**NG SAMPLE APPENDICES**

**NG SAMPLE APPENDIX 1/1: ACCOMMODATION AND EQUIPMENT FOR THE EMPLOYER’S REPRESENTATIVE**

**A. Temporary Accommodation and Equipment for the Employer’s Representative**

**Accommodation Required [Location (if appropriate) and floor area to be inserted or referenced to drawing numbers]**

**1** Temporary initial accommodation

**2** Principal office

**3** Subsidiary static office

**4** Subsidiary portable office

**5** Off Site accommodation at 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.]*

**Duration of Time Accommodation Required**

*[To be included if the time when offices/laboratories are required and equipment is to be installed, tested and made operational is different from that stated in sub-Clauses 101.1 and 101.2*

*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**

*[The details should include a list of consumable stores, Computer, surveying and testing equipment, computer software, first aid equipment and details of room temperature needed]*

**B. Accommodation and Equipment for the Employer’s Representative (which shall become the property of the Employer at the end of the Defects Period)**

**Accommodation Required** *[Location (if appropriate) and floor area to be inserted or referenced to drawing numbers]*

1Principal office

**Time Accommodation Required**

*[To be included if the time when offices/laboratories are required and equipment is to be installed, tested and made operational is different from that stated in sub-Clauses 101.1 and 101.2*

**Fittings and Furnishings of Accommodation (to be supplied new and unused)**

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

**NG SAMPLE APPENDIX 1/2: VEHICLES FOR THE EMPLOYER’S PERSONNEL**

|  |  |  |
| --- | --- | --- |
| *Type**(as defined below)* | *Number**Required* | *Period**Required* |
| ABCD |  |  |

**Type “A” 8 Seat Vehicle**

 The vehicle is to be non-commercial type, be suitable for off-road use, have 4 wheel drive, have seating for 8 persons and be supplied in an inconspicuous colour. The vehicle shall be free from markings identifying any company associated with the Contract. The equipment shall include:

 Fire extinguisher, heater and demister, hazard flashing unit, heavy duty suspension, spare wheel, petrol filler cap lock, bonnet lock and spare wheel lock, internal and external mirrors, mud flaps, link mats front and rear, mudshield for front and rear brakes, rubber pads for clutch and brake pedals, interior sun visors, gearbox covers, tow rope, towing hooks front and rear, laminated windscreen, wire mesh guards for side, tail, stop and flasher lamps, covers for universal joints and one or more suitable roof mounted amber beacons .

**Type “B” Long Wheelbase Vehicle**

 The vehicle is to be suitable for off-road use, have 4 wheel drive, have seating for 2 persons and be supplied with fully enclosed cab and hard top, in an inconspicuous colour. The vehicle shall be free from markings identifying any company associated with the Contract. The equipment shall be as for the Station Wagon with the following variations:

 Link mats and heater shall be supplied for the front only. The vehicle shall be adapted for CBR testing to the approval of the Employer’s Representative.

**Type “C” Short Wheelbase Vehicle**

 The vehicle is to be as type B but not adapted for CBR testing.

**Type “D” Light Van or Estate Car**

 The vehicle shall have a carrying capacity of at least 0.25 tonne, a minimum ground clearance (unladen) of 150 mm and independent suspension.

 The vehicle shall be finished in an inconspicuous colour. The vehicle shall be free from markings identifying any company associated with the Contract. The equipment shall include:

 Reversing lamp, fire extinguisher, luggage rack complete with straps suitable for carrying survey equipment.

**NG SAMPLE APPENDIX 1/3: COMMUNICATIONS SYSTEM FOR THE EMPLOYER’S PERSONNEL**

**1** Includethe number and type of mobiles telephones required by the Employer’s Personnel.

**2** Identify the length of time the mobile telephones are required.

**3** Identify accessories such as chargers, spare batteries, hands free sets, etc.

**4** Specify connections to GSM service provider

**5** Identify whether the telephones are required earlier than the normal 4 weeks from the Starting Date.

**NG SAMPLE APPENDIX 1/4: WORKING AND FABRICATION DRAWINGS**

|  |  |  |
| --- | --- | --- |
| *Series* | *Description of Work* | *Minimum period for**submission of drawings* |
|  |  |  |

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

[*Notes to compiler:*

1. *The scope of the testing covered in Table NG 1/1 should not be regarded as exhaustive. Routine tests carried out by manufacturers and suppliers in compliance with an Irish or 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.*
2. *Where tests are taken from Irish Standards, or British 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 (see NG 004.3).*
3. *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.*
4. *Where INAB accreditation is required this should be indicated by the symbol (IL) in the Test column. Tests where this should apply are indicated in Table NG 1/1.]*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Clause* | *Work,Goods orMaterial* | *Test* | *FrequencyOf Testing* | *TestCertificate* | *Comments* |
|  |  |  |  |  |  |

Notes:

1 Tests comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See sub-Clause 105.4).

2 (IL) indicates that an INAB test report or certificate is required.

3 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.

4 Cube strength tests are not required for concrete complying with Clause 2602.

5 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.

**NG SAMPLE APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER’S REPRESENTATIVE**

[Note to compiler:

 Give details of the samples to be provided or made available by the Contractor for testing by the Employer’s Representative and the locations to which they are to be delivered. . Where INAB laboratory accreditation for sampling is required this should be indicated by the symbol (IL) 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.]

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Clause* | *SampleDescription* | *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 sub-Clause 105.4).

**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.

**4** (IL) indicates INAB laboratory accreditation is required for sampling

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

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

**1** Extent of the Site.

 [Cross-reference should be made to the Drawings where appropriate.

 Include areas of roads for advance signing and coning by the Contractor where relevant.]

**2** Limitations on the Use of the Site.

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

**NG SAMPLE APPENDIX 1/8: OPERATIVES FOR THE EMPLOYER’S REPRESENTATIVE**

|  |  |  |
| --- | --- | --- |
| *Operatives Required* | *No.* | *Period Required* |
| Chainman/DriverDriver/Laboratory Handyman |  |  |

**NG SAMPLE APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION**

**Noise**

**1** The Local Authority has informally agreed that the following measures would be appropriate and these are given as a guide; however it is for the Contractor to decide whether to seek the Local Authority’s formal consent to his proposed methods of work and to the steps he proposes in order to minimise noise.

**2** The normal working hours within the Site shall be Monday to Friday between .. and .. hours and Saturday between .. and .. hours, with no working on public holidays. Exceptionally, the Employer’s Representative’s consent for work outside these hours may be given after any necessary consultation. .. days’ notice is required from the Contractor when seeking such consent.

**3** The noise levels (see Note (i) below) scheduled below for periods outside the normal working hours will only be permitted when consent has been given to exceptional working.

**4** The ambient noise level, LAeq (see Note (ii) below) from all sources when measured 2.0 m above the ground at noise control stations numbers 1 to .. on Drawing Numbers ….... shall either not exceed the appropriate level given in the Schedule or not exceed by more than 3Db(A) the existing ambient noise level, L Aeq (see Note (iii) below), at the control station measured over the same period, whichever level is the greater. The maximum sound level at any noise control station shall not exceed the level given in the Schedule. Exceptionally the Contractor may be given permission to carry out works which exceed the noise levels in the Schedule, provided that .. days’ notice of the date and timing of these works is given to the Employer’s Representative and the Contractor demonstrates that he intends to take all reasonable measures to mitigate the noise nuisance. After consultations with the Local Authority and any other interested bodies a decision will be given within .. days of receipt of the notice.

|  |  |  |
| --- | --- | --- |
| *Schedule* |  | *Total Noise Levels at Control Stations* |
| *Period* | *Hours* | *Ambient Noise Level,**LAeq measured at**Control Station: dB(A)* | *Period of Hours**over which LAeq**is applicable* | *Maximum Sound Level**(see Note(iv)below measured**at Control Station: dB(A)* |
| Mondays to FridaysSaturdaysSundaysAll unattended plant outsidenormal working hours |  |  |  |  |

 Notes:

1. *Noise levels relate to free field conditions. Where noise control stations are located 1 m from facades of buildings, the permitted noise levels can be increased by 3 dB(A).*
2. *The ambient noise level, L Aeq, at a noise control station is the total L Aeq from all the noise sources in the vicinity over the specified period.*
3. *The existing ambient noise level, L Aeq, at a control station is the total L Aeq from all the noise sources in the vicinity over the specified period prior to the commencement of the Works.*
4. *Maximum sound level is the highest value indicated on a sound level meter which meets the requirements of IS EN 61672 : 1Class 1 or 2 set to SLOW response and frequency weighting A or an integrating - averaging sound level meter to IS EN 61672 : 2.*

**Vibration**

 [Note to compiler: Include here:]

1. *Locations where vibration limits are to be complied with.*
2. *Limits of vibrational amplitude and resultant peak particle velocity.*
3. *Requirements for instrumentation and monitoring.*
4. *Employer’s Representative’s arrangements for Contractor to monitor vibration in property off Site.*

**NG SAMPLE APPENDIX 1/10: STRUCTURES TO BE DESIGNED BY THE CONTRACTOR**

 [Note to compiler: List under (A) the structures to be designed by the Contractor and under (B) the structures for which a choice of designs is offered, i.e. structures for which the Contractor may propose a design if he elects not to construct the design prepared by the Employer’s Representative. The design specifications and any special requirements should either follow immediately after the table or be cross-referenced to other Appendices.]

|  |  |  |
| --- | --- | --- |
| *Structure* | *Location* | *Design Specification* |
| (A) |  |  |
| (B) |  |  |

**NG SAMPLE APPENDIX 1/11: STRUCTURAL ELEMENTS AND OTHER FEATURES TO BE DESIGNED BY THE CONTRACTOR**

 [Note to compiler: List here the structural elements and other features to be designed by the Contractor. The design specifications and any special requirements should either follow immediately after the table or be cross-referenced to other Appendices.]

|  |  |  |
| --- | --- | --- |
| *Structural Element* | *Location* | *Design Specification* |
|  |  |  |

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

**1** The information given below will be available for inspection during the tender period at:

 Local Authority/Consultants Office

 Address .........................

 Tel No. .........................

 and will be supplied to the Contractor at the commencement of the Works.

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

**2** Specific requirements for setting out.

**3** References to drawings or schedules quoting existing ground levels [111.1].

**4** Level of information on existing detail to be recorded by the Contractor.

**NG SAMPLE APPENDIX 1/13: PROGRAMME OF WORKS**

**1** The Contractor shall provide the programme in the form of a network diagram/bar chart [delete as appropriate] produced as a result of a “critical path analysis” and must abide by the constraints stated or implied in the Contract. It shall show the level of detail appropriate to each stage of the Works and all activities and restraints, each of which shall be given a short title. All events shall be numbered and annotated with earliest and latest event dates.

**2** At the time of presentation of the programme the Contractor shall also provide a mass-haul diagram showing his intended earthworks movements and locations and capacities of anticipated plant and other resource input.

**3** Schedule of Stated Constraints

 *[The constraints known at tender stage should be inserted here. Typical constraints, including those that could have been commitments by the Employer, are as follows:]*

1. *Work to privately and publicly owned services and supplies [although this is usually agreed informally giving the Contractor latitude in determining his programme].*
2. *Possession (rail, property, wayleave, etc.).*
3. *Traffic safety and management including notice requirements and restrictions arising from the use of substances hazardous to health.*
4. *Provision of environmental protection prior to the main construction operations*
5. *Trials and demonstrations in advance of main construction.*
6. *Approval by the Employer’s Representative of domestic subcontractor nominations.*
7. *Completion of the communications installation 8 weeks before the date for completion of the Works.*
8. *Compliance with technical approval procedures in relation to structures designed by the Contractor, including awaiting approvals, resubmissions and modifications.*

**4** The level of detail should be not less than the following:

 Level 1

1. *Each bridge.*
2. *Earthworks – each cutting and embankment.*
3. *Roadworks – in lengths not exceeding 1.0 km for main route and for each side road, link road and slip road:*

(a) Fencing

(b) Site clearance

(c) Topsoil strip

(d) Drainage (pre-earthworks and second stage)

(e) Sub-base

(f) Subgrade improvement layer

(g) Roadbase or concrete paving

(h) Surfacing.

1. *Major privately and publicly owned services and supplies.*
2. *Traffic management measures including operation of site accesses, plant crossings and temporary diversions for traffic.*
3. *Farm or householder Accommodation Works.*
4. *Landscaping Works.*

**NG SAMPLE APPENDIX 1/14: MONTHLY STATEMENTS**

 The monthly statements submitted by the Contractor to the Employer’s Representative in accordance with the Conditions shall, whenever dealing with matters covered by the Bills of Quantities, be set out under Part and Section headings similar to those in the Bill of Quantities and shall separately identify each item and specify quantity, unit, rate and value.

**NG SAMPLE APPENDIX 1/15: ACCOMMODATION WORKS**

**1** Schedule of Accommodation Works already determined and included in the Tender Documents.

**2** Copies of Schedule of Accommodation Works and details which may be agreed during the Tender period will be made available at:

 Local Authority/Consultant’s Office

 Address

 Tel No

**3** Reference (where appropriate) to Accommodation Works and details which may be included in the Works but are unlikely to be determined prior to receipt of tenders.

**NG SAMPLE APPENDIX 1/16: PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES**

**1** This Appendix contains details of services and supplies affected by the Works, details of preliminary arrangements that have been made with Statutory Undertakers and others for the alteration of services affected by the Works, and details of any orders already placed.

**2** The Contractor shall make arrangements with the Statutory Undertakers and others concerned, for the co‑ordination of his work with all work which needs to be done by them or their contractors concurrently with the Works. Compliance with the periods of notice given in this Appendix does not relieve the Contractor of his obligations.

**3** Private services to individual properties have not generally been listed or shown on the Drawings. The Contractor shall make arrangements with the Statutory Undertakers and others concerned for the phasing of all necessary disconnections and diversion of private services affected by the Works.

**4** Disconnected apparatus shall be removed by the Contractor only with the prior consent of the Authority concerned.

**5** The names, addresses and telephone numbers of the authorities serving in the locality are listed below.

|  |  |  |
| --- | --- | --- |
| *Names* | *Address and Tel No.* | *Contact* |
| Statutory Undertakers |  |  |
| Other Authorities |  |  |

**6** Services and Supplies Affected by the Works

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Location* | *Description* | *Group\** | *Drawing No.* | *Notice* *Required to**Commence* | *Time for**Completion* |
| Statutory Undertakers |  |  |  |  |  |
| Other Authorities/Bodies/Individuals |  |  |  |  |  |

\*

A Work expected to be completed before the commencement of the Works.

B Work required after commencement of the Works which does not require prior work by the Contractor.

C Work required after commencement of the Works which does require prior work by the Contractor.

D Work expected to be under construction at the commencement of the Works.

E Work required to be carried out jointly by the Contractor (all Civil Works) and the Statutory Undertaker (Cabling only) in close liaison and co-operation with each other.

F Work to be wholly undertaken by the Contractor (in liaison with the statutory undertaker)

*[Note to compiler: Insert here details of any other preliminary arrangements that have been made and/or details of any orders already placed]*

**NG SAMPLE APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT**

*[Note to compiler:*

*The following should be inserted in the Appendix as appropriate and extended when required:]*

**Traffic Safety and Management Requirements**

*[When the Contractor is not required to submit traffic management proposals or to supply sign faces, posts or fixings, this should be stated]*

1. Phasing of Works [include details of traffic orders that have been or are being made].
2. Drawings showing traffic management layout, including:

(a) Geometric Design.

(b) Position of traffic signals.

(c) Width of lanes.

(d) Working areas.

(e) Safety zones.

(f) Crossovers [include construction details, and geometrical design required where this has not been shown on the Drawings].

(g) Running lane for emergency vehicles.

(h) Location for emergency vehicles.

(i) Access and exit locations for construction.

1. Timing of operations.
2. Road lighting requirements (Appendix 14/3).
3. Requirements for Temporary Emergency Telephones.
4. Whether hazard warning lights are an acceptable alternative to a roof-mounted amber flashing lamp and if so, in what circumstances [117.14].
5. Whether a traffic safety and control officer is required [117.18].
6. Restrictions arising from the use of substances hazardous to health [cross-reference should be made to Appendix 1/23].

**Maintenance Requirements**

1. Crossovers
2. Ramps
3. Roads
4. Timescale for responsibility if different from sub-Clause 117.7

**Notice Requirements**

 *Notice required by the Road Authority in order to arrange for:*

1. *amending or making traffic orders ................................*
2. *authorising of non-prescribed signs .............................*
3. *authorising temporary traffic signals ..........................*
4. *moving signs to be compatible with the state of the Works as described in sub-Clause 117.11*

**Details of Events That Could Have a Bearing on the Works**

 *[These could include such events as:]*

 Race meetings,

 Football fixtures, and

 Road reconstruction work being carried out in the vicinity.

**Roads, Private Roads, and Other Ways Affected by the Works**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| *Description* | *Predicted**24 Hour**Annual**Average**Daily Traffic**AADT* | *Eighty Five**Percentile**Speed of**Cars (mph)* | *Speed Limit**(mph) if**Proposed**[State whether**Mandatory or**Advisory]* | *Type(s) of**Traffic**Control* | *Special**Facilities**[Pedestrian,**Equestrian**etc.]* | *Whether to**be kept**Open or**Closed* |
|  |  |  |  |  |  |  |

Note: Particulars of temporary diversions for traffic are contained in Appendix 1/18.

Roads including footpaths, cycle tracks and other traffic routes, described above or listed in Appendix 1/19 are the responsibility of:

Authority

Address

Tel No

**NG SAMPLE APPENDIX 1/18: TEMPORARY DIVERSIONS FOR TRAFFIC**

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

**1** Temporary Diversions for Traffic Specified by the Employer’s Representative

1. *Roads Open to Vehicles*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Description* | *Drawing No.**Or Ref.* | *Construction/**Design**Requirements\** | *Maintenance**Requirements**(including**timescale for**responsibility)* | *Remarks**(including**constraints and**reinstatement**details)* |
| Major |  |  |  |  |
| Minor |  |  |  |  |

1. *Other Roads and Private Rights of Way*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Description* | *Drawing No.**Or Ref.* | *Existing**Usage* | *Construction/**Design**Requirements\** | *Maintenance**Requirements**(including**timescale for**responsibility)* | *Remarks**(including**constraints and**reinstatement**details)* |
| Footpaths |  |  |  |  |  |
| Cycle Tracks |  |  |  |  |  |
| Bridleways |  |  |  |  |  |
| +Private Meansof Access |  |  |  |  |  |

*Note: Particulars of traffic are contained in Appendix 1/17.*

*[\* This could include a schedule of different forms of construction and geometrical design required where this has not been shown on the Drawings.*

*+ Not always a need to define individual accesses, particularly in urban situations. Reference can be made to road names or other appropriate means of identification.]*

1. *Temporary Structures Specified by the Employer’s Representative*

 *[Give full particulars, including outline Approval in Principle forms where appropriate, if temporary structures are to be designed by the Contractor.]*

**2** Temporary Diversions Proposed by the Contractor

1. *Notice Requirements [118.5]*
2. *Details of any Constraints*

**NG SAMPLE APPENDIX 1/19: ROUTEING OF VEHICLES**

 *[Note to compiler: Insert details as appropriate under the following headings:]*

1. *Permitted Access Routes To and From the Site*

*[A list of drawings showing the permitted access routes and details of temporary traffic signs.]*

1. *The Use of the Permanent Works by Construction Traffic*

*[The requirements with which the Contractor must comply in submitting details under the Conditions of Contract.]*

1. *Movement of Machinery and Plant Across Public Roads*

*[The requirements for the provision of haul route traffic signals, the equipment for which requires the approval of the Local Authority and An Garda Siochana.]*

1. *Temporary Structures for Construction Traffic Spanning Areas Used by the Public*

*[Detail to which temporary structures must be designed including, in the case of structures spanning a public road, the requirement for the Contractor to follow the technical approval procedures contained in NRA Standard BD 2. In the case of structures spanning a railway, river or canal, the requirements of the appropriate authority should be given.]*

**NG SAMPLE APPENDIX 1/20: RECOVERY VEHICLES FOR BREAKDOWNS**

**Requirements for Recovery Vehicles**

**1** Recovery Vehicles to be Provided

 *[Include here details of circumstances when recovery vehicles are to be provided.]*

**1.2** Heavy recovery vehicles:

(a) ... No. heavy recovery vehicle(s) shall be provided .

(b) A heavy recovery vehicle shall comply with the following:

**1.3** Light Recovery Vehicle

(a) ... No. light recovery vehicle(s) shall be provided.

(b) A light recovery vehicle shall comply with the following:

**2** Inspection Requirements

 The Contractor shall arrange for all recovery vehicles to be inspected for roadworthiness and a copy of each report shall be provided for the Employer’s Representative. Each person manning the vehicle shall have a valid licence to operate the vehicle.

**3** Locations for Recovery Vehicles

 *[Details of locations for recovery vehicles together with any specific requirements such as need for hardstandings.]*

**4** Communication System

 *[Details of communication system required.]*

**5** Location(s) for Vehicle Removal

 *[Details of location(s) to which broken down or accident damaged vehicles should be removed.]*

**NG SAMPLE APPENDIX 1/21: INFORMATION BOARDS**

 *[Note to compiler: Include here the locations and details of information boards including supports, wind bracing, etc., or cross-references to the drawings giving the information.]*

**NG SAMPLE APPENDIX 1/22: PROGRESS PHOTOGRAPHS**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| *Location* | *Type* | *No.* | *Aerial / Ground* | *Frequency**required* | *Remarks* |
|  |  |  |  |  |  |

**NG SAMPLE APPENDIX 1/23: SUBSTANCES HAZARDOUS TO HEALTH**

 *[Note to compiler: Details should be inserted in the Appendix as appropriate under the following headings:]*

1. Restrictions in relation to traffic management measures. *[These should include need for additional safety zones or lane closures.]*
2. Restrictions in relation to working practices. *[These should include conditions in relation to wind speed and direction, night working and restrictions in relation to traffic conditions i.e. working to stop when adjacent traffic speed falls below a specified level.]*
3. Measures to be taken to protect members of the public. *[These should include measures such as screening and signing.]*
4. Monitoring to be undertaken by Contractor. *[Depending on substances or processes, air quality monitoring may be required where traffic, pedestrians or properties are adjacent to or close to the Works. Details of requirements should be given.]*

 *[Note to compiler: Further information on the need for specific requirements may be obtained from the Road Authority/NRA.]*

**NG SAMPLE APPENDIX 1/24: QUALITY MANAGEMENT SCHEMES**

 *[Note to compiler: List here, in the format shown in the example below, the full list of quality management schemes applying to, and certification bodies accepted in, the Contract.]*

 The following is the list of accepted quality management schemes referred to in sub-Clauses 104.3 and 104.4.

**Scheme**:

**1** **Description: Manufacture of Fencing Components**

 Certification Bodies: Name(s)

 Address(es)

 Specification: Fencing components shall be in accordance with the 300 and 400 Series of the Specification and the Drawings referred to in the Contract

**2** **Description:**

Certification Bodies:

 Specification:

**NG SAMPLE APPENDIX 1/25: PRODUCT CERTIFICATION SCHEMES**

 *[Note to compiler: Include here the full list of both marked and unmarked product certification schemes accepted in the Contract and referred to in sub-Clauses 104.4 and 104.6.]*

**NG SAMPLE APPENDIX 1/26: NSAI AGRÉMENT CERTIFICATES**

 *[Note to compiler: Include here the full list of types of work, goods or materials for which proprietary products are required to have an NSAI Agrément Certificate or equivalent.]*

**TABLE N/G 1/1**

**Typical Testing Details**

Key

† indicates a requirement in SRW for the test to be carried out by the Contractor; such tests should therefore be scheduled in 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 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 (i.e., 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.

(IL) indicates that an Irish National Accreditation Board test report or certificate is required.

*[Notes to compiler:*

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

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

*3. ‘Source approval’ and ‘1 test per x m3 for each source’ indicates that a test result is required for each cut section within a road scheme or for each quarry producing that material (or for each part of a quarry where there is variation within the quarry) or other similar sources.*

*4. For materials covered by the 600 Series in instances where the quantities of material used are less than the volumetric quantities shown on Table NG 1/1, a minimum of 1 test per source shall be undertaken]*

| **Table NG 1/1 Typical Testing Details** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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) |  | *[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]* |
| 310 | Environmental Noise Barriers |  |  |  |  |  |
|  |  | Post Foundations | Load test on site | As required in Sub-Clause 310.29 |  | Evidence of design calculations required |
|  |  |  | Deflection test on site | As required in Sub-Clause 310.28 |  |  |
|  |  | Preservation of Timber | Moisture Content | As required in sub-clause 310.14 | Required | Quality management scheme applies *[Tests / samples should not normally be required]* |
|  |  | Vandal resistance | Destruction testing | As required in Appendix 3/2 |  | See sub-clause 310.11 |
| 311 | Preservation of timber | Moisture content | As required in sub-Clause 311.2 | Required for each batch | Quality management scheme applies |
| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 400 |
| 407 | Anchorages in drilled holes | On-site tensile load test | *[As required (Appendix 4/1 and 4/7)]* | Required | † See sub-Clause 407.1-4 *[Special requirements to be provided in Appendix 4/1 & 4/7]* |
|  | Road Restraint System | As required by the system manufacturer | As required by the system manufacturer |  | As required by the system manufacturer |
|  | Ground Conditions | In situ testing (sub- Clause 407.6 & 7)  | *[As required (sub-clause 407.7)]* |  |  |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 500 |
| 501 | Pipes for drainage and service ducts |  |  |  |  |
|  |  | Vitrified clay | [See Note A] |  |  |  |
|  |  | Concrete – PC/SRC | Not exceeding 900mm dia |  |  | [See Note B] | Product Certification Scheme applies*[Note A: Additional manufacturer’s tests are provided for in the relevant standard but should normally not be required.]*[*Note B: Certificates are provided for in the relevant standard but should normally not be required except for pipes which are not quality marked in accordance with relevant standard.]* |
|  |  | Concrete- Pre-stressed |  |  |  |
|  |  | Iron - Cast |  |  |  |
|  |  | Iron Ductile |  |  | [See Note B] |
|  |  | UPVC |  |  |  |
|  |  | Plastics (see Table 5/1) |  |  |  |
|  |  | Corrugated steel | (Manufacturer's tests) |  | Required (AASHTO) |
|  |  | Corrugated steel bitumen protection |  |  |  |  |
|  |  | Concrete PC/SRC exceeding 900mm dia |  (Manufacturer's tests) | As per Clause 509.10 | Required |  |
|  |  | Other materials |  |  | Required | NSAI Agrément Certificate or equivalent required |
| 503 | Pipe bedding |  |  |  | *Appropriate tests/samples for the resistance to freezing and thawing (magnesium sulphate soundness) should be scheduled where required, NG Series 800.]* |
|  |  | Grading and fines content (Washing and sieving method to be used) | 1 per week(min of 3)\* | Required | *[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 13242.* |
|  |  |  | Water Soluble Sulphate (WS) content (IN) | 5 per source\* |  | *[Minimum to allow for natural variability of sulphur compounds]* |
|  |  |  | Resistance to fragmentation (IL) | 1 per source\* |  | *[LA Category]* |
| 505 | Filter medium backfill  |  |  |  | *Appropriate tests/samples for the resistance to freezing and thawing (magnesium sulphate soundness) should be scheduled where required, NG Series 800.]* |
|  |  | Plastic index (IL) | 1 per source\* | Required | *[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 13242]* |
|  |  |  | Grading and fines content (Washing and sieving method to be used) | 1 per 500 tonnes\* |  | *[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 1324.]*  |
| 505 (Contd) |  |  | Water Soluble Sulphate (WS) content (IL) | 5 per source\* |  | *[Minimum to allow for natural variability of sulphur compounds]* |
|  |  |  | Resistance to fragmentation (IL) | 1 per source\* |  | *[LA Category]* |
| 506 | Sealing existing drains |  |  |  | *[Appropriate tests/samples should be scheduled where not included under other clauses]* |
|  | Concrete |
|  |  | Grout |  |  |  |
| 507 | Chambers |  |  |  |  |
|  |  | Precast concrete |  |  |  | Product certification scheme applies |
|  |  | Corrugated galvanised steel | (Manufacturer's tests) |  | Required | Product certification scheme applies |
|  |  | Manhole steps |  |  |  | Product certification scheme applies |
|  |  | Steel fitments |  |  |  |  |
|  |  | Covers, grates and frames |  |  |  | Product certification scheme applies |
|  |  | Cover bolts |  |  |  | Quality management scheme applies |
| 508 | Gullies and pipe junctions |  |  |  | Product certification scheme applies |
|  |  | Precast concrete |  |  |  |
| 508(Contd) |  | Cast iron and steel |  |  |  |
| 509 | Watertightness of joints | Air test | All pipelines with watertight joints *[As required in Appendix 5/1 for partly watertight joints]* | Required |  |
| 512 | Backfill to pipe bays | Grading | 1 per 50 tonnes (min of 3)\* |  |  |
|  |  |  | Water Soluble Sulphate (WS) content (IL) | 5 per source\* |  |
| 513 | Permeable backing to earth retaining structures |  |  |  | *Appropriate tests/samples for the resistance to freezing and thawing (magnesium sulphate soundness) should be scheduled where required, NG Series 800.]* |
|  |  | Granular Material | Piping Ratio (as Cl 513) | 1 per 100 tonnes (min of 3)\* |  |
|  |  |  | Permeability (as Cl 513) |  |  |  |
|  |  | Precast hollow concrete blocks | (Manufacturer’s tests) |  | Required |  |
| 514 | Fin Drains |  | (Manufacturer’s tests) |  | Required | INAB (or equivalent) certification applies |
| 515 | Narrow Filter Drains |  |  |  |  |
|  |  | Geotextile, pipes and fittings | (Manufacturer’s tests) |  | Required | INAB (or equivalent) certification applies |
| 515 (Contd) |  | Granular fill | Plastic Index (IL) | 1 per source\* | Required |  |
|  |  |  | Resistance to fragmentation (IL) |  |  |  |
|  |  |  | Water soluble sulphate (WS) content (IL) | 5 per source\* |  | *[Minimum to allow for natural variability of sulphur compounds]* |
|  |  |  | Oxidisable sulphides (OS) content and total potential sulphate (TPS) content (IL) |  |  |  |
|  |  |  | Grading and fines content | 1 per week (min of 3)\* | Required | *[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 13242.]* |
|  |  |  | Permeability (IL) | 1 per source\* |  |  |
| 516 | Combined drainage and kerb systems | Load test | A minimum of 1 test per 1000m for each type and source | Required | Certification that the system complies with Clause 516 is required *[Quality mark in accordance with relevant standard or equivalent applies]* |
|  | (Manufacturer’s tests) |  | Required |  |
| 517 | Linear drainage systems | Load test | A minimum of 1 test per 1000m for each type and source | Required | Certification that the system complies with Clause 517 is required *[Quality mark in accordance with relevant standard or equivalent applies]* |
| 518 | Thermoplastic structured wall pipes and fittings | (Manufacturer’s tests) |  | Required | INAB (or equivalent) certification applies |
| 519 | Geotextiles for filter drains | (Manufacturer’s tests) | 1 per source\* | Required | Certification that the system complies with Clause 519 is required *[Quality mark in accordance with relevant standard or equivalent applies]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 600 |
| 601631 to 633635 to 637640 | Acceptable material |  |  |  |  |
|  | Class | General Description |  |  |  |  |
|  | 1 | General granular fill | Grading  | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  | Uniformity Coefficient | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  | MCV | As Required\* |  |  |
|  |  |  |  | MC | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  | 1C only | LA Coefficient (IL) | 1 test per 1,000m3 for each source (min of 2 total per source)\* |  |  |
|  |  | 2 | General cohesive fill | Grading  | 1 test per 1,000m3 for each source\*  |  | *[Cross-reference should be made to any requirements in Appendix 6/1]* |
|  |  |  |  | Plastic Limit | 1 test per 1,000m3 for each source\* |  |
|  |  |  |  | MC | 1 test per 500m3 for each source\* |  |
|  |  |  |  | MCV | 1 test per 500m3 for each source\* |  |
|  |  |  |  | Undrained Shear Strength | 1 test per 1,000m3 for each source (min of 2 total per source)\* |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  | Effective Angle of Internal Friction and Effective Cohesion | 1 test per 1,000m3 for each source (min of 2 total per source)\* |  |
|  | 4 | Landscape fill | Grading (IL) | 1 test per 2,000m3 for each source\*  |  |  |
|  |  |  |  | MC (IL) | 1 test per 2,000m3 for each source\*  |  |  |
|  |  |  |  | MCV (IL) | 1 test per 1,000m3 for each source\* |  |  |
|  |  | 5 | Topsoil | Grading  | 1 test per 500m3 (min of 1 per day during topsoiling works)\* |  |  |
|  |  | 6 | Selected granular fill |  |  |  |  |
|  |  |  |  | (Class 6A, 6B & 6C) | Grading  | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  |  | Uniformity Coefficient | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  |  | Plastic Limit (IL) | 1 test per 2,000m3 for each source\*  |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | LA Coefficient (IL) | 1 test per 1,000m3 for each source (min of 2 total per source)\* |  |  |
|  |  |  | (Class 6C Only) | Moisture Content (IL) | 1 test per 2,000m3 for each source\*  |  |  |
|  |  |  |  | (Class 6A & 6C Only) | Slake Durability (IL) | 1 test per 1,000m3 for each source (min of 2 total per source)\* |  |  |
|  |  |  |  | (Class 6F1, 6F2 & 6F3) | Grading  | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | Optimum MC (IL) | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | MC | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | LA Coefficient (IL) | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  |  | Slake Durability (IL) | 1 test per 1,000m3 for each source\* |  |  |
|  |  |  |  |  | Total Sulfur Content (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Class RA (asphalt) content (IL) | 2 per source\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | Bitumen Content (IL) | 2 per source\* |  |  |
|  |  |  | (Class 6G) | Grading  | 1 test per 250m3 for each source (min of 2 total per source)\* |  |  |
|  |  |  |  |  | LA Coefficient (IL) | 1 test per 500m3 for each source (min of 1 total per source)\* |  |  |
|  |  |  |  | (Class 6H Only) | Grading  | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | Plastic Limit (IL) | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | LA Coefficient (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | MC (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | MCV (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | pH Value (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Chloride Ion Content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | Water soluble sulfate content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | Resistivity (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Redox Potential (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  | (Class 6I & 6J Only) | Grading  | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | Uniformity Coefficient | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | MC (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | MCV (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | Effective Angle of Internal Friction and Effective Cohesion (IL) | 1 test per 200m3 for each source (min of 1 test per week)\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | Coefficient of friction and adhesion (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  | pH Value (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | Chloride Ion Content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Water soluble sulfate content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Resistivity (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Redox Potential (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Organic Content (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Microbial Activity (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | LA Coefficient (IL) | 1 test per 200m3 for each source\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | Slake Durability (IL) | 1 test per 500m3 for each source\* |  |  |
|  |  |  | (Class 6K, 6L & 6M) | Grading  | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  | Plastic Limit (IL) | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | Resistivity (IL) | 1 test per source (source approval)\* |  |  |
|  |  |  |  |  | Water soluble sulfate content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Chloride Ion Content (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | pH Value (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | (Class 6K & 6M Only) | Uniformity Coefficient | 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | Optimum MC (IL) | 1 test per 200m3 for each source\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | MC (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  | MCV (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  | LA Coefficient (IL) | 1 test per 200m3 for each source (min of 1 total per source)\* |  |  |
|  |  |  |  | (Class 6N1, 6N2 & 6P) | Grading  | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | LA Coefficient (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | Undrained Shear Strength (IL) | As Required |  |  |
|  |  |  |  |  | Effective Angle of Internal Friction and Effective Cohesion (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Permeability (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | MC  | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  |  | MCV (IL) | 1 test per 200m3 for each source\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  |  |  |  | pH Value (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  | Water soluble sulfate content (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  |  | Slope Stability (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  |  | Slake Durability (IL) | 1 test per 200m3 for each source\* |  |  |
|  |  |  |  | (Class 6Q) | Testing and frequency as per Class 1 Material with the addition of the following: |  |  |
|  |  |  |  |  | Water soluble sulfate content (IL) | 1 test per 200m3 for each source (min of 1 total per source)\* |  |  |
|  |  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source (min of 1 test per week)\* |  |  |
|  |  |  |  | Chloride Ion Content (IL) | 1 test per 200m3 for each source (min of 1 total per source)\* |  |  |
|  |  |  |  |  | pH Value (IL) | 1 test per 200m3 for each source (min of 1 total per source)\* |  |  |
| 601631 to 633635 to 637640 (Cont’d) |  | 7 | Cohesive Material(Class 7H) | Testing and frequency as per Class 2 Material with the addition of the following: |  |  |
|  |  |  |  | Water soluble sulfate content (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  | Oxidisable sulfides (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  | Chloride Ion Content (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  | pH Value (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  | 8 | Miscellaneous fill | MC | Source approval and 1 test per 500m3 for each source\* |  |  |
|  |  |  |  | MCV (IL) | Source approval and 1 test per 500m3 for each source\* |  |  |
| 601.11 & 601.12 | Fill adjacent to cementitious materials or metallic elements | Water soluble sulfate content (IL) | 1 test per 250m3 (min of 1 test per location)\* |  |  |
|  |  | Oxidisable sulfides (IL) | 1 test per 250m3 (min of 1 test per location)\* |  |  |
| 602.20 | Material within 350mm of designed final surface of road or central reserve. | Frost Heave (IL) | 1 test per 5,000m3 (min of 1 total per source)\* |  |  |
| 609 | Geotextiles Used to Separate Earthworks Materials | Durability | 1 test per source/supplier\* |  | *Requirements should be given in Appendix 6/5 or 6/9 as appropriate* |
| 609(Cont’d) |  | Tensile Load | 1 test per 500m2 (min of 1 test per source/supplier)\* |  |
|  |  | CBR Puncture Resistance | 1 test per 500m2 (min of 1 test per source/supplier)\* |  |
|  |  | Permeability | 1 test per 500m2 (min of 1 test per source/supplier)\* |  |
|  |  | Pore Size | 1 test per 500m2 (min of 1 test per source/supplier)\* |  |
| 612 | Compaction of Fill Material |  |  |  |  |
|  | Method Compaction | Field Dry Density (IL) | 1 test per 10,000m2\* |  | †† |
|  | End Product Compaction | Optimum MC (IL) | 1 test per each class of material and each source\* |  | † |
|  | Field Dry Density (IL) | 1 test per 250m3\* |  | † |
| 618 | Topsoiling and grass seeding  | Rate of spread of fertiliser | 1 test per 1,000m2 |  |  |
|  |  | Rate of spread of seeding |  |  |
|  |  | Chemical analysis of fertiliser | 1 per source\* |  | †† |
| 618 (Cont’d) |  | Grass seed germination and purity (Manufacturer's test) | 1 per source\* | Required prior to sowing | † |
| 622 | Earthworks for reinforced earth and anchored earth structures | Redox Potential  | 5 locations within the affected area\* |  | † |
|  | Reinforcing Elements  | Coefficient of friction | 1 test for each type of element with each type of fill\* |  |  |
|  | Anchor Elements | Adhesion |  |  |
| 624 | Ground Anchorages | Proof Loading | Every anchor |   | † |
| 626 | Gabions | Gabion mesh | Source Approval | Required |   |
| 642 | Earthworks materials adjacent to structures | Constrained soil modulus (M\*) | 3 on each side of structure |   |   |
| 614 | Lime and Cement Improvement - U1 | Water soluble sulfate content | Source Approval |  |  |
|  |   | Organic Content | Source Approval |  |  |
|  |   | Rate of spread | 1 per 500m2\* |  |  |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 800 |
| 801802804805806807808809 | Unbound mixtures placed within 500mm of cement bound materials, concrete pavements, structures or products | Water soluble sulfate (WS) content (IL)  |  1 per 200m3 for each source (min of 5 total per source)\* | Required | *[Where Required]**[See NG 808]* |
| Oxidisable sulphides (OS) content (IL) | 1 per 200m3 for each source (min of 5 total per source)\* |
| Unbound mixtures placed adjacent to metallic structural elements forming part of the Works | Water-soluble sulfate (WS) content (IL) | 1 per 200m3 for each source (min of 5 total per source)\* |  | *[Where Required]**[See NG 809]* |
|  | Oxidisable sulfides (OS) content (IL) | 1 per 200m3 for each source (min of 5 total per source)\* |  |  |
|  | Unbound mixtures | Grading and fines content | 1 per 1000 tonnes or minimum of 2 per day\* |  | *[Results of routine control tests from the factory production control system operated by the producer to be provided - see Annex C of IS EN 13242]* |
|  |  | Flakiness index (IL) | 1 per week\* |  |  |
|  |  | Los Angeles Coefficient (IL) | 2 per year\* |  |  |
|  |  | Methylene Blue (IL) | 1 per week\* |  |  |
|  |  | Water absorption (IL) | *[As Required]* |  | *[See NG 801.10]* |
| 801802804805806807808809(Contd) |  | Magnesium Sulphate Soundness (IL)) | 1 per 2 years\* | Required | *[Where Required]* |
|  | Types A, B, C & D granular material | OMC (IL) | 2 per year\* |  | *[Declared values from the factory production control system operated by the producer to be provided - see Annex D of IS EN 13285]* |
|  | Moisture Content | 1 per 1000 tonnes or minimum of 2 per day\* |  |
|  | Types B, C, D & E granular material | Liquid Limit (IL) | 1 per week\* |  |  |
|  |  | Types A & C granular material | CBR (IL) | 1 per week\* |  |  |
|  |  |  | Density (IL) | 2 per year\* |  |  |
|  |  | Type C granular material | Percentage of crushed or broken particles and of totally rounded particles in coarse aggregates | 1 per month\* |  |  |
|  |  | Type A granular material | Plasticity index (IL) | 1 per week\* |  |  |
| 810821822823824825826 | Cement Bound Mixtures | Water soluble sulphate (WS) content (IL) | 1 per 200m3 for each source (min of 5 total per source)\* | Required | *[See NG 808 & 820]* |
| Oxidisable sulphides (OS) content (IL) | 1 per 200m3 for each source (min of 5 total per source)\* | *[See NG 808 & 820]* |
| Tests for control and checking of HBM  | Tests specified in Table 8/15 and Table 8/16  | *[See NG 825]* |
|  | Coefficient of linear expansion (IL) | *[As required]* |  | *[See Clause 819]* |
|  | Tests for laboratory mixture design  | As specified in Clause 826 |  | *[See NG 826]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 900 |
| 2.234567.27.38.18.48.69 | Constituent materials  |  |
|  | Bond and tack coats | Requirements per Tables 15 | As per Type Test report applicable to the Contract | Required | Constituent materials include aggregate, binder, fillers, additives, chippings, pre-coated chippings, reclaimed asphalt, and all other materials that comprise the product. For products not covered by a Harmonised Technical Specification, material properties to be tested at the beginning of the contract to verify the values declared.Tables refer to those contained in NRA Series 900. |
|  | Bituminous mixtures | Requirements per Tables 1, 2, 4, 5, 7, 8, 10, 11 & 14Clause 4.2.4 for pre-coated chippings | As per Type Test report applicable to the Contract |  |
|  | Aggregate for Surface Courses – Bituminous Mixtures | Friction After Polishing Test (IS EN 12697-49) | 1 test per property per source (source approval)\* |  |
|  | Surface dressing | Requirements per Tables 15, 17 & 18 | As per Type Test report applicable to the Contract |  |
|  | Surface Dressing - Aggregate | Friction After Polishing Test (IS EN 12697-49) | 1 test per property per source (source approval)\* |  |
|  | High friction surfacing – binders | Requirements per Table 23a | 1 test per property per source (source approval)\* |  |
| High friction surfacing – manufactured aggregates | Requirements per Table 23b |
| High friction surfacing – natural aggregates | Requirements per Table 23c |
|  | Low energy bound mixtures – Paving Grade and Polymer Modified Bitumens | Requirements per Table 14 | 1 test per property per source (source approval)\* |  |
| Low energy bound mixtures – Virgin Aggregates and Virgin Filler | Requirements per Table 24a |
| Low energy bound mixtures – Cationic Bitumen Emulsions | Requirements per Table 24b |
|  | Permanent repair material systems | Requirements per Table 26a  | 1 test per property per source (source approval)\* |  |
|  | Emergency repair material systems | Requirements per Table 28a  | 1 test per property per source (source approval)\* |  |
|  | Reclaimed asphalt | Requirements per Tables 13a & 13b | As per Type Test report applicable to the Contract |  |
| 34568.1 | Product Composition  |  |
|  | Bituminous mixtures – All mixtures | Grading (IL) | A minimum of 1 per 600 tonnes or minimum 2 per five day period or part thereof whichever is greater. | Required | IS EN 13108-21 Factory Production Control (FPC) procedures apply.The samples shall be taken in conjunction with the product manufacturer. Portions of the same samples shall be split between the manufacturer, contractor and the Employer’s Representative to enable subsequent test results to be compared. |
|  |  | Binder content (IL) |  |
|  | Low energy bound mixtures | Combined grading (IL) | 1 per day\* | Required | The samples shall be taken in conjunction with the product manufacturer. Portions of the same samples shall be split between the manufacturer, contractor and the Employer’s Representative to enable subsequent test results to be compared. |
|  |  | Binder content (IL) |  |  |
| 8.48.6 |  | Permanent repair material systems | Requirements per Table 26b  | 1 test per property per source (source approval)\* |  |  |
|  | Emergency repair material systems | Requirements per Table 28b  | 1 test per property per source (source approval)\* |  |  |
| 910 | Works  |
|  |   | Bituminous mixtures - All mixtures | Temperature of mixture at time of delivery |  Per delivery |   |   |
|  |  |  | Layer thickness | 1 pair of cores every 1,000 linear metres laid per lane. |  | Measurement taken for each core extracted for in situ air void analysis. |
|  |  |  | Temperature of mixture at time of rolling | Continuously |  |  |
|  |  |  | Air void content (IL) | 1 pair of cores every 1,000 linear metres laid per running lane. | Required | Cores taken from the wheel tracks.  |
|  |  |  | Water sensitivity (IL) | 1 per Contract |  |
|  |   | Bituminous mixtures – Containing >10% reclaimed asphalt | Recovered penetration (IL) | As required per Series 900 | Required  |   |
|   |   |  | Recovered softening point (IL) |  |   |   |
|   |   |  | Indirect tensile strength (IL) |  |   |   |
|   |   |  | Moisture induced sensitivity test conditioning (IL) |  |   | Requirement is to make available to the Employer’s Representative |
|   |   |  | Rheology (IL) |  |   |  Requirement is to make available to the Employer’s Representative |
|  |  | Bituminous mixtures - Asphalt Concrete base and binder course specific | Permanent Works – In situ air void content within 100mm of joint (IL) | 1 pair of cores every 250 linear metres laid per running lane | Required | Cores centred 100mm from the final joint position.  |
|  |  |  | In situ air void content at refusal (IL) | 1 pair of cores every 1,000 linear metres laid per running lane |  | Cores taken from the wheel tracks.  |
|  |  |  | Resistance to permanent deformation (IL) | 6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre |  | Cores taken from the wheel tracks. |
|  |  |  | Stiffness (IL) | 1 pair of cores every 1,000 linear metres laid per running lane |  | Cores taken from the wheel tracks. |
|  |  | Bituminous mixtures - Asphalt Concrete surface course specific | Macrotexture - Volumetric Patch (IL) | 10 over 50 metres lane length | Required | Refer to Series 900 for requirements regarding minimum test coverage. |
|  |  | Bituminous mixtures - Hot Rolled Asphalt surface course specific | Resistance to permanent deformation (IL) | 6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre | Required | Cores not to be taken from the wheel tracks. |
|  |  |  | Rate of Spread of Chippings for shoulder-to-shoulder cover | At Contract start |  | Refer to Series 900 for requirements of repeating measurements. |
|  |  |  | Rate of Spread of Chippings for mechanical chipping spreader | 1 per 100m or 1 per day |  | Refer to Series 900 for requirements of repeating measurements. |
|  |  |  | Macrotexture - Volumetric Patch (IL) | 10 over 50 metres lane length | Required | Refer to Series 900 for requirements regarding minimum test coverage. |
|  |  | Bituminous mixtures - Stone Mastic Asphalt binder course specific | Resistance to permanent deformation (IL) | 6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre | Required | Cores taken from the wheel tracks. |
|  |  | Bituminous mixtures - Stone Mastic Asphalt surface course specific | Macrotexture - Volumetric Patch (IL) | 10 over 50 metres lane length | Required | Refer to Series 900 for requirements regarding minimum test coverage. |
|  |  |  | Resistance to permanent deformation (IL) | 6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre |  | Cores not to be taken from the wheel tracks. |
|  |  | Bituminous mixtures - Porous asphalt surface course specific | Relative hydraulic conductivity (IL) | Every 1,000 linear metres laid per lane and fraction thereof\* | Required |  |
|  |  | Bond and Tack Coat | Rate of spread of binder | 1 every 20,000 square metres or 1 ever month, whichever is greater |  |   |
|  |  |  | Accuracy of spread of binder | 1 every 6 months  |  |  |
|  |  | Surface Dressing | Rate of spread of binder | As required per Series 900  |  |   |
|  |  |  | Accuracy of spread of binder |  |  |  |
|  |  |  | Rate of spread of chipping |  |  |  |
|  |  |  | Accuracy of spread of chipping |  |  |  |
|  |  |  | Volumetric patch (IL) | 10 over 50 metres lane length | Required | Refer to Series 900 for requirements regarding minimum test coverage. |
|  |  |  High friction surfacing   | Volumetric patch (IL)  | 10 over 50 metres lane length | Required | Refer to Series 900 for requirements regarding minimum test coverage. |
|   |  |   | Surface shear strength of installed system (IL) | 2 per substrate type |  | At least 1 test measured in the wheel track zone.Test locations at least 20 metres apart. |
|  |  |  Low energy bound mixtures  | Moisture content (IL) | 1 core every 50 linear metres laid per lane. | Required |  |
|  |  |  | Relative in-situ density (IL) |  |  |  |
|  |  |  | Air voids content (IL) |  |  |  |
|  |  |  | Indirect tensile stiffness modulus (IL) | 1 pair of cores every 250 linear metres laid per lane. |  | 1 core per pair taken from the wheel track zone.  |
|  |  | Repair systems (PRMS, LSRS, ERMS) | Volumetric patch (IL) | 1 per discrete area | Required  | Methodology described in IS EN 13036-1 should be followed with number of test measurements to suit size of repair. |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1000 |
| 1001 | Cement types as stated in sub-Clause 1001.3 |  |  | Required | Certificate to be provided monthly\* for each type of cement.Quality management and product certification schemes apply |
|  | Cements (all types)  | Chloride content | Monthly\* |  | Tests to be carried out by the manufacturer and results included on the test certificates required above |
|  | Ground granulated blastfurnace slag  | Sulphate content | Monthly\* |
|  |  | Acid-soluble alkali content | Daily (PC)Weekly (PFA ggbs) |
|  | Aggregates | Grading and fines content | 1 per delivery(min 1 weekly per source) |  | Results of routine control tests by the manufacturer/ supplier to be provided. Product certification scheme applies |
|  |  |  | Shell content (IL) (Only required where marine aggregates are used) | Monthly \* |  |
|  |  |  | Flakiness index (IL) | Monthly\* |  |
|  |  |  | Resistance to fragmentation (IL) | Every 6 months\* |  |
|  |  |  | Chloride ion content (IL) | Daily\* |  |
|  |  |  | Acid soluble sulphate content (IL) | Monthly\* |  |  |
| 1001(Contd) |  | Fine aggregate | Acid-soluble material (IL) | Monthly\* |  | *[As required, See sub-Clause 1001.11]* |
|  | Water | Tests specified in IS EN 1008 | *[As required].* |  |  |
| Chloride content | Monthly\* |
| Sulphate content | Monthly\* |
| Acid-soluble alkali content | Weekly\* |
| Admixtures | Chloride content | 1 per consignment | Required (BS 934-2) | *[See sub-Clause 1001.5]* |
|  |  | Sulphate content | 1 per consignment | Required |
|  |  |  | Acid-soluble alkali content | 1 per consignment |  |  |
| 1002100310041044 | Concrete | Air content test (IL) | As required in Table 10/9 | Required |  |
| Density of in situ Concrete cores (IL) | As required in Table 10/9 |
| Cube strength (IL) | As required in Table 10/9 |
| 1005 | Consistence | Compaction index (IL) | As required in Table 10/9 |  | *[See sub-Clause 1005.2]* |
| Vebe (IL) |
| 10111012 | Dowel barsTie 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\* |
| 1015 | Joint filler board | Weathering test | 3 per source |  | 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 |
| 10161017 | Applied sealants | Initial Penetration | 1 per 1000m or 1 per day | Required (BS EN 14188-1,BS 2499-2,BS 5212-1,BS 5212-2)(IS EN 13880-2,IS EN 13880-3,and BS 4254) |  |
| 10161017(Contd) |
|  |  | Resilience | 1 per 1000m or 1 per day |  |  |
|  | Compression seals |  |  | Required(ASTM D2628)(BS 2752)(BS 4443-4,Method 10 andIS EN ISO 2440)(IS EN ISO 1856)(BS 903: Part A16or IS ISO 1817) |  |
|  | 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\* | Required |  |
| 10261044 | Surface macrotexture | BS EN 13036-1 Volumetric Patch Technique (IL) | 1 per day (set of 10)\* | Required |  |
| 1027 | Aluminised curing compound | Efficiency Index | 1 per source\* |  |  |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1100 |
| 1101 | Precast concrete kerbs, channels, edgings and quadrants | Bending strength | Minimum of 8 per 1000 units of each product (IS EN 1340) | Required |  |
| 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 | Minimum of 8 per 1000 units of each product (IS EN 1339) | Required |  |
|  | Bedding | Granular material |  |  |  | *[Appropriate tests/samples should be scheduled where not included under other Clauses]* |
|  |  | Mortar |  |  |  |  |
| 1107 | Concrete block paving  | Compressive strength | Minimum of 8 per 1000 units of each product (IS EN 13389) | Required |  |
| 1108 | Clay pavers | Bending strength | Minimum of 8 per 1000 units of each product (IS EN 1344) | Required |  |
|  |  | Skid resistance | Minimum of 8 per 1000 units of each product (IS EN 1344) |  |  |
| 1109 | Cellular grass paving systems |  |  |  | NSAI Agrément certificate or equivalent scheme applies |
| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1200 |
| 1202 | Permanent traffic signs | Test specified in the Standard/Specification given in Clause 1202 |  | Required | I.S. EN 12899-4 Factory ProductionControl procedures apply.  |
| 1213 | Permanent traffic cones and traffic cylinders | Part 7 of I.S. EN 13422 |  | Required | Quality management and product certification schemes apply |
| 1215 | Traffic signals |  |  |  | Quality management scheme applies.Statutory approval of equipment applies |
|  |  | Cables |  |  |  | *[Special sample tests to BS 6346 should be scheduled where appropriate]*Product certification scheme applies |
|  |  | Controllers *[Other equipment]* | Tests 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 the National Rules for Electrical Installations is required. |
| 1216 | Thermoplastic road marking materials | Tested for the requirements of the specification in accordance with I.S. EN 1436 initially on application and as detailed during the guarantee period.  |  | Required  | Quality management and product certification schemes apply.  |
| 1217 | Retroreflecting road studs | Test specified in the Standard/ Specification given in Clause 1217 |  | Required  | Quality management and product certification schemes apply |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1300 |
| 1305 | Anchorages for use in drilled holes  | Tensile load (Manufacturer’s tests)  |  | Required | To provide well attested and documented evidence |
| 1306 | Anchorages in drilled holes to columns with flange plates | Loading test on site | *[As required]* |  | † |
| 1310 | Welding | Welding procedures (manufacturer’s tests) | (Every seven years) |  |  |
| Welding qualification (Manufacturer’s tests)  | (Every two years) |  | Quality management scheme applies |
| Production testing (Manufacturer’s tests) | (Clause 1310 (7.1.4) |  |  |
|  | Welded joints | Destructive testing  | *[See sub-Clause 1310 (7.15)]* |  | †† (IL) *[See NG 1310]* |
| 1313 | GFRP laminates | Loss on ignition | 1 per 200 production columns |  |  |
|  | Colour fastness | 1 per batch  |  |  |
|  | Electric strength |  |  |  |
|  | Water absorption |  |  |  |
|  | Impact strength |  |  |  |
| 1314 | Brackets for laminating GFRP lighting columns |  |  |  |  |
|  |
|  | Polyurethane foam | Bulk density | 1 per batch |  |  |
| Surface hardness |  |
|  |  | Apparent bulk density | 2 per batch |  |  |
|  |  | Impact strength |  |  |  |
| Flexural stress |
| Series 1400 |
| 1421 | Cable |  |  |  | Product certification scheme applies*[Special sample tests to BS 6346 should be scheduled where appropriate]* |
| 1424  | Lighting Units | Tests specified in Clause 1424 | Each unit | Required | †Product certification scheme applies. Certification that the installation complies with the National Rules for Electrical Installations is required |
| Networks | Tests specified in Clause 1424 | Each network | Required | † Certification that the installation with the National Rules for Electrical Installations is required |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1500 |
| 1506 | Multipair communications cable |  |  | Required | Certification that each completed cable complies with the specification given in Appendix 15/1 |
| Fibre optic communications cable |  |  | Required | Certification that each completed cable complies with the specification given in Appendix 15/1 |
| Power supply cable for communications systems |  |  | Required | Certification that each completed cable complies with the specification given in Appendix 15/1 |
| 1518 | Motorway communications and power cable | Tests specified in the specification given in Appendix 15/1 | Each cable (Stage 1). As required in Appendix 15/1 (Stage 2) |  | † Results to be reported in accordance with the specification |
| Motorway optical fibre communications cable | Tests specified in the specification given in Appendix 15/1 | Each cable (Stage 1). As required in Appendix 15/1 (Stage 2) |  | † Results to be reported in accordance with the specification |
| CCTV co-axial cable | *[As required]* |  |  | *[See NG 1518]* |
| 1523 | Detector loops |
|  |  | Cable |  |  | Required | Certification that completed cables comply with the specification stated in Appendix 15/1 is required |
| 1523 (Con’d) |  | Epoxy resin |  |  | Required *[where considered Appropriate]* | Certification that the epoxy resin complies with Clause 1523 is required |
|  |  | Feeder cable |  |  | Required | Certification that completed cables comply with the specification stated in Appendix 15/1 is required |
|  |  | Joints | Pull test (4 kgf) | Each crimp |  |  |
|  |  | Installation | Series resistance | Each loop | Required | Certification in accordance with Clause 1523 is required |
|  |  | Insulation resistance |
|  |  | Inductance |
| 1530 | Pipes for motorway communications ducts |
|  |  | UPVC |  |  |  | Product Certification Scheme appliesCertificates are provided for in the relevant standard but should normally not be required except for pipes which are not quality marked in accordance with relevant standard. |
|  |  | Plastics (see Table 5/1) |  |  |  |
|  |  | Other materials |  | Required | NSAI Agrément Certificate or equivalent required |
|  | Thermoplastic structured wall pipes and fittings | *[Manufacturer’s**Tests]* |  | Required | INAB (or equivalent) certification applies |
| 1530 (Cont’d) | Pipe bedding |  | *[Appropriate tests/samples for the resistance to freezing and thawing (magnesium sulphate soundness) should be scheduled where required, NG Series 800.]* |
|  |  | Grading and finescontent *(Washing and**sieving method to be**used)* | 1 per week(min of 3)\* | Required | *[Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 13242.]* |
|  |  | Water SolubleSulphate (WS)content (IN) | 5 per source\* |  | *[Minimum to allow for natural variability of sulphur compounds]* |
|  |  | Resistance tofragmentation (IL) | 1 per source\* |  | *[LA Category]* |
| 1532 | Chambers |
|  |  | Precast concrete |  |  |  | Product certification scheme applies |
|  |  | Corrugated galvanised steel | *[Manufacturer's Tests]* |  | Required | Product certification scheme applies |
|  |  | Manhole steps |  |  |  | Product certification scheme applies |
|  |  | Steel fitments |  |  |  |  |
|  |  | Covers, grates and frames |  |  |  | Product certification scheme applies |
| 1532 (Cont’d) |  | Cover bolts |  |  |  | Quality management scheme applies |
| 1533 | Cable ducts |
|  | Mandrel test | Test specified in Clause 1533 | Each duct | Required | † Certificate that each length of duct between chambers satisfies the mandrel test is required. |
|  | Air test | Test specified in Clause 1533 | Each duct | Required | † Certificate that each length of duct between chambers satisfies the air test is required. |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1600 |
| 1601 | Soil samplesIn situ soil tests |  |  | Required | *[Appropriate soil tests should be scheduled where required]* |
| 1602 to 16061610To1615 | ConcreteGrout ReinforcementPrestressingSteelworkWeldingProtection against corrosion |  |  | Required | *[Appropriate tests / samples should be scheduled where not included under other Clauses / Series]* |
| 1606 | Coatings for protection against corrosion | Adhesion | As required in Appendix 16/6 |  |  |
| 1607 | Reduction of friction on piles |  |  |  | *[Particular requirements detailed in Appendix 16/7 should be scheduled]* |
| 1608 | Integrity testing |  |  |  | *[Particular requirements detailed in Appendix 16/8 should be scheduled]* |
| 1616 | Dynamic testing |  |  |  | *[Particular requirements detailed in Appendix 16/16 should be scheduled]* |
| 1609 | Static load testing of piles |  |  | Required | *[Testing of preliminary piles should not be scheduled in Appendix 1/5**Particular requirements detailed in Appendix 16/9 should be scheduled]* |
| 1612 | Self hardening slurry mixes |  |  |  | *[Particular requirements detailed in Appendix 16/12 should be scheduled]* |
| 1617 | Instrumentation |  |  |  | *[Particular requirements detailed in Appendix 16/17 should be scheduled]* |
| 1618 | Support fluids | To be proposed by the Contractor |  |  | *[Particular requirements detailed in Appendix 16/18 should be scheduled]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1700 |
| 170217031704 | Cement types as stated in sub-Clause 1702.1 |  |  | Required | Certificate to be provided monthly\* for each type of cement.Quality management and product certification schemes apply. |
|  | Cements (all types)  | Chloride content | Monthly\* |  | Tests to be carried out by the manufacturer and results included on the test certificates required above |
|  | Ground granulated blastfurnace slag  | Sulphate content | Monthly\* |
|  |  | Acid-soluble alkali content | Daily (PC) Weekly (PFA ggbs) |
|  | Aggregates | Grading and fines content | 1 per delivery(min 1 weekly per source) |  | Results of routine control tests by the manufacturer/ supplier to be provided. Product certification scheme applies |
|  |  |  | Shell content (IL) (Only required where marine aggregates are used) | Monthly \* |  |
|  |  |  | Flakiness index (IL) | Monthly\* |  |
|  |  |  | Resistance to fragmentation (IL) | Every 6 months\* |  |
|  |  |  | Drying shrinkage (IL) | Monthly\* |  |
|  |  |  | Chloride content (IL) | Daily\* |  |
| 170217031704 (Contd) |  |  | Sulphate content (IL) | Monthly\* |  |  |
|  |  | Blastfurnace slag | Bulk density (IL) | 1 per 500 tonnes \* |  |  |
|  |  |  | Stability (IL) | 1 per 500 tonnes \* |  |  |
|  |  | Sulphur content (IL) | 1 per 500 tonnes \* |  |  |
|  | Water | Tests specified in IS EN 1008 | *[As required].* |  |  |
| Chloride content | Monthly\* |
|  | Sulphate content | Monthly\* |
| Acid-soluble alkali content | Weekly\* |
|  | Admixtures |  | Chloride content | 1 per consignment | Required (IS EN 934-2) | *[See sub-Clause 1702.3]* |
|  |  | Sulphate content | 1 per consignment | Required |
|  |  |  | Acid-soluble alkali content | 1 per consignment |  |  |
| 1707 | Concrete | Cube strength (IL) | Prestressed concrete – 2 cubes from 12m3 or 2 batches whichever represents the lesser volume | Required | Contractor to cast and test sufficient copies to demonstrate cube strength before transfer† |
|  |  |  | Reinforced Concrete - 2 cubes from 24 m3or 4 batches whichever represents the lesser volume |  |  |
|  |  |  | Mass Concrete – 2 cubes from 50 m3 or 50 batches whichever represents the lesser volume |  | *[See also Table NG 17/1]* |
|  |  |  | Additional cubes for special purposes |  | *[Tests/samples should be scheduled as required See NG 1707.5]* |
|  |  | Cube strength identity testing as described in Appendix 17/4 (IL) | 2 cubes from each of 2 samples of each batch |  | *[Requirements should be given in Appendix 17/4 as appropriate]**[See sub-Clause 1707.2 and Appendix 1/6]* |
| . |  | Density  | *[As required]* |  | *[Requirements should be given in Appendix 17/1 as appropriate]* |
|  |  | Modulus of elasticity |  |  |  |
|  | Fresh concrete | Consistence (IL) *[The method should be stated in Appendix 17/1]* | Each batch |  | *[See sub-Clause 1707.2]* |
| 1707(Cont’d) | Air content  | Each batch  |  |
|  |  | Cement content  | *[As required]* |  |  |
|  | Water/cement ratio  |  |
| 1709 | Silane |  |  | Required for each delivery | Certificate that the silane complies with Clause 1709 is required (Cl 1709.2) |
|  |  | Refractive Index | Three samples |  | *[See sub-Clause 1709.2 (ii)]* |
|  |  | Trial panels |  |  | *[See sub-Clause 1709.8]* |
| 1710 | Concrete packingMortar packingEpoxy resin bonding agent |  |  |  | *[Appropriate tests/samples should be scheduled see NG 1710.9 (v)]* |
|  | Precast concrete manufactured off Site | Cube strength (Manufacturer's tests) |  |  | Contractor to make available records of tests by manufacturer |
| 1711 | Grouting and Duct Systems for Post-tensioned Tendons |  |  |  | CARES Scheme for Supply and Installation of Post-tensioned Systems In Concrete Structures or an equivalent scheme is required.Quality management and product certification schemes for cement apply |
|  |  | Full scale trials |  |  | See sub-Clause 1711.1 and Appendix 17/6 |
| 1711(Cont’d) |  | Air pressure tests |  |  | See sub-Clause 1711.3 and Appendix 17/6 |
|  |  | Duct assembly verification tests |  |  | See sub-Clause 1711.3 and Appendix 17/6 |
|  |  | Wall thickness of ducts after tensioning |  |  | See sub-Clause 1711.3 and Appendix 17/6. Contractor should provide evidence of testing |
|  |  | Fluidity | See Table 17/7 |  | See sub-Clause 1711.8 and sub-Clause 1711.9 and Table 17/8 |
|  |  | Bleeding |  |  |
|  |  | Volume change |  |  |  |
|  |  | Cube strength  |  |  |  |
|  |  | Sieve |  |  |  |
|  | Sedimentation |  |  |  |
|  |  | Admixtures |  |  | Required  | Quality management and product certification schemes apply Data on their suitability, including previous experience should be made available.See sub-Clause 1711.10 |
| 1712 | Reinforcement |  |  |  | Product certification scheme applies |
|  |  | Steel bars |  |  | Required (BS 4449 & IS EN 10080) |  |
|  |  | Steel wire |  |  | Required (BS 4482 & IS EN 10080) |  |
|  |  | Steel fabric |  |  | Required (BS 4483 & IS EN 10080) |  |
|  |  | Stainless steel |  |  | Required (BS 6744) |  |
| 1713 | Fabricated reinforcement  |  |  | Required | 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 listed in Appendix 1/25  |
| 1716 | Reinforced jointing systems | Permanent elongation Characteristic strength (Manufacturer’s tests) |  | Required for each type of connection | NSAI Agrément certificate or equivalent scheme to apply |
| 1717 | Reinforcement metal arc welding | Welding procedure approval (BS 7123) | As required in BS 7123 |  | *[Where tests in addition to those specified in BS 7123 (tensile test and macroetch test) are required full details should be scheduled]*Tests should be carried out by an independent testing body specified in BS 8666 |
|  |  | Welder approval (BS 7123) |  |  |
| 1718 | Prestressing Tendons |  |  |  | Product certification scheme appliesCARES (PT6-PT8) |
|  |  | Steel wire |  |  | Required (BS 5896) |  |
|  |  | Steel bar |  |  | Required (BS 4486) |  |
|  |  | Seven-wire Strand |  |  | Required (BS 5896) |  |
|  |  | Pre-stressing steel (all types) | Proof loadBreaking loadElongationDuctilityRelaxationModulus of elasticity | *[As required]* |  | † |
| 1718 (Cont’d) |  | Super strand to BS 5896 or other than lowest strength 3-7 mm dia wires to BS 5896 | 0.1% proof loadBreaking load | Each reel |  | † |
| 1724 | Post-tensioning anchorages | Tests in accordance with IS EN 13391(Manufacturer’s tests) |  | Required(IS EN 13391) | Product certification scheme appliesCARES Scheme |
| 1726 | Stainless steel bar |  |  | Required (BS 6744) | Product certification scheme applies |
| 1727 | Inspection and testing of structures and components | As required by Appendix 17/4 | As required in Appendix 17/4 | Required | *[Tests should be scheduled as appropriate and requirements given in Appendix 17/4]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1800 |
| 1805.2 | Metallic products | Inspection documents to EN10204 | All Metallic Products | Required according to IS EN 1090-2:2008+A1:2011, Table 1  | *[Give type of metallic product and document required, noting specific requirement for steel grade S355 JR and J0 described in 1805.2]* |
| 1805.3.4 | Special properties of constituent products | 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]* |
| 1806.4.4 | Check of the capability of cutting processes that are likely to produce local hardness | Testing in accordance with IS EN ISO 6507 | As required |  |  |
| 1806.5.4 d) | Check of the hardness and geometry of hollow section components subject to bending by cold forming | Check of the hardness, testing in accordance with IS EN ISO 6507  | As required |  |  |
| 1807.4.1.2 | Qualification of welding procedures (Processes 111, 114, 12, 13 and 14) | Tests specified in IS EN ISO 15614-1 or IS EN ISO 15613 | As required in IS EN ISO 15614-1 or IS EN ISO 15613 |  | Results to be reported in accordance with IS EN ISO 15614-1 or IS EN ISO 15613 |
| 1807.4.1.2 (3) | Qualification of welding procedures for joints with restricted access | Tests specified in IS EN ISO 15613 | As required in IS EN ISO 15613 |  | Results to be reported in accordance with IS EN ISO 15613 |
| 1807.4.1.3 | Qualification of welding procedures for other welding processes | Tests specified in the standards listed in IS EN 1090-2:2008+A1:2011, Table 13 | As required in the standards listed in IS EN 1090-2:2008+A1:2011, Table 13 |  | Results to be reported in accordance with the standards listed in IS EN 1090-2:2008+A1:2011, Table 13.Note the requirement in IS EN 1090-2:2008+A1:2011, 7.5.12 relating to stud weld procedure testing. |
| 1807.4.1.4 | Validity of welding procedure qualification | Additional tests specified in ISEN 1090-2:2008+A1:2011, 7.4.1.4 for a welding procedure qualified in accordance with IS EN ISO 15614-1, which is undertaken by a welding process that has not been used | As required in IS EN 1090-2:2008+A1:2011, 7.4.1.4 |  | Results to be reported in accordance with IS EN ISO 15614-1 |
| 1807.4.1.4 (1) | Validity of welding procedure qualification | Welding production test in accordance with the qualification standard for the process concerned | As required |  | Results to be reported in accordance with the qualification standard for the process concerned |
| 1807.4.2 | Qualification of welders and welding operators | Tests specified in IS EN ISO 9606-1 (welders) or IS EN ISO 14732 (welding operators)  | As required in IS EN ISO 9606-1 or IS EN ISO 14732 as appropriate | Required | Certificate to be in accordance with IS EN ISO 9606-1or IS EN ISO 14732 as appropriate |
| 1807.4.2 | Qualification of welders of hollow section branch connection with angles less than 60º | Specific qualification test. Tests specified in IS EN ISO 9606-1. | As required |  |  |
| 1807.4.2 (1) | Qualification of welders of joints with restricted access | Specific qualification test. Tests specified in IS EN ISO 9606-1. | As required |  |  |
| 1807.5.1.1 | Verification that joint preparation in steel grades higher than S460 are free from cracks | Testing in accordance with IS EN ISO 3452-1 (penetrant) or IS EN ISO 17638 (Magnetic particle)  | As required |  |  |
| 1807.5.1.1 (1) | Qualification of welding procedures where prefabrication primers are to be left on the fusion faces. | Tests specified in IS EN ISO 15614-1 or IS EN ISO 15613 using such prefabrication primers | As required in IS EN ISO 15614-1 or IS EN ISO 15613 |  | Results to be reported in accordance with IS EN ISO 15614-1 or IS EN ISO 15613 |
| 1807.5.4 (1) | Welding of joints in hollow sections, full penetration butt welds with restricted access | Pre-production weld test conforming to IS EN ISO 15613. | As required |  |  |
| 1807.5.6 (3) | Verification of ground surface are free of cracks following removal of temporary welded attachments | Testing in accordance with IS EN ISO 17638 (Magnetic particle)  | As required |  |  |
| 1807.5.9.2 (1) | Verification of the absence of surface cracking in continuity welds in permanent steel backing | Testing in accordance with IS EN ISO 3452-1 (penetrant) or IS EN ISO 17638 (Magnetic particle)  | As required |  |  |
| 1807.5.18 | Welding of bridge decks | Production tests in accordance with IS EN 1090-2:2008+A1:2011, 12.4.4 c) | As required |  |  |
| 1808.5.3 (1) | k value check for the Torque method  | Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H | Daily |  |  |
| 1808.5.4 (2) | k value check for the combined method | Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H | Daily |  |  |
| 1808.5.5 (1) | Preload check for HRC method | Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H | Each assembly lot |  |  |
| 1808.9 | 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]* |
| 1810.1 (5) | Slip resistant connections | Slip factor test in accordance with IS EN 1090-2:2008+A1:2011, Annex G | As required in Appendix 18/1 |  | *[Give specific requirements in Appendix 18/1 with cross reference in Appendix 1/5]* |
| 1810.1 (10) | 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]* |
| 1812.2.1 (1) | Specific testing of constituent 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]* |
| 1812.2.1 (2) | Mechanical fasteners | Sample testing as specified in 1812.2.1 (2) | As required in 1812.2.1 (2) |  | Results to be reported in accordance with 1812.2.1 (2).Testing not required if mechanical fasteners supplied by a NHSS 3 registered Organisation. See 1800.5.2 |
| 1812.2.1 (3) | Mechanical fasteners | Suitability testing as specified in 1812.2.1 (3) | As required in 1812.2.1 (3) |  | Results to be reported in accordance with 1812.2.1 (3). |
| 1812.4.1 | Inspection before and during welding | None destructive testing methods selected in accordance with IS EN ISO 17635 | As required in IS EN 1090-2:2008+A1:2011, 12.4.1 |  |  |
| 1812.4.2.2 | Inspection after welding – Scope of inspection | Supplementary none destructive testing determined by the manufacturer, according to the nature of the work in normal production. | As required in IS EN 1090-2:2008+A1:2011, 12.4.2.2  |  | See 1812.4.2.2 (6)  |
| 1812.4.2.2(1) | Inspection after welding - Specific inspection of welds | Supplementary none destructive testing in accordance with 1812.4.2.2 | As required by 1812.4.2.2 (1) to (5) |  |  |
| 1812.4.3 (1) | Welded shear studs | Production tests as specified in IS EN ISO 14555, 14.2 | As required in 1812.4.3 (1) |  | Results to be documented in accordance with 1812.4.3 (4) |
| 1812.4.3 (2) | Welded shear studs | Hammer test as specified in 1812.4.3 (2) | Every welded shear stud |  |  |
| 1812.4.3 (3) | Welded shear studs | Simplified production tests as specified in IS EN ISO 14555, 14.3 | As required in 1812.4.3 (3) |  | Results to be documented in accordance with 1812.4.3 (4) |
| 1812.4.4 (1) | Production tests on welding | Production tests on welding as specified in 1812.4.4 (1) | As required in 1812.4.4 (1)  |  | Results to be reported in accordance with the relevant standard |
| 1812.4.4 (2) | Production tests on welding using run-off coupon plates | Production tests on run-off coupon plates as specified in 1812.4.4 (2) | As required in 1812.4.4 (2) |  |  |
| 1812.7.4 | Other acceptance tests  | Test requirements for components erected to a specific load as specified in Appendix 18/1 | As required in Appendix 18/1 |  | *[Give specific requirements in Appendix 18/1 with cross reference in Appendix 1/5]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 1900 |
| 1903 | Abrasives | Grading | *[As required]* |  | *†† [See NG 1903]* |
| Hardness |
| 1909 | Galvanised Coatings | Test specified in IS EN ISO 1461 | *[As required]* |  |  |
|  | Thermally sprayed aluminium metal coatings | Tests specified in IS EN ISO 2063 | *[As required]* |  |  |
|  |  | Aluminium coating material |  |  | Required in accordance with IS EN ISO 14919 |  |
| 1910 | Thermally sprayed aluminium metal coating | Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or ‘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 IS EN ISO 2063 | *[As required]* |  |  |
| 1911, Table 19/2B  | Hot dip galvanised coating to fasteners | Tests specified in IS 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 |
| Specific gravity | As required by rate of ‘A’ and ‘B’ sampling | See NG 1912, 7; Appendix 19/4, Note 4;  |
|  |  | Colour match | As required by rate of ‘A’ and ‘B’ sampling | See NG 1912, 7 |
| 1914 | Coating System |  |  |  |  |
|  | Minimum film thicknesses | Minimum dry film thickness measurements In accordance with IS EN ISO 2808 | Required – representative testing |  |  |
|  | Adhesion | Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or ASTM D4541 – Type III | Required – representative testing |  |  |
|  | Defects | Visual assessment supplemented by appropriate testing | Required |  | *[Any additional tests should be scheduled in Appendix 1/5]* |
|  | 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 |  |  |
| 1972 | Abrasives | Grading | *[As required]* |  | *†† [See NG 1972]* |
| Hardness |
| 1974 | Thermally sprayed aluminium metal coatings | Tests specified in IS EN ISO 2063 | *[As required]* |  |  |
|  | Aluminium coating material |  |  | Required in accordance with IS EN ISO 14919 |  |
| 1975 | Thermally sprayed aluminium metal coating | Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or ‘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 IS EN ISO 2063 | *[As required]* |  |  |
| 1978 | Paints |  |  |  |  |
|  | ‘A’ and ‘B’ Samples | Provision of samples for ‘A’ and ‘B’ sample tests |  | Samples selected in accordance with Clause 1978 |
| Specific gravity | As required by rate of ‘A’ and ‘B’ sampling | See NG 1978, 7; Appendix 19/4, Note 4;  |
| Colour match | As required by rate of ‘A’ and ‘B’ sampling | See NG 1978, 7 |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 2000 |
| 2003 | Permitted waterproofing systems | *[As required – See NG 2003]* |  |  | NSAI Agrément Certificate or equivalent applies |
|  | Additional bituminous protection  | Tests specified in IS EN 13108-4 | 1 per 15 tonnes\* |  | Sampling to comply with IS EN 13108-4 |
|  |  | Stability value | Tests specified in BS 594897 | 1 per 15 tonnes\* |  |  |
| 2004  | Permitted waterproofing systems | *[As required – See NG 2004]* |  |  | NSAI certification or equivalent applies |
| 20082009 | Waterproofing membrane | Tensile strength, elongation at break (BS ISO 37) |  |  | Tests results to be provided to the Employer’s Representative ( Clause 2008.2) |
|  |  | Tear strength (BS ISO 34-1) |  |  |
|  |  | Deck adhesion (Clause 2008.5) | Three tests per 500m2 of sprayed membrane |  |  |
|  |  | “Holiday Test” |  |  |  |
| Series 2100 |
| 2101 | Complete Bridge bearings | Tests specified in Appendix 21/1 | As required in Appendix 21/1 |  | *[Tests & samples should be scheduled only where tests are required on samples cut from a finished bearing]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 2400 |
| 2401 | Masonry cement |  |  | Required (IS EN 413-2) | Quality management scheme applies |
|  | Chloride content | Monthly |  | Test to be carried out by the manufacturer and results included on the test certificate |
| 2402 | Sand |  |  | Required per consignment (IS EN 13139)  |  |
|  |  | Chloride content  | Monthly |  | Test to be carried out by the manufacturer and results included on the test certificate |
| 2404 | Mortar admixtures |  |  | Required (IS EN 934-3) | Product certification scheme applies |
| 2405 | Lime |  |  | Required (IS EN 459-1) |  |
| 2406 | Bricks |  |  |  | Product certification scheme applies |
|  |  | Clay | Active soluble salt content (IS EN 772-5)Compressive strength (IS EN 772-1)Water absorption (IS EN 772-7)Freeze/thaw resistance |  |  | *[Tests/samples (in accordance with IS EN 771-1 should be scheduled as required]* |
|  | Calcium silicate |  |  | Required IS EN 771-2) |
|  | Concrete |  |  | Required (IS EN 772-2) |
| 2407 | Blocks |  |  |  |  |
|  |  | Concrete |  |  | Required (IS EN 772-2) |  |
| 2408 | Manufactured Stone | In accordance with IS EN 771-5 |  | Required |  |
| 2410 | Stainless Steel |  |  |  |  |
| 2411 |  | Wire/fabric |  |  | Required (IS EN 10088-1) |  |
|  |  | Bars |  |  | Required (BS 6744) |  |
| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| **Clause** | **Work, Goods or Material** | **Test** | **Frequency of Testing** | **Test Certificate** | **Comments** |
| Series 2500 |
| 2501 | Materials for corrugated steel buried structures |  |  |  | Type approval applies |
|  |  | Steel plate |  |  | Required as appropriate to the standard or specification listed in NRA BD 12 and Appendix 25/1. |  |
|  |  | Nuts and bolts |  |  |  |
|  |  | Metal coating |  |  |  |
|  |  | Protective coating |  |  | NSAI Agrément Certificate or equivalent applies |
|  |  | Paved invert system |  |  |  |
| 2502 | Materials for reinforcing elements, prefabricated facing and capping units, and washers |  |  |  | NSAI Agrément Certificate or equivalent applies |
|  |  | Carbon steel strip |  |  | Required (IS EN 10025-1 and IS EN 10025-2) | Silicon content and mechanical properties to be stated on the certificate |
|  |  | Stainless steel strip |  |  | Required (IS EN 10029, IS EN 10048, IS EN 10051 and IS EN ISO 9445) | Mechanical properties to be stated on the certificate |
| 2502 (Contd) | Reinforcing bar for anchor elements |  |  | Required (IS EN 10080 and BS 4449) | Tests scheduled for welding and galvanizing of anchor elements under Series 1700 and Series 1900 respectively are required. |
|  | Materials for fasteners |  |  |  |  |
|  |  | Steel alloy |  |  | Required (IS EN ISO 898-1, IS EN ISO 4016, IS EN ISO 4018 and IS EN ISO 4034) | Tests for galvanizing scheduled under Series 1900 are required  |
|  |  | Stainless steel |  |  | Required (IS EN 10088-1, IS EN ISO 3506-1 and IS EN ISO 3506-2) |  |
|  |  | Bolts, screws and nuts |  |  | Required (IS EN ISO 898-1 and IS EN ISO 4016, IS EN ISO 4018 and IS EN ISO 4034) | Tests for galvanizing scheduled under Series 1900 are required |
| 2503 | Materials for Reinforced Clay Brickwork Retaining Walls of Pocket-type and Grouted Cavity Construction |  |  |  |  |
| 2503 (Contd) |  | Clay bricks | Compressive strength (IS EN 772-1)Water absorption (IS EN 772-7)Freeze/thaw resistance | 1 set of tests per type of brick\* |  | *[Tests/samples (in accordance with IS EN 771-1 should be scheduled as required]* |

| **Table NG 1/1 Typical Testing Details (Cont’d)** |  |  |  |  |
| --- | --- | --- | --- | --- |
| **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 |  | † Laboratory tests (IL) |
|  | 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 |
| 2604 | Plastic coating to fencing posts, gates and ancillaries | Impact test Adhesion Retention of adhesionSalt sprayAccelerated weathering (Manufacturer’s tests) |  | Required (BS 1722-16) | Records of all tests to be available for inspection |
| Series 2700 |
| 2703 | Polyethelene Pipes  |  |  |  |  |
|  |  | Butt fusion joints | Tensile test to WIS 4-32-08 | As required in Appendix 27/1 |  | Test Report to be made available to the Engineer’s Representative |
|  |  | Electrofusion joints | Double cantilever cleavage test to WIS 4-32-08 | As required in Appendix 27/1 |  | Test Report to be made available to the Engineer’s Representative |
| 2708 | Integrity of pipes, joints and fittings | Pressure drop test to IS EN 815 | As required in Appendix 27/1 |  | Test Records to be made available to the Engineer’s Representative |
| 2709 | Watermain disinfection | Chlorine residual test  | *[As required]* |  | *[Tests should be scheduled as appropriate and requirements given in Appendix 27/1]*Test Records to be made available to the Engineer’s Representative |
| Bacteriological testing  | *[As required]* |  | *[Tests should be scheduled as appropriate and requirements given in Appendix 27/1]*Test Records to be made available to the Engineer’s Representative |