

CITY OF DURBAN

STANDARD ENGINEERING SPECIFICATION

PART "F"

PROTECTION WORKS

PART "F" : PROTECTION WORKS

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PART "F" : PROTECTION WORKS

F.1 SCOPE

This work covers the protection of exposed surfaces by various means and the protection of property by the erection of wire mesh fences, brick walls and wire mesh gabion retaining structures.

F.2 INTERPRETATIONS

F.2.1 Definitions

Definitions for this specification are included in Part "AB" General Specifications.

F.2.2 Supporting Specifications

The following standards are referred to in the specification:

S.A.B.S. 0145 - 1978	-	Concrete Masonry Construction
675 - 1977	-	Zinc Coated Fencing Wire (plain and barbed)
831 - 1971	-	Portland Cement 15 and Rapid Hardening Portland Cement 15
1090 - 1976	-	Sand for Plaster and Mortar

all as published by General Notice 463 dated 9 July 1983.

S.A.B.S. 1215 - 1984	-	Concrete Masonry Units
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as published in Government Notice 2636 dated 30 November 1984.

B.S. 5896 - 1980	-	Specification for High Tensile Steel Wire Strand for the Prestressing of Concrete
S.A.B.S. 1200DK - 1984	-	Gabions and Pitching
B.S. 4483 - 1985	-	Steel Fabric for the Reinforcement of Concrete
A.S.T.M. G23 - 1981	-	Operating light-exposure apparatus (carbon-arc type) with and without water for exposure of non-metallic materials
A.S.T.M. D1499 - 1964	-	Operating light-and water-exposure apparatus (carbon-arc type) for exposure of plastics.

F.3 MATERIALS

F.3.1 Grass

Grass shall be Cynodon Dactylon "creeping" variety.

F.3.2 Topsoil

Topsoil when obtained from a commercial source shall be a soil of a medium texture containing a high proportion of loamy material. It shall be neither too sandy nor too clayey and shall contain some evidence of fibrous plant roots.

The topsoil is to be free of perennial weed root stocks, stone, glass, metallic and plastic substances.

F.3 MATERIALS (CONT'D)

F.3.2 Topsoil (Cont'd)

A 1 kg sample of the topsoil shall be submitted for approval by the Engineer, 4 weeks before the topsoiling operation is due to commence.

F.3.3 Stone Pitching

F.3.3.1 Stones

Stones for pitching shall be petrologically sound and angular in shape. The size of the stones shall generally conform to a plan size of approximately 225 mm x 300 mm with a minimum thickness of 225 mm.

F.3.3.2 Cement Mortar and Grout

The cement and sand for the cement mortar and grout shall comply with S.A.B.S 1090. Pointing of the stones shall be carried out with Class 1 - 10 MPa cement mortar.

F.3.4 Gabions

F.3.4.1 General

A gabion is a steel mesh cage formed in woven wire and filled with packed rocks, generally shaped like a rectangular box when used for retaining structures, and like a mattress for linings.

The type of gabion required shall be specified in Part "AA" : Project Specification.

F.3.4.2 Wire

All wire used for fabrication of the mesh and the lacing, bracing and connecting of cages shall be mild steel conforming to S.A.B.S. 675 with a Class A zinc coating or equivalent and, in additions, shall be plastic coated.

The zinc coating shall have a mass per unit area at least equal to the value tabulated below.

Table 1 : Minimum Mass of Zinc Coating

Nominal Diameter of Wire		Minimum Mass of Zinc Coating per Unit Area g/m ²
Over mm	Up to and including mm	
1,8	2,24	240
2,24	2,72	260
2,72	3,55	275

F.3 **MATERIALS (CONT'D)**

F.3.4 Gabions (Cont'd)

F.3.4.2 Wire (Cont'd)

The plastic coating shall be of grey or black polyvinyl chloride applied by an extrusion process with a nominal thickness of at least 0,50 mm and a thickness at no point of less than 0,45 mm. After the weaving and binding operations, it shall be capable of resisting without cracking the deleterious effects of exposure to intermittent water spraying and continuous light when tested for a period of not less than 3 000 hours in accordance with the latest approved A.S.T.M. Standards G23-81 and D1499-64. It shall satisfy the tests for bonding to the wire core, salt corrosion and creeping corrosion as specified in clause 7.5 of S.A.B.S. 1 200 DK.

F.3.4.3 Mesh

The wire shall be machine woven into an hexagonal mesh, the joints being formed by twisting each pair of wires through not less than one and a half turns.

F.3.4.4 Woven Cages

The gabion mesh shall be supplied cut, selvedged and ready for folding into a rectangular cage complete with lid, and panels, and diaphragms dividing the cage into compartments.

All panel edges which are required to be laced on site shall be selvedged. Selvedge wires shall be woven integrally with the mesh, except at cut ends where they shall be tightly bound to the cut wire.

Sufficient plastic coated galvanised wire for lacing, bracing and connecting shall be supplied with the gabion cages to complete all the wiring operations that are necessary for the assembly and installation of the cages.

F.3.4.5 Rock Fill

The rock fill shall consist of clean, hard unweathered rock fragments free from fissures and flaking.

F.3.4.6 Dimensions of Gabions and Rock Fill

The dimensions of the wire, mesh and rock filling shall be as shown in Table 2 : Dimensions of Gabions and Rock Fill.

F.3 MATERIALS (CONT'D)

F.3.4 Gabions (Cont'd)

F.3.4.6 Dimensions of Gabions and Rock Fill (Cont'd)

Table 2 : Dimensions of Gabions and Rock Fill

Gabion Description		Diaphragm Mean Spacing	Wire Mesh		Rock Fill Largest Dimensions		Minimum Nominal Diameter of Zinc-Coated Steel Wire			
			Woven							
Type	Depth mm		b mm	1 mm	Min. mm	Max. mm	Mesh mm	Selvedge mm	Lacing mm	Bracing mm
Mattress	230	600	60	80	75	150	2,0	2,4	2,0	2,0
	300	600 600	60 80	80 100	75 100	150 150	2,0 2,2	2,4 2,7	2,0 2,0	2,0 2,0
Box	500	1 000 1 000	80 100	100 120	100 150	150 225	2,4 2,4	3,0 3,0	2,0 2,0	2,0 2,0
	1 000	1 000 1 000	80 100	100 120	100 150	150 225	2,4 2,7	3,0 3,4	2,0 2,0	2,0 2,0

- NOTES :**
1. b - a nominal dimension measured between the centres of the parallel twisted sides of the hexagon.
 2. 1 - a nominal dimension measured at right angles to "b" between the ends of the in line twists.
 3. The minimum dimension of rock fill shall be such that no rock shall pass through a ring of diameter 10% greater than b while the maximum largest dimension shall be as shown in the table above.

F.3.5 Brickwalls

F.3.5.1 Footings

The concrete strength for footings shall be 20/26 as specified in Part "C" : Concrete Work : clause 5.6.1.

F.3.5.2 Brickwork

The external faces of all brickwork shall be formed in face units or aesthetic face units (FUA) of solid concrete masonry having a minimum nominal compressive strength of 14 MPa, first quality red face brick (category FBS or equivalent) or as may be specified in the Schedule of Quantities. Elsewhere bricks shall be solid concrete masonry units having a minimum nominal compressive strength of 14 MPa or selected good quality plaster bricks, category NFX - E28 or equivalent.

The mortar used shall be Mix Class 1 - 10 MPa, complying with S.A.B.S. 0145.

F.3 **MATERIALS (CONT'D)**

F.3.6 **Fencing**

The materials described below are for the supply and erection of a 2,3 m x 1,3 m high plastic coated wire mesh fence, including a vertical security apron of 4 strands of aluminium barbed wire.

F.3.6.1 **Posts**

All posts and stays shall be made of prestressed concrete.

The post dimensions given below shall be adhered to, although alternatives may be considered provided full details are supplied at the time of tender.

(a) **Dimensions**

- (i)** Corner, end and intermediate straining posts shall be 100 mm x 100 mm x 3,3 m with chisel ends.

Corner and straining posts shall have 2 No. 75 mm x 75 mm x 3 m stays fastened to them, and end posts shall have 1 No. 75 mm x 75 mm x 3 m stay.

- (ii)** Intermediate posts shall be 75 mm x 75 mm x 3,1 m with chisel ends.

- (iii)** Stays shall be 75 mm x 75 mm x 3,0 m with the head shaped to fit into a recess provided in the straining posts.

(b) **Prestressed Concrete Details**

Cement used shall be Portland Cement 15 or rapid hardening Portland Cement 15 complying with S.A.B.S. 831.

Aggregate shall be an approved hard stone not exceeding 13 mm nominal size.

Prestressing steel shall comply with B.S. 5896.

F.3.6.2 **Fence Straining Wires**

Straining wires shall be 3,15 mm core diameter steel wire P.V.C. coated to 4,0 mm.

F.3.6.3 **Fence**

Fencing shall consist of 55 mm diamond mesh, of 2,5 mm core diameter steel wire P.V.C. coated to 3,15 mm, 2,0 m high, with barbed top and bottom and shall be fixed to the straining wires by means of approved P.V.C. coated clips.

F.3 **MATERIALS (CONT'D)**

F.3.6 Fencing (Cont'd)

F.3.6.4 Security Fencing

Security fencing shall be 3 No. Strands of 12,5 gauge aluminium barbed wire, with barbs having 4 points and spaced 150 mm apart. The wires shall be attached to the posts with approved P.V.C. coated binding wire.

F.4 **PLANT**

Not applicable to this specification.

F.5 **CONSTRUCTION**

F.5.1 Topsoiling

The surface to be topsoiled shall be prepared by trimming to a semi-rough surface which is essential to the proper placing of the topsoil.

Topsoil shall either be imported or recovered if available from stockpiles as a result of work under the earthworks operation and transported to the site for distribution.

The topsoil shall be spread to cover the whole surface area with a layer of topsoil the average thickness being at least 100 mm after trimming.

On areas to be grassed and subject to mowing, all stones shall be removed from the topsoil.

The transport of topsoil up to a distance of 1 km from the on site stockpile will be regarded as free haul.

After completion of the topsoiling on any surface the Contractor shall protect and maintain the topsoiled areas and bear all costs involved in the repairs to any damaged work.

F.5.2 Grass Planting

The area to be planted shall be fertilised after soil tests have been carried out by the Contractor to determine the correct fertiliser requirements and its rate of application.

The grass stolons shall be planted in moist soil at a maximum spacing of 150 mm in both directions.

The full responsibility of maintaining the grassed areas shall rest with the Contractor until the end of the maintenance period.

Maintenance shall include watering, re-fertilisation when necessary, re-grassing of unsatisfactory areas, weeding, cutting and any other work for the establishment of a satisfactory stand of grass.

F.5 **CONSTRUCTION (CONT'D)**

F.5.2 **Grass Planting (Cont'd)**

Maintenance shall also include the repair of erosion damage to the grassed areas.

F.5.3 **Stone Pitching**

All areas to be stone pitched shall first be trimmed and compacted to ensure that no subsequent settlement occurs.

A trench shall be excavated along the toe of any slope to be pitched to ensure keying of the pitching into stable material. The depth of trench shall be as specified by the Engineer but will not exceed 1 m.

Commencing at the bottom of the trench, the stone shall be laid, rammed and firmly bedded into the slope and against adjoining stones.

The stones shall be laid at right angles to the slope to give a minimum slab thickness of 225 mm measured at right angles to the surface.

The interstices between the stones shall be filled with cement mortar with the face of the pitching left proud to enable the joints to be finished with a minimum thickness of 225 mm. Before the mortar is applied the surface of the stones shall be thoroughly wetted. The mortar shall be cured for a period of not less than four days.

The finished surface of the pitching shall present an even, tight and neat appearance with no stones varying by more than 25 mm from the specified surface lines and grades.

F.5.4 **Catchwater Banks**

Catchwater banks shall be constructed to the cross-section shown on the drawings. The material shall be obtained from site.

The material shall be hand trimmed and compacted to the profile indicated on the drawings, and a drain shall be formed against the uphill face by consolidating the loose face of the bank, and trimming the invert to an even grade.

The bank shall be shaped to suit the discharge conditions at chutes, or outlets to undisturbed ground. The Contractor shall inspect the channel at suitable intervals during the maintenance period, and shall carry out such repairs and reconstruction as may be required to establish a stable bank.

F.5.5 **Gabions**

The gabion foundation is to be trimmed to an even surface at the required level, such that the whole base of the loaded cage will be uniformly supported without the mesh being deformed from a plane surface by more than 50 mm.

F.5 CONSTRUCTION (CONT'D)

F.5.5 Gabions (Cont'd)

When the foundation is on rock, all projecting ribs and pinnacles shall be knapped off, and all crevices and hollows shall be filled with hand packed stone spalls.

On other materials all high spots and protruding boulders shall be removed, and any soft spots or loose fill shall be compacted to match the density of the undisturbed material.

Filling of gabions may only take place by hand when the cages are under tension and is to be carried out in such a manner as to provide the minimum of voids and the maximum of interlock. Selected rock particles of adequate size shall be so packed as to obtain a fair-faced finish on exposed faces.

Care shall be exercised not to damage the protective coatings on the wire and any section so damaged shall be repaired or replaced.

The tension of the gabion shall be released only when the cage is sufficiently full to prevent distortion. The edges of adjacent gabions shall be wired together.

If mattress gabions are laid on slopes of 1 in 1,5 and greater, 20 mm diameter mild steel stakes shall be driven through the mattress to a minimum depth of 600 mm into the ground staggered at 1 m centres in rows 1 m apart.

The box and mattress gabions shall be backed with a geofabric blanket as specified in clause PG.3.8 (Drainage Grade), with an overlap of 300 mm between adjacent mats.

Transverse braces shall be provided between the exposed outer vertical or battered faces of box gabions and the nearest opposite inner face.

There shall be wrapped around the central two mesh widths of each compartment of the gabion concerned at one-third or one-half box height intervals for 1 000 mm and 500 mm box heights respectively as the filling proceeds and 'Spanish' windlassed together to ensure a neat frame and line and to prevent bulging in excess of the specified tolerance.

Where practical, consecutive courses of gabion cages shall be staggered to avoid the coincidence of vertical joints.

Where specially shaped gabions are required for gussets, joints, angles, splays or the like, wire mesh cages shall be modified on site by cutting or folding, surplus mesh being removed or wired to an adjacent face, and any cut edges being securely laced together.

The special cages shall be integrated with the gabion structure by assembling, tensioning, filling and closing as specified for rectangular cages.

F.5 **CONSTRUCTION (CONT'D)**

F.5.6 Brickwalls

F.5.6.1 Footings

Footings shall be constructed to the dimensions shown on drawings and in conformity with any other requirements detailed on the drawings.

F.5.6.2 Brickwalls in Retaining Walls

The brickwork shall be cross-bonded in English bond with the external facing in stretcher bond. The front face shall be tied into the rear brickwork with "Brickforce" or similar every third course.

All exposed joints in the brickwork shall be half round recessed, well rubbed with a standard jointing tool of suitable size to ensure that the entire exposed surface presents a smooth and polished appearance.

Vertical joints shall be provided at ± 30 m centres.

Weepholes shall be provided as shown on the drawings at 1,5 m centres and shall be formed in 75 mm diameter fibre cement pipes. A 300 mm x 300 mm x 100 mm thick no-fines concrete block shall be placed centrally over each pipe and against the inner face of the wall to act as a filter. The no-fines concrete blocks shall be made from 19 mm stone and shall have a minimum crushing strength of 5 MPa at 28 days.

Allowance for brick cutting shall be deemed to be included in the contract rates and shall be carefully and neatly carried out to ensure that joint thickness tolerances are maintained.

F.5.6.3 Brickwork in Walls other than Retaining Walls and Manholes

The requirements for such walls shall be similar to those detailed for retaining walls.

Wall ties, or similar, of an approved pattern shall be provided at intervals of 1 m horizontally and 0,5 m vertically.

As in the case of retaining walls allowance for brick cutting shall be deemed to be included in the rates.

F.5.7 Fencing

F.5.7.1 Posts and Stays

F.5.7.1.1 Corner end and intermediate straining posts

The posts shall be bedded in concrete to a depth of 900 mm. The minimum size of the foundation shall be 450 mm x 450 mm x 975 mm deep and the concrete shall be well rammed around the posts to finish flush with the ground level.

Intermediate straining posts shall be erected at distances not exceeding 45 m, while corner posts shall be provided at all changes of direction.

F.5 **CONSTRUCTION (CONT'D)**

F.5.7 Fencing (Cont'd)

F.5.7.1 Posts and Stays (Cont'd)

F.5.7.1.2 Intermediate posts shall be bedded in concrete of minimum size 300 mm x 300 mm x 775 mm deep and shall be erected at 3 m centres.

F.5.7.1.3 Stays shall be bedded in concrete of minimum size 300 mm x 300 mm x 600 mm.

F.5.7.2 Prestressed Concrete Details

F.5.7.2.1 Concrete Mix

The concrete strength shall be 40/13 as specified in Part "C" Concrete Work : clause 5.6.1.

All concrete shall be mechanically vibrated.

F.5.7.2.2 Method of Manufacture and Finishing

All posts and struts shall be cast in properly designed steel moulds, and the stems shall be uniformly stressed by means of one centrally placed stressing wire so as to give a minimum compression of 4,0 MPa at initial stress.

Only prestressing steel which is clean and completely free of rust will be accepted. No wire shall be stressed beyond 75% U.T.S.

The heads (or security arms) may be cast on after the stems have set, but the stressing wires are to extend to within 50 mm of the end of such head, subject to a minimum concrete cover of 25 mm at the end.

Before casting on the head, the end of the stem shall be roughened, cleaned off and treated with a wet-to-dry concrete epoxy adhesive of approved quality.

The shape of the head of all posts shall be chisel shaped.

Where holes are required in corner posts, gate posts or straining posts, such holes shall be accurately drilled in the specified positions along the length. The finished surfaces of all posts and stays shall be smooth and free from honeycombing or other blemishes.

If an epoxy resin compound is to be used to affix the stay to the straining posts it shall be Epidermix 350 or an equivalent dry to dry concrete adhesive. The contact surfaces shall be adequately chipped and must be clean, dry and sound before application. The surfaces shall be held together by means of wire or a similar method and no straining wire shall be placed until the full cure period is attained.

F.5 **CONSTRUCTION (CONT'D)**

F.5.7 Fencing (Cont'd)

F.5.7.3 Fence Straining Wires

Straining wires shall be evenly spaced. They shall be tensioned in such a sequence as to prevent cracking of the posts, and shall not be passed through the straining posts but shall be secured to them by means of a Spanish hitch.

F.5.7.4 Fence

The fence shall be fixed to the straining wires by means of approved P.V.C. coated clips, spaced at 300 mm centres.

F.6 **TOLERANCES**

F.6.1 Topsoil

F.6.1.1 Levels

After trimming, no point of the topsoil surface, in verge and median areas, shall deviate more than 20 mm from the specified levels.

F.6.1.2 Thickness

In any section, the average layer thickness shall not be less than that specified. The allowable tolerance at any individual test shall be ± 20 mm.

F.6.2 Prestressed Concrete Posts

All posts and struts shall be a uniform cross-section throughout their length, with a maximum tolerance of - 3 mm and plus 6 mm. The length shall be as specified, with a maximum tolerance of - 13 mm and + 40 mm.

F.6.3 Gabions

F.6.3.1 Rock Filled Cages

After assembly and filling on site, the width and depth of each cage shall be within 3% of the specified dimensions and the length within 10%.

F.6.3.2 Structures

The permissible deviations shall be within the limits given in Table 3 below.

F.6 TOLERANCES (CONT'D)

F.6.3 Gabions (Cont'd)

F.6.3.2 Structures (Cont'd)

Table 3 : Maximum Permissible Deviations in Structures

Item	Permissible Deviation mm
1. Position relative to true position in plan.	300
2. Position relative to adjacent gabion edges:- (i) if designed to coincide	40
(ii) if designed with an offset "0"	"0" - 5
3. Alignment:- (i) on edges designed to be straight, departure from a straight line between any two points on the edge at a distance of 'ℓ' metres apart.	4 'ℓ' + 30
(ii) on curved structures, difference between the design radius and the radius to the end of the chord formed by the cage.	150
4. Level : relative to design level.	50
5. Bulging:- Maximum bulge between the top and bottom edges of an exposed even vertical or battered face on a cage of depth "d" mm.	"d" - 15

F.7 TESTING

F.7.1 General

All testing shall be in accordance with the method specified under Part "AB" General Specifications.

After approval by the Engineer of the results of the preliminary tests on the materials, the materials may be delivered to the site. The Contractor shall be responsible thereafter for ensuring continued compliance with the specification prior to the delivery of materials.

F.7 TESTING (CONT'D)

F.7.2 Preliminary Testing of Materials

F.7.2.1 Rock Fill

F.7.2.1.1 Weathering

All stone shall have a weathering loss of not more than 5% after 10 cycles of weathering in a sodium sulphate solution as specified in clause 7.3 of S.A.B.S. 1200 DK-1984.

F.7.2.1.2 Durability

Dolerite stone shall have a durability loss of not more than 5% after immersion in ethylene glycol as specified in clause 7.4 of S.A.B.S. 1200 DK-1984.

F.7.2.2 Gabion Cages

F.7.2.2.1 Wire Mesh Joints

The tightness of the twisted joints of wire mesh shall be tested as specified in clause 7.6.1 of S.A.B.S. 1200 DK-1984. A force of at least 1,7 kN shall be required to separate the wires.

F.7.2.2.2 Selvedge Binding

The selvedge binding shall be tested as specified in clause 7.6.2 of S.A.B.S. 1200 DK-1984.

The force required to separate the selvedge binding from the mesh shall be at least 8,5 kN.

F.7.2.2.3 End Panels

The attachment of an end panel to the bottom panel of a gabion shall be tested as specified in clause 7.6.3 of S.A.B.S. 1200 DK-1984. The force required to separate the end panel from the bottom panel shall be at least 8,5 kN per metre.

F.7.2.2.4 Diaphragms

The attachment of a diaphragm to the bottom panel mesh shall be tested as specified in F.7.2.2.3. The force required to separate the diaphragm from the panel shall be at least 6,0 kN per metre.

F.8 MEASUREMENT AND PAYMENT

F.8.1 Topsoiling

Topsoiling shall be measured in square metres (m²) of area covered.

The rate shall cover the supply of topsoil either from stockpile or imported from a commercial source, transport from the stockpile inside a free haul distance of 1 km, trimming of the earthworks to a semi-rough surface prior to the spreading of the topsoil, spreading in a manner described, trimming and finishing.

F.8 **MEASUREMENT AND PAYMENT (CONT'D)**

F.8.1 Topsoiling (Cont'd)

Where specified in the Schedule of Quantities that topsoil shall be imported from a commercial source, the rate shall include for all haulage and royalties.

F.8.2 Overhaul of Topsoil from Stockpile

Overhaul of topsoil shall be measured in cubic metre-kilometres (m³km).

The overhaul distance shall be the distance in kilometres between centres of position of loading and its authorised position of placing, less the 1 km free haul.

The volume of the overhauled material shall be determined by converting area and thickness of completed work to cubic metres.

F.8.3 Grass Planting

The work in grass planting shall be measured in square metres (m²) of area effectively covered with a satisfactory cover of living grass.

A satisfactory cover of grass is defined as a cover of living grass in which no bare patches exist larger than 0,1 m².

The rate shall cover the supply of grass and fertilizer, preparation, application of the fertilizer, planting and for the maintenance of the planted area (including cutting of grass).

F.8.4 Pitching

Stone pitching shall be measured in square metres (m²) of slope area covered with pitching, with special features of the pitching such as toe walls and return walls assessed separately.

The rate shall cover the supply and transport of suitable stone, excavation, preparation of the bed, construction of the stone pitching, laying, keying, grouting, pointing and finishing.

F.8.5 Catchwater Banks

Catchwater banks shall be measured in metres (m) along the invert line of completed banks at a rate to include for excavation, placing and compacting material from site, trimming to shape, forming and maintaining the drain invert, and finishing the ends at chutes and outlets.

F.8.6 Gabions

The unit of measurement shall be cubic metre (m³) of gabion in place.

The rate shall cover additional trimming of cuttings and embankments where necessary, supply, transport and erection of gabion boxes, tensioning, lacing and internal bracing, supply and filling of gabions with suitable rock, placing of gabions including supply and installation of mild steel stakes through mattresses on-slopes of 1 in 1,5 or greater and all cutting and wastage.

F.8 **MEASUREMENT AND PAYMENT (CONT'D)**

F.8.6 **Gabions (Cont'd)**

Excavation, where required, shall be paid for under Part 'DD' : Earthworks for Structures, the unit of measurement being cubic metres (m³).

Where cages have to be installed in non-standard shapes to satisfy the design requirements of the structures these will be measured by the rate per cubic metre (m³) of gabion in place extra over that for the provision of standard shapes, to allow for all necessary on site folding, cutting, crimping and wiring of wire mesh gabions.

F.8.7 **Brickwalls**

- (a) The unit of measurement for the brickwork shall be square metres (m²), provision being made for variation in price dependent on the thickness of the brickwork.
- (b) Brick on edge coping shall be measured per running metre (m).
- (c) Concrete in footings shall be measured in cubic metres (m³).

The rate shall cover the supply and transport of all materials to site and the construction of all footings, brickwork, etc.

NOTE : No additional payment shall be made for normal ancillary work, cutting, waste, etc., but a special rate per running metre (m) shall be allowed for cutting bricks on the rake to enable the top of a wall to be at the same grade as the adjoining land, road etc.

F.8.8 **Fencing**

The unit of measurement shall be the metre (m).

The rate shall cover the supply of all materials, labour and plant necessary to complete the work as specified under clause F.5.7 and shall include for the supply and erection of straining posts and stays calculated at the standard 45 m interval. Allowance shall be made in the Schedule of Quantities for extra straining posts required by the Engineer.