

IMPLEMENTATION SPECIFICATION FOR ROAD **WORKS**

VOLUME 2 – NOTES OF GUIDANCE



*This Specification Series implements the requirements in
Subsidiary Legislation 499.57, Part II (New Roads and Road
Works Regulations) in accordance with the Agency for
Infrastructure Malta ACT XXV111, CAP. 588, Part I*

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100 PRELIMINARIES NOTES FOR GUIDANCE

TABLE NG 1/1: Typical Testing Details

[Note to compiler: Appropriate contract compliance testing should be scheduled for all relevant works, goods or materials on site and as installed including those falling under the Construction Products Regulation.]

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 300					
306	Permanent fencing				Quality management scheme applies
	Concrete components	Cover to reinforcement	1 per consignment (maximum 1 per 100 components) (BS 1722)		[Tests/samples should not normally be required]
308	Gates and stiles				Quality management scheme applies
	Reinforced concrete posts	Cover to reinforcement	1 per consignment (maximum 1 per 100 components) (BS 3470)		[Tests/samples should not normally be required]
308 & 310	Preservation of timber	Full sapwood penetration	As required in Clause 310	Required for each batch	Quality management scheme applies [Tests/Samples should not normally be required]
Series 400					
401	Welding	Welding procedures (Manufacturer's tests)	(Every seven years)	Required	Requirements here are applicable only to legacy systems not falling under the Construction Products Regulation (CPR). Quality management scheme applies
		Welder qualification (Manufacturer's tests)	As required in Clause 402		
		Production testing (Manufacturer's tests)	As required in sub-Clause 402		
	Welded joints	Destructive testing	[See Clause 402]		
402	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturer's tests)		Required	To provide well attested and documented evidence
403	Anchorage in drilled holes	Loading test on site	As required in contract specific Appendix 4/1	Required	
	Post foundations			Required	

405	Vehicle parapets			Required	Quality management scheme applies – applicable only to legacy systems not falling under the CPR.
406	Anchorage and attachment systems for use in drilled holes	Ultimate tensile load (Manufacturer's test)		Required	To provide well attested and documented evidence for legacy systems not falling under the CPR.

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 400 (continued)					
407	Vehicle parapet components			Required	
	General				In accordance with manufacturer's installation manual
	Legacy systems	Static destructive testing:			Acceptance criteria in BS 6779-1 clause 9.4.3.2.6.3
409	Anchorage in drilled holes	On-site tensile load test	As required in contract specific Appendix 4/1	Required	†
412	Pedestrian Parapets and Guardrails		Manufacturer's tests: yield/proof strength of material, ultimate strength and the extension at break		(N)
Series 500					
501	Pipes for drainage and service ducts				Product certification scheme or equivalent applies for products not falling under the Construction Products Regulation (CPR). [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
	Vitrified clay				
	Concrete-PC/SRC	Not exceeding 900 mm dia			
	Concrete-Prestressed				
	Iron-cast				
	Iron-ductile				
	PVC-U				
GRP					
	Plastics. See Table 500-1				

	Corrugated steel	(Manufacturer's tests)		Required (AASHTO)	
	Corrugated steel bitumen protection	Not exceeding 900 mm dia			
	Other materials			Required	Product Acceptance Scheme or equivalent applies
503	Pipe bedding	Grading and fines content			[Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Water-soluble sulfate (WS) content (N)			
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)			
		Resistance to fragmentation (N)			

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (continued)					
505	Filter medium backfill	Plastic index (N)	1 per source*		[For bedding types not falling under the Construction Products Regulation (CPR), Results of routine control tests from the factory production control system operated by the producer to be provided - see MSA EN 13285] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Resistance to fragmentation (N)	1 per source*		

		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
		Grading	1 per 500 tonnes*		[For bedding types not falling under the (CPR), Results of routine control tests from the factory production control system operated by the producer to be provided - see MSA EN 13285] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Permeability (N)	1 per source*		
506	Sealing existing drains				[Appropriate tests/samples should be scheduled where not included under other Clauses]
	Concrete				
	Grout				
507	Chambers				Product certification scheme or equivalent applies
	Precast concrete				
	Corrugated galvanized steel	(Manufacturer's tests)		Required	Product certification scheme or equivalent applies
	Steel fitments				
	Covers, grates and frames				Product certification scheme or equivalent applies
	Cover bolts				Quality management scheme or equivalent applies
508	Gullies and pipe junction				For products not falling under the (CPR) product certification scheme or equivalent applies [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
	Precast concrete				
	Clay				
	Cast iron and steel				

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 500 (continued)					
509	Watertightness of joints	Air test	All pipelines with watertight joints [As required in contract specific Appendix 5/1 for partly watertight joints]	Required	
512	Backfill to pipe bays	Grading	1 per 50 tonnes (min of 3)*		[Acceptance testing can be scheduled for bedding types not falling under the Construction Products Regulation (CPR)] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Water-soluble sulfate (WS) content (N)	5 per source*		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source*		
513	Permeable backing to earth retaining structures	Plastic index (N)	1 per source*		[Acceptance testing can be scheduled for bedding types not falling under the CPR] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Water-soluble sulfate (WS) content (N)	5 per source		
		Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
		Resistance to fragmentation (N)	1 per source*		
		Grading	1 per 200 tonnes (min of 3)*		
		Permeability (N)	1 per source*		

	Precast hollow concrete blocks	(Manufacturer's tests)		Required	
514	Fin Drains	(Manufacturer's tests)		Required	Product Acceptance Scheme or equivalent) applies

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 500 (continued)						
515	Narrow filter drains					
		Geotextile, pipes and fittings	(Manufacturer's tests)		Required	Product Acceptance Scheme or equivalent) applies
		Granular fill	Plastic index (N)	1 per source*		[Acceptance testing can be scheduled for bedding types not falling under the Construction Products Regulation (CPR)]
			Resistance to fragmentation (N)			
			Water-soluble sulfate (WS) content (N)	5 per source		
			Oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	5 per source		
			Grading	1 per 200 tonnes (min of 3)*		
	Permeability (N)	1 per source*				
516	Combined drainage and kerb systems		Load test			
517	Linear drainage systems		Load test			
518	Thermoplastics structured wall pipes and fittings		(Manufacturer's tests)		Required	Product Acceptance Scheme or equivalent applies
Series 600						
601 & 627	Acceptable material				Required	[Acceptance testing can be scheduled for materials not falling under the Construction Products Regulation (CPR)]
	Class	General Description				

						[For recycled aggregate, see sub-Clauses 601.12 and 601.18]
						[Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
	1	General granular fill	Grading/uniformity coefficient	Twice a week*		
			mc/MCV (N)	2 per 1000 m ³ up to max of 5 per day*		
			SMC of chalk (N)	Twice a week*		
		1C only	Resistance to fragmentation (N)	Weekly*		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (continued)						
	Class	General Description	Grading	Twice a week*	Required	
	4	Landscape fill	Grading/mc/MCV (N)	Daily*		
	5	Topsoil	Grading	Daily*		
	6	Selected granular fill	Grading/uniformity coefficient	1 per 400 tonnes*		
			PI/LL (N)	Daily*		
			Resistance to fragmentation (N)	Weekly for on-site material*		[LA category but not for Class 6F4 and 6F5]
			SMC (N)	Weekly*		
			omc/mc, mc or MCV (N)	1 per 400 tonnes*		[Not for Class 6F4 and 6F5]
			Organic matter/ water soluble sulfate (WS) (N)	Weekly*		[MSA EN 1744-1 clause 10, clause 13]
			Oxidisable sulfides (OS) and total potential sulfate (TPS) content (N)	Weekly*		
			pH/chloride ion content (N)	Weekly*		
		Resistivity (N)	[As required]			

			Undrained and drained shear parameters (N)	[As required]		[Cross-reference should be made to any requirements in contract specific Appendix 6/1]
	6F4 and 6F5		Size designation and overall grading category	1 per week*		[Acceptance testing can be scheduled for materials not falling under the Construction Products Regulation (CPR)] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
			Maximum fines and oversize categories	1 per week*		
			Volume stability of blast furnace slag	6 monthly		
			Volume stability of steel (BOF and EAF) slag	6 monthly		
			Other aggregate requirements	Annex C of MSA EN 13242		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600 (continued)						
	Class	General Description			Required	
			Laboratory dry density and optimum water content			[MSA EN 1744-1, clause 10, clause 11, clause 13]
			Water content			
	8	Miscellaneous fill	mc/MCV (N)	Daily*		
		Fill adjacent to cementitious material or metallic items	Water-soluble sulfate (WS) content, oxidisable sulfides (OS) content and total potential sulfate (TPS) content (N)	1 per 400 tonnes or per location if less than 400 tonnes*		[At least 5 tests per source for sulfur compounds, MSA EN 1744-1 clause 10, clause 11, clause 13]
602	Earthworks material beneath surface of a road or paved central reserve Imported onto site		Frost heave (N)	1 every four months*	Required	[Acceptance testing can be scheduled for materials not falling under the Construction Products Regulation (CPR)] [Appropriate contract compliance testing should be scheduled for all products]
	On site source			As required		

					including those falling under CPR]
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TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
Series 600 (continued)						
607	Geotextiles	Tensile strength	1 per 400 square metres	Required	[Appropriate contract compliance testing should be scheduled. Details should be given in contract specific Appendix 6/5 or 6/9, cross reference as appropriate]	
		Elongation				
		Tensile strength of seams and joints				
		Static puncture				
		Characteristic opening size				
		Water permeability				
		Durability				
610	Compaction of fills			Required		
	Method compaction	Field dry density (N)	[As required]		††	
	End product compaction	Optimum mc (2.5 kg rammer/vibrating hammer method) (N)	Each class or sub class of material*		†	
		Field dry density (N)	1 per 400 tonnes*		†	
611	Cement stabilisation to form capping	Rate of spread of cement	1 per 500 square metres of cement spread*	Required		
618,	Earthworks for reinforced soil and anchored earth structures	Redox potential	5 locations within the affected area*	Required	[Acceptance testing can be scheduled for materials not falling under the Construction Products Regulation (CPR)] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR] †	
		Drainage layers	Grading Chemical analysis	1 per 400 tonnes*		
		Reinforcing elements	Coeff. of friction	Each type of element with each type of fill*		
		Anchor elements	Adhesion			

620	Ground anchorages	Proof loading	As required in contract specific Appendix 6/10	Required	†
622	Gabions			Required	[Appropriate contract compliance testing should be scheduled. See MSA EN 10223-3 or MSA EN 10223-8 as appropriate. Details should be given in contract specific Appendix 6/10, cross reference as appropriate]
	Fill	Grading	1 per 400 tonnes*		
		Los Angeles coefficient (N)			
Wire and wire mesh	[As appropriate to properties stated in contract specific Appendix 6/10, e.g. tensile strength of mesh, assessment of coating, weld shear strength]	1 per 400 square metres*			
619	Earthworks materials for corrugated steel buried structures	Constrained soil modulus (M*)	3 on each side of each structure*	Required	

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 700					
709	Constituent materials in recycled aggregate and recycled concrete aggregate	Quality control	As required by the 'Quality Protocol for the production of aggregates from inert waste'	Required	
Series 800					
801, 803, 804, 805, 806, 807	General Requirements for unbound mixtures for use adjacent to cement bound materials, concrete pavements, structures or products	Water-soluble sulfate content (N)	1 per 400 tonnes or per location if less than 400 tonnes*	Required	[Acceptance testing can be scheduled for materials not falling under the Construction Products Regulation (CPR)] [Appropriate contract compliance testing should be scheduled for all products including those falling under CPR]
		Oxidisable sulfides content and total potential sulfate content (N)			
			1 per source		
	Unbound mixtures beneath surface of a	Frost heave (N)	1 per source*		

road or paved central reserve	Grading and fines content	1 per week*		
	Plastic index (N)			
	Resistance to fragmentation (N)	6 monthly*		
	Resistance to wear - micro-Deval test			
	Resistance to freezing and thawing (magnesium sulfate soundness) (N)	1 per source*		
	Water absorption (N)	[As required]		
	Volume stability of blast furnace slags	6 monthly		
	Volume stability of steel (BOF and EAF) slags	6 monthly		
	Surface modulus specified in Clause 885 (N)	1 per source and then monthly*		
	OMC/mc (N)	[As required]		
	Density (N)	[As required]		
	Water absorption (N)	[As required]		
	Deformation resistance specified in clause 886			

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 800 (continued)					
807, 815 & 816	General Requirements for Cement and other Hydraulically Bound Mixtures	Binder content	For Audit Test purpose only	Required	
		Coefficient of linear expansion	[As required]		
		Tests for control and checking of HBM	[As required]		
		Tests for laboratory mixture design test specified in Clause 880	[As required]		

		Immediate Bearing Index Category Test MSA EN 13286-47	[As required]		
		Compressive strength MSA EN 13286-41 (N)	[As required]		
		Modulus of elasticity MSA EN 13286-43 (N)	[As required]		
		Surface modulus Specified in Clause 884 (N)	[As required]		
		Deformation resistance specified in Clause 886	[As required]		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900					
902 & 924	Aggregates for bituminous materials			Required	
		Resistance to fragmentation (hardness)	Resistance to fragmentation (N)		
		Resistance to freezing and thawing (durability)	Soundness (N)		
			Water absorption (N)		
		Cleanness	Sieve test (mass passing 0.063 mm sieve) (N)		
		Shape	Flakiness index (N)		
		Coarse aggregate for surface courses	Resistance to polishing (PSV) (N)		
			Resistance to surface abrasion (AAV) (N)		
		Binders for bituminous materials	Penetration (N)		
			Softening point (N)		
	[Other MSA EN tests]				

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
904 924, 906 & 908	Bituminous mixtures	Grading (N)	For Audit Test purpose only		
		Binder Content (N)			
921	Warm Mix Asphalts	General properties		Required	Product Acceptance Scheme or equivalent applies (Clause 942 mixtures).
906, 908, 909 & 910	Asphalt (Design Mixtures)	Permanent Works - In situ air void content (N)	[As required]		
		Permanent Works - Refusal air void content (N)			
		Permanent Works - Deformation resistance			
		Deformation resistance (design)	[As required]		
		Stiffness (design)			

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
914	Surface macrotexture	Volumetric Patch (N)	[As required]	Required	
915	High friction surfaces	Quality control checks	As required in sub-Clause 924.5	Required	Product Acceptance Scheme or equivalent applies
		System coverage	As required in sub-Clause 924.6		

	Aggregate	Resistance to polishing (PSV) (N)				
908	Stone mastic asphalt (SMA) binder course and regulating course	Permanent Works - In situ air void content (N)	[As required]			
		Permanent Works - Deformation resistance				
		Binder drainage test (design)	[As required]			
		Deformation resistance (design)				
913	Bond coats, tack coats and other bituminous sprays					
		Binder	Product identification			
			Vialit cohesion			
			Accuracy of spread			
			Rate of spread			
			Penetration at 25°C and 5°C (N)			

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900 (continued)					
920	Geosynthetics	General properties		Required	Product Acceptance Scheme Certification applies
		As built manual		Required	
		Bond condition			As stipulated in the Quality Plan for installation
		Accuracy of spread and rate of spread of bond coat (N)			The test should be repeated for each binder distributor used

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000					
1001, 1027 & 1034	Cement				
	Portland cement CEM I				
	Portland blastfurnace cement				

	Blastfurnace cement CEM III/A					
	Portland pfa cement CEM II/B-V					
	Pozzolanic cement CEM IV/A					
	Portland cement with microsilica					
	Ground granulated blast furnace slag					
	Admixtures					
	Mixing water					Sulfate content (N)
	Aggregates					Resistance to freezing and thawing - magnesium sulfate soundness (N)
						Water absorption (N)
						Flakiness index (N)
						Shell content (N)
						Resistance to fragmentation (N)
						Resistance to polishing (PSV) (N)
	Resistance to abrasion (AAV) (N)					
	Grading and fines content (N)					
	Chloride content (N)					
	Total sulfur (TS) and acid-soluble sulfate (AS) content (N)					
					Product Acceptance Scheme applies for microsilica	

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
	Flint coarse aggregate containing white flints	Water absorption (N)			

	Sand (ie fine aggregate)	Acid-soluble material (N)			
1002, 1003, 1004 & 1034	Pavement concrete	Air content test (N)		Required	Product certification scheme or equivalent applies
		Density (N)			
		Strength (N)			
1005	Consistence (Workability)	Degree of Compactability (Compaction Index) (N)		Required	
		Vebe (N)			
		Slump (N)			
1010 & 1011	Dowel bars Tie bars			Required (BS 4449)	Product certification scheme applies
	Dowel bars and supporting cradles	Load test	1 per arrangement*		
	Sheathed dowel bars	Bond stress	4 bars		
	Cranked tie bars (coated)	Bend test	4 bars*		
		Salt fog cabinet	4 bars*		
1014	Joint filler board	Weathering test	3 per source	Required	Normally undertaken by manufacturer
		Compression and recovery	4 per source		
		Extrusion	1 per source		
	Cork filler board	Immersion in water	2 per source		
		Immersion in acid	2 per source		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1000 (continued)					
1015 & 1016	Applied sealants		1 per 1000m or 1 per day		
		Resilience	1 per 1000m or 1 per day		

	Compression seals		Compression set	1 per type of seal*		
			Immersion in oil	1 per type of seal*		
	Self-expanding cork seal		Tests specified in Clause 1017	1 per type of seal*		
1023 & 1034	Surface macrotexture		MSA EN 13036-1 Volumetric Patch Technique (N)	1 per day (set of 10)*	Required	
1024	Aluminised curing compound		Efficiency index	1 per source*	Required	
1027	Wet lean concrete		Density	As required in Table 1000-8	Required	
			Cube strength (N)			
1033	Foamed Concrete		Cube strength (N)	2 cubes per 12 m ³	Required	
1045	Testing, Control and Checking of RCC		Testing, Control and Checking of RCC	Tests specified in 1059 Table 1000-8		
			Compressive Strength (N)	[As required]		
Series 1100						
1101	Precast concrete kerbs, channels, edgings and quadrants		Bending strength			
1102	In situ asphalt kerbs		Grading	1 test per 500 metres laid*	Required	[See BS 5931 for materials for in situ asphalt kerbs]
			Binder content			
1104	Precast concrete flags		Bending strength			
	Bedding	Granular material				[Appropriate tests/samples should be scheduled where not included under other Clauses]
		Mortar				

1107	Concrete block paving	Compressive strength			
1108	Clay pavers	Bending strength			
		Skid resistance			
Series 1200					
1202	Permanent traffic signs				
1207	Anchorage in drilled holes to supports of traffic signs	Loading test on site	[As required]		
1210	Holding down bolts and anchorages to bases of permanent bollards				
1212	Road Markings				

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200 (continued)					
1214	Permanent traffic cones and traffic cylinders			Required	Certification that permanent traffic cones and cylinders have been tested and comply with MSA EN 13422 is required
	Flat traffic delineators			Required	
		Tests specified in Clause 1214	[As required]		† [Where required]
	Other traffic delineators			Required	Certification that the delineators have been tested and comply with Clause 1214 is required
		Tests specified in contract	[As required]		† [Where required]

		specific Appendix 12/4			
	Temporary cones, cylinders, FTD's and other delineators			Required	Certification that at least 1 in 500 of any batch of cones, cylinders, FTD's and other delineators to be used in the Temporary Works have passed the tests in Clause 1214 as appropriate is required
1217	Traffic signals				Statutory type approval of equipment applies
	Cables				Product certification scheme or equivalent applies
	Controllers [Other equipment]	Test specified in Appendix 12/5	Each controller before delivery to Site and again after installation		
	Cabling	Tests a, b, c, e, f, g, h, j as defined in sub-Clause 1424.2	Each traffic signals installation	Required	Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required
1218	Detector loops				
	Cable			Required	Certification that completed cables comply with specification TR 2029 is required
	Epoxy resin			Required [where considered appropriate]	Certification that the epoxy resin complies with specification MCH 1540 is required

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200 (continued)					
	Feeder cable			Required	Certification that completed cables comply with specification TR 2031 is required
	Joints	Pull test (4 kgf)	Each crimp		
	Installation	Series resistance	Each loop	Required	Certification in accordance with
		Insulation resistance			

		Inductance			specification MCH 1540 is required
Series 1300					
1304	Anchorage for use in drilled holes	Tensile load			
1305	Anchorage in drilled holes to columns and masts with flange plates	Loading test on site	[As required]		†
Series 1400					
1421	Cable				Product certification scheme or equivalent applies

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1400 (continued)					
1424	Lighting Units	Tests specified in Clause 1424	Each unit	Required	† Product certification scheme or equivalent applies Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required
	Networks	Tests specified in Clause 1424	Each network	Required	† Certification that the installation complies with BS7671 (the IEE Wiring Regulations) is required

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700					
1707	Hardened concrete – Identity Testing	Cube strength (N) – as described in contract specific Appendix 17/4	Prestressed concrete- two cubes from 12 m ³ or 2 batches whichever represents the lesser volume	Required	Contractor to cast and test sufficient additional cubes to demonstrate cube strength before transfer [See Clause 1724] †

			Reinforced concrete- two cubes from 24 m ³ or 4 batches whichever represents the lesser volume		
			Mass concrete-two cubes from 50 m ³ or 50 batches whichever represents the lesser volume		
			Additional cubes for special purposes		[Tests/samples should be scheduled as required]
		Density	[As required]		[Requirements should be given in contract specific Appendix 17/1 as appropriate]
	Fresh concrete – Identity Testing	Consistence (slump or flow) (N)	Each batch	Required	[See Clause 1707]
		Air content	Each batch		
		Density	[As required]		
		Water/cement ratio			
1709	Hydrophobic impregnation	Refractive Index	Three samples		[See Clause 1709]
		Trial panels			[See Clause 1709]
	Anti-graffiti coatings	Trial panels			[See Clause 1709]

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1710	Concrete packing Mortar packing Epoxy resin bonding agent				[Appropriate tests/samples should be scheduled]
	Precast concrete not conforming to any Product Standard or to MSA EN 13369	Cube strength (Manufacturer's tests)			Contractor to make available records of tests by the manufacturer. See sub-Clause 1710.8
1711	Grouting and Duct Systems for Post-tensioned tendons				Product acceptance scheme or equivalent applies
		Full scale trials, where required in the contract			See sub-Clause 1711.1 and Appendix 17/6
		Duct assembly verification tests			See sub-Clause 1711.4 and Appendix 17/6
		Fluidity	In accordance with MSA EN 447 and MSA EN 446		See sub-Clause 1711.2 and sub-Clause 1711.3
		Bleeding			
		Volume change			
		Cube strength			
		Sieve			
		Density			
Time Setting					
1712	Reinforcement				
	Steel bars			Required (BS 4449)	Product certification scheme or equivalent applies
	Steel wire			Required (BS 4482)	
	Steel fabric			Required (BS 4483)	
	Stainless steel			Required (BS 6744)	

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700 (continued)					
1713	Fabricated reinforcement			Required (BS 8666)	Certification that fabricated reinforcement complies with the routine inspection/testing requirements of BS 8666 is required if the fabrication is not covered by a product certification scheme or equivalent
1716	Reinforcement jointing systems	Permanent elongation characteristic strength (Manufacturer's tests)		Required for each type of connection	Product acceptance scheme or equivalent applies
1717	Reinforcement – Welding	Welding procedure approval (MSA EN ISO 17660)	As required in MSA EN ISO 17660		[Where tests in addition to those specified in MSA EN ISO 17660 are required full details should be scheduled] Tests should be carried out by an independent testing body
		Welder approval (MSA EN ISO 17660)			
1718	Prestressing tendons				Product certification scheme or equivalent applies
	Steel wire and strand			Required (BS 5896)	
	Steel bar			Required (BS 4486)	
	Prestressing steel (all types)	Proof load Breaking load Elongation Ductility Relaxation Modulus of elasticity	[As required]		†
	Other than lowest strength wire or strand to BS 5896	0.1% proof load	Each reel		†
1724	Post-tensioning anchorages	Tests in accordance with MSA EN 13391 (Manufacturer's tests)		Required (MSA EN 13391)	Product certification scheme or equivalent applies

1726	Stainless steel bar			Required (BS 6744)	Product certification scheme or equivalent applies
1727	Inspection and testing of structures and components				[Tests should be scheduled as appropriate, and requirements given in contract specific Appendix 17/4]
1729	Post-installed anchors and reinforcing bar connections	Proof load	[As required]	Test report (BS 8539)	[Requirements should be detailed in contract specific Appendix 1/5. Cross reference contract specific Appendix 17/8 as necessary]

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800					
1805	Metallic products listed in MSA EN 1090-2:2018, Table 1	As required by the relevant product standard	As required by the relevant product standard	Required according to MSA EN 1090-2:2018, Table 1	[Give type of metallic product and type of document required]
	Additional properties of constituent products other than stainless steels	Testing to identify internal discontinuities or cracks in zones to be welded as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
	Additional properties of stainless steels	Testing for special delivery conditions for stainless steels as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]

	Steel castings	Testing of steel castings in accordance with BS EN 1090-2:2018, 5.4	As required according to MSA EN 1090-2:2018, 5.4 and 1812.		Results to be reported in accordance with the relevant standard
	Special fasteners	Testing of special fasteners as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
1806	Check of the capability of cutting processes that are likely to produce local hardness	Testing in accordance with BS EN ISO 6507	As required according to MSA EN 1090-2:2018, 6.4.4		Results to be reported in accordance with MSA EN ISO 6507
	Qualification of flame straightening procedure	Testing of tensile, impact and hardness properties in accordance with BS EN ISO 10025-1	As required according to MSA EN 1090-2:2018, 6.5.3.1		
	Check of the hardness of hollow section components subject to bending by cold forming	Testing of hardness properties in accordance with BS EN ISO 6507	As required according to MSA EN 1090-2:2018, 6.5.4		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
1807	Qualification of welding procedures and welding personnel for an Exceptional Welding Process	Tests specified in MSA EN ISO 15613 and MSA EN ISO 15614-1	As required according to MSA EN ISO 15613 and MSA EN ISO 15614-1		Results to be reported in accordance with MSA EN ISO 15613 and MSA EN ISO 15614-1

	Qualification of welding procedures for tack welds	Testing of hardness properties within the tack weld length in accordance with MSA EN ISO 9015-1	As required by 1807.4		Results to be reported in accordance with MSA EN ISO 9015-1
	Qualification of welding procedures for Processes 111, 114, 12, 13 and 14	Tests specified in MSA EN ISO 15614-1, MSA EN ISO 15613 or 17660-1 as appropriate	As required according to MSA EN ISO 15614-1, MSA EN ISO 15613 or 17660-1 as appropriate		Results to be reported in accordance with MSA EN ISO 15614-1, MSA EN ISO 15613 or 17660-1 as appropriate
	Qualification of welding procedures for joints with restricted access	Tests specified in MSA EN ISO 15613	As required according to MSA EN ISO 15613		Results to be reported in accordance with MSA EN ISO 15613
	Qualification of welding procedures for other welding processes	Tests specified in the standards listed in MSA EN 1090-2:2018, Table 13 and 1807.4	As required in the standards listed in MSA EN 1090-2:2018, Table 13 and 1807.4		Results to be reported in accordance with the standards listed in MSA EN 1090-2:2018, Table 13 and 1807.4 Note the requirement in MSA EN 1090-2:2018, 7.5.12 relating to stud weld procedure testing.
	Validity of welding procedure qualification	Welding production tests in accordance with the qualification standard for the process concerned	As required by the qualification standard for the process concerned		Results to be reported in accordance with the qualification standard for the process concerned

	Qualification of welders and welding operators	Tests specified in MSA EN ISO 9606-1 (welders) or MSA EN ISO 14732 (welding operators)	As required according to MSA EN ISO 9606-1 (welders) or MSA EN ISO 14732 (welding operators)	Required according to MSA EN ISO 9606-1 (welders) or MSA EN ISO 14732 (welding operators)	Certificate to be in accordance with MSA EN ISO 9606-1, Annex A or MSA EN ISO 14732, Annex C as appropriate
	Qualification of welders for reinforcing steels	Tests specified in MSA EN ISO 17660-1	As required according to MSA EN ISO 17660-1	As required according to MSA EN ISO 17660-1	Certification to be as required by MSA EN ISO 17660-1
	Qualification of welders of joints with restricted access	Specific qualification test. Tests specified in MSA EN ISO 9606-1	As required according to MSA EN ISO 9606-1	Required according to MSA EN ISO 9606-1	Certificate to be in accordance with MSA EN ISO 9606-1, Annex A

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
	Qualification of welders for an Exceptional Welding Process	Specific qualification test. Tests specified in 1807.3	As required by 1807.3	Required according to MSA EN ISO 9606-1	Certificate to be in accordance with MSA EN ISO 9606-1, Annex A
	Qualification of welders of a hollow section branch connection with angles less than 60°	Specific qualification test. Tests specified in MSA EN ISO 9606-1	As required according to MSA EN ISO 9606-1	Required according to MSA EN ISO 9606-1	Certificate to be in accordance with MSA EN ISO 9606-1, Annex A
	Verification that cut areas in joint preparation for steel grades higher than S460 are free from cracks	Testing in accordance with BS EN ISO 3452 (penetrant) or BS EN 17638 (magnetic particle)	As required		

	1807.5.1.1 Qualification of welding procedures where prefabrication primers are to be left on the fusion faces or the heat affected zone.	Tests specified in MSA EN ISO 15614-1 or MSA EN ISO 15613 using such prefabrication primers	As required according to MSA EN ISO 15614-1 or BS EN ISO 15613		Results to be reported in accordance with MSA EN ISO 15614-1 or MSA EN ISO 15613
	Welding of joints in hollow sections, where access to the joint is restricted	Pre-production weld test conforming to MSA EN ISO 15613.	As required according to MSA EN ISO 15613		
	Verification that the ground surface is free of cracks following removal of temporary welded attachments	Testing in accordance with MSA EN 17638 (magnetic particle)	As required		
	Verification that the ground surface is free of cracks following removal of run-on/run-off pieces or supplementary material	Testing as required In accordance with MSA EN ISO 3452 (penetrant) or MSA EN 17638 (magnetic particle)	As required		
	Verification of the absence of surface cracking in continuity welds in permanent steel backing	Testing in accordance with MSA EN ISO 3452 (penetrant) or MSA EN 17638 (magnetic particle)	As required		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
	Verification of stray arc sites for the absence of cracking	Testing in accordance with MSA EN ISO 3452 (penetrant) or MSA EN 17638 (magnetic particle)	As required		
	Welding of orthotropic bridge decks	Production tests in accordance with MSA EN	As required		

		1090-2:2018, 12.4.4 c)			
1808	Qualification of welding procedures for welding of property class 4.6 nuts, bolts and washers	Tests specified in MSA EN ISO 15613	As required according to MSA EN ISO 15613		Results to be reported in accordance with MSA EN ISO 15613
	Slip factor for friction surfaces in slip resistant connections	Slip factor test in accordance with MSA EN 1090-2:2018, Annex G	As required by 1810 and Appendix 18/1		[Refer to 1810.5 and associated Appendix 18/1 entry]
	Use of torque wrenches	Conformance test in accordance with MSA EN ISO 6789	As required according to MSA EN ISO 6789	Required according to MSA EN ISO 6789	
	k value check for the torque method	Test in accordance with MSA EN 1090-2:2018, Annex H	Daily		
	Determination of the angle of rotation for the combined method where the surface under the bolt head or nut is not perpendicular to the bolt axis	Test in accordance with MSA EN 1090-2:2018, Annex H	As required		Refer to MSA EN 1090- 2:2018, Table 21 Note
	k value check for the combined method	Test in accordance with MSA EN 1090-2:2018, Annex H	Daily		
	Determination of tightening torque for a HRC bolting assembly to be tightened by the torque method	Test in accordance with MSA EN 1090-2:2018, Annex H	Option, as required		
	Preload check for HRC method	Test in accordance with MSA EN 1090-2:2018, Annex H	Each assembly lot		

	Use of special fasteners and fastening methods	Procedure tests for special fasteners and fastening methods as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
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TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
1810	Slip resistant connections	Slip factor test in accordance with MSA EN 1090-2:2018, Annex G	As required in Appendix 18/1		[Refer to 1808.4. Give specific requirements in Appendix 18/1 with cross reference in Appendix 1/5]
	Verification of the preparation carried out before overcoating galvanized components	Test as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
	Hot dip galvanised components or specific locations of hot dip galvanised components to be subject to additional non-destructive testing	Test as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
	Leak testing of hermetically sealed spaces	Bubble emission technique in accordance with MSA EN 1593	As required in Appendix 18/1		See Appendix 18/1 entry for 1810.6 for spaces that are to be hermetically sealed
1812	Specific testing of constituent products	Tests as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
	Specific testing of proprietary products not covered by standards.	Tests as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
	Mechanical fasteners	Sample testing as specified in 1812 in accordance with MSA EN ISO 3269	As required in 1812 in accordance with MSA EN ISO 3269		Results to be reported in accordance with 1812. Testing not required if mechanical fasteners

					supplied by a NHSS 3 registered Organisation. See 1800.5.2
	Mechanical fasteners	Suitability testing as specified in 1812 in accordance with the relevant standard	As required in 1812 three fasteners from each inspection lot		Results to be reported in accordance with 1812.
	Structural steel products	Sample testing as specified in 1812 in accordance with the relevant product standard	As required in 1812 in accordance with the relevant product standard		Results to be reported in accordance with 1812. Testing not required if Structural steel products supplied by a NHSS 3B registered Organisation. See 1800.5.3

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
	Steel castings	Testing of steel castings in accordance with MSA EN 1090-2:2018, 5.4 and Clause 1812	As required according to MSA EN 1090-2:2018, 5.4 and 1812.		Results to be reported in accordance with MSA EN 12681. See 1805
	Non-conforming product testing for conformity	As required to confirm product conformity	As required		Results to be recorded
	Type testing of welded joints	Non-destructive testing to confirm quality level B is achieved	As required		
	Routine inspection and testing of welds	Surface non-destructive testing following visual inspection using method specified in MSA EN 1090-2:2018, 12.4.2.3	As required		
	Routine inspection and testing of welds	Supplementary non-destructive testing determined by the manufacturer,	As required according to MSA EN 1090-2:2018, 12.4.2.3 and Clause 1812		

		according to the nature of the work in normal production.			
	Project specific inspection of welded joints	Supplementary non-destructive testing in accordance with 1812	As required by Clause 1812.4.2		Testing to 1812.4.2.3 may be included. See 1812.4.2
	Welded shear studs	Production tests as specified in MSA EN ISO 14555	As required by 1812.4.3		Results to be documented in accordance with 1812.4.3
	Welded shear studs	Simplified production tests as required by MSA EN ISO 14555	As required by 1812.4.3		Results to be documented in accordance with 1812.4.3
	Welded shear studs	Production surveillance hammer test as specified in 1812.4.3 (3)	Every welded stud		Results to be documented in accordance with 1812.4.3
	Productions tests on welding	Production tests on welding as specified in 1812.4.4	As required by 1812.4.4		Results to be reported in accordance with the relevant standard

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800 (continued)					
	Specific production test on welding using run-off coupon plates	Production tests on run-off coupon plates as specified in 1812.4.4	As required by 1812.4.4		
	Specific production tests of welds made by an Exceptional Welding Process	Production tests on welding as specified in 1807.3	As required by 1807.3		
	Testing of welding of reinforcing steel	Testing of welding in accordance with MSA EN 1090-2:2018, 12.4.5, according to MSA EN ISO 17660-1	As required by MSA EN 1090-2:2018, 12.4.5, according to MSA EN ISO 17660-1		

	Testing of preloaded bolting assemblies used for stainless steel connections	Tests as specified in Appendix 18/1	As required in Appendix 18/1		[Give specific testing requirements and frequency of testing in Appendix 18/1 with cross reference in Appendix 1/5]
Series 1900					
1903	Abrasives	Grading	As required		
	Abrasives	Hardness	As required		
1909	Galvanised Coatings	Tests specified in MSA EN ISO 1461	As required		
	Thermally sprayed aluminium metal coatings	Tests specified in MSA EN ISO 2063	As required		
	Aluminium coating material			Required in accordance with MSA EN ISO 14919	
1910	Thermally sprayed aluminium metal coating	Pull off adhesion test in accordance with ASTM D4541-Type III	At the start of the works and [specify subsequent intervals]		
	Thermally sprayed aluminium metal coating (excepted areas)	Grid test specified in MSA EN ISO 2063	As required		[Any additional tests should be scheduled in Appendix 19/5]

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1900 (continued)					
1911, Table 1900-3	Hot dip galvanised coating to fasteners	Tests specified in MSA EN ISO 10684	As required		[Any additional tests should be scheduled in Appendix 19/5]
1912	Paints - 'A' and 'B' samples	Provision of samples for 'A' and 'B' sample tests			Samples selected in accordance with Clause 1912
	Paints - 'A' and 'B' samples	Specific gravity	As required by rate of 'A' and 'B' sampling		See Appendix 19/4
	Paints - 'A' and 'B' samples	Colour match	As required by rate of 'A' and 'B' sampling		
1914	Coating system minimum film thicknesses	Minimum dry film thickness measurements. In accordance with MSA EN	Required – representative testing		

		ISO 2808, BS3900-C5			
	Coating system adhesion	Pull off adhesion test in accordance with ASTM D4541 – Type III	Required – representative testing		
	Coating system defects	Visual assessment supplemented by appropriate testing	Required		[Any additional tests should be scheduled in Appendix 1/5]
	Coating system defects – pin-holing or porosity	Low or high voltage detectors in accordance with ASTM G62-07	Required – representative testing excluding corners, bolted joints or welds		
Series 2000					
2003	Permitted waterproofing systems	[As required]			Product Acceptance Scheme or equivalent applies
	Additional bituminous protection		1 per 15 tonnes*		
	Stability value		1 per 15 tonnes*		
2004	Tar	Tests specified in BS 76	1 per source*		Sampling to comply with BS 76
	Cut back bitumen				

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2100					
2101	Bridge bearings				
	Bearings (other than Elastomeric bearings)	Load testing – serviceability limit state	As required in contract specific Appendix 21/1		
		Load testing – ultimate limit state			
		Other tests specified in contract specific Appendix 21/1			
Elastomeric bearings	Compressive test	As required in contract			
	Stiffness test				

		Shear stiffness test	specific Appendix 21/1		4.3.3 and Annex H, or state in contract specific Appendix 21/1]
		Other tests specified in contract specific Appendix 21/1			
Series 2400					
2401	Masonry cement				
2402	Sand				
2403	Water	Tests specified in MSA EN 1008	[As required]		
2404	Mortar admixtures				
2405	Lime				
2406/ 2413	Bricks				
	Clay				
	Calcium silicate				
	Concrete				
2406	Blocks				
	Clay				
	Concrete				
2408, 2409	Stainless steel				
	Wire/fabric				
	Bars				
	Ready mixed mortars				
	Mortars		1 set of tests per mix*		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2600					
2601	Bedding mortar materials			Required for each batch	Certification in accordance with Clause 2601 is required
	Bedding mortar	Flow cone test	Each batch		†
		Flow between glass plates			
		Compressive strength			
		Expansion test			
		Water absorption			
		Elastic stability	1 per source		
Flow cone test Compressive strength	Each load		Site control tests		

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2600 (continued)					
2604	Plastic coating to fencing posts, gates and ancillaries			Required (BS 1722: Part 16) applicator is required	Certification by powder manufacturer and coating
2606	Granolithic concrete				Testing to be in accordance with Clauses 1702, 1703, 1707 and 1710
2607	Hardened foamed concrete for structures	Cube Strength (N)	2 cubes per 12 m ³	Required	[Requirements should be given in contract specific Appendix 26/8 as appropriate]
		Density	[As required]	Required	
	Fresh foamed concrete for structures	Density	[As required]	Required	
		Water/cement ratio			
Series 5000					
5003	Abrasives	Grading	[As required]		††
		Hardness			
5005	Aluminium and zinc spray coatings	Tests specified in MSA EN 22063	[As required]		Areas to be tested in accordance with Clause 5006
	Aluminium coating material			Required (MSA EN 1301-1)	
	Zinc coating material			Required (MSA EN 1179)	
	Sherardized coatings	Tests specified in BS 4921	[As required]		[Sampling procedure and any special adhesion requirements including test method should be scheduled]
	Zinc electroplated coatings	Tests specified in BS 3382 : Part 2	[As required]		
	Plating to high strength grip and tension control bolts				[Special tests to detect hydrogen embrittlement should be scheduled where required]
5006	Metal spray coatings	Tensile test specified in MSA EN 22063	[As required]		†
		Grid test specified in MSA EN 22063	[As required]		†

TABLE NG 1/1: Typical Testing Details (continued)

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 5000 (continued)					
5007	Paints				
	'A' and 'B' Samples	Specific Gravity	[see Clause 5007]		†† Samples will be selected in accordance with Clause 5007 [see Clause5009]
		Colour match			
		Composition			
Application characteristics					

Key

† indicates a requirement in SRW for the test to be carried out by the Contractor; such tests should therefore be scheduled in contract specific Appendix 1/5.

†† indicates a statement in SRW that the test may/will be carried out under the direction of the Overseeing Organisation; samples for such tests should therefore be required in contract specific Appendix 1/6.

* indicates that the frequency of testing is given for general guidance and is only indicative of the frequency that may be appropriate (ie. no frequency is given in the SRW or reference documents). Where materials are known to be marginal or if initial test results show them to be such, the frequency of testing should be increased. Conversely where material properties are consistently in excess of specified minimum requirements or well below specified maximum limits, then the frequency of testing should be reduced.

(N) indicates that a UKAS or equivalent accredited laboratory sampling and test report or certificate is required.

[Notes to compiler:

The above symbols apart from (N) are for guidance when preparing contract specific Appendices 1/5 and 1/6 and should not be reproduced in those Appendices.

Other guidance is printed in italics and should likewise not be reproduced in contract specific Appendices 1/5 and 1/6. Appropriate contract specific requirements should be scheduled.

The compiler should include details in contract specific Appendices 1/5 and 1/6 to confirm which tests are site testing and which are supplier or manufacturer tests.]

1/1 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/1: TEMPORARY ACCOMMODATION AND EQUIPMENT FOR THE OVERSEEING ORGANISATION

Accommodation Required

[Note to compiler: Include details of the required accommodation under suitable headings, the following are examples.]

- i. Temporary initial accommodation
- ii. Principal office
- iii. Laboratory

[sufficient space to be allowed to retain samples of materials] **Location (if appropriate**

- iv. Subsidiary static office **and floor area to be**
- v. Subsidiary portable office **inserted or referenced to**
- vi. Off Site accommodation at **drawing numbers)**
fabricator's or precaster's works

[Note: The compiler should bear in mind that all accommodation should satisfy the relevant requirements of current legislation on health, safety and welfare and be proportional to the size, value and duration of the Works.]

Duration of Time Accommodation Required

[Include if the date when offices/laboratories are to be occupied and equipment is to be installed, tested and made operational is different from that stated in Clause 101. Include date all accommodation is vacated and removed. Include time of day and number of days in week that accommodation is required.]

Fittings and Furnishings of Accommodation, and other Equipment Required

[The details should include a list of consumable stores, surveying and testing equipment, first aid equipment, details of room temperature needed, and details of any other equipment required.]

1/4 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/4: WORKING AND FABRICATION DRAWINGS

Series	Description of Work	Minimum period for submission of drawings

1/5 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/5: TESTING TO BE CARRIED OUT BY THE CONTRACTOR

[Notes to compiler:

- i. The scope of the testing covered in Table NG 1/1 should not be regarded as exhaustive.
- ii. Routine tests carried out by manufacturers and suppliers in compliance with a British Standard or other standard or specification are not included but where a standard or specification makes provision for a test certificate this is indicated in the table.
- iii. Where tests are taken from Standards which are undated in the specification they should be checked to ensure that test requirements have not been altered by subsequent issues since the date of the last published national alteration to the SRW.
- iv. The schedule of tests for the contract should be completed by selecting the tests and data from Table NG 1/1. Different frequencies and additional tests should be included as appropriate. Where the frequency of testing in Table NG 1/1 is given by reference to a Clause in the SRW, the frequency requirements of the Clause should be repeated in full in Appendix 1/5.
- v. Where UKAS or equivalent laboratory accreditation is required this should be indicated by the symbol (N) in the Test column. Sampling and associated tests where this should apply are indicated in Table NG 1/1.
- vi. In the tabulation, include the same level of detail as is included in Table NG 1/1: Typical Testing Details.]

Clause No	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments

Notes:

- i. Unless otherwise stated above, all sampling and testing in this Appendix shall be by the Contractor.
- ii. Tests comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor.
- iii. (N) indicates that a UKAS or equivalent accredited laboratory sampling and test

report or certificate is required.

- iv. Unless otherwise shown in this Appendix tests for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
- v. Cube strength tests are not required for concrete complying with Clause 2602.
- vi. Unless otherwise shown in this Appendix test certificates for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.

1/6 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE OVERSEEING ORGANISATION

[Notes to compiler:

- i. Give details of the samples, including source samples, to be provided or made available by the Contractor for testing by the Overseeing Organisation and the locations to which they are to be delivered. Where UKAS or equivalent laboratory accreditation for sampling is required this should be indicated by the symbol (N) in the "Sample Description" column. Samples where this should apply can be determined from subsequent testing requirements. Tests which require accreditation are indicated in Table NG 1/1.
- ii. In this case of testing by the Overseeing Organisation, it is intended that column 3, 'Frequency of Sampling', is obtained by reference to Table NG 1/1.
- iii. Compilers should consider whether the Appendix can be realistically completed in such a way as to properly indicate that the requirements can be met by use of the transport for the Overseeing Organisation to carry samples, leaving the Contractor to provide only small quantities of replacement materials. Excessive complication is often found to be unnecessary.]

Clause No. or Series	Sample Description	Frequency of Sampling	Delivery Location	Comments

Notes:

- i. Samples comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See Clause 105).
- ii. Unless otherwise shown in this Appendix samples of work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
- iii. Unless otherwise scheduled under Clause 2602 samples of concrete complying with that Clause are not required.
- iv. (N) indicates UKAS or equivalent laboratory accreditation required for sampling.

[The following is a model showing how compilers should complete contract specific Appendix 1/6:]

1/6 APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE OVERSEEING ORGANISATION

Clause No. or Series	Sample Description	Frequency of Sampling	Delivery Location	Comments

Notes:

- 1 Samples comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (see Clause 105).
- 2 Unless otherwise shown in this Appendix, samples of work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in

the Works.

- 3 Unless otherwise scheduled under Clause 2602, samples of concrete complying with that Clause are not required.

v. (N) indicates UKAS or equivalent laboratory accreditation required for sampling.

1/7 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/7: SITE EXTENT AND LIMITATIONS ON USE

[Note to compiler: Include details as appropriate, under the following headings:]

Extent of the Site.

[Cross-reference should be made to the Drawings where appropriate. Include areas of highway for traffic management and advance signing and coning by the contractor where relevant.]

Limitations on the Use of the Site.

[Cross-reference should be made to contract specific Appendix 1/23 where appropriate.]

1/8 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/8: OPERATIVES FOR THE OVERSEEING ORGANISATION

Operatives Required	Duties & Skills	No.	Period Required
Chainman/Driver Driver/Laboratory Operative	[Outline of duties and/or skills required]		

[Note to compiler: Include details as appropriate]

1/10 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/10: PERMANENT WORKS TO BE DESIGNED BY THE CONTRACTOR

[Note to compiler: List under (A) the work items or elements to be designed by the Contractor and under (B) the work items or elements for which a choice of designs is offered, ie. work items or elements for which the Contractor may propose a design if he elects not to construct the design prepared by the Overseeing Organisation.

The design specifications and any special requirements should either follow immediately after the table or be cross-referenced to other site specific Appendices. The specification details should include standards to be used and Technical Approval requirements including timescales, for structures this should include alternative details if BD2 (DMRB 1.1.1) is not to be used.]

Work Item or Element	Location	Design Specification
(A)		
(B)		

1/11 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/11: TEMPORARY WORKS DESIGN

Note to compiler: List here the items that have requirements with respect to temporary works design. Any special requirements should either follow immediately after or be cross-referenced to other contract specific Appendices.

1/12 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS

[Note to compiler: include here the appropriate option for paragraph 1.]

1 The information given below will be available for inspection during the tender period at:
..... [include here address and contact details of where the information can be viewed] and will be supplied to the Contractor at the commencement of the Works.

[or]

2 The information given below is contained in [include here the details and location of the Data Room, disks, extranet website or other electronic media used as appropriate.]

[Note to compiler: Include here details of the setting out information that is available.]

- 3 Specific requirements for setting out.
- 4 References to drawings or schedules quoting existing ground levels [111.1].
- 5 Level of information on existing detail to be recorded by the Contractor.

1/18 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/18: TEMPORARY HIGHWAYS FOR TRAFFIC

[Note to compiler: The following should be inserted in the Appendix as appropriate and extended when required:]

Temporary Highways for Traffic Specified by the Overseeing Organisation

- i. Highways Open to Vehicles

Description	Drawing No. or Ref.	Design Responsibility, Construction/ Design Requirements*	Maintenance Requirements (including timescale for responsibility)	Remarks (including Constraints and Reinstatement details)
Major				
Minor				

ii. Other Highways and Private Rights of Way

Description	Drawing No. or Ref.	Existing Usage	Design Responsibility , Construction/ Design Requirements *	Maintenance Requirements (including timescale for responsibility)	Remarks (including Constraints and Reinstatement details)
Footpaths					
Cycle Tracks					
Bridleways					
+ Private means of Access					

[* This should include a schedule of design and/or construction requirements including the standards to be used, any applicable constraints, and geometrical design details where these have not been shown on the Drawings.

Cross reference should be made to contract specific Appendix 1/11 for relevant details including temporary structures. Cross reference can and should be made to other applicable contract specific appendices such as Appendix 7/1 for pavement requirements.]

+ It is not always necessary to define individual accesses, particularly in urban situations. Reference can be made to road names or other appropriate means of identification.]

Temporary Highways Proposed by the Contractor

- i. Requirements for statutory orders, including if applications are to be made through the Overseeing Organisation including notice period requirements [118.5].
- ii. Details of any Constraints.

1/21 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/21: INFORMATION BOARDS

[Note to compiler: Include here the locations and details of information boards, or cross-references to the drawings giving the information. Also include any Overseeing Organisation, or employer specific requirements for logos, branding or visual identity.]

1/22 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/22: PROGRESS PHOTOGRAPHS.

[Note to compiler: include details as follows.]

- 1 Specific times required, including the first set if it is required in a shorter time than the given interval.
- 2 Specific work items or events that photographs are required for.
- 3 Details of media required for submission of photographs to the Overseeing Organisation.
- 4 The designation of the person to accompany the photographer.
- 5 State if the photographer is not required to be a professional photographer.

Location	Type and format	No. of Photographs and Distance Between Photographs or Specific Aspects Required	Aerial / Ground	Frequency Required / Interval	Remarks

1/23 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/23: RISKS TO HEALTH AND SAFETY

[Note to compiler: include here information on the following.]

- 1 Details of known specific or extraordinary hazards or risks that would require particular

or unusual precautions and would place limitations on the methods of working.

- 2 Details of known required actions or precautions.
- 3 Details of notifications required to and from the Overseeing Organisation or other parties.
- 4 Details of any specific monitoring requirements and submission of records to the Overseeing Organisation.

1/24 NG SAMPLE CONTRACT SPECIFIC APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM

[Notes to compiler: If the main Contractor is not required to institute a quality management system this should be stated in this appendix, otherwise this appendix should list the quality plan requirements, the following list can be used, supplemented as necessary.]

- 1 The Quality Plan shall be submitted to the Overseeing Organisation for its acceptance not later than* days after award of the Contract

[* normally 21 days]

The Contractor shall submit method statements etc. prior to commencement of any related work or activity and to a timetable included in the Quality Plan.

- 2 The Quality Plan shall include details on the following as a minimum.
 - i. Contractor's Organisation and Management.
Including the organisation of the contract, line command and communication links between parties involved in the Contract on and off site.
Names, roles, responsibilities and authority of principals and key personnel.
 - ii. Identification of the parts of the Contractor's Quality Management System relevant to the Works.
 - iii. Supply Chain Management
Including details of control and communications processes, assessment of the supplier's and subcontractor's quality management systems and quality control capabilities, monitoring arrangements, review and acceptance of work items being undertaken by the subcontractor or supplier.
Details and scheduling of Quality Plans required by relevant National Highways Sector Schemes or other quality management schemes.
Details of registration to relevant National Highway Sector Schemes or other quality management schemes.
 - iv. Document Control
Controls relevant to the Works, including the control and processing of testing results, materials and workmanship certification and quality records
The management of quality records as required in Clause 104
The control and scheduling of all documentation to be submitted to the Overseeing Organisation as required by the Specification throughout the Works.
 - v. Resource Management
Including details of relevant skills and experience of personnel involved in the Works.
The relevant training and/or competency assessment certificates and/or registration/skills cards as required by Clause 104, or scheduling of when they will

be provided.

vi. Method Statements

Method Statements for initial items of work and scheduling for all other method statements required. This scheduling shall include times for submission of method statements such that they are submitted a minimum of 14* days prior to the commencement of the work.

[*Note to compiler: this time period should be amended relevant to suit the particular requirements.]

vii. Hold Points

As described in Clause 104.

3 Schedule of Road Restraint Systems (Vehicle and Pedestrian)

[Note to Compiler: Complete the schedule below and include in Appendix 4/1. Incorporate in the schedule all the Road Restraint Systems (i.e. safety barriers, terminals, transitions, vehicle parapets, crash cushions, pedestrian parapets and pedestrian guardrails) and any associated anti-glare screens required. Cross-reference should be made to the drawings where appropriate. The Road Restraint Systems should be listed in order of occurrence, irrespective of type, and the respective start and end chainages of the proposed systems listed.]

All the Performance Class Requirements appropriate for the Road Restraint System and other details such as parapet height should be included. The difference between the Finish and Start Chainages should be at least the Length of Need of the Road Restraint System as defined in CD 377.]

[Col 0	Col 1	Col 2	Col 3	Col 4	Col 5	Col 6	Col 7	Col 8	Col 9	Col 10	Col 11	Col 12	Col 13]
RRS Ref	Location & Start Chainage (m)	Finish Chainage (m)	Position on Highway Cross-Section	Type of Road Restraint System	Set-back (m)	Barrier Containment Level/ Terminal Performance Class (P)	Impact Severity Level (ISL)	Working Width Class (W)	Vehicle Intrusion (VI)	Performance Level and whether Redirective (R) or Non-redirective (NR) whether Directional or Bi-directional	Permanent Lateral Displacement Zone (D.x.y) or Characteristic Permanent Lateral Displacement Zone Class (D)	Vehicle Exit Box Class or Vehicle Redirection Zone Class (Z)	Other Requirements/ Comments

Notes to compiler:

- Col 0 Give unique alpha or numeric reference for use in cross-referencing.
- Col 1 Give chainage and location, for example, road name, verge, central reserve, slip road etc.
- Col 3 For example, south verge, central reserve, north verge etc.
- Col 4 Give barrier type: Safety barriers, vehicle parapets, vehicle/pedestrian parapets, transitions, RBS, terminals, crash cushions, pedestrian

- parapets, pedestrian guardrails). Enter temporary safety barrier where required.
- Col 6 Give containment level for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS and terminal performance class for terminals. Enter temporary safety barrier where required.
- Col 7 Give the Impact Severity Level for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS, terminals, crash cushions. Enter temporary safety barrier where required.
- Col 8 Give the Working Width Class for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS. Enter temporary safety barrier where required.
- Col 9 Give the Vehicle Intrusion Class for safety barriers, vehicle and vehicle/pedestrian parapets, transitions, RBS with a containment level of H1 or greater.
- Col 10 For crash cushions give the Performance Level and whether the cushion should be Redirective (R) or Non-redirective (NR) and whether the cushion should be directional or bi-directional.
- Col 11 For terminals give Permanent Lateral Displacement Zone (D.x.y) and for crash cushions give Permanent Lateral Displacement Zone Class (D). Enter temporary safety barrier where required.
- Col 12 For Terminals give Vehicle Exit Box Class and for crash cushions give Vehicle Redirection Zone Class (Z). Enter temporary safety barrier where required.
- Col 13 Give all other requirements including required RRS heights, need for anti-glare screens, dynamic deflection, need to consider proximity of embankment slope, requirements to accommodate pedestrians on verges, mitigation measures for risks to motorcyclists, measures to reduce the risk of injury to pedestrians, equestrians and other vulnerable users (e.g. no sharp edges), minimum height above the paved surface for the purpose intended for parapets, plinth width for parapets, clearance to hazards that are vulnerable to residual loading and loading requirements for structures, maximum opening and closing times for RBS. Enter temporary safety barrier where required.4/2

NG SAMPLE CONTRACT SPECIFIC APPENDIX 4/2: INFORMATION REQUIRED TO DEMONSTRATE COMPLIANCE OF
TRANSITIONS AND TERMINALS TO CLAUSE 401

[Note to Compiler: Include the following proformas which the Contractor is to complete and submit to the Overseeing Organisation with supporting information to demonstrate compliance of the proposed road restraint system transition and/or terminal with MSA EN 1317-1:2010, MSA EN 1317-2:2010 and DD ENV 1317-4:2002 as required by clause 401].

The Contractor shall complete and submit the following supporting information for each type of transition or terminal as required by Clause 401 demonstrating compliance with MSA EN 1317-1:2010, MSA EN 1317-2: 2010, DD ENV 1317-4:2002 to the Overseeing Organisation for acceptance:

SUBMISSION FOR COMPLIANCE WITH CLAUSE 401 TYPE OF TRANSITION: Ref(s) used in contract specific Appendix 4/1 Schedule of RRS: CONTAINMENT PERFORMANCE CLASS/PERFORMANCE LEVEL/PERFORMANCE CLASS (*): TEST REPORT NUMBER:(Test of) Test Type: (Primary/Complementary Test) (*) TEST NUMBER: TEST DATE: (*) delete as appropriate				
COMPANY NAME: CONTACT: ADDRESS: Tel: / Fax:/ E-mail: PRODUCT NAME:				
Initial submission documents to be supplied for consideration of Initial Type Test (ITT).				
Item		Comment	Item Received (Y or N)	Date requested
1	Test report	In accordance with either MSA EN 1317-2:2010, Annex A or DD ENV 1317-4:2002, clause 7.8.		
2	Video/high speed film	Of test coverage as specified in relevant part of DD ENV 1317-4:2002. Annotated showing date, test number and performance class		
3	Still photographs	Of complete installation.		
4	Still photographs	Of vehicle before and after impact.		
5	Drawings	Fully detailed drawings of tested item.		
6	Certification from the manufacturer	Confirming that the item tested complies with drawings supplied.		
7	Confirmation from test house	That the test conforms to the relevant requirements of MSA EN 1317-1:2010 and MSA EN 1317-2:2010 and DD ENV 1317-4:2002 for transitions.		
Additional information, which will be required on acceptance of initial type test prior to installation.				
8	System specification	Manufacturer's specification.		
9	Installation details	Manufacturer's drawings.		
10	Installation procedures	Manufacturer's installation instructions or installation manual.		
11	Maintenance Manual	Manufacturer's inspection, repair and maintenance instructions.		
12	Certificate of registration	National Highways Sector Scheme 2B for the Supply and Installation of Vehicle Restraint Systems for each organisation installing the transition.		

13	Additional information	Any additional information required in contract specific Appendix 4/1.					
Notes:							
1. All documents are to be in English.							
Signature:				Name:			
Date:							
						Sheet 2 of 3	
<p>SUBMISSION FOR COMPLIANCE WITH CLAUSE 401 (cond.) TYPE OF TRANSITION: Ref(s) used in contract specific Appendix 4/1 Schedule of RRS: CONTAINMENT PERFORMANCE CLASS/LEVEL(*) TEST REPORT NUMBER: (Test of) Test Type: (Primary/Complementary Test) (*) TEST NUMBER: TEST DATE: (*) delete as appropriate</p>							
COMPANY NAME: CONTACT:							
ADDRESS:							
Tel: / Fax:/ E-mail:							
PRODUCT NAME:							
			Specified	Actual	Satisfactory (Yes or No)	Compliance	
MSA EN 1317-1: 2010, Table 1	Vehicle Details	Impact Conditions Total vehicle mass (kg) Speed (km/h) Angle (degrees) Combination of tolerances meets Figure 6 of ENV1317-4:2002 (± ...) (0, +7%) (-1, + 1.5) Refer to Figure 6 of ENV1317-4:2002				
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m) (± 10%) (± 10%) ±				
		Model				N/A	
MSA EN 1317-2: 2010, clause 4.2	Vehicle Restraint System (VRS)	The transition shall contain the vehicle without breakage of any of the principal longitudinal elements of the system.					

	transition Behaviour	All totally detached parts of the transition with a mass greater than 2,0 kg shall be identified, located and recorded in the test report with their size. Elements of the transition shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into the passenger compartment that can cause serious injuries shall not be permitted. Foundations, ground anchorages and fixings shall perform according to the design of the VRS transition.				
MSA EN 1317-2: 2010, clause 4.3	Vehicle Behaviour	During and after the impact, no more than one of the wheels of the vehicle shall completely pass over or under the transition. The vehicle shall not roll over (including rollover of the vehicle onto its side), during or after impact. For tests with Heavy Goods Vehicles and buses, not more than 5 % of the mass of the ballast shall become detached or be spilt during the test up to the time when the wheel tracks of the vehicle leaves the exit box The vehicle shall leave the transition after impact so that the wheel track does not cross a line parallel to the initial traffic face of the system, at a distance A (2.2m for cars, 4.4m for other vehicles) plus the width of the vehicle plus 16 % of the length of the vehicle within a distance B (10m for cars, 20m for other vehicles) from the last (namely closest to the downstream end of the barrier) point P, where the last of the vehicle wheel tracks re-crosses the original line of the traffic face of the barrier after initial impact.				
MSA EN 1317-2: 2010, clause 5.3.2	Installation	The length of the transition shall be sufficient to demonstrate the full performance characteristics of the system. Post foundation shall meet the design specification. Description of impact point location (with explanation of the choice of impact point if not at 3/4L for the light vehicle test and L/2 for the heavy vehicle test)				
MSA EN 1317-2: 2010, clause 4.4	Impact Severity Level	SPECIFIED THIV Limit 33 km/h ASI Limit 1.4	ACTUAL THIV km/h ASI			
MSA EN 1317-2: 2010, clause 4.4	Transition Deformation	DEFORMATION CHARACTERISTIC Dynamic Deflection Working Width Vehicle Intrusion	MEASURED (m) [Class]	NORMALISED (m) [Class]		
MSA EN 1317-2: 2010, clause 5.6, Figure 4	Photographic coverage	Photographic coverage shall be sufficient to clearly describe behaviour and vehicle motion during and after impact. High speed cameras shall be operated at a minimum of 200 frames per second and stills. As recommended in clause 5.6 and Figure 4. Still Photography shall also be provided.				
	Drawings	Drawings included				

N/A = Not Applicable	
FULLY COMPLIES WITH STANDARD: MSA EN 1317-1:2010 , MSA EN 1317-2:2010 , DD ENV 1317-4:2002	
Signature:	Name:
Date:	

Sheet 3 of 3

SUBMISSION FOR COMPLIANCE WITH CLAUSE 401 TYPE OF TERMINAL:						
Ref(s) used in contract specific Appendix 4/1 Schedule of RRS:						
PERFORMANCE CLASS: (Test of)						
Test Type: (Primary/Complementary Test) (*) TEST TYPE NUMBER:						
TEST NUMBER: TEST DATE: (*) delete as appropriate						
COMPANY NAME:						
CONTACT: ADDRESS:						
Tel: / Fax:/ E-mail:						
PRODUCT NAME:						
			Specified	Actual	Satisfactory (Yes or No)	Compliance
MSA EN 1317-1: 2010, Table 1 and DD ENV 1317-4: 2002, clauses 7.4 and 7.5	Vehicle Details	Impact Conditions Total vehicle mass (kg) Speed (km/h) Angle (degrees) Combination of tolerances meets Figure 6 of ENV1317-4:2002 (± ...) (0, +7%) (-1, + 1.5) Refer to Figure 6 of ENV1317-4:2002			
		Centre of Gravity Vertical height (m) Longitudinal (m) Lateral (m) (± 10%) (± 10%) ±			
		Model				

DD ENV 1317-4: 2002, clauses 5.4 and 5.5.2	Terminal Behaviour	<p>Elements of the terminal shall not penetrate the passenger compartment of the vehicle. Deformations of, or intrusions into, the passenger compartment that could cause serious injuries are not permitted.</p> <p>No major part of the terminal shall become totally detached and come to rest outside the permanent lateral displacement zones defined in clause 5.4 of DD ENV 1317-4:2002.</p> <p>Anchorage and fixings shall perform to the terminal design specifications and other specified requirements as listed in the test report.</p> <p>The permanent lateral displacement zone for the terminal shall be reported after the test.</p>		
DD ENV 1317-4: 2002, clause 5.5.3	Vehicle Behaviour	<p>The vehicle shall not overturn, although rolling, yawing and moderate pitching may be accepted. For the terminal Performance Class P1 rolling onto a side may be accepted.</p> <p>The exit box values for the specified test are as defined in Figures 5 and Tables 7 and 8. (as appropriate).</p>		
DD ENV 1317-4: 2002, clause 7.3.2	Installation	1) The terminal shall conform to the structural design details and with the system installation details as given in the design specification of the manufacturer.		
DD ENV 1317-4:2002, clause 5.5.4 and Table 5	Impact Severity Level	<p>SPECIFIED</p> <p>Level A: THIV ≤ 44km/h (Tests 1 and 2) THIV ≤ 33km/h (Tests 4 and 5) ASI ≤ 1.0</p> <p>Level B: THIV ≤ 44km/h (Tests 1 and 2) THIV ≤ 33km/h (Tests 4 and 5) ASI ≤ 1.4</p>	ACTUAL	
DD ENV 1317-4:2002, clause 7.7, Figure 7	Photographic coverage	<p>Photographic coverage shall be sufficient to describe clearly terminal and vehicle motion during and after impact.</p> <p>High speed cameras and/or high speed video cameras at a minimum of 200 frames per second. Still photography shall also be provided.</p>		
	Drawings	Drawings included		
			N/A = Not Applicable	
FULLY COMPLIES WITH STANDARD: MSA EN 1317-1 and DD ENV 1317-4:2002				
Signature:		Name:		
Date:				

SERIES 600 EARTHWORKS NOTES FOR GUIDANCE

6/5 NG SAMPLE CONTRACT SPECIFIC APPENDIX 6/5: GEOTEXTILES USED TO SEPARATE EARTHWORKS MATERIALS

[Note to compiler: Include here the following contract specific requirements and details:]

1

Characteristics	Test Standard	Value and unit
Tensile Strength	MSA EN ISO 10319	
Elongation at Maximum Load	MSA EN ISO 10319	
Static Puncture Resistance (CBR test)	MSA EN ISO 12236	
Dynamic Perforation Resistance (cone drop test)	MSA EN 918	
Characteristic Opening Size	MSA EN ISO 12956	
Water Permeability Normal to the Plane	MSA EN ISO 11058	
Durability	MSA EN 13251 (Table 1, Annex B and Annex C)	Duration in years
Other [compiler to include here any necessary contract specific performance characteristics not covered by the above]		

[Add columns or repeat table where more than one type is required.]

- 2 Drawing references for locations where geotextiles and geotextile-related products are to be used including details of laying and lapping [609. 1].
- 3 Required Attestation of Conformity System or Assessment and verification of consistency of performance (AVCP) as detailed in MSA EN 13251 (System 2+ or System 4)].
- 4 Contract compliance testing details [cross reference to contract specific Appendix 1/5].

SERIES 700 ROAD PAVEMENTS GENERAL NOTES FOR GUIDANCE

7/1 NG SAMPLE CONTRACT SPECIFIC APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS

1 PERMITTED PAVEMENT OPTIONS – SCHEDULE 1A

[Note to compiler: Complete Schedule 1A].

[Note to compiler: Permitted pavement options should be detailed in Schedule 3. Each permitted pavement option should be given a unique reference number. For example 'A1'. An appropriate drawing number should be inserted for each area.]

Schedule 1A: Permitted Pavement Options										
Drawing ref.	Area				Design traffic for 40 years (msa)	Design traffic (cv/ lane/day)	Site Category	Investigatory Level	Min PSV/ Max AAV	Permitted pavement option
	Description [eg Mainline]	Chainage		Lane (Direction)						
		From	To							

PERMITTED FOUNDATION OPTIONS – SCHEDULE 1B

[Note to compiler: Complete Schedule 1B].

Schedule 1B: Permitted Foundation Options										
Drawing Ref.	Area	Chainage	Foundation class	Construction type [eg Widening]	Design option [eg Restricted]	Capping		Subbase		Comments
						Material or layer stiffness	Layer thickness	Material or layer stiffness	Layer thickness	
F1										
F2										
etc										

2 GENERAL REQUIREMENTS – SCHEDULE 2

[Note to compiler: Complete Schedule 2. Where necessary, a separate General Requirements Schedule should be completed for each of the Areas identified in Schedule 1].

Schedule 2: General Requirements – Area [.....]		
Grid for checking surface levels of pavement courses [702]:	Longitudinal dimension:	
	Transverse dimension:	
Surface regularity [702, Table 700-2]	Category of Road:	
Interval for measurement of longitudinal regularity [702]:		
Interval for measurement of transverse regularity [702]:		

3 PERMITTED CONSTRUCTION MATERIALS – SCHEDULE 3

[Note to compiler: Complete Schedule 3. A separate Permitted Construction Materials Schedule should be completed for each of the Permitted Pavement Options identified in Schedule 1.]

Schedule 3: Permitted Construction Materials				
	Pavement Option [eg A1]		Pavement Option [eg A2]	
Pavement Layer	Material Ref.	Thickness (mm)	Material Ref.	Thickness (mm)
Surface Treatment	ST1**			
Surface Course	SC1**		SC2**	
Binder Course	BC1**		BC2**	
Base	B1**			
Upper base			UB2**	
Lower base			LB2**	
Subbase	SB1**		SB2**	
[Other – eg regulating, geosynthetics and steel meshes]	GS1**		RA2**	
Total Thickness				
Capping is not required/is required* as described in contract specific Appendix 6/7. [*Compiler to indicate as appropriate]				

[** Compiler's unique reference for insertion in Schedule 5]

SERIES 1300 ROAD LIGHTING COLUMNS AND BRACKETS, CCTV MASTS AND CANTILEVER MASTS NOTES FOR GUIDANCE

13/2 APPENDIX 13/2 (SPECIFICATION FOR HIGHWAY WORKS) TYPICAL LIGHTING COLUMN AND BRACKET DATA - SHEET 1

Name of Manufacturer:

Column Reference No.

Revision No.

Date

NAME OF CONTRACT:

Acceptable positions of bracket arms relative to door position

Part A General

Column nominal height

	(m)
--	-----

Column material

Material design strength

	(N/mm ²)
--	----------------------

No. of door openings

Door opening size - Height

	(mm)
--	------

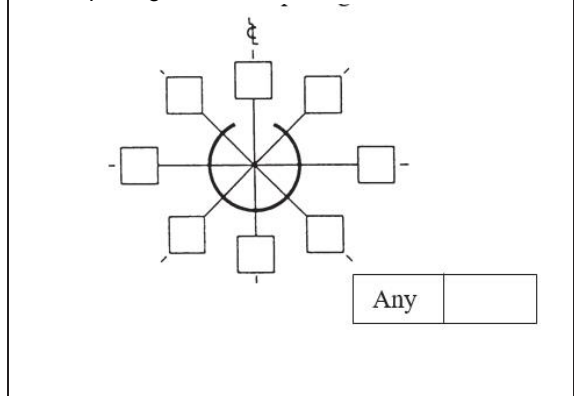
Width

	(mm)
--	------

Cross-section of base compartment

Height (mm)	Width (mm)	Depth (mm)

Door Opening



Manufacturer's drawing ref. no.

Corrosion protection (steel columns only) - basic system type (Clause 1911)

Reference Wind Velocity $V_{ref,0}$ as defined in MSA EN 40-3-1

	m/s
--	-----

Details of signs and attachments allowed for in the design Area (mm²), Eccentricity (mm), Height - additional sacrificial steel thickness, above that needed in the design, from the bottom of the column to at least 250 mm above the anticipated ground level

	mm
--	----

Part B Foundation Data Planted base	Planting depth				(m)
	Standard Soil Type Factor G				
	630	390	230		
Diameter of concrete surround (if any) Flange plate	Bolt hole centres	Bolt Hole diameter	Design load/bolt		
	(mm)	(mm)	(N)		
Relevant forces and moments at ground level					
Line of action of max. moment relating to door opening					

NOTE: For flange plates with slotted holes a diagram shall be included with this Data Sheet.

13/2 APPENDIX 13/2 (SPECIFICATION FOR HIGHWAY WORKS) TYPICAL LIGHTING COLUMN AND BRACKET DATA - SHEET 2

Part C Acceptable Luminaires Luminaire: Maximum Characteristics

Post Top Column:

		Terrain Categories as defined in MSA EN 40-3-1				
		I	II	III	IV	
Luminaire Connection		Luminaire Max Wt (kg)				
		Maximum Windage Area (m ²) for Terrain Categories as defined in MSA EN 40-3-1				
Diameter	Length					

Single Arm Bracket Column:

Luminaire Lever Arm (mm)	
Due to wt. of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	(11/04) Maximum Windage Area (m ²) for Terrain Categories as defined in MSA EN 40-3-1					
			Grade	Design Strength (N/mm ²)		Diameter (mm)	Length (mm)							

Double Arm Bracket Column:

Luminaire Lever Arm (mm)	
Due to wt. of luminaire	Due to windage on luminaire

Bracket Projection (m)	Ref No.	Drawing No.	Material		Luminaire Fixing Angle	Luminaire Connection		Luminaire Maximum Wt (kg)	Maximum Windage Area (m ²) for Terrain Categories as defined in MSA EN 40-3-1					
			Grade	Design Strength (N/mm ²)		Diameter (mm)	Length (mm)							

Part D Certification

It is certified that the information given in this Data Sheet has been obtained in accordance with this Specification.

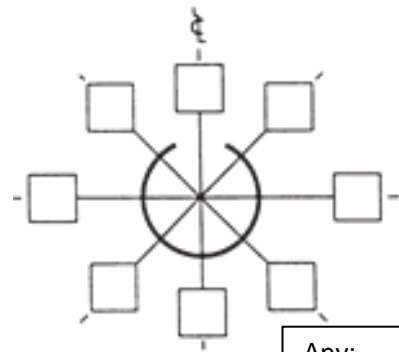
Signed on behalf of the Contractor Date

13/5 APPENDIX 13/5 (SPECIFICATION FOR HIGHWAY WORKS) TYPICAL CCTV MAST DATA

Name of manufacturer:	Mast reference No:
	Revision No.
	Date:
NAME OF CONTRACT:	Acceptable positions of bracket arms relative to door position

Part A – General

Mast nominal height	(m)
Mast material	
Material design strength	(N/mm ²)
No of door openings	
Door opening size	Height (mm)
	Width (mm)
	Manufacturers drawing ref no.



Any:

Cross section of base compartment	Height (mm)	Width (mm)	Depth (mm)	Attachments	Area (mm ²)	Eccentricity (mm)	Height (mm)

Design Information (as defined in the Institution of Lighting Engineers Technical Report No. 7: 2000)

Effective wind speed, V_e		m/s
Response factor (β)		Size reduction factor (\ddot{a})

Corrosion protection - basic system type (Clause 1911)

Details of signs and attachments allowed for in the design Area
(mm²), Eccentricity (mm), Height (mm)

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Part B – Foundation Data

Flange base	Bolt hole centres	Hole diameter	Design load/bolt
	(mm)	(mm)	(N)
Relevant forces and moments at ground level			
Line of action of max. moment relating to door opening			

Note: For flange plates with slotted holes a diagram shall be included with this data sheet

Part C – Acceptable CCTV Cameras, Housing and Mountings

Mounting Reference No.		Drawing No.	
Material grade		Material design strength	(N/mm ²)
Combined CCTV Camera, Housing and Mounting Maximum Weight			(kg)
CCTV Camera, Housing and Mounting Maximum Windage Areas			(m ²)
Lever arm of CCTV Camera, Housing and Mounting	- due to weight		(m)
	- due to windage		(m)

Part D – Certification

It is certified that the information given in this Data Sheet has been obtained in accordance with the requirements of this Specification.

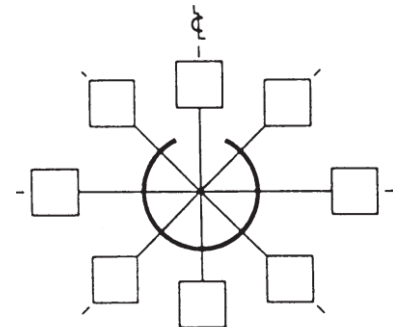
13/8 APPENDIX 13/8 (SPECIFICATION FOR HIGHWAY WORKS) TYPICAL CANTILEVER MAST DATA - SHEET 1

Name of Manufacturer:	Cantilever Mast Reference No.	
	Revision No.	
	Date	
NAME OF CONTRACT	Acceptable positions of outreach arms relative to door position	

Part A – General

Column nominal height		(m)
Cantilever projection		
Column material		
Material design strength		(N/mm ²)
No. of door openings		
Door opening size	Height	(mm)
	Width	(mm)

Door Opening



Any:

Manufacturer's drawing ref no.

Cross section of base compartment	Height (mm)	Width (mm)	Depth (mm)

Design Information as defined in MSA EN 40-3-1

Reference wind velocity, (V _{ref,0})		(m/s)	Exposure Coefficient C _e (z)	
Response factor (β)		Size reduction factor (ä)	Topography factor (f)	
Corrosion protection - basic system type (-Clause 1911)				
Details of signs and attachments allowed for in the design Area (mm ²), Eccentricity (mm), Height (mm)				

- additional sacrificial steel thickness, above that needed in the design, from the bottom of the column to at least 250mm above the anticipated ground level

(mm)

Part B – Foundation Data

Planted base Planting depth

(m)

Standard Soil Type Factor G		
630	390	230

Diameter of concrete surround (if any)

Flange Plate

Bolt hole centres	Bolt hole diameter	Design load/bolt
(mm)	(mm)	(N)

Relevant forces and moments at ground level

--

Line of action of max. moment relating to door opening

--

Note: For flange plates with slotted holes a diagram shall be included with this data sheet

Part C - Acceptable Traffic Signals or Speed Cameras, Housings and Mountings

Mounting Reference No.

--

Drawing No.

--

Material grade

--

Material design strength

(N/mm ²)

Combined Traffic Signal or Speed Camera, Housing and Mounting Maximum Weight

(kg)

Traffic Signal or Speed Camera, Housing and Mounting Maximum Windage Areas

(m ²)

Lever arm of Traffic Signal or Speed Camera, Housing and Mounting
- due to weight
- due to windage

(m)
(m)

Part D - Certification

It is certified that the information given in the Data Sheet has been obtained in accordance with this Specification.

Signed on behalf of the Contractor:

SERIES 1400 ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS NOTES FOR GUIDANCE

14/4 NG SAMPLE APPENDIX 14/4: ELECTRICAL EQUIPMENT FOR ROAD LIGHTING

The Contractor shall insert below details of the equipment which he proposes to use in the Works and shall submit the information as soon as the Contract has been awarded.

1 Luminaires and Lamps

The luminaires shall be compatible with the columns and brackets offered in Appendix 13/2 and the information shall include the lamp type and wattage and luminaire circuit wattage.

[The compiler should state here any particular requirements. For example: luminaire design attitude, luminaire (glare control) classification, LTI, MTI or other, IP (Ingress Protection) enclosure rating, any exclusion of PECU sockets, mounting height (nominal), ratings of fuses in integral gear compartments.] [1407.1, 1407.2(i), 1407.2(iii) to 1407.2(v)]

Manufacturer	Cat. No.	Glare Control		IP Rating		PECU Socket	(Design Table Ref. No.)*	(Isoluminance Template Ref. No.)*
		Luminous Intensity Class	Glare Index Class	Optical Housing	Control Gear Housing			

[*If required, to ensure the assembly of Road Lighting Units conforms to the performance requirements of MSA EN 13201-2.]

2 Ancillary Equipment

[Note to compiler: Include here:]

viii. The positioning of equipment described in Clauses 1411 to 1416 within the base compartment of columns [1416.3, 1417.1].

- ix. Requirements for wiring and installation of components within columns [1419.1].
- x. Requirements for group switching [1409.4].
- xi. Requirement for and location of shorting plug where lanterns are a pair mounted on twin arm brackets [1409.3].

Clause	Item	Manufacturer	Catalogue or Type No	Requirements [Compiler to complete]	
1409	Photo-electric control units			Differential and switching levels (if required)	
1410	Shorting plug				
1411	Time Switches				
1412	Ballasts				
1413	Ignitors				
1414	Starters				
1415	Capacitors				
1416	Cut-outs				Current rating
	Fuse Holders				Conductor size
	Fuse Links				Current rating
1419	MCBs			MCB class	
	Wiring				

3 Feeder Pillars

Feeder pillars shall be suitable for the layouts shown on drawing nos..... and conform with the requirements shown on the Drawings and in the following list.

[See also clauses 1418 and 1419]

[The compiler should state here:]

- i. Any particular requirements for hinges, locks, keys, circuit details, earth electrodes.

Location of Feeder Pillar	Manufacturer	Catalogue No.

4 Cables and Cable Joints

[The compiler should state here:]

- i. References to drawings which show requirements for the installation of cable covers [1421].
- ii. Reference to drawings which show cable lines, cable joints and cable joint marker blocks [1421 and 1422].
- iii. Particular requirements for cable laying, additional protection and support [1421].
- iv. Requirement for cables following the same route if different from the requirement of Clause 1421.
- v. Requirements for installation of power supply cables adjacent to communication cables if different from the requirements of Clause 1421.
- vi. Reference to drawings which show identifying marks to be indented in permanent marker blocks [1421]. [Cross-reference should be made to HCD drawing no. I1 where appropriate].
- vii. Requirements for terminating armoured cables [1423].

Location of Cables Cable Joints	Manufacturer	Catalogue No. Reference No. or Name of Cable

SERIES 1700 STRUCTURAL CONCRETE NOTES FOR GUIDANCE

17/1 NG SAMPLE CONTRACT SPECIFIC APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE

[Note to compiler: insert requirements for each designed concrete in the works, expand table as necessary]

Requirement	Schedule		
Designed Concrete Ref / Location in the Works			
Intended Working Life of Structure [See note to compiler 2]			
Nominal Cover to Reinforcement [See note to compiler 2]			
Applicable Exposure Classes (Excluding DC-class) [See note to compiler 2]			
DC-class (where appropriate) [See note to compiler 1]			
Compressive Strength Class of Concrete [See note to compiler 1]			
Minimum Cement Content (kg/m ³) [See note to compiler 1]			
Maximum Free Water/Cement Ratio [See note to compiler 1]			
Required Group or Type and Class of Cement or Combination (where a DC-class has not been specified) [See note to compiler 1]			
Maximum Aggregate Size, mm [See note to compiler 1]			
Chloride Content Class [See note to compiler 1]			
For Lightweight Concrete, the Density Class or Target Density [See note to compiler 1]			
For Heavyweight Concrete, the Target Density [See note to compiler 1]			
Consistence Class [See note to compiler 4]			
Special Type or Class of Cement or Combination			
Required Source/Special Type of Aggregate			
Maximum Cement Content (kg/m ³)			
Required Admixture [See note to compiler 5]			
Air Entrainment Required [YES/NO]			
Minimum or Maximum Temperature of Fresh Concrete °C			
Sampling and Testing [See 1707]			
Requirements to Control Early Thermal Cracking [See 1704] or Other Requirements [See Clause 4.3 of BS 8500-1]			

[Notes to compiler:

- 1 Denotes basic requirements for designed concrete.
- 2 Intended working life, nominal cover to reinforcement and applicable exposure classes (other than DC-class) do not form part of the specification to the Contractor or concrete producer but may be listed here because the concrete requirements are dependent on these parameters.
- 3 In appropriate circumstances any of the above information may be included but ensure that the requirements specified do not conflict with each other.
- 4 This shall only be completed for designed concretes where there is a design data requirement for specific consistencies.

- 5 Include here any limiting value / requirement for the essential characteristics of the different types of admixtures.
- 6 Cross-reference should be made to contract specific Appendix 1/5 and/or contract specific Appendix 1/6 as appropriate.]

17/5 NG SAMPLE CONTRACT SPECIFIC APPENDIX 17/5: BURIED CONCRETE

[Note to compiler:

The following information should be completed for each structure, or group of structures, and applies only for buried concrete or partially buried concrete, i.e. with one or more faces in contact with natural or disturbed ground or imported backfill.]

<p>STRUCTURE NAME OR LOCATION [a separate appendix should be provided for each structure or location with varying conditions or design constraints – identical conditions and constraints may be grouped together in one appendix]</p>	
<p>ACEC CLASS FOR SITE [derived from Table A.2 of BS 8500-1]</p>	
<p>DESIGN CHEMICAL CLASS [derived from the ACEC class determined by assessment of ground conditions, together with the hydraulic gradient due to groundwater and adjusted as necessary by reference to the footnotes to Table A.9 of BS 8500-1 for increase in concrete quality when used as an Additional Protective Measure]</p>	
<p>OTHER REQUIREMENTS AND DESIGN CONSTRAINTS [e.g. Any restrictions on cement or combination group, other concrete restrictions, site constraints, limitations on drainage, Additional Protective Measures required etc]</p>	