MICHIGAN STATE
UNIVERSITY

ELECTRONIC BIDDING

PUBLICLY BID AND ADVERTISED
SPECIFICATION FOR

UNION - REPLACE ROOFS 8 AND 29

PROJECT NUMBER

CP22133

Tuesday, March 28, 2023

AT

MICHIGAN STATE UNIVERSITY
EAST LANSING, MICHIGAN

Infrastructure Planning and Facilities
Planning, Design and Construction

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SCHEDULE OF DRAWINGS

Project Title: **UNION - REPLACE ROOFS 8 AND 29**
Capital Project Number: **CP22133**
No. of Sheets: **4**

ADVERTISEMENT FOR BIDS

DATE: **March 28, 2023**

PROJECT TITLE: **UNION - REPLACE ROOFS 8 AND 29**

PROJECT NUMBER: **CP22133**

for

MICHIGAN STATE UNIVERSITY

located at

EAST LANSING, MICHIGAN

OWNER: BOARD OF TRUSTEES
MICHIGAN STATE UNIVERSITY

ENGINEER/ARCHITECT: PLANNING, DESIGN AND CONSTRUCTION
Infrastructure Planning and Facilities
Michigan State University

DESIGN REPRESENTATIVE: **Brandon Charland PHONE: 517-884-6099**

CONSTRUCTION REPRESENTATIVE: **Tonino Pacifico PHONE: 517-243-0260**

Roofing Technology Associates, LTD.
38031 Schoolcraft
Livonia, **MI 48150**

BID DUE DATE: Until 3:00 p.m. on **Wednesday, April 26, 2023**, the Owner will receive bids for the work as set forth in the Bidding Documents at via the Owner's Oracle Primavera Unifier Bid Manager, at which time and place all proposals will be publicly opened. Bidders are responsible for properly registering for this process and familiarizing themselves with the system and its requirements. Registration information can be found at https://ipf.msu.edu/construction/partners/prospective-partners.

Proposals are invited for the following work:
Proposal 1 – General Construction Work

This project involves This project involves removal of existing roof section 29 (10,741 s.f) and section 8 (1, 344 s.f), removal of edge metal (most likely unsalvageable), installing a 30 year conventional Soprema roof system, and replacement of slate (only to replace slate that is damaged during roof removal). Soprema system consist of vapor barrier to the deck, 2 layers of 2" ISO insulation, cover board, base sheet, mid ply, and granulated cap sheet, installation of new copper edge meta, and stripping the edge metal off with a mid and cap sheet. Alsan and fabric at all seems around perimeter 90-degree change.

This project is publicly bid and advertised.

The substantial construction completion, depending on material availability, date for the project, as set forth in the project manual and drawings is **August 18, 2023**. See applicable start date and interim completion dates in the General Requirements (Division One) – Part 1 Work Sequence section.

LIQUIDATED DAMAGES:
☐ Shall, or ☒ Shall not be assessed for Substantial Completion at:
$_____PER D

☐ Shall, or ☒ Shall not be assessed for Final Completion at:
$_____PER DAY

EXCLUSIONS FROM MUTUAL WAIVERS OF CONSEQUENTIAL DAMAGES:
DEFAULT IS NONE. (If exclusions apply, project team to insert applicable exclusions below).

The complete set of documents is also available for viewing through our new MSU Plan Room or via the MSU Planning, Design and Construction (PDC) web page at https://ipf.msu.edu/construction/partners/prospective-partners, and then select "Construction projects out to bid".

PLAN ROOMS

The Bidding documents are on file and may be examined at the following locations during regular business hours, Monday through Friday:

Builders Exchange of Lansing &
Central Michigan
1240 East Saginaw
Lansing, MI 48906

Dodge Data & Analytics
25330 Telegraph Road, Suite 350
Southfield, MI 48009

Dodge Data & Analytics
914 E. Vine Street
Kalamazoo, MI 49001

Dodge Data & Analytics
1311 South Linden Road, Suite B
Flint, MI 48532

Builders Exchange
P.O. Box 2031
Grand Rapids, MI 49501

Tri-City Builders & Traders Exchange
334 South Water
Saginaw, MI 48607

Construction Association of Michigan
43636 Woodward Avenue
P. O. Box 3204
Bloomfield Hills, MI 48302-3204

Builders Exchange
3431 East Kilgore
Kalamazoo, MI 49001

CNS Construction News Service
of West Michigan, Inc.
1793 R. W. Berends Dr. SW.
Wyoming, MI 49509-4993

MMSDC Michigan Minority Supplier
Development Council.
100 River Place STE 300
Detroit, MI 48207

Builders Exchange of NW MI, Inc.
1373 Barlow St., Suite 4
Traverse City, MI 49686

Capital Imaging
2521 East Michigan Avenue
Lansing, MI 48912

A pre-bid site inspection will be held on **Wednesday, April 12, 2023** at **2:00 p.m.**. All interested Contractors or Bidders are encouraged to attend. Interested parties should meet at the **South entrance of the MSU Union off of West Circle Drive**. All Contractors submitting bids for the work will be held to have visited the site prior to submitting bids.

Each proposal shall be accompanied by a bid security as set forth in the Instructions to Bidders.

The Owner reserves the right to reject any or all proposals either in whole or in part and to waive any irregularities.

Withdrawal of any proposal is prohibited for a period of 120 days after the actual date of the opening thereof.

Performance and Labor and Material Bonds are required as set forth in the Instructions to Bidders.

All prospective Bidders, their Subcontractors and suppliers must be awardable by and in compliance with the directives and guidelines of the Contract Compliance Division of the Michigan Civil Rights Commission.

SUBCONTRACTING AND SUPPLIER DIVERSITY

The University makes a continuous effort to broaden its business relationships with Minority Business Enterprise (MBE) contractors, Women Business Enterprise (WBE) contractors, and small business concerns (including veteran-owned small business, service-disabled veteran owned small business, HUB Zone small business, and small disadvantaged business concerns certified by the U.S. Small Business Administration). For the purposes of this provision, suppliers are considered subcontractors. If third parties are needed to fulfill contractual obligations to the University, you are strongly encouraged to consider all qualified sources, including WBE, MBE, and small business subcontractors. For purposes of this paragraph, MBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by individuals who are members of a minority and with respect to which more than 50% of the net profit or loss attributable to the business accrues to shareholders who are members of a minority. WBE is defined as a business enterprise of which more than 50% of the voting shares or interest in the business is owned, controlled, and operated by women and with respect to which more than 50% of the net profit or loss attributable to the business accrues to the women shareholders.

The apparent Low Bidder shall, within 24 hours, after receipt of bids, provide the names of any MBE/WBE/small business subcontractors, description of work to be done by each, dollar value of work, and percentage of contract price. This information shall be included with the contract breakdown specified in Section 012000.1.4 of the specifications.

The Michigan State University Purchasing Department maintains a list of known Minority and Women Business Enterprises in the region for informational purposes. Bidders can obtain a copy of this list by calling (517) 355-0357. This list is not intended to be comprehensive. Similarly, it does not constitute an endorsement or certification of acceptability of the contractors and vendors included.

INSTRUCTION TO BIDDERS

ARTICLE 1

DEFINITIONS

1.1 Bidding Documents include the Advertisement or Invitation to Bid, Instruction to Bidders, the Bid Form, other sample bidding and Contract forms and the proposed Contract Documents including any Addenda issued prior to receipt of Bids.

1.2 All definitions set forth in ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU) and in other Contract Documents are applicable to the Bidding Documents.

1.3 **Addenda** are written or graphic instruments, issued by the Architect prior to the receipt of Bids, which modify or interpret the Bidding Documents by addition, deletions, clarifications or corrections.

1.4 A **Bid** is a complete and properly signed proposal to do the Work or designated portion thereof, for the sums stipulated therein, supported by data called for by the Bidding Documents.

1.5 **Base Bid** is the sum stated in the Bid for which the Bidder offers to perform the Work described as the base, to which Work may be added or deducted for sums stated in Alternate Bids.

1.6 An **Alternate Bid** (or Alternate) is an amount stated in the Proposal to be added to or deducted from the amount of the Base Bid if the corresponding change in project scope or materials or methods of construction described in the Bidding Documents is accepted.

1.7 A **Unit Price** is an amount stated in the Bid as a price per unit of measurement for materials or services as described in the Contract Documents.

1.8 A **Bidder** is one who submits a Bid for a prime Contract with the Owner for the Work described in the proposed Contract Documents.

1.9 A **Sub-bidder** is one who submits a Bid to a Bidder for materials or labor for a portion of the Work.

1.10 **Bid Manager** is the Oracle Primavera Unifier Bid Manager application used the by the Owner to received competitive bids for this project.

ARTICLE 2

BIDDER'S REPRESENTATION

2.1 Each Bidder, by making his/her Bid, represents that:

2.1.1 They have read and understand the Bidding Documents and their Bid is made in accordance therewith.

2.1.2 They have visited the site and are familiar with the local conditions under which the Work is to be performed.

2.1.3 Their Bid is based upon the materials, systems and equipment described in the Bidding Documents, without exceptions.

ARTICLE 3

BIDDING DOCUMENTS

3.1 COPIES

3.1.1 Bidders may obtain complete sets of the Bidding Documents via the MSU PLANNING, DESIGN AND CONSTRUCTION web page at https://ipf.msu.edu/construction/partners/prospective-partners, or as outlined in the Advertisement for Bids, page AB-2.

3.1.2 Complete sets of Bidding Documents shall be used in preparing Bids; neither the Owner nor the Architect assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

3.1.3 The Owner or Architect, in making copies of the Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids on the Work and does not confer a license or grant for any other use.

3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

3.2.1 Bidders shall promptly notify the Architect of any ambiguity, inconsistency or error which they may discover upon examination of the Bidding Documents or of the site and local conditions.

3.2.2 Bidders requiring clarification or interpretation of the Bidding Documents shall make a written request to be received by the Architect at least fourteen days prior to the date for receipt of Bids.

3.2.3 Any interpretation, correction or change of the Bidding Documents will be made by Addendum. Interpretations, corrections or changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon such interpretations, corrections and changes.

3.3 SUBSTITUTIONS

3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

3.3.2 No substitution will be considered unless written request for approval has been submitted by the Bidder and has been received by the Architect at least fourteen days prior to the date for receipt of Bids. Each such request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data, and any other information necessary for an evaluation. A statement setting forth any changes in other materials, equipment or work that incorporation of the substitute would require shall be included. It is the burden of the bidder proposing the substitution to establish its merits. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

3.3.3 If the Architect approves any proposed substitution, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

3.4 ADDENDA

3.4.1 The Architect and Owner will endeavor to notify all known plan holders of addenda issued, but it is the Bidder’s responsibility to verify receipt of all addenda.

3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

3.4.3 Normally Addenda will not be issued later than five days prior to the date for receipt of Bids except an Addendum, if necessary, postponing the date for receipt of Bids or withdrawing the request for Bids.

3.4.4 Each Bidder shall ascertain prior to submitting their Bid that they have received all Addenda issued, and receipt of all Addenda shall be acknowledged on their bid.

ARTICLE 4

BIDDING PROCEDURE

4.1 FORM AND STYLE OF BIDS

4.1.1 Bids shall be submitted via the Bid Manager on the form specified.

4.1.2 All fields on the Bid Form shall be completed.

4.1.3 All requested Alternates shall be listed and quoted in the Bid Manager. Failure to quote a requested Alternate will be cause to reject the Bid.

4.1.3.1 If an alternate is added via Addendum, bidders will include by [adding new line to bid form, clearly labeling ALTERNATE X(x being the number)] or [providing pricing on an attachment, also clearly labeling pricing for Alternate.]

4.1.4 All requested Unit Prices shall be listed and quoted via attachment in the Bid Manager. Failure to quote a requested Unit Price will be cause to reject the Bid.

4.1.5 Acknowledge the receipt of the last Addendum on the Bid Form. By acknowledging this addendum, Bidder also acknowledges receipt of all prior consecutive addenda (e.g., acknowledging Addendum 3 also acknowledges Addendum 1 and 2).

4.1.6 Bidder shall make no additional stipulations on the Bid Form nor qualify its Bid in any manner.

4.1.7 By submitting a Bid via the Bid Manager, the Bidder has committed the offer to perform the Work. The Owner will rely on this document as properly signed by the Bidder. The Owner may rely on this commitment, including submitting a claim on the Bidder's Bid Bond if they fail to enter into a contract per the project manual.

4.2 BID SECURITY

4.2.1 Any base bid greater than $50,000 shall be accompanied by a Bid Security in the form of a bid bond made payable to the Board of Trustees, Michigan State University, in the amount of not less than five percent (5%) of the Base Bid, as a proposal guarantee, pledging that the Bidder will enter into a Contract with the Owner on the terms stated in its Bid, and will furnish bonds as described hereunder in Article 8 covering the faithful performance of the Contract and the payment of all obligations arising thereunder. Bidder shall attach a scanned copy of the bid bond to the bid in Unifier Bid Manager.

As an alternative to a bid bond, Bidders may provide certified check, cashiers' check, or money order made payable to the Board of Trustees, Michigan State University, in the amount of not less than five percent (5%) of the Base Bid, to be delivered to MSU Infrastructure Planning and Facilities, 1147 Chestnut Road, Room 101, East Lansing, MI 48824. The proposal guarantee of Bidders under consideration will be returned immediately after approval of contracts by the Owner; those of all others will normally be returned upon request within 48 hours after bid opening.

Should the Bidder refuse to enter into a Contract or fail to furnish such bonds within 30 days of notification of intent to award, the amount of the Bid Security shall be forfeited to the Owner as liquidated damages, not as penalty.

4.2.2 The bonding firm must be listed on the current U.S. Department of Treasury Circular 570, rated A- or better by Best, and be licensed to do business in the State of Michigan. The bonds are to be made out to "Michigan State University, Board of Trustees."

4.2.3 The Owner will have the right to retain the Bid Security of Bidders under consideration until either (a) the Contract has been executed and bonds have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn, or (c) all Bids have been rejected.

4.3 SUBMISSION OF BIDS

4.3.1 Bids shall be completed prior to the time and date for receipt of Bids indicated in the Advertisement or Invitation to Bid, or any extension thereof made by Addendum. Bids received after the time and date for receipt of Bids will not be considered.

4.3.2 Bidder shall assume full responsibility for timely delivery at location designated for receipt of Bids.

4.3.3 Oral, telephone, paper, or faxed Bids are invalid and will not receive consideration.

4.4 MODIFICATION OR WITHDRAWAL OF BID

4.4.1 A Bid may not be modified, withdrawn, or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and Bidder so agrees in submitting his/her Bid.

4.4.2 Prior to the time and date designated for receipt of Bids, Bids submitted early may be modified or withdrawn only by withdrawing current Bid, and resubmitting within the Bid Manager.

4.4.3 Bid security shall be in an amount sufficient for the Bid as modified or resubmitted.

4.5 BIDDER REGISTRATION

4.5.1 The Owner will only receive Bids via the Bid Manager, which requires prior registration and invitation. The Bidder is responsible to familiarize itself with this system and request access in a timely manner.

4.5.2 The Owner will endeavor to maintain a list of all interested bidders and invite to all public bids. Bidders interested in being added to this list must register. Registration information can be found at https://ipf.msu.edu/construction/partners/prospective-partners.

4.5.3 Bidders are encouraged to continue to monitor projects via plan rooms and other advertising venues. They must express interest to bid on MSU projects by request at least 7 days prior to a bid opening. Owner takes no responsibility for inviting a bidder after that date.

ARTICLE 5

CONSIDERATION OF BIDS

5.1 OPENING OF BIDS

5.1.1 Unless stated otherwise in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be opened publicly and will be read aloud. Opening will generally take place in MSU Infrastructure Planning and Facilities Building, 1147 Chestnut Road, East Lansing, Michigan 48824.

5.1.1.1 Unless stated otherwise in the Advertisement or Invitation to Bid, the Owner will endeavor to share bid results within 24 hours of opening.

5.1.1.2 The Owner will endeavor to stream the bid opening, and will share details in the bid invitation

5.2 REJECTION OF BIDS

5.2.1 The Owner shall have the right to reject any or all Bids.

5.3 ACCEPTANCE OF BID (AWARD)

5.3.1 The Owner shall have the right to waive any informality or irregularity in any Bid received.

5.3.2 If the University accepts any alternates, it will do so in the order representing the Owner's opinion of the best value to Michigan State University. The Owner shall be the sole judge of value. The low bidder will be determined on the basis of the sum of the base bid and the alternates accepted.

5.4 ACCEPTANCE OF CONTRACTOR AND SUBCONTRACTORS

5.4.1 Each portion of the Work shall be performed by an organization equipped and experienced to do the Work in each particular field, and no portion shall be reserved by the Contractor unless they are so equipped and experienced. Within 24 hours after the receipt of Bids, the successful Contractor shall submit a list of each Subcontractor proposed for each section of the Work. Subcontractors shall be satisfactory to the Owner. Unless authorized to the contrary in writing from the Owner, Subcontracts shall be awarded to the firms named in this list. Acceptance of the Bid does not imply approval of the Subcontractors subsequently named, but each Subcontractor shall be approved individually.

ARTICLE 6

QUALIFICATION OF CONTRACTORS

6.1 SUBMISSION OF QUALIFICATION STATEMENT

6.1.1 Bidders to whom award of a Contract is under consideration shall submit to the Architect upon his/her request, a properly executed Contractor's Qualification Statement, Consensus Docs 221 – Constructor's Statement of Qualifications for a Specific Project, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

6.2 NONDISCRIMINATION

6.2.1 In performing under this Contract, the Contractor agrees not to discriminate against any employee, or applicant for employment, with respect to hire, tenure, terms, conditions or privileges of employment, or any matter directly or indirectly related to employment, because of race, color, religion, national origin, age, sex, height or weight, marital status or handicap. Subcontracts with each Subcontractor will contain a provision requiring nondiscrimination in employment, as herein specified. Any breach of this covenant may be regarded as a material breach of this Contract. The foregoing is included as a part of the University's institutional Affirmative Action/Equal Opportunity commitment.

6.3 APPROVED ASBESTOS ABATEMENT CONTRACTORS

6.3.1 The Department of Environmental Health and Safety (EHS) annually prequalifies asbestos abatement contractors to perform asbestos abatement work on Campus. Asbestos abatement work shall only be performed by one of the asbestos abatement contractors on the approved list. The current list is available from the PDC Project Representative, the Environmental Coordinator for EHS, and at https://ehs.msu.edu/_assets/docs/asbestos/2022-asbestos-contractors.pdf.

ARTICLE 7

POST-BID INFORMATION

7.1 SUBMISSIONS

7.1.1 Unless waived by the Architect, the apparent low Bidder shall, within 24 hours after receipt of bids, submit the following information to the Architect:

7.1.1.1 A designation of the Work to be performed by the Bidder with their own forces.

7.1.1.2 The proprietary names and the suppliers of principal items or systems of material and equipment proposed for the Work.

7.1.1.3 A list of names of the Subcontractors or other persons or organizations (including those who are to furnish materials or equipment fabricated to a special design) proposed for each division and/or major subdivision, for the Owner’s approval.

7.1.1.4 The names of the MBE/WBE and a description of work to be done by each, dollar value of Work and percentage of Contract price.

7.1.1.5 List of representatives authorized to perform Unifier functions on behalf of the contractor using the Unifier New Company Request, available at Unifier System Vendor Information Form.

7.1.1.6 Certificate of Insurance demonstrating compliance with project requirements.

7.1.2 At the option of the Owner, the Bidder may be required to establish to the satisfaction of the Architect and the Owner the capability, reliability, and responsibility of the proposed Contractor and Subcontractors to furnish and perform the Work.

7.1.3 Subcontractors and other persons and organizations proposed by the Bidder and accepted by the Owner and the Architect must be used on the Work for which they were proposed and accepted and shall not be changed except with the written approval of the Owner and the Architect.

ARTICLE 8

PERFORMANCE BOND AND LABOR AND MATERIAL PAYMENT BOND

8.1 OWNER'S RIGHT TO REQUIRE BONDS

8.1.1 Each Bidder under a proposal in which the base bid exceeds $50,000, shall include the premiums for furnishing a Performance Bond and also Labor Material Bond, each in the full amount of the proposal sum as specified in the Owner / Constructor Agreement.

8.1.2 The bonding firm must be listed on the current U.S. Department of Treasury Circular 570, rated A- or better by Best, and be licensed to do business in the State of Michigan. The bonds are to be made out to "Michigan State University, Board of Trustees."

8.1.3 In assuming assigned Subcontractor by the successful Bidder for general building work as specified, each assigned Subcontractor for each Subcontract shall reimburse the General Contractor his/her proportionate share of the premiums for bonds.

8.2 TIME OF DELIVERY AND FORM OF BONDS AND INSURANCE

8.2.1 The Bidder shall deliver two (2) copies of the required bonds and insurance to the Owner not later than the date of execution of the Contract.

8.2.2 The Bidder shall require the Attorney-In-Fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of his/her Power of Attorney.

ARTICLE 9

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

9.1 FORM TO BE USED

9.1.1 The Agreement for the Work will be governed by the project manual, and by the terms and conditions of ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU).

9.1.2 If the project is under $250,000, an MSU Purchase Order will be used and the terms and conditions of ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor (as modified by MSU), will serve as the applicable General Conditions for administration of the Work.

9.1.3 If the project is over $250,000, the ConsensusDocs 200- Standard Agreement and General Conditions Between Owner and Constructor will be used and the terms and conditions of that Agreement will be formalized through the execution of a Contract Finalization Form.

ARTICLE 10

APPLICATION FOR PAYMENT

10.1 FORM TO BE USED

10.1.1 Applications for Payment shall be submitted in Unifier in accordance with the Pay Apps (Pay Applications) business process. Refer to the MSU IPF website for more information

ARTICLE 11

ELECTRONIC TRANSACTIONS

11.1 UNIFIER

11.1.1 The Owner reserves the right to require that any or all transactions and submissions be
a. conducted and delivered electronically through Unifier, a web-based project management software system. Unifier functions on most popular web browsers. If the owner requires the use of Unifier, the owner will provide the necessary licenses for access into Unifier and the initial training necessary to use Unifier. Access to Unifier will be password restricted, and any proposal, acceptance, quote or other information submitted through Unifier through the use of a party's password shall be deemed to be the submission of such party and any proposal, acceptance, quote or other information in the submission shall be binding on such party as if such proposal, acceptance, quote or other information was in a writing signed by such party. Owner shall not be required to verify the validity of any such submission or inquire as to the authority of the user gaining access to Unifier through the use of a party's password. The following are the minimum Unifier user software and hardware requirements. It is the responsibility of the vendor to verify compatibility of their systems with Unifier. For more information, see Unifier System Vendor Information Form.

11.2 CONTRACT EXECUTION

11.2.1 The Owner may choose to accept a scanned signed contract, provided through Unifier, as acceptance of the agreement. The Owner will rely on this document as properly signed by the Constructor.

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 011000 - SUMMARY

PART 1 - GENERAL

1.1 SUMMARY OF WORK

A. Work Under This Contract

Remove and replace roof 8. Roof 8 is 1344 S.F.
Remove and replace roof 29. Is 10,741 S.F.
Total roof replace S.F = 12,085
Crane Rental if needed to remove of existing and stocking of new roof material
Provide dumpster for construction debris
Removal of existing roof, removal of edge metal (most likely unsalvageable), installing a 30 year conventional Soprema roof system, and replacement of slate (only to replace slate that is damaged during roof removal). Soprema system consist of vapor barrier to the deck, 2 layers of 2" ISO insulation, cover board, base sheet, mid ply, and granulated cap sheet, installation of new copper edge meta, and stripping the edge metal off with a mid and cap sheet. Alsan and fabric at all seems around perimeter 90-degree change. Scope is for using adhesive to lay in insulation, cover board, however, can be mechanically fastened, and estimate would still be the same due to additional plates and screws and time to mechanically fasten.
Removal of "temporary" roof satellite. Dispose of it. Install cap where existing wire penetrate roof.
Need to figure out how to redo existing plumbing roof vent extensions.
Hazardous Building Materials Review—No asbestos was located on the roof per RTA
Repair any existing landscaping damaged due to removing or installing the new roof system

Out of Scope
Repairing or replacing existing roof hatch

1. This Contract encompasses the furnishing of all labor, materials, services, equipment, and insurance to complete the following as shown on drawing and specified herein:

2. Any premium time necessary to complete this project as scheduled, shall be included in the Base Bid.

3. All pertinent requirements of the Invitation to Bidders, Instructions to Bidders, and General Conditions shall form a part of these specifications and the Contractor shall consult them in detail for instructions pertaining to the work in the following divisions.

B. Work Performed Under Separate Contracts

- Temporary tree protection installed by MSU Landscape services.

1. The following will be provided by the Owner or by others under separate contracts:

a. Tie-back, pruning, removal and/or transplanting of existing plantings

b. Parking gate equipment and parking booth installation and wiring. Conduit installed by Contractor

c. Departmental possessions - furniture, books, personal items, etc., shall be relocated by the Department or University as required.

d. Smart Ball utility locators

e. As-built Site Survey

1) The Contractor shall notify the Project Representative when new underground utility installation starts, or when existing utilities are exposed, to allow the Project Representative to coordinate with IPF Facility Information Services for documentation.

2) The Project Representative shall coordinate with IPF Facility Information Services for an As-built Survey upon completion of exterior improvements and utilities.

C. Pre-Ordered Products

1. The Contractor shall assume full responsibility for all pre-ordered products after their arrival at MSU. This includes transportation, handling, storage, start-up, warranty services, and installation in accordance with the General Conditions unless otherwise specified.

D. Work Sequence

1. The Substantial construction completion date for this project is:

- August 18, 2023

1.2 WORK RESTRICTIONS

A. Access Routes

1. All materials and equipment (new and demolition), including mechanical and electrical, shall be transported through a building via the designated building receiving area (usually the loading dock), and through main corridor to rooms or areas. Alternate routes may be used only with the approval of the Project

Representative.

B. Owner Occupancy

1. Unless otherwise stated, University buildings will continue to function and remain occupied during the construction process.

2. On every project involving new construction, additions or alterations to existing facilities, M.S.U. requires the ability of a person with physical disabilities to independently get to, enter, and use the site, facility, building or element. In no way shall a site, building or facility be restricted to individuals with disabilities, due to alterations or construction, which would normally be made accessible to individuals with no disabilities. Alternate routes for all new and alterations of existing facilities shall incorporate the latest federal, state and local barrier free standards and include temporary access accommodations for individuals with disabilities.

C. Use of Site

1. There shall be a pre-construction site walk-thru with the Project Representative to clarify and discuss limitations and concerns prior to construction.

2. Construction fence

a. A construction fence shall be placed around the construction site as shown on the drawings and as approved by the Project Representative.

b. The Contractor is responsible for installing and maintaining the construction fence and gates to restrict access by the public to the area under construction. The Contractor may be required to reposition the fence and/or gate(s) during the course of construction to accommodate the construction activities in order to minimize the inconvenience to the public.

c. The fence shall be constructed of chain link fabric with a minimum height of 6', with metal or wood posts at not to exceed 8' spacing. Fence fabric shall be supported by either a top bar or tension cable. Gates (where specified) will be constructed of a suitable metal frame with chain link fabric with a height of not less than 6'. This fence shall be installed before work commences.

d. Metal signs reading "Construction Area - Keep Out" must be attached to the fence at not more than 20' spacing and to the gate(s).

e. Where any fence crosses an existing walk, drive, or road, a lighted MDOT Type 1 barricade or larger shall be attached to the inside of the fence facing on-coming pedestrian and/or vehicular traffic.

f. No construction work, parking, storage of materials or related activities shall occur beyond this boundary fencing.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 012000 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 PROPOSAL QUOTATION REQUIREMENTS

A. Projects to be bid will be quoted as required by the front-end documents on the specification.

1.2 ALLOWANCES

A. An allowance of for re-working the existing plumbing vent pipe extension should be included in your bid based on field observations from the Pre-Bid Walk through. Itemize this allowance in the cost proposal.

1.3 UNIT PRICES

A. Unit prices will be used to adjust the Lump Sum Bid for work that is added to or subtracted from the project. Unit prices quoted shall include all associated work items required to complete the task specified and shall include all labor fringes, overhead, profit, handling fee and any associated cost related to the work item. Unit prices must be reasonable and customary for the work specified. The successful bidder must be able to support and document the prices quoted as they relate to the quoted Base Bid. ALL UNIT PRICES MUST BE PROVIDED FOR THE BASE BID TO BE CONSIDERED VALID.

1.4 CONTRACT BREAKDOWNS

A. Within twenty-four (24) hours after receipt of Bids, the apparent Low Bidder shall submit to the Architect/Engineer, the following:

1. A Schedule of Values (SOV), indicating the cost of each specified Division and/or Major Subdivision of the Bid. The approved SOV will be used as the basis for estimating partial payments to the Contractor when allowed per the front-end documents.

    a. All contracts shall assign a minimum of 1% of the contract value for final completion and project closeout. This item must be identified as a separate line item labeled *Closeout* on the SOV. Exceptions must be approved by the Construction Superintendent.

    b. Due to changes to Generally Accepted Accounting Practices, environmental remediation must be separately reported in the Owner's financial statements. Accordingly, all contracts shall carry remediation costs in separate lines clearly marked *remediation*. These titles should not be used in other line descriptions.

    c. Construction Management contracts shall carry separate detail lines for at least the following lines:

        i. Preconstruction Services

ii. Construction phase staffing
iii. General conditions
iv. Bonds and Insurance. Note that subcontractor bonds are not required to be separately listed.
v. Fee
vi. Closeout

2. Identify a Subcontractor for each Division and/or Major Subdivision for the Owner's approval. Once approved, no Subcontractors will be changed without the Owner's written consent. The List of Subcontractors will have indicated the MBE/WBE Contractors and their percentages of the Contract Price as specified in the "Cover Letter" or "Advertisement for Bids" of this project.

3. A list of representatives authorized to perform Unifier functions on behalf of the Contractor using the Unifier System - Vendor Information available at http://ipf.msu.edu/index.cfm/capital-project-procedures/documents/unifier-system-vendor-information/.

1.5 CONTRACT MODIFICATION PROCEDURES

A. Change Management Quotation Requirements

1. Quotations for changes in the Contract will be submitted via Unifier when requested, as outlined in Section 012000-1.5.B, Change Management Procedures. This section will not prohibit the Project Representative from requesting and receiving verbal quotations. It is intended that mutual cooperation will keep any changes to an absolute minimum. The Contractor shall promptly document any verbal request by initiating a Change Management or Change Request record in Unifier. The Contractor shall not engage in added work without proper authorization by the Owner. Any added work the Contractor engages in without authorization shall be at the Contractor’s risk. In no event shall the failure of the Construction Representative to initiate a change constitute authorization for the Contractor to proceed with work.

2. The Change Order Quotation Format Form is available on the MSU Capital Project Delivery Procedures website (http://procedures.ipf.msu.edu/index.cfm/capital-project-delivery-procedures/). This Form shall be forwarded to each required Subcontractor, and is recommended as an outline of the information required by this Contract.

3. The Contractor will submit quotations through Unifier, including detailed breakdowns. Upon request, originals of any documents shall be provided to the Owner. The Project Representative will receive quotations from the Contractor only. Subcontractors will submit quotations through the Contractor. All Contractors will submit quotations with information and back-up data as indicated on the quotation form.

B. Change Management Procedures

1. Change Orders shall be issued as required to alter the Contract, (i.e. change the work scope, materials, dates, etc.), in accordance with the General Conditions of the Contract, and the following procedure:

a. The Contractor or the Project Representative shall initiate a Change Request in the Unifier Project Management System. Each Change Request will consist of only one change item of work.

b. Items brought up by the Department or Contractor shall be reviewed first with the Project Representative.

c. The Architect/Engineer will review the Change Request, and with the Project Representative, will determine the need for an item to be changed in the Contract by Change Order.

d. If the Change Request is approved, the Contractor will receive a request through Unifier to proceed with the work and/or provide pricing, as applicable. Provide a quotation for the item requiring change, unless the Change Request is submitted as a lump sum with a quotation attached

e. The Contractor will submit a quotation for each Change Request item in accordance with the applicable Unifier business process. Overhead and profit shall be applied consistent with the General Conditions.

f. The Project Representative and Architect/Engineer will evaluate the quotations and accept or reject each item quoted. A Change Order will be created within the Unifier system and will be issued through the MSU Purchasing Department to change the contract amount if required.

g. The Construction Supervisor or Director of Planning, Design and Construction has approval authority for the Contract Change.

1.6 CONTRACT PAYMENT PROCEDURES

A. Payment application requirements
1. Payment applications shall be submitted in Unifier, consistent with the contract documents.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 013000 - ADMINISTRATIVE REQUIREMENTS

PART 1 - GENERAL

1.1 PROJECT MANAGEMENT AND COORDINATION

A. Project Meetings

1. Project meetings may be called as deemed necessary by the Project Manager.

B. Project Scope Documentation

1. The Contractor shall use PlanGrid for coordination of changes in the field, punch list items, and potential use for plan review comments.

C. Project Coordination

1. The Contractor is ultimately responsible for coordination to complete all work shown on drawings and specified herein independent of the location of the work on drawings and within the specifications. The arrangement of work within the specification into Divisions and Sections shall be considered as given for convenience of reference only and shall not be held to conform to jurisdictional rules which may prevail in any particular trade. It shall be the responsibility of the Contractor to so arrange or group items of work under a particular trade to conform to the prevailing customs of that trade and best interest of the Owner. Specific items of work will be performed by specific subcontractors or workmen when so specified herein or subsequently deemed necessary by the Project Representative to produce competent results.

2. The Contractor shall lay out the work and be responsible for all lines and measurements of the work. Before ordering material or executing work the Contractor shall obtain field measurements and prepare the work to fit conditions properly.

3. The Contractor will be held responsible for any error resulting from his/her failure to verify the figures shown on the drawing before laying out the work.

4. No extra charge will be allowed on account of slight variations between field dimensions and dimensions given on the drawings.

D. Mechanical and Electrical Coordination

1. Connection to Existing Equipment

a. The Contractor shall make arrangements with Planning, Design and Construction, through the Project Representative, before connecting to existing facilities. Unless otherwise noted, if interruption of service is required it shall be done at the convenience of the Owner.

1.2 CONSTRUCTION PROGRESS DOCUMENTATION

A. Construction Schedule Development/Coordination Responsibilities.

1. The Critical Path Method (CPM) will be used to plan, schedule, execute and report status of work under this contract. It shall include and properly coordinate dates for performance of all divisions for each major portion of the Work, and including completion of off-site requirements and tasks if request by Project Representative.

   a. Within fourteen (14) calendar days of the Letter of Intent or contract award, the Contractor shall develop a proposed Baseline schedule for the Work, and submit it to each subcontractor to incorporate their own work.

   b. All subcontractors, both direct and indirect, shall, within seven (7) calendar days of receipt of the Contractor's Schedule, submit revisions, comments and feedback to the Contractors, which shall be incorporated into the proposed schedule.

   c. Upon receipt of the schedule from the Subcontractors, the Contractor will incorporate Subcontractors information into the Baseline Construction Schedule with appropriate logic ties and Contract Milestones, and distribute to the Architect/Engineer and Owner within seven (7) calendar days. Thus the Contractor Schedule development will be completed within twenty-eight (28) calendar days from Letter of Intent or Contract, awaiting Owner approval.

   d. After project schedule has been accepted by the Owner the Contractor within five days (5 days) schedule a meeting with all subcontractors to review and encourage schedule compliance.

2. **All Subcontractors shall cooperate with the General Contractor to prepare and maintain the Construction Schedule, which shall include, without limitation, the following information at the General Contractor request.**

   a. Shop Drawing review and approval, product procurement, fabrication, shop inspection, and delivery dates including lead times. Note: A/E shall be given 14 days upon receipt of submittal to review and return submittal.

   b. Each phase of the Work, including the Punch List, Project Closeout requirements, Contract Completion and Occupancy;

   c. Milestone dates that are required by the Contract Documents and Progress Milestones. Milestones should typically be based on the critical path and not exceed one (1) month between milestones.

   d. The critical path of the Work

   e. Planned disruptions and shutdowns due to other operations, facilities and functions, if any.

3. Upon receipt of the proposed Construction Schedule, the Architect/Engineer (A/E) and Owner (or other designee of the Owner), shall review the Construction Schedule and submit a copy of the Construction Schedule with comments to the Contractor within seven (7) calendar days. Within five (5) calendar days of review of comments from the Owner, all requested changes shall be incorporated in to the baseline Construction Schedule and a printout and electronic copy shall be provided to the Owner. Thus, the Contractor Schedule development with Owner review and Contractor modifications/changes shall not exceed forty (40) calendar days from the Letter of Intent.

4. **No progress payments will be made to the Contractor without a Baseline Construction Schedule approved by the Owner (or other designee of the Owner).**

5. Unless otherwise specified in the Contract Documents or waived in writing by the Owner, the Contractor shall provide **monthly progress reports, at a minimum,** to the Architect/Engineer and the Owner, which shall include recommendations for adjusting the construction schedule to meet Milestone Completion dates and contract completion dates.

6. An updated construction schedule shall be submitted each month to the Project Rep. The Project Rep shall review the submittal, provide comments as necessary. No **payment will be made without an updated construction schedule approved by the Project Representative.**

7. When it is apparent to the contractor and A/E that critical path activities, scheduled Milestone completion dates, or contract completion dates will not be met, the Contractor shall submit to the Owner for review and approval, a plan to avoid or minimize any delay. Such a plan may include, without limitation, increasing the Contractor's workforce; increasing the number of working hours per shift, shifts per workday, workdays per week, the amount of construction equipment, and rescheduling of activities, or any combination thereof; to achieve maximum practical concurrency of work efforts and eliminate the cause of such delay. The Contractor agrees that such actions as described in this paragraph or other action deemed necessary by the Contractor will be taken promptly and without additional cost to the Owner.

8. Any request for time extensions or damages due to delay will only be considered where it is proven by the Contractor, using acceptable scheduling techniques, that the project's contractual intermediate milestones or contract completion dates have been directly impacted by the alleged issue causing the delay. This does not preclude the Contractor's right to finish the Project early. It does explicitly establish the condition upon which the Contractor shall be entitled to request time extensions or delay damages.

B. Construction Schedule Technical Requirements

1. The Critical Path Method (CPM) shall be used to plan, schedule, execute and report the status of work under this contract. The CPM Construction Schedule shall be developed utilizing a Scheduling Software approved by Owner. It shall include and properly

coordinate dates for performance of all divisions for each major portions of the work, including completion of off-site requirements and tasks.

2. The objective of the CPM Construction Schedule is to define and plan the reasonable timing and sequencing of all work, from Letter of Intent or Notice to Proceed to Final Contract Completion (along with interim Milestone Completion dates required by the contract) without exceeding the Contract Time limits. At a minimum, CPM activities shall be used for defining the following:

    a. Permitting
    b. Submittal/procurement/approval process (including shop drawing preparation)
    c. Material and equipment fabrication and delivery
    d. Construction/Installation
    e. Trade coordination
    f. Shutdowns
    g. Owner performed work and Owner-provided items
    h. Work of Other Contractors (indirect) hired by the Owner
    i. Governing Agencies inspections
    j. Punch list
    k. Commissioning
    l. Clean-up and project close-out
       Contract Completion/Occupancy

3. The Construction Schedule level of detail shall be broken down to the extent individual activities do not combine (a) Subcontractor work; (b) distinct divisions of work; (c) work in separate facilities or areas; or (d) rough-in and finish items of work. Construction/Installation activities shall not exceed duration of fifteen (15) workdays and Owner review/approval activities are to include a reasonable time for review depending on the size and complexity of the submittal.

4. Preparation of the "Baseline" Construction Schedule shall commence following the issuance of a Letter of Intent, and shall be submitted to the Architect/Engineer and Owner (or other designee of the Owner) within twenty-eight (28) calendar days of issuance of the Letter of Intent. The Architect/Engineer and Owner will review and provide comments as it relates to the schedule. The Construction Schedule must involve input from all major subcontractors and be signed by the Contractor and all Primes/Subcontractors indicating their approval in the accuracy of the Baseline Construction Schedule and/or Schedule Updates. Submittal and approval of the Baseline Construction Schedule and/or Monthly Schedule Updates are required prior to the corresponding progress payment being released.

5. The Contractor will utilize "Retained Logic" as the method of calculating the Construction Schedule and Updated Schedules, which will be computer generated and computer drawn.

6. The Construction Schedule requirement shall include but not be limited to (a) Baseline Schedule; (b) Monthly schedule updates, (c) Weekly 2 week look-ahead schedules.

7. The Contractor shall provide the current updated Construction Schedule for review and discussion at each regular progress meeting. In addition, the Contractor shall prepare a two-week look-ahead schedule for distribution at the progress meetings. This information shall be derived directly from the current Construction Schedule. The two-week look-ahead schedule shall include all activities scheduled to commence, continue or complete in the upcoming two weeks.

8. Each monthly schedule submittal will consist of one electronic file containing current schedule files or back-up, narrative, reports and plots discussed later in this section. Each monthly schedule shall be submitted using the Unifier Transmittal process. Each schedule submittal shall be uniquely identified as to which revision and/or update and will incorporate any Owner schedule review comments from previous schedule submissions. The date of the data shall be within two (2) calendar days of the Schedule submittal date.

9. The Construction Schedule shall meet the following criteria:

   a. Activity descriptions shall be clear and concise

   b. Activities shall be coded with sufficient detail to identify the activity as to phase, type of work, responsibilities, area of work, interface with other contracts, and any other coding necessary to accurately describe or sort the work activity.

   c. Activity durations shall be sufficiently short to accurately disseminate an item of work with the maximum installation activity not to exceed fifteen (15) workdays.

   d. Architect/Engineer and Owner review and approval activities will allow for sufficient time depending on the size, quantity of and complexity of the submission(s) (14 calendar days minimum).

   e. Logic ties shall be shown on graphics at the discretion of the Owner. Logic ties shall be accurate and reasonable with no regard to preferential logic that would sequester float for any one party. Logic ties will be reasonable to the point that a true critical path is identifiable from the beginning of the project (Letter of Intent) to the Final Completion milestone. Constraint dates are to be used at a minimum with a description for their basis if used. No open-ended activities shall be allowed.

   f. The Construction Schedule shall allow for and depict: recognized national holidays, proposed number of workdays per week for each activity (calendar), adherence to specific restrictions, constraints and contract completion milestones (interim and final) stipulated in the contract documents and work of separate Contractors.

   g. Contractually specified interim Completion Milestone dates shall be constrained to show negative float, if the early finish date of the last activity in that phase falls after the interim Milestone Completion date.

10. For all major equipment and materials fabricated or supplied for this project, the

Construction Schedule shall show a sequence of activities including:

a. Preparation of submittal shop drawings, samples and O&M instructions.
b. Review of shop drawings, samples and O&M instructions by the Architect/Engineer (allow reasonable time for review depending on size and complexity of the submittal, minimum 14 calendar days).
c. Shop fabrication and delivery
d. Erection or installation
e. Testing of equipment and materials
f. Required dates of completion
g. Instruction of operating personnel

11. Baseline Construction Schedule and Periodic Schedule Monthly Update submittals shall include the following information:

a. Report content:
    1) Activity number
    2) Activity description
    3) Activity durations in work days (not to exceed 15 workdays)
    4) Remaining durations in work days
    5) Early and late start dates (Actual dates when progressed)
    6) Early and late finish dates (Actual dates when progressed)
    7) Percent complete
    8) Total float
    9) Free float
b. An electronic file of the schedule files with all current schedule information.

12. If a Construction Schedule revision is required as determined by the Owner, Contractor or Architect/Engineer, the Contractor must include a complete schedule submittal with reports accompanied with a detailed narrative report describing the basis for any and all changes proposed by the Contractor. The Contractor cannot make significant revision(s) to the schedule without written approval by the Owner.

13. Schedule float is not for the exclusive use of any one party and should be shared for the projects benefit. The Contractor's work shall proceed to the early start dates and the Owner shall have the right to reserve and apportion float time according to the needs of the project.

14. If any of the Project Contract Milestones fall behind more than five (5) workdays, the Contractor is required to develop a Time Recovery Plan and Schedule, which shall be monitored weekly by the Contractor. The Contractor shall detail within the next Construction Schedule submittal narrative, the reorganization means and methods instituted in the schedule recovery plan to get back to the contract completion date(s). The recovery period should be achieved within the shortest reasonable time.

a. If the recovery plan does not achieve its goal by the next pay request period, the Contractor will be required to develop another recovery plan until the Contract Completion Milestones are back on schedule.

b. If the recovery plan has sufficient regained compliance with the Project Milestone Dates, use of the Baseline Construction Schedule will be resumed.

15. Time Extensions/Adjustments will only be granted when the Contractor can accurately demonstrate through the use of the Construction Schedule and accepted scheduling techniques, the need for a time extension due to delays, change orders or impacts by others. Schedule fragments and/or critical path schedule analysis shall be developed and submitted with each change order or other request for time adjustment. Time extension requests shall be submitted within ten (10) days of the onset of the occurrence impacting the Construction Schedule. Failure to submit this information by the time stated above shall result in rejection of the request. Based primarily on information provided by the Contractor, the Owner will decide the extent of impact and respond within a reasonable time depending on the complexity of the analysis required.

a. If the time extension request is approved, the impact period will then be incorporated into the Construction Schedule.

b. If the time extension request is rejected, no change to the project schedule will be permitted.

16. The Contractor shall coordinate its work with the Owner and other Subcontractors and shall cooperate with other Subcontractors by utilizing orderly progress toward completion in accordance with the work scheduled.

1.3 MILESTONE SCHEDULE REQUIREMENTS

A. The following Milestone Schedule dates for the listed work are provided as part of the contract requirements.

MILESTONE ACTIVITY	START	COMPLETION
Bids Due	4/12/23	5/3/23
Submittal process	5/18/23	6/7/23
Construction	6/29/23	8/18/23

1.4 SUBMITTALS

A. Submittal Schedule

1. Concurrently with the development of the Contractor’s Construction Schedule, the Contractor shall prepare a complete schedule of submittals. Submit the initial Submittal Schedule along with the Construction Schedule, at, or prior to, the Pre-Construction Conference.

a. Coordinate the Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products, as well as the Contractor’s Construction Schedule.

b. Prepare the schedule in chronological order. Provide the following information:

- Scheduled date for the first submittal
- Related section number or specification number
- Submittal category (Shop Drawing, Product Data, Calculations, Test Results or Samples.
- Name of the subcontractor
- Scheduled date for resubmittal
- Scheduled date for completion of the A/E's review

2. Distribution: Following the Owner's response to the initial submittal, print and distribute copies to the Project representative, A/E, Owner, subcontractors, suppliers and other parties required to comply with the submittal dates indicated. Keep copies at the Project Site at all times.

   a. When revisions are made, distribute to the same parties and post at the same locations. Delete parties for distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

3. Schedule Updating: Revise the schedule after each meeting or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting, or as requested by the Project Representative.

B. Submittals are required for, but are not limited to, each of the following. The Contractor should refer to each of the following referenced sections for additional requirements of each submittal. All submittals are to be processed electronically using Unifier.

1. GENERAL SUBMITTALS
   Section 012000 for Contract Breakdowns
   Section 013000 for Safety Documentation
   Section 017000 for FADE Log

2. AS-BUILT DRAWINGS
   As-built Drawings are required as specified in Section 017000.

3. CERTIFICATES OF INSPECTION
   Certificates of Inspection are required as specified in Section 017000.

   220500 for Plumbing Permits and Inspection
   223500 for Boiler Permits and Inspection
   260500 for Electrical Permits and Inspection

4. OPERATION AND MAINTENANCE DATA
   Operation and maintenance data is required as specified in Section 017000.

5. GUARANTEES
   Guarantees are required as specified in Section 017000.

   Plus,
   Section 07 2216 Substrate Board and Insulation

Section 07 5216 Conventional Modified Bitumen Roofing

6. SAMPLES
Samples are required as specified in Section 013000 for the following items:

7. SHOP DRAWINGS
Shop drawings are required as specified in Section 013000 for the following items:

C. Shop Drawings and Samples

1. The Contractor shall review, stamp with their approval, and submit via the Unifier Submittal process to the Project Representative all Shop Drawings and Samples asked for in these specifications, or deemed necessary by the Architect/Engineer.

2. Work will not begin on any item requiring Shop Drawings or samples until the Contractor receives approval in writing from the Architect/Engineer. Any material or item, ordered or fabricated prior to final approval shall be at the Contractors' risk. No changes shall be made on the approved drawings or samples without the written consent of the Architect/Engineer. Each Shop Drawing or Sample shall be properly identified as to MSU project title and number, Contractor, item, etc., with cover sheet, stamp, tag, etc., so as not to be confused with any other. The Contractor shall direct specific attention with written explanation to any deviation from what is specified or shown on the drawing.

D. Shop Drawings

1. The Shop Drawing will be identified by job name, date, Contractor name and name of person reviewing for compliance with Contract Documents. Shop Drawings are drawings, diagrams, schedules and other data specifically prepared by the Contractor to illustrate some portion of the Work for which submittals are required by the Contract Documents. The purpose of their submittal is to demonstrate the way by which the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents.

2. The Contractor shall review for compliance with the Contract Documents, approve and submit to the Owner all Shop Drawings required by the Contract Documents. Submittal shall be with reasonable promptness and in such sequence as to cause no delay in the Work or in activities of the Owner or their separate Contractors. Submittals which are not marked as reviewed for compliance with the Contract Documents and approved by the Contractor may be returned by the Owner without action.

3. By approving and submitting Shop Drawings the Contractor represents that the Contractor has determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

4. The Owner will review and approve or take other appropriate action on the Shop Drawings submitted by the Contractor only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. Review of Shop Drawings is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Owner's review shall not constitute approval of safety precautions or, unless otherwise stated by the Owner, of any construction means, methods, techniques, sequences or procedures. The Owner's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

E. Samples

1. Samples shall be submitted as directed to provide a representative sample. Samples shall be physical examples, from the actual materials, to be used whenever practical. All packing and transportation charges on samples shall be paid by the Contractor.

2. A Submittal record shall be created in Unifier for each sample, indicating the manufacturer and specifications, and informing the Owner of the status of delivery of the physical sample. The physical sample will be retained by the Owner. The Submittal record will be returned to the Contractor with a review status by the Owner.

3. Approval of Samples shall be generally for quality, color, and finish, and shall not modify the requirements of any of the Contract Documents as to dimensions or design.

1.5 SPECIAL PROCEDURES

A. Constructor Safety Requirements

1. MIOSHA regulations apply to all university projects. Each constructor is responsible for ensuring compliance with "all applicable requirements" that govern their work, including any additional regulations, interpretations, clarifications, and consensus standards incorporated therein by reference.

2. MSU-specific safety requirements are published in the Constructor Safety Requirements Manual. The most current version of this manual is available at http://www.ehs.msu.edu/contractors. Constructors will be held to the version of the manual in effect at the time of contract execution.

3. Requirements specific to work at Michigan State University generally fall into one of two categories:

    a. Administrative Requirements, such as but not limited to communication, planning, documentation, submittals, notifications, reporting, and inspections.

b. Safety Requirements unique to work at MSU, such as but not limited to Control of Hazardous Energy/Lock Out Tag Out, Confined Space, Electrical, Excavations, Fall Protection, Hot Work, etc.

4. Constructor shall submit a Site-Specific Safety Plan or work under an existing Area-Specific Safety Plan where allowed, as described in the MSU Contractor Safety Requirements Manual.

B. Hazardous Materials

1. If the Contractor suspects a material, preexisting or newly discovered, within the scope of this project to be a hazardous material such as, asbestos, lead, polychlorinated biphenyl or any other potentially hazardous material, that has not already been identified and/or in the scope of work for the Contractor to abate, notify the Project Representative immediately. Do not impact or disturb the material in question until it has been determined to either be non-hazardous, included in the original scope of work, or until other arrangements can be made with the project representative and the MSU Department of Environmental Health and Safety (EHS).

2. Due to the age of buildings on the Michigan State University campus, all coated surfaces shall be assumed to contain lead-based paint. This includes but is not limited to any type of paint, primer, coating, lacquer, or varnish on any building component. Proper precautions must be taken to ensure that workers and building occupants are not exposed to airborne lead concentrations at or above the OSHA Action Level (AL) of 30 ug/m3.

3. If work will be conducted on any coated surface at MSU, the contractor must submit to the Department of Environmental Health and Safety (EHS) and Infrastructure Planning and Facilities Project Representative current proof of appropriate detailed written lead work plan in accordance with 29 CFR § 1926.62 (Michigan Part 603). This submittal will include proof of training, written respirator program, and negative exposure assessments from projects with similar conditions at a minimum. Contractors performing work on campus must follow the provisions of the MSU Lead Management Program from EHS.

4. Any work that impacts Lead shall comply with the provisions of the MSU EHS Lead Management Plan.

5. Any work that impacts Asbestos shall comply with the provisions of the MSU EHS Asbestos Management Plan.

1.6 Requests for Information

A. Requests for Information (RFI's) shall be processed within Unifier, using the RFI business process. Failure to complete the tasks within the Unifier time frames shall not be a basis for a delay claim.

PART 2 – PRODUCTS
Not Used

PART 3 – EXECUTION
Not Used

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 REGULATORY REQUIREMENTS

A. Applicable Codes, Standards, and Regulations

1. The following list of codes and regulations, establish the minimum requirements applied to work done at MSU. Where the specifications or plans, exceed the applicable code, the specifications and plans shall be followed.

a. NFPA National Fire Codes.
b. NFPA National Electrical Code.
c. ICC International Building Code.
d. ICC International Plumbing Code.
e. ICC International Mechanical Code.
f. State of Michigan Elevator Safety Act - Act 227, P.A. 1967.
g. State of Michigan Boiler Act - Act 290, P.A. 1965.
h. State of Michigan Construction Code Act - Act 230, P.A. 1972, as amended.
i. State of Michigan Occupational Safety and Health Act - Act 154, P.A. 1974, as amended.
j. Americans With Disabilities Act (ADA) Public Law 101-336.
k. Regulations of Air Pollution Control Commission State of Michigan, and the Federal Clean Air Act (42 U.S.C. 1857C - 8 © (1)).
l. Soil Erosion and Sedimentation Control - Act 451 of 1994, parts 31 and 91, as amended.
m. Environmental Impact Statement Executive Order 1974-4.
n. State Fire Safety Board's New Rules for Schools, Colleges, and Universities.
o. State of Michigan Safe Drinking Water Act, P.A. 339 of 1976, and Federal Water Pollution Control Act (33 U.S.G. 1319 ©).
p. State of Michigan Energy Code (Adopting ASHRAE 90 by reference).

1.2 REFERENCES

A. Abbreviations and Symbols

1. AIA - American Institute of Architects
2. ACI - American Concrete Institute
3. AISC - American Institute of Steel Construction
4. ANSI - American National Standards Institute
5. ASTM - American Society for Testing Materials
6. BOCA - Building Officials and Code Administrators
7. LEED - Leadership in Energy and Environmental Design
7. NFPA - National Fire Protection Association
8. OSHA - Occupational Safety and Health Act
9. SMACNA - Sheet Metal and Air Conditioning Contractors National Association

10. MDOT - Michigan Department of Transportation
11. USGBC - U.S. Green Building Council

1.3 QUALITY CONTROL

A. Testing Laboratory Services

1. All work (materials and installation procedure) shall be tested and inspected by an independent testing and inspection agency, approved by the Project Representative to provide the quality control requirements in accordance with these specifications. Results of these tests and inspections when performed in accordance with these specifications will not be disputed by either party. Failure of the Contractor to provide quality control in accordance with this specification may result in the replacement of the work at the Contractor's expense.

B. Contractor's Responsibilities

1. Submit the name of the proposed testing and inspection agency(s) to the Project Representative for review and approval prior to contracting for such services.

2. Employ and pay the cost of independent testing and inspection as required in this specification. Pay applications from the testing/inspection agency shall be reviewed by the Owner before the Contractor's pay request for testing/inspection services is approved.

3. Advise the testing and inspection agency sufficiently in advance of the work to be inspected in the field to allow time to schedule personnel and equipment to perform the required inspections. Failure of the work to be inspected shall be the sole responsibility of the Contractor regardless of the fault of the testing and inspection agency.

4. Furnish certificates to authenticate the type and or quality of products furnished for installation as required in these specifications.

5. Shall notify the Project Representative in a timely manner when and where testing is to take place to provide sufficient time for the Project Representative to be in attendance.

C. Testing & Inspection Agency Responsibilities

1. Perform all testing and inspection of the work in accordance with these specifications.

2. Furnish qualified personnel and sufficient equipment in a timely manner when required by the Contractor and/or Project Representative to perform all testing and inspection in accordance with these specifications.

3. Provide written reports (2 copies) in a timely manner of the work tested and inspected. The reports shall include complete material test results and for in-place material, a sketch showing the exact location where the test was taken on the project site.

4. The inspection and testing agency and its representatives are not authorized to revoke, alter, relax, enlarge or release any requirements of the Contract Documents, nor to approve or accept any portion of the work.

5. Work will be checked by representatives of the testing agencies as it progresses, but failure to detect any defective work or product will not in any way prevent later rejection when such defect is discovered, nor will it obligate the Owner to final acceptance. When it appears that the work or product furnished is in non-conformance with the Contract Documents, the representative of the testing agency will direct the attention of the Project Representative and Contractor to such non-conformance.

D. Authority of the Project Representative

1. May order additional tests and inspection beyond those required, if in their opinion, the subject work may not meet specification. The costs for these tests and inspections shall be borne by the Contractor.

2. May terminate the testing and inspection agency. The Contractor shall then furnish to the Project Representative the name of an additional agency for approval.

3. May perform quality control tests and inspections.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1- GENERAL

1.1 TEMPORARY UTILITIES

A. General

1. The Contractor for the general construction work shall be responsible for all items specified in Section 015000. The Contractor shall install and maintain all items until project is finished and shall remove same and restore areas to their original conditions.

B. Temporary Electricity

1. The Contractor may use any permanent electrical outlets in the construction area.

2. Construction lighting shall be turned off during unoccupied periods, with the exception of lighting required for safety reasons such as path of egress.

3. Temporary service for heavy loads, or where no other service is available, will be provided by the general Contractor at the Contractor's expense. Power for temporary service connected to public utility company lines, (before an MSU service meter) will be paid for by the Contractor. Power for temporary service connected to the MSU power system, or after an MSU service meter, will be furnished by the Owner at no charge.

4. The contractor shall install temporary lighting within the construction area consistent with MIOSHA requirements.

C. Temporary Heat

1. All equipment and labor for temporary heat shall be furnished by the Contractor. Use of University utilities for temporary heat will be at the discretion of the Owner. The cost of natural gas or steam for heating new structures or other applications requiring temporary heat will be paid by the Contractor.

D. Temporary Telephone Service

1. If there is no University phone at the immediate work site, the Contractor shall provide a temporary job site telephone and/or provide the Job Superintendent with a phone activated paging device or cell phone.

E. Temporary Water

1. Each Contractor may use water for construction purposes from the nearest University source.

F. Temporary Sanitary Facilities

1. A toilet in the work area may be used by the Contractor's employees.

2. Where there is no toilet in the work area, an approved chemical type portable toilet will be provided by the Contractor.

1.2 VEHICULAR ACCESS AND PARKING

A. Parking Regulations

1. Unless otherwise directed, all non-University personnel working on the Campus of Michigan State University are required to park as Visitors. Between 7:00 a.m. and 6:00 p.m., Monday through Friday, Visitors may park only in metered parking spaces or gate controlled parking lots.

2. Commercial permits are available from the Department of Police and Public Safety (355-8440), which will allow parking in specific areas. The cost of a commercial permit is the responsibility of the Contractor.

3. Permits for one day parking in areas reserved for university employees are available to Contractors or their personnel from the Department of Police and Public Safety at the current rate, with a signed note from the Project Representative.

4. Parking permits are not required for vehicles south of Mount Hope Road.

6. Remote parking for Contractor personnel is available in parking lot Ramp 6 on Grand River Avenue. There is a monthly fee. Check with MSU Department of Public and Police Safety for cost per vehicle. Due to the limited number of faculty/staff parking spaces in the vicinity of the construction site, no general commercial permits will be issued.

1.3 TEMPORARY BARRIERS AND ENCLOSURES

A. General

1. The Contractor shall provide, install, and maintain necessary temporary barriers, warning signs, and other safety measures to protect the public, property, and plant growth.

2. The Contractor will be required to work within limitations imposed by the University Police and Public Safety Department with respect to vehicular and pedestrian traffic. When approved by the Owner, if it becomes necessary to occupy a traffic lane for **ANY** length of time, proper directional signs, flashers and barricades shall be provided at the Contractor's expense in accordance with the most recent edition of the Michigan Manual of Uniform Traffic Control Devices. The Contractor will replace if damaged or stolen, all barricades, flares, and night protection at Contractor's expense, all being considered as incidental to the work.

B. Dust Control

1. Temporary Partitions

a. The Contractor shall construct necessary temporary partitions to isolate the new work from the existing building.

b. Unless noted otherwise, construct partitions of 2" x 4" wood studs, 16" on center and heavy mil, fire retardant plastic sheeting securely attached so as to keep dust, dirt, and debris from spreading beyond the work area.

2. Return Air Openings

a. The Contractor shall block all return air openings in the work area so that dust will not carry into other areas of the building.

3. Site Dust

a. The General Contractor shall be responsible for eliminating airborne dust in the work area and staging area by application of appropriate mitigation measures, as approved by the Owner.

C. Security Measures

1. Temporary & Access Keying

a. The MSU Infrastructure Planning and Facilities Key Shop will furnish construction keys, and furnish and install construction cores for use during construction as deemed necessary by the Project Representative. The Contractor may pick up the construction keys at the Key Shop with the form, "Authorization for Construction Cores and Keys," completed and authorized by the Project Representative.

b. All construction keys and facility keys issued to a Contractor for a particular project will be returned to the Project Representative before final payment will be processed. If keys are not returned, the Contractor may be held responsible to pay for re-keying any and all affected facilities.

2. Campus Security and Access Control System

   a. When deemed necessary by the Project Representative, temporary security access cards will be issued to the Contractor for building exterior doors, rooms, and/or spaces that are secured by the Campus Security and Access Control System.

   b. On construction projects where the security system is active and armed during construction the Contractor will be assessed a false alarm fee for any unauthorized entry of a secure space and/or setting off an alarm by propping open secured doors/windows, cutting into the security wiring, removing security devices, or any other action causing an alarm.

   c. The false alarm fees shall be as follows:

First occurrence	No assessed fee
Second occurrence	$500
Third and subsequent occurrences	$1,000 each

   d. The breaches of security and associated fees shall be assessed by project to the Contractor, not by sub-contractor, vendor, supplier, etc.

D. Campus Woody Plant Protection

1. Coordinate all plant protection and site work limits with the Project Representative. SITE WORK CANNOT COMMENCE WITHOUT A PRE-CONSTRUCTION WALK-THROUGH.

   All Contractor employees engaged on the project site shall attend, or are expected to have attended, the Contractor Woody Plant Protection Seminar, hosted by MSU's Landscape Services (formerly Grounds Maintenance) Division. This seminar will be presented on an annual basis at a minimum. Coordinate with the Project Representative for times and locations of the seminar(s).

2. Work by Owner

   a. Tie-back of existing plantings. Pruning, thinning, and sealing of existing plantings. Root pruning and root protection of exposed roots. Watering of existing trees under stress. Salvaging of existing small trees, shrubs, and other plant growth that the Owner wishes to retain.

   b. Tree protection barricades will be provided by the Owner. Plant damage occurring within installed barricades does not absolve the Contractor from damage assessment.

   c. Work shall be performed by MSU Landscape Services Department unless otherwise arranged, as needed to provide either preventative or remedial care to plants on a construction site. Contractor shall immediately contact the Project

Representative should "protected plants" be compromised in violation of agreed upon fencing locations and work limits. Failure to communicate promptly could result in 100% damage assessment of fines.

3. Protection of Plantings

a. Protect existing trees and other vegetation indicated to remain in place. Prohibited practices include breaking of branches, scraping of bark, or unauthorized cutting; nailing or bolting into trees or plants; use of trees or plants as temporary support (i.e. for cables); unauthorized filling, excavating, trenching or auguring within the root zone; compaction/driving over the root zone; (see definitions below), storage of any materials or vehicles within the root zone; dumping of construction waste or materials (including liquids); unauthorized removal or relocation of woody plants; removal of tree protection barricades or construction fencing prior to completion of project.

b. Compaction within the root zone is the increasing of the soil density caused by heavy equipment or concentrated foot traffic which significantly alters the soil conditions from that which was present prior to construction.

c. The root zone of a tree is one and a half the distance of plant crown drip line outward from the stem, along undisturbed grade. Should placement of concrete be specified or authorized by the Owner within the root zone, a sulfur application will be applied by the Owner. The Contractor shall notify the Owner at least 48 hours prior to pouring concrete. Trees to receive sulfur shall be identified by Owner.

4. Damage

a. Damage to campus woody plants shall include any of the items indicated in paragraph 2.a above as determined solely by the Owner. The Owner shall evaluate damage and establish proportional fines up to 100% of the value shown below, regardless of the current disposition of the plant.

b. 100% Value Schedule for Campus Trees

1" - 3" caliper	$200/inch
3" - 6" DBH	$290/inch
6" - 9" DBH	$380/inch
9" - 12" DBH	$480/inch
12" - 15" DBH	$670/inch
15" DBH or greater	$960/inch

c. DBH is the tree trunk diameter at breast height.

d. Replacement value for shrubs, vines, and perennials shall be assessed at three times the current market cost of the plant.

e. Alternatives to the above protective measures, or any variations, must be

approved by the staff Landscape Architect and the Project Representative. (Measures may include: thinning and root pruning, fertilization, aeration, boring & jacking, hand excavation, supervision by campus arborist, seasonal schedule recommendations.) Alternatives would be based on the specific requirements of the plant species in question, as determined by the staff Landscape Architect.

1.4 TEMPORARY CONTROLS

A. Soil Erosion and Sediment Control (SESC)

1. The Contractor shall comply with all Contract Documents, approved SESC plans, permit conditions and with Parts 31 and 91 of Public Act 451 of 1994. The Owner shall obtain a Soil Erosion and Sedimentation Control (SESC) permit from the appropriate Municipal (MEA) or County (CEA) Enforcing Agency. Permit Fees and MEA/CEA routine inspections will be paid for by the Owner.

2. Prior to beginning any earth change, the Contractor shall retain a DEQ Certified Storm Water Operator (CSWO) to provide the required SESC reports (which include the weekly and storm event reports as well as all follow up reports for both violations and storm event corrections) on the standard DEQ form. The Contractor shall provide the reports to the Owner on a weekly basis, and retain those reports for 3 years.

3. Prior to beginning any earth change, and during the life of the contract, the Contractor shall install and maintain all temporary SESC measures as shown on the Contract Documents, SESC plans, and as directed by the Owner, CSWO, DEQ, or MEA/CEA, until MSU officially takes over responsibility for the site.

4. Immediately prior to MSU taking responsibility for the site, the Contractor:
   a. Will be required to clean all catch basins affected by the construction, both within the Contract Limits and all surrounding roads and lawn areas when soil may have spread as the result of construction activities.
   b. Shall put all temporary SESC measures in satisfactory condition as determined by the CSWO.

5. All temporary SESC measures will remain in place and will become the property of the Owner when responsibility for maintaining the SESC measures becomes the Owner's responsibility.

6. The Contractor shall conduct all excavation, filling, grading and clean-up operations in a manner such that sediment generated by wind or water is not discharged off site or into any storm sewer, drainage ditch, river, lake, air or underground utility system. Stage the work per plan to minimize the area of exposed soil, thereby reducing the opportunity for soil erosion.

7. Water from trenches and other excavation shall be passed through an approved filtration bag to remove sediments from the water before it is released into the storm water drainage system.

8. If sediment extends beyond the project limits, the Contractor shall be responsible for cleanup and restoration of all surfaces and utility systems to the condition that existed prior to the Contract award.

9. All SESC measures shall be maintained daily.

10. Should violations (irrespective of a fine being assessed) be identified by the Owner, CSWO, MEA/CEA or DEQ, they shall be corrected within 24 hours of notification. The correction(s) shall be approved by the Owner, CSWO, MEA/CEA or DEQ. All subsequent inspections performed by the Owner, CSWO, MEA/CEA or DEQ as a result of the violation (and any other associated costs) will be paid by the Contractor. If identified violations are not corrected within 24 hours of written notice, the Owner shall have the right to make necessary repairs at the Contractor's expense, without being required to provide further notice to Contractor.

11. Fines assessed as a result of the violation for non-compliance of the SESC provisions, will be paid by the Contractor. If a "Stop Work" order for non-compliance is issued, a time extension request for that time period will **not** be granted. (Fines could be assessed up to and including $25,000/DAY for each violation.)

12. Only one Seven Day Notice will be issued for violations of the SESC provisions. Should subsequent violations be identified, the contractor will be expected to make the satisfactory correction within 24 hours of notification. Should the corrections not be made, the Owner, without further notice to the Contractor, will correct the violation. The cost of the corrective action will be charged to the Contractor.

1.5 CONSTRUCTION DEBRIS CONTROL

A. The Contractor shall provide and administer a system for disposal of construction debris, and shall be responsible for seeing that the site and the new building are at all times free of accumulated debris caused by the construction. For purposes of this paragraph, debris shall include ALL materials used in construction including construction roads and pads. Special attention should be given to materials that could leach into the ground, including but not limited to lime based materials, all chemicals, and any liquids except clean water.

B. The Contractor shall comply with LEED Materials & Resources Credit 2, including documentation of the Construction Waste materials recycled, reused and sent to the landfill, using the Construction Waste Management form and process provided by the Owner in Unifier. This form shall be submitted monthly, and will be generated from completed payment applications. Negative reports are required.

C. This shall include, but not be limited to, rubbish containers conveniently located throughout the site for the daily disposal of debris directly into them from each work location. Debris shall not be allowed to accumulate on the ground through-out the site overnight.

D. All combustible debris shall be removed to a solid waste disposal site properly licensed under Act 87 of the Public Acts of 1965 of the State of Michigan.

E. No burning of debris will be permitted on the Project site or elsewhere on the Owner's property.

F. Should the Contractor not execute the work required in this section, the Owner reserves the right to perform the work by other forces and deduct the cost from the contract price.

1.6 CONFINED SPACES

A. The workplace may contain permit confined spaces and entry is allowed only through compliance with a confined space program as defined by 29 CFR 1910.146. The contractor is responsible for assessing real or potential atmospheric hazards and other serious safety and health hazards in the confined space. MSU will make available records of known confined space hazards. The contractor shall provide all necessary equipment for confined space entry. If MSU personnel will be working in or near confined spaces occupied by the contractor, the contractor is required to coordinate activities with the Project Representative. The contractor will inform the Project Representative of procedures followed and hazards confronted or created during entry operations.

1.7 LOCK-OUT/TAG-OUT PROCEDURE

A. The Contractor shall conform to Michigan State University Infrastructure Planning and Facilities lock-out/tag-out procedure. Copies are available from Planning, Design and Construction, Infrastructure Planning and Facilities Building, Michigan State University.

1.8 FM RED TAG PERMIT MONITORING SYSTEM

A. When working on fire protection sprinkler systems the Contractor shall conform to the Factory Mutual Red Tag Permit Monitoring System modified by notifying the Project Representative in lieu of the Emergency Organization, Public Fire Department, and Factory Mutual. Documentation is available from Factory Mutual, (781) 255-4359.

1.9 FM HOT WORK PERMIT SYSTEM

A. For all hot work operations, the Contractor shall conform to the Factory Mutual Hot Work Permit System modified by notifying the Project Representative in lieu of the Fire Safety Supervisor and Factory Mutual. Documentation is available from Factory Mutual, (781) 255-4359.

1.10 HAZARDOUS SUBSTANCE SPILLS

A. Releases of hazardous substances that pose a significant threat to health and safety, or that, by their very nature, require more than a routine response, are emergency situations. If a release of an emergency nature occurs, call 911 immediately. Provide all applicable information and stay on the phone until told to hang up. If a non-emergency release of a hazardous substance occurs, contact the MSU Infrastructure Planning and Facilities Project Representative immediately.

1.11 ROOF PROTECTION

A. In the event a roof has to be used as a storage, work and/or walkway area, the following protective measures shall be employed.

1. The size and location of the storage, work or walkway areas shall be approved by the MSU Infrastructure Planning and Facilities Project Representative.

2. The storage, work or walkway area protection shall consist of a 1-inch layer of water resistant insulation such as EPS, and a layer of ½ inch plywood. Stagger the seams of the insulation and plywood; use plywood clips to prevent cupping.

3. The perimeter of the area shall be lined with barricades and warning tape to ensure that all traffic will stay on the protected areas.

1.12 CRANE HOISTING

A. Crane hoisting of equipment or materials over occupied spaces shall be performed at the convenience of the Owner, with arrangements made by the Project Representative.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 016000 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Storage and Protection

1. The Contractor shall be responsible for work, material, and equipment until finally inspected, tested, and accepted. The project shall be protected against theft, injury, and damage. Material and equipment received on the site shall be carefully stored until installation.

B. Staging Area

1. Should the Contractor require exterior staging or on-site storage of materials - the location of this area must be agreed upon prior to actual use of the space by the Project Representative and the Contractor. The area will not be within the drip-line of any tree or in plant beds, as per Section 015000.1.3.D.3.

2. If this exterior area is outside the fenced project site, the area shall be enclosed with a minimum 4' high welded wire fence, with metal fence T-posts not exceeding 8' on center. Fence fabric shall be supported by either a top bar or a tension cable.

3. The Contractor shall be responsible for the cost of placing and removing the fence.

4. Each designated area shall have only one access route from the road or drive.

5. The area is not to be used for employee parking, but may be utilized by the Contractors' vehicles and equipment necessary to service the project.

6. Any areas damaged as a result of the staging operation shall be repaired by the Contractor, at no additional cost to the Owner.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 017000 - EXECUTION REQUIREMENTS

PART 1- GENERAL

1.1 EXAMINATION

A. Pre-Bid Site Inspection

1. Each Bidder shall be held to have visited the site of the proposed work before submitting their proposal and to have familiarized themselves with all existing conditions affecting the execution of the work in this project. No allowance or extra consideration on behalf of the Contractor or Subcontractor will subsequently be made by reason of failure to observe the site conditions.

1.2 PREPARATION

A. Protection of Work and Property

1. Contractor shall protect existing and new work as required by this construction or as requested by the Project Representative.

2. Interior Protection

a. This will include, but not be limited to the wall, floor, and ceiling finishes to remain at the construction site, along the access route to the site, existing elevators, and other areas such as roofs and mechanical rooms where related work is specified or required.

3. Exterior Protection

a. The Contractor shall be responsible for any damage to existing facilities, including but not limited to the following: buildings, trees and shrubs, walks, roads, utility systems, terraces and steps, lights, and unreasonable turf damage as determined by the Project Representative. Damage shall be repaired by the Contractor in accordance with MSU's Construction Standards at no cost to the Owner.

b. No crawler cranes, bulldozers, or other equipment, fitted and running on steel treads, shall be permitted to traverse any walk, road, street, or other thoroughfare on the Campus of Michigan State University. Where it is necessary to unload such equipment on these thoroughfares, and when approved by the Project Representative, planking shall be provided to protect same. If this is not done, and damage is observed, the cost of replacing shall be the burden of the Contractor causing such damage.

c. Staging zones for materials and equipment shall be coordinated with Project Representative. They are to be placed on paved areas where possible. Set-up and storage areas shall be fenced with minimum 6-foot high pedestal-type chain link

fencing. Locations shall be reviewed with the Department of Police and Public Safety and approved by the Project Representative.

d. Crane hoist dates shall be coordinated with Project Representative for sufficient notice to building users. Project Representative shall direct the notice to the building users and coordinate with DPPS.

e. Owner may provide temporary access-ways in turf or root zone areas, as determined in pre-construction walk-through. For heavy equipment on turf areas, Alturna mats or approved equal, must be utilized for travel and set-up zones.

f. All electric, telephone, and steam vaults and water valves shall be protected and remain accessible at all times. Heavy equipment shall not be run over the top of vaults or valve boxes, nor shall materials be stored over them.

g. Contractor shall provide lighted barricades if building entrances or pedestrian walks are closed after work hours or on the weekends.

h. Tree pruning, plant tie-back, and vine removal shall be done by the Owner, as coordinated with the Project Representative, and as noted in Section 015000.1.3.D.2.a. Trees or other plant material shall not be used as anchor points for any lines or equipment.

i. Plant protection as directed by the Project representative:

   a. Minor work: Plants adjacent to, or below work zones are to be washed off daily. In no case shall masonry dust or other construction debris remain on plants for more than 24 hours.
   b. Major work: Plants adjacent to, or below work zones are to be covered with breathable woven mesh tarp. Tarp shall be removed at the end of each day and debris disposed of. Debris and dust shall not be absorbed into soil.

1.3 EXECUTION

A. Cutting and Patching – Concrete and Masonry

1. The Contractor shall be responsible for any cutting, fitting, and patching that may be required to complete this project, except for core drilling required for mechanical and electrical installations, which shall be the responsibility of the Mechanical or Electrical Contractor.

2. The Contractor shall not endanger any work of any other Contractors by cutting, excavating, or otherwise altering any other work and shall not cut or alter the work of any other Contractor except with the written consent of the Architect/Engineer.

3. No cutting of structural members of the building, likely to impair its strength, shall be done without written approval from the Architect/Engineer.

4. To avoid damage to hidden utilities and structural re-enforcement any cutting or core drilling over one inch in diameter, through concrete floors and slabs will be x-rayed/scanned by the contractor prior to cutting.

    a. A qualified engineer will conduct an on-site assessment before any cutting or drilling of a pre-tensioned or post-tensioned component or other structural component of a building or structure commences. The assessment will be documented and provided to the person contracted to carry out the work.

    b. If any load bearing member is cut, cored or removed all the requirements of 29 CFR 1926 Subpart T (LARA Part 20) shall apply. This will require notifications to the DEQ 10 working days before cutting begins. Emergency notifications are possible under specific conditions.

    c. The responsible person for the project shall ensure substantial compliance with the requirements for exposure to Silica Dust. Substantial compliance will also be required for all other construction safety standards and published by the State of Michigan or Federal OSHA.

    d. Work shall be conducted outside of the regular hours to avoid disturbing the building occupants. An exception to this rule will be granted only by the project manager and shall be in writing.

    e. The MSU project representative or employee shall be responsible for locating all utilities in the area to be cut. This part of the job is mandatory and shall be given appropriate attention. Minimally the responsible person shall review all available prints and consider structural scanning. The MSU representative or employee shall take necessary steps to isolate and lock out any energy sources that may be jeopardized by the cut to protect worker safety and avoid equipment damage. In some cases, utilities will need to be cut and relocated to conduct the work. The responsible person shall take steps to notify repair persons in advance of the anticipated timing and scope of the repair project or the need for temporary services.

    f. Responsible person shall inspect the area to ensure that no damage has occurred and that the area is cleaned to an acceptable level.

5. Cutting and Patching for Mechanical Work

    a. The Mechanical Contractor shall be responsible for any core drilling required to complete their work.

    b. The Mechanical Contractor shall be responsible for the accurate location of all openings necessary for the installation of the mechanical work. Any additional openings required to move their work due to an error in the initial layout and the repair of inaccurate openings, shall be made at the expense of the Mechanical Contractor.

6. Cutting and Patching for Electrical Work

a. The Electrical Contractor shall be responsible for any core drilling required to complete their work.

b. The Electrical Contractor shall be responsible for the accurate location of all openings necessary for the installation of the electrical work. Any additional openings required to move their work due to an error in the initial layout and the repair of inaccurate openings, shall be done at the expense of the Electrical Contractor.

B. Salvaging of Materials

1. Materials or equipment shown on drawing or specified herein to be removed, which are not to be reused or salvaged, shall become the property of the Contractor and will be removed from University property and disposed of legally.

1.4 CLEANING UP

A. Cleaning up shall be in accordance with the General Conditions of the Contract.

B. No rubble, dust, or debris shall be allowed to accumulate or be transported throughout the building.

C. A thorough final cleaning of all of the adjacent streets, as specified by the Project Representative, will be required before final payment is made.

D. If the Contractor fails to clean up, the Owner may do so and the cost thereof shall be charged to the Contractor.

1.5 STARTING AND ADJUSTING

A. Refer to each Division for requirements.

1.6 CLOSEOUT PROCEDURES

A. In general, one or more walk-throughs will be performed with the Contractor and punch lists developed of items to be completed before the project can be closed out.

1.7 CLOSEOUT SUBMITTALS AND PROJECT DELIVERABLES

A. Operation and Maintenance Data

1. The Contractor shall provide operation and maintenance data as required in this specification, and submit the required information through use of the Unifier system.

2. Submittals for equipment and systems shall contain the manufacturer's information on installation, balancing, operating, maintenance, lubrication, and repair instructions and parts list for each component.

3. Please refer to MSU Document Submittal Standards at: http://ipf.msu.edu/construction/business-partners/standards-for-construction/index.html

B. As-Built Drawings

1. Submission of all As-built Drawings called for in this specification shall precede request for final payment.

2. The Contractor shall submit As-built Drawings in electronic (.pdf) format, that is not password protected, indicating any deviations from the Contract Drawings, including contract Change Orders. Upon request of the Owner, printed copies of the As-Built drawings shall be provided as well.

3. Provide any Building Information Model (BIM) data developed for this Project to the Project Representative.

C. Facility Asset Data Exchange (FADE) Log

1. The Constructor shall furnish all information as indicated on the FADE log spreadsheet. The University's FADE procedure and requirements for asset tracking and populating the log can be found at the following web addresses:

   FADE process during design phase:
   https://us.promapp.com/ipfmsu/Process/Minimode/Permalink/GkN4dmXiYTf9MzXAPt5ydu

   FADE process during construction:
   https://us.promapp.com/ipfmsu/Process/Minimode/Permalink/C3uQcSUvsfB7pLuXYgcL3P#

   Should the Owner change the FADE process change in form or content, the Constructor is not relieved of fully executing the work required to compile the information and complete the Log.

D. Construction Safety Documentation

1. The Contractor shall provide written documentation of the following site safety information, as it pertains to the project only:

   a. List of all lost time accidents.
   b. Reportable incident rate (total hours worked).
   c. Details of many MIOSHA site visits, including resulting citations, violations, or actions.

E. Certificates of Inspection

1. The Contractor shall provide a copy of all Certificates of Inspection called for in this specification. Refer to Section 013000 Part 1.4.B.

F. Construction Waste Management – LEED Documentation

1. The Contractor shall provide written documentation of the Construction Waste Management program, as required for LEED Materials & Resources Credit 2. A form for this purpose is provided within this specification. Refer to Section 024200, Construction Waste Management.

G. Warranty

1. The Contractor shall provide a written guarantee stating that all work performed and material furnished is free from all defects in workmanship, and material for a period of one year, unless noted otherwise, after the equipment has been accepted by the Owner. Final payment or Certificate of Substantial Completion, whichever is issued first, shall constitute Owner acceptance.

PART 2 - PRODUCTS
Not Used

PART 3 - EXECUTION
Not Used

END OF SECTION

SECTION 024113– SITE DEMOLITION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. Provide labor, materials and equipment as necessary to complete work as indicated on the Drawings and specified herein.

B. This section includes the removal of existing structures, fences, pavements, and other items indicated on the Drawings or specified, or both.

C. Related sections include the following:
1. Division 01 Section "General Requirements – Temporary Facilities and Controls."
2. Division 31 Section "Site Clearing."
3. Division 31 Section "Earthwork."

1.3 PROJECT CONDITIONS

A. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Project Representative. Provide alternate routes around closed or obstructed traffic ways if required.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

3.1 DEMOLITION OPERATIONS

A. At the direction of the Project Representative, certain items within the Project limits may be salvaged by the Contractor to the Owner. Salvaged materials or equipment will be indicated on the Drawings or specified. Salvaged items not indicated or noted to be reinstalled shall be delivered to designated location(s) on campus as directed by Project Representative.

B. Materials to be recycled shall be hauled from the project to Beaumont Landscape Supply, 4080 Beaumont Road, East Lansing MI 48824. Call (517) 884-4880 to coordinate drop-off time and location.

1. Items to be salvaged include, but are not limited to:
a. Post and chain fencing

b. Ornamental fencing and gates
c. Chain link fence
d. Catch basins and manhole frames and covers
e. Bike racks
f. Litter receptacles and ash urns
g. Light fixtures and poles
h. Face brick
i. Paver brick
j. Limestone cap
k. Steel and concrete bollards
l. Irrigation system components, including but not limited to valves, heads, and vacuum breakers

2. Materials to be recycled include, but are not limited to:
   a. Concrete material (pavement, curb and gutter, walls and footings)
   b. Bituminous pavement millings
   c. Topsoil
   d. Clean pavement base aggregate

C. The use of explosives is not permitted.

D. Conduct demolition operations and the removal of debris to ensure minimum interference with adjacent roads, streets, walks, and other facilities, operations and people.

E. Conduct operations to prevent damage by falling debris or other cause to adjacent buildings, structures, vegetation to be retained, and other facilities as well as persons.

F. Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Project Representative. Repairs shall be made at no cost to the Owner.

3.2 REMOVAL OF PAVEMENTS

A. Saw cut concrete curb and gutter and flatwork on nearest existing joint beyond area required to be removed as shown on the Drawings.

B. Provide a minimum of 18 inches between the new gutter pan edge and the bituminous paving edge.

3.3 CLEANUP

A. Contractor shall be responsible for disposing debris from demolition and salvage operations. Disposal of debris shall be done legally off the Owner's property, except that specifically requested for salvage by the Project Representative. Burning of debris is not permitted.

B. During demolition operations, keep dust to a minimum using appropriate methods.

C. During demolition operations, access roads and adjacent concrete pathways shall be maintained broom clean. Roads shall be cleaned by using a pick-up type sweeper. A front-end tractor mounted sweeper is not permitted.

D. The site shall be graded to provide surface drainage and shall be left in a clean condition.

END OF SECTION 024113

SECTION 024200– CONSTRUCTION WASTE MANAGEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for the following:
   1. Salvaging nonhazardous demolition and construction waste.
   2. Recycling nonhazardous demolition and construction waste.
   3. Disposing of nonhazardous demolition and construction waste.

B. Related sections include the following:

   1. Division 01 Section “General Requirements – Temporary Facilities and Controls.”

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations and clearing debris including soil, vegetation, and rocks are not to be included.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Collect, reprocess and reuse of materials diverted or recovered from solid waste stream.

E. Salvage: Recovery of demolition or construction materials from existing buildings or construction sites and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction materials from existing buildings or construction sites and subsequent incorporation into the Work.

1.4 PERFORMANCE GOALS

A. General: Develop waste management plan that results in end-of-Project rates for salvage/recycling of 50 (75) percent by weight of total waste generated by the Work.

1.5 SUBMITTALS

A. Waste Management Plan: Submit 3 copies of plan within 14 days of date established for commencement of the Work

B. Waste Reduction Progress Reports: Concurrent with each Application for Payment, submit 2 copies of report. Include separate reports for demolition and construction waste. Include the following information:

1. Material category.
2. Generation point of waste.
3. Total quantity of waste in tons.
4. Quantity of waste salvaged, both estimated and actual in tons or cubic yards.
5. Quantity of waste recycled, both estimated and actual in tons or cubic yards.
6. Total quantity of waste recovered (salvaged plus recycled) in tons or cubic yards.
7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.

C. Waste Reduction Calculations: Before request for Substantial Completion, submit 2 copies of calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.

D. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.

E. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.

F. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

G. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licenses to accept them. Include manifests, weight tickets, receipts, and invoices.

H. LEED Submittal: LEED letter template for Credit 2, signed by Contractor, tabulating total waste material, quantities and weight (tons) diverted and means by which it is diverted, and statement that requirements for the credit have been met.

1.6 QUALITY ASSURANCE

A. Waste Management Coordinator Qualifications: LEED Accredited Professional by U.S. Green Building Council, or person familiar and experienced with LEED construction waste management requirements.

B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

C. Waste Management Conference: Conduct conference at Project site to comply with requirements in Division 01 Section. Review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan including responsibilities of Waste Management Coordinator.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.7 WASTE MANAGEMENT PLAN

A. General: Develop plan consisting of waste identification, waste reduction plan, and cost/revenue analysis. Include separate sections in plan for demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of construction waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.

1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses and telephone numbers.
3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses and telephone numbers.
4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
5. Disposed materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number for each landfill and incinerator facility.
6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location on Project site where materials separation will be located.

D. Plan for and describe the means for securing waste containers from unauthorized users.

E. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:

1. Total quantity of waste.

2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
3. Total cost of disposal (with no waste management).
4. Revenue from salvaged materials.
5. Revenue from recycled materials.
6. Savings in hauling and tipping fees by donating materials.
7. Savings in hauling and tipping fees that are avoided.
8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement waste management plan as approved by Owner. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

1. Comply with Division 01 Section "Temporary Facilities and Controls" for operation, termination, and removal requirements.
2. Observe and follow site measures that prevent cross-contamination of waste. Cross-contamination could render some portion of waste to be non-recyclable, thereby disqualifying the Project from earning LEED Credit MR 2, and the exemplary performance credit of diverting 95% of waste from landfill.

B. Waste Management Coordinator: Engage a waste management coordinator to be responsible for implementing, monitoring, and reporting status of waste management work plan. Coordinator shall be present at Project site full time for duration of Project. The Construction Superintendent may perform the role of the Waste Management Coordinator.

C. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at the Project site.

a. Distribute waste management plan to everyone concerned within three days of submittal return.
b. Distribute waste management plan to entities upon execution of their contracts. Review plan procedures and locations established for salvage, recycling, and disposal.

D. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

a. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
b. Comply with Division 01 Section "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

A. Salvaged Items for Reuse in the Work:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until installation.
4. Protect items from damage during transport and storage.
5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.

B. Salvaged Items for Sale and Donation: Not permitted on Project site.

C. Salvaged Items for Owner's Use:

a. Clean salvaged items.
b. Pack or crate items after cleaning. Identify contents of containers.
c. Store items in a secure area until delivery to Owner.
d. Transport items to Owner's storage area off-site designated by Owner.
e. Protect items from damage during transport and storage.

D. Doors and Hardware: Brace open end of door frames. Except for removing door closes, leave door hardware attached to doors.

3.3 RECYCLING DEMOLITION AND CONTRUCTION WASTE, GENERAL

A. General:

a. Recycle paper and beverage containers used by on-site workers.
b. Concrete, masonry, or asphalt crushed and reused are to be identified and include in calculations.
c. Exclude hazardous waste from calculations.

B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical.

a. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

i. Inspect containers and bins for contamination and remove contaminated materials if found.

b. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
c. Stockpile materials away from construction area. Do not store within drip line of remaining trees.

d. Store components off the ground and protect from the weather.
e. Remove recyclable waste off Owner's property and transport to recycling receiver or processor.

3.4 RECYCLING CONSTRUCTION WASTE

A. Packaging:

a. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
b. Polystyrene Packaging: Separate and bag materials.
c. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
d. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes: Chip brush, branches, and trees on-site.

a. Comply with requirements in Division 2 Section "Exterior Plants" for use of chipped organic waste as organic mulch.

C. Wood Materials:

a. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
b. Clean Sawdust; Bag sawdust that does not contain painted or treated wood.
    i. Comply with requirements in Division 2 Section "Exterior Plants" for use of clean sawdust as organic mulch.

D. Gypsum Board: Stack large clean pieces on wood pallets and store in a dry location.

a. Clean Gypsum board: Grind scraps of clean gypsum board using small mobile chipper or hammer mill. Screen out paper after grinding.
    i. Comply with requirements in Division 2 Section "Exterior Plants" for use of clean ground gypsum board as inorganic soil amendment.

E. Metals: Separate metal by type or to meet requirements of recycling receiver or processor.

3.5 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

a. Except as otherwise specified, do not allow excessive on-site accumulation of waste materials.
b. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
c. Coordinate with each product manufacturer for take-back programs. Set aside scrap to be returned to manufacturer for recycling into new product.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 024200

SECTION 06 1000
ROUGH CARPENTRY

PART I - GENERAL

1.01 SCOPE

A. This Section involves completing the following in accordance with the requirements of this Section and Division 1:
   1. All new wood indicated on drawings and specified herein (included in base bid).
   2. Replace, as necessary and designated by the University's Representatives, all deteriorated wood nailers with pressure treated lumber (on a unit price basis).

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Substrate Board & Base Sheet – See Section 072216

B. Conventional Modified Bitumen Roofing – See Section 075216

C. Sheet Metal Flashing – See Section 076200

D. Joint Sealants - See Section 079200

1.03 SUBMITTALS

A. UNIT PRICES
   1. The Contractor shall submit on the Bid Proposal Form a list of all proposed unit prices for labor and materials being used in replacement of existing deteriorated wood nailers. The price quoted shall be per lineal foot as installed for the following sizes:
      a. 1" x 6"
      b. 1" x 8"
      c. 2" x 4"
      d. 2" x 6"
      e. 2" x 8"
      f. 2" x 10"
      g. 2" x 12"
      h. 1/2" Plywood

1.04 REFERENCES

A. AWPA C2 – Lumber, Timber, Bridge Ties and Mine Ties – Preservative Treatment by Pressure Process; American Wood-Preservers' Association; 2001

B. PS 20 – American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 1999.

PART II - PRODUCTS

2.01 QUALITY ASSURANCE

A. DIMENSIONAL LUMBER
   1. Lumber Standards: Manufacturer lumber to comply with PS 20 "American Softwood Lumber Standard" and with applicable, grading rules of inspection agencies certified by American Lumber Standards Committee's (ALSC) Board of Review.
   2. Grading Agency: National Lumber Grades Authority (NLGA).

3. Grade Stamp: Factory mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, species, moisture content at time of surfacing and mill.
4. Sizes: Nominal sizes as indicated on drawings, S4S.
5. Moisture Content: Provide seasoned lumber with 19% maximum moisture content at time of dressing and shipment, for sizes 2" or less in thickness, unless otherwise indicated.

B. FACTORY TREATED LUMBER
1. Pressure Treatment of Lumber Above Grade: AWPA Treatment C2 using waterborne preservative to 0.25 lb/cu ft retention for dimension lumber. AWPA Treatment C9 using waterborne preservative to 0.25 lb/cu ft retention for plywood.
2. Kiln dry after treatment to maximum moisture content of 19% for dimension lumber.
3. Kiln dry after treatment to maximum moisture content of 15% for plywood.

C. PLYWOOD
1. Preservative-treated plywood (both new and replacement plywood for the roofs) shall be pressure treated in accordance with AWPA Standard U1 with preservatives as required for Use Category UC2 (protected from weather but may be subject to sources of moisture. Preservative-treated plywood shall be all veneer APA Rated Roof Sheathing, Exposure 1 and 4-foot by 8-foot in size. The preservative-treated plywood shall be marked by an approved inspection agency certified to inspect preservative-treated wood, indicating compliance with treating, drying, retention and penetration requirements of applicable AWPA Standards or equivalent code-approved preservative-treating and quality control requirements. The new plywood thickness shall be as specified. Replacement plywood shall match the thickness of the plywood removed.

D. ANCHORS / FASTENERS
1. A. Fasteners in contact with wood blocking and nailers shall be formed of Type 316 stainless steel.

PART III - EXECUTION

3.01 DELIVERY AND STORAGE

A. NEW LUMBER
1. The lumber shall be delivered to the site, clearly labeled with the manufacturer's name, and such identifying marking as appropriate. Materials damaged in handling shall not be used.
2. The lumber shall be protected from the weather and standing moisture at all times. Completely cover the lumber stored outside with waterproof tarpaulin covering. Damaged materials or materials with evidence of moisture damage will be conspicuously marked for permanent removal from the job.

3.02 DEMOLITION AND SUBSTRATE PREPARATION

A. EXISTING NAILERS
1. Closely inspect all existing wood nailers. Completely remove and discard deteriorated wood nailers.
   a. Wood nailer replacement shall be bid as a Unit Price extra.
2. Closely inspect the existing wood nailers for securement. Loosely attached wood nailers shall be secured as described below in the Securement Section.

3.03 INSTALLATION PROCEDURES

A. GENERAL
   1. Nailers and blocking shall be secured in place to support the loads intended.
   2. End joints of new and existing nailers and adjacent layers of new nailers shall be offset a minimum of 4-feet. The ends of the nailers shall be secured with two anchors/screws appropriate for the substrate they are being secured to.

B. PLYWOOD
   1. Install 1/2" plywood on the masonry wall to provide a flush substrate for the base flashings on Area 8.

C. SECUREMENT
   1. Securement of existing, replacement and new nailers shall be as follows:
      a. Existing nailers shall be secured where they are not securely attached to the building. Install additional screws/anchors/fasteners to properly secure the nailers in place. Install screws/anchors/fasteners appropriate for the substrate.
      b. Replacement nailers shall be secured to the existing building using the same securement method and spacing used to secure the nailers that were removed. If original securement methods are not possible to accomplish, contact the University's Representative for an approved alternate method of attachment.
      c. Wood blocking and wood nailers shall be secured to other wood components with #12 stainless steel screws spaced 12-inches on-center. The screws shall penetrate the base lumber a minimum of 1-inch. Stagger the screw locations from the front to the back of the nailers where possible to provide solid securement.
      d. Wood nailers shall be secured to the masonry walls with stainless steel masonry anchors spaced 12-inches on-center. Pre-drill holes in the masonry walls prior to installing the anchors.

END OF SECTION

SECTION 07 2216
SUBSTRATE BOARD AND INSULATION

PART I - GENERAL

1.01 SCOPE

A. This Section involves completing the following in accordance with the requirements of this Section and Division 1:
   1. Furnish all labor, materials and equipment required to install new substrate board and insulation as shown on the drawings and specified herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Rough Carpentry – See Section 061000

B. Modified Bitumen Roofing – See Section 075216

C. Sheet Metal Flashing – See Section 076200

D. Joint Sealants - See Section 079200

1.03 SUBMITTALS

A. PROPOSED PRODUCT LIST
   1. Before any materials are delivered to the jobsite, the Contractor shall submit a complete list of all proposed materials, including manufacturers names being used to install the roofing system specified to the University's Representative.

PART II - PRODUCTS

2.01 QUALITY ASSURANCE

A. Acceptable Manufacturers – Substrate Board
   1. DensDeck Prime Roof Board – 5/8 inches thick mechanically fastened

B. Acceptable Manufacturers - Primer
   1. Soprema, Inc., Elastocol Stick

C. Acceptable Manufacturers – Vapor Barrier (Field of roof)
   1. Soprema, Inc., Sopralene Flam Stick

D. Acceptable Manufacturers – Insulation Board
   1. Soprema, Inc., Sopra-Iso 1.5-inches thick (Areas 1, 2 and 3) set in Duotack SPF

E. Acceptable Manufacturers – Cover board
   1. DensDeck Prime Roof Board – ¼ inches thick set in Duotack SPF

F. Acceptable Manufacturers - Substrate Board Fasteners
   1. Soprema Inc., Soprafix #12 MP

2.02 PRODUCT DESCRIPTION

A. SUBSTRATE BOARD
   1. The substrate board shall be 1 layer of 5/8" thick DensDeck Prime Roof Board mechanically fastened.

B. PRIMER
   1. The primer to be applied prior to the vapor barrier shall be Elastocol Stick.

C. VAPOR BARRIER
   1. The vapor barrier for the field of the roof shall be 1 layer of Sopralene 180 Flam Stick.

D. INSULATION
   1. The new roof insulation for Areas 4, 5, 6 and 7 shall be one layer of 1.5-inch thick Sopra-iso rigid isocyanurate roof insulation board set in Duotack SPFadhesive.

E. COVERBOARD
   1. The cover board for all areas shall be 1 layer of 1/4" thick DensDeck Prime Roof Board set in Duotack SPF adhesive

PART III - EXECUTION

3.01 DELIVERY AND STORAGE

A. The substrate board, insulation and cover board shall be delivered to the job site in the original unopened containers or wrappers, clearly labeled with the manufacturer's name and such identifying numbers as are appropriate. The material shall be stored on pallets to keep it clear from the ground.

B. Materials shall be protected from the weather and standing moisture at all times. Completely cover the materials stored outside using a waterproof tarpaulin covering. Extend covering down to the pallet so that no material remains exposed and properly secure to resist wind uplift. Unprotected, moist or otherwise damaged materials or materials with evidence of moisture damage, such as staining, will be conspicuously marked for permanent removal from the job.

C. Rolls of felt shall be stored by standing on end.

3.02 INSTALLATION PROCEDURES

A. GENERAL
   1. Do not install any more substrate board, vapor barrier, insulation, and coverboard than can be completely covered with roofing materials on the same day.
   2. Stagger the end joints of the boards between rows a minimum of 12-inches in all directions. Cut the substrate boards to fit closely around penetrations.
   3. Install the insulation and cover boards with a maximum joint width of 1/4-inch. Joint spaces which exceed 1/4-inch shall be filled in with matching material. At locations where less than a full-sized sheet of board is required, use the largest size practical to fill in the area.
   4. Roof decks and walls shall be clean, dry and smooth for accepting the new roof system.

B. SUBSTRATE BOARD
   1. Once the wood deck on Area 29 has been cleaned of all debris, install one layer of 5/8-inch thick substrate board. The boards shall be secured with one screw and plate per every 2 square feet of substrate board.
   2. Once the concrete deck on Area 8 has been cleaned of all debris, install one layer of 5/8-inch thick substrate board.in Duotack 365 Adhesive. The barrier board shall be set into adhesive with ½-inch to 3/4-inch wide beads of roof insulation adhesive spaced approximately 12-inches on-center in the field of the roof and spaced approximately 6-inches on-center at the 8-foot wide outside perimeter edges of the roofs.
   3. Stagger the boards in adjacent rows the maximum distance possible. Gaps between boards larger than ¼-inch shall be filled in with matching substrate board.

C. PRIMER
   1. Apply primer to the substrate board following manufacturer's instructions.

D. VAPOR BARRIER

1. Begin the installation of the self-adhered plies at the low point of the roof. Provide proper width side laps and end laps in the membrane. Evenly press each roll into place to ensure good adhesion to the substrate. The installed membrane shall be free of air pockets, wrinkles, fish mouths and tears.

E. INSULATION
1. Neatly cut the insulation boards at the perimeters and penetrations in the roofs. Install the largest pieces of insulation practical.
2. On Area 29 install one layer of 1.5-inch thick isocyanurate insulation over the substrate board.
3. On Area 8 install two layers of 2.6-inch thick isocyanurate insulation over the substrate board.
4. The insulation shall be set into adhesive with ½-inch to 3/4-inch wide beads of roof insulation adhesive spaced approximately 12-inches on-center in the field of the roof and spaced approximately 6-inches on-center at the 8-foot wide outside perimeter edges of the roofs.

F. COVER BOARD
1. Install one layer of 1/4-inch thick cover board (DensDeck Prime Roof Board) over the insulation. The cover board shall be set into adhesive with ½-inch to 3/4-inch wide beads of roof insulation adhesive spaced approximately 12-inches on-center in the field of the roof and spaced approximately 6-inches on-center at the 8-foot wide outside perimeter edges of the roofs.

END OF SECTION

SECTION 07 5216
CONVENTIONAL MODIFIED BITUMEN ROOFING

PART I - GENERAL

1.01 SCOPE

A. This Section involves completing the following in accordance with the requirements of this Section and Division 1:
   1. Removal of the existing roofing system from the wood roof deck of Area 29 and from the concrete deck of Area 8.
   2. Installation of a conventional modified bitumen roof membrane and base flashing on Areas Areas 8 and 29.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Rough Carpentry - see Section 061000

B. Substrate Board and Base Sheet – see Section 072216

C. Sheet Metal Flashing – see Section 076200

D. Joint Sealants - See Section 079200

1.03 SUBMITTALS

A. PROPOSED PRODUCT LISTS
   1. Before any materials are delivered to the jobsite, the Contractor shall submit a complete list of all proposed materials, including manufacturers names being used to install the roofing system specified to the University's Representative.

B. SHOP DRAWINGS
   1. Furnish shop drawings of sheet metal work to the University's Representative for approval, in accordance with Section 013300, prior to the start of reroofing operations.

C. UNIT PRICES
   1. The Contractor shall submit on the Bid Proposal Form a list of all proposed unit prices for labor and materials being used in the repair of isolated deck damages or covering of small openings in the steel roof deck. The price quoted shall be per square foot as installed for 18-gauge galvanized steel plate.
   2. The Contractor shall submit on the Bid Proposal Form a list of all proposed unit prices for labor and materials being used in the replacement of deteriorated steel deck.

1.04 PROJECT CONDITIONS

1. Weather Conditions Limitations: Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with manufacturer's recommendation and warranty requirements.
   a. Do not install materials when rain, cold, moisture, frost, snow or other climatic conditions prevent the adhesion of bitumen or other formation of a homogeneous membrane.

1.05 PRODUCT HANDLING

A. Store and handle roofing materials in a manner which will prevent moisture intrusion. Store in a dry, well ventilated, weather tight place. Unless protected from weather or other moisture sources, do not leave unused felts on the roof overnight or when roofing work is not in progress. Store rolls of felt and other sheet materials on end on pallets or other raised surface and completely cover with tarps. Handle and store materials and equipment in a manner to avoid damage and/or significant or permanent deflection of deck.

1.06 WARRANTY

A. The Contractor shall provide a five (5) year Roofing Contractor's Warranty covering the insulation, roofing and flashing. Defects in material or workmanship, which are discovered and made known to the Contractor during the guarantee period, shall be repaired or replaced and/or adjustments shall be made without delay upon written notification from the Owner and at no additional cost to the Owner

B. The Contractor shall provide a 30-year material manufacturer's warranty (Soprema Warranty) warranting that all work of this Section shall remain serviceable and watertight for a period of thirty years from date of final certificate of the project; and to make good without expense to the University any work becoming defective during that period. The insulation material shall be included in the warranty.

PART II – PRODUCTS

2.01 QUALITY ASSURANCE

A. Acceptable Manufacturers (Modified Bitumen Membrane Base Ply)
   1. Soprema, Sopralene Flam Stick

B. Acceptable Manufacturers (Modified Bitumen Membrane Mid Ply)
   1. Soprema, Sopralene Flam 180

C. Acceptable Manufacturers (Modified Bitumen Membrane Top Ply)
   1. Soprema, Sopralene Flam 180 FR GR

D. Acceptable Manufacturers (Modified Bitumen Flashing Base Ply)
   1. Soprema, Sopralene Flam Stick

E. Acceptable Manufacturers (Modified Bitumen Flashing Top Ply)
   1. Soprema, Sopralene Flam 180 FR GR

F. Acceptable Manufactureres (PMMA Flashing)
   1. Soprema, ALSAN RS Resin
   2. Soprema, ALSAN RS Fleece

G. Acceptable Manufacturers (Touch-up Granules)
   1. Soprema, Granules Grey Blend

H. Reference Standards
   1. The latest publications of NRCA Roofing and Waterproofing Manual and SMACNA Architectural Sheet Metal, as applicable to this project.

I. Installer References
   1. The Contractor shall be a licensed installer for the approved membrane manufacturer and have installed conventional roof systems of a similar nature. The Contractor shall have a minimum of 5 years experience and submit references from past jobs. Failure to meet these criteria will be basis for rejection of the bid.
   2. The Contractor shall provide names and phone numbers of key individuals in the firm that can be reached 24 hours a day. Telephone numbers to an answering service or telephone answering machine will not be considered acceptable.

J. Installation Standards
   1. Accomplish work under this Section in strict accordance with the roofing manufacturer's published specifications and best trade practices to achieve a completely watertight roofing and flashing installation.
   2. Provide materials which have been tested, listed and labeled by Underwriters Laboratories (UL).

K. General
1. The Roofing Contractor will be responsible for measurements. Before ordering material, preparing shop drawings, or doing any work, verify at the site all dimensions which may affect the work. The Roofing Contractor assumes full responsibility for the accuracy of figures. No allowance for additional compensation will be considered for discrepancies between dimensions on the drawings and actual field dimensions.
2. Immediately refer to any conflicts among requirements of these specifications, on drawings, those of regulatory agencies, material manufacturer's recommendations and good roofing practices to the University's Representative.
3. Accomplish all work in strict compliance with the roofing manufacturer's latest published specifications and details submitted to and reviewed by the University's Representative and follow the best trade practices to achieve complete watertight roofing and flashing installations.
4. Final results are the entire responsibility of the Roofing Contractor.

2.02 PRODUCT DESCRIPTION

A. GENERAL
1. Performance: Provide roofing materials recognized to be of generic type indicated and tested to show compliance with indicated performances, or provide other similar materials certified in writing by the manufacturer to be equal or better than specified in every significant respect, and acceptable to the University's Representative.
2. Compatibility: Provide products which are recommended by the selected material manufacturer to be fully compatible with indicated substrates, or provide separation materials as required to eliminate contact between incompatible materials.

B. ROOF SYSTEM
1. The roofing system to be utilized shall be a three-ply granular-surfaced, 30-year type modified bitumen roof, utilizing a self-adhering modified bitumen base ply and two plies of heat weldable modified bitumen membrane.
2. Base flashing shall be a 30-year type, modified bitumen flashing constructed with the same type of plies used to construct the roof membrane.
3. The base ply shall be a self-adhering SBS modified bitumen sheet reinforced with non-woven polyester. This membrane ply shall have a film top surface.
4. The interply of the membrane shall be a heat weldable SBS modified bitumen sheet reinforced with non-woven polyester. This membrane ply shall have film top and bottom surfaces.
5. The top ply of the membrane shall be a heat weldable SBS modified bitumen sheet reinforced with non-woven polyester. This membrane ply shall have a granule surfaced top surface.
6. Modified bitumen roof cement for the modified bitumen membrane and base flashings (where required) shall be approved by the selected membrane manufacturer for use with their material.

C. ROOF DECK
1. Isolated repairs to the wood roof deck shall be accomplished with 18-gauge galvanized plate.

PART III - EXECUTION

3.01 DELIVERY AND STORAGE

A. Products shall be delivered to job site and stored on wood pallets designed to keep them off the ground. Rolls of felts will be stored by standing on end.

B. All materials will be kept in a perfectly dry condition at all times. Any felts or other materials that have been subjected to dampness or rain will be marked for permanent removal from the premises.

3.02 DEMOLITION AND SUBSTRATE PREPARATION

A. GENERAL
1. Roof Contractor is to provide dumpsters be responsible for removal of material and debris from the premises.
2. MSU Landscape Services to Provide:
a. Tree Protection
1) Any tree trimming required will be done by MSU Landscape Services
b. Jobsite Fencing
c. Sidewalk Closure and Pedetrian Detour Signs
d. Temporary crushed asphalt fines, protection mats, wood mulch or concrete for staging area for Crane and Dumpster as necessary.
3. Crane
a. Crane rental and operation to be provided by the Roof Contractor and included in the bid proposal.
b. Crane set-up to be in one location, with one mobilization.
c. Coordination of shut down notices require seven (7) days advance notice when crane is in use on the project.

B. ROOFING SYSTEM
1. Remove and discard the existing protected roof roof membrane, light-guard insulation boards, base flashings and miscellaneous debris down to the wood roof deck on Area 29.
2. Remove and discard the existing built-up roof, base flashings and miscellaneous debris down to the concrete deck on Area 8.

C. DRAINS
1. Remove and save the existing drain strainers, clamps, clamping rings and bolts from the existing roof drains. Replace broken strainers, bolts, etc. with new cast iron components as part of the Base Bid. The Roofing Contractor shall inspect the drain bowl for condition and notify the University's Representative of deteriorated conditions.
a. Replacement of deteriorated drain bowls if necessary will be bid as a Unit Price Extra.

D. EDGE METAL
1. Completely remove and discard the existing copper edge metal from the perimeter of Area 29.

E. ROOF DECK
1. Closely inspect the wood roof deck. Repair isolated areas of deterioration and/or small holes with sheet metal plates as directed by the University's Representative to provide a structurally sound roof deck.
a. The deck repairs shall be bid as a Unit Price Extra.

F. ROOF HATCH COPPER METAL CURB
1. Scarify the copper metal curb of the roof hatch on Area 29 to like new condition in preparation to receive primer and PMMA flashing materials. See Detail 5.

G. ROOF VENT EXTENSIONS.

1. Remove and discard existing roof vent extensions on Area 29. Methodology for adding new extensions or replacing existing vent stacks to be determined and addressed via addendum.

H. SATELLITE DISH
1. Remove and discard the satellite dish on Area 29.

I. MISCELLANEOUS
1. Remove debris, scrap and rubbish from the roof areas and building grounds daily. Upon completion of the work, remove excess material and waste from site and clean finished surfaces marked by roofing work.

3.03 INSTALLATION PROCEDURES

A. GENERAL
1. The Contractor shall comply with the manufacturer's instructions, except where more stringent requirements are indicated herein.
2. The Contractor for this work shall insist on a thoroughly dry substrate surface before beginning work.
3. Do not install any roofing materials during rain or other inclement weather. One exception is that temporary work may be installed during such weather to protect materials that are already installed. Remove all temporary work and materials that have been exposed to such weather, then install permanent materials as specified during acceptable weather conditions.
4. The Contractor shall notify the University's Representative for his inspection and approval before installing any materials.
5. Any areas in the existing roof that are damaged during construction shall be repaired with materials to match existing as directed by the University's Representative.
6. Do not apply roofing materials when moisture in any form can be seen or felt on the surface to which those materials will be applied. Do not apply materials when foaming, bubbling, or blistering of the bitumen occurs.
7. Schedule and supervise work crews so that the area of roofing begun one day is completely finished before leaving the job site that day. Included are all flashings within each days work area and adjoining the membrane.
8. At the end of each day's roofing installation, protect edge of incomplete work, including ply sheets and insulation.

B. DRAINS
1. Return the reusable clamping rings and bolts to the existing drain bowls and clamp the flashings in place. Reinstall the existing strainers and make sure the drains are free of debris and are functioning properly.

C. ROOF DECK REPAIRS
1. Install 18-gauge galvanized plates over small holes (less than 6-inches in diameter) and where isolated areas of deterioration are present in the existing roof deck. The plates shall extend 6-inches past the deficient conditions in every direction. The outside perimeter edges of the plates shall be secured 12-inches on-center with screws.

D. NAILERS
1. Install wood nailers as specified in Section 061000.

E. INSULATION AND COVER BOARD
1. Install the new substrate board and insulation as specified in Section 072216.

F. BASE PLY

1. Completely unroll the base ply of the roof membrane (Sopralene Flam Stick 180) and allow to relax for a minimum of 10 minutes. Reroll the ends of each roll, one end at a time to insure proper alignment, creating two sub-rolls.
2. Prime all surfaces with approved asphalt primer where required by the material manufacturer prior to the installation of the self-adhered membrane. Allow the primer to dry prior to the installation of the self-adhered membrane.
3. Install the reinforcing membrane and the first flashing ply at walls, curbs and other vertical surfaces prior to installing the base ply of the membrane. The field base membrane ply shall be run tight to the base of all vertical surfaces.
4. Begin the installation of the self-adhered plies at the low point of the roof. Provide proper width side laps and end laps in the membrane. Evenly press each roll into place to ensure good adhesion to the substrate. Completely heat fuse the laps in the sheets together. A small flow of asphalt shall be visible in front of each roll and a small bead of asphalt shall bleed out of the side lap. The installed membrane shall be free of air pockets, wrinkles, fish mouths and tears. Seal the laps by running a heated trowel along the edges of the membrane.

G. MIDDLE AND TOP PLIES OF ROOF MEMBRANE
1. Completely unroll the middle and top plies of the roof membrane (Sopralene Flam 180 and Sopralene Flam 180 FR GR) and allow to relax for a minimum of 10 minutes. Reroll the ends of each roll, one end at a time to insure proper alignment, creating two sub-rolls.
2. Begin the installation of the plies shall begin at the low point of the roof. Off set the laps in the plies of the membrane the distances required by the material manufacturer. Evenly heat the underside of each roll with a torch in a manner to evenly and continuously melt the asphalt on the roll. A small flow of asphalt shall be visible in front of each roll and a small bead of asphalt shall bleed out of the side lap. The installed membrane shall be free of air pockets, wrinkles, fish mouths and tears. Seal the laps by running a heated trowel along the edges of the membrane.
3. Broadcast mineral granules in the bleed out of the laps on the top ply (Sopralene Flam 180 FR GR) while the material is still hot.
4. The latest printed instructions will govern the application procedure including all technical bulletins related to various types of weather applications.
5. Install chalk lines on the deck/roof membrane ply surfaces to assist with the alignment of the new roof membrane plies.

H. BASE FLASHING
1. Neatly flash the perimeter edges and walls in strict compliance with the base flashing manufacturer’s specifications and the drawings utilizing heat welding installation methods. The upper edges of the flashings shall be secured 8-inches on-center with large diameter capped nails or anchors with washers approved by the base flashing manufacturer for use on other substrates.
2. The upper edge, nail heads and anchors in the flashing shall be sealed with a three-course of asphalt plastic or modified bitumen roof cement and fabric as approved by the material manufacturer.
3. The upper edge of the base flashing on the masonry wall surrounding Area 5 shall be sealed with a three-course of Alsan Flashing and PolyFleece Fabric as approved by the material manufacturer.
4. ALL FLASHINGS SHALL BE COMPLETED DAILY AS THE PROJECT PROGRESSES

I. LIQUID APPLIED FLASHING

1. The square-to-round transition vent flashings on Area 4 shall be sealed with a three-course of Alsan Flashing and PolyFleece Fabric as approved by the material manufacturer. See Detail 2
2. The Mechanical unit with sheet metal sides and no curb shall be sealed with a three-course of Alsan Flashing and PolyFleece Fabric as approved by the material manufacturer. See Detail 8

J. PENETRATION FLASHINGS
1. Plumbing vent pipes shall be flashed with sheet metal sleeved flanges and umbrellas as specified in Section 076200.

K. ROOF DRAIN FLASHING
1. Install lead flashings and reinforcing plies at the roof drains on Areas 8 and 29. Prepare all surfaces around each drain in accordance with the membrane manufacturer's requirements. The base ply of membrane shall be set into a minimum 8-inch wide bed of roof cement at the drain. Coat the base ply with roof cement where the lead is to be set. Install reinforcing plies over the lead flashing. The reinforcing plies shall extend 3-inches beyond the lead. Install the membrane plies into the drain bowl. The drain flashing, base ply, reinforcing and membrane plies and lead flashing shall extend 1-inch minimum past the clamping ring. Turn the materials down into the bowl. See Detail 4.
2. Ensure that the drain line is clear of debris and is functioning properly.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART I - GENERAL

1.01 SCOPE

A. This Section involves completing the following in accordance with the requirements of this Section and Division 1:
   1. Installation of lead flashings on all drains.
   2. Installation of copper sleeved flange and umbrella flashings on the stacks, goosenecks, conduits and pipes.
   3. Installation of prefinished copper gravel stop fascia.
   4. Installation of prefinished aluminum counterflashing.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Rough Carpentry - see Section 061000

B. Substrate Board and Base Sheet – see Section 072216

C. Conventional Modified Bitumen Roofing - see Section 075216

D. Joint Sealants - see Section 079200

1.03 SUBMITTALS

A. SHOP DRAWINGS
   1. The Contractor shall prepare shop drawings of all sheet metal work and submit them to the University's Representative for approval.

1.04 PROJECT CONDITIONS

A. FIELD MEASUREMENTS
   1. Take field measurements to verify and supplement the dimensions indicated.

PART II - PRODUCTS

2.01 QUALITY ASSURANCE

A. REFERENCE STANDARDS
   1. The latest publication of the following standard specifications shall establish the minimum requirements when not otherwise specified in this section:

2.02 MATERIALS

A. ROOF DRAIN FLASHINGS
   1. The lead sheets for the drain flashings shall be minimum four-pound lead sheets, 30-inches x 30-inches in size. The lead shall be primed in accordance with the membrane manufacturer's latest printed requirements.

B. PENETRATION FLASHINGS
   1. Flashings for the pipes, stacks, gooseneck and conduit penetrations shall be flanged sleeve and umbrella type flashings. The flanged sleeves and umbrella shall be fabricated from 16-ounce copper similar to SMACNA Figure 4-16B.
   2. The flanged sleeves shall be fabricated to provide a 12-inch flashing height. The flanges shall be a minimum of 4-inches wide and shall be continuous around the bases of the sleeves. All joints in the flanged sleeves shall be continuously soldered.
   3. The umbrellas shall extend past the sleeves a minimum of 4-inches. The umbrellas shall be held in place with stainless steel draw bands. Continuously solder the joints on the umbrellas.

C. PLUMBING VENT PIPE FLASHINGS
1. Plate for covering the holes in the roof decks between the plumbing vent pipes and the decks shall be formed of 18 gauge galvanized steel. The plates shall be 12-inch by 12-inch in size with a hole slightly larger than the pipe so that the pipe doesn't bind on the plate. Anchors for the plate shall be appropriate for the substrate present.
2. Sleeve, flange and umbrella type flashings for the plumbing vent pipes shall be formed of 16-ounce copper. Fabricate in accordance with SMACNA Figure 4- 16B. The flashings shall slightly larger than the penetrations that are being flashed. The sleeves shall be a minimum of 8-inches above the finished roof and shall have 4-inch flanges. The umbrellas shall extend a minimum of 4-inches beyond the sleeves. Joints in the sleeves, flanges and umbrellas shall be soldered.
3. Sealant for the sleeves shall be a two-part pourable sealer as used for pitch pan flashings.

D. COUNTERFLASHINGS
1. Counterflashings for the interior wall and curbs on Area 29 shall be formed of .050 aluminum having a 70% Kynar or Hylar 5000 based finish coating. The counterflashings shall have 4-inch faces and bottom hemmed edges.

E. METAL EDGE/FASCIA
1. Metal edge/fascia for the perimeter of Area 29 shall be formed from 16 ounce copper. Continuous copper cleats for the metal edge/fascia shall have 3-inch face and extend 1-inch past the 1x6 nailer with bent bottom edges to engage the metal edge/fascia.

F. NAILS / SCREWS
1. Nails and screws for securing the sheet metal flashings into treated lumber shall be formed of Type 316 stainless steel. Use copper nails on copper materials.

G. SEALANT
1. Refer to section 07 9200 Joint Sealants **SEALANT A**
2. The sealant color shall match the color of the sheet metal it is being applied in conjunction with.

PART III - EXECUTION

3.01 PREPARATION

A. GENERAL
1. Install work in accordance with the drawings, specifications and approved shop drawings.
2. Hem all free edges of metal. Make ample provisions for expansion and contraction. As far as practical, secure sheet metal with concealed fastenings. Drive no nails or bolts through exposed parts of sheet metal except where no other method of fastening is practical.

3.02 INSTALLATION

A. GENERAL
1. Perform sheet metal work in accordance with the latest addition of the SMACNA "Architectural Sheet Metal Manual".

B. ROOF DRAIN FLASHINGS
1. Install new lead flashings for the roof drains on Area 4. The lead shall be installed as specified in Section 075552.

C. PENETRATION FLASHINGS
1. Install copper flanged sleeves at the bases of the pipes, stacks, goosenecks and conduits. Set the flanged sleeves into roof cement on the new roof membrane and cover with double targets of modified bitumen membrane flashing in accordance with the membrane manufacturer's latest printed 30-year details.

2. Install copper umbrellas to tightly fit over the sleeved flanges. Secure the umbrellas with stainless steel draw bands. Seal the top of the umbrella with the specified sealant

D. PLUMBING VENT PIPE FLASHINGS
1. Install galvanized steel plate around the plumbing vent pipes to cover the openings between the roof decks and plumbing vent pipes. Secure the plates to the roof decks with appropriate anchors.
2. Install copper flanged sleeves at the bases of the plumbing vent pipes. Set the flanged sleeves onto the new roof membranes in roof cement and strip-in with double targets of modified bitumen membrane flashing in accordance with the membrane manufacturer's latest printed 30-year details. Fill the sleeves with pourable sealer.
3. Install copper umbrellas over the sleeved flanges. Secure the umbrellas with stainless steel draw bands. Seal the tops of the umbrellas with the specified sealant.

E. COUNTERFLASHINGS
1. Install reglet mounted counterflashings along the interior wall of Area 29. Corners in the counterflashing must be formed, lapped and sealed as necessary to provide a continuous system that is watertight. Adjacent sections of counterflashing shall lap a minimum of 4-inches. Caulk the top of the counterflashings. Sections of the counterflashing shall not be fastened together. Cut new reglet 1 ½-inches into masonry walls. See Detail 2.

F. METAL EDGE/FASCIA
1. Install new copper cleat along the outside face of the perimeter of Area 29. Secure the cleats 12-inches on-center with copper nails to the 1x6 wood nailers on the slate-side of of the wall.
2. Install new copper metal edge/fascia on the perimeter of Area 29. Hook the bottom hemmed edges of the metal edge faces onto the cleats and set the primed flanges of the metal edge/fascia in a continuous bed of roof cement. Secure the flanges with copper nails spaced 3-inches on-center. Strip-in the flanges with modified bitumen flashing membrane.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 MSU ISSUES

A. It the intent of MSU that all joint sealants used on its projects will comply with LEED™ NC 3 Credit Requirements EQ Credit 4.1: Low-Emitting Materials: Adhesives and Sealants.

1.02 SUMMARY

A. This Section includes joint sealants for the applications listed in 3.6 JOINT SEALANT SCHEDULE below, and including those specified by reference to this Section:

1.03 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

1.04 SUBMITTALS

A. VOC Statement and Product Data: For each joint-sealant product indicated.

B. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

C. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

D. SWRI Validation Certificate: For each elastomeric sealant specified to be validated by SWRI's Sealant Validation Program.

E. Qualification Data: For Installer and testing agency.

F. Preconstruction Field Test Reports: When requested by owner, indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on preconstruction testing specified in "Quality Assurance" Article.

G. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:
   1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
   2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

H. Field Test Report Log: For each elastomeric sealant application.

I. Product Test Reports: Based on comprehensive testing of product formulations performed by a qualified testing agency, indicating that sealants comply with requirements.

J. Warranties: Submit written special warranty as specified in this Section. Include contact information, description of coverage, and start date for each special warranty.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

C. Preconstruction Compatibility and Adhesion Testing: Submit to joint-sealant manufacturers, for testing indicated below, samples of materials that will contact or affect joint sealants.
   1. Use ASTM C 1087 or manufacturer's standard test method to determine whether priming and other specific joint preparation techniques are required to obtain rapid, optimum adhesion of joint sealants to joint substrates.
   2. Submit not fewer than six pieces of each type of material, including joint substrates, shims, joint-sealant backings, secondary seals, and miscellaneous materials.
   3. Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4. For materials failing tests, obtain joint-sealant manufacturer's written instructions for corrective measures including use of specially formulated primers.
   5. Testing will not be required if joint-sealant manufacturers submit joint preparation data that are based on previous testing of current sealant products for adhesion to, and compatibility with, joint substrates and other materials matching those submitted.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.
   1. Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
   2. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
   3. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.
   4. Test other joint sealants for compliance with requirements indicated by referencing standard specifications and test methods.

E. Preconstruction Field-Adhesion Testing: Before installing elastomeric sealants, field test their adhesion to Project joint substrates as follows:
   1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
   2. Conduct field tests for each application indicated below:
      a. Each type of elastomeric sealant and joint substrate indicated.
      b. Each type of nonelastomeric sealant and joint substrate indicated.
   3. Notify M.S.U. Project Manager seven days in advance of dates and times when test joints will be erected.
      a. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C 1193.
         1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
   4. Report whether sealant in joint connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
   5. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.06 PROJECT 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.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.07 WARRANTY

A. Special Warranty
1. Provide installation warranty for a period of 5 years against defective materials and workmanship.
2. During the warranty period restore defective work to the standard of the contract documents without additional compensation, including all materials, labor, refinishing and other costs incidental to the work. Within 24 hours after receipt of notice from the owner, inspect the work and immediately repair leaks. Restore work found to be defective as defined in the contract documents, within 10 days after receipt of notice from the owner.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.

2.02 MATERIALS, 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 sealant manufacturer, based on testing and field experience.

2.03 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

D. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Single-Component Neutral-Curing Silicone Sealant; SEALANT A
1. Available Products:
a. Dow; DOWSIL 790 Silicone Building Sealant.
b. GE Silicones; SilPruf SCS2000.
c. Dow; DOWSIL 791 Silicone Weatherproofing Sealant.
d. Dow; DOWSIL 795 Silicone Building Sealant.

e. Pecora Corporation; 895.
f. Dow; DOWSIL 756 SMS Building Sealant.
g. Or as approved

2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

F. Multicomponent Immersible Urethane Sealant SEALANT B
1. Available Products:
a. LymTal International, Inc., Iso-Flex 881 (NS – nonsag)
2. LymTal International, Inc., Iso-Flex 880 (P – pourable).
a. Or as approved
3. Type and Grade: M (multicomponent) and NS (nonsag) or P (pourable).
4. Class: 25.
5. Uses Related to Exposure: T (traffic), NT (nontraffic) and I (immersible).

G. Single-Component Mildew-Resistant Acid-Curing Silicone Sealant SEALANT C.:
1. Available Products:
a. Dow; DOWSIL 786 Silicone Sealant - M
b. GE Silicones; Sanitary SCS1700.
c. Tremco; Tremsil 200.
d. Or as approved
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).

2.04 LATEX JOINT SEALANTS

A. Latex Sealant: Comply with ASTM C 834.SEALANT D.

B. Available Products:
1. DAP DYNAFLEX 230.
2. Pecora Corporation; AC-20+Silicone.
3. Or as approved.

2.05 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant for Concealed Joints: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission. SEALANT E.
1. Available Products:
a. Pecora Corporation; BA-98.
b. Tremco; Tremco Acoustical Sealant.
c. Or as approved.

2.06 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) O (open-cell material) or B (bicellular material with a surface skin), as approved in writing by joint-sealant manufacturer for joint application indicated, 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 where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.07 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

3.01 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 joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 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, blast cleaning, 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.
   3. Remove laitance and form-release agents from concrete.
   4. Clean nonporous 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:
   5. Metal.
      a. Glass.
      b. Porcelain enamel.

c. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on 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 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.

3.03 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 C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. 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.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. 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.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified 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. On all sealants, use dry tooling only (without agents).
   3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

3.04 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.

3.05 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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.06 JOINT-SEALANT SCHEDULE

A. SEALANT A: Control joints in interior and exterior (non-traffic) masonry. Joints in interior and exterior precast architectural concrete. Joints between interior masonry non-bearing walls or partitions and under side of floors, beams and slabs. Joints around pipes, conduits, and ducts that penetrate walls and partitions. Exterior joints at perimeter of metal frames, including door and window frames. Exterior joints at ends of aluminum windowsills. Horizontal (non-traffic) and vertical expansion joints in exterior brick masonry.

B. SEALANT B: Isolation and control joints in exposed interior concrete floors. Expansion joints in interior tile. Expansion and control joints in exterior curbs and walks, and in paving other than concrete road paving, subject to pedestrian and vehicular traffic.

C. SEALANT C: Perimeter of toilet fixtures, vanities, kitchen counters, interior non-traffic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.

D. SEALANT D: Interior joints at the perimeter of hollow metal doorframes (except at the face of hollow metal frames adjoining walls finished with wall tile, which will have grout tight to the door frames.)

E. SEALANT E: Use as specified in SECTION 092613 GYPSUM VENEER PLASTER and SECTION 095113 ACOUSTICAL PANEL CEILINGS.

END OF SECTION