ADDENDUM No. 3

To

INVITATION FOR BIDS

REPLACEMENT OF SELECT WPCF BUR ROOFS with EPDM ROOFING SYSTEMS

DATE OF ADDENDUM: November 21, 2018

ATTENTION BIDDERS

The IFB is modified as set forth in this Addendum. The original IFB documents remain in full force and effect, except as modified by this Addendum, which is hereby made part of this IFB. Respondents shall take this Addendum into consideration when preparing and submitting its Bids.

PROPOSAL SUBMITTAL DEADLINE

The Proposal submittal deadline remains the same and is not changed by this Addendum.

QUESTIONS SUBMITTED BY EMAIL and FROM OCTOBER 23 MANDATORY PRE-BID CONFERENCE

1. Clarification – The roofing membrane to be installed is a fully adhered, black, 90-mil EPDM Membrane with a 30-year warranty. Specifications and details based upon Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee are included in Attachment 1 of this Addendum. 30-year roofing systems by Carlisle Syntec and Firestone Building Products are approved equals.

2. Clarification – The insulation going back on the roofs is to be ¼" sloped tapered insulation with a minimum of R=30.

3. Clarification – The lightning protection is to be installed at the Sludge Dewatering Building. This work is described in the IFB, including the details in Appendix E. No lighting protection is to be installed at the other three buildings.

4. Question: Can you provide asbestos testing results?

   Answer: The asbestos survey test results are included in Attachment 2 of this Addendum.

5. Question: What are the hours available to work on the site?

   Answer: Site access is available 7 am to 4 pm, Monday to Friday, including holidays.

6. Question: Will space be allotted for material storage?

   Answer: Material storage area, approximately 20' by 20', will be made available for the Contractor. The Contractor is responsible for ensuring that the stored material is properly secured and protected from the weather.

7. Question: Can the existing vapor barrier stay in place?

   Answer: The existing vapor barrier on all roofs are to be removed and properly disposed.

8. Question: Are the WBE/MBE requirements mandatory?

   Answer: The MBE/WBE goals are not mandatory.

9. Question: Is the testing agency by the Owner or the Contractor?

   Answer: The Contractor is responsible for the testing agency.

10. Question: Is the Owner responsible for raising the units and the electrical disconnects and reconnects?

    Answer: The Contractor is responsible for all electrical work associated with the reroofing work, including raising the units and the electrical disconnects and reconnects.

11. Question: Can you provide roof plans for the other 3 buildings?

    Answer: No additional roof plans will be provided. All contractors had an opportunity to examine each of the roofs during the mandatory pre-bid meeting. The Vehicle Storage Garage roof dimensions are approximately 26' by 26'. The Septage Blower Building – East and Septage Blower Building – West dimensions are approximately 20' 4" by 32'.

12. Question: Do the 6’ of roof drain piping need to be abated if we use roof drain inserts?

    Answer: Roof drain inserts may be used. Contractor is responsible for conducting roof drain and leader tests or submit plumber’s verification.

ATTACHMENT 1

ROOFING SPECIFICATIONS AND DETAILS

TO BE ADDED TO APPENDIX D OF THE IFB

SECTION 075323

ETHYLENE PROPYLENE DIENE MONOMER (EPDM) MEMBRANE ROOFING

1.GENERAL

1. SECTION INCLUDES

A. Adhered EPDM membrane roofing system.

B. Cover board.

C. Roof insulation.

D. Vapor retarder.

2. DESIGN CRITERIA

A. General: Installed roofing membrane systems shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Installer must comply with current code requirements based on authority having jurisdiction.

D. 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.

3. SUBMITTALS

A. Product Data: Manufacturer's data sheets for each product to be provided.

B. Detail Drawings: Provide roofing system plans, elevations, sections, details, and details of attachment to other Work, including:

1. Base flashings, cants, and membrane terminations.

2. Tapered insulation, including slopes.

3. Crickets, saddles, and tapered edge strips, including slopes.

4. Insulation fastening patterns.

C. Verification Samples: Provide for each product specified.

D. Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install roofing system.

E. Maintenance Data: Refer to Johns Manville's latest published documents on www.JM.com.

F. Guarantees: Provide manufacturer's current guarantee specimen.

G. Prior to beginning the work of this section, roofing contractor shall provide a copy of the final System Assembly Letter issued by Johns Manville Roofing Systems indicating that the products and system to be installed shall be eligible to receive the specified manufacturer's guarantee when installed by a certified JM contractor in accordance with our application requirements, inspected and approved by a JM Technical Representative.

H. Prior to roofing system installation, roofing contractor shall provide a copy of the Guarantee Application Confirmation document issued by Johns Manville Roofing Systems indicating that the project has been reviewed for eligibility to receive the specified guarantee and registered.

4. QUALITY ASSURANCE

A. Installer Qualifications: Qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and is eligible to receive the specified manufacturer's guarantee.

B. Manufacturer Qualifications: Qualified manufacturer that has UL listing for roofing system identical to that used for this Project.

C. Testing Agency Qualifications: Independent testing agency with the experience and capability to conduct the testing indicated, as documented in accordance with ASTM E329.

D. Test Reports:

1. Roof drain and leader test or submit plumber's verification.

2. Core cut (if requested).

3. Roof deck fastener pullout test.

E. Source Limitations: Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system must be labeled by the single source roofing system manufacturer issuing the guarantee.

F. Fire-Test-Response Characteristics: Roofing materials shall comply with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.

5. DELIVERY, STORAGE, AND HANDLING

A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.

B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.

C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

6. PROJECT CONDITIONS

A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.

7. GUARANTEES

A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.

1. Single-Source special guarantee includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, cover board, substrate board, vapor retarder, walkway products, manufacturer's expansion joints, manufacturer's edge metal products, and other single-source components of roofing system marketed by the manufacturer.
2. Guarantee Period: 30 years from date of Substantial Completion.
3. Approved Equals: Firestone Building Products, Carlisle Syntec

B. Installer's Guarantee: Submit roofing Installer's guarantee, including all components of roofing system for the following guarantee period:

1. Guarantee Period: Two years from date of Substantial Completion.

C. Existing Guarantees: Guarantees on existing building elements should not be affected by scope of work.

1. Installer is responsible for coordinating with building owner's representative to verify compliance.

2.PRODUCTS

1. ETHYLENE PROPYLENE DIENE MONOMER ROOFING MEMBRANE - EPDM

A. Non-reinforced uniform, flexible sheet made from Ethylene Propylene Diene Monomer, ASTM D 4637, Type I. Basis of Design: JM EPDM NR, JM EPDM NR FIT SYSTEMS

1. Thickness (minimum): 90 mils (2.2 mm)

2. Exposed Face Color: Black.

3. Factory Inseam Tape: 6-inch (150-mm) wide minimum, butyl splice tape with release film.

2. AUXILIARY ROOFING MATERIALS

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

1. Liquid-type auxiliary materials shall meet VOC limits of authorities having jurisdiction.

B. Sheet Flashing: Manufacturer's sheet flashing of same material, type, reinforcement, thickness, and color as sheet membrane. Basis of Design: JM EPDM Peel & Stick Flashing

C. Primer Material: Manufacturer's standard synthetic-rubber polymer primer. Basis of Design:[JM EPDM Tape Primer (Low VOC)]

D. Seaming Material: Manufacturer's standard 6-inch- (150-mm-) wide minimum, butyl splice tape with release film. Basis of Design: JM EPDM Seam Tape Plus

E. Sealing Strip: Manufacturer's standard 6-inch- (150-mm-) and 9-inch- (200-mm-) wide, 45 mil (1.14 mm) thick minimum, cured EPDM with factory-laminated, self-adhering seam tape. Basis of Design: JM EPDM Peel & Stick Sealing Strip

F. Bonding Adhesive: Manufacturer's standard solvent and water-based bonding adhesive for membrane, and solvent and water-based bonding adhesive for base flashings. Basis of Design: JM LVOC Membrane Adhesive

G. Slip Sheet: Manufacturer's recommended slip sheet, based on type required for application.

H. Metal Termination Bars: Manufacturer's standard predrilled stainless-steel or aluminum bars, with anchors. Basis of Design: JM Termination Systems

I. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate, and acceptable to membrane roofing system manufacturer. Basis of Design: All Purpose Fasteners

J. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, preformed inside and outside corner sheet flashings, T-joint covers, termination reglets, cover strips, sealants and other accessories. Basis of Design: JM EPDM Pourable Sealer, JM One-Part Pourable Sealer, JM EPDM Peel & Stick Inside/Outside Corners, JM EPDM Peel & Stick Pipe Boots, JM EPDM Peel & Stick Pourable Sealer Pockets, JM EPDM Peel & Stick Sealing Strip, JM EPDM Peel & Stick T-Joint Patch, JM EPDM Reinforced Termination Strip with Tape (RTS), JM EPDM Pre-Taped Curb Flashing, Single Ply LVOC Caulk – Black and White, JM Weathered Membrane Cleaner, and JM Single Ply Sealing Mastic

3. AUXILIARY ROOFING SYSTEM COMPONENTS

A. Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: Presto-Lock Coping

B. Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: Presto-Tite Fascia (Single Ply Systems)

C. Metal/Membrane Flashing: Specially designed and manufactured flashing for sealing and waterproofing. JM EPDM Metal/Membrane Flashing

D. Metal Flashing Sheet: Metal flashing sheet is specified in the IFB.

4. WALKWAYS

A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway pads sourced from membrane roofing system manufacturer. Basis of Design: JM EPDM Peel & Stick Walkpads

5. COVER BOARD

A. High-Density Polyisocyanurate: ASTM C 1289, Type II, Class 4, Grade 3, High-density Polyisocyanurate technology bonded in-line to mineral-surfaced, fiber glass reinforced facers with greater than 140 lbs of compressive strength. Basis of Design: Invinsa Roof Board

B. Composite Polyisocyanurate Board Insulation: Closed cell medium density foam bonded to high-density foam to create a composite board with coated glass facers. High-Density layer meets the requirements of ASTM C 1289, Type II, Class 4, Grade 3. Normal-Density layer meets the requirements of ASTM C 1289, Type II, Class 2. Basis of Design: Invinsa Foam

6. ROOF INSULATION

A. General: Preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B. Polyisocyanurate Board Insulation: ASTM C 1289, Type II, Grade 2 (20 psi) Basis of Design: ENRGY 3

1. Provide insulation package with minimum R Value: 30, minimum required by applicable code

2. Provide insulation package with minimum thickness:

3. Base Layer 2.6" 20psi Energy 3 (4x4) - R=15.0

4. Second Layer 2.7" InvinsaFoam (4x4) - R=15.3

5. Provide insulation package in multiple layers.

6. Minimum Long-Term Thermal Resistance (LTTR): 5.7 per inch.

a. Determined in accordance with CAN/ULC S770 at 75ºF (24ºC)

7. TAPERED INSULATION

A. Tapered Insulation: ASTM C 1289, Type II, Grade 2 (20 psi), provide factory-tapered insulation boards fabricated to slope of 1/4 inch per 12 inches (1:48), unless otherwise indicated. Basis of Design: Tapered ENRGY 3

8. INSULATION ACCESSORIES

A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with membrane roofing.

B. Fasteners: Factory-coated steel fasteners and metal or plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening roof insulation to substrate, and furnished by roofing system manufacturer. Basis of Design: All Purpose Fasteners - Concrete Deck. Ultrafast Fasteners - Steel Deck

C. Urethane Adhesive: Manufacturer's two component polyurethane adhesive formulated to adhere insulation to substrate. Basis of Design: JM Two-Part Urethane Insulation Adhesive (UIA), JM One-Step Foamable Adhesive, Roofing Systems Urethane Adhesive (RSUA), and JM Two-Part Urethane Insulation Adhesive (UIA) Canister

D. Wood Nailer Strips: Comply with requirements of the IFB

9. VAPOR RETARDER

A. Self-Adhered SBS Vapor Retarder: Tri-laminate woven polyethylene, nonslip UV protected top surface; suitable for application method specified. Basis of Design: JM Vapor Barrier SA

B. Self-Adhered Primer: One-part penetrating primer solution to enhance the adhesion of self-adhering membranes. SA Primer Low VOC

3.EXECUTION

1. EXAMINATION

1. General:

a. Verify that roof openings and penetrations are in place and set and braced and that roof drains are securely clamped in place.

b. Verify that wood cants, blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.

2. Steel Decks:

a. Verify that surface plane flatness and fastening of steel roof deck complies with requirements in Division 05 Section "Steel Decking."

3. Concrete Decks:

a. Verify that concrete curing compounds that will impair adhesion of roofing components to roof deck have been removed.

b. Verify that concrete substrate is visibly dry and free of moisture.

2. PREPARATION

A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.

C. If applicable, prime surface of deck with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.

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

3. RE-ROOF PREPARATION

A. Remove all roofing membrane, surfacing, coverboards, insulation, fasteners, asphalt, pitch, adhesives, etc.

1. Remove an area no larger than can be re-roofed in one day.

2. Contractor is responsible for all costs associated with removal and disposal of all asbestos containing material in accordance with all applicable regulations and standards.

B. Tear out all base flashings, counterflashings, pitch pans, pipe flashings, vents and like components necessary for application of new membrane.

C. Remove abandoned equipment curbs, skylights, smoke hatches, and penetrations.

1. Install decking to match existing as directed by Owner's Representative.

D. Raise (disconnect by licensed craftsmen, if necessary) all HVAC units and other equipment supported by curbs to conform with the following:

1. Modify curbs as required to provide a minimum 8" base flashing height measured from the surface of the new membrane to the top of the flashing membrane.

2. Secure of flashing and install new metal counterflashing prior to re-installation of unit.

3. Perimeter nailers must be elevated to match elevation of new roof insulation.

E. Immediately remove all debris from roof surface. Demolished roof system may not be stored on the roof surface.

F. Proceed with installation only after unsatisfactory conditions have been

4. VAPOR-RETARDER INSTALLATION

1. Self-adhere vapor retarder to substrate according to roofing system manufacturer's instruction.

2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.

B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.

1. Repair tears and voids in laps and lapped seams not completely sealed.

C. Completely seal vapor retarder at terminations, obstructions, and penetrations to prevent air movement into membrane roofing system.

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

5. INSULATION INSTALLATION

A. Coordinate installation of roof system components so insulation and cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with roofing system manufacturer's written instructions for installation of roof insulation and cover board.

C. Install tapered insulation under area of roofing to conform to slopes indicated.

D. Install insulation boards with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with like material.

E. Install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches (150 mm) in each direction.

F. Trim surface of insulation boards where necessary at roof drains so completed surface is flush and does not restrict flow of water.

G. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

H. Adhered Insulation: Adhere each layer of insulation to substrate as follows:

1. Install each layer in a two-part urethane adhesive according to roofing system manufacturer's instruction.

2. Install each layer to resist uplift pressure at corners, perimeter, and field of roof.

6. COVER BOARD INSTALLATION

A. Coordinate installing membrane roofing system components so cover board is not exposed to precipitation or left exposed at the end of the workday.

B. Comply with membrane roofing system manufacturer's written instructions for installing roof cover board.

C. Install cover board with long joints in a continuous straight line. Joints should be staggered between rows, abutting edges and ends per manufacturer's written instructions. Fill gaps exceeding 1/4 inch (6 mm) with cover board.

1. Cut and fit cover board within 1/4 inch (6 mm) of nailers, projections, and penetrations.

D. Trim surface of cover board where necessary at roof drains so completed surface is flush and does not restrict flow of water.

1. Install tapered edge strips at perimeter edges of roof that do not terminate at vertical surfaces.

E. Adhered Cover Board: Adhere cover board to substrate as follows:

1. Install in a two-part urethane adhesive according to roofing system manufacturer's instruction.

2. Install to resist uplift pressure at corners, perimeter, and field of roof.

F. Mechanically Fastened Cover Board: Install cover board and secure to deck using mechanical fasteners designed and sized for fastening specified cover board to deck type.

1. Fasten to resist uplift pressure at corners, perimeter, and field of roof.

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

7. ROOFING MEMBRANE INSTALLATION, GENERAL

A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.

B. Where roof slope exceeds 1/2 inch per 12 inches (1:24), contact the membrane manufacturer for installation instructions regarding installation direction and backnailing.

C. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.

D. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.

1. Provide tie-offs at end of each day's work to cover exposed roofing membrane 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.

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

8. ADHERED ROOFING MEMBRANE INSTALLATION

A. Install roofing membrane over area to receive roofing in accordance with membrane roofing system manufacturer's written instructions.

1. Unroll roofing membrane and allow to relax before installing.

2. Install sheet in accordance with roofing system manufacturer's written instructions.

B. Accurately align roofing membrane and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.

C. Bonding Adhesive: Apply solvent-based bonding adhesive to substrate and underside of roofing membrane at rate required by manufacturer and allow to partially dry before installing roofing membrane. Do not apply bonding adhesive to splice area of roofing membrane.

D. Mechanically fasten roofing membrane securely at terminations, penetrations, and perimeter of roofing.

E. Apply roofing membrane with side laps shingled with slope of roof deck where possible.

F. Field Fabricated Seam Installation: Clean and prime both faces of splice areas, apply splice tape, and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of roofing membrane terminations.

G. Tape to Tape Installation: Align membrane for appropriate overlap, remove release liners and firmly roll side and end laps of overlapping roofing membranes according to manufacturer's written instructions to ensure a watertight seam installation.

H. Spread sealant or mastic bed over deck drain flange at deck drains and securely seal roofing membrane in place with clamping ring.

I. Install roofing membrane and auxiliary materials to tie in to existing roofing.

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

9. BASE FLASHING INSTALLATION

10. WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.

B. Roof-Paver Walkways: Install walkway roof pavers according to manufacturer's written instructions in locations indicated, to form walkways. Leave 3 inches (75 mm) of space between adjacent roof pavers.

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

11. FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.

B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.

1. Notify Owner 48 hours in advance of date and time of inspection.

C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

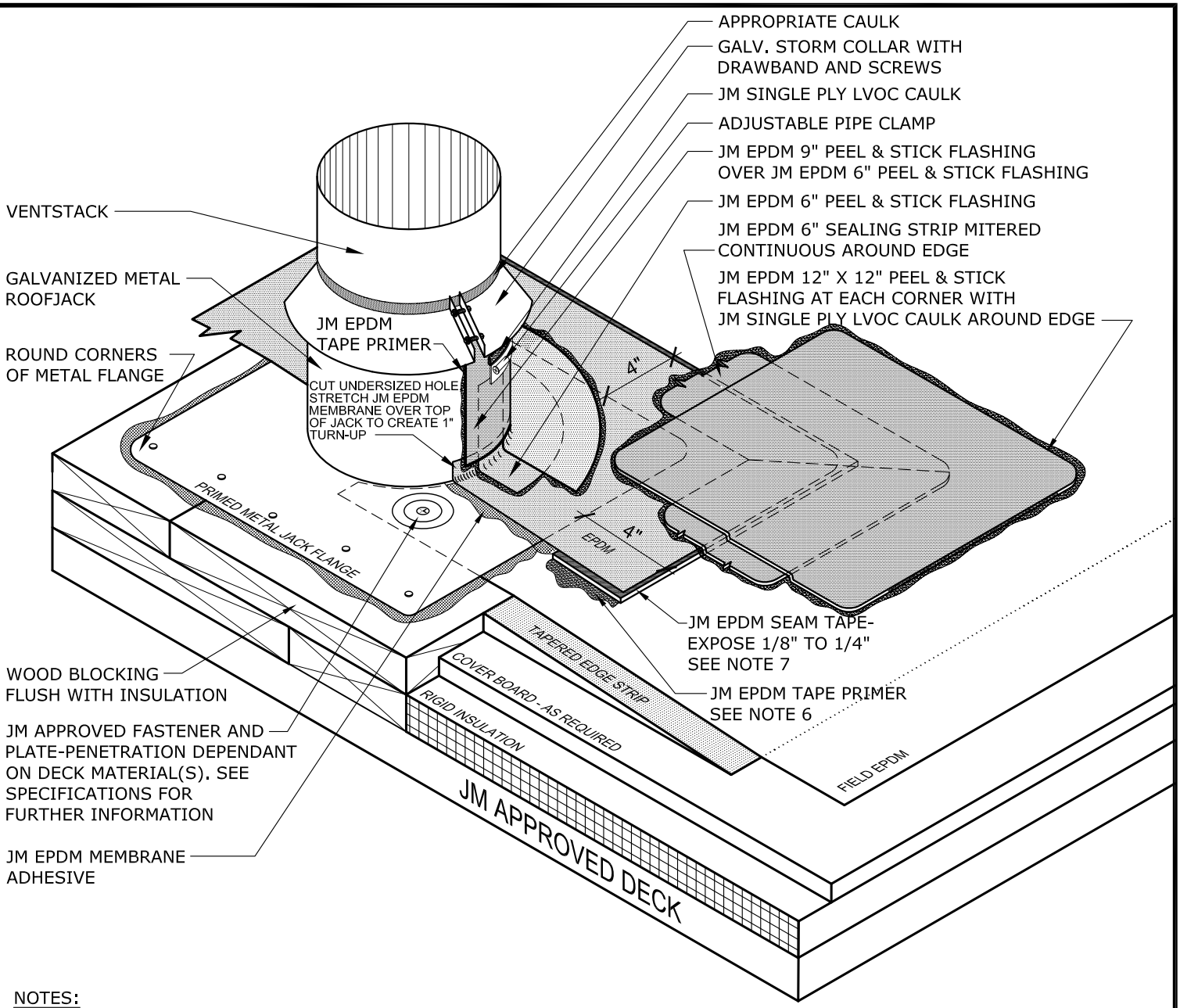
12. PROTECTION AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period.

B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075323



NOTES:

1. REFER TO JOHNS MANVILLE WEBSITE (www.jm.com) FOR MOST UP-TO-DATE INFORMATION.
2. PLEASE SEE SINGLE PLY FLASHING SPECIFICATIONS FOR A FULL DESCRIPTION OF INSTALLATION INSTRUCTIONS AND REQUIREMENTS WHICH ARE CONSIDERED A PART OF THIS DETAIL.
3. ANY CARPENTRY OR METAL WORK SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS AND/OR PROJECT SPECIFICATIONS. THESE COMPONENTS SHOULD BE REVIEWED AND APPROVED BY A LICENSED DESIGN PROFESSIONAL.
4. ON RE-ROOF OR RECOVER PROJECTS, VENT PIPES MUST BE CLEANED OF LARGE DEPOSITS OF ASPHALT. ALUMINUM TAPE IS WRAPPED AROUND THE PIPE AS A SEPARATION LAYER. NEW ASPHALT-COATED CAST IRON PIPES MUST BE WRAPPED WITH ALUMINUM TAPE.
5. DETAILS TO BE USED IN CONJUNCTION WITH GUIDE SPECIFICATIONS CONTAINING REQUIREMENTS FOR NAILERS, INSULATION, ETC.
6. JM EPDM TAPE PRIMER OR JM SINGLE PLY MEMBRANE PRIMER (LOW VOC) MUST BE APPLIED ON ALL SURFACES COMING INTO CONTACT WITH JM EPDM PEEL & STICK FLASHINGS. ROLL MEMBRANE WITH HAND ROLLER UNDER PRESSURE AT SEAM.
7. 1/8" TO 1/4" OF EPDM SEAM TAPE MUST BE EXPOSED ALONG ENTIRE LENGTH OF ALL SEAMS.
8. ALL SEALANTS / CAULKING SHALL BE PERIODICALLY INSPECTED AND MAINTAINED BY THE BUILDING OWNER THROUGHOUT THE LIFE OF THE ROOF.

Use in place of Sheet A2

DRAWING NO.
E-DV-02
NEW DETAIL

VENT PIPE 30 YEAR

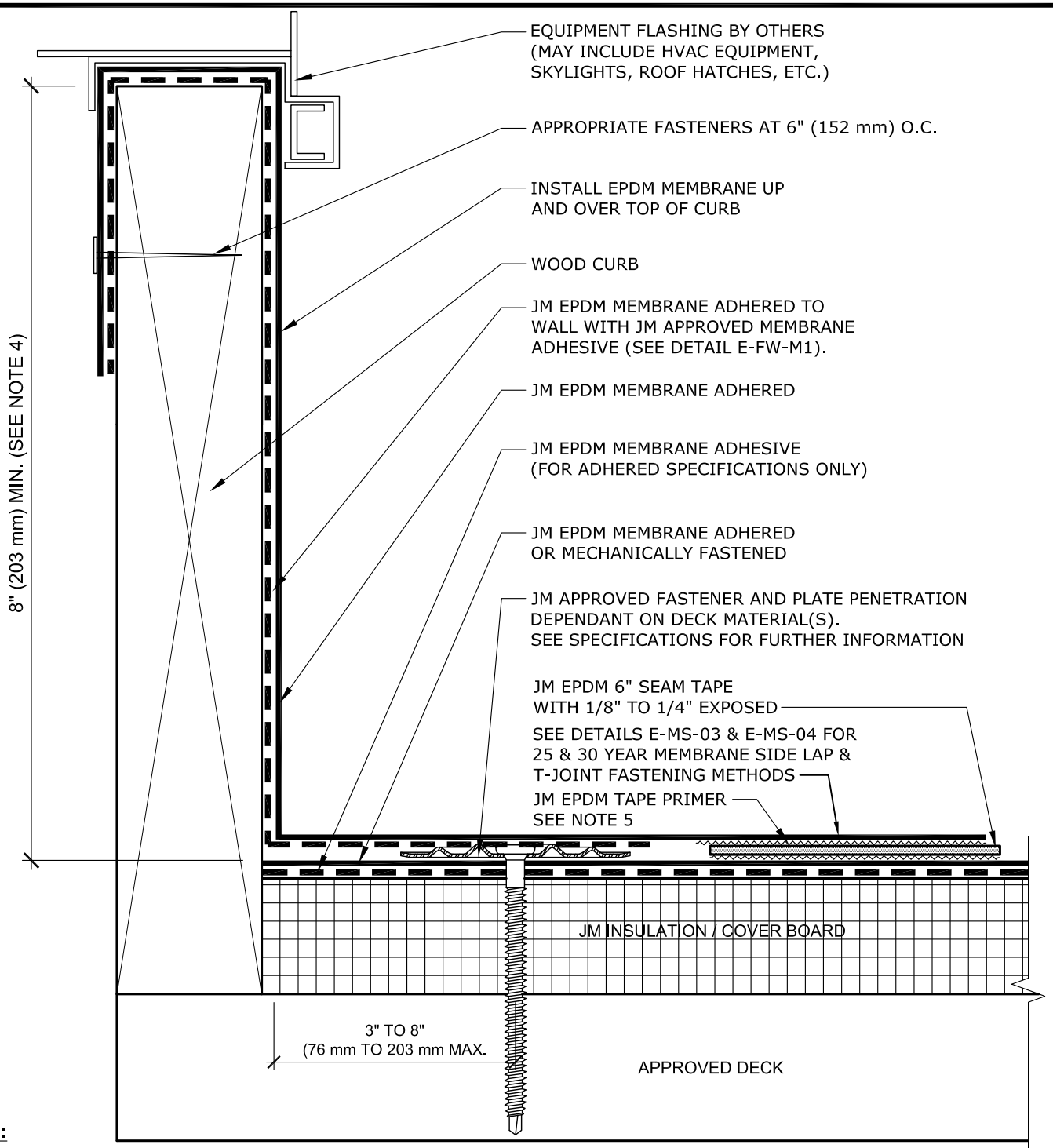
MEMBRANE TYPE:
JM EPDM

SCALE
N.T.S

ISSUE DATE
1-11-17

MAXIMUM GUARANTEE TERM:
30 YEAR

Johns Manville



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4. HEIGHT OF CURB TO BE ADJUSTED WITH NAILERS. IT IS PREFERRED TO RAISE CURB ONTO NAILERS TO EXTEND FLASHING HEIGHT.
5. JM EPDM TAPE PRIMER OR JM SINGLE PLY MEMBRANE PRIMER (LOW VOC) MUST BE APPLIED ON ALL SURFACES COMING INTO CONTACT WITH JM EPDM PEEL & STICK PRODUCTS. ROLL MEMBRANE WITH HAND ROLLER UNDER PRESSURE AT SEAM.
6. 1/8" TO 1/4" OF EPDM SEAM TAPE MUST BE EXPOSED.
7. REINFORCED JM EPDM MEMBRANE IS REQUIRED FOR MECHANICALLY FASTENED INSTALLATIONS ONLY.
8. SEE E-FW-B DETAILS FOR JM APPROVED BASE FLASHING TIE IN TERMINATION METHODS.

Use in place of Sheet A3

DRAWING NO.
E-FC-12
NEW DETAIL

WOOD CURB BASE FLASHING

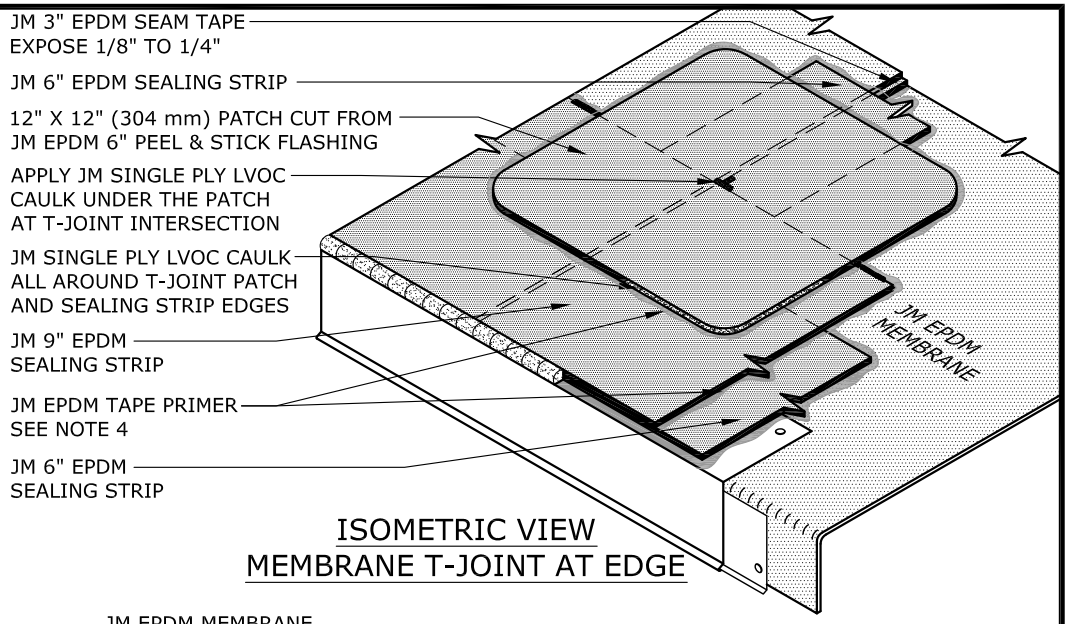
MEMBRANE TYPE:
JM EPDM

SCALE
N.T.S

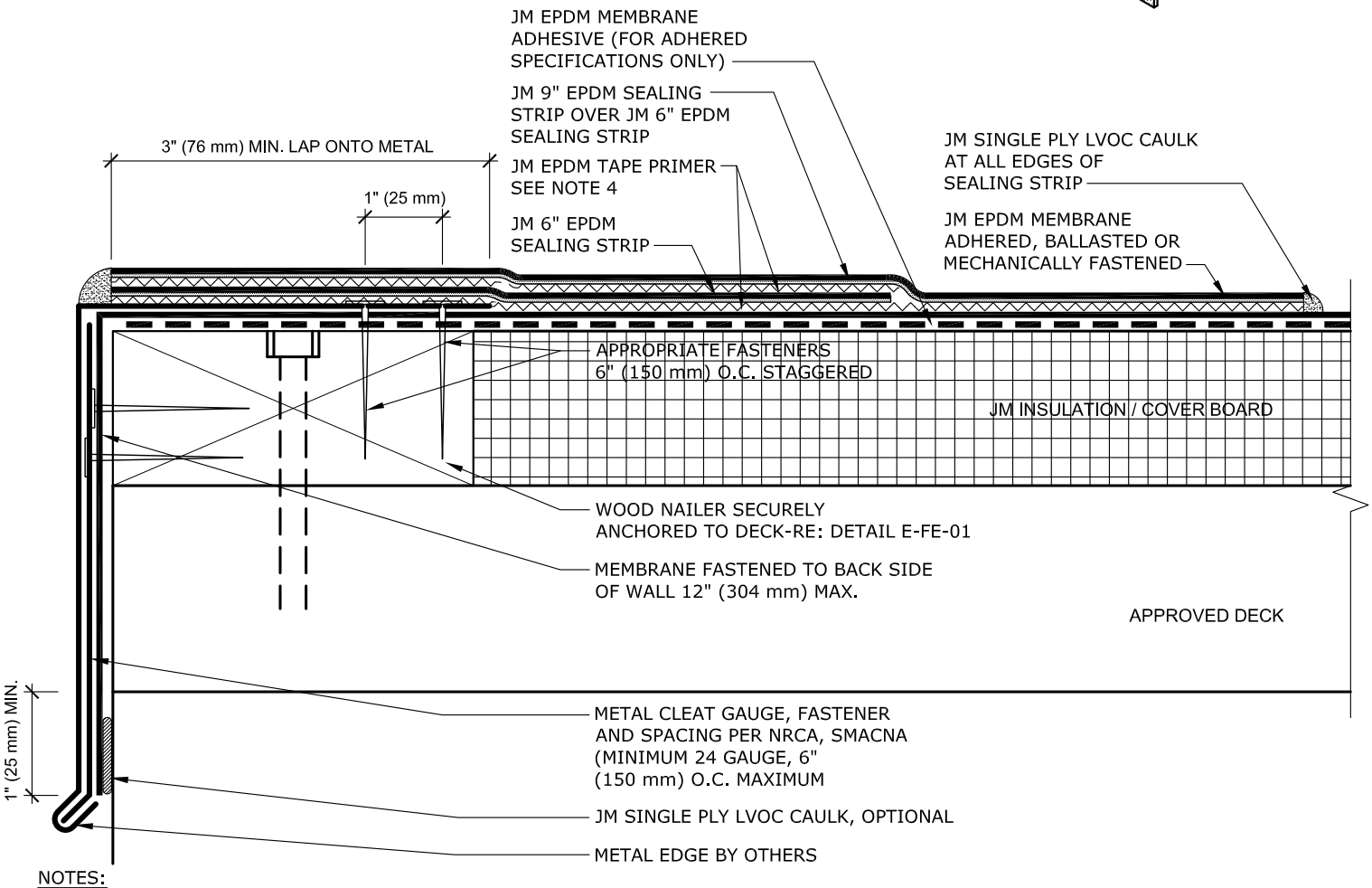
ISSUE DATE
5-22-18

MAXIMUM GUARANTEE TERM:
30 YEAR

Johns Manville



ISOMETRIC VIEW
MEMBRANE T-JOINT AT EDGE



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1. REFER TO JOHNS MANVILLE WEBSITE (www.jm.com) FOR MOST UP-TO-DATE INFORMATION.
2. PLEASE SEE SINGLE PLY FLASHING SPECIFICATIONS FOR A FULL DESCRIPTION OF INSTALLATION INSTRUCTIONS AND REQUIREMENTS WHICH ARE CONSIDERED A PART OF THIS DETAIL.
3. ANY CARPENTRY OR METAL WORK SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS AND/OR PROJECT SPECIFICATIONS. THESE COMPONENTS SHOULD BE REVIEWED AND APPROVED BY A LICENSED DESIGN PROFESSIONAL.
4. JM EPDM TAPE PRIMER OR JM SINGLE PLY MEMBRANE PRIMER (LOW VOC) MUST BE APPLIED ON ALL SURFACES COMING INTO CONTACT WITH JM EPDM PEEL & STICK PRODUCTS. ROLL MEMBRANE WITH HAND ROLLER UNDER PRESSURE AT SEAM.

Use in place of Sheet A4

DRAWING NO.
E-FE-V3
NEW DETAIL

METAL DRIP EDGE WITH EPDM SEALING STRIP 30 YEAR

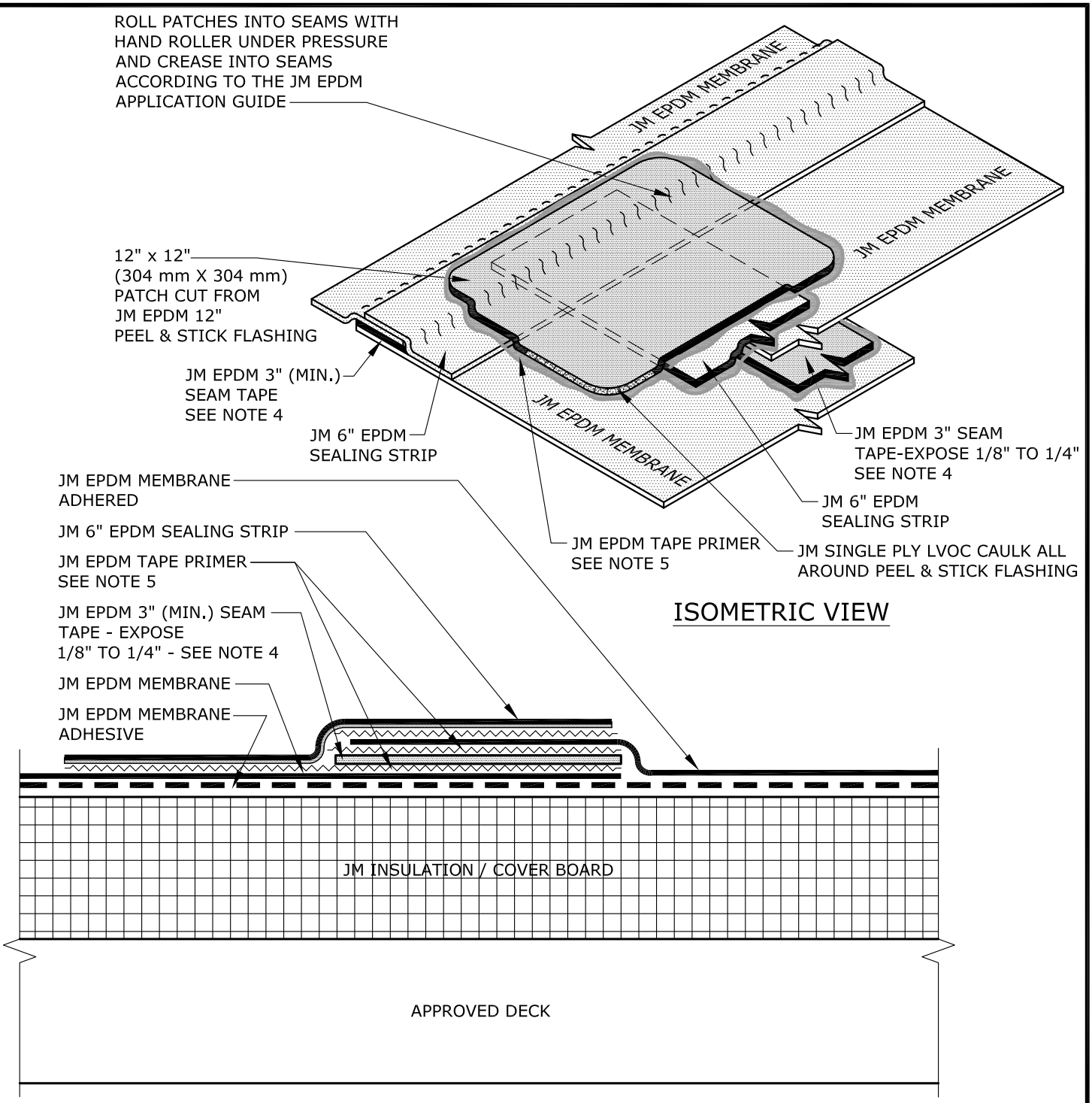
MEMBRANE TYPE:
JM EPDM

SCALE
N.T.S

ISSUE DATE
7-10-17

MAXIMUM GUARANTEE TERM:
30 YEAR

Johns Manville



ISOMETRIC VIEW

NOTES:

1. REFER TO JOHNS MANVILLE WEBSITE (www.jm.com) FOR MOST UP-TO-DATE INFORMATION.
2. PLEASE SEE SINGLE PLY FLASHING SPECIFICATIONS FOR A FULL DESCRIPTION OF INSTALLATION INSTRUCTIONS AND REQUIREMENTS WHICH ARE CONSIDERED A PART OF THIS DETAIL.
3. ANY CARPENTRY OR METAL WORK SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS AND/OR PROJECT SPECIFICATIONS. THESE COMPONENTS SHOULD BE REVIEWED AND APPROVED BY A LICENSED DESIGN PROFESSIONAL.
4. 1/8" TO 1/4" OF JM EPDM SEAM TAPE MUST BE EXPOSED ALONG ENTIRE LENGTH OF ALL SEAMS.
5. JM EPDM TAPE PRIMER OR JM SINGLE PLY MEMBRANE PRIMER (LOW VOC) MUST BE APPLIED ON ALL SURFACES COMING INTO CONTACT WITH JM EPDM PEEL & STICK PRODUCTS.
   ROLL MEMBRANE WITH HAND ROLLER UNDER PRESSURE AT SEAM IN ACCORDANCE WITH THE JM EPDM INSTALLATION GUIDE.

Use in place of Sheet A5

DRAWING NO.
E-MS-04
REPLACES EL-14T

EPDM SIDE LAP & T-JOINT 30 YEAR

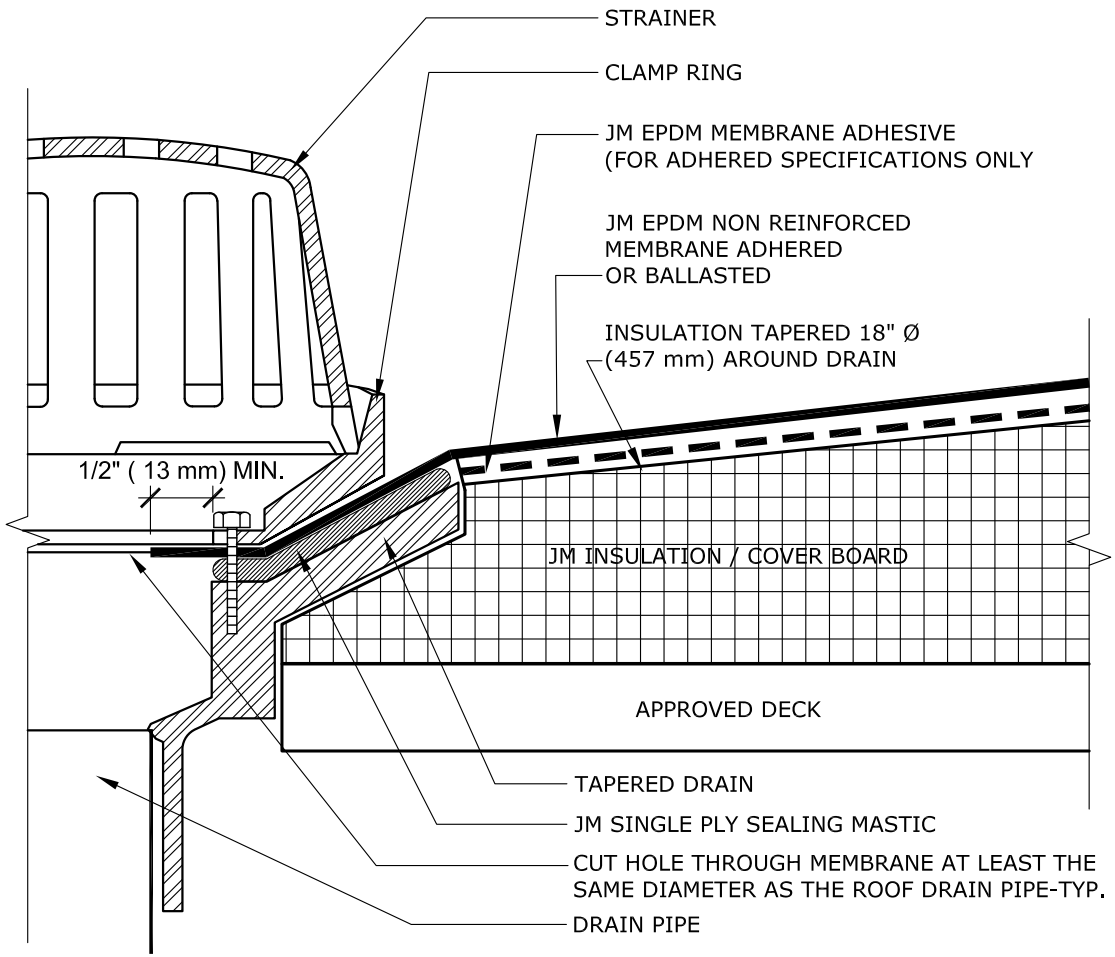
MEMBRANE TYPE: JM EPDM

SCALE: N.T.S

ISSUE DATE: 7-10-17

MAXIMUM GUARANTEE TERM: 30 YEAR

Johns Manville



NOTES:

1. REFER TO JOHNS MANVILLE WEBSITE (www.jm.com) FOR MOST UP-TO-DATE INFORMATION.
2. PLEASE SEE SINGLE PLY FLASHING SPECIFICATIONS FOR A FULL DESCRIPTION OF INSTALLATION INSTRUCTIONS AND REQUIREMENTS WHICH ARE CONSIDERED A PART OF THIS DETAIL.
3. ANY CARPENTRY OR METAL WORK SHOULD BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH LOCAL CODE REQUIREMENTS AND/OR PROJECT SPECIFICATIONS. THESE COMPONENTS SHOULD BE REVIEWED AND APPROVED BY A LICENSED DESIGN PROFESSIONAL.
4. NO SEAMS OR FOLDS UNDER THE CLAMPING RING.

Use in place of Sheet A6

PRIMARY DRAIN SUMP (LOW SLOPE) LESS THAN 3:12 SLOPE

DRAWING NO.	MEMBRANE TYPE:	ISSUE DATE
E-DV-08	JM EPDM	7-11-17
REPLACES ED-1	MAXIMUM GUARANTEE TERM: 30 YEAR	SCALE N.T.S

Johns Manville

ATTACHMENT 2

ASBESTOS SURVEY TEST REPORT

Asbestos Identification Laboratory

165 New Boston St., Ste 227
Woburn, MA 01801
781-932-9600

Web: www.asbestosidentificationlab.com
Email: mikemanning@asbestosidentificationlab.com

Batch: 37028

NVLAP®
Lab Code: 200919-0

October 31, 2018

Robert DaPrato
Commonwealth Environmental
128 Forest Street
Medford, MA 02155

Project Number:
Project Name: 6 Tony's Ln., Wareham, MA

Date Sampled: 2018-10-29
Work Received: 2018-10-29
Work Analyzed: 2018-10-31

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

Dear Robert DaPrato,

Asbestos Identification Laboratory has completed the analysis of the samples from your office for the above referenced project .

The information and analysis contained in this report have been generated using the EPA /600/R-93/116 Method for the Determination of Asbestos in Bulk Building Materials. Materials or products that contain more than 1% of any kind or combination of asbestos are considered an asbestos containing building material as determined by the EPA. This Polarized Light Microscope (PLM) technique may be performed either by visual estimation or point counting. Point counting provides a determination of the area percentage of asbestos in a sample. If the asbestos is estimated to be less than 10% by visual estimation of friable material, the determination may be repeated using the point counting technique. The results of the point counting supersede visual PLM results. Results in this report only relate to the items tested. This report may not be used by the customer to claim product endorsement by NVLAP or any other U.S. Government Agency.

Laboratory results represent the analysis of samples as submitted by the customer. Information regarding sample location, description, area, volume, etc., was provided by the customer. Asbestos Identification Laboratory is not responsible for sample collection activities or analytical method limitations. Unless notified in writing to return samples, Asbestos Identification Laboratory discards customer samples after 30 days. Samples containing subsamples or layers will be analyzed separately when applicable. Reports are kept at Asbestos Identification Laboratory for three years. This report shall not be reproduced, except in full, without the written consent of Asbestos Identification Laboratory.

- NVLAP Lab Code: 200919-0
- Massachusetts Certification License: AA000208
- State of Connecticut, Department of Public Health Approved Environmental Laboratory Registration Number: PH-0142
- State of Maine, Department of Environmental Protection Asbestos Analytical Laboratory License Number: LB-0078(Bulk) LA-0087(Air)
- State of Rhode Island and Providence Plantations. Department of Health Certification: AAL-121
- State of Vermont, Department of Health Environmental Health License AL934461

Thank you Robert DaPrato for your business.

Michael Manning
Owner/Director

October 31, 2018

Robert DaPrato
Commonwealth Environmental
128 Forest Street
Medford, MA 02155

Project Number:
Project Name: 6 Tony's Ln., Wareham, MA

Date Sampled: 2018-10-29
Work Received: 2018-10-29
Work Analyzed: 2018-10-31

Analysis Method: BULK PLM ANALYSIS EPA/600/R-93/116

FieldID / LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
001 / 408030	Vapor Barrier-Roof	Sludge Bldg East	black	Non-Fibrous 80	**Detected** Chrysotile 20
002 / 408031	Vapor Barrier	Sludge Bldg East	black	Non-Fibrous 90	**Detected** Chrysotile 10
003 / 408032	Black Paper Insulation Roof	Sludge Bldg East	black	Cellulose 70 Non-Fibrous 30	None Detected
004 / 408033	Black Paper Insulation Roof	Sludge Bldg East	black	Cellulose 70 Non-Fibrous 30	None Detected
005 / 408034	Vapor Barrier Roof	Sludge Bldg West	black	Non-Fibrous 80	**Detected** Chrysotile 20
006 / 408035	Vapor Barrier Roof	Sludge Bldg West	black	Non-Fibrous 85	**Detected** Chrysotile 15
007 / 408036	Black Paper Insulation Roof	Sludge Bldg West	black	Cellulose 70 Non-Fibrous 30	None Detected
008 / 408037	Black Insulation Paper Roof	Sludge Bldg West	black	Cellulose 70 Non-Fibrous 30	None Detected
009 / 408038	Black Shiny Flashing Roof	Sludge Bldg	black	Non-Fibrous 100	None Detected
010 / 408039	Black Flashing Roof	Sludge Bldg	black	Non-Fibrous 100	None Detected
011 / 408040	Black Paper/Tar Insulation Roof	Vehicle Storage Bldg	black	Fiberglass 50 Cellulose 40 Non-Fibrous 10	None Detected
012 / 408041	Black Insulation/Tar Paper Roof	Vehicle Storage Bldg	black	Fiberglass 50 Cellulose 40 Non-Fibrous 10	None Detected
013 / 408042	Fiber Board Insulation Roof	Vehicle Storage Bldg	brown	Cellulose 95 Non-Fibrous 5	None Detected
014 / 408043	Fiber Board Insulation Roof	Vehicle Storage Bldg	brown	Cellulose 95 Non-Fibrous 5	None Detected

FieldID LabID	Material	Location	Color	Non-Asbestos %	Asbestos %
015 408044	Black Paper Insulation Roof	West Septage Bldg	black	Cellulose 80 Non-Fibrous 20	None Detected
016 408045	Black Paper Insulation Roof	West Septage Bldg	black	Cellulose 85 Non-Fibrous 15	None Detected
017 408046	Black Vapor Barrier Roof	West Septage Bldg	black	Non-Fibrous 75	**Detected** **Chrysotile 25**
018 408047	Black Vapor Barrier Roof	West Septage Bldg	black	Non-Fibrous 75	**Detected** **Chrysotile 25**
019 408048	Black Paper Insulation Roof	East Septage Bldg	black	Cellulose 80 Non-Fibrous 18	**Detected** **Chrysotile 2**
020 408049	Black Paper Ins Roof	East Septage Bldg	black	Cellulose 80 Non-Fibrous 18	**Detected** **Chrysotile 2**
021 408050	Vapor Black Barrier Roof	East Septage Bldg	black	Non-Fibrous 75	**Detected** **Chrysotile 25**
022 408051	Black Vapor Barrier Roof	East Septage Bldg	black	Non-Fibrous 75	**Detected** **Chrysotile 25**

Wednesday 31

Analyzed by: Erik Gongas

End of Report

Batch: 37028

Client: Commonwealth Env Testing
Address: 128 Forest St - Medford - MA
Project Site & #: 6 Tony's Ln - Wareham - MA
Phone / email address: 617-605-0405
Contact: Rob DaPrato
Relinquish by/date: 10/29/18
Received by/date:
# of Samples Received: 22

CHAIN OF CUSTODY

EPA/600/R-93/116

Asbestos Identification Lab
165 New Boston St.
Suite 227
Woburn, MA 01801
(781)932-9600
www.asbestosidentificationlab.com

Date Sampled:

BATCH# 37028 Rev 06/16

Page 1

PAID

Turnaround Time: [ ] Less 3 Hrs [ ] Same Day [ ] Next Day [x] Two Day

Sample Method: [x] Bulk [ ] Soil [ ] Wipe [ ] Point Count

Stop on 1st Positive? Yes/No

Notify Method: Mail/E-Mail/Verbal

Anayzed By: Emi Gerga

Date: 10/31/18

Temp in Celsius = 21

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: II	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
408030	001	Material VAPOR BARRIER - ROOF Location SLUDGE BLDG - EAST	0	blk	N	gn	N	Chrysotile	70	W	=	+	—	~	1.577	1.577							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															80
37	002	Material VAPOR BARRIER Location SLUDGE BLDG. EAST	0	blk	N	gn	N	Chrysotile	W	W	=	+	—	~	1.577	1.577							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															90
39	003	Material BLACK PAPER INSULATION Location ROOF SLUDGE-BLDG EAST	0	blk	N	gn FN	N	Chrysotile															
								Amosite															
								Crocidolite											R				
								Tremolite															
								Anthophyllite											70				30
								Actinolite															

E.G ~~no~~ Scrape

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Temp in Celcius = 21 / Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
33	004	Material BLACK PAPER INSULATION ROOF. Location SLUDGE BLDG. - EAST	0	blk	N	gn T	N	Chrysotile											R				
								Amosite															
								Crocidolite															
								Tremolite											70				30
								Anthophyllite															
								Actinolite															
34	005	Material VAPOR BARRIER ROOF. Location SLUDGE BLDG. WEST	0	blk	N	gn	N	Chrysotile	20	W	=	+	L	N	1.551	1.571							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															80
								Actinolite															
35	006	Material VAPOR BARRIER ROOF Location SLUDGE BLDG. WEST	0	blk	N	gn	N	Chrysotile	15	W	=	+	L	N	1.551	1.571							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															85
								Actinolite															
36	007	Material BLACK PAPER INSULATION ROOF Location SLUDGE- BLDG. WEST	0	blk	N	gn T	N	Chrysotile															
								Amosite											R				
								Crocidolite															
								Tremolite															
								Anthophyllite											70				30
								Actinolite															
37	008	Material BLACK INSULATION PAPER ROOF Location SLUDGE- BLDG WEST	0	blk	N	gn T	N	Chrysotile															
								Amosite											R				
								Crocidolite															
								Tremolite															
								Anthophyllite											70				30
								Actinolite															

Temp in Celcius = 21

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope					Asbestos Minerals	Optical Properties						RI		Non-Asbestos Percentage (%)						
			% of Asbestos	Color	Homogeneity	Texture	Friable		Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	∥	⊥	Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
38	009	Material - BLACK SHINY - FLASHING ROOF- Location SLUDGE BLDG.	0	blk	y	sm	~	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															100
								Anthophyllite															
								Actinolite															
39	010	Material BLACK FLASHING. Location ROOF SLUDGE-BLDG.	0	blk	y	sm	~	Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															100
								Actinolite															
40	011	Material BLACK PAPER / TAR INSULATION Location VEHICLE ROOF STORAGE BLDG	0	blk	~	sm F	~	Chrysotile															
								Amosite															
								Crocidolite									I		R				
								Tremolite															
								Anthophyllite									50		40				10
								Actinolite															
41	012	Material BLACK INSULATION / TAR PAPER Location ROOF VEHICLE STORAGE BLDG	0	blk	~	sm F	~	Chrysotile															
								Amosite															
								Crocidolite									I		R				
								Tremolite															
								Anthophyllite									50		40				10
								Actinolite															
42	013	Material FIBER BOARD INSULATION ROOF Location VEHICLE - STORAGE BLDG	0	br	N	sm F	y	Chrysotile															
								Amosite															
								Crocidolite											R				
								Tremolite															
								Anthophyllite											95				5
								Actinolite															

Temp in Celcius = 21

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ‖	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
43	014	Material FIBER BOARD INSULATION ROOF Location VEHICLE STORAGE - BLDG	0	br	N	SM FI	N	Chrysotile											R				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite											95				5
								Actinolite															
44	015	Material BLACK PAPER INSULATION. ROOF Location WEST SEPTAGE - BLDG	0	blk	N	SM FI	N	Chrysotile											R				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite											80				20
								Actinolite															
45	016	Material BLACK PAPER INSULATION ROOF Location WEST SEPTAGE - BLDG.	0	blk	N	SM FI	N	Chrysotile											R				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite											85				15
								Actinolite															
46	017	Material BLACK VAPOR BARRIER ROOF Location WEST SEPTAGE BLDG.	0	blk	N	SM FI	N	Chrysotile	25	N	=	+	L	N	LDT	LDT							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															75
								Actinolite															
4085031	018	Material BLACK VAPOR BARRIER ROOF Location WEST SEPTAGE - BLDG	0	blk	N	SM FI	N	Chrysotile	25	N	=	+	L	N	LDT	LDT							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															75
								Actinolite															

Temp in Celcius = 21

Lab ID# (Lab Use Only)	Field ID/ (Client Reference)	Material / Location	Stereo Scope: % of Asbestos	Color	Homogeneity	Texture	Friable	Asbestos Minerals	Optical Properties: Asbestos %	Morphology	Extinction	Sign of Elongation	Birefringence	Pleochroism	RI: ∥	RI: ⊥	Non-Asbestos Percentage (%): Fiberglass	Mineral Wool	Cellulose	Hair	Synthetic	Other	Non-Fibrous
	019	Material BLACK PAPER INSULATION ROOF Location EAST SEPTAGE ROOF	0	blk	N	gn F	N	Chrysotile	2	W	=	+	L	N	1.555	1.551			R				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite											82				18
								Actinolite															
	020	Material BLACK PAPER-INS ROOF Location EAST SEPTAGE - ROOF	0	blk	N	gn F	N	Chrysotile	2	W	=	+	L	N	1.555	1.551			R				
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite											80				18
								Actinolite															
	021	Material VAPOR BLACK - BARRIER Location ROOF EAST SEPTAGE ROOF	0	blk	N	gn F	N	Chrysotile	25	W	=	+	L	N	1.555	1.551							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															25
								Actinolite															
	022	Material BLACK VAPOR BARRIER ROOF Location EAST SEPTAGE - ROOF	0	blk	N	gn F	N	Chrysotile	25	W	=	+	L	N	1.555	1.551							
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															75
								Actinolite															
		Material Location						Chrysotile															
								Amosite															
								Crocidolite															
								Tremolite															
								Anthophyllite															
								Actinolite															