

GENERAL NOTES

1. APPLICABILITY
- 1.1 THE STANDARD VAPOR INTRUSION MITIGATION SYSTEM (VIMS) COMPONENTS SHALL BE INSTALLED DURING CONSTRUCTION OF THE BUILDING. THE VIMS HAS BEEN DESIGNED TO VENT SUB-SLAB SOIL VAPORS TO THE EXTERIOR OF THE BUILDING BY PROVIDING A PATHWAY TO ALLOW SOIL VAPOR TO MIGRATE TO THE BUILDING EXTERIOR RATHER THAN INTO THE BUILDING. THE VIMS IS DESIGNED IN GENERAL CONFORMANCE WITH THE FINAL VAPOR INTRUSION MITIGATION ADVISORY, REVISION 2 (CALIF. 2011) (THE "ADVISORY") AND IN CONSIDERATION OF THE DRAFT INTERIM FRAMEWORK FOR ASSESSMENT OF VAPOR INTRUSION AT TCE CONTAMINATED SITES IN THE SAN FRANCISCO BAY REGION (SRWQCB, 2014). THIS DRAWING SET PERTAINS SPECIFICALLY TO THE TENANT IMPROVEMENT OF THE SLAB LEAVE OUT AREA. THE VENT PIPE, AGGREGATE LAYER, SOL VAPOR BARRIER, PROTECTIVE SAND LAYER, AND CONCRETE TOP SLAB HAVE ALREADY BEEN INSTALLED IN THE SLAB LEAVE OUT AREA PER DETAIL 7/0-1.1.
2. VIMS COMPONENTS
- 2.1 SOL VAPOR BARRIER
- 2.1.1 MATERIALS. THE SOL VAPOR BARRIER SHALL CONSIST OF: 1) APPROVED AGGREGATE SUBSTRATES; 2) BASE LAYER, EPFO BASE, 20S, 3) CORE LAYER, EPFO E-SHAY LAYER (80 MILS MINIMUM) AND 4) BOND LAYER, EPFO SHEED 20S LAYER. THE SOL VAPOR BARRIER COMPONENTS ARE SHOWN ON DETAIL 7/0-1.1. THE SELECTED MEMBRANE MATERIALS SHALL BE CHEMICALLY COMPATIBLE WITH THE CHEMICALS OF CONCERN IN SOIL AND/OR SOIL VAPOR AT THE SITE.
- 2.1.1.1 SAND OR AGGREGATE LAYER. A SAND OR AGGREGATE LAYER SHALL BE PLACED UNDER THE BASE LAYER AND SHALL BE A MINIMUM OF 4 INCHES. AGGREGATE SUBSTRATES SHALL MEET THE FOLLOWING CONDITIONS AND BE APPROVED BY THE MANUFACTURER: AGGREGATE SUBSTRATES SHALL BE COMPACTED TO MEET STRUCTURAL AND BUILDING CODE REQUIREMENTS, THEN ROLLED FLAT TO PROVIDE A UNIFORM SUBSTRATE, AND 3 INCH MINUS AGGREGATE, WITH NO MORE THAN ONE FRACTURED FACE IS RECOMMENDED. OTHER AGGREGATE SUBSTRATES MAY BE APPROVED BY THE MANUFACTURER PROVIDED THEY DO NOT CREATE SHEAR ANGULAR PROJECTIONS THAT MAY COMPROMISE THE VAPOR BARRIER SYSTEM. IF THE AGGREGATE SUBSTRATES ARE NOT APPROVED BY THE MANUFACTURER, A GEOTEXTILE FABRIC (US FABRICS 3000V OR SIMILAR, IF APPROVED BY MANUFACTURER) MUST BE PLACED BETWEEN THE AGGREGATE SUBSTRATE AND THE EPFO BASE LAYER. A PROTECTIVE SAND LAYER SHALL BE PLACED ABOVE THE COMPLETED SOL VAPOR BARRIER AND SHALL BE A MINIMUM OF 2 INCHES. THE PROTECTIVE SAND LAYER SHALL MEET THE SPECIFICATIONS BELOW FOR SAND.
- TABLE 1: SPECIFICATIONS FOR SAND
- | Sieve Size | Percentage Passing Sieve |
|------------------|--------------------------|
| No. 10 (2.0 mm) | 100 |
| No. 40 (4.75 mm) | 90-100 |
| No. 100 (1.5 mm) | 75-90 |
| No. 14 (1.18 mm) | 65-75 |
| No. 20 (850 um) | 55-65 |
| No. 30 (600 um) | 40-55 |
| No. 40 (4.75 mm) | 25-40 |
| No. 60 (250 um) | 5-25 |
| No. 200 (75 um) | 0-5 |
- TABLE 2: SPECIFICATIONS FOR AGGREGATE
- | Sieve Size | Percentage Passing Sieve |
|------------------------|--------------------------|
| 1-1/2 inch (38.1 mm) | 95-100 |
| 1 inch (25.4 mm) | 90-100 |
| 3/4 inch (19 mm) | 85-100 |
| 3/8 inch (9.5 mm) | 80-100 |
| 1/4 inch (6.3 mm) | 65-85 |
| No. 10 (2.0 mm) | 5-15 |
| No. 20 (850 um) | 0-5 |
| No. 40 (4.75 mm) | 0-2 |
| ASTM C 136 Test Method | 0 |
- 2.1.1.2 BASE LAYER. THE BASE LAYER SHALL BE COMPOSED OF A HIGH STRENGTH LAMINATED HOPE GEOTEXTILE THAT IS THERMALLY BONDED TO A POLYPROPYLENE GEOTEXTILE JOINING THE BASE LAYER. A HIGH PUNCTURE RESISTANCE (CLASS A RATING) AS WELL AS HIGH CHEMICAL RESISTANCE. THE BASE LAYER SHALL BE INSTALLED OVER THE SUBSTRATE WITH THE HOPE SIDE FACING UP.
- 2.1.1.3 CORE LAYER. THE CORE LAYER SHALL BE AN ELASTIC WATER-BASED COPOLYMER MODIFIED ASPHALTIC MEMBRANE APPLIED TO A MINIMUM THICKNESS OF 60 MILS.
- 2.1.1.4 BOND LAYER. THE BOND LAYER SHALL BE COMPOSED OF A HIGH STRENGTH LAMINATED HOPE GEOTEXTILE THAT IS THERMALLY BONDED TO A POLYPROPYLENE GEOTEXTILE JOINING THE BASE LAYER. A HIGH PUNCTURE RESISTANCE (CLASS A RATING) AS WELL AS HIGH CHEMICAL RESISTANCE. THE BOND LAYER SHALL BE INSTALLED AS A PROTECTION COURSE OVER THE BASE AND CORE LAYERS WITH THE GEOTEXTILE SIDE FACING UP.
- 2.1.2 SUBMITTALS. THE FOLLOWING PRODUCT DATA FOR THE SOL VAPOR BARRIER SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER NO LATER THAN 30 DAYS PRIOR TO CONSTRUCTION: 1) MANUFACTURER'S PRINTED INSTRUCTIONS FOR EVALUATING AND PREPARING THE SUBSTRATE; 2) PRODUCT TECHNICAL DATA, INCLUDING TESTED PHYSICAL AND PERFORMANCE PROPERTIES; 3) SAMPLES OF SOL VAPOR BARRIER COMPONENTS; AND 4) CERTIFIED INSTALLER CERTIFICATES.
- 2.1.3 INSTALLATION. THE SOL VAPOR BARRIER SHALL BE INSTALLED BEFORE THE ENTIRE BUILDING GROUND LEVEL/FLOOR SLAB.
- 2.1.3.1 MATERIALS SHALL BE DELIVERED TO THE PROJECT SITE AS SPECIFIED BY THE MANUFACTURER, LABELED WITH MANUFACTURER'S NAME, PRODUCT BRAND NAME AND TYPE, DATE OF MANUFACTURE, SHELF LIFE, AND DIRECTIONS FOR STORING AND MIXING WITH OTHER COMPONENTS.
- 2.1.3.2 MATERIALS SHALL BE STORED AS SPECIFIED BY THE MANUFACTURER IN A CLEAN, DRY, PROTECTED LOCATION AND WITHIN THE TEMPERATURE RANGE REQUIRED BY THE MANUFACTURER.
- 2.1.3.3 STORED MATERIALS SHALL BE PROTECTED FROM DIRECT SUNLIGHT.
- 2.1.3.4 MATERIAL THAT CANNOT BE APPLIED WITHIN ITS STATED SHELF-LIFE SHALL BE REMOVED AND REJECTED.
- 2.1.3.5 AREAS ADJACENT TO INSTALLATION AREA SHOULD BE PROTECTED. WHERE NECESSARY, MAKING SHALL BE APPLIED TO PREVENT DAMAGE TO SURFACES TO BE REMOVED. WHERE NECESSARY, MEMBRANE ABUTS TO OTHER FINISH SURFACES. MINIMUM CLEARANCE OF 24 INCHES IS REQUIRED FOR APPLICATION OF PRODUCT. FOR AREAS WITH LESS THAN 24-INCH CLEARANCE, THE MEMBRANE MAY BE APPLIED BY HAND.
- 2.1.3.6 SOL VAPOR BARRIER INSTALLATION SHALL ONLY BE PERFORMED WHEN EXISTING AND FORECASTED WEATHER CONDITIONS ARE WITHIN MANUFACTURER'S RECOMMENDATIONS FOR THE MATERIAL AND APPLICATION METHOD USED. AMBIENT TEMPERATURE SHALL BE WITHIN MANUFACTURER'S SPECIFICATIONS, GREATER THAN 45°F/4°C. (CONSULT MANUFACTURER FOR THE PROPER REQUIREMENTS WHEN DESIRING TO APPLY THE CORE LAYER BELOW 45°F/7°C).
- 2.1.3.7 ALL PLUMBING, ELECTRICAL, MECHANICAL AND STRUCTURAL ITEMS TO BE UNDER OR PASSING THROUGH THE SOL VAPOR BARRIER SYSTEM SHALL BE PROTECTED IN THEIR PROPER POSITIONS AND APPROPRIATELY PROTECTED PRIOR TO MEMBRANE APPLICATION AND SMOKE TESTED IN ACCORDANCE WITH SOL VAPOR BARRIER MANUFACTURER QUALITY ASSURANCE STANDARDS.
- 2.1.3.8 THE SOL VAPOR BARRIER SHALL BE INSTALLED BEFORE PLACEMENT OF FILL MATERIAL AND REINFORCING STEEL. WHEN NOT POSSIBLE, ALL EXPOSED REINFORCING STEEL SHALL BE MASKED BY GENERAL CONTRACTOR PRIOR TO CORE LAYER APPLICATION.
- 2.1.3.9 STAKES USED TO SECURE THE CONCRETE FORMS SHALL NOT PENETRATE THE SOL VAPOR BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED. IF STAKES NEED TO PUNCTURE THE SOL VAPOR BARRIER SYSTEM AFTER IT HAS BEEN INSTALLED, THE NECESSARY REPAIRS NEED TO BE MADE BY A CERTIFIED APPLICATION. TO CORRECT THE STAKING PROCEDURE IN AGREEMENT WITH THE MANUFACTURER'S RECOMMENDATION, CONTACT THE MANUFACTURER.
- 2.1.3.10 THE BASE LAYER SHALL BE INSTALLED OVER SUBSTRATE MATERIAL IN ONE DIRECTION WITH 5X-INCH OVERLAPS AND THE GEOTEXTILE (FABRIC SIDE) FACING DOWN, DEPENDENT ON PER MANUFACTURER SPECIFICATIONS.
- 2.1.3.11 THE BASE SEAMS SHALL BE SECURED BY APPLYING 60 MILS OF CORE BETWEEN THE 6" OVERLAPPED SHEETS WITH THE GEOTEXTILE SIDE DOWN.
- 2.1.3.12 IF APPROVED BY THE MANUFACTURER AND INSTALLER OF THE MEMBRANE, THE BASE SEAMS SHALL BE SECURED BY APPLYING 30 MILS OF CORE ON EITHER SIDE OF THE 6-INCH OVERLAPPED SEAMS (60 MIL TOTAL) WITH THE GEOTEXTILE SIDE DOWN.
- 2.1.3.13 THE INSTALLER SHALL MANUALLY VERIFY THERE ARE NO GAP/FISH MOUTHS IN SEAMS.
- 2.1.3.14 AN EQUAL AMOUNT OF BASE AND CORE SHALL BE INSTALLED IN ONE DAY, LEAVING UNSPRAYED BASE OVERNIGHT MIGHT ALLOW EXCESS MOISTURE TO COLLECT ON THE BASE. IF EXCESS MOISTURE COLLECTS, IT SHALL BE REMOVED.
- NOTE: IN WINDY CONDITIONS IT MIGHT BE NECESSARY TO ENCAPSULATE THE SEAM BY SPRAYING THE CORE LAYER OVER THE COMPLETED BASE SEAM.
- 2.1.3.15 CORE LAYER APPLICATION. SPRAY EQUIPMENT SHALL BE SET UP ACCORDING TO MANUFACTURER'S INSTRUCTIONS AND MATERIALS MIXED AND PREPARED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
- 2.1.3.16 THE TWO CATALYST NOZZLES (800) SHOULD BE ADJUSTED TO CROSS AT ABOUT 18" FROM THE END OF THE WAND. THE AREA OF CATALYST AND EMULSION SPRAY SHOULD BE LESS THAN 24" BUT GREATER THAN 12" FROM THE DESIRED SURFACE WHEN SPRAYING. WHEN PROPERLY SPRAYED, THE FAN PATTERN OF THE CATALYST SHOULD RANGE BETWEEN 85° AND 90°.
- 2.1.3.17 THE AMOUNT OF CATALYST USED SHOULD BE ADJUSTED BASED ON THE AMBIENT AIR TEMPERATURE AND SURFACE TEMPERATURE OF THE SUBSTRATE RECEIVING THE MEMBRANE. IN HOT WEATHER, LESS CATALYST WILL BE USED AS HOT CONDITIONS WILL QUICKLY "BREAK" THE EMULSION AND FACILITATE THE CURING OF THE CATALYST. IN COLD WEATHER, MORE CATALYST WILL BE NEEDED TO "BREAK" THE EMULSION QUICKER TO EXPEDITE CURING AND SET UP TIME IN COLD WEATHER.
- 2.1.3.18 ONE SPRAY COAT OF THE CORE LAYER SHALL BE APPLIED TO OBTAIN A SEAMLESS MEMBRANE FREE FROM PINHOLES OR SHADOWS, WITH AN AVERAGE DRY FILM THICKNESS OF 60 MILS (1.52 mm). THE CORE LAYER SHOULD BE SPRAYED IN A PATTERN THAT IS PERPENDICULAR TO THE APPLICATION SURFACE. THE CONCERN WHEN SPRAYING AT AN ANGLE IS THAT AN AREA MIGHT BE MISSED. USING A PERPENDICULAR SPRAY PATTERN WILL LIMIT VOIDES AND THIS SPOTS, AND WILL ALSO CREATE A UNIFORM AND CONSISTENT MEMBRANE.
- 2.1.3.19 THE FILM THICKNESS OF THE CORE LAYER SHALL BE VERIFIED EVERY 50 SQ FT (46.45 sq m). THE CORE LAYER WILL GENERALLY CURE IN 24 TO 48 HOURS. AS A RULE, WHEN TEMPERATURE DECREASES OR HUMIDITY INCREASES, THE CURING OF THE MEMBRANE WILL BE PROLONGED. THE MEMBRANE DOES NOT NEED TO BE FULLY CURED PRIOR TO THE PLACEMENT OF THE BOND LAYER. PROVIDED 60 MIL THICKNESS HAS BEEN VERIFIED AND A SMOKE TEST WILL BE CONDUCTED.
- 2.1.3.20 WHEN APPLYING TO A VERTICAL CONCRETE WALL, THE CORE LAYER CAN BE APPLIED DIRECTLY TO THE CONCRETE SURFACE USING MANUFACTURER'S RECOMMENDED PROTECTION MATERIAL BASED ON SITE SPECIFIC CONDITIONS. NOTE: CARE SHOULD BE TAKEN TO NOT TRAP MOISTURE BETWEEN THE LAYERS OF THE CORE. TRAPPING MOISTURE MAY OCCUR FROM APPLYING A SECOND COAT PRIOR TO THE MEMBRANE PRIOR TO CURING. REPAIRS AND DETAILING MAY BE DONE OVER THE CORE LAYER WHEN NOT FULLY CURED.
- 2.1.3.21 THE BOND LAYER PROTECTION COURSE SHALL BE INSTALLED PERPENDICULAR TO THE DIRECTION OF THE BASE LAYER WITH OVERLAPPED SEAMS OVER THE NOMINALLY CURED CORE LAYER.
- 2.1.3.22 ANY WATER THAT HAS COLLECTED ON THE SURFACE OF THE CORE LAYER SHALL BE REMOVED PRIOR TO THE PLACEMENT OF THE BOND LAYER.
- 2.1.3.23 THE SEAMS OF THE BOND LAYER SHALL BE OVERLAPPED IN THE SAME MANNER AS THE BASE LAYER.
- 2.1.3.24 FOR MEMBRANE REPAIRS THAT ARE WITHIN 6 INCHES OF CUT SLAB, SEE DETAIL 4/2-1.1. FOR MEMBRANE REPAIRS THAT ARE GREATER THAN 6 INCHES FROM CUT SLAB, SEE DETAIL 4/2-1.1. THE REPAIRED MEMBRANE SHALL BE SMOKE TESTED IN ACCORDANCE WITH NOTE 5.1.1.
- 2.1.4 UTILITY PENETRATIONS THROUGH THE SOL VAPOR BARRIER (AS DESCRIBED BELOW). PENETRATIONS SHALL BE FIELD TESTED FOR QUALITY ASSURANCE IN ACCORDANCE WITH THIS SPECIFICATION AND SOL VAPOR BARRIER MANUFACTURER'S SPECIFICATIONS.
- 2.1.4.1 ALL PIPE PENETRATIONS SHOULD BE SECURED IN PLACE PRIOR TO THE INSTALLATION OF THE SOL VAPOR BARRIER. NO REBAR SHALL BE USED TO SUPPORT ANY PIPING UNDER THE MEMBRANE. PLASTIC OR FIBERGLASS STAKES CAN BE USED TO SUPPORT PIPING UNDER THE MEMBRANE, BUT NO STAKES SHALL PENETRATE THE MEMBRANE.
- 2.1.4.2 ANY LODGE PENETRATIONS SHOULD BE SECURED PRIOR TO MEMBRANE APPLICATION, AS LOOSE PENETRATIONS COULD POTENTIALLY EXERT PRESSURE ON THE SOL VAPOR BARRIER AND DAMAGE THE SOL VAPOR BARRIER AFTER INSTALLATION.
- 2.1.4.3 TO PROPERLY SEAL AROUND PENETRATIONS, THE BASE LAYER SHALL BE CUT TO EXTEND 6" BEYOND THE OUTSIDE PERIMETER OF THE PENETRATION. A HOSE SHALL BE CUT IN THE BASE SOL VAPOR BARRIER BIG ENOUGH TO SLIDE OVER THE PENETRATION, ENSURING THE BASE LAYER FITS snug AGAINST THE PENETRATION. NO GAP LARGER THAN 1/8" SHOULD BE PRESENT BETWEEN THE BASE LAYER AND THE PENETRATION.
- 2.1.4.4 THE BASE LAYER SHALL BE SEALED USING THE CORE TO THE UNDERLYING BASE LAYER. ONE COAT OF CORE SHALL BE APPLIED TO THE BASE LAYER AND AROUND THE PENETRATION AT A THICKNESS OF 30 MILS. THE PENETRATION SHOULD BE TREATED IN A 6-INCH RADIUS AROUND PENETRATION AND 3 INCHES OUTSIDE PENETRATING OBJECT.
- 2.1.4.5 A FABRIC REINFORCING STRIP SHALL BE EMBEDDED AFTER THE FIRST APPLICATION OF THE CORE MATERIAL, AND THEN A SECOND 30-MIL COAT BE APPLIED OVER THE EMBEDDED STRIP AND THE REINFORCING STRIP ENSURING ITS COMPLETE SATURATION OF THE EMBEDDED STRIP AND TIGHT SEAL AROUND THE PENETRATION.
- 2.1.4.6 AFTER THE PLACEMENT OF THE BOND LAYER, A CABLE TIE SHALL BE PLACED AROUND THE FINISHED PENETRATION. THE CABLE TIE SHOULD BE SNUG, BUT NOT OVERLY TIGHT SO AS TO SLICE INTO THE FINISHED SEAL. A FINAL APPLICATION OF CORE MAY BE USED TO PROVIDE A FINISHING SEAL AFTER THE BOND LAYER HAS BEEN INSTALLED.
- NOTE: METAL OR OTHER LIKE KNEE PENETRATION SURFACES MAY REQUIRE TREATMENT IN ORDER TO ACHIEVE PROPER ADHESION. FOR PLASTIC PIPES, SAND PAPER MAY BE USED TO ACHIEVE A PROFILE. AN EMERY CLOTH MAY BE APPROPRIATE FOR METAL SURFACES. AN EMERY CLOTH SHALL ALSO BE USED TO REMOVE ANY RUST ON METAL SURFACES.
- 2.1.4.7 WHERE MULTIPLE PENETRATIONS DO NOT ALLOW THE APPROPRIATE HORIZONTAL CLEARANCE BETWEEN PENETRATIONS FOR THE INSTALLATION OF THE SOL VAPOR BARRIER, A CONCRETE BANK MUST BE POURED AROUND THE PENETRATIONS. THE CONCRETE BANK MUST EXTEND A MINIMUM OF 12 INCHES ABOVE THE LEVEL OF THE SOL VAPOR BARRIER AND A MINIMUM OF 6 INCHES OF CONCRETE MUST BE BETWEEN THE SOL VAPOR BARRIER AND THE OUTER-MOST PENETRATIONS IN THE BANK.
- 2.1.5 FOUNDATION SEAL. PER MANUFACTURER GUIDELINES, GAS TIGHT SEALS SHALL BE PROVIDED WHERE THE SOL VAPOR BARRIER ATTACHES TO INTERIOR AND PERIMETER FOOTINGS.
- 2.2 VENT PIPING
- 2.2.1 MATERIALS. VENT PIPING SHALL CONSIST OF MINIMUM SCHEDULE 40, MINIMUM 3-INCH DIAMETER, RIBED, SMOOTH OR PERFORATED PVC PIPE. PER PLAN DETAILS, CORRUGATED PVC DRAIN PIPING MAY BE USED FOR SHORT RUNS BELOW SHALLOW FOOTINGS AND/OR UTILITY PIPING, AND SHALL BE CONNECTED TO SOLID PVC PIPE USING AN APPROPRIATE FITTING. A FABRIC SLEEVE (AOS FILTER SOCK OR SIMILAR) SHALL BE PLACED AROUND ALL VENT PIPING INCLUDING CORRUGATED PIPING IF IT IS PERFORATED.
- 2.2.2 VENT PIPING TRENCHES. VENT PIPES SHALL BE PLACED IN TRENCHES WITH A MINIMUM OF 2 INCHES OF APPROVED AGGREGATE SUBSTRATES (PER NOTE 2.1.1.1) AROUND THE SIDES AND BOTTOM OF THE VENT PIPE AND 4 INCHES OF APPROVED AGGREGATE ABOVE THE VENT PIPE. A GEO-FABRIC TO PREVENT APPROVED AGGREGATE FROM ENTERING THE VENT PIPES SHALL BE PLACED AROUND THE VENT PIPE.
- 2.2.3 INSTALLATION. VENT PIPING SHALL BE INSTALLED BELOW THE SOL VAPOR BARRIER IN THE MIXED USE BUILDINGS.
- 2.2.3.1 THE VENT PIPING SHALL BE LOCATED NO GREATER THAN 25 FEET APART.
- 2.2.3.2 EXCEPT WHERE NEEDED TO ACCOMMODATE SHALLOW FOOTINGS AND/OR UTILITIES, UNDULATIONS IN THE VENT PIPING, WHICH MAY IMPED THE FLOW OF GAS, SHALL BE AVOIDED.
- 2.2.3.3 VENT PIPING SHALL BE CONNECTED TO VENT RISERS WHICH EXTEND ABOVE THE BUILDING.
- 2.3 VENT RISERS
- 2.3.1 MATERIAL. VENT PIPING SHALL CONSIST OF MINIMUM 4-INCH DIAMETER CAST IRON OR GALVANIZED STEEL AND SHALL COMPLY WITH THE UNIFORM PLUMBING AND MECHANICAL CODES. ALL JOINTS SHALL BE TIGHTLY SEALED WITH APPROVED MATERIALS.
- 2.3.2 INSTALLATION. VENT RISERS SHALL BE CONNECTED TO VENT PIPING AND EQUIPPED WITH A SHUT-OFF VALVE AS SHOWN IN THESE PLANS.
- 2.3.2.1 WHERE VENT RISERS ARE CAST IN CONCRETE, PIPING SHALL BE WRAPPED WITH HIGH DENSITY PVC FOAM TAPE [CLOSED CELL, ADHESIVE BACKED, 3/8-INCH THICK (MINIMUM) BY 4-INCH WIDE (MINIMUM)].
- 2.3.2.2 WHERE VENT RISERS TRANSITION THROUGH BUILDING FOOTINGS, THE PENETRATION SHALL BE ACCOMPLISHED WITH THE APPROVAL OF THE PROJECT STRUCTURAL ENGINEER.
- 2.3.2.3 VENT RISERS SHALL BE PROPERLY SECURED WITH BRACKETS A MINIMUM OF EVERY 5 FEET.
- 2.3.2.4 VENT RISER PIPE SHALL BE CLEARLY MARKED TO INDICATE THAT THE PIPE MAY CONTAIN VAPORS. THIS MAY BE ACCOMPLISHED THROUGH TIGHT LABELS OR OTHER PERMANENT LABELING METHOD. VENT RISER PIPE SHALL BE CLEARLY AND PERMANENTLY LABELED "VAPOR", IN 1/2" HIGH LETTERS, NEAR THEIR TERMINATION POINT AND AT 5-FOOT INTERVALS ALONG THE REMAINDER OF THE VENT PIPE. THE LABELS SHOULD BE ENGAGED WITH WALLS OR OTHER ENCLOSURES. THE MINIMUM TEXT SIZE FOR ALL LETTERS ON SIGAGE IS 1/8".
- 2.3.2.5 TO PREVENT UV DAMAGE, VENT RISERS SHALL BE PAINTED WITH A LIGHT-COLORED, WATER-BASED PAINT WHEN EXPOSED TO SUNLIGHT.
- 2.3.2.6 UPON INSTALLATION, VMS VENT RISERS SHALL BE PAINTED WITH A LIGHT-COLORED, WATER-BASED PAINT WHEN EXPOSED TO SUNLIGHT.
- 2.3.2.7 VENT RISERS SHALL REMAIN VERTICAL. IF NECESSARY, HORIZONTAL SPANS SHALL BE MINIMIZED AND NOT EXCEED 45 DEGREES RELATIVE TO VERTICAL.
- 2.3.2.8 OUTLETS. VENT RISER OUTLETS ATTACHED TO, OR PENETRATING THE SIDES OF, BUILDINGS SHOULD BE LOCATED AT LEAST 15 FEET ABOVE GROUND LEVEL, AT LEAST ONE FOOT ABOVE THE LEVEL OF THE ROOF, AND AT LEAST 10 FEET AWAY FROM ANY OPENABLE WINDOW, DOOR, OPENING, AIR INTAKE, OR VENT SHAFT, AND AT LEAST 3 FEET FROM ANY LOT LINE, ALLEY OR STREET.
- 2.3.2.1 VENT RISER OUTLETS ABOVE THE ROOF LINE SHOULD TERMINATE ABOVE THE HIGHEST POINT OF THE ROOF OF THE BUILDING OR ROISE, WHERE PRACTICABLE.
- 2.3.2.2 VENT RISER OUTLETS SHALL TERMINATE A MINIMUM OF 2 FEET ABOVE THE ROOF LINE. EACH PASSIVE VENT RISER SHALL BE EQUIPPED WITH A SPINNER VENT.
- 2.3.2.3 CONTINGENCY TO CONVERT PASSIVE SYSTEM TO ACTIVE. THE CONDITIONS REQUIRING THE SYSTEM TO BE CONVERTED TO ACTIVE WILL BE PROVIDED IN THE OPERATION AND MAINTENANCE (O&M) PLAN. CONVERSION TO AN ACTIVE SYSTEM MAY INVOLVE THE INSTALLATION OF IN-LINE FANS (E.G., RADON FANS) ON EACH RISER PIPE ON THE ROOF OF THE BUILDING.
- 2.3.4.1 TO ALLOW AN EASIER CONVERSION TO AN ACTIVE SYSTEM IN THE EVENT THE PASSIVE SYSTEM IS CONVERTED TO ACTIVE, ELECTRICAL JUNCTION BOXES OR 120V VOLT ELECTRICAL OUTLETS SHALL BE INSTALLED ON THE ROOF ADJACENT TO EACH RISER PIPE.
- 2.4 MONITORING PROBES AND SAMPLING PORTS
- 2.4.1 MATERIAL. MONITORING PROBES SHALL BE CONSTRUCTED OF STAINLESS STEEL TUBING CONNECTED TO SAMPLING PROBES SHALL BE 3/8-INCH DIAMETER TIE-ON TUBING OR EQUIVALENT. PROTECTIVE COATING AROUND SAMPLE TUBING SHALL BE CONNECTED OF MINIMUM SCHEDULE 80 PVC AND SHALL BE NO SMALLER THAN 5 INCH IN DIAMETER. MONITORING PROBES SHALL BE CONSTRUCTED TO WITHSTAND CORROSION AND CONSTRUCTION OF THE SUBS. ALL JOINTS SHALL BE TIGHTLY SEALED WITH APPROVED MATERIALS. SAMPLING PORT PIPING AND ASSOCIATED FITTINGS SHALL BE CONSTRUCTED OF MINIMUM SCHEDULE 80 PVC. ALL JOINTS SHALL BE TIGHTLY SEALED WITH APPROVED MATERIALS.
- 2.4.2 INSTALLATION. MONITORING PROBE PIPING SHALL BE INSTALLED IN MIDDLE OF AGGREGATE LAYER WITH SAMPLING TUBING CONNECTED THROUGH PROTECTIVE CONDUIT. SAMPLING PORTS SHALL BE ROUTED TO THE OUTSIDE AND EQUIPPED WITH A SAMPLING PORT AND A SHUT-OFF VALVE.
- 2.4.2.1 WHERE MONITORING PROBE PIPING IS CAST-IN CONCRETE, PIPING SHALL BE WRAPPED WITH HIGH DENSITY PVC FOAM TAPE [CLOSED CELL, ADHESIVE BACKED, 3/8-INCH THICK (MINIMUM) BY 4-INCH WIDE (MINIMUM)].
- 2.4.2.2 WHERE MONITORING PROBE PIPING TRANSITIONS THROUGH BUILDING FOOTINGS, THE PENETRATION SHALL BE ACCOMPLISHED IN COMPLIANCE WITH THE UNIFORM BUILDING CODE AND WITH THE APPROVAL OF THE PROJECT STRUCTURAL ENGINEER.
- 2.4.2.3 MONITORING PROBE PIPING SHOULD TERMINATE INSIDE OF A UTILITY VAULT AND IT MUST BE DRAINAGE IF IT IS A DRAINAGE.
- 2.4.2.4 UTILITY VAULT SHALL BE WATER-TIGHT AND INSTALLED SO THAT WATER DRAINS AWAY FROM THE I/D.
- 3 UTILITY CORRIDOR PROTECTION
- 3.1 INSTALLATION. TRENCH DAMS SHALL BE INSTALLED TO PROTECT UTILITY CORRIDORS FROM THE MIGRATION OF UNDERGROUND GAS INTO BUILDINGS OR STRUCTURES ALONG THE TRENCH BACKFILL. ALL PIPING AND ELECTRICAL CONDUITS INSTALLED BELOW GROUND SHALL BE PLACED IN TRENCHES SEALED WITH TRENCH DAMS PRIOR TO ENTERING THE BUILDING UNLESS PROHIBITED BY APPLICABLE BUILDING CODES.
- 3.2 MATERIALS. TRENCH DAMS SHALL BE CONSTRUCTED OF ONE OF THE FOLLOWING:
- 3.2.1 BENTONITE CEMENT SLURRY TRENCH DAM. A MIXTURE OF 4% TYPE I CEMENT AND 26% POWDERED BENTONITE. TRENCH DAM SHALL EXTEND A MINIMUM OF 3 FEET FROM THE BUILDING FOUNDATION, 4 INCHES BEYOND THE LIMITS OF THE UTILITY TRENCH AND 8 INCHES ABOVE THE BOTTOM OF THE FOUNDATION.
- 3.2.2 COMPACTED NATIVE SOIL TRENCH DAM. NATIVE SOILS SHALL BE COMPACTED AT LEAST 90% RELATIVE COMPACTION IN ACCORDANCE WITH ASTM D-1557 TESTING PROCEDURES. THE LENGTH OF THE COMPACTED NATIVE SOIL TRENCH DAM SHALL BE A MINIMUM OF 3 FEET FOR TRENCHES THAT ARE 18 INCHES WIDE OR LESS. FOR UTILITY TRENCHES THAT ARE WIDER THAN 18 INCHES, THE LENGTH OF THE TRENCH DAM SHALL BE A MINIMUM OF 3 TIMES THE UTILITY TRENCH WIDTH.
- 3.2.3 CONCRETE MIXES OTHER THAN BENTONITE CEMENT SLURRY MAY BE USED FOR UTILITY TRENCH DAMS PROVIDED THAT CONDUIT OR PIPING WITH HIGH DENSITY PVC BARRIER TAPE [CLOSED CELL, ADHESIVE BACKED, 3/8-INCH THICK (MINIMUM) BY 5 INCH WIDE (MINIMUM)] WITHIN THE TRENCH DAM. THE TAPE SHALL BE APPLIED TO A CLEAN SURFACE AND WITH SAMS BUTTED TOGETHER. CONDUIT/PIPING PROTECTION REQUIREMENTS SHOULD BE VERIFIED WITH UTILITY PROVIDER'S STANDARDS. TRENCH DAMS SHALL EXTEND A MINIMUM OF 3 FEET FROM THE BUILDING FOUNDATION, 4 INCHES BEYOND THE LIMITS OF THE UTILITY TRENCH AND 8 INCHES ABOVE THE BOTTOM OF THE FOUNDATION.
- 3.3 CORROSION PROTECTION. PIPING AND CONDUIT PLACED IN TRENCH DAMS SHALL BE PROTECTED FROM CORROSION AND SETTLEMENT AS NEEDED DEPENDING ON THE SIZE AND TYPE OF PIPING MATERIAL, AND UTILITY PROVIDER STANDARDS. CONDUIT INSTALLERS WILL BE RESPONSIBLE FOR UNDERSTANDING THE CORROSION OF THE BACKFILL MATERIALS, AS NECESSARY.
- 3.4 CONDUIT SEALS. CONDUIT SEALS SHALL BE PROVIDED AT THE TERMINATION OF ALL UTILITY CONDUITS TO REDUCE THE POTENTIAL FOR ELAVATED CONCENTRATIONS OF CHEMICALS IN SOL VAPOR TO MIGRATE ALONG THE CONDUIT TO OTHER NON-IMPACTED AREAS OF THE SITE. SEALS SHALL BE CONSTRUCTED OF CLOSED CELL POLYURETHANE FOAM OR OTHER INERT GAS IMPERMEABLE MATERIAL, EXTENDING A MINIMUM OF SIX INCHES AND A MAXIMUM OF FOUR CONDUIT DIAMETERS INTO THE CONDUIT. WHERE THE CONDUIT ENTERS THE BUILDING, THE SEAL SHOULD BE PLACED BELOW THE BUILDING SLAB. ELECTRICAL CONDUIT SHOULD BE PROVIDED WITH THE FOLLOWING:
- 4 NOTIFICATION PLACARDS
- 4.1 PERMANENT NOTIFICATION PLACARDS ARE REQUIRED TO INDICATE THE PRESENCE OF THE SOL VAPOR BARRIER AND/OR VENT PIPING.
- 4.1.1 THE NOTIFICATION PLACARDS SHALL BE POSTED AND MAINTAINED AT THE FRONT OF THE BUILDING THAT IS CONSTRUCTED WITH A SOL VAPOR BARRIER AND/OR VENT PIPING.
- 4.1.2 THE NOTIFICATION PLACARD SHALL BE UNCOVERED AND LOCATED IN A CONSPICUOUS LOCATION.
- 4.1.3 WHEN CAST IN FLOORS, THE PLACARD SHALL ALSO REMAIN UNCOVERED AND IN A CONSPICUOUS LOCATION.
- 4.2 NO OTHER FORMS OF NOTIFICATION (E.G., AN ALARM SYSTEM) ARE SPECIFIED FOR THE VIMS.
- 5 QUALITY ASSURANCE
- 5.1 INITIAL QUALIFICATIONS. VAPOR MEMBRANE INSTALLER SHALL BE AN EPFO AUTHORIZED CONTRACTOR WHOSE TRAINING AND PROVISIONS SHALL BE IN ACCORDANCE WITH EPFO STANDARDS AND POLICIES, FOR PROJECT REQUIRING A NO-DOLLAR LIMIT LABOR AND MATERIAL WARRANTY. THE VAPOR MEMBRANE INSTALLER SHALL BE A SIGNATURE CERTIFIED AT THE TIME OF BIDDING. LEAK TESTING PERFORMED BY THE INSTALLER WILL BE OVERSEEN BY RAMBOLL.
- 5.2 CERTIFIED THIRD PARTY INSPECTION. AS REQUIRED BY THE MANUFACTURER'S WARRANTY, AN INDEPENDENT INSPECTOR MUST BE HIRED BY THE INSTALLER TO INSPECT AND VERIFY THAT THE SOL VAPOR BARRIER HAS BEEN INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS. THE INDEPENDENT INSPECTOR SHALL BE A SIGNATURE CERTIFIED AND COMPLY WITH THE DOCUMENTATION REQUIREMENTS FOR PROJECTS WITH METHANE GAS PRESENT. INSPECTORS MUST MEET THE LOCAL BUILDING CODE REQUIREMENTS AND THE REQUIREMENTS SET FORTH BY THE MANUFACTURER.
- 5.3 PRE-INSTALLATION MEETING. A MEETING SHALL BE HELD PRIOR TO APPLICATION OF THE WATERPROOFING SYSTEM TO ASSURE PROPER SUBSTRATE PREPARATION, CORNER NOTIFICATION CONDITIONS, AND ANY ADDITIONAL PROJECT SPECIFIC REQUIREMENTS. ATTENDEES OF THE MEETING SHALL INCLUDE, BUT ARE NOT LIMITED TO THE FOLLOWING:
- EPFO REPRESENTATIVE, EPFO CERTIFIED INSTALLER, THIRD PARTY INSPECTOR, GENERAL CONTRACTOR, OWNER REPRESENTATIVE, CONCRETE/SHORTCURE CONTRACTOR, REBAR CONTRACTOR, PROJECT DESIGN TEAM AND ALL APPROPRIATE RELATED TRADES.
- 5.4 FIELD SAMPLE. APPLY MEMBRANE SYSTEM FIELD SAMPLE EVERY 500 FT² (46.5 M²) OF APPLIED SPRAY LAYER TO DEMONSTRATE PROPER APPLICATION TECHNIQUES AND STANDARDS OF WORKMANSHIP.
- 5.5 NOTIFY ARCHITECT AND INDEPENDENT INSPECTOR ONE WEEK IN ADVANCE OF THE DATES AND TIMES WHEN FIELD SAMPLES WILL BE PREPARED.
- 5.6 IF ARCHITECT AND INDEPENDENT INSPECTOR DETERMINES THAT FIELD SAMPLE DOES NOT MEET REQUIREMENTS, REAPPY MEMBRANE SYSTEM UNTIL FIELD SAMPLE IS APPROVED.
- 5.7 NOTIFY COMPOSITE MEMBRANE SYSTEM MANUFACTURER REPRESENTATIVE, ARCHITECT, CERTIFIED INSPECTOR, AND OTHER APPROPRIATE PARTIES ONE WEEK IN ADVANCE OF THE DATES AND TIMES WHEN FIELD SAMPLE WILL BE PREPARED.
- 5.8 IF ARCHITECT AND CERTIFIED INSPECTOR DETERMINES THAT FIELD SAMPLE DOES NOT MEET REQUIREMENTS, REAPPY COMPOSITE MEMBRANE SYSTEM UNTIL FIELD SAMPLE IS APPROVED.
- 5.9 RETAIN AND MAINTAIN APPROVED FIELD SAMPLE DURING CONSTRUCTION IN AN UNDISTURBED CONDITION AS A STANDARD FOR JUDGING THE COMPLETED PROPOSED MEMBRANE SYSTEM. AN UNDAMAGED FIELD SAMPLE MAY BECOME PART OF THE COMPLETED WORK.
- 5.10 MATERIALS. MEMBRANE MATERIALS AND SYSTEM SHALL BE SINGLE SOURCED.
- 5.11 ONE ROUND OF SMOKE TESTING SHALL BE PERFORMED PRIOR TO THE INSTALLATION OF CONCRETE REINFORCING. SMOKE TESTING SHALL BE CONDUCTED PER THE SMOKE TESTING PROTOCOL PROVIDED BY THE SOL VAPOR BARRIER MANUFACTURER, WHERE LEAKS ARE IDENTIFIED, REPAIRS SHOULD BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND ADDITIONAL TESTING PERFORMED UNTIL NO LEAKS ARE DETECTED.
- 6 INSPECTIONS
- 6.1 IN ADDITION TO THE THIRD PARTY INSPECTIONS DISCUSSED IN NOTE 5.2, INSPECTION AND PERIODIC OBSERVATIONS OF THE VIMS SHALL BE PERFORMED BY THE VAPOR BARRIER ENGINEER (I.E. THE ENGINEER OR THEIR DESIGNEE) AT A MINIMUM, INSPECTION/OBSERVATION SHALL TAKE PLACE AT THE FOLLOWING STAGES OF THE INSTALLATION:
- 6.1.1 DURING THE INSTALLATION OF THE (SUB-SLAB) VENT PIPING.
- 6.1.2 AFTER BACKFILLING OF THE (SUB-SLAB) VENT PIPING.
- 6.1.3 DURING THE INSTALLATION OF THE (SUB-SLAB) SOL VAPOR BARRIER.
- 6.1.4 AFTER THE INSTALLATION OF THE (SUB-SLAB) SOL VAPOR BARRIER, THE VAPOR BARRIER SHALL BE SMOKE TESTED AT THIS TIME. THE SMOKE TESTING WILL BE PERFORMED BY THE INSTALLER AND OBSERVED BY THE VAPOR BARRIER ENGINEER AND THE THIRD PARTY INSPECTOR. THESE TESTS SHALL BE DOCUMENTED IN THE AS-BUILT REPORT.
- 6.1.5 DURING THE PLACEMENT OF THE PROTECTIVE COURSE.
- 6.1.6 PRIOR TO PLACING THE CONCRETE SLAB OVER THE SOL VAPOR BARRIER, THE VAPOR BARRIER INSTALLER SHALL CERTIFY IN WRITING THAT THE SOL VAPOR BARRIER HAS BEEN INSTALLED AND TESTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND A FREE OF LEAKS.
- 6.1.7 DURING, AND AT THE COMPLETION OF, THE VENT RISER INSTALLATION FOR THE (SUB-SLAB) VENT PIPING.
- 6.1.8 AT THE COMPLETION OF CONSTRUCTION PRIOR TO THE RESUMANCE OF THE CERTIFICATION OF OCCUPANCY.
- 6.2 AS-BUILT PLANS AND THE INSTALLER'S FINAL CERTIFICATION OF THE SOL VAPOR BARRIER SYSTEM SHALL BE SUBMITTED TO THE OWNER AT THE COMPLETION OF THE FINAL INSPECTION.
- 6.3 THE VAPOR BARRIER ENGINEER/ENGINEER OF RECORD SHALL PROVIDE A REPORT OF THEIR PERIODIC OBSERVATIONS TO THE OWNER AT THE CONCLUSION OF THE INSTALLATION.
- 7 OPERATION AND MAINTENANCE
- 7.1 ROUTINE OPERATION AND MAINTENANCE (O&M) MAY CONSIST OF PERIODIC SITE VISITS TO CHECK ON SYSTEM OPERATION AND CONDUCT ROUTINE MAINTENANCE REQUIRED BY THE MANUFACTURER'S SPECIFICATIONS. INSPECTION FREQUENCY WILL BE SPECIFIED IN AN OPERATION, MAINTENANCE AND MONITORING (O&M&M) PLAN.
- 7.2 O&M WILL BE CONDUCTED FROM ACCESSIBLE, EXTERIOR PORTIONS OF THE BUILDING ONLY.
- 7.3 VAPOR SAMPLING FROM VAPOR PROBES WILL BE CONDUCTED FROM EXTERIOR PORTIONS OF THE BUILDING IN ACCORDANCE WITH AGENCY REQUIREMENTS.

GENERAL NOTES (CONTINUED)

ABBREVIATIONS

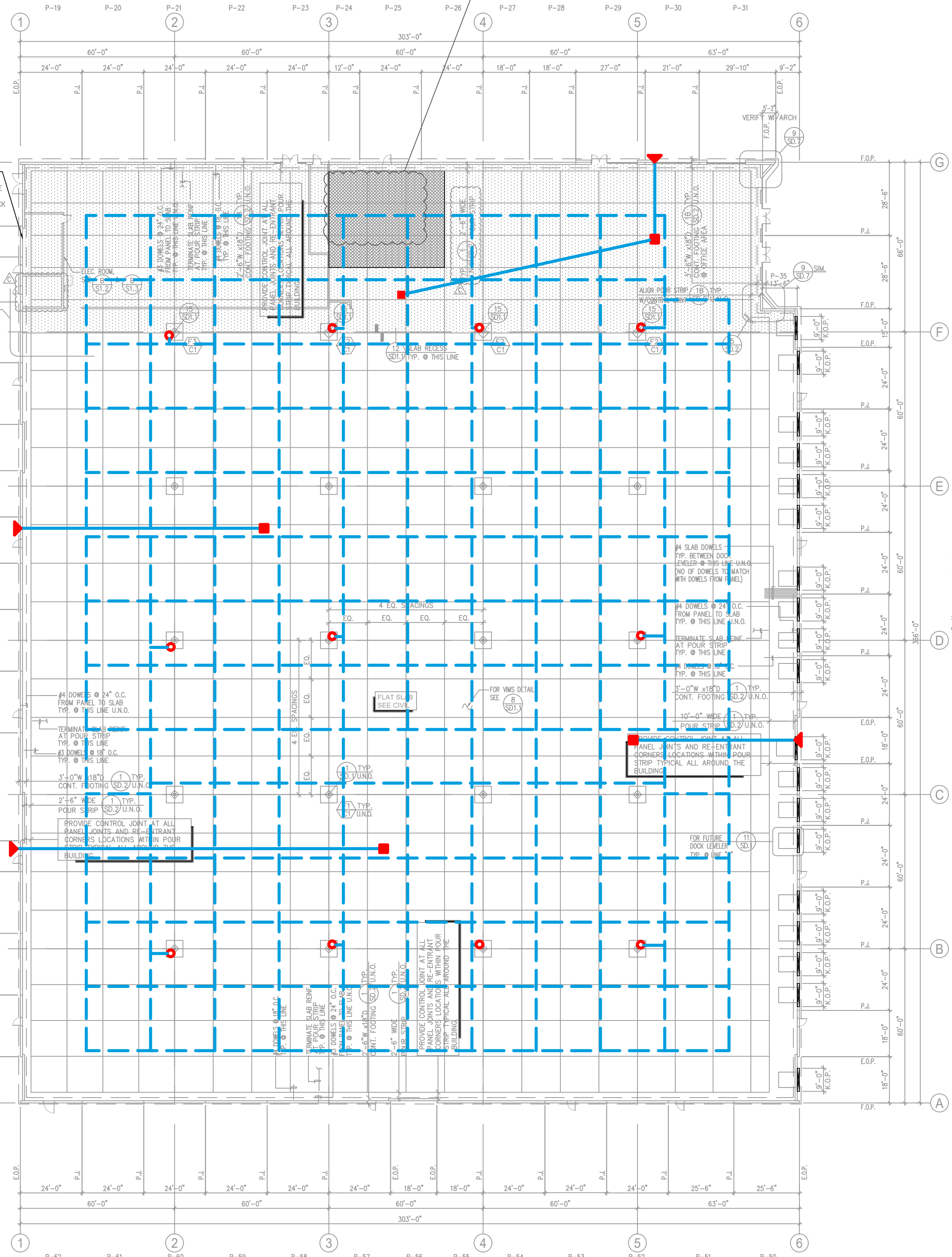
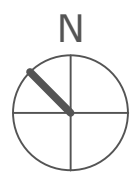
VIMS = VAPOR INTRUSION MITIGATION SYSTEM

SYMBOLS

- HORIZONTAL VENT PIPE
- ▲ SAMPLE VAULT
- VENT RISER PIPE
- SAMPLE PROBE

SITE LAYOUT

SCALE: 1" = 30'



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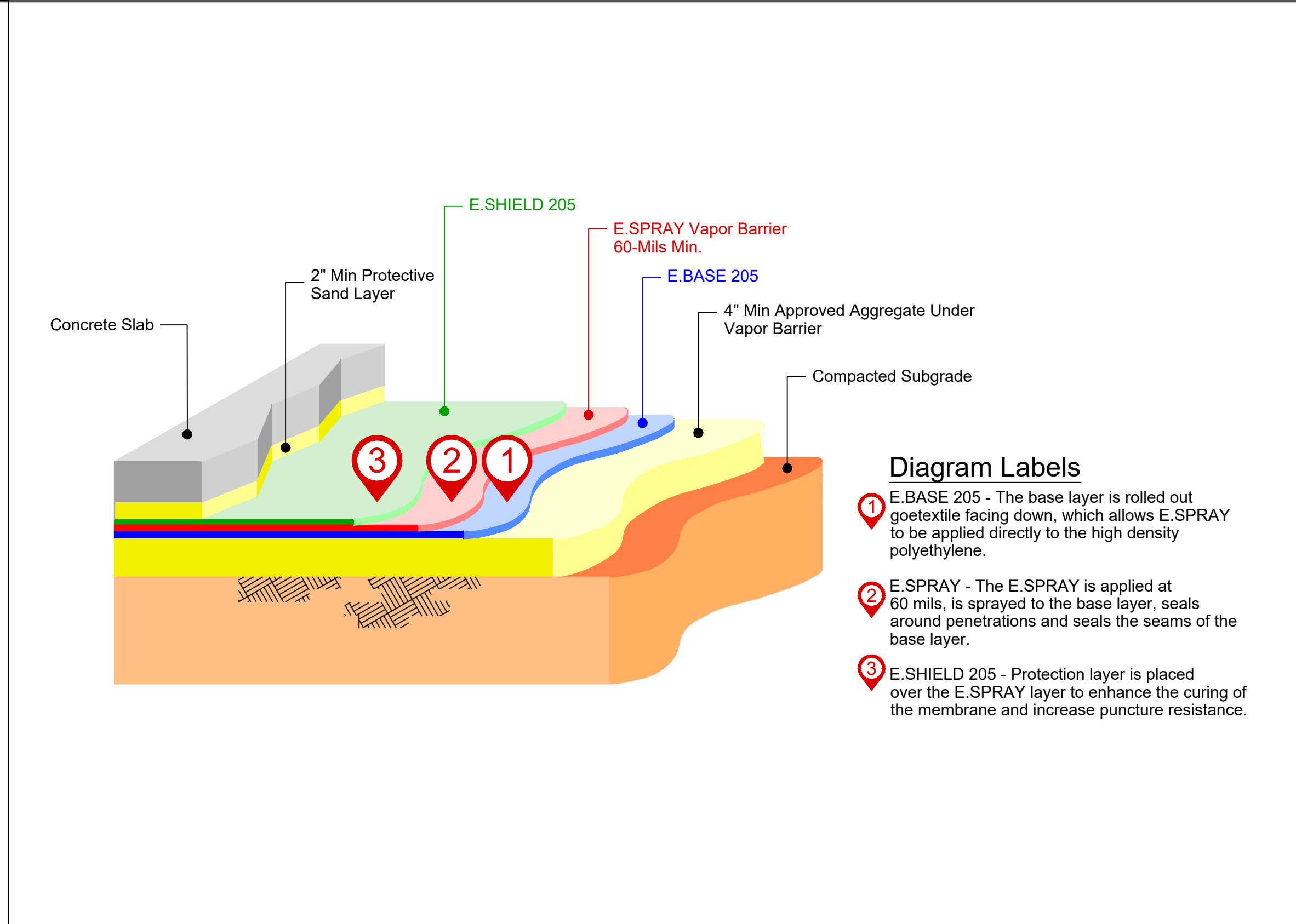
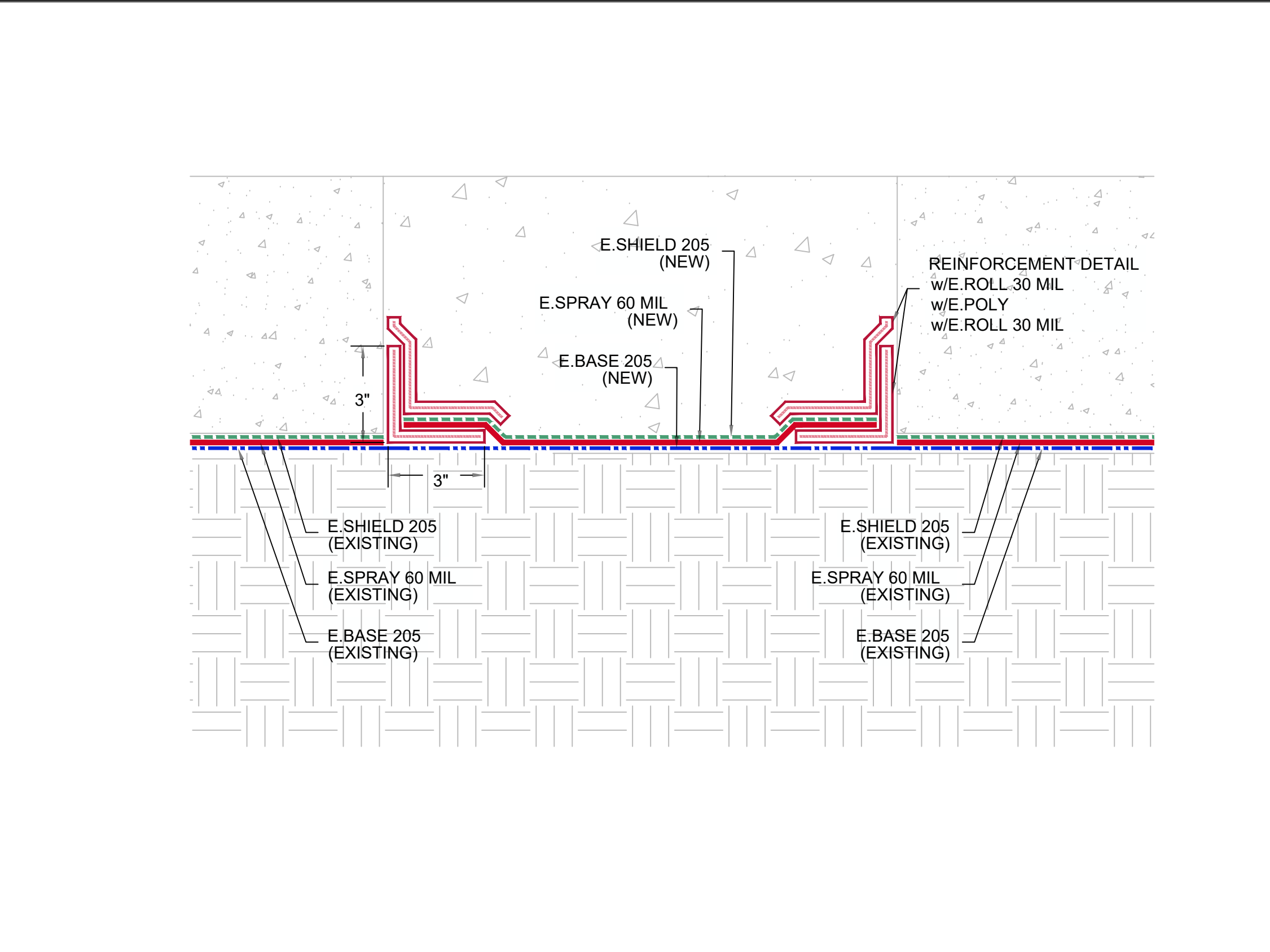
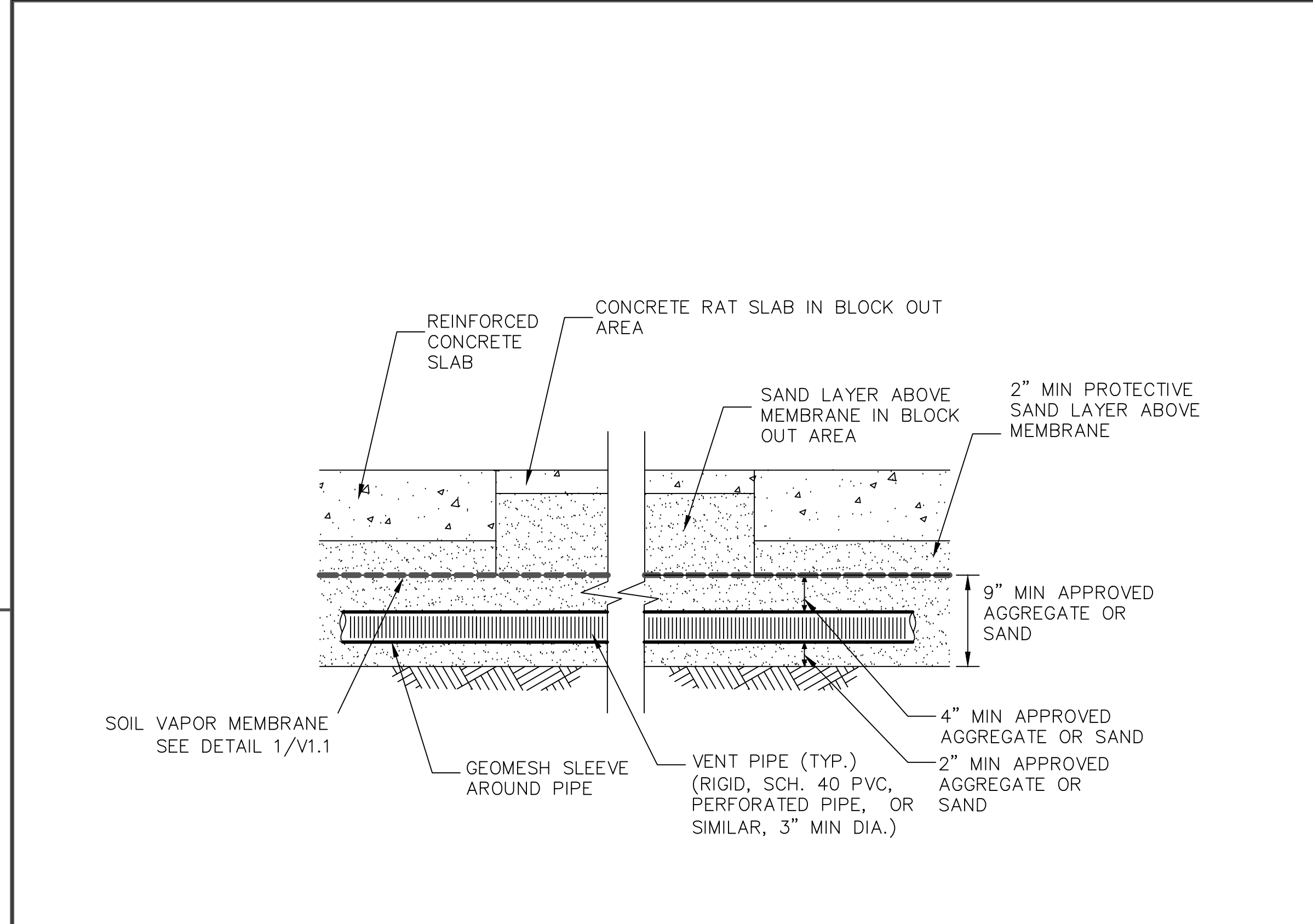
17300 RED HILL AVE.
IRVINE, CALIFORNIA 92614

VIMS NOTES

DATE	REVISIONS
2/14/2020	1. PLAN CHECK CORRECTIONS 3
2/14/2020	2. REVISED
3	
7	

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JOB NO.: 1690027919_Conv-002

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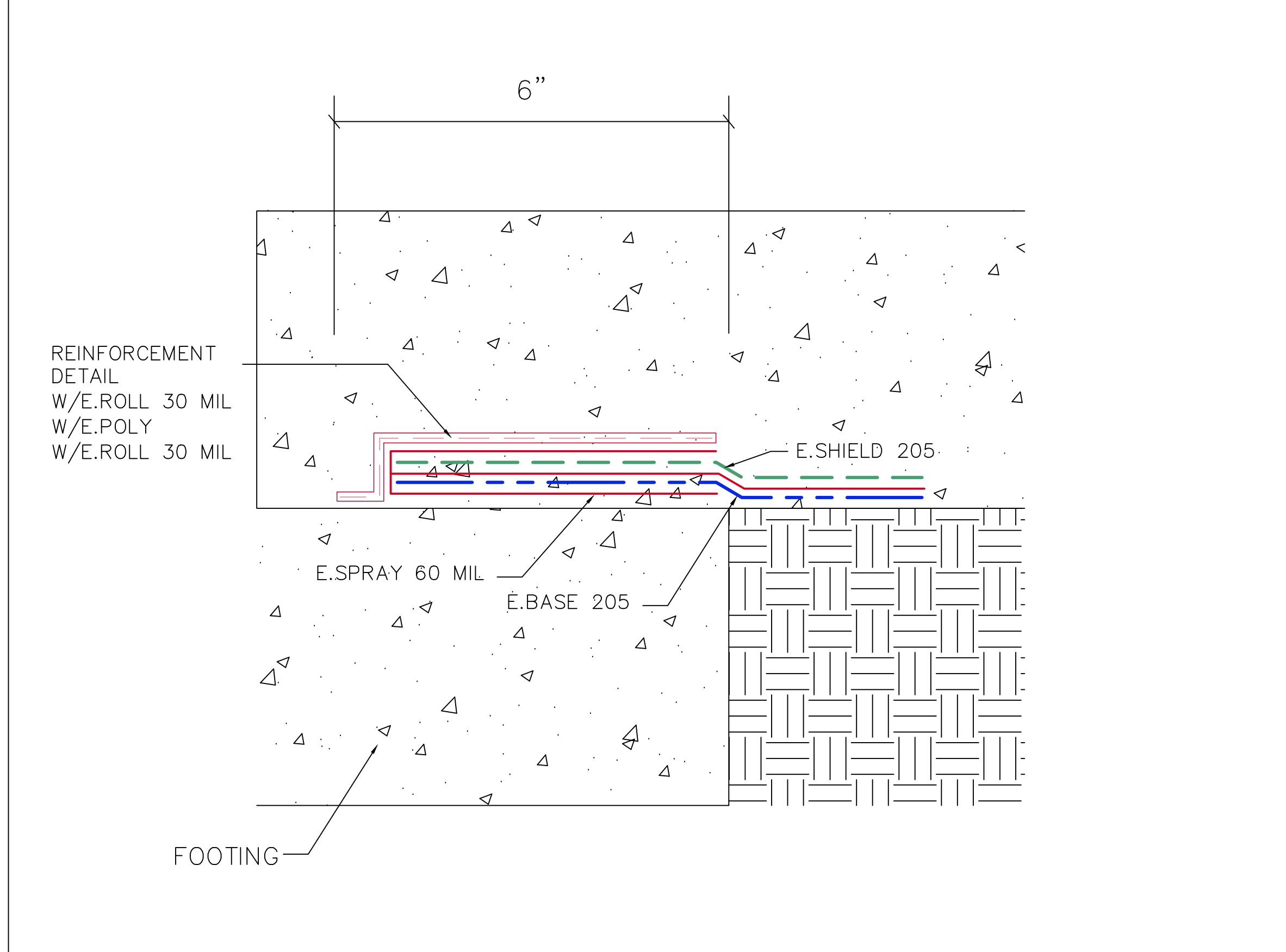
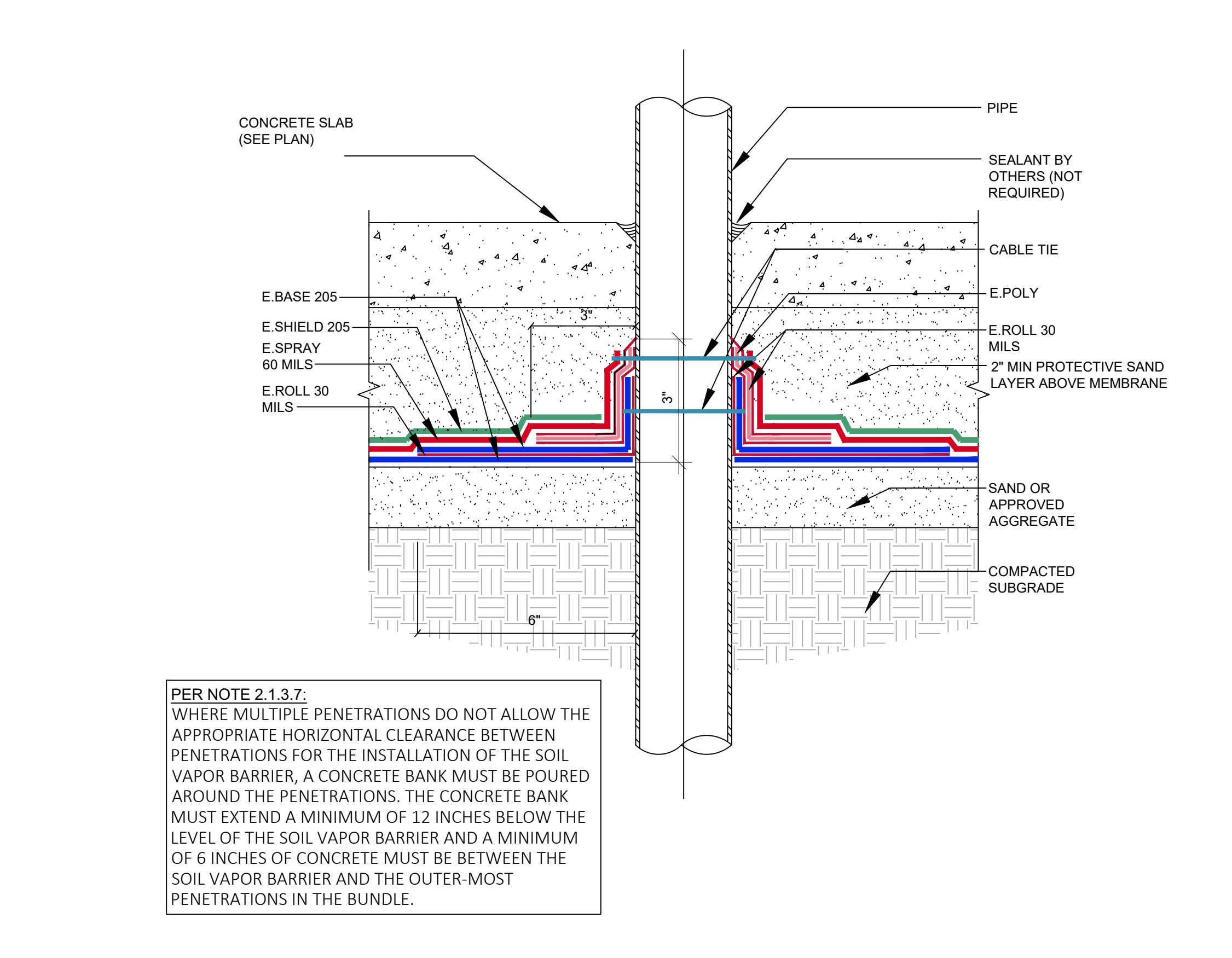
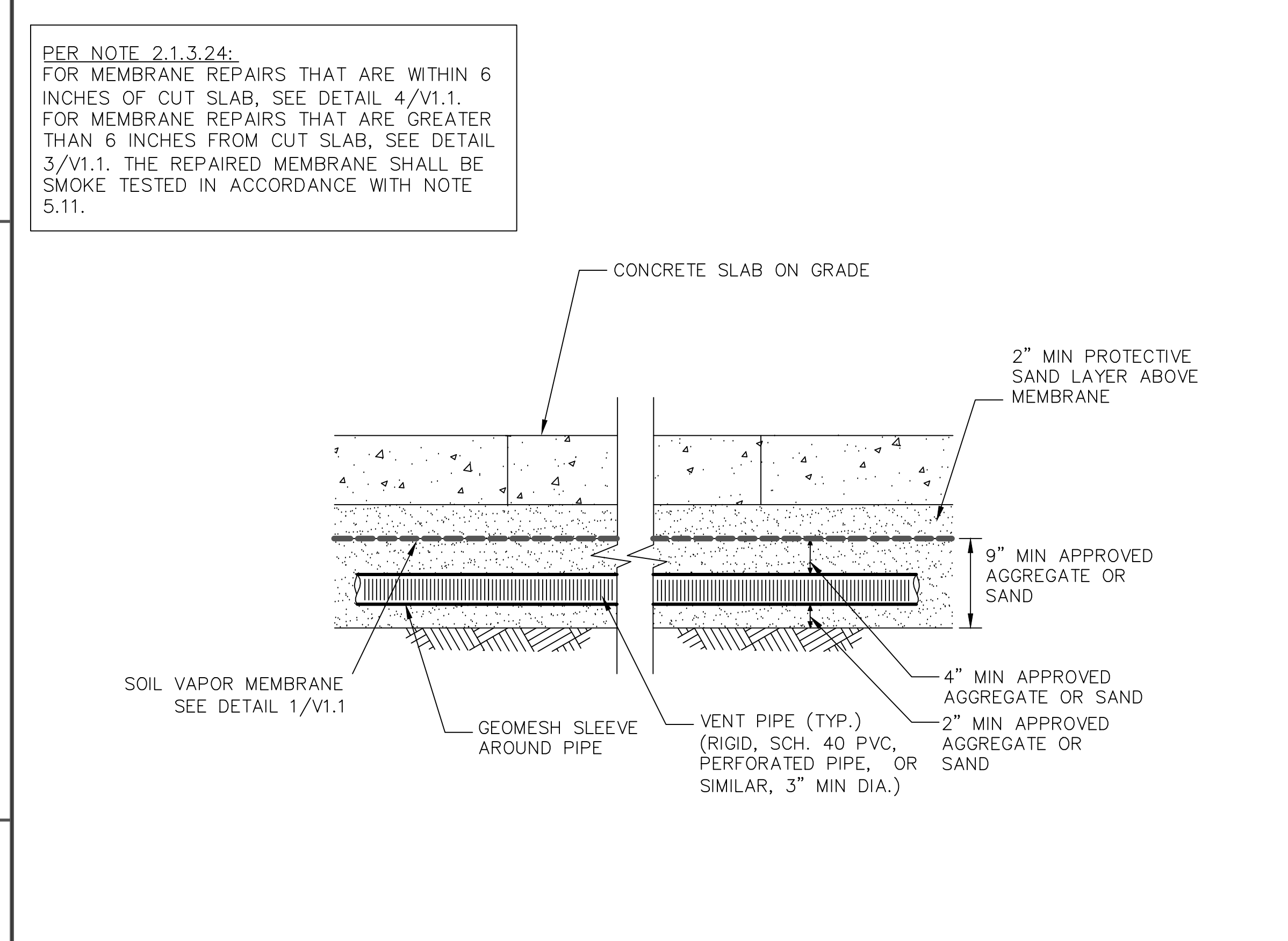


EXISTING MEMBRANE AT SLAB BLOCK OUT (BEFORE TENANT IMPROVEMENT)

7 MEMBRANE REPAIR AGAINST CUR SLAB

4 VAPOR BARRIER CONFIGURATION

1

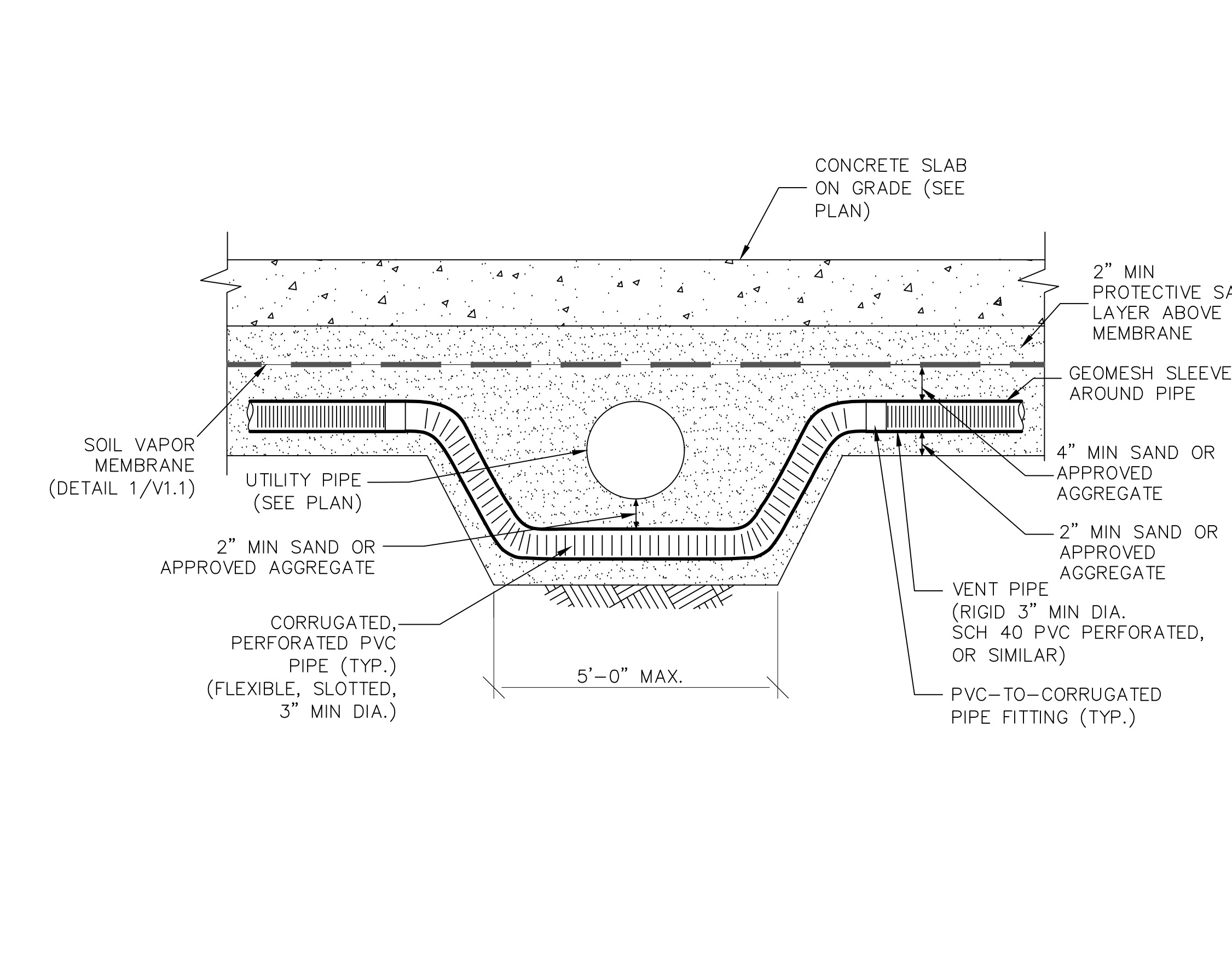


MEMBRANE AT COMPLETION OF TENANT IMPROVEMENT FOR KITCHEN

8 PIPE PENETRATION

5 MEMBRANE TERMINATION DETAIL

2



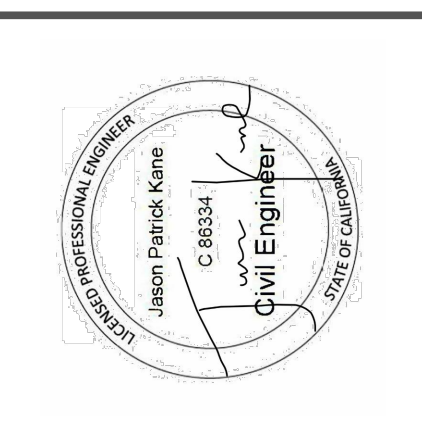
VENT PIPE CROSSING UNDERGROUND PIPE

6 MEMBRANE OVERLAP DETAIL

MEMBRANE OVERLAP DETAIL

3

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VIMS DETAILS	
DATE	REMARKS
2/4/2026	PLAN CHECK CORRECTIONS 3
4/30/2026	REV. 10/26/2024 2
3	
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