

ADDENDUM

Project:	Polk Elementary Renovation	Addendum Number:	004
	2615 Polk Avenue		
	Ogden, Utah 84401	Date:	April 10, 2020
FFKR Project #:	19030		
Contractor:	TBD		

This Addendum is for all persons preparing Bids for the above-named project; and, as such, shall be made a part of the Documents. Changes, corrections, and deletions enumerated herein shall be included in the Contractor's Bid. Bidders should acknowledge receipt of this Addendum in the space provided on the Contractor's Bid Form. Failure to do so may subject the Bidder to disqualification. In case of any conflict between the drawings, specifications, and this addendum, this addendum shall govern.

Summary: Contract Document Revisions

Reason for Instruction: Bid Clarification

Instructions to Bidders: With the recent changes in operation, I have sent each of you a calendar invite for the bid opening that includes a google hangout invite so that you can all participate in the bid opening remotely. I have also put the following instructions on SciQuest: Due to COVID-19 concerns, we will open bids online via google hangout. To obtain the video link, contact Chris Kartchner by email @ ckartchner@bdkjv.com with BDK identifying your name and organization.

RFI Responses: **Question 036:**

Reference CP101 & CP102 KN12 – Makes reference (1/CP502) to a 13' tall wall backed with Geofoam. The wall indicated by the keynote appears to be only 12" to 36" per the grading plan. Please clarify where this condition takes place.

Response:

The detail 1/CP502 has been updated in Addendum 3 to show a maximum height of 14'-9". This condition takes place at the south end of the site; it is the wall that connects to the south end of the new building, turns west, and terminates at the west property line.

Question 042:

Between Grids XE & XF / X7 & X9
 S103; detail 4/S260 and note 2 refers to 2x6 wood wall framing
 A102.1A Refers these same walls to Wall P6S (metal stud framing)
 Please clarify if wood framing is required; provide headers, sheathing, fire rating

Response:

Provide framing as noted on Structural Notes S001.

Question 044:

See S001, Note B

All framing in contact with concrete shall be treated, etc.

See 2/S260 and similar

Can the 16" LVL or LSL have a vapor barrier behind such as 30# felt or ice and water shield in lieu of having to pressure treat? We are advised that treating engineered lumber will degrade the material.

Response:

Wood walls specified on sheet S103A and in detail 4/S260 are short pony walls that are located above the concrete roof beams. These walls support the roof framing. Metal stud walls on A102.1A are non-structural framing below.

Specifications: See attached revised specification sections dated 04/10/2020 listed as follows (revisions are identified by bold text):

SECTION 00 4100 – Bid Form

SECTION 01 2100 - Allowances

SECTION 07 5216 – Styrene Butadiene Styrene (SBS) Modified Bituminous Membrane Roofing

Drawings: **Civil:** No Revisions

Landscape: No Revisions

Architectural:

See attached revised drawing sheets:

G200 remove kindergarten toilet

A400 revise toilet type

Structural: No Revisions

Mechanical and Plumbing: No Revisions

Electrical: No Revisions

Food Service: No Revisions

Supporting Documents: As listed above.

Approved Substitution Requests: X

Unapproved Substitution Requests: X

Architect	April 09, 2020
	Date

DOCUMENT 00 4100 - BID FORM

BID FOR: Polk Elementary Building Replacement and Associated Improvements

TO: Ogden City School District
Purchasing Office, 1950 Monroe Blvd
Ogden, UT, 84401

SUBMITTED BY: _____
Name of Bidder

Address: _____

Phone #: _____ Fax#: _____

Contractors, License No.: _____

License Expiration Date: _____

To Whom it may concern:

The undersigned has carefully examined the site, the proposed Contract Documents consisting of Drawings, Specifications, and all Addenda prepared by FFKR ARCHITECTS pertinent to the construction of the above referenced Project and further, being familiar with all other conditions affecting the Work, the undersigned hereby proposes and agrees to furnish and provide all labor, materials, supervision, transportation, tools, equipment, services and other facilities necessary and required for the expeditious completion of the Work included in the Bid Division indicated above, in strict conformity with said conditions and Contract Documents.

The undersigned has reviewed the work outlined in the Bid Division, fully understands the scope of work required in this Proposal, acknowledges that the Proposal includes the work of all trades within the Bid Division, understands the Construction Management function as described in the Contract Documents, understands that each bidder who is awarded a Contract shall be in fact a Prime Contractor, not a Subcontractor to the (District Name), and agrees that the proposal, if accepted by the Owner, will be the basis for a contract with the Owner to enter into such a contract in accordance with the intent of the Contract Documents.

The undersigned agrees to complete the work required within the Bid Division, within the time indicated in Contract Documents subject to liquidated damages as specified in the Contract Documents

Enclosed is a Bid Security for five percent (5%) of the amount of the Base Bid, made payable to the order of Ogden City District, to be left in escrow with the Owner as a guarantee that the undersigned will enter into a Contract and will furnish specified insurance and bonds.

The undersigned has notified the Construction Manager of any discrepancies or omissions, or of any doubt about the meaning of any of the Contract Documents and has contacted the Construction Manager before bid date to verify the issuing of any clarifying Addenda.

The undersigned further acknowledges receipt of the following Addenda:

NO,:	_____	DATE:	_____
NO,:	_____	DATE:	_____
NO,:	_____	DATE:	_____
NO,:	_____	DATE:	_____
NO,:	_____	DATE:	_____
NO,:	_____	DATE:	_____

(Include All Addenda Received)

BASE BID

BID LINE ITEM: _____

The undersigned proposes to provide and construct the Work required for the above listed Bid Division,

in accordance with said Contract Documents for the lump-sum price of:

Dollars (\$ _____). **PROJECT IS TAX**

EXEMPT. (Amount shall be shown in both words and figures. In case of discrepancy, the amount shown in words shall govern).

SCHEDULE OF UNIT PRICES

The following unit prices shall prevail should it become necessary to change quantities of work items from those as specified or as shown on the drawings. Price quoted shall include full compensation for labor, materials, tools, equipment, and incidentals required for a complete installation:

A.	Removal and replacement of 100 sf of asphalt.	\$ _____ /100 sq ft
B.	Removal and replacement of 10 lf of curb and gutter.	\$ _____ /10 lf
C.	Removal and replacement of 10 lf of valley gutter.	\$ _____ /10 lf
D.	Removal and replacement of 10 lf of sprinkler line.	\$ _____ /10 lf
E.	Additional of specified fencing with 2 installed posts 10 lf.	\$ _____ /10 lf
F.	Removal and replacement of 100 square feet of specified sod.	\$ _____ /100 sq ft
G.	Removal and replacement of 100 square feet of play surface.	\$ _____ /100 sq ft
H.	Additional (1) specified pedestrian gate.	\$ _____ /Each
I.	Repair and point up of 10 square feet of exterior masonry.	\$ _____ /10 sq ft
J.	Replacement of 1 finial decorative item.	\$ _____ /Each
K.	Removal and replacement of 1 sidewalk panel of standard width in documents.	\$ _____ /Each
L.	Not used.	
M.	Additional 5 lineal foot of footing attachment for micropile /5 ln ft.	\$ _____ /5 lf
N.	Removal and replacement of door and frame as specified, 1 each.	\$ _____ /Each
O.	Replace one window and frame existing structure to remain 1 each.	\$ _____ /Each

SCHEDULE OF ALTERNATES

Total Alternate No. 01

Roof Mounted Photovoltaic System as described in Section 01 2300 "Alternates"

_____ Dollars (_____)

Additive Bid Alternate # 01: Is to include all associated Site, Utility, Building, Mechanical and Electrical work as shown and detailed on the Contract Documents.

Total Alternate No. 02

Add Creative Energies (LG405N2W-V5 405 watt Module, Inverters and Mounting Structures as described in Section 01 2300 "Alternates"

_____ Dollars (_____)

Additive Bid Alternate # 02: Is to include all associated Site, Utility, Building, Mechanical and Electrical work as shown and detailed on the Contract Documents.

SCHEDULE OF ALLOWANCES

A Total Allowance No. 01

Unit Cost Allowance: Ten (10) Rated and Twenty (20) non-rated access doors, as identified in the documents, section 01 2100 3.3 A.

_____ Dollars(_____)

B Total Allowance No. 02

Lump sum Allowance for **\$25,000** for residential appliances, as specified in section 11 3013 "Residential Appliances" and as shown on the Drawings. Identified in Section 01 2100 3.3 B.

Twenty-Five Thousand Dollars (\$25,000)

C Total Allowance No. 03

Owner Controlled Contingency Allowance of \$1,000,000, to be used at the District's sole discretion.

One Million Dollars (\$1,000,000)

D Total Allowance No. 04

Unit Cost Allowance: Ten (10) square feet repairing and pointing of existing masonry, as identified in the documents, section 01 2100 3.3 D and Unit Price I in Section 01 2200 "Unit Prices". Include the sum of \$50,000 as an Owner-Controlled Allowance to be applied at this work.

Fifty Thousand Dollars (\$50,000)

E Total Allowance No. 05

Ten (10) square feet mortar restoration at all historic exterior surfaces, as identified in the documents, section 01 2100 3.3 D and Unit Price I in Section 01 2200 "Unit Prices". Include the sum of \$50,000 as an Owner-Controlled Allowance to be applied at this work.

Fifty Thousand Dollars (\$50,000)

F Total Allowance No. 06

Lump sum Allowance for \$7,000 for art murals at the Commons and Media Center as shown on the Drawings.
Identified in Section 01 2100 3.3 F.

Total Bid

AGREEMENT

It is understood and agreed that if written notice of the Owner's acceptance of this proposal is mailed, emailed, or delivered to the undersigned after the opening of the bid, and within Ninety (90) days, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the Owner a Contract in accordance with the bid as accepted, and will also furnish and deliver to the Owner the Payment Bond, Performance Bond and Certificate of Insurance as specified, all within ten (10) working days after receipt of notification of award, and that the work under the Contract shall be commenced by the undersigned bidder, if awarded the Contract, on the date to be stated in a Notice to Proceed, issued to the Contractor and shall be completed by the Contractor in the time specified in the Contract Documents. In the event the bidder to whom an award is made fails or refuses to execute the Contract within the specified time frame, the Owner may declare the bidder's bid security forfeited as damages caused by the failure of the bidder to enter into the Contract.

Enclosed herewith is a listing of subcontractors, or scope of work being self-performed. If notified by the Construction Manager, Bidder must provide a binding certified copy of this list within twenty-four (24) hours of the notification. Failure to include this list in the bid or provide the certified list as described in the bidding instructions may result in a rejection of Bid.

The undersigned acknowledges the fact that the Owner reserves the right to accept or reject any and all proposals, to waive any informality in receipt of this proposal, with or without cause or reason, and award the Contract on the basis stated in the Instructions to Bidders.

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth below, together with the signatures of authorized officers or agents; if bidder is a partnership, the true name of the firm shall be set forth below together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his signature shall be placed below.

Construction Documents
Addendum No#4

Pursuant to the provisions as set forth in Instructions to Bidders, and the General Conditions, the above named Contractor hereby designates below the names and locations of the place of business of each subcontractor. District may request subcontractor license number

[illegible]

OGDEN SCHOOL DISTRICT
POLK ELEMENTARY RENOVATION AND ADDITION
2615 Polk Avenue; Ogden, Utah, 84401

Construction Documents
Addendum No#4

Contractor Name

END OF DOCUMENT

SECTION 01 2100 - ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements governing allowances.
- B. Types of allowances include the following:
 - 1. Lump-sum allowances.
 - 2. Unit-cost allowances.
 - 3. Contingency allowances.
- C. Related Requirements:
 - 1. Section 01 2200 "Unit Prices" for procedures for using unit prices, including adjustment of quantity allowances when applicable.
 - 2. Section 01 2600 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
 - 3. Section 01 4000 "Quality Requirements" for procedures governing the use of allowances for field testing by an independent testing agency.

1.3 DEFINITIONS

- A. Allowance: A quantity of work or dollar amount included in the Contract, established in lieu of additional requirements, used to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

1.4 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection, or purchase and delivery, of each product or system described by an allowance must be completed by the Owner to avoid delaying the Work.
- B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

- C. Purchase products and systems selected by Architect from the designated supplier.

1.5 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances in the form specified for Change Orders.

1.6 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.7 LUMP-SUM ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include ~~taxes~~, freight, and delivery to Project site. **Note that Project is tax exempt.**
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 UNIT-COST ALLOWANCES

- A. Allowance shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include ~~taxes~~, freight, and delivery to Project site. **Note that Project is tax exempt.**
- B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials ordered by Owner or selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.9 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Architect for Owner's purposes and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Contractor's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Contractor's related costs and reasonable overhead and profit.
- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.10 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, required maintenance materials, and similar margins.
 - 1. Include installation costs in purchase amount only where indicated as part of the allowance.
 - 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other markups.
 - 3. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs due to a change in the scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Contractor's handling, labor, installation, overhead, and profit.
 - 1. Do not include Contractor's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of Work has changed from what could have been foreseen from information in the Contract Documents.
 - 2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF ALLOWANCES

- A. Allowance No. 01: Unit-Cost Allowance: Include allowance for 10 rated and twenty non-rated access doors, as identified in the drawings and as specified in Section 08 3113 "Access Panels."
- B. Allowance No. 02: Lump-Sum Allowance: Include the sum of \$25,000.00 for residential appliances, as specified in Section 11 3013 "Residential Appliances."
 - 1. This allowance includes material, receiving, handling, and installation costs, and Contractor overhead and profit.
- C. Allowance No. 03: Owner Controlled Contingency Allowance: Include a contingency allowance of \$1,000,000.00 for use according to Owner's written instructions.
- D. Allowance No. 04: Unit-Cost Allowance per 10 square feet, also include the sum of \$50,000 as an Owner-Controlled Allowance to be applied at this rate for South masonry wall pointing, patch and repair for original school, as specified in Section 04 0513 "Repainting of Mortar Joints."
- E. Allowance No. 05: Unit-Cost Allowance per 10 square feet, also include the sum of \$50,000 as an Owner-Controlled Allowance for mortar restoration at all historic exterior surfaces, as specified in Section 04 0120 "General Masonry Restoration", Section 04 0121 "Masonry Restoration Treatment" and Section 04 0122 "Masonry Cleaning."
- F. Allowance No. 06: Lump-Sum Allowance: Include the sum of \$7,000.00 for art murals at the Commons and Media Center.

END OF SECTION 01 2100

SECTION 07 5216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS
MEMBRANE ROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Styrene-butadiene-styrene (SBS)-modified bituminous membrane **roofing assembly, as follows:**
 - a. Loose laid type II nailable base sheet over existing metal decking substrate.
 - b. Mechanically attached R-30 polyisocyanurate insulation.
 - c. High density wood fiber board cover board adhered to insulation with hot bitumen.
 - d. Modified bituminous base sheet adhered to cover board with hot asphalt.
 - e. Modified bituminous mineral cap sheet adhered to base sheet with hot asphalt
 - f. Installation of overflow scuppers along each internal drain areas.

B. Related Requirements:

1. Section 06 1000 "Rough Carpentry" for wood nailers, curbs, and blocking, and for wood-based, structural-use roof deck panels.
2. Section 07 0150 "Preparation for Reroofing" for tear off existing roofing, flashings and demo curbs as indicated.

1.3 DEFINITIONS

- A. Roofing Terminology: Definitions in ASTM D1079 and glossary of NRCA's "The NRCA Roofing Manual: Membrane Roof Systems" apply to Work of this Section.
- B. Hot Roofing Asphalt: Roofing asphalt heated to its equiviscous temperature, the temperature at which its viscosity is 125 centipoises for mop-applied roofing asphalt and 75 centipoise for mechanical spreader-applied roofing asphalt, within a range of plus or minus 25 deg F measured at the mop cart or mechanical spreader immediately before application.

1.4 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting roof deck construction, conduct conference at Project site. Meet with the same participants and review the same items listed for the preinstallation conference. In addition, review status of submittals and coordination of work related to roof construction. Notify participants at least 5 working days before conference.
- B. Preinstallation Conference: Conduct conference at Project site. Comply with requirements in Section 01 3100 "Project Management and Coordination." Review methods and procedures related to roofing system including, but not limited to, the following:
 - 1. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing Installer, roofing system manufacturer's representative, deck Installer, and installers whose work interfaces with or affects roofing including installers of roof accessories and roof-mounted equipment.
 - 2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
 - 3. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
 - 5. Review structural loading limitations of roof deck during and after roofing.
 - 6. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing system.
 - 7. Review governing regulations and requirements for insurance and certificates if applicable.
 - 8. Review temporary protection requirements for roofing system during and after installation.
 - 9. Review roof observation and repair procedures after roofing installation.
- C. Manufacturer's Inspections:
 - 1. The Roofing Systems Manufacturer shall provide weekly jobsite inspections and weekly written progress reports with photographs of work in progress as required.
 - 2. Confirm, whenever called upon by the Architect or Owner that no application procedures were in conflict with the published specifications other than those that may have been previously reported and corrected.
 - 3. Inspections: Performed only by a full-time employee of the Roofing System Manufacturer. The Representative has been in the employment of Manufacturer a minimum of 5 years and live within 100-mile radius of the jobsite.
 - 4. The Roofing System Manufacturer provide inspections of the roofing system, whenever called upon by the Architect or Owner, for the duration of the delivered warranty period.
 - 5. Manufacturer's Representative shall attend job progress meeting to discuss any issues with sub trades that interface with the roof installation.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include data substantiating that materials comply with requirements.

- B. Shop Drawings: For roofing system. Include plans, sections, details, and attachments to other work, **including the following:**
 - 1. **Layout and thickness of insulation.**
 - 2. Base flashings and membrane terminations.
 - 3. Flashing details at penetrations.
 - 4. **Tapered insulation, including slopes.**
 - 5. Crickets, saddles, and tapered edge strips, including slopes.
- C. Samples for Verification: For the following products:
 - 1. **Cap Sheet: Samples of manufacturer's standard colors for selection by Architect.**
 - 2. **Flashing Sheet: Samples of manufacturer's standard colors for selection by Architect.**
 - 3. **12-by-12-inch square of roof insulation.**
 - 4. Six insulation fasteners of each type, length, and finish.
- D. **Wind Uplift Resistance Submittal: For roofing system indicating compliance with wind uplift performance requirements.**

1.6 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system and is eligible to receive the standard roofing manufacturer's warranty.
- B. Manufacturer Certificates:
 - 1. **Performance Requirement Certificate:** Signed by roof membrane manufacturer certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of complying with performance requirements.
 - 2. **Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.**
- C. Qualification Data: For firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of Owners and Architects, and other information specified.
- D. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, indicate compliance of components of roofing system with requirements based on comprehensive testing of current product specification.
 - 1. Indicate compliance of bulk roofing asphalt materials delivered to Project with requirements. Include quantity and statistical and descriptive data for each product. Submit certificate with each load before it is used.

2. Include continuous log showing time and temperature for each load of bulk bitumen, indicating date obtained from manufacturer, where held, and how transported before final heating and application in roof.
- E. Research/Evaluation Reports: Evidence of roofing system's compliance with building code in effect for Project from a model code organization acceptable to authorities having jurisdiction.
- F. **Field Test Reports:**
 1. **Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.**
- G. **Field quality-control reports.**
- H. Warranties: Sample copy of standard roofing manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.
- I. Wind Uplift Calculation: Roofing system manufacturer's engineering department shall provide a ASCE 7-10 Calculation per IBC, Chapter 15. Calculations shall be diagrammatically show fastening pattern for insulation attachment.
- J. Litigation and settlements: Provide a notarized statement from a corporate officer stating roofing system manufacturer has not settled litigation or paid fines to a public agency in excess of twenty million dollars.
- K. Inspection Report: Copy of roofing system manufacturer's inspection report of completed roofing installation.
- L. **Maintenance Data: For roofing system to include in maintenance manuals.**

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer to perform Work of this Section who has specialized in installing roofing similar to that required for this Project; who is approved, authorized, or licensed by the roofing system manufacturer to install manufacturer's product; and who is eligible to receive standard roofing manufacturer's warranty. All bidding roofing contractors must have full-time roofing installers on the payroll of the company and have an established certified and verifiable apprenticeship-training program for minimum 5 years. Brokers or jobbers that subcontract roofing work are not acceptable for certification to bid. All contractors must provide an AIA Qualification Form with their roofing bid to be considered as a responsible bidder.
- B. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, FMG, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated, weathertight location to ensure no significant moisture pick-up and maintain at a temperature exceeding roofing system manufacturer's written instructions. Store rolls of felt and other sheet materials on end on pallets or other raised surfaces. Do not double-stack rolls.
 1. Handle and store roofing materials and place equipment in a manner to avoid significant or permanent damage to deck or structural supporting members.
- B. Do not leave unused felts and other sheet materials on the roof overnight or when roofing work is not in progress unless protected from weather and moisture and unless maintained at a temperature exceeding 50 deg F.
- C. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer. Protect stored liquid material from direct sunlight.
 1. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.
- D. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- E. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.9 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements.

1.10 WARRANTY

- A. General Warranty: The warranties specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. **Special Roofing Manufacturer's Warranty: Manufacturer's written warranty, without monetary dollar limitation, signed by roofing system manufacturer agreeing to promptly**

repair leaks in the roof membrane, base flashings, roof insulation, fasteners, coverboard, and parapet wall panels, resulting from defects in materials and workmanship.

1. **Warranty shall state minimum of 120 mph wind speed coverage and shall not limit coverage to gale force or less uplift requirements.**
 2. **Manufacturer's roofing warranty must match specified Performance Requirements.**
 3. **Provide warranty for the following warranty period:**
 - a. **Warranty Period: 30 years from date of Substantial Completion, plus additional 10 year as specified below.**
- C. **Additional 10-Year Warranty: In addition to 30-year Warranty indicated above, provide an additional 10-year warranty, same as above, contingent upon the following:**
1. **At end of 30 years, Manufacturer agrees to promptly conduct a thorough inspection of existing roof. Manufacturer will recommend to the Owner all repairs required to extend an additional 10-year warranty. Upon Owner's completion of recommended repairs, Special Warranty period is extended an addition 10 years.**
- D. **Installer Warranty: Submit a written warranty, without monetary limitation, signed by installing company agreeing to promptly repair leaks in the roof membrane, base flashings, roof insulation, fasteners, coverboard, metal flashings.**
1. **Warranty Period: 2 years from date of Substantial Completion.**

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. **General Performance: Installed roofing system and flashings shall withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Roof system and flashings shall remain watertight.**
1. **Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G152, ASTM G154, or ASTM G155.**
 2. **Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D3746/D3746M, ASTM D4272/D4272M, or the "Resistance to Foot Traffic Test" in FM Approvals 4470.**
- B. **Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by membrane roofing manufacturer based on testing and field experience.**
- C. **Uniform Wind Uplift Load Capacity**
1. **Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.**

- a. Design Code: ASCE 7, Method 2 for Components and Cladding.

D. Dead Load: Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure. See Structural Drawing notes for applicable loads.

- E. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

2.2 MANUFACTURERS

- A. Source Limitations: Obtain components for roofing system from roof membrane manufacturer or manufacturer approved by roof membrane manufacturer.

2.3 BASE FELT

- A. **Asphalt-Coated Fiberglass Mat Base Sheet: ASTM D4601/D4601M, Type II, nonperforated**, asphalt-impregnated and -coated, **glass-fiber sheet**, dusted with fine mineral surfacing on both sides.

1. Weight: 40lbs/100sq. ft. minimum.

2.4 BASE SHEET MATERIALS

- A. **SBS-Modified Bitumen Fiberglass Mat Base Sheet: ASTM D6163/D6163M, Type I, Grade S**, SBS-modified asphalt sheet, reinforced with fiberglass fabric, smooth surfaced, suitable for cold adhesive or hot asphalt application method.

1. **Manufacturers: Subject to compliance with requirements, provide products by one of the following:**

- a. **Firestone Building Products.**
- b. **GAF.**
- c. **Garland.**
- d. **Siplast.**
- e. **Soprema, Inc.**

2. **Base-Sheet Physical Properties: Provide base sheets with the following minimum performance requirements when tested according to ASTM D 5147 or ASTM D 6164:**

- a. Thickness: 80 mils.
- b. Tensile Strength: 100 lbf/in.MD, 100 lbf/in. XD
- c. Elongation at Maximum Load: 3.5 percent at 73 deg F in each direction.
- d. Tear Strength: 110 lbf/in.MD, 110 lbf/in. XD
- e. Low-Temperature Flexibility: Pass at minus ASTM D 5147, 20 deg F.

2.5 STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS CAP SHEET

- A. **Granule-Surfaced Roofing Cap Sheet: ASTM D6163/D6163M, Type I, Grade G, SBS-modified asphalt sheet, reinforced with fiberglass fabric, suitable for cold adhesive or hot asphalt application method.**

1. **Manufacturers: Subject to compliance with requirements, provide products by one of the following:**

- a. **Firestone Building Products.**
- b. **GAF.**
- c. **Garland.**
- d. **Siplast.**
- e. **Soprema, Inc.**

2. **Cap Sheet Physical Properties:** Provide mineral surfaced SBS-modified bituminous membrane materials with the following properties when tested according to ASTM D 5147 or ASTM D 6164:

- a. Thickness: 155 mils.
- b. Tensile Strength: 310 lbf/in.MD, 310lbf/in.CMD.
- c. Elongation at Maximum Load: 3.5 percent at 73 deg F in each direction.
- d. Tear Strength: 500 lbf/in.MD, 500lbf/in.CMD
- e. Low-Temperature Flexibility: Pass at minus 30 deg F.
- f. Compound Stability: Not less than 250 deg F.
- g. Reinforcing: Combination fiberglass/polyester.

3. Granule Color: White.

2.6 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.

- 1. **Adhesives and Sealants: Comply with VOC limits of authorities having jurisdiction.**
- 2. Furnish liquid-type auxiliary materials that meet VOC limits of authorities having jurisdiction.

- B. Metal Flashing Sheet: Metal flashing sheet as specified in Section 07 6200 "Sheet Metal Flashing and Trim."

- C. **Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.**

- D. Wood Nailer Strips: Furnish wood nailer strips complying with requirements of Section 06 1000 "Rough Carpentry."

- E. **Mastic Sealant: Polyisobutylene, plain or modified bitumen; nonhardening, nonmigrating, nonskinning, and nondrying.**

- F. Metal Termination Bars: Manufacturer's standard, predrilled stainless-steel or aluminum bars, approximately 1 by 1/8 inch thick; with anchors.**
- G. Glass-Fiber Fabric: Woven glass-fiber cloth, treated with asphalt, complying with ASTM D1668/**D1668M**, Type I.
- H. Miscellaneous Accessories: Provide those recommended by roofing system manufacturer.

2.7 ROOF INSULATION

- A. General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated. Insulation boards to be four foot by four foot in size.
- B. Polyisocyanurate Board Insulation: ASTM C1289, Type II, Class 1, Grade 3, felt or glass-fiber mat facer on both major surfaces.
 - 1. **Manufacturers: Subject to compliance with requirements, provide products by one of the following:**
 - a. **Atlas Molded Products; a Division of Atlas Roofing Corporation.**
 - b. **Atlas Roofing Corporation.**
 - c. **Firestone Building Products.**
 - d. **GAF.**
 - 2. **Compressive Strength: 25 psi.**
 - 3. **Thickness:**
 - a. **Base Layer: 1-1/2 inches.**
 - b. **Upper Layer: As required to attain minimum R-Value of 30.**
- C. **Tapered Insulation: Provide factory-tapered insulation boards.**
 - 1. **Material: Match roof insulation.**
 - 2. **Minimum Thickness: 1/4 inch.**
 - 3. **Slope:**
 - a. **Roof Field: 1/4 inch per foot unless otherwise indicated on Drawings.**
 - b. **Saddles and Crickets: 1/2 inch per foot unless otherwise indicated on Drawings.**

2.8 INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatibility with other roofing system components.

- B. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation and cover boards to substrate, and acceptable to roofing system manufacturer.
- C. **Insulation** Cant Strips: ASTM C208, **Type II, Grade 1**, cellulosic-fiber insulation board.
- D. Tapered Edge Strips: ASTM C 728, rigid, perlite insulation board.
- E. Cover Board: ASTM C208, Type II, Grade 2, **cellulosic-fiber insulation board**, 1/2 inch thick.

2.9 ASPHALT MATERIALS

- A. Roofing Asphalt: ASTM D312/D312M, Type IV.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. **Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.**
 - 1. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
 - 2. **Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.**
 - 3. **Verify that cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.**
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. **Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions.**
 - 1. **Remove sharp projections.**
- B. Prevent materials from entering and clogging roof drains and from spilling or migrating onto surfaces of other construction.
 - 1. Remove roof-drain plugs when no work is taking place or when rain is forecast.
- C. **Perform fastener-pullout tests according to roof system manufacturer's recommendations.**

1. **Submit test result within 24 hours of performing tests.**
 - a. **Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.**
2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
3. Fill substrate surface voids that are greater than 1/4-inch-wide with an acceptable fill material.
4. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
5. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
6. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
7. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.

3.3 INSTALLATION OF ROOFING, GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
 1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
 2. Do not unroll cold materials under low ambient conditions, to prevent unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, replace it with roll from a heated storage area.
- C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water.
- D. Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system at the end of the workday or when rain is forecast.
 1. Remove and discard temporary seals before beginning work on adjoining roofing.

- E. Coordinate installation and transition of roofing system component serving as an air barrier with air barrier specified in Section 07 2726 "Fluid-Applied Membrane Air Barriers."
- F. **Asphalt Heating:**
 - 1. **Heat asphalt to its equiviscous temperature, measured at the mop cart or mechanical spreader immediately before application.**
 - a. **For cap sheets, heat asphalt according to cap sheet manufacturer's recommendations.**
 - 2. **Circulate asphalt during heating.**
 - 3. **Do not raise asphalt temperature above equiviscous temperature range more than one hour before time of application.**
 - a. **For cap sheets, comply with cap sheet manufacturer's recommendations.**
 - 4. **Do not exceed asphalt manufacturer's recommended temperature limits during asphalt heating.**
 - 5. **Do not heat asphalt within 25 deg F of flash point.**
 - 6. **Discard asphalt maintained at a temperature exceeding finished blowing temperature for more than four hours.**
 - 7. **Apply hot roofing asphalt within plus or minus 25 deg F of equiviscous temperature.**
 - a. **For cap sheets, comply with cap sheet manufacturer's recommendations.**
- G. **Substrate-Joint Penetrations: Prevent roofing asphalt and adhesives from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.**

3.4 NAILABLE BASE FELT SHEET INSTALLATION

- A. Loose lay one lapped **ply of type II** base-sheet course over decking substrate according to roofing system manufacturer's written instructions.
 - 1. **Install base sheet in 25 lbs. per square of bitumen shingled over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof.**
 - 2. **Lap ply sheet ends 8 inches. Stagger end laps 2 inches minimum.**
 - 3. **Extend plies 2 inches beyond top edges of cants at wall and projection bases.**

3.5 INSTALLATION OF INSULATION

- A. **Coordinate installing roofing system components, so insulation is not exposed to precipitation or left exposed at the end of the workday.**
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.

- C. **Nailer Strips: Mechanically fasten 4-inch nominal-width, wood nailer strips of same thickness as insulation perpendicular to sloped roof deck at the following spacing:**
1. **16 feet apart for roof slopes greater than 1 inch per 12 inches but less than 3 inches per 12 inches.**
 2. **48 inches apart for roof slopes greater than 3 inches per 12 inches.**
- D. **Insulation Cant Strips:** Install and secure preformed 45-degree insulation cant strips at junctures of roofing system with vertical surfaces or angle changes greater than 45 deg F.
- E. **Installation Over Metal Decking:**
1. Install base layer of insulation **over loose-laid base sheet** with joints staggered **not less than 24 inches** in adjacent rows and with long joints continuous at right angle to flutes of decking.
 - a. Locate end joints over crests of decking.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch in width.
 - d. At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.
 - 1) Trim insulation, so that water flow is unrestricted.
 - e. Fill gaps exceeding 1/4 inch with insulation.
 - f. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.
 - g. **Mechanically attach base layer of insulation using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to metal decks.**
 - 1) **Fasten insulation according to requirements in FM Approvals' RoofNav for specified Windstorm Resistance Classification.**
 2. **Install upper layers of insulation and tapered insulation, with joints of each layer offset not less than 12 inches from previous layer of insulation.**
 - a. **Install with long joints continuous and with end joints staggered not less than 12 inches in adjacent rows.**
 - b. **Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.**
 - c. **Make joints between adjacent insulation boards not more than 1/4 inch in width.**
 - d. **At internal roof drains, slope insulation to create a square drain sump, with each side equal to the diameter of the drain bowl plus 24 inches.**
 - e. **Trim insulation, so that water flow is unrestricted.**
 - f. **Fill gaps exceeding 1/4 inch with insulation.**
 - g. **Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.**
 - h. **Adhere top layers of insulation to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified**

Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:

- 1) Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.**

3.6 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines, with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction.**
 - 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.**
 - 2. At internal roof drains, conform to slope of drain sump.**
 - a. Trim cover board, so that water flow is unrestricted.**
 - 3. Cut and fit cover board tight to nailers, projections, and penetrations.**
 - 4. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav listed roof assembly requirements for specified Windstorm Resistance Classification and FM Global Property Loss Prevention Data Sheet 1-29, as follows:**
 - a. Set cover board in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature.**

3.7 INSTALLATION OF ROOFING MEMBRANE, GENERAL

- A. Start installation of roofing in presence of roofing system manufacturer's technical personnel.**
- B. Where roof slope exceeds 1/2 inch per 12 inches, install roofing membrane sheets parallel with slope.**
 - 1. Backnail roofing sheets to nailer strips according to roofing system manufacturer's written instructions.**
 - a. Back nail slopes greater than 2:12 to prevent slippage of the ply sheets. Use ring or spiral-shank 1-inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12.**
 - b. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.**
- C. Coordinate installation of roofing system so insulation and other components of the roofing system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is forecast.**

1. **Provide tie-offs at end of each day's work to cover exposed roofing sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt, with joints and edges sealed.**
2. **Complete terminations and base flashings, and provide temporary seals to prevent water from entering completed sections of roofing system.**
3. **Remove and discard temporary seals before beginning work on adjoining roofing.**

3.8 INSTALLATION OF BASE SHEET

A. Before installing, unroll base sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature.

1. Base Ply: Install base sheet in 25 lbs. per square of bitumen shingled uniformly to achieve one or more plies over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof. Do not step on base rolls until asphalt has cooled, fish mouths should be cut and patched.

B. Installation of Asphalt-Coated Fiberglass-Mat Base Sheet:

1. Install base sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.
2. Extend roofing sheets over and terminate above cants.
3. Install base sheet in a shingle fashion.
4. Adhere to substrate in a solid mopping of hot roofing asphalt.
5. Install base sheet without wrinkles or tears, and free from air pockets.
6. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.
 - a. Lap ply sheet ends 8 inches. Stagger end laps 2 inches minimum.
 - b. Stagger end laps not less than 18 inches.**
 - c. Completely bond and seal laps, leaving no voids.**
 - d. Install base flashing ply to all perimeter and projection details after membrane application.
 - e. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
 - f. Install base flashing ply to all perimeter and projection details.
 - g. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.
7. Repair tears and voids in laps and lapped seams not completely sealed.

3.9 INSTALLATION OF SBS-MODIFIED BITUMINOUS CAP SHEET

A. Before installing, unroll cap sheet, cut into workable lengths, and allow to lie flat for a time period recommended by manufacturer for the ambient temperature at which cap sheet will be installed.

B. Install modified bituminous roofing cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system.

1. Solidly bond the modified membrane to the base layers with specified material at the rate of 25 to thirty 30 lbs. per 100 square feet.
2. Roll must push a puddle of hot material in front of it with material slightly visible at all side laps. Use care to eliminate air entrapment under the membrane. Exercise care during application to eliminate air entrapment under the membrane.
3. Apply pressure to seams to ensure that the laps are solidly bonded to substrate.
4. Install subsequent rolls of modified membrane as above with a minimum of 4-inch side laps and 8-inch end laps. Stagger end laps. Apply membrane in the same direction as the previous layers but stagger the laps so they do not coincide with the laps of the base layers.
5. Apply hot material no more than 5 feet ahead of each roll being embedded.
6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the specified hot material.
7. Use hot air welder to ensure full adhesion of edge and lap seams with minimal bleed out.
8. Install cap sheet as follows:
 - a. Adhere to substrate in a solid mopping of hot roofing asphalt applied at asphalt temperature recommended by cap sheet manufacturer.
9. **Install cap sheet without wrinkles or tears, and free from air pockets.**
10. **Install cap sheet, so side and end laps shed water.**

C. Laps: Accurately align roofing sheets, without stretching, and maintain uniform side and end laps.

1. **Lap side laps as recommended by roof membrane manufacturer but not less than 3 inches.**
2. **Stagger end laps not less than 18 inches.**
3. **Completely bond and seal laps, leaving no voids.**
4. **Roll laps with a 20-pound roller.**
5. **Repair tears and voids in laps and lapped seams not completely sealed.**

D. Apply pressure to the body of the cap sheet according to manufacturer's instructions, to remove air pockets and to result in complete adhesion of base sheet to substrate.

3.10 INSTALLATION OF ACCESSORIES

- A. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.
- B. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section **06 1000 "Rough Carpentry."**
1. **Install** nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.

2. **Install wood nailers** to match the height of insulation, providing a smooth and even transition between flashing and insulation areas.
 3. **Space nailer lengths** with a minimum 1/8-inch gap for expansion and contraction between each length or change of direction.
 4. **Fasten** nailers and flashings in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs./lineal foot in any direction.
- C. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.
- D. Termination Bar: Install metal termination bars or approved top edge securement at the terminus of flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

3.11 INSTALLATION OF FLASHING AND STRIPPING

- A. **Install base flashing over cant strips and other sloped and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:**
1. **Flashing Sheet Application: Adhere flashing sheet to substrate in a solid mopping of hot roofing asphalt applied at asphalt temperature recommended by flashing sheet manufacturer. Apply hot roofing asphalt to back of flashing sheet if recommended by roofing system manufacturer.**
 2. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
 3. Prepare walls, penetrations, expansion joints and surfaces to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
 4. Adhere to the underlying base flashing ply with specified hot material unless otherwise noted in these specifications. Nail off at a minimum of 8 inches o.c. from the finished roof at all vertical surfaces.
 5. Solidly adhere the entire sheet of flashing membrane to the substrate.
 6. Seal all vertical laps of flashing membrane with a three-course application of trowel-grade mastic and mesh.
 7. Coordinate counter flashing, cap flashings, expansion joints, and similar work with modified bitumen roofing work as specified.
 8. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
 9. **Extend base flashing up walls or parapets a minimum of 8 inches above roofing membrane and 4 inches onto field of roofing membrane.**
- B. **Install roofing cap-sheet stripping where metal flanges and edgings are set on roofing according to roofing system manufacturer's written instructions.**

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed or nailed 4 inches on center and covered with an acceptable counter flashing.

3.12 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Coping Cap:

1. Minimum flashing height is 8 inches above finished roof height. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches.
3. Attach tapered board to top of wall.
4. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches on to field of roof and set in cold asphalt. Nail membrane at 8 inches o.c.
5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
6. Install continuous cleat and fasten at 6 inches o.c. to outside wall.
7. Install new 22-gauge metal coping cap hooked to continuous cleat.
8. Install batten strips at all seams.
9. Fasten inside cap 24 inches o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

B. Surface Mounted Counterflashing:

1. Minimum flashing height is 8 inches above finished roof height. Maximum flashing height is 24 inches. Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches.
3. Install base flashing ply covering wall set in bitumen with 6 inches on to field of the roof.

4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
6. Secure 22-gauge counterflashing set on butyl tape above flashing at 8 inches o.c. and caulk top of counterflashing.

C. Curb Detail/Air Handling Station:

1. Minimum curb height is 8 inches above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches.
3. Install base flashing ply covering curb set in bitumen with 6 inches on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

D. Roof Drain:

1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches from center of drain.
3. Run roof system plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30-inch square minimum) in 1/4-inch bed of mastic. Run lead/copper into drain a minimum of 2 inches. Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Install base flashing ply (40-inch square minimum) in bitumen.
6. Install modified membrane (48-inch square minimum) in bitumen.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

E. Metal Edge:

1. Prime nailer at a rate of 100 square feet per gallon and allow to dry.
2. Run all field plies over to wood nailer edge.
3. Install base flashing ply covering wall set in bitumen with 6 inches on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and allow to cure and aluminize.
5. Secure 22-gauge metal flashing per drawing details.

3.13 FIELD QUALITY CONTROL

- A. Testing Agency: Engage a qualified testing agency to inspect substrate conditions, surface preparation, roof membrane application, flashings, protection, and drainage components, and to furnish reports to Architect.

- B. Test Cuts: Remove test specimens to evaluate problems observed during quality-assurance inspections of roofing membrane as follows:
 - 1. **Determine** approximate quantities of components within roofing membrane according to ASTM D3617/D3617M.
 - 2. **Examine test specimens for** interply voids according to ASTM D3617/D3617M and to comply with criteria established in Appendix 3 of ARMA/NRCA's "Quality Control Guidelines for the Application of Polymer Modified Bitumen Roofing."
 - 3. Repair areas where test cuts were made according to roofing system manufacturer's written instructions.
- C. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion, in presence of Architect, and to prepare inspection report.
 - 1. Notify Architect and Owner 48 hours in advance of date and time of inspection.
 - 2. Provide manufacturer's field observations on weekly basis. Provide a final inspection upon completion of the Work.
 - a. Warranty shall be issued upon manufacturer's acceptance of the installation.
 - b. Daily Field observations shall be performed by a Technical Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
 - c. Provide observation reports from the Technical Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
 - d. Provide a final report from the Technical Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.
- D. **Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.**
- E. **Roofing system will be considered defective if it does not pass tests and inspections.**
 - 1. **Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.**

3.14 PROTECTING AND CLEANING

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2-inch recover board is required on new roofing.

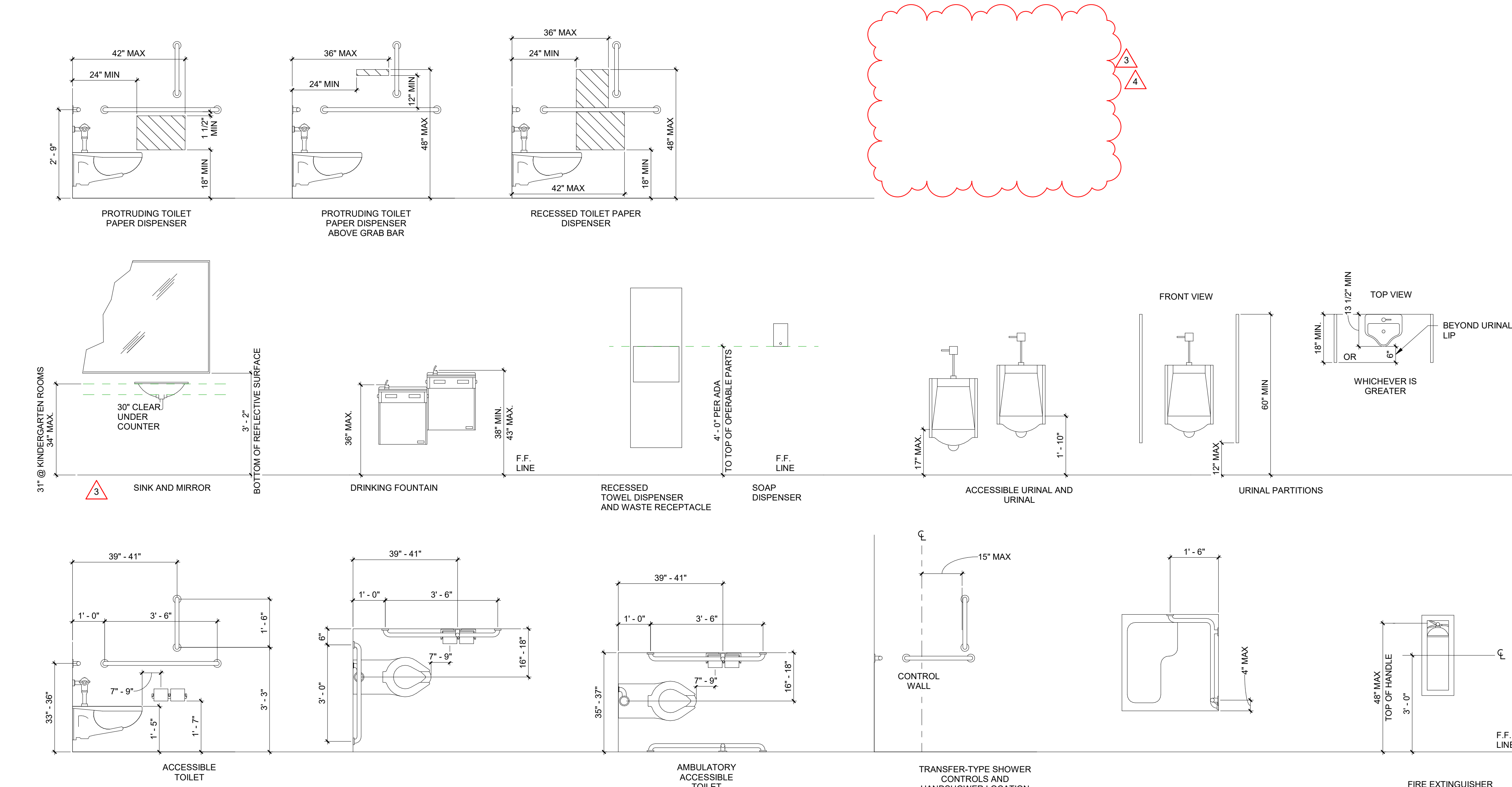
- E. Special permission shall be obtained from the Manufacturer before permitting traffic over new roofing.
- F. **Protect roofing system from damage and wear during remainder of construction period.**
 - 1. **When remaining construction does not affect or endanger roofing, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.**
- G. **Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.**
- H. **Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.**

END OF SECTION 07 5216

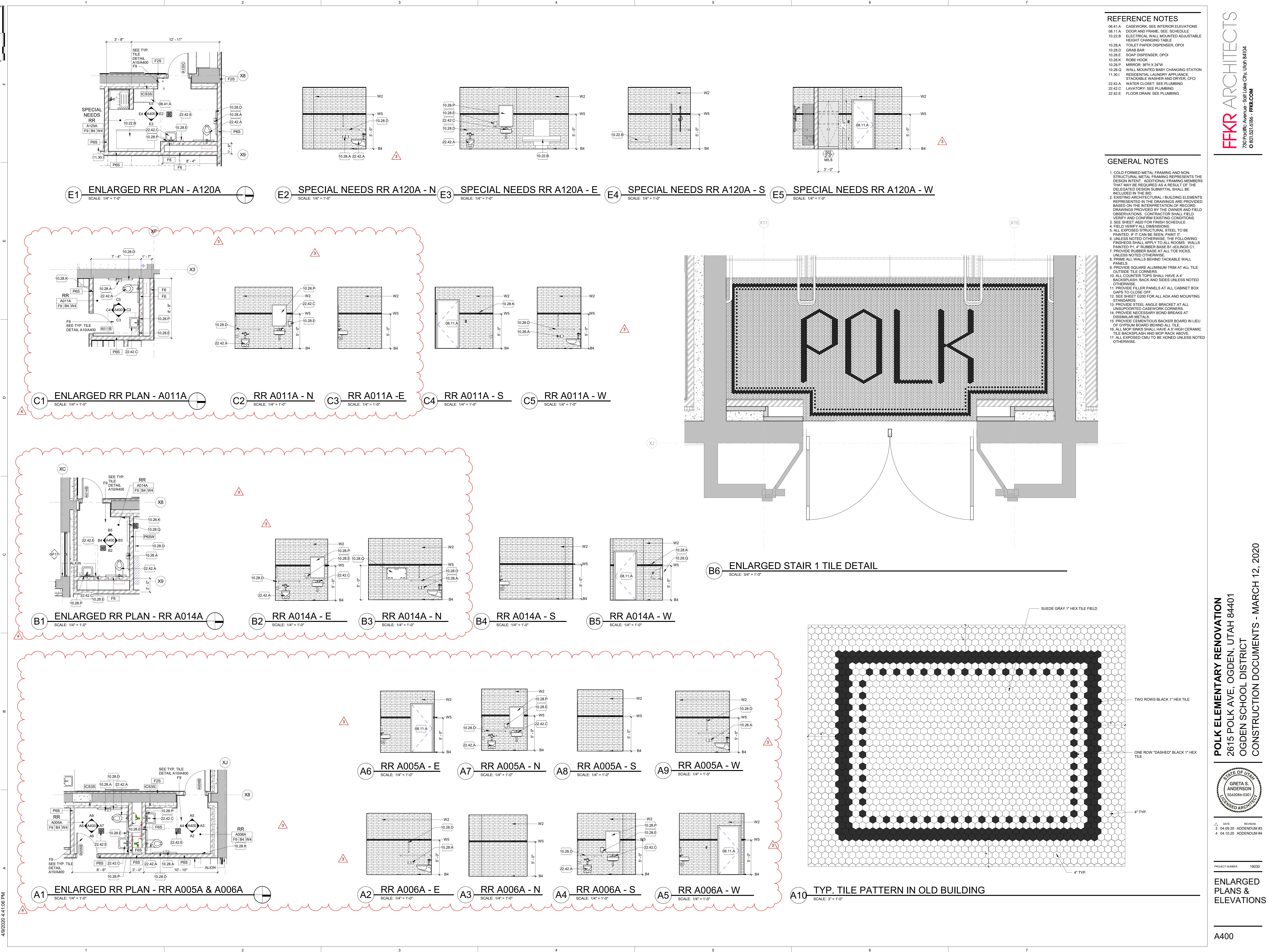
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A4 ADA FIXTURE REQUIREMENTS
SCALE: 1/2" = 1'-0"



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