



# TECHNICAL NOTES on Brick Construction

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## Technical Notes 29B - Brick in Landscape Architecture - Misc. Applications [Apr. 1967] (Reissued May 1988)

### INTRODUCTION

In this issue of *Technical Notes* are suggestions for the use of brick in landscape architecture that take advantage of the unique practicality and permanent beauty of the material. The color and texture of brick will complement the masses and lines of contemporary architecture. And for traditional architecture, brick lends the same charm that has endured for more than a century and a half on the grounds surrounding the splendid mansions of Colonial America.

The success of landscape architecture depends upon the intelligent spacing and inter-relationship of the various elements, understanding the limits and possibilities of structural and plant materials, discreetly evaluating the weakness and strength of various colors and textures, and choosing materials which are sympathetic with the site, with each other and with the people who are to see and use them.

Brick is an ideal material for use in landscape architecture for it is made of natural earth material, clay or shale, burned to permanent hardness. In the manufacturing process, brick take on colors which we know as earth colors - reds, browns, buffs and yellows - which are entirely harmonious with nature.

### MATERIALS AND WORKMANSHIP

Most garden and landscape structures will be subjected to the extremes of exposure to the elements. Therefore, proper selection of materials and high quality workmanship cannot be emphasized too strongly.

**Brick.** Brick for garden structures should meet the requirements for grade SW of ASTM Standards for Facing Brick, C 216 (where exposed to view) or ASTM Standard Specifications for Building Brick, C 62 (where not exposed such as below grade). Used or salvaged brick should not be used for garden structures unless they are tested and meet the grade SW requirements. Most used brick do not meet these requirements (see *Technical Notes* 15, "Salvaged Brick").

**Mortar.** Types M and S. conforming to ASTM Specifications for Mortar for Unit Masonry, C 270, are recommended for reinforced and non-reinforced brick garden structures.

**Workmanship.** All head, bed and collar joints should be completely filled with mortar. Less than excellent workmanship should not be permitted, since a defect may result in deterioration due to the extreme exposure of garden structures.

### DESIGN

The best possible materials and workmanship will not in themselves assure successful and permanent garden structures. Careful consideration must also be given to construction details. The following *Technical Notes* outline details which may be helpful: 29 Rev "Brick in Landscape Architecture, Terraces and Walks", and 29A Rev Brick in Landscape Architecture, "Garden Walls", and 7A Rev, "Water Resistance of Brick Masonry - Materials, Part II", and 7B Rev., "Water Resistance of Brick Masonry, "Construction and Workmanship", Part III.

**Steps.** Brick steps, such as those shown in Fig. 1, offer a practical solution to problems which develop in landscaping a slope. The relatively small sizes of brick permit flexibility of design, such as adjustments of tread and riser dimensions, and construction of curves. All treads should pitch outward slightly (1/4 in.) for drainage.

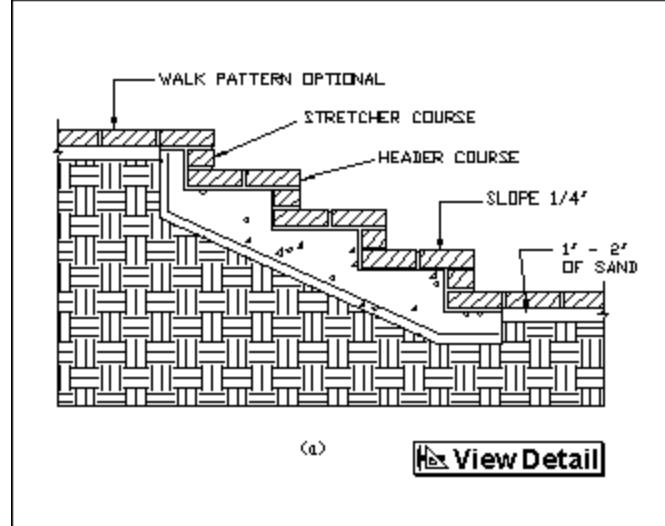


FIG. 1a

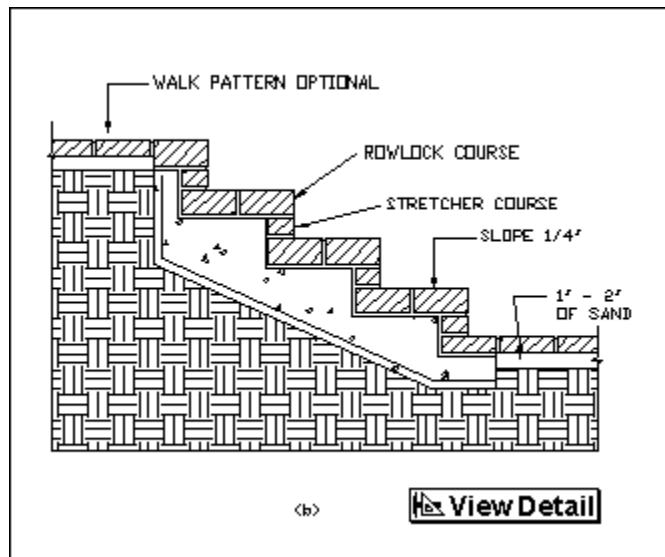


FIG. 1b

**Brick Screens.** Pierced brick screens offer beauty as well as privacy, without loss of light or air (see Fig. 2). A brick screen can provide a handsome separation between the children's play area and the adults' terrace, and cooling breezes are not thwarted by any of the numerous patterns available to the designer. Unlike hedges that require trimming or wood fences with their need for repainting, brick walls are maintenance-free.



**FIG. 2**

**Outdoor Fireplaces.** An outdoor fireplace can be a garden structure of beauty when brick are used to execute an imaginative but highly practical design, such as shown in Fig. 3. Fireplaces should be planned to face the prevailing breezes. This orientation not only allows the smoke to blow away, but also provides the best draft. Fire brick should be selected for the firebox of outdoor fireplaces.



**FIG. 3**

**Planting boxes.** Planters may be constructed indoors and outdoors, in a wide variety of designs. They protect decorative plants from animals and facilitate waist-high gardening as shown in Fig. 4.

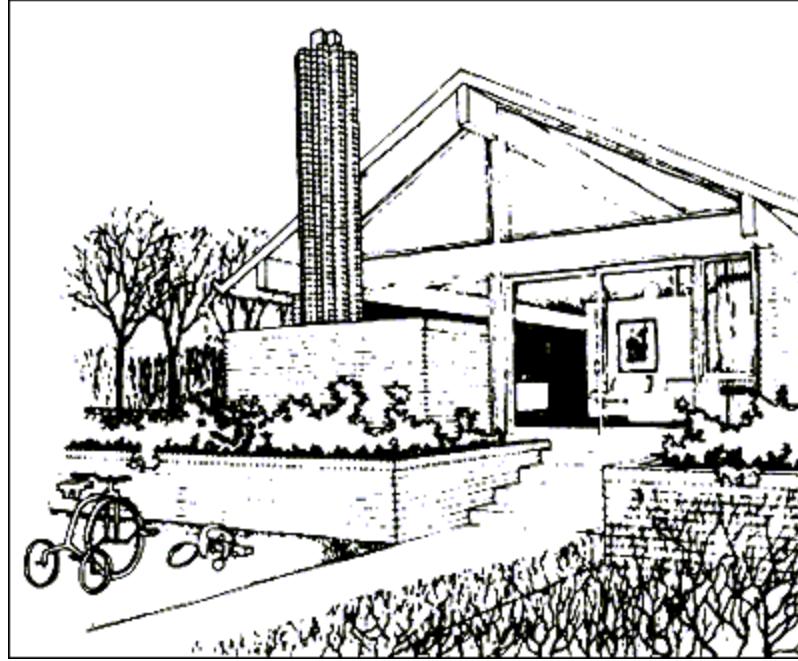


FIG. 4

In constructing brick planting boxes, adequate drainage must be provided. This may be accomplished by weep holes, as indicated in Fig. 5. When the planting box is designed with a closed bottom, as indicated in Fig. 6, a drain should be provided. Also, careful attention should be given to the waterproofing of the inside to prevent efflorescence and staining on the outside face of the brick. In addition, walls must be checked to insure their resistance to lateral earth pressures.

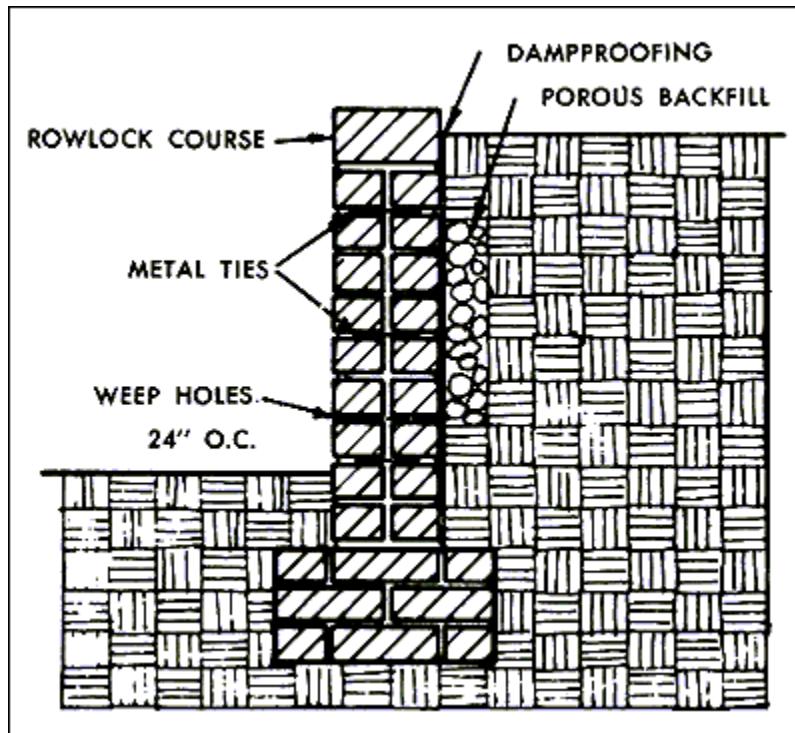


FIG. 5

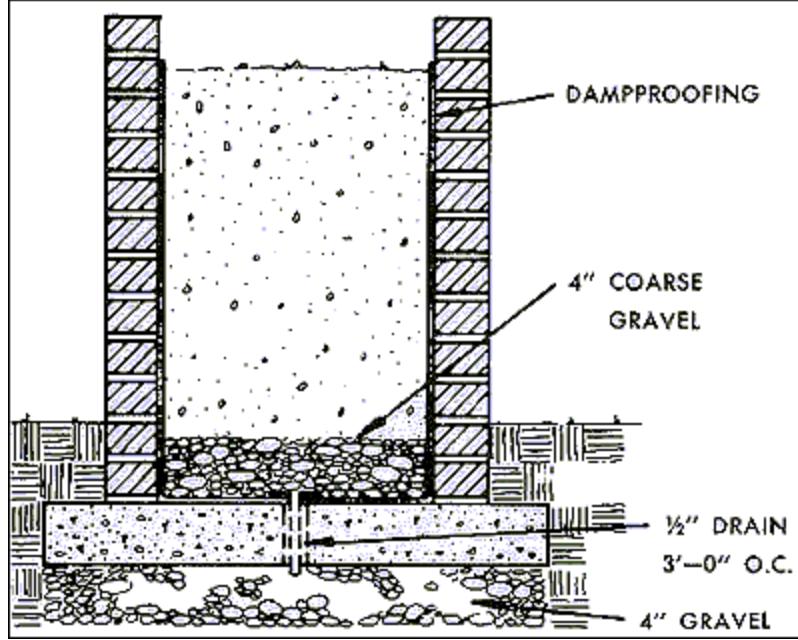


FIG. 6

**Edging.** Brick edging, as indicated in Fig. 7, may be used to define the lawn area and keep it trim and neat for all seasons. In addition, the brick strip provides a surface for the lawnmower and thereby eliminates hand trimming.

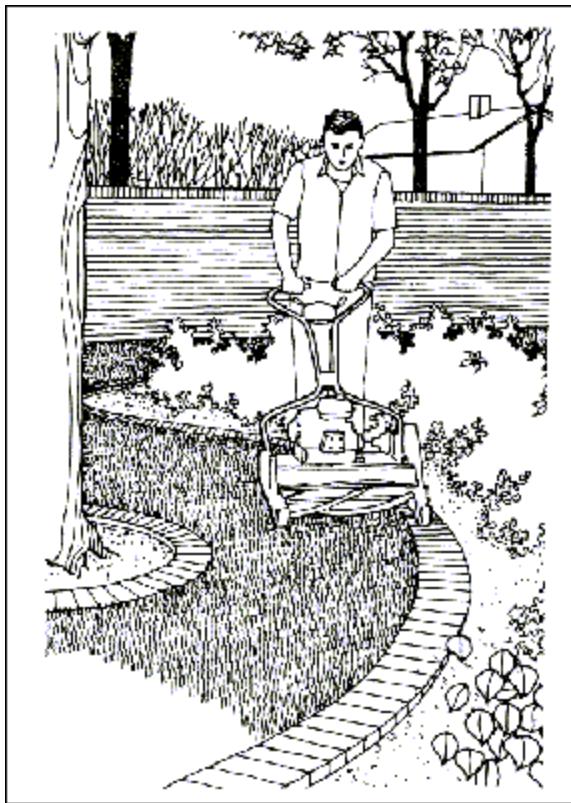
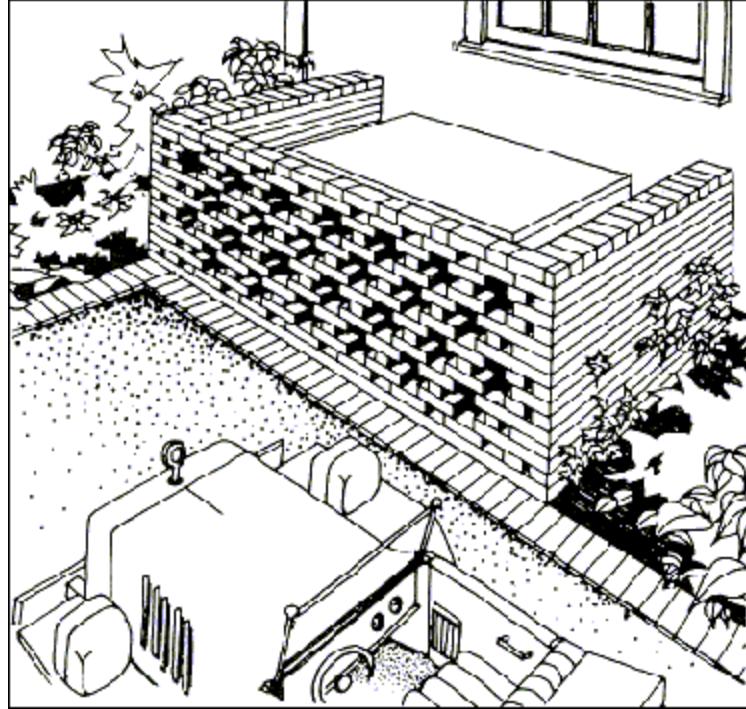


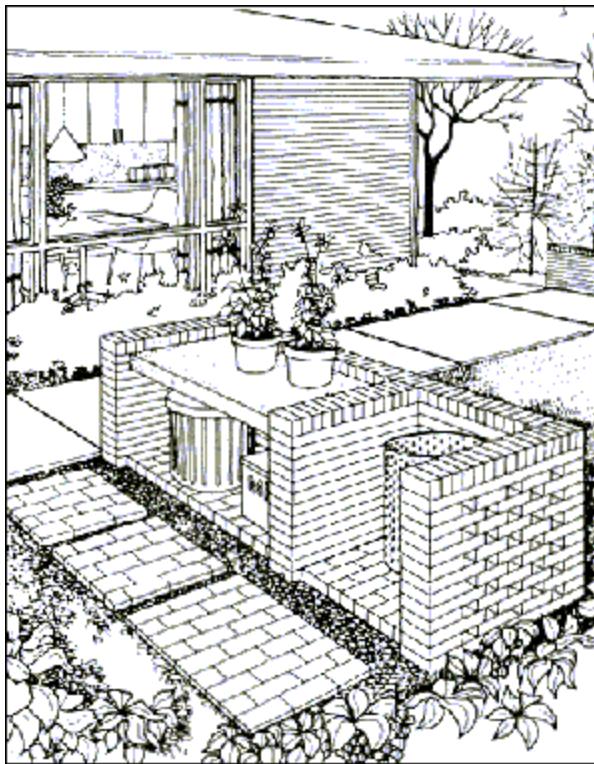
FIG. 7

**Concealment Structures.** Figure 8 shows the condenser of a central air-conditioning system that has been concealed by a low perforated brick screen. The screen must have adequate openings to allow free circulation of air required for efficient operation. Also, access for servicing should be provided.



**FIG. 8**

Trash cans are unsightly, but a low brick enclosure, as indicated in Fig. 9, will banish from sight such undesirable items in landscape architecture. In addition to being handsome, the structure is maintenance-free.

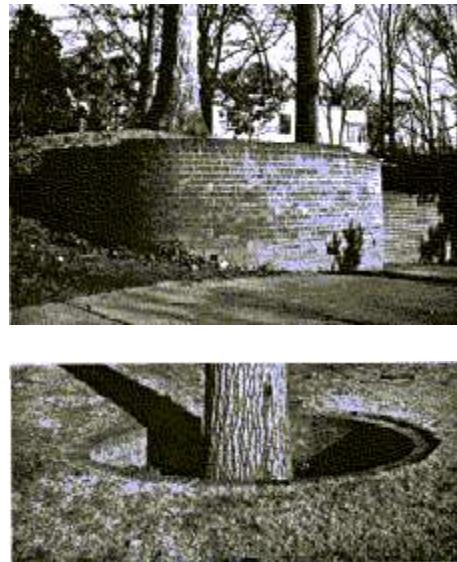


**FIG. 9**

**Tree Protection.** Tree roots require air, water and minerals to survive. When a grade level is changed and the soil depth over the roots is either increased or decreased, the roots have difficulty obtaining a normal amount of air, water and minerals. Therefore, to insure the life of a tree, it is necessary to protect it from a grade change.

The properly designed brick retaining wall, reinforced or non-reinforced, is very effective in withstanding lateral pressure from earth when changes in grade are necessary.

Visual evidence of respect for nature is shown in the photographs in Fig. 10. Mature trees were preserved, utilizing a brick retaining wall and a handsome brick tree well.



**FIG. 10**

*Raising the Grade.* Minor fills, 6 in. or less in depth, will not harm most species of trees, if the fill is good top soil that is high in organic matter and loamy in texture. For major grade changes, air and adequate water must be supplied to the roots of the tree. This may be accomplished by constructing a brick retaining wall around the trunk of the tree and placing a layer of gravel and a system of drain tile on original grade over the roots of the tree. Figure 11 indicates two plans for placing the drain tile. The tile should slope in the direction indicated. It is important that the tile extend through the brick retaining wall so that water will not collect around the trunk of the tree. In addition to the tile placed on original grade, it may be necessary to place a series of bell tile vertically over the roots, and connected to the tile system for additional air and water circulation. This detail is shown in Fig. 12. The system must be designed to fit the contour of the land so that water drains away from the tree trunk.

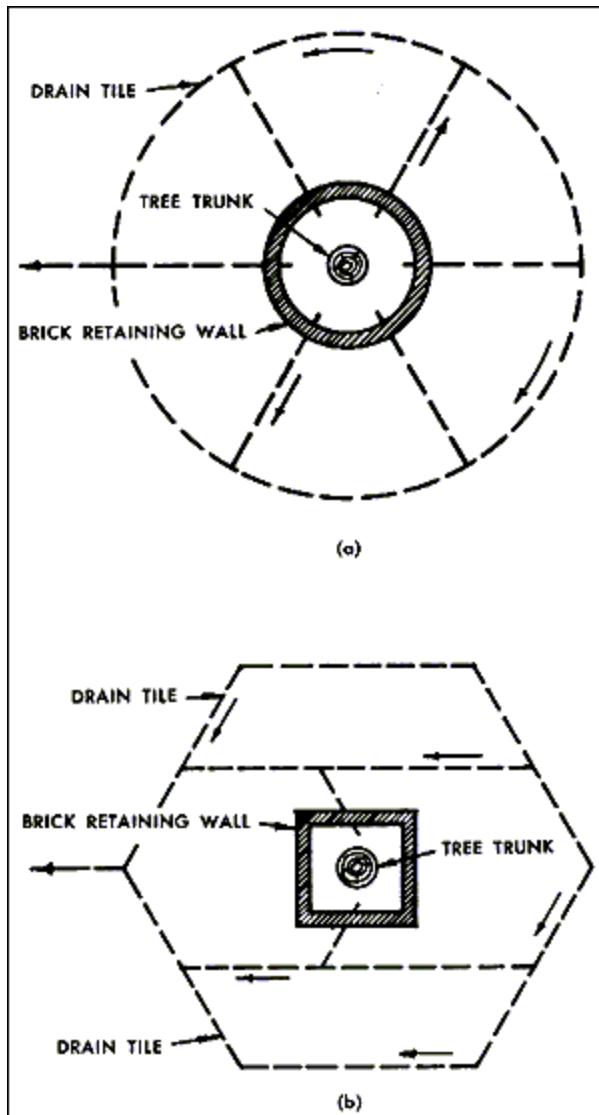


FIG. 11

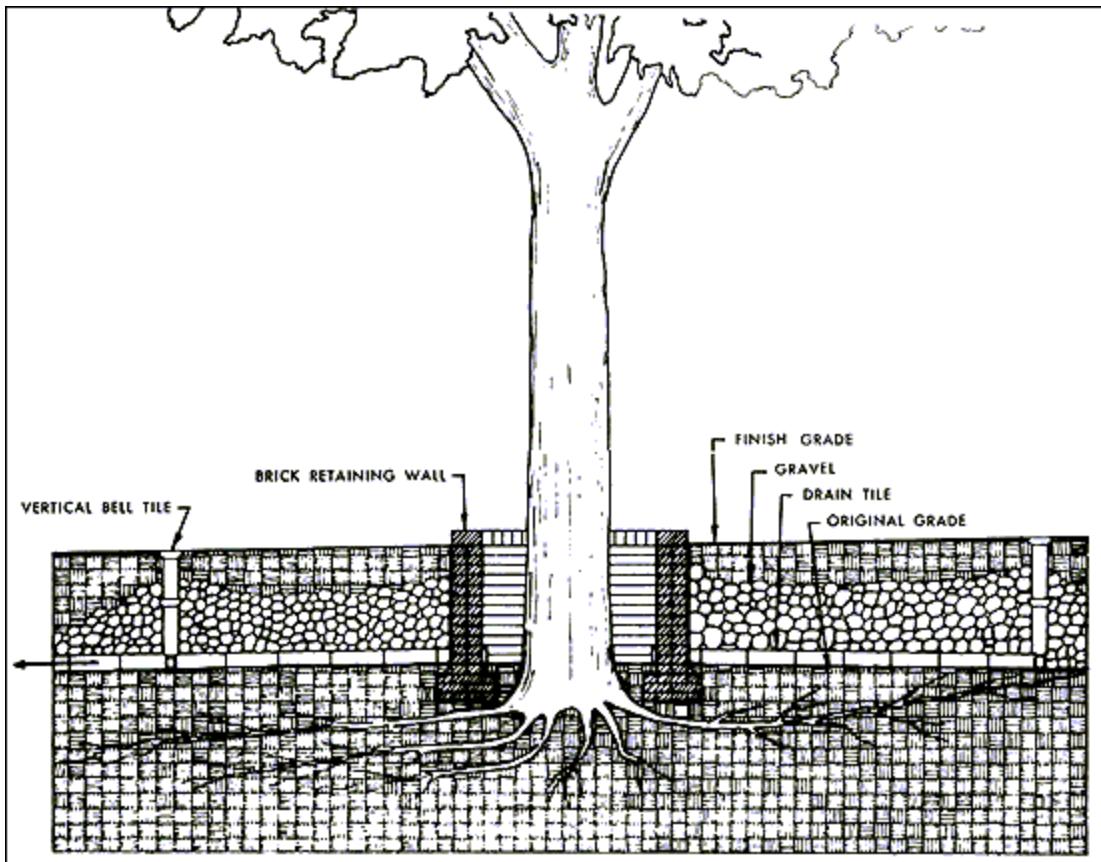


FIG. 12

If economy is essential, or the questionable value of a tree will not permit the expense involved in the construction of a complete aeration system, a variation may be adopted. For example, if a tree was originally on a well drained slope, sufficient drainage may be obtained through the fill by using coarse gravel around a series of bell tile placed vertically over the roots, in which case the horizontal tile drains may be omitted.

*Lowering the Grade.* Protecting a tree from a lowered grade is usually less complicated than protecting it from a raised grade. Lowering the grade can be equally harmful to a tree unless proper attention is given to cutting the roots, pruning branches, stimulating root growth and watering. Generally, protection is achieved by terracing the grade. If space is available, the tree may be unharmed if it remains on a gently sloping mound. Another way to protect a tree from a lowered grade is to build a brick retaining wall between it and the lower grade, as shown in Fig. 13.

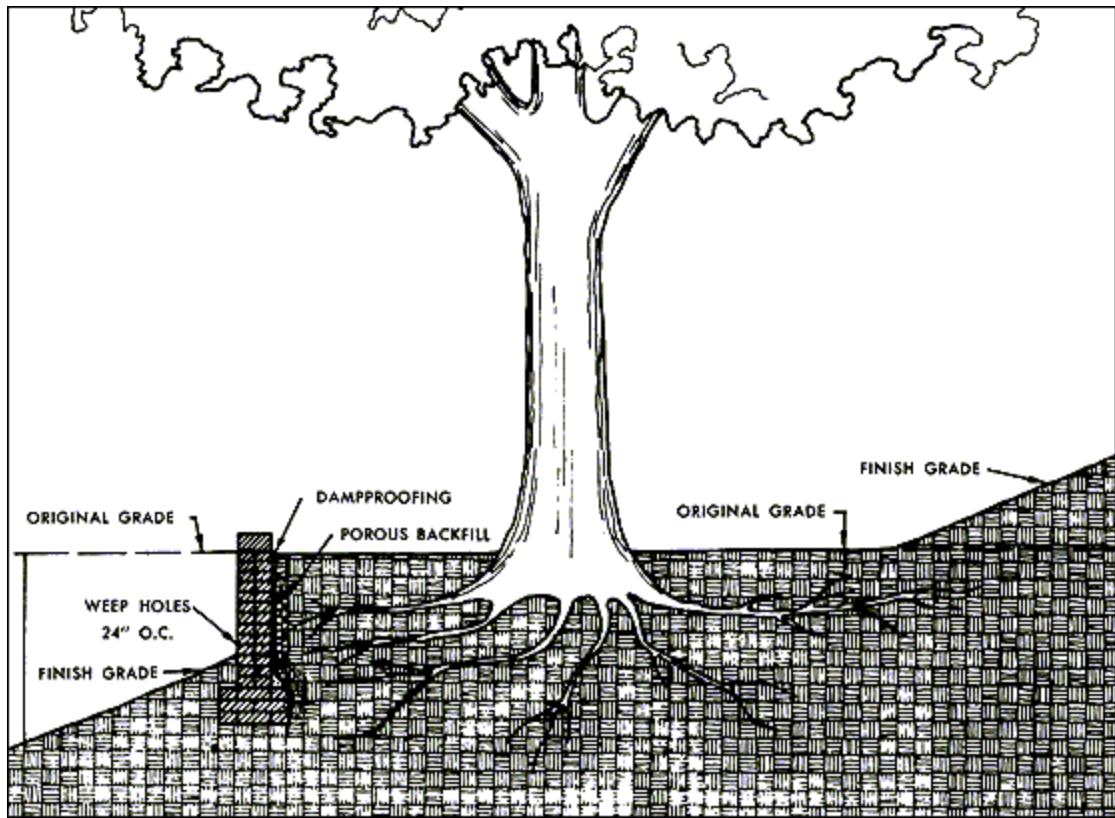


FIG. 13