PROJECT MANUAL

PIKES PEAK LIBRARY DISTRICT
REPLACE ROOFING PENROSE/CARNEGIE LIBRARY

PIKES PEAK LIBRARY DISTRICT

August 10, 2021

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Pikes Peak Library District
Replace Roofing Penrose/Carnegie Library

SECTION 01 11 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

A. The Project consists of:

1) Project Location: Penrose/Carnegie Library - 20 N Cascade Ave, Colorado Springs, CO 80903

B. The Work consists of:

1) Replace Roofing System – Deck 1:

a) Demolition: At the areas indicated on the Roof Plan, remove the existing adhered EPDM roofing membrane in 6” wide strips set 10’ on center. Remove the existing flashings and counterflashings not designated to remain. This area will receive a roof recover.
b) Set a layer of 0.5” thick high density isocyanurate foam insulation over the existing prepared roof system. Secure the cover board with FM Approved screw and plate roof insulation fasteners.
c) Install a new fully adhered EPDM membrane over the top of the cover board insulation.
d) Install new cured and uncured EPDM flashings.
e) Provide new sheet metal flashing and counterflashings.
f) Provide a written 20 year warranty covering the new roofing material and labor in a leak free state at a no-dollar limit. Also provide a roofing contractor’s two year written warranty covering the new roofing system in a leak free state.

2) Replace Roofing System – Decks 2, 3 & 4A:

a) Demolition: At the areas indicated on the Roof Plan, remove the existing adhered EPDM roofing system and underlying insulation down to the surface of the metal deck. Remove the existing flashings and counterflashings not designated to remain.
b) Base Insulation Layers: Install a new base layer of 2” thick isocyanurate foam insulation. Set a second layer of foam over the first that is 3” thick. Secure both layers of foam simultaneously to

the metal deck with FM Approved screw and plate insulation fasteners.

c) Crickets: Set tapered isocyanurate foam insulation crickets over the foam base layers as shown on the Drawings. Secure tapered insulation cricket boards with low rise foam adhesive.

d) Cover Board: Set a 0.5" thick high density isocyanurate foam cover board over the layers of foam insulation. Secure the cover board with low rise foam adhesive.

e) Install a new fully adhered EPDM membrane over the top of the cover board insulation.

f) Install new cured and uncured EPDM flashings.

g) Provide new sheet metal flashing and counterflashings.

h) Provide a written 20 year warranty covering the new roofing material and labor in a leak free state at a no-dollar limit. Also provide a roofing contractor's two year written warranty covering the new roofing system in a leak free state.

3) Replace Roofing System – Decks 4 & 5:

a) Demolition: At the areas indicated on the Roof Plan, remove the existing adhered EPDM roofing system and underlying insulation down to the surface of the concrete deck. Remove the existing flashings and counterflashings not designated to remain.

b) Base Insulation Layers: Install a new base layer of 2" thick isocyanurate foam insulation. Set a second layer of foam over the first that is 3" thick. Secure both layers of foam with low rise foam adhesive.

c) Tapered Insulation: Cover the base layers of foam insulation with a tapered isocyanurate foam insulation system that has a slope of 1/8" per foot (0.125/12). Secure tapered foam insulation boards with low rise foam adhesive.

d) Cover Board: Set a 0.5" thick high density isocyanurate foam cover board over the layers of foam insulation. Secure the cover board with low rise foam adhesive.

e) Install a new fully adhered EPDM membrane over the top of the cover board insulation.

f) Install new cured and uncured EPDM flashings.

g) Provide new sheet metal flashing and counterflashings.

h) Provide a written 20 year warranty covering the new roofing material and labor in a leak free state at a no-dollar limit. Also provide a roofing contractor's two year written warranty covering the new roofing system in a leak free state.

4) Replace Roofing System – Decks 6 & 7:

a) Demolition: At the areas indicated on the Roof Plan, remove the existing adhered EPDM roofing system and underlying insulation

down to the surface of the metal deck. Remove the existing flashings and counterflashings not designated to remain.

b) Base Insulation Layers: Install a new base layer of 2" thick isocyanurate foam insulation. Set a second layer of foam over the first that is 3" thick. Secure both layers of foam simultaneously to the metal deck with FM Approved screw and plate insulation fasteners.

c) Tapered Insulation: Cover the base layers of foam insulation with a tapered isocyanurate foam insulation system that has a slope of 1/8" per foot (0.125/12). Secure tapered foam insulation boards with low rise foam adhesive.

d) Cover Board: Set a 0.5" thick high density isocyanurate foam cover board over the layers of foam insulation. Secure the cover board with low rise foam adhesive.

e) Install a new fully adhered EPDM membrane over the top of the cover board insulation.

f) Install new cured and uncured EPDM flashings.

g) Provide new sheet metal flashing and counterflashings.

h) Provide a written 20 year warranty covering the new roofing material and labor in a leak free state at a no-dollar limit. Also provide a roofing contractor's two year written warranty covering the new roofing system in a leak free state.

5) Replace Roofing System – Decks 6 & 7:

a) Demolition: At the areas indicated on the Roof Plan, remove the existing adhered EPDM roofing system and underlying insulation down to the surface of the metal deck. Remove the existing flashings and counterflashings not designated to remain.

b) Base Insulation Layers: Install a new base layer of 3" thick isocyanurate foam insulation. Set a second layer of foam over the first that is also 3" thick. Secure both layers of foam simultaneously to the metal deck with FM Approved screw and plate insulation fasteners.

c) Tapered Insulation: Cover the base layers of foam insulation with a tapered isocyanurate foam insulation system that has a slope of 1/8" per foot (0.125/12). Secure tapered foam insulation boards with low rise foam adhesive.

d) Cover Board: Set a 0.5" thick high density isocyanurate foam cover board over the layers of foam insulation. Secure the cover board with low rise foam adhesive.

e) Install a new fully adhered EPDM membrane over the top of the cover board insulation.

f) Install new cured and uncured EPDM flashings.

g) Provide new sheet metal flashing and counterflashings.

h) Provide a written 20 year warranty covering the new roofing

material and labor in a leak free state at a no-dollar limit. Also provide a roofing contractor's two year written warranty covering the new roofing system in a leak free state.

C. The Work will be constructed under a single prime contract. The successful bidder must accomplish all roofing work through that firm's crews.

1.3 CONTRACT FORMS

A. Refer to Project Manual Index

1.4 SCOPE OF SERVICES

A. The work of this Contract, except as otherwise specified, shall include all labor, materials, equipment and facilities necessary to produce the required result, all transportation and services, and all materials and equipment incorporated and intended to be incorporated in such results. The Work includes all fees, taxes, permit costs, insurance premiums, and costs for overhead, superintendence, temporary facilities, and other direct and indirect costs and expenses incidental to the performance of the Work.

1.5 EXISTING CONDITIONS

A. The Contractor shall accept the area of the work in its present condition and carefully examine the area of the work and determine for himself all existing conditions visually discernable and/or reasonably expected from his understanding of the Construction Documents.

1.6 CONTRACTOR USE OF PREMISES

A. General: During the construction period the Contractor shall have restricted use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited by the Owner's right to perform work and where indicated on the Plans.

B. Confine operations at site to areas within the limits of the work of this Contract.

1) Do not load structure with weight that will endanger structure.
2) Do not reasonably encumber site with materials or equipment.
3) Assume full responsibility for protection and safekeeping of products stored on premises.
4) Move any stored products which interfere with operations of Owner.
5) Obtain and pay for use of additional storage or work areas needed for operation.

1.7 OCCUPANCY REQUIREMENTS

A. Owner Occupancy: The Owner will occupy the building during construction. The Contractor shall use all reasonable means to not disrupt the operations of the building or the personnel in and around the building.

1.8 PROTECTION

A. The Contractor shall make all necessary provisions for the protection of the public and traffic and the use of surrounding areas. He shall provide barriers and any other safeguards as required to protect the public in accordance with the local laws. The safeguards and protections shall be fully maintained in first-class condition during the entire construction period, and at no time shall required protection be removed. When required, provide all-night lights, lanterns, flares, etc. for night-time protection. All excavations shall be completely protected at all times.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 11 00

SECTION 01 14 13 – ACCESS AND SETUP

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: This specification section covers the allowable access location and setup procedures. Also covered are the phasing requirements for the installation of the new roofing.
B. Related Work:

1) The contractor shall submit engineering documentation indicating that any scaffolding or hoist equipment used on this job can operate within the project lifting and load parameters for the equipment design.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work of this Section.
B. Only qualified personnel may use equipment or give signals to equipment operators.
C. Operate all equipment within equipment design standards.
D. Photograph all surfaces that are to be used for storage, access and setup. Photographs need to be of sufficient clarity to indicate the condition of the storage, access and setup surfaces and any adjacent walls, streets or sidewalks. Provide one set of the photographs to the Owner prior to the start of work. Contractor shall restore all affected surfaces to the same condition at job's end.

1.3 EQUIPMENT HANDLING

A. Schedule equipment arrival with Building Staff so as not to interfere with normal facility operations.
B. Do not block any roads or entrances without 72 hours of notification and Building Staff approval.
C. Secure all delivered equipment and setup material against theft or vandalism.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 PHASING REQUIREMENTS

A. The major phases of the project shall take place in a manner so that the roof is finished on a daily basis and the roof is watertight. Do not phase construct any portion of the roof without permission from Roof Consultant.

3.2 SITE ACCESS

A. Site access locations are shown on the drawings. The Contractor must stay within these boundaries.
B. Access to the site may be restricted by Building Events. Coordinate access requirements with the Building Staff.
C. Limited amounts of water and electricity shall be provided by the Owner.
D. Do not block or lock building exits or entrances without permission from the Building Staff.
E. Setup areas must be kept clean or screened off.
F. Interior access will not be allowed.
G. If access openings must be cut to install new materials, coordinate with Building Staff. Obtain utility locate prior to cutting into any concealed spaces.

3.3 INTERIOR STORAGE AND ACCESS

A. No interior access or storage is allowed. The one exception is for work that must be performed from the inside such as drain installation.

3.4 COMPLIANCE

A. Do not permit materials not complying with provisions of this Section to be brought onto or stored at the job site.
B. Promptly remove non-complying materials and replace with materials meeting the requirements of this Section.

3.5 DISPOSAL CHUTE

A. Contractor must provide adequate protection around demolition disposal locations. A disposal chute and a tarp that spans the length of the dumpster must be used or a tarp that completely covers the side of the building.
B. Contractor is responsible for cleaning, painting and repairing any walls, windows or sidewalks damaged by demolished material and equipment at no additional cost to owner.

END OF SECTION 01 14 13

01 14 16 CLIENT INTERFACE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: This specification section covers the phasing, coordination and protection considerations that must be taken by the Contractor in order to protect the client in the building.

1.2 PERSONNEL

A. Provide a single point of primary contact for the project. This person shall coordinate and notify the Client and Owner as to concerns. Likewise and concerns from the Client or Owner shall be relayed to this party first.
B. Provide a point of contact on the roof for the Client and Owner so that at emergencies can be acted on immediately.

1.3 PHONE NUMBERS

A. Submit emergency contact phone numbers of the Primary Contact, the Roof Top Contact and a number for emergency after hour problems.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL COORDINATION

A. While working on the roof, the Contractor will be required to coordinate the shutdown of any mechanical intakes in the area of work.
B. A coordination meeting will be held to schedule the shutdown of these intakes.
C. The Contractor must contact the Client Contact and the Principle Representative the day before any scheduled work indicating that work is planned for the next day.

3.2 ODOR CONTROL

A. The Contractor shall not open any liquid containers near air intakes or other openings into the building. Work shall be staged so as to minimize the effects of odors on the interior building occupants.
B. A 3’ diameter barrel fan must be available on the job site to dilute any odors from the work.

END OF SECTION 01 14 16

SECTION 01 31 13 – COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and supervisory requirements necessary for coordinating construction operations including, but not necessarily limited to, the following:

1) General project coordination procedures.
2) Coordination Drawings.
3) Administrative and supervisory personnel.
4) General installation provisions.
5) Cleaning and protection.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1) Division 1 Section "Access and Setup" specifies procedures accessing the site and allowable storage restrictions.
2) Division 1 Section "Project Meetings" for progress meetings.
3) Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.
4) Division 1 Section "Materials and Equipment" for coordinating general installation.
5) Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.3 COORDINATION

A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.

1) Where installation of one part of the Work is dependent on installation of other components, either before or after its own installation, schedule construction activities in the sequence required to obtain the best results.

2) Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
3) Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
4) Make provisions to accommodate items scheduled for later installation.

B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.

1) Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

C. Separate Contractors: Coordinate with the work of separate contractors performing work concurrent with the work of this contract.
D. Superintendent: A part-time superintendent representing the General Contractor shall be present at the site at times during construction activities.
E. Foreman: Provide a full time qualified foreman that will be present during all aspects of the work.
F. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and assure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1) Preparation of schedules.
2) Installation and removal of temporary facilities.
3) Delivery and processing of submittals.
4) Progress meetings.
5) Project closeout activities.

G. Conservation: Coordinate construction operations to assure that operations are carried out with consideration given to conservation of energy, water, and materials.

1) Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 SUBMITTALS

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
B. Manufacturer's Instructions: Comply with manufacturer's installation instructions and recommendations, to the extent that those instructions and recommendations are more explicit or stringent than requirements contained in Contract Documents.
C. Inspect materials or equipment immediately upon delivery and again prior to installation. Reject damaged and defective items.
D. Provide attachment and connection devices and methods necessary for securing Work. Secure Work true to line and level. Allow for expansion and building movement.
E. Visual Effects: Provide uniform joint widths in exposed Work. Arrange joints in exposed Work to obtain the best visual effect. Refer questionable choices to the Roof Consultant for final decision.
F. Recheck measurements and dimensions, before starting each installation.
G. Install each component during weather conditions and Project status that will ensure the best possible results. Isolate each part of the completed construction from incompatible material as necessary to prevent deterioration.
H. Coordinate temporary enclosures with required inspections and tests, to minimize the necessity of uncovering completed construction for that purpose.

3.2 GENERAL COORDINATION PROVISIONS

A. Inspection of Conditions: Require the Installer of each major component to inspect both the substrate and conditions under which Work is to be performed. Do not proceed until unsatisfactory conditions have been corrected in an acceptable manner.
B. Coordinate temporary enclosures with required inspections and tests to minimize the necessity of uncovering completed construction for that purpose.

3.3 CLEANING AND PROTECTION

A. Clean and protect construction in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to assure protection from damage or deterioration at Substantial Completion.
B. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to assure operability without damaging effects.
C. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period. Where applicable, such exposures include, but are not limited to, the following:

    1) Water or ice.
    2) Solvents.
    3) Chemicals.

4) Puncture.
5) Abrasion.
6) Heavy traffic.
7) Combustion.
8) Unusual wear or other misuse.
9) Contact between incompatible materials.
10) Unprotected storage.
11) Improper shipping or handling.
12) Theft.
13) Vandalism.

END OF SECTION 01 31 13

SECTION 01 33 00 – SUBMITTALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.
B. Certificates of Insurance in General Conditions
C. Application for Payment in General Conditions
D. Tax Data in General Conditions

1.2 SUMMARY

A. All submittals shall be made electronically and sent directly to the Owner's Representative and the Roof Consultants Office for review. Use the Submittal Register for every submittal. Submit pertinent items that may not be listed on the register.
B. In general, submit information and data for all new roofing components and detailed accessories.
C. Monthly submit a schedule indicating planned performance and actual performance in sufficient detail to track each trade. If contractor becomes more than 3 weeks behind the original anticipated schedule. A meeting shall be held where a plan shall be proposed by the Contractor for bringing the work back in line with the schedule.
D. Submit all Safety Data Sheets prior to bringing materials on site.
E. Submit engineering reports for any platforms, scaffolding or other load bearing accessories that may have to be erected in order to compete the work. The reports shall be detailed enough to establish that the scaffolding and platforms can be erected and maintained in a safe condition without jeopardizing the building or personnel.
F. Highlight items intended for use if copies of pages are submitted with more than a single item on them.
G. Indicate materials, finishes, sizes, thicknesses, configurations, reinforcements, fastenings, connections, supports, anchors, connections to other work, fabrication details, erection details, accessories, rough-in drawings, schedules, etc.
H. Submit the materials list as indicated in various Divisions to the Roof Consultant/Engineer prior to the delivery of materials to the job site.
I. Provide the Roof Consultant/Engineer with manufacturer's instructions and Maintenance Manuals as indicated in various Divisions.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 33 00

SUBMITTAL REGISTER
ADHERED 60 MIL EPDM ROOF SYSTEM
REPLACE ROOFING - PIKES PEAK LIBRARY DISTRICT
PENROSE/CARNEGIE LIBRARY
CONTRACTOR _____

SUB I.D. NO.	SPEC. DIV. NO.	TYPE OF SUB	DESCRIPTION OF MATERIAL	SUBMITTAL DATE	APPROVE/ REJECT	RESUBMIT BY	FINAL ACTION	REMARKS
1	01 11 00	LETTER	SAMPLE GUARANTY					
2	01 11 00	FORM	CONTRACTOR SUPPLIED SUBMITTAL REGISTER					WITH EACH SUBMITTAL
3	01 11 00	FORM	CONTRACTOR SUPPLIED SCHEDULE					
4	06 10 00	LETTER	WOOD FIRE TREATED PRESERVATIVE LITERATURE					
5	07 53 23	LETTER	INSULATION					
6	07 53 23	LETTER	EPDM MEMBRANE LITERATURE					
7	07 53 23	LETTER	ADHESIVES					
8	07 53 23	LETTER	FLASHING MATERIALS					
9	07 60 00	SAMPLE	PRE-FINISHED SHEET METAL SAMPLE					

SUBMITTAL REGISTER
ADHERED 60 MIL EPDM ROOF SYSTEM
REPLACE ROOFING - PIKES PEAK LIBRARY DISTRICT
PENROSE/CARNEGIE LIBRARY
CONTRACTOR _____

10	07 53 23	LETTER	LAP SEALANT AND WATER BLOCK					
11	07 92 00	LETTER	SEALANTS					
12	07 53 23	LETTER	FASTENER LITERATURE & FASTENING PATTERN					
13	22 14 26	LETTER	DRAIN PARTS DRAIN TEST REPORT					
14	01 33 00	LETTER	SAFETY DATA SHEETS					
15		LETTER	SUBCONTRACTOR LIST					
16		LETTER	EMERGENCY CONTACTS					

This submittal register lists the major items to be submitted for this project. Submit any other material items not shown but will be used in the construction of this roofing project.

SECTION 01 31 19 – PROJECT MEETINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings, including, but not limited to, the following:

1) Preconstruction conferences.
2) Progress meetings.

B. The Contractor shall schedule, conduct and record the contents of the meetings and distribute typed minutes to all pertinent parties within two days after the meeting.

C. Related Sections: The following Sections contain requirements that relate to this Section:

1) Division 1 Section "Coordination" for procedures for coordinating project meetings with other construction activities.
2) Division 1 Section "Submittals" for submitting the Contractor's Construction Schedule.
3) See individual specification sections for requirements for preconstruction conferences.

1.3 PRECONSTRUCTION CONFERENCE

A. Schedule a preconstruction conference before starting construction, at a time convenient to the Owner/Owner's Representative and the Roof Consultant, but no later than 15 days after execution of the Agreement. Hold the conference at the Project Site or another convenient location. Conduct the meeting to review responsibilities and personnel assignments.

B. Attendees: Authorized representatives of the Owner, Roof Consultant, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress, including the following:

1) Construction schedule.
2) Critical work sequencing.
3) Designation of responsible personnel.
4) Procedures for processing field decisions and Change Orders.
5) Procedures for processing Applications for Payment.
6) Distribution of Contract Documents.
7) Submittal of Shop Drawings, Product Data, and Samples.
8) Preparation of record documents.
9) Use of the premises.
10) Parking availability.
11) Office, work, and storage areas.
12) Equipment deliveries and priorities.
13) Safety procedures.
14) First aid.
15) Security.
16) Housekeeping.
17) Working hours.

D. Submittals: Contractor is responsible for submitting the following at the preconstruction conference:

1) Schedule of Values
2) List of major subcontractors
3) Construction schedule
4) Critical work sequencing

1.4 PROGRESS MEETINGS

A. Conduct progress meetings at the Project Site at weekly intervals. Notify the Construction Manager and the Roof Consultant of scheduled meeting dates.

B. Attendees: In addition to representatives of the Owner and the Roof Consultant, each subcontractor, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the status of the Project.

1) Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
2) Review the present and future needs of each entity present, including the

following:

a) Interface requirements.
b) Time.
c) Sequences.
d) Status of submittals.
e) Deliveries.
f) Off-site fabrication problems.
g) Access.
h) Site utilization.
i) Temporary facilities and services.
j) Hours of work.
k) Hazards and risks.
l) Housekeeping.
m) Quality and work standards.
n) Change Orders.
o) Documentation of information for payment requests.

D. Reporting: No later than working 3 days after each meeting, distribute minutes of the meeting to each party present and to parties who should have been present. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1) Schedule Updating: Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 31 19

SECTION 01 73 29 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for cutting and patching of nominally completed work to accommodate coordination, other work, testing, etc.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1) Division 1 Section "Coordination" for procedures for coordinating cutting and patching with other construction activities.
2) Refer to other Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.

a) Requirements of this Section apply to mechanical and electrical installations. Refer to Division 15 Sections for other requirements and limitations applicable to cutting and patching mechanical and electrical installations.

1.3 SUBMITTALS

A. Cutting and Patching Proposal: Submit a proposal describing procedures well in advance of the time cutting and patching will be performed if the Owner requires approval of these procedures before proceeding. Request approval to proceed. Include the following information, as applicable, in the proposal:

1) Describe the extent of cutting and patching required. Show how it will be performed and indicate why it cannot be avoided.
2) Describe anticipated results in terms of changes to existing construction. Include changes to structural elements and operating components as well as changes in the building's appearance and other significant visual elements.
3) List products to be used and firms or entities that will perform Work.
4) Indicate dates when cutting and patching will be performed.

5) Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out-of-service. Indicate how long service will be disrupted.
6) Where cutting and patching involves adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with the original structure.
7) Approval by the Roofing Consultant to proceed with cutting and patching does not waive the Roofing Consultant's right to later require complete removal and replacement of unsatisfactory work.

1.4 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would change their load-carrying capacity or load-deflection ratio.

1) Obtain approval of the cutting and patching proposal before cutting and patching structural elements.

B. Operational Limitations: Do not cut and patch operating elements or related components in a manner that would result in reducing their capacity to perform as intended. Do not cut and patch operating elements or related components in a manner that would result in increased maintenance or decreased operational life or safety.

C. Visual Requirements: Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in the Roofing Consultant's opinion, reduce the building's aesthetic qualities. Do not cut and patch construction in a manner that would result in visual evidence of cutting and patching. Remove and replace construction cut and patched in a visually unsatisfactory manner.

1.5 WARRANTY

A. Warranties: Replace, patch, and repair material and surfaces cut or damaged by methods and with materials in such a manner as not to void any warranties required.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

PART 3 - EXECUTION

3.1 INSPECTION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed before cutting. If unsafe or unsatisfactory conditions are encountered, take corrective action before proceeding.

1) Before proceeding, meet at the Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of work to be cut.

B. Protection: Protect construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

3.3 PERFORMANCE

A. General: Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1) Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

B. Cutting: Cut existing construction using methods least likely to damage elements retained or adjoining construction. Where possible, review proposed procedures with the original Installer; comply with the original Installer's recommendations.

1) In general, where cutting, use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2) To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
3) Cut through concrete and masonry using a cutting machine, such as a Carborundum saw or a diamond-core drill.
4) Comply with requirements of applicable Division 2 Sections where cutting and patching requires excavating and backfilling.

C. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1) Where feasible, inspect and test patched areas to demonstrate integrity of the installation.
2) Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3) Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken surface containing the patch after the area has received primer and second coat.

3.4 CLEANING

A. Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar items. Thoroughly clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

END OF SECTION 01 73 29

SECTION 01 77 00 – CONTRACT CLOSEOUT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

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

1) Inspection procedures.
2) Project record document submittal.
3) Operation and maintenance manual submittal.
4) Submittal of warranties.
5) Final cleaning.

B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 2 through 16.

1.3 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1) In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete.

a) Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.
b) If 100 percent completion cannot be shown, include a list of incomplete items (Contractor's Punch List), the value of incomplete construction, and reasons the Work is not complete.

2) Advise the Owner of pending insurance changeover requirements.
3) Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
4) Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.

5) Submit record drawings, maintenance manuals, final project photographs, damage or settlement surveys, property surveys, and similar final record information.
6) Complete final cleanup requirements, including touchup painting.
7) Touch up and otherwise repair and restore marred, exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, the Roofing Consultant will either proceed with inspection or advise the Contractor of unfilled requirements. The Roofing Consultant will prepare the Certificate of Substantial Completion following inspection or advise the Contractor of construction that must be completed or corrected before the certificate will be issued (Roofing Consultant's Punch List).

1) The Roofing Consultant will repeat inspection when requested and assured that the Work is substantially complete. If a third inspection is required, cost to cover the Roofing Consultant's and Construction Manager's time and associated expenses will be deducted from Contractor's payment.
2) Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1) Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include insurance certificates for products and completed operations where required.
2) Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3) Submit a signed copy of the Roofing Consultant's final inspection list of items to be completed or corrected, endorsed and dated by the Roofing Consultant. The signed copy of the list shall state that each item has been completed or otherwise resolved for acceptance and shall be endorsed and dated by the Roofing Consultant.

B. Reinspection Procedure: The Roofing Consultant will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except for items whose completion is delayed under circumstances acceptable to the Roofing Consultant.

1) Upon completion of reinspection, the Roofing Consultant will prepare a certificate of final acceptance. If the Work is incomplete, the Roofing Consultant will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final

acceptance.

2) If necessary, reinspection will be repeated once, and if a subsequent visit is required, funds associated with the Roofing Consultant's and Construction Manager's inspection will be deducted from the Contractor's payment.

1.5 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes. Protect record documents from deterioration and loss in a secure, fire-resistant location. Provide access to record documents for the Roofing Consultant's reference during normal working hours.

B. Record Drawings: Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark which drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1) Contractor shall pay all reproduction costs including sepias and prints.
2) Mark new information that is important to the Owner but was not shown on Contract Drawings or Shop Drawings.
3) Note related change-order numbers where applicable.
4) Organize record drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda. Include with the Project Manual one copy of other written construction documents, such as Change Orders and modifications issued in printed form during construction.

1) Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications.
2) Give particular attention to substitutions and selection of options and information on concealed construction that cannot otherwise be readily discerned later by direct observation.
3) Note related record drawing information and Product Data.
4) Upon completion of the Work, submit record Specifications to the Roofing Consultant for the Owner's records.

D. Record Product Data: Maintain one copy of each Product Data submittal. Note related Change Orders and markup of record drawings and Specifications.

1) Mark these documents to show significant variations in actual Work

performed in comparison with information submitted. Include variations in products delivered to the site and from the manufacturer's installation instructions and recommendations.

2) Give particular attention to concealed products and portions of the Work that cannot otherwise be readily discerned later by direct observation.

3) Upon completion of markup, submit complete set of record Product Data to the Roofing Consultant for the Owner's records.

E. Record Sample Submitted: Immediately prior to Substantial Completion, the Contractor shall meet with the Roofing Consultant and the Owner's personnel at the Project Site to determine which

F. Samples are to be transmitted to the Owner for record purposes. Comply with the Owner's instructions regarding delivery to the Owner's Sample storage area.

G. Miscellaneous Record Submittals: Refer to other Specification Sections for requirements of miscellaneous record keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order. Identify miscellaneous records properly and bind or file, ready for continued use and reference. Submit to the Construction Manager for the Owner's records.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operation and Maintenance Instructions: Arrange for each Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. Provide instruction by manufacturer's representatives if installers are not experienced in operation and maintenance procedures.

3.2 FINAL CLEANING

A. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Division 1 Section "Construction Facilities and Temporary Controls."

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

1) Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.

a) Remove labels that are not permanent labels.
b) Vacuum clean carpeted surfaces and similar soft surfaces and mop and/or wax as required all hard surface flooring.
c) Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
d) Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films, and similar foreign substances. Restore reflective surfaces to their original condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
e) Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
f) Clean the site, including landscape development areas, of rubbish, litter, and other foreign substances. Sweep paved areas broom clean; remove stains, spills, and other foreign deposits. Rake grounds that are neither paved nor planted to a smooth, even-textured surface.

C. Removal of Protection: Remove temporary protection and facilities installed for protection of the Work during construction.

D. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from the site and dispose of lawfully.

1) Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF SECTION 01 77 00

SECTION 01 78 36 – WARRANTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes administrative and procedural requirements for warranties required by the Contract Documents, including manufacturer's standard warranties on products and special warranties beyond one year.

1) Refer to the General Conditions for terms of the Contractor's period for correction of the Work.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1) Division 1 Section "Submittals" specifies procedures for submitting warranties.
2) Division 1 Section "Contract Closeout" specifies contract closeout procedures.
3) Divisions 2 through 16 Sections for specific requirements for warranties on products and installations specified to be warranted.
4) Certifications and other commitments and agreements for continuing services to Owner are specified elsewhere in the Contract Documents.

C. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties do not relieve the Contractor of the warranty on the Work that incorporates the products. Manufacturer's disclaimers and limitations on product warranties do not relieve suppliers, manufacturers, and subcontractors required to countersign special warranties with the Contractor.

1.3 DEFINITIONS

A. Standard product warranties are preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to the Owner.
B. Special warranties are written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide greater rights for the Owner.

1.4 WARRANTY REQUIREMENTS

A. Related Damages and Losses: When correcting failed or damaged warranted construction, remove and replace construction that has been damaged as a result of such failure or must be removed and replaced to provide access for correction of warranted construction.

B. Reinstatement of Warranty: When Work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.

1.5 SUBMITTALS

A. Submit written warranties to the Roofing Consultant prior to the date certified for Substantial Completion. If the Roofing Consultant's Certificate of Substantial Completion designates a commencement date for warranties other than the date of Substantial Completion for the Work, or a designated portion of the Work, submit written warranties upon request of the Roofing Consultant.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 78 36

SECTION 02 41 13 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Demolish and remove from the site those items so indicated on the Drawings and specified herein.

B. The Work specified herein applies to the roof replacement project at the Penrose/Carnegie Library. The major demolition work items are as follows:

1) Replace Roofing:

a) Remove down to the substrate and dispose of the roofing and sheet metal flashings not designated to remain.
b) Remove and dispose of any items not designated to remain so as to facilitate with the installation of the new roofing system.
c) Lift and reset mechanical equipment or other items as necessary to install the new roofing system.

2) General:

a) During the work on the roof, collect material as it is removed and dispose of. Take caution that wind does not spread material.
b) Make sure demolished materials do not plug roof drains.
c) Make sure wind does not broadcast adhesives and asphalt.

C. Related Work: Documents affecting Work of this Section include, but are not necessarily limited to, General Conditions, and Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are trained and experienced in the necessary crafts and who are completely familiar with the requirements and the methods needed for proper performance of Work of this Section.

1.3 PRODUCT HANDLING.

A. Comply with pertinent requirements listed in Division 7.

PART 2 - PRODUCTS

2.1 No products are required in this section.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. General:

1) Prior to start of demolition, carefully study the Drawings and these Specifications.
2) In company with the Roofing Consultant/Engineer and Owner, visit the site and verify the extent of demolition to be performed under this Contract.

B. Using only the means and equipment approved for this purpose by the governmental agencies having jurisdiction, demolish and completely remove from the jobsite the existing construction designated to be removed.

C. Shut off, cap, and otherwise protect existing public utility lines in accordance with the requirements of the public agency or utility having jurisdiction.

D. Demolished material shall be considered to be property of the Contractor and shall be completely removed from the jobsite.

E. Use means necessary to prevent dust becoming a nuisance to the Owner, surrounding areas, and other Work being performed on or near the site.

END OF SECTION 02 41 13

SECTION 06 10 00 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work Included: Provide wood, nails, bolts, screws, framing anchors and other rough hardware, and other items needed and perform rough carpentry for the construction shown on the Drawings, as specified herein, and as needed for the complete and proper installation.
B. Related Work: Documents affecting work in this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.
C. The work is primarily associated with the installation of new wood nailers and curbs. All wood shall be compliant with AWPA U1, Use Category 3B and fire preservative treated (Non-Com).

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the crafts and who are completely familiar with the specified requirements and the methods needed for the proper performance of the work of this Section.
B. Codes and Standards: In addition to complying with the pertinent codes and regulations of governmental agencies having jurisdiction unless otherwise specifically directed or permitted by the Roofing Consultant comply with:

1) "Product Use Manual" of the Western Wood Products Association for the selection and use of products included in that manual.
2) "Plywood Specification and Grade Guide" of the American Plywood Association.

1.3 PRODUCT HANDLING

A. Comply with pertinent provisions of Section 01 34 00.
B. Deliver the materials to the job site, in a safe manner, out of the way of traffic, and shored up off the ground surface.
C. Identify framing lumber as to grades, and store each grade separately from other grades.
D. Protect materials with adequate waterproof wrapping.
E. Use extreme care in off loading of lumber to prevent damage, splitting, and breaking of materials.

PART 2 - PRODUCTS

2.1 GRADE STAMPS

A. Identify framing lumber by the stamp of the Western Pine Inspection Bureau, or such other grade stamp as is approved in advance by the Roofing Consultant.
B. Identify plywood as to species, grade, and glue type by the stamp of the American Plywood Association.
C. Identify other materials of the Section by the appropriate stamp of the agency approved in advance by the Roofing Consultant.

2.2 MATERIALS

A. Provide materials in quantities needed for Work as shown on the Drawings, and meeting or exceeding the following standards of quality:

1) Horizontal framing members: Douglas Fir-Hemlock, Pine, construction grade.
2) Plywood Sheathing: Structural II, CDX, exterior; or standard sheathing with exterior glue.
3) Steel Items: Comply with ASTM A7 or ASTM A36. Use galvanized steel in exterior locations.
4) Machines Bolts: Comply with ASTM A307.
5) Lag Bolts: Comply with Fed Spec FF-B-561.
6) Nails: Use common except as otherwise noted. Comply with Fed Spec FF-N-1. Use galvanized at exterior locations.

2.3 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Roofing Consultant.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 DELIVERIES

A. Stockpile materials sufficiently in advance of need to assure their availability in a timely manner for this work.
B. Make as many trips to the job site as are needed to deliver materials of this Section in a timely manner to ensure orderly progress of the Work.

3.3 COMPLIANCE

A. Do not permit materials not complying with provisions of this Section to be brought onto or stored at the job site.
B. Promptly remove non-complying materials and replace with materials meeting the requirements of this Section.

3.4 WORKMANSHIP

A. Produce joints which are tight, true, and well nailed, with members assembled in accordance with the Drawings and with pertinent codes and regulations.
B. Carefully select members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts or proper nailing, and will allow making of proper connections. Cut out and discard defects which render a piece unable to serve its intended function. Lumber may be rejected by the Roofing Consultant, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting.
C. Do not shim any component.

3.5 GENERAL FRAMING

A. In addition to framing operation normal to the fabrication and erection as indicated on the Drawings, install wood blocking and backing required for the work of other trades.
B. Set horizontal and sloped members with crown up.
C. Do not notch, cut, or bore members for pipes, ducts, or conduits or for other reasons except as shown on the Drawings or as specifically approved in advance by the Roofing Consultant.
D. Make bearings full unless otherwise indicated on the Drawings.
E. Finish bearing surfaces on which structural members are to rest so as to give sure and even support.
F. Where framing members slope, cut or notch the ends as required to give uniform bearing surface.

3.6 BLOCKING AND BRIDGING

A. Install blocking as required to support items of finish and to cut off concealed draft openings, both vertical and horizontal, between ceiling and floor areas.
B. Install solid block between joists at points of support and wherever sheathing is discontinuous. Blocking may be omitted where joists are supported on metal hangers.

3.7 ALIGNMENT

A. Nailing:

1) Use only common wire nails or spikes, except where otherwise

specifically noted on the Drawings.

2) Provide penetration into the piece receiving the point of not less than 1/2 the length of the nail or spike, provided, however, that 16d nails may be used to connect two pieces of 2" (nominal) thickness.
3) Nail without splitting wood.
4) Pre-bore as required.
5) Remove split members and replace with members complying with the specified requirements.

B. Bolting:

1) Drill holes 1/16" larger in diameter than the bolts being used.
2) Drill straight and true from one side only.
3) Do not bear bolt threads on wood, but use washers under head and nut where both bear on wood, and use washers under all nuts.

C. Screws:

1) For lag screws and wood screws, pre-bore holes same diameter as roof of threads, enlarging holes to shank diameter for length of shank.

END OF SECTION 06 10 00

SECTION 07 53 23 – ADHERED EPDM SINGLE-PLY ROOFING

PART 1 - GENERAL

1.1 DESCRIPTION: Furnish the labor, administration, materials and equipment to integrate the work into the overall building system so as to provide a leak free, EPDM (Ethylene Propylene Diene Monomer) elastomeric roof system. The system is an assembly of components including the insulation, roofing membrane, metal flashings, and all related parts necessary to complete the assembly.

1.2 ROOF PERFORMANCE REQUIREMENTS: Provide new insulated EPDM roof systems meeting the following requirements.

A. Wind Resistance: The roofing system must meet FM 1-90 Approval.
B. Thermal Insulation: The finished roof assembly shall have a minimum thermal insulation value of R-30. Refer to the Roof Plan on Sheet R1.0 for exact thermal values at each roof deck. Note the roof on Deck 1 is a recover so minimum thermal values do not apply.
C. Fire Resistance: The roof shall meet the fire resistance requirements of a UL Class A listing.
D. Warranty: The Contractor shall supply a written manufacturer's 20 year warranty covering material and labor in a leak free state t a no-dollar-limit. The Contractor shall also provide a written Contractor's warranty covering the Work in a leak free state for two years.

1.3 SECTION INCLUDES:

A. Adhered EPDM Roofing Membrane
B. Roof Board Insulation
C. Insulation Cover Board
D. EPDM Flashings & seam Tapes
E. Insulation Fasteners & Membrane Adhesives

1.4 PRE-CONSTRUCTION CONFERENCE

A. Prior to the start of work hold a pre-construction conference covering all aspects of the new roof installation. The meeting attendees shall include the manufacturer's representative along with the roofing subcontractor's foreman and superintendent. At a minimum, the following items must be addressed:

1) Mobilization and staging.
2) Protection of the public.
3) Storage location for materials.
4) Environmental installation requirements.
5) Protection of new roofing.
6) Tie-in to existing roofing.

7) Construction of new drain sumps.
8) Fume control.
9) Manufacturer's inspections.
10) Warranty.

1.5 QUALITY ASSURANCE

A. A roofing consultant has been engaged to provide part time inspection of materials and workmanship. The Contractor shall provide a minimum of one week's notice to the Contracting Officer prior to the start of roofing operations so that such services can be scheduled.

B. Except as modified and supplemented herein, follow the published requirements and written recommendations of the EPDM membrane and other material manufacturers. Concerning methods of application industry standards apply only when this contract does not address the matter. Industry Standards shall be pre-defined in the "NRCA (National Roofing Contractors Association) Manual of Roofing and Waterproofing".

C. Qualifications:

1) Qualifications of Contractor: Contractor shall be approved by the membrane manufacturer to install the specified roof system and shall be eligible to receive the specified warranty upon completion of the work. Such approval shall have been issued and in effect for not less than two years prior to the bid opening date.
2) Qualifications of Installers: Use adequate number of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and methods needed for proper performance of the work in this section. In acceptance or rejection of the work, no allowance will be made for lack of skill on the part of the workers. Technicians working on the project shall have received training by the roof membrane manufacturer for the procedures necessary to perform the specified work.
3) Supervisor Qualifications: Supervisor shall be certified by the membrane manufacturer. Certification shall have been issued at least 2 years prior to bid date.
4) Manufacturer Representation: Membrane manufacturer shall be represented by a full time individual or firm based in Colorado. Products represented by part time or regional entity will not qualify.

D. U.L. Listing: Provide materials bearing Underwriters Laboratories (U.L.) marking on bundle, package or container indicating that materials have been produced under U.L.'s classification and follow-up service.

E. FM Listing: Provide roofing system and roof covering material that have been evaluated by Factory Mutual for fire spread, wind uplift and hail damage, and bearing FM Class 1 approval markings.

1.6 REFERENCES

A. *Factory Mutual Research Approval Guide* – Factory Mutual Research

Corporation, An FM Global Affiliate.

B. *Roofing Materials and Systems Directory and Fire Resistance Directory* – Underwriters Laboratories Inc.

1.7 SUBMITTALS

A. When submitting manufacturer's literature, highlight all items pertaining to this project. See Division 1 for other items.

B. Submit to the Contracting Officer the items listed in the Submittal Register found in Division 1, and any other pertinent items not listed but necessary to complete the construction.

C. Submit current manufacturer's literature for all items shown above. Also submit literature for any other items which may have a direct bearing on the quality of the finished roofing.

D. Provide certification that materials meet the ASTM and Federal Specifications.

1.8 MATERIAL STORAGE AND HANDLING

A. Where applicable, the Contractor shall store material in accordance with the material manufacturer's recommendation as to temperature.

B. All insulation and water sensitive products shall be protected from the elements at all times. Such materials are to be stored in an enclosure or securely covered with a waterproof tarp; the plastic wrappers on the insulation products shall not be used as a means of weather protection.

C. All materials shall be labeled for ready identification. Labels shall include the name of the manufacturer and product description.

D. The Contractor shall store only that material on the roof that can be used in one day. Material stored on the roof shall be scattered so as not to apply a concentrated load to the roofing system (greater than 20 psf). No materials shall be stored on new roofing unless a protective layer of plywood with a foam insulation base is used.

E. The Contractor shall use extreme care when transporting materials to the roof surface. Damaged materials shall not be installed and must be removed from the job site.

F. The Contractor shall provide all required storage enclosures and safeguards.

G. Materials shall be delivered in their original, unopened containers, clearly labeled. No materials shall be stored below 40 degrees F. Should any materials be stored below this temperature, they may not be installed until they are restored to a temperature greater than this.

H. No materials shall be stored on surfaces with slopes greater than ½" per foot.

I. Extreme caution must be used to properly secure the materials from wind.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Roofing materials shall not be installed in rain or snow. Roofing materials shall not be applied when there is heavy dew or frost on the roofing area. Application

will not be allowed when the forecasted daily high temperature is less than 50 degrees or the wind speed is greater than 15 MPH.

B. Do not heat the solvent based materials with an open flame in order to bring to a proper application temperature. Store materials in a heated location overnight if necessary.

C. Provide drum heaters to properly maintain adhesive materials.

1.10 PROTECTION

A. Adjacent surfaces shall be protected from stain and disfigurement during the demolition and application of roofing materials.

B. The Contractor shall keep the building interior protected from the elements at all times. Representatives from the Contractor shall be available in one hours notice should an emergency occur.

1.11 SCHEDULE

A. Work is to be performed on a daily basis with each section completed before progressing to the next section of roofing unless specifically directed otherwise by the A/E.

B. Completion of work will be defined as the installation of all specified roof preparation, insulation, field membrane, flashings, termination bars, and caulking.

1.12 DEFECTS

A. Conditions which may be detrimental to the completion or performance of the specified work shall be reported in writing to the Roofing Consultant/Engineer prior to commencing such work. Such work shall not start until defects have been corrected.

PART 2 - PRODUCTS

2.1 ABBREVIATIONS

A.	ASTM	American Society for Testing and Materials
B.	AWPB	American Wood Preservers Bureau
C.	FM	Factory Mutual
D.	FS	Federal Specification or Federal Standard
E.	SMACNA	Sheet Metal and Air Conditioning Contractors National Assoc., Inc.
F.	UL	Underwriters Laboratories
G.	WWPA	Western Wood Products Association

2.2 APPLICABLE PUBLICATIONS

A. The following publications of the issue listed below and referred thereafter by basic designation only form a part of this specification to the extent indicated by the references thereto (use latest publication):

2.3 ASTM PUBLICATIONS:

A. ASTM A 307 Bolts & Nuts
B. ASTM A 526 Galvanized Steel
C. ASTM C 208 Wood Fiber Insulation

2.4 FEDERAL STANDARDS/SPECIFICATIONS:

A. TT-S 230C Sealing Compound

2.5 ROOF SYSTEM COMPONENTS

A. Isocyanurate Foam Insulation: Provide material meeting ASTM C 1289, Type II, Class I, Grade 2. Product shall have fiberglass facers.

1) Use 4’ x 8’ boards for mechanical attachment.
2) Use 4’ x 4’ boards for adhesive attachment.

B. Cover Board: Provide high density isocyanurate foam cover board meeting ASTM C 1289, Type II, Class 4, Grade 1.
C. Mechanical Insulation Attachment: Use FM Approved screw and plate insulation fasteners.
D. Adhesive Insulation Attachment: Provide manufacturer’s approved low rise foam insulation adhesive. If required provide primer for adhesive.
E. EPDM Roofing: ASTM D4637, Type I fully adhered 60 mil fire rated EPDM sheet over insulation. Finished construction must provide UL Class A surface. Products from Manville, Firestone and Carlisle are approved.
F. Seam Tape: Where possible use manufacturer’s EPDM seam tape to construct field seams.
G. Tapered Insulation: Tapered isocyanurate foam insulation meeting ASTM C 1289, Type II, Class I, Grade 2.
H. Accessories: Supply manufacturer required accessory products such as lap sealant in order to fully construct EPDM membrane system.

1) Termination Bar: Where termination bars are indicated, they shall be a minimum 1/8” x 1” extruded aluminum, with caulk lip as required.
2) Batten Strips: Where batten strips are indicated, they shall be minimum 1” x .043” Galvalume steel strip.
3) Screw Fasteners: Corrosion-resistant, self-tapping, self-drilling #14 screw with low profile head meeting Factory Mutual 4470 requirements.
4) Corrosion-resistant, factory-made metal batten strip, bar, or individual locking metal plates as indicated in details.

2.6 PRODUCTS SUPPLIED BY OTHER MANUFACTURERS

A. Temporary water cutoff shall be constructed with hot asphalt or sprayed polyurethane foam sealant.
B. Exposed sealant joints at termination bars and roof related sheet metal shall be constructed with one part polyurethane sealant; NP-1 by Sonneborn or approved equal.
C. All other materials not specifically described but required for a complete and proper installation of the work in this section shall be as selected by the Contractor, approved by the manufacturer, and subject to the approval of the A/E.

PART 3 - EXECUTION

3.1 GENERAL

A. Deliver all materials to the site in a dry condition with labels intact. Either enclose materials in a trailer or cover with a waterproof tarpaulin to protect from the weather and moisture.
B. For materials delivery in quantity to the site, obtain and submit a certification that the materials meet the required specification.
C. Work so that each area of the membrane is completed the same day it is begun. This includes all base flashings.
D. Ensure that fasteners do not penetrate conduit or other miscellaneous items located on the underside of the roof deck.
E. All surfaces scheduled to receive membrane or flashing must be free of physical contact with any bituminous surfaces, clean, and smooth.
F. One, thirty-gallon per minute puddle type pump must be available on the job in case water must be removed from the roof surface on an emergency basis.
G. The workers will not have access to the interior of the building unless it is related to associated interior work.

3.2 PREPARATION

A. Prepare all surfaces according to applicable specification sections.
B. Perform any and all measures necessary to protect the work of other trades from damage due to performance of work specified under this section. Contractor shall restore to original condition any damage caused during performance of such work.
C. Surfaces scheduled to receive roofing are to be free of any standing water, frost, snow, or loose debris.
D. Substrate is to be smooth, free of sharp projections, and free of obvious depressions.
E. All metal fittings shall be in place before roofing.
F. All nailers shall be securely installed prior to roofing.
G. At start of each workday, drains located within daily work area shall be temporarily plugged to prevent debris from falling into the drain. Plugs to be

removed at the end of each workday.

3.3 OPERATIONAL PROCEDURES

A. Install temporary tie-ins and water cut-offs at the end of each workday. Remove all temporary tie-ins at the beginning of each workday.
B. Except for expedient temporary work, do not roof during inclement weather as defined in the General Section of the Specification. Remove all temporary work prior to installing permanent components and materials.
C. Confine equipment, storage of materials, debris, operations and movement of workers within the limits established for access at the pre-construction conference.
D. Protect the building, all contents, and surrounding areas from damage, and building occupants from injury during the work. Do not affect the normal conduct of operations of the personnel in the building. Repairs must be made to all damage caused by lack of such protection to the Owner's satisfaction. If they determine that the repairs are beyond the Contractor's ability, then they will have the repairs performed by others and may charge the Contractor for these repairs.
E. Remove daily all debris from the demolition and installation of the roof.
F. When wheeled or other traffic over the partially or fully completed roofing is unavoidable, use adequate plywood protection for the membrane.
G. Provide fifteen pound fire extinguishers at the point of application of any solvent based materials. The extinguishers should be Type A, B, C. No open flames shall be allowed around any of the solvent based products.

3.4 DEMOLITION

A. Remove the existing roofing system to the surface of the decking and wall substrates.
B. If conditions are uncovered that would be detrimental to the application of the specified work, immediately notify the Contracting Officer.

3.5 INSULATION INSTALLATION

A. Cut the insulation to fit snugly around penetrations and at the perimeters. No insulation gaps of over 1/4" shall be allowed. If gaps greater than this are created, then they shall be eliminated using trimmed pieces of isocyanurate insulation glued in place.
B. Insulation boards shall be fully adhered with the 4' dimension staggered if possible.
C. Follow additional applicable requirements of the roof insulation manufacturer and membrane manufacturer. No wet insulation shall be included in the final construction.
D. Install tapered insulation with slope direction as indicated on the approved shop drawings. Miter cut all panels at valleys for tight fit and alignment throughout valley length.

E. Install tapered saddles in valleys, where indicated on the approved drawings in the sizes shown. End of saddle shall provide for slope into the sump at the drainage device. End of saddle shall be of sufficient width at sump such that flat spots do not occur in valley. Saddle slope shall be twice the field slope.

F. When a tapered insulation system is installed along a perimeter edge of uniform nailer height, utilize tapered edge strip along nailers as tapered insulation thickness decreases for smooth transition and for proper support for the membrane system.

G. Utilize tapered insulation panels and tapered edge strips to construct sumps at roof drains, scuppers and gutters where detailed. Sump size shall be as shown in approved shop drawings. Delete thermal insulation within sumps, as required, for installation of tapered panels so as to provide continuous slope down to drainage device, without creating a sharp/steep sloped transition. At no time shall slope within drain sump exceed 1:12, unless otherwise noted in drawings.

H. Install tapered crickets on the upslope side of all rectangular penetrations greater than 2'-0" in width perpendicular with slope. Cricket slope shall be twice the field's slope.

I. Utilize tapered edge strip at transitions in construction of more than ¼" to provide a smooth transition and proper support for the membrane system or subsequent insulation layer. Field cut and shape edge strip as required. Direct slope of edge strip so as to provide for proper drainage.

J. Verify that tapered insulation is properly installed according to the approved shop drawings and that no irregularities exist that will result in ponding water in the finished roof system.

3.6 MEMBRANE INSTALLATION

A. Except as modified and supplemented herein, apply membrane to meet the requirements and recommendations of the membrane manufacturer.

B. Surfaces which have been contaminated by bitumen or other products which are not compatible with the membrane, flashings, or adhesives shall be cleaned or covered with plywood prior to the application of any roofing materials.

C. Lift all mechanical unit and other roof top items as necessary to facilitate the proper installation of the membrane and flashings. Unit must be reset and brought back to proper functioning condition as soon as possible after the application of the roofing system. HVAC and other mechanical units require 96 hours of written notice from the Contractor to the Owner before approval can be given for this type of work.

D. When placing the membrane, ensure factory and field fabricated seams do not intersect drain sumps. Seams through drain sumps will not be approved.

E. Over the new insulation system, unroll the EPDM sheet without stretching. Allow sheet to relax for 1/2 hour prior to seaming operations.

F. Work with largest sheets possible.

G. Use seam tape at all field formed rubber to rubber membrane seams unless indicated otherwise by manufacturer.

H. Fold membrane back approximately in half so as to expose the underside. Sweep the mating surface and insulation to remove contaminants.

I. Apply bonding adhesive with roller to both the underside of the membrane and the insulation. Keep bonding adhesive out of seam area. Bonding adhesive shall be applied at rates directed by the manufacturer.
J. Allow bonding adhesive to flash off until tacky. Roll the coating portion of the sheet into the coated substrate slowly and evenly to avoid wrinkling.
K. Repeat the process on the remaining half sheet.
L. Overlap each successive sheet at side laps and all end laps 3" minimum. Sheets shall be spliced so that 2.75” minimum splice tape seam results.
M. All seams shall be cleaned prior to seaming. Change cleaning pads and membrane cleaner often.
N. After required seam cleaning, apply seam primer and allow to dry.
O. After primer has dried, apply splice tape and press onto lower sheet. Peel release paper and allow upper sheet to fall onto splice tape. Immediately roll seam with 2” silicon roller.
P. On a daily basis, seams shall be checked for voids or other deficiencies, repairs made and lap seam sealant applied where required.
Q. All T-joints at factory seams and field formed seams shall be covered with 6” diameter, self-adhering, semi-cured EPDM patches.
R. Repair all cuts, punctures, wrinkles within 18” of seams, wrinkles running toward seams, or wrinkles that can be pinched and folded over. Wrinkles requiring repair shall be cut out and patched. Seam cleaner, seam primer, splice adhesive and lap sealant shall be used for all repairs. All cuts and punctures shall be repaired the same day they are discovered.
S. For cold weather application procedures, refer to the manufacturer’s specifications for additional requirements.
T. After waiting at least two hours, but prior to leaving the job for the day, the Contractor shall apply lap sealant as recommended by the manufacturer.

3.7 FLASHING INSTALLATION

A. Clean all surfaces to be flashed prior to the application of any new materials.
B. Bond the specified flashing materials to the substrate in such a manner as to avoid loose spots, sags, and wrinkles. Flash all items in the configuration shown on the Drawings.
C. Flashings shall be constructed and terminated as indicated. Care shall be taken when drilling into brick or terra cotta surfaces. The specified water cutoff sealant shall be applied behind the top edges of the flashings. All base flashing details that are terminated to surfaces of walls shall be detailed using a termination bar and a subsequent sheet metal counterflashing. Termination bars shall be fastened at all prepunched holes using appropriate fasteners. All fasteners heads and top edges of termination bars shall be sealed using a one part, polyurethane sealant.
D. Uncured EPDM flashing usage shall be limited to scuppers, pitch pans, vent pipes and other unusually shaped penetrations. Otherwise, cured EPDM or self-adhering, semi-cured EPDM shall be used.
E. Where possible, pre-manufactured, self-adhering EPDM pipe boots shall be used in lieu of field wrapping of pipes.
F. All base flashings shall be totally bonded to the substrate. Loose, wrinkled or

poorly bonded flashings will not be accepted.

G. Flashing seams shall be constructed by cleaning and priming the seam areas and installing 3" splice tape.

H. If splice adhesive bonding of seams is required, all splices shall be 3" minimum width. All splice-bonded seams shall be stripped-in with self-adhering, semi-cured EPDM flashing.

3.8 DRAIN FLASHINGS

A. Install tapered insulation drain sump.

B. Position the membrane over the drain ensuring no factory or field fabricated seams are located within the sump.

C. Cut hole with ½" - ¾" membrane extending past drain bolt locations. Drain holes shall be no smaller than the drain pipe size.

D. Cut holes in the membrane for the bolts to penetrate through. **DO NOT CUT NOTCHES BACK TO THE BOLT LOCATIONS.**

E. Apply water cutoff sealant over the drain bowl flange.

F. Install the clamping ring and tighten all bolts to achieve complete compression. All bolt locations shall be functional.

G. Set drain strainer.

H. At job's end test all drains for functionality with a ¾" diameter hose running into the drain for 10 minutes.

3.9 SEALANT

A. Clean the substrate as best possible so no contaminants such as bitumen and dust remain.

B. If required, prime the surface with the primer recommended by the manufacturer. Also, use sealant backing if required by manufacturer.

END OF SECTION 07 53 23

SECTION 07 60 00 – SHEET METAL FLASHING AND TRIM

PART 1 - GENERAL

1.1 DESCRIPTION

A. Work included: Provide flashings and sheet metal not specifically described in other Sections of these Specifications but required to prevent penetration of water through the exterior shell of the building.
B. This Section covers sheet metal accessories needed for the project but are not sold by the roof system manufacturer.
C. Related work: Documents affecting work of this Section include, but are not necessarily limited to, General Conditions, Supplementary Conditions, and Sections in Division 1 of these Specifications.

1.2 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work of this Section.
B. In addition to complying with pertinent codes and regulations, comply with pertinent recommendations contained in current edition of "Roofing Consultantural Sheet Metal Manual" published by the Sheet Metal and Air Conditioning Contractors National Association (SMACNA).
C. Standard commercial items may be used for flashing, trim, reglets, and similar purposes provided such items meet or exceed the quality standards specified.

1.3 SUBMITTALS

A. When submitting manufacturer's literature, highlight all items pertaining to this project.
B. Submit to the Roofing Consultant the manufacturer's latest published materials and samples along with any other items necessary for construction.
C. Submit current manufacturer's literature for all items proposed to be provided under this Section.
D. Provide certification that materials meet the state ASTM and Federal specifications.
E. Shop Drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
F. Manufacturer's recommended installation procedures which, when approved by the Roofing Consultant, will become the basis for accepting or rejecting actual installation procedures used on the Work.

1.4 PRODUCT HANDLING

A. Comply with pertinent sections of Division 7.

PART 2 - PRODUCTS

2.1 MATERIALS AND GAGES

A. Where sheet metal is required, and no material or gage is indicated on the Drawings, provide the highest quality and gage commensurate with the referenced standards.

2.2 GALVANIZED IRON

A. Provide sheet metal or sheet iron of a standard brand of open-hearth copper-bearing steel, copper-molybdenum iron, or pure iron sheets.
B. Zinc coating:

1) Where galvanizing is required, provide zinc coating by hot-dip galvanize to all surfaces.

C. Weight:

1) Provide not less than 1-1/4 oz. per sq. ft., nor more than 1-1/2 oz. per sq. ft., to surfaces required to be galvanized.
2) Comply with ASTM A93.

2.3 PRE-FINISHED SHEET METAL

A. Provide factory applied Kynar 500 or equal finish.

2.4 NAILS, RIVETS AND FASTENERS

A. Use only soft iron rivets having rust-resistive coating, galvanized nails, and cadmium plated screws and washers in connection with galvanized iron and steel.

2.5 ALUMINUM

A. Where aluminum is shown, use flat stock of 6063-T5 alloy in thicknesses indicated. Use appropriate fasteners so as not to create galvanic action.

2.6 FLUX

A. Where flux is required, use raw muriatic acid.

2.7 SOLDER

A. Where solder is required, comply with ASTM B32.

2.8 SCREWS

A. Provide new stainless steel screw fasteners at wall panels where existing screws are to be removed for installation of new flashings and counterflashings. Screw shall be of same type and size and shall integral washer flanges with neoprene washers.
B. At all other locations where new fasteners are called out, provide fastener of same type of material as that to be fastened. Do not use screws smaller than #10.

2.9 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Roofing Consultant.

PART 3 - EXECUTION

3.1 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.2 WORKMANSHIP

A. General:

1) Form sheet metal accurately and to the dimensions and shapes required, finishing molded and broken surfaces with true, sharp, and straight lines and angles and, where intercepting other members, coping to an accurate fit and soldering securely.
2) Unless otherwise specifically permitted by Roofing Consultant, turn exposed edges back with 1/2" hem.
3) Form, fabricate, and install sheet metal to adequately provide for expansion and contraction in the finished Work.

B. Weatherproofing:

1) Finish watertight and weathertight where so required.
2) Make lock seam work flat and true to line, sweating full of solder.
3) Make lock seams and lap seams, when soldered, at least 1/2" wide.
4) Where lap seams are not soldered, lap according to pitch, but in no case less than 3".
5) Make flat and lap seams in the direction of flow.

C. Joints:

1) Provide 3” splice joint at perimeter trim metal and at counterflashings. Set lap in 2 beads of sealant. Secure with ½” splice into hem and two pop rivets of same type of metal as flashing material.
2) Join other parts with rivets or sheet metal screws where necessary for strength and stiffness.
3) Provide suitable watertight expansion joints for runs of more than 40'-0", except where closer spacing is indicated on the Drawings or required for proper installation.

D. Fastening:

1) For fastening into brick or concrete use soft metal jacketed pre-drilled drive-pins, 1/4" in diameter.

3.3 EMBEDMENT

A. Embed metal in connection with roofs in a solid bed of sealant, using materials and methods which may be described in sections of Division 7.

3.4 TESTS

A. Upon request of the Roofing Consultant, demonstrate by hose or standing water that the flashing and sheet metal are completely watertight.

END OF SECTION 07 60 00

SECTION 07 92 00 – SEALANT AND CAULKING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section covers sealant and caulking material and application.

1.2 QUALITY CONTROL

A. Installer Qualifications: An experienced installer who has specialized in installing joint sealants similar in material, design, and extent to those indicated for this Project and whose work has resulted in joint-sealant installations with a record of successful in-service performance.

1.3 SUBMITTALS

A. Submit in accordance with Section 01 33 00, SUBMITTALS.
B. Manufacturer's installation instructions for each product used.
C. Cured samples of exposed sealants for each color where required to match adjacent material.
D. Manufacturer's Literature and Data:

1) Caulking compound
2) Primers
3) Sealing compound, each type, including compatibility when different sealants are in contact with each other.

1.4 PROJECT CONDITIONS

A. Environmental Limitations:

1) Do not proceed with installation of joint sealants under following conditions:

a) When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4.4 °C (40 °F).
b) When joint substrates are wet.

B. Joint-Width Conditions:

1) Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint-Substrate Conditions:

1) Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.5 DELIVERY, HANDLING, AND STORAGE:

A. Deliver materials in manufacturers' original unopened containers, with brand names, date of manufacture, shelf life, and material designation clearly marked thereon.
B. Carefully handle and store to prevent inclusion of foreign materials.
C. Do not subject to sustained temperatures exceeding 5 °C (90 °F) or less than 32 °C (40 °F).

PART 2 - PRODUCTS

2.1 SEALANTS:

A. S-1:

1) ASTM C920, polyurethane.
2) Type M.
3) Class 25.
4) Grade NS.
5) Shore A hardness of 20-40

2.2 COLOR:

A. Sealants used with exposed masonry shall match color of mortar joints.
B. Sealants used with unpainted concrete shall match color of adjacent concrete.
C. Color of sealants for other locations shall be light gray or aluminum, unless specified otherwise.

2.3 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 C1330, of type indicated below and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

1) Type C: Closed-cell material with a surface skin.

2.4 PRIMER:

A. As recommended by manufacturer of caulking or sealant material.
B. Stain free type.

PART 3 - EXECUTION

3.1 INSPECTION:

A. Inspect substrate surface for bond breaker contamination and unsound materials at adherent faces of sealant.
B. Coordinate for repair and resolution of unsound substrate materials.
C. Inspect for uniform joint widths and that dimensions are within tolerance established by sealant manufacturer.

3.2 PREPARATIONS:

A. Prepare joints in accordance with manufacturer's instructions and SWRI.
B. Clean surfaces of joint to receive caulking or sealants leaving joint dry to the touch, free from frost, moisture, grease, oil, wax, lacquer paint, or other foreign matter that would tend to destroy or impair adhesion.

1) 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.
2) Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air. Porous joint surfaces 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.

a) Metal.
b) Glass.
c) Porcelain enamel.
d) Glazed surfaces of ceramic tile.

C. Do not cut or damage joint edges.
D. Apply masking tape to face of surfaces adjacent to joints before applying primers, caulking, or sealing compounds.

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. Apply primer to sides of joints wherever required by compound manufacturer's printer instructions.

1) Apply primer prior to installation of back-up rod or bond breaker tape.
2) Use brush or other approved means that will reach all parts of joints.

F. Take all necessary steps to prevent three sided adhesion of sealants.

3.3 SEALANT DEPTHS AND GEOMETRY:

A. At widths up to 6 mm (1/4 inch), sealant depth equal to width.
B. At widths over 6 mm (1/4 inch), sealant depth 1/2 of width up to 13 mm (1/2 inch) maximum depth at center of joint with sealant thickness at center of joint approximately 1/2 of depth at adhesion surface.

3.4 INSTALLATION:

A. General:

1) Apply sealants and caulking only when ambient temperature is between 5 degrees C and 38 degrees C (40 and 100 degrees F).
2) Do not use polysulfide base sealants where sealant may be exposed to fumes from bituminous materials, or where water vapor in continuous contact with cementitious materials may be present.
3) Do not use sealant type listed by manufacture as not suitable for use in locations specified.
4) Apply caulking and sealing compound in accordance with manufacturer's printer instructions.
5) Avoid dropping or smearing compound on adjacent surfaces.
6) Fill joints solidly with compound and finish compound smooth.
7) Tool joints to concave surface unless shown or specified otherwise.
8) Finish paving or floor joints flush unless joint is otherwise detailed.
9) Apply compounds with nozzle size to fit joint width.
10) Test sealants for compatibility with each other and substrate. Use only compatible sealant.

B. For application of sealants, follow requirements of ASTM C1193 unless specified otherwise.

3.5 CLEANING:

A. Fresh compound accidentally smeared on adjoining surfaces: Scrape off

immediately and rub clean with a solvent as recommended by the caulking or sealant manufacturer.

B. After filling and finishing joints, remove masking tape.

C. Leave adjacent surfaces in a clean and unstained condition.

END OF SECTION 07 92 00

SECTION 22 14 26.13 – ROOF DRAIN TESTING & REPAIR

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section covers the work that is related to roof drains.
B. Four new cast iron roof drains and cast iron leaders are also part of this work.

1.2 RELATED WORK

A. Refer to Section 07 53 23 for flashing of roof drains.

1.3 SUMMARY

A. Provide labor and components to test and repair the existing roof drains.

PART 2 - PRODUCTS

2.1 DRAIN PARTS: Provide roof accessories as needed to make drains functional with properly secured flashings.

PART 3 - EXECUTION

3.1 Drain Work

A. Drain Testing: Prior to starting of work flood test each drain leader with a ¾" hose running at full flow for 10 minutes. After work is complete perform the same water test. Owners representative or Roof Consultant must be present for test. Document finding in writing and submit.
B. Strainers: Where roof drain strainers are missing, broken or plastic. Provide new cast iron strainers from Josam, Wade or others. If exact match can't be made provide closest match that function and sits in the bowl properly.
C. Bolts: Provide new clamp ring bolts as needed. Remove and retap as needed.

END OF SECTION 22 14 26.13