MORTAR

A. Basis of Design Product: Subject to compliance with requirements, provide Zono-Patch by Siplast or provide one of the following products:

1. Securock® Brand Gypsum-Concrete Patch by United States Gypsum Company
2. QUIKRETE® Concrete Patching Compound by QUIKRETE Companies, The

B. Source Limitations: Obtain patching mortar from manufacturer approved by membrane roofing manufacturer.

2.2 MISCELLANEOUS MATERIALS

A. Water: Potable.

2.3 MIXES

A. General: Mix products, in clean containers, according to manufacturer's written instructions.

B. Do not add water, thinners, or additives unless recommended by manufacturer.

C. When practical, use manufacturer's premeasured packages to ensure that materials are mixed in proper proportions.

1. When premeasured packages are not used, measure ingredients using graduated measuring containers; do not estimate quantities or use shovel or trowel as unit of measure.

D. Do not mix more materials than can be used within time limits recommended by manufacturer. Discard materials that have begun to set.

PART 3 - EXECUTION

3.1 CONCRETE MAINTENANCE

A. Comply with manufacturers' written instructions for surface preparation and product application.

3.2 EXAMINATION

A. After removal of roofing materials and cleaning of existing cast-in-place concrete roof deck areas of deteriorated or delaminated concrete using hammer or chain-drag sounding and mark boundaries.

1. Locate areas of spalled and chipped concrete that will impair adhesion of roofing system.
2. Mark areas for removal by simplifying and squaring off boundaries.
3. Photograph damaged areas and indicated location of damaged areas on roof plan, with cross references to corresponding photographs.
4. Submit photographs and roof plan in concrete damage report.

3.3 PREPARATION

A. Ensure that supervisory personnel are on-site and on duty when concrete maintenance work begins and during its progress.

B. Protect persons, motor vehicles, surrounding surfaces of building being repaired, building site, plants, and surrounding buildings from harm resulting from concrete maintenance work.

1. Comply with each product manufacturer's written instructions for protections and precautions. Protect against adverse effects of products and procedures on people and adjacent materials, components, and vegetation.
2. Use only proven protection methods appropriate to each area and surface being protected.
3. Provide temporary barricades, barriers, and directional signage to exclude public from areas where concrete maintenance work is being performed.
4. Erect temporary protective covers over walkways and at points of pedestrian and vehicular entrance and exit that must remain in service during course of concrete maintenance work.
5. Contain dust and debris generated by concrete maintenance work and prevent it from reaching the public or adjacent surfaces.
6. Use water-mist sprinkling and other wet methods to control dust only with adequate, approved procedures and equipment that ensure that such water will not create a hazard or adversely affect other building areas or materials.
7. Protect roof deck and other surfaces along haul routes from damage, wear, and staining.
8. Provide supplemental sound-control treatment to isolate removal and dismantling work from other areas of the building.
9. Protect adjacent surfaces and equipment by covering them with heavy polyethylene film and waterproof masking tape or a liquid strippable masking agent.

a. If practical, remove items, store, and reinstall after potentially damaging operations are complete.

10. Neutralize and collect alkaline and acid wastes for disposal off Owner's property.
11. Dispose of debris and runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

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C. Existing Drains: Prior to the start of work in an area, test drainage system to ensure that it is functioning properly. Notify Architect immediately of inadequate drainage or blockage. Do not begin work in an area until the drainage system is in working order.

1. Prevent solids such as aggregate or mortar residue from entering the drainage system. Clean out drains and drain lines that become sluggish or blocked by sand or other materials resulting from concrete maintenance work.
2. Protect drains from pollutants. Block drains or filter out sediments, allowing only clean water to pass.

D. Preparation for Concrete Removal: Examine construction to be repaired to determine best methods to safely and effectively perform concrete maintenance work. Examine adjacent work to determine what protective measures will be necessary. Make explorations, probes, and inquiries as necessary to determine condition of construction to be removed in the course of repair.

1. Verify that affected utilities have been disconnected and capped.
2. Inventory and record the condition of items to be removed for reinstallation or salvage.

3.4 REMOVAL OF CONCRETE

A. Do not overload structural elements with debris.

B. Saw-cut perimeter of areas indicated for removal to a depth of at least 1/2 inch.

1. Make cuts perpendicular to concrete surfaces and no deeper than cover on reinforcement.

C. Remove deteriorated and delaminated existing cast-in-place concrete by breaking up and dislodging from reinforcement.

D. Remove additional concrete if necessary to provide a depth of removal of at least 1/2 inch over entire removal area.

E. Test areas where concrete has been removed by tapping with mallet, and remove additional concrete until unsound and disbonded concrete is completely removed.

F. Provide surfaces with a fractured profile of at least 1/8 inch that are approximately perpendicular or parallel to original concrete surfaces.

1. At columns and walls, make top and bottom surfaces level unless otherwise directed.

G. Thoroughly clean removal areas of loose concrete, dust, and debris.

3.5 INSTALLATION OF PATCHING MORTAR

A. Place patching mortar as specified in this article unless otherwise recommended in writing by manufacturer.

1. Provide forms where necessary to confine patch to required shape.
2. Wet substrate and forms thoroughly and then remove standing water.

B. General Placement: Place patching mortar by troweling toward edges of patch to force intimate contact with edge surfaces.

1. For large patches, fill edges first and then work toward center, always troweling toward edges of patch.
2. At fully exposed reinforcing bars, force patching mortar to fill space behind bars by compacting with trowel from sides of bars.

C. Consolidation: After each lift is placed, consolidate material and screed surface.

D. Multiple Lifts: Where multiple lifts are used, score surface of lifts to provide a rough surface for placing subsequent lifts. Allow each lift to reach final set before placing subsequent lifts.

E. Finishing: Allow surfaces of lifts that are to remain exposed to become firm and then finish to a surface matching adjacent concrete.

F. Curing: Wet-cure cementitious patching materials, including polymer-modified cementitious patching materials, for not less than seven days by water-fog spray or water-saturated absorptive cover.

END OF SECTION 030130

SECTION 053100 - STEEL DECKING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof deck.

1.2 UNIT PRICES

A. Work of this Section is affected by existing steel decking unit price and the patching and repair of existing deteriorated existing steel decking unit price.

B. Work of this Section is affected by unit prices specified in Section 010000 "Special Conditions."

C. General: Unit prices include the cost of preparing existing construction to receive the work indicated.

1.3 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

E. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

F. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

G. "Provide": Furnish and install, complete and ready for the intended use.

H. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

I. "Installer Qualifications": A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Roof deck.

B. Shop Drawings:

1. Include layout and types of deck panels, anchorage details, reinforcing channels, pans, cut deck openings, special jointing, accessories, and attachments to other construction.

1.5 INFORMATIONAL SUBMITTALS

A. Welding certificates.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. Welding Qualifications: Qualify procedures and personnel in accordance with SDI QA/QC and the following welding codes:

a. AWS D1.1/D1.1M.
b. AWS D1.3/D1.3M.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect steel deck from corrosion, deformation, and other damage during delivery, storage, and handling.

B. Store products in accordance with SDI MOC3. Stack steel deck on platforms or pallets and slope to provide drainage. Protect with a waterproof covering and ventilate to avoid condensation.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. AISI Specifications: Comply with calculated structural characteristics of steel deck in accordance with AISI S100.

2.2 ROOF DECK

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. ASC Steel Deck; ASC Profiles, LLC.
2. DACS, Inc.
3. Epic Metals Corporation.
4. Verco Decking, Inc.; a Nucor company.
5. Vulcraft Group; Division of Nucor Corp.
6. Vulcraft/Verco Group; a division of Nucor Corp.

B. Fabrication of Roof Deck: Fabricate panels, without top-flange stiffening grooves, to comply with SDI RD and with the following:

1. Galvanized-Steel Sheet: ASTM A653/A653M, Structural Steel (SS), Grade 33, G60 zinc coating.
2. Deck Profile: Match existing.
3. Profile Depth: Match existing.
4. Design Uncoated-Steel Thickness: 0.0358 inch minimum.

2.3 ACCESSORIES

A. Provide manufacturer's standard accessory materials for deck that comply with requirements indicated.

B. Mechanical Fasteners: Corrosion-resistant, low-velocity, power-actuated or pneumatically driven carbon-steel fasteners; or self-drilling, self-threading screws.

C. Side-Lap Fasteners: Corrosion-resistant, hexagonal washer head; self-drilling, carbon-steel screws, No. 10 minimum diameter.

D. Flexible Closure Strips: Vulcanized, closed-cell, synthetic rubber.

E. Miscellaneous Sheet Metal Deck Accessories: Steel sheet, minimum yield strength of 33,000 psi, not less than 0.0359-inch design uncoated thickness, of same material and finish as deck; of profile indicated or required for application.

F. Galvanizing Repair Paint: ASTM A780/A780M.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine supporting frame and field conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install deck panels and accessories in accordance with SDI C, SDI NC, and SDI RD, as applicable; manufacturer's written instructions; and requirements in this Section.

B. Install temporary shoring before placing deck panels if required to meet deflection limitations.

C. Locate deck bundles to prevent overloading of supporting members.

D. Place deck panels on supporting frame and adjust to final position with ends accurately aligned and bearing on supporting frame before being permanently fastened. Do not stretch or contract side-lap interlocks.

E. Place deck panels flat and square and fasten to supporting frame without warp or deflection.

F. Cut and neatly fit deck panels and accessories around openings and other work projecting through or adjacent to deck.

G. Provide additional reinforcement and closure pieces at openings as required for strength, continuity of deck, and support of other work.

H. Comply with AWS requirements and procedures for manual shielded metal arc welding, appearance and quality of welds, and methods used for correcting welding work.

I. Mechanical fasteners may be used in lieu of welding to fasten deck. Locate mechanical fasteners and install in accordance with deck manufacturer's written instructions.

3.3 INSTALLATION OF ROOF DECK

A. Fasten roof-deck panels to steel supporting members by arc spot (puddle) welds of the surface diameter indicated or arc seam welds with an equal perimeter that is not less than 1-1/2 inches long, and as follows:

1. Weld Diameter: Match existing, but no less than 5/8 inch, nominal.
2. Weld Spacing: Weld edge and interior ribs of deck units with a minimum of 2 welds per deck unit at each support. Space welds to match existing spacing, but no greater than 18 inches apart, maximum.
3. Weld Washers: Install weld washers at each weld location.

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B. Side-Lap and Perimeter Edge Fastening: Fasten side laps and perimeter edges of panels between supports, at intervals not exceeding the lesser of one-half of the span or 18 inches, and as follows:

1. Mechanically fasten with self-drilling, No. 10 diameter or larger, carbon-steel screws.

C. End Bearing: Install deck ends over supporting frame with a minimum end bearing of 1-1/2 inches, with end joints as follows:

1. End Joints: Lapped 2 inches minimum or butted at Contractor's option.

D. Miscellaneous Roof-Deck Accessories: Install ridge and valley plates, finish strips, end closures, and reinforcing channels in accordance with deck manufacturer's written instructions. Weld or mechanically fasten to substrate to provide a complete deck installation.

E. Flexible Closure Strips: Install flexible closure strips over partitions, walls, and where indicated. Install with adhesive in accordance with manufacturer's written instructions to ensure complete closure.

3.4 REPAIR

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on both surfaces of deck with galvanized repair paint in accordance with ASTM A780/A780M and manufacturer's written instructions.

END OF SECTION 053100

SECTION 055000 - METAL FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal ladders.
2. Miscellaneous steel trim.

1.2 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

E. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

F. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

G. "Provide": Furnish and install, complete and ready for the intended use.

H. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

I. "Manufacturer Qualifications": A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

J. "Installer Qualifications": A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

K. "Fabricator Qualifications": A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

L. "Delegated Design Engineer Qualifications": An experienced professional engineer's experience with providing delegated-design engineering services of the kind indicated, including documentation that engineer is licensed in the State in which Project is located

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For the following:

1. Manufactured metal ladders.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items.

C. Delegated Design Submittal: For ladders, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

A. Qualifications:

1. Delegated Design Engineer.

B. Certificates:

1. Welding certificates.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following welding codes:
1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design ladders.

B. Structural Performance of Aluminum Ladders: Ladders, including landings, are to withstand the effects of loads and stresses within limits and under conditions specified in ANSI A14.3.

C. Structural Performance: Gratings to withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Uniform load of 100 lbf/sq. ft.
2. Limit deflection to L/360 or 1/4 inch, whichever is less.

D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces

2.2 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Aluminum Plate and Sheet: ASTM B209, Alloy 6061-T6.

D. Aluminum Extrusions: ASTM B221, Alloy 6063-T6.

E. Aluminum-Alloy Rolled Tread Plate: ASTM B632/B632M, Alloy 6061-T6.

2.3 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless steel fasteners for fastening aluminum.

B. Stainless Steel Bolts and Nuts: Regular hexagon-head annealed stainless steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1.

C. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless steel bolts, ASTM F593, and nuts, ASTM F594.

2.4 MISCELLANEOUS MATERIALS

A. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.5 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

2.6 METAL LADDERS

A. General:

1. Comply with ANSI A14.3.

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B. Aluminum Ladders:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Fixfast USA.
b. Halliday Products.
c. O'Keeffe's Inc.
d. Precision Ladders, LLC.
e. Royalite Manufacturing, Inc.
f. Thompson Fabricating, LLC.
g. Upnovr, Inc.

2. Source Limitations: Obtain aluminum ladders from single source from single manufacturer.
3. Space siderails 18 inches apart unless otherwise indicated.
4. Siderails: Continuous extruded-aluminum channels or tubes, not less than 2-1/2 inches deep, 3/4 inch wide, and 1/8 inch thick.
5. Rungs: Extruded-aluminum tubes, not less than 3/4 inch deep and not less than 1/8 inch thick, with ribbed tread surfaces.
6. Fit rungs in centerline of siderails; fasten by welding or with stainless steel fasteners or brackets and aluminum rivets.
7. Provide platforms as indicated on Drawings fabricated from pressure-locked aluminum bar grating or extruded-aluminum plank grating, supported by extruded-aluminum framing. Limit openings in gratings to no more than 1/2 inch in least dimension.
8. Support each ladder at top and bottom and not more than 60 inches o.c. with welded or bolted aluminum brackets.

2.7 MISCELLANEOUS STEEL TRIM

A. Unless otherwise indicated, fabricate units from steel shapes, plates, and bars of profiles shown with continuously welded joints and smooth exposed edges. Miter corners and use concealed field splices where possible.

B. Provide cutouts, fittings, and anchorages as needed to coordinate assembly and installation with other work.

1. Provide with integrally welded steel strap anchors for embedding in concrete or masonry construction.

C. Galvanize and primemiscellaneous steel trim.

2.8 GENERAL FINISH REQUIREMENTS

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated on Drawings to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.

B. Preparation for Shop Priming Galvanized Items: After galvanizing, thoroughly clean galvanized surfaces of grease, dirt, oil, flux, and other foreign matter, and treat with metallic phosphate process.

C. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

2.10 ALUMINUM FINISHES

A. As-Fabricated Finish: AA-M12.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, and other connectors.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, or dissimilar metals with the following:

1. Aluminum: Heavy coat of bituminous paint.

END OF SECTION 055000

SECTION 055119 - METAL GRATING STAIRS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal grating stairs.
2. Steel railings and guards.

1.2 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written instructions to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorages for metal stairs, railings, and guards.

1. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, blocking for attachment of wall-mounted handrails, and items with integral anchors, that are to be embedded in concrete or masonry.
2. Deliver such items to Project site in time for installation.

C. Schedule installation of railings and guards so wall attachments are made only to completed walls.

1. Do not support railings and guards temporarily by any means that do not satisfy structural performance requirements.

1.3 ACTION SUBMITTALS

A. Product Data: For metal grating stairs and the following:

1. Gratings.
2. Shop primer products.

B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

1. Include plans, elevations, sections, details, and attachment to other work.
2. Indicate sizes of metal sections, thickness of metals, profiles, holes, and field joints.
3. Indicate locations of anchors, weld plates, and blocking for attachment of wall-mounted handrails.

C. Delegated-Design Submittal: For stairs, railings and guards, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For professional engineer's experience with providing delegated design engineering services of the kind indicated, including documentation that engineer is licensed in the state in which Project is located.

B. Welding certificates.

C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Fabricator of products.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification.

1. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers.
2. Protect steel members and packaged materials from corrosion and deterioration.
3. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures.

a. Repair or replace damaged materials or structures as directed.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design stairs, railings, and guards, including attachment to building construction.

B. Structural Performance of Stairs: Metal stairs withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Uniform Load: 100 lbf/sq. ft..
2. Concentrated Load: 300 lbf applied on an area of 4 sq. in..
3. Uniform and concentrated loads need not be assumed to act concurrently.
4. Stair Framing: Capable of withstanding stresses resulting from railing and guard loads in addition to loads specified above.
5. Limit deflection of treads, platforms, and framing members to L/360.

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C. Structural Performance of Railings and Guards: Railings and guards, including attachment to building construction, withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:

1. Handrails and Top Rails of Guards:

a. Uniform load of 50 lbf/ft. applied in any direction.
b. Concentrated load of 200 lbf applied in any direction.
c. Uniform and concentrated loads need not be assumed to act concurrently.

2. Infill of Guards:

a. Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
b. Infill load and other loads need not be assumed to act concurrently.

3. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

a. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

A. Metal Surfaces: Provide materials with smooth, flat surfaces unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

C. Steel Bars for Grating Treads: ASTM A36/A36M or steel strip, ASTM A1011/A1011M or ASTM A1018/A1018M.

D. Steel Tubing for Railings and Guards: ASTM A500/A500M (cold formed).

1. Provide galvanized finish for exterior installations and where indicated.

E. Steel Pipe for Railings and Guards: ASTM A53/A53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.

F. Provide galvanized finish for exterior installations and where indicated.

2.3 FASTENERS

A. General: Provide Type 304 stainless steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941/F1941M, Class Fe/Zn 5 where built into exterior walls.

1. Select fasteners for type, grade, and class required.

B. Fasteners for Anchoring Railings and Guards to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings and guards to other types of construction indicated and capable of withstanding design loads.

C. Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Provide mechanically deposited or hot-dip, zinc-coated anchor bolts for exterior stairs.

E. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors capable of sustaining, without failure, a load equal to 6 times the load imposed when installed in unit masonry and 4 times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

1. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

2.4 MISCELLANEOUS MATERIALS

A. Welding Electrodes: Comply with AWS requirements.

B. Shop Primers: Provide primers that comply with Section 099100 "Painting."

2.5 FABRICATION, GENERAL

A. Provide complete stair assemblies, including metal framing, hangers, railings, guards, clips, brackets, bearing plates, and other components necessary to support and anchor stairs and platforms on supporting structure.

1. Join components by welding unless otherwise indicated.
2. Use connections that maintain structural value of joined pieces.

B. Assemble stairs, railings, and guards in shop to greatest extent possible.

1. Disassemble units only as necessary for shipping and handling limitations.
2. Clearly mark units for reassembly and coordinated installation.

C. Cut, drill, and punch metals cleanly and accurately.

1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
2. Remove sharp or rough areas on exposed surfaces.

D. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

E. Form exposed work with accurate angles and surfaces and straight edges.

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F. Weld connections to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Weld exposed corners and seams continuously unless otherwise indicated.
5. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish # 3 - Partially dressed weld with spatter removed.

G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible.

1. Where exposed fasteners are required, use Phillips flat-head (countersunk) screws or bolts unless otherwise indicated.
2. Locate joints where least conspicuous.
3. Fabricate joints that are exposed to weather in a manner to exclude water.
4. Provide weep holes where water may accumulate internally.

2.6 FABRICATION OF STEEL-FRAMED STAIRS

A. NAAMM Stair Standard: Comply with NAAMM AMP 510, "Metal Stairs Manual," for Industrial Class, unless more stringent requirements are indicated.

B. Stair Framing:

1. Fabricate stringers of steel plates or channels.

a. Stringer Size: As required to comply with "Performance Requirements" Article.
b. Provide closures for exposed ends of channel stringers.
c. Finish: Shop primed.

2. Construct platforms and tread supports of steel plate or channel headers and miscellaneous framing members as required to comply with "Performance Requirements" Article.

a. Provide closures for exposed ends of channel framing.
b. Finish: Shop primed.

3. Weld or bolt stringers to headers; weld or bolt framing members to stringers and headers.
4. Where masonry walls support metal stairs, provide temporary supporting struts designed for erecting steel stair components before installing masonry.

C. Metal Bar-Grating Stairs: Form treads and platforms to configurations shown from metal bar grating; fabricate to comply with NAAMM MBG 531, "Metal Bar Grating Manual."

1. Fabricate treads and platforms from welded steel or pressure-locked steel grating with openings in gratings no more than 3/4 inch in least dimension.

a. Surface: Serrated.
b. Finish: Shop primed.

D. Risers: Open.

2.7 FABRICATION OF STAIR RAILINGS AND GUARDS

A. Fabricate railings and guards to comply with requirements indicated for design, dimensions, details, finish, and member sizes, including wall thickness of member, post spacings, wall bracket spacing, and anchorage, but not less than that needed to withstand indicated loads.

1. Rails and Posts: 1-1/2-inch-diameter.
2. Picket Infill: 1/2-inch- round or square pickets spaced to prohibit the passage of a 4-inch diameter sphere.

B. Welded Connections: Fabricate railings and guards with welded connections.

1. Fabricate connections that are exposed to weather in a manner that excludes water.

a. Provide weep holes where water may accumulate internally.

2. Cope components at connections to provide close fit, or use fittings designed for this purpose.
3. Weld all around at connections, including at fittings.
4. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
5. Obtain fusion without undercut or overlap.
6. Remove flux immediately.
7. Finish welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #3 - Partially dressed weld with spatter removed as shown in NAAMM AMP 521.

C. Form changes in direction of railings and guards as follows:

1. By inserting prefabricated elbow fittings.

D. Close exposed ends of railing and guard members with prefabricated end fittings.

E. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated.

1. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

F. Connect posts to stair framing by direct welding unless otherwise indicated.

G. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, end closures, flanges, miscellaneous fittings, and anchors for interconnecting components and for attaching to other work.

1. Furnish inserts and other anchorage devices for connecting to concrete or masonry work.
2. For galvanized railings and guards, provide galvanized fittings, brackets, fasteners, sleeves, and other ferrous-metal components.
3. Provide type of bracket with predrilled hole for exposed bolt anchorage and that provides 1-1/2-inch clearance from inside face of handrail to finished wall surface.

H. Fillers: Provide fillers made from steel plate, or other suitably crush-resistant material, where needed to transfer wall bracket loads through wall finishes to structural supports.

1. Size fillers to suit wall finish thicknesses and to produce adequate bearing area to prevent bracket rotation and overstressing of substrate.

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2.8 FINISHES

A. Finish metal stairs after assembly.

B. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

1. Do not quench or apply post-galvanizing treatments that might interfere with paint adhesion.
2. Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.

C. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."

D. Apply shop primer to uncoated surfaces of metal stair components, except those with galvanized finishes and those to be embedded in concrete or masonry unless otherwise indicated. Comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify elevations of floors, bearing surfaces and locations of bearing plates, and other embedments for compliance with requirements.

1. For wall-mounted railings, verify locations of concealed reinforcement within gypsum board and plaster assemblies.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF METAL STAIRS

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal stairs to in-place construction.

1. Include threaded fasteners for concrete and masonry inserts, through-bolts, lag bolts, and other connectors.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal stairs. Set units accurately in location, alignment, and elevation, measured from established lines and levels and free of rack.

C. Install metal stairs by welding stair framing to steel structure or to weld plates cast into concrete unless otherwise indicated.

D. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

E. Fit exposed connections accurately together to form hairline joints.

1. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations.
2. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
3. Comply with requirements for welding in "Fabrication, General" Article.

3.3 INSTALLATION OF RAILINGS AND GUARDS

A. Adjust railing and guard systems before anchoring to ensure matching alignment at abutting joints with tight, hairline joints.

1. Space posts at spacing indicated or, if not indicated, as required by design loads.
2. Plumb posts in each direction, within a tolerance of 1/16 inch in 3 feet.
3. Align rails and guards so variations from level for horizontal members and variations from parallel with rake of stairs for sloping members do not exceed 1/4 inch in 12 feet.
4. Secure posts, rail ends, and guard ends to building construction as follows:

a. Anchor posts to steel by welding or bolting to steel supporting members.
b. Anchor handrail and guard ends to concrete and masonry with steel round flanges welded to rail and guard ends and anchored with post-installed anchors and bolts.

B. Attach handrails to wall with wall brackets.

1. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
2. Secure wall brackets to building construction as required to comply with performance requirements.

3.4 REPAIR

A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055119

SECTION 061053 - MISCELLANEOUS ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood blocking and nailers.

1.2 DEFINITIONS

A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.

B. Dimension Lumber: Lumber of 2 inches nominal or greater size but less than 5 inches nominal size in least dimension.

C. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

D. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. Dress lumber, S4S, unless otherwise indicated.

B. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.

2.2 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. Dimension Lumber Items: Construction or No. 2 grade lumber of any of the following species:

1. Hem-fir (north); NLGA.
2. Mixed southern pine or southern pine; SPIB.
3. Spruce-pine-fir; NLGA.
4. Hem-fir; WCLIB or WWPA.
5. Spruce-pine-fir (south); NeLMA, WCLIB, or WWPA.

C. Concealed Boards: 19 percent maximum moisture content of any of the following species and grades:

1. Mixed southern pine or southern pine, No. 2 grade; SPIB.
2. Eastern softwoods, No. 2 Common grade; NELMA.
3. Northern species, No. 2 Common grade; NLGA.

2.3 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.

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1. Where carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot dip zinc coating complying with ASTM A 153/A 153M or Type 304 stainless steel.

B. Nails, Brads, and Staples: ASTM F 1667.

C. Screws for Fastening to Metal Framing: ASTM C 954, length as recommended by screw manufacturer for material being fastened.

D. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.

E. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01, ICC-ES AC58, ICC-ES AC193, or ICC-ES AC308 as appropriate for the substrate.

1. Material: Carbon-steel components, zinc plated to comply with ASTM B633, Class Fe/Zn 5.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

B. Set carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

C. Do not splice structural members between supports unless otherwise indicated.

D. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

E. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

F. Securely attach carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
2. ICC-ES evaluation report for fastener.

G. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials.

Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.

3.2 WOOD BLOCKING AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.

END OF SECTION 061053

SECTION 070150 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Full roof tear-off.
2. Base flashing removal.
3. Fastener pull-out testing.
4. Disposal.

1.2 DEFINITIONS

A. Full Roof Tear-off: Removal of existing roofing system down to existing roof deck.

B. Roofing Terminology: Definitions in ASTM D 1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

C. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

D. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

E. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

F. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

G. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

H. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

I. "Provide": Furnish and install, complete and ready for the intended use.

J. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

K. "Installer Qualifications": A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

1.3 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project Site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing tear-off, including, but not limited to, the following:

a. Reroofing preparation, including roofing system manufacturer's written instructions.
b. Temporary protection requirements for existing roofing system components that are to remain.
c. Existing roof drains and roof drainage during each stage of reroofing, and roof-drain plugging and plug removal.
d. Construction schedule and availability of materials, Installer's personnel, equipment, and facilities needed to avoid delays.
e. Existing roof deck conditions requiring Architect notification.
f. Existing roof deck removal procedures and Owner notifications.
g. Condition and acceptance of existing roof deck and base flashing substrate for reuse.
h. Structural loading limitations of roof deck during reroofing.
i. Base flashings, special roofing details, drainage, penetrations, equipment curbs, and condition of other construction that affect reroofing.
j. HVAC shutdown and sealing of air intakes.
k. Shutdown of fire-suppression, -protection, and -alarm and -detection systems.
l. Asbestos removal and discovery of asbestos-containing materials.
m. Governing regulations and requirements for insurance and certificates if applicable.
n. Existing conditions that may require Architect notification before proceeding.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Photographs: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces that might be misconstrued as having been damaged by reroofing operations.

1. Submit before Work begins.

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1.6 QUALITY ASSURANCE

A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

B. Regulatory Requirements:

1. Comply with governing EPA notification regulations before beginning roofing removal.
2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.7 FIELD CONDITIONS

A. Existing Roofing System: See Drawings for makeup of existing roofing system.

B. Owner will occupy portions of building immediately below reroofing area.

1. Conduct reroofing so Owner's operations are not disrupted.
2. Provide Owner with not less than 72 hours' written notice of activities that may affect Owner's operations.
3. Coordinate work activities daily with Owner so Owner has adequate advance notice to place protective dust and water-leakage covers over sensitive equipment and furnishings, shut down HVAC and fire-alarm or -detection equipment if needed, and evacuate occupants from below work area.
4. Before working over structurally impaired areas of deck, notify Owner to evacuate occupants from below affected area.

a. Verify that occupants below work area have been evacuated before proceeding with work over impaired deck area.

C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.

D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.

E. Limit construction loads on existing roof areas scheduled to be reroofed.

1. Uniformly distributed materials.

F. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

1. Remove only as much roofing in one day as can be made watertight in the same day, or before the onset of inclement weather.

G. Hazardous Materials: It is not expected that hazardous materials, such as asbestos-containing materials, will be encountered in the Work.

1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Architect and Owner.

    a. Hazardous materials will be removed by Owner under a separate contract.

PART 2 - PRODUCTS

2.1 INFILL AND REPLACEMENT MATERIALS

A. Cast-in-place concrete patching specified in Section 030130 "Maintenance of Cast-in-Place Concrete."

B. Steel deck is specified in Section 053100 "Steel Decking."

C. Wood blocking, curbs, and nailers are specified in Section 061053 Miscellaneous Rough Carpentry."

2.2 AUXILIARY REROOFING MATERIALS

A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of existing and new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protection of In-Place Conditions:

1. Protect existing roofing system that is not to be reroofed.
2. Limit traffic and material storage to areas of existing roofing that have been protected.
3. Maintain temporary protection and leave in place until replacement roofing has been completed. Remove temporary protection on completion of reroofing.
4. Comply with requirements of existing roof system manufacturer's warranty requirements.

B. Test existing perimeter drainage system to verify that it is not blocked or restricted.

1. Immediately notify Architect of any blockages or restrictions.

C. Test existing roof drains to verify that they are not blocked or restricted.

1. Immediately notify Architect of any blockages or restrictions.

D. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.

1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.

E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.

1. Prevent debris from entering or blocking roof drains and conductors.

    a. Use roof-drain plugs specifically designed for this purpose.
    b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.

2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.

    a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

A. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.

B. Remove aggregate ballast from roofing.

C. Remove loose aggregate from aggregate-surfaced, built-up bituminous roofing using a power broom.

D. Full Roof Tear-off: Where indicated on Drawings, remove existing roofing and other roofing system components down to the existing metal decking and to existing cast-in-place concrete roof deck.

1. Remove substrate board, vapor retarder, roof insulation, and cover board.
2. Remove base flashings and counter flashings.
3. Remove perimeter edge flashing and gravel stops.
4. Remove copings, where indicated on Drawings.
5. Remove expansion-joint covers.
6. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
7. Remove roof drains indicated on Drawings to be removed.
8. Remove wood blocking, curbs, and nailers.
9. Bitumen and felts that are firmly bonded to concrete decks are permitted to remain if felts are dry.

    a. Remove unadhered bitumen, unadhered felts, and wet felts.

10. Remove excess asphalt from steel deck.

a. A maximum of 15 lb/100 sq. ft. of asphalt is permitted to remain on steel decks.

11. Remove fasteners from deck or cut fasteners off slightly above deck surface.
12. Where rotted or deteriorated existing wood blocking is exposed during roof tear-off and where such blocking would covered by new construction, remove unsatisfactory material and install new wood blocking according to the requirements of Section 061053 "Miscellaneous Rough Carpentry."

3.3 DECK PREPARATION

A. Inspect deck after tear-off of roofing system.

B. Patch and repair existing cast-in-place concrete deck as required by Section 030130 "Maintenance of Cast-in-Place Concrete."

C. Patch and repair existing metal deck as required by Section 053100 "Steel Decking."

D. If broken or loose fasteners that secure metal deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

E. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.

1. Do not proceed with installation until directed by Architect.

F. Provide additional deck securement as required to comply with roof performance requirements specified in Section 075216 "SBS Modified Bituminous Membrane Roofing."

G. Install new steel deck to replace unsuitable existing metal deck as directed by Architect.

1. Comply with requirements of Section 053100 "Steel Decking."
2. Deck replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

H. Prepare and paint steel deck surface.

1. In compliance with ASTM A 780/A 780M, prepare areas where rust has been removed from metal decking and apply galvanizing repair paint.

3.4 INFILL MATERIALS INSTALLATION

A. Immediately after tear-off and inspection of deck, repair areas of deteriorated deck to match existing decking system as follows:

1. Cast-in-place concrete patching specified in Section 030130 "Maintenance of Cast-in-Place Concrete."
2. Installation of steel decking is specified in Section 053100 "Steel Decking."

3. Installation of wood blocking, curbs, and nailers is specified in Section 061053 Miscellaneous Rough Carpentry."

3.5 BASE FLASHING REMOVAL

A. Remove existing base flashings.

1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.

B. Do not damage metal counterflashings that are to remain.

1. Replace metal counterflashings damaged during removal with counterflashings specified in Section 076200 "Sheet Metal Flashing and Trim."

C. When directed by Architect, replace parapet wood blocking, curbs, and nailers to comply with Section 061053 "Miscellaneous Rough Carpentry."

3.6 DISPOSAL

A. Collect demolished materials and place in containers.

1. Promptly dispose of demolished materials.
2. Do not allow demolished materials to accumulate on-site.
3. Storage or sale of demolished items or materials on-site is not permitted.

B. Transport and legally dispose of demolished materials off Owner's property.

END OF SECTION 070150

SECTION 075216 - SBS MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous protected membrane roofing.
2. Roof insulation.
3. Walkways.
4. Replacement Roof Drains.

B. Work of this Section is applicable to the following buildings:

1. Police HQ and Government Annex, not including Roof 'D.'

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

J. "Manufacturer Qualifications": A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

K. "Installer Qualifications": A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Roofing Conference: Conduct conference at Project Site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.

B. Shop Drawings: Include plans, sections, details, and attachments to other work, including the following:

1. Base flashings and membrane terminations.

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2. Layout and thickness of insulation, including:

a. Tapered insulation, including slopes.
b. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

3. Crickets, saddles, and tapered edge strips, including slopes.
4. Flashing details at penetrations.

C. Samples for Verification: For the following products:

1. Cap sheet, of color required.
2. Flashing sheet, of color required.
3. Walkway pads or rolls, of color required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

a. Submit evidence of compliance with performance requirements.

C. Sample Warranties: For manufacturer's special warranties.

D. Report: Manufacturer's technical personnel's written report of Final Inspection.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturers: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing manufacturer.

1. Protect stored liquid material from direct sunlight.
2. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes roof membrane, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
2. Warranty Period: 30 years from date of Substantial Completion.
3. Manufacturers No Dollar Limit (NDL) Total Systems Warranty Form, without monetary limitation, non-prorated.
4. Warranty shall cover wind speeds less than, or equal to 72 mph.
5. Where more than one building is part of the project, a separate warranty shall be issued for each building.

B. Special Project Warranty: Submit roofing Installer's warranty, signed by Installer, covering the Work of this Section, including all components of roofing system, such as roof membrane, base flashing, roof insulation, fasteners, cover boards, and walkway products, for the following warranty period:

1. Warranty Period: 2 years from date of Final Completion.

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PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing system and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.

1. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
2. Impact Resistance: Roof membrane to resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Wind Uplift Resistance: Design roofing system to resist the wind uplift pressures indicated in the "Report of Roof System Design Wind-load Analysis" Report attached to this Section for each Zone of each building when tested according to FM Approvals 4474, UL 580, or UL 1897. Those reports are as follows:

1. Report of Roof System Design Wind-load Analysis, Roof 'J' LFUCG: Government Center Annex.
2. Report of Roof System Design Wind-load Analysis, Roof 'K' LFUCG: Government Center Annex.

C. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and are listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.

1. Fire/Windstorm Classification: Class 1A-90.
2. Hail-Resistance Rating: FM 1-34 SH.

D. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

E. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency.

1. Identify products with appropriate markings of applicable testing agency.

F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.

1. Identify products with appropriate markings of applicable testing agency.

2.2 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Johns Manville; a Berkshire Hathaway company.
2. Soprema.
3. Siplast, Inc.
4. Firestone Building Products

B. Source Limitations: Obtain components including, but not limited to: roof insulation, fasteners, roof membrane, roofing mastics, PMMA flashing system, auxiliary roofing materials, accessories, and asphalt materials for roofing system from same manufacturer as membrane roofing or manufacturer approved by membrane roofing manufacturer.

2.3 BASE SHEET MATERIALS

A. SBS-Modified Bitumen Fiberglass Mat Base Sheet: ASTM D6163 or ASTM D6164, Type I or Type II, Grade S, SBS-modified asphalt sheet, reinforced with fiberglass fabric or polyester fabric; smooth surfaced; suitable for cold adhesive or hot asphalt application method.

1. Maximum filler content in elastomeric blend – 35% by weight.
2. Ultimate Elongation @ 73°F (23°C): 50% (ASTM D 5147)

2.4 CAP SHEET MATERIAL

A. Granule-Surfaced Roofing Cap Sheet: ASTM D6163, Type I, Grade G, SBS-modified asphalt sheet, reinforced with fiberglass fabric; suitable for cold adhesive asphalt application method.

1. Granule Color: White.
2. Maximum filler content in elastomeric blend – 35% by weight.
3. Ultimate Elongation @ 73°F (23°C): 55% (ASTM D 5147)

2.5 BASE FLASHING SHEET MATERIALS

A. Backer Sheet: ASTM D6163, Type I or II, Grade S, SBS-modified asphalt sheet, reinforced with glass fibers; smooth surfaced; suitable for application method specified.

B. SBS-Modified Asphalt Metal-Foil-Surfaced Flashing Sheet: ASTM D6298, metal-foil-surfaced SBS-modified asphalt sheet (reinforced with glass fibers); suitable for application method specified, and as follows:

1. Foil Surfacing: Aluminum.
2. Maximum filler content in elastomeric blend – 35% by weight.
3. Ultimate Elongation @ 73°F (23°C): 45% (ASTM D 5147)

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C. Fluid applied, 2 component, catalyzed polymethyl methacrylate (PMMA), liquid resin, reinforced flashing system consisting of the following components:

1. PMMA Primer.
2. Base coat.
3. Non-woven, polyester, fleece sheet reinforcement.
4. Top coat.

2.6 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with other roofing components.

1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Replacement Roof Drains: One-piece aluminum body, cast aluminum strainer dome, clamping ring, aluminum flange, and stem pipe with mechanical seal.

1. Basis of Design Product: Subject to compliance with requirements, Hercules® RetroDrain®, by OMG, Inc.
2. Drain Body: 1.25-inch thick, spun aluminum.
3. Strainer Dome: Cast aluminum.
4. Clamp Ring: Aluminum.
5. Stem Pipe: Aluminum.
   a. Diameter: Maximum diameter to fit existing drain pipe.
   b. Length: 12 inches.
6. Flange: Aluminum.
   a. Diameter: 17.5 inches.

C. Catalyzed Acrylic Resin Flashing System: A reinforced, multi-component, flexible Poly(methyl methacrylate) (PMMA) based resin flashing system consisting of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece.

1. Basis of Design: Subject to compliance with the requirements provide Parapro 123 Flashing System by Siplast®.
2. Flashing System Primer: Catalyzed acrylic resin flashing system manufacturer's recommended primer.

D. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.

E. Cold-Applied Asphalt Adhesive: ASTM D3019, Type III, roof membrane manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive, specially formulated for compatibility and use with roofing membrane and base flashings.

F. Asphalt Roofing Cement: ASTM D4586, Type II, asbestos free, of consistency required by roofing system manufacturer for application.

G. Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.

H. Insulation Cant Strips: Provide one of the following based on roofing member manufacturer's written recommendation:

1. Perlite insulation board, ASTM C728.
2. Cellulosic-fiber insulation board, ASTM C208, Type II, Grade 1.

I. Wood Cants, Blocking, Curbs, and Nailers: As specified in Section 061053 "Miscellaneous Rough Carpentry."

J. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate; tested by manufacturer for required pullout strength, and acceptable to roofing system manufacturer.

K. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

L. Solvent-Free Adhesive: Manufacturer's standard single component, solvent-free, non-toxic adhesive for application on metal-foil-surfaced flashing sheets.

1. VOC Content: Not more than 32 g/L average.

M. Metal Flashing Sheet: As specified in Section 076200 "Sheet Metal Flashing and Trim."

N. Miscellaneous Accessories: Provide accessories recommended by roofing system manufacturer.

O. Walkway Pads: Reinforced asphaltic composition pads with slip-resisting mineral-granule surface, manufactured as a traffic pad for foot traffic and acceptable to roofing system manufacturer, 3/8 inch thick, minimum.

1. Pad Size: 36 by 36 inches.

P. Catalyzed Acrylic Resin Flashing System: A reinforced, multi-component, flexible Poly(methyl methacrylate) (PMMA) based resin flashing system consisting of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece.

1. Basis of Design: Subject to compliance with the requirements provide Parapro 123 Flashing System by Siplast®.
2. Flashing System Primer: Catalyzed acrylic resin flashing system manufacturer's recommended primer.

2.7 ROOF INSULATION

A. General: Preformed roof insulation boards, manufactured or approved by roof membrane manufacturer, approved for use in FM Approvals' RoofNav listed roofing assemblies.

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B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apache Products Company.
b. Atlas Roofing Corporation.
c. Hunter Panels.
d. Johns Manville; a Berkshire Hathaway company.

2. Board size: 48 by 48 by 2.2 inches.

C. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain.

1. Where roof slope in field is 1/8:12, fabricate to slopes of 1/4 inch per 12 inches or as otherwise indicated on Drawings
2. Where roof slope in field is 1/4:12, fabricate to slopes of 1/2 inch per 12 inches or as otherwise indicated on Drawings
3. Minimum Thickness: 1/2 inch.

D. Tapered Insulation: Provide factory-tapered polyisocyanurate insulation boards.

1. Material: Match roof insulation.
2. Minimum Thickness: 1/2 inch.
3. Slope:

a. Roof Field: 1/8 inch per foot unless otherwise indicated on Drawings.
b. Saddles and Crickets: 1/4 inch per foot unless otherwise indicated on Drawings.

2.8 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with other roofing system components.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

C. Insulation Adhesive: Provide one of the following of insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:

1. Modified asphaltic, asbestos-free, cold-applied adhesive.
2. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
3. Full-spread spray-applied, low-rise, 2-component urethane adhesive.

D. Tapered Edge Strips: Provide one of the following based on roofing member manufacturer's written recommendation:

1. Perlite insulation board, ASTM C 728.
2. Cellulosic-fiber insulation board, ASTM C 208, Type II, Grade 1.

E. Glass-Mat Gypsum Cover Board: ASTM C1177/C1177M, water-resistant gypsum board.

1. Basis of Design Product: Subject to compliance with requirements, provide DensDeck® Prime Roof Board by Georgia-Pacific Gypsum LLC, or provide a comparable product by one of the following:

a. Certainteed; SAINT-GOBAIN.
b. Georgia-Pacific Gypsum LLC.
c. National Gypsum Company.
d. USG Corporation.

2. Thickness: 5/8 inch.
3. Surface Finish: Factory primed.

2.9 ASPHALT MATERIALS

A. Asphalt Primer: ASTM D41.

B. Roofing Asphalt: ASTM D312, Type III or IV as recommended by roofing system manufacturer for application.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work:

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations.
3. Verify that deck is securely fastened with no projecting fasteners and with no adjacent units in excess of 1/16 inch out of plane relative to adjoining deck.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation, according to roofing system manufacturer's written instructions.

1. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

1. Remove roof-drain plugs when no work is taking place or when rain is forecast.

C. Prime surface of concrete deck with asphalt primer at a rate of 3/4 gal./100 sq. ft. and allow primer to dry.

3.3 SUMMARY OF WORK

A. The following is a general outline of roof work to be performed:

1. Roofing System Description Over Existing Metal Deck:

a. Mechanically attach base layer of 2.2" polyisocyanurate insulation to metal deck.
b. Adhere base layer of 2.2" polyisocyanurate insulation to existing metal decking with cold-applied asphalt adhesive.
c. Install second layer of 2.2" polyisocyanurate insulation with cold-applied asphalt adhesive.
d. Install tapered polyisocyanurate crickets and saddles, with cold-applied asphalt adhesive.
e. Install one layer of cover board with cold-applied asphalt adhesive.
f. Install one ply of smooth surface SBS modified bitumen fiberglass mat base sheet with cold-applied asphalt adhesive.
g. Install replacement roof drains.
h. Install one ply of granule surfaced SBS modified bitumen cap sheet with cold-applied asphalt adhesive.
i. Adhere foil faced modified flashings at walls and curbs.
j. Install top sheet of flashing with an aluminum foil facer.

2. Roofing System Description Over Existing Concrete Deck:

a. Apply primer to existing concrete deck.
b. Adhere base layer of 2.2" polyisocyanurate insulation to existing concrete deck with cold-applied asphalt adhesive.
c. Install second layer of 2.2" polyisocyanurate insulation with cold-applied asphalt adhesive.
d. Install tapered polyisocyanurate crickets and saddles, with cold-applied asphalt adhesive.
e. Install one layer of cover board with cold-applied asphalt adhesive.
f. Install one ply of smooth surface SBS modified bitumen fiberglass mat base sheet with cold-applied asphalt adhesive.
g. Install replacement roof drains.
h. Install one ply of granule surfaced SBS modified bitumen cap sheet with cold-applied asphalt adhesive.
i. Adhere foil faced modified flashings at walls and curbs.
j. Install top sheet of flashing with an aluminum foil facer.

3.4 INSTALLATION OF ROOFING, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav listed roof assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.

B. Comply with roofing system manufacturer's written instructions.

C. Start installation of roofing in presence of manufacturer's technical personnel.

D. Coordinate installation of roofing system, so components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.

1. Provide tie-offs at end of each day's work to cover exposed roofing sheets with a course of coated felt set in roofing cement with joints and edges sealed.
2. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.
3. Remove and discard temporary seals before beginning work on adjoining roofing.

E. Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.

3.5 INSTALLATION OF ASPHALT-COATED FIBERGLASS MAT BASE SHEET

A. Where roofing system will be installed over concrete decking, install one lapped course of asphalt-coated fiberglass mat base sheet as follows:

1. Mechanically fasten asphalt-coated fiberglass mat base sheet to roof deck using mechanical fasteners specifically designed and sized for fastening slip sheet to decking.

a. Lap edges a minimum of 2 inches, or as recommended by roof membrane manufacturer.
b. Lap ends a minimum of 6 inches, or as recommended by roof membrane manufacturer.

3.6 INSTALLATION OF INSULATION OVER METAL DECKING

A. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.

1. Locate end joints over crests of decking.
2. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
3. Make joints between adjacent insulation boards not more than 1/4 inch in width.
4. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.

a. Trim insulation, so that water flow is unrestricted.

5. Fill gaps exceeding 1/4 inch with insulation.
6. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
7. Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.

a. Fasten insulation according to requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.
b. Fasten insulation to resist specified uplift pressure at corners, perimeter, and field of roof.

B. Install upper layers of insulation and tapered insulation, with joints of each layer offset not less than 12 inches from previous layer of insulation.

1. Staggered end joints within each layer not less than 24 inches in adjacent rows.
2. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
3. Make joints between adjacent insulation boards not more than 1/4 inch in width.
4. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
5. Trim insulation, so that water flow is unrestricted.
6. Fill gaps exceeding 1/4 inch with insulation.
7. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
8. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

a. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.7 INSTALLATION OF INSULATION OVER CAST-IN-PLACE CONCRETE DECKING

A. Install base layer of insulation with joints staggered not less than 24 inches in adjacent rows.

1. Prime concrete with asphalt primer if required by roofing system manufacturer.
2. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
3. Make joints between adjacent insulation boards not more than 1/4 inch in width.
4. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.

a. Trim insulation, so that water flow is unrestricted.

5. Fill gaps exceeding 1/4 inch with insulation.
6. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
7. Adhere base layer of insulation to concrete roof deck according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

a. Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft., and allow primer to dry.
b. Set insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

B. Install upper layers of insulation and tapered insulation, with joints of each layer offset not less than 12 inches from previous layer of insulation.

1. Staggered end joints within each layer not less than 24 inches in adjacent rows.
2. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
3. Make joints between adjacent insulation boards not more than 1/4 inch in width.
4. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.

a. Trim insulation, so that water flow is unrestricted.

5. Fill gaps exceeding 1/4 inch with insulation.
6. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
7. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

a. Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.8 INSTALLATION OF COVER BOARDS

A. Install cover boards over insulation with long joints in continuous straight lines, with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.

1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
2. At internal roof drains, conform to slope of drain sump.

a. Trim cover board, so that water flow is unrestricted.

3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

a. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.

3.9 INSTALLATION OF SBS-MODIFIED FIBERGLASS-MAT BASE SHEET

A. Before installing, unroll base sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature.

B. Installation of SBS-Modified Fiberglass-Mat Base Sheet:

1. Adhere base sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.
2. Extend roofing sheets over and terminate above cants.
3. Install base sheet in a shingle fashion.
4. Adhere to substrate in a uniform coating of cold-applied adhesive.
5. Install base sheet without wrinkles, tears, or air pockets.
6. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.

a. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches.
b. Lap end laps as recommended by roof membrane manufacturer but not less than 6 inches.
c. Stagger end laps not less than 18 inches.
d. Heat weld laps, leaving no voids.
e. Roll laps with a 20-pound roller.

7. Repair tears and voids in laps and lapped seams not completely sealed.
8. Apply pressure to the body of the base sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

C. Install roofing base sheet stripping where metal flanges and edgings are set on roofing base sheet according to roofing system manufacturer's written instructions.

3.10 INSTALLATION OF SBS-MODIFIED BITUMINOUS CAP SHEET

A. Before installing, unroll cap sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature at which cap sheet will be installed.

B. Install modified bituminous roofing cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.

1. Extend cap sheet over and terminate above cants.
2. Install cap sheet in a shingle fashion.
3. Install cap sheet as follows:

a. Adhere to substrate in cold-applied adhesive.

4. Install cap sheet without wrinkles or tears, and free from air pockets.
5. Install cap sheet so side and end laps shed water.

C. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.

1. Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches.
2. Lap end laps as recommended by roof membrane manufacturer but not less than 12 inches.
3. Stagger end laps not less than 18 inches.
4. Heat weld laps, leaving no voids.
5. Roll laps with a 20-pound roller.
6. Repair tears and voids in laps and lapped seams not completely sealed.

D. Apply pressure to the body of the cap sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

3.11 INSTALLATION OF FOIL-SURFACED FLASHING AND STRIPPING

A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof; secure to substrates according to roofing system manufacturer's written instructions and as follows:

1. Over Wood Sheathing: Mechanically attach asphalt-coated fiberglass mat base sheet to wood sheathing.
2. Over Concrete and CMU: Prime concrete and CMU substrates with asphalt primer if required by roofing system manufacturer.
3. Adhere backer sheet to asphalt-coated fiberglass mat base sheet in a uniform coating of cold-applied adhesive.
4. Adhere backer sheet over roofing membrane at cants in cold-applied adhesive.
5. Apply solvent-free adhesives for installation of metal-foil-surfaced flashing sheets.

B. Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.

C. Mechanically fasten top of base flashing securely with continuous metal termination bar anchored into substrate at 6 inches o.c. minimum.

D. Roof Drains: Apply liquid primer and catalyzed acrylic resin flashing system accordance with the membrane system manufacturer's printed installer's guidelines and other applicable written recommendations as provided by the manufacturer.

1. Clamp flashing system into roof-drain clamping ring.

3.12 INSTALLATION OF FLUID APPLIED PMMA FLASHING AND STRIPPING

A. Using masking tape, mask the perimeter of the area to receive the flashing system.

1. Apply resin primer to substrates.

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B. Pre-cut fleece sheet reinforcement to ensure a proper fit at transitions and corners prior to membrane application.

1. Apply an even base coat of flashing resin to prepared surfaces using a roller at the rate specified by the resin manufacturer.
2. Work the fleece into the wet, catalyzed resin.
3. Lap fleece layers a minimum of 2 inch and apply an additional coat of catalyzed resin between layers of overlapping fleece.
4. Apply an even top coat of catalyzed resin immediately following embedment of the fleece.
5. Ensure that the flashing resin is applied to extend beyond the fleece.
6. Remove the tape before the catalyzed resin cures.

C. Should work be interrupted for more than 12 hours or the surface of the cured resin becomes dirty or contaminated by the elements, wipe the surface to be lapped with new flashing resin using the specified cleaner/solvent.

1. Allow the surface to dry for a minimum 20 minutes and a maximum 60 minutes before continuing work.

3.13 INSTALLATION OF REPLACEMENT ROOF DRAINS

A. Install replacement roof drain according to manufacturer's written instructions.

1. Remove debris and obstructions from existing roof drain pipe.
2. Verify that there are no traps or bends in the existing roof drain that would obstruct replacement roof drain stem.
3. Insert replacement roof drain stem into existing roof drain and tighten mechanical seal.
4. Fasten replacement roof drain flange to deck or nailers and install flashing.
5. Place clamping ring over flashing and secure to flange studs.
6. Install strainer dome and secure to clamp ring.

3.14 INSTALLATION OF ROOF WALKWAY PADS

A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size, according to walkway pad manufacturer's written instructions.

1. Set walkway pads in cold-applied adhesive.
2. Install walkways as indicated on Drawing, and if not indicated, install walkways at following locations:

a. Perimeter of each rooftop unit and other mechanical equipment which requires periodic maintenance.
b. Between each rooftop unit and other mechanical equipment which requires periodic maintenance locations, creating a continuous path connecting rooftop units and equipment.

c. Between each roof hatch and each rooftop unit and other mechanical equipment which requires periodic maintenance locations and path connecting rooftop units and equipment.
d. Top and bottom of each roof access ladder with landings on roof surface.
e. Between each roof access ladder and each rooftop unit and other mechanical equipment which requires periodic maintenance locations and paths connecting rooftop units and equipment.
f. As required by roof membrane manufacturer's warranty requirements.

3. Provide 3-inch clearance, minimum, between adjoining pads.

3.15 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a site representative qualified by roofing membrane manufacturer to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components; and to furnish reports to Architect.

1. Minimum inspections include the following milestones:

a. Inspection of existing deck substrate immediately prior to installation of insulation.
b. Inspection of during installation of modified base sheet.
c. Inspection just prior to installation of modified cap sheet.

2. Submit written reports of observations during inspections, included problems identified, location of problem, and corrective steps taken.

B. Final Roof Inspection: Arrange for roofing system manufacturer's field service representative to inspect roofing installation on completion, in presence of Architect, and to prepare a written inspection report.

1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
2. Submit copy of manufacturer's technical personnel's written report of Final Inspection.

C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

D. Roofing system will be considered defective if it does not pass tests and inspections.

E. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

3.16 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

Government Center Annex & Police Headquarters Roof Replacements
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B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.17 ATTACHMENTS

A. Reports: Refer to attached reports, immediately following this section, for Wind Uplift Resistance Performance Requirements for each Roof Zone:

1. Report of Roof System Design Wind-load Analysis, Roof 'J' LFUCG: Government Center Annex.
2. Report of Roof System Design Wind-load Analysis, Roof 'K' LFUCG: Government Center Annex.

END OF SECTION 075216

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ASCE 7-05, ASCE 7-10 and ASCE 7-16

Report of Roof System Design Wind-load Analysis

Report Date: 8/14/2023

ASCE 7 Version: ASCE 7-10

This report is applicable to:

Roof 'J'
LFUCG: Government Center Annex
162 W. Main St
Lexington, KY, 40507

This report has been prepared by:

Jean-Paul Grivas
Patrick D. Murphy Co., Inc., Architects
4606 Illinois Ave
Louisville, KY 40213

Preparer's comments:

None

Roof Wind Designer provides users an easy-to-use means for accurately determining design wind loads and design uplift resistance capacities for roof systems on many commonly encountered building types that are subject to building code compliance.

Design wind loads are derived using American Society of Civil Engineers (ASCE) standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," Chapter 30—Wind Loads—Components and Cladding (C&C), Envelope Procedure, Part 2: Low-rise Buildings (Simplified). ASCE 7-10 is a widely-recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the 2012 and 2015 editions of the International Building Code.

The fundamental concept of wind design for roof systems is the tested uplift-resistance capacity for a building's roof system needs to be equal to or greater than the roof systems' design wind loads. Roof Wind Designer determines roof systems' minimum recommended design wind loads. From these values, Roof Wind Designer determines the necessary design uplift capacities for the roof system incorporating an appropriate safety factor. Users can select wind-resistance roof systems using these design uplift capacity values.

Roof Wind Designer also will provide design wind load calculations related to edge-metal flashing systems for buildings with roof slopes of 1½:12 or less. These calculations are applicable to roof systems using metal fascia, embedded edge-metal or metal copings to secure membrane roof systems' perimeter edges.

Roof Wind Designer relies solely upon the preparer who generates this report to accurately input appropriate information that is applicable to the specific building to which this report applies. This report applies to only the specific roof area and building that is indicated above. Any misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and results of this report.

Use of Roof Wind Designer is subject to a license agreement and important legal notices and disclaimers. By inputting project information and generating this report, the preparer who generates this report accepts this license agreement and important legal notices and disclaimers. A copy of this license agreement and important legal notices and disclaimers is included at the end of this report and is considered to be a part of this report.

Summary of the building and roof area information input by the preparer:

Roof Area Dimensions (feet):	90 x 27
Mean Roof Height (feet):	45.0
Roof Slope:	Flat: 1½:12 or less
Parapet(s) (minimum 36 inches high):	No
Building Configuration	Enclosed
Exposure:	B
Occupancy Category:	IV
Basic Wind Speed (three-second peak gust, mph):	115 from ASCE 7-10, Figure 26.5-1B Basic Wind Speed (value assigned by preparer)
Roof Deck Type:	Steel Deck
Roof Covering Type:	Modified Bitumen

In ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), roof area dimensions, mean roof height, roof slope, the building's configuration and exposure, risk category, and basic wind speed are used in the determination of the design wind loads.

The building's configuration (open, partially enclosed, enclosed) affects design wind loads of the roof system. ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), is limited to buildings of an enclosed configuration. An enclosed configuration is defined by ASCE 7-10 as a building that does not comply with the requirements for open or partially enclosed buildings. An open building is one having each wall at least 80 percent open. A partially enclosed building is one where the total area of openings in a wall that receives positive external pressure exceeds the sum of the area openings in the balance of the building envelope (walls and roof) by more than 10 percent and where the total area of openings in a wall that receives positive external pressure exceeds 4 ft2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

A building's exposure has an effect on the magnitude of design wind loads that act on a building and the building's roof system. ASCE 7-10 provides for three Exposure Categories: B, C and D. Exposure Category C shall apply for all cases where Exposure Categories B or D do not apply. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the windward direction for a distance of at least 2,600 feet. For buildings whose mean roof height is less than or equal to 30 feet, the upwind distance may be reduced to 1,500 feet. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 feet. Exposure D shall also apply where the ground surface roughness immediately upward of the site is B or C, and the site is within a distance of 600 feet or 20 times the building height, whichever is greater from an Exposure D condition.

A building's occupancy has an effect on the magnitude of design wind loads that act on a building and the building's roof system. In ASCE 7-10, a building's occupancy determines a risk category. ASCE 7-10 provides for four Risk Categories: I, II, III and IV. Part 2: Low-rise Buildings (Simplified) uses risk category to determine the applicable basic wind speed map.

Risk Category II applies to all buildings except those listed in Risk Categories I, III or IV. Risk Category I applies to buildings that represent a low hazard to human life in the event of failure. Risk Category III applies to buildings that represent a substantial hazard to human life in the event of failure. Risk Category IV applies to buildings designated as essential facilities or buildings where the failure of which could pose a substantial hazard to the community. Essential facilities are defined as buildings that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes.

The basic wind speed is representative of a 3-second peak gust wind speed at 33 feet above the ground in Exposure C and is determined from Figure 26.5-1A—Basic Wind Speeds for Occupancy Category II Buildings and Other Structures, Figure 26.5-1B—Basic Wind Speeds for Occupancy Category III and VI Buildings and Other Structures and Figure 26.5-1C—Basic Wind Speeds for Occupancy Category I Buildings and Other Structures.

Roof edge parapets may assist in reducing design wind loads acting in the corner regions of the roof area. ASCE 7-10, Part 3: Buildings with h > 60 ft., allows for this reduction only when a minimum 36-inch-high parapet occurs at the two outside edges of the specific corner area where the design wind load is being reduced.

Wind Design for Roof Systems

ASCE 7-10 specifies wind design procedures for buildings and organizes them into two categories: main wind force-resisting systems, and component and cladding elements. Main wind force-resisting systems are the structural elements assigned to provide the support and stability for the overall building. Components and cladding are elements of the building envelope that do not qualify as part of the main wind force-resisting system. Roof systems and edge-metal flashing systems are considered components and cladding.

ASCE 7-10 provides two methods to determine minimum design load requirements for buildings: strength design method and allowable stress design (ASD) method. Design wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values.

Roof systems and roof system components generally are designed using the ASD method. Because the ASD method's results often are used, a designer can adjust the strength design method's values to ASD method's values. A load-reduction factor is applied as a multiplier to the strength design values to determine the ASD values. ASCE 7-10 provides a load-reduction factor of 0.6 for this purpose, and the calculation is expressed as follows:

ASD value = Strength design value x 0.6

Roof Wind Designer determines design wind loads based upon the strength design method and then adjusts those values to the ASD method's values.

Design Wind Loads

To determine design wind loads on roof areas, ASCE 7-10 identifies three primary areas of differing wind loads on a roof area: roof area field, roof area perimeter and roof area corners. Within ASCE 7-10 these areas are designated as Zones 1, 2 and 3, respectively. Also, ASCE 7-10 identifies a dimension determined by calculation, referred to as "a," that defines the depth of the perimeter and corner zones from the roof area's edges.

Strength Design Method:

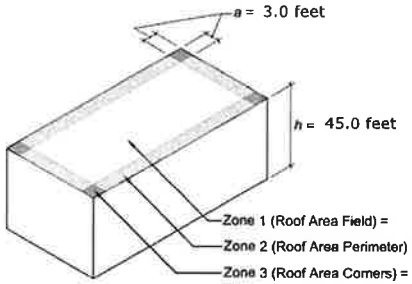
ASCE 7-10 uses three basic wind speed maps for different categories of building occupancies. These maps provide basic wind speeds that are applicable for calculating pressures and they are based on strength design. The strength design values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	26.7 pounds per square foot
Zone 2 (roof area perimeter):	44.7 pounds per square foot
Zone 3 (roof area corners):	67.3 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, the strength design values are depicted as follows:

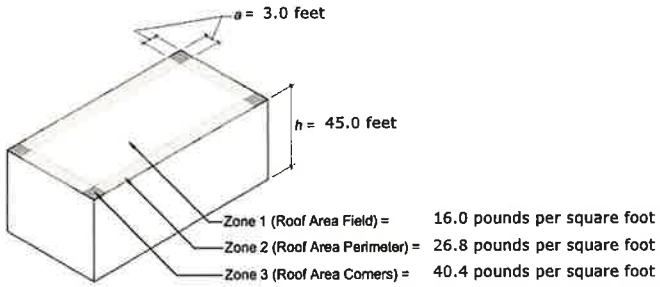


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, the load-reduction factor of 0.6 is applied. The ASD values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	16.0 pounds per square foot
Zone 2 (roof area perimeter):	26.8 pounds per square foot
Zone 3 (roof area corners):	40.4 pounds per square foot

Graphically, the ASD values are depicted as follows:



Minimum Recommended Design Uplift-resistance Capacities

Accepted engineering principles practice provides for applying a reasonable "safety factor" to design wind-uplift loads when using the ASD method to determine the minimum recommended design uplift-resistance capacities. This safety factor is intended to address possible variances in design wind load determination, normally anticipated variances in the materials and construction of the building, including the roof system, and any normally anticipated deterioration of the materials' physical properties because of aging. This safety factor is applied to the ASD values.
The equation to determine required design uplift-resistance capacity is:

Design uplift-resistance capacity = ASD Design wind load x Safety factor

For membrane roof systems, Roof Wind Designer determines roof systems' minimum recommended design uplift-resistance capacities, using a safety factor defined in ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly Performance." This recognized consensus standard indicates design uplift-resistance loads shall have a minimum 2.0 safety factor from the design wind uplift loads determined using ASCE 7.

For roof assemblies with steel deck and a steel or aluminum metal panel roof system, Roof Wind Designer applies a safety factor of 1.67. This safety factor is recommended in AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and "Aluminum Design Manual: Part 1—Specification for Aluminum Structures" for bending.

On this basis, taking into consideration the ASD design wind-uplift loads and the safety factor, the minimum recommended design uplift-resistance capacities for the specific roof area and building identified in this report are as follows:

Zone 1 (roof area field):	32.0 pounds per square foot
Zone 2 (roof area perimeter):	53.6 pounds per square foot
Zone 3 (roof area corners):	80.8 pounds per square foot

Using these minimum recommended design uplift-resistance capacity values, a user can select an appropriate wind-resistant roof system. The tested uplift-resistance capacity of the roof system should be greater than the minimum recommended design wind-resistance loads for the roof system to be considered appropriately wind resistant. This is expressed as:

Tested uplift-resistance capacity ≥ Design uplift-resistance capacity

Important note: To determine minimum recommended design uplift-resistance capacity values using the strength design method, designers will have to determine an appropriate safety factor on their own. Because the strength design method already includes a more conservative determination of design uplift loads, it is generally recognized any safety factor applied to design loads derived from using the strength design method can be less than the safety factor applied to the design loads derived from the ASD method.

Tested Uplift-resistance Load Capacities of Roof Systems

Roof systems' tested uplift-resistance load capacities typically are determined by laboratory testing or engineering analysis. In the International Building Code's 2009 and previous editions, four recognized test methods are referenced as acceptable methods for determining roof systems uplift-resistance capacities: FM 4450, FM 4470, UL 580 and UL 1898. The International Building Code's 2012 and 2015 editions reference FM 4474 instead of FM 4450 and FM 4470.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks," and FM 4470, "Approval Standard for Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof and Liquid Applied Roof Assemblies for use in Class I and Noncombustible Roof Deck Construction," are the laboratory test methods and serve as the technical basis of the FM Approvals' approval classifications (FM 1-60, FM 1-75, FM 1-90 etc.), with which most roofing professional are familiar. FM Approvals' applies a safety factor of 2 within these classifications. For example, a roof system that has an FM 1-60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, a FM 1-75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM 1-90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM 4474, "American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive And/or Negative Differential Pressures," is similar to the uplift-resistance test methods contained in FM 4450 and FM 4470 and results in uplift classifications Class 60, Class 75, Class 90, etc., which are similar to the FM 1-60, FM 1-75, FM 1-90, etc., respectively derived using FM 4450 and FM 4470. For example, a roof system that has an FM Class 60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, an FM Class 75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM Class 90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-deck Roof Components," addresses FM Global's recommended guidelines for addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

FM Approvals online approval directory containing a listing of FM Approval's-approved roof systems and a copy of FM Global's Loss Prevention Data Sheet 1-29 can be viewed in the reference documents section of FM Approval's RoofNav application accessible at www.roofnav.com.

UL 580, "Standard for Tests for Uplift Resistance of Roof Assemblies" and UL 1897, "Standard for Uplift Tests for Roof Covering Systems" are the laboratory test methods and serve as the technical basis for Underwriters Laboratories (UL's) Inc.'s classifications (Class 30, Class 60, Class 90, etc.) for uplift resistance. UL's classifications do not apply a safety factor. A UL classification indicating a roof system that has a Class 30 designation has been tested and found resistant to uplift loads of 30 psf, a Class 60 designation has been tested and found resistant to uplift loads of 60 psf, a Class 90 designation has been tested and found resistant to uplift loads of 90 psf, and so forth. UL does not provide specific guidance regarding addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

Additional information regarding UL's wind-uplift classifications is available in UL's Roofing Materials & Systems Directory and in the certifications section of UL's website by accessing www.ul.com and typing "TGIK" into the UL category code field.

Additional information regarding roof systems' wind-uplift capacities may also be available by contacting individual roof system manufacturers.

Wind Load Design for Perimeter Edge Metal

The International Building Code references standard ANSI/SPRI ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems." This code requirement is applicable to roof slopes less than 2:12. Because a roof slope of 1½:12 or less was selected for this project, this report also contains design load calculations related to edge-metal system design.

ANSI/SPRI ES-1 includes two primary elements: determination of design wind loads at roof edges (perimeter edge metal) and testing for resistance loads of perimeter edge metal. However, IBC does not adopt ANSI/SPRI ES-1 in its entirety. It requires low-slope metal edge securement be designed and installed using IBC's Chapter 16—Structural Design and tested for resistance in accordance with ANSI/SPRI ES-1's Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems," RE-2, "Test Method for Dependently or Independently Terminated Edge Systems," and Test RE-3, "Test for Copings," as applicable.

The fundamental concept of wind design as it applies to perimeter edge-metal systems is that the tested wind-resistance (uplift-resistance) capacity of perimeter edge-metal system should be greater than or equal to the design resistance loads that will act upon the perimeter edge-metal system. Design wind-resistance loads are derived from a building's design wind loads, taking into consideration an appropriate safety factor. Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads. Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance perimeter edge-metal systems.

Wind-resistance capacities of perimeter edge-metal systems are determined by testing in accordance with the test methods in ANSI/SPRI ES-1. Once design wind loads and minimum recommended design wind-resistance loads (including a safety factor) are determined, designers can select appropriate perimeter edge-metal systems that have tested capacities equal to or greater than the minimum recommended design wind resistance loads.

Design Wind Loads Using ASCE 7

IBC Chapter 16—Structural Design of IBC uses ASCE 7 as the basis for determining design wind loads; therefore, NRCA recommends using ASCE 7 for design wind load calculations instead of ANSI/SPRI ES-1.

As previously discussed in the section on Wind Load Design for Roof Systems, ASCE 7-10 provides two design methods to determine minimum load requirements for buildings: strength design and allowable stress design (ASD). The wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values. However, roof systems and roof system components generally are designed using ASD.

Because ASD results often are used, a designer may want to adjust the strength design values to ASD values. A load-reduction factor is applied as a multiplier to adjust the values. An appropriate load-reduction factor is 0.6 and the calculation is expressed as follows:

Strength design value x 0.6 = ASD value

Roof Wind Designer provides the calculations for strength design and then adjusts those values to ASD values.

Strength Design Method:

ASCE 7 identifies a vertical surface as a "roof zone" and a horizontal surface as a "wall zone." As previously mentioned, Zones 1 through 3 are associated with roof areas. For wall areas, ASCE 7-10 identifies two primary areas of differing horizontal wind loads: perimeter and corners. These areas are designated as Zones 4 and 5, respectively. The dimension that defines the distance of the perimeter and corner zones is the same distance "a" used with defining Zones 1 through 3 for roof areas.

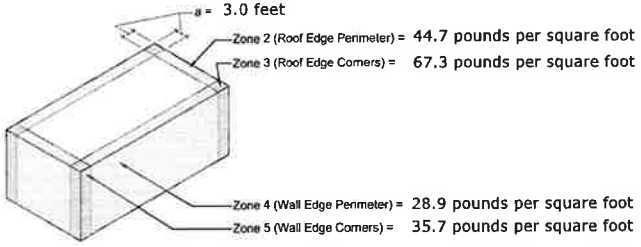
For the zones described by this report, the strength design wind loads determined using ASCE 7-10 are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	44.7 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	67.3 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	28.9 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	35.7 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, these values are depicted as follows:

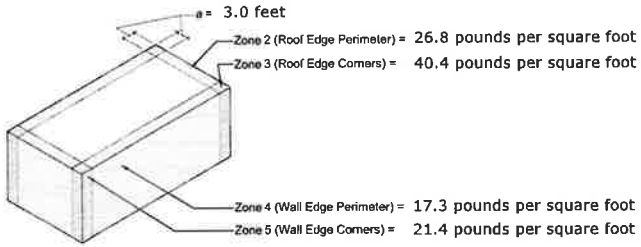


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, a load-reduction factor of 0.6 should be applied. The ASD values determined for the wall area described by this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	26.8 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	40.4 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	17.3 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	21.4 pounds per square foot

Graphically, these values are depicted as follows:



Minimum Recommended Design Wind-resistance Loads

NRCA recommends designers include an appropriate safety factor in their design wind-resistance calculations for perimeter edge-metal flashings. NRCA suggests a minimum safety factor of 2.0 be applied to steel or aluminum edge-metal flashings. This is consistent with the minimum safety factor recommended in ANSI/SPRI ES-1's design wind load calculations section.

The safety factor is applied to the ASD values. The equation to determine required design wind-resistance load is:

Design wind-resistance capacity = [ASD Design wind load] x [Safety factor of 2.0]

Taking into consideration the design wind-uplift loads, the minimum recommended design wind-resistance loads for the specific roof and wall areas described in this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	53.6 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	80.8 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	34.7 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	42.9 pounds per square foot

Please note: The safety factor used to determine minimum recommended design wind-resistance loads for perimeter edge metal may be a different value than the safety factor used in the roof system calculations.

Tested Resistance Load Capacities of Perimeter Edge Metal

Using the minimum recommended design wind-resistance values, a user can select an appropriately wind-resistant perimeter edge metal. The tested wind-resistance load capacity—commonly referred to as "load capacity"—of the perimeter edge metal should be greater than the minimum recommended design wind-resistance capacities for the perimeter edge-metal system to be considered appropriately wind-resistant.

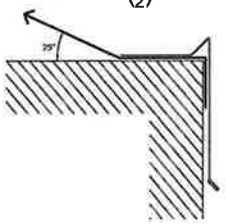
Tested wind-resistance capacities of edge-metal flashing systems are determined by testing. IBC requires the testing be done in accordance with the RE-1, RE-2 and RE-3 test methods contained in ANSI/SPRI ES-1 as applicable to the specific roof perimeter edge metal configuration. These three test methods are:

- Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."
- Test RE-2, "Test Method for Dependently or Independently Terminated Edge Systems."
- Test RE-3, "Test for Copings."

The following images illustrate how to apply the design wind-resistance capacities (including a safety factor) for fascia, embedded edge metal and copings based on RE-1, RE-2 and RE-3:

Force at Perimeter = $\left(\frac{r}{2}\right)$ x 127.1 pounds per square foot

Force at Corners = $\left(\frac{r}{2}\right)$ x 191.4 pounds per square foot



where:

r = horizontal distance to first row of fasteners from edge of roof system

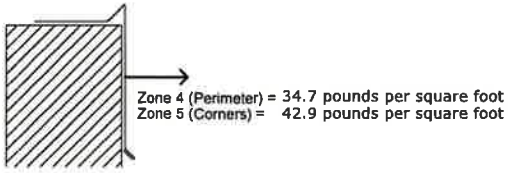
or

r = 6 feet, for ballasted roof systems

RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."

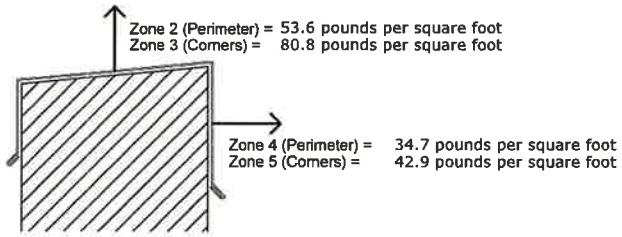
Note: The resultant forces indicated on the figure need to be further adjusted, depending on row spacing of the membrane fasteners or if the roof system is ballasted.

RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



RE-3, "Test for Copings."

RE-3 tests copings' resistances to outward (horizontal) and upward (vertical) pressures.

Using these minimum recommended design wind-resistance load values, a user can select an appropriately wind-resistant edge-metal flashing system. The tested wind-resistance capacity of the edge-metal flashing system should be greater than the minimum recommended design wind-resistance loads for the edge-metal flashing system to be considered appropriately wind-resistant. This is expressed as:

Tested wind-resistance capacity ≥ Design wind-resistance capacity

NRCA has conducted extensive testing using methods RE-2 and RE-3 of various edge-metal flashing profiles that are usually shop-fabricated. The edge-metal profiles tested are based upon the construction details contained in The NRCA Roofing Manual.

Visit www.nrca.net/roofing/Shop-fabricated-edge-metal-testing-242 to view drawings of the specific edge-metal flashings that have been tested. The drawings contain the tested wind-resistance capacity values for each edge-metal flashing profile. NRCA maintains certification programs with Underwriters Laboratories Inc. and Intertek Testing Services, N.A. Each program has its specific set of tested edge-metal flashing profiles.

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ASCE 7-05, ASCE 7-10 and ASCE 7-16

Report of Roof System Design Wind-load Analysis

Report Date: 8/14/2023

ASCE 7 Version: ASCE 7-10

This report is applicable to:	This report has been prepared by:
Roof 'K' LFUCG: Government Center Annex 162 W. Main St Lexington, KY, 40507	Jean-Paul Grivas Patrick D. Murphy Co., Inc., Architects 4606 Illinois Ave Louisville, KY 40213

Preparer's comments:

None

Roof Wind Designer provides users an easy-to-use means for accurately determining design wind loads and design uplift resistance capacities for roof systems on many commonly encountered building types that are subject to building code compliance.

Design wind loads are derived using American Society of Civil Engineers (ASCE) standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," Chapter 30—Wind Loads—Components and Cladding (C&C), Envelope Procedure, Part 2: Low-rise Buildings (Simplified). ASCE 7-10 is a widely-recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the 2012 and 2015 editions of the International Building Code.

The fundamental concept of wind design for roof systems is the tested uplift-resistance capacity for a building's roof system needs to be equal to or greater than the roof systems' design wind loads. Roof Wind Designer determines roof systems' minimum recommended design wind loads. From these values, Roof Wind Designer determines the necessary design uplift capacities for the roof system incorporating an appropriate safety factor. Users can select wind-resistance roof systems using these design uplift capacity values.

Roof Wind Designer also will provide design wind load calculations related to edge-metal flashing systems for buildings with roof slopes of 1½:12 or less. These calculations are applicable to roof systems using metal fascia, embedded edge-metal or metal copings to secure membrane roof systems' perimeter edges.

Roof Wind Designer relies solely upon the preparer who generates this report to accurately input appropriate information that is applicable to the specific building to which this report applies. This report applies to only the specific roof area and building that is indicated above. Any misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and results of this report.

Use of Roof Wind Designer is subject to a license agreement and important legal notices and disclaimers. By inputting project information and generating this report, the preparer who generates this report accepts this license agreement and important legal notices and disclaimers. A copy of this license agreement and important legal notices and disclaimers is included at the end of this report and is considered to be a part of this report.

Summary of the building and roof area information input by the preparer:

Roof Area Dimensions (feet):	166 x 54
Mean Roof Height (feet):	30.0
Roof Slope:	Flat: 1½:12 or less
Parapet(s) (minimum 36 inches high):	No
Building Configuration	Enclosed
Exposure:	B
Occupancy Category:	IV
Basic Wind Speed (three-second peak gust, mph):	115 from ASCE 7-10, Figure 26.5-1B Basic Wind Speed (value assigned by preparer)
Roof Deck Type:	Structural Concrete
Roof Covering Type:	Modified Bitumen

In ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), roof area dimensions, mean roof height, roof slope, the building's configuration and exposure, risk category, and basic wind speed are used in the determination of the design wind loads.

The building's configuration (open, partially enclosed, enclosed) affects design wind loads of the roof system. ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), is limited to buildings of an enclosed configuration. An enclosed configuration is defined by ASCE 7-10 as a building that does not comply with the requirements for open or partially enclosed buildings. An open building is one having each wall at least 80 percent open. A partially enclosed building is one where the total area of openings in a wall that receives positive external pressure exceeds the sum of the area openings in the balance of the building envelope (walls and roof) by more than 10 percent and where the total area of openings in a wall that receives positive external pressure exceeds 4 ft2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

A building's exposure has an effect on the magnitude of design wind loads that act on a building and the building's roof system. ASCE 7-10 provides for three Exposure Categories: B, C and D. Exposure Category C shall apply for all cases where Exposure Categories B or D do not apply. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the windward direction for a distance of at least 2,600 feet. For buildings whose mean roof height is less than or equal to 30 feet, the upwind distance may be reduced to 1,500 feet. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 feet. Exposure D shall also apply where the ground surface roughness immediately upward of the site is B or C, and the site is within a distance of 600 feet or 20 times the building height, whichever is greater from an Exposure D condition.

A building's occupancy has an effect on the magnitude of design wind loads that act on a building and the building's roof system. In ASCE 7-10, a building's occupancy determines a risk category. ASCE 7-10 provides for four Risk Categories: I, II, III and IV. Part 2: Low-rise Buildings (Simplified) uses risk category to determine the applicable basic wind speed map.

Risk Category II applies to all buildings except those listed in Risk Categories I, III or IV. Risk Category I applies to buildings that represent a low hazard to human life in the event of failure. Risk Category III applies to buildings that represent a substantial hazard to human life in the event of failure. Risk Category IV applies to buildings designated as essential facilities or buildings where the failure of which could pose a substantial hazard to the community. Essential facilities are defined as buildings that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes.

The basic wind speed is representative of a 3-second peak gust wind speed at 33 feet above the ground in Exposure C and is determined from Figure 26.5-1A—Basic Wind Speeds for Occupancy Category II Buildings and Other Structures, Figure 26.5-1B—Basic Wind Speeds for Occupancy Category III and VI Buildings and Other Structures and Figure 26.5-1C—Basic Wind Speeds for Occupancy Category I Buildings and Other Structures.

Roof edge parapets may assist in reducing design wind loads acting in the corner regions of the roof area. ASCE 7-10, Part 3: Buildings with h > 60 ft., allows for this reduction only when a minimum 36-inch-high parapet occurs at the two outside edges of the specific corner area where the design wind load is being reduced.

Wind Design for Roof Systems

ASCE 7-10 specifies wind design procedures for buildings and organizes them into two categories: main wind force-resisting systems, and component and cladding elements. Main wind force-resisting systems are the structural elements assigned to provide the support and stability for the overall building. Components and cladding are elements of the building envelope that do not qualify as part of the main wind force-resisting system. Roof systems and edge-metal flashing systems are considered components and cladding.

ASCE 7-10 provides two methods to determine minimum design load requirements for buildings: strength design method and allowable stress design (ASD) method. Design wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values.

Roof systems and roof system components generally are designed using the ASD method. Because the ASD method's results often are used, a designer can adjust the strength design method's values to ASD method's values. A load-reduction factor is applied as a multiplier to the strength design values to determine the ASD values. ASCE 7-10 provides a load-reduction factor of 0.6 for this purpose, and the calculation is expressed as follows:

ASD value = Strength design value x 0.6

Roof Wind Designer determines design wind loads based upon the strength design method and then adjusts those values to the ASD method's values.

Design Wind Loads

To determine design wind loads on roof areas, ASCE 7-10 identifies three primary areas of differing wind loads on a roof area: roof area field, roof area perimeter and roof area corners. Within ASCE 7-10 these areas are designated as Zones 1, 2 and 3, respectively. Also, ASCE 7-10 identifies a dimension determined by calculation, referred to as "a," that defines the depth of the perimeter and corner zones from the roof area's edges.

Strength Design Method:

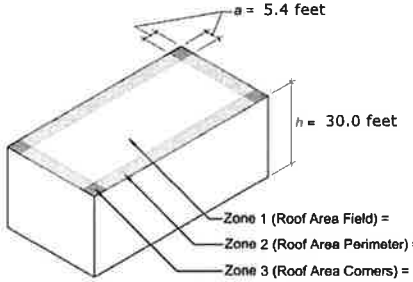
ASCE 7-10 uses three basic wind speed maps for different categories of building occupancies. These maps provide basic wind speeds that are applicable for calculating pressures and they are based on strength design. The strength design values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	23.8 pounds per square foot
Zone 2 (roof area perimeter):	39.9 pounds per square foot
Zone 3 (roof area corners):	60.1 pounds per square foot

Also, the calculated "a" dimension is as follows:

a:	5.4 feet

Graphically, the strength design values are depicted as follows:



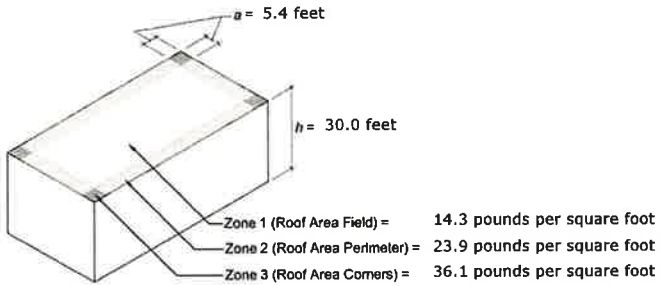
23.8 pounds per square foot
39.9 pounds per square foot
60.1 pounds per square foot

Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, the load-reduction factor of 0.6 is applied. The ASD values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	14.3 pounds per square foot
Zone 2 (roof area perimeter):	23.9 pounds per square foot
Zone 3 (roof area corners):	36.1 pounds per square foot

Graphically, the ASD values are depicted as follows:



Minimum Recommended Design Uplift-resistance Capacities

Accepted engineering principles practice provides for applying a reasonable "safety factor" to design wind-uplift loads when using the ASD method to determine the minimum recommended design uplift-resistance capacities. This safety factor is intended to address possible variances in design wind load determination, normally anticipated variances in the materials and construction of the building, including the roof system, and any normally anticipated deterioration of the materials' physical properties because of aging. This safety factor is applied to the ASD values.
The equation to determine required design uplift-resistance capacity is:

Design uplift-resistance capacity = ASD Design wind load x Safety factor

For membrane roof systems, Roof Wind Designer determines roof systems' minimum recommended design uplift-resistance capacities, using a safety factor defined in ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly Performance." This recognized consensus standard indicates design uplift-resistance loads shall have a minimum 2.0 safety factor from the design wind uplift loads determined using ASCE 7.

For roof assemblies with steel deck and a steel or aluminum metal panel roof system, Roof Wind Designer applies a safety factor of 1.67. This safety factor is recommended in AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and "Aluminum Design Manual: Part 1—Specification for Aluminum Structures" for bending.

On this basis, taking into consideration the ASD design wind-uplift loads and the safety factor, the minimum recommended design uplift-resistance capacities for the specific roof area and building identified in this report are as follows:

Zone 1 (roof area field):	28.6 pounds per square foot
Zone 2 (roof area perimeter):	47.9 pounds per square foot
Zone 3 (roof area corners):	72.1 pounds per square foot

Using these minimum recommended design uplift-resistance capacity values, a user can select an appropriate wind-resistant roof system. The tested uplift-resistance capacity of the roof system should be greater than the minimum recommended design wind-resistance loads for the roof system to be considered appropriately wind resistant. This is expressed as:

Tested uplift-resistance capacity ≥ Design uplift-resistance capacity

Important note: To determine minimum recommended design uplift-resistance capacity values using the strength design method, designers will have to determine an appropriate safety factor on their own. Because the strength design method already includes a more conservative determination of design uplift loads, it is generally recognized any safety factor applied to design loads derived from using the strength design method can be less than the safety factor applied to the design loads derived from the ASD method.

Tested Uplift-resistance Load Capacities of Roof Systems

Roof systems' tested uplift-resistance load capacities typically are determined by laboratory testing or engineering analysis. In the International Building Code's 2009 and previous editions, four recognized test methods are referenced as acceptable methods for determining roof systems uplift-resistance capacities: FM 4450, FM 4470, UL 580 and UL 1898. The International Building Code's 2012 and 2015 editions reference FM 4474 instead of FM 4450 and FM 4470.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks," and FM 4470, "Approval Standard for Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof and Liquid Applied Roof Assemblies for use in Class I and Noncombustible Roof Deck Construction," are the laboratory test methods and serve as the technical basis of the FM Approvals' approval classifications (FM 1-60, FM 1-75, FM 1-90 etc.), with which most roofing professional are familiar. FM Approvals' applies a safety factor of 2 within these classifications. For example, a roof system that has an FM 1-60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, a FM 1-75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM 1-90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM 4474, "American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive And/or Negative Differential Pressures," is similar to the uplift-resistance test methods contained in FM 4450 and FM 4470 and results in uplift classifications Class 60, Class 75, Class 90, etc., which are similar to the FM 1-60, FM 1-75, FM 1-90, etc., respectively derived using FM 4450 and FM 4470. For example, a roof system that has an FM Class 60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, an FM Class 75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM Class 90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-deck Roof Components," addresses FM Global's recommended guidelines for addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

FM Approvals online approval directory containing a listing of FM Approval's-approved roof systems and a copy of FM Global's Loss Prevention Data Sheet 1-29 can be viewed in the reference documents section of FM Approval's RoofNav application accessible at www.roofnav.com.

UL 580, "Standard for Tests for Uplift Resistance of Roof Assemblies" and UL 1897, "Standard for Uplift Tests for Roof Covering Systems" are the laboratory test methods and serve as the technical basis for Underwriters Laboratories (UL's) Inc.'s classifications (Class 30, Class 60, Class 90, etc.) for uplift resistance. UL's classifications do not apply a safety factor. A UL classification indicating a roof system that has a Class 30 designation has been tested and found resistant to uplift loads of 30 psf, a Class 60 designation has been tested and found resistant to uplift loads of 60 psf, a Class 90 designation has been tested and found resistant to uplift loads of 90 psf, and so forth. UL does not provide specific guidance regarding addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

Additional information regarding UL's wind-uplift classifications is available in UL's Roofing Materials & Systems Directory and in the certifications section of UL's website by accessing www.ul.com and typing "TGIK" into the UL category code field.

Additional information regarding roof systems' wind-uplift capacities may also be available by contacting individual roof system manufacturers.

Wind Load Design for Perimeter Edge Metal

The International Building Code references standard ANSI/SPRI ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems." This code requirement is applicable to roof slopes less than 2:12. Because a roof slope of 1½:12 or less was selected for this project, this report also contains design load calculations related to edge-metal system design.

ANSI/SPRI ES-1 includes two primary elements: determination of design wind loads at roof edges (perimeter edge metal) and testing for resistance loads of perimeter edge metal. However, IBC does not adopt ANSI/SPRI ES-1 in its entirety. It requires low-slope metal edge securement be designed and installed using IBC's Chapter 16—Structural Design and tested for resistance in accordance with ANSI/SPRI ES-1's Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems," RE-2, "Test Method for Dependently or Independently Terminated Edge Systems," and Test RE-3, "Test for Copings," as applicable.

The fundamental concept of wind design as it applies to perimeter edge-metal systems is that the tested wind-resistance (uplift-resistance) capacity of perimeter edge-metal system should be greater than or equal to the design resistance loads that will act upon the perimeter edge-metal system. Design wind-resistance loads are derived from a building's design wind loads, taking into consideration an appropriate safety factor. Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads. Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance perimeter edge-metal systems.

Wind-resistance capacities of perimeter edge-metal systems are determined by testing in accordance with the test methods in ANSI/SPRI ES-1. Once design wind loads and minimum recommended design wind-resistance loads (including a safety factor) are determined, designers can select appropriate perimeter edge-metal systems that have tested capacities equal to or greater than the minimum recommended design wind resistance loads.

Design Wind Loads Using ASCE 7

IBC Chapter 16—Structural Design of IBC uses ASCE 7 as the basis for determining design wind loads; therefore, NRCA recommends using ASCE 7 for design wind load calculations instead of ANSI/SPRI ES-1.

As previously discussed in the section on Wind Load Design for Roof Systems, ASCE 7-10 provides two design methods to determine minimum load requirements for buildings: strength design and allowable stress design (ASD). The wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values. However, roof systems and roof system components generally are designed using ASD.

Because ASD results often are used, a designer may want to adjust the strength design values to ASD values. A load-reduction factor is applied as a multiplier to adjust the values. An appropriate load-reduction factor is 0.6 and the calculation is expressed as follows:

Strength design value x 0.6 = ASD value

Roof Wind Designer provides the calculations for strength design and then adjusts those values to ASD values.

Strength Design Method:

ASCE 7 identifies a vertical surface as a "roof zone" and a horizontal surface as a "wall zone." As previously mentioned, Zones 1 through 3 are associated with roof areas. For wall areas, ASCE 7-10 identifies two primary areas of differing horizontal wind loads: perimeter and corners. These areas are designated as Zones 4 and 5, respectively. The dimension that defines the distance of the perimeter and corner zones is the same distance "a" used with defining Zones 1 through 3 for roof areas.

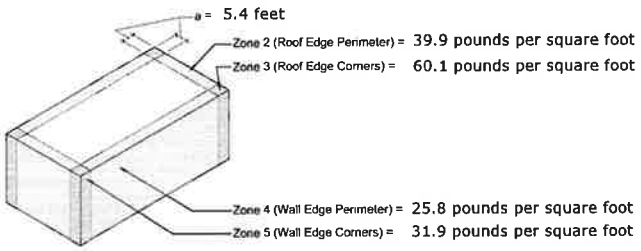
For the zones described by this report, the strength design wind loads determined using ASCE 7-10 are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	39.9 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	60.1 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	25.8 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	31.9 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	5.4 feet

Graphically, these values are depicted as follows:

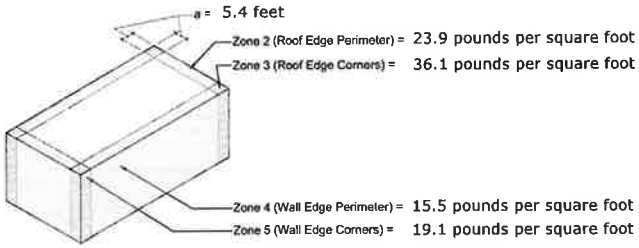


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, a load-reduction factor of 0.6 should be applied. The ASD values determined for the wall area described by this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	23.9 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	36.1 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	15.5 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	19.1 pounds per square foot

Graphically, these values are depicted as follows:



Minimum Recommended Design Wind-resistance Loads

NRCA recommends designers include an appropriate safety factor in their design wind-resistance calculations for perimeter edge-metal flashings. NRCA suggests a minimum safety factor of 2.0 be applied to steel or aluminum edge-metal flashings. This is consistent with the minimum safety factor recommended in ANSI/SPRI ES-1's design wind load calculations section.

The safety factor is applied to the ASD values. The equation to determine required design wind-resistance load is:

Design wind-resistance capacity = [ASD Design wind load] x [Safety factor of 2.0]

Taking into consideration the design wind-uplift loads, the minimum recommended design wind-resistance loads for the specific roof and wall areas described in this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	47.9 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	72.1 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	31.0 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	38.3 pounds per square foot

Please note: The safety factor used to determine minimum recommended design wind-resistance loads for perimeter edge metal may be a different value than the safety factor used in the roof system calculations.

Tested Resistance Load Capacities of Perimeter Edge Metal

Using the minimum recommended design wind-resistance values, a user can select an appropriately wind-resistant perimeter edge metal. The tested wind-resistance load capacity—commonly referred to as "load capacity"—of the perimeter edge metal should be greater than the minimum recommended design wind-resistance capacities for the perimeter edge-metal system to be considered appropriately wind-resistant.

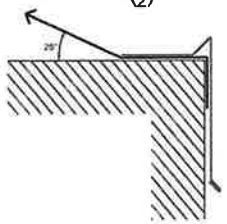
Tested wind-resistance capacities of edge-metal flashing systems are determined by testing. IBC requires the testing be done in accordance with the RE-1, RE-2 and RE-3 test methods contained in ANSI/SPRI ES-1 as applicable to the specific roof perimeter edge metal configuration. These three test methods are:

- Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."
- Test RE-2, "Test Method for Dependently or Independently Terminated Edge Systems."
- Test RE-3, "Test for Copings."

The following images illustrate how to apply the design wind-resistance capacities (including a safety factor) for fascia, embedded edge metal and copings based on RE-1, RE-2 and RE-3:

Force at Perimeter = $\left(\frac{r}{2}\right)$ x 113.5 pounds per square foot

Force at Corners = $\left(\frac{r}{2}\right)$ x 170.9 pounds per square foot



where:

r = horizontal distance to first row of fasteners from edge of roof system

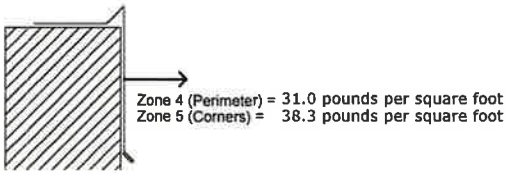
or

r = 6 feet, for ballasted roof systems

RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."

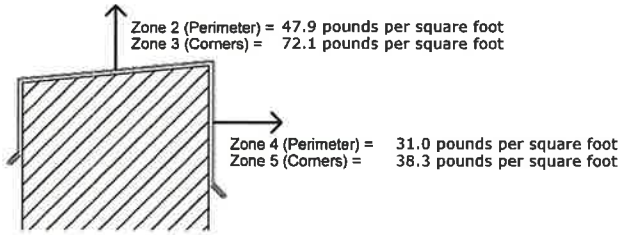
Note: The resultant forces indicated on the figure need to be further adjusted, depending on row spacing of the membrane fasteners or if the roof system is ballasted.

RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



RE-3, "Test for Copings."

RE-3 tests copings' resistances to outward (horizontal) and upward (vertical) pressures.

Using these minimum recommended design wind-resistance load values, a user can select an appropriately wind-resistant edge-metal flashing system. The tested wind-resistance capacity of the edge-metal flashing system should be greater than the minimum recommended design wind-resistance loads for the edge-metal flashing system to be considered appropriately wind-resistant. This is expressed as:

Tested wind-resistance capacity ≥ Design wind-resistance capacity

NRCA has conducted extensive testing using methods RE-2 and RE-3 of various edge-metal flashing profiles that are usually shop-fabricated. The edge-metal profiles tested are based upon the construction details contained in The NRCA Roofing Manual.

Visit www.nrca.net/roofing/Shop-fabricated-edge-metal-testing-242 to view drawings of the specific edge-metal flashings that have been tested. The drawings contain the tested wind-resistance capacity values for each edge-metal flashing profile. NRCA maintains certification programs with Underwriters Laboratories Inc. and Intertek Testing Services, N.A. Each program has its specific set of tested edge-metal flashing profiles.

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National Roofing Contractors Association (NRCA) — *Roof Wind Designer*

Clicking the "I Accept" button below constitutes your acceptance and acknowledgment of the terms and conditions set forth below. If you do not agree to these terms and conditions, you may not use the Roof Wind Designer software application. By accepting these terms and conditions, you acknowledge and agree as follows:

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5. The calculations used in Roof Wind Designer are based on recognized engineering principles including recognized consensus standard ASCE 7-10 "Minimum Design Loads for Buildings and Other Structures," which is referenced in most current building codes as the method for determining design wind loads for buildings, and building components and claddings, including roof systems. Roof Wind Designer only may be used for determining design wind loads pursuant to the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) under ASCE 7-10. When using ASCE 7-10, buildings requiring the use of the Envelope Procedure, Part 1: Low-rise Buildings, Directional Procedure or the Wind Tunnel Procedure are beyond the scope of Roof Wind Designer.
6. The safety factors used in calculating the minimum recommended design wind resistance loads for which your roof system should be designed is determined using ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly," AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and AA ADM1, "Aluminum Design Manual: Part 1-A—Specification for Aluminum Structures, Allowable Stress Design; and Part 1-B—Aluminum Structures, Load and Resistance Factor Design."
7. Roof Wind Designer relies upon your input to generate a Report intended to serve as a guide in determining the appropriate design wind loads and minimum recommended design resistance loads for roof systems. The Report applies only to the specific building identified by you and relies solely on the input supplied by you.
8. Any misinformation, miscalculations, mistakes or changes in the information that you enter into the application may affect the results, accuracy, reliability and/or other aspects of the Report.
9. By agreeing to use Roof Wind Designer, you specifically acknowledge that neither NRCA or the Supporting Organizations is undertaking to render specific professional advice. You must rely solely on your own judgment or consult a technically competent roof professional to determine what application or design resistance loads, whether included in the Report or not, is appropriate for your purpose. Neither NRCA or the Supporting Organizations assume responsibility for any decision made by you relating to the suitability or use of Roof Wind Designer or the Report.
10. Neither NRCA or the Supporting Organizations make any guarantee, representation or warranty, express or implied, at law or in equity, and NRCA and the Supporting Organizations expressly disclaim any and all such guarantees, representations or warranties whatsoever as to the validity, accuracy or sufficiency of the information supplied by Roof Wind Designer and/or the Report and assumes no responsibility or liability in connection therewith. NRCA and the Supporting Organizations assume no liability or responsibility in connection with the use or misuse of Roof Wind Designer or the information included therein or supplied thereby or in connection with any modifications to or adaptations of Roof Wind Designer and/or the Report by you or any other party and expressly disclaim any such liability or responsibility.
11. You expressly assume all risk of loss, harm and/or injury resulting from the use or misuse of the Roof Wind Designer and/or the Report. Additionally, the wind-resistance loads suggested by the Report may not be appropriate in all instances and requires verification and use by technically competent roof professionals.
12. Links or pointers connecting the Roof Wind Designer website with other Internet sites are provided as a courtesy only and do not imply, directly or indirectly, the endorsement, sponsorship or approval by NRCA or the Supporting Organizations of the linked site, the company, organization or individual operating the site, or any product, service, company or organization referenced in the site. In general, any website that has an address (or URL) that does not contain "nrca.net" is a linked website. The content of any linked site does not necessarily reflect the opinions, standards or policies of NRCA. NRCA assumes no responsibility or liability for the accuracy or completeness of content contained in any linked site or for the compliance with applicable laws of such linked sites.
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SECTION 075419 - POLYVINYL-CHLORIDE (PVC) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Mechanically fastened, polyvinyl chloride (PVC) roofing system.
2. Roof insulation.
3. Walkways.

B. Work of this Section is applicable to the following buildings:

1. Police Headquarters, Roof 'D' Overlay.

1.2 DEFINITIONS

A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to work of this Section.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

J. "Manufacturer Qualifications": A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

K. "Installer Qualifications": A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

L. "Manufacturer's Technical Representative Qualifications": An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

M. "Factory-Authorized Service Representative Qualifications": An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

1.3 PREINSTALLATION MEETINGS

A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project Site.

1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, air barrier Installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Review and finalize construction schedule, and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review deck substrate requirements for conditions and finishes, including flatness and fastening.
5. Review structural loading limitations of roof deck during and after roofing.
6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
7. Review governing regulations and requirements for insurance and certificates if applicable.
8. Review temporary protection requirements for roofing system during and after installation.
9. Review roof observation and repair procedures after roofing installation.

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1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:

1. Layout and thickness of insulation.
2. Base flashings and membrane terminations.
3. Flashing details at penetrations.
4. Roof plan showing orientation of steel roof deck and orientation of roof membrane, roof membrane seam pattern, fastening spacings, and patterns for mechanically fastened roofing system.
5. Insulation fastening patterns for corner, perimeter, and field-of-roof locations.

C. Samples for Verification: For the following products:

1. Roof membrane and flashing, of color required.
2. Walkway pads or rolls, of color required.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer and manufacturer.

B. Installer Certificates: Submitted on Request an Installer Certificate, signed by roofing system manufacturer certifying that roofing system Installer is approved, authorized, or licensed by manufacturer to install roofing system and is eligible to receive the Roofing Manufacturer's Warranty as specified in Warranty Article below.

C. Manufacturer Certificates:

1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.

a. Submit evidence of compliance with performance requirements.

D. Field quality-control reports.

E. Sample Warranties: For manufacturer's special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Maintenance Data: For roofing system to include in maintenance manuals.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is UL listed for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1. Experience: Minimum of 10 years in business continuously.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials to Project site in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, approval or listing agency markings, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.

1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials, and place equipment in a manner to avoid permanent deflection of deck.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.

1. Special warranty includes membrane roofing, base flashings, roof insulation, fasteners, cover boards, roofing accessories, and other components of roofing system.
2. Manufacturers No Dollar Limit (NDL) Total Systems Warranty Form, without monetary limitation, non-prorated.
3. Warranty shall cover wind speeds less than, or equal to 72 mph.

4. Warranty shall have hourly rates for repairs, not open ended.
5. Where more than one building is part of the project, a separate warranty shall be issued for each building.
6. Warranty Period: 20 years from date of Substantial Completion.

B. Special Project Warranty: Submit roofing Installer's warranty, on warranty form at end of this Section, signed by Installer, covering the Work of this Section, including all components of roofing system such as roof membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, vapor retarders, roof pavers, and walkway products, for the following warranty period:

1. Warranty Period: 2 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. General Performance: Installed roofing and base flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.

1. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.
2. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.

B. Wind Uplift Resistance: Design roofing system to resist the wind uplift pressures indicated in the "Report of Roof System Design Wind-load Analysis" Report attached to this Section for each Zone of each building when tested according to FM Approvals 4474, UL 580, or UL 1897. Those reports are as follows:

1. Report of Roof System Design Wind-load Analysis, Roofs 'A', 'B', & 'E', LFUCG: Police HQ.
2. Report of Roof System Design Wind-load Analysis, Roofs 'D', LFUCG: Police HQ.
3. Report of Roof System Design Wind-load Analysis, Roofs 'F', LFUCG: Police HQ.

C. Material Compatibility: Roofing materials shall be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roof membrane manufacturer based on testing and field experience.

D. Exterior Fire-Test Exposure: ASTM E108 or UL 790, Class A; for application and roof slopes indicated; testing by a qualified testing agency.

E. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated on Drawings.

1. Identify products with appropriate markings of applicable testing agency.

2.2 POLYVINYL CHLORIDE (PVC) ROOFING

A. PVC Sheet: ASTM D4434/D4434M, Type III, fabric reinforced.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Carlisle SynTec Incorporated.
b. Johns Manville; a Berkshire Hathaway company.
c. Sika Sarnafil.
d. Firestone Building Products.
e. Soprema.

2. Thickness: 60 mils.
3. Exposed Face Color: White.

B. Source Limitations: Obtain components for roofing system, including insulation and fasteners, from roof membrane manufacturer or manufacturers approved by roof membrane manufacturer.

2.3 AUXILIARY ROOFING MATERIALS

A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.

1. Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as PVC sheet.

C. Prefabricated Pipe Flashings: Roofing membrane manufacturer's recommended premolded PVC pipe flashing.

D. Bonding Adhesive: Manufacturer's standard, water based.

E. Slip Sheet: Manufacturer's standard, of thickness required for application.

F. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.

G. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing components to substrate, and acceptable to roofing system manufacturer.

H. Induction Fastening System: Electromagnetic induction welding, a non-membrane penetrating fastening system for installing roof insulation and thermoplastic membrane roofing.

1. Provides coated plates and fasteners as required to secure roof insulation and membrane roofing to roof deck without penetrating roof materials and comply with Performance Requirements.

I. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, lap sealants, termination reglets, and other accessories.

2.4 ROOF INSULATION

A. General: Preformed roof insulation boards manufactured or approved by PVC roof membrane manufacturer.

B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Atlas Roofing Corporation.
b. Carlisle SynTec Incorporated.
c. Firestone Building Products.
d. GAF.
e. Hunter Panels.
f. Johns Manville; a Berkshire Hathaway company.

2. Size: As indicated on Drawings.

a. Modify edge profile as required to match slope of metal roof panel flutes and ribs and provide a tight fit as indicated on the Drawings.
b. Width: As required to provide a tight fit between metal roof panel flutes and ribs as indicated on Drawings.
c. Length: Manufacturer's standard.
d. Thickness: Match depth of metal roof panel flutes and height of metal roof panel ribs.

C. Provide performed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for slope to drain.

1. Fabricate to slopes indicated.

2.5 INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.

C. Cover Boards: ASTM C1289 Type II, Class 4, Grade 1, 1/2-inch thick polyisocyanurate, having a minimum compressive strength of 100 psi.

D. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application.

2.6 WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads or rolls, approximately 3/16 inch thick and acceptable to roofing system manufacturer.

1. Size: Approximately 36 by 60 inches.
2. Color: Contrasting with roof membrane.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.

1. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
2. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing system installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof-drain plugs when no work is taking place or when rain is forecast.

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3.3 SUMMARY OF WORK

A. The following is a general outline of work to be performed:

1. Install wood blocking as required indicated on Drawings, as recommended by roofing system manufacturer, as required to comply with Performance Requirements, and as needed to align with top of insulation.
2. Installed flute filler insulation as per manufacturer recommendations.
3. Install cover board insulation and mechanically fasten according to manufacturer's recommendation.
4. Using Induction Fastening System, mechanically fasten PVC roof membrane according to manufacturer's recommendations.
5. Install flashings and metal components to the roof system.

3.4 INSTALLATION OF ROOFING, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition.

3.5 INSTALLATION OF INSULATION

A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.

B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

3.6 INSTALLATION OF COVER BOARDS

A. Install cover boards over insulation with long joints perpendicular to slope, in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.

1. Loosely butt cover boards together and fasten to roof deck.
2. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
3. Cut and fit cover board tight to nailers, projections, and penetrations.
4. Fasten cover boards to substrate according to requirements of FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification and to resist uplift pressure at corners, perimeter, and field of roof according to Performance Requirements.

3.7 INSTALLATION OF MECHANICALLY FASTENED ROOFING, INDUCTION FASTENING SYSTEM

A. Using Induction Fastening System, mechanically fasten roofing over area to receive roofing according to roofing system manufacturer's written instructions.

1. Unroll roofing and allow relaxing before retaining.
2. Install sheet according to ASTM D 5082.
3. For in-splice attachment, install roofing with long dimension perpendicular to steel roof deck flutes.

B. Start installation of roofing in presence of roofing system manufacturer's technical personnel.

C. Accurately align roofing and maintain uniform side and end laps of minimum dimensions required by manufacturer.

1. Stagger end laps.

D. Using Induction Fastening System, mechanically fasten roofing securely at terminations, penetrations, and perimeter of roofing.

E. Apply roofing with side laps shingled with slope of roof deck where possible.

F. In-Seam Attachment: Secure one edge of PVC sheet using fastening plates or metal battens centered within seam, and mechanically fasten PVC sheet to roof deck.

G. Seams: Clean seam areas, overlap roofing, and hot-air weld side and end laps of roofing and sheet flashings according to manufacturer's written instructions to ensure a watertight seam installation.

1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of sheet.
2. Verify field strength of seams a minimum of twice daily, and repair seam sample areas.
3. Repair tears, voids, and lapped seams in roofing that do not comply with requirements.

3.8 INSTALLATION OF BASE FLASHING

A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.

B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.

D. Preformed Pipe Flashing Installation: Secure flashing sleeve to roof membrane according to flashing sleeve manufacturer's written instructions; flash sleeve flange to surrounding roof membrane according to roof membrane manufacturer's instructions.

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E. Clean seam areas, overlap, and firmly roll sheet flashings into the adhesive. Hot-air weld side and end laps to ensure a watertight seam installation.

F. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.9 INSTALLATION OF WALKWAYS

A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.

1. Install flexible walkways at the following locations:

a. Perimeter of each rooftop unit.
b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
d. Top and bottom of each roof access ladder.
e. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
f. Locations indicated on Drawings.
g. As required by roof membrane manufacturer's warranty requirements.

2. Provide 6-inch clearance between adjoining pads.
3. Heat weld to substrate or adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

3.10 FIELD QUALITY CONTROL

A. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.

B. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

3.11 PROTECTING AND CLEANING

A. Comply with roofing manufacturer's written instructions for protection of roof surface.

B. Protect roofing system from damage and wear during remainder of construction period.

1. When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

C. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

E. Perform the following cleaning operations immediately after completing roofing installation:

1. Remove marking left by foot traffic, excess adhesive and seam sealer, discoloration caused by spilled fluids, and other blemishes from surfaces.
2. Using a blower, remove dirt, trash, organic debris, and other clutter from roofing surfaces thoroughly.

F. Protect roofing membrane from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

3.12 ATTACHMENTS

A. Reports: Refer to attached reports, immediately following this section, for Wind Uplift Resistance Performance Requirements for each Roof Zone:

1. Report of Roof System Design Wind-load Analysis, Roofs 'A', 'B', & 'E', LFUCG: Police HQ.
2. Report of Roof System Design Wind-load Analysis, Roofs 'D', LFUCG: Police HQ.
3. Report of Roof System Design Wind-load Analysis, Roofs 'F', LFUCG: Police HQ.

3.13 ROOFING INSTALLER'S WARRANTY

A. WHEREAS _____ of _____, herein called the "Roofing Installer," has performed roofing and associated work ("work") on the following project:

1. Owner: <Insert name of Owner>.
2. Address: <Insert address>.
3. Building Name/Type: **<Insert information>**.
4. Address: <Insert address>.
5. Area of Work: <Insert information>.
6. Acceptance Date: _____.
7. Warranty Period: **<Insert time>**.
8. Expiration Date: _____.

B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant said work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period Installer will, at Installer's own cost and expense, make or

cause to be made such repairs to or replacements of said work as are necessary to correct faulty and defective work and as are necessary to maintain said work in a watertight condition.

D. This Warranty is made subject to the following terms and conditions:

1. Specifically excluded from this Warranty are damages to work and other parts of the building, and to building contents, caused by:

a. lightning;
b. peak gust wind speed exceeding 72;
c. fire;
d. failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
e. faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
f. vapor condensation on bottom of roofing; and
g. activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.

2. When work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of work.
4. During Warranty Period, if Owner allows alteration of work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of said alterations, but only to the extent said alterations affect work covered by this Warranty. If Owner engages Roofing Installer to perform said alterations, Warranty shall not become null and void unless Roofing Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a promenade, work deck, spray-cooled surface, flooded basin, or other use or service more severe than originally specified, this Warranty shall become null and void on date of said change, but only to the extent said change affects work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on said work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of original work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this _____ day of _____, _____.

1. Authorized Signature: _____.
2. Name: _____.
3. Title: _____.

END OF SECTION 075419

roofwinddesigner.com

ASCE 7-05, ASCE 7-10 and ASCE 7-16

Report of Roof System Design Wind-load Analysis

Report Date: 8/14/2023
ASCE 7 Version: ASCE 7-10

This report is applicable to:	This report has been prepared by:
Roofs 'A', 'B' & 'E' LFUCG: Police HQ 150 W. Main St Lexington, KY, 40507	Jean-Paul Grivas Patrick D. Murphy Co., Inc., Architects 4606 Illinois Ave Louisville, KY 40213

Preparer's comments:

None

Roof Wind Designer provides users an easy-to-use means for accurately determining design wind loads and design uplift resistance capacities for roof systems on many commonly encountered building types that are subject to building code compliance.

Design wind loads are derived using American Society of Civil Engineers (ASCE) standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," Chapter 30—Wind Loads—Components and Cladding (C&C), Envelope Procedure, Part 2: Low-rise Buildings (Simplified). ASCE 7-10 is a widely-recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the 2012 and 2015 editions of the International Building Code.

The fundamental concept of wind design for roof systems is the tested uplift-resistance capacity for a building's roof system needs to be equal to or greater than the roof systems' design wind loads. Roof Wind Designer determines roof systems' minimum recommended design wind loads. From these values, Roof Wind Designer determines the necessary design uplift capacities for the roof system incorporating an appropriate safety factor. Users can select wind-resistance roof systems using these design uplift capacity values.

Roof Wind Designer also will provide design wind load calculations related to edge-metal flashing systems for buildings with roof slopes of 1½:12 or less. These calculations are applicable to roof systems using metal fascia, embedded edge-metal or metal copings to secure membrane roof systems' perimeter edges.

Roof Wind Designer relies solely upon the preparer who generates this report to accurately input appropriate information that is applicable to the specific building to which this report applies. This report applies to only the specific roof area and building that is indicated above. Any misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and results of this report.

Use of Roof Wind Designer is subject to a license agreement and important legal notices and disclaimers. By inputting project information and generating this report, the preparer who generates this report accepts this license agreement and important legal notices and disclaimers. A copy of this license agreement and important legal notices and disclaimers is included at the end of this report and is considered to be a part of this report.

Summary of the building and roof area information input by the preparer:

Roof Area Dimensions (feet):	135 x 57
Mean Roof Height (feet):	60.0
Roof Slope:	Flat: 1½:12 or less
Parapet(s) (minimum 36 inches high):	No
Building Configuration	Enclosed
Exposure:	B
Occupancy Category:	IV
Basic Wind Speed (three-second peak gust, mph):	115 from ASCE 7-10, Figure 26.5-1B Basic Wind Speed (value assigned by preparer)
Roof Deck Type:	Structural Concrete
Roof Covering Type:	Modified Bitumen

In ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), roof area dimensions, mean roof height, roof slope, the building's configuration and exposure, risk category, and basic wind speed are used in the determination of the design wind loads.

The building's configuration (open, partially enclosed, enclosed) affects design wind loads of the roof system. ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), is limited to buildings of an enclosed configuration. An enclosed configuration is defined by ASCE 7-10 as a building that does not comply with the requirements for open or partially enclosed buildings. An open building is one having each wall at least 80 percent open. A partially enclosed building is one where the total area of openings in a wall that receives positive external pressure exceeds the sum of the area openings in the balance of the building envelope (walls and roof) by more than 10 percent and where the total area of openings in a wall that receives positive external pressure exceeds 4 ft2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

A building's exposure has an effect on the magnitude of design wind loads that act on a building and the building's roof system. ASCE 7-10 provides for three Exposure Categories: B, C and D. Exposure Category C shall apply for all cases where Exposure Categories B or D do not apply. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the windward direction for a distance of at least 2,600 feet. For buildings whose mean roof height is less than or equal to 30 feet, the upwind distance may be reduced to 1,500 feet. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 feet. Exposure D shall also apply where the ground surface roughness immediately upward of the site is B or C, and the site is within a distance of 600 feet or 20 times the building height, whichever is greater from an Exposure D condition.

A building's occupancy has an effect on the magnitude of design wind loads that act on a building and the building's roof system. In ASCE 7-10, a building's occupancy determines a risk category. ASCE 7-10 provides for four Risk Categories: I, II, III and IV. Part 2: Low-rise Buildings (Simplified) uses risk category to determine the applicable basic wind speed map.

Risk Category II applies to all buildings except those listed in Risk Categories I, III or IV. Risk Category I applies to buildings that represent a low hazard to human life in the event of failure. Risk Category III applies to buildings that represent a substantial hazard to human life in the event of failure. Risk Category IV applies to buildings designated as essential facilities or buildings where the failure of which could pose a substantial hazard to the community. Essential facilities are defined as buildings that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes.

The basic wind speed is representative of a 3-second peak gust wind speed at 33 feet above the ground in Exposure C and is determined from Figure 26.5-1A—Basic Wind Speeds for Occupancy Category II Buildings and Other Structures, Figure 26.5-1B—Basic Wind Speeds for Occupancy Category III and VI Buildings and Other Structures and Figure 26.5-1C—Basic Wind Speeds for Occupancy Category I Buildings and Other Structures.

Roof edge parapets may assist in reducing design wind loads acting in the corner regions of the roof area. ASCE 7-10, Part 3: Buildings with h > 60 ft., allows for this reduction only when a minimum 36-inch-high parapet occurs at the two outside edges of the specific corner area where the design wind load is being reduced.

Wind Design for Roof Systems

ASCE 7-10 specifies wind design procedures for buildings and organizes them into two categories: main wind force-resisting systems, and component and cladding elements. Main wind force-resisting systems are the structural elements assigned to provide the support and stability for the overall building. Components and cladding are elements of the building envelope that do not qualify as part of the main wind force-resisting system. Roof systems and edge-metal flashing systems are considered components and cladding.

ASCE 7-10 provides two methods to determine minimum design load requirements for buildings: strength design method and allowable stress design (ASD) method. Design wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values.

Roof systems and roof system components generally are designed using the ASD method. Because the ASD method's results often are used, a designer can adjust the strength design method's values to ASD method's values. A load-reduction factor is applied as a multiplier to the strength design values to determine the ASD values. ASCE 7-10 provides a load-reduction factor of 0.6 for this purpose, and the calculation is expressed as follows:

ASD value = Strength design value x 0.6

Roof Wind Designer determines design wind loads based upon the strength design method and then adjusts those values to the ASD method's values.

Design Wind Loads

To determine design wind loads on roof areas, ASCE 7-10 identifies three primary areas of differing wind loads on a roof area: roof area field, roof area perimeter and roof area corners. Within ASCE 7-10 these areas are designated as Zones 1, 2 and 3, respectively. Also, ASCE 7-10 identifies a dimension determined by calculation, referred to as "a," that defines the depth of the perimeter and corner zones from the roof area's edges.

Strength Design Method:

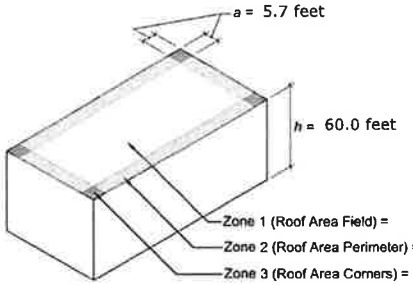
ASCE 7-10 uses three basic wind speed maps for different categories of building occupancies. These maps provide basic wind speeds that are applicable for calculating pressures and they are based on strength design. The strength design values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	29.0 pounds per square foot
Zone 2 (roof area perimeter):	48.7 pounds per square foot
Zone 3 (roof area corners):	73.3 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	5.7 feet

Graphically, the strength design values are depicted as follows:

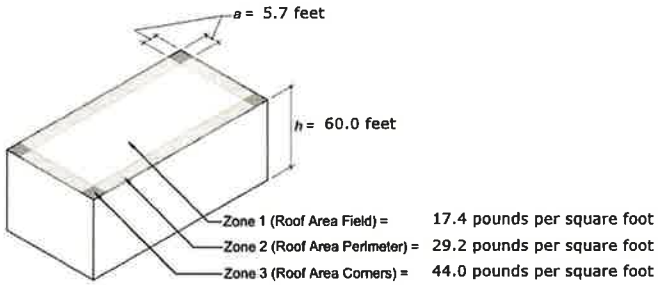


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, the load-reduction factor of 0.6 is applied. The ASD values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	17.4 pounds per square foot
Zone 2 (roof area perimeter):	29.2 pounds per square foot
Zone 3 (roof area corners):	44.0 pounds per square foot

Graphically, the ASD values are depicted as follows:



Minimum Recommended Design Uplift-resistance Capacities

Accepted engineering principles practice provides for applying a reasonable "safety factor" to design wind-uplift loads when using the ASD method to determine the minimum recommended design uplift-resistance capacities. This safety factor is intended to address possible variances in design wind load determination, normally anticipated variances in the materials and construction of the building, including the roof system, and any normally anticipated deterioration of the materials' physical properties because of aging. This safety factor is applied to the ASD values.
The equation to determine required design uplift-resistance capacity is:

Design uplift-resistance capacity = ASD Design wind load x Safety factor

For membrane roof systems, Roof Wind Designer determines roof systems' minimum recommended design uplift-resistance capacities, using a safety factor defined in ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly Performance." This recognized consensus standard indicates design uplift-resistance loads shall have a minimum 2.0 safety factor from the design wind uplift loads determined using ASCE 7.

For roof assemblies with steel deck and a steel or aluminum metal panel roof system, Roof Wind Designer applies a safety factor of 1.67. This safety factor is recommended in AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and "Aluminum Design Manual: Part 1—Specification for Aluminum Structures" for bending.

On this basis, taking into consideration the ASD design wind-uplift loads and the safety factor, the minimum recommended design uplift-resistance capacities for the specific roof area and building identified in this report are as follows:

Zone 1 (roof area field):	34.8 pounds per square foot
Zone 2 (roof area perimeter):	58.4 pounds per square foot
Zone 3 (roof area corners):	88.0 pounds per square foot

Using these minimum recommended design uplift-resistance capacity values, a user can select an appropriate wind-resistant roof system. The tested uplift-resistance capacity of the roof system should be greater than the minimum recommended design wind-resistance loads for the roof system to be considered appropriately wind resistant. This is expressed as:

Tested uplift-resistance capacity ≥ Design uplift-resistance capacity

Important note: To determine minimum recommended design uplift-resistance capacity values using the strength design method, designers will have to determine an appropriate safety factor on their own. Because the strength design method already includes a more conservative determination of design uplift loads, it is generally recognized any safety factor applied to design loads derived from using the strength design method can be less than the safety factor applied to the design loads derived from the ASD method.

Tested Uplift-resistance Load Capacities of Roof Systems

Roof systems' tested uplift-resistance load capacities typically are determined by laboratory testing or engineering analysis. In the International Building Code's 2009 and previous editions, four recognized test methods are referenced as acceptable methods for determining roof systems uplift-resistance capacities: FM 4450, FM 4470, UL 580 and UL 1898. The International Building Code's 2012 and 2015 editions reference FM 4474 instead of FM 4450 and FM 4470.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks," and FM 4470, "Approval Standard for Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof and Liquid Applied Roof Assemblies for use in Class I and Noncombustible Roof Deck Construction," are the laboratory test methods and serve as the technical basis of the FM Approvals' approval classifications (FM 1-60, FM 1-75, FM 1-90 etc.), with which most roofing professional are familiar. FM Approvals' applies a safety factor of 2 within these classifications. For example, a roof system that has an FM 1-60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, a FM 1-75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM 1-90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM 4474, "American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive And/or Negative Differential Pressures," is similar to the uplift-resistance test methods contained in FM 4450 and FM 4470 and results in uplift classifications Class 60, Class 75, Class 90, etc., which are similar to the FM 1-60, FM 1-75, FM 1-90, etc., respectively derived using FM 4450 and FM 4470. For example, a roof system that has an FM Class 60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, an FM Class 75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM Class 90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-deck Roof Components," addresses FM Global's recommended guidelines for addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

FM Approvals online approval directory containing a listing of FM Approval's-approved roof systems and a copy of FM Global's Loss Prevention Data Sheet 1-29 can be viewed in the reference documents section of FM Approval's RoofNav application accessible at www.roofnav.com.

UL 580, "Standard for Tests for Uplift Resistance of Roof Assemblies" and UL 1897, "Standard for Uplift Tests for Roof Covering Systems" are the laboratory test methods and serve as the technical basis for Underwriters Laboratories (UL's) Inc.'s classifications (Class 30, Class 60, Class 90, etc.) for uplift resistance. UL's classifications do not apply a safety factor. A UL classification indicating a roof system that has a Class 30 designation has been tested and found resistant to uplift loads of 30 psf, a Class 60 designation has been tested and found resistant to uplift loads of 60 psf, a Class 90 designation has been tested and found resistant to uplift loads of 90 psf, and so forth. UL does not provide specific guidance regarding addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

Additional information regarding UL's wind-uplift classifications is available in UL's Roofing Materials & Systems Directory and in the certifications section of UL's website by accessing www.ul.com and typing "TGIK" into the UL category code field.

Additional information regarding roof systems' wind-uplift capacities may also be available by contacting individual roof system manufacturers.

Wind Load Design for Perimeter Edge Metal

The International Building Code references standard ANSI/SPRI ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems." This code requirement is applicable to roof slopes less than 2:12. Because a roof slope of 1½:12 or less was selected for this project, this report also contains design load calculations related to edge-metal system design.

ANSI/SPRI ES-1 includes two primary elements: determination of design wind loads at roof edges (perimeter edge metal) and testing for resistance loads of perimeter edge metal. However, IBC does not adopt ANSI/SPRI ES-1 in its entirety. It requires low-slope metal edge securement be designed and installed using IBC's Chapter 16—Structural Design and tested for resistance in accordance with ANSI/SPRI ES-1's Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems," RE-2, "Test Method for Dependently or Independently Terminated Edge Systems," and Test RE-3, "Test for Copings," as applicable.

The fundamental concept of wind design as it applies to perimeter edge-metal systems is that the tested wind-resistance (uplift-resistance) capacity of perimeter edge-metal system should be greater than or equal to the design resistance loads that will act upon the perimeter edge-metal system. Design wind-resistance loads are derived from a building's design wind loads, taking into consideration an appropriate safety factor. Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads. Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance perimeter edge-metal systems.

Wind-resistance capacities of perimeter edge-metal systems are determined by testing in accordance with the test methods in ANSI/SPRI ES-1. Once design wind loads and minimum recommended design wind-resistance loads (including a safety factor) are determined, designers can select appropriate perimeter edge-metal systems that have tested capacities equal to or greater than the minimum recommended design wind resistance loads.

Design Wind Loads Using ASCE 7

IBC Chapter 16—Structural Design of IBC uses ASCE 7 as the basis for determining design wind loads; therefore, NRCA recommends using ASCE 7 for design wind load calculations instead of ANSI/SPRI ES-1.

As previously discussed in the section on Wind Load Design for Roof Systems, ASCE 7-10 provides two design methods to determine minimum load requirements for buildings: strength design and allowable stress design (ASD). The wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values. However, roof systems and roof system components generally are designed using ASD.

Because ASD results often are used, a designer may want to adjust the strength design values to ASD values. A load-reduction factor is applied as a multiplier to adjust the values. An appropriate load-reduction factor is 0.6 and the calculation is expressed as follows:

Strength design value x 0.6 = ASD value

Roof Wind Designer provides the calculations for strength design and then adjusts those values to ASD values.

Strength Design Method:

ASCE 7 identifies a vertical surface as a "roof zone" and a horizontal surface as a "wall zone." As previously mentioned, Zones 1 through 3 are associated with roof areas. For wall areas, ASCE 7-10 identifies two primary areas of differing horizontal wind loads: perimeter and corners. These areas are designated as Zones 4 and 5, respectively. The dimension that defines the distance of the perimeter and corner zones is the same distance "a" used with defining Zones 1 through 3 for roof areas.

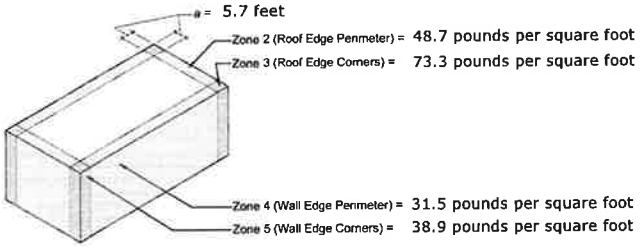
For the zones described by this report, the strength design wind loads determined using ASCE 7-10 are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	48.7 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	73.3 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	31.5 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	38.9 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	5.7 feet

Graphically, these values are depicted as follows:

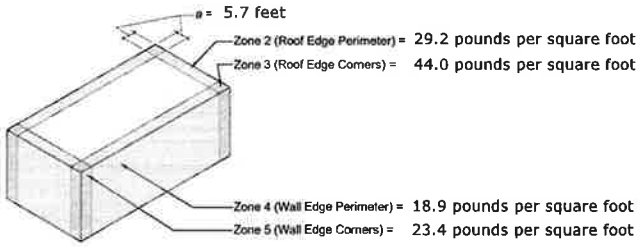


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, a load-reduction factor of 0.6 should be applied. The ASD values determined for the wall area described by this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	29.2 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	44.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	18.9 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	23.4 pounds per square foot

Graphically, these values are depicted as follows:



Minimum Recommended Design Wind-resistance Loads

NRCA recommends designers include an appropriate safety factor in their design wind-resistance calculations for perimeter edge-metal flashings. NRCA suggests a minimum safety factor of 2.0 be applied to steel or aluminum edge-metal flashings. This is consistent with the minimum safety factor recommended in ANSI/SPRI ES-1's design wind load calculations section.

The safety factor is applied to the ASD values. The equation to determine required design wind-resistance load is:

Design wind-resistance capacity = [ASD Design wind load] x [Safety factor of 2.0]

Taking into consideration the design wind-uplift loads, the minimum recommended design wind-resistance loads for the specific roof and wall areas described in this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	58.4 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	88.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	37.8 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	46.7 pounds per square foot

Please note: The safety factor used to determine minimum recommended design wind-resistance loads for perimeter edge metal may be a different value than the safety factor used in the roof system calculations.

Tested Resistance Load Capacities of Perimeter Edge Metal

Using the minimum recommended design wind-resistance values, a user can select an appropriately wind-resistant perimeter edge metal. The tested wind-resistance load capacity—commonly referred to as "load capacity"—of the perimeter edge metal should be greater than the minimum recommended design wind-resistance capacities for the perimeter edge-metal system to be considered appropriately wind-resistant.

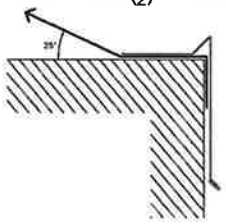
Tested wind-resistance capacities of edge-metal flashing systems are determined by testing. IBC requires the testing be done in accordance with the RE-1, RE-2 and RE-3 test methods contained in ANSI/SPRI ES-1 as applicable to the specific roof perimeter edge metal configuration. These three test methods are:

- Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."
- Test RE-2, "Test Method for Dependently or Independently Terminated Edge Systems."
- Test RE-3, "Test for Copings."

The following images illustrate how to apply the design wind-resistance capacities (including a safety factor) for fascia, embedded edge metal and copings based on RE-1, RE-2 and RE-3:

Force at Perimeter = $\left(\frac{r}{2}\right)$ x 138.4 pounds per square foot

Force at Corners = $\left(\frac{r}{2}\right)$ x 208.5 pounds per square foot



where:

r = horizontal distance to first row of fasteners from edge of roof system

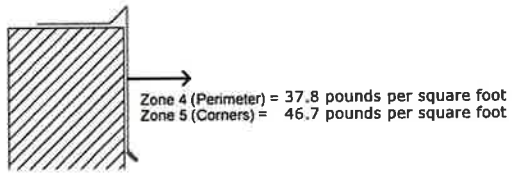
or

r = 6 feet, for ballasted roof systems

RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."

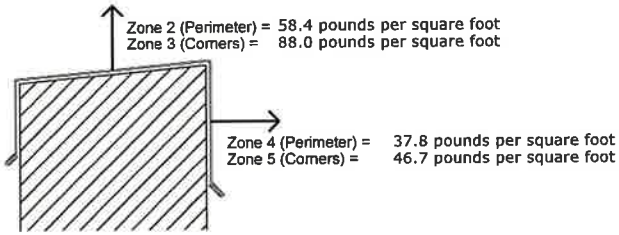
Note: The resultant forces indicated on the figure need to be further adjusted, depending on row spacing of the membrane fasteners or if the roof system is ballasted.

RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



RE-3, "Test for Copings."

RE-3 tests copings' resistances to outward (horizontal) and upward (vertical) pressures.

Using these minimum recommended design wind-resistance load values, a user can select an appropriately wind-resistant edge-metal flashing system. The tested wind-resistance capacity of the edge-metal flashing system should be greater than the minimum recommended design wind-resistance loads for the edge-metal flashing system to be considered appropriately wind-resistant. This is expressed as:

Tested wind-resistance capacity ≥ Design wind-resistance capacity

NRCA has conducted extensive testing using methods RE-2 and RE-3 of various edge-metal flashing profiles that are usually shop-fabricated. The edge-metal profiles tested are based upon the construction details contained in The NRCA Roofing Manual.

Visit www.nrca.net/roofing/Shop-fabricated-edge-metal-testing-242 to view drawings of the specific edge-metal flashings that have been tested. The drawings contain the tested wind-resistance capacity values for each edge-metal flashing profile. NRCA maintains certification programs with Underwriters Laboratories Inc. and Intertek Testing Services, N.A. Each program has its specific set of tested edge-metal flashing profiles.

roofwinddesigner.com

ASCE 7-05, ASCE 7-10 and ASCE 7-16

Report of Roof System Design Wind-load Analysis

Report Date: 8/14/2023

ASCE 7 Version: ASCE 7-10

This report is applicable to:	This report has been prepared by:
Roof 'D' LFUCG: Police HQ 150 W. Main St Lexington, KY, 40507	Jean-Paul Grivas Patrick D. Murphy Co., Inc., Architects 4606 Illinois Ave Louisville, KY 40213

Preparer's comments:

None

Roof Wind Designer provides users an easy-to-use means for accurately determining design wind loads and design uplift resistance capacities for roof systems on many commonly encountered building types that are subject to building code compliance.

Design wind loads are derived using American Society of Civil Engineers (ASCE) standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," Chapter 30—Wind Loads—Components and Cladding (C&C), Envelope Procedure, Part 2: Low-rise Buildings (Simplified). ASCE 7-10 is a widely-recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the 2012 and 2015 editions of the International Building Code.

The fundamental concept of wind design for roof systems is the tested uplift-resistance capacity for a building's roof system needs to be equal to or greater than the roof systems' design wind loads. Roof Wind Designer determines roof systems' minimum recommended design wind loads. From these values, Roof Wind Designer determines the necessary design uplift capacities for the roof system incorporating an appropriate safety factor. Users can select wind-resistance roof systems using these design uplift capacity values.

Roof Wind Designer also will provide design wind load calculations related to edge-metal flashing systems for buildings with roof slopes of 1½:12 or less. These calculations are applicable to roof systems using metal fascia, embedded edge-metal or metal copings to secure membrane roof systems' perimeter edges.

Roof Wind Designer relies solely upon the preparer who generates this report to accurately input appropriate information that is applicable to the specific building to which this report applies. This report applies to only the specific roof area and building that is indicated above. Any misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and results of this report.

Use of Roof Wind Designer is subject to a license agreement and important legal notices and disclaimers. By inputting project information and generating this report, the preparer who generates this report accepts this license agreement and important legal notices and disclaimers. A copy of this license agreement and important legal notices and disclaimers is included at the end of this report and is considered to be a part of this report.

Summary of the building and roof area information input by the preparer:

Roof Area Dimensions (feet):	23 x 21
Mean Roof Height (feet):	60.0
Roof Slope:	Flat: 1½:12 or less
Parapet(s) (minimum 36 inches high):	No
Building Configuration	Enclosed
Exposure:	B
Occupancy Category:	IV
Basic Wind Speed (three-second peak gust, mph):	115 from ASCE 7-10, Figure 26.5-1B Basic Wind Speed (value assigned by preparer)
Roof Deck Type:	Steel Deck
Roof Covering Type:	PVC

In ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), roof area dimensions, mean roof height, roof slope, the building's configuration and exposure, risk category, and basic wind speed are used in the determination of the design wind loads.

The building's configuration (open, partially enclosed, enclosed) affects design wind loads of the roof system. ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), is limited to buildings of an enclosed configuration. An enclosed configuration is defined by ASCE 7-10 as a building that does not comply with the requirements for open or partially enclosed buildings. An open building is one having each wall at least 80 percent open. A partially enclosed building is one where the total area of openings in a wall that receives positive external pressure exceeds the sum of the area openings in the balance of the building envelope (walls and roof) by more than 10 percent and where the total area of openings in a wall that receives positive external pressure exceeds 4 ft2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

A building's exposure has an effect on the magnitude of design wind loads that act on a building and the building's roof system. ASCE 7-10 provides for three Exposure Categories: B, C and D. Exposure Category C shall apply for all cases where Exposure Categories B or D do not apply. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the windward direction for a distance of at least 2,600 feet. For buildings whose mean roof height is less than or equal to 30 feet, the upwind distance may be reduced to 1,500 feet. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 feet. Exposure D shall also apply where the ground surface roughness immediately upward of the site is B or C, and the site is within a distance of 600 feet or 20 times the building height, whichever is greater from an Exposure D condition.

A building's occupancy has an effect on the magnitude of design wind loads that act on a building and the building's roof system. In ASCE 7-10, a building's occupancy determines a risk category. ASCE 7-10 provides for four Risk Categories: I, II, III and IV. Part 2: Low-rise Buildings (Simplified) uses risk category to determine the applicable basic wind speed map.

Risk Category II applies to all buildings except those listed in Risk Categories I, III or IV. Risk Category I applies to buildings that represent a low hazard to human life in the event of failure. Risk Category III applies to buildings that represent a substantial hazard to human life in the event of failure. Risk Category IV applies to buildings designated as essential facilities or buildings where the failure of which could pose a substantial hazard to the community. Essential facilities are defined as buildings that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes.

The basic wind speed is representative of a 3-second peak gust wind speed at 33 feet above the ground in Exposure C and is determined from Figure 26.5-1A—Basic Wind Speeds for Occupancy Category II Buildings and Other Structures, Figure 26.5-1B—Basic Wind Speeds for Occupancy Category III and VI Buildings and Other Structures and Figure 26.5-1C—Basic Wind Speeds for Occupancy Category I Buildings and Other Structures.

Roof edge parapets may assist in reducing design wind loads acting in the corner regions of the roof area. ASCE 7-10, Part 3: Buildings with h > 60 ft., allows for this reduction only when a minimum 36-inch-high parapet occurs at the two outside edges of the specific corner area where the design wind load is being reduced.

Wind Design for Roof Systems

ASCE 7-10 specifies wind design procedures for buildings and organizes them into two categories: main wind force-resisting systems, and component and cladding elements. Main wind force-resisting systems are the structural elements assigned to provide the support and stability for the overall building. Components and cladding are elements of the building envelope that do not qualify as part of the main wind force-resisting system. Roof systems and edge-metal flashing systems are considered components and cladding.

ASCE 7-10 provides two methods to determine minimum design load requirements for buildings: strength design method and allowable stress design (ASD) method. Design wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values.

Roof systems and roof system components generally are designed using the ASD method. Because the ASD method's results often are used, a designer can adjust the strength design method's values to ASD method's values. A load-reduction factor is applied as a multiplier to the strength design values to determine the ASD values. ASCE 7-10 provides a load-reduction factor of 0.6 for this purpose, and the calculation is expressed as follows:

ASD value = Strength design value x 0.6

Roof Wind Designer determines design wind loads based upon the strength design method and then adjusts those values to the ASD method's values.

Design Wind Loads

To determine design wind loads on roof areas, ASCE 7-10 identifies three primary areas of differing wind loads on a roof area: roof area field, roof area perimeter and roof area corners. Within ASCE 7-10 these areas are designated as Zones 1, 2 and 3, respectively. Also, ASCE 7-10 identifies a dimension determined by calculation, referred to as "a," that defines the depth of the perimeter and corner zones from the roof area's edges.

Strength Design Method:

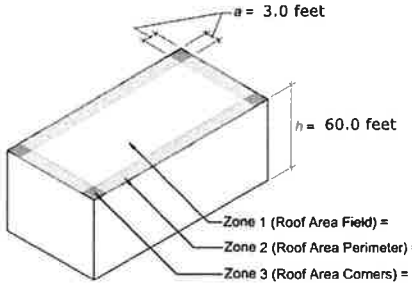
ASCE 7-10 uses three basic wind speed maps for different categories of building occupancies. These maps provide basic wind speeds that are applicable for calculating pressures and they are based on strength design. The strength design values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	29.0 pounds per square foot
Zone 2 (roof area perimeter):	48.7 pounds per square foot
Zone 3 (roof area corners):	73.3 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, the strength design values are depicted as follows:



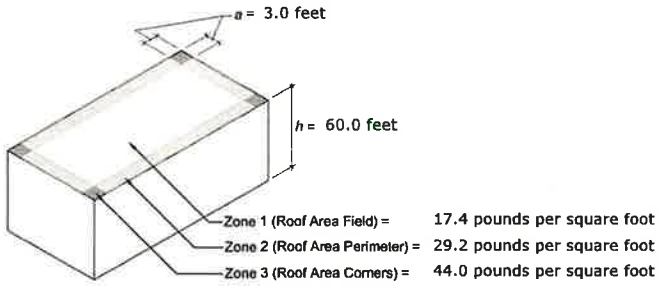
29.0 pounds per square foot
48.7 pounds per square foot
73.3 pounds per square foot

Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, the load-reduction factor of 0.6 is applied. The ASD values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	17.4 pounds per square foot
Zone 2 (roof area perimeter):	29.2 pounds per square foot
Zone 3 (roof area corners):	44.0 pounds per square foot

Graphically, the ASD values are depicted as follows:



Minimum Recommended Design Uplift-resistance Capacities

Accepted engineering principles practice provides for applying a reasonable "safety factor" to design wind-uplift loads when using the ASD method to determine the minimum recommended design uplift-resistance capacities. This safety factor is intended to address possible variances in design wind load determination, normally anticipated variances in the materials and construction of the building, including the roof system, and any normally anticipated deterioration of the materials' physical properties because of aging. This safety factor is applied to the ASD values.
The equation to determine required design uplift-resistance capacity is:

Design uplift-resistance capacity = ASD Design wind load x Safety factor

For membrane roof systems, Roof Wind Designer determines roof systems' minimum recommended design uplift-resistance capacities, using a safety factor defined in ASTM D6630, "Standard Guide for Low Slope Insulated Roof Membrane Assembly Performance." This recognized consensus standard indicates design uplift-resistance loads shall have a minimum 2.0 safety factor from the design wind uplift loads determined using ASCE 7.

For roof assemblies with steel deck and a steel or aluminum metal panel roof system, Roof Wind Designer applies a safety factor of 1.67. This safety factor is recommended in AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and "Aluminum Design Manual: Part 1—Specification for Aluminum Structures" for bending.

On this basis, taking into consideration the ASD design wind-uplift loads and the safety factor, the minimum recommended design uplift-resistance capacities for the specific roof area and building identified in this report are as follows:

Zone 1 (roof area field):	34.8 pounds per square foot
Zone 2 (roof area perimeter):	58.4 pounds per square foot
Zone 3 (roof area corners):	88.0 pounds per square foot

Using these minimum recommended design uplift-resistance capacity values, a user can select an appropriate wind-resistant roof system. The tested uplift-resistance capacity of the roof system should be greater than the minimum recommended design wind-resistance loads for the roof system to be considered appropriately wind resistant. This is expressed as:

Tested uplift-resistance capacity ≥ Design uplift-resistance capacity

Important note: To determine minimum recommended design uplift-resistance capacity values using the strength design method, designers will have to determine an appropriate safety factor on their own. Because the strength design method already includes a more conservative determination of design uplift loads, it is generally recognized any safety factor applied to design loads derived from using the strength design method can be less than the safety factor applied to the design loads derived from the ASD method.

Tested Uplift-resistance Load Capacities of Roof Systems

Roof systems' tested uplift-resistance load capacities typically are determined by laboratory testing or engineering analysis. In the International Building Code's 2009 and previous editions, four recognized test methods are referenced as acceptable methods for determining roof systems uplift-resistance capacities: FM 4450, FM 4470, UL 580 and UL 1898. The International Building Code's 2012 and 2015 editions reference FM 4474 instead of FM 4450 and FM 4470.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks," and FM 4470, "Approval Standard for Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof and Liquid Applied Roof Assemblies for use in Class I and Noncombustible Roof Deck Construction," are the laboratory test methods and serve as the technical basis of the FM Approvals' approval classifications (FM 1-60, FM 1-75, FM 1-90 etc.), with which most roofing professional are familiar. FM Approvals' applies a safety factor of 2 within these classifications. For example, a roof system that has an FM 1-60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, a FM 1-75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM 1-90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM 4474, "American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive And/or Negative Differential Pressures," is similar to the uplift-resistance test methods contained in FM 4450 and FM 4470 and results in uplift classifications Class 60, Class 75, Class 90, etc., which are similar to the FM 1-60, FM 1-75, FM 1-90, etc., respectively derived using FM 4450 and FM 4470. For example, a roof system that has an FM Class 60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, an FM Class 75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM Class 90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-deck Roof Components," addresses FM Global's recommended guidelines for addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

FM Approvals online approval directory containing a listing of FM Approval's-approved roof systems and a copy of FM Global's Loss Prevention Data Sheet 1-29 can be viewed in the reference documents section of FM Approval's RoofNav application accessible at www.roofnav.com.

UL 580, "Standard for Tests for Uplift Resistance of Roof Assemblies" and UL 1897, "Standard for Uplift Tests for Roof Covering Systems" are the laboratory test methods and serve as the technical basis for Underwriters Laboratories (UL's) Inc.'s classifications (Class 30, Class 60, Class 90, etc.) for uplift resistance. UL's classifications do not apply a safety factor. A UL classification indicating a roof system that has a Class 30 designation has been tested and found resistant to uplift loads of 30 psf, a Class 60 designation has been tested and found resistant to uplift loads of 60 psf, a Class 90 designation has been tested and found resistant to uplift loads of 90 psf, and so forth. UL does not provide specific guidance regarding addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

Additional information regarding UL's wind-uplift classifications is available in UL's Roofing Materials & Systems Directory and in the certifications section of UL's website by accessing www.ul.com and typing "TGIK" into the UL category code field.

Additional information regarding roof systems' wind-uplift capacities may also be available by contacting individual roof system manufacturers.

Wind Load Design for Perimeter Edge Metal

The International Building Code references standard ANSI/SPRI ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems." This code requirement is applicable to roof slopes less than 2:12. Because a roof slope of 1½:12 or less was selected for this project, this report also contains design load calculations related to edge-metal system design.

ANSI/SPRI ES-1 includes two primary elements: determination of design wind loads at roof edges (perimeter edge metal) and testing for resistance loads of perimeter edge metal. However, IBC does not adopt ANSI/SPRI ES-1 in its entirety. It requires low-slope metal edge securement be designed and installed using IBC's Chapter 16—Structural Design and tested for resistance in accordance with ANSI/SPRI ES-1's Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems," RE-2, "Test Method for Dependently or Independently Terminated Edge Systems," and Test RE-3, "Test for Copings," as applicable.

The fundamental concept of wind design as it applies to perimeter edge-metal systems is that the tested wind-resistance (uplift-resistance) capacity of perimeter edge-metal system should be greater than or equal to the design resistance loads that will act upon the perimeter edge-metal system. Design wind-resistance loads are derived from a building's design wind loads, taking into consideration an appropriate safety factor. Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads. Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance perimeter edge-metal systems.

Wind-resistance capacities of perimeter edge-metal systems are determined by testing in accordance with the test methods in ANSI/SPRI ES-1. Once design wind loads and minimum recommended design wind-resistance loads (including a safety factor) are determined, designers can select appropriate perimeter edge-metal systems that have tested capacities equal to or greater than the minimum recommended design wind resistance loads.

Design Wind Loads Using ASCE 7

IBC Chapter 16—Structural Design of IBC uses ASCE 7 as the basis for determining design wind loads; therefore, NRCA recommends using ASCE 7 for design wind load calculations instead of ANSI/SPRI ES-1.

As previously discussed in the section on Wind Load Design for Roof Systems, ASCE 7-10 provides two design methods to determine minimum load requirements for buildings: strength design and allowable stress design (ASD). The wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values. However, roof systems and roof system components generally are designed using ASD.

Because ASD results often are used, a designer may want to adjust the strength design values to ASD values. A load-reduction factor is applied as a multiplier to adjust the values. An appropriate load-reduction factor is 0.6 and the calculation is expressed as follows:

Strength design value x 0.6 = ASD value

Roof Wind Designer provides the calculations for strength design and then adjusts those values to ASD values.

Strength Design Method:

ASCE 7 identifies a vertical surface as a "roof zone" and a horizontal surface as a "wall zone." As previously mentioned, Zones 1 through 3 are associated with roof areas. For wall areas, ASCE 7-10 identifies two primary areas of differing horizontal wind loads: perimeter and corners. These areas are designated as Zones 4 and 5, respectively. The dimension that defines the distance of the perimeter and corner zones is the same distance "a" used with defining Zones 1 through 3 for roof areas.

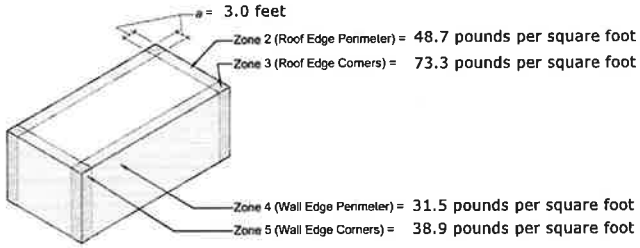
For the zones described by this report, the strength design wind loads determined using ASCE 7-10 are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	48.7 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	73.3 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	31.5 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	38.9 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, these values are depicted as follows:

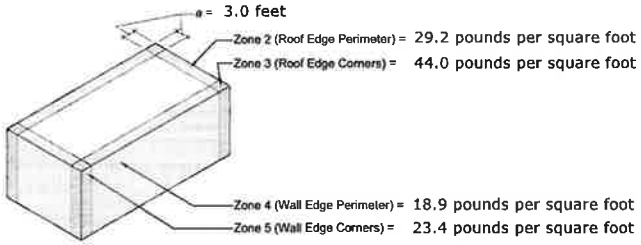


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, a load-reduction factor of 0.6 should be applied. The ASD values determined for the wall area described by this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	29.2 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	44.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	18.9 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	23.4 pounds per square foot

Graphically, these values are depicted as follows:



Minimum Recommended Design Wind-resistance Loads

NRCA recommends designers include an appropriate safety factor in their design wind-resistance calculations for perimeter edge-metal flashings. NRCA suggests a minimum safety factor of 2.0 be applied to steel or aluminum edge-metal flashings. This is consistent with the minimum safety factor recommended in ANSI/SPRI ES-1's design wind load calculations section.

The safety factor is applied to the ASD values. The equation to determine required design wind-resistance load is:

Design wind-resistance capacity = [ASD Design wind load] x [Safety factor of 2.0]

Taking into consideration the design wind-uplift loads, the minimum recommended design wind-resistance loads for the specific roof and wall areas described in this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	58.4 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	88.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	37.8 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	46.7 pounds per square foot

Please note: The safety factor used to determine minimum recommended design wind-resistance loads for perimeter edge metal may be a different value than the safety factor used in the roof system calculations.

Tested Resistance Load Capacities of Perimeter Edge Metal

Using the minimum recommended design wind-resistance values, a user can select an appropriately wind-resistant perimeter edge metal. The tested wind-resistance load capacity—commonly referred to as "load capacity"—of the perimeter edge metal should be greater than the minimum recommended design wind-resistance capacities for the perimeter edge-metal system to be considered appropriately wind-resistant.

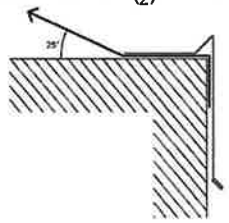
Tested wind-resistance capacities of edge-metal flashing systems are determined by testing. IBC requires the testing be done in accordance with the RE-1, RE-2 and RE-3 test methods contained in ANSI/SPRI ES-1 as applicable to the specific roof perimeter edge metal configuration. These three test methods are:

- Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."
- Test RE-2, "Test Method for Dependently or Independently Terminated Edge Systems."
- Test RE-3, "Test for Copings."

The following images illustrate how to apply the design wind-resistance capacities (including a safety factor) for fascia, embedded edge metal and copings based on RE-1, RE-2 and RE-3:

Force at Perimeter = $\left(\frac{r}{2}\right)$ x 138.4 pounds per square foot

Force at Corners = $\left(\frac{r}{2}\right)$ x 208.5 pounds per square foot



where:

r = horizontal distance to first row of fasteners from edge of roof system

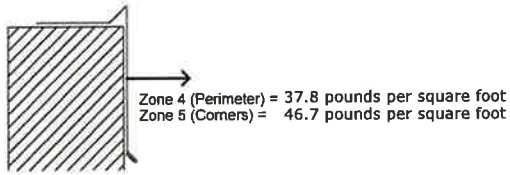
or

r = 6 feet, for ballasted roof systems

RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."

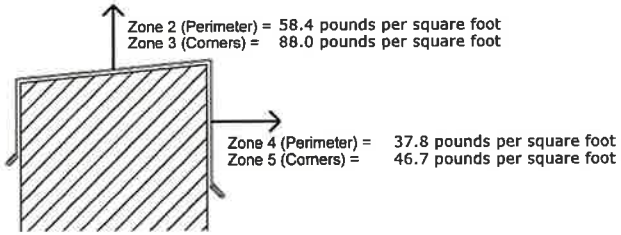
Note: The resultant forces indicated on the figure need to be further adjusted, depending on row spacing of the membrane fasteners or if the roof system is ballasted.

RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



RE-3, "Test for Copings."

RE-3 tests copings' resistances to outward (horizontal) and upward (vertical) pressures.

Using these minimum recommended design wind-resistance load values, a user can select an appropriately wind-resistant edge-metal flashing system. The tested wind-resistance capacity of the edge-metal flashing system should be greater than the minimum recommended design wind-resistance loads for the edge-metal flashing system to be considered appropriately wind-resistant. This is expressed as:

Tested wind-resistance capacity ≥ Design wind-resistance capacity

NRCA has conducted extensive testing using methods RE-2 and RE-3 of various edge-metal flashing profiles that are usually shop-fabricated. The edge-metal profiles tested are based upon the construction details contained in The NRCA Roofing Manual.

Visit www.nrca.net/roofing/Shop-fabricated-edge-metal-testing-242 to view drawings of the specific edge-metal flashings that have been tested. The drawings contain the tested wind-resistance capacity values for each edge-metal flashing profile. NRCA maintains certification programs with Underwriters Laboratories Inc. and Intertek Testing Services, N.A. Each program has its specific set of tested edge-metal flashing profiles.

roofwinddesigner.com

ASCE 7-05, ASCE 7-10 and ASCE 7-16

Report of Roof System Design Wind-load Analysis

Report Date: 8/14/2023

ASCE 7 Version: ASCE 7-10

This report is applicable to:	This report has been prepared by:
Roof 'F' LFUCG: Police HQ 150 W. Main St Lexington, KY, 40507	Jean-Paul Grivas Patrick D. Murphy Co., Inc., Architects 4606 Illinois Ave Louisville, KY 40213

Preparer's comments:

None

Roof Wind Designer provides users an easy-to-use means for accurately determining design wind loads and design uplift resistance capacities for roof systems on many commonly encountered building types that are subject to building code compliance.

Design wind loads are derived using American Society of Civil Engineers (ASCE) standard ASCE 7-10, "Minimum Design Loads for Buildings and Other Structures," Chapter 30—Wind Loads—Components and Cladding (C&C), Envelope Procedure, Part 2: Low-rise Buildings (Simplified). ASCE 7-10 is a widely-recognized consensus standard and is referenced in and serves as the technical basis for wind load determination in the 2012 and 2015 editions of the International Building Code.

The fundamental concept of wind design for roof systems is the tested uplift-resistance capacity for a building's roof system needs to be equal to or greater than the roof systems' design wind loads. Roof Wind Designer determines roof systems' minimum recommended design wind loads. From these values, Roof Wind Designer determines the necessary design uplift capacities for the roof system incorporating an appropriate safety factor. Users can select wind-resistance roof systems using these design uplift capacity values.

Roof Wind Designer also will provide design wind load calculations related to edge-metal flashing systems for buildings with roof slopes of 1½:12 or less. These calculations are applicable to roof systems using metal fascia, embedded edge-metal or metal copings to secure membrane roof systems' perimeter edges.

Roof Wind Designer relies solely upon the preparer who generates this report to accurately input appropriate information that is applicable to the specific building to which this report applies. This report applies to only the specific roof area and building that is indicated above. Any misinformation, miscalculations, mistakes or changes that have been input into this application may affect the results, accuracy, reliability and results of this report.

Use of Roof Wind Designer is subject to a license agreement and important legal notices and disclaimers. By inputting project information and generating this report, the preparer who generates this report accepts this license agreement and important legal notices and disclaimers. A copy of this license agreement and important legal notices and disclaimers is included at the end of this report and is considered to be a part of this report.

Summary of the building and roof area information input by the preparer:

Roof Area Dimensions (feet):	96 x 30
Mean Roof Height (feet):	60.0
Roof Slope:	Flat: 1½:12 or less
Parapet(s) (minimum 36 inches high):	No
Building Configuration	Enclosed
Exposure:	B
Occupancy Category:	IV
Basic Wind Speed (three-second peak gust, mph):	115 from ASCE 7-10, Figure 26.5-1B Basic Wind Speed (value assigned by preparer)
Roof Deck Type:	Steel Deck
Roof Covering Type:	Modified Bitumen

In ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), roof area dimensions, mean roof height, roof slope, the building's configuration and exposure, risk category, and basic wind speed are used in the determination of the design wind loads.

The building's configuration (open, partially enclosed, enclosed) affects design wind loads of the roof system. ASCE 7-10, the Envelope Procedure, Part 2: Low-rise Buildings (Simplified), is limited to buildings of an enclosed configuration. An enclosed configuration is defined by ASCE 7-10 as a building that does not comply with the requirements for open or partially enclosed buildings. An open building is one having each wall at least 80 percent open. A partially enclosed building is one where the total area of openings in a wall that receives positive external pressure exceeds the sum of the area openings in the balance of the building envelope (walls and roof) by more than 10 percent and where the total area of openings in a wall that receives positive external pressure exceeds 4 ft2 or 1 percent of the area of that wall, whichever is smaller, and the percentage of openings in the balance of the building envelope does not exceed 20 percent.

A building's exposure has an effect on the magnitude of design wind loads that act on a building and the building's roof system. ASCE 7-10 provides for three Exposure Categories: B, C and D. Exposure Category C shall apply for all cases where Exposure Categories B or D do not apply. Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the windward direction for a distance of at least 2,600 feet. For buildings whose mean roof height is less than or equal to 30 feet, the upwind distance may be reduced to 1,500 feet. Exposure D shall apply where the ground surface roughness, as defined by Surface Roughness D, prevails in the upwind direction for a distance greater than 5,000 feet. Exposure D shall also apply where the ground surface roughness immediately upward of the site is B or C, and the site is within a distance of 600 feet or 20 times the building height, whichever is greater from an Exposure D condition.

A building's occupancy has an effect on the magnitude of design wind loads that act on a building and the building's roof system. In ASCE 7-10, a building's occupancy determines a risk category. ASCE 7-10 provides for four Risk Categories: I, II, III and IV. Part 2: Low-rise Buildings (Simplified) uses risk category to determine the applicable basic wind speed map.

Risk Category II applies to all buildings except those listed in Risk Categories I, III or IV. Risk Category I applies to buildings that represent a low hazard to human life in the event of failure. Risk Category III applies to buildings that represent a substantial hazard to human life in the event of failure. Risk Category IV applies to buildings designated as essential facilities or buildings where the failure of which could pose a substantial hazard to the community. Essential facilities are defined as buildings that are intended to remain operational in the event of extreme environmental loading from wind, snow or earthquakes.

The basic wind speed is representative of a 3-second peak gust wind speed at 33 feet above the ground in Exposure C and is determined from Figure 26.5-1A—Basic Wind Speeds for Occupancy Category II Buildings and Other Structures, Figure 26.5-1B—Basic Wind Speeds for Occupancy Category III and VI Buildings and Other Structures and Figure 26.5-1C—Basic Wind Speeds for Occupancy Category I Buildings and Other Structures.

Roof edge parapets may assist in reducing design wind loads acting in the corner regions of the roof area. ASCE 7-10, Part 3: Buildings with h > 60 ft., allows for this reduction only when a minimum 36-inch-high parapet occurs at the two outside edges of the specific corner area where the design wind load is being reduced.

Wind Design for Roof Systems

ASCE 7-10 specifies wind design procedures for buildings and organizes them into two categories: main wind force-resisting systems, and component and cladding elements. Main wind force-resisting systems are the structural elements assigned to provide the support and stability for the overall building. Components and cladding are elements of the building envelope that do not qualify as part of the main wind force-resisting system. Roof systems and edge-metal flashing systems are considered components and cladding.

ASCE 7-10 provides two methods to determine minimum design load requirements for buildings: strength design method and allowable stress design (ASD) method. Design wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values.

Roof systems and roof system components generally are designed using the ASD method. Because the ASD method's results often are used, a designer can adjust the strength design method's values to ASD method's values. A load-reduction factor is applied as a multiplier to the strength design values to determine the ASD values. ASCE 7-10 provides a load-reduction factor of 0.6 for this purpose, and the calculation is expressed as follows:

ASD value = Strength design value x 0.6

Roof Wind Designer determines design wind loads based upon the strength design method and then adjusts those values to the ASD method's values.

Design Wind Loads

To determine design wind loads on roof areas, ASCE 7-10 identifies three primary areas of differing wind loads on a roof area: roof area field, roof area perimeter and roof area corners. Within ASCE 7-10 these areas are designated as Zones 1, 2 and 3, respectively. Also, ASCE 7-10 identifies a dimension determined by calculation, referred to as "a," that defines the depth of the perimeter and corner zones from the roof area's edges.

Strength Design Method:

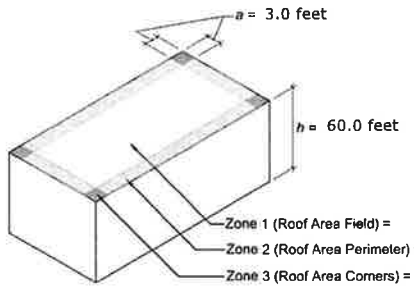
ASCE 7-10 uses three basic wind speed maps for different categories of building occupancies. These maps provide basic wind speeds that are applicable for calculating pressures and they are based on strength design. The strength design values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	29.0 pounds per square foot
Zone 2 (roof area perimeter):	48.7 pounds per square foot
Zone 3 (roof area corners):	73.3 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, the strength design values are depicted as follows:

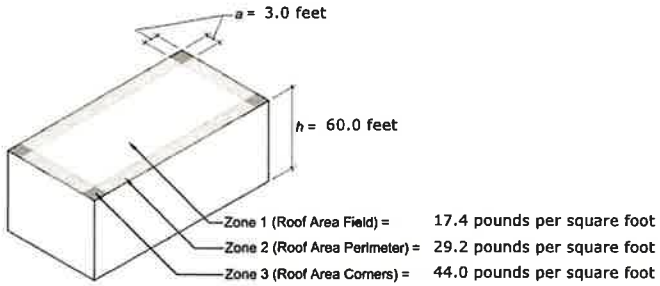


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, the load-reduction factor of 0.6 is applied. The ASD values determined for the roof area described by this report are as follows:

Zone 1 (roof area field):	17.4 pounds per square foot
Zone 2 (roof area perimeter):	29.2 pounds per square foot
Zone 3 (roof area corners):	44.0 pounds per square foot

Graphically, the ASD values are depicted as follows:



Minimum Recommended Design Uplift-resistance Capacities

Accepted engineering principles practice provides for applying a reasonable "safety factor" to design wind-uplift loads when using the ASD method to determine the minimum recommended design uplift-resistance capacities. This safety factor is intended to address possible variances in design wind load determination, normally anticipated variances in the materials and construction of the building, including the roof system, and any normally anticipated deterioration of the materials' physical properties because of aging. This safety factor is applied to the ASD values.
The equation to determine required design uplift-resistance capacity is:

Design uplift-resistance capacity = ASD Design wind load x Safety factor

For membrane roof systems, Roof Wind Designer determines roof systems' minimum recommended design uplift-resistance capacities, using a safety factor defined in ASTM D6630, "Standard Guide for Low Slope insulated Roof Membrane Assembly Performance." This recognized consensus standard indicates design uplift-resistance loads shall have a minimum 2.0 safety factor from the design wind uplift loads determined using ASCE 7.

For roof assemblies with steel deck and a steel or aluminum metal panel roof system, Roof Wind Designer applies a safety factor of 1.67. This safety factor is recommended in AISI S100, "North American Specification for the Design of Cold-formed Steel Structural Members" and "Aluminum Design Manual: Part 1—Specification for Aluminum Structures" for bending.

On this basis, taking into consideration the ASD design wind-uplift loads and the safety factor, the minimum recommended design uplift-resistance capacities for the specific roof area and building identified in this report are as follows:

Zone 1 (roof area field):	34.8 pounds per square foot
Zone 2 (roof area perimeter):	58.4 pounds per square foot
Zone 3 (roof area corners):	88.0 pounds per square foot

Using these minimum recommended design uplift-resistance capacity values, a user can select an appropriate wind-resistant roof system. The tested uplift-resistance capacity of the roof system should be greater than the minimum recommended design wind-resistance loads for the roof system to be considered appropriately wind resistant. This is expressed as:

Tested uplift-resistance capacity ≥ Design uplift-resistance capacity

Important note: To determine minimum recommended design uplift-resistance capacity values using the strength design method, designers will have to determine an appropriate safety factor on their own. Because the strength design method already includes a more conservative determination of design uplift loads, it is generally recognized any safety factor applied to design loads derived from using the strength design method can be less than the safety factor applied to the design loads derived from the ASD method.

Tested Uplift-resistance Load Capacities of Roof Systems

Roof systems' tested uplift-resistance load capacities typically are determined by laboratory testing or engineering analysis. In the International Building Code's 2009 and previous editions, four recognized test methods are referenced as acceptable methods for determining roof systems uplift-resistance capacities: FM 4450, FM 4470, UL 580 and UL 1898. The International Building Code's 2012 and 2015 editions reference FM 4474 instead of FM 4450 and FM 4470.

FM 4450, "Approval Standard for Class 1 Insulated Steel Roof Decks," and FM 4470, "Approval Standard for Single Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof and Liquid Applied Roof Assemblies for use in Class I and Noncombustible Roof Deck Construction," are the laboratory test methods and serve as the technical basis of the FM Approvals' approval classifications (FM 1-60, FM 1-75, FM 1-90 etc.), with which most roofing professional are familiar. FM Approvals' applies a safety factor of 2 within these classifications. For example, a roof system that has an FM 1-60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, a FM 1-75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM 1-90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM 4474, "American National Standard for Evaluating the Simulated Wind Uplift Resistance of Roof Assemblies Using Static Positive And/or Negative Differential Pressures," is similar to the uplift-resistance test methods contained in FM 4450 and FM 4470 and results in uplift classifications Class 60, Class 75, Class 90, etc., which are similar to the FM 1-60, FM 1-75, FM 1-90, etc., respectively derived using FM 4450 and FM 4470. For example, a roof system that has an FM Class 60 approval classification is recommended for use where the ASD design wind load is 30 pounds per square foot (psf) or less, an FM Class 75 approval designation is recommended for use where the design wind load is 37.5 psf or less, and an FM Class 90 approval classification is recommended for use where the design wind load is 45 psf or less, and so forth.

FM Global's Loss Prevention Data Sheet 1-29, "Roof Deck Securement and Above-deck Roof Components," addresses FM Global's recommended guidelines for addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

FM Approvals online approval directory containing a listing of FM Approval's-approved roof systems and a copy of FM Global's Loss Prevention Data Sheet 1-29 can be viewed in the reference documents section of FM Approval's RoofNav application accessible at www.roofnav.com.

UL 580, "Standard for Tests for Uplift Resistance of Roof Assemblies" and UL 1897, "Standard for Uplift Tests for Roof Covering Systems" are the laboratory test methods and serve as the technical basis for Underwriters Laboratories (UL's) Inc.'s classifications (Class 30, Class 60, Class 90, etc.) for uplift resistance. UL's classifications do not apply a safety factor. A UL classification indicating a roof system that has a Class 30 designation has been tested and found resistant to uplift loads of 30 psf, a Class 60 designation has been tested and found resistant to uplift loads of 60 psf, a Class 90 designation has been tested and found resistant to uplift loads of 90 psf, and so forth. UL does not provide specific guidance regarding addressing wind-uplift capacity in Zone 2 (roof area perimeter) and Zone 3 (roof area corners).

Additional information regarding UL's wind-uplift classifications is available in UL's Roofing Materials & Systems Directory and in the certifications section of UL's website by accessing www.ul.com and typing "TGIK" into the UL category code field.

Additional information regarding roof systems' wind-uplift capacities may also be available by contacting individual roof system manufacturers.

Wind Load Design for Perimeter Edge Metal

The International Building Code references standard ANSI/SPRI ES-1, "Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems." This code requirement is applicable to roof slopes less than 2:12. Because a roof slope of 1½:12 or less was selected for this project, this report also contains design load calculations related to edge-metal system design.

ANSI/SPRI ES-1 includes two primary elements: determination of design wind loads at roof edges (perimeter edge metal) and testing for resistance loads of perimeter edge metal. However, IBC does not adopt ANSI/SPRI ES-1 in its entirety. It requires low-slope metal edge securement be designed and installed using IBC's Chapter 16—Structural Design and tested for resistance in accordance with ANSI/SPRI ES-1's Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems," RE-2, "Test Method for Dependently or Independently Terminated Edge Systems," and Test RE-3, "Test for Copings," as applicable.

The fundamental concept of wind design as it applies to perimeter edge-metal systems is that the tested wind-resistance (uplift-resistance) capacity of perimeter edge-metal system should be greater than or equal to the design resistance loads that will act upon the perimeter edge-metal system. Design wind-resistance loads are derived from a building's design wind loads, taking into consideration an appropriate safety factor. Roof Wind Designer determines roof systems' minimum recommended design wind-resistance loads. Using these minimum recommended design wind-resistance loads, users can select appropriate wind resistance perimeter edge-metal systems.

Wind-resistance capacities of perimeter edge-metal systems are determined by testing in accordance with the test methods in ANSI/SPRI ES-1. Once design wind loads and minimum recommended design wind-resistance loads (including a safety factor) are determined, designers can select appropriate perimeter edge-metal systems that have tested capacities equal to or greater than the minimum recommended design wind resistance loads.

Design Wind Loads Using ASCE 7

IBC Chapter 16—Structural Design of IBC uses ASCE 7 as the basis for determining design wind loads; therefore, NRCA recommends using ASCE 7 for design wind load calculations instead of ANSI/SPRI ES-1.

As previously discussed in the section on Wind Load Design for Roof Systems, ASCE 7-10 provides two design methods to determine minimum load requirements for buildings: strength design and allowable stress design (ASD). The wind load calculations determined by the Envelope Procedure, Part 2: Low-rise Buildings (Simplified) method result in strength design values. However, roof systems and roof system components generally are designed using ASD.

Because ASD results often are used, a designer may want to adjust the strength design values to ASD values. A load-reduction factor is applied as a multiplier to adjust the values. An appropriate load-reduction factor is 0.6 and the calculation is expressed as follows:

Strength design value x 0.6 = ASD value

Roof Wind Designer provides the calculations for strength design and then adjusts those values to ASD values.

Strength Design Method:

ASCE 7 identifies a vertical surface as a "roof zone" and a horizontal surface as a "wall zone." As previously mentioned, Zones 1 through 3 are associated with roof areas. For wall areas, ASCE 7-10 identifies two primary areas of differing horizontal wind loads: perimeter and corners. These areas are designated as Zones 4 and 5, respectively. The dimension that defines the distance of the perimeter and corner zones is the same distance "a" used with defining Zones 1 through 3 for roof areas.

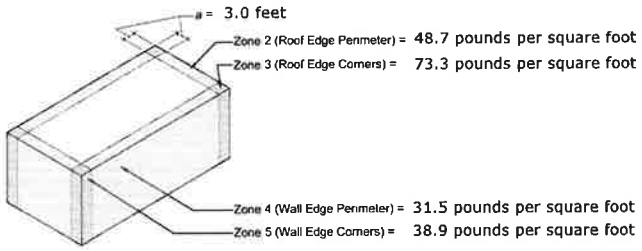
For the zones described by this report, the strength design wind loads determined using ASCE 7-10 are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	48.7 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	73.3 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	31.5 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	38.9 pounds per square foot

Also, the calculated "a" dimension is as follows:

***a*:**	3.0 feet

Graphically, these values are depicted as follows:

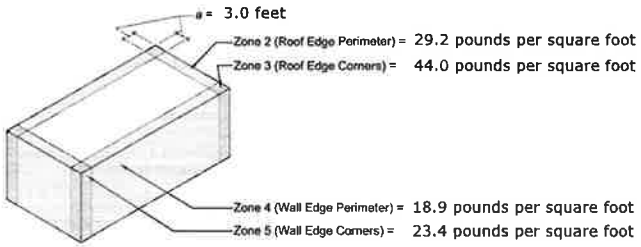


Adjustment of Strength Design to Allowable Stress Design (ASD):

To adjust the strength design values to ASD values, a load-reduction factor of 0.6 should be applied. The ASD values determined for the wall area described by this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	29.2 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	44.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	18.9 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	23.4 pounds per square foot

Graphically, these values are depicted as follows:



Minimum Recommended Design Wind-resistance Loads

NRCA recommends designers include an appropriate safety factor in their design wind-resistance calculations for perimeter edge-metal flashings. NRCA suggests a minimum safety factor of 2.0 be applied to steel or aluminum edge-metal flashings. This is consistent with the minimum safety factor recommended in ANSI/SPRI ES-1's design wind load calculations section.

The safety factor is applied to the ASD values. The equation to determine required design wind-resistance load is:

Design wind-resistance capacity = [ASD Design wind load] x [Safety factor of 2.0]

Taking into consideration the design wind-uplift loads, the minimum recommended design wind-resistance loads for the specific roof and wall areas described in this report are as follows:

Zone 2 (roof edge perimeter, vertical load direction):	58.4 pounds per square foot
Zone 3 (roof edge corners, vertical load direction):	88.0 pounds per square foot
Zone 4 (wall edge perimeter, horizontal load direction):	37.8 pounds per square foot
Zone 5 (wall edge corners, horizontal load direction):	46.7 pounds per square foot

Please note: The safety factor used to determine minimum recommended design wind-resistance loads for perimeter edge metal may be a different value than the safety factor used in the roof system calculations.

Tested Resistance Load Capacities of Perimeter Edge Metal

Using the minimum recommended design wind-resistance values, a user can select an appropriately wind-resistant perimeter edge metal. The tested wind-resistance load capacity—commonly referred to as "load capacity"—of the perimeter edge metal should be greater than the minimum recommended design wind-resistance capacities for the perimeter edge-metal system to be considered appropriately wind-resistant.

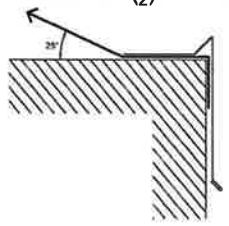
Tested wind-resistance capacities of edge-metal flashing systems are determined by testing. IBC requires the testing be done in accordance with the RE-1, RE-2 and RE-3 test methods contained in ANSI/SPRI ES-1 as applicable to the specific roof perimeter edge metal configuration. These three test methods are:

- Test RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."
- Test RE-2, "Test Method for Dependently or Independently Terminated Edge Systems."
- Test RE-3, "Test for Copings."

The following images illustrate how to apply the design wind-resistance capacities (including a safety factor) for fascia, embedded edge metal and copings based on RE-1, RE-2 and RE-3:

Force at Perimeter = $\left(\frac{r}{2}\right)$ x 138.4 pounds per square foot

Force at Corners = $\left(\frac{r}{2}\right)$ x 208.5 pounds per square foot



where:

r = horizontal distance to first row of fasteners from edge of roof system

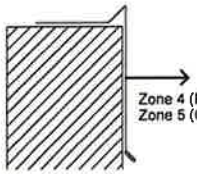
or

r = 6 feet, for ballasted roof systems

RE-1, "Test Method for Dependently Terminated Roof Membrane Systems."

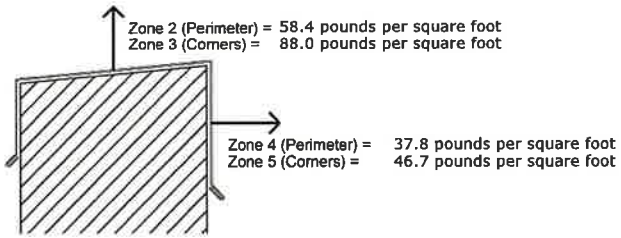
Note: The resultant forces indicated on the figure need to be further adjusted, depending on row spacing of the membrane fasteners or if the roof system is ballasted.

RE-1 tests an edge metal system's ability to restrain a membrane force from billowing. This test method is only applicable to ballasted and mechanically attached membrane systems that do not contain a "peel stop" within 12 inches of the roof edge. RE-1 is not applicable to adhered roof membranes.



RE-2, "Test Method for Dependently or Independently Terminated Roof Membrane Systems."

RE-2 tests resistances to horizontal (outward from building face) loads for gravel stops or fascias.



RE-3, "Test for Copings."

RE-3 tests copings' resistances to outward (horizontal) and upward (vertical) pressures.

Using these minimum recommended design wind-resistance load values, a user can select an appropriately wind-resistant edge-metal flashing system. The tested wind-resistance capacity of the edge-metal flashing system should be greater than the minimum recommended design wind-resistance loads for the edge-metal flashing system to be considered appropriately wind-resistant. This is expressed as:

Tested wind-resistance capacity ≥ Design wind-resistance capacity

NRCA has conducted extensive testing using methods RE-2 and RE-3 of various edge-metal flashing profiles that are usually shop-fabricated. The edge-metal profiles tested are based upon the construction details contained in The NRCA Roofing Manual.

Visit www.nrca.net/roofing/Shop-fabricated-edge-metal-testing-242 to view drawings of the specific edge-metal flashings that have been tested. The drawings contain the tested wind-resistance capacity values for each edge-metal flashing profile. NRCA maintains certification programs with Underwriters Laboratories Inc. and Intertek Testing Services, N.A. Each program has its specific set of tested edge-metal flashing profiles.

SECTION 076200 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof-drainage sheet metal fabrications
2. Low-slope roof sheet metal fabrications.
3. Miscellaneous sheet metal fabrications.

B. Work of this Section is applicable to the following buildings:

1. Police HQ and Government Annex, not including Roof 'D.'

1.2 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

F. "Provide": Furnish and install, complete and ready for the intended use.

G. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

H. "Fabricator Qualifications": A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, flashings, and counterflashings.
10. Include details of special conditions.
11. Include details of connections to adjoining work.

C. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.

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1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested.

C. Evaluation Reports: For copings and roof edge flashing, from an agency acceptable to authority having jurisdiction showing compliance with ANSI/SPRI/FM 4435/ES-1.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

B. Special warranty.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are ANSI/SPRI/FM 4435/ES-1 tested and FM Approvals approved, shop is to be listed as able to fabricate required details as tested and approved.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
2. Protect stored sheet metal flashing and trim from contact with water.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual: Architectural Metal Flashing, Condensation and Air Leakage Control, and Reroofing " and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install copings and roof edge flashings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

D. SPRI Wind Design Standard: Manufacture and install copings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

1. Design Pressure:

a. Horizontal (Outward): 35 psi.
b. Vertical (Upward): 90 psf.

E. FM Approvals Listing: Manufacture and install copings and roof edge flashings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

F. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

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2.2 SHEET METALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Stainless Steel Sheet: ASTM A240/A240M, Type 304Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: ASTM A480/A480M, No. 2D (dull, cold rolled).

C. Metallic Coated Steel Sheet: Provide zinc coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A755/A755M.

1. Surface: Smooth, flat.
2. Exposed Coil Coated Finish:

a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Color: As selected by Architect from manufacturer's full range.
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

D. Lead Sheet: ASTM B749 lead sheet.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, , protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength aluminum or stainless steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.
3. Fasteners for Stainless Steel Sheet: Series 300 stainless steel.

C. Worm Gear Clamps: Series 300 stainless steel, sizes as required to suit project applications.

D. Solder:

1. For Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.

E. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

F. Elastomeric Sealant: Comply with requirements of Section 079200 "Joint Sealants."

G. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

H. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Class 1, Grade 2, felt or glass-fiber mat facer on both major surfaces.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Apache Products Company.
b. Atlas Roofing Corporation.
c. Hunter Panels.
d. Johns Manville; a Berkshire Hathaway company.

I. Mineral-Wool Blanket Insulation, Unfaced: ASTM C665, Type I (blankets without membrane facing); consisting of fibers; passing ASTM E136 for combustion characteristics.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Johns Manville; a Berkshire Hathaway company.
b. Rockwool International.
c. Thermafiber, Inc.; an Owens Corning company.

2. Flame-Spread Index: Not more than 25 when tested in accordance with ASTM E84.
3. Smoke-Developed Index: Not more than 50 when tested in accordance with ASTM E84.
4. Application: Expansion joint fill.

J. Spray Polyurethane Foam Insulation: Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. BASF Corporation.
b. BaySystems NorthAmerica, LLC.
c. Dow Chemical Company (The).

2. Minimum density of 1.5 lb/cu. ft., thermal resistivity of 6.2 deg F x h x sq. ft./Btu x in. at 75 deg F.
3. Application: Insulation for Miscellaneous Voids.

K. Flexible Flashing Material: EPDM Sheet, ASTM D4637/D4637M, Type I, nonreinforced, EPDM sheet.

1. Thickness: 60 mils nominal.

L. Catalyzed Acrylic Resin Flashing System: A reinforced, multi-component, flexible Poly(methyl methacrylate) (PMMA) based resin flashing system consisting of a catalyzed acrylic resin primer, basecoat and topcoat, combined with a non-woven polyester fleece.

1. PMMA Primer.
2. Base coat.
3. Non-woven, polyester, fleece sheet reinforcement.
4. Top coat.

2.4 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams: Form seams as follows:

1. Stainless Steel Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Metallic Coated Steel Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters:

1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
2. Fabricate in minimum 96-inch-long sections.
3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness.
4. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
5. Gutter Profile: As indicated on Drawings.
6. Gutters:

a. Galvanized Steel: 0.028 inch thick.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

1. Fabricated Hanger Style: As indicated on Drawings.
2. Fabricate from the following materials:

a. Galvanized Steel: 0.028 inch thick.

C. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Galvanized Steel: 0.028 inch thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates. Shop fabricate interior and exterior corners.

1. Joint Style: Overlapped, 4 inches wide.
2. Fabricate from the following materials:

a. Galvanized Steel: 0.028 inch thick.

B. Drip Edges: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

C. Copings: Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long, sections. Fabricate joint plates of same thickness as copings. Furnish with continuous cleats to support edge of external leg and drill elongated holes for fasteners on interior leg. Miter corners, fasten and seal watertight. Shop fabricate interior and exterior corners.

1. Coping Profile: As indicated on Drawings and in accordance with SMACNA's "Architectural Sheet Metal Manual."
2. Joint Style: Butted with expansion space and 6-inch-wide, exposed cover plate.
3. Fabricate from the following materials:

a. Galvanized Steel: 0.028 inch thick.

D. Roof-to-Wall Transition Expansion-Joint Cover: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Stainless Steel: 0.0250 inch thick.
2. Galvanized Steel: 0.028 inch thick.

E. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Stainless Steel: 0.0188 inch thick.
2. Galvanized Steel: 0.028 inch thick.

F. Slip-Up Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Stainless Steel: 0.0188 inch thick.
2. Galvanized Steel: 0.028 inch thick.

G. Flashing Receivers: Fabricate from the following materials:

1. Stainless Steel: 0.0156 inch thick.

H. Roof-Penetration Flashing: Fabricate from the following materials as indicated on Drawings:

1. Solid-Wall PVC Pipe: ASTM D 2665.
2. Galvanized Steel: 0.028 inch thick.
3. Lead: 4 lb.

I. Vent/Heat Pipe Collar: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch thick.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Trim and Blocking Wrap: Wrap wood blocking where indicated on the Drawings with sheet metal fabricated from the following materials:

1. Galvanized Steel: 0.022 inch thick.

B. Conduit/Cable Penetration Flashing: Fabricate from the following materials:

1. Stainless Steel: 0.025 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

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3.2 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds, sealant, and solder.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
5. Space individual cleats not more than 12 inches apart. Attach each cleat with at least 2 fasteners. Bend tabs over fasteners.
6. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
7. Do not field cut sheet metal flashing and trim by torch.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.

a. Embed hooked flanges of joint members not less than 1 inch into sealant.
b. Form joints to completely conceal sealant.
c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
d. Adjust setting proportionately for installation at higher ambient temperatures.

1) Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.

1. Pretin edges of sheets with solder to width of 1-1/2 inches; however, reduce pretinning where pretinned surface would show in completed Work.
2. Do not solder metallic-coated steel sheet.
3. Do not pretin zinc-tin alloy-coated copper.
4. Do not use torches for soldering.
5. Heat surfaces to receive solder, and flow solder into joint.

a. Fill joint completely.
b. Completely remove flux and spatter from exposed surfaces.

6. Stainless Steel Soldering:

a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
b. Promptly remove acid-flux residue from metal after tinning and soldering.
c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

H. Rivets: Rivet joints in metallic-coated steel sheet where necessary for strength and where indicated on Drawings.

3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters:

1. Join sections with joints sealed with sealant.
2. Provide for thermal expansion.
3. Attach gutters at eave or fascia to firmly anchor them in position.
4. Provide end closures and seal watertight with sealant.
5. Slope to downspouts.
6. Fasten gutter spacers to front and back of gutter.
7. Anchor gutter with straps spaced not more than 24 inches apart to roof deck unless otherwise indicated, and loosely lock to front gutter bead.
8. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.

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2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Provide elbows at base of downspout to direct water away from building.

D. Splash Pans:

1. Install where downspouts discharge on low-slope roofs.
2. Set in asphalt roofing cement compatible with the substrate.

E. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated on Drawings. Lap joints minimum of 4 inches in direction of water flow.

3.4 INSTALLATION OF ROOF FLASHINGS

A. Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated. Interlock bottom edge of roof edge flashing with continuous cleat anchored to substrate at staggered 3-inch centers.
3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

C. Copings:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated.

a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
b. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

D. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless steel draw band and tighten.

E. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.
4. Secure in waterproof manner by means of anchor and washer spaced at 12 inches o.c. along perimeter and 6 inches o.c. at corners areas unless otherwise indicated.

F. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

1. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.
2. Apply spray polyurethane foam insulation where indicated on Drawings to fill voids according to manufacturer's written instruction.

3.5 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.7 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200

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SECTION 076200.15 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Formed low-slope roof sheet metal fabrications.

B. Work of this Section is applicable to the following buildings:

1. Police Headquarters, Roof 'D' Overlay.

1.2 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

F. "Provide": Furnish and install, complete and ready for the intended use.

G. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

H. "Fabricator Qualifications": A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

1.3 COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leakproof, secure, and noncorrosive installation.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of special conditions.
10. Include details of connections to adjoining work.

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

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1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type roof edge flashing that is ANSI/SPRI/FM 4435/ES-1 tested.

C. Product Certificates: For each type of coping that is ANSI/SPRI/FM 4435/ES-1 tested.

D. Sample Warranty: For special warranty.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

B. Special warranty.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings that are ANSI/SPRI/FM 4435/ES-1 tested, shop shall be listed as able to fabricate required details as tested and approved.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage.

1. Store sheet metal flashing and trim materials away from uncured concrete and masonry.
2. Protect stored sheet metal flashing and trim from contact with water.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

1.10 WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Exposed Panel Finish: Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. SPRI Wind Design Standard: Manufacture and install copings tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressure:

1. Design Pressure:

a. Horizontal (Outward): 35 psi.
b. Vertical (Upward): 90 psf.

D. FM Approvals Listing: Manufacture and install copings that are listed in FM Approvals' "RoofNav" and approved for windstorm classification, Class 1-90. Identify materials with name of fabricator and design approved by FM Approvals.

E. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METALS

A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

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B. Stainless Steel Sheet: ASTM A240/A240M, Type 304Type 304, dead soft, fully annealed; with smooth, flat surface.

1. Finish: ASTM A480/A480M, No. 2D (dull, cold rolled).

C. Metallic Coated Steel Sheet: Provide zinc coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 coating designation; prepainted by coil-coating process to comply with ASTM A755/A755M.

1. Surface: Smooth, flat.
2. Exposed Coil Coated Finish for Base Flashings and Roof Edge Flashings:

a. PVC Coated Metal: Manufacturer's standard heat-fused, non-reinforced PVC laminated to galvanized steel sheet metal.

3. Exposed Coil Coated Finish for Gutters, Downspouts, Splash Pans and Other Sheet Metal Items:

a. 2-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight in color coat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

4. Color: As selected by Architect from manufacturer's full range.
5. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil.

D. Lead Sheet: ASTM B749 lead sheet.

2.3 MISCELLANEOUS MATERIALS

A. Provide materials and types of fasteners, , protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
b. Blind Fasteners: High-strength stainless steel rivets suitable for metal being fastened.
c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel according to ASTM A 153/A 153M or ASTM F 2329.

C. Solder:

1. For Stainless Steel: ASTM B32, Grade Sn60, with acid flux of type recommended by stainless steel sheet manufacturer.

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: Comply with requirements of Section 079200 "Joint Sealants."

F. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

2.4 FABRICATION, GENERAL

A. Custom fabricate sheet metal flashing and trim to comply with details indicated and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required.

1. Fabricate sheet metal flashing and trim in shop to greatest extent possible.
2. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
3. Verify shapes and dimensions of surfaces to be covered and obtain field measurements for accurate fit before shop fabrication.
4. Form sheet metal flashing and trim to fit substrates without excessive oil-canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
5. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances:

1. Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.
2. Fabricate sheet metal flashing and trim that is capable of installation to tolerances specified.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal in accordance with cited sheet metal standard to provide for proper installation of elastomeric sealant.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Fabricate cleats and attachment devices of sizes as recommended by cited sheet metal standard and by FM Global Property Loss Prevention Data Sheet 1-49 for application, but not less than thickness of metal being secured.

G. Seams: Form seams as follows:

1. Stainless Steel Seams: Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. Metallic Coated Steel Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use. Rivet joints where necessary for strength.

2.5 ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters:

1. Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required.
2. Fabricate in minimum 96-inch-long sections.
3. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard, but with thickness not less than twice the gutter thickness.
4. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.
5. Gutter Profile: As indicated on Drawings.
6. Gutters:

a. Galvanized Steel: 0.028 inch thick.

B. Downspouts: Fabricate rectangular downspouts to dimensions indicated on Drawings, complete with mitered elbows. Furnish with metal hangers from same material as downspouts and anchors. Shop fabricate elbows.

1. Fabricated Hanger Style: As indicated on Drawings.
2. Fabricate from the following materials:

a. Galvanized Steel: 0.028 inch thick.

C. Splash Pans: Fabricate to dimensions and shape required and from the following materials:

1. Galvanized Steel: 0.028 inch thick.

2.6 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop): Fabricate in minimum 96-inch-long, but not exceeding 12-foot-long sections. Furnish with 6-inch-wide, joint cover plates. Shop fabricate interior and exterior corners.

1. Joint Style: Overlapped, 4 inches wide.
2. Fabricate from the following materials:

a. Galvanized Steel: 0.028 inch thick.

B. Roof-to-Wall Transition Expansion-Joint Cover: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

C. Base Flashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

D. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

E. Flashing Receivers: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

F. Roof-Penetration Flashing: Fabricate from the following materials:

1. Lead: 4 lb.

2.7 MISCELLANEOUS SHEET METAL FABRICATIONS

A. Curb Flashing: Fabricate from the following materials:

1. Galvanized Steel: 0.028 inch thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for installation tolerances, substrate, and other conditions affecting performance of the Work.

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1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install sheet metal flashing and trim to comply with details indicated and recommendations of cited sheet metal standard that apply to installation characteristics required unless otherwise indicated on Drawings.

1. Install fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.
2. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of welds, sealant, and solder.
3. Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement.
4. Install sheet metal flashing and trim to fit substrates and to result in watertight performance.
5. Space individual cleats not more than 12 inches apart. Attach each cleat with at least 2 fasteners. Bend tabs over fasteners.
6. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks.
7. Do not field cut sheet metal flashing and trim by torch.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.

1. Space movement joints at maximum of 10 feet with no joints within 24 inches of corner or intersection.
2. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws and that penetrate substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated.

   a. Embed hooked flanges of joint members not less than 1 inch into sealant.
   b. Form joints to completely conceal sealant.
   c. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way.
   d. Adjust setting proportionately for installation at higher ambient temperatures.

      1) Do not install sealant-type joints at temperatures below 40 deg F.

2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter.

1. Pretin edges of sheets with solder to width of 1-1/2 inches; however, reduce pretinning where pretinned surface would show in completed Work.
2. Do not solder metallic-coated steel sheet.
3. Do not pretin zinc-tin alloy-coated copper.
4. Do not use torches for soldering.
5. Heat surfaces to receive solder, and flow solder into joint.

   a. Fill joint completely.
   b. Completely remove flux and spatter from exposed surfaces.

6. Stainless Steel Soldering:

   a. Tin edges of uncoated sheets, using solder for stainless steel and acid flux.
   b. Promptly remove acid-flux residue from metal after tinning and soldering.
   c. Comply with solder manufacturer's recommended methods for cleaning and neutralization.

H. Rivets: Rivet joints in metallic-coated steel sheet where necessary for strength and where indicated on Drawings.

3.3 INSTALLATION OF ROOF-DRAINAGE SYSTEM

A. Install sheet metal roof-drainage items to produce complete roof-drainage system in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters:

1. Join sections with joints sealed with sealant.
2. Provide for thermal expansion.
3. Attach gutters at eave or fascia to firmly anchor them in position.
4. Provide end closures and seal watertight with sealant.
5. Slope to downspouts.
6. Fasten gutter spacers to front and back of gutter.

7. Anchor gutter with straps spaced not more than 24 inches apart to roof deck unless otherwise indicated, and loosely lock to front gutter bead.
8. Install gutter with expansion joints at locations indicated on Drawings, but not exceeding, 50 feet apart. Install expansion-joint caps.

C. Downspouts:

1. Join sections with 1-1/2-inch telescoping joints.
2. Provide hangers with fasteners designed to hold downspouts securely to walls.
3. Locate hangers at top and bottom and at approximately 60 inches o.c.
4. Provide elbows at base of downspout to direct water away from building.

D. Splash Pans:

1. Install where downspouts discharge on low-slope roofs.
2. Set in asphalt roofing cement compatible with the substrate.

3.4 INSTALLATION OF ROOF FLASHINGS

A. Install sheet metal flashing and trim to comply with performance requirements and cited sheet metal standard.

1. Provide concealed fasteners where possible, and set units true to line, levels, and slopes.
2. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Copings:

1. Install roof edge flashings in accordance with ANSI/SPRI/FM 4435/ES-1.
2. Anchor to resist uplift and outward forces in accordance with recommendations in cited sheet metal standard unless otherwise indicated.

   a. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 16-inch centers.
   b. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

3. Anchor to resist uplift and outward forces in accordance with recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

C. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.

1. Insert counterflashing in receivers and fit tightly to base flashing.
2. Extend counterflashing 4 inches over base flashing.
3. Lap counterflashing joints minimum of 4 inches.
4. Secure in waterproof manner by means of anchor and washer spaced at 12 inches o.c. along perimeter and 6 inches o.c. at corners areas unless otherwise indicated.

D. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof.

1. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

3.5 INSTALLATION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

3.6 CLEANING

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

3.7 PROTECTION

A. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions.

B. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended in writing by sheet metal flashing and trim manufacturer.

C. Maintain sheet metal flashing and trim in clean condition during construction.

D. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures, as determined by Architect.

END OF SECTION 076200.15

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SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Urethane joint sealants.
2. Butyl joint sealants.

1.2 DEFINITIONS

A. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

B. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

C. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

D. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

E. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

F. "Provide": Furnish and install, complete and ready for the intended use.

G. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

H. "Testing and Inspecting Agency Qualifications": An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

A. Product Data: For each joint-sealant product.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each kind and color of joint sealant required, provide Samples with joint sealants in 1/2-inch-wide joints formed between two 6-inch-long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Joint-Sealant Schedule: Include the following information:

1. Joint-sealant application, joint location, and designation.
2. Joint-sealant manufacturer and product name.
3. Joint-sealant formulation.
4. Joint-sealant color.

1.5 INFORMATIONAL SUBMITTALS

A. Product Test Reports: For each kind of joint sealant, for tests performed by manufacturer and witnessed by a qualified testing agency or by a qualified testing agency.

B. Preconstruction Laboratory Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation are needed for adhesion.

C. Sample Warranties: For special warranties.

1.6 CLOSEOUT SUBMITTALS

A. Manufacturers' special warranties.

B. Installer's special warranties.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.

B. Product Testing: Test joint sealants using a qualified testing agency.

1. Testing Agency Qualifications: Qualified according to ASTM C 1021 to conduct the testing indicated.

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1.8 PRECONSTRUCTION TESTING

A. Preconstruction Laboratory Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.

1. Adhesion Testing: Use ASTM C 794 to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
2. Compatibility Testing: Use ASTM C 1087 to determine sealant compatibility when in contact with glazing and gasket materials.
3. Submit manufacturer's recommended number of pieces of each type of material, including joint substrates, joint-sealant backings, and miscellaneous materials.
4. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
5. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures, including use of specially formulated primers.
6. Testing will not be required if joint-sealant manufacturers submit data that are based on previous testing, not older than 24 months, of sealant products for adhesion to, staining of, and compatibility with joint substrates and other materials matching those submitted.

1.9 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.10 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 2 years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: 5 years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 25, NT: Single-component, nonsag, nontraffic-use, plus 25 percent and minus 25 percent movement capability, urethane joint sealant; ASTM C 920, Type S, Grade NS, Class 25, Use NT.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Bostik, Inc.
   b. MasterSeal Sealants, MBCC Group.
   c. Pecora Corporation.
   d. Sherwin-Williams Company (The).
   e. Sika Corporation; Joint Sealants.
   f. Tremco Incorporated.

2.3 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C 1311.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

   a. Bostik, Inc.
   b. Everkem Diversified Products, Inc.
   c. Pecora Corporation.

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2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience.

C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

D. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 EXTERIOR JOINT-SEALANT SCHEDULE

A. Joint Sealant Application: Roofing and Flashing Surfaces:

1. Joint Locations:

a. Roofing Specialties.
b. Sheet metal flashing and trim.
c. Other joints as indicated on Drawings.

2. Joint Sealant: Urethane, S, NS, 25, NT.

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B. Joint-Sealant Application: Concealed mastics.

1. Joint Locations:

a. Other joints as indicated on Drawings.

2. Joint Sealant: Butyl-rubber based.

END OF SECTION 079200

SECTION 089119 - FIXED LOUVERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Fixed extruded-aluminum louvers.

1.2 DEFINITIONS

A. Louver Terminology: Definitions of terms for metal louvers contained in AMCA 501 apply to this Section unless otherwise defined in this Section or in referenced standards.

B. Horizontal Louver: Louver with horizontal blades (i.e., the axis of the blades are horizontal).

C. Drainable-Blade Louver: Louver with blades having gutters that collect water and drain it to channels in jambs and mullions, which carry it to bottom of unit and away from opening.

D. Wind-Driven-Rain-Resistant Louver: Louver that provides specified wind-driven-rain performance, as determined by testing in accordance with AMCA 500-L.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For louvers and accessories. Include plans, elevations, sections, details, and attachments to other work. Show frame profiles and blade profiles, angles, and spacing.

C. Samples: For each type of metal finish required.

1.4 INFORMATIONAL SUBMITTALS

A. Product Test Reports: Based on evaluation of comprehensive tests performed in accordance with AMCA 500-L by a qualified testing agency or by manufacturer and witnessed by a qualified testing agency, for each type of louver and showing compliance with performance requirements specified.

B. Sample Warranties: For manufacturer's special warranties.

1.5 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."

1.6 FIELD CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 WARRANTY

A. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of baked enamel, powder coat, or organic finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain fixed louvers from single source from a single manufacturer where indicated to be of same type, design, or factory-applied color finish.

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Louvers withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated without permanent deformation of louver components, noise or metal fatigue caused by louver-blade rattle or flutter, or permanent damage to fasteners and anchors. Wind pressures are considered to act normal to the face of the building.

1. Wind Loads:

a. Determine loads based on a uniform pressure of 30 lbf/sq. ft., acting inward or outward.

B. Louver Performance Ratings: Provide louvers complying with requirements specified, as demonstrated by testing manufacturer's stock units identical to those provided, except for length and width in accordance with AMCA 500-L.

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C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

D. SMACNA Standard: Comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for fabrication, construction details, and installation procedures.

2.3 FIXED EXTRUDED-ALUMINUM LOUVERS

A. Horizontal, Continuous-Line, Drainable-Blade Louver, Extruded Aluminum: Drainable-blade louver with blade gutters (drains) in rear 2-thirds of blades only.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Architectural Louvers Co.; Harray, LLC.
b. Construction Specialties, Inc.
c. Greenheck Fan Corporation.
d. Ruskin; Air Distribution Technologies, Inc.; Johnson Controls, Inc.

1. Louver Depth: 2 inches.
2. Frame and Blade Nominal Thickness: Not less than 0.080 inch.
3. Louver Performance Ratings:

a. Free Area: Not less than 7.8 sq. ft. for 48-inch-wide by 48-inch-high louver.
b. Point of Beginning Water Penetration: Not less than 850 fpm.
c. Air Performance: Not more than 0.10-inch wg static pressure drop at 850 fpm free-area intake velocity.

4. AMCA Seal: Mark units with AMCA Certified Ratings Seal.

2.4 LOUVER SCREENS

A. General: Provide screen at each exterior louver.

1. Screen Location for Fixed Louvers: Interior face.
2. Screening Type: Bird screening.

B. Secure screen frames to louver frames with stainless steel machine screws, spaced a maximum of 6 inches from each corner and at 12 inches o.c.

C. Louver Screen Frames: Fabricate with mitered corners to louver sizes indicated.

1. Metal: Same type and form of metal as specified for louver to which screens are attached. Reinforce extruded-aluminum screen frames at corners with clips.
2. Finish: Same finish as louver frames to which louver screens are attached.

3. Type: Non-rewirable, U-shaped frames.

D. Louver Screening for Aluminum Louvers:

1. Bird Screening, Aluminum: 1/2-inch-square mesh, 0.063-inch wire.

2.5 MATERIALS

A. Aluminum Extrusions: ASTM B221, Alloy 6063-T5, T-52, or T6.

B. Aluminum Sheet: ASTM B209, Alloy 3003 or 5005, with temper as required for forming, or as otherwise recommended by metal producer for required finish.

C. Fasteners: Use types and sizes to suit unit installation conditions.

1. Use tamper-resistant screws for exposed fasteners unless otherwise indicated.
2. For fastening aluminum, use aluminum or 300 series stainless steel fasteners.
3. For fastening stainless steel, use 300 series stainless steel fasteners.
4. For color-finished louvers, use fasteners with heads that match color of louvers.

D. Postinstalled Fasteners for Concrete and Masonry: Torque-controlled expansion anchors, fabricated from stainless steel components, with allowable load or strength design capacities calculated in accordance with ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing in accordance with ASTM E488/E488M conducted by a qualified testing agency.

E. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.

2.6 FABRICATION

A. Factory assemble louvers to minimize field splicing and assembly. Disassemble units as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.

B. Maintain equal louver blade spacing, including separation between blades and frames at head and sill, to produce uniform appearance.

C. Fabricate frames, including integral sills, to fit in openings of sizes indicated, with allowances made for fabrication and installation tolerances, adjoining material tolerances, and perimeter sealant joints.

1. Frame Type: Channel unless otherwise indicated.

D. Include supports, anchorages, and accessories required for complete assembly.

E. Join frame members to each other and to fixed louver blades with fillet welds concealed from view , threaded fasteners, or both, as standard with louver manufacturer unless otherwise

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indicated or size of louver assembly makes bolted connections between frame members necessary.

2.7 ALUMINUM FINISHES

A. Finish louvers after assembly.

B. High-Performance Organic Finish, 2-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in color coat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
2. Color and Gloss: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and openings, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Coordinate setting drawings, diagrams, templates, instructions, and directions for installation of anchorages that are to be embedded in concrete or masonry construction. Coordinate delivery of such items to Project site.

3.3 INSTALLATION

A. Locate and place louvers level, plumb, and at indicated alignment with adjacent work.

B. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.

C. Form closely fitted joints with exposed connections accurately located and secured.

D. Provide perimeter reveals and openings of uniform width for sealants and joint fillers, as indicated on Drawings.

E. Protect unpainted galvanized- and nonferrous-metal surfaces that are in contact with concrete, masonry, or dissimilar metals from corrosion and galvanic action by applying a heavy coating of bituminous paint or by separating surfaces with waterproof gaskets or nonmetallic flashing.

F. Install concealed gaskets, flashings, joint fillers, and insulation as louver installation progresses, where weathertight louver joints are required. Comply with Section 079200 "Joint Sealants" for sealants applied during louver installation.

3.4 ADJUSTING AND CLEANING

A. Clean exposed louver surfaces that are not protected by temporary covering, to remove fingerprints and soil during construction period. Do not let soil accumulate during construction period.

B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to finishes. Thoroughly rinse surfaces and dry.

C. Restore louvers damaged during installation and construction, so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by Architect, remove damaged units and replace with new units.

1. Touch up minor abrasions in finishes with air-dried coating that matches color and gloss of, and is compatible with, factory-applied finish coating.

END OF SECTION 089119

SECTION 099100 – PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes surface preparation and the application of paint systems on the following new and existing exterior substrates:

1. Exterior Materials:

a. Galvanized metal.

1.2 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

H. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

I. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."

J. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

K. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

L. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

M. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

N. "Provide": Furnish and install, complete and ready for the intended use.

O. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product. Include preparation requirements and application instructions.

B. Samples for Initial Selection: For each type of topcoat product.

C. Samples for Verification: For each type of paint system and each color and gloss of topcoat.

D. Product List: Cross-reference to paint system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include color designations.

1.4 INFORMATIONAL SUBMITTALS

A. Recommendations: Written recommendations from manufacturers for products and methods as required below in Part 2 and Part 3 of this section.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

1.6 FIELD CONDITIONS

A. Apply paints only when temperature of surfaces to be painted and ambient air temperatures are between 50 and 95 deg F.

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B. Do not apply paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Benjamin Moore & Co.
2. PPG Architectural Coatings.
3. Sherwin-Williams Company (The).

B. Products: Subject to compliance with requirements, provide one of the products listed in the Exterior Painting Schedule for the paint category indicated.

2.2 PREPARATORY CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F.

C. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for every 5 gal. of solution required.

2.3 PAINT, GENERAL

A. Material Compatibility:

1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

B. Colors: As selected by Architect from manufacturer's full range.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.

C. Proceed with coating application only after unsatisfactory conditions have been corrected.

1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" or "MPI Maintenance Repainting Manual" applicable to substrates and paint systems indicated.

B. Remove hardware, covers, plates, and similar items already in place that are removable and are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.

1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

C. Clean substrates of substances that could impair bond of paints, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

D. Galvanized-Metal Substrates: Remove grease and oil residue from galvanized sheet metal by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

3.3 PROTECTION

A. Comply with each manufacturer's written instructions for protecting building and other surfaces against damage from exposure to its products. Prevent chemical solutions from coming into contact with people, motor vehicles, landscaping, buildings, and other surfaces that could be harmed by such contact.

1. Cover adjacent surfaces with materials that are proven to resist chemical solutions being used unless the solutions will not damage adjacent surfaces. Use protective materials that are UV resistant and waterproof. Apply masking agents to comply with manufacturer's written instructions. Do not apply liquid masking agent to painted or porous surfaces. When no longer needed, promptly remove masking to prevent adhesive staining.
2. Do not apply chemical solutions during winds of sufficient force to spread them to unprotected surfaces.
3. Neutralize and collect alkaline and acid wastes before disposal.
4. Dispose of runoff from operations by legal means and in a manner that prevents soil erosion, undermining of paving and foundations, damage to landscaping, and water penetration into building interiors.

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3.4 PREPARATORY CLEANING

A. General: Use the gentlest, appropriate method necessary to clean surfaces in preparation for painting. Clean all surfaces, corners, contours, and interstices.

B. Detergent Cleaning: Wash surfaces by hand using clean rags, sponges, and bristle brushes. Scrub surface with detergent solution and bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet. Rinse with water applied by clean rags or sponges.

3.5 APPLICATION

A. Apply paints according to manufacturer's written instructions and to recommendations in "MPI Architectural Painting Specification Manual" or "MPI Maintenance Repainting Manual" as applicable to substrates and paint systems indicated.

B. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.6 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing paint application, clean spattered surfaces. Remove spattered paints by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 PAINTING SCHEDULE

A. Galvanized-Metal Substrates: Latex System: Primer, intermediate & topcoat. Sheen as indicated on drawings.

1. Water-Based Light Industrial Coating System: Primer, intermediate, and topcoat. Sheen as indicated on drawings.

a. Benjamin Moore & Co.
1) Primer, Rust Inhibitive, Water Based: HP04 Super Spec HP Metal Primer.

2) Intermediate: HP29 Ultra Spec Exterior HP Semi-Gloss, HP28 Ultra Spec HP Gloss.
3) Topcoat: HP29 Ultra Spec Exterior HP Semi-Gloss, HP28 Ultra Spec HP Gloss.

b. PPG Paints.
1) Primer: 90-912 Pitt Tech Plus Int/Ext DTM Primer.
2) Intermediate: Pitt-Tech Plus Int/Ext DTM Acrylic, 90-1110 Satin, 90-1210 Semi-Gloss, 90-1310 Gloss.
3) Topcoat: Pitt-Tech Plus Int/Ext DTM Acrylic, 90-1110 Satin, 90-1210 Semi-Gloss, 90-1310 Gloss.

c. Sherwin Williams Co.
1) Primer: B66-310 Pro-Cryl Universal Primer.
2) Intermediate: B66 Pro Industrial Acryic EgShel, B66 Semi-Gloss, B66 Gloss.
3) Topcoat: B66 Pro Industrial Acrylic EgShel, B66 Semi-Gloss, B66 Gloss.

END OF SECTION 099100