

# Appendix A12 – Reinstatement of Modular Surface Layers



Researched, compiled and produced by



and



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# Introduction- SROH Appendix 12

This advisory document is designed to assist incoming and existing Inspectors as support and refresher material. It will be provided in simple language to aid in understanding and avoiding technical or descriptive explanation.

The current edition (Ed 4) of the Specification for Reinstatement of Openings in the Highway (SROH) has been updated to assist readers in understanding, and introduce new methods and developments within street-works.

Remember, the SROH applies to works undertaken on carriageway's, footway's and verge's maintained at public expense (not private roads or land).

You will now be taken through the key items within Appendix A12 which will enable you to have a better understanding of what to look for when monitoring the reinstatement of modular surface layers.



**Please note:**

This document is simply to aid in understanding of the Specification for the Reinstatement of Openings in the Highway (SROH) and should not be used for any other purpose. The simplicity of language is to assist in explanation, but may detract from certain technical or descriptive specification requirements and, therefore, the SROH should be consulted for clarity.

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.1 – Interim Reinstatement

### What it says in the SROH

**A12.1.1** Where an interim reinstatement is required, the existing modules should be re-used, including any broken modules. Where damage has resulted in fragmentation or widespread breakage of modules [subject to the special case of natural material modules (as set out in A12.2.5 and A12.2.6)], then bituminous mixtures may be used for an interim reinstatement provided they meet the performance requirements of S2 and compaction of such mixtures does not result in further damage to adjacent modules.

### What it means

Where you are placing a modular reinstatement into an “interim” status, you can re-use suitable and broken modular paving. You are also allowed to use bituminous materials as part of the interim or temporary reinstatement. However, where you decide to apply this method, you must ensure the existing adjacent materials (slabs, blocks, modules, etc.) are not damaged as a result of using bituminous materials. This makes sense when you consider how you will treat these materials in the interim period as you would not likely use a vibrating roller over where you could break or smash the existing modular paving.



So I am allowed to re-use broken slabs?

Yes you can, but remember this is only in an interim reinstatement. The rules change for a permanent reinstatement.



OK, but I can use bituminous materials in a modular FW?

You can, but remember this only applies to interim or temporary reinstatement. This cannot happen for permanent reinstatement unless specific permission is granted.



Remember, you can only use broken modular or bituminous materials for interim reinstatements on modular surfaces

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2 – Permanent Reinstatement

### What it says in the SROH

**A12.2.2** Permanent reinstatement of modules must include all modules situated within or beyond the effective width of the reinstatement (W) described in S2.1.5 and must also include any other modules disturbed in the course of carrying out excavation or reinstatement.

**A12.2.3** Clean undamaged modules must be re-used for permanent reinstatement. Broken modules cannot be used for permanent reinstatement and must be replaced.

### What it means

The effective width of the reinstatement is described below. It simply means the size of your excavation or trench will automatically become larger because of the modules you affect during works. For example, you can saw-cut and dig within an area of 1m x 1m in bituminous materials and work within it. However, to dig the same excavation in an ASP (Artificial Stone Paving – concrete slabs) you will certainly affect slabs that overhang or encroach on your works, therefore making the reinstatement area larger than required for the excavation. The Figures shown below taken from the SROH will assist in your understanding of this.

Figure S2.1a Surface area of reinstatement – modules  $\leq 305$  mm

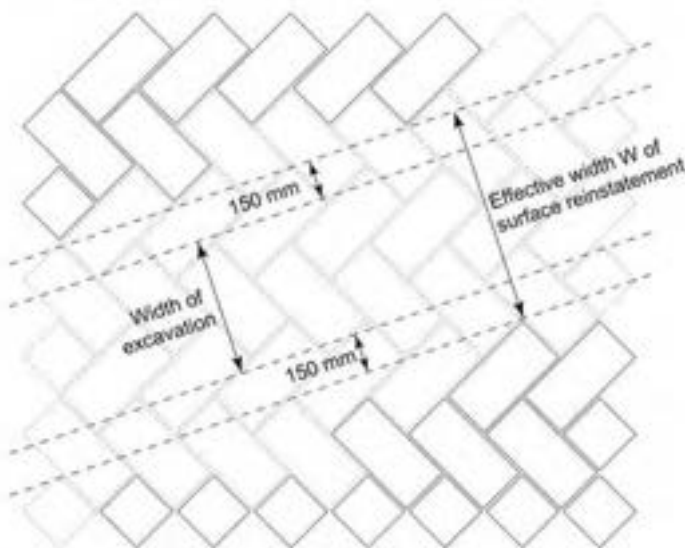
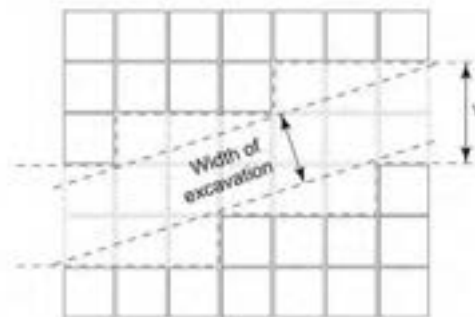


Figure S2.1b Surface area of reinstatement – modules  $> 305$  mm



SROH Figures S2.1a and S2.1b show what the effective width (W) is in reinstatements with modular paving. Figure S2.1a relates to modules of 305mm or less and shows how effective width is applied. Figure S2.1b shows how effective width applies when modules are greater than 305mm



So I am allowed to re-use broken slabs in permanent?

No you cannot. Any broken or damaged ASP, blocks or artificial stone modules are not allowed in permanent reinstatement.



What does the effective width mean?

This essentially means the width of the existing modules your works will have an effect on. You can see this from the Figures on the left. You will notice, there is a different effective width for modules greater or less than 305mm

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2 – Requirements for Natural Material Modules

### What it says in the SROH

#### A12.2.6 Damaged natural material modules

- 1) Where damaged modules are to be re-used in the reinstatement, a joint inspection must be arranged before starting excavation to agree the extent of usage of damage modules and the minimum size acceptable for re-use.
- 2) The undertaker should make a photographic record of the joint inspection which should be agreed between the undertaker and the authority.



Remember, you can only re-use broken modules made of natural materials once agreed. This does not apply to any kind of manufactured module such as concrete slabs (ASP), block paving, or any other kind of module that is man made.

### What it means

Where you have natural stone modules such as York Stone, Bath Stone, Purbeck Stone, Granite and other naturally occurring materials, it is a requirement to carry out a joint inspection to agree as to what damaged modules can be re-used within the new reinstatement. This will determine what fragments, sizes and condition are acceptable before they can be used.

The undertaker should also record all these observations through images showing what damage exists, and what is allowed for re-use through agreement with the authority, so they are clear on the reinstatement requirements.



The undertaker must use best endeavours to match existing profiles and meet the tolerances specified in S2. However, where the pre-existing profile of damaged modules is near or in excess of current intervention and construction tolerances specified in S2, it will be difficult for the undertaker to construct a complying reinstatement. The undertaker must use best endeavours to ensure that the interface between the reinstatement and the adjoining surfaces does not create a hazardous trips.

*This only applies to natural materials*

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2 – Requirements for Natural Material Modules



The above paving is a natural Purbeck stone paving module which can be re-used where fragmented or cracked after agreement with the local authority. Remember, it is required that broken and damaged modules are recorded prior to start of works.



The above is an artificial stone paving (ASP) which is man made or manufactured and therefore, cannot be re-used in a reinstatement if damaged or broken. Only undamaged modules can be re-used.



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2 – Infills in Modular Reinstatements

### What it says in the SROH

#### A12.2.7 General

1) Where gaps greater than 5 mm between the nearest module and the immediately adjacent fixed feature (such as edgings, channel blocks, drainage features, surface boxes, ironware) or boundary feature (such as walls, fences and the like) arise as a direct result of works, the undertaker should avoid the gap by cutting the modules to the proper dimensions. If this is not possible, the undertaker must fill the gaps to the full depth of the adjacent paving module as follows:

a) for smaller gaps a 1:4 cement to sand mortar ratio should be used

b) for larger gaps, where aggregate can be used, a 1:5:3 cement to sand to aggregate concrete ratio should be applied, using a maximum aggregate size of 10 mm.

c) alternatively, PMMA can be used as infill prior agreement with the authority.

2) Infills should generally be as small as possible. Where the physical characteristics of the bond, fixed feature, or proximity of other fixed features do not allow for a small infill, then best endeavours should be used to achieve surface tolerances (see S2) with the smallest infill possible.

*This essentially means no edge depression, surface depression or surface crowning that would provide a defect requiring intervention.*

3) Infills should match existing work by the Authority. *This will ensure the type and style of infill is maintained when compared with existing.*

4) If the gap requiring a new cement infill is the result of an uneven surface (existing before commencement of the works), the new cement infills should be limited to a 1 year guarantee. All practicable effort should be made to avoid the use of cement infills for this application. For the 1 year guarantee to apply to the cement infills the undertaker is required to document the existing surface before commencement of works and must be able to demonstrate why all alternatives to the use of cement infills for this application have been ruled out.

*Remember, for the one year guarantee to apply, it is a requirement that the undertaker has documented the uneven surface before commencement of works and must be able to demonstrate that all alternatives are not suitable, in order to be ruled out as acceptable.*



The one year guarantee will not apply where no documentation of existing surface condition is made prior to works commencement, along with provision of evidence that all alternatives have been objectively considered and ruled out.

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2.8 – Infills widths and limitations

### What it says in the SROH

#### A12.2.8 Infill widths and limitations

1) Where possible, infills should be limited to a maximum width of 50 mm in modular areas, irrespective of whether the existing footway was originally constructed in accordance with BS 7533.

2) In the case of modules where one side of the module is greater than 305 mm, there are instances where it is permissible to increase the width of the infill to a maximum of 150 mm to achieve a better engineered and more aesthetically pleasing reinstatement. These include instances where the intervening distance is less than 150 mm:

- a) between the undertaker's newly laid apparatus and the nearest module (on any side), or
- b) between two or more pieces of undertaker's newly laid apparatus, or
- c) to an existing fixed or boundary feature.

*(see images on next slide from SROH – NGA12 relating to modules greater than 305 mm)*

### What it means

You should always ensure that your infills are generally less than 50mm irrespective of what is provided for in the existing footway

Where it can be shown to be acceptable custom and practice, in exceptional cases the maximum permissible infill width may be increased to 200 mm for irregularly shaped apparatus.

*Typical examples can be seen in SROH - NGA12 (next page).*



The above exceeds 50mm but is allowable, as it is 150mm and it is unlikely you would insert a weak and narrow strip of paving.



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2.8 – Infills widths and limitations

Figure NGA12.1 Extension of infill concrete - modules over 305 mm

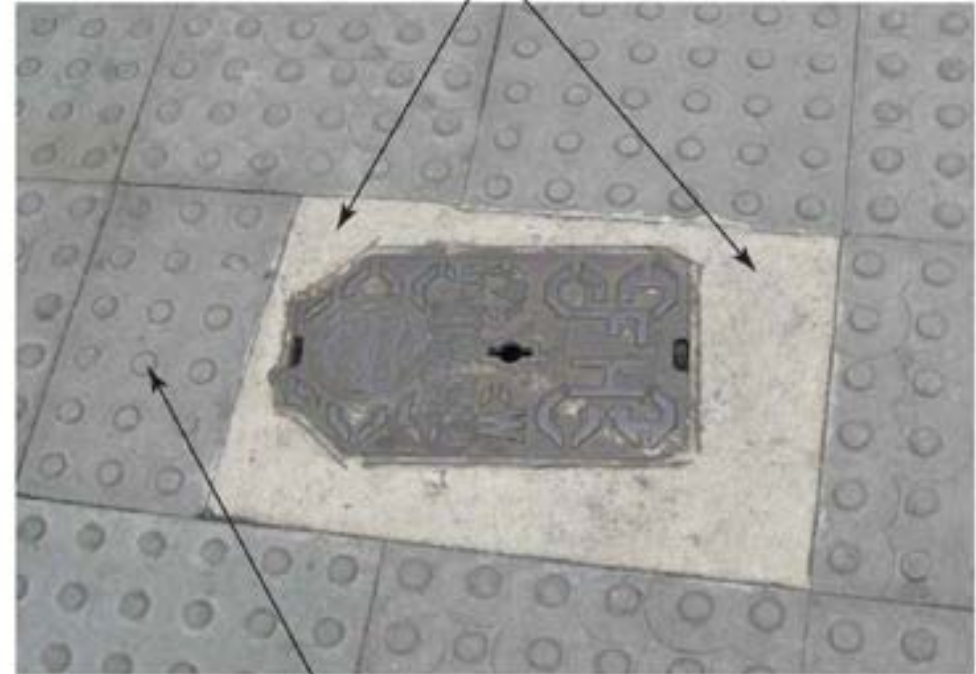
Infill concrete extended to nearest module to accommodate irregular shape of ironwork and to avoid cutting or trimming of modules



Maximum width of infill measured orthogonally from ironwork face increased to 200 mm to accommodate irregular shape

Figure NGA12.2 Extension of infill concrete - modules over 305 mm

Infill concrete extended to nearest module to accommodate irregular shape of ironwork and to avoid cutting or trimming of modules



Using varying width infill limits cutting or trimming of modules



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2.8 – Infills widths and limitations



Similarly, for modules where all sides are 305 mm or less, there are instances where it is permissible to increase the width of the infill to the same as the full width of module (measured on the shortest side) to achieve a better engineered and more aesthetically pleasing reinstatement. These include instances where the intervening distance is less than the full width of a module plus 25 mm (measured on the shortest side):

- a) between the undertaker's newly laid apparatus and the nearest module (on any side), or
- b) between two or more pieces of undertaker's newly laid apparatus, or
- c) to an existing fixed or boundary feature.

*(see image on right from SROH – NGA12 relating to modules less than 305 mm)*

Remember, all this information is available within the SROH code of Practice should you require guidance on meaning. These images will assist in your understanding of the prescribed text within A12

Figure NGA12.3 Extension of infill concrete – modules up to 305 mm



Maximum width of infill is the width of a module plus 25 mm

Infill concrete extended to nearest complete module



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2.9 Acceptable localised loss of modular pattern

### What it says in the SROH

#### A12.2.9 Acceptable localised loss of modular pattern

1) Physical characteristics may prevent or limit the possibility of completing a uniform and closely matching modular reinstatement immediately adjacent to features. The physical characteristics of the module itself, the existing as-laid bond, as well as the physical characteristics of the fixed or boundary feature, may individually or collectively contribute to such a situation.

2) In all instances, the undertaker should attempt to minimise the width of the infill. However, the following exceptions are permissible:

a) Where the above physical characteristics are present, permanently reinstated modules immediately adjacent to the feature may be laid with a degree of localised loss of bond pattern. The introduction of a stringer (or in some cases, soldier) course immediately adjacent to the feature is not considered as a loss of bond pattern. The loss of bond pattern should be limited, where practicable, to the first two rows beyond any stringer course, being laid in such a manner as to aesthetically integrate with the surrounded bond pattern.

b) If adjacent modules abut an existing contiguous infill such as at a property boundary, then the infill must match the existing.

c) In the case of fixed features that are not rectangular, there is no requirement to cut modules to match the edge profile of the fixed feature to otherwise reduce the infill at irregular edges.

d) Where localised custom and practice adopted by the authority for its own works differs from the above, infills may be laid to a standard consistent with that of the authority.

### What it means

Essentially, the SROH makes allowance for the difficulty in maintaining the bond or pattern in modular paving. This particularly applies to block paving and smaller modules where cutting around chamber covers or street furniture is difficult. There is no requirement to end up with small and undesirable bits of modular units just to maintain the exact pattern as the existing and this can be seen by the representations as shown in SROH NGA12



Phew! There's a lot of text there, can you help me understand it?



Ok, so does that apply in all cases?



I see that if the local authority have done it a certain way, you can use the same approach?



Ha Ha! I'll do my best.

What it means is that the undertaker should try and keep infills as small as possible. This can be assisted by changing the bond in the pattern immediately beside the feature.



No it doesn't. If it meets a private driveway and an existing soldier course exists, it must remain. But if you have an unusually shaped chamber cover, it may be difficult to cut into and therefore affects the infill.



Yes, but you must ensure it is local authority work and not another undertakers unchecked reinstatement. See the next page for SROH examples as found under NGA12

# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.2.9 Acceptable localised loss of modular pattern



As mentioned on previous pages, here you will find the representations provided within the SROH code of practice under NGA12 which shows what is meant by breaking bond or pattern, along with demonstrating what is allowable in reinstatement of modular units up to 305 mm in size.

Figure NGA12.4 Acceptable loss of module pattern – modules up to 305 mm

Use of cut half blocks (100 mm x 100 mm) minimises apparent loss of module pattern (herringbone in this example)



Use of larger blocks here creates acceptable loss of module pattern. This is preferred over using small angular blocks to maintain the pattern.

Figure NGA12.5 Acceptable loss of module pattern – modules up to 305 mm

Use of larger cut blocks here creates acceptable loss of module pattern (herringbone in this example). This is preferred over using small angular blocks to maintain the pattern.



Use of larger cut blocks here leads to preferable arrangement of block pavers at the corners

Figure NGA12.6 Acceptable loss of module pattern – modules up to 305 mm

Use of cut half blocks (100 mm x 100 mm) minimises apparent loss of module pattern (herringbone in this example)



Use of larger cut blocks here creates acceptable loss of module pattern. This is preferred over using small angular blocks to maintain the pattern.



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.3 Provision of replacement modules

### What it says in the SROH

**A12.3.1** Authorities are advised to retain stocks of modules used in their areas to enable them to provide replacements when required. Where no suitable replacements are available, authorities should assist undertakers in locating sources elsewhere.

1

Every effort should be made to match, in order of preference, the colour, shape and size of existing modules when reinstating the site.

2

Where modules are found to be damaged before work starts, the authority may provide suitable replacements to the undertaker, free of charge.

3

Where replacements modules are required owing to loss or breakages arising from the undertaker's works, the undertaker must reinstate with modules purchased at the undertaker's expense or purchased from the authority at reasonable cost.

4

If an appropriate module is not identified, the undertaker must use best endeavours to use the most appropriate source of modules.

### What it means

Local authorities should have a reserve stock of modules which can be called upon when works are undertaken and there are existing broken modules that require replacement. This applies to all artificial (ASP) and natural stone paving and if no stock is available, the authority should assist the undertaker in finding elsewhere.



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.4 Joint inspection and recovery of costs

### What it says in the SROH

**A12.4.1** Within limits of undertaker's works – Following notification from the undertaker, a joint inspection must be arranged before the commencement of all standard or major works to agree the extent of damaged, settled or deformed surfacing within the limits of the works. Where the authority does not provide suitable replacements to the undertaker in accordance with paragraph A12.3.1, it may contribute to the undertaker the sum notified by the undertaker as the cost of replacing the same.

1

Outside limits of undertaker's works – Following notification from the undertaker, a joint inspection must be arranged to agree the need and extent of any remedial measures outside of the limits of the undertaker's works. An apportionment of the additional costs based on the relative areas of permanent reinstatement must be agreed. In the event of an authority failing to agree to meet a proportion of the costs of reinstating modules, the undertaker must proceed in accordance with S2.8.

The authority should assist in securing the correct replacement modulars to allow the undertaker to complete the reinstatement. In some cases, it can be very difficult to source unusual modules which are no longer available, and this is where it is useful for authority to hold stock, otherwise the undertaker uses best endeavours to match.

### What it means

Where works are to be carried out, before the undertaker starts, they can request a joint inspection to determine how many damaged and broken modules will need replacement within the proposed works area. The authority should have a stock of replacements and provide them to the undertaker, but if not, they may contribute the cost of the replacements once provided by the undertaker.



# Appendix A12 – Reinstatement of Modular Surface Layers

## A12.4 Joint inspection and recovery of costs

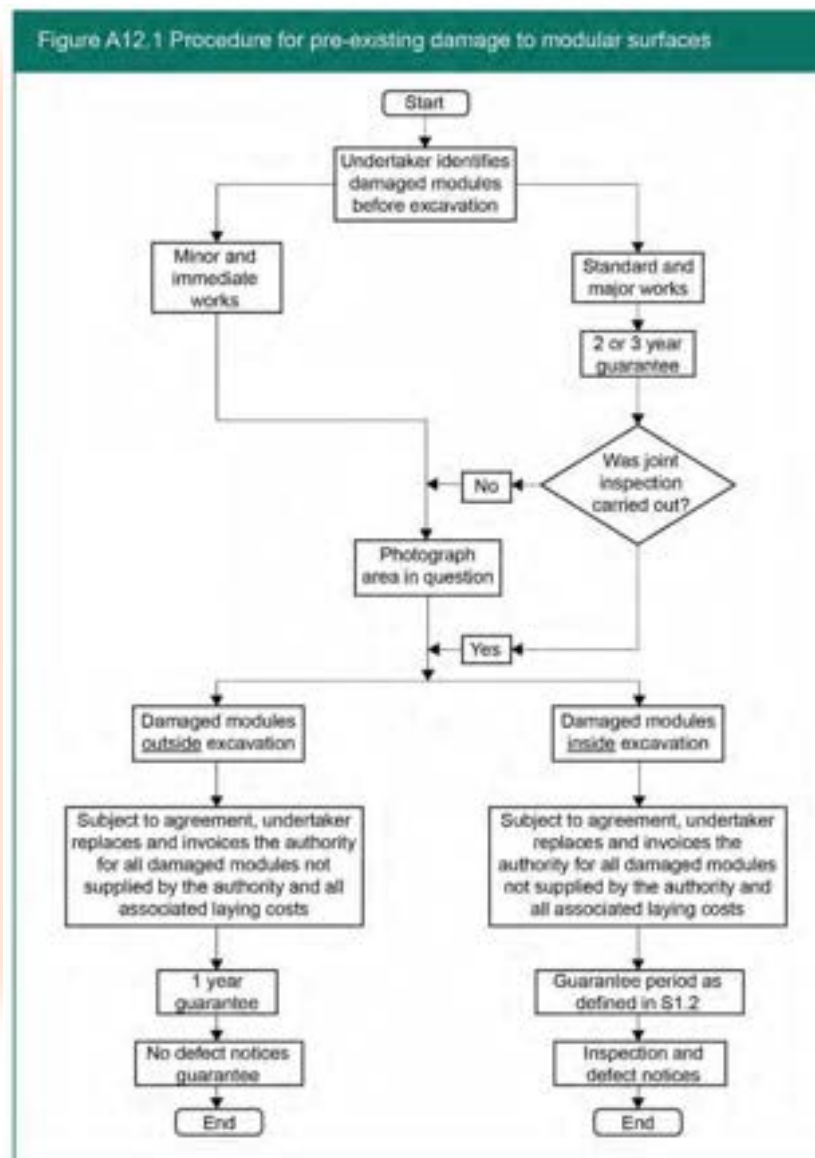
### What it says in the SROH

**A12.4.3** Prior joint inspections will usually be impractical for minor and immediate works. However, such works are usually small individual openings and a proportion of such works will be inspected by the authority within the sample inspection regime. On completion of all minor and immediate works, the undertaker must be free, and at its discretion subject to S2.8 and A12.3.3, to recover all reasonable costs from the authority according to the procedure illustrated in Figure A12.1.

### What it means

For small or minor works, where it is not reasonable to undertake a joint inspection before starting, it is proposed that these are later inspected under the local authority sample inspection process. However, if it proven that the undertaker has carried out works and replaced damaged modules at his cost, they should be able to recover reasonable costs from the authority according to the procedure as shown within the SROH at Figure A12.1 as seen on the right.

Figure A12.1 Procedure for pre-existing damage to modular surfaces





# A12 - Summary

Can I use broken modules in a reinstatement?

Only if reinstatement is in an interim status, or unless the modules are natural material.

What do you mean by natural material?

Natural material is something like, York Stone, Purbeck Stone, Bath Stone, Portland Stone or granite which may be more appealing or robust. You cannot mistake artificial stone paving (ASP) for a natural material.

What is the difference between an infill and a fillet?

Essentially they are exactly the same thing. However, there may be different approaches to the materials used. They are both between modules or other boundary.

Why are infills limited in size?

The general requirement for size of an infill is 50mm. However, this may increase depending on the type of modular being used. Larger modules greater than 305mm will allow for a maximum size of 150mm where it might be unsuitable to cut a narrow and weak element of ASP just to achieve the suggested size of 50mm infill.

What is the difference between ASP (slabs) and block paving?

As far as the SROH is concerned, they are both deemed as modular paving. However, they each fall into the category of larger than 305mm (ASP) and smaller than 305mm (Block paving) and each has a slightly different criteria in terms of effective width and infill requirements.

