



2026 CH Roof Replacement

MARLOW, OKLAHOMA

BID DOCUMENTS AND SPECIFICATIONS

JUNE 2026

June 2, 2026
Date

2026 CH ROOF REPLACEMENT JUNE 2026

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TECHNICAL SPECIFICATIONS

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**CITY OF MARLOW
BID ADVERTISEMENT FOR
2026 CH ROOF REPLACEMENT**

Notice is hereby given that the City of Marlow (hereinafter "Owner") will receive sealed bids at the City Clerk's Office, at 119 N. 2nd Street, Marlow, Oklahoma, 73055 until **3:00** on the **23rd** day of **July 2026**, for **2026 CH ROOF REPLACEMENT**. Bids will be publicly opened and read aloud in the City Clerk's Office. Bids received after the closing time will not be considered. Bidders are invited to be present when the bids are opened. Minority and small business owners are encouraged to submit bid proposals.

Bid documents and copies of specifications may be obtained from the City Clerk, 119 N. 2nd Street, Marlow, Oklahoma, 73055 Marlow, Oklahoma.

A **mandatory** pre-bid conference will be held in the City Hall Conference Room, 119 N. 2nd Street, Marlow, Oklahoma on July 8, 2026 at 10:00 a.m. Firms represented at the previous pre-bid conference held on May 12, 2026 will not be required to attend this pre-bid conference.

Only those firms registered with the Oklahoma Construction Industries Board as registered roofing contractors in good standing will be considered for award of a contract.

A cashier's check or a certified check on a solvent bank in Oklahoma or a bid bond in the amount of five percent (5%) of the bid shall accompany the proposal of each bidder. The check or bond shall be made payable to the Owner. All checks or bonds will be returned to unsuccessful bidders. This check or bond shall be as a guarantee of contractor's ability to perform the contract bid upon, and that he will enter into a written contract with the Owner to perform said work and/or furnish said materials in accordance with said specifications and furnish the required bonds within fifteen (15) business days after the acceptance of his bid. No bidder may withdraw his bid for a period of sixty (60) days after the closing date for the receipt of bids.

A Maintenance Bond guaranteeing the repair of all damage due to improper materials or workmanship for a period of one (1) year after the acceptance of the work by the Owner will be required. A Performance Bond and a Statutory Payment Bond in the amount of 100% of the contract price each with a Corporate Surety licensed in Oklahoma and approved by the Owner will be required for the faithful performance of the contract, and the bidder shall state in the proposal the name and address of the Surety or Sureties who will sign this bond in case the contract is awarded to him. Copies of required bond forms are included in the bid packet.

The Owner reserves the right to reject any and all bids, to waive irregularities in any bid, and award a contract to the bidder who, in the opinion of the Owner, offers a proposal which appears to be in the best interest of the Owner.

Questions concerning this project shall be addressed to the City Administrator Monday through Friday from 8:30 a.m. until 5:00 p.m. Central Time at (580) 658-5401.

FOR THE CITY OF MARLOW

Amber Hall
City Clerk
2026 CH ROOF REPLACEMENT



P.O. Box 113
Marlow, Ok 73055

BID PROPOSAL
2026 CH ROOF REPLACEMENT

Submission Deadline July 23, 2026
3:00 p.m.

Proposal of _____
(hereinafter called "Bidder"), organized and existing under the laws of the
State of _____, doing business as _____
_____ to
the City of Marlow (hereinafter call "Owner").

In compliance with your Advertisement for Bids, Bidder hereby proposes to perform all
work for the construction of 2026 CH ROOF REPLACEMENT Project, in Marlow, Ok in
strict accordance with the contract documents within the time set forth therein and at the
prices stated on the Bid Schedule.

Project shall be completed by (date) _____.

Bidder: _____ By: _____
Name of Company *Signature & Title*

Mailing Address: _____

Phone No Fax No Email

SUBSCRIBED AND SWORN TO BEFORE ME THIS ____ DAY OF ____ 20____.

MY COMMISSION EXPIRES:

NOTARY PUBLIC

BID SCHEDULE

<u>Item No.</u>	<u>Description</u>	<u>Unit</u>	<u>Est Qty</u>	<u>Unit Price</u>	<u>Total Price</u>
1	R&R Single-ply membrane mechanically attached - 60 mil	SQ	111	\$	\$
2	R&R Insulation - ISO board, 1 1/2"	SQ	111	\$	\$
3	Glass mat gypsum - 1/4" - primed and installed	SQ	111	\$	\$
4	R&R Flash parapet wall only PVC/TPO - up to 3'	LF	861	\$	\$
5	R&R Aluminum termination bar / flashing for membrane roofs	LF	597	\$	\$
6	R&R Cap flashing - large	LF	45	\$	\$
7	R&R Cap flashing	LF	129	\$	\$
8	R&R Counterflashing - Apron flashing	LF	90	\$	\$
9	Detach & Reset Central air - condenser unit - 2 ton - 14-15 SEER	EA	1	\$	\$
10	R&R Pipe jack flashing - PVC/TPO	EA	6	\$	\$
11	R&R Roof scupper - PVC/TPO clad aluminum	EA	8	\$	\$
12	Roof drain cover - Detach & reset	EA	6	\$	\$
13	R&R Curb flashing - PVC/TPO	LF	26	\$	\$
TOTAL BID (NUMBERS)				\$	
TOTAL BID (WORDS)					
					DOLLARS

AFFIDAVIT OF NON-COLLUSION

STATE OF _____)
COUNTY OF _____) ss

The undersigned, of lawful age, being first sworn, on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the bidder has not been a party to any collusion among bidders in restraint of freedom of competition by agreement to bid at a fixed price or to refrain from bidding; or with any City official or employee as to quantity, quality or price in the prospective contract, or any other terms of said prospective contract; or in any discussions between bidders and any City official concerning exchange of money or other thing of value for special consideration in the letting of a contract; that the bidder has not paid, given or donated or agreed to pay, give or donate to any officer or employee of the City of Marlow, Oklahoma, any money or other thing of value, either directly or indirectly, in the procuring of the award of a contract pursuant to this bid.

Bidder: _____ By: _____
Name of Company *Signature & Title*

Mailing Address: _____

Phone No Fax No Email

SUBSCRIBED AND SWORN TO BEFORE ME THIS ____ DAY OF ____ 20____.

MY COMMISSION EXPIRES:

NOTARY PUBLIC

BUSINESS RELATIONSHIPS AFFIDAVIT

STATE OF _____)
COUNTY OF _____) ss

_____, of lawful age, being first duly sworn, on oath says that (s)he is the agent authorized by the bidder to submit the attached bid. Affiant further states that the nature of any partnership, joint venture, or other business relationship presently in effect or which existed within one (1) year prior to the date of this statement with the architect, engineer, or other party to the project is as follows:

Affiant further states that any such business relationship presently in effect or which existed within one (1) year prior to the date of this statement between any officer or director of the bidding company and any officer or director of the architectural or engineering firm or other party to the project is as follows:

Affiant further states that the names of all persons having any such business relationships and the positions they hold with their respective companies or firms are as follows:

(If none of the business relationship hereinabove mentioned exist, Affiant should so state.)

Bidder: _____ By: _____
Name of Company Signature & Title

Mailing Address: _____

Phone No Fax No Email

SUBSCRIBED AND SWORN TO BEFORE ME THIS ____ DAY OF ____ 20____.

MY COMMISSION EXPIRES:

NOTARY PUBLIC

AGREEMENT

THIS STATEMENT MUST BE COMPLETED AND SUBMITTED WITH BID

Date: _____

BIDDERS QUALIFICATIONS STATEMENT

1. Name of bidder _____
2. Business Address _____
3. Date Organized Under Present Firm Name _____
4. Type of Organization:
- ☐ Individual
- ☐ Partnership consisting of the following members:
- _____
- _____
- ☐ Corporation with the following officers:
- _____ President _____ Vice President
- _____ Secretary _____ Treasurer
5. Background and Experience of Principal Members of Firm:
- a. Name _____
- Years of experience in construction work _____
- Duties performed _____
- b. Name _____
- Years of experience in construction work _____
- Duties performed _____
- c. Name _____
- Years of experience in construction work _____
- Duties performed _____
- d. Name _____
- Years of experience in construction work _____
- Duties performed _____

6. Projects Now Under Contract:

Description and Location	Construction Cost	% Comp.	Estimated Comp. Date

7. Projects similar to this project completed during the last five years:

Owner	Project Description	Cost

8. Bonding Capacity:

- a. Maximum bonding Capacity \$ _____
- b. Amount obligated for current work \$ _____
- c. Net capacity available for new work \$ _____

9. Bonds written by:

Company _____ Name	Agent _____ Name
_____ Address	_____ Address

10. Banking Connections:

11. Condensed Financial Data:

Current Assets: \$ _____

Current Liabilities: \$ _____

Present Net Worth: \$ _____

12. References:

NOTE: The Owner reserves the right to rely on the information provided herein by the named Bidder to make necessary investigations regarding the responsibility of the Bidder and to determine the responsibility of the Bidder. The Owner shall have sole authority to determine the responsibility of the Bidder.

Signature

(CONTRACT)
City of Marlow
2026 CH ROOF REPLACEMENT

THIS AGREEMENT is dated as of the ____ day of _____, in the year of 20____, by and between the CITY OF MARLOW, hereinafter referred to as OWNER, and _____ hereinafter referred to as the CONTRACTOR.

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1. WORK

CONTRACTOR shall complete all work as specified or indicated in the contract documents. The work is generally described as follows:

2026 CH ROOF REPLACEMENT

ARTICLE 2. CONTRACT TIME

2.1 ALL work shall be complete by October 31, 2026 and shall be completed in 45 Calendar days after starting work.

2.2 Liquidated Damages. OWNER and CONTRACTOR recognize that time is of the essence of this agreement and that OWNER will suffer financial loss if the work is not substantially complete within the time specified in 2.1 above, plus any extensions thereof allowed. They also recognize the delays, expense and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by OWNER if the work is not substantially completed on time. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER Five Hundred Dollars (\$500.00) for each day that expires after the time specified in paragraph 2.1 for substantial completion until the work is substantially complete.

ARTICLE 3. CONTRACT PRICE

3.1 OWNER shall pay CONTRACTOR for performance of the work in accordance with the contract documents in current funds as follows:

_____ Dollars.
(\$ _____)

ARTICLE 4. PAYMENT PROCEDURES

4.1 CONTRACTOR may submit an invoice or application for payment on a monthly basis at any time prior to completion of the work. All payments made by the Owner are subject to procedures established by the Owner to authorize payment at its regularly scheduled meetings. The Owner regularly scheduled meetings are held on the 4th Tuesday of each month. Invoice or application for payment must be received in the City Administrator's office no less than ten (10) business days prior to the regular meeting at which authorization for payment is to be requested.

4.2 Final Payment. Upon final completion and acceptance of the work, including all submittals, OWNER shall pay the remainder of the contract price, subject to the procedures noted in paragraph 4.1 above.

ARTICLE 5. CONTRACTOR'S REPRESENTATIONS

In order to induce OWNER to enter into this agreement, CONTRACTOR makes the following representations:

5.1 CONTRACTOR has familiarized himself with the nature and extent of the contract documents, and the written resolution thereof by the Owner is acceptable to CONTRACTOR.

5.2 CONTRACTOR has given the Owner written notice of all conflicts, errors, discrepancies or omissions that he has discovered in the contract documents, and the written resolution thereof by the Owner is acceptable to CONTRACTOR.

ARTICLE 6. CONTRACT DOCUMENTS

The contract documents which comprise the entire agreement between OWNER and CONTRACTOR are attached to this agreement, made a part hereof, and consists of the following:

- 6.1 This agreement (pages 1 to 3 inclusive).
- 6.2 Exhibits to this agreement (pages ____to____inclusive).
- 6.3 Performance and other bonds, consisting of _____pages.
- 6.4 Notice of Award.
- 6.5 Specifications bearing the title: **2026 CH ROOF REPLACEMENT**
- 6.6 Addenda numbers____to____, inclusive.
- 6.7 CONTRACTOR'S bid (pages _____to _____, inclusive).
- 6.8 Documentation submitted by CONTRACTOR prior to Notice of Award (pages ____ to ____ inclusive).
- 6.9 Any modification, including change orders, duly delivered after execution of agreement.

There are no contract documents other than those listed above in Article 6.

The contract documents may only be altered, amended, or repealed by written and approved change order.

ARTICLE 7. MISCELLANEOUS

7.1 No assignment by a party hereto of any rights under or interests in the contract documents will be binding on another party hereto without written consent of the party sought to be bound; and specifically but without limitations, moneys that may become due and moneys that are due may not

be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment. No assignment will release or discharge the assignor from any duty or responsibility under the contract documents.

7.2 OWNER and CONTRACTOR each binds himself, his partners, successors, assigns, and legal representatives to the other party hereto, his partners, successors, assigns, and legal representatives in respect to all covenants, agreements and obligations contained in the contract documents.

IN WITNESS WHEREOF, the parties hereto have signed this agreement in duplicate. One counterpart has been delivered to OWNER and CONTRACTOR. All portions of the contract documents have been signed or identified by OWNER and CONTRACTOR.

This agreement will be effective the _____ day of _____ 20____.

OWNER:

CONTRACTOR:

CITY OF MARLOW

By: _____
Mayor

By: _____
Signature & Title

CORPORATE SEAL
Attest:

CORPORATE SEAL
Attest:

By: _____

By: _____

ADDRESS FOR GIVING NOTICES:

ADDRESS FOR GIVING NOTICES:

City of Marlow

ATTN: City Administrator

P.O. Box 113

Marlow, OK 73055

Phone: (580) 658-5401

Phone: _____

Fax: (580) 658-5406

Fax: _____

jmcpherson@cityofmarlow.com

Email: _____

STATUTORY BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____, as Principal, and _____, as Surety, are held firmly bound unto the State of Oklahoma in the sum of _____ DOLLARS (\$_____), for the payment of which, well and truly to be made, we, and each of us, bind ourselves, our heirs, executors and assigns, themselves, and its successors and assigns, jointly and severally, firmly by these presents.

Dated this _____ day of _____, 20__.

The conditions of this obligation are such, that whereas, the above Bonded Principal _____ is the lowest and best bidder for the making of the following work and improvements, viz:

2026 CH ROOF REPLACEMENT in Marlow, Oklahoma (Project)

and has entered into a certain written contract with The City of Marlow on the _____ day of _____ 20__, for the construction of said work and improvement, in exact accordance with the bid of said Principal, and according to certain specifications heretofore made, adopted and placed on file in the office of the City Clerk of the City of Marlow.

NOW, THEREFORE, if said principal shall fail or neglect to pay all indebtedness incurred by said Principal or subcontractor of said Principal who perform work in the performance of such, for labor and materials furnished by any supplier and consumed in the performance of said contract, and such repairs to and rental of machinery and equipment as may be furnished by a subcontractor to the person or persons contracting with this Owner within thirty (30) days after the same becomes due and payable, the person, firm or corporation entitled thereto may sue and recover on this bond, the amount so due and unpaid.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, for the obligations of this Bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney—in—fact, duly authorized so to do, the day and year first above written.

ATTEST:

Secretary

Principal

By: _____

Surety

By: _____

ATTEST:

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENTS THAT:

_____, as Principal, and _____, a corporation organized under the laws of the State of _____, as Surety, are held and firmly bound unto the City of Marlow, in the penal sum of _____ Dollars (\$_____) in lawful money of the United States of America, for the payment of which, well and truly to be made, we bind ourselves and each of us, our heirs, executors, administrators, trustees, successors, and assigns, jointly and severally, firmly by these presents.

The condition of this obligation is such that WHEREAS, said Principal entered into a written contract with The City of Marlow, dated _____, 20____, for the 2026 CH ROOF REPLACEMENT in Marlow, Oklahoma (PROJECT) all incompliance with the specifications therefore, made a part of said Contract and on file in the office of the City Clerk, City of Marlow, Oklahoma.

NOW THEREFORE, if said Principal shall, in all particulars, well, truly and faithfully perform and abide by said Contract and each and every covenant, condition, and part thereof, and shall fulfill all obligations resting upon said Principal by the terms of said Contract and said specifications, and if said Principal shall protect and save harmless said City of Marlow from any pecuniary loss resulting from the reach of any of the items, covenants and conditions of said Contract resting upon said Principal, then this obligation shall be null and void, otherwise to be and retain in full force and effect.

It is further expressly agreed and understood by the parties hereto that no changes or alternations in said Contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the Sureties, or any of them, from the obligations of this Bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers, and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year set forth below.

Dated this _____ day of _____, 20____.

Principal

ATTEST:

Secretary

By: _____

Surety

ATTEST:

By: _____

MAINTENANCE BOND

KNOW ALL MEN BY THESE PRESENTS:

That we, _____ as Principal, and _____, as Surety, are held and firmly bound into the CITY OF MARLOW, a Municipal Corporation in the State of Oklahoma, in the full and just sum of _____ DOLLARS (\$_____) such sum being equal to the contract price for the payment of which, well and truly to be made, we, and each of us, bind ourselves, our heirs, executors, and assigns, themselves, and its successors and assigns, jointly and severally, firmly by these presents.

The conditions of this obligation are such, that whereas, said Principal, has by certain contract between _____ and the CITY OF MARLOW dated this _____ day of _____ 20__, agreed to perform for the City of Marlow, 2026 CH ROOF REPLACEMENT in compliance with the specifications therefore, made part of said contract and on file in the office of the City Clerk of the City of Marlow; and to maintain the said improvement in the amounts set forth above against any failure due to workmanship or material for a period of ONE year from the date of acceptance of the work by the City of Marlow.

NOW THEREFORE, if said Principal shall pay or cause to be paid to the City of Marlow all damages, loss and expense, which may result by reason of defective materials and/or workmanship in connection with said work, occurring within a period of ONE year from and after acceptance of said project by the OWNER; and if Principal shall save and hold harmless the OWNER from all damages, loss and expense occasioned by or resulting from any failure whatsoever of said Principal, then this obligation shall be null and void, otherwise to be and remain in full force and effect.

It is further agreed that if the said Principal or Surety herein shall fail to maintain said improvements against any failure due to defective workmanship and/or material for a period of ONE year and at any time repairs shall be necessary, that the cost of making said repairs shall be determined by the City of Marlow or some person(s) designated by them to ascertain the same; and if, upon thirty (30) days notice, the said amount ascertained shall not be paid by the Principal or Surety herein, or if the necessary repairs are not made, that said amount shall become due upon the expiration of thirty (30) days and suit may be maintained to recover the amount so determined in any court of competent jurisdiction; and that the amount so determined shall be conclusive upon the parties as to the amount due on this bond for the repair(s) included therein, and that the cost of all repairs shall be so determined from time-to-time during the life of this bond as the conditions of the improvements may require.

It is further expressly agreed and understood by the parties hereto that no changes or alterations in said contract and no deviations from the plan or mode of procedure herein fixed shall have the effect of releasing the sureties, or any of them, from the obligations of this bond.

IN WITNESS WHEREOF, the said Principal has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its duly authorized officers; and the said Surety has caused these presents to be executed in its name and its corporate seal to be hereunto affixed by its attorney-in-fact, duly authorized so to do, the day and year first above written.

ATTEST:

Principal

Secretary

By: _____

Surety

ATTEST:

By: _____

City of Marlow
2026 CH ROOF REPLACEMENT
PROJECT REQUIREMENTS

1.0 GENERAL CONDITIONS

- 1.1. Proposal is to remove and replace roofing on the City of Marlow City Hall Building located at 119 S 2nd St. in Marlow. Estimated total roof area to be replaced is 11,114 Square Feet
- 1.2. Quoted prices shall remain valid for not less than 60-days.
- 1.3. The prices bid shall be for completed work as specified herein. Details necessary for completed work not listed herein shall be considered incidental to the work and will not be paid for separately.
- 1.4. The City of Marlow reserves the right to reject any and all bids.
- 1.5. Attendance at the Pre-Bid Conference is MANDATORY. Bids will not be accepted from firms who do not have a representative attending the Pre-Bid Conference. Firms represented at the previous pre-bid conference held on May 12, 2026 will not be required to attend this pre-bid conference. No plans, specifications or bid documents will be issued after the Pre-Bid Conference. All bidders must visit and inspect the construction sites and shall be familiar with the physical characteristics and conditions at the construction sites prior to submitting a bid.
- 1.6. The Owner reserves the right to consider alternative proposals submitted in writing by Bidders or by the Contractor.
- 1.7. Notice to Proceed will be issued within 10 days after award of a contract by the City Council of the City of Marlow. Work may start at any time after Notice to Proceed is Issued.
 - 1.7.1. All work shall be completed no later than October 31, 2026.
 - 1.7.2. All work shall be completed within 45 Calendar Days after starting work.
 - 1.7.3. The work shall proceed continuously from start of work until Final Completion.
- 1.8. Contractor shall perform all work consistent with OSHA regulations and requirements.
- 1.9. Contractor shall be responsible for Quality Control of all products and the work. The Contractor shall be responsible for and shall pay all costs of Quality Control testing. Contractor shall provide copies of all Quality Control test reports to Owner upon request.
- 1.10. Contractor shall participate in a pre-construction conference with the Owner before beginning work.
- 1.11. All materials shall be new and shall be of standard production as offered by the manufacturer, unless otherwise approved by the Owner.
- 1.12. Contractor shall transmit materials submittals for review and acceptance by the Owner prior to ordering materials. These materials submittals may be in portable document format (pdf) or in hard copy.
- 1.13. All work shall comply with the applicable Rules, Codes and Standards listed in these Specifications, and all Federal, State and Local codes and ordinances, as well as any other authorities that may have lawful jurisdiction pertaining to the work specified. None of the terms or provisions of this specification shall be construed as waiving any of the rules, regulations or

requirements of these authorities. The contractor shall procure all necessary permits or licenses to carry out his work.

- 1.14. In any instance where these specifications call for materials for construction of a better quality or larger capacity than required by the codes, the provisions of these specifications shall take precedence. The codes shall govern in other cases of direct conflict between the codes and the specifications.
- 1.15. Purchases of materials for this project shall be exempt from Sales taxes and use taxes as provided for by State law.

2.0 TECHNICAL REQUIREMENTS

- 2.1. All work shall be completed while the building is open for normal business operations. Contractor shall conduct operations so as to not interfere with normal operations of City Hall and the adjoining parking areas. All contractor staging shall take place on the north side of the building and on the south side of the building in areas designated by the Owner.
- 2.2. Contractor shall schedule operations such that no work takes place during the following events. All work sites shall be cleaned of construction equipment, materials and debris to accommodate all traffic, including pedestrian traffic, during these events.
 - 2.2.1. New Year's Eve and New Year's Day
 - 2.2.2. Good Friday and Easter
 - 2.2.3. Memorial Day and preceding weekend
 - 2.2.4. Independence Day and Independence Day Parade
 - 2.2.5. World's Largest Garage Sale weekend
 - 2.2.6. Labor Day and preceding weekend
 - 2.2.7. Thanksgiving Day and weekend following
 - 2.2.8. Christmas
- 2.3. Minimum warranty periods shall be as listed in the various Technical Specifications Sections.



GENERAL PROVISIONS

SECTION 101 DEFINITION OF TERMS

Wherever the words, forms or phrases herein defined, or pronouns used in their stead occur in these specifications, in the contract or in the advertisement or any document or instrument herein contemplated or to which these specifications apply, the intent and meaning shall be interpreted as follows:

ADVERTISEMENT - All of the legal publications pertaining to the work contemplated or under contract.

ATTORNEY - The Attorney of the City of Marlow/Marlow Municipal Authority or the duly authorized assistants or agents of the Attorney.

AWARD - The decision of the Owner to accept the proposal of the lowest and best bidder for the work, subject to the execution and approval of a satisfactory contract and the required bonds therefor, and to such other conditions as may be specified or otherwise required by law.

AUTHORITY - Marlow Municipal Authority, acting through its duly authorized representatives or agents.

AUDITOR - The Auditor of the City of Marlow/Marlow Municipal Authority of Marlow, Oklahoma or the duly authorized assistants or agents of the Auditor.

BIDDER - Any person or persons, partnership, company, firm or corporation acting directly or through a duly authorized representative, submitting a proposal for the work contemplated.

CHANGE ORDER - A written order issued by the Owner to the Contractor providing for additions, deletions or revisions to the Work, or for an adjustment in the Contract Price or the Contract Time.

CITY - City of Marlow, a Municipal Corporation in the State of Oklahoma.

CLERK/TREASURER - The Clerk/Treasurer of the City of Marlow or the duly authorized assistants or agents of the Clerk/Treasurer.

CONTRACT - The written agreement covering the performance of the work. The contract includes the Advertisement and Notice to Contractors, Proposal, Bonds, Specifications, including special Provisions, Plans, or working drawings and any supplemental agreement pertaining to the work or materials therefore.

CONTRACTOR - The person or persons, partnership, company, firm or corporation entering into contract for the execution of the work, acting directly or through a duly authorized representative.

CONTRACT TIME - The number of calendar days stated in the Agreement to achieve completion of the Contract so that it is ready for final acceptance and final payment. When a calendar date of completion is shown in a proposal, the Contract Time shall be the number of days between the effective date of the Notice to Proceed and the specified Completion Date.

ENGINEER - City Engineer, City of Marlow/Marlow Municipal Authority, Oklahoma or the duly authorized agents, engineers, assistants, inspectors or superintendents, acting singularly or severally within the scope of the particular duties entrusted to them.

EXTRA WORK - Any work performed by the Contractor not provided for by the plans, specifications or special provisions.

FURNISH - To supply.

CITY ADMINISTRATOR/GENERAL MANAGER - The Administrator of the City of Marlow/Marlow Municipal Authority of Marlow, Oklahoma.

MAINTENANCE BOND - The approved form of security furnished by the Contractor and his Surety as a guarantee that he will maintain the work constructed by him in good condition for the period of time required.

OWNER - The City of Marlow or Marlow Municipal Authority, as listed in the Solicitation for Bids or Advertisement for Bids.

OWNER'S REPRESENTATIVE – The individual or company designated by the Owner to represent the Owner during the execution of the work with a duty to protect the Owner's interests in the work.

PERFORMANCE BOND - The approved form of security furnished by the Contractor and his Surety as a guarantee of good faith on the part of the Contractor to execute the work in accordance with the plans, specifications and terms of the contract.

PLAN OR PLANS - All of the drawings pertaining to the contract and made a part thereof, including such supplemental drawings as the Owner may issue from time to time, in order to clarify or explain other drawings or for the purpose of showing changes in the work as authorized under the Section, "Changes and Alterations", or for showing details not shown thereon.

PROPOSAL – The written statement or statements duly filed with the Clerk/Treasure of the person or persons, partnership, company, firm or corporation proposing to do the work contemplated.

PROPOSAL FORM - The approved form on which the formal bids for the work are to be prepared and submitted.

PROPOSAL GUARANTY - The security, designated in the "proposal form" and in the Advertisement, to be furnished by the bidder as a guarantee of good faith to enter into a contract with the Owner and to execute the required bonds for the work contemplated after the work is awarded to him and as liquidated damages in event of failure to do so.

PROVIDE - To furnish and construct, erect or install.

DIRECTOR OF PUBLIC WORKS - Director of Public Works of the City of Marlow/Marlow Municipal Authority, Oklahoma or the duly authorized agents, engineers, assistants, inspectors or superintendents, acting singularly or severally within the scope of the particular duties entrusted to them.

SPECIAL PROVISIONS - The special clauses setting forth conditions or requirements peculiar to the specific project involved, supplementing the Standard Specifications and taking precedent over any conditions or requirements of the Standard Specifications with which they are in conflict.

SPECIFICATIONS - The directions, provisions, and requirements contained herein, together with the "Special Provisions" supplemental hereto, pertaining to the method and manner of performing the work or to the kinds, quantities or qualities of materials to be furnished under the contract, and methods of measurement and basis of payment.

The Standard Specifications, referred to hereinafter, are the editions in effect on the date of the invitation for bids.

STATUTORY BOND - The approved form of Surety furnished by the Contractor and his Surety as a guarantee that he will pay, in full, all bills and accounts for material and labor used in the construction of the work, as provided by law.

SURETY OR SURETIES - The Corporate body which is bound by such bonds as are required with and for the Contractor, and engages to be responsible for the entire and satisfactory fulfillment of the contract and for any and all requirements as set out in the specifications, contract or plans.

THE WORK - All design and construction activities included within the scope of the plans and specifications, including the furnishing of labor, materials, tools, equipment and incidentals, to be performed by the Contractor and Consultant under the terms of the contract.

TREASURER – The Treasurer of the City of Marlow/Marlow Municipal Authority of Marlow, Oklahoma, or the duly authorized assistants or agents of the Treasurer.

TRUSTEES - The Trustees of the Marlow Municipal Authority.

A.A.N.	American Association of Nurserymen
A.A.R.	Association of American Railroads
A.A.S.H.T.O.	American Association of State Highway and Transportation Officials
A.G.C	Associated General Contractors of America
A.I.A.	American Institute of Architects
A.I.S.C.	American Institute of Steel Construction
A.N.S.I.	American National Standards Institute (United States of American Standards Institute)
A.R.A.	American Railway Association
A.R.E.A.	American Railway Engineering Association
A.S.A.	American Standards Association
A.S.C.E.	American Society of Civil Engineers
A.S.L.A.	American Society of Landscape Architects
A.S.T.M.	American Society for Testing Materials
A.W.P.A.	American Wood Preservers Association
A.W.S.	American Welding Society
A.W.W.A.	American Water Works Association
F.A.A.	Federal Aviation Agency of the U.S. Department of Transportation
F.H.W.A.	Federal Highway Association
F.R.A.	Federal Rail Administration
F.S.S.	Federal Specifications and Standards (General Services Administration)
FM	Factory Mutual
I.E.S.	Illuminating Engineering Society
I.M.S.A.	International Municipal Signal Association
I.T.E.	Institute of Traffic Engineers
M.U.T.C.D.	Manual on Uniform Traffic Control Devices
N.E.C.	National Electrical Code
N.E.M.A.	National Electrical Manufacturers Association
N.S.F.	National Sanitary Foundation
O.A.C.	Oklahoma Aeronautics Commission
O.D.E.Q.	Oklahoma Department of Environmental Quality
O.D.O.T.	Oklahoma Department of Transportation
O.S.D.H.	Oklahoma State Department of Health
O.S.H.A	Occupational Safety and Health Association
O.W.R.B.	Oklahoma Water Resources Board
S.A.E.	Society of Automotive Engineers
S.S.P.C.	Steel Structures Paint Council
U.L.	Underwriter's Laboratory

SECTION 102 PROPOSAL REQUIREMENTS AND CONDITIONS

102.01 CONTENTS OF PROPOSAL FORM. The Owner will furnish bidders with proposal forms which will state the general location and description of the contemplated work and which will contain a list of the items of work to be completed or materials to be furnished and upon which bid prices are requested. The proposal form will state the time limits for commencing and for completing the work and will provide for entering the amount of the proposal guaranty. The proposal form will contain a non-collusion affidavit.

102.02 INTERPRETATION OF PLANS AND SPECIFICATIONS. If any person contemplating submitting a bid for the proposed contract is in doubt as to the true meaning of any part of the plans, specifications or other proposed contract documents, he shall submit to the Owner a written request for an interpretation thereof. The person submitting such request will be responsible for its prompt delivery. An interpretation of the proposed documents will be made only by Addendum duly issued and a copy of such Addendum will be mailed or delivered to each person receiving a set of such documents. The Owner will not be responsible for any other explanations or interpretations of the proposed documents.

102.03 EXAMINATION OF DOCUMENTS AND SITE OF THE WORK. Bidders are advised that the plans and specifications on file with the Clerk/Treasurer shall constitute all the information which the Owner will furnish. No other information given by the Owner or any official thereof prior to the execution of the contract shall ever become a part of or change the contract, plans or specifications or be binding on the Owner. Bidders are required, prior to submitting any proposal, to read carefully the specifications, the proposal, contract and bond forms; to examine carefully all plans on file with the Clerk/Treasurer; to visit the site of the work; to examine carefully local conditions; to inform themselves by their independent research of the difficulties to be encountered and judge for themselves of the accessibility of the work and all attending circumstances affecting the cost of doing the work or the time required for its completion and obtain all information required to make an intelligent proposal. Bidders shall rely exclusively upon their own estimates, investigations and other data, which are necessary for full information upon which the proposal may be based. It is mutually agreed that submission of a proposal will be evidence that the bidder has made the examination and investigations required herein.

102.04 PREPARATION OF PROPOSAL. The bidder shall submit his proposal in single copy on the forms furnished by the Owner. All blank spaces in the proposal forms shall be correctly filled in and the bidder shall state the prices, written in ink, both in words and numerals, for which he proposes to do the work contemplated or furnish the materials required.

Such prices shall be written distinctly legible, in case of conflict between words and

numerals, the words will govern. If an individual submits the proposal, he must sign his name or his duly authorized agent and list his mailing address. If the proposal is submitted by a firm or partnership, the name and mailing address of the firm or partnership must be listed and the proposal signed by a member of the firm or partnership as a person duly authorized. If the proposal is made by a company or corporation, the company or corporate name and the state under the laws of which said company, or corporation is chartered and the business address must be listed and the proposal signed by an official or agent duly authorized. Powers of Attorney, authorizing agents or others to sign proposals must be properly certified and must be in writing on file with the Clerk/Treasurer.

102.05 NON-COLLUSION AFFIDAVIT. Each proposal or copy thereof shall be accompanied by a sworn statement in writing that the person signing the proposal executed said proposal on behalf of the bidder therein named and that he had lawful authority to do so and that said bidder has not directly or indirectly entered into any agreement, expressed or implied, with any other bidder or bidders having for its object the controlling of the amount of such bid or any bids, the limiting of the bid or bidders, the parceling or farming out to any bidder or bidders or other persons of any part of the contract or any bid or the subject matter of the bid or of the profits thereof, and that he had not and will not divulge said sealed bid to any person whatever except those having a partnership or other financial interest with him in said bid, until after the said sealed bids are opened.

102.06 PROPOSAL GUARANTY. Proposals will not be considered unless the original filed with the Clerk/Treasurer is accompanied by a certified or cashier's check, bank money order, or bidder's bond, in the required amount, made payable to the Owner. The proposal guaranty shall be in an amount of not less than five percent (5%) of the total amount of the bid unless otherwise provided in the Advertisement or Special Provisions. The proposal guaranty is required as evidence of good faith and as a guarantee that if awarded the contract, the bidder will execute the contract and furnish the required bonds within the required time and as liquidated damages in event of failure to do so.

102.07 FILING OF PROPOSALS. No proposals will be considered by the Owner unless they are filed in sealed envelopes with the Clerk/Treasurer in his office in the City Hall, Marlow, Oklahoma, within the time limit for receiving proposals, as stated in the advertisement. Each proposal shall be plainly marked on the envelope with the word "Proposal", the name of the project, and the date and hour of opening.

102.08 WITHDRAWAL OF PROPOSALS. Permission will not be granted to withdraw or modify any proposal after it has been filed.

102.09 OPENING OF PROPOSALS. The proposals filed with the Clerk/Treasurer will be opened in public at the time and place stated in the advertisement.

Bidders are invited to attend the bid opening at the time and place set forth in the advertisement.

102.10 IRREGULAR PROPOSALS. Proposals may be considered irregular if they show any omissions, alterations of forms, additions or conditions not requested unauthorized alternate bids or irregularities of any kind. However, the Owner reserves the right to waive technicalities as to changes, alterations or reservations and make the award in the best interest of the Owner.

102.11 REJECTION OF PROPOSALS. The Owner reserves the right to reject any or all proposals, and all proposals submitted are subject to this reservation. Proposals may be rejected for any of the following specific reasons:

- (a) Proposal received after the time limit for receiving proposals as stated in the advertisement;
- (b) Proposal prices obviously unbalanced;
- (c) Summation of proposal prices on any one project above the Engineers estimate of cost for such project;
- (d) Proposal containing any irregularities.

102.12 DISQUALIFICATION OF BIDDERS. Bidders may be disqualified and their proposals not considered for any of the following specific reasons:

- (a) Where more than one proposal for an individual, firm, partnership or corporation is filed under the same or different names and where such proposals are not identical in every respect;
- (b) Reasonable grounds for believing that any bidder is interested in more than one proposal for the work contemplated or materials to be furnished;
- (c) Reason for believing that collusion exists among bidders;
- (d) The bidder being in arrears on any existing contracts, interested in any litigation against the Owner or having defaulted on a previous contract;
- (e) Incomplete work which, in the judgment of the Owner, will hinder or prevent the prompt completion of additional work, if awarded.

SECTION 103

AWARD AND EXECUTION OF CONTRACT

103.01 CONSIDERATION OF PROPOSALS. After the proposals are opened, those proposals containing unit prices will be tabulated for comparison on the basis of the quantities shown in the approximate estimate. Until the final award of the contract, the Owner reserves the right to reject any or all proposals, to waive technicalities and to advertise for new proposals or proceed to do the work otherwise when the best interests of the Owner will be promoted thereby.

Projects advertised as all parts tied: Bidder shall submit a bid for each part. Tied bid projects will be considered on the basis of the total dollar amount bid for all tied parts.

Projects advertised as parts not tied: Bidder may submit a bid for an individual part, or multiple parts, as either tied or separate. Bidder shall clearly indicate the intent of his bids. Bids submitted as tied bids will be considered on the basis of the total dollar amount bid for all tied parts. Bids submitted as separate parts may be considered on the basis of the dollar amount for each part, or the total dollar amount of any combination of parts, when it appears to be in the best interest of the Owner.

103.02 AWARD OF CONTRACT. The Owner reserves the right to withhold the award of the contract for a reasonable period of time from the date of opening the proposals and no award will be made until the necessary investigations are made as to the responsibility of the low bidder. The awarding of the contract shall give the bidder no right of action or claim against the Owner upon such contract until the execution of the contract shall have been completed and the contract delivered to the Contractor. The Owner reserves the right to award all or any portion or portions of the work.

103.03 RETURN OF PROPOSAL GUARANTY. As soon as the proposal prices have been compared, the Owner may, at its discretion, return the proposal guaranties accompanying proposals which in its judgment would not be considered in making the award.

103.04 SURETY BONDS. With the execution and delivery of the contract, the Contractor shall furnish and file with the Owner in the amounts herein required, the following surety bonds:

- (a) A good and sufficient Performance Bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, guaranteeing the full and faithful execution of the work and performance of the contract and for the protection of the Owner and all property owners interested against any damage by reason of the negligence of the Contractor, or the improper execution of the work or the use of inferior materials;

- (b) A good and sufficient Statutory Payment Bond in an amount equal to one hundred percent (100%) of the approximate total amount of the contract, guaranteeing payment for all labor, materials and equipment used in the construction of the improvement.
- (c) A good and sufficient Maintenance Bond in an amount equal to one hundred percent (100%) of the contract price, conditioned for the maintenance in good condition of the improvement for a period of one (1) year from the time of acceptance by the Owner, or as otherwise specified in the Advertisement and Proposal.
- (d) No surety will be accepted who is now in default or delinquent on any bond or who is interested in any litigation against the Owner. AD bonds shall be made on forms acceptable to the Owner and shall be executed by surety companies licensed to do business in the State of Oklahoma and acceptable to the Owner. Each bond shall be executed by the Contractor and the Surety.

Should any surety on the contract be determined unsatisfactory at any time by the Owner, notice will be given to the Contractor to that effect and the Contractor shall forthwith substitute a new Surety or Sureties satisfactory to the Owner. No payment will be made under the contract until the new surety or sureties, as required, have qualified and been accepted by the Owner. The contract shall not be operative nor shall any payments be due until approval of the bonds has been made by the Owner.

103.05 EXECUTION OF CONTRACT. The person(s), partnership, company, firm or corporation to whom a contract is awarded shall within ten (10) business days after such award sign the necessary agreements entering into the required contract with the Owner and execute and deliver the required bonds.

No contract shall be binding on the Owner until it has been approved by the Attorney, executed by the Owner and delivered to the Contractor.

103.06 FAILURE TO EXECUTE CONTRACT. Upon failure of the bidder to execute the required bonds or to sign the required contract within ten (10) business days after the contract is awarded, he will be considered to have abandoned his proposal and the Owner may annul the award. By reason of the uncertainty of market prices of the materials and labor and it being impracticable and extremely difficult to fix the amount of damages to which the Owner would be put by reason of said bidder's failure to execute said bonds and contract within ten (10) business days, the proposal guaranty accompanying the proposal shall be the agreed amount of damages which the Owner will suffer by reason of such failure on the part of the bidder and shall thereupon be retained by the Owner as liquidated damages. The filing of a proposal will be considered as an acceptance of this provision.

103.07 PRE-WORK CONFERENCE. The Contractor and Consultant shall attend a Pre-Work Conference, scheduled by the Owner, to clarify the intent of the work and to present the Contractor's work plan, including progress schedule as provided by Section 107.04, prior to starting work on the project.

SECTION 104 SCOPE OF WORK

104.01 INTENT OF PLANS AND SPECIFICATIONS. The intent of the plans and specifications is to prescribe a complete work or improvement which the Contractor undertakes to provide, in full compliance with the plans, specifications, special provisions, proposal and contract. The Contractor shall provide all work as specified in the plans, special provisions, specifications, proposal and contract, except that specifically shown to be provided by the Owner or others, and shall provide such additional extra and incidental work as may be considered necessary to complete the work in a satisfactory and acceptable manner. He shall furnish all labor, materials, tools, equipment and incidentals necessary to the prosecution of the work.

104.02 SPECIAL PROVISIONS. Should any work or any conditions which are not thoroughly or satisfactorily stipulated or covered by the general or standard specifications be anticipated on any proposed work "Special Provisions" for such work may be prepared and shall be considered as a part of the specifications and contract.

104.03 INCREASED OR DECREASED QUANTITIES OF WORK. The Owner reserves the right to alter the quantities of the work to be performed or to extend or shorten the improvement any time when and as found necessary, by means of change orders, and the Contractor shall perform the work as altered, increased or decreased. No allowance will be made for any change in anticipated profits nor shall such changes be considered as waiving or invalidating any condition or provision of the contract.

104.04 ALTERATIONS OF PLANS AND SPECIFICATIONS. The Owner reserves the right to make such changes in the plans and in the character of the work as may be necessary or desirable to insure completion of the work in the most satisfactory manner, provided such changes do not materially alter the original plans and specifications or change the general nature of the work as a whole. Such changes shall not be considered as waiving or invalidating any condition or provision of the contract.

104.05 EXTRA WORK. When any work is necessary to the proper completion of the project for which no prices are provided in the proposal or contract, the Contractor shall do such work, but only when and as ordered in writing by the Owner and with the prior approval of the Owner.

Payment for extra work will be made as hereinafter provided.

104.06 FINAL CLEANUP. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall clean and remove from the site of the work surplus and discarded materials, temporary structures, stumps or portions of trees and debris of any kind. He shall leave the site of the work in as good or better than condition as prior to work.

SECTION 105 CONTROL OF THE WORK AND MATERIALS

105.01 AUTHORITY OF OWNER'S REPRESENTATIVE. All work shall be provided to the satisfaction of the Owner's Representative. He shall decide all questions which arise as to the quality and acceptability of materials furnished, work performed, manner of performance, rate of progress of the work, interpretation of the plans and specifications, acceptable fulfillment of the contract, compensation, mutual rights between contractors under these specifications and suspension of work. He shall determine the amount and quality of work performed and materials furnished and his decisions and estimates shall be final. His estimate in such event shall be a condition precedent to the right of the Contractor to receive money due him under the contract.

The authority of the Owner's Representative shall not be construed to include the authority to waive, revise or modify specifications as herein set forth either as to kind, type or quality of materials or manner or quality of construction, unless an appropriate Change Order is executed.

Neither the Owner's Representative, nor his designated representatives, shall act as supervisor of the work, nor shall the Contractor rely on any such supervision.

105.02 DETAIL SHOP AND WORKING DRAWINGS FURNISHED BY CONTRACTOR. The Contractor shall submit to the Owner's Representative for approval, such additional shop and working drawings of structures or equipment as may be required, and, prior to the approval of such drawings by the Owner's Representative, any work done or materials ordered shall be at the Contractor's risk. The contract price shall include the cost of furnishing such drawings.

105.03 CONFORMITY WITH PLANS. ALLOWABLE DEVIATIONS. All work shall conform to the lines, grades, cross-sections and dimensions shown on the plans. All deviations from the plans will be accomplished by Change Orders prepared by the Engineer. All Change Orders shall be in writing, and shall, except in case of emergency, be approved by the governing body of the Owner before the work is commenced. Where an actual emergency exists, wherein the delay caused by submitting the Change Order to the governing body of the Owner for approval would jeopardize the interest of the Owner or the public, the Owner's Representative may approve the change in writing. However, Change Orders approved by the Owner's Representative under the circumstances outlined above shall be submitted to the governing body of the Owner for consideration at the next regular meeting. Two (2) copies shall be furnished to the Owner and two (2) copies shall be furnished to the Contractor of all Change Orders approved by the Owner's Representative. Change Orders submitted to the governing body of the Owner for approval shall bear the approval of the Owner's Representative and shall be prepared in four (4) copies, distribution as follows: 2 copies to the Contractor; and 2 copies to the Owner's Representative.

Change Orders shall include the following:

- (a) Complete detail of the work contemplated.
- (b) Estimated cost of the work as originally planned and as contemplated by the Change Order.
- (c) Complete justification.
- (d) Statement as to whether the prices shown are contract bid prices or agreed prices.
- (e) Statement by the Contractor that he agrees to perform the work at the prices shown.

105.04 EXISTING STRUCTURES NOT SHOWN ON PLANS. The plans show the location of certain existing surface and subsurface structures. The Owner assumes no responsibility for failure to show any or all structures on the plans or to show them in their exact location. It is mutually agreed such failure will not be considered sufficient basis for claims for extra work or for increasing the pay quantities in any manner whatsoever, unless the obstruction encountered is such as to necessitate substantial changes in the lines or grades or requires the building of a special structure, provision for which is not made in the plans, in which case the provisions in these specifications for "Extra Work" will apply.

105.05 COORDINATION OF PLANS, SPECIFICATIONS, PROPOSAL AND SPECIAL PROVISIONS. The plans, these specifications, the proposal, Special Provisions and all supplementary documents are intended to describe a complete work and are essential parts of the contract. A requirement occurring in any of them is binding. In case of discrepancies, figured dimensions shall govern over scaled dimensions; plans shall govern over specifications; Special Provisions shall govern over the plans and over both General and Standard Specifications, and the quantities shown on the plans shall govern over those shown in the proposal. The Contractor shall take no advantage of any apparent error or omission in the plans and specifications, and the Owner's Representative shall be permitted to make such corrections or interpretations as may be deemed necessary for the fulfillment of the plans and specifications. In the event the Contractor discovers any apparent error or discrepancy, he shall immediately call such error or discrepancy to the attention of the Owner's Representative.

105.06 COOPERATION OF CONTRACTOR. Three sets of plans and specifications will be furnished the Contractor as follows: One office copy, one for the Field Superintendent, and one copy for job use. The Contractor, however, shall have a set of plans and specifications available at all points where a separate construction crew is working.

The Contractor shall give the work the consistent attention necessary to facilitate the progress thereof, and he shall cooperate with the Owner's Representative and any inspectors and with other contractors in every way possible. The Contractor shall provide a competent Superintendent on the work at all times who is fully authorized as his agent on the work. Such Superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the Owner's Representative or his representative.

The Contractor and his Superintendent shall provide all reasonable facilities to enable the Owner's Representative and any inspectors to inspect the workmanship and materials entering the work.

105.07 CONSTRUCTION STAKING. The Contractor shall furnish, place and maintain construction layout stakes necessary for the proper prosecution and inspection of the work under the contract in accordance with these Specifications.

The Owner will locate and reference the centerline of construction and will establish bench marks and set sufficient right-of-way stakes to define right-of-way limits. The Owner will set stakes to mark centerline and establish bench marks for bridges and special structures as may be considered necessary. The Owner's stakes and benchmarks shall constitute field control staking.

The Contractor shall exercise care in the preservation of stakes and bench marks and shall have them reset at his expense when any are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout of the work required. The Contractor shall not engage the services of any person or persons in the employment of the Owner or its equipment for the performance of any of this work.

The Contractor shall provide field forces and shall set all additional stakes needed, such as offset stakes, reference point stakes, slope stakes, pavement and curb line and grade stakes, stakes for bridges, sewers, roadway drainage, pipe underdrains, paved gutter, fence, culverts or other structures, and any other horizontal or vertical controls necessary to secure a correct layout of the work. Stakes for line and grade shall be adequate to maintain the specified tolerances for the operation being performed. The station number and the distance from the centerline of construction shall be marked on all grade stakes.

The Contractor shall furnish the original of his survey records to the Owner for the Owner's permanent file. These records shall be furnished as they are completed during the progress of the work. These records shall be in permanently bound field books and/or level books and formatted in a manner commonly accepted by the surveying profession. The Owner's Representative may at any time check the correctness of the Contractor's staking work by using spot check method. When significant errors occur, the Contractor shall resurvey to the satisfaction of the Owner's Representative. The Contractor shall furnish, at his expense, platforms and equipment necessary for proper and safe access for checking his staking. Any inspection or checking of the Contractor's layout by the Owner's Representative and the acceptance of all or any part of it shall not relieve the Contractor of his responsibility to secure the proper dimensions, grades, and elevation of the several parts of the work. Deviations resulting from plan errors will be resolved by the Owner.

Contractor construction staking will not be paid as a separate item, but all associated costs shall be included in the price bid for other items of work.

105.08 MEASUREMENTS. Before ordering any material or doing any work, the Contractor shall verify all measurements involved and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of difference between actual dimensions and the measurements indicated on the drawings, and any difference which may be found shall be submitted to the Owner's Representative for consideration before proceeding with the work.

105.09 SOURCE OF SUPPLY AND QUALITY OF MATERIALS. The Contractor shall not start delivery of materials until the Owner's Representative has approved the source of supply. Only materials conforming to the requirements of these specifications shall be used in the work and such materials shall be used only after written the Owner's Representative has given approval and only so long as the quality of said material remains equal to the requirements of the specifications. The Contractor shall furnish approved materials from other sources, if, for any reason, the product from any source at any time before commencing or during the prosecution of the work proves unacceptable. After approval, any material which has become mixed with or coated by dirt or any other foreign substances during its delivery and handling shall not be used in the work.

105.10 MATERIALS AND WORKMANSHIP. The Contractor shall submit samples of materials, finish, appliances, etc., when required by the Owner's Representative, and all such samples must be approved by the Owner's Representative in writing before the work is executed and all work shall conform in all respects to the approved samples. Any work which does not conform to the approved samples will be rejected, and shall be removed and replaced by work that does so conform.

105.11 SAMPLES AND TESTS OF MATERIALS. Where, in the opinion of the Owner's Representative or called for in the specifications, tests of materials are necessary, such tests shall be made by, and at the expense of the Contractor, unless otherwise provided. Tests, unless otherwise specified, are to be made in accordance with the latest standard methods of the American Society for Testing Materials. The Contractor shall provide such facilities as the Owner's Representative may require for collecting and forwarding samples and shall not use the materials represented by the samples until test results have been approved by the Owner's Representative.

The Contractor in all cases shall furnish the required samples without charge.

105.12 CONTRACTOR'S QUALITY CONTROL

- (a) Contractor shall be responsible for all Quality Control necessary to ensure compliance with these specifications and any manufacturer's requirements. Contractor's Quality Control shall include testing, documentation, and daily diaries, with copies to the Owner's Representative. All associated costs for Contractor's Quality Control shall be included in the price bid for other items.
- (b) The Contractor must show proof that all employees associated with this project shall have been employed by the Contractor for a period not less than six (6) months, unless waived by the Owner's Representative.

105.13 STORAGE OF MATERIALS. Materials shall be stored so as to insure the preservation of their quality and fitness for the work. They shall be placed on wooden platforms or other hard, clean surfaces and not on the ground, and shall be placed under cover when directed. Stored materials shall be located so as to facilitate prompt inspection.

105.14 INSPECTION. The Contractor shall furnish the Owner's Representative with every reasonable facility for ascertaining whether or not the work as performed is in accordance with the requirements and intent of the plans and specifications. If the Owner's Representative requires, the Contractor shall at any time before acceptance of the work, remove and uncover

such portions of the finished work as may be directed, for inspection. After inspection, the Contractor shall restore said portions of the work to the condition required by the specifications.

Should the work thus exposed on examination prove acceptable the cost of uncovering or removing and the replacing of the covering or making good the parts removed will be paid for as "Extra Work". Should the work so exposed or examined prove unacceptable, the cost of covering or removing and the replacing of the covering or making good of the parts removed shall be at the Contractor's expense. When ample notice of the intention to complete or cover up the work was not given by the Contractor to the Owner's Representative, then the cost of the uncovering or removing and the replacing of the covering or making good of the parts removed shall be borne by the Contractor regardless of whether or not the work examined proved acceptable or unacceptable. Any work provided or materials used without suitable supervision or inspection by the Owner's Representative may be ordered removed and replaced at the Contractor's expense.

105.15 REMOVAL OF DEFECTIVE AND UNAUTHORIZED WORK All work which has been rejected or condemned shall be repaired, or, if it cannot be satisfactorily repaired, it shall be removed and replaced at the Contractor's expense. Defective materials shall be removed immediately from the site of the work.

Work provided without lines and grades having been given, work provided beyond the lines or not in conformity with the grades shown on the plans or as given, save as herein provided; work provided without written authority and prior agreement in writing as to prices, will be provided at the Contractor's risk and will be considered unauthorized, and, at the option of the Owner's Representative may not be measured and paid for and may be ordered removed at the Contractor's expense.

Upon the failure of the Contractor to satisfactorily repair or to remove and replace, if so directed, any rejected, unauthorized or condemned work or materials immediately after receiving notice from the Owner's Representative, the Owner's Representative shall, after giving written notice to the Contractor, have the authority to cause unauthorized work to be removed and to deduct the cost thereof from any compensation to become due to the Contractor. If the Owner's Representative and Owner deem it inexpedient to correct work injured or done not in accordance with the contract, an equitable deduction from the contract price may be made therefor.

105.16 CORRECTION OF WORK AFTER FINAL PAYMENT. Neither the final certificate nor payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials or workmanship and, unless otherwise specified, he shall remedy any defects due thereto and pay for any damage to other work resulting therefrom, which shall appear within a period of one year from the date of substantial completion. The Owner shall give notice of observed defects with reasonable promptness.

105.17 FINAL INSPECTION. The Owner's Representative shall make final inspection of all work included in the contract or any portion thereof as soon as practicable after the work is completed and ready for acceptance. If the work is not acceptable to the Owner's Representative at the time of such inspection, he shall inform the Contractor as to the particular defects to be remedied before the final acceptance can be made.

SECTION 106
LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

106.01 **LAWS TO BE OBSERVED.** The Contractor shall, at all times, observe and comply with all Federal and State laws and City ordinances and regulations which in any manner affect the conduct of the work and shall observe and comply with all orders and decrees which exist at the present or which may be enacted later, of bodies or tribunals having jurisdiction or authority over the work, and no plea of misunderstanding or ignorance thereof will be considered. The Contractor and his surety shall defend, indemnify and save harmless the City and all its officers, agents, employees and servants against any claims or liability arising from or based on the violation of any such law, ordinance, regulation, order or decree, whether by himself or his employees.

106.02 **PERMITS AND LICENSES.** The Contractor shall procure all permits and licenses, pay all charges or fees, and give all notices necessary and incidental to the due and lawful prosecution of the work.

106.03 **PATENTED DEVICES, MATERIALS AND PROCESSES.** If the Contractor is required or desires to use any design, device, material or process covered by letters patent or copyright, he shall provide for such use by suitable legal agreement with the patentee or owner. It is mutually understood and agreed that without exception the contract prices shall include all royalties or costs arising from patents, trademarks and rights in any way involved in the work. The Contractor and Surety shall defend, indemnify and save harmless the Owner and all its officers, agents and employees from all suits, actions or claims of any character, name and description brought for or on account of infringement or alleged infringement by reason of the use of any such patented design, device, material or process or any trademark or copyright used in connection with the work agreed to be performed under this contract, and shall indemnify the Owner for any cost, expense or damage which it may be obliged to pay by reason of any action or actions, suit or suits which may be commenced against the Owner for any such infringement or alleged infringement at any time during the execution or after the completion of the work contracted for herein, It is mutually agreed that the Owner may give written notice of any such suit to the Contractor, and thereafter the Contractor shall attend to the defense of the same and save and keep harmless the Owner from all expense, counsel fees, cost liabilities, disbursements, recoveries, judgments and executions in any manner growing out of, pertaining to or connected therewith.

106.04 **SANITARY PROVISIONS.** The Contractor shall establish and enforce among his employees such regulations in regard to cleanliness and disposal of garbage and waste as will tend to prevent the inception and spread of contagious or infectious diseases and to effectively prevent the creation of a nuisance about the work or any property, either public or private and such regulations as are required by the Owner's Representative shall be put into effect immediately by the Contractor. Contractor shall strictly comply with all sanitary laws and regulations of the Owner and the State of Oklahoma.

106.05 **PUBLIC CONVENIENCE AND SAFETY.** Materials stored about the work shall be so placed and the work shall at all times be so conducted as to cause no greater obstruction of the traveling public than is considered necessary by the Owner's Representative. The Contractor shall make arrangements satisfactory to the Owner's Representative for handling traffic. Sidewalks must not be obstructed unless by special permission of the Owner's Representative. Neither the materials excavated nor the construction materials or plant used in the construction

of the work shall be placed so as to endanger the work or prevent free access to all fire hydrants, water valves, gas valves, manholes for electric, telephone, telegraph or traffic signal conduits, sewers or fire alarm or police call boxes in the vicinity. The Owner reserves the right to remedy any neglect on the part of the Contractor as regards the public convenience and safety which may come to its attention, after twenty-four (24) hours notice in writing to the Contractor, save in cases of emergency when it shall have the right to remedy any neglect without notice and, in either case, the cost of such work done by the Owner shall be deducted from monies due or to become due the Contractor. The Contractor shall notify the Owner's Representative a minimum of 24 hours before any street is closed or obstructed and shall keep any street or streets in condition for unobstructed use by fire and other emergency apparatus, as much as is practical.

Where the Contractor is required to construct temporary culverts or bridges or make other arrangements for crossings over ditches or streams, his responsibility for accidents shall include the roadway approaches as well as the structures of such crossings.

Contractor shall give written notice to all residents/occupants/businesses that may be affected by the work (e.g. water disruption, street closure, sewer jet cleaning). Said written notice shall be delivered no less than 48 hours, nor more than 2 weeks prior to the start time of the disruption.

The written form may be "door hangars", but in any event shall be submitted to and approved by the Owner's Representative prior to use. At a minimum the form shall contain:

- Project Identification
- Contractor Name, address, Telephone Number
- Type of Construction
- Reason for affecting or disrupting service and duration of such

106.06 PRIVILEGES OF CONTRACTOR IN STREETS, ALLEYS, OR RIGHTS-OF-WAY.

For the performance of the contract, the Contractor will be permitted to occupy such portions of streets or alleys, other public places or other rights-of-way as provided for in the ordinances of the City, as shown on the plans or as permitted by the Owner's Representative. A reasonable amount of tools, materials and equipment for construction may be stored in such space but not more than is necessary to avoid delay in the construction. Excavated and waste materials shall be piled or stacked in such a way as not to interfere with spaces that may be designated to be left free and unobstructed, nor inconvenience occupants of adjoining property. Other contractors of the Owner may, for all purposes required by their contracts, enter upon the work and premises used by the Contractor, and the Contractor shall give to other contractors of the Owner, all reasonable facilities and assistance for the completion of the adjoining work. Any additional grounds desired by the Contractor for his use shall be provided by him at his own expense.

106.07 RAILWAY CROSSINGS. When the work encroaches upon the right-of-way of any railway, the Owner will secure for the Contractor, all the necessary contracts, easements or authority to enter upon such right-of-way for the prosecution and completion of the work. Where railway tracks are to be crossed, the railway company, if it elects to do so, may construct the necessary bridges, trestles, cribs or other structures for the safe operation of trains or cars across any excavation during the time of construction of the work, and the cost of construction of such bridges, trestles, cribs or other structures shall be paid to the railway company by the Contractor together with the necessary cost of any supervision or other incidental expenses which may be required by the railway company while the work is in progress on the right-of-way of the railway company, and all such costs shall be taken into consideration by the Contractor in submitting proposals. The Contractor shall take such special precautions for the safety of the

work and the traveling public as may be necessary by sheeting, bracing and thoroughly supporting the sides of any excavation and supporting and protecting any adjacent structures.

106.08 BARRICADES AND WARNING SIGNS. Where work is carried on, in or adjacent to any street, alley, or public place, the Contractor shall furnish and erect such barricades, fences, lights, signs and other appurtenances in accordance with the MUTCD and OSHA requirements. The Contractor shall take such precautionary measures for the protection of persons or property and of the work as are necessary. Failure to comply with this requirement may result in the Owner's Representative discontinuing or suspending the work until the Contractor shall have provided the necessary protection.

The Contractor's responsibility for the maintenance of barricades, signs and lights and protection of the work shall not cease until the project shall have been accepted by the Owner.

106.09 USE OF EXPLOSIVES. Should the Contractor elect to use explosives to loosen rock or for any other purpose in the prosecution of the work, he shall obtain the required permits and the written permission of the Owner's Representative before any blasting is done, but neither the issuance of said permits, the granting of said permission nor any other act, requirement or condition contained in the specifications, nor any order, direction or approval given by the Owner's Representative or any other official or employee of the Owner shall be construed as requiring or directing the use of any explosives or as accepting any liability for any injury or damage to persons or property resulting from such usage. No blasting shall be done unless an Inspector is present and the Contractor shall notify the City Code Enforcement Division when he is ready to begin any blasting work. All necessary precautions shall be taken by the Contractor as required by the ordinances of the City or the laws of the State of Oklahoma relative to blasting and the necessary provisions shall be made for the protection of the new work and all blasting shall be so conducted as not to endanger persons or property. Only sufficient quantity of explosives necessary for the immediate day's work shall be kept on hand by the Contractor. Storage of caps, exploders and explosives shall be done strictly in compliance with the orders of the Owner's Representative and the ordinances of the City. The Contractor shall be responsible for and shall make good any damage caused by blasting or accidental explosions.

The Contractor shall notify the proper representatives of any public service corporation, any company or individual, not less than forty-eight (48) hours in advance of any blasting which might cause damage to their or his property along or adjacent to the work. Wherever explosives are stored, they shall be kept in a safe, secure manner and all storage places shall be plainly marked "Dangerous Explosives", and shall be under the care of a competent watchman at all times.

106.10 PROTECTION AND RESTORATION OF PROPERTY. The Contractor shall not enter upon private property for any purpose without first obtaining permission and he shall be responsible for the preservation of and shall use every precaution necessary to prevent damage to all trees, fences, culverts, bridges, pavements, driveways, sidewalks, etc., to all water, sewer, gas or electric lines or appurtenances thereof and to all other public or private property along or adjacent to the work. The Contractor shall notify the proper representatives of any public service corporation, and company or any individual, not less than twenty-four (24) hours in advance of any work which might damage or interfere with the operation of their or his property, along or adjacent to the work. He shall be responsible for all damage or injury to property of any character resulting from any act, omission, neglect, or misconduct in the manner or method of executing the work or due to his non-execution of the work, or at any time due to defective work or materials, and said responsibility shall not be released until the work shall have been completed and accepted. When any direct or indirect damage or injury is done to public or private property

on account of any act, omission, neglect or misconduct in the execution of the work or in consequence of the non-execution thereof on the part of the Contractor, he shall restore at his expense such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding or otherwise restoring, or he shall make good such damage for injury in an acceptable manner.

In case of the failure on the part of the Contractor to restore such property or make good such damage or injury, the Owner may, upon forty-eight (48) hours written notice, under ordinary circumstances, and without notice when a nuisance or hazardous condition results, proceed to repair, rebuild or otherwise restore such property as may be determined necessary and the cost thereof will be deducted from any monies due or to become due the Contractor under his contract.

106.11 PROTECTION AND PRESERVATION OF LAND MONUMENTS AND PROPERTY-LINE MARKS. The Contractor shall protect carefully from disturbance or damage all land monuments and iron pins or other markers which establish property lines, provided that where such monuments or markers must, of necessity, be disturbed or removed in the performance of the contract, the Contractor shall first give ample notice to the Owner's Representative, so that he may witness or reference in such monuments or markers. Should the Contractor disturb, remove or damage any established land monument or property line mark without first giving the Owner's Representative ample notice, the Owner's Representative may, at his option deduct the cost of re-establishing such monuments or markers from any monies due to become due the Contractor.

106.12 RESPONSIBILITY FOR DAMAGE CLAIMS. The Contractor and his surety shall defend, indemnify and save harmless the Owner and all its officers, agents and employees from all suits, actions or claims of any character, name and description brought for or on account of any injuries or damages received or sustained by any person or persons or property by or from the said Contractor or his employees or by or in consequence of any negligence in safeguarding the work or through the use of unacceptable materials in constructing the work or by or on account of any act or omission, neglect or misconduct of said Contractor or by or on account of any claim or amounts arising or recovered under the Workmen's Compensation Law or any other law, ordinance, order or decree, and so much of the money due the said Contractor under and by virtue of his contract as shall be considered necessary by the Owner may be retained for the use of the Owner, or in case no money is due, his surety shall be held until such suit or suits, action or actions, claim or claims for injury or damages as aforesaid shall have been settled and satisfactory evidence to the effect furnished to the Owner.

106.13 CONTRACTOR'S CLAIM FOR DAMAGES. Should the Contractor claim compensation for any alleged damage by reason of the acts or omissions of the Owner, he shall within ten (10) days after the sustaining of such damage, make a written statement to the Owner's Representative, setting out in detail the nature of the alleged damage. On or before the 25th day of the month succeeding that in which any such damage is claimed to have been sustained, the Contractor shall file with the Owner's Representative an itemized statement of the details and amount of such damage, and upon request shall give the Owner's Representative access to all books of accounts, receipts, vouchers, bills of lading and other books or papers containing any evidence as to the amount of such damage. Unless such statement shall be filed as thus required, the Contractor's claim for compensation shall be waived and he shall not be entitled to payment on account of any such damage.

106.14 PUBLIC UTILITIES AND PUBLIC PROPERTY. In the event it is necessary to change or move the property of any owner of a public utility, such owner will, upon proper application by the Contractor, be notified by the Owner's Representative to change or move such property within a specified time, and the Contractor shall not interfere with such property until ordered to do so by the Owner's Representative. The right is reserved to the owner of public utilities to enter upon the limits of the contract for the purpose of making such repairs or changes of their property that may be necessary by performance of the contract. The Owner shall have the privilege of entering upon the limits of the contract for the purpose of repairing or relaying sewer and water lines and appurtenances, repairing culverts or storm drains, and for making other repairs, changes or extensions to any utilities.

The Contractor shall provide all notices to the ONE-OKIE system prior to excavating, in accordance with State law.

106.15 TEMPORARY SEWER AND DRAIN CONNECTIONS. When existing sewers have to be taken up or removed, the Contractor at his own expense shall provide and maintain temporary outlets and connections for all private or public drains, sewers or sewer, inlets. He shall also take care of all sewage and drainage which will be received from these drains, sewers and sewer inlets, and for this purpose he shall provide and maintain at his own expense adequate pumping facilities and temporary outlets or diversions. He shall construct such troughs, pipes or other structures necessary and be prepared at all times to dispose of drainage and sewage received from these temporary connections until such time as the permanent connections are built and in service. The existing sewers and connections shall be kept in service and maintained under the contract, save where specified or ordered to be abandoned by the Owner's Representative. All water or sewage shall be disposed of in a satisfactory manner so that no nuisance is created and that the work under construction will be adequately protected.

106.16 ARRANGEMENT AND CHARGE FOR POTABLE WATER FURNISHED BY THE OWNER. If the Contractor desires to use Owner water he shall pay the rate established by City ordinances for such service and he shall make complete and satisfactory arrangements with the Water Department for so doing. Meters will be used and the Contractor shall deposit the cost of the water meter with the Water Department and will pay for all repairs and maintenance of the meter for the period which he has the meter in use or in his possession.

106.17 USE OF FIRE HYDRANTS. The Contractor or his employees shall not open, turn off, interfere with, attach pipe or hose to or connect anything with any fire hydrant, stop valve or stop cock or tap any water main belonging to the Owner, unless duly authorized to do so by the Water Department.

106.18 USE OF A SECTION OR PORTION OF THE WORK. Whenever in the opinion of the Owner's Representative any portion of the work or any structure is in suitable condition it may be put into use by the written order of the Owner's Representative and such usage shall not be held to be in any way acceptance of said work or structure or any part thereof or as a waiver of any of the provisions of these specifications or contract. Pending final completion and acceptance of the work, all necessary repairs and renewals on any section of the work so put into use, due to defective material or workmanship, to natural causes other than ordinary wear and tear or to the operations of the Contractor shall be performed by and at the expense of the Contractor.

106.19 CONTRACTOR'S RESPONSIBILITY FOR THE WORK. Until issuance of written acceptance by the Owner's Representative as provided for in these specifications, the work shall

be under the charge and care of the Contractor, and he shall take every necessary precaution to prevent injury or damage to the work or any part thereof by the action of the elements or from any other cause whatsoever, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good, at his own expense, all injuries or damage to any portion of the work occasioned by any of the above causes before acceptance.

106.20 PERSONAL RESPONSIBILITY OF PUBLIC OFFICIALS. In carrying out any of the provisions contained herein or in exercising any power or authority granted to him by the contract, there shall be no liability upon the Owner's Representative or his authorized assistants, either personal or as officials of the Owner, it being understood that in such matters he acts as the agent and representative of the Owner.

106.21 WAIVER OF LEGAL RIGHTS. Inspection by the Owner's Representative or by any of the duly authorized representatives of the Owner's Representative, any order, measurement, or certificate by the Owner's Representative, any order by the Owner for the payment of money, any payment for or acceptance of any work or any extension of time or any possession taken by the Owner, shall not operate as a waiver of any provision of the contract or any power therein provided. Any waiver of any breach of contract shall not be held to be a waiver of any other or subsequent breach. The Owner reserves the right to correct any error that may be discovered in any estimate that may have been paid and to adjust the same to meet the requirements of the contract and specifications. The Owner reserves the right to claim and recover by process of law sums as may be sufficient to correct any error or errors or make good any deficiency in the work resulting from such error or deficiency, dishonesty or collusion discovered in the work after the final payment has been made.

106.22 CONTRACTOR'S INSURANCE. The Contractor shall not commence work under this contract until he has obtained all insurance required under this specification and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until all similar insurance required for the subcontractor has been so obtained and approved.

- (a) WORKMEN'S COMPENSATION AND DEATH LIABILITY INSURANCE. The Contractor shall secure and maintain during the life of this contract Workmen's Compensation Insurance as prescribed by the laws of the State of Oklahoma for all his employees employed at the site of the project. The Contractor shall require any subcontractor similarly to provide Workmen's Compensation and Employer's Death Liability insurance for all the latter's employees, unless such employees are covered by the protection afforded by the Contractor.
- (b) PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE. The Contractor shall secure and maintain during the life of this contract such Public Liability and Property Damage Insurance as will protect the Owner, himself, and any subcontractor performing work covered by this contract, from claims for damages for personal injury, including accidental death, as well as from claims for property damages, which may arise from operations under this contract, whether such operations be by himself or by any subcontractor or by anyone directly or indirectly employed by either of them.
- (c) Contractor shall provide to the City a certificate of public liability insurance, a certificate of worker's compensation insurance, and automobile public liability insurance as follows:

Comprehensive Public Liability and Property Damage

Bodily Injury	\$ 125,000 per individual
	\$1,250,000 in the aggregate per occurrence;
Property Damage	\$ 25,000 per occurrence
	\$ 125,000 in the aggregate

Worker's Compensation Insurance. Statutory limits as required by the laws of the State of Oklahoma, including employer's liability insurance with \$500,000 limit.

Automobile Public Liability Insurance

Bodily Injury	\$ 125,000 per individual
	\$1,000,000 in the aggregate per occurrence

Public Liability Insurance in the amount of not less than fifty thousand dollars(\$50.000) for injuries, including accidental death, or one hundred thousand dollars(\$100.000) for one accident.

106.23 LIENS. Neither the final payment nor any part of the retained percentage shall become due until the Contractor, if required, shall deliver to the Owner a complete release of all liens arising out of this Contract, or receipts in full in lieu thereof and, if required in either case, an affidavit that so far as he has knowledge or information the releases and receipts include all the labor and material for which a lien could be filed; but the Contractor may, if any subcontractor refuses to furnish a release or receipt in full, furnish a bond satisfactory to the Owner, to indemnify him against any lien. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all monies that the latter may be compelled to pay in discharging such a lien, including all costs and a reasonable attorney's fee.

SECTION 107 PROSECUTION AND PROGRESS

107.01 SUBLETTING OF WORK. If the Contractor sublets the whole or any part of the work to be done under this contract, he will not under any circumstances be relieved of his responsibility and obligations. All transactions of the Owner's Representative shall be with the Contractor. Subcontractors will be considered only in the capacity of employees or workmen and shall be subject to the same requirements as to character and competency. The Contractor shall at all times when work is in operation, be represented either in person or by a qualified superintendent or qualified designated representative.

The Contractor shall submit the name and address of any proposed subcontractor to the Owner's Representative in writing prior to said subcontractor performing any of the work. The Contractor shall clearly list the types and amounts of work of the subcontractor.

107.02 ASSIGNMENT OF CONTRACT. The Contractor shall not assign, transfer, convey or otherwise dispose of the contract or his right, title, or interest in or to the same or any part thereof without the previous consent of the Owner's Representative in writing, approved by the governing body of the Owner and concurred in by the Surety. If the Contractor does, without such previous consent, assign, transfer, convey, or otherwise dispose of the contract or of his right, title or interest therein or any part thereof to any person or persons, partnership, company, firm or corporation or by bankruptcy, voluntary or involuntary, or by assignment under the insolvency laws of any state, attempt to dispose of the contract or make default in or abandon said contract, then the contract may, at the option of the Owner, be revoked and annulled unless the Surety shall successfully complete said contract and any monies due or to become due under said contract shall be retained by the Owner as liquidated damages for the reason that it would be impractical and extremely difficult to determine the actual damages.

107.03 PROSECUTION OF WORK. The Contractor shall begin the work to be performed under the contract within the time limit stated in the advertisement, proposal and contract, and shall conduct the work in such a manner and with sufficient equipment, materials and labor as is necessary to insure its completion within the time limit set forth in the proposal and contract. Should the prosecution of the work for any reason be discontinued by the Contractor for an extended period of time, he shall notify the Owner's Representative at least twenty-four (24) hours in advance of resuming operations.

107.04 PROJECT SCHEDULES. Within ten days after the effective date of the agreement, the Contractor shall submit to the Owner's Representative for review a progress schedule indicating the times (number of days or dates) for starting and completing the various stages of the Work, including any milestones specified in the contract documents.

No progress payment shall be made to the Contractor until the schedules are submitted to and acceptable to the Owner's Representative as provided below. The progress schedule will be acceptable to the Owner's Representative as providing an orderly progression of the work to completion within any specified milestones and the contract times, but such acceptance will neither impose on the Owner's Representative responsibility for the sequencing, scheduling or progress of the work nor interfere with or relive the Contractor from the Contractor's full responsibility therefor. The Contractor's schedule of Shop Drawing(s) and Sample submissions will be acceptable to the Owner's Representative as providing a workable arrangement for reviewing and processing the required submittals.

107.05 LIMITATION OF OPERATIONS. The Contractor shall conduct his work so as to create a minimum amount of inconvenience to the public. At any time when in the judgment of the Owner's Representative the Contractor has obstructed or closed or is carrying on operations on a greater portion of the site or public way than is necessary for the proper execution of the work, the Owner's Representative may require the Contractor to finish sections on which work is in progress before work is started on any additional section.

107.06 CHARACTER OF WORKMEN AND EQUIPMENT. The Contractor shall employ such superintendents, foremen and workmen as are careful and competent, and the Owner's Representative may require removal from the project of any person or persons employed by the Contractor, in, about or on the work who shall misconduct himself or be incompetent or negligent in the proper performance of his or their duties or neglect or refuse to comply with the directions of the Owner's Representative, and such person or persons shall not be employed again thereon without the written consent of the Owner's Representative. The Owner's Representative may withhold all payments which are or may become due or may suspend the work until such orders are fulfilled.

All workmen shall have sufficient skill and experience to properly perform the work assigned them. All workmen engaged on special work or skilled work or in any trade shall have sufficient experience in such work to properly and satisfactorily perform it and operate the equipment involved, and shall make due and proper effort to execute the work in the manner prescribed in these specifications.

In the employment of labor, preference shall be given, other conditions being equal, to bona fide residents of the Owner or the area, but no other preference or discrimination among citizens of the United States shall be made.

The Contractor shall furnish such equipment as is considered necessary for the prosecution of the work in an acceptable manner and at a satisfactory rate of progress. All equipment, tools and machinery used for handling materials and executing any part of the work shall be operated and maintained in a satisfactory working condition in accordance with the equipment manufacturers' recommendations. Equipment on any portion of the work shall be such that no injury to the work or adjacent property will result from its use.

107.07 DAYS WORK WORKING HOURS. Work shall be performed only during regular and commonly accepted and prescribed working hours. No work shall be performed nights, Sundays or during City holidays unless authorized in writing.

107.08 TIME OF COMMENCEMENT AND COMPLETION. The Contractor shall commence work within the time specified in the advertisement, proposal and contract and the rate of progress shall be such that the whole work will be performed and the premises cleaned up in accordance with the contract, plans and specifications within the time limit, as stated in the contract, unless an extension of time is granted in the manner hereinafter specified.

107.09 EXTENSION OF TIME OF COMPLETION. If the Contractor finds it impossible, for reasons beyond his control, to complete the work within the Contract time as specified or as extended in accordance with the provisions of this Subsection, he may, at any time prior to the expiration of the Contract time as extended, make a written request to the Owner's Representative for an extension of time setting forth therein the reasons which he believes will justify the granting of his request. The Contractor's plea that insufficient time was specified in

the Proposal and the Contract or that previously unprotested time charges were incorrect shall not be grounds for an extension of time. If the Owner's Representative finds that the work was delayed because of conditions beyond the control and without the fault of the Contractor, the Owner's Representative may extend the time for completion in such amounts as the conditions justify. The extended time for completion shall be in full force and effect the same as though it were the original time for completion. Daily time charges will cease when the project is completed.

In adjusting the contract time for the completion of the project, all strikes, lockouts, unusual delays in transportation or any condition over which the Contractor has no control and also any suspensions ordered by the Owner's Representative for causes not the fault of the Contractor shall be excluded from the computation of the contract time for completion of the work. If the satisfactory execution and completion of the contract should require work or materials in greater amounts or quantities than those set forth in the contract, then the contract time shall be increased in the same proportion as the cost of the original work. No allowance shall be made for delays or suspension of the prosecution of the work due to the fault of the Contractor.

107.10 FAILURE TO COMPLETE WORK ON TIME. It is mutually agreed by Owner and Contractor that time is of the essence of this Contract and that Owner will suffer financial loss if the Work is not substantially complete within the time specified in the Contract, plus any extensions thereof allowed in accordance with Section 107.09 of these General Conditions. They also recognize the delays, expense and difficulties involved in proving, in a legal or arbitration proceeding, the actual loss suffered by Owner if the Work is not substantially complete on time. Accordingly, instead of requiring any such proof, Owner and Contractor agree that as liquidated damages for delay (but not as a penalty) Contractor shall pay Owner the amount set forth in the Special Provisions, until the work is substantially complete.

107.11 TEMPORARY SUSPENSIONS. The Owner's Representative shall have the authority to suspend the work wholly or in part for such period or periods, as he may deem necessary, due to unsuitable weather or such other conditions as are considered favorable for the suitable prosecution of the work.

If it should be necessary to stop work for an indefinite period, the Contractor shall store all materials in such manner that they will not obstruct or impede the traveling public unnecessarily nor become damaged in any way, and he shall take every precaution to prevent damage or deterioration of the work performed, and shall provide suitable drainage of the work.

107.12 SUSPENSION OF WORK AND ANNULMENT OF CONTRACT. The work or any portion of the work under contract may be suspended on written order of the Owner's Representative or the Owner, with copy of such notice to be served upon the Contractor's Surety, or the contract may be annulled by the Owner, for any good cause or causes, said causes including but not limited to the following:

- (a) Failure of the Contractor to start the work within the time limit specified;
- (b) Substantial evidence that the progress being made by the Contractor is insufficient to complete the work within the specified time;
- (c) Failure of the Contractor to provide sufficient and proper equipment for properly executing the work;

- (d) Deliberate failure on the part of the Contractor to observe any requirements of these specifications or to comply with any orders given by the Owner's Representative, as provided for in these specifications;
- (e) Failure of the Contractor to promptly make good any defects in materials or workmanship or any defects of any other nature, the correction of which had been directed in writing by the Owner's Representative.
- (f) Substantial evidence of collusion for the purpose of illegally procuring a contract or perpetrating fraud on the Owner in the construction of work under contract.

When work is suspended for any one of the causes itemized above, or for any other cause or causes, the Contractor shall discontinue the work or such part thereof as the Owner shall designate, whereupon the Surety may, at its option, assume the contract or that portion thereof which the Owner has ordered the Contractor to discontinue and may perform the same or may, with the written consent of the Owner's Representative, approved by the Owner, sublet the work or portion of the work so assumed; provided, however, that the Surety shall exercise its option, if at all, within two (2) weeks after the written notice to discontinue work has been served upon the Contractor and upon the Surety or its authorized agent. The Surety, in such event shall assume the Contractor's place in all respects and shall be paid by the Owner for all work performed by it in accordance with the terms of the contract and, if the Surety, under the provisions hereof, shall assume said entitled contract, all monies remaining due the Contractor at the time of his default shall thereupon become due and payable to the Surety as the work progresses, subject to all the terms of the contract.

In the event that the Surety does not within the time hereinbefore specified, exercise its right and option to assume the contract, or that portion thereof which the Owner has ordered the Contractor to discontinue, then the Owner shall have the power to complete, by contract or otherwise as it may determine, the work herein described, or such part thereof as it may deem necessary, and the Contractor hereby agrees that the Owner shall have the right to take possession of and use any of the materials, tools, equipment, supplies and property of every kind provided by the Contractor for the purpose of his work and to procure other tools, equipment and materials for the completion of the same, and to charge to the account of the Contractor the expense of said contract for labor, materials, tools, equipment and expenses incident thereto. The expense so charged shall be deducted by the Owner out of such monies as may be due or may at any time thereafter become due to the Contractor under and by virtue of the contract or any part thereof. The Owner shall not be required to obtain the lowest bid for the work of completing the contract but the expense to be deducted shall be the actual cost of such work. In case such expense is less than the same which would have been payable under the contract, if the same had been completed by the Contractor, the balance shall operate as liquidated damages, as herein above set forth. In case such expense shall exceed the amount which would, have been payable under the contract, if the same had been completed by the Contractor, then the Contractor and his Surety shall pay the excess as due and payable. When, any particular part of the work is being carried out by the Owner by contract or otherwise under the provisions of this Section, the Contractor shall continue the remainder of the work in conformity with the terms of the contract and in such manner as not to hinder or interfere with the performance of workmen employed as above provided by the Owner.

107.13 TERMINATION OF CONTRACT. The Contract will be considered fulfilled save as provided in any bond or bonds or by law, when all the work has been completed, the final inspection made by the Owner's Representative, and final acceptance and final payment made by the Owner.

SECTION 108 MEASUREMENT AND PAYMENT

108.01 MEASUREMENT OF QUANTITIES. The determination of quantities of work accepted and completed under the terms of the contract or as directed by the Owner's Representative, in writing, will be made by the Owner's Representative, based on measurements taken by him or his assistants, or at the sole discretion of the Owner's Representative determination of quantities may be based on measurements taken by the Contractor. These measurements will be taken according to the United States Standard Measurements. When materials are measured in the vehicle, the measurement will be taken at the point of delivery. The capacity of all vehicles shall be plainly marked on each vehicle and the capacity or markings shall not be changed without permission of the Owner's Representative.

108.02 SCHEDULE OF VALUES. (For Lump Sum Items or Contracts Only) Prior to work commencing, Owner's Representative and Contractor shall determine and agree to payments based on a percentage of the Lump Sum amount, to correlate to completion of respective phases of the work.

108.03 SCOPE OF PAYMENT. The Contractor shall receive and accept the compensation as herein provided as full payment for furnishing all labor, materials, tools, equipment and incidentals; for performing all work contemplated and embraced under the contract; for all loss or damage arising out of the nature of the work or from the action of the elements; for any unforeseen defects or obstructions which may arise or be encountered during the prosecution of the work and before its final acceptance by the Owner's Representative; for all risks of every description connected with the prosecution of the work; for all expenses incurred by or in consequence of suspension or discontinuance of such prosecution of the work as herein specified; for any infringement of patents, trademarks or copyrights and for completing the work in an acceptable manner according to the plans and specifications.

The payment of any current or partial estimate prior to final acceptance of the work by the Owner shall in no way constitute an acknowledgment of the acceptance of the work nor in any way prejudice or affect the obligation of the Contractor to repair, correct, renew, or replace at his expense any defects or imperfections in the construction or in the strength or quality of the materials used in or about the construction of the work under the contract and its appurtenances nor any damage due to or attributable to such defects, which defects, imperfections or damage shall have been discovered on or before the final inspection and acceptance of the work. The Owner's Representative shall be the sole judge of such defects, imperfections or damage and the Contractor shall be liable to the Owner for failure to correct the same as provided herein.

108.04 PAYMENT FOR EXTRA WORK. Extra work provided by the Contractor, as authorized and approved by the Owner's Representative and the Owner, will be paid for in the manner hereinafter described and the compensation thus provided shall be accepted by the Contractor as payment in full for all labor, materials, tools, equipment and incidentals, and all superintendents' and timekeepers' services, all insurance and all other overhead expense incurred in the prosecution of the extra work. Payment for extra work will be made by one or more of the following methods:

- (a) Unit prices agreed upon by the Owner's Representative and the Contractor and approved by the governing body of the Owner in writing, before said work is commenced, subject to all other conditions of the contract;

- (b) A lump sum price agreed upon by the Owner's Representative and the Contractor and approved in writing by the governing body of the Owner before said work is commenced, subject to all other conditions of the contract;
- (c) The actual cost including labor, materials, tools, equipment and field supervision of such extra work plus fifteen percent (15%); said 15% understood and agreed to be full compensation for all overhead expenses and profits, when agreed upon by the Owner's Representative and the Contractor, and approved in writing by the governing body of the Owner before said work is commenced; subject to all other conditions of the contract.

The Contractor shall, on or before the 10th day of the month succeeding that in which any extra work shall have been performed, file with the Owner's Representative his claim and an account giving the itemized cost of such work and shall give the Owner's Representative access to all accounts, bills and vouchers relating thereto.

108.05 PAYMENT PROCEDURES. The Contractor shall submit an Invoice or Application for Payment for work completed as of the date of the Invoice or Application. All payments made by the Owner are subject to procedures established for the governing body of the Owner to authorize payment at its regularly scheduled meetings.

Invoice or Application for Payment must be received in the City Administrator's Office no less than ten (10) business days prior to the regular meeting at which authorization for payment is to be requested.

Retainage shall be withheld from all progressive payments in accordance with Oklahoma Statutes.

Upon final completion and acceptance of the work, including all submittals, the Owner shall pay the remainder of the Contract price, subject to the procedures as noted in this section.

It is understood that payments will be subject to correction in the payment rendered following discovery of an error in any previous payment and such payment shall not in any respect, be taken as an admission by the Owner of the amount of work done or of its quality or sufficiency nor as an acceptance of the work or the release of the Contractor of any of his responsibility under the contract.

108.06 PAYMENTS WITHHELD. The Owner's Representative may withhold or, on account of subsequently discovered evidence, nullify the whole or a part of any payment to such extent as may be necessary to protect the Owner from loss on account of:

- (a) Defective work not remedied;
- (b) Claims filed or reasonable evidence indicating probable filing of claims;
- (c) Failure of the Contractor to make payments properly to subcontractors or for materials or labor;
- (d) A reasonable doubt that the contract can be completed for the balance then paid;
- (e) Damage to another Contractor.

When the above conditions are remedied, payment shall be made for amounts withheld as a result of such condition.

108.07 STATE SALES AND USE TAX. Under the terms of contracts established between the City of Marlow and the Contractor, the Contractor will be appointed agent for the City of Marlow, Oklahoma, for the purpose of the tangible personal property purchased or rented for the project. Legal title to all tangible personal property purchased, and the right to direct the use of all tangible personal property rented by Contractor shall pass directly from the vendor to the City of Marlow. Upon passage of title, all of such property will be included in the project owned by the City of Marlow. Title to all such property shall pass to the City of Marlow from the vendor. All such property procured under the terms of contracts established between the City of Marlow and the Contractor is exempt from Oklahoma sales and use taxes and/or City sales taxes. Contracts established between the Marlow Municipal Authority and the Contractor shall not provide for sales and/or use tax exemption.

108.08 ACCEPTANCE AND FINAL PAYMENT. Whenever the improvement provided for by the contract shall have been completely performed on the part of the Contractor, and all parts of the work have been approved by the Owner's Representative and accepted by the Owner a final pay request showing the value of the work will be prepared by the Contractor as soon as the necessary measurements and computations can be made. All prior pay requests, upon which payments have been made, are subject to necessary corrections or revisions in the final payment. The amount of this pay request, less any sums that have been deducted or retained under the provisions of the contract, will be paid to the Contractor as soon as practicable after the final acceptance, provided the Contractor has furnished to the Owner satisfactory evidence that all sums of money due for any labor, materials, apparatus, fixtures or machinery furnished for the purpose of such improvement have been paid or that the person or persons to whom the same may respectively be due have consented to such final payment.

The acceptance by the Contractor of the last payment, as aforesaid, shall operate as and shall be a release to the Owner from all claims of liability under the contract for anything performed or furnished or relating to the work under the contract or for any act or neglect of Owner relating to the contract.

108.09 FINAL MEASUREMENT AND FINAL PAY REQUESTS. Final measurement will be taken and final pay requests compiled as soon as work has progressed to a point where the final measurements may be taken accurately.

108.10 This contract, and all documents incorporated herein by reference or executed in connection herewith, are intended solely to govern the relationship between the Contractor and the Owner and their mutual obligations in respect to the subject of the contract. To that end, no provision of this contract, or of any document mentioned above, shall be interpreted or given legal effect to create an obligation on the part of the Owner to third persons, including by way of illustration but not of exclusion, sureties upon performance bonds, payment bonds, or other bonds; assignees of the contractor; subcontractors; and persons performing labor, furnishing material, or in any other way contributing to or assisting in the performance of the obligations of the Contractor; nor shall any such provisions be interpreted or given legal effect to afford a defense against any obligation owed or assumed by such third person to the Owner or in any way to restrict the freedom of the Owner to exercise full discretion in its dealing with the Contractor.



TECHNICAL SPECIFICATIONS

SECTION 01010

SUMMARY OF WORK

PART 1 - GENERAL

1.1 SECTION INCLUDES

- 1.1.1. Contractor's Use of Site
- 1.1.2. Sales and Use Taxes
- 1.1.3. Trade Licenses
- 1.1.4. Existing Conditions
- 1.1.5. Proposed Work

1.2 CONTRACTOR'S USE OF SITE

- 1.2.1 Contractor shall have limit use of the site during construction to the roof and areas designated by the Owner.
- 1.2.2 Cooperate with Owner's on-site personnel to minimize conflict and facilitate Owner's operations.

1.3 SALES AND USE TAXES

- 1.3.1 The Contract Price shall exclude all applicable State and Local Sales and Use Taxes. A tax-exempt purchase authorization will be provided to the Contractor.

1.4 TRADE LICENSES

- 1.4.1 All electrical work and plumbing work shall be performed by or under the supervision of a licensed electrician or plumber, respectively, in accordance with the Oklahoma Statutes.

1.5 EXISTING CONDITIONS

- 1.5.1 Existing TPO roof at the Marlow City Hall.

1.6 PROPOSED WORK

- 1.6.1 Removal and replacement of TPO roof system.
- 1.6.2 Disposal of removed materials.

"END OF SECTION"

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Submittal procedures.
- 1.1.2. Shop drawings.
- 1.1.3. Product data.
- 1.1.4. Manufacturers' instructions.
- 1.1.5. Manufacturers' certificates.

1.2. SUBMITTAL PROCEDURES

- 1.2.1. Transmit each submittal in an acceptable form, as determined by the Owner.
- 1.2.2. Sequentially number the transmittal forms. Resubmittals to have original number with an alphabetic suffix.
- 1.2.3. Identify Project, Contractor, Subcontractor or supplier, pertinent Drawing sheet and detail numbers, and specification Section number, as appropriate.
- 1.2.4. Schedule submittals to expedite the Project and deliver to Owner and Engineer at business address. Coordinate submission of related items.
- 1.2.5. Identify variations from the Specifications and Product or system limitation which may be detrimental to successful performance of the equipment.
- 1.2.6. Provide space for Engineer review stamp.
- 1.2.7. Revise and resubmit submittals as required, identify all changes made since previous submittal by specific notation or color highlighting on the drawings or product data.

1.3. SHOP DRAWINGS AND PRODUCT DATA

- 1.3.1. Submit two copies, one of which will be retained.
- 1.3.2. Product Data originals shall be marked by Contractor or Responsible supplier to identify applicable products, models, options, and other data. Supplement manufacturer's standard data to provide information unique to this project.

1.4. MANUFACTURER'S INSTRUCTIONS

- 1.4.1. As specified in individual specification Sections and/or in Section 01730 - Operation and Maintenance Data, submit manufacturers' printed

instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, in accordance with submittal procedures required by Section 01730.

- 1.4.2. Identify conflicts between manufacturers' instructions and the specifications.

1.5. MANUFACTURER'S CERTIFICATES

1.5.1. When specified in individual specification Sections, submit original reproducible manufacturers' certificate to Engineer for review.

- 1.5.2. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits and certifications as appropriate.

1.6. PRODUCT AND EQUIPMENT WARRANTIES

- 1.6.1. Submit in accordance with Section 01740.

END OF SECTION

SECTION 01600

MATERIAL AND EQUIPMENT

PART 1 - GENERAL

1.1. SECTION INCLUDES

- 1.1.1. Products.
- 1.1.2. Transportation and Handling.
- 1.1.3. Storage and protection.
- 1.1.4. Product options.
- 1.1.5. Substitutions.

1.2. RELATED SECTIONS

- 1.2.1. Section 01300 - Submittals

1.3. PRODUCTS

- 1.3.1. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work. Does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
- 1.3.2. Do not use materials and equipment removed from existing premises, except as specifically permitted by the specifications.
- 1.3.3. Provide interchangeable components of the same manufacturer, for similar components.

1.4. TRANSPORTATION AND HANDLING

- 1.4.1. Transport and handle Products in accordance with manufacturer's instructions.
- 1.4.2. Promptly inspect shipment to assure that products comply with requirements, quantities are correct, and products are undamaged.
- 1.4.3. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

1.5. STORAGE AND PROTECTION

- 1.5.1. Store and protect products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive Products in weather-tight, climate-controlled enclosures.

1.6. PRODUCT OPTIONS

- 1.6.1. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.
- 1.6.2. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.
- 1.6.3. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions (the words "or equal"): Submit a request for substitution for any manufacturer not named.

END OF SECTION

SECTION 01700

CLOSEOUT PROCEDURES

PART 1 – GENERAL

1. SUMMARY

1.1. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

- 1.1.1. Inspection procedures.
- 1.1.2. Instruction of Owner's personnel.
- 1.1.3. Final cleaning.

2. SUBSTANTIAL COMPLETION

2.1. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following: (list items below that are incomplete in request)

- 2.1.1. Prepare a list of items to be completed and corrected (punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
- 2.1.2. Advise Owner of pending insurance changeover requirements.
- 2.1.3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications and similar documents.
- 2.1.4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
- 2.1.5. Deliver tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number where applicable.
- 2.1.6. Submit test records.
- 2.1.7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
- 2.1.8. Complete final cleaning requirements, including touchup painting.
- 2.1.9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

2.2. Inspection: Submit a written request for inspection to determine Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner's Representative will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Owner's Representative, that must be completed or corrected before certificate will be issued.

- 2.2.1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
- 2.2.2. Results of completed inspection will form the basis of requirements for Final Completion.

3. FINAL COMPLETION

3.1. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

- 3.1.1. Submit copy of Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), confirming each item has been completed or otherwise resolved for acceptance.
- 3.1.2. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- 3.1.3. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.

3.2. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner and Owner's Representative will either proceed with inspection or notify Contractor of unfulfilled requirements. Arc will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

3.3. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

4. LIST OF INCOMPLETE ITEMS (PUNCH LIST)

4.1. Preparation: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

- 4.1.1. Organize list of spaces in sequential order.
- 4.1.2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

5. PROJECT RECORD DOCUMENTS

5.1. General: Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Owner's and Construction Manager's reference.

5.2. Record Drawings: Maintain and submit one set of blue or black line white prints of Contract Drawings and Shop Drawings.

5.2.1. Mark Record Prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to prepare the marked-up Record Prints.

5.2.1.1. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.

5.2.1.2. Accurately record information in an understandable drawing technique.

5.2.1.3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installation.

5.2.1.4. Mark Contract Drawings or Shop Drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on Contract Drawings.

5.2.2. Mark important additional information that was shown schematically on original Drawings.

5.2.3. Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING". Organize into manageable sets.

PART 2 – PRODUCTS

1. MATERIALS

- 1.1. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 – EXECUTION

1. FINAL CLEANING

- 1.1. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- 1.2. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
- 1.3. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - 1.3.1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - 1.3.2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - 1.3.3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - 1.3.4. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - 1.3.5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - 1.3.6. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - 1.3.7. Touch-up and otherwise repair and restore marred, exposed finishes and surfaces.
 - 1.3.8. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - 1.3.8.1. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - 1.3.9. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - 1.3.10. Replace parts subject to unusual operating conditions.
 - 1.3.11. Leave Project clean and ready for occupancy.
- 1.4. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 01700

SECTION 01730

OPERATING AND MAINTENANCE DATA

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- A. Compile product data and related information appropriate for Owner's maintenance and operation of products furnished under the contract.
 - 1. Prepare operating and maintenance data as specified in this section and as referenced in other pertinent sections of specifications.
- B. Instruct Owner's on-site personnel in the maintenance of products and in the operation of equipment and systems. All instruction to be at the site of the work.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Submittals: Section 01300.
- B. Contract Closeout: Section 01700.

1.3 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of the described products.
 - 2. Completely familiar with requirements of this section.
 - 3. Skilled as a technical writer to the extent required to communicate essential data.
 - 4. Skilled as a draftsman competent to prepare required drawings.

1.4 FORM OF SUBMITTALS

- A. Prepare data in the form of an instructional manual for use by Owner's personnel.
- B. Format: One copy in pdf format and one hard copy meeting the following requirements.
 - 1. Size: 8-1/2 in. x 11 in.
 - 2. Paper: 20 pound minimum, white, for typed pages.
 - 3. Test data: Manufacturer's printed data, or neatly typewritten.
 - 4. Drawings:
 - a. Provide reinforced, punched binder tab and bind in with text.
 - b. Fold larger drawings to the size of the text pages.
 - 5. Provide fly-leaf for each separate product, or each piece of operating equipment.
 - 6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS" and list:

- a. Title of Project.
- b. Identify of separate structure as applicable.
- c. Identity of general subject matter covered in the manual.

C. Binders:

- 1. Commercial quality three-ring binders with durable and washable plastic covers.
- 2. Maximum ring size: 1-1/2".
- 3. When multiple binders are used, correlate the data into related consistent groupings.

1.5 CONTENT OF MANUAL

A. Neatly typewritten table of contents of each volume, arranged in a systematic order.

- 1. Contractor, name of responsible principal, address and telephone number.
- 2. A list of each product required to be included, indexed to the content of the volume.
- 3. List, with each product, the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance contractor, as appropriate.
 - c. Identify the area of responsibility of each.
 - d. Local source of supply for parts and replacement.
- 4. Identify each product by product name and other identifying symbols as set forth in contract documents.

B. Product Data:

- 1. Include only those sheets which are pertinent to the specific product.
- 2. Annotate each sheet to:
 - a. Clearly identify the specific product or part installed.
 - b. Clearly identify the data applicable to the installation.
 - c. Delete reference to inapplicable information.

C. Drawings:

- 1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
- 2. Coordinate drawings with information in project record documents to assure correct illustration of completed installation.
- 3. Do not use project record documents as maintenance drawings.

D. Written text, as required to supplement product data for the particular installation:

- 1. Organize in a consistent format under separate headings for different procedures.
- 2. Provide a logical sequence of instructions for each procedure.

E. Copy of each warranty, bond and service contract issued.

- 1. Provide information sheet for Owner's personnel, give:
 - a. Proper procedures in the event of failure.
 - b. Instances which might affect the validity of warranties or bonds.

F. All instructions, product data, and drawings must be marked to delete non-applicable information.

****END OF SECTION****

SECTION 01740

PRODUCT AND EQUIPMENT WARRANTIES

PART 1 – GENERAL

1.1 SECTION INCLUDES:

- 1.1.1 Preparation and submittal.
- 1.1.2 Schedule of submittals.

1.2 RELATED SECTIONS

- 1.2.1 Section 01730 – Operation and Maintenance Data.
- 1.2.2 Individual Specifications Sections: Warranties required for specific products or work.

1.3 FORM OF SUBMITTALS

- 1.3.1 Bind in commercial qualify, 8-1/2 x 11 binder with hardback, cleanable, plastic covers.
- 1.3.2 Label cover of each binder with typed or printed title PRODUCT AND EQUIPMENT WARRANTIES, with title of Project, name, address and telephone number of equipment supplier; and name of responsible principal.
- 1.3.3 Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified, and the name of the product or work item.
- 1.3.4 Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List suppliers and manufacturer, with name, address, and telephone number of responsible principal.
- 1.3.5 Warranty language must conform to the applicable paragraph in the Section for each product or equipment. Each warranty must be signed and dated by the Chief Executive Officer of the Supplier or Manufacturer with notarized acknowledgement of signature. Warranty period will not start until date of inspection and acceptance of the equipment. Commissioning period will not be included in the warranty period.

1.4 PREPARATION OF SUBMITTALS

- 1.4.1 Initial submittal shall accompany the product/equipment approved submittals. Product/equipment will not be approved without warranty confirming to specification requirements.
- 1.4.2 Original warranties to be submitted with delivery of equipment.
- 1.4.3 Verify that documents are in proper form, contain full information, and are notarized.
- 1.4.4 Retain warranties until time specified for submittal.

1.5 SCHEDULE OF SUBMITTALS

- 1.5.1 Section 01010 SUMMARY OF WORK

1.5.2 Section 01300 SUBMITTALS

1.5.3 Section 01730 OPERATION AND MAINTENANCE DATA

PART 2 – PRODUCTS

Not used.

PART 3 – EXECUTION

Not used.

END OF SECTION

SECTION 02050 DEMOLITION

PART I- GENERAL

1.1. Work Included:

Demolition shall include removal and disposal or removal and storage of roofing materials to complete the specified repairs only.

1.1.1. All materials, labor, services and incidentals necessary for the completion of this section of the work.

1.1.2. Remove all materials, debris, and rubbish from site.

1.2. The General Provisions shall apply to this entire section.

1.3. Submittals:

1.3.1. Schedule of alteration and demolition work.

1.3.1.1. Before commencing any alteration, removal or demolition work, the Contractor shall prepare and submit for approval by the Owner a schedule showing the commencement, the order, and the completion dates of the various parts of this work.

1.3.1.2. Before starting any work relating to existing utilities (electrical, sewer, water, heat, gas, fire lines, etc.) that will temporarily discontinue or disrupt service to any existing buildings, the Contractor will be required to give notice to the Owner's Representative and obtain his approval in writing before proceeding with this phase of the work.

PART II - PRODUCTS
(NOT USED)

PART III - EXECUTION

3.1. General Requirements:

3.1.1. Permits, Licenses, Ordinances and Regulations:

All work shall comply with local and other governing ordinances, codes, and regulations, but this requirement does not relieve the Contractor of the responsibility of the Contractor, who shall pay any fees and give any notices necessary in connection therewith.

3.1.2. Protection of Existing Improvements

3.1.2.1. Protection shall be provided to prevent damage to existing improvements on the Owner's property and adjoining properties.

3.1.2.2. Damaged improvements shall be restored to their original condition, as acceptable to the Owner.

3.1.2.3. Land areas outside the limits of demolition performed under this contract shall be preserved in their present condition. The Contractor shall confine his demolition activities to areas defined for work on the drawings or specifically assigned by the Owner's Representative.

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3.1.3. Protection of Work Site:

- 3.1.3.1. Provide barricade or other type protectors necessary to warn and prevent unauthorized personnel from entering work sites.
- 3.1.3.2. Demolition operations and the removal of debris shall be conducted in a manner that will ensure minimum interference with roads, driveways, walks and other adjacent occupied or used facility.
- 3.1.3.3. Roads, driveways, walks and other adjacent occupied or used facilities shall not be closed or obstructed without written permission from the Owner's Representative.

3.1.4. The existing metal deck shall remain intact. The existing CMU walls shall remain intact.

3.1.5. Demolition:

Alterations and demolition shall be as indicated on the drawings and in accordance with applicable technical sections of the specifications. The contractor shall do all necessary demolition or removal of existing work as required in connection with this project, including shoring, bracing, etc., and removal of unwanted material and debris from the site. Demolish existing items as necessary to tie on new construction as detailed. This work shall be done in a most careful manner, as the contractor will be held responsible for any damage which may be caused thereby to any part or parts of existing structures.

Where alterations occur, or new and old work join, the immediate adjacent surfaces or so much thereof as is required by the involved conditions, shall be cut, removed, patched, repaired or refinished, and left in as good a condition as existed prior to the commencing of the work. The materials and workmanship employed in the alterations involving new construction, unless otherwise shown or specified, shall conform to that of the original work. Each contractor shall perform that portion of the alteration work, which is generally performed by his trade and subcontractors.

The Contractor shall furnish and install adequate guards, barricades and other temporary protection to prevent injury to persons.

All necessary scaffolding, shoring, bracing, etc. shall be constructed in an adequate and safe manner. Wherever a cutting torch or other equipment that might cause a fire is used, provide and maintain fire extinguishers nearby ready for immediate use. Hydrants shall be accessible at all times. No debris shall be permitted to accumulate within a radius of 15 feet of fire hydrants.

3.1.6. Ownership of Materials

All existing materials removed under this contract shall become the property of the Contractor (unless otherwise noted in the Specifications or Drawings to remain the property of the Owner) and shall be removed by him from the site. Salvaged material specified or noted on the drawings to be retained shall be protected and stored where directed. General construction equipment and mechanical and electrical equipment remain the property of the Owner shall be carefully removed by the Contractor and shall be stored by him on the site where directed, except such items indicated or specified to remain or be relocated shall be set and connected in the indicated location.

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3.1.7.Clean-up:

Disposition of all material, debris, and rubbish shall be the responsibility of the Contractor. Leave site clean. Completely remove all material, debris, and rubbish from site. Absolutely no burning of debris on this site will be allowed.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fire-retardant-treated lumber.
 - 2. Miscellaneous lumber.
 - 3. Plywood backing panels.

1.2 DEFINITIONS

- A. Boards or Strips: Lumber of less than 2 inches nominal size in least dimension.
- B. Dimensional Lumber: Lumber of 2 inches nominal size or greater but less than 5 inches nominal size in least dimension.
- C. Exposed Framing: Framing not concealed by other construction.
- D. Lumber grading agencies, and abbreviations used to reference them, include the following:
 - 1. NeLMA: Northeastern Lumber Manufacturers' Association.
 - 2. NLGA: National Lumber Grades Authority.
 - 3. SPIB: The Southern Pine Inspection Bureau.
 - 4. WCLIB: West Coast Lumber Inspection Bureau.
 - 5. WWPA: Western Wood Products Association.

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. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 - 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency in accordance with ASTM D5664.
 - 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates:
 - 1. For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
 - 2. For preservative-treated wood products. Indicate type of preservative used and net amount of preservative retained.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack wood products flat with spacers beneath and between each bundle to provide air circulation. Protect wood products from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

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PART 2 - PRODUCTS

2.1 WOOD PRODUCTS

- A. Lumber: Comply with DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Grade lumber 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. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
 - 4. Dress lumber, S4S, unless otherwise indicated.
- B. Maximum Moisture Content:
 - 1. Boards: 19 percent.
 - 2. Dimension Lumber: 15 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness unless otherwise indicated.

2.2 FIRE-RETARDANT-TREATED LUMBER

- A. General: Where fire-retardant-treated materials are indicated, materials are to comply with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame-spread index of 25 or less when tested in accordance with ASTM E84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.
 - 1. Treatment is not to promote corrosion of metal fasteners.
 - 2. Interior Type A: Treated materials are to have a moisture content of 28 percent or less when tested in accordance with ASTM D3201/D3201M at 92 percent relative humidity. Use where exterior type is not indicated.
 - 3. Design Value Adjustment Factors: Treated lumber is to be tested according to ASTM D5664 and design value adjustment factors are to be calculated according to ASTM D6841.
- C. Kiln-dry lumber after treatment to maximum moisture content of 19 percent. Kiln-dry plywood after treatment to maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency and other information required by authorities having jurisdiction.
- E. Application: Treat all rough carpentry unless otherwise indicated.

2.3 MISCELLANEOUS LUMBER

- A. Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:
 - 1. Blocking.
 - 2. Nailers.

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- B. Dimension Lumber Items: Construction or No. 2 grade lumber of the following species:
 - 1. Mixed southern pine or southern pine; SPIB.
 - 2. Spruce-pine-fir; NLGA.
 - 3. Spruce-pine-fir (south); NeLMA, WCLIB, or WWP.
 - 4. Western woods; WCLIB or WWP.
- C. Concealed Boards: 19 percent maximum moisture content and any of the following species and grades:
 - 1. Mixed southern pine or southern pine; No. 2 grade; SPIB.
 - 2. Spruce-pine-fir (south) or spruce-pine-fir; Construction or No. 2 Common grade; NeLMA, NLGA, WCLIB, or WWP.
 - 3. Western woods; Construction or No. 2 Common grade; WCLIB or WWP.
- D. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.4 PLYWOOD BACKING PANELS

- A. Equipment Backing Panels: Plywood, DOC PS 1, Exterior, C-C Plugged, fire-retardant treated, in thickness indicated or, if not indicated, not less than 3/4-inch nominal thickness.

2.5 FASTENERS

- A. General: Fasteners are to be of size and type indicated and comply with requirements specified in this article for material and manufacture. Provide nails or screws, in sufficient length, to penetrate not less than 1-1/2 inches into wood substrate.
- B. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners of Type 304 stainless steel.
- C. Power-Driven Fasteners: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
- D. Post-Installed Anchors: Fastener systems with an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 as appropriate for the substrate.

2.6 METAL FRAMING ANCHORS

- A. Materials: Unless otherwise indicated, fabricate from the following materials:
 - 1. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M, G60 coating designation.
 - a. Use for interior locations unless otherwise indicated.
 - 2. Heavy-Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653/A653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 coating designation; and not less than 0.036 inch thick.
 - a. Use for wood-preservative-treated lumber and where indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough

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carpentry accurately to other construction. Locate nailers, blocking, and similar supports to comply with requirements for attaching other construction.

- C. Install plywood backing panels by fastening to studs; coordinate locations with utilities requiring backing panels. Install fire-retardant-treated plywood backing panels with classification marking of testing agency exposed to view.
 - D. Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
 - E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.
 - F. 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.
 - G. Comply with AWPAC M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 - 1. Use inorganic boron for items that are continuously protected from liquid water.
 - 2. Use copper naphthenate for items not continuously protected from liquid water.
 - H. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
 - I. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. Table 2304.10.1, "Fastening Schedule," in ICC's International Building Code (IBC).
 - 2. ICC-ES evaluation report for fastener.
 - J. 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 INSTALLATION OF WOOD BLOCKING AND NAILERS
- 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 wood blocking to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
 - C. Attach wood roofing nailers securely to substrate to resist the designed outward and upward wind loads indicated on Drawings and in accordance with ANSI/SPRI ED-1, Tables A6 and A7.
 - D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.
- 3.3 PROTECTION
- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

PART 1 GENERAL

1.1. REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM C1289	Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
FM 4450	Approval Standard for Class 1 Insulated Steel Deck Roofs
FM APP GUIDE	Approval Guide https://www.approvalguide.com/
ICC IBC	International Building Code
NFPA 1	Fire Code
UL 1256	(2023) Fire Test of Roof Deck Constructions

1.1. SUBMITTALS

1.1.1.Shop Drawings

- 1.1.1.1. Insulation Board Layout
- 1.1.1.2. Verification of Existing Conditions

1.1.2.Product Data

- 1.1.2.1. Insulation
- 1.1.2.2. Fasteners
- 1.1.2.3. Moisture Control

1.1.3.Design Data

- 1.1.3.1. Wind Resistance
- 1.1.3.2. Test Reports
- 1.1.3.3. Flame Spread Rating

1.1.4.Certificates

- 1.1.4.1. Installer Qualifications
- 1.1.4.2. Indoor Air Quality For Insulation

1.1.5.Manufacturer's Instructions

- 1.1.5.1. Nails and Fasteners
- 1.1.5.2. Roof Insulation

1.1. SHOP DRAWINGS

Submit insulation board layout and attachment indicating methods of attachment and spacing of fasteners on each board, transitions, tapered components, thicknesses of materials, and closure and termination conditions. Show locations of ridges, valleys, crickets, interface with, and slope to, roof drains. Base shop drawings on verified field measurements and include verification of existing conditions. Show location and spacing of wood nailers required for securing of insulation.

1.2. PRODUCT DATA

Include data for material descriptions, recommendations for product shelf life, requirements for cover board or coatings, and precautions for flammability and toxicity. Include data to verify compatibility of

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sealants with insulation.

1.1. MANUFACTURER'S INSTRUCTIONS

Include field of roof, perimeter, and corner attachment requirements.

Provide a complete description of installation sequencing for each phase of the roofing system. Include weatherproofing procedures.

1.1. QUALITY CONTROL

Provide certification of installer qualifications from the insulation manufacturer confirming the specific installer has the required qualifications for installing the specific roof insulation system(s) indicated.

1.1. WIND RESISTANCE REQUIREMENTS

The complete roof system assembly must be rated and installed to resist wind loads meeting local code regulations and validated by uplift resistance testing in accordance with Factory Mutual (FM) test procedures. Coordinate with roof covering attachment requirements and submit wind resistance test certification, attachment patterns for field, perimeter, and corner roof areas along with perimeter and corner boundary dimensions.

1.1. FIRE PERFORMANCE REQUIREMENTS

1.1.1. Insulation in Roof Systems

Comply with the requirements of ICC IBC. Roof insulation must have a flame spread rating of 75 or less when tested in accordance with ASTM E84. Additional documentation of compliance with flame spread rating is not required when insulation of the type used for this project as part of the specific roof assembly is listed and labeled as FM Class 1 approved.[Only roof assemblies that pass

1.1.2. Thermal Barrier Requirements

Separate insulation from a steel deck with a thermal barrier of glass mat gypsum roof board in accordance with the requirements of the ICC IBC

1.1.3. Fire Resistance Ratings for Roofs

Provide in accordance with ICC IBC Chapter 7 and Table 721.1(3) Min Fire and Smoke Protection For Floor and Roof Systems.

1.1. CERTIFICATIONS

Provide current product certification documentation from certification body.

1.2. DELIVERY, STORAGE, AND HANDLING

1.1.1. Delivery

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Deliver materials to the project site in manufacturer's unopened and undamaged standard commercial containers bearing the following legible information:

- 1.1.1.1. Name of manufacturer
- 1.1.1.2. Brand designation
- 1.1.1.3. Specification number, type, and class, as applicable, where materials are covered by a referenced specification.
- 1.1.1.4. Deliver materials in sufficient quantity to allow continuity of the work.

1.1.2.Storage and Handling

Store and handle materials in accordance with manufacturer's printed instructions. Protect from damage, exposure to open flame or other ignition sources, wetting, condensation, and moisture absorption. Keep materials wrapped and separated from off-gassing materials (such as drying paints and adhesives). Do not use materials that have visible moisture or biological growth. Store in an enclosed building or trailer that provides a dry, adequately ventilated environment. Replace damaged material with new material.

1.1. ENVIRONMENTAL CONDITIONS

As per manufacturer's recommendations or Government's instructions, do not install roof insulation during inclement weather or when air temperature is below 40 degrees F and interior humidity is 45 percent or greater, or when there is visible ice, frost, or moisture on the roof deck.

PART 2 PRODUCTS

2.1 INSULATION

2.1.1.Insulation Type

Provide roof insulation that is compatible with attachment methods for the specified insulation and roof membrane.

Polyisocyanurate Board: Provide in accordance with ASTM C1289 REV A Type I, foil faced both sides or as otherwise specified by TPO manufacturer's requirements.

- 2.1.1.1. Insulation Thickness – Match existing (total thickness of 1 1/2 inches minimum)

2.1.2.Cants and Tapered Edge Strips

Where cants and tapered edge strips are necessary, provide preformed cants and tapered edge strips of the same material as the roof insulation. When unavailable, provide pressure-preservative treated wood, or rigid perlite board cants and edge strips as recommended by the roofing manufacturer for the specific application, unless otherwise indicated. Face of cant strips to incline at 45 degrees with a minimum vertical height of 4 inches. Taper edge strips at a rate of one to 1 1/2 inch per foot down to approximately 1/8 inch thick.

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2.1.3.Glass Mat Gypsum Roof Board

ASTM C1177/C1177M, 0 Flame Spread and 0 Smoke Developed when tested in accordance with ASTM E84, 500 psi, Class A, non-combustible, 1/4 inch thick, 4 by 8 feet board size.

2.2 FASTENERS

Provide flush-driven fasteners through flat round or hexagonal steel or plastic plates. Provide zinc-coated steel plates, flat round not less than 1 3/8 inch diameter, hexagonal not less than 28 gage. Provide high-density plastic plates, molded thermoplastic with smooth top surface, reinforcing ribs and not less than 3 inches in diameter. Fully recess fastener head into plastic plate after it is driven. Form plates to prevent dishing. Do not use bell or cup shaped plates. Provide fasteners in accordance with insulation manufacturer's recommendations for holding power when driven. Provide fasteners for steel decks in accordance with FM APP GUIDE (<https://www.approvalguide.com/>) for Class I roof deck construction, and spaced to withstand uplift pressure of 90 pounds per square foot.

2.2.1 Fasteners for Steel Decks

Approved hardened penetrating fasteners or screws in accordance with FM 4450 and listed in FM APP GUIDE for Class I roof deck construction. Quantity and placement to withstand a minimum uplift pressure of 90 psf in accordance with FM APP GUIDE.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

3.1.1. Surface Preparation

To correct defects and inaccuracies in roof deck surface to eliminate poor drainage from hollow or low spots, perform the following:

- 3.1.1.1. Provide wood nailers of the same thickness as the insulation at eaves, edges, curbs, walls, and roof openings for securing of cant strips, gravel stops, gutters, flashing flanges, and curbs. Space nailers in accordance with approved shop drawings.
- 3.1.1.2. Cover steel decks with a layer of insulation board of sufficient width to span the width of a deck rib opening, and in accordance with fire safety requirements. Secure with piercing or self-drilling, self-tapping fasteners of quantity and placement in accordance with FM APP GUIDE. Locate insulation joints parallel to ribs of deck on solid bearing surfaces only, not over open ribs.

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3.2 INSULATION INSTALLATION

Apply insulation in two layers with staggered joints when total required thickness of insulation exceeds 1/2 inch. Lay insulation so that continuous longitudinal joints are perpendicular to direction of roofing, and end joints of each course are staggered with those of adjoining courses. When using multiple layers of insulation, provide joints of each succeeding layer that are parallel and offset in both directions with respect to the layer below. Keep insulation 1/2 inch clear of vertical surfaces penetrating and projecting from roof surface. Verify required slopes to each roof drain.

3.2.1. Installation Using Only Mechanical Fasteners

Secure total thickness of insulation with penetrating type fasteners.

3.2.2. Special Precautions for Installation of Polyisocyanurate Insulation

Where polyisocyanurate foam board insulation is provided, install cover board over top surface of foam board insulation. Stagger joints of insulation with respect to foam board insulation below.

3.2.3. Cant Strips

Where necessary, provide edge strips in the right angle formed by the juncture of roof and wood nailing strips that extend above the level of the roof. Install edge strips flush to vertical surfaces of wood nailing strips. Where possible, nail edge strips to adjoining surfaces. Where installed against non-nailable materials, install in an approved adhesive.

3.3 PROTECTION

3.3.1. Protection of Applied Insulation

Completely cover each day's installation of insulation with finished roofing on the same day. Phased construction is not permitted. Protect open spaces between insulation and parapets or other walls and spaces at curbs, scuttles, and expansion joints, until permanent roofing and flashing are applied. Storing, walking, wheeling, or trucking directly on insulation or on roofed surfaces is not permitted. Provide smooth, clean board or plank walkways, runways, and platforms near supports, as necessary, to distribute weight evenly. Protect exposed edges of insulation with cutoffs at the end of each workday or whenever precipitation is imminent. Cutoffs must be two layers of EPDM membrane set in roof cement. Fill all profile voids in cutoffs to prevent trapping moisture below the membrane. Remove cutoffs when work resumes.

3.3.2. Damaged Work and Materials

Restore work and materials that become damaged during construction to original condition or replace with new materials.

3.4 INSPECTION

Establish and maintain inspection procedures to assure compliance of the installed roof insulation with

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Contract requirements. Remove, replace, correct in an approved manner, any work found not in compliance. Quality control must include, but is not limited to, the following:

Observation of environmental conditions; number and skill level of insulation workers; start and end time of work.

Verification of certification, listing or label compliance with FM Data Sheets.

Verification of proper storage and handling of insulation and vapor retarder materials before, during, and after installation.

Inspection of mechanical fasteners; type, number, length, and spacing.

Coordination with other materials, cants, sleepers, and nailing strips.

Inspection of insulation joint orientation and laps between layers, joint width and bearing of edges of insulation on deck.

Installation of cutoffs and proper joining of work on subsequent days.

Continuation of complete roofing system installation to cover insulation installed same day.

Verification of required slope to each roof drain.

--End of Section --

SECTION 07 54 23 - THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Thermoplastic polyolefin (TPO) roofing system.
 - 2. Accessory roofing system materials.
 - 3. Substrate board.
 - 4. Temporary roof/Vapor barrier.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking; and for wood-based, structural-use roof deck panels.
 - 2. Section 07 62 00 "Sheet Metal Flashing and Trim" for metal roof flashings and counterflashings.
 - 3. Section 07 71 00 "Manufactured Roof Specialties" for premanufactured copings and roof edge fasciae.
 - 4. Section 07 91 00 "Preformed Joint Seals" for preformed joint seals where necessary.
 - 5. Section 07 92 00 "Joint Sealants" for joint sealants, joint fillers, and joint preparation.

1.2 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary in NRCA's "Roofing Manual: Membrane Roof Systems" apply to Work of this Section.

1.3 PREWORK CONFERENCE

- A. Before starting roof deck construction, conduct conference at the Project site.
 - 1. Meet with Owner, Owner's insurer if applicable, Roofing System 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.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Assembly Letter: Submit an assembly letter on roofing manufacturer's letterhead showing the following:
 - 1. Roof assembly and fastening pattern and attachment method(s).
 - 2. Roof warranty length and type.

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- C. Samples for Verification: For the following products:
 - 1. Roofing membrane and flashings, of color required.
- D. Wind-Uplift-Resistance Submittal: For roofing system indicating compliance with wind-uplift performance requirements.
- E. Provide a copy of approved project registration of the project with the roofing manufacturer.
 - 1. Registration shall show assembly, fastening pattern and method of fastening. Documentation shall show that roofing contractors project registration is approved by the roofing manufacturer.
- F. Provide evidence of compliance with Oklahoma Bill #2180 "Roofing Contractor Registration Act", and current Commercial Endorsement with Oklahoma Construction Industries Board.

1.5 INFORMATIONAL SUBMITTALS

- A. Manufacturer Certificates:
 - 1. Performance Requirement Certificate: Signed by roofing membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of compliance with specified performance requirements.
 - 2. Special Warranty Certificate: Signed by roofing membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- B. Field quality-control reports.
- C. Qualification Data: For roofing system Installer.
- D. Sample warranties.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing system.
- B. Warranty Documentation:
 - 1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
 - 2. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.
 - a. Provide additional document from the roofing manufacturer that the final punch list has been completed.

1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: 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, certified, 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 system 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.

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- 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.
 - 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.
 - 1. Store in a dry location.
 - 2. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing system 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 in accordance with manufacturer's written installation 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 to include all components of roofing system, such as roof insulation, fasteners, adhesives, roofing membrane, base flashing sheet, walkways, and other components of roofing system.
 - 2. Warranty Period: 20 years from date of Substantial Completion.
- B. Roofing System Installer's Warranty: Submit Roofing System Installer's warranty, on warranty form at end of this Section, signed by Roofing System Installer, covering the Work of this Section, including all components of roofing system, such as roof insulation, fasteners, adhesives, cover board, roofing membrane, base flashing sheet, and other components of roofing system.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. Obtain components for roofing system from roofing membrane manufacturer or manufacturer approved by roofing membrane manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Installed roofing system and flashings to withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roofing system and flashings to remain watertight.
 - 1. Accelerated Weathering: Roofing membrane to withstand 2000 hours of exposure when tested in accordance with ASTM G152, ASTM G154, or ASTM G155.
 - 2. Impact Resistance: Roofing membrane to resist impact damage when tested in accordance with ASTM D3746/D3746M, ASTM D4272/D4272M, or the Resistance to Foot Traffic Test in FM Approvals 4470.

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- B. Material Compatibility: Roofing system materials to be compatible with one another and adjacent materials under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.
- C. Wind-Uplift Resistance: Design roofing system to resist the following wind-uplift pressures when tested in accordance with FM Approvals 4474, UL 580, or UL 1897: As indicated on the Drawings.
 - 1. Zone 1 (Roof Area Field): -28 PSF
 - 2. Zone 2 (Roof Area Perimeter): -39 PSF
 - 3. Zone 3 (Roof Area Corners): -60 PSF
- D. FM Approvals' RoofNav Listing: Roofing membrane, base flashings, and component materials to 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. Hail-Resistance Rating: FM Global Property Loss Prevention Data Sheet 1-34 SH.
- E. Cool Roof Rating Council (CRRC): Roofing system to be listed by the CRRC for low-slope roof products.
- F. Energy Performance: Roofing system to have an initial solar reflectance index (SRI) of not less than 0.70 and an emissivity of not less than 0.75 when tested in accordance with CRRC S100.
- G. Exterior Fire-Test Exposure: Class A; for application and roof slopes indicated; when tested by a qualified testing agency in accordance with ASTM E108 or UL 790.
 - 1. Identify products with appropriate markings of applicable testing agency.
- H. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated.
 - 1. Identify products with appropriate markings of applicable testing agency.

2.3 THERMOPLASTIC POLYOLEFIN (TPO) ROOFING SYSTEM

- A. TPO Roofing Membrane Sheet: ASTM D6878/D6878M, internally fabric- or scrim-reinforced, fabric-backed (fleece) TPO sheet.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Carlisle Syntec Systems
 - b. Elevate; Holcim Building Envelope
 - c. GAF
 - d. IKO Innovati; IKO Industries Inc.
 - e. Johns Manville; a Berkshire Hathaway company
 - f. Kingspan
 - g. Versico
 - 2. TPO Thickness: 60 mil, nominal.
 - 3. Total Thickness with Fleece: 115 mil.
 - 4. Membrane attachment: Splatter pattern with foam adhesive.
 - 5. Exposed Face Color: White.

2.4 ACCESSORY ROOFING SYSTEM MATERIALS

- A. General: Accessory materials as recommended in writing by roofing membrane manufacturer for intended use and compatible with other roofing system components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Base and Sheet Flashings: Manufacturer's standard sheet flashing of same material, type, reinforcement, thickness, and color as roofing membrane.

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- C. Prefabricated Pipe Flashings: As recommended in writing by roofing membrane manufacturer.
- D. Bonding Adhesive: Roofing membrane manufacturer's standard foam adhesive formulated for compatibility with fleece backed TPO membrane and wide variety of substrate materials.
- E. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.
- F. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roofing system components to substrate; tested for required pullout strength, and acceptable to roofing membrane manufacturer.
- G. Miscellaneous Accessories: As recommended in writing by roofing membrane manufacturer.

2.5 SUBSTRATE BOARD

- A. Glass-Mat Gypsum Roof Substrate Board: ASTM C1177/C1177M, water-resistant gypsum board.
 - 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. Georgia-Pacific Gypsum LLC
 - 1) DensDeck Prime.
 - b. Gold Bond Building Products, LLC provided by National Gypsum Company
 - 1) DEXcell FA.
 - 2. Thickness: Type X, 5/8 inch.
 - 3. Surface Finish: Factory primed.
- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening substrate board to roof deck.
- C. Bonding Adhesive: Manufacturer's standard, designed for adhering substrate board to roof deck.

2.6 TEMPORARY ROOF/VAPOR BARRIER

- A. Temporary Roof/Vapor Barrier: Comprised of SBS modified bitumen adhesive, factory-laminated to a tri-laminate woven, high-density polyethylene top surface. Release liner protecting adhesive. May be used as a temporary roof membrane for up to ninety (90) days.
 - 1. Thickness: 0.0325" (0.826 mm) minimum, when tested in accordance with ASTM D 5147.
 - 2. Max Load at Break at 73 °F (23 °C): 64 lbf/in, MD (11 kN/m) 88 lbf/in, XMD (15 kN/m) when tested in accordance with ASTM D 5147.
 - 3. Low Temperature Flexibility: -30 °F (-34 °C) when tested in accordance with ASTM D 5147.
 - 4. Moisture Vapor Permeance, 0.02 perms (0.92 Ng/Pa•s•m²) maximum, when tested in accordance with ASTM E96.
 - 5. Air Permeability: 0.00114 ft³/min•ft² (0.007 L/sec•m²) maximum, when tested in accordance with ASTM E2178.
 - 6. Acceptable Product: V-Force Vapor Barrier Membrane by Elevate.
 - a. Other manufacturers:
 - 1) Carlisle Syntec Systems.
 - 2) GAF.
 - 3) IKO Innovati; IKO Industries Inc.
 - 4) Johns Manville; a Berkshire Hathaway company.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Roofing System 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.
 - 3. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Section 05 31 00 "Steel Decking."
 - 4. 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.
 - 5. Verify that substrate is visibly dry and free of moisture.
 - 6. Verify that any materials that will impair adhesion of roofing components to roof deck have been removed.
 - 7. Verify any damaged sections of decks have been repaired or replaced.
 - 8. Verify adjacent any deck panels are vertically aligned to within 1/8 inch at top surface.
- 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 in accordance with 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.
- C. Prime surface of deck with primer in accordance with roofing system manufacturer's written installation instructions and allow primer to dry.
- D. Perform fastener-pullout tests in accordance with roofing system manufacturer's written instructions.
 - 1. Submit test result within 24 hours after performing tests.
 - a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.
- E. Install sound-absorbing insulation strips in ribs of acoustical steel roof deck in accordance with roof deck manufacturer's written instructions.

3.3 INSTALLATION OF SUBSTRATE BOARD

- A. Install substrate board with long joints in continuous straight lines, with end joints staggered not less than 24 inches in adjacent rows.
 - 1. Install substrate board at right angle to flutes of steel roof deck. Locate end joints over crests of steel roof deck.
 - 2. Tightly butt substrate boards together.
 - 3. Cut substrate board to fit tight around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - 4. Fasten substrate board to top flanges of steel deck to resist uplift pressure at corners, perimeter, and field of roof in accordance with roofing system manufacturers' written installation instructions.

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3.4 TEMPORARY ROOF/VAPOR BARRIER INSTALLATION

- A. Install temporary roof/vapor barrier over substrate board if necessary to prevent water intrusion into building. No additional payment will be made for this work.
- B. Install temporary roof/vapor barrier in accordance with manufacturer's recommendations.
- C. Application can be made at ambient temperatures as low as 25 °F as long as membrane has been stored in a heated area so that it will be between 50 °F and 100 °F at the time of application.
- D. Install with minimum 3" side laps and 6" end laps.
- E. Roll in with a 75 lb. roller to fully mate each roll to substrate, including all lap areas.
- F. Install temporary roof/vapor barrier to flashed into roof drains. Edges shall be water tight at the edges so that it provides a water tight installation.

3.5 INSTALLATION OF THERMOPLASTIC-POLYOLEFIN (TPO) ROOFING SYSTEM, GENERAL

- A. Install roofing system materials and components in accordance with roofing system manufacturer's written installation instructions, FM Approvals' RoofNav listed roof assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- 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.

3.6 INSTALLATION OF TPO ROOFING MEMBRANE

- A. Installation of TPO roof shall be installed over the entire surface of the roof.
- B. Install roofing membrane over roof area for adhered application method in accordance with roofing system manufacturer's written installation instructions.
- C. Unroll roofing membrane and allow it to relax before installing.
- D. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps. Apply roofing membrane with side laps shingled with slope of roof deck where possible.
- E. Spatter-Attached Membrane: Bond membrane sheet to substrate using membrane Manufacturer's recommended bonding material, application rate, pattern/spacing, and procedures.
- F. Adhered Application: Apply bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply to splice area of roofing membrane.
 - 1. In addition to adhering, mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roof area.
- G. Seams and End Laps: Clean seam areas, overlap membrane, and hot-air-weld side seams and end laps of roofing membrane and sheet flashings to ensure a watertight installation.
 - 1. Test lap edges with probe to verify seam weld continuity. Apply lap sealant to seal cut edges of roofing membrane and sheet flashings.
 - 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 membrane that do not comply with

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requirements.

- H. Spread sealant bed over deck-drain flange at roof drains, and securely seal roofing membrane in place with clamping ring.
- I. Install TPO expansion joint using a foam rod that has a diameter 1.5 times greater than the gap. Install in accordance with manufacturer's recommendations.

3.7 INSTALLATION OF BASE AND SHEET FLASHINGS

- A. General: Install and adhere base and sheet flashing and preformed flashing accessories to substrates in accordance with roofing system manufacturer's written installation instructions.
- B. Apply bonding adhesive to substrate and underside of flashings 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.
- D. Clean seam areas, overlap, and firmly roll flashings into the adhesive. Hot-air-weld side seams and end laps to ensure a watertight installation.
- E. Terminate and seal top of flashings and mechanically anchor to substrate through termination bars.

3.8 INSTALLATION OF WALKWAYS

- A. Flexible Walkways: Install walkway products in accordance with manufacturer's written installation 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 roofing 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 in accordance with roofing system manufacturer's written instructions.

3.9 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Owner.
- 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.

SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Custom flashing and trim fabrications, made from the following:
 - 1. Sheet metal materials.
 - 2. Miscellaneous materials.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 07 54 23 – Thermoplastic-Polyolefin (TPO) Roofing for roofing membrane.
 - 3. Section 07 71 00 "Manufactured Roof Specialties" for manufactured copings, roof-edge specialties, roof-edge drainage systems, reglets, and counterflashings.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. ES-1 Documentation: Metal Roof Copings and Edging: Roof edges shall meet ANSI/SPRI ES-1 requirements and if shop fabricated provide in profile as tested and provide documentation showing approved testing.
 - 1. If Contractor at his option provides shop fabricated ES-1 approved metal edges and copings in lieu of manufactured metal edges and copings. Provide verification proof that sheet metal shop has ES-1 approval with UL as part of the submittal package.
- C. Shop Drawings: For sheet metal flashing and trim.
 - 1. Plans, elevations, sections, and attachment details.
 - 2. Fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled Work.
 - 3. Identification of material, thickness, weight, and finish for each item and location in Project.
 - 4. Details for forming, including profiles, shapes, seams, and dimensions.
 - 5. Details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
 - 6. Details of termination points and assemblies.
 - 7. Details of special conditions.
 - 8. Details of connections to adjoining work.
 - 9. Formed flashing and trim at scale of not less than 1-1/2 inches per 12 inches.
- D. Samples: For each exposed product and for each color and texture specified, 12 inches long by actual width.
- E. Samples for Verification: Actual sample of finished products for each type of exposed finish for sheet metal and other metal accessories.
 - 1. Sheet Metal Flashing and Trim: Manufacturers' standard size. Include finished seam with required profile. Include fasteners, cleats, clips, closures, and other attachments.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For sheet metal flashing and trim, and its accessories.

1.4 DELIVERY, STORAGE, AND HANDLING

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- 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.

1.5 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.

1.6 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. Finish Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCEREQUIREMENTS

- A. Sheet metal flashing and trim assemblies, including cleats, anchors, and fasteners, are to 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 are not to rattle, leak, or loosen, and are to 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. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 SHEET METAL MATERIALS

- A. Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.
- B. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with minimum ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with minimum ASTM A792/A792M, Class AZ50 coating designation; structural quality. Prepainted by the coil-coating process to comply with ASTM A755/A755M.
 - 1. Nominal Thickness: 0.028 inch .
 - 2. Surface: Smooth, flat.
 - 3. Exposed Coil-Coated Finish:

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- a. Two-Coat Fluoropolymer: Fluoropolymer finish containing not less than 70 percent 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 Owner from manufacturer's full range or as required to match adjacent material.
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.

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) or Aluminum-Zinc Alloy-Coated Steel Sheet: Series 300 stainless steel or hot-dip galvanized steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
- C. 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.
- D. Elastomeric Sealant: ASTM C920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.
 1. Elastomeric Sealant: ASTM C920, elastomeric polymer formula, Type S, Grade NS, Class 50, Use T, NT, M, A & G. Basis of Design:
 - a. Titebond Metal Roof WeatherMaster Sealant as manufactured by Franklin International.
- E. Bituminous Coating: Cold-applied asphalt emulsion in accordance with ASTM D1187/D1187M.

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

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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 ft. 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.
2. Use lapped expansion joints only where required.

D. Sealant Joints: Where movable, non-expansion-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:

1. Fabricate nonmoving seams with flat-lock seams. Tin edges to be seamed, form seams, and solder.
2. 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.

H. Do not use graphite pencils to mark metal surfaces.

2.5 LOW-SLOPE ROOF SHEET METAL FABRICATIONS

A. Roof Edge Flashing (Gravel Stop) and Fascia Cap: Fabricate in minimum 96-inch- long, but not exceeding 12 ft. long sections. Furnish with 6-inch- wide, joint cover plates. Shop fabricate interior and exterior corners.

1. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate.
2. Roof edges shall meet ANSI/SPRI ES-1 requirements and if shop fabricated provide in profile as tested and provide documentation showing approved testing for profile used.
3. Fabricate from the following materials:
 - a. Galvanized Steel: 0.028 inch thick.

B. Copings: Fabricate in minimum 96-inch- long, but not exceeding 12 ft.- 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 the Drawings.
2. Joint Style: Butted with expansion space and 6-inch- wide, concealed backup plate.

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3. Fabricate from the following materials:
 - a. Galvanized Steel: 0.040 inch thick.

- C. Counterflashing: Shop fabricate interior and exterior corners. Fabricate from the following materials:
 1. Galvanized Steel: 0.28 inch thick.

2.6 MISCELLANEOUS SHEET METAL FABRICATIONS

- A. Equipment Support 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, substrates, 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 substrate to prevent air infiltration or water penetration.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF SHEET METAL FLASHING AND TRIM, 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, 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 sealant.
 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. Install continuous cleats with fasteners spaced not more than 12 inches o.c.
 6. Space individual cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
 7. Install exposed sheet metal flashing and trim with limited oil-canning, and free of buckling and tool marks..
 8. Do not field cut sheet metal flashing and trim by torch.
 9. Do not use graphite pencils to mark metal surfaces.
- 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.
 1. Coat concealed side of sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
 2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

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- C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim.
 - 1. Space movement joints at maximum of 10 ft. 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.
 - 3. Use lapped expansion joints only where indicated on Drawings.
- D. Fasteners: Use fastener sizes 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 07 92 00 "Joint Sealants."
- G. Rivets: Rivet joints in uncoated aluminum where necessary for strength.

3.3 INSTALLATION OF SLOPED ROOF SHEET METAL FABRICATIONS

- 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 copings 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

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required windstorm classification.

- D. Counterflashing: Coordinate installation of counterflashing with installation of base flashing.
 - 1. Insert counterflashing in reglets or 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.
- E. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with **[elastomeric][butyl]** sealant and clamp flashing to pipes that penetrate roof.

3.4 INSTALLATION OF WALL SHEET METAL FABRICATIONS

- A. Install sheet metal wall flashing to intercept and exclude penetrating moisture in accordance with cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.
- B. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

3.5 INSTALLATION TOLERANCES

- A. Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 ft. 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 and neutralize flux materials. Clean off excess solder.
- B. 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 Owner.

END OF SECTION

SECTION 07 71 00 – MANUFACTURED ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Manufactured units for the following applications:
 - 1. Roof-edge specialties.
- B. Related Requirements:
 - 1. Section 06 10 00 "Rough Carpentry" for wood nailers, curbs, and blocking.
 - 2. Section 07 54 23 "Thermoplastic-Polyolefin (TPO) Roofing" for membrane roofing.
 - 3. Section 07 62 00 "Sheet Metal Flashing and Trim" for custom- and site-fabricated, sheet metal flashing and trim.
 - 4. Section 07 92 00 "Joint Sealants" for field-applied sealants between roof specialties and adjacent materials.

1.2 PRECONSTRUCTION CONFERENCE

- A. Preconstruction Conference: Conduct conference at Project site.
 - 1. Meet with Owner, Owner's insurer if applicable, roofing-system testing and inspecting agency representative, roofing Installer, roofing-system manufacturer's representative, Installer, structural-support Installer, and installers whose work interfaces with or affects roof specialties, including installers of roofing materials and accessories.
 - 2. Examine substrate conditions for compliance with requirements, including flatness and attachment to structural members.
 - 3. Review special roof details, roof drainage, and condition of other construction that will affect roof specialties.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of roof specialty.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties.
 - 1. Plans, expansion-joint locations, keyed details, and attachments to other work. Distinguish between factory pre manufactured- and field-assembled installation.
 - 2. Details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 4. Details of termination points and assemblies, including fixed points.
 - 5. Details of special conditions.
- C. Samples: For each type of roof specialty and for each color and texture specified.
- D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- E. Samples for Verification:
 - 1. Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.
 - 2. Include roof-edge specialties made from 12-inch lengths of full-size components in specified material, and including fasteners, cover joints, accessories, and attachments.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of roof specialty roof-edge flashings that is ANSI/SPRI/FM 4435/ES-1 tested.
- B. Product Test Reports: For roof-edge flashings, for tests performed by a qualified testing agency.
- C. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roof specialties.
- B. Completed warranty documentation.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products that are FM Approvals listed for specified class or ANSI/SPRI/FM 4435/ES-1 tested to specified design pressure.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.
- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.

1.9 COORDINATION

- A. Coordinate roof specialties with roofing system, exterior wall system, air barrier, flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leakproof, weathertight, secure, and noncorrosive installation.
 - 1. Performance Coordination: Coordinate with the Work of roofing and exterior wall Sections to ensure that roof specialties provided under the Work of this Section meet or exceed specified roofing and exterior wall design performance requirements.
- B. Confirm and coordinate compatibility of materials and comply with warranty requirements of roofing system manufacturer.
- C. Coordinate roof specialties layout and seams with sizes and locations of joints and seams in adjacent materials.

1.10 WARRANTY

- A. Manufacturers Wind Warranty:
 - 1. Roof Edge: Lifetime, 215 mph wind warranty – Anchor Tite.
 - 2. Coping: 20 year, 120 mph wind warranty – Perma-Tite Continuous Cleat Coping.
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finishes or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:

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- 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. General Performance: Roof specialties to withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install roof-edge specialties that are listed in FM Approvals' "Approval Guide" and approved for minimum windstorm classification, Class 1-90 . Identify materials with FM Approvals' markings.
- C. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested in accordance with ANSI/SPRI/FM 4435/ES-1 and capable of resisting the following design pressures:
 1. Design Pressure: As indicated on Drawings.
- D. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. 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 ROOF-EDGE SPECIALTIES

- A. Roof-Edge Fascia: Manufactured, two-piece, roof-edge fascia consisting of snap-on metal fascia cover in section lengths not exceeding 12 ft. and a continuous metal receiver with integral drip-edge cleat to engage fascia cover and secure single-ply roof membrane. Provide matching corner units.
 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. Hickman; an MTL Company
 - b. Metal-Era, Inc.
 2. Pull-Off Resistance: Tested in accordance with ANSI/SPRI/FM 4435/ES-1 using test methods RE-1 and RE-2 to positive and negative design wind pressure as defined by applicable local building code.
 3. Metallic-Coated Steel Fascia Covers: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, nominal 24 ga. thickness.
 - a. Basis of Design:
 - 1) Hickman Edge Systems; TerminEdge Drip Edge EX Flat: www.hickmanedgesystems.com.
 - 2) Metal Era, Inc., Anchor-Tite Drip Edge: www.metalera.com.
 - b. Surface: Smooth, flat finish.
 - c. Finish: Two-coat fluoropolymer.
 - d. Color: As indicated on the Exterior Finish Schedule on the Drawings.
 4. Corners: Factory mitered and sealed watertight.
 5. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
 6. Extruded Anchor Bar:
 - a. Material: Aluminum.
 - b. Thickness: Varies based on face height.

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- c. Extruded Lengths: 12'-0".
- d. Fastener Holes: Prepunched.
- e. Anchor Bar Splices: EPDM Rubber.
- f. Lap Joints: Manufacturers standard.

2.3 SHEET METAL MATERIALS

- A. Metallic-Coated Steel Sheet: Zinc-coated (galvanized) steel sheet complying with minimum ASTM A653/A653M, G90 coating designation, or aluminum-zinc alloy-coated steel sheet complying with minimum ASTM A792/A792M, Class AZ50 coating designation; structural quality.
 - 1. Exposed Coil-Coated Finish: Prepainted by the coil-coating process to comply with ASTM A755/A755M. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.
 - a. Two-Coat Fluoropolymer Finish: AAMA 2605. System consisting of primer and fluoropolymer color topcoat containing not less than 70 percent PVDF resin by weight in color coat.
 - 2. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester-backer finish consisting of prime coat and wash coat, with a minimum total dry film thickness of 0.5 mil.
- B. Aluminum Extrusions and Tubes: ASTM B221, manufacturer's standard alloy and temper for type of use, finished to match assembly where used; otherwise, mill finished.

2.4 MISCELLANEOUS MATERIALS

- A. Provide materials and types of fasteners, protective coatings, sealants, and other miscellaneous items required by manufacturer for a complete installation.
- B. Fasteners: Roof specialty manufacturer's recommended fasteners, designed to meet performance requirements, suitable for application and metals being fastened. Match finish of exposed fasteners with finish of material being fastened. Provide nonremovable fastener heads to exterior exposed fasteners. Furnish the following unless otherwise indicated:
 - 1. Fasteners for Metallic-Coated Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel in accordance with ASTM A153/A153M or ASTM F2329/F2329M.
 - 2. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
- C. Gaskets: Manufacturer's standard tubular or fingered design of neoprene, EPDM, PVC, or silicone or a flat design of foam rubber, sponge neoprene, or cork.
 - 1. Elastomeric Sealant: ASTM C920, elastomeric polymer formula, Type S, Grade NS, Class 50, Use T, NT, M, A & G. Basis of Design:
 - a. Titebond Metal Roof WeatherMaster Sealant as manufactured by Franklin International.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D1187/D1187M.
- E. Asphalt Roofing Cement: ASTM D4586, asbestos free, of consistency required for application.

2.5 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM/NOMMA AMP 500, "Metal Finishes Manual for Architectural and Metal Products," for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations

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in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install roof specialties in accordance with manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer's written installation instructions.
 - 1. Coat concealed side of uncoated aluminum roof specialties with bituminous coating where in contact with wood, ferrous metal, or cementitious construction.
 - 2. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 ft. with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate substrate not less than recommended in writing by fastener manufacturer to achieve maximum pull-out resistance. Install all fasteners provided by manufacturer in every prepunched hole to meet ES-1.
- E. Seal concealed joints with butyl sealant as required by roof specialty manufacturer.
- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges

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of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.3 INSTALLATION OF ROOF-EDGE SPECIALTIES

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.4 CLEANING AND PROTECTION

- A. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing in accordance with ASTM A780/A780M.
- B. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- C. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures, as determined by the Owner.

END OF SECTION

SECTION 07 91 00 - PREFORMED JOINT SEALS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Preformed, foam joint seals.
- B. Related Requirements:
 - 1. Section 07 92 00 "Joint Sealants" for liquid sealants applied over preformed seals in dual-seal systems.

1.2 PRECONSTRUCTION CONFERENCE

- A. Preconstruction Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data:
 - 1. Preformed, foam joint seals.
- B. Samples for Initial Selection: Manufacturer's color sheets, showing full range of available colors for each type of exposed preformed joint seal.
- C. Samples for Verification: Actual samples of each type and color of exposed preformed joint seal.
 - 1. Size: 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint seals.
- D. Preformed Joint Seal Schedule: Include the following information:
 - 1. Joint seal location and designation.
 - 2. Joint width and movement capability.
 - 3. Joint seal manufacturer and product name.
 - 4. Joint seal color.

1.4 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.5 WARRANTY

- A. Special Installer's Warranty: Installer agrees to repair or replace preformed joint seals that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.
- B. Special Manufacturer's Warranty: Manufacturer agrees to furnish preformed joint seals to repair or replace those that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

- A. For preformed joint seals, obtain each color, type, and variety of joint seal from single source
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with resources to provide products of consistent quality in appearance and physical properties.

2.2 PREFORMED, FOAM JOINT SEALS

- A. Preformed, Foam Joint Seals: Manufacturer's standard joint seal manufactured from urethane or EVA (ethylene vinyl acetate) foam with minimum density of 10 lb/cu. ft. and impregnated with a nondrying, water-repellent agent. Factory produce them in precompressed sizes in roll or stick form to fit joint widths based on design criteria indicated, with factory- or field-applied adhesive for bonding to substrates.
 - 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. EMSEAL; a Sika Company
 - b. LymTal International, Inc.
 - c. MM Systems Corporation
 - d. Nystrom, Inc.
 - e. Pecora Corporation
 - 2. Design Criteria:
 - a. Nominal Joint Width: As indicated on Drawings.
 - b. Minimum Joint Width: As indicated on Drawings.
 - c. Maximum Joint Width: As indicated on Drawings.
 - d. Movement Capability: -25 percent/+25 percent.
 - 3. Joint Seal Color: As selected by Owner from full range of industry colors.

2.3 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by preformed joint seal manufacturer for joint substrates indicated.
- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to preformed joint seal manufacturer, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces, and formulated to promote best adhesion to joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with preformed joint seals and surfaces adjacent to joints.
- D. Sealant for Adhering Extruded-Silicone Joint Seals: Silicone adhesive sealant recommended by extruded-silicone joint seal manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive preformed joint seals, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting preformed joint seal performance.
- 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 preformed joint seals to comply with preformed joint seal manufacturer's written instructions and the following requirements:

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1. Remove all foreign material from joint substrates that could interfere with adhesion of preformed joint seal, including dust, paints (except for permanent protective coatings tested and approved for seal adhesion and compatibility by seal 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 optimal bond with preformed joint seals. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
 - a. Concrete.
 - b. Masonry.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint seals. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
- B. Joint Priming: Prime joint substrates where recommended by preformed joint seal manufacturer or as indicated by tests or prior experience. Apply primer to comply with joint seal manufacturer's written instructions. Confine primers to areas of joint seal bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of adhesive or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF PREFORMED, FOAM JOINT SEALS

- A. General: Comply with preformed joint seal manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.
1. Install each length of seal immediately after removing protective wrapping.
 2. Firmly secure compressed joint seals to joint gap side to obtain full bond using exposed pressure-sensitive adhesive or field-applied adhesive as recommended by manufacturer.
 3. Do not pull or stretch material. Produce seal continuity at splices, ends, turns, and intersections of joints.
 4. For applications at low ambient temperatures, heat foam joint seal material in compliance with manufacturer's written instructions.

3.4 PROTECTION

- A. Protect preformed joint seals from damage resulting from construction operations or other causes so seals are without deterioration or damage at time of Substantial Completion.
- B. Cut out, remove, and repair damaged or deteriorated seals so repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Urethane joint sealants.
 - 4. Mildew-resistant joint sealants.
 - 5. Butyl joint sealants.
 - 6. Latex joint sealants.

1.2 ACTION SUBMITTALS

- A. Product Data:
 - 1. Silicone joint sealants.
 - 2. Nonstaining silicone joint sealants.
 - 3. Urethane joint sealants.
 - 4. Mildew-resistant joint sealants.
 - 5. Butyl joint sealants.
 - 6. Latex joint sealants.
- B. Samples for Initial Selection: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant manufacturer and product name.
 - 2. Joint-sealant formulation.
 - 3. Joint-sealant color.

1.3 INFORMATIONAL SUBMITTALS

- A. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

- A. Manufacturers' special warranties.

1.5 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.

1.6 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.

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1. Warranty Period: Two 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: Five 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 SOURCE LIMITATIONS

- A. Obtain joint sealants from single manufacturer for each sealant type.

2.2 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 Owner from manufacturer's full range.

2.3 SILICONE JOINT SEALANTS

- A. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 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. Adfast
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation
 - d. Sika Corporation - Building Components
 - e. The Dow Chemical Company
- B. Silicone, S, NS, 35, NT: Single-component, nonsag, plus 35 percent and minus 35 percent movement capability. nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 35, Use NT.
 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. Adfast
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Sika Corporation - Building Components
 - d. The Dow Chemical Company

- C. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S,

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Grade NS, Class 25, Use NT.

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. GE Construction Sealants; Momentive Performance Materials Inc.
 - b. Pecora Corporation
 - c. Sika Corporation - Building Components
 - d. The Dow Chemical Company

2.4 NONSTAINING SILICONE JOINT SEALANTS

- A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.
- B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.
 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. Adfast
 - b. Pecora Corporation
 - c. Sika Corporation - Building Components
- C. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.
 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. Adfast
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation
 - d. Sika Corporation - Building Components
 - e. The Dow Chemical Company

2.5 URETHANE JOINT SEALANTS

- A. Urethane, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 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. Adfast
 - b. Bostik; Arkema
 - c. Master Builders Solutions, brand of MBCC Group, a Sika company
 - d. Pecora Corporation
 - e. PPG Paints; PPG Industries, Inc.
 - f. Sherwin-Williams Company (The)
 - g. Sika Corporation - Building Components
 - h. Tower Sealants, Inc.
- B. Urethane, M, P, 50, T, NT: Multicomponent, pourable, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type M, Grade P, Class 50, Uses T and NT.
 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering

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products that may be incorporated into the Work include, but are not limited to, the following:

- a. LymTal International, Inc.

2.6 IMMERSIBLE JOINT SEALANTS

- A. Urethane, Immersible, S, P, 25, T, NT, I: Immersible, single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade P, Class 25, Uses T, NT, and I.
 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. Tremco Incorporated
 - b. W. R. Meadows, Inc

2.7 MILDEW-RESISTANT JOINT SEALANTS

- A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.
- B. Silicone, Mildew Resistant, Acid Curing, S, NS, 25, NT: Mildew-resistant, single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, acid-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 25, Use NT.
 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. Adfast
 - b. GE Construction Sealants; Momentive Performance Materials Inc.
 - c. Pecora Corporation
 - d. PPG Paints; PPG Industries, Inc.
 - e. Sika Corporation - Building Components
 - f. Soudal Accumetric
 - g. The Dow Chemical Company
 - h. Tremco Incorporated

2.8 BUTYL JOINT SEALANTS

- A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.
 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; Arkema
 - b. Everkem Diversified Products, Inc.
 - c. GSSI Sealants
 - d. Pecora Corporation
 - e. Sika Corporation - Building Components

2.9 LATEX JOINT SEALANTS

- A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.
 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. Adfast
 - b. Franklin International
 - c. Pecora Corporation
 - d. PPG Paints; PPG Industries, Inc.
 - e. Sherwin-Williams Company (The)

2.10 JOINT-SEALANT BACKING

- A. Sealant Backing Material: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
 - 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. Adfast
 - b. Alcot Plastics Ltd.
 - c. Construction Foam Products; a division of Nomaco, Inc.
 - d. Master Builders Solutions, brand of MBCC Group, a Sika company
- B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.11 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. Remove loose particles remaining after cleaning

operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Exterior insulation and finish systems.
3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Metal.
 - b. Glass.
 - c. Porcelain enamel.
 - d. Glazed surfaces of ceramic tile.

- B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C. Masking Tape: Use masking tape where required to prevent contact of sealant or primer with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

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 sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
 1. Do not leave gaps between ends of sealant backings.
 2. Do not stretch, twist, puncture, or tear sealant backings.
 3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.
- D. 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.
- E. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with 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.
 1. Remove excess sealant from surfaces adjacent to joints.
 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated.

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 JOINT-SEALANT SCHEDULE

- A. A. Joint-Sealant Application: Exterior joints in horizontal traffic surfaces.
 - 1. 1. Joint Locations:
 - a. Isolation and contraction joints in cast-in-place concrete slabs.
 - b. Joints between different materials listed above.
 - 2. Joint Sealant: Urethane, M, P, 50, T, NT.
 - 3. Joint-Sealant Color: As selected by Owner from manufacturer's full range of colors.
- B. Joint-Sealant Application: Exterior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Construction joints in cast-in-place concrete.
 - b. Joints between plant-precast architectural concrete units.
 - c. Joints between metal panels.
 - d. Perimeter joints between materials listed above and frames of doors, windows, and louvers.
 - e. Control and expansion joints in overhead surfaces.
 - 2. Joint Sealant: Silicone, nonstaining, S, NS, 50, NT.
 - 3. Joint-Sealant Color: As selected by Owner from manufacturer's full range of colors.
- C. Joint-Sealant Application: Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces.
 - 1. Joint Locations:
 - a. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - 2. Joint Sealant: Silicone, mildew resistant, acid curing, S, NS, 25, NT.
 - 3. Joint-Sealant Color: As selected by Owner from manufacturer's full range of colors.
- D. Joint-Sealant Application: Concealed mastics.
 - 1. Joint Locations:
 - a. Door thresholds.
 - b. Other joints as indicated on Drawings.
 - 2. Joint Sealant: Butyl-rubber based.

END OF SECTION