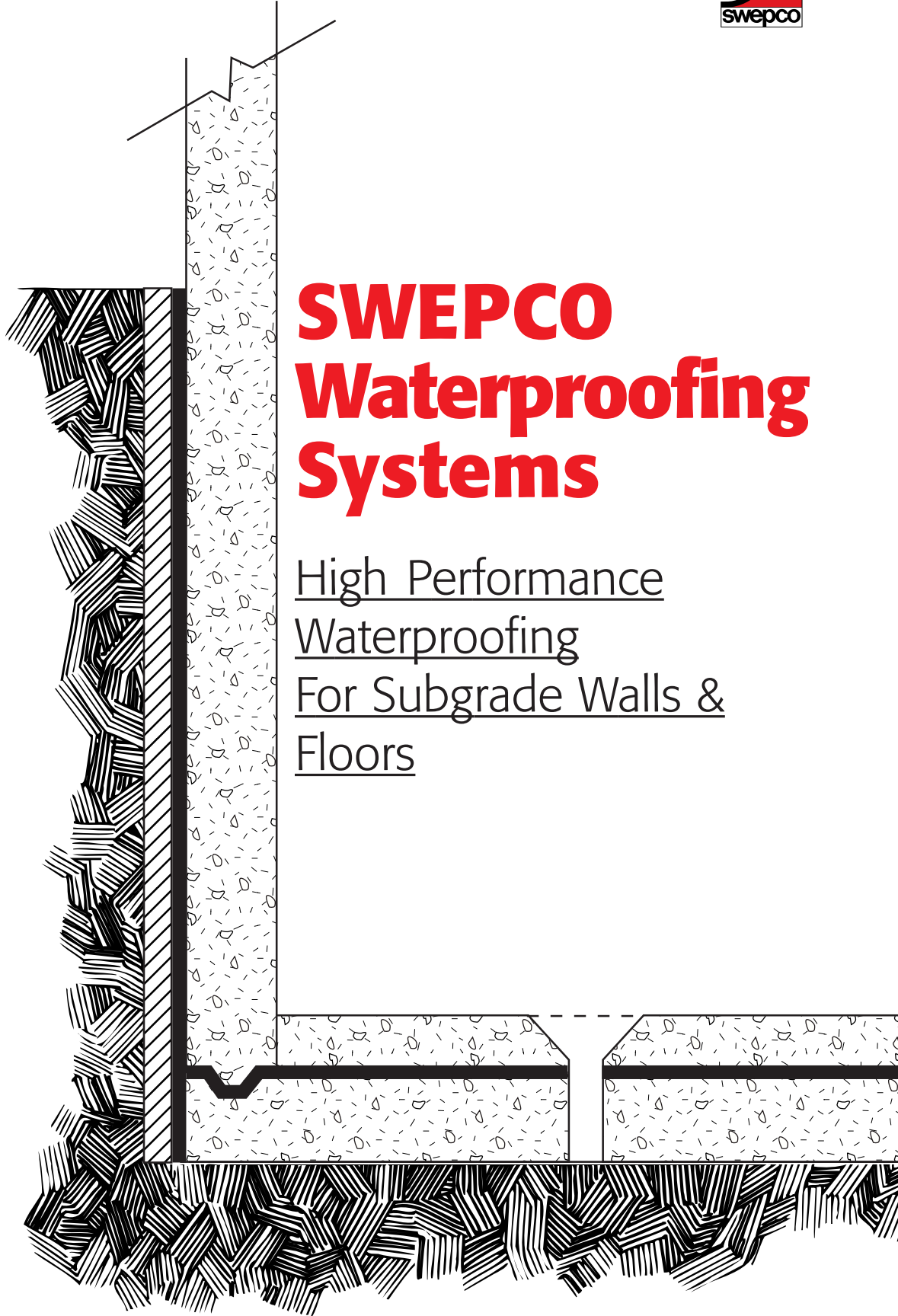


subgrade waterproofing



SWEPACO Waterproofing Systems

High Performance
Waterproofing
For Subgrade Walls &
Floors

General Specifications

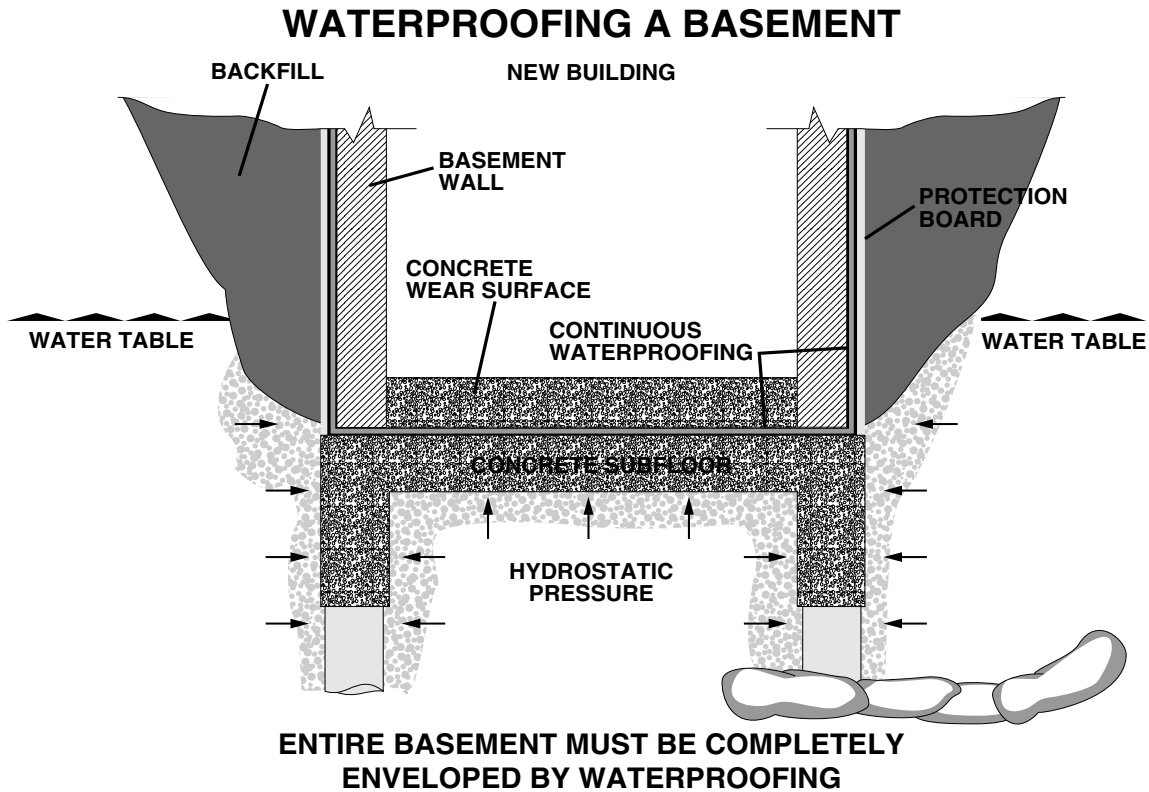
SWEPCO WATERPROOFING SYSTEMS GENERAL SPECIFICATIONS

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I. OVERVIEW

SWEPCO Waterproofing Systems are installed at the construction stage. The systems for walls are installed on the outside surface of the walls; these systems are not for use on the inside walls of existing buildings that are already leaking. The Waterproofing Systems for floors are installed on the concrete sub-floor and are then covered with a concrete wear surface. Which SWEPCO Waterproofing System to select depends on

whether the structure is subjected to hydrostatic pressure, and if so, the amount of hydrostatic pressure (hydrostatic head). There are systems for structures with no exposure to hydrostatic pressure as well as systems to protect against hydrostatic pressure up to 30 ft. of hydrostatic head. Generally, the greater the hydrostatic head, the more material (and the more layers) in the system.



II. INDEX TO SYSTEMS AND GUARANTEES

SUBGRADE WALLS

System 801
 System 802
 System 803
 System 804
 System 805

HYDROSTATIC HEAD

None (Light Dampproofing)
 None (Heavy Dampproofing)
 0-4.00 feet (0-1.22m)
 4.00-15.00 feet (1.22-4.57m)
 15.00-30.00 feet (4.57-9.14m)

GUARANTEE

2 Years
 5 Years
 5 Years
 10 Years
 10 Years

SUBGRADE FLOORS

System 901
 System 902
 System 903
 System 904

None (Heavy Dampproofing)
 0-4.00 feet (0-1.22m)
 4.00-15.00 feet (1.22-4.57m)
 15.00-30.00 feet (4.57-9.14m)

5 Years
 10 Years
 10 Years
 10 Years

For applications where hydrostatic water pressure exceeds 30 ft. (9.14m) of hydrostatic head, consult Engineering Department, Southwestern Petroleum Corporation.

The above guarantees are applicable only to Waterproofing Systems installed on the subgrade floors and walls of buildings and are not applicable for other waterproofing applications such as swimming pools, water tanks, planter boxes and bathrooms.

III. BENEFITS

QUALITY INGREDIENTS

Every product used in the engineering of a SWEPCO Waterproofing System is carefully selected and formulated with the finest ingredients . . . ingredients not found in other waterproofing products. Raw materials like “Heart of Texas” Asphalt® and finely milled blue black slate and proprietary chemical additives like Zonamine® and ZHD-7® are first selected and then tested rigorously under stringent ISO 9000 Certified Quality procedures. This attention to detail at the ingredient level helps insure maximum performance from every component in the system.

VERSATILITY

SWEPCO Waterproofing Systems include solutions for both dampproofing and waterproofing exteriors of subgrade walls and floors. SWEPCO Waterproofing Systems can be used in both vertical and horizontal applications such as foundation and basement walls, tunnels, utility conduits, shafts, floor slabs, bathrooms, kitchens, laboratories and multi-level parking decks. They also include retrofit systems for post construction correction of common floor problems.

SUPERIOR PERFORMANCE

This combined focus on quality products, ingredients and engineering results in superior overall performance.

Superior perm ratings mean ground water or water vapor simply can't penetrate the waterproofing membrane.

Excellent abrasion and impact resistance to help prevent damage by careless work of other trades before backfilling or installation of protection courses.

IV. MATERIALS

GENERAL: Waterproofing materials shall be stored in dry, watertight, above ground storage rooms. Particular caution shall be exercised to prevent all forms of reinforcement materials and insulation from becoming wet or damp. All SWEPCO labels shall be intact and legible.

SWEPCO CONCRETE PRIMER is a black, liquid coating manufactured of the highest quality asphalt and select ingredients. It is used to prime concrete and masonry walls and floors prior to installation of a waterproofing system. It absorbs dust and scale, providing a much more bondable surface and stronger waterproofing system. Concrete Primer meets or exceeds ASTM Designation D-41 and Canadian Government Specification Board Standard 37-GP-9 Ma.

SWEPCO HEAVY DUTY PATCHING COMPOUND is a thick, black waterproofing compound manufactured from “Heart of Texas” Asphalt®, High Strength Micro Fibers, two superior mineral stabilizers and two powerful chemical additives - Zonamine™ and ZHD-7™. It is used as an adhesive, and a sealer. SWEPCO Heavy Duty Patching Compound meets or exceeds ASTM Designation D-4586, Type 1 and Canadian Government Specification Board Standard CGSB-37.5-M89.

Excellent adhesion – high strength, flexible bond won't delaminate or permit water migration if surface is penetrated
Exceptional tensile strength and flexibility for protection from failure of the waterproofing membrane.

Extra strength and reinforcement at all cold joints and other high stress areas

Exceptional resistance to deterioration from soil borne moisture, salts, acids, alkalis or other contaminants.

Exceptional resistance to age hardening and oxidation.

Together, these properties yield durability and reliability, the two most important performance criteria for below grade waterproofing.

SCHEDULING FLEXIBILITY

Once installed, many waterproofing products require immediate protection from sunlight, moisture or accidental damage. SWEPCO Waterproofing Systems don't. The tough waterproofing membranes provided by SWEPCO Waterproofing Systems can remain exposed for months if necessary to accommodate prolonged construction schedules or delays.

GUARANTEED TO PERFORM

It is rare in the industry for a manufacturer to offer guarantees on subgrade waterproofing systems. But SWEPCO Waterproofing Systems come with a written guarantee, a guarantee which protects the building owner against leakage attributable to failure of the products used in the system. These guarantees are one more reason to feel confident in specifying SWEPCO Waterproofing Systems for all your subgrade moisture control requirements.

(Note: Heavy Duty Patching Compound is a solvent-base product. It is used in SWEPCO Waterproofing Systems specifying Heavy Duty Roof Coating.)

FLEX•SHIELD® PATCHING COMPOUND, a water-base product is substituted for Heavy Duty Patching Compound in SWEPCO Waterproofing Systems specifying Flex•Shield® Roof Coating, a water-base coating.

HEAVY DUTY ROOF COATING is specially refined, high quality blend of “Heart of Texas” Asphalt®, High Strength Micro Fibers and two special chemical additives, Zonamine™ and ZHD-7™. Heavy Duty Roof Coating meets or exceeds ASTM Designation D-4479, Type I and Canadian Government Specification Board Standard 37.8-M88.

SWEPCO FLEX•SHIELD® ROOF COATING is a blend of high quality vacuum reduced asphalt, emulsified in a water base vehicle, containing inorganic fibers and selected mineral stabilizers. It is designed for economical waterproofing. SWEPCO Flex•Shield® Roof Coating meets or exceeds ASTM Designation D-1227, Type IV and Canadian Government Specification Board Standard 37.2-M88. This product is subject to freezing. Do not attempt application in tem-

peratures below 40°F (4°C) or if rain is expected before complete curing can occur.

SWEPCO ADHESIVE #9 is a specially prepared adhesive manufactured from “Heart of Texas” Asphalt®, a plasticized adhesive resin, High Strength Micro Fibers and Zonamine™, a moisture displacement additive. It is formulated to provide a flexible solid bond for SWEPCO Heavy Duty PolyPly on horizontal surfaces. SWEPCO Adhesive #9 meets or exceeds ASTM Designation D-3019, Type III and Canadian Government Specification Board Standard 37.4-M89

HEAVY DUTY POLYMASTER® is a heavy duty reinforcing mat composed of polyester strands bonded into a random, non-woven pattern under heat and pressure. It is used to reinforce certain SWEPCO Waterproofing Systems. It is up to nine times stronger, 10,000 times more flexible and 20 times more stretchable than either fiberglass reinforcements or typical organic roofing felts.

V. APPLICATION TECHNIQUES

HYDROSTATIC WATER PRESSURE

Hydrostatic water pressure exists below the water table. Determining if hydrostatic water pressure is present and to what degree is the responsibility of the architect. This is normally determined by soil analysis or is based upon previous findings and experience in the same locale.

When hydrostatic water pressure exists, great care must be taken to make sure that there is an uninterrupted waterproofing membrane surrounding the sub-grade structure. Conceptually, a basement should be treated as if the building were submerged in water. Water will infiltrate anywhere there is not adequate waterproofing protection.

THRU-WALL FLASHING

A thru-wall flashing must be installed in all situations where there is hydrostatic water pressure. The thru-wall flashing connects the floor membrane to the wall membrane providing uninterrupted protection. A thru-wall flashing must be installed any place there is a joint created by different pourings of concrete.

If there is no thru-wall flashing, water will seep between the wall and the floor, defeating the purpose of the waterproofing system. The thru-wall flashing must be installed before the wall is constructed and great care should be taken so that this membrane is not punctured.

In cases where the reinforcing steel protrudes through the membrane from the footing to the wall, each reinforcing bar must be sealed with Heavy Duty Patching Compound and Heavy Duty Patching Fabric.

HEAVY DUTY PATCHING FABRIC is an inorganic glass fiber mesh coated with a specially prepared asphalt. It has an open weave design with a thread count of 20 x 20 per inch (2.54 cm). It is designed to reinforce flashings and repairs made with Heavy Duty Patching Compound. Meets ASTM D-1668, Type III and Canadian Government Specification Board Standard 37-GP-63M.

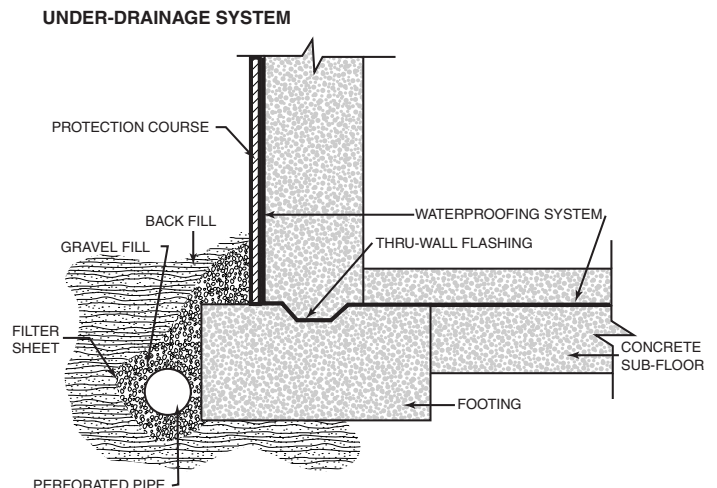
SWEPCO HEAVY DUTY POLYPLY is a premium quality, 1.5 mm thick, state-of-the-art waterproofing membrane. It consists of a heavy polyester reinforcing mat sandwiched between two layers of modified asphalt. The membrane is bonded with SWEPCO’s cold-applied Adhesive #9, a liquid asphalt roofing glue, and then top-surfaced with one of SWEPCO’s cold-process coatings.

CUT-OFF FLASHING

A cut-off flashing of Heavy Duty Patching Compound and Heavy Duty Patching Fabric must be utilized at the termination of all waterproofing systems containing Heavy Duty PolyMaster®, Heavy Duty Patching Fabric or Heavy Duty PolyPly. The cut-off flashing should overlap equally onto the system and the wall; e.g., if using a 6 inch (15.24 cm) cut-off flashing, it should lap 3 inches (7.62 cm) onto the top edge of the waterproofing system and 3 inches (7.62 cm) onto the wall.

UNDER-DRAINAGE SYSTEM

It is recommended that an under-drainage system be utilized when hydrostatic water pressure exists. A typical under-drainage system is a perforated pipe or a spaced clay pipe. The holes or the spacing in the pipe allow moisture to filter into the pipe where it is carried away from the building.



APPLICATION OF THE MEMBRANE

The application of Heavy Duty PolyPly on a floor should be treated as if it were a built-up roof system. The membrane should be rolled and all steps taken to insure good bonding and that no fishmouths or open seams develop. Use a roller weighing at least 3.00 lb. per inch (0.54 kg/cm) of width.

When dealing with tall subgrade walls, it is often advisable to anchor Heavy Duty PolyMaster®, Heavy Duty Patching Fabric or Heavy Duty PolyPly with concrete nails at the top of the area to be waterproofed. Nailing should be on 6 inch (15.24 cm) centers through 1 inch (2.54 cm) metal caps or metal nailing strips.

BACKFILLING

After the subgrade walls have been sealed, it is normal procedure for the excavated material to be replaced. This is generally called "backfilling". This procedure can be damaging to the waterproofing membrane and is one of the biggest hazards in waterproofing. The excavation contractor must exercise extreme caution to prevent machinery and/or backfill material from damaging the installed waterproofing system. See "Protection Course" for more information.

PROTECTION COURSE

It is required that a protective barrier be installed to prevent the backfill material from coming in contact with the installed waterproofing membrane. A layer of 1/2 inch (1.27 cm) treated building board insulation, 1/2 inch (1.27 cm) fiberglass insulation, or similar material can be spot bonded with Heavy Duty Patching Compound to the waterproofing system as a protection course. Specialized filtration protection panels are acceptable and should be installed according to the manufacturer's specifications.

CONDENSATION

Condensation can be a problem under certain conditions,

e.g., if the basement or subgrade area to be waterproofed will be utilized for a shower room, laundry or some other operation that creates a high relative humidity.

When moisture turns to vapor it can infiltrate the wall moving toward the outside. As it reaches the outer edges of the wall, the moisture will condense if the ground temperature is below the dew point. When this occurs, condensation can build up within the wall and act very much like leakage.

In the case of concrete masonry unit walls*, it is recommended that these walls be vented to the outside so that this moisture may escape. If condensation problems are anticipated, it is a very good idea to install an interior vapor barrier consisting of one layer of Heavy Duty Patching Compound troweled on at a rate of 40.00 pounds per 100 sq. ft. (1.95 kg/m²). The walls should be primed first with SWEPCO Concrete Primer to provide a better bond. The interior wall coverings should then be installed over this but should not penetrate the vapor barrier.

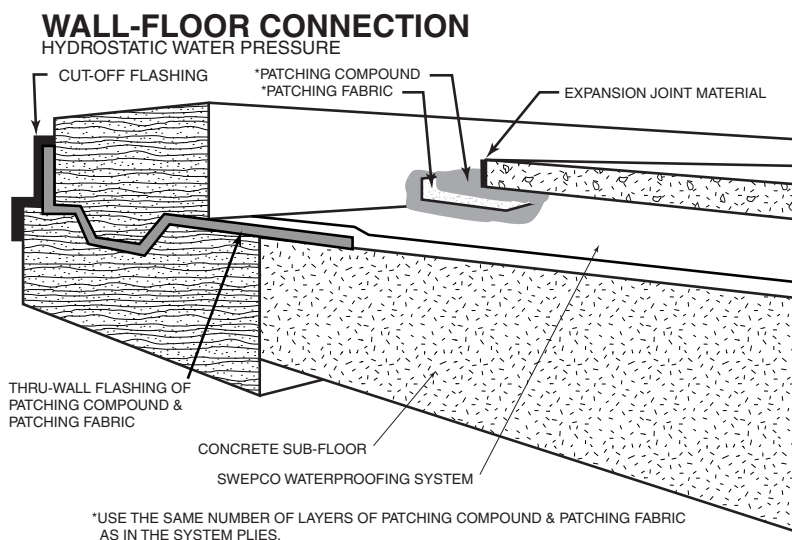
PREPARATIONS

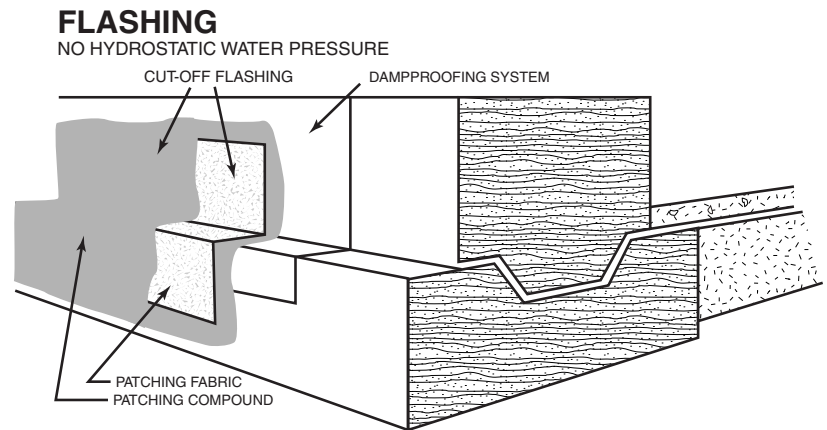
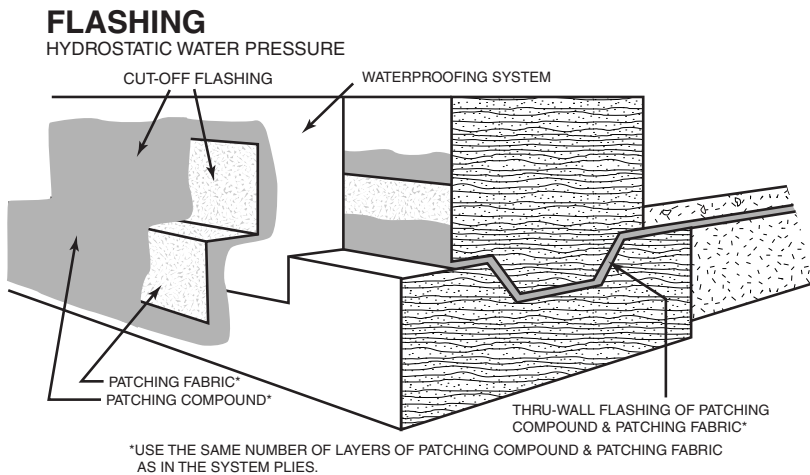
CONCRETE WALLS: Shall be dry and fully cured prior to installing any waterproofing materials. All high spots or depressions shall be removed/filled to make the wall smooth. The entire surface shall then be treated with SWEPCO Concrete Primer, applied at 1.00 gal. per 100 sq. ft. (0.41 liter/m²).

***CONCRETE MASONRY UNIT WALLS:** Shall be smooth and dry prior to installing any waterproofing materials. Mortar Joints shall be smooth and uniform avoiding any rough areas that could penetrate the membrane. The entire surface shall then be treated with SWEPCO Concrete Primer, applied at 1.00 gal. per 100 sq. ft. (0.41 liter/m²).

*Concrete Masonry Units refer to all types of high quality concrete blocks. These are sometimes referred to as cinder blocks, haydite blocks or lightweight concrete blocks.

VI. CONSTRUCTION DETAILS





VII. SAMPLE SPECIFICATION

DIVISION 7: MOISTURE PROTECTION

SECTION 7D: SUBGRADE WATERPROOFING

1. GENERAL

All provisions of the "GENERAL CONDITIONS" and "SUPPLEMENTARY GENERAL CONDITIONS" sections form a part of this section.

2. WORK INCLUDED IN THIS SECTION

- Installation of all waterproofing for subgrade walls.
- Installation of all waterproofing for subgrade floors.
- Installation of all flashings
- Installation of protection board
- (Here insert any other work to be included.)

3. WORK NOT INCLUDED IN THIS SECTION

- Additional excavation
- Installation of any backfill material
- (Here insert other work not to be included.)

4. MATERIALS

- GENERAL: (Here insert the "GENERAL" section as listed in the "MATERIALS" section of this specification.)
- WATERPROOFING MEMBRANE: Shall be SWEPCO Waterproofing System _____ for subgrade walls and

SWEPCO Waterproofing System _____ for subgrade floors. The materials shall be:

- (Here list all SWEPCO materials to be used in the SWEPCO Waterproofing System for subgrade Floors and Walls as listed in the "MATERIALS" section of this specification plus any other materials to be used.)
-
-

5. SUBGRADE WALLS AND FLOORS

- GENERAL: (Here insert "GENERAL" specifications as listed in the section "SUB-GRADE WALLS AND FLOORS" of this specification.)
- TYPE OF SURFACE: (Here insert the type of subgrade wall and/or floor as listed in the section "SUBGRADE WALLS AND FLOORS" of this specification.)

6. PROTECTION BOARD (if applicable)

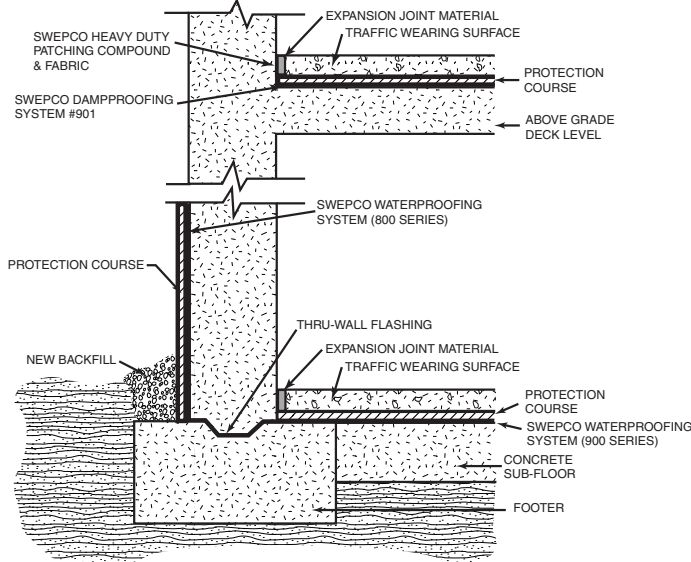
7. GUARANTEE

- Insert years of guarantee.
- Insert conditions of guarantee.

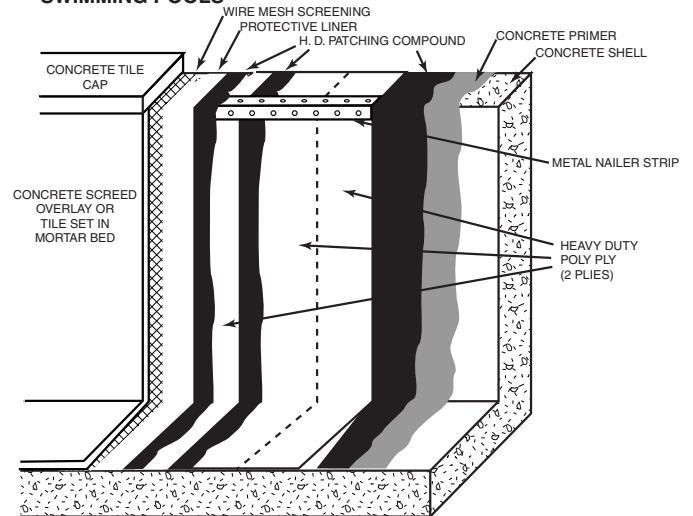
OTHER WATERPROOFING APPLICATIONS

MULTI-DECK PARKING GARAGES

TYPICAL FOR EXISTING CONSTRUCTION

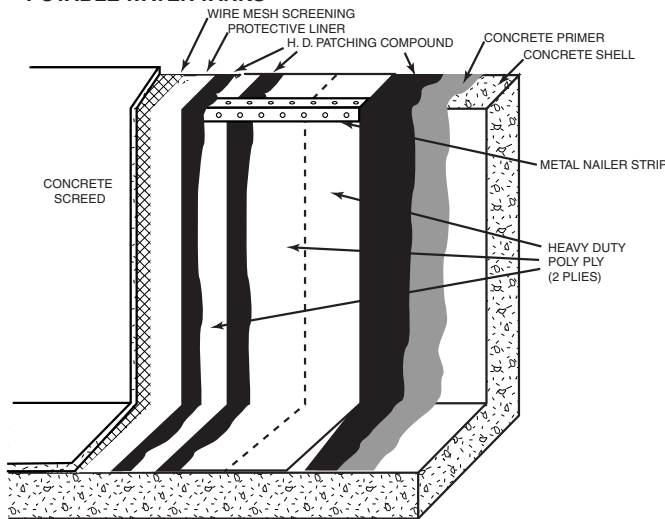


SWIMMING POOLS

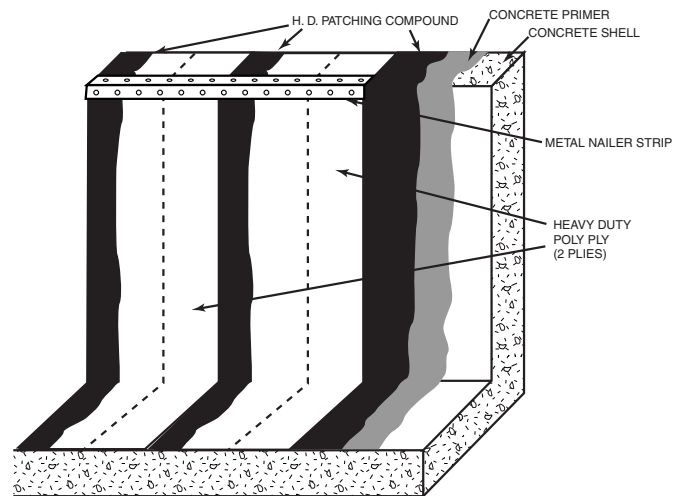


Install floor system first, then wall system. Floor membrane shall extend 6" (15.24 cm) up wall. Wall membrane shall extend 6" (15.24 cm) onto floor.

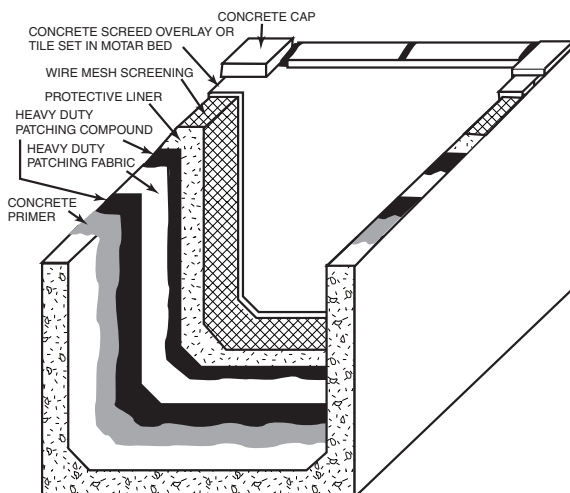
POTABLE WATER TANKS



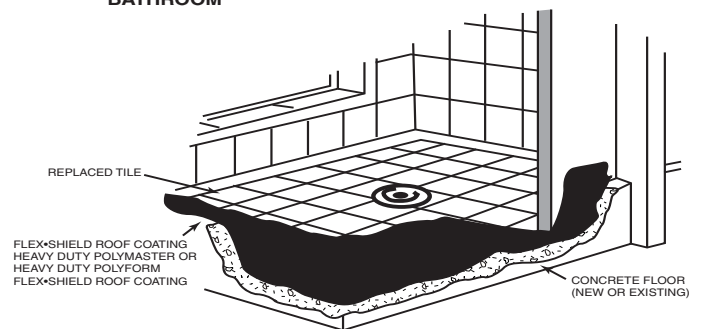
NON-POTABLE WATER TANKS



PLANTER BOXES



BATHROOM



Guarantees are applicable only to Waterproofing Systems installed on the subgrade floors and walls of buildings and are not applicable for other waterproofing applications such as swimming pools, water tanks, planter boxes and bathrooms.

SOUTHWESTERN PETROLEUM CORPORATION

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