

Series 400: Road Restraint Systems (Vehicle and Pedestrian)

(05/04)

Safety Barriers

- Units **1** (11/04) The units of measurement shall be:
 - (i) safety barrier linear metre.
 - (ii) transition number.
- Measurement **2** (11/04) The measurement of safety barriers shall be the developed length along the centre line for the containment performance class between the following points: the end of each safety barrier and the interface with connections, transitions and terminals.
- 3** (11/04) The measurement of transitions shall be the complete installation.
- Itemisation **4** (11/04) Separate items shall be provided for safety barriers and transitions in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Safety barrier.
	2 Transition.
II	1 Each containment performance class.
III	1 Each working width class.
IV	1 Designed to be impacted on one side only.
	2 Designed to be impacted on both sides.
V	1 Straight or curved exceeding 120 metres radius.
	2 Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3 Curved not exceeding 50 metres radius.

Safety Barriers and Transitions

- Item coverage **5** (11/04) The items for safety barriers and transitions shall in accordance with the Preambles to Bill of Quantities General Directions include for:
 - (a) design;
 - (b) provision of design calculations and details to the Overseeing Organisation for acceptance;
 - (c) reports, certificates;
 - (d) provision of data and drawings;
 - (e) re-submissions and modifications;
 - (f) amendments to the Works;
 - (g) obtaining approvals;
 - (h) everything necessary for the design, fabrication, installation and testing of the Works.

Terminals

- Units **6** (11/04) The unit of measurement shall be:
 - (i) terminal number.
- Measurement **7** (11/04) The measurement of terminals shall be the complete installation.
- Itemisation **8** (11/04) Separate items shall be provided for terminals in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Terminal.
II	1 Each lateral displacement zone class.
III	1 Each performance class.
IV	1 Designed to be impacted on one side only. 2 Designed to be impacted on both sides.

Terminals

- 9** (11/04) The items for terminals shall in accordance with the Preambles to Bill of Quantities General Directions include for:
 - (a) safety barriers and transitions (as this Series paragraph 5).

Item coverage

Connections to Existing Systems

- Units **10** (11/04) The unit of measurement shall be:
 - (i) connection to existing system number.
- Measurement **11** (11/04) The measurement of connections to existing systems shall be the complete installation.
- Itemisation **12** (11/04) Separate items shall be provided for connections to existing systems in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Connection to existing system.
II	1 Each containment performance class.
III	1 Each working width class.
IV	1 Each type of connection.

Connections to Existing Systems

- 13** (11/04) The items for connections to existing systems shall in accordance with the Preambles to Bill of Quantities General Directions include for:
 - (a) safety barriers and transitions (as this Series paragraph 5).

Item coverage

2 Curved not exceeding 50 metres radius.

Vehicle Parapets

21 (11/04) The items for vehicle parapets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage (a) safety barriers and transitions (as this Series paragraph 5).

Pedestrian Parapets and Pedestrian Guardrails

Definition

22 (11/04) Any reference to “pedestrian” shall be deemed to include equestrian and cyclist.

Units

23 (11/04) The unit of measurement shall be:

- (i) pedestrian parapet, pedestrian guardrail.....linear metre.

Measurement

24 (11/04) The measurement of pedestrian parapets and pedestrian guardrails shall be the developed length along the centre line.

Itemisation

25 (11/04) Separate items shall be provided for pedestrian parapets and pedestrian guardrails in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Pedestrian parapet.
	2 Pedestrian guardrail.
II	1 Different classes.
III	1 Different heights.
IV	1 Different locations.
V	1 Straight or curved exceeding 50 metres radius.
	2 Curved not exceeding 50 metres radius.
VI	1 Curved in plan to different radii.

Note 1: Group V Features shall be applied only to Group I Feature 1.

Note 2: Group VI Feature shall be applied only to Group I Feature 2.

Pedestrian Parapets and Pedestrian Guardrails

26 (11/04) The items for pedestrian parapets and pedestrian guardrails shall in accordance with the Preambles to Bill of Quantities General Directions include for:

- Item coverage (a) safety barriers and transitions (as this Series paragraph 5).

Anti-glare Screens

Units

27 (11/04) The unit of measurement shall be:

- (i) anti-glare screen linear metre.

Measurement

28 (11/04) The measurement of anti-glare screens shall be the developed

Itemisation **29** (11/04) Separate items shall be provided for anti-glare screens in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Anti-glare screen.
II	1 Each type of anti-glare screen.
III	1 Straight or curved exceeding 120 metres radius.
	2 Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3 Curved not exceeding 50 metres radius.

Anti-glare Screens **30** (11/04) The items for anti-glare screens shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage (a) safety barriers and transitions (as this Series paragraph 5).

Remove from Store and Re-erect Safety Barriers

Units **31** (11/04) The units of measurement shall be:

- (i) remove from store and re-erect beam linear metre.
- (ii) remove from store and re-erect post, mounting bracket, terminal section, full height anchorage, expansion joint anchorage, connection to bridge parapet, connection piece number.
- (iii) concrete foundation and socketed foundation to re-erected post number.

Measurement **32** (11/04) The measurement of remove from store and re-erect beams shall be the developed length along the centre line of the beams or in the case of double sided safety barrier and double rail safety barrier, measured once only along the centre line of the posts, between the following points:

- (a) the end of each safety barrier type at a connection to bridge parapet or within a connection piece assembly;
- (b) the connection of safety barrier to terminal sections, full height anchorages and expansion joint anchorages.

33 (11/04) The measurement of remove from store and re-erect terminal sections, full height anchorages, expansion joint anchorages and connections to bridge parapets shall be the complete installation. Mounting brackets and all other posts required between those points defined in paragraph 32 shall be measured. Concrete foundations and socketed foundation to posts, between those points defined in paragraph 32, shall only be measured for those locations stated in the Contract.

34 (11/04) The measurement of remove from store and re-erect connection pieces shall be the complete installation.

35 (11/04) The measurement of remove from store and re-erect expansion joint anchorages shall be for each anchorage on each side of the expansion joint.

Itemisation

36 (11/04) Separate items shall be provided for remove from store and re-erect safety barrier in accordance with Chapter II paragraphs 3 and 4 and the following:

Group	Feature
I	1 Each type of re-erected safety beam.
	2 Each type of re-erected post.
	3 Each type of re-erected mounting bracket.
	4 Each type of re-erected terminal section.
	5 Each type of re-erected full height anchorage.
	6 Each type of re-erected expansion joint anchorage.
	7 Each type of re-erected connection to bridge parapet.
	8 Each type of re-erected connection piece.
	9 Each type of concrete foundation to re-erected post.
	10 Each type of socketed foundation to re-erected post.
II	1 Straight or curved exceeding 120 metres radius.
	2 Curved exceeding 50 metres radius but not exceeding 120 metres radius.
	3 Curved not exceeding 50 metres radius.

Remove from Store and Re-erect Beams

37 (11/04) The items for remove from store and re-erect beams shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) loading, transporting from store, unloading and positioning for re-erection;
- (b) replacing items damaged during the foregoing operations;
- (c) modification and new materials;
- (d) (11/04) transitions;
- (e) making good to protective system.

Remove from Store and Re-erect Posts

38 (11/04) The items for remove from store and re-erect posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) loading, transporting from store, unloading and positioning for re-erection;
- (b) replacing items damaged during the foregoing operations;
- (c) modification and new materials;
- (d) making good to protective system;
- (e) fabrication (as Series 1800 paragraph 6);
- (f) protective system (as Series 1900 paragraph 4);
- (g) driving in any material;
- (h) fixing to structures including attachment systems;
- (i) fixing to beam including spacers;
- (j) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies;

- (k) bedding;
- (l) filling;
- (m) making good to protective system.

Remove from Store and Re-erect Mounting Brackets

39 (11/04) The items for remove from store and re-erect mounting brackets shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) loading, transporting from store, unloading and positioning for re-erection;
- (b) replacing items damaged during the foregoing operations;
- (c) modification and new materials;
- (d) making good to protective system;
- (e) fabrication (as Series 1800 paragraph 6);
- (f) protective system (as Series 1900 paragraph 4);
- (g) fixing to structures including adaptor platforms;
- (h) fixing to beam;
- (i) drilling or forming holes and pockets and casting in bolts, base plates and anchorage assemblies.

Remove from Store and Re-erect Terminal Sections, Full Height Anchorages, Expansion Joint Anchorages, Connections to Bridge Parapets and Connection Pieces

40 (11/04) The items for remove from store and re-erect terminal sections, full height anchorages, expansion joint anchorages, connections to bridge parapets and connection pieces shall, in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) loading, transporting from store, unloading and positioning for re-erection;
- (b) replacing items damaged during the foregoing operations;
- (c) modification and new materials;
- (d) making good to protective system.

Concrete Foundations and Socketed Foundations to Re-erected Posts

41 (11/04) The items for concrete foundations and socketed foundations to re-erected posts shall in accordance with the Preambles to Bill of Quantities General Directions include for:

Item coverage

- (a) excavation in any material (as Series 600 paragraphs 17, 18, 19 and 23);
- (b) disposal of material (as Series 600 paragraph 39);
- (c) concrete (as Series 1700 paragraphs 5 and 10);
- (d) formwork (as Series 1700 paragraph 15);
- (e) reinforcement (as Series 1700 paragraph 26);
- (f) casings;
- (g) fabrication (as Series 1800 paragraph 6);
- (h) protective system (as Series 1900 paragraph 4);
- (i) socket covers and filling;
- (j) plastic sheeting.