# SECTION 07 13 53

# ELASTOMERIC SHEET MEMBRANE WATERPROOFING

## PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes the requirements for sheet-applied elastomeric membrane waterproofing. Typical applications include but are not limited to waterproofing of below grade walls and foundations, and plaza decks. The location and extent of membrane waterproofing are indicated on the Contract Drawings.

1.02 REFERENCES

A. This Section incorporates by reference the latest revisions or the dated references (as noted) of the following documents.

1. ASTM International (ASTM)

a. ASTM C836/C836M Standard Specification for High Solids Content, Cold Liquid-Applied Elastomeric Waterproofing Membrane for Use with Separate Wearing Course

b. ASTM D41/D41M Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

c. ASTM D146/D146M Standard Test Methods for Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing

d. ASTM D297 Standard Test Methods for Rubber Products - Chemical Analysis

e. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension

f. ASTM D429 Standard Test Methods for Rubber Property - Adhesion to Rigid Substrates

g. ASTM D471 Standard Test Method for Rubber Property - Effect of Liquids

h. ASTM D570 Standard Test Method for Water Absorption of Plastics

i. ASTM D573 Standard Test Method for Rubber - Deterioration in an Air Oven

j. ASTM D624 Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers

k. ASTM D638 Standard Test Method for Tensile Properties of Plastics

l. ASTM D746 Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact

m. ASTM D903 Standard Test Method for Peel or Stripping Strength of Adhesive Bonds

n. ASTM D1004 Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting

o. ASTM D1149 Standard Test Methods for Rubber Deterioration - Cracking in an Ozone Controlled Environment

p. ASTM D1204 Standard Test Method for Linear Dimensional Changes of Nonrigid Thermoplastic Sheeting or Film at Elevated Temperature

q. ASTM D1876 Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)

r. ASTM D1970/D1970M Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection

s. ASTM D2136 Standard Test Method for Coated Fabrics - Low-Temperature Bend Test

t. ASTM D2240 Standard Test Method for Rubber Property - Durometer Hardness

u. ASTM D3045 Standard Practice for Heat Aging of Plastics without Load

v. ASTM D3767 Standard Practice for Rubber-Measurement of Dimensions

w. ASTM D4787 Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates

x. ASTM D5385 Standard Test Method for Hydrostatic Pressure Resistance of Waterproofing Membranes

y. ASTM D5957 Standard Guide for Flood Testing Horizontal Waterproofing Installations

z. ASTM E96/E96M Standard Test Methods for Water Vapor Transmission of Materials

aa. ASTM E154/E154M Standard Test Methods for Water Vapor Retarders Used in Contact with Earth under Concrete Slabs, on Walls, or as Ground Cover

bb. ASTM G62 Standard Test Methods for Holiday Detection in Pipeline Coatings

cc. ASTM WK27666 New Practice for Electrical Conductance Methods for Locating Leaks in Exposed or Covered Waterproof Membranes

2. Washington State Department of Transportation (WSDOT)

a. WSDOT Standard Specifications for Road, Bridge, and Municipal Construction, 2018 edition

1.03 SUBMITTALS AND TRANSMITTALS

A. Submit the following:

1. Shop Drawings: Drawings, diagrams, instructions, and schedules specifically prepared to illustrate the work, as aids to the Contractor for integrating the product or system into the project, and to show how multiple systems and interdisciplinary work will be coordinated. Shop Drawings shall include:

    a. Locations, extent, and type of waterproofing installation

    b. Substrate preparation details

    c. Application details, including methods of adhesion and attachment, laps and related conditions

    d. Termination details

    e. Protective covering details

    f. Interface with existing or future adjoining Work

    g. Penetration Details

2. Samples: Fabricated or unfabricated physical examples of materials, equipment or workmanship that illustrate functional and aesthetic characteristics of a material or product and establish standards by which the work can be judged. Submit samples of each type of elastomeric waterproofing sheet, protection board, primer, adhesive and mastic. Samples may also include field samples and mock-ups constructed on the project site to establish standards by which the ensuing work can be judged. Submit Samples for the following:

    a. Elastomeric waterproofing sheet material: 12 inch square

    b. Primer, adhesive and mastic: 4 oz. jar

    c. Protection board: 12 inch square

    d. Drainage matting: 12 inch square

B. Transmit the following:

1. Qualifications of Manufacturer, Manufacturer Representative, Installers and Applicators

2. Product Data: Catalog cuts, illustrations, schedules, diagrams, performance charts, instructions and brochures illustrating size, physical appearance and other characteristics of materials, systems or equipment for the work. Provide Product Data for the following:

    a. Elastomeric waterproofing sheet material

    b. Primer, adhesive, and mastic

    c. Protection board

    d. Drainage matting

    e. Accessories

3. Manufacturer's Instructions: Preprinted material describing installation of a product, system or material, including special notices and MSDS concerning impedances, hazards and safety precautions. Provide Manufacturer's Instructions for the following:

a. Elastomeric waterproofing sheet material

b. Primer, adhesive, and mastic

c. Protection board

d. Drainage matting

4. Test Reports

a. Elastomeric waterproofing sheet material

1) Report signed by authorized official of testing laboratory that a material, product or system identical to the material, product or system to be provided has been tested in accord with the specified testing requirements herein. Testing must have been performed within three (3) years of date of Contract Award.

b. Field Quality Control, as specified in Article 3.05

c. Verification of Conditions, as specified in Article 3.01

5. Certificates:

a. Provide statement printed on the Manufacturer's letterhead and signed by its responsible officials attesting that product, system or material complies with the performance requirements herein.

b. Provide a certificate stating the installer and applicators meet the Qualifications requirements herein and are certified by the waterproofing system Manufacturer.

c. Upon completion of the Work of this Section, provide a certificate stating that waterproofing system has been installed in conformance with the reviewed submittals and manufacturer's recommendations.

1.04 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Elastomeric sheet membrane waterproofing system shall be manufactured by a firm with a minimum of 10 years of experience in the production of elastomeric sheet membrane waterproofing. Manufacturers proposed for use shall submit evidence of ability to meet all requirements specified.

2. Installer: A firm, which has at least five (5) years of experience in Work of the type required by this Section, and is approved by the Manufacturer to install the proposed waterproofing system. Installer shall provide a list of projects of similar design and complexity completed within the past five (5) years.

3. Applicator: All waterproofing applicators shall have undergone application training accepted by the Manufacturer of the proposed waterproofing system and be experienced in the installation and testing of the proposed system.

B. Manufacturer's Representative: Maintain a trained representative of the manufacturer on-site during waterproofing Work. The Manufacturer's Representative shall inspect surface preparation and waterproofing installation to verify that installation is in compliance with the manufacturer's written guidelines and recommendations.

C. Pre-Installation Conference:

1. Prior to starting application of waterproofing system, arrange and attend a pre-installation conference to ensure a clear understanding of drawings and specifications. Give the Resident Engineer seven (7) days advance written notice of the time and place of meeting. Ensure that the waterproofing installer, membrane manufacturer's representative, and other trades that may perform other types of work over or adjacent to the membrane after installation attend this conference.

2. Record discussions and agreements, and furnish copy to each participant. Submit one (1) copy to the Resident Engineer.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver and store materials out of the weather, in manufacturer's original packaging with brand name and product identification clearly marked. Do not permit uncertified materials in the work area.

B. Deliver materials in sufficient quantity to continue work without interruption.

C. Store and protect materials in accordance with manufacturer's instructions, and use within their indicated shelf life.

D. When hazardous materials are involved, adhere to special precautions of the manufacturer, local, state and federal regulations.

E. Promptly remove from the site materials or incomplete work adversely affected by exposure to moisture, freezing, UV light, or other environmental conditions.

1.06 ENVIRONMENTAL CONDITIONS

A. Do not apply waterproofing during inclement weather or when there is ice, frost, surface moisture, or visible dampness on the surface to receive waterproofing.

B. Do not apply waterproofing when ambient and substrate surface temperatures are 40 degrees Fahrenheit or below. This restriction will be waived if the Contractor devises a means, approved by the Resident Engineer, of maintaining the surface ambient temperatures above 40 degrees Fahrenheit.

C. Waterproofing system that is exposed to sunlight shall be UV resistant. Waterproofing system for surge tanks shall be resistant to disinfecting and other cleaning chemicals that might be used over the service life of these elements.

1.07 WARRANTY

A. Sheet Membrane Waterproofing: Provide a written 10-year material warranty issued by the membrane manufacturer upon completion of work.

B. Contractor's Warranty: Provide a written warranty for the water tightness of the waterproofed elements for the period of 10 years beyond the final contract completion date. Leakage, seepage, and damp patches shall be mitigated during the warranty period at no cost to Sound Transit. Work related to sheet membrane waterproofing and flashing found to be defective or not in compliance with Contract Documents shall be removed and replaced at no cost to Sound Transit.

## PART 2 - PRODUCTS

2.01 SYSTEM REQUIREMENTS

A. Performance Requirements

1. No water leakage, seepage, or damp patches shall be acceptable on the interior surface of waterproofed elements.

2.02 MATERIALS

A. Unless a specific type of product is indicated on the Contract Drawings, provide one of the types of elastomeric waterproofing sheet material and related primers, adhesives, and mastics as specified herein. Ensure compatibility of waterproofing materials within a specific type, with each other, with the materials on which they will be applied, and with existing waterproofing materials where applicable. Materials shall conform to the applicable performance requirements cited below when tested in accordance with the referenced ASTM publications.

B. Butyl Rubber Sheeting (Post Applied Waterproofing Membrane)

1. Not less than 60 mils (0.06 inch or 1.5 mm) minimum thickness.

2. Butyl Rubber Sheeting Performance Requirements

a. Thickness Tolerance, ASTM D412: Plus or minus 10 percent

b. Specific Gravity, ASTM D297: 1.20, plus or minus 0.05

c. Tensile Strength, ASTM D412: 1200 psi minimum

d. Tensile Stress at 300 percent elongation, ASTM D412: 600 psi minimum

e. Elongation, ASTM D412: 300 percent minimum

f. Tear Resistance, Die C, ASTM D624: 150 pound force per inch minimum

g. Shore A Hardness, ASTM D2240: Five-second interval before reading; 60 plus or minus 10

h. Ozone Resistance, ASTM D1149: No cracks, 7 days - 50 pphm - 100 degrees Fahrenheit, 20 percent elongation

i. Heating Aging-Accelerated, ASTM D573: Tensile retention, 60 percent of minimum original elongation retention; 60 percent of minimum original requirement; 7 days, 240 degrees Fahrenheit

j. Butyl Identification, ASTM D471, Tricresyl Phosphate Immersion: Maximum volume swell 10 percent, 70 hours, 212 degrees Fahrenheit

k. Low Temperature Flexibility, ASTM D746: No failure at minus 40 degrees Fahrenheit

l. Water Absorption, ASTM D471: plus 1 percent maximum. 7 days, 158 degrees Fahrenheit

m. Exposure to Fungi and Bacteria in Soil, ASTM E154/E154M, Minimum 16 Weeks: Unaffected

n. Water Vapor Transmission, 80 Degrees Fahrenheit Permeance, ASTM E96/E96M, Procedure B or BW: 0.15 perms maximum

3. Adhesive, Cement, and Tape for Use with Butyl Rubber

a. As recommended by the butyl rubber waterproofing membrane manufacturer.

C. Thermoplastic Membrane: Polyvinyl Chloride (PVC)

1. Polyvinyl chloride (PVC) flexible sheets with non-woven fiberglass reinforcing not less than 60 mils (0.06 inch or 1.5 mm) minimum thickness.

2. Thermoplastic Membrane Performance Requirements

a. Tensile strength ASTM D638:1600 psi minimum

b. Elongation at break, ASTM D638: 250 percent minimum

c. Seam strength, ASTM D638: 90 percent minimum of tensile strength

d. Retention of properties after heat aging, ASTM D3045

1) Tensile strength, ASTM D638: 95 percent of original

2) Elongation, ASTM D638: 95 percent of original

e. Tear resistance, ASTM D1004: 17 Pound Force

f. Low Temperature Bend, ASTM D2136: minus 40 Fahrenheit

g. Liner Dimensional Change, ASTM D1204: 0.002 percent

h. Weight Change after Immersion in Water, ASTM D570: 2.0 percent maximum

3. Adhesives

a. Adhesive for thermoplastic flashings as recommended by manufacturer.

b. Adhesive for Sub-Membrane Grid: 100 percent solids, two-part urethane, with minimum tensile strength of 150 psi, in accordance with ASTM D412 and adhesion to concrete of 12 ply in accordance with ASTM D429 as recommended by manufacture.

4. Accessories

a. Securement strip: 14 gauge stainless steel metal bar 1 inch wide, pre-punched 1 inch on center for securement. Provide securement strip at perimeter and at any penetrations as well as any elevation changes, where recommended by the Manufacturer for below ground membrane sheeting installation.

D. Composite, Self-Adhering Membrane Sheeting (Post Applied Waterproofing Membrane)

1. Cold applied composite sheet consisting of rubberized asphalt and cross-laminated, high-density polyethylene film. Not less than 60 mils (0.06 inch or 1.5 mm) minimum thickness is required.

2. Composite, Self-Adhering Sheeting Performance Requirements

   a. Tensile Strength, ASTM D412, Die C: 250 psi minimum

   b. Ultimate Elongation, ASTM D412, Die C: 200 percent minimum

   c. Water Vapor Transmission, ASTM E96/E96M 80 Degrees Fahrenheit Permeance, Procedure B: 0.1 perm maximum

   d. Pliability Degrees Fahrenheit, ASTM D146/D146M: (180 Degrees Bend Over One Inch Mandrel): No cracks at minus 25 degrees Fahrenheit

   e. Cycling over Crack at minus 15 Degrees Fahrenheit: Membrane is applied and rolled across two primed concrete blocks with no separation between blocks. Crack opened and closed from zero to 1/4 inch. No effect at 100 cycles

   f. Puncture Resistance, ASTM E154/E154M: 200 pounds minimum

   g. Lap Adhesion at Minimum Application Temperature, ASTM D1876 Modified: 5 lbs./in.

   h. Peel Strength, ASTM D903 Modified: 9 lbs./in.

   i. Resistance to Hydrostatic Head, ASTM D5385: 231 feet of water

   j. Water Absorption, ASTM D570: 0.1 percent maximum

3. Primer

   a. Asphalt composition, ASTM D41/D41M, or synthetic polymer in solvent as recommended by the membrane manufacturer.

4. Mastic

   a. Polymer modified asphalt in suitable solvent of trowel-grade consistency and as recommended by the membrane manufacturer.

E. Pre-Applied Waterproofing Membrane

1. Pre-applied (prior to concrete placement) membrane for use under horizontal slabs, sumps, blind side applications.

2. 1.2 mm (0.046 inch) nominal thickness comprising 0.8 mm (0.030 inch) of high density polyethylene film, and layers of specially formulated synthetic adhesive layers. The membrane shall form an integral and permanent bond to poured concrete to prevent water migration at the interface of the membrane and structural concrete.

3. Pre-Applied Membrane physical characteristics:

   a. Thickness, ASTM D3767 Method A, 1.2 mm (0.046 in.) nominal

   b. Low Temperature Flexibility, ASTM D1970/D1970M, Unaffected at minus 23 degrees Celsius (minus 10 degrees Fahrenheit)

   c. Elongation, ASTM D412 Modified, greater than 300 percent

   d. Crack Cycling at minus 23 degrees Celsius (minus 10 degrees Fahrenheit), 100 Cycles, ASTM C836/C836M, Unaffected

e. Tensile Strength, Film, ASTM D412, 27.6 MPa (4,000 lbs/in.$^2$) minimum

f. Peel Adhesion to Concrete, ASTM D903 Modified, 880 N/m (5.0 lbs/in.)

g. Lap Adhesion, ASTM D1876 Modified, 440 N/m (2.5 lbs/in.)

h. Resistance to Hydrostatic Head, ASTM D5385 Modified, greater than70 m (231 ft)

i. Puncture Resistance, ASTM E154/E154M, 990 N (180 lbs) minimum

j. Permeance, ASTM E96/E96M Method B, less than 0.6 ng/m$^2$sPa (0.01 perms)

k. Water Absorption, ASTM D570 less than 0.5 percent

4. Accessory Items: Provide all waterproofing system accessory products from a single source as required by manufacturer.

F. Protection Board

1. Provide protection board as recommended by the membrane manufacturer that is compatible with the waterproofing membrane, backfill material, and follow-on Work.

G. Drainage Matting

1. Three-dimensional, high impact resistant polymeric grid with woven monofilament drainage fabric bonded to the grid meeting WSDOT Standard Specifications Section 9-33.2(3) for Prefabricated Drainage Mat.

2. The drainage matting shall be compatible with the waterproofing membrane, backfill material, and follow-on Work.

## PART 3 - EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Before starting the work, the manufacturer's representative and the installer shall verify that surfaces to be waterproofed are in satisfactory condition.

B. Notify the Resident Engineer of defects or conditions that will prevent a satisfactory application.

C. Do not start application until defects and conditions have been corrected.

3.02 SURFACE PREPARATION

A. Ensure surfaces to be treated are clean, dry, smooth, and free from deleterious materials and projections.

B. Thoroughly wet holes, joints, cracks, and voids in masonry or concrete substrate with water and fill with Portland cement mortar, strike flush, and permit to dry.

C. Cut off high spots or grind smooth.

D. Finish top surfaces of projecting masonry or concrete ledges below grade, except footings, to a steep bevel with Portland cement mortar.

E. Sweep surfaces to be covered before applying waterproofing to remove dust and foreign matter.

F. Cure concrete by a method compatible with the waterproofing system. Curing compound containing wax or oil shall be removed prior to the application of waterproofing.

3.03 APPLICATION

A. Follow manufacturer's printed installation instructions.

B. Where indicated, mop continuous cant strips in place at vertical and horizontal corners before installing the waterproofing membrane. Do not use untreated wood or wood fiber cants.

C. Carry waterproofing of horizontal surfaces up abutting vertical surfaces as indicated and adhere solid to the substrate. Avoid wrinkles and buckles in applying membrane and joint reinforcement.

D. Non-Self-Adhering Membrane:

1. Unroll membrane and allow to remain flat for at least one-half hour before application.

2. Apply an asphalt concrete primer prior to application of asphaltic adhesive.

3. Where solvent adhesive is applied, allow major portion of solvent to evaporate so that bonding adhesive does not stick to a dry finger touching it.

4. Apply elastomeric waterproofing membrane in a full bed of adhesive at a uniform coverage rate in accordance with the recommendations in the membrane manufacturer's printed instructions.

5. Where membrane on horizontal surfaces is to receive concrete fill, apply adhesive in 4-inch wide strips at 2 feet on center.

6. Pull membrane tight without stretching.

7. As soon as adhesive is fully set and dry, recheck lap splices. Where openings or fishmouths appear, reseal and reroll lap splices.

E. Self-Adhering Membrane:

1. Apply composite, self-adhering membrane on surfaces primed at a uniform coverage rate in accordance with membrane manufacturer's printed instructions.

2. Remove release sheet and apply with tacky surface in contact with dried primer.

F. Protection: Protect membrane over horizontal surfaces from abnormal traffic during installation. Use only equipment with rubber tires. Provide walkway protection where heavy traffic from other trades is expected. Do not store material on membrane.

G. Butyl Rubber:

1. Lap sheets at sides and ends a minimum of 6 inches over the preceding sheet.

2. Apply lap splicing cement over entire 6 inches splice area prior to application of sealant. Sealant shall be continuous along the entire length of the splice.

3. Maintain a continuous bead of sealant at all membrane splices or as required by the manufacturer.

4. When membrane will be below water table, provide a tongue and groove cemented splice a minimum of 6 inches with factory made heat vulcanized seam not less than 2 inches or as required by the manufacturer.

H. Thermoplastic Membrane (PVC)

1. Deck shall be clean, smooth and dry without surface irregularities.

2. Consult with membrane manufacturer prior to grid application. Install 12 inches wide sub-membrane containment grid as required by manufacturer. Provide and install the containment grid at intervals across the width and length of the substrate, at the base of all transitions, walls, curbs, penetrations, and at the perimeter of each deck/substrate section.

3. Fully adhere strips to the substrate in a full bedding of two-part urethane adhesive medium.

4. Adjacent sheets shall be welded in accordance with manufacturer's instructions. All side and end lap joints shall be hot-air welded. Lap area shall be a minimum of 3 inch wide when machine welding, and a minimum of 4 inch wide when hand welding but not less than recommended by the manufacturer. Overlaps shall be with the flow of water.

I. Composite, Self-Adhering Membrane

1. Lap sheets at edges and ends a minimum of 2-1/2 inches over the preceding sheet. All side laps shall be a minimum 2-1/2 inches and end laps shall be 5 inches.

2. Laps shall be self-adhesive, mastic as per manufacturer's recommendation. Roll or firmly press to adhere membrane to substrate.

3. Cover corners and joints with two layers of reinforcement by first applying a 12 inch width of membrane centered along the axis.

4. Flash drains and penetration with a second ply of membrane for a distance of 6 inches from the drain or penetration.

5. Finish exposed terminated edges of membrane on horizontal or vertical surfaces with a troweled bead of mastic. Apply mastic around edges of membrane, and drains and penetrations. Apply mastic at end of each work day.

J. Reinforced Polypropylene Geomembrane:

1. Follow manufacturer’s printed installation instruction.

3.04 FLASHING

A. Flash penetrations through membrane. Ensure that where reinforcing bars penetrate a waterproofing membrane, each of those penetrations be sealed with the appropriate sealant or mastic flashing component.

B. Embed elastomeric membrane in a heavy coat of adhesive, except for self-adhering membrane.

C. Continuous metal reglets shall be installed, horizontally on footing and vertically on intersecting and connecting walls.

D. Metal reglets shall receive exposed edges of membrane waterproofing. Secure membrane into reglets by lead wedges and fill with cement as recommended by manufacturer of waterproofing materials.

E. Counterflash upper edge of membrane waterproofing and protective covering.

3.05 FIELD QUALITY CONTROL

A. Notify the Resident Engineer one day prior to date of performing tests.

B. In conjunction with visual and manual inspection, test the integrity of the sheet membrane waterproofing in accordance with one of the following methods:

1. Flood Testing:

a. ASTM D5957 Standard Guide for Flood Testing Horizontal Waterproofing Installations

b. Before concealment, cover elastomeric waterproofing on horizontal surfaces over finished spaces with a minimum of 1 inch and a maximum of 4 inches of ponded water for 72 hours. The entire surface to be tested shall be divided into smaller compartments, using containment assemblies in accordance with ASTM D5957, such that within each tested compartment the maximum ponded water heights do not exceed 4 inches. Temporarily seal all penetrations with pipe plugs. Do not add water after start of 72 hour period. Carefully measure water level, at locations approved by Resident Engineer, at 4 hour intervals from the beginning to the end of 72 hour period.

c. If leakage is detected during the test period, remove water and inspect waterproofing membrane. Make repairs or replacements as directed and repeat test.

d. Testing shall not be performed if rain is anticipated to occur during the test period.

e. If rain occurs during the 72 hour testing period, the testing period shall be restarted.

2. Low Voltage Electrical Conductance Testing or High Voltage Spark Testing:

a. ASTM D4787 Standard Practice for Continuity Verification of Liquid or Sheet Linings Applied to Concrete Substrates

b. ASTM G62 Standard Test Method for Holiday Detection in Pipeline Coatings

c. ASTM WK27666 New Practice for Electrical Conductance Methods for Locating Leaks in Exposed or Covered Waterproof Membranes

C. One hundred percent of the sheet membrane waterproofing surfaces shall be visually inspected and integrity tested.

D. The visual inspection and integrity testing shall be performed by an independent commercial testing agency, employed and paid for by the Contractor.

E. The testing agency shall report test results in writing to Contractor, waterproofing installer, Manufacturer and Resident Engineer on the same day that inspections are made. Reports

shall give observations and indicate compliance or non-compliance with Contract Documents.

F. Do not proceed with work that conceals membrane waterproofing before receiving approval and acceptance of the Resident Engineer.

3.06 PROTECTIVE COVERING

A. After installation has been inspected and approved by the Resident Engineer, apply a protective covering to the membrane waterproofing prior to backfilling or concrete floor slab construction.

B. Protect vertical membrane waterproofing with a 1/2 inch minimum thickness of asphalt plank; 1/2 inch minimum thickness of fiberboard; or 1/8 inch minimum thickness of compatible water-resistant bitumen type protection board with edges abutting adjacent edges and exposed surfaces covered by a taping system recommended by manufacturer of protection board.

C. Cover horizontal membrane waterproofing with similar protection board and a minimum of 3 inches of lean concrete; place uniformly and allow to set before installing subsequent construction. Lean concrete shall conform to Section 6-02.3(2)D of the WSDOT Standard Specifications.

D. For reinforced polypropylene geomembrane waterproofing system for surge tanks that are indicated on the Contract Documents as to be permanently exposed, protective covering in Articles 3.06.B and 3.06.C are not required. Follow requirements of the manufacturer.

**END OF SECTION**