FIG 1 – AUSSIE SKIN 560G INSTALLED ON BLINDSIDE WALL

AVM System — Aussie Clay 590

DESCRIPTION

AVM Aussie Clay 590 is heavy-duty high strength Bentonite Composite Sheet Waterproofing Membranes consisting of needle punched woven and non-woven geotextile fabrics encapsulating a thick layer (1 lb/ sq.ft. / 4.8 kg/M2) of active sodium bentonite between them. Aussie Clay works by forming a low permeability membrane once it comes in contact with water. Once wetted, the sodium bentonite swells (up to 15 times its size when unconfined) to form a strong continuous membrane. As Aussie Clay swells, it's also designed to self-seal and expand towards the concrete to fill-in small cracks and voids, as well as reduce the potential of lateral water migration. Aussie Clay forms a mechanical bond to the concrete in a pre-applied waterproofing application. There are four different versions of AVM's Aussie Clay 590 product: Aussie Clay 590. Aussie Clay 590-PL, Aussie Clay 590 SW, and Aussie Clay 590 SW-PL.

Installation Instructions

Aussie Clay is excellent for waterproofing below-grade horizontal and vertical surfaces. Typical applications are underslab, backfilled walls, and property line construction, including soldier pile and lagging, metal sheet piling, shotcrete soil retention and concrete caisson retaining walls. Installation of Aussie Clay is fast and easy. Simply position the product into place and fasten. Aussie Clay can be installed on green concrete, in virtually any weather, without the need for primers or adhesives. Aussie Clay can be easily cut on site to form around corners and penetrations. Aussie Clay is installed with an accompaniment of accessory and associated system products to provide a waterproofing system.

Aussie Clay 590 – Granule Bentonite encapsulated in a woven and non-woven geotextile membrane.

Aussie Clay 590-PL – Aussie Clay 590 with an additional HDPE liner that is fused to the non-woven side of the membrane to increase its overall waterproofing performance and vapor permeance.

Aussie Clay 590 SW – A specially formulated sodium bentonite blend that allows activation in jobsite conditions with elevated salt content and contamination (chemicals, acids, hydrocarbons) encapsulated in a woven and non-woven geotextile membrane.

Aussie Clay 590 SW-PL – Aussie Clay 590 SW with an additional HDPE liner that is fused to the non-woven side of the membrane to increase its overall waterproofing performance and vapor permeance.

NOTE: A site sample may be required to be sent to AVM to test prior to the use of Aussie Clay 590 for warranty consideration. Aussie Clay SW and Aussie Clay SW-PL are used where ground water is contaminated with either salt, chemicals or other foreign substances, as determined by a site water analysis, which can keep Aussie Clay or Aussie Clay PL from hydrating. Please contact your local rep for details.

Membrane	Roll Length	Roll Weight	QTY/Pallet	Pallet Weight	VOC
Aussie Clay 590	3.77'x16.4'	73.4 lbs.	35 rolls/pallet	2615 lbs.	N/A
Aussie Clay 590-PL	3.77'x16.4'	77.8 lbs.	35 rolls/pallet	2765 lbs.	N/A
Aussie Clay 590 SW	3.77'x16.4'	73.4 lbs.	35 rolls/pallet	2615 lbs.	N/A
Aussie Clay 590 SW-PL	3.77'x16.4'	78.3 lbs.	35 rolls/pallet	2787 lbs.	N/A

ACCESSORY PRODUCTS

Aussie Clay Sealant: 5.2-gallon pail of trowel-grade sodium bentonite-butyl rubber sealant used to seal around penetrations and as repair to membrane.

Aussie Clay Granules: 50 lb. bag of sodium bentonite granules used to seal up against cold joint and as repair to membrane.

Aussie Seal M: Marine grade single component polyether sealant/adhesive. Used to adhere Aussie Swell Red Waterstop, around penetrations, and at terminations.

Aussie Swell Red Waterstop: Active swelling concrete joint waterstop used around penetrations and applicable concrete joints.

AVM Drain Board 6000: Drainage composite composed of a molded core profile core & a filter fabric. Used to remove hydrostatic presence in non-hydrostatic conditions. Can also improve substrate conditions.

AVM Bottom Drain: Thickened base drain composite designed to collect water from sheet drainage pales and then discharge water through collector pipes to collection system

Termination Bar: Extruded-aluminum or formed-stainless-steel bars with upper flange to receive sealant. Used to terminate membrane at grade or during transitions.

Staples: Galvanized staples approved by membrane manufacturer. Staples for securing vertical waterproofing panels to wood lagging prior to concrete placement.

Tie Back Cover: 4", 6", & 8" heavy duty plastic used to cover tie-backs during concrete placement.

Aussie Tube: ½ in. wide permeable tube installed prior to concrete placement, with packers set at 25 ft. on center. Inject after concrete cure. Provide min. 2-½ in. concrete cover on all sides. Stagger end laps of hose min. 2 in. Used in trouble areas and in cold joints as a waterstop.

Aussie Skin 550G: Pre-applied sheet waterproofing membrane comprised of thick HDPE layer, pressure sensitive adhesive, & granular protection layer. Used in conjunction with Aussie Clay 590 in **hydrostatic shotcrete applications**.

LIMITATIONS

Aussie Clay 590 is designed for below-grade applications in which the membrane will be properly confined. Use Aussie Clay with reinforced shotcrete walls or cast-in-place walls, conforming to ACI 506 Core Grade 1 or 2; minimum 8″ thick. Do not use stay-in-place concrete forming, use removable forming products only. Aussie Clay is not designed for above grade or unconfined waterproofing applications and should not be installed in standing water or over ice. All substrate should be prepared prior to installation of Aussie Clay 590.

If ground water contains contamination or is of a conductivity of 2,500 µmhos/cm or greater, water samples should be submitted to the manufacturer for compatibility testing. Aussie Clay SW or Aussie Clay SW-PL may be required if contaminated ground water or saltwater conditions exist. Do not use Aussie Clay on masonry block foundation walls or in split-slab plaza deck applications.

SECTION 1 – UNDERSLAB INSTALLATION

Aussie Clay is designed for use under reinforced concrete slabs 4″ or greater on a compacted earth/gravel substrate or a prepared mud/rat slab. Aussie Clay SW or SW-PL us used in contaminated conditions or high saltwater content. As mentioned above, a site sample would need to be sent to the AVM lab for water conductivity testing. A site sample would include either 2 lbs of soil taken from the excavated site in non-hydrostatic conditions or 1L of water in hydrostatic conditions. Complete all required elevator pit, sump pit, grade beam and piling work prior to installing the Aussie Clay 590 over the main slab area. All areas should be tied into the underslab waterproofing to create proper continuous installation forming a monolithic barrier throughout the underslab. For hydrostatic conditions, Aussie Clay should be installed under footings and grade beams. For non-hydrostatic conditions, Aussie Clay can be installed around footings and grade beams.

1.1 – Substrate

Prior to installing the Aussie Clay 590, the substrate must be prepared to meet the installation requirements. Aussie Clay 590 can be placed on compacted earth/crushed stone or a prepared non-reinforced mud slab. Aussie Clay 590 should not be installed over void forms.

Earth or Crushed Stone: Earth/sand substrates should be compacted to a minimum of 85″ Modified Proctor Density. The substrate must be free of loose aggregate and sharp protrusions. Avoid curved or rounded substrates. Ensure substrate is well compacted to avoid displacement of substrate due to traffic or concrete placement. Grout around all penetrations such as utility conduits, etc. for stability. The finished sub-grade surface shall be well-leveled, uniform, free of debris and standing water or ice. Aggregate sub-grades shall consist of ¾″ stone or smaller and rolled flat, free from any protruding sharp edges.

Unreinforced Concrete Rat Slab: Provide uniform, broom finished concrete substrate. Infill voids, honeycombs and gaps greater than ½ in. deep with grout. Grind down all projections, ridges, and sharp fins greater than ¼ in.

1.2 – INSTALLATION: General

Install Aussie Clay Waterproofing System over the prepared substrate with the dark gray woven geotextile side facing the installer so the concrete will be placed against the dark gray geotextile side. Install Aussie Clay with minimum 4″ sheet edge overlaps fastened with washer-head fasteners or staples placed maximum 24″ on center. Stagger end laps a minimum of 12″ to avoid a build-up of layers. Protect Aussie Clay from prehydration before concrete placement or backfill. After rain or snow, standing water should be removed from waterproofing as soon as possible. Protect adjacent work areas and finish surfaces from contamination from waterproofing products during installation operations. If the membrane becomes excessively hydrated prior to concrete placement, be aware of any bentonite displacement and repair accordingly (refer to TB-290 for repairs to Aussie Clay 590). **Figure 1.1** shows the standard overlap spacing for the Aussie Clay 590.

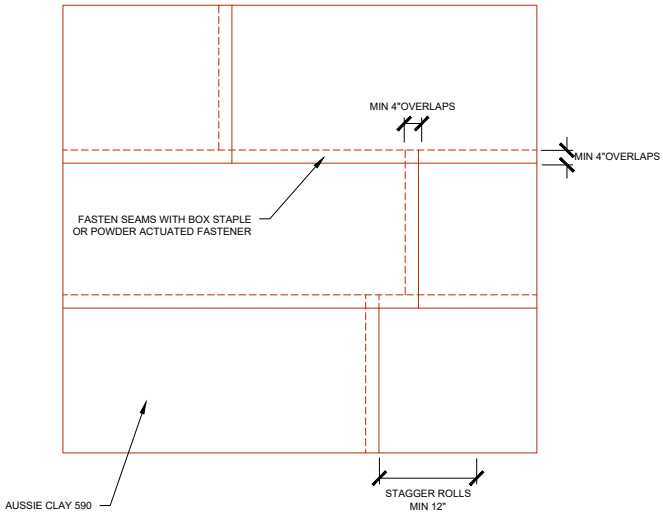

FIGURE 1.1 – STANDARD OVERLAP SPACING

Whenever the slab is poured in sections, extend Aussie Clay a minimum 12″ beyond the slab edge. This 12″ tail section of membrane will then tie into the new membrane with the new membrane overlapping a minimum of 4″. The poured concrete slab section should receive an Aussie Swell Red waterstop in the pour joint. This is shown in **Figure 1.2**. These 12″ tails should be protected from foot traffic and damage. If the tail does succumb to damage, please reach out to your local AVM sales representative or a Technical Services Representative for repair guidelines. When the installation reaches a slab or footing edge and will tie into vertical installation, the tail can be secured to the top of the form prior to the concrete pour. Once the forms are removed, installation can be tied in. This is shown in **Figure 1.3**.

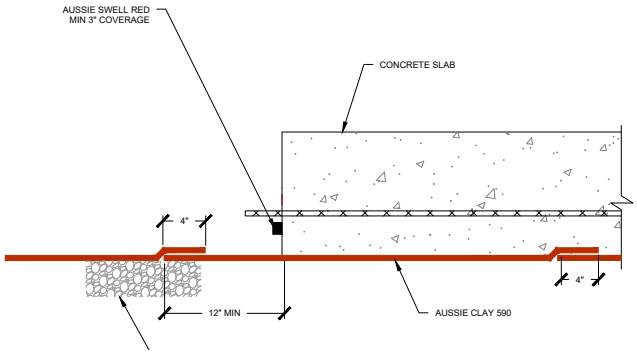

FIGURE 1.2 – POUR JOINT IN SLAB

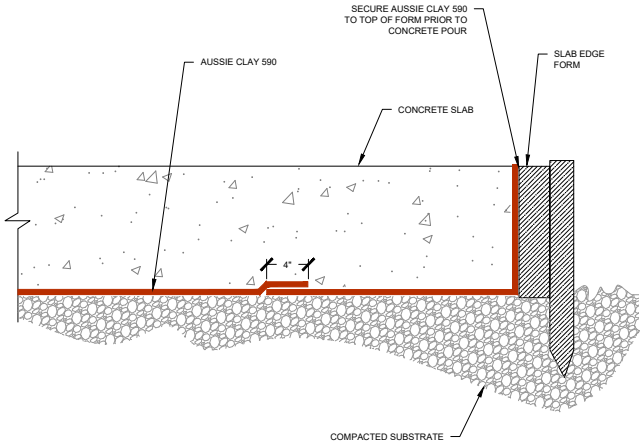

FIGURE 1.3 – SLAB EDGE

Figure 1.4 shows a general view of the above installation in an isometric view. As noted above, it is important to install an Aussie Swell Red Waterstop with 3″ of concrete coverage in all applicable slab construction joints.

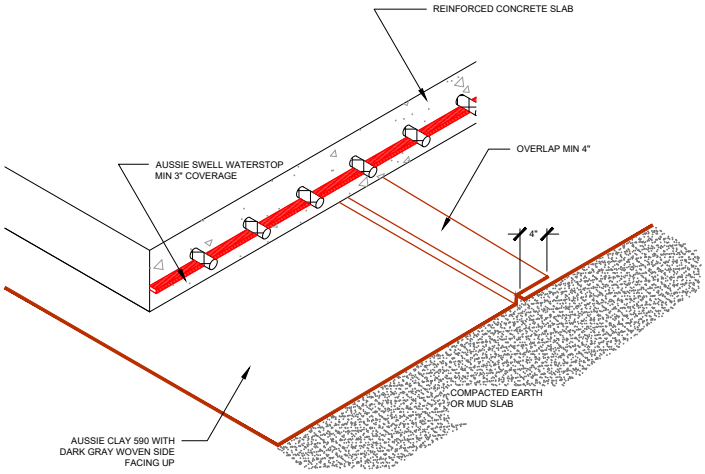

FIGURE 1.4 –GENERAL UNDERSLAB ASSEMBLY

1.3 – INSTALLATION: Raised Slabs, Slab on Grade, and Wrapped Footings

Tying underslab waterproofing to vertical waterproofing is necessary in hydrostatic conditions in order to create a bathtub of continuous waterproofing around the building preventing that hydrostatic pressure from entering the building through the slab or the wall/slab joint. In a non-hydrostatic condition, the waterproofing will typically tie into a water discharge system that would remove any ground or surface water. Aussie Clay 590 is a highly versatile waterproofing membrane that can be installed underslab and both pre-applied and post applied up the walls vertically. Section 1.6 will show the transition from underslab to a blindside wall. **Figures 1.5-1.7** will show this transition in various non-hydrostatic applications while **Figures 1.8-1.9** will show the membrane transition from underslab to wrap into a backfill application.

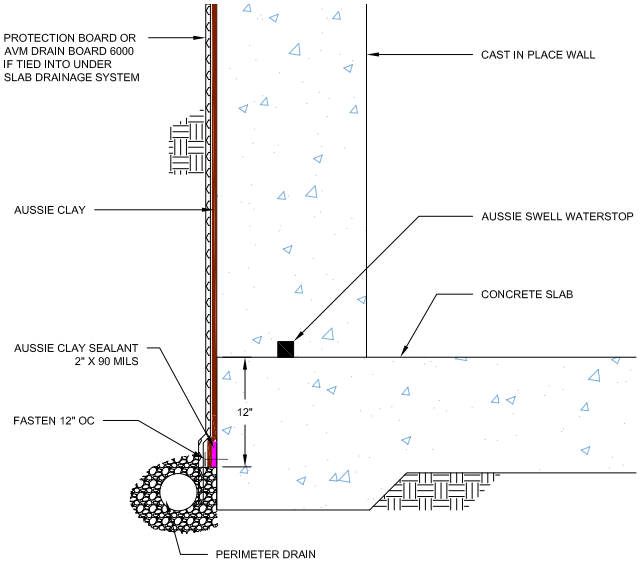

FIGURE 1.7 – NON-HYDROSTATIC FLUSH SLAB

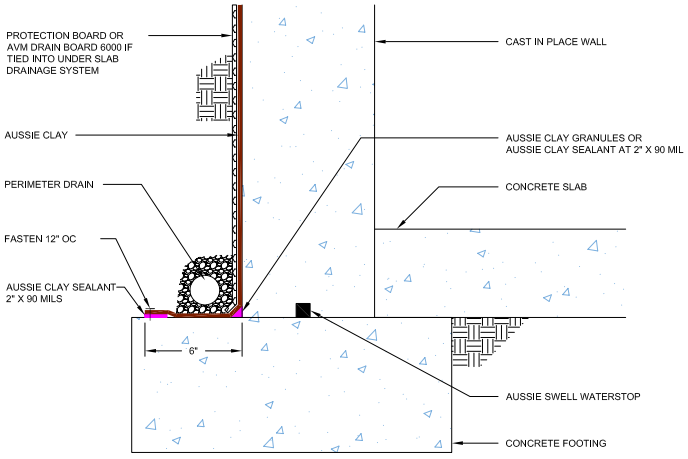

FIGURE 1.5 – NON-HYDROSTATIC SLAB ON FOOTING DETAIL

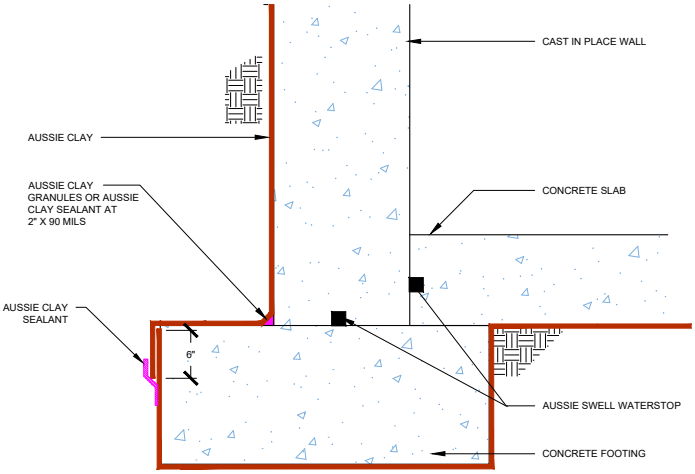

FIGURE 1.8 – HYDROSTATIC SLAB ON FOOTING

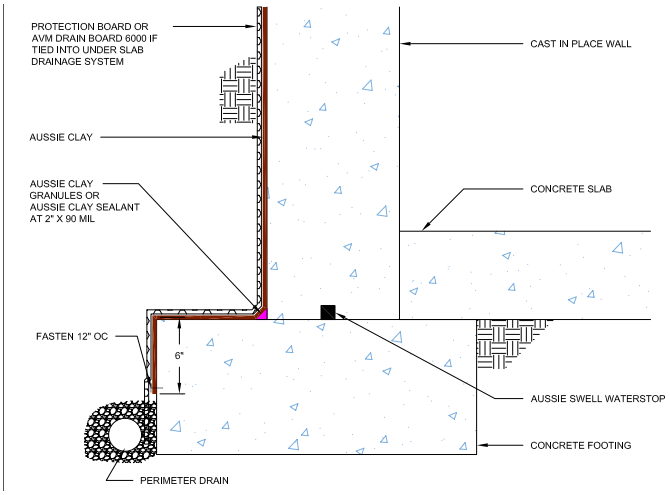

FIGURE 1.6 – NON-HYDROSTATIC SLAB ON FOOTING

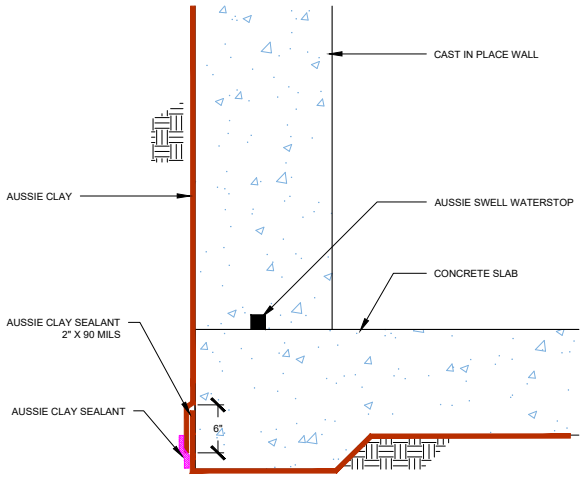

FIGURE 1.9 – HYDROSTATIC FLUSH SLAB

When transitioning from the underslab to the vertical wall, overlap the existing material a minimum of 6". The membrane should be undamaged. Please consult the AVM Technical Team whenever a tail or tie-in material is damaged during the slab pour.

1.4 – INSTALLATION: Pipe Penetrations

When waterproofing around penetrations, the sequencing will vary depending on if the substrate is a mud slab or if there is compacted earth/gravel. For a mud slab substrate, the first step is to sprinkle Aussie Clay granules or trowel Aussie Clay Sealant at ¼" thick and extending 4" around the base of the penetration. Then cut the Aussie Clay 590 to closely fit around the penetration. From there trowel a ¾" cant of the Aussie Clay Sealant around the base of the penetration onto the Aussie Clay 590 to fill any voids between the membrane and the pipe penetration. This is shown in **Figure 1.10**. When the substrate is compacted stone or earth, the above sequencing will not be effective as the initial granules/sealant placed around the penetration will not have a solid surface to sit on. A patch of Aussie Clay 590 that extends 8" around the perimeter of the penetration is cut to fit snug around the penetration is placed first. Then the remainder of the detailing will be the same as the above. **Figure 1.11** will show the penetration detailing when there is compacted gravel or earth in lieu of a mud slab. Keep in mind, all penetration will need to receive an Aussie Swell Red waterstop wrapped around it and maintaining 3" of concrete coverage.

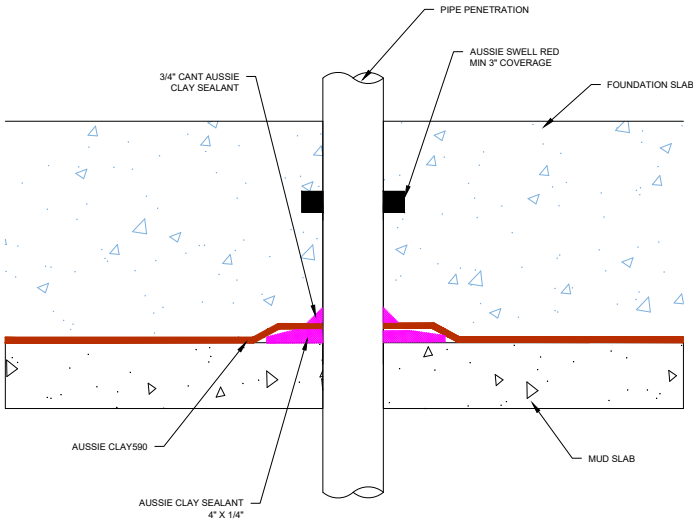

FIGURE 1.10 – SINGLE PENETRATION THROUGH SLAB W/ MUD SLAB

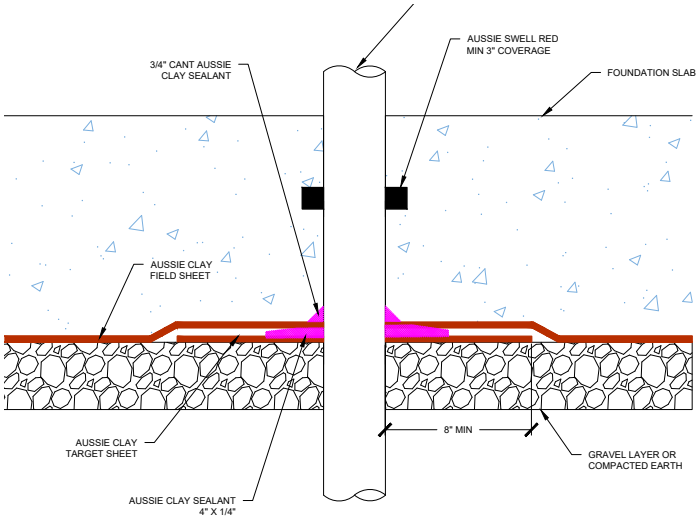

FIGURE 1.11 – SINGLE PENETRATION THROUGH SLAB W/ GRAVEL LAYER

The same sequencing above would be done when there are multiple penetrations coming up through the slab. The substrate would dictate whether a target patch would need to be placed initially. For penetrations that are closer together than 6", please refer to the AVM Technical Team for a detail. **Figures 1.12 & 1.13** will show the multiple pipe penetration details based on the substrate listed.

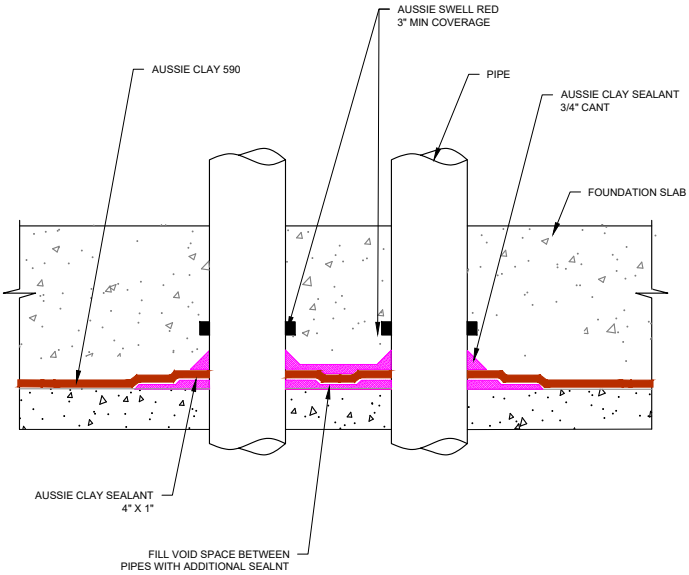

FIGURE 1.12 – MULTIPLE PENETRATIONS ON MUD SLAB

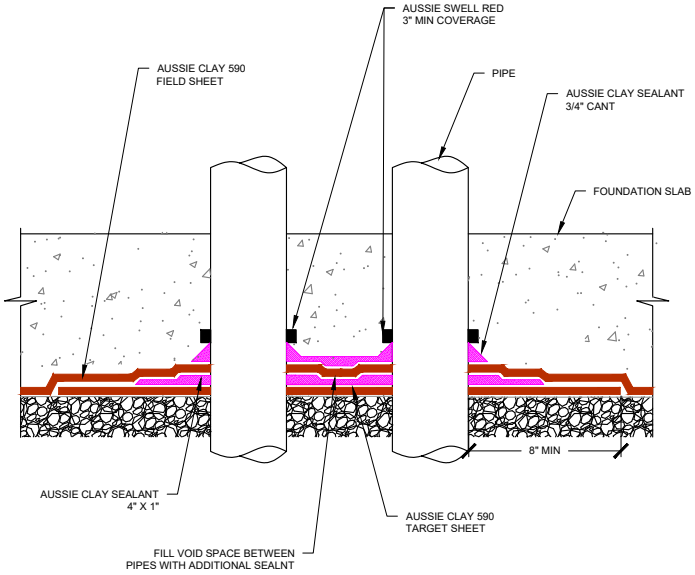

FIGURE 1.13 – MULTIPLE PENETRATIONS ON GRAVEL LAYER

Pipe Rakers, I-Beam penetrations, or other uniquely shaped penetrations will always require the additional Aussie Clay patch that extends 8″ around the perimeter of the penetration as shown in **Figure 1.14**. This will not be indicative of the substrate like standard penetrations are.

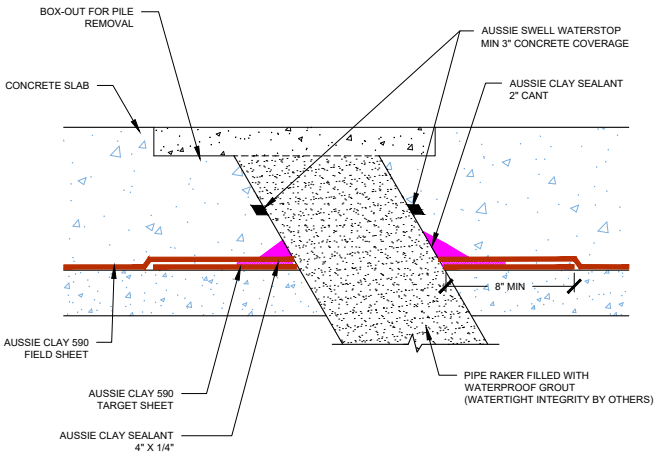

FIGURE 1.14 – PIPE RAKER THROUGH SLAB

1.5– INSTALLATION: Elevator Pit

Aussie Clay 590 should be placed on vertical surfaces and on the substrate underslab to provide a continuous envelope around the elevator pit. Ensure the soil cut is smooth to provide a proper substrate for the Aussie Clay 590. When the soil conditions are unstable, it is recommended to install a retaining wall to contain the soil and provide a substrate for the membrane to be installed over. **Figure 1.15** shows a standard elevator pit detail with the membrane extending a minimum of 12″ onto the horizontal surface from the top of the pit.

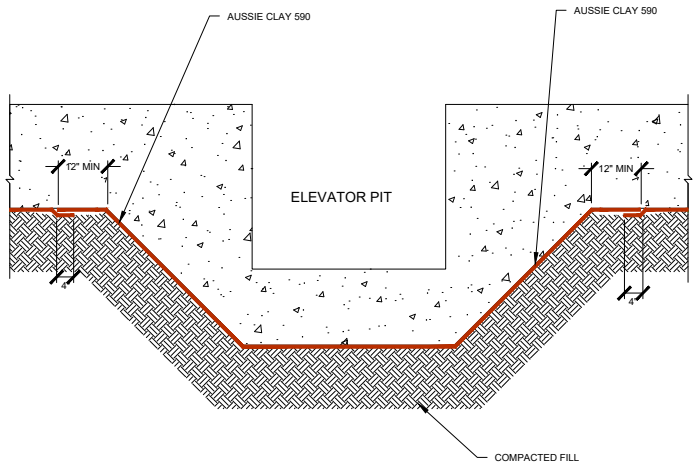

FIGURE 1.15 – TYPICAL ELEVATOR PIT

Figures 1.16 will show the pits if the pit walls and the foundation slab were done as separate pours. **Figure 1.17** will show the same sequence but with a flush slab and with the membrane tying into a vapor barrier. All pour joints will require an Aussie Swell Red waterstop. For other elevator pit conditions, please consult the AVM Technical Team for assistance.

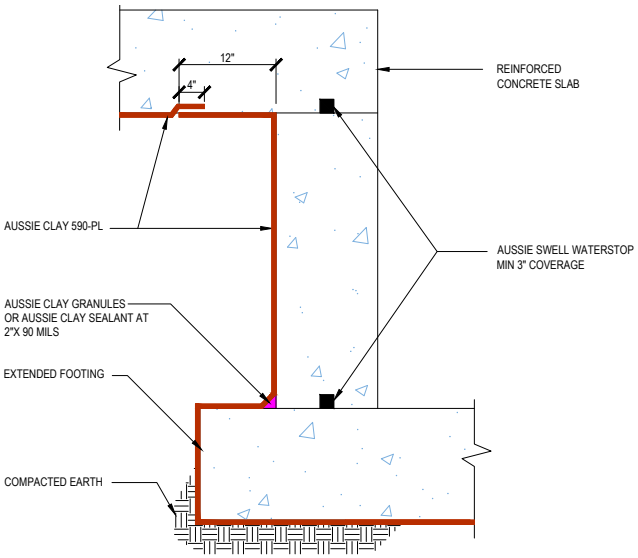

FIGURE 1.16 – ELEVATOR PIT HYDROSTATIC

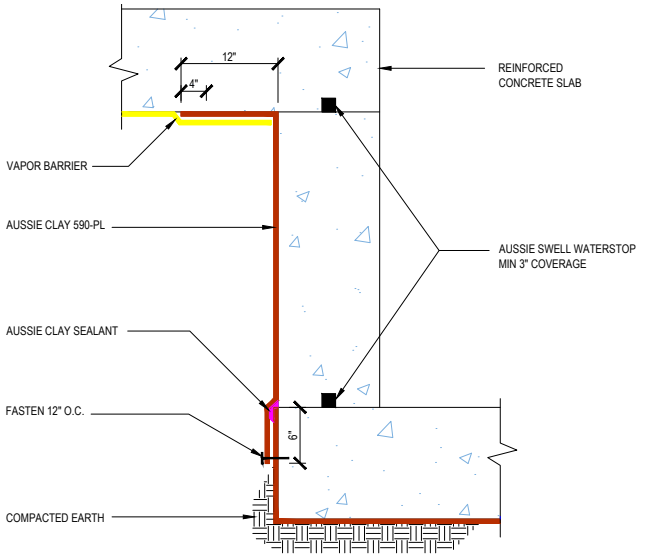

FIGURE 1.17 – ELEVATOR PIT FLUSH SLAB W/ VAPOR BARRIER

1.6 – INSTALLATION: Transition to Propertyline

Where the propertyline retaining walls like soldier pile and lagging or metal sheet piling are used as the outside form, continue the Aussie Clay 590 installation up the retaining wall system a minimum of 12" above the top of slab or footing. This transition is shown in **Figure 1.18**.

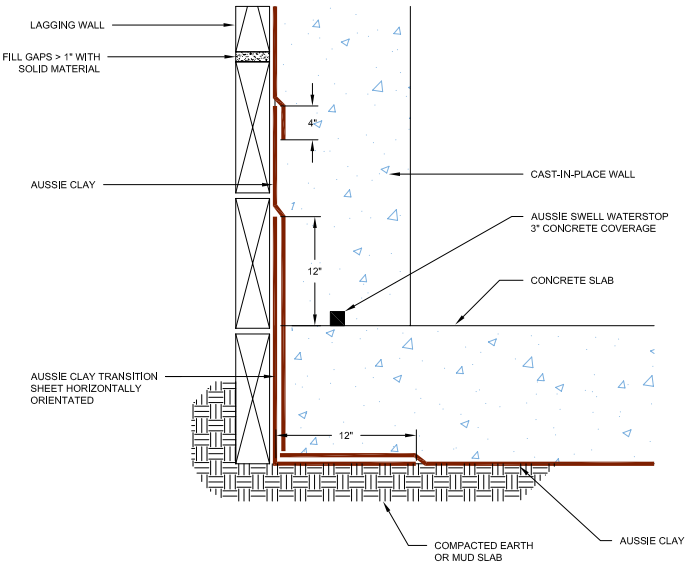

FIGURE 1.18 – SLAB TO WALL TRANSITION OVER LAGGING

For non-hydrostatic conditions, there typically would not be a transition from underslab waterproofing to vertical wall waterproofing as it would be unnecessary. However, the vertical waterproofing would tie into a drainage system. AVM's Drainboard 6000 would be placed over the outside of the waterproofing and it would lead surface water down into the AVM Bottom Drain, which ties into an underslab drainage system. This can be seen in **Figure 1.19**.

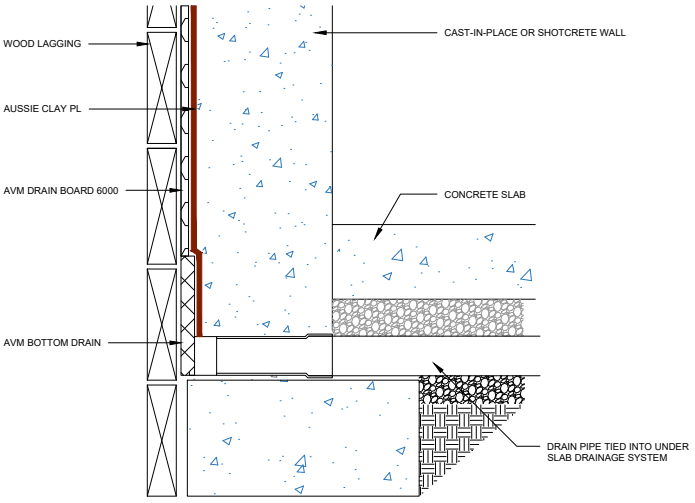

FIGURE 1.19 – NON-HYDROSTATIC TRANSITION OVER LAGGING WITH DRAINAGE

For a metal sheet piling shoring system, first install the Aussie Clay 590 corner transition sheet horizontally oriented with the bottom edge extending 12" onto the substrate. To lay the corner transition sheet flat onto the substrate, cut the bottom edge of the sheet in the angled orientation of the piling. Place Aussie Clay Granules or trowel Aussie Clay Sealant along the base of the shoring wall. From there, install the base shoring wall Aussie Clay 590 sheet horizontally oriented and overlapping the corner transition sheet. This is shown in **Figure 1.20**.

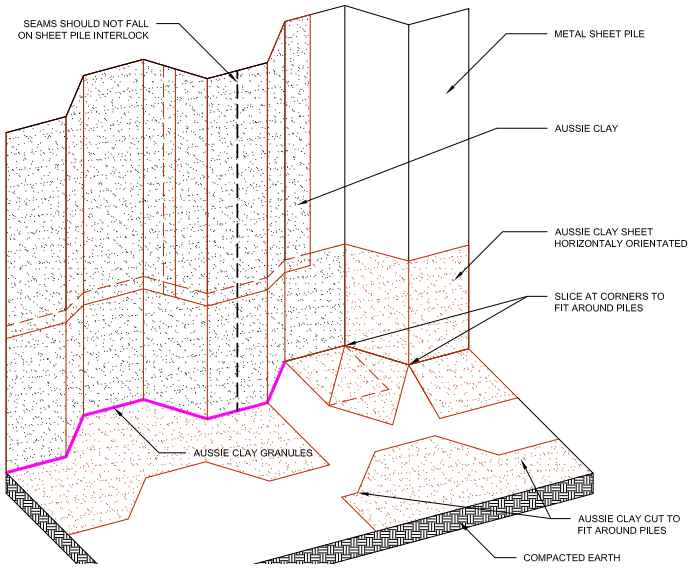

FIGURE 1.20 – SHEET METAL PILE TRANSITION

SECTION 2 - PROPERTYLINE INSTALLATION

To maximize the space of the available land, propertyline has become a popular construction technique. Aussie Clay 590 has been proven to be able to effectively waterproof the foundation walls of projects that undergo this type of technique. Aussie Clay 590 can be installed over wood pile and lagging, shotcrete retaining walls, or sheet metal piling as well in hydrostatic and non-hydrostatic conditions. When installing the Aussie Clay 590 in this type of application, it is important to install the membrane with the dark gray woven side facing the installer (like in underslab applications). For non-hydrostatic conditions, it is recommended that the AVM Drainboard 6000 is used to collect water and carry it into a drainage system. Please consult an AVM Technical Representative for shotcrete applications.

2.1 – SUBSTRATE:

Prior to installing the Aussie Clay 590, the substrate needs to be prepared to meet the installation requirements. Penetrations should already be in place to ensure proper detailing at the time of installation. Any penetrations that are not in place should be communicated to the waterproofing contractor to ensure detailing prior to concrete placement.

Sheet Metal Piling: Use concrete, plywood, board insulation, drainage panel or other approved facing over sheet metal piling to provide support to the membrane.

Wood Lagging Shoring: Wood lagging shoring should extend to the lowest level of the waterproofing installation with any voids or cavities exterior of the lagging filled with compacted soil or cementitious grout. Cavitied and any voids should be filled with grout, compacted earth, 2-part urethane expanding foam, or any other approved filler prior to Aussie Clay 590 installation. Gaps between lagging boards or any planar offsets should not exceed 1". Any gaps in excess of 1" should be filled with grout or other solid material such as extruded polystyrene (20 psi minimum) prior to installation of the Aussie Clay 590. If AVM Drainboard 6000 is installed, the gaps between planes and lagging can be 2" maximum.

2.2 – INSTALLATION: General

Once the transition sheet from slab-to wall is installed per the guidelines mentioned in Section 1.7, the Aussie Clay 590 can be installed either vertically or horizontally oriented. Aussie Clay 590 sheets should be fastened to the shoring using washer head fasteners placed a maximum of every 24" O.C. around the sheet edge. The succeeding sheets of Aussie Clay 590 should overlap the previous sheet a minimum of 4". The bottom edge of the upper sheet should always be over the top edge of the lower sheet.

Installation up the wall should continue until grade detail with the sheet ends of the adjacent roll staggered a minimum of 12". Overlap sheet joints should never occur at the same elevation as a concrete pour joint. This can be avoided by chalk lining the location of construction joints.

2.3 – INSTALLATION: Pipe Penetrations

Pipe penetrations should be installed prior to the installation of the Aussie Clay 590. The first step of detailing around a penetration in a propertyline application is to install a cut patch of the Aussie Clay 590 snuggly around the penetration with the edges of the patch extending a minimum of 8" around the perimeter of the penetration. Once the patch is placed, apply a ring of Aussie Clay Sealant extending a minimum of 4" around the base of the penetration at ¼" thick. Then place the main course of Aussie Clay 590 tightly around the penetration over the patch and sealant already placed. Then install a ¾" cant of Aussie Clay Sealant around the base of the penetration over the main course of the membrane. This is shown on **Figure 2.1**. For sleeved penetrations, ensure the gap between the pipe and the sleeve is filled with a non-shrink cementitious grout and a mechanical seal is installed by others. This is shown in **Figure 2.2**. All penetrations will receive an Aussie Swell Red waterstop.

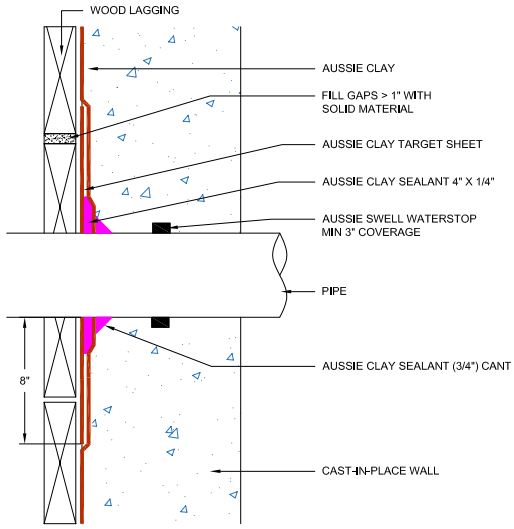

FIGURE 2.1 – TYPICAL PIPE PENETRATION THROUGH LAGGING

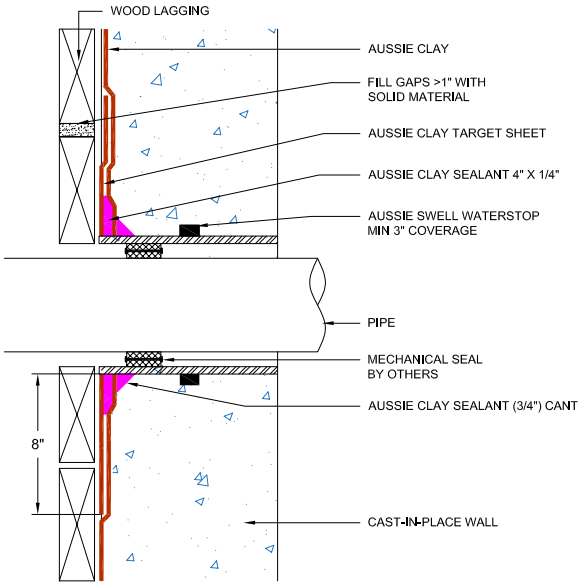

FIGURE 2.2 – SLEEVED PIPE PENETRATION THROUGH LAGGING

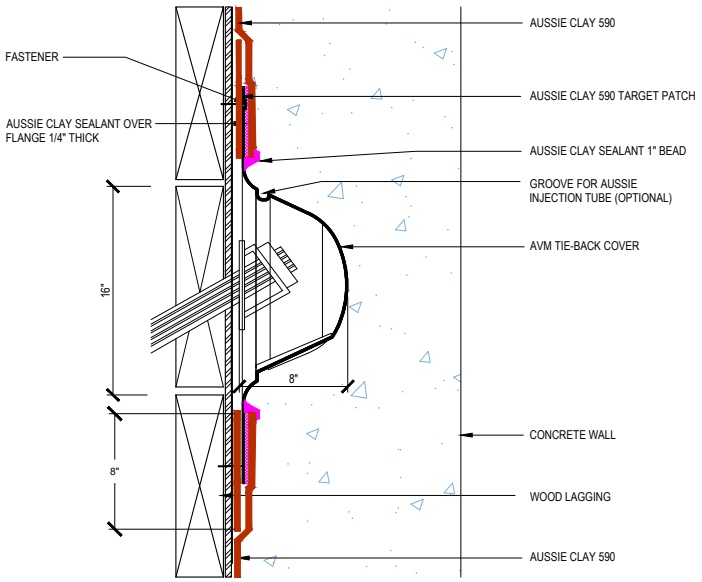

FIGURE 2.3 – 8" TIE-BACK COVER

2.4 – INSTALLATION: Tie-Backs

Tie-backs can be installed a few different ways with the Aussie Clay 590 system: by utilizing an AVM Tie-back Cover (recommended) or boxing out and de-tensioning the tie-back after the concrete is placed. If neither of these options can be achieved, refer to the AVM Technical Team. When using an AVM Tie-Back cover, first select the proper size to fit over the tie-back and allow proper concrete coverage per project requirements. Sizes come in 4", 6", & 8" tie-back covers. The cover should fit over entire tie-back head without the tie-back plate or cables in direct contact with the cover. All voids should be addressed with non-shrink cementitious grout or approved 2-part expanding urethane foam. Like the penetrations in the previous section, install an Aussie Clay 590 patch that extends 8" in all directions around the tie-back. The selected AVM Tie-back cover will then be placed over the tie-back and the edges of the Aussie Clay 590 patch and fastened. Apply ¼" bead of Aussie Clay Sealant over the flange of the AVM Tie-back Cover. The field sheet of the Aussie Clay 590 will then be placed over the flange and butt up against the boot head. An inch bead of Aussie Clay Sealant is then placed around the perimeter of the boot head where the Aussie Clay 590 field sheet edge is. **Figure 2.3** shows the detail for an 8" cover. Non-hydrostatic conditions would have AVM Drainboard 6000. Review Tie-Back Cover TDS on the website for more information on all AVM Tie-Back Cover products. **Figure 2.4** shows a 4" cover for soil anchors.

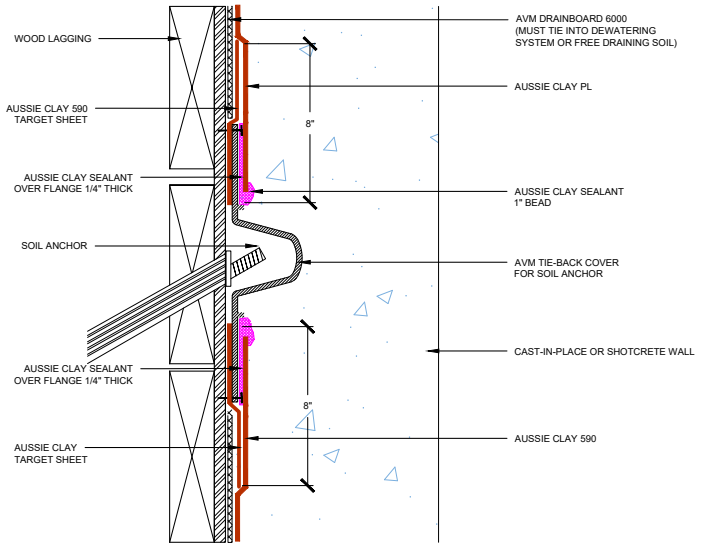

FIGURE 2.4 – 4" TIE-BACK COVER

De-tensioning the tie-back by the way of boxing it out is another common way to waterproof tie-back. In this method, the idea is to block the tie-back during concrete placement and then come back and torch it off the wall afterwards. With this approach, install the Aussie Clay 590 field sheet tight up against the tie back. Install forms or place a sonotube around the tie-back to prevent it from receiving concrete during placement. The forms/sonotube should not have a gap between it and the membrane to prevent concrete from seeping through. Once concrete is placed, the forms/sonotube will be removed and the tie-back can be de-tensioned. Aussie Seal M should be placed around any sharp edges to prevent damage to the membrane. Install a patch of Aussie Clay 590 centered over the de-tensioned tie-back that extends a minimum of 4" past the tie-back. The seams between the patch and the field sheet will be coated with Aussie Clay Sealant. Install an Aussie Swell Red waterstop around the perimeter of the boxed-out are keeping a minimum of 3" of concrete coverage. The boxed-out area will then be filled with concrete mix. **Figure 2.5** will show this sequencing.

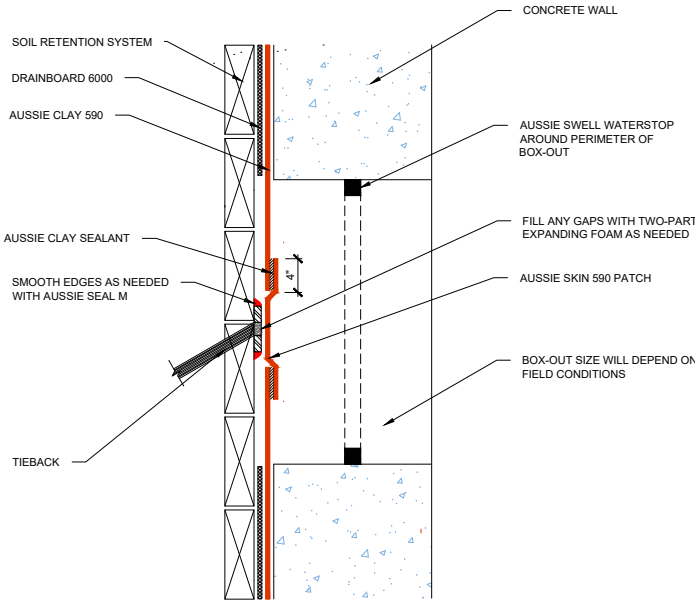

FIGURE 2.5 – 4" TIE-BACK/SOIL ANCHOR DETAIL

2.5 – INSTALLATION: Rebar Ties, Rakers, Soldier Piles

This section will show how to detail more obscure types of penetrations through the membrane. Any penetrations not discussed in this section, please refer to the AVM Technical team for assistance.

Soldier piles throughout the project should be stripped prior to installing the Aussie Clay 590 directly over it. In non-hydrostatic conditions, the AVM Drainboard 6000 would be acceptable, and nothing further would need to be done for typical soldier piles. Otherwise, cement board or strip of Aussie Clay 590 can be centered over the pile, giving the field sheet a smoother surface. The strip should extend a minimum of 4" past both sides of the pile. Apply Aussie Clay Sealant to the Aussie Clay 590 strip surface along both edges of each pile as shown in **Figure 2.6**. Very similarly, when the conditions of the lagging are face lagged, place a strip of Aussie Clay Sealant that extends a minimum of 4" past the bolted plates. From there, install the field sheet over with Aussie Clay Sealant in between the Aussie Clay 590 sheets as shown in **Figure 2.7**.

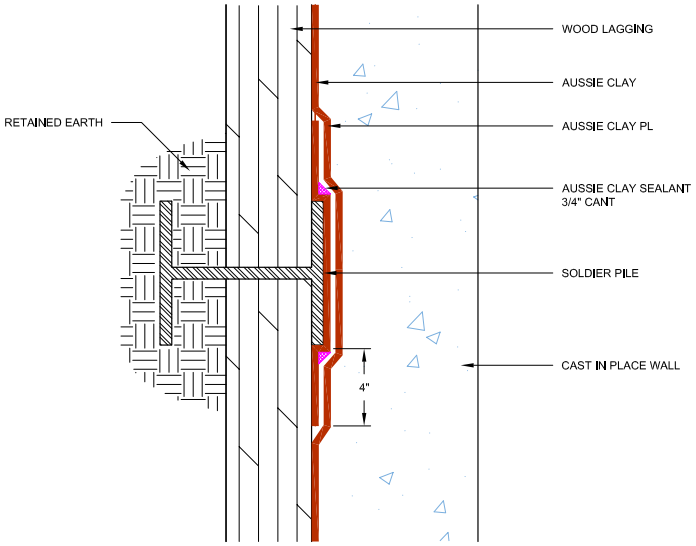

FIGURE 2.6 – TYPICAL SOLDIER PILE

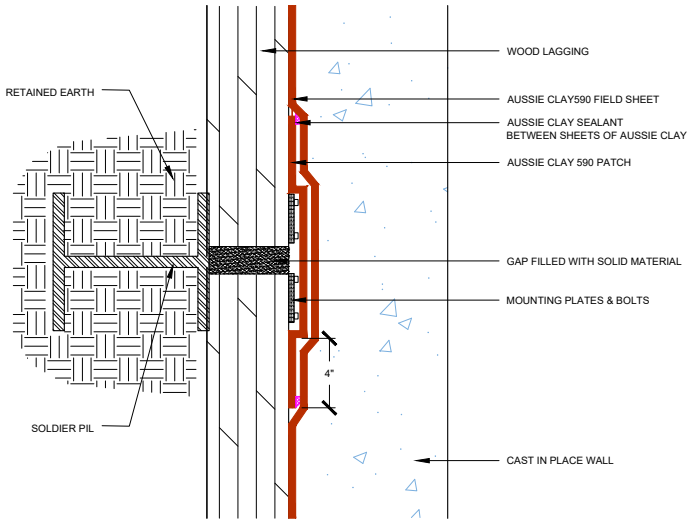

FIGURE 2.7 – FACE LAGGED SOLDIER PILE

The detailing differs when the soldier pile sticks out of the lagging in conditions such as mid-lagged or back-lagged piles. This would be treated more in line like a penetration detail. The pile strip of Aussie Clay 590 would be secured to each side of the pile along with a ¼" thick bead of Aussie Clay Sealant extending 3". The pile strip of Aussie Clay 590 should extend a minimum of 4" past the pile. The field sheet of Aussie Clay 590 would then be placed over that along with a ¾" cant of the Aussie Clay Sealant much like a penetration detail. An Aussie Swell Red waterstop would be installed the length of the pile. A ¾" cant of Aussie Clay Sealant should continue around the base of the pile at under slab Aussie Clay if applicable. This is all shown in **Figure 2.8** which shows a back-lagged soldier pile condition. A mid-lagged pile would follow the same installation instructions.

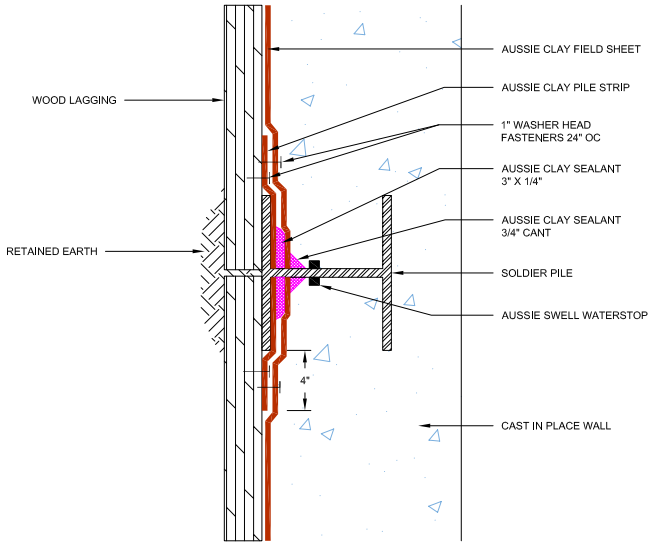

FIGURE 2.8 – BACK LAGGED SOLDIER PILE

I-Beams and Rakers through the walls are very similar to regular penetrations in terms of detailing. What makes these a little more unique is that they are not uniform all the way around. **Figure 2.9** will show a wall I-beam raker. The patch should always extend 8" past the shoring pile when completing this detail. A full 2" cant of Aussie Clay Sealant is placed around the perimeter of the base of the I-beam. Always wrap the I-beam with an Aussie Swell Red while maintaining 3" of concrete coverage.

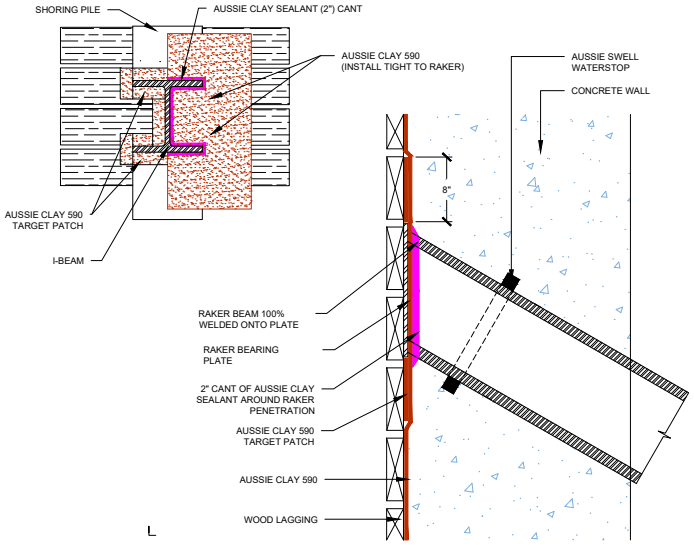

FIGURE 2.9 – WALL I-BEAM RAKER DETAIL

When detailing rebar ties or small penetrations that you cannot fit an Aussie Swell Red around, you can detail with just a ¾" cant of Aussie Clay Sealant. If the rebar ties are penetrating from the soldier pile, you still need to place the strip of Aussie Clay 590 does prior to the filed sheet fitting snug around the tie. Refer to **Figure 2.10** for a rebar tie penetration detail coming from a soldier pile.

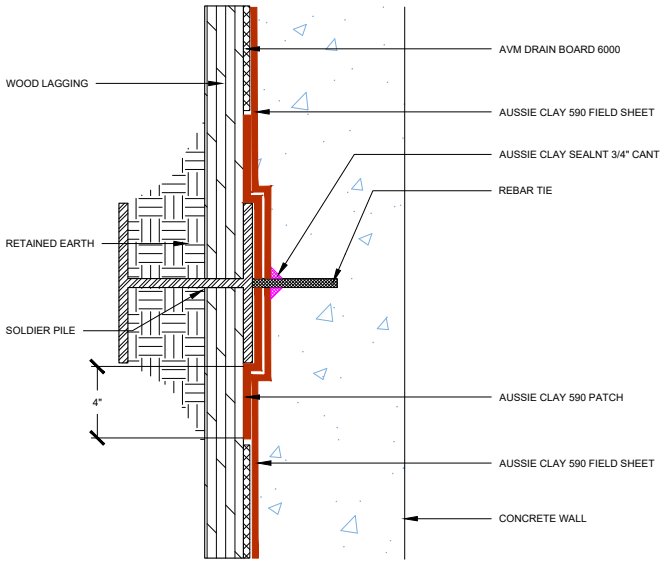

FIGURE 2.10 – REBAR TIE PENETRATION

Installation Instructions

For blindside application terminations, prior to installing the Aussie Clay 590 to finished grade, install a ½" thick cementitious wall board over the steel piles from finished grade to the specified depth that the wood lagging and pile would be removed. Bring the Aussie Clay 590 over the cementitious board as shown in **Figure 2.11**. The cementitious board will protect the waterproofing membrane during excavation and removal of the steel pile and the wood lagging boards. In the even damage does occur, please consult an AVM Technical Representative.

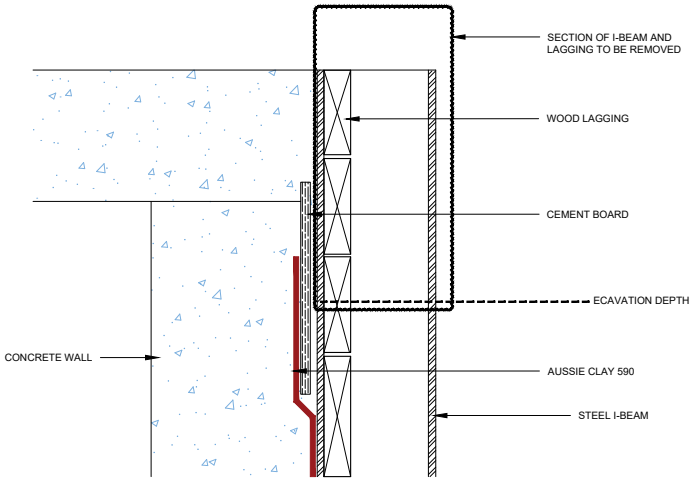

FIGURE 2.11 – CEMENT BOARD AT GRADE

SECTION 3 – BACKFILL INSTALLATION

When installing Aussie Clay 590 post concrete placement, you want to ensure the dark gray woven side is installed up against the concrete wall. Aussie Clay 590can be installed once the forms are removed as it is unnecessary for the concrete to be completely cured prior to installation. The membrane sheets will be held in place by washer head fasteners, installed a maximum of 24″ O.C.

3.1 – Substrate

Like other applications mentioned before, the substrate will need to be prepared prior to installation of Aussie Clay 590. In applications where there is a footing, the footing should be swept clean of debris, rocks, clumps of dirt and silt to allow direct contact of the Aussie Clay 590 to the concrete. Standing and pooled water should also be removed prior to installation. Surface defect like honeycombing or voids greater than 1″ in the concrete should be filled with a cementitious grout. Protrusions greater than a ¼″ and other sharp surfaces should be removed or shaved down flush to the substrate to prevent the membrane from becoming damaged after installation and backfill. Form tie-holes will need to be filled in with cementitious non-shrink grout. Tapered form tie-holes should be filled flush to the surface with non-shrink grout as well. Once grouted, apply Aussie Clay Sealant over the surface of the form tie-holes. See **Figure 3.1** for form tie-hole preparation.

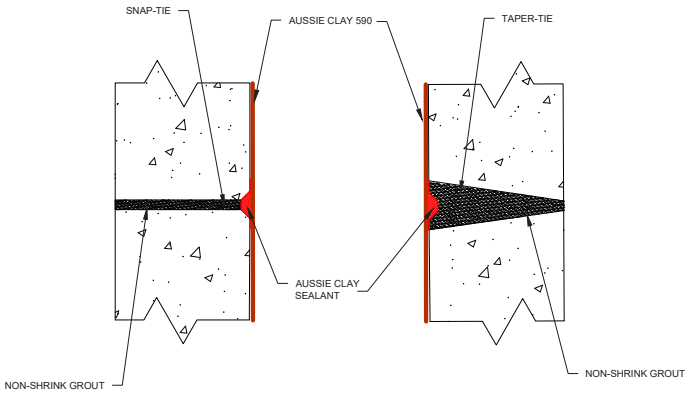

FIGURE 3.1 – FORM TIE-HOLES PREPARATION

3.2 – INSTALLATION: General

Prior to installing the first course of the Aussie Clay 590, place Aussie Clay granules or trowel Aussie Clay Sealant at the inside corner of the footing (if it is extended). Ensure the granules/sealant are applied continuously so that there are no gaps. To begin the installation of the Aussie Clay 590, you will want to begin at the bottom corner of the wall with a horizontally oriented base course. Start with around 6’ on one wall and wrap the rest around the corner onto the other wall surface. Cut the bottom edge where the corner is about 6’ so the Aussie Clay 590 can extend onto the footing a minimum of 6’. Apply Aussie Clay Sealant in the corner at the laps and over the outside corner. Take a small section of Aussie Clay 590 and install it over the uncovered area in the corner. Fasten the membrane edge that extends onto the footing every 12″ O.C. Apply a 90-mil thick coat of Aussie Clay Sealant at the membrane edge 2″ thick. This will be shown in **Figure 3.2**.

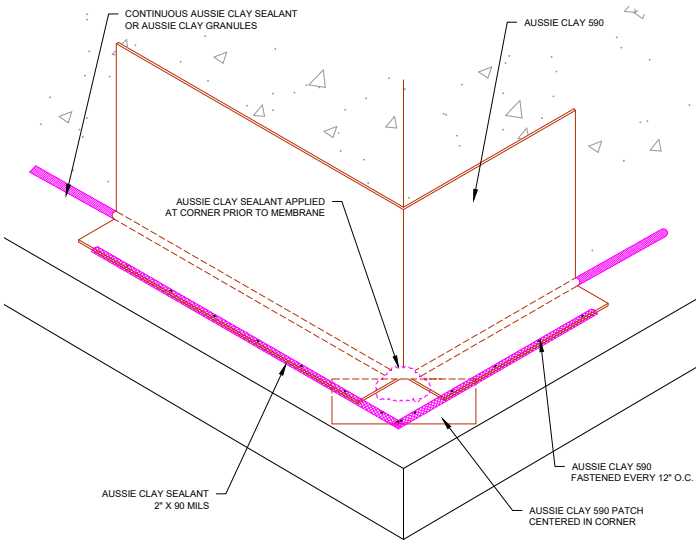

FIGURE 3.2 – OUTSIDE CORNER EDGE - NH

The bottom course of the Aussie Clay 590 should be installed horizontally oriented all the wall across. Each roll should overlap the proceeding roll a minimum of 4″ and should extend onto the footing a minimum of 6″. **Figure 3.3** will show this installation on an extended slab/footing. When there is no footing and the slab is flush to the wall, the Aussie Clay 590 should extend down 12″ past the wall/slab joint as seen in **Figure 3.4**.

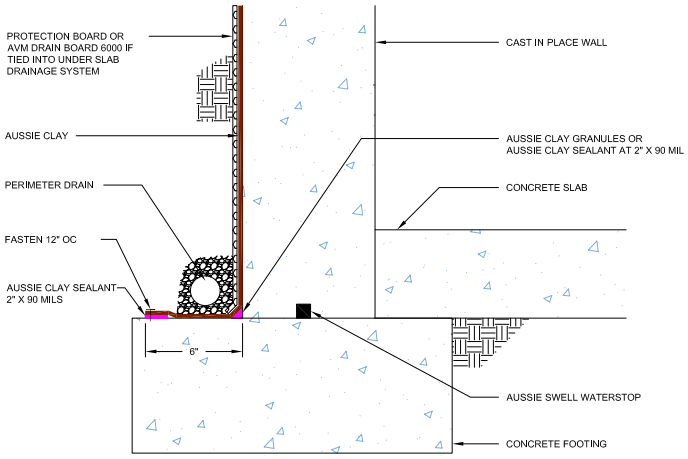

FIGURE 3.3 – BOTTOM OF THE WALL WITH FOOTING

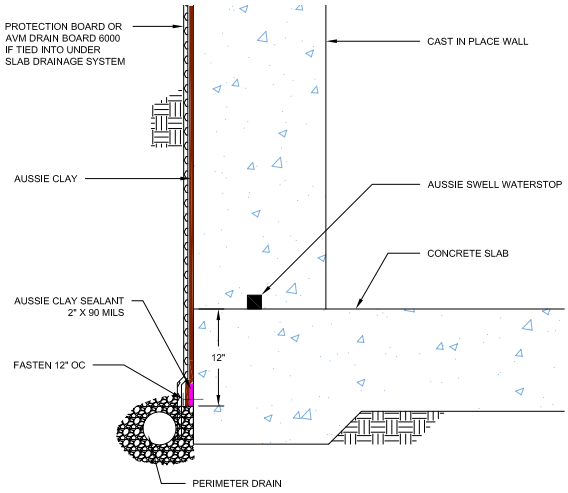

FIGURE 3.4 – BOTTOM OF THE WALL WITH FLUSH SLAB

Once the horizontal base course is installed, the proceeding rolls can be installed either horizontally or vertically oriented. The laps should all be a minimum of 4″ and should be staggered a minimum of 12″. Drain board or an approved protection course (such as 25 psi XPS board) should be installed over the membrane to protect it from damage. Backfill lifts should be kept to 6’. The backfill should be used as a platform to install proceeding rolls of Aussie Clay 590. All backfill must adhere to a minimum compaction of 85% Modified Proctor density. The backfill should not exceed stones larger than ¾″, be free of sharp protrusions and debris, and should be consisted of compactable soils/earth or an angular aggregate. Please consult the AVM Technical Team with further questions on backfill requirements.

When installing inside corners, always place an Aussie Clay Sealant cant at ¾″ thick into the corner prior to running the Aussie Clay 590 membrane over it. **Figure 3.5** shows a step by step approach with inside corners at the footing.

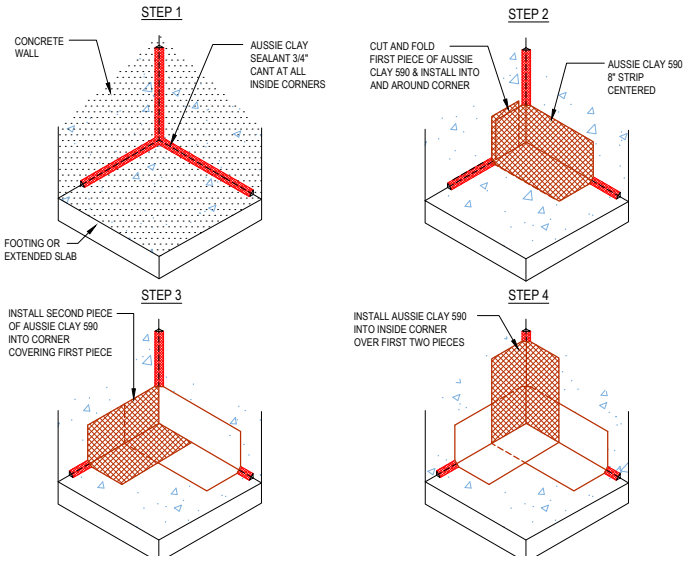

FIGURE 3.5 – INSIDE CORNER

3.3 – INSTALLATION: Pipe Penetrations

When detailing pipe penetrations, first apply 90 mils of Aussie Clay Sealant 4" around the base of the perimeter of the penetration. Cut the Aussie Clay Sealant to fit snug around the penetration. Finally apply a ¾" cant of Aussie Clay Sealant around the base of the penetration to ensure there are no gaps between the pipe and the membrane. For multiple penetrations that are less than 4" from each other, follow the same installation guidelines with the 90 mils of Aussie Clay Sealant being continuous. Please refer to the AVM Technical Team for pipe penetrations less than 4" apart. **Figure 3.6** will show a typical pipe penetration. **Figure 3.7** will show a sleeved pipe penetration with non-shrink grout placed between the sleeve and the pup and with a mechanical seal installed by others.

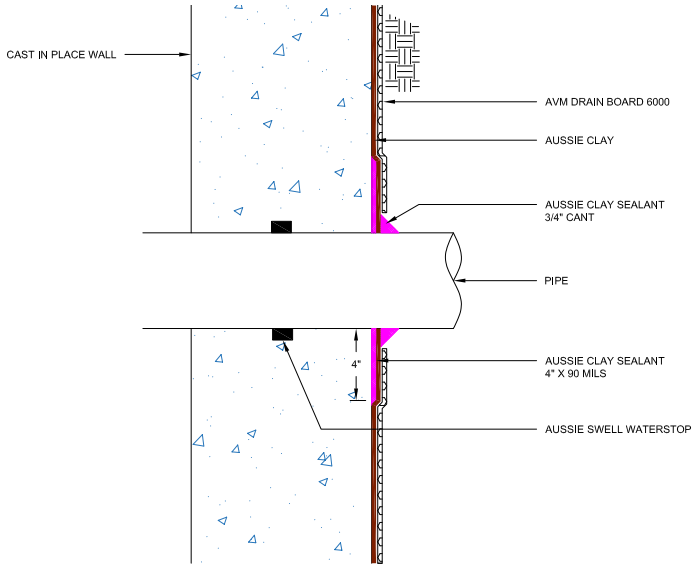

FIGURE 3.6 – TYPICAL PIPE PENETRATION

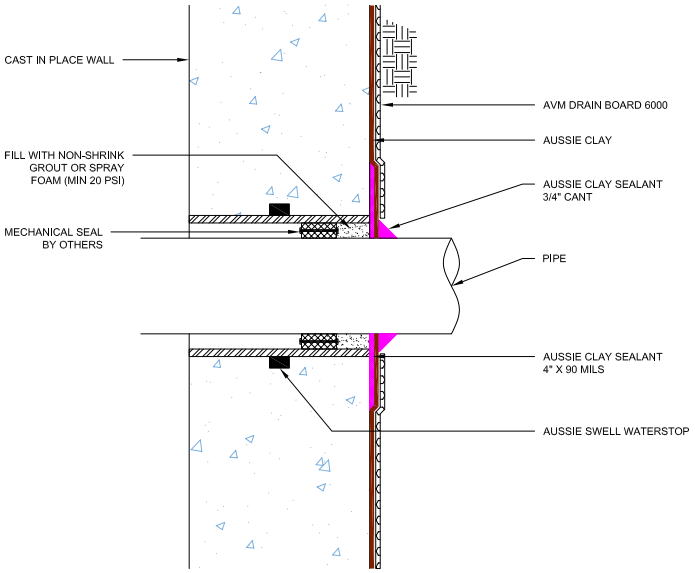

FIGURE 3.7 – SLEEVED PIPE PENETRATION

3.4 – INSTALLATION: Grade Termination

There are a few different options when terminating the Aussie Clay 590 at the grade elevation. The first method is to simply bring the Aussie Clay 590 membrane up to the finished grade elevation and terminating using a stainless steel or a weather resistant termination bar. Fasten through the term bar every 12" O.C. and finish with a tooled bead of Aussie Seal M directly above the termination bar. **Figure 3.8** shows this method.

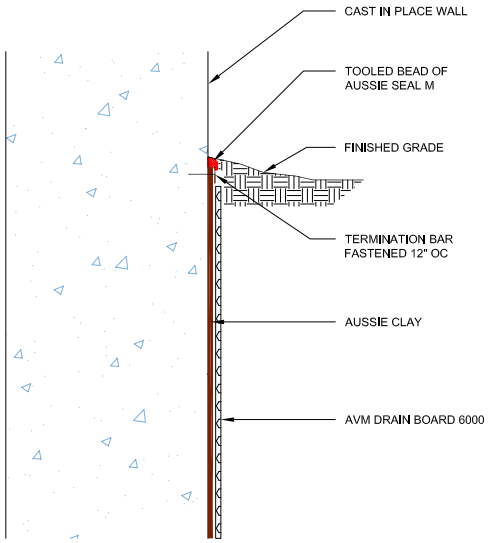

FIGURE 3.8 – TYPICAL GRADE TERMINATION

The other option to change to a flashing membrane. Terminate the Aussie Clay 590 below the finished grade elevation 12″ with washer head fasteners maximum 12″ O.C. Seal the edge of the terminated Aussie Clay 590 with Aussie Clay Sealant. Install Aussie Mate 580-AL to concrete surface (AVM Adhesive 501 optional) with the bottom edge of the Aussie Mate overlapping the top edge of the Aussie Clay 590 a minimum of 6″. Extend the Aussie Mate 580-AL up the rest of the wall to finished grade and terminate with a term bar fastened every 12″ O.C. and a tooled bead of Aussie Seal M. This is shown on **Figure 3.9**.

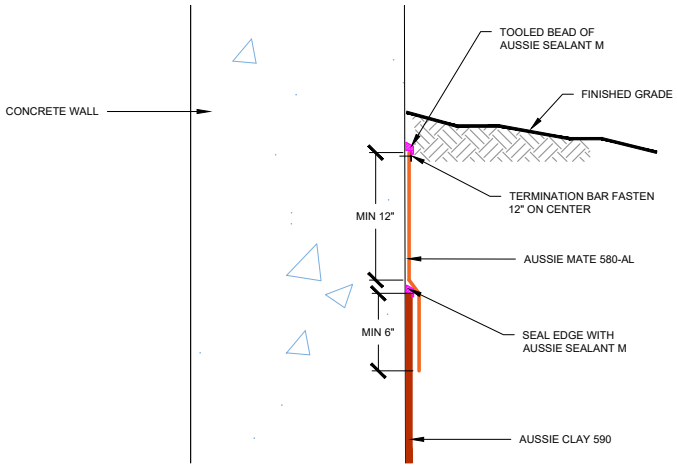

FIGURE 3.9 – GRADE TERMINATION WITH FLASHING

Brick ledge backfilled wall applications can be done by either method as well, **Figures 3.10 & 3.11** will show these terminations at a brick ledge.

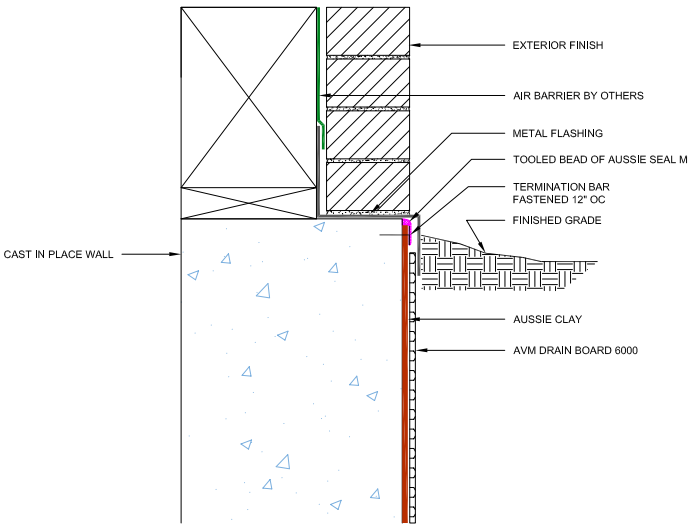

FIGURE 3.10 – TYPICAL TERMINATION AT BRICK LEDGE

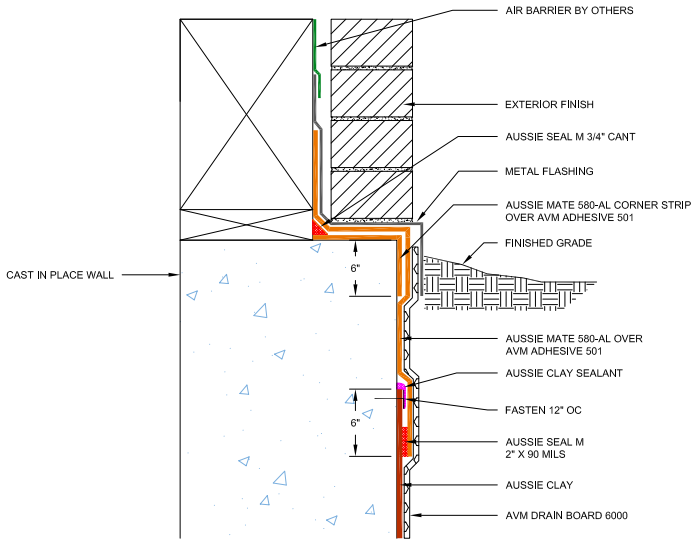

FIGURE 3.11 – BRICK LEDGE TERMINATION WITH FLASHING

SECTION 4 – SHOTCRETE INSTALLATION

Shotcrete is a method of concrete placement that is done by pneumatically shooting a wet or dry mix of concrete onto a surface at high velocity. In typical commercial foundation construction, it is reinforced by steel rebar. In a propertyline application, the application of shotcrete reduces a lot of formwork needed. This differs from cast in place, where forms are put up and concrete is poured.

With the ease of placement and decreased construction costs, shotcrete has evolved into an increasingly popular method of concrete placement. Despite the advantages that shotcrete presents, it also creates challenges when it comes to waterproofing and maintaining the structure's watertight integrity. Some of these challenges include product damage due to the high speed of the concrete sprayed onto the membrane, poor consolidation due to rebar and penetrations hindering the placement, and large voids due to shadowing from rebar, penetrations and other structural elements that are encapsulated in the concrete.

Because of these challenges, the installation guidelines will slightly differ when Aussie Clay 590 is used. These guidelines will vary depending on if the condition is hydrostatic or not. Hydrostatic conditions exist when the elevation of the below grade foundation is lower than the project site groundwater level or where the historic high-water table is per the project's geotechnical report. If the elevation of the below grade foundation does not contain any groundwater or is higher than the historic high-water table per the geotechnical report the condition would be considered non-hydrostatic. This section will go over the installation guidelines for Aussie Clay 590 for both hydrostatic and non-hydrostatic conditions.

4.1 – Non-Hydrostatic Conditions

With the absence of a hydrostatic presence, the installation of Aussie Clay 590 would be similar to the installation depicted in "Section 2 – Propertyline Installation" of this product manual. AVM Drainboard 6000 is installed onto the shoring first and should tie into a underslab drainage system to remove surface waters from building up around the perimeter of the building. Once the transition sheet from slab-to wall is installed, the Aussie Clay 590 can be installed either vertically or horizontally oriented. Aussie Clay 590 sheets should be fastened to the shoring using washer head fasteners placed a maximum of every 24″ O.C. around the sheet edge. The succeeding sheets of Aussie Clay 590 should overlap the previous sheet a minimum of 4″. The bottom edge of the upper sheet should always be over the top edge of the lower sheet. Fasteners should be placed a maximum of 12″ on all overlaps.

Installation up the wall should continue until grade detail with the sheet ends of the adjacent roll staggered a minimum of 12″. Overlap sheet joints should never occur at the same elevation as a concrete pour joint. This can be avoided by chalk lining the location of construction joints.

4.2 – Hydrostatic Conditions

The presence of hydrostatic conditions amplifies the challenges that surround shotcrete and waterproofing. If the membrane is damaged during shotcrete placement or if there is poor consolidation or large voids due to shadowing of rebar, water can find a way into the structure. Because of this, a few additional measures should be administered to ensure watertight integrity despite the challenges.

The additional measures include installing two layers of Aussie Clay 590 onto the shoring for extra protection. The outer layer (the layer that goes directly onto the shoring) of the membrane should be Aussie Clay 590-PL, which is the version with the poly-liner on the non-woven side of the membrane. Aussie Clay 590 sheets should be fastened to the shoring using washer head fasteners placed a maximum of every 24″ O.C. around the sheet edge. The succeeding sheets of Aussie Clay 590 should overlap the previous sheet a minimum of 4″. Installation up the wall should continue until grade detail with the sheet ends of the adjacent roll staggered a minimum of 12″.

The inside layer, which will be installed over the Aussie Clay 590-PL, should be the standard version of the Aussie Clay 590. The membrane should be installed so that the membrane overlaps are not placed at the same elevation and location as the overlaps of the outside layer of Aussie Clay 590-PL. Once the transition sheet from slab-to wall is installed, the Aussie Clay 590 can be installed either vertically or horizontally oriented. Aussie Clay 590 sheets should be fastened to the shoring using washer head fasteners placed a maximum of every 24" O.C. around the sheet edge. The succeeding sheets of Aussie Clay 590 should overlap the previous sheet a minimum of 4". The bottom edge of the upper sheet should always be over the top edge of the lower sheet in a shingled fashion. Fasteners should be placed at a maximum of 12" on all overlaps in for the inside layer of Aussie Clay 590. Fasteners can be placed at a maximum of 24" at overlaps on the outside sheet.

Installation up the wall should continue until grade detail with the sheet ends of the adjacent roll staggered a minimum of 12". Overlap sheet joints should never occur at the same elevation as a concrete pour joint. This can be avoided by chalk lining the location of construction joints.

4.3 – Hydrostatic Conditions – Slab to Wall Transition

To begin installation up the wall in a hydrostatic shotcrete application, take a transition sheet of Aussie Clay 590-PL oriented horizontally and extend it 12" onto the underslab and bring it up the wood lagging 12" past the top of the slab. The underslab waterproofing should come over the top of the transition sheet that extends onto the underslab and butt against the shoring. From the bottom of the shoring, begin the installation of the outer later of Aussie Clay 590-PL and run it up the wall over the horizontal transition sheet with the fasteners being placed every 24" O.C. max. Installers should then take a horizontally oriented sheet of Aussie Clay 590 and place it over the outer layer of the Aussie Clay 590-PL starting at the bottom of the shoring. Once the initial horizontally oriented inner layer sheet is installed, the inner layer of Aussie Clay 590 can be installed either vertically or horizontally oriented. **Figure 4.1** shows the transition up a lagging wall in a hydrostatic shotcrete condition.

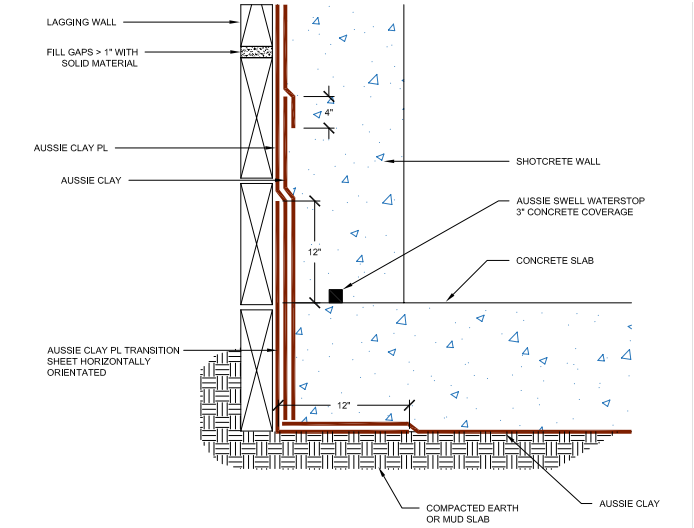

FIGURE 4.1 – LAGGING WALL TRANSITION IN A SHOTCRETE HYDROSTATIC CONDITION

When installing over sheet metal piles, the transition would be similar, but the sheets would be required to be cut at the corners to fit around piles. This includes the underslab waterproofing sheet and the horizontally oriented transition sheet. Aussie Clay Granules should be placed continuously at the base of the sheet metal piling. The outer layer would need to be Aussie Clay 590-PL. Seams should not fall on the sheet pile interlocks. **Figure 4.2** shows the installation at the transition up sheet metal shoring in a hydrostatic shotcrete condition.

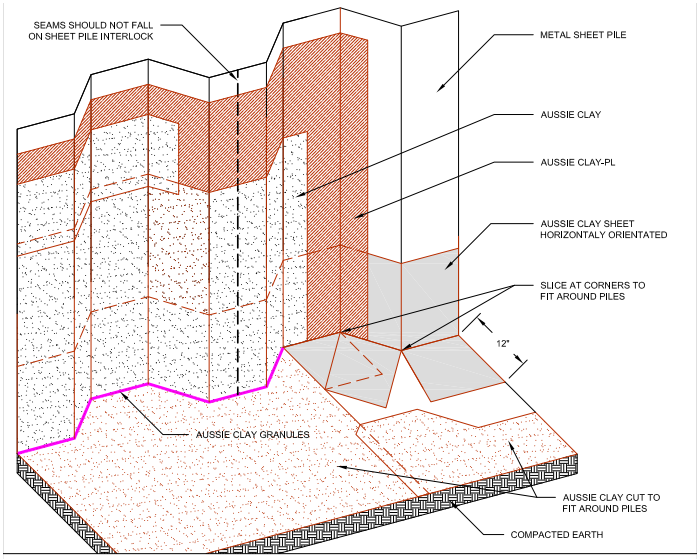

FIGURE 4.2 – SHEET METAL PILING TRANSITION IN A SHOTCRETE HYDROSTATIC CONDITION

4.4 – Hydrostatic Conditions – Penetrations

When dealing with penetrations, take the outer layer of Aussie Clay 590-PL and cut it to fit snuggly over the penetration. Once the outer layer is placed, take the Aussie Clay Sealant and place it around the penetration at the base at ¼" and extend it 4" onto the Aussie Clay 590-PL around the perimeter of the penetration. Take the inner layer of the Aussie Clay 590 and cut it to fit it snuggly around the penetration over the Aussie Clay 590-PL and the sealant. A ¾" cant of the Aussie Clay Sealant would then be smeared around the base of the penetration over the inner layer. An Aussie Swell Red Waterstop is then wrapped around the penetration maintaining a minimum of 3" of concrete coverage. **Figures 4.3-4.4** show how typical penetrations are detailed in a shotcrete hydrostatic condition.

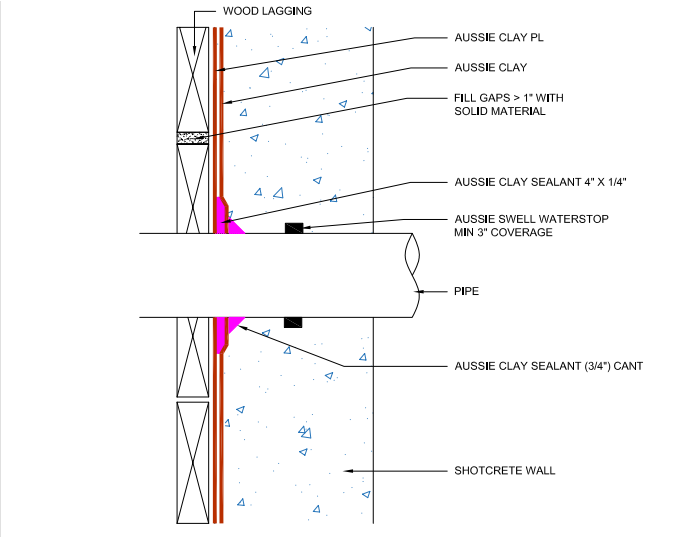

FIGURE 4.3 – PIPE PENETRATION IN HYDROSTATIC SHOTCRETE CONDITION

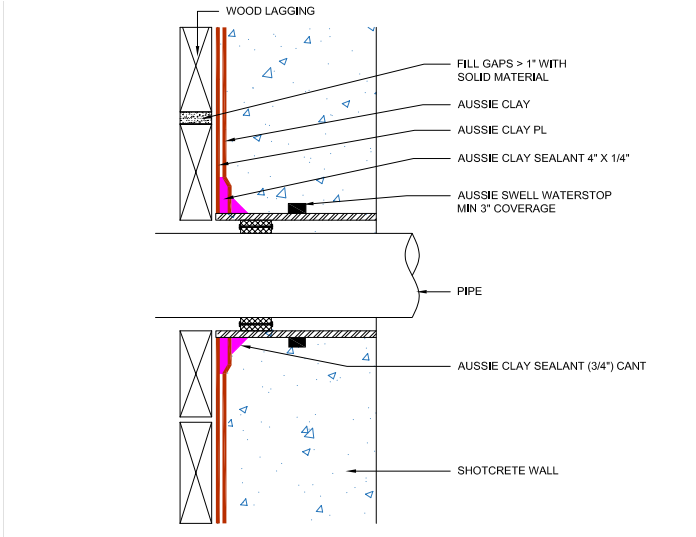

FIGURE 4.4 – SLEEVED PIPE PENETRATION IN HYDROSTATIC SHOTCRETE CONDITION

SECTION 5 – PROTECTION/REPAIRS/SPECIAL CONDITIONS

Aussie Clay 590 contains bentonite, which is mined in the Earth making it resilient in freezing temperatures. However, adhesives and sealants do not bond as well due to the colder temperatures reducing the adhesive strength. During the colder temperatures, additional measures may need to be taken for the sealants. Aussie Seal M and Aussie Clay Sealant should be stored in a warmer area, such as a warm room or tent, to ensure proper bonding and performance. Try and apply the sealants while still warm to ensure proper performance. If needed, use a heat gun at the lowest heat setting to blow hot air to pre-heat the substrates. Check for proper adhesion once installed.

5.1 – Protecting the Membrane

The membrane is often exposed to environmental and construction traffic, so it is important to protect the membrane during construction until the placement of concrete.

1. Use only water-based marking chalk on top of the installed waterproofing membrane. If other construction marking products are intended to be used, they must be reviewed and approved in writing by the waterproofing manufacturer.
2. Protect the membrane during concrete placement from overspray with polyethylene sheeting or other approved means. Remove contamination and cured overspray material from membrane with mechanical means, taking extra care to not damage the waterproofing prior to further placement of adjoining concrete. Damages due to removal of concrete will need to be repaired prior to further placement of concrete.
3. Do not permit vehicular traffic on unprotected membrane.
4. Inspect for damage just prior to placement of concrete or backfill and make all repairs in accordance with manufacturer's recommendations.
5. Install AVM Drainboard 6000 or an approved protection board over Aussie Clay 590 in backfill applications to prevent the backfill material from damaging the membrane.

5.2 – Special Conditions

Aussie Clay 590 is not recommended for waterproofing masonry block walls. Consult an AVM Technical Representative regarding any applications not mentioned in any sections of this product, including precast walls, expansion joints, wall-to-deck transitions, & shotcrete.

Use Aussie Clay SW in conditions where the groundwater contains high concentrations of salt or chemicals. These conditions are common in industrial sites, coasts near the ocean, or sites near laundry mats. Site samples should be submitted to AVM for compatibility testing when using the Aussie Clay 590. For compatibility testing, send 2 Liters of water in a clean and sealed container from hydrostatic sites (per geotechnical report) or 1lb of site soil in a sealed container from non-hydrostatic sites. AVM will test the samples at no charge and will provide a written report evaluating the sample's compatibility with Aussie Clay 590 complete with product recommendations or installation requirements.

Technical Data

Property	Test Method	Results	Unit
Swell Index	ASTM D5890	≥24	ml/2g
Fluid Loss	ASTM D5891	≤18	ml/2g
Bentonite Mass Per Unit Area	ASTM D5993	1.0 (4.8)	lb/sqft (kg/sqm)
Hydrostatic Resistance	ASTM D5385M	231 (70)	ft (m)
Permeability	ASTM D5084	1 x 10-11	m/s max
Tensile Strength	ASTM D6768	8.0/8.0	kN/m min
Puncture Resistance	ASTM D6241	337 lbs (1.5)	lbs (kN)
Peel Adhesion to Concrete	ASTM D903M	15 (2.6)	lbs/in (kN/m)
Low Temperature Flexibility	ASTM D1970	Unaffected	-25°F (-32°C)

Item/Component	Packaging	Approximate Shipping Weights	Qty/Pallet	Weight/Pallet	Qty/Truck	VOC
AUSSIE CLAY	3.77'x16.4' Roll (61.9 sq.ft.)	73.4 lbs. (33.3 kg) / Roll	35 Rolls/Pallet	2615 Lbs (1186 kg)	16 Pallets *	N/A