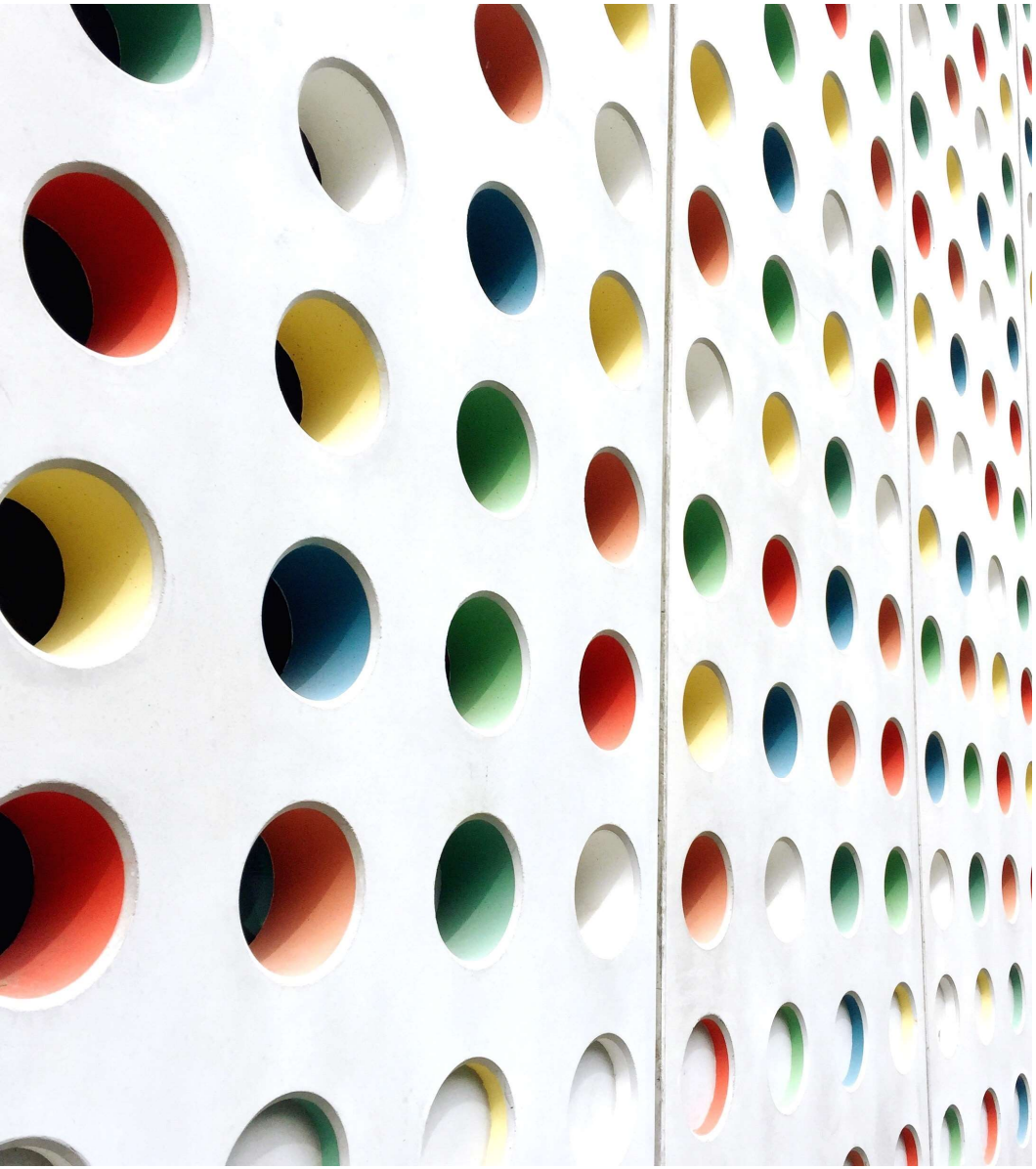


Title 5 Breakout, Barriers and Retaining Walls

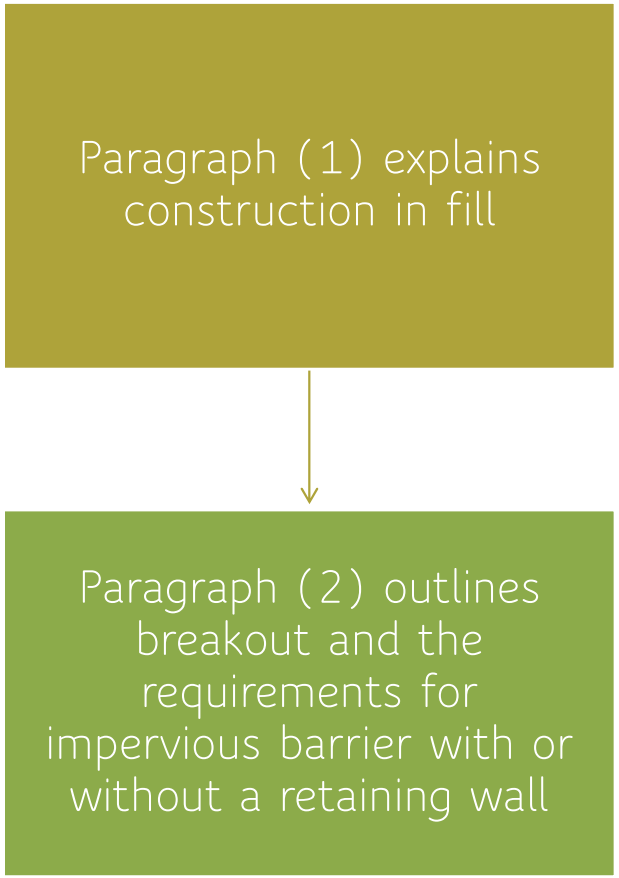
MassDEP/MHOA SEMINAR 2022

CLAIRE GOLDEN, MassDEP

Itinerary

- Regulations
- Guidelines
- Retaining Walls
- Construction
- Regional Contacts

Regulations



310 CMR 15.255 Construction in Fill

What is Construction in Fill?

Any system where fill is required to replace topsoil, peat or other unsuitable or impervious soil layer above the requisite four feet of naturally occurring pervious material is a system constructed in fill. Any system constructed in fill which extends either wholly or partially above natural grade for the purpose of complying with 310 CMR 15.212 (depth to groundwater) is a mounded system. All soil absorption systems constructed in fill shall be sized using the soil class of the underlying naturally occurring pervious material.

310 CMR 15.255(1)

Examples of Construction in Fill

Mounded leaching area

- Traditional mound
- Dramatically regraded area – usually new construction

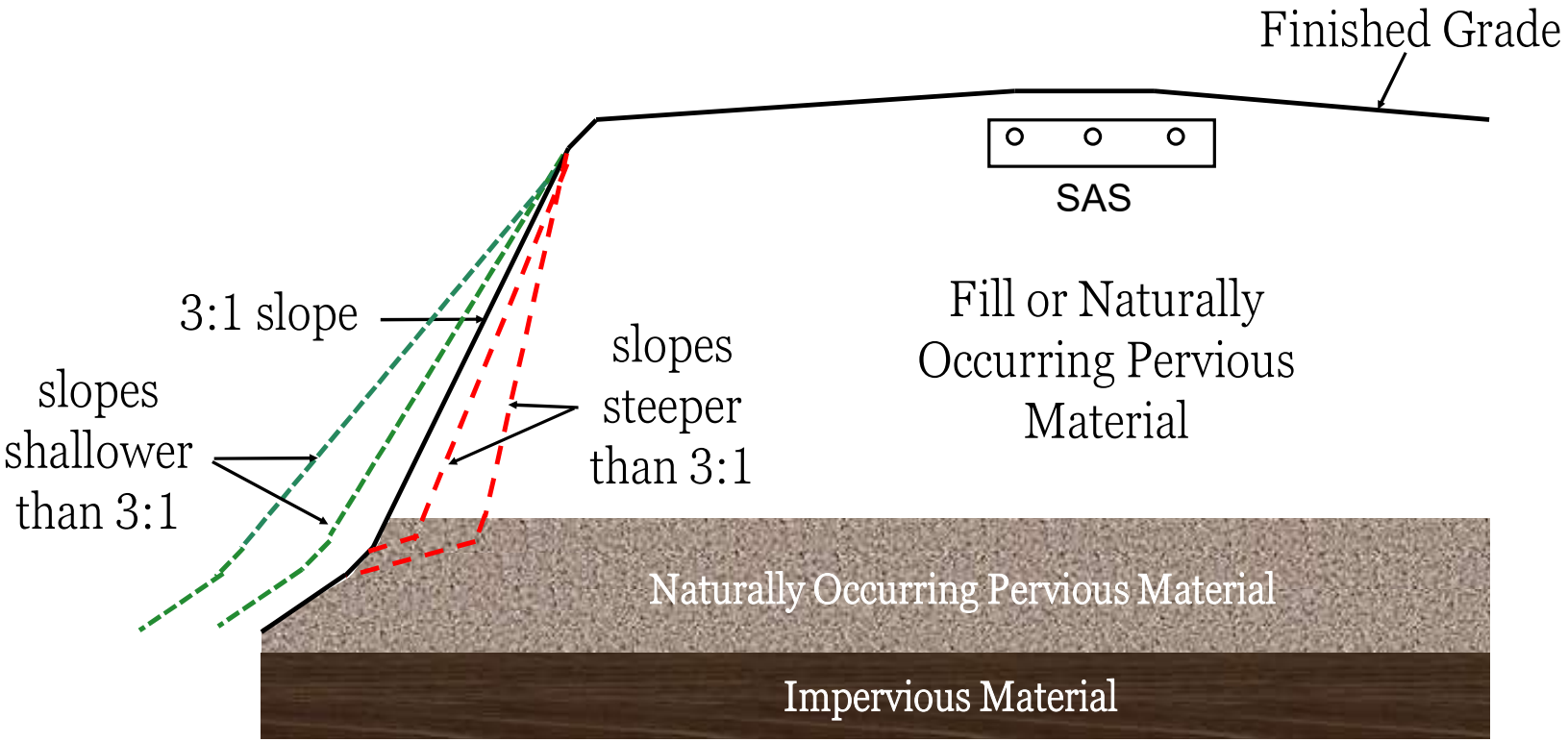
Removal of fill/impervious material/tighter soils and replacement with fill

310 CMR 15.255(2)

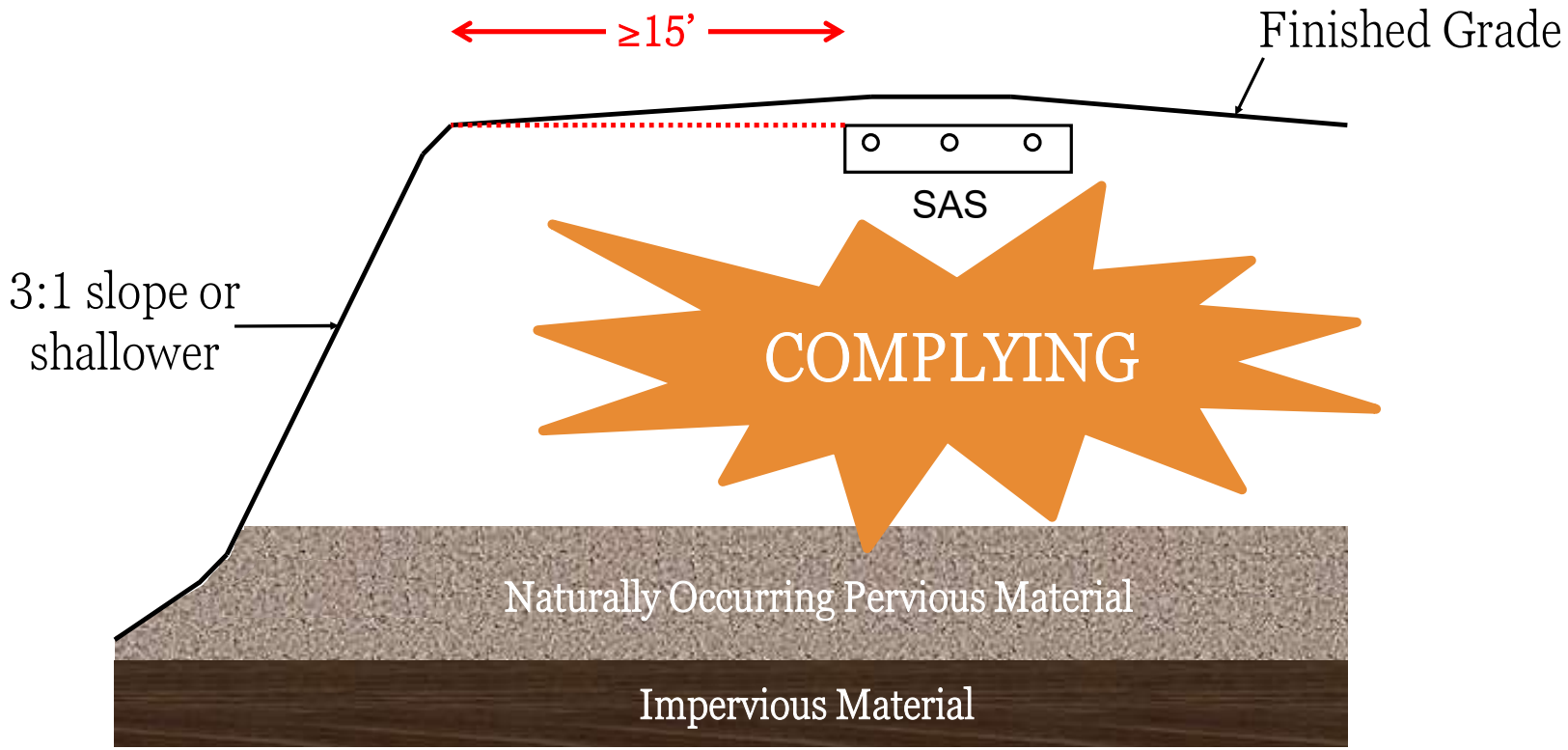
The finished side slopes of a mounded system shall not be steeper than 3:1(horizontal:vertical). A minimum 15 foot horizontal separation distance shall be provided between the soil absorption area and the adjacent side slope as measured from the edge of the top of the two inch layer of ⅛ to ½ inch washed stone aggregate or geotextile fabric cover. The toe of the slope shall be a minimum of five feet from any property line, or a swale or other drainage system directing runoff away from the adjacent property shall be installed. Adjustments to the above horizontal separation may be allowed if a suitable impervious barrier is installed to prevent potential sewage breakout…

So what exactly does this mean?

The finished side slopes of a mounded system shall not be steeper than 3:1(horizontal:vertical).



A minimum 15 foot horizontal separation distance shall be provided between the SAS and the adjacent side slope …



The toe of the slope shall be a minimum of five feet from any property line…

310 CMR 15.255(2) continues...

Adjustments to the above horizontal separation may be allowed if a suitable impervious barrier is installed to prevent potential sewage breakout. The impervious barrier shall meet the following requirements:

(a) the impervious barrier shall be designed by a R.S. or a P.E.
(b) construction of the impervious barrier shall be supervised by the designer.
(c) prior to issuance of a Certificate of Compliance, the applicant shall submit to the Approving Authority an as-built plan prepared and certified by the designer that the impervious barrier has been constructed in accordance with the approved design plan.

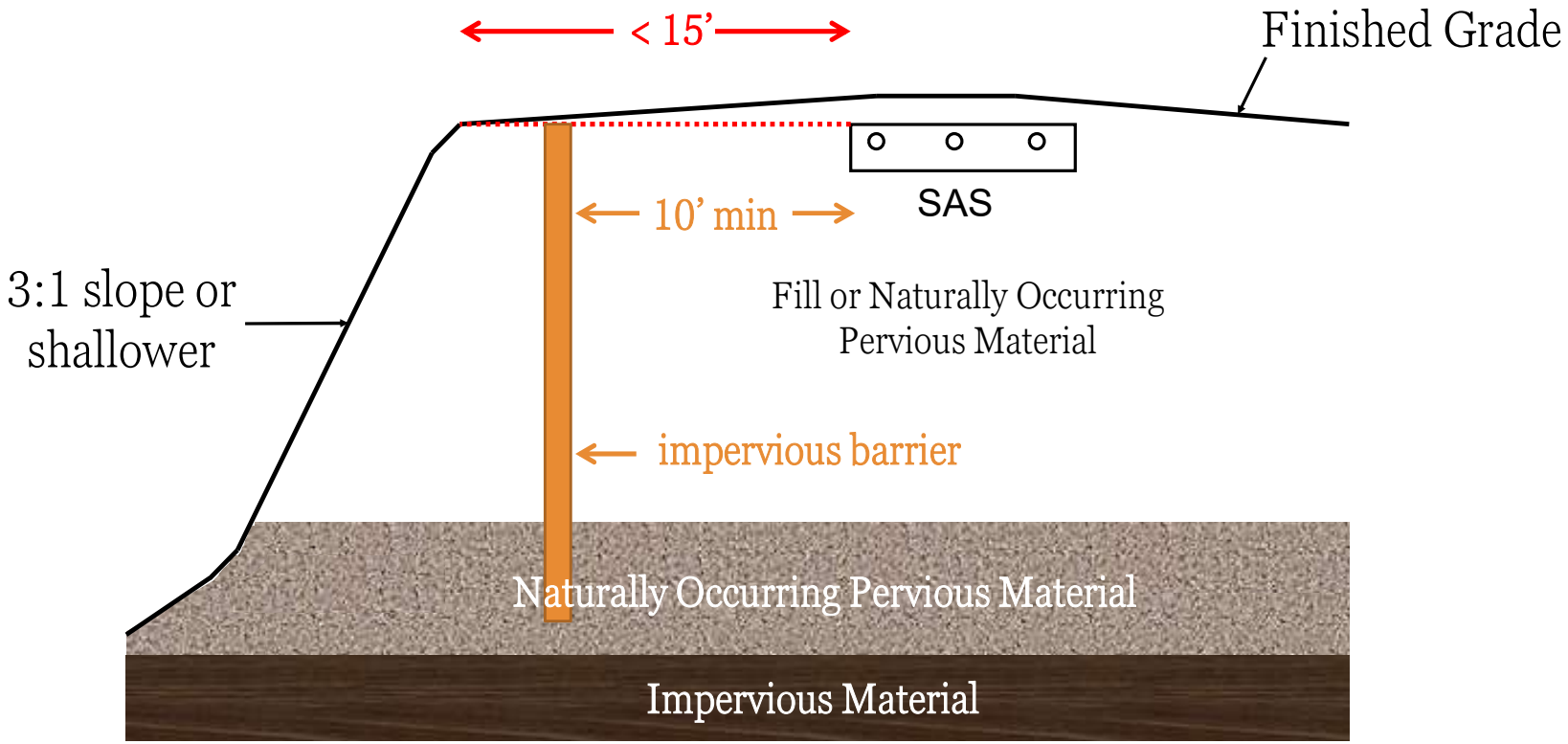
...and continues...

(d) the elevation of the top of the impervious barrier shall be no lower than the "breakout“ elevation, which is the elevation of the top of the two inch layer of ⅛ inch to ½ inch washed stone aggregate cover.

(e) the recommended distance from the impervious barrier to the edge of the soil absorption system closest to the barrier should be at least ten feet.

(f) where a retaining wall to stabilize the slope is required and also is proposed as an impervious barrier, in addition to meeting the requirements in 310 CMR 15.255(2), it shall be constructed of suitable structural material and be designed by a Massachusetts Registered Professional Engineer.

So based on the Code, what is required?



GUIDELINES

GUIDELINES FOR DESIGN AND INSTALLATION OF IMPERVIOUS BARRIERS AND SLOPE STABILIZATION FOR TITLE 5 SYSTEMS, MARCH 1, 2002

Impervious Barrier Design

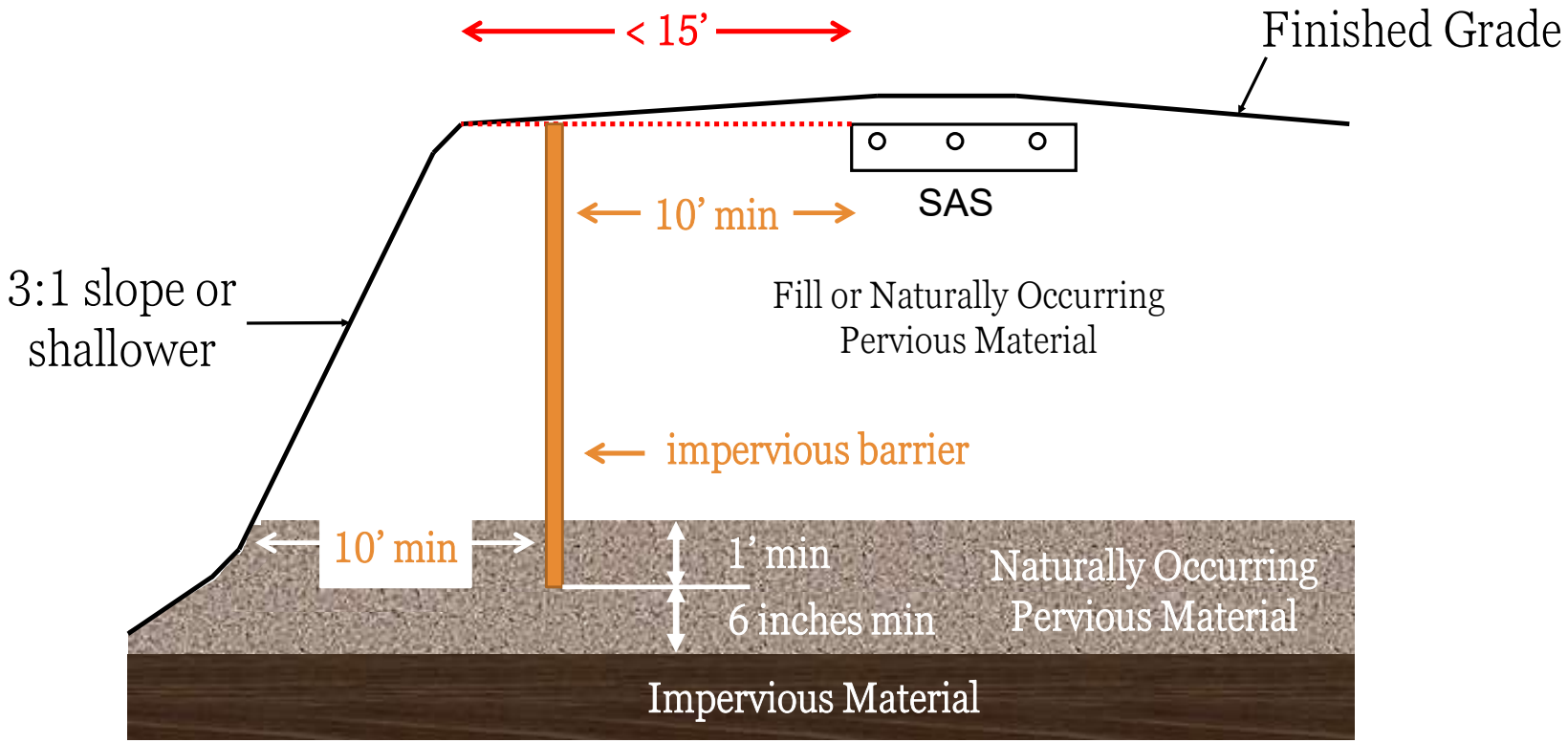
Top elevation at least as high as the top of the peastone or chambers [same as 310 CMR 15.255(2)(d)].

Bottom elevation shall at extend at least 1 foot below the existing natural ground elevation.

Minimum 10 foot horizontal distance between the bottom of the impervious barrier and the edge of the adjacent side slope.

In remedial (upgrade) situations if there is less than 4 feet vertical distance from the bottom of the SAS to ledge or impervious strata, the impervious barrier shall be at least 6 inches above the impervious strata.

Using the Regulations and the Guidelines



Clay Barriers

Constructed of compacted clay (NRCS classifications for clay – hydraulic conductivity no higher than 10^{-7} cm/sec);

At least 2 feet in width; and

Covered with at least six inches of cover material (soil) and stabilized (vegetated) to prevent erosion due to weather conditions.

Plastic Membranes

- Sufficient tensile strength to withstand perforation, including cracking, tearing and breaking;
- At least 40 mils thick and significant durability and resistance to the temperature and moisture conditions expected in the subsurface environment; and
- Installed without holes or gaps and so that perforations do not develop after installation.

All Materials for Barriers Shall

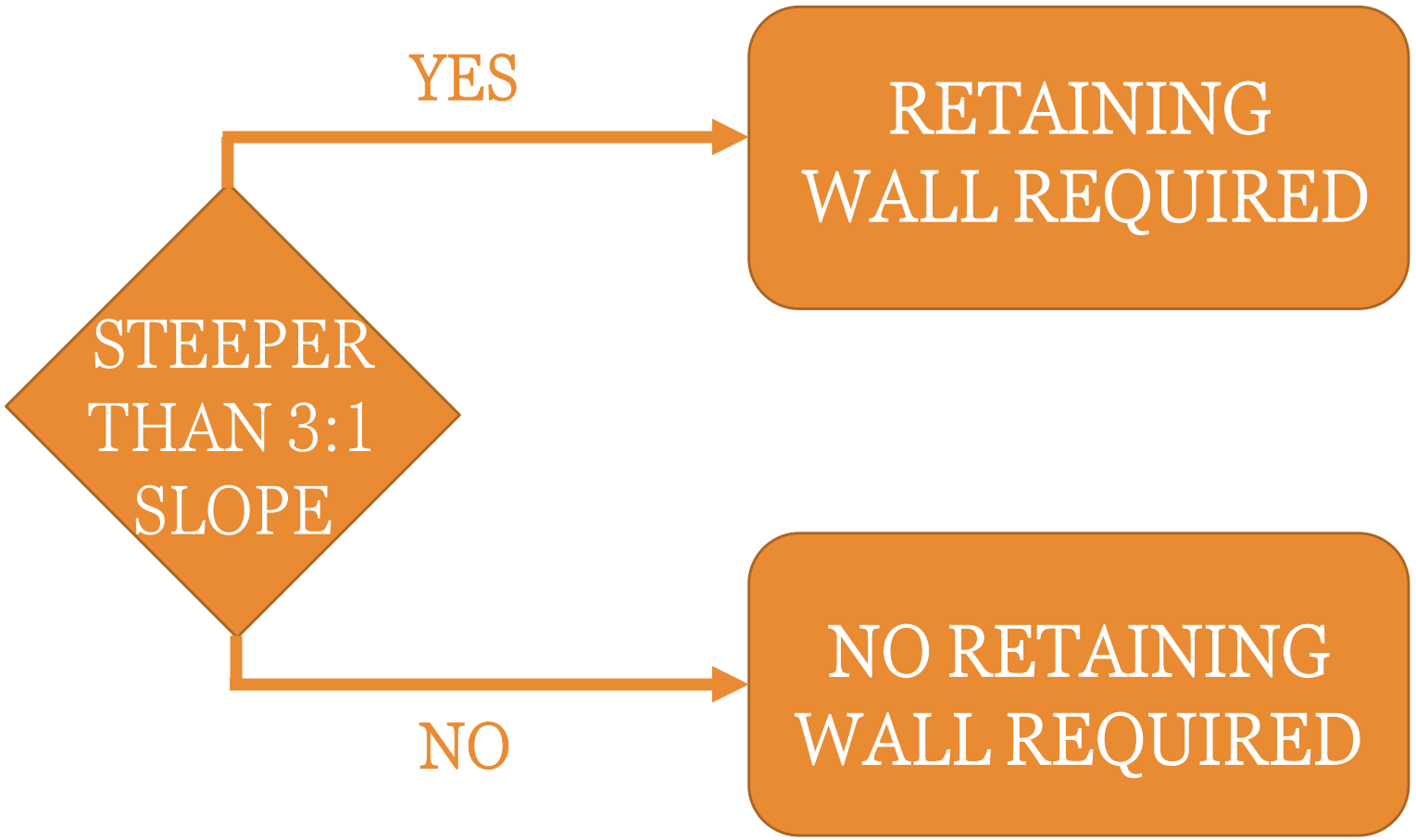
Have no weep holes;

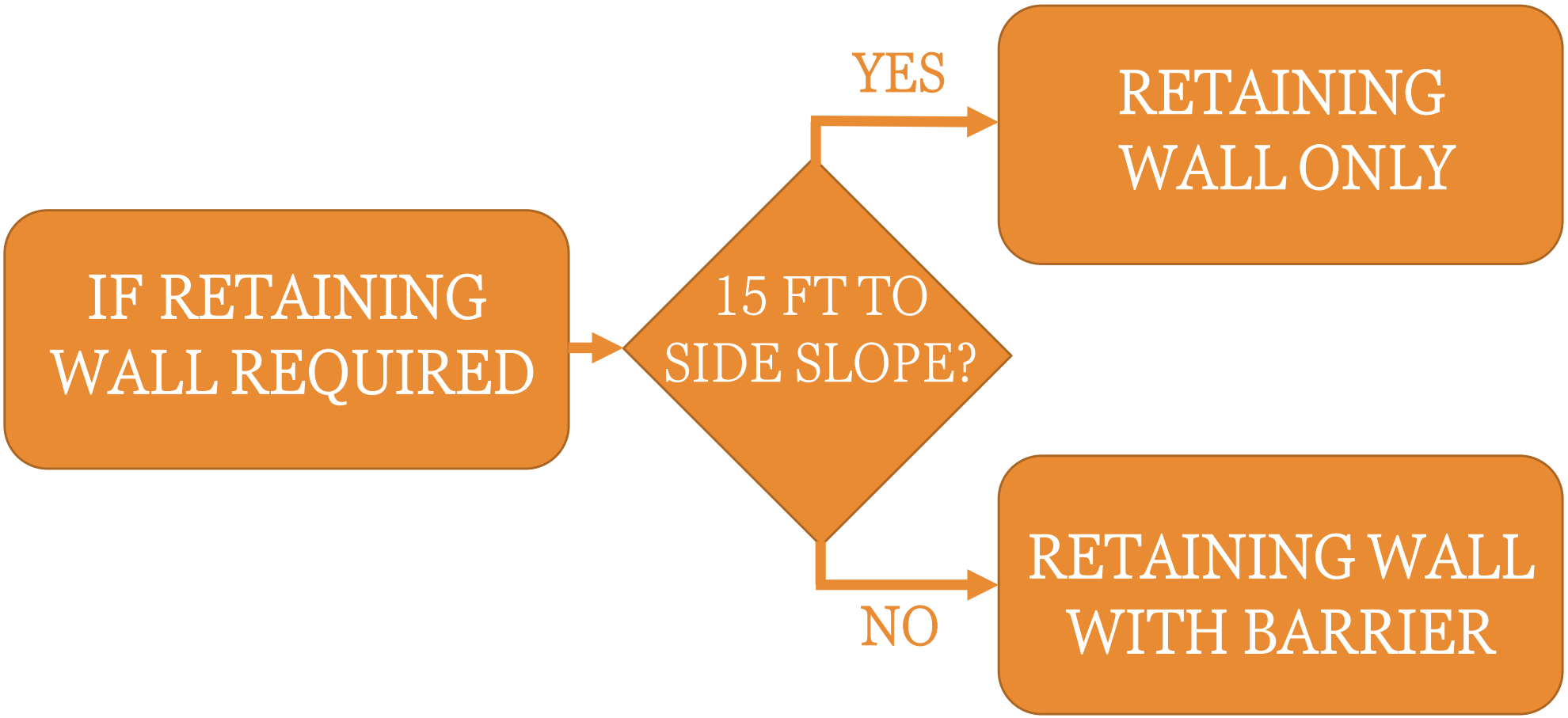
Have waterproof surface on at least the upgradient side, consisting of a durable waterproof lining or applied waterproof coating;

Be anchored or reinforced as necessary to maintain structural integrity; and

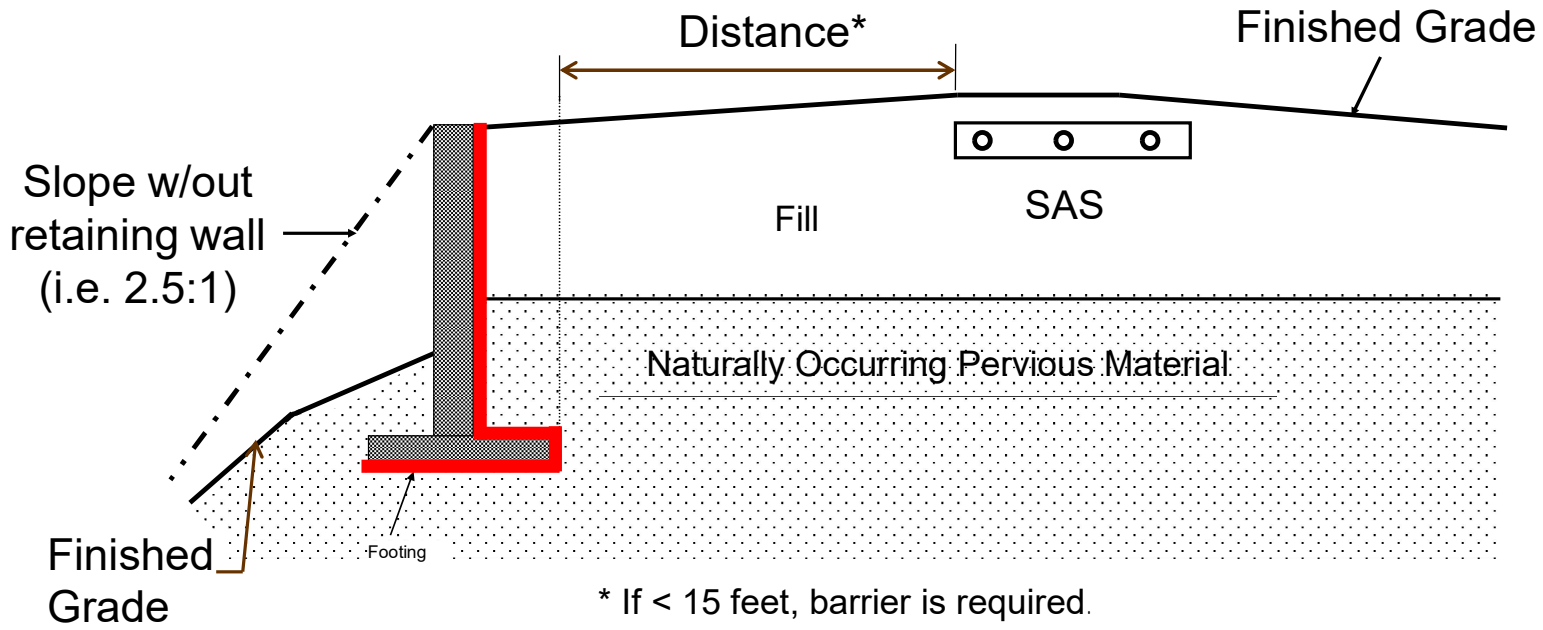
Not allow seepage or deterioration over time.

RETAINING WALLS


STEEPER THAN 3:1 SLOPE
YES
RETAINING WALL REQUIRED
NO
NO RETAINING WALL REQUIRED


IF RETAINING WALL REQUIRED
15 FT TO SIDE SLOPE?
YES
RETAINING WALL ONLY
NO
RETAINING WALL WITH BARRIER

Typical Retaining Wall



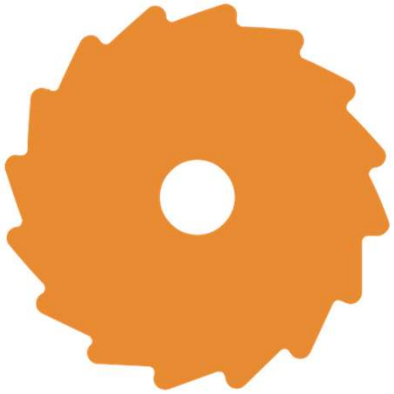
Retaining Wall Without Barrier

Material shall be structurally sound, non-degradable and waterproof.

It shall be designed by a MA Registered Professional Engineer [same as 310 CMR 15.255(2)(f)].

Distance from the SAS to the retaining wall shall be measured from the closest edge of the footing, if a footing is used.

P.E. must inspect the installation and construction and must certify in writing, prior to issuance of the Certificate of Compliance, that it has been installed as designed.



CONSTRUCTION

Barrier and/or Wall Construction

Follow accepted engineering practice;

Not installed during weather conditions that may prevent proper installation;

Not backfilled without inspection by the designer and the approving authority (BOH or MassDEP);

No modification without appropriate approvals by approving authority (BOH or MassDEP);

Designer shall follow all other applicable state and local building codes; and

Preparation and submittal of an as-built.

MassDEP REGIONAL CONTACTS

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	Brett Rowe (SE MA)	brett.rowe@mass.gov
WERO	Matt Sokop	matthew.sokop@mass.gov
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	Dan Kurpaska	daniel.kurpaska@mass.gov