

Chapter 12 : Armature Design

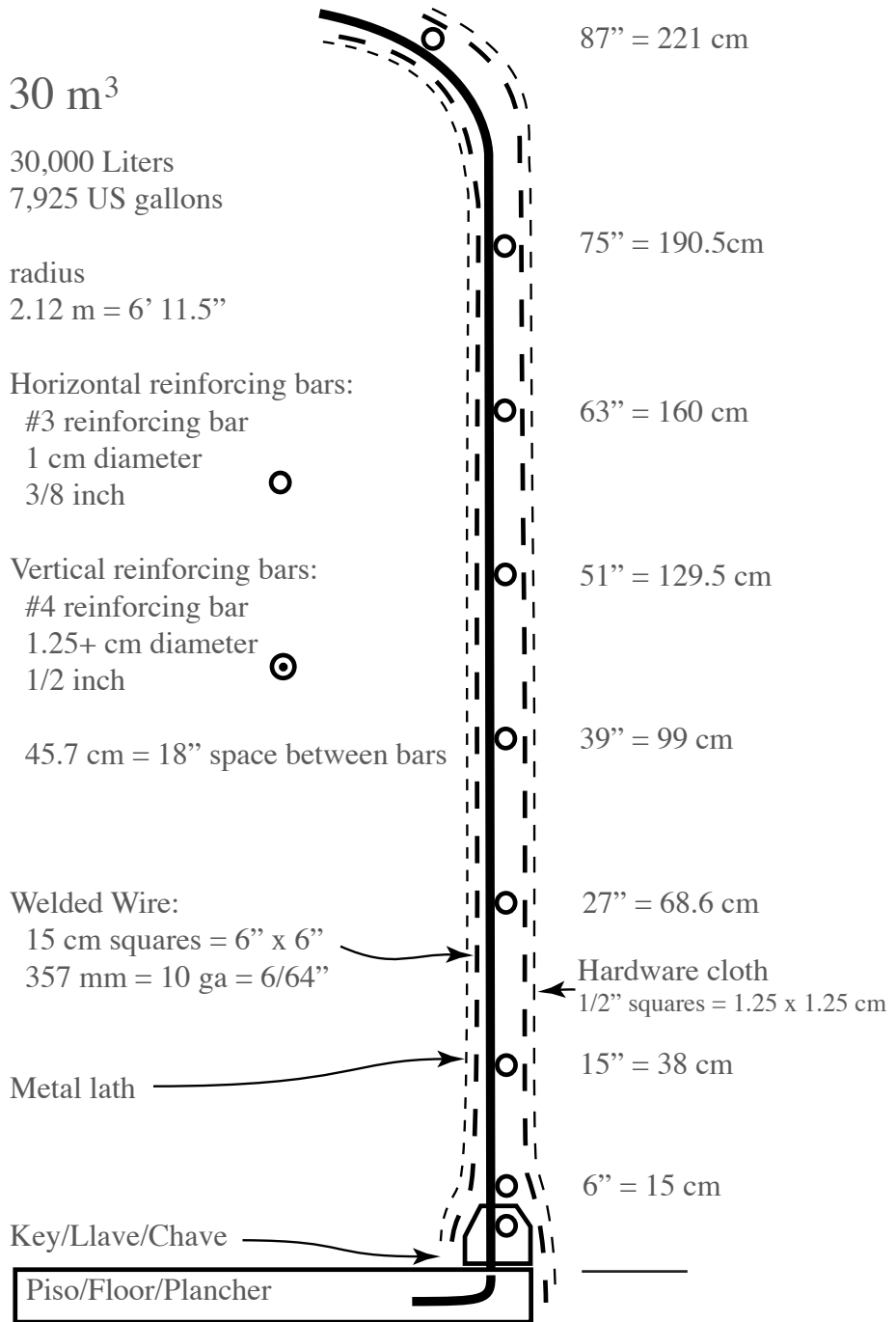
The schematic diagrams of water tank armatures in this chapter are primarily used by ferrocement.com as a tool to help estimate quantities of materials. While it is true that these armature steel layouts have worked in the past and the smallest sizes are very simple to build, there cannot be guarantees that they will work in the present.

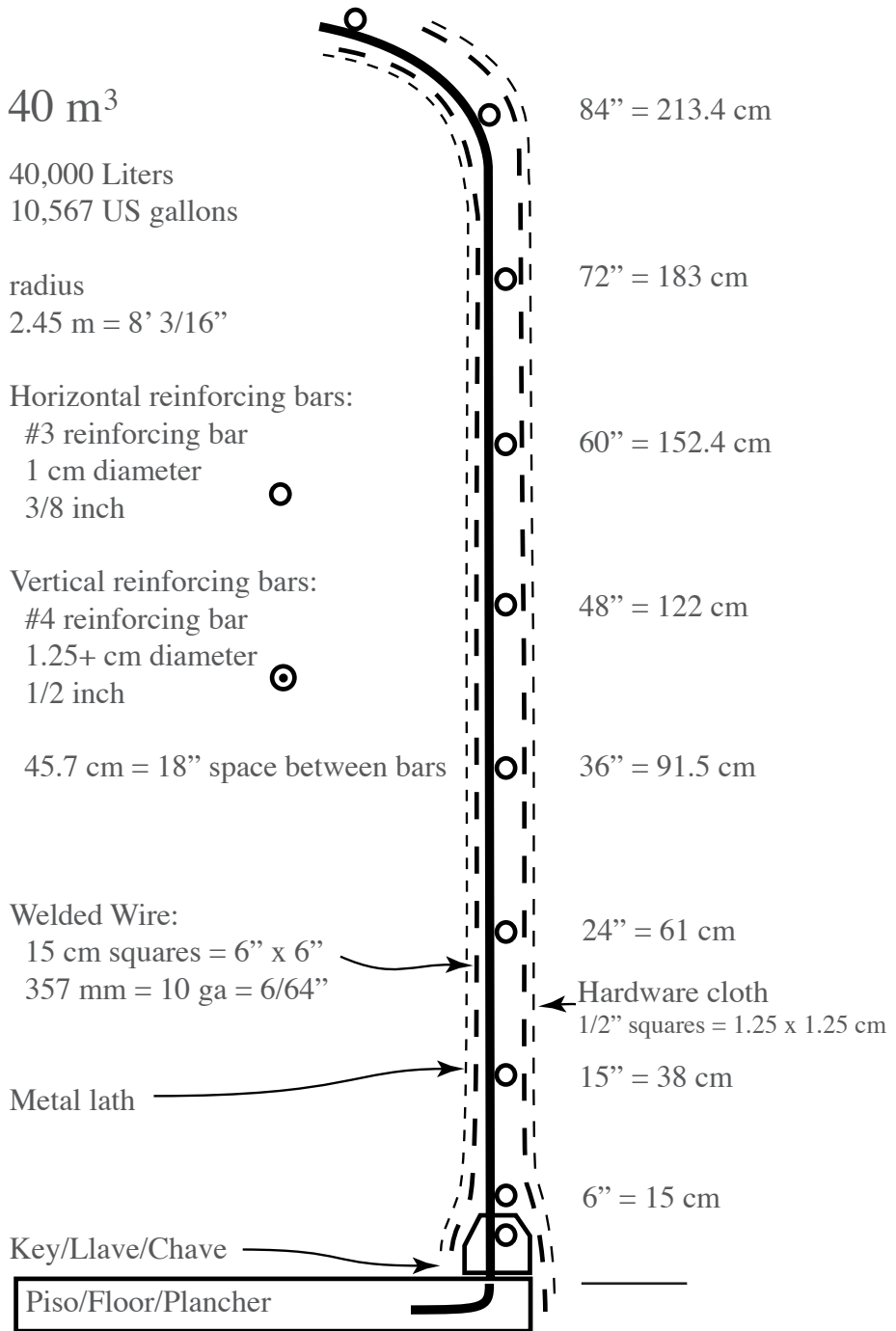
Materials lists derived from these drawings are relatively simple to accomplish and provide a good method for thinking through the plan of construction. Add factors like 5 percent for overlaps and 10 percent for unanticipated thick areas and other wastage of plaster. The heights of horizontal bars are rounded nominal numbers.

The reason these schematics are not guaranteed is simple; it is impossible to know the quality of materials utilized by individuals who may build a water tank like this anywhere in the world in conditions ranging from the bottom of a hot and dry desert valley to the highest freezing mountain top.

The author and ferrocement.com have no knowledge of the materials, workmanship or site conditions used to accomplish these armature designs. All builders should calculate using the methods in chapter one and the strength data for the actual materials put into the armature, especially for larger sizes. The quality of portland cement and chemically neutral sand and water as well as the attention given to the concrete as it hardens over time are all important factors which are discussed in detail elsewhere in this manual. If you have further questions, send them to contact@ferrocement.com.

Notice the additional layer of welded wire on the lower half of the 100 cubic meter size, this is meant to illustrate the increasing strength required as volume increases. A little extra care and patience is required as the size approaches 50,000 gallons and a ten foot wall (200 cubic meters and 3 meter wall). The three meter (10') wall should have a girdle of #5 bar at center of wall height. Four hundred cubic meters (100,000 gallons) requires caution and full attention to and consideration for the large weight of fresh, wet concrete plaster on the roof. This is not difficult but, as noted in the house building manual, can become dangerous quite suddenly, without warning.





50 m³

50,000 Liters
13,210 US gallons

radius
2.73 m = 8.96'

Horizontal reinforcing bars:

#3 reinforcing bar
1 cm diameter
3/8 inch

Vertical reinforcing bars:

#4 reinforcing bar
1.25+ cm diameter
1/2 inch

45.7 cm = 18" space between bars

Welded Wire:

15 cm squares = 6" x 6"
357 mm = 10 ga = 6/64"

Metal lath

Key/Llave/Chave

Piso/Floor/Plancher

90" = 228.6 cm

78" = 198 cm

66" = 168 cm

54" = 137 cm

42" = 107 cm

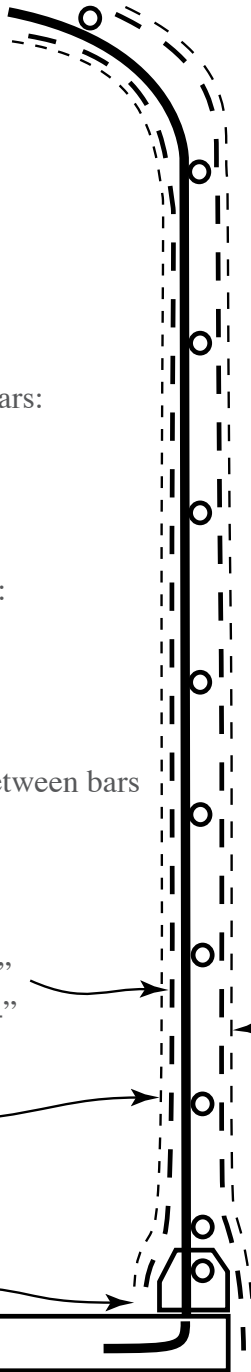
33" = 84 cm

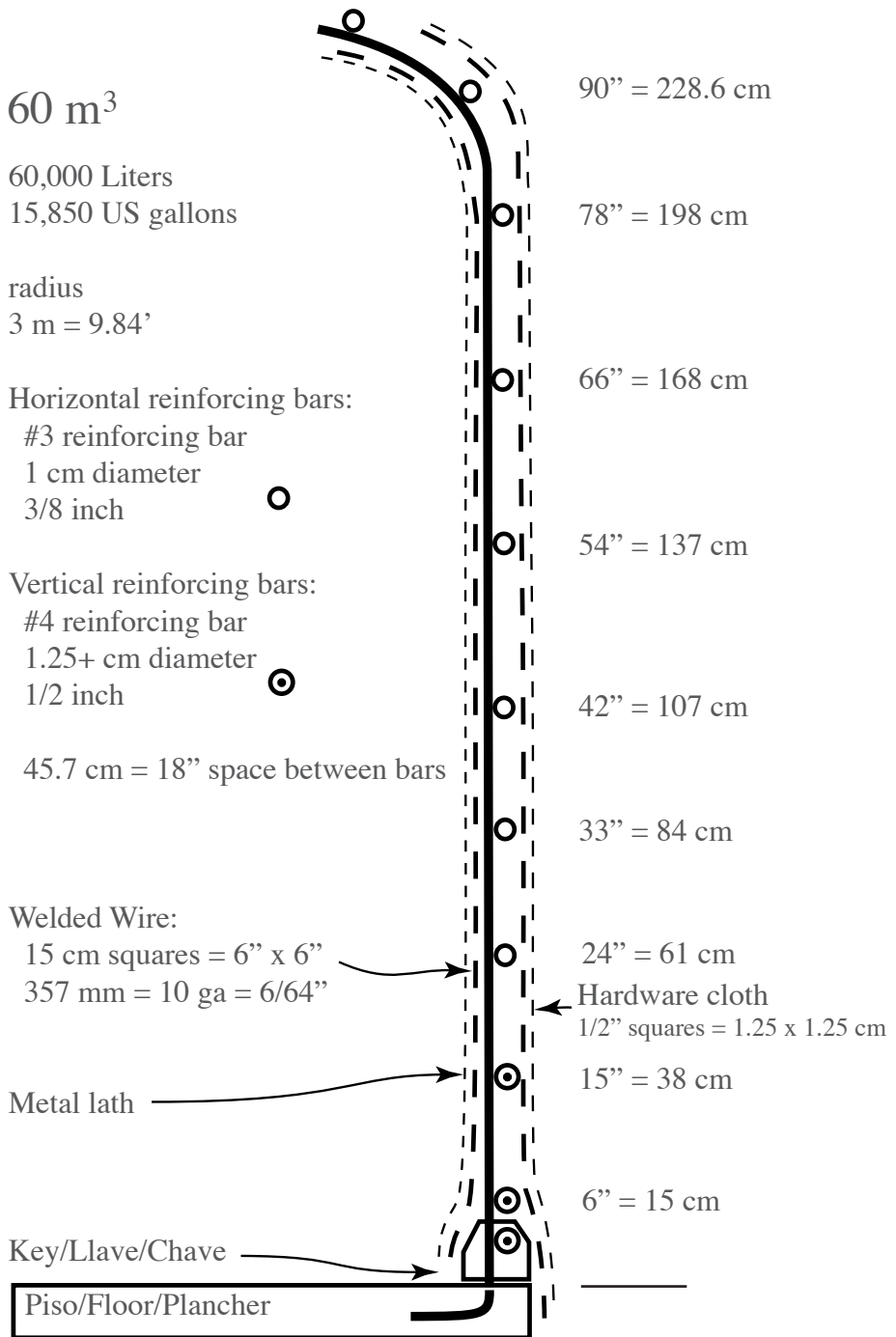
24" = 61 cm

Hardware cloth
1/2" squares = 1.25 x 1.25 cm

15" = 38 cm

6" = 15 cm





75 m³

75,000 Liters
19,812 US gallons

radius
3.35 m = 11'

Horizontal reinforcing bars:

#3 reinforcing bar
1 cm diameter
3/8 inch

Vertical reinforcing bars:

#4 reinforcing bar
1.25+ cm diameter
1/2 inch

40 cm = 16" space between bars

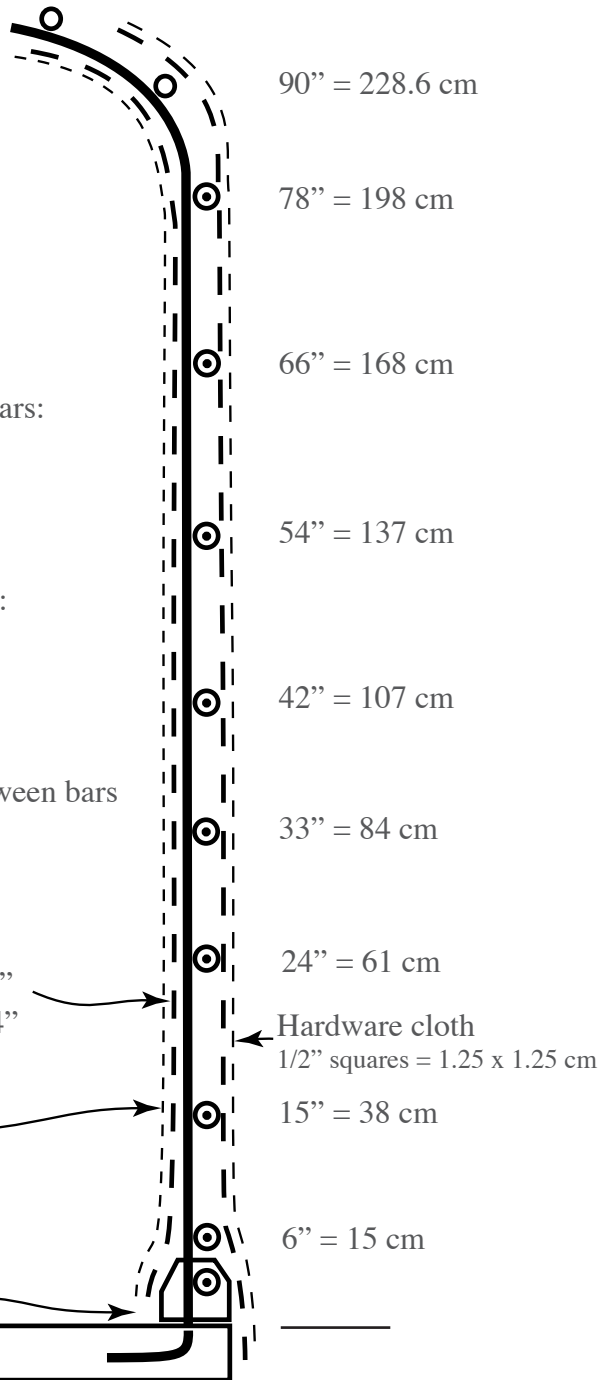
Welded Wire:

15 cm squares = 6" x 6"
357 mm = 10 ga = 6/64"

Metal lath

Key/Llave/Chave

Piso/Floor/Plancher



100 m³

100,000 Liters
26,420 US gallons

radius
3.87 m = 12.7'

Horizontal reinforcing bars:

#3 reinforcing bar
1 cm diameter
3/8 inch

Vertical reinforcing bars:

#4 reinforcing bar
1.25+ cm diameter
1/2 inch

38 cm = 15" space between bars

Welded Wire:

15 cm squares = 6" x 6"
357 mm = 10 ga = 6/64"

Metal lath

Key/Llave/Chave

Piso/Floor/Plancher

