

Multi-party Framework Agreement for Pavement and Associated Works 2026 for Tipperary County Council. Framework will be established initially for 12 months with the option to extend for a further 2 periods of 12 months.



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Tipperary County Council

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1 Site Information

1. The Sites under this multi-party framework are located on various roads throughout Co. Tipperary across 5 no. Municipal Districts including; Clonmel, Carrick On Suir, Nenagh, Thurles & Tipperary Cahir Cashel.
2. The sites under this framework are subject to individual District job/work package awards. The various districts are shown in the drawing entitled "Map of the Districts for Tipperary" included in the works requirements documents.

2 Scope of the Works

The scope of the Works involves everything that is contained within the Works Requirements. As a guide, each individual work package may comprise of the following, but may not be limited to:

- Site set-up.
- Site clearance works as agreed with the Employer's Representative.
- Undertaking the role of Project Supervisor for the Construction Stage
- Pavement works including overlay etc., repairs, restoration improvement, surface restoration and new pavement construction as outlined in each individual work package.
- Pavement works to domestic and agricultural accesses.
- Drainage works as instructed by the Employer's Representative.
- Installation and removal of road markings, road studs and traffic signs as instructed by the Employer's Representative.
- Road Sweeping and cleaning.
- Clean up the site and demobilise.
- All temporary works associated with the project for example temporary traffic management, trench supports etc.

3 Preamble to Specification

1. The Specification referred to in the Contract shall be the Specification for Works (SPW) in TII Publications (Standards) published by TII as a collective group of documents under the Construction and Commissioning activity within the online TII Publications system (<http://www.tiipublications.ie/>), current on the date 10 working days prior to the tender returns date or, if applicable, the extended tender returns date and incorporating all amendments current on that date and as extended by the following:-
 - (i) Appendix 0/1: Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures;
 - (ii) Appendix 0/2: Contract-specific minor alterations to existing Clauses, Tables and Figures;
 - (iii) The Numbered Appendices listed in Appendix 0/3;
 - (iv) Appendix 0/4 containing a list of the drawings referred to in the Specification.
2. An Additional Clause as indicated by a suffix 'AR' in Appendix 0/1 is a Contract-specific alteration.
3. A Substitute Clause as indicated by a suffix 'SR' in Appendix 0/1 is a Contract-specific alteration.
4. A Cancelled Clause indicated by a suffix 'CR' in Appendix 0/1 is a Contract-specific alteration.
5. Insofar as any of the Numbered Appendices may conflict or be inconsistent with any provision of the SPW the Numbered Appendices shall always prevail.
6. Any reference in the Contract to a part of the SPW or Appendix shall be deemed to refer to the corresponding Substitute part of the SPW or Appendix listed in Appendix 0/1 or 0/2.
7. Where a part of the SPW is altered, any original Table/Figure referred to in the part of the SPW shall apply unless the Table/Figure is also altered. Where a Table/Figure is altered, any reference in a part of the SPW to the original Table/Figure shall apply to the altered Table/Figure.
8. Where a part of the SPW relates to work goods or materials that are not required for the Works it shall be deemed not to apply.
9. Any Appendix referred to in the SPW that is not used shall be deemed not to apply.
10. References in the SPW to "NRA Road Construction Details" shall be taken to refer to Standard Construction Details (SCD) in TII Publications (Standards) published by TII as a collective group of documents under the Construction and

Commissioning activity within the online TII Publications system (<http://www.tiipublications.ie/>), current on the date 10 working days prior to the tender returns date or, if applicable, the extended tender returns date.

11. Text shown in grey highlight applies only to Contracts where the applicable Conditions of Contract is either the Public Works Contract for Civil Engineering Works Designed by the Employer, the Public Works Contract for Minor Building and Civil Engineering Works Designed by the Employer.
12. Text shown in square brackets immediately following text shown in grey highlight, if any, is deemed to replace the text in grey highlight for Contracts where the applicable Conditions of Contract is the Public Works Contract for Civil Engineering Work Designed by the Contractor.
13. Throughout the SPW and Appendices to the SPW, the following interpretations shall apply:
 - **"Base Course"** shall mean **"Binder Course"**.
 - **"Roadbase"** shall mean **"Base"**.
 - **"Wearing Course"** shall mean **"Surface Course"**.
 - **"UK Department of Transport"** shall mean **"UK Highways Agency"**.
14. Where capitalised terms are used in this specification and their terms are not defined terms in the Contract the terms shall be read as the lower case word.

APPENDIX 0/1: Contract-Specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract

Table 0/1.1 - List of Additional Clauses, Tables and Figures

Clause No.	Title

Table 0/1.2 - Additional Clauses And Tables

Clause No.	Title and written text

Table 0/1.3 - List of Substitute Clauses, Tables and Figures

Clause No.	Title and written text

Table 0/1.4 - List of Cancelled Clauses, Tables and Figures

Clause No.	Title and written text

APPENDIX 0/2: Contract-Specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Contract

Table 0/2.1 - List of Altered Clauses

Clause / Table / Figure No.	Title
117	Traffic Safety and Management

Table 0/2.2 - Alterations to Clauses

Clause No.	Alterations to be made
117	Traffic Safety and Management Insert at end of sub-clause 1: <i>"and Chapter 8 (Temporary Traffic Measures and Signs for Roadworks) of the Department of Transport Traffic Signs Manual."</i>

APPENDIX 0/3: List of Numbered Appendices Referred to in the Specification and Included in the Contract

This Appendix 0/3 comprises a list of the Numbered Appendices referred to in the Specification and included in this Contract.

Responsibility for the compilation/completion of the appendices is indicated by the following symbols:

E	Employer compiles
C	Contractor to compile and submit to the Employer's Representative
E/C	Employer partially compiles and Contractor completes and submits to the Employer's Representative
T/C	Tenderer compiles and returns with his Tender. Post award of the Contract the Contractor reviews and submits to the Employer's Representative.
(P)	The symbol 'P' indicates the appendix is a national pro-forma and the format must not be altered

Where a Contractor or Tenderer is required to compile or complete an Appendix, the Contractor or Tenderer shall do so in accordance with the GSW, and providing information similar to that stated in the sample appendices as a minimum.

Appendix 0/3 is comprised of two lists, A and B, of Numbered Appendices as follows.

List 'A' is a list of the Numbered Appendices referred to in the SPW with those not adopted marked 'Not Used'. Those identified by the letters 'T' or 'C' shall be compiled by the Tenderer or the Contractor respectively.

List 'B' gives a list of Contract – specific Numbered Appendices devised for this Contract.

Table 0/3.1 - List of Numbered Appendices – List A

Compiled/ Completed By	Appendix No.	Title
		INTRODUCTION
E	0/1	Contract-specific Additional, Substitute and Cancelled Clauses and Tables included in the Contract
E	0/2	Contract-specific Minor Alterations to Existing Clauses and Tables included in the Contract
E	0/3	List of Numbered Appendices Referred to in the Specification and included in the Contract
E	0/4	List of drawings included in the Works Requirements
		PRELIMINARIES
Not Used	1/1	Accommodation and Equipment for The Employer's Representative
Not Used	1/2	Vehicles for the Employer's Personnel
Not Used	1/3	Communications System for the Employer's Personnel
E	1/4	Working and Fabrication Drawings
E	1/5	Testing to be carried out by the Contractor
E	1/6	Supply and Delivery of Samples to the Employer's Representative
E	1/7	Site Extent and Limitations on Use
Not Used	1/8	Operatives for the Employer's Representative
E	1/9	Control of Noise and Vibration
Not Used	1/10	Principal Structures to be Designed by the Contractor
Not Used	1/11	Structural Elements and Other Features to be Designed by the Contractor
E	1/12	Setting Out and Existing Ground Levels
Not Used	1/13	Programme of Design and Execution and Completion of the Works
Not Used	1/14	Monthly Statements
Not Used	1/15	Accommodation Works
Not Used	1/16	Privately & Publicly Owned Services & Supplies
E	1/17	Traffic Safety & Management
E	1/18	Temporary Diversions for Traffic
E	1/19	Routeing of Vehicles
Not Used	1/20	Recovery Vehicles for Breakdowns
Not Used	1/21	Information Boards
Not Used	1/22	Progress Photographs
E	1/23	Substances Hazardous to Health
E	1/24	Quality Management System
E	1/25	Product Certification Schemes
E	1/26	Irish Agreement Board Roads and Bridges Certificates

Compiled/ Completed By	Appendix No.	Title
Not Used	1/28	Archaeological Works Requirements
E	1/70	General Obligations
E	1/71	As Built Records
		SITE CLEARANCE
Not Used	2/1	List of Buildings, etc, to be Demolished
Not Used	2/2	Filling of Trenches and Pipes
E	2/3	Retention of Material Arising from Site Clearance
Not Used	2/4	Explosives and Blasting
E	2/5	Hazardous Materials
		FENCING AND ENVIRONMENTAL NOISE BARRIERS
E	3/1	Fencing, Gates and Stiles
E	3/2	Fencing: TII Publications Standard Construction Details
		ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)
Not Used	4/1	Safety Barriers
Not Used	4/2	Pedestrian Restraint Systems
Not Used	4/3	Safety Barrier Terminals
Not Used	4/4	Safety Barrier Maintenance
Not Used	4/5	Anti-Glare Screens
Not Used	4/6	Safety Barriers: TII Publications Standard Construction Details
Not Used	4/7	Vehicle Parapet Systems
		DRAINAGE AND SERVICE DUCTS
E	5/1	Drainage Requirements
Not Used	5/2	Service Duct Requirements
Not Used	5/3	Surface Water Channels and Drainage Channel Blocks
Not Used	5/4	Fin Drains and Narrow Filter Drains and Geotextiles for Filter Drains
Not Used	5/5	Combined Drainage and Kerb Systems
Not Used	5/6	Linear Drainage Channel Systems
E	5/7	Drainage and Service Ducts: TII Publications Standard Construction Details
Not Used	5/8	Thermoplastics Structural Wall Pipes and Fittings
Not Used	5/9	Attenuation
		EARTHWORKS
Not Used	6/1	Requirements for Acceptability & Testing of Earthworks Materials
E	6/2	Requirements for Dealing with Class U2 Unacceptable Material

Compiled/ Completed By	Appendix No.	Title
Not Used	6/3	Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction)
Not Used	6/4	Not Used
E	6/5	Geotextiles Used to Separate Earthworks Materials
Not Used	6/6	Fill to Structures & Fill Above Structural Foundations
Not Used	6/7	Sub-formation & Capping & Preparation & Surface Treatment of Formation
Not Used	6/8	Topsoiling, Grass Seeding and Turfing
Not Used	6/9	Earthwork Environmental Bunds, Landscape Areas, Screening Mounds, Strengthened Embankments
Not Used	6/10	Ground Anchorages, Crib Walling and Gabions
Not Used	6/11	Swallow Holes & Other Naturally Occurring Cavities & Disused Mine Workings
Not Used	6/12	Instrumentation & Monitoring
Not Used	6/13	Ground Improvement
		ROAD PAVEMENTS – GENERAL
E	7/1	Permitted Pavement Options
E	7/2	Excavation & Reinstatement of Existing Surfaces
Not Used	7/3	Surface Dressing Product (End Performance)
E	7/4	Bituminous Sprays
E	7/5	Road Pavements: TII Publications Standard Construction Details
Not Used	7/6	Breaking Up or Perforation of Existing Pavement
Not Used	7/7	Not Used
Not Used	7/8	Not Used
E	7/9	Cold Milling (Planing) of Bituminous Bound Flexible Pavement
Not Used	7/10	Microsurfacing
Not Used	7/11	High Friction Surfacing
Not Used	7/12	Low Energy Bound Mixtures
Not Used	7/21	Recipe Surface Dressing
		KERBS, FOOTWAYS AND PAVED AREAS
Not Used	11/1	Kerbs, Footways and Paved Areas
Not Used	11/2	Access Steps
Not Used	11/3	Kerbs, Footways and Paved Areas: TII Publications Standard Construction Details
		TRAFFIC SIGNS
E	12/1	Traffic Signs: General
E	12/2	Traffic Signs: Reflective Marker
E	12/3	Traffic Signs: Road Markings & Studs

Compiled/ Completed By	Appendix No.	Title
Not Used	12/4	Traffic Signs: Cones, Cylinders, FTD's & Other Traffic Delineators
Not Used	12/5	Traffic Signs: Traffic Signals
Not Used	12/6	Traffic Signs: Special Sign Requirements on Gantries
Not Used	12/7	Traffic Signals: Preparation and Finish of Metal and other Surfaces
		ROAD LIGHTING COLUMNS AND BRACKETS
Not Used	13/1	Information to be Provided by the Designer for the Road Lighting Works when Specifying Lighting Columns and Brackets
Not Used	13/2	Column & Bracket Data Sheets 1 & 2
Not Used	13/3	Instructions for Completion of Column and Bracket Data Sheet
Not Used	13/4	Certification for Lighting Columns
Not Used	13/5	Road Lighting Columns and Brackets: NRA Road Construction Details
		ELECTRICAL WORK FOR ROAD LIGHTING AND TRAFFIC SIGNS
Not Used	14/1	Site Records
Not Used	14/2	Location of Lighting Units and Feeder Pillars
Not Used	14/3	Temporary Lighting
Not Used	14/4	Electrical Equipment for Road Lighting
Not Used	14/5	Electrical Equipment for Traffic Signs
Not Used	14/6	Preparation and Finish of Metal and Other Surfaces
		MOTORWAY COMMUNICATIONS
Not Used	15/1	Motorway Communications
		PILING AND EMBEDDED RETAINING WALLS
Not Used	16/1	General Requirements for Piling and Embedded Retaining Walls
Not Used	16/2	Precast Reinforced and Prestressed Concrete Piles and Precast Reinforced Concrete Segmental Piles
Not Used	16/3	Bored Cast-in-Place Piles
Not Used	16/4	Bored Piles Constructed Using Continuous Flight Augers and Concrete or Grout Injection Through Hollow Auger Stems
Not Used	16/5	Driven Cast-in-Place Piles
Not Used	16/6	Steel Bearing Piles
Not Used	16/7	Reduction of Friction on Piles
Not Used	16/8	Non-Destructive Methods for Testing Piles
Not Used	16/9	Static Testing of Piles
Not Used	16/10	Diaphragm Walls

Compiled/ Completed By	Appendix No.	Title
Not Used	16/11	Hard/Hard Secant Pile Walls
Not Used	16/12	Hard/Soft Secant Pile Walls
Not Used	16/13	Contiguous Bored Pile Walls
Not Used	16/14	King Post Walls
Not Used	16/15	Steel Sheet Piles
Not Used	16/16	Integrity Testing of Wall Elements
Not Used	16/17	Instrumentation for Piles and Embedded Walls
Not Used	16/18	Support Fluid
		STRUCTURAL CONCRETE
Not Used	17/1	Concrete – Classification of Mixes
Not Used	17/2	Concrete – Impregnation and Coating Schedule
Not Used	17/3	Concrete – Surface Finishes
Not Used	17/4	Concrete – General
		STRUCTURAL STEELWORK
Not Used	18/1	Requirements for Structural Steelwork
		PROTECTION OF STEELWORK AGAINST CONCRETE
Not Used	19/1	(Specification for Road Works) Sheet No. Form BE/P1 (New Works) Paint System Sheet
Not Used	19/2	(New Works) Requirements for Other Work
Not Used	19/3	(Specification for Road Works) Form BE/P2 Paint Data Sheet
Not Used	19/3	(Specification for Road Works) Form BE/P3 Paint Sample Despatch List: Sheet 1
Not Used	19/3	(Specification for Road Works) Form BE/P3 Paint Sample Despatch List: Sheet 2
Not Used	19/4	(New Works) General Requirements
Not Used	19/5	(Specification for Road Works) Form BE/P1 (Maintenance) Paint System Sheet 1
Not Used	19/6	(Specification for Road Works) Form BE/P1 (Maintenance) Paint System Sheet 2
Not Used	19/7	(Maintenance) Requirements for Other Work
Not Used	19/8	(Maintenance) General Requirements
		WATERPROOFING FOR CONCRETE STRUCTURES
Not Used	20/1	Form PWS Proprietary Waterproofing Systems Data Sheet (1991 & Annex 'A')
Not Used	20/2	Waterproofing for Concrete Structures
		BRIDGE BEARINGS
Not Used	21/1	Bridge Bearing Schedule
		BRIDGE EXPANSION JOINTS AND SEALING OF GAPS
Not Used	23/1	Bridge Deck Expansion Joint Schedule

Compiled/ Completed By	Appendix No.	Title
Not Used	23/2	Sealing of Gaps Schedule (other than in Bridge Deck Expansion Joints)
		BRICKWORK, BLOCKWORK AND STONWORK
Not Used	24/1	Brickwork, Blockwork and Stonework
Not Used	24/2	Brickwork, Blockwork and Stonework: NRA Road Construction Details
		SPECIAL STRUCTURES
Not Used	25/1	Requirements for Corrugated Steel Buried Structures
Not Used	25/2	Requirements for Reinforced Soil and Anchored Earth Structures
Not Used	25/3	Requirements for Reinforced Clay Brickwork Retaining Walls of Pocket Type and Grouted Cavity Construction Structures
		MISCELLANEOUS
Not Used	26/1	Ancillary Concrete
Not Used	26/2	Bedding Mortar
Not Used	26/3	Cored Thermoplastic Node Markers
		REQUIREMENTS FOR WATERMAINS
Not Used	27/1	Requirements for Watermains
Not Used	27/2	Watermains: TII Publications Standard Construction Details
		TRENCHLESS INSTALLATION OF ROAD DRAINAGE & SERVICE DUCTS
Not Used	28/1	Trenchless and Minimum Dig Techniques
		CCTV SURVEY OF ROAD DRAINAGE SYSTEMS
Not Used	29/1	CCTV Survey of Road Drainage Systems

Table 0/3.2 – List of Numbered Appendices – List B

Compiled/ Completed By	Appendix No.	Title
		PRELIMINARIES
Not Used	1/70	General Obligations
Not Used	1/71	As-Built Records
		LANDSCAPING
Not Used	30/1	Landscaping, Planting and Ecology

APPENDIX 0/4: List of Drawings Included in the Works Requirements

Table 0/4.1 – List of Contract-Specific Drawings Supplied to Each Tenderer

Drawing Number(s)	Title

Standard TII SCD Drawings: All the TII Standard Construction Details contain the following drawings are brought into the Contract by reference.

APPENDIX 1/4: Working and Fabrication Drawings

1. Whenever required by the Contract, the Contractor shall supply calculations, test reports, data sheets, etc. in support of his detailed working and fabrication drawings to the Employer's Representative. Such documents shall remain the property of the Employer's Representative.
2. The Contractor shall submit three copies of all relevant documents to the Employer's Representative at least two weeks in advance of the date on which the Contractor proposes to commence such Works.
3. Drawings shall be to an appropriate scale and in sufficient detail to enable the Employer's Representative to assess the Contractor's works proposals.
4. The Contractor shall provide the following working and/or fabrication drawings to the Employer's Representative:

Table 1/4.1 – Working and/or Fabrication Drawings to be Provided by the Contractor

Series	Description of Work
100	Traffic Management Proposals as required by the Contract

APPENDIX 1/5: Testing To Be Carried Out By The Contractor

1. The scope of the testing covered in Table 1/5.1 for the Works 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. In addition to the scope of testing outlined in Table 1/5.1, the Contractor shall also satisfy all testing requirements outlined elsewhere in the Works Requirements, in particular those included in the following Appendices:
 - Appendix 1/24;
 - Appendix 5/1;
 - Appendix 12/3;
3. Table 1/5.1 on the following pages gives the minimum frequency of testing to be carried out by the Contractor to demonstrate compliance with the Works Requirements. Testing shall be carried out immediately after sampling and results shall be passed to the ER upon completion of testing.
4. Additional testing shall be carried out by the Contractor as and when instructed by the ER. A Driver/Laboratory Operative shall be made available to the ER when and as required for the purposes of additional testing.

The person proposed by the Contractor shall be competent in ability to be trained as a sampling operative. The ability of the nominee to carry out sampling duties will be subject to assessment by the ER.

5. Tests carried out by the Contractor to demonstrate compliance with the Works Requirements shall be carried out by a laboratory approved by the ER.
6. (IL) indicates that an Irish Laboratory Accreditation Board (ILAB) test report or certificate shall be required. (IAB) indicates that an Irish Agreement Board Certificate or British Agreement Board Certificate shall be required.
7. Unless otherwise shown in this Appendix 1/5 of the Works Requirements, tests and certificates for work, goods or materials as scheduled under one clause are required for all such work, goods or materials in the Works.

Table 1/5.1 – Testing to be Carried out by the Contractor

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)		
308	Gates and Stiles					Quality management scheme applies
		Reinforced concrete posts	Cover to reinforcement	1 per consignment (maximum 1 per 100 components) (BS 3470)		
311	Preservation of timber		Moisture content	As required in sub-Clause 311.2	Required for each batch	Quality management scheme applies
Series 500						
501	Pipes for drainage and service ducts					
	Vitrified clay					Product Certification Scheme applies
	Concrete – PC/SRC	Not exceeding 900mm dia			[See Note B]	
	Concrete- Pre- stressed					
	Iron – Cast					
	Iron Ductile				[See Note B]	
501	UPVC					

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	Plastics (see Table 5/1)	(Manufacturer's tests)		Required (AASHTO)	
	Corrugated steel				
	Corrugated steel bitumen protection				
	Concrete PC/SRC exceeding 900mm dia	(Manufacturer's tests)	As per Clause 509.10	Required	
	Other materials			Required	
503	Pipe bedding				
		Grading and fines content (Washing and sieving method to be used)	1 per week(min of 3)	Required	
		Water Soluble Sulphate (WS) content (IN)	5 per source		
		Resistance to fragmentation (IL)	1 per source		
505	Filter medium backfill				
		Plastic index (IL)	1 per source	Required	
		Grading and fines content (Washing and sieving method to be used)	1 per 500 tonnes		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Water Soluble Sulphate (WS) content (IL)	5 per source		
		Resistance to fragmentation (IL)	1 per source		
506	Sealing existing drains				
	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				
	Cast iron and steel				
509	Water tightness of joints	Air test		Required	
512	Backfill to pipe bays	Grading	1 per 50 tonnes (min of 3)		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Water Soluble Sulphate (WS) content (IL)	5 per source		
513	Permeable backing to earth retaining structures				
	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
	Granular fill	Plastic Index (IL)	1 per source	Required	
		Resistance to fragmentation (IL)			
		Water soluble sulphate (WS) content (IL)	5 per source	Required	
		Oxidisable sulphides (OS) content and total potential sulphate (TPS) content (IL)	1 per week (min of 3)		
		Grading and fines content			
		Permeability (IL)	1 per source		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
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	

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600						
601	Acceptable material					
631 to 633	Class	General				
635 to 637		Description				
640	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		
			Optimum moisture content (2.5kg rammer) (IL)	4 tests per source at locations to be agreed with the ER		
		1A3	Effective angle of friction (ϕ') and effective cohesion (c')	Source approval and 1 test per 1000m³ for each source (min of 1 test per week)	Required	
		1A3	Slake Durability (IL)	1 test per 1,000m³ for each source	Required	
		1A3 and 1C	LA Coefficient (IL)	1 test per 1,000m³ for each source (min of 2 total per source)	Required	
601	2	General cohesive fill	Grading	1 test per 1,000m³ for each source with maximum of three per day	Required	
631 to 633			Plastic Limit	1 test per 1,000m³ for each source	Required	
635 to 637			MC	1 test per 500m³ for each source	Required	
640						
(Cont'd)						

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			MCV	1 test per 500m ³ for each source	Required	
			Optimum Moisture Content (2.5kg rammer) (IL)	1 test per each class of material and each source		
	4	Landscape Fill	Grading	1 test per 2,000m ³ for each source		
			MC (IL)	1 test per 2,000m ³ for each source		
			MCV (IL)	1 test per 1,000m ³ for each source		
	5	Topsoil	Grading	1 test per 500m ³ for each source (min of 1 per day during topsoiling works)		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
601	6 Selected granular fill (Class 6A, 6B & 6C) (Class 6C only) (Class 6A & 6C only) (Class 6F1, 6F2 & 6F3) (Class 6G)				
631 to 633		Grading	1 test per 1,000m ³ for each source	Required	
635 to 637		Uniformity Coefficient	1 test per 1,000m ³ for each source		
640		Plastic Limit (IL)	1 test per 2,000m ³ for each source		
(Cont'd)		LA Coefficient (IL)	1 test per 1,000m ³ for each source (min. of 2 total per source)		
		Moisture Content	1 test per 2,000m ³ for each source	Required	
		Optimum Moisture Content (vibratory hammer) (IL)	4 tests per source at locations to be agreed with ER	Required	
		Slake Durability (IL)	1 test per 1,000m ³ for each source (min of 2 total per source)	Required	
		Grading	1 test per 500m ³ for each source		
		Optimum MC (vibrating hammer) (IL)	1 test per 500m ³ for each source		
		MC	1 test per 500m ³ for each source		
		LA Coefficient (IL)	1 test per 1,000m ³ for each		
		Slake Durability (IL)	1 test per 1,000m ³ for each		
		Total Sulfur Content (IL)	1 test per source (source		
		Class RA (asphalt) content (IL)	2 per source		
		Bitumen Content (IL)	2 per source		
601	(Class 6G)	Grading	1 test per 250m ³ for each source (min. of 2 total per source)		
631 to 633		LA Coefficient (IL)	1 test per 500m ³ for each source (min of 1 total per source)		
635 to 637		Grading	1 test per 200m ³ for each source		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
640 (Cont'd)		(Class 6H only)	Plastic Limit (IL)	1 test per 500m ³ for each source		
			LA Coefficient (IL)	1 test per 200m ³ for each source		
			MC (IL)	1 test per 200m ³ for each source		
			MCV (IL)	As required		
			pH Value (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Chloride Ion Content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Oxidisable 25eflector (IL)	Source approval and 1 test per 500m ³ 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)		
601		(Class 6H only)	Microbial Activity (IL)	1 test per source (source approval)		
631 to 633			Slake durability (IL)	1 test per 500m ³ for each source		
635 to 637		(Class 6I & 6J only)	Grading	1 test per 200m ³ for each source		
640 (Cont'd)			Uniformity Coefficient	1 test per 500m ³ for each source		
			MC (IL)	1 test per 200m ³ for each source		
			MCV (IL)	As required		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)			Effective Angle of Internal Friction and Effective Cohesion (IL)	1 test per 200m ³ for each source (min of 1 test per week)		
			Coefficient of friction and adhesion (IL)	1 test per source (source approval)		
			pH Value (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Chloride Ion Content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Oxidisable 26eflector (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Resistivity (IL)	1 test per source (source approval)		
		(Class 6I & 6J only)	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 5200m ³ for each source		
			Slake Durability (IL)	1 test per 500m ³ for each source		
		(Class 6K, 6L & 6M)	Grading	1 test per 500m ³ for each source		
			Liquid and Plastic Limit (IL)	1 test per 500m ³ for each source		
			Resistivity (IL)	1 test per source (source approval)		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)			Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Oxidisable 27eflector (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Chloride Ion Content (IL)	Source approval and 1 test per 500m ³ for each source		
			pH Value (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
		(Class 6K, 6L & 6M)	LA Coefficient (IL)	1 test per 200m ³ for each source (min of 1 total per source)		
			Slake Durability (IL)	1 test per 500m ³ for each source		
			Uniformity Coefficient	1 test per 500m ³ for each source		
			Optimum MC (IL)	1 test per 200m ³ for each source		
			MC (IL)	1 test per 200m ³ for each source		
			MCV (IL)	As required		
		(Class 6N1, 6N2 & 6P)	Grading	1 test per 200m ³ for each source		pH, Water soluble sulfate content and Oxidisable sulphide testing to be undertaken on Class 1A and Class 6A when material placed within 500mm of steel structures (backfill to RW02 Sheet Pile Wall and associated tie rods, walers etc)
			LA Coefficient (IL)	1 test per 200m ³ for each source		
			Undrained Shear Strength (IL)	As Required		
			Effective Angle of Internal Friction and Effective Cohesion	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
			Permeability (IL)	Source approval and 1 test per 500m ³ for each source		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments			
601 631 to 633 635 to 637 640 (Cont'd)			MC	1 test per 200m ³ for each source					
			MCV (IL)	As required					
			pH Value (IL)	Source approval and 1 test per 500m ³ for each source					
		(Class 6N1, 6N2 & 6P)	Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)					
			Oxidisable 28reflector (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)					
			Slope Stability (IL)	Source approval and 1 test per 500m ³ for each source as required by EP					
			Slake Durability (IL)	1 test per 200m ³ for each source					
			(Class 6Q)	Testing and frequency as per Class 1 Material with the addition of the following:					Clause 601.11 and 601.12 may require increased frequencies of testing at certain locations
				Water soluble sulfate content (IL)	1 test per 200m ³ for each source (min of 1 total per source)				
		Oxidisable 28reflector (IL)		Source approval and 1 test per 500m ³ for each source (min of 1 test per week)					
		Chloride Ion Content (IL)		1 test per 200m ³ for each source (min of 1 total per source)					
		pH Value (IL)		1 test per 200m ³ for each source (min of 1 total per source)					
		(Class 6W)	Testing and frequency as per Class 6H Material with the addition of the following:						
			Effective Angle of Internal Friction and Effective Cohesion (IL)	1 test per 200m ³ for each source (min of 1 test per week)					

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)	7	Cohesive material (Class 7H)	Testing and frequency as per Class 2 materials with the addition of the following:			
			Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source		
			Oxidisable 29eflector (IL)	Source approval and 1 test per 500m ³ for each source		
			Chloride Ion Content (IL)	Source approval and 1 test per 500m ³ for each source		
			pH Value (IL)	Source approval and 1 test per 500m ³ for each source		
	8	Miscellaneous fill	MC	Source approval and 1 test per 500m ³ for each source		
			MCV (IL)	Source approval and 1 test per 500m ³ for each source		
601.11 & 601.12	Fill adjacent to cementitious materials or metallic contents		Water soluble sulfate content (IL)	1 test per 250m ³ (min of 5 tests per location)		
			Oxidisable 29eflector (IL)	1 test per 250m ³ (min of 5 tests per location)		
602.20	Material within 350mm of designed final surface or road or		Frost Heave (IL)	1 test per 5,000m ³ (min of 1 total per source)		
609	Geotextiles Used to Separate Earthworks Materials		Durability	1 test per source/supplier		Refer to Appendices 6/5 and 6/9 for acceptability criteria
			Tensile Strength & Tensile Strength at 5% Elongation	1 test per 500m ² (min of 1 test per source/supplier)		
			CBR Puncture Resistance	1 test per 500m ² (min of 1 test per source/supplier)		
			Permeability	1 test per 500m ² (min of 1 test per source/supplier)		
			Characteristic Pore Opening Size (O ₉₀) & Flow Rate	1 test per 500m ² (min of 1 test per source/supplier)		
612	Compaction of Fill Material	Method Compaction	Field Dry Density (IL)	1 test per 10,000m ³		The test will be carried out under the direction of the ER
			Optimum MC (IL)	1 test per each class of material per each source per week (Review after 8 weeks)		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
		End Product Compaction	Field dry density (IL)	1 test per 250m ³		
			Optimum MC (IL)	1 test per each class of material per each source per week (Review after 8 weeks)		
613	Sub-formation		Plate bearing tests	100m longitudinal centres alternating between running lanes in a pattern to be agreed		
			Shallow Inspection Pit	1 pit every 25m along the edge of sub-formation		
			Grading	One test per shallow inspection pit as per Appendix 6/7 Point 16		Only applicable to certain ground conditions and design CBR values. Refer to Appendix 6/7 Point 16
			Undrained Shear Strength	20m grid spacing		Geonor H-60 Hand Vane or equivalent
614	Lime and Cement Improvement – U1		Water soluble sulfate content	Source Approval		
			Organic Content	Source Approval		
			Rate of Spread	1 per 500m ²		
			Pulverisation	1 per 500m ²		
			Grading of quicklime	Source Approval		
616	Preparation and surface treatment of formation		Plate bearing tests	50m longitudinal centres alternating between running lanes in a pattern to be accepted by the ER		100% proof rolling and inspection required by ER
618	Topsoiling and grass seeding		Rate of spread of fertiliser	1 test per 1,000m ²		
			Rate of spread of seeding	1 test per 1,000m ²		
			Chemical analysis of fertiliser	1 per source		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Grass seed germination and purity (Manufacturer's test)	1 per source and mix variety	Required prior to sowing	
621	Geogrids & Geocomposites – Strengthen Embankments for access tracks in soft ground areas	Radial Secant Stiffness at 0.5% Strain	1 test per 500m ² (min of 1 test per source / supplier)		Refer to Appendices 6/5 and 6/9 for acceptability criteria
		Radial Secant Stiffness Ratio	1 test per 500m ² (min of 1 test per source / supplier)		
		Hexagon Pitch	1 test per 500m ² (min of 1 test per source / supplier)		
		Static Puncture Resistance (CBR Test)	1 test per 500m ² (min of 1 test per source / supplier)		
		Durability	1 test per source/supplier		
642	Earthworks materials adjacent to structures	Constrained soil modulus (M*)	3 on each side of each structure		
601.2	Class U1 Material	Waste Acceptance Criteria (WAC) Testing	1 test per 400m ³ , where disposal off site required. Minimum one test per source	Required	WAC testing in accordance with Waste Management Acts and Regulations, 1996 to 2014 to categorise for disposal to appropriate licensed receptor
601.3	Class U2 Material	Waste Acceptance Criteria (WAC) Testing	1 test per 25m ³ , minimum one test per location encountered	Required	WAC testing in accordance with Waste Management Acts and Regulations, 1996 to 2014 to categorise for disposal to appropriate licensed receptor
Series 800					
	Unbound mixtures placed within 500mm of cement bound materials, concrete pavements, structures or	Water soluble sulfate (WS) content (IL)	1 per 200m ³ for each source (min of 5 total per source)	Required	
		Oxidisable 31eflector (OS) content (IL)	1 per 200m ³ 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 200m ³ for each source (min of 5 total per source)		
		Oxidisable 31eflector (OS) content (IL)	1 per 200m ³ 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		
		Flakiness index (IL)	1 per week		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
801		Los Angeles	2 per source		
802		Methylene Blue (IL)	1 per week		
804		Water absorption			
801		Magnesium Sulphate Soundness (IL))	1 per source	Required	
802					
804					
805					
806					
807	Types A, B, C & D granular material	OMC (IL)	2 per source		
		Moisture Content	1 per 1,000 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 source		
	Type C granular material	Percentage of crushed or broken particles and of totally rounded particles in coarse aggregates			
	Type A granular material				
		Plasticity index (IL)	1 per week		
	Cement Bound Mixtures	Water soluble sulfate (WS) content (IL)	1 per 200m³ for each source (min of 5 total per source)	Required	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
810		Oxidisable 33eflector (OS) content (IL)	1 per 200m ³ for each source (min of 5 total per source)		
821		Tests for control and checking of HBM	Tests specified in Table		
822		Coefficient of linear expansion (IL)	[As required]		
823		Tests for laboratory mixture design	As specified in Clause 826		
824					
Series 900					
2.2	Constituent materials				
3	Bond and tack coats	Requirements per Table 15	As per Type Test Report applicable to the Contract	Required	Constituent materials include aggregate, binder, fillers, additives, 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 Series 900 of the Specification.
4	Bituminous mixtures	Requirements as per Tables 1, 2, 4, 5, 7, 8, 10, 11 & 14	As per Type Test Report applicable to the Contract		
5	Aggregates for Surface Courses – Bituminous Mixtures	Friction After Polishing Test (IS EN 12697-49)	1 test per property per source (source approval)		
6	Surface dressing	Requirements per Tables 15, 17 & 18	As per Type Test Report applicable to the Contract		
7.2	Surface Dressing – Aggregate	Friction After Polishing Test (IS EN 12697-49)	1 test per property per source (source approval)		
7.3	High friction surfacing – binders	Requirements per Table 23a	1 test per property per source (source approval)		
8.1	High friction surfacing – manufactured aggregates	Requirements per Table 23b			
8.4	High friction surfacing – natural aggregates	Requirements per Table 23c			
8.6					
9					

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	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		
3	Product Composition				
4					
5					
6	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.
8.1		Binder Content (IL)			
					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

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
					enable subsequent results to be compared.
	Low energy bound mixtures	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 results to be compared.
		Binder Content (IL)			
8.4 8.6	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)		
9	Works				
10	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 lane	Required	Cores taken from the wheel tracks.

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		Water Sensitivity (IL)	1 per Contract		A minimum of three pairs of cores shall be taken.
	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	Required	Cores centred 100mm from the final joint position.
					A minimum of three pairs of cores shall be taken.
		In situ air void content air refusal (IL)	1 pair of cores every 1,000 linear metres laid per lane		Cores taken from the wheel tracks.
		Resistance to permanent deformation (IL)			A minimum of three pairs of cores shall be taken.
	Stiffness (IL)	1 pair of cores per site between 3,000m² up to 10,000m², 1 pair of cores per 10,000m² thereafter			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	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 3737reflect.37r length of material from each source; 1 core from each subsequent lane kilometre	Required	
		Rate of Spread of Chippings for shoulder-to-shoulder cover	At Contract start		Refer to Series 900 for requirements regarding minimum test coverage
		Rate of Spread of Chippings for mechanical chipping spreader	1 per 100m or 1 per day		Refer to Series 900 for requirements regarding minimum test coverage
		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 lane kilometre	Required	
	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 lane kilometre		
	Bituminous mixtures – Porous Asphalt surface course specific	Relative hydraulic conductivity (IL)	Every 1,000 linear metres laid per lane and fraction thereof	Required	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	Bond and Tack Coat	Rate of spread of binder	1 every 20,000 square metres or 1 every 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)				

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
		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
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	
Series 1200					
1202	Permanent traffic signs			Required	Certification that the traffic sign is capable of passing the tests in "Certification Scheme, Specification, and Guidance for the Construction of Traffic Signs- TS4" and the specified parts of BS 873 is required.
1209	Holding down bolts and anchorages to bases of permanent bollards			Required	Certification that the holding down bolts and anchorages are capable of complying with the performance requirements of BS 873: Par 3 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.

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1217	Retroreflecting road studs	Test specified in the Standard/ Specification given in CI 1217		Required	Quality management and product certification schemes apply
1213	Permanent traffic cones and traffic cylinders			Required	Certification that permanent traffic cones and cylinders have been tested and comply with BS
	Flat traffic delineators	Tests specified in BS 873: Part 8	2 of each size and category/type	Required	Certification that FTD's have been tested and comply with Clause 1213 is required
		Tests specified in			Not required
	Other Traffic Delineators				
		Tests specified in Appendix 12/4			
	Temporary cones, cylinders, FTD's and other delineators			Required	Certification that at least 1 in 500 of any batch of cones, cylinders, FTD's and other delineators to be used in Temporary Works have passed the tests in Clause 1213 as appropriate is required.
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 12620)	

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			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)			
		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)	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
	Bars			Required (BS 6744)	
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	Each load		Site control tests
2604	Plastic coating to fencing posts, gates and ancillaries	Impact test Adhesion Retention of adhesion Salt spray Accelerated		Required (BS 1722-16)	Records of all tests to be available for inspection

Notes to Table 1/5.1:

1. Tests comparable to those specified in this Appendix shall be necessary for any equivalent work, goods or materials proposed by the Contractor (refer to sub-Clause 105.4 of the Specification).
2. (IL) indicates that an Irish Laboratory Accreditation Board (ILAB) test report or certificate shall be required. IAB indicates that an Irish Agreement Board Certificate, or British Agreement Board Certificate shall be required.
3. Unless otherwise shown in this Appendix 1/5 of the Works Requirements, tests for work, goods or materials as scheduled under one clause are required for all such work, goods or materials in the Works.
4. Unless otherwise shown in this Appendix 1/5 of the Works Requirements, test certificates for work, goods or materials as scheduled under any one Clause shall be required for all such work, goods or materials in the execution and completion of the Works.
5. Where testing for CBR is specified, an appropriate alternative test described in DN-PAV-03021 may be employed subject to acceptance by the ER. Appropriate correlation testing shall be undertaken to demonstrate suitability of the alternative test.
6. Where the frequency of testing is specified per time period (e.g. daily, weekly) and the intensity of work is such that significant volumes of material are being used in construction then, at the discretion of the ER, the frequency of testing per time period may be varied to a test per volume/tonnage. The test per volume / tonnage rate will be selected by the ER based on providing a reasonable coverage of test results to allow material acceptability to be satisfactorily assessed.
7. Subgrade formations shall be inspected visually by the Contractor and where it is not clear that a minimum undrained shear strength of 40kPa (50 kPa beneath the Steepened 1V:1.5H embankments) can be achieved from visual inspections the shear strength shall be measured by a Geonor H-60 shear vane or similar equipment. The size of the vane should be modified depending on the strength of the soil.
8. In-situ CBR or plate bearing tests on sub-formation and formation shall follow Figures 1/5.1 and 1/5.2 respectively. In-situ CBR and plate bearing test frequency in subgrade formation can be increased over those shown in Figures 1/5.1 and 1/5.2 at the discretion of the ER, particularly for locations where ground conditions are observed to vary within short distances.
9. Where sub-formation and formation levels coincide, testing is to be carried out at the formation frequency.
10. Plate bearing tests to prove formation to structural (culvert) foundations shall be carried out following the testing methodology in Appendix 6/6. A minimum frequency of 1 plate bearing test per 25m² of foundation shall be carried out. This testing frequency applied to tests in both sub-grade formation and in the Class 6N2 upfill. Where directed by the ER additional PBT shall be carried out.

11. For Slake Durability and LA Coefficient tests, results from the same source may be used for a number of different materials. For example, separate tests are not required for Class 6F2 / Class 1C / Class 6N etc. from the same source material.

Figure 1/5.1: CBR/Plate bearing test on sub-formation

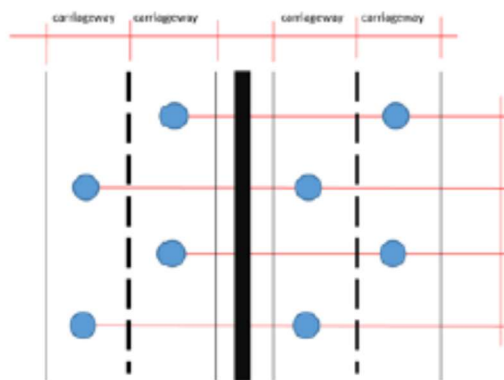
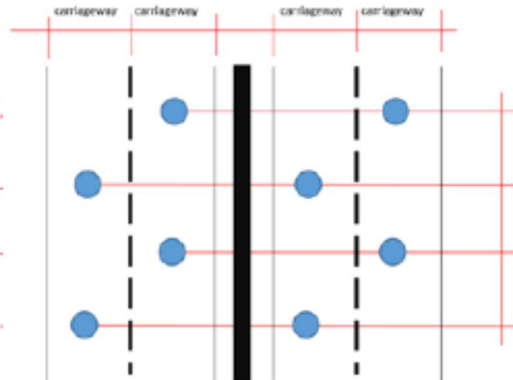


Figure 1/5.2:

CBR/Plate bearing test on formation



● CBR/ Plate bearing test on formation (Clause 616)

APPENDIX 1/6: Supply and Delivery of Samples to the Employer's Representative

1. Samples comparable to those specified in this Appendix shall be necessary for any equivalent work, goods or materials proposed by the Contractor (Refer to sub-Clause 105.6 of the Specification).
2. Unless otherwise shown in this Appendix 1/6 samples of work, goods or materials schedule under any one Clause are required for all such works, goods or materials in the Works.
3. These samples shall be in addition to those taken and tested by the Contractor in accordance with Clause 105.2 of the Specification.
4. The Employer's Representative will provide comment within 10 working days.
5. Any work executed prior to approval is done solely at the Contractor's risk, no additional costs will be entertained in this respect.
6. Samples are to be provided or made available by the Contractor for testing by the Employer's Representative, as listed in Table 1/6.1 below;

Table 1/6.1 – Samples to be Provided to the Employer's Representative

Specification, Series or Clause	Sample Description	Frequency of Sampling	Delivery Location	Comments
600 series	Samples of earthwork materials including 6F1, 6F2, 6F2A	Weekly	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier
800 series	Samples of road pavement unbound materials	1 per 500 tonnes or minimum of 2 per week	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier
900 series	Samples of bituminous mixtures	1 per 500 tonnes or minimum of 2 per week	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier
1216	Thermoplastic Marking Material	Up to 100kg	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier
1216.3	Glass Beads	Up to 50kg	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier
1217	Road Studs	Up to 10 No. of each type	Employer's Representative's Site Office	ER to be notified of changes to batches, supplier

APPENDIX 1/7: Site Extent and Limitations on Use

1. Extent of the Site

- 1.1. Subject to the other provisions of the Contract, the extent of the Site shall include:
 - (i) Area Provided by the Employer specific to each job/works package under this framework;
 - (ii) Any further land acquired by or conveyed to the Employer (from any person, including the Contractor) from time to time for the purposes of the execution and completion of the Works;
 - (iii) Further lands designated as Public Road as per the Roads Act 1993, beyond the extent of the lands described in (i) and (ii) above which shall be required to facilitate utility diversions and to provide Traffic Signs, Road Markings and Road Studs and the like;
 - (iv) Lands owned or occupied by third parties where such lands are permitted to be accessed by such third parties to execute and complete Accommodation Works
 - (v) Areas required for the installation, alteration and removal of plant for statutory or other bodies. The use of these areas will be limited by the terms of the way-leaves acquired by the statutory or other bodies for execution of the works.
- 1.2. In addition, and subject to the agreement of the Local Authority and written consent of the Employer's Representative, the extent of the Site shall include areas required for local traffic control measures by the Contractor in compliance with Clauses 117 and 118 of the Specification, as and when necessary.
- 1.3. The Contractor shall be responsible for providing lands for site compounds and any temporary site facilities.

2. Limitations On The Use Of The Site

- 2.1 Unless otherwise agreed with the Employer's Representative, the Contractor shall, at all times, maintain access for all property owners and maintain access to business premises and public buildings for the general public affected by the permanent or temporary works during the course of the Works.
- 2.2 The Contractor is limited in the use of access routes by means of public roads to the site as stated in Appendix 1/19.
- 2.3 The Site shall be used solely for the execution and completion of the Works including the correction of Defects in the Works.
- 2.4 The Contractor's attention is drawn to Appendix 1/9 of the Works Requirements concerning limitations on noise and vibration. The normal working hours shall be Monday to Friday between 07:00 and 20:00 hours, with no working on Saturdays and Sundays and public holidays. For work in urban areas, working hours may be restricted and all working hours shall be agreed with the Employers Representative. Exceptionally, the Employer's Representative's

consent for work outside these hours may be given after necessary consultation and written approval. A minimum of seven days' notice shall be required from the Contractor when seeking such consent.

- 2.5 Works other than the pumping out of excavations, security and emergency works shall not be undertaken outside normal working hours without the written permission of the Employer. The Contractor will not commence the work until written permission is received from the Employer's Representative. Said permission may be withdrawn at any time.
- 2.6 The Contractor shall not use areas of land with a temporary right of access, for any purpose other than the execution and completion of the Works including correction of Defects.
- 2.7 The Contractor shall ensure that all areas of land, which have been temporarily occupied, shall be reinstated to the satisfaction of the affected landowner, occupier and the relevant Authorities, Utilities, Service Providers and Private Utility Services and other such entities.
- 2.8 On occasions when overtime and shift work is permitted, the hauling of spoil and delivery of materials outside normal working hours shall be prohibited and the noise limits outlined in the table in Appendix 1/9 of the Works Requirements shall apply.
- 2.9 The Contractor shall note and have regard to the presence of other contractors on parts of and adjacent to the Site.
- 2.10 The Contractor's attention is drawn to other Works Requirements concerning site constraints and restrictions. The Contractor shall be aware that third parties shall be operating within the extent of the Site and that those areas within this Appendix 1/7 shall not be for the sole use of the Contractor.
- 2.11 The Contractor's use of the Site shall be limited to the constraints and restrictions contained within this Appendix 1/7, Appendix 1/17, Appendix 1/18 and Appendix 1/19 of the Works Requirements.
- 2.12 Prior to entering parcels of land not acquired in their entirety, the Contractor shall erect suitable fencing (either permanent or temporary), at his own cost taking into account adjacent land usage, to maintain site security and to exclude the general public.
- 2.13 When carrying out Accommodation Works on land not provided by the Employer, the Contractor shall minimise the area of land occupied to that which is essential for the safe execution and completion of such part of the Works.
- 2.14 Accommodation Works and other Works to lands outside the boundary walls and fences shall be executed and completed as soon as possible so that inconvenience to the property owner shall be minimised.
- 2.15 No Site accommodation shall be erected on such lands or close to entrances to such lands unless agreed otherwise in writing by the landowner.

- 2.16 Access for pedestrians, cyclists and vehicular traffic shall be maintained to all properties affected by the Works. Should pedestrian, cyclist and vehicular traffic be diverted then adequate signing shall be in place.
- 2.17 Where the execution and completion of the Works affects lands and property the Contractor shall provide suitable temporary access having regard to the use of the lands and property.
- 2.18 Clearance of vegetation is not permitted during bird breeding season of 1st March to 31st August in accordance with the Wildlife (Amendment) Act.
- 2.19 The Contractor shall allow for supervision of demolition or survey prior to demolition of potential bat roost locations by a suitably qualified bat specialist.
- 2.20 The Contractor shall ensure that temporary facilities, parked vehicles and plant, stockpiled material and the like are not situated within the Site area so as to adversely affect users of the public roadway or adjacent land users or businesses.
- 2.21 The Contractor shall abide by the requirements of An Garda Síochana at all times and in particular shall comply with their requirements relating to traffic management.
- 2.22 The Employer shall be entitled to enter upon the Works or any part thereof with or without plant or equipment without conditions before the Date for Substantial Completion of the Works for purposes of the delivery and storage of plant or equipment required in connection with the Works.

3. Licenses

- 3.1. The disposal of unacceptable/surplus material must be to properly licensed tips in accordance with planning, waste and all other relevant legislation.
- 3.2. It is the responsibility of the Contractor to obtain all licenses, permits, permissions etc. required and to allow for these in the programme.

4. Additional Particular Limitations on use of Certain Lands

- 4.1. The Contractor must give a minimum of 72 hours advance notice to property owners where scheduled works have the effect of removing or limiting access to properties. A written record of this advance notice must be provided to the Employer's Representative prior to commencement of these works.

5. Public Safety

- 5.1. The Contractor shall be responsible for complying with all statutory requirements with respect to public safety for all works in connection with this Contract. The Contractor's particular attention is drawn to the requirements of the Safety, Health and Welfare (at Work) Act 2005 (as amended and enacted) and the Safety, Health and Welfare at Work (Construction) Regulations 2013 (and amendments thereto).

- 5.2. The Contractor shall allow for taking all necessary precautions to protect members of the public in general who may venture near to or within the Site boundary.
- 5.3. The Contractor shall submit to the Employer's Representative prior to commencement of the Works, for his comment, proposals for complying with these requirements.
- 5.4. The Contractor shall take all necessary precautions to prevent trespassers onto the Site.
- 5.5. The Contractor shall notify the Employer's Representative of the person delegated with the responsibility for Site safety.

APPENDIX 1/9: Control of Noise and Vibration

1. Noise Control

- 1.1 Tipperary County Council has informally agreed that the following measures would be appropriate and these are given as a guide; however, it's 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.
- 1.2 The Contractor shall comply with the current national guidelines as specified in The National Roads Authority Guidelines for the Treatment of Noise and Vibration in National Road Schemes (Revision 1, 25th October 2004). The Contractor shall comply with the contents and recommendations of BS 5228: Code of Practice for Noise and Vibration Control on Construction and Open Sites together with the specific requirements of this Appendix 1/9. Further to Clause 109 of the Specification, the Contractor's attention is particularly drawn to sections 5, 8 and 10 of the British Standard. Notwithstanding the above, the Contractor shall refer to CIRIA Project Report 70, to minimise noise.
- 1.3 Without prejudice to the Contractor's obligations under the preceding paragraph the Contractor shall comply in particular with the following requirements:
 - (a) All vehicles and mechanical equipment shall be maintained in good and efficient working order and shall be fitted with effective exhaust silencers.
 - (b) Machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum. Generators, or any other plant, shall not be left running / operational after hours unless in an emergency, and agreed with the Employer's Representative.
 - (c) Where practicable, plant with directional noise characteristics shall be positioned to minimise noise at adjacent properties.
 - (d) Static machines shall be sited as far away as practicable from inhabited buildings.
 - (e) Where it is necessary to provide power for the running of traffic signals, pumps etc., at any time outside normal working hours, then the sources of such power shall be from mains electricity except if the Employer's

Representative agrees in writing that alternative plant may be used, after consultation with Tipperary County Council.

- (f) Good relations with people living and working in the vicinity of the roadworks are important. People who are likely to be affected by the noise shall be informed, by letter drop or other appropriate means, of any works to be carried out outside normal working hours.

Notification of the public shall take place at least one week prior to the commencement of Site works.

- (g) The Contractor shall organise his operations with regard to the positioning of plant and the location of haul routes etc., so that it minimises construction noise to adjacent properties.
- (h) The period referred to as 'night' for the purposes of the Contract shall be from 19:00 hours to 07:00 hours.

- 1.4 The normal working hours within the Site shall be Monday to Friday between 07:00 and 20:00 hours, with no working Saturdays or on Sundays or on public holidays.

Exceptionally, the Employer's Representative's consent for work outside these hours may be given (in agreement with Tipperary County Council) after any necessary consultation. Five working days' notice is required from the Contractor when seeking such consent. For work in urban areas, working hours may be restricted and all working hours shall be agreed with the Employers Representative.

- 1.5 All Contractor's machinery and equipment used on the Works shall be the quietest of its type for carrying out the work required and shall be maintained in good condition with regard to minimising noise output. All Contractor's machinery and equipment shall be operated and maintained in accordance with the manufacturer's written recommendations including the use and maintenance of any specific noise reduction measures. The Contractor shall organise his operations with regard to the positioning of machinery and equipment and the location of haul routes, so as to minimise noise impacts on adjacent properties.

- 1.6 All compressors shall be "sound reduced" models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines shall be in use and all ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended in writing by the manufacturers. Pumps and mechanical static plant shall be enclosed by acoustic sheds or screens where directed by

the Employer's Representative. Machines in intermittent use shall be shut down in the periods between works or throttled down to a minimum. The Contractor shall remove from the Site any item of Contractor's Things, which in the opinion of the Employer's Representative shall be ineffectively silenced.

- 1.7 The noise levels (refer to note (i) of Schedule 1/9) scheduled for periods outside the normal working hours shall only be permitted when written consent has been given by the Employer's Representative to exceptional working under the other provisions of this Contract.
- 1.8 The maximum sound level shall not exceed the level given in Schedule 1/9.

Schedule 1/9 - Total Noise Levels

Schedule		Maximum Permissible Noise Levels during works	
Period	Hours	Activity Noise level, $L_{Aeq,1hour}$: dB	Maximum Sound Level: L_{Amax} dB(A) (See Note (iv))
Monday to Friday	0700 – 1900	70	80
Monday to Friday	1900 – 2200*	60	65
Saturdays	0800 – 1630	65	75
Sundays and Public Holidays	0900 – 1600*	60	65
All unattended plant outside the above working hours		60	65
Night time working		50	55

Notes to Schedule 1/9:

- (i) Noise levels relate to free field conditions. Where noise monitoring locations shall be located 1 metre from the

façade of buildings, the permitted noise levels may be increased by 3dB(A).

- (ii) The ambient noise level L_{Aeq} , shall be the total L_{Aeq} from all the noise sources in the vicinity over the specified period.
- (iii) The existing ambient noise level L_{Aeq} , shall be the total L_{Aeq} from all the noise sources in the vicinity over the specified period prior to the commencement of the execution of the Works.
- (iv) Maximum sound level shall be the highest value indicated on a sound level meter which meets the requirements of IEC 61672.

*Construction activity at these times, other than that required in respect of emergency works, will normally require the explicit permission of the Employer's Representative.

- 1.9 Provided that the Contractor has taken all reasonable steps to comply with the noise and vibrational requirements given in this Appendix 1/9, in exceptional circumstances the Contractor may be given permission to execute Works, which exceed the noise levels in Schedule 1/9, provided that 5 days written notice of the date of timing of such Works to the satisfaction of the Employer's Representative shall be given to the Employer's Representative and the Contractor demonstrates that he intends to take all reasonable measures to mitigate the noise nuisance to third parties. After consultations with the Employer a decision shall be given in writing within 3 days of receipt of such notice.
- 1.10 Works other than pumping out excavations, security and emergency works shall not normally be permitted at night and on Saturdays or Sundays and on Public Holidays. Exceptionally, the Employer's Representative's consent for work outside these hours may be given after any necessary consultations. Seven days' notice is required from the Contractor when seeking such consent. This consent will include the highest permissible construction noise limit (s) applicable for the work. The Contractor shall monitor construction noise level (s) and demonstrate compliance with the limits in accordance with Schedule 1/9.
- 1.11 Any plant such as generators or pumps, which are required to work outside of 07:00 – 19:00 hours, will be surrounded by an acoustic enclosure to the satisfaction of the Employer's Representative which shall restrict the noise levels to those indicated in the Schedule 1/9.

- 1.12 The TII guidelines provide indicative noise levels that are considered to be typically acceptable, though more stringent limits are appropriate where pre-construction noise levels are low. Limits are suggested for both the 1-hour "A" weighted equivalent continuous noise level ($L_{Aeq,1hr}$) and for the maximum noise level (L_{Amax}). While limits are suggested for evening working and for working daytimes on Saturdays or Sundays and Bank Holidays the explicit permission of the Employer shall be required before non-emergency works are conducted at these times.
- 1.13 The Contractor shall furnish such information as may be required by the Employer in relation to noise levels emitted by plant or equipment used or installed on the Site or which the Contractor intends to use or install on the Site and also afford all reasonable facilities to enable the Employer to carry out such site noise-monitoring as may be necessary.
- 1.14 The Employer's Representative shall have the right to order the Contractor to cease using any item of plant insufficiently silenced or generating noise levels in excess of those specified.
- 1.15 Compliance with these conditions and the other requirements of the Contract will not of itself constitute any grounds for defence against any proceedings, whereby any occupier of premises may complain to a Court of law of a noise nuisance.

2. Control of Mud and Dust

- 2.1 Access/egress points onto the public roads shall be kept free from dust and mud. Laying hardcore and the installation of wheel washers or other necessary means shall be implemented by the Contractor in order to minimise dust nuisance.
- 2.2 The Contractor shall provide, use, maintain and keep available plant and equipment necessary to minimise the formation and accumulation of dust arising from the works, normally in dry weather conditions.
- 2.3 Additionally, the Contractor shall at his own cost be in a position to provide portable dust monitoring equipment as well as experienced operative personnel to record dust concentrations when required by the Employer's Representative for the duration of the Contract.

- 2.4 The Contractor shall take all measures necessary to prevent spillage onto public roads adjoining the Site and all roads forming part of the Site. The Contractor shall, using wheel washing equipment or other methods as approved by the Employer's Representative, prevent mud from the site being carried onto any surface or facilities in use by the public.

In the event of mud or site material being deposited on a public road surface, the Contractor shall take all necessary steps to ensure the roads are cleaned immediately using road vacuum sweepers, or similar methods to be approved by the Employer's Representative, without adversely affecting public traffic.

- 2.5 The Contractor shall provide, use, maintain and keep available plant and equipment necessary to minimise the need for stock piling material on-site.
- 2.6 Vehicle speeds shall be restricted on site and vehicles must be sheeted to prevent the release of material during their journey.

3. General Requirements

- 3.1 The Local Authority responsible for environmental matters is:

Tipperary County Council
Civic Offices
Emmet St.
Clonmel
Co. Tipperary

- 3.2 Notwithstanding the above, the Contractor shall comply with the following general requirements.
- 3.3 Explosives shall only be permitted for use on this Contract with the agreement of the Employer.
- 3.4 The Contractor shall be liable for and shall indemnify the Employer against any expense, liability, loss, claim or proceedings whatsoever in respect of damage, noise, vibration, fumes, dust, smoke and other nuisance and any alleged nuisance or any negligence on the part of the Contractor arising out of or in the course of or by reason of the carrying out of the Works.
- 3.5 The Contractor shall take all reasonable precautions to prevent operatives, including those employed by sub-contractors, from trespassing on adjacent property.

- 3.6 Should the Contractor wish, or is required, to make use of adjoining land or property, he shall serve notices, obtain written permission, pay any fees or charges the cost of which is to be included within the Contractors offer, subsequently clear away and make good any damage to the satisfaction of the Employer.
- 3.7 The Contractor shall take all necessary precautions to minimise any disturbance, inconvenience or nuisance to the occupiers and users of neighbouring properties and to the public generally and allow for executing any noisy or offensive operations at such times and in such a manner as not to cause unnecessary inconvenience.
- 3.8 If in the opinion of the Employer any of the arrangements, etc. for control of noise, fumes, pollution and all other statutory obligations are inadequate the Employer reserves the right to arrange the necessary remedial action and to set off such costs against monies due to the Contractor.
- 3.9 The Contractor shall take all necessary precautions to avoid excessive electromagnetic disturbance of apparatus outside the Site.
- 3.10 The Contractor must ensure that all electrical equipment and plant is suppressed so as to cause no unacceptable electrical or other interference to surrounding properties.

APPENDIX 1/12: Setting Out and Existing Ground Levels

1. Specific Requirements for Setting Out

- 1.1. The Contractor shall accurately, truly and properly set out the Works and be responsible for the correctness of the positions, levels, dimensions and alignment of all parts of the Works and shall provide all necessary instruments, appliances, materials, equipment and labour in connection therewith. The Contractor shall ensure the careful protection and reservation of all benchmarks, sight-rails, pegs and other things used in setting out the Works.
- 1.2. Before work begins on Site, the Contractor shall obtain approval for his proposed methods of setting out and dimensional measurements for the construction that will satisfy the accuracies required by the Specification.
- 1.3. The Contractor shall verify the existing alignments at tie-in points and notify the Employer's Representative of any discrepancy.
- 1.4. The Contractor shall set out the Works by reference to Ordinance Survey Datum (Malin Head). Horizontal alignment shall be determined in accordance with Ordinance Survey Irish Transverse Mercator co-ordinates.
- 1.5. The Contractor shall not destroy any Permanent Ground Marker (PGM) or Permanent Bench Mark (PBM) until a replacement subsidiary permanent control marker has been established in a position agreed with the Employer's Representative.
- 1.6. Where the Contractor establishes subsidiary permanent control markers, such markers shall be of a substantial type and construction, to the satisfaction of the Employer's Representative. A schedule of all such subsidiary markers, detailing colour coding or any other distinguishing features shall be supplied to the Employer's Representative.
- 1.7. When survey ground markers, reference pegs or Works bench marks lie outside the limits of the Area Provided for the Works, the Contractor shall make all arrangements with the landowners and occupiers for entry and maintenance and shall pay fees in that connection. Upon completion of the Works or when directed by the Employer's Representative, the Contractor shall remove such markers, pegs and bench marks and reinstate the ground to the satisfaction of the Employer's Representative.
- 1.8. Running chainages shall be clearly indicated at regular intervals not greater than 50m by a method approved by the Employer's Representative. These chainage markers shall

be maintained during construction of the Works, and shall be co-ordinated with and shall be continuous with the centre lines of adjacent Contracts and the Contractor shall, subject to the satisfaction of the Employer's Representative, make any adjustments necessary to achieve this requirement.

- 1.9. Level pegs or pins, profile boards and batter rails established to control the level of the Works, shall be of types approved by the Employer's Representative and shall be located in positions agreed by the Employer's Representative.
- 1.10. Where the precise information as to line and level of drainage works is not indicated on the drawings, the position of the Centre line and levels of such works shall be agreed on site with the Employer's Representative before such works are commenced.
- 1.11. The Contractor shall, as soon as is practicable, supply the Employer's Representative with records in an approved form relating to all control station reference pegs and works bench marks and shall keep such records up-to-date by formal notice to the Employer's Representative.
- 1.12. The Contractor shall after notifying the Employer's Representative afford him two working days to check the Contractor's setting out of any portion of the Works in advance of commencement of construction. Such checking shall be entirely at the discretion of the Employer's Representative. Any reduction in this timing is to be agreed in advance with the Employer's Representative.
- 1.13. The Contractor shall establish an approved site datum and horizontal reference grid on which all subsequent setting out and measurements on the Site shall be based.
- 1.14. All survey reference stations shall be carefully preserved except where construction requires their removal. Before such removal substitute stations shall be established by the Contractor to the satisfaction of the Employer's Representative.
- 1.15. The Contractor shall ensure that where necessary, in order to maintain his Programme, lines and level of any necessary parts of the Works are set out in such time as to enable Statutory Undertakings plant and other publicly or privately owned services or supplies to be installed, altered or removed.
- 1.16. Permanent markings for setting out shall not be applied to surfaces that will be retained at the end of the Contract.
- 1.17. When the Contractor is required to remove items and subsequently replace them a detailed survey shall be carried out prior to removal of the items. As a minimum the survey shall record sufficient data in 3 dimensions to accurately re-

establish the items in their original position and orientation.

- 1.18. The Contractor at the end of the project shall produce as-built information correct to Ordnance Survey Irish National Grid coordinates. The validity of the revised coordinates of the ground markers defining the master traverse shall be proved from Ordnance Survey Trigonometrical Stations of at least 3rd order.

2. Accuracy

- 2.1. The Contractor shall ensure when setting out that he complies with all requirements for special accuracy and critical dimensions shown on drawings or otherwise specified. Where work is not otherwise specified the Contractor must not exceed the tolerances in BS 5606.
- 2.2. The Contractor shall ensure that appropriate methods are employed to identify the accuracy of measurements to be made in verifying the Works.
- 2.3. The Contractor shall use appropriate instruments and methods and monitoring and control procedures to ensure that specified standards of accuracy are obtained, and provide systematic checking as the work proceeds to ensure that the adopted methods, materials, monitoring and control procedures are adequate. All equipment utilised by the Contractor and/or Consultants shall have a valid relationship to a recognised measurement control standard.
- 2.4. The Contractor shall take corrective action in respect of work not complying with the standard of accuracy or tolerances specified, including rectification of work already carried out, adjustment of methods or materials used, increased supervision of identified source of inaccuracy. When any adjustment of design and/or details may be required the Contractor shall immediately notify the Employer's Representative.
- 2.5. The Contractor shall, wherever satisfactory accuracy, fit and/or appearance of the work are likely to be critical or difficult to achieve, obtain consent to proposals or to the appearance of the relevant aspects of the partially finished work as soon as possible.

3. Appearance and Fit

- 3.1. The Contractor shall ensure that tolerances of components or finished work do not exceed the maximum deviations in size, position or shape stated in the Contract Documents; check dimensions of components on delivery to site and inform the Employer's Representative of any departure from specified tolerances; adjust the positions of components and/or the size of joints within their respective specified limits so that adverse results caused by an accumulation of

individual acceptance tolerances is avoided; if notwithstanding such adjustments adverse effects cannot be avoided, immediately inform the Employer's Representative and request his instructions. Such instructions by the Employer's Representative shall be deemed not to be a Change Order.

- 3.2. The Contractor shall arrange the setting out, erection and juxtaposition of components and application of finishes so that there is a satisfactory fit at junctions, there are no practically or visually unacceptable changes in plane, line or level and that the finished work has a true and regular appearance.

4. Markings for Setting Out Purposes

- 4.1. The colour white shall be used for all paint markings used for setting out purposes put down by the Contractor.
- 4.2. Marking out for the purposes of Statutory Undertakers shall be carried out using the colours in Table 1/12.2 below.

Table 1/12.2 – Marking Out Colours for Statutory Undertakers

Authority	Paint Colour	Letter Code
Water	Blue	W
Electricity	Red	E
Telecom	Silver Grey	T
Gas	Yellow	G
Broadband/Cable TV	Green	V

Definitions:

- a. Traffic Management System: A traffic management system is the method chosen to direct traffic through or around the Site to facilitate construction of the Works.
- b. Traffic Management Operation: A traffic management operation consists of those activities necessary to assemble, maintain, alter or remove a traffic management system.
- c. Traffic Management Equipment: Traffic management equipment consists of all signs and their covers, cones, cylinders, studs, barriers, TVCB's, road markings and lights, including their support and fixings and any cabling, piping, joints, connectors, gas/electric supply, weighting down and any other thing required for any traffic management system.
- d. Carriageway Occupation: Carriageway occupation is the period of time from the start of placing the first cone on the carriageway at the commencement of a taper within a traffic management system to the time of removal of the last cone from the carriageway when removing the taper of a traffic management system.
- e. Safety Zone]
Works Area] As defined in Chapter 8 of the TSM
Working Space]
- f. Works Traffic: Vehicles or items of plant that are required within the Works Area for the purposes of carrying out the Works.

- 1.1 The carrying out of the works which form part of the works packages issued under this framework necessitates the setting up, maintenance, alteration and removal of Traffic Safety and Management measures. The Contractor shall be responsible for the planning, design, implementation, maintenance and removal of traffic safety and management measures required in order to facilitate and complete the Works. Site specific traffic management restrictions may be issued for each specific work package.
- 1.2 The Contractor shall comply at all times with the requirements of Chapter 8 of the Department of Transport Traffic Signs Manual, and the Guidance for the Control and Management of Traffic at Road Works prepared by the Local Government Management Services Board and any additional requirements detailed in the TII Publications (Standards).
- 1.3 The Contractor shall only use lightweight water filled barriers or concrete barriers as barriers within the Temporary Traffic Management phases implemented, unless otherwise agreed

to in writing by the Employer's Representative.

- 1.4 The Contractor shall supply details and layout drawings of his proposed traffic safety and management measures to Tipperary County Council, a minimum of 2 weeks prior to the commencement of these works to allow the relevant roads authority time to review the measures. The Contractor shall advise, liaise and agree details of his traffic management proposals with Tipperary County Council Roads Area Engineer.
- 1.5 The Contractor shall, within three weeks before the commencement of the execution of each of the traffic management phases of the works, give to the Employer's Representative detailed traffic management plans showing the sequence of execution, within the programme constraints. The traffic management plans shall include the following information as a minimum:
 - (1) Phasing of the works;
 - (2) Drawings showing the traffic management layout, including:
 - a. Geometric Design
 - b. Width of Lanes
 - c. Working Areas
 - d. Safety Zones
 - e. Access and exit locations for construction vehicles
 - f. Barriers
 - g. Signing
 - h. Road markings
 - i. Temporary lighting
 - j. Provision for pedestrians
 - k. Provision for emergency services
 - l. Timing of operations.
 - m. Road lighting.
- 1.6 Drawings showing the Contractor's Traffic Management Plan shall be to a scale not less than 1/1000, supplemented by drawings at 1/500 scales as necessary, or as required by the Employer's Representative.
- 1.7 The Contractor's traffic management proposals shall take account of the work area required for paving and the location of construction joints.
- 1.8 The public road shall remain open to traffic for the duration of the Works. Full road closure of the public road is not permitted, unless there are no other acceptable alternatives

and with consideration of the contents of Section 9 of this Appendix 1/17. Single lane shuttle systems will generally be permitted at locations to facilitate the Works.

- 1.9 A temporary road closure for public roads shall only be permitted in circumstances where the Contractor can demonstrate to the Employer's Representative that such a public road closure is absolutely necessary for the execution of the Works and in accordance with a risk assessment report.
- 1.10 The Contractor shall be subject to the full statutory procedures outlined in the Temporary Closing of Roads Regulations for closure of public roads. The period of closure of the public road shall be the minimum to facilitate construction of the Works. All applications relating to road closures of public roads, lane occupations, signs or signals must be submitted to the Employer's Representative in writing for agreement.
- 1.11 The details required shall include reasons for closure of the public road start date and time, duration of closure of the public road and alternative routes. The Contractor shall supply, erect and maintain all signs, lighting and barriers to affect the closure of the public road and any necessary diversionary routes to the satisfaction of the Employer's Representative and Tipperary County Council.
- 1.12 The Contractor shall supply, erect and subsequently remove information signs informing the public of the proposed road closures of public roads at least 20 working days in advance of the proposed closure date of the public road. These information signs shall state the closure date of the public road and be erected in locations to be approved by the Employer's Representative and comply with the requirements of Clause 117 of the Specification.
- 1.13 All necessary traffic safety precautions shall be undertaken by the Contractor to ensure the safety of all traffic and pedestrians using the existing roads adjacent to the Site and connecting minor roads during the execution and completion of the Works, and all precautions shall be taken to minimise disruption to the local residents. The Contractor shall maintain access at all times to land and property affected by or adjacent to the Works. The Contractor shall pay particular attention to farm and business premises adjacent to the Site.
- 1.14 The Contractor shall provide, maintain and finally remove all necessary temporary gates, stiles, ramps and any similar items and shall provide temporary crossings of trenches and other obstructions. Where the Contractor has to maintain these ways across the Site they shall be maintained at existing ground level and fenced on both sides with

temporary fencing.

Where it is necessary to have gaps, the Contractor shall ensure that gaps in the fencing for Site traffic shall be gated with the gates giving priority to non-Site traffic. During working hours, the Contractor shall ensure that the crossings are manned such that Site traffic can use the crossing without prejudicing the security of the crossing.

- 1.15 The Contractor shall ensure that no item of plant, goods or equipment (including stores or offices) shall be placed or parked on the public roadway or its verges in a manner which shall / may result in danger to the personnel on the Site or members of the public, or which shall / may restrict sight distances on all accesses to the Site or on public roads.
- 1.16 The Contractor shall be responsible for the maintenance of all public roads, Site access roads and temporary diversions within the Site until issue of the Certificate of Substantial Completion. The Contractor shall constantly monitor the public roads while any Lane and/or Carriageway Occupations are in force during the execution of the Works. Any defects identified shall be rectified immediately to the satisfaction of the Employer's Representative.
- 1.17 The Contractor shall keep a daily record of all defects, the times when they were identified or reported to him, the action taken to correct the defects, and the times when they were successfully corrected. A copy of this record shall be forwarded to the Employer's Representative on the following day, until the completion of those Works requiring the Lane or Carriageway Occupation.
- 1.18 The Contractor shall provide and maintain access to all existing properties adjacent to the Works.
- 1.19 In the event of a traffic accident occurring adjacent to any of the Works, the Contractor shall immediately contact the Gardaí and the Employers Representative informing them of the following:
 - (1) Location of the accident
 - (2) The seriousness of the accident and whether any persons are trapped, whether the collision involves vehicles carrying inflammable, corrosive or hazardous substances, whether there is a possibility of ignition from leaking fuel or chemicals.
- 1.20 Liaison with Traffic Gardaí shall be through the nearest Garda station to the works as advised by the Employer's Representative.

- 1.21 The Contractor shall provide telephone numbers of a minimum of 3 employees who can be contacted by the Gardaí and/or Employer's Representative, both during and outside normal working hours, and who shall be responsible for initiating whatever action shall reasonably be required in the event of an emergency.
- 1.22 The Contractor shall liaise with all businesses/organisations, land owners and residents affected by the Works.
- 1.23 All drivers including those delivering plant and materials must be given clear instructions regarding the traffic arrangements applicable at any particular time.
- 1.24 The Contractor shall be responsible for maintaining the running traffic carriageway and any pedestrian routes adjacent to the Works in a clean and safe condition at all times.
- 1.25 The Contractor shall assist the Gardaí in moving wide/abnormal loads through the Works by modifying the signing/coning as necessary. Signs/cones so moved shall be replaced immediately the abnormal loads have passed through the Works.
- 1.26 Heavy Goods Vehicles used on Site by the Contractor, his Sub-Contractors or suppliers must be fitted with an audible reversing warning device.
- 1.27 Suitable locations shall be agreed with the Gardaí and the bus service operators for temporary bus stops where existing facilities are affected by the Works.
- 1.28 The Contractor shall inform the Tipperary County Council Roads Area Engineer, and local Traffic Information Outlets at least two weeks in advance of any planned changes to the Temporary Traffic Management Layouts.

2. Road Markings

- 2.1 During the operation of temporary traffic arrangements, the Contractor shall remove road studs and remove or obscure all road markings and signs not appropriate to the traffic movements and lane widths in operation at any time during the Contract.
- 2.2 The Contractor shall provide temporary road markings and temporary warning and information signs, appropriate to the traffic movements and lane widths in operation at all times during the Contract. Temporary road markings and temporary road signs shall be to the requirements of the Traffic Signs Manual published by the Department of Transport. Temporary signs, erected in advance of their being required to direct traffic movements, shall be covered prior to being required to direct and control traffic

movements. Temporary road signs and markings shall remain in position only insofar as they are appropriate to the traffic movements currently operating. The Contractor shall ensure that additional signs are available on site to deal with additional requirements resulting from lane blockages.

3. Traffic Cones, Traffic Cylinders and Lamps

- 3.1 Traffic cones and cylinders shall conform to the requirements of BS EN 13422. All cones which are to be used for traffic management purposes shall be in accordance with the Traffic Signs Manual.
- 3.2 The Contractor shall clean all cones and cylinders as required and at least daily and replace all reflective sleeves monthly.
- 3.3 Road danger lamps shall conform to the requirements of BS EN 12352. They shall show an amber flashing light and be cleaned daily. Batteries and bulbs shall be checked weekly and replaced as required.

4. Traffic Safety and Control Officer

- 4.1 The Contractor shall appoint a Traffic Safety and Control Officer in accordance with Clause 117 of the Specification. The principal Traffic Safety and Control Officer, or one of his deputies, shall be available at any time of the day or night and shall be in a position to put into immediate effect any traffic measures considered necessary by the Employer's Representative or Garda Síochána to ensure the safety of the public. The Traffic Safety and Control Officer shall be entirely responsible for:
 - (i) Liaison with the Employer's Representative, Tipperary County Council and the Garda Síochána in all matters relating to traffic management,
 - (ii) the management of traffic during periods when traffic restrictions are necessary, and ensuring that all traffic management requirements are met,
 - (iii) immediately notifying the Garda Síochána of any accidents or emergencies,
 - (iv) ensuring the safe working of plant, machinery and personnel, and ensuring that all personnel engaged on the Works are aware of the Contractor's obligations and duties in respect of site safety when working on or adjacent to a live carriageway,
 - (v) notifying the Employer's Representative of any deterioration in traffic management equipment and trafficked road surfaces,
 - (vi) submitting to the Employer's Representative weekly information sheets detailing all traffic management operations, traffic incidents, breakdowns and removal of broken down or damaged vehicles occurring within the Site.

5. Traffic Management Co-ordination Meetings

- 5.1 Prior to the implementation of any traffic management scheme or at intervals as required by the Employer's

Representative, meetings shall be held consisting of representatives of the following organisations:

- Tipperary County Council;
- The Garda Síochána;
- The Employer's Representative;
- The Contractor (Traffic Safety and Control Officer);
- Other interested parties may also attend should the Employer's Representative deem it necessary.

6. Maintenance Requirements

- 6.1 The Contractor shall supply, erect and maintain all signs and barriers to effect the closure and any necessary diversion routes to the satisfaction of the Employer's Representative.
- 6.2 The Contractor shall maintain arrangements whereby he can quickly call out personnel outside the normal working hours to carry out work needed for an emergency. The Employer's Representative shall be provided with a list of names, addresses and telephone numbers of the Contractor's staff who are responsible for the organising of emergency work.
- 6.3 In the event of an accident occurring within the Site, and once broken down or damaged vehicles and debris have been removed, the Contractor shall, on the direction of the Employer's Representative, restore the road surface to its original condition, reinstate safety fencing and anchorages to the satisfaction of the Employer's Representative. The Contractor shall submit to the Employer's Representative within 48 hours fully detailed and separate records of plant, labour and materials used for restoration and reinstatement.
- 6.4 The Contractor shall ensure that all signs, cones, barriers, delineators and bollards used in connection with the Works shall be cleaned regularly, at intervals not greater than twenty-four hours. The Contractor shall ensure that all reflective patches and sleeves on cones or other delineators are replaced at intervals of not greater than 28 days, or as necessary.

7. Roads, Private Roads and Other Ways Affected by the Works

- 7.1 The Contractor will be required to maintain existing public roads within the Site to their previous condition before the commencement of the Contract. Roads shall be kept clean and clear of mud and debris. Road surfaces shall be maintained to a high standard and any potholes or other such defects shall be repaired by the Contractor as soon as possible after they have been brought to his attention. Winter maintenance i.e. gritting and salting of roads will be

carried out by Tipperary County Council unless they are prevented from carrying out these operations due to the nature of the works ongoing on the Site.

- 7.2 The use of any road for haul road crossing purposes is subject to the acceptance of the Employer's Representative and Tipperary County Council. No advance approval as to the use of haul road crossings has been obtained. The Contractor shall be responsible for all programming, costs and arrangements arising from any such proposal he may wish to pursue.
- 7.3 Where traffic flows are stated in the Schedule to this Appendix (predicted AADT) these are approximate and for guidance only.
- 7.4 Tipperary County Council, Civic Offices, Limerick Road, Nenagh, Co. Tipperary is the Road Authority for the Roads, including footpaths and other traffic routes described below or listed in Appendix 1/19

8. Site Vehicles, Personnel and Plant

- 8.1 No site vehicles shall exceed 30kph when travelling within the working areas of the Site, and a maximum 15kph speed limit is to be observed by site traffic adjacent to works in progress, accommodation or standing plant. Temporary site speed limit signs are to be erected as appropriate, or as directed by the Employer's Representative.
- 8.2 All heavy goods vehicles used on the Site by the Contractor including his sub-contractors and suppliers must be fitted with an audible reversing warning sign.
- 8.3 No site vehicles are permitted to drive against the normal flow or to face oncoming traffic.
- 8.4 Construction vehicles, or the vehicles of the Contractor's sub-contractors or suppliers, shall only enter or leave the working areas of the Site via approved accesses and egresses.
- 8.5 All vehicles and plant engaged in the works or entering/exiting the working areas shall have roof mounted amber flashing lamp. The lamp shall be used in the circumstances stated in sub-clause 117.14, or as instructed by the Employer's Representative, his representative or the Gardaí. Hazard warning lights shall not be used as an alternative to the roof mounted amber flashing lamp.
- 8.6 Vehicles, not engaged in the construction of the Works, which are the property of the Contractor, sub-contractors or employees shall be parked in locations dedicated by the Contractor, where they do not interfere with the Works, or obstruct any sight lines.

- 8.7 The Contractor shall arrange that all vehicles leaving a work area and entering a traffic lane shall, prior to entry, have its wheels and underbody cleaned so as to avoid mud being deposited on the public road. For this purpose, the Contractor shall employ a pressure cleaner at each Site egress. In addition, the Contractor shall employ a suction sweeper with water jets to remove mud and dirt deposited on the public road. All public roads shall be swept when mud and dirt are a hazard to traffic.
- 8.8 Notwithstanding the above, the suction sweeper shall be available full time during earthworks and drainage operations.

9. Minimum Provisions for Vehicular Traffic

- 9.1 The Contractor may be required to do a full traffic stop while laying DBM/Surface Course on sections where the required safe working widths cannot be achieved, i.e. at tie-ins and house fronts. Similarly, a full traffic stop may be required when blasting is taking place. In fulfilling this requirement, the Contractor is to ensure that Works are planned in such a manner as to ensure traffic is not held up for unnecessarily long periods of time. The duration of full traffic stops will be agreed with the Employer's Representative prior to implementation.
- 9.2 Where the existing available carriageway width is sufficient to maintain two-way traffic, the Contractor shall refer to the Traffic Signs Manual for details on requirements.
- 9.3 Where the existing available carriageway width is not sufficient to maintain two-way traffic, alternate one-way (shuttle) working will be permitted provided:
- 9.4 An optimal carriageway width shall be maintained at all times where possible. The Contractor shall refer to Traffic Signs Manual for details on the minimum requirements acceptable.
- 9.5 The minimum width shall only be considered where "follow-me" convoy vehicles are provided to assist guiding vehicles through the works during site working hours.
- 9.6 The one-way shuttle system shall be designed to operate on the basis of a maximum time delay per vehicle of 6 minutes and a maximum queue length of 35 vehicles.
- 9.7 If unacceptable traffic congestion disruption occurs or where queuing traffic affects the operation of another junction, the shuttle working is to be removed forthwith and an alternative method employed.
- 9.8 Flagmen shall be used to provide variable 'green' time commensurate with actual demand at all times during working hours. Outside working hours temporary traffic

signals may be considered, subject to a risk assessment. The Contractor's proposal together with the risk assessment shall be submitted to the Employer's Representative.

- 9.9 At all times when one-way shuttle working is in operation, a sufficient number of suitable operatives are to be in attendance solely for traffic management duties. At least one of the traffic management operatives must be a banksman dedicated to working in conjunction with drivers for unloading, lookout for overhead cables, goalposts, and such like.
- 9.10 The overall length of road subject to shuttle working shall be designed to satisfy the requirements in Appendix 1/7 and should be no greater than 500m in length, with inter-visibility (where practicable) between flagmen and traffic signals. The geometry of the road including bends and junctions shall be taken account of when planning and implementing the shuttle system.
- 9.11 The requirements in the above Clauses 9.3 to 9.8 above may be altered in line with recommendations in the Guidance for The Control and Management of Traffic at Road Works.

10. Pedestrian Traffic

- 10.1 The Contractor shall programme the works with the aim of ensuring the safety of pedestrians/cyclists at all times and keeping disruption to pedestrians/cyclists to an absolute practical minimum, and shall submit to the Employer's Representative a method statement to demonstrate how he intends to achieve that aim.

11. Variable Message Signs (VMS's)

- 11.1 The Contractor is required to have a minimum of 2 No. VMS, 1 on each approach of each section to the works, the location of which shall be agreed with the Employer's Representative. The VMS shall be in place by the Starting Date and shall be maintained in place until the Date for Substantial Completion.
- 11.2 The messages to be shown on the VMS shall be agreed with the Employer's Representative.

12. Additional Requirements

- 12.1 All modifications of existing junctions required by the Contractor's Traffic Management Plan must be completed to the satisfaction of the Employer's Representative prior to implementation of any temporary traffic diversion.
- 12.2 The road markings at modified junctions are to be reinstated to their original layout to the satisfaction of the Employer's Representative upon completion of the construction works and removal of the temporary traffic diversion.

- 12.3 The Contractor shall provide to the Employer's Representative the names and contact details of the personnel responsible for traffic management. These persons to be available outside of normal working hours to respond to emergency call outs from An Garda Síochána and Tipperary County Council.

APPENDIX 1/18: Temporary Diversions for Traffic

Temporary Diversions for Traffic Proposed by the Contractor

1. General

- 1.1 The Contractor shall be responsible for all repairs required as a result of accidental or wilful damage to a temporary diversion.
- 1.2 The Contractor shall agree all temporary diversions in advance with the Employers Representative/District Engineer:
 - (i) the temporary roadways shall be executed to an alignment and design consented to in writing by the Employer's Representative;
 - (ii) the design for all temporary roadways shall ensure that surface water shall not be allowed to pond on or immediately adjacent to any sections of the temporary diversion;
 - (iii) the standard of execution and lighting of diversions and the like shall be suitable in all respects for the class or classes of traffic using the existing carriageways;
 - (iv) suitable drainage shall be provided;
 - (v) temporary road markings, traffic signs and barriers (containment or otherwise) shall be provided as necessary;
 - (vi) temporary fencing/barriers shall be provided to separate pedestrians from vehicular traffic and pedestrian walkways shall be lit at night;
 - (vii) the minimum carriageway width for temporary diversions and temporary roads shall be as tabulated in Table 1/18.1 below;

Table 1/18.1 – Temporary Diversion Dimensions

Temporary Diversion	Width (metres)
Two Lane traffic	6.0
Single Lane traffic	3.0
Footpaths	2.0

Notes to Table 1/18.1:

- (i) Widening on bends shall be applied as necessary.
- (ii) where alternate one-way (shuttle) working of traffic shall be required, the Contractor shall provide and maintain vehicle activated electric

light traffic control signals or flagmen with Stop & Go/Téigh battens and such traffic signs as may be consented to in writing by the Employer's Representative and the relevant roads authority;

- (iii) suitable locations shall be agreed by the Gardaí and the bus service operators for temporary bus stops where existing facilities shall be / may be affected by the Works;
- (iv) the temporary road pavement shall be maintained during the execution of the Works until such time as the traffic diversion shall be no longer required;
- (v) when the diversion shall be no longer required, the diversion materials shall be removed and the area shall be reinstated to its original condition, where appropriate in accordance with the provisions of Clause 117 of the Specification; and
- (vi) notwithstanding the foregoing, the Contractor shall consult and comply with the relevant road authority regarding any additional measures that shall be required where traffic is required to run on temporary surfaces.

1.3 The Contractor shall supply details of the following for each temporary road diversion (prior to the diversion being executed):

- (i) the phasing of the execution and completion of the Works including but not limited to the remedying of Defects in the Works; and
- (ii) drawings showing the traffic management layouts including as follows:
 - (a) position of traffic signs and signals;
 - (b) width of Lanes;
 - (c) working areas;
 - (d) safety zones;
 - (e) entry and exit points from the Site and Off-Site Areas for Site vehicles, and the like; and
 - (f) facilities for pedestrians and other non-motorised users.

1.4 The Contractor shall provide and maintain access to all existing properties adjacent to the Works. Disruption to property owners' or tenant's movements and privacy shall be kept to a minimum and the Employer's Representative shall be notified in writing 5 days in advance of any operation that would result in such disruption.

- 1.5 Local businesses shall be given at least 7 working days advance notice in writing of any such diversions. Signage for local business shall be erected along diversion routes to show where access can be made.
- 1.6 Temporary lights powered by a generator shall not be permitted within 100 metres of any occupied property.

2. Notice Requirements

- 2.1 For any temporary diversion required by the Contractor the standard of diversion shall be agreed with the Employer's Representative prior to the construction of the diversion.
- 2.2 For any diversion requiring the making of statutory orders or the publication of notices, the Contractor shall allow a period of 9 weeks following the submission of a formal application through the Employer's Representative to the responsible authority for orders to be made and notices to be published.
- 2.3 All diversions shall be designed to a standard suitable for the traffic using it. Such designs shall be submitted to the Employer's Representative for his acceptance at least 14 days prior to construction of the diversion, and no work shall commence until the Employer's Representative's acceptance has been received.
- 2.4 Before proposing any temporary diversions/alterations, the Contractor shall consult with the local roads authority, the Garda Síochána, Ambulance, Fire Service, Bus Éireann, and Private Bus companies and shall then submit an outline of their requirements to the Employer's Representative for his comments.
- 2.5 All risks associated with the obtaining of such orders and notices and the like shall rest with the Contractor.

3. Details of any Constraints

- 3.1 Refer to individual works package details.

APPENDIX 1/19: Routeing of Vehicles

1 Permitted Access Routes to and from the Site

- 1.1 Access to and from the Site will be permitted only from the controlled access points, off public roads. These access points shall have advance warning signage and will be suitably wide to allow access for all vehicles in one turning movement from the public road. Under no circumstances shall queuing of delivery vehicles be permitted on public roads.
- 1.2 Access into and out of the Site shall be directly from and onto the public roadway. Suitable works access and exits shall be provided in accordance with the Traffic Signs Manual Chapter 8.
- 1.3 Vehicles leaving the Site shall be subject to the Control of Mud and Dust requirements outlined in Appendix 1/9.
- 1.4 Permitted access routes to and from the Site shall be agreed with the Employers Representative for each work package.
- 1.5 Access to and from the Site shall be by sharing road space with through traffic.
- 1.6 Site access/egress points shall be designed taking into account existing traffic volumes and anticipated type and volumes of site generated traffic.
- 1.7 Dump trucks, including articulated dump trucks engaged in material haulage are not permitted on the public road network. Importation of materials and disposal of material offsite shall only be carried out utilising tipper lorries to the satisfaction of the Employer's Representative.
- 1.8 The Contractor, his subcontractors and suppliers shall use only these Permitted Access Routes for all purposes in connection with the works (including the import of acceptable and disposal of unacceptable materials) unless otherwise agreed by the Employer's Representative
- 1.9 Should the Contractor wish to seek the Employer's Representative permission to use non-permitted routes, or to use the permitted routes for purposes other than those allowed under the Contract, it shall be the responsibility of the Contractor to first liaise as necessary with the relevant road authority, and to demonstrate to the Employer's Representative that agreement has been obtained.
- 1.10 The permitted access routes shall not be used for the transportation of earthworks materials in cut to fill operations unless offsite stockpiling has been approved by the Employer's Representative

Table 1/19.1 – Permitted Access Routes

Permitted Route	Time constraints on use
Existing public roads	As advised by the Employers Representative for each individual work package under this framework.

2 The Use of Permanent Works by Construction Traffic

- 2.1 The finished pavement forming part of the permanent works may be used to carry construction traffic only when measures approved by the Employer's Representative have been taken to protect them from damage.
- 2.2 Subject and without prejudice to the Conditions of Contract, the Contractor shall submit his proposals at least four weeks before it is proposed to use any of the pavement forming part of the permanent works to carry construction traffic. The proposal shall include supporting calculations, details of any loadings, proposed protective measures, and any other information required by the Employer's Representative in order to fully assess the proposal. The proposals shall not be implemented by the Contractor without the acceptance of the Employer's Representative.
- 2.3 The acceptance of the Employer's Representative to proposals to use pavement forming part of the permanent works for construction traffic shall not relieve the Contractor of his responsibilities under the Contract.

3 Loaded Dump Trucks

- 3.1 No licences will be issued to the Contractor on this project for loaded dump trucks on public roadways going to or from the Site as part of the Contract. All materials removed from the Site shall be by appropriately permitted vehicles/hauliers, and shall be transported to a suitably licensed site. All such documentation shall be copied to the Employer's Representative prior to the removal of any material from the Site.

4 Movement of Machinery and Plant Across Public Roads

- 4.1 The provisions for Contractor's haul route crossings of public roads detailed in this Appendix shall be read in conjunction with the requirements of Appendix 1/17.
- 4.2 The Contractor shall, where he proposes to move machinery and plant across public roads, seek the consent of the Road Authority (Tipperary County Council) and the Employer's Representative. In seeking consent, the Contractor shall submit details of the layout of the crossing, and all proposed signing, safety equipment and controls proposed.
- 4.3 At any Site haul route crossing of public or private right of way, a speed limit of 15km/h shall be enforced on the haul route within 50 metres of the crossing.
- 4.4 The Contractor shall comply with the maximum legal permissible loads for public roads in Ireland and where requested by the Employer's Representative, the Contractor shall provide evidence of compliance with regard to delivery of material to Site. The Contractor shall also prohibit the use of tracked plant on road surfaces outside of the Site unless suitably approved protective measures are taken to safeguard the integrity of the road surfaces. Pumping of water onto a public road or private property shall not be permitted. Heavy discharges to gullies and storm drains shall have silt traps incorporated in the temporary discharge arrangement. Any damage so caused shall be made good by the Contractor at his own expense.

5 The Cleaning of Permanent Works After use by Construction Traffic

- 5.1 The Contractor shall take every precaution to prevent dirt, mud or other material being dropped or spread by traffic associated with the Works on roads being part of the Works, which are made available for public use by the Contractor, whether such traffic is the Contractor's own vehicles, his sub-contractors or his suppliers or vehicles hired by any of the above. The Contractor shall clean roadways of any such dirt, mud or other materials which may be spilt or spread by traffic travelling to or from the site in connection with the works, whether such traffic belongs to the Contractor, his sub-contractors or his suppliers. The Contractor shall clean

all public roads within a distance of 500m of the Site and will employ a road suction sweeper where necessary. Such cleaning operations shall be carried out notwithstanding road cleaning work being carried out by the Employer or other Contractors to the Employer.

6 Temporary Structures for Construction Traffic Spanning Areas used by the Public

- 6.1 Any temporary structures for construction traffic proposed by the Contractor spanning areas used by the public shall be subject to the requirements of the appropriate authority. It is the responsibility of the Contractor to liaise as necessary with the authorities involved to secure acceptance for his proposals and to demonstrate to the Employer's Representative that such acceptances have been obtained prior to commencement of the relevant Site works.

7 General Use and Cleaning of Public Roads

- 7.1 Pumping of water onto a public road or private property shall not be permitted. Heavy discharges to gullies and storm drains shall have silt traps incorporated in the temporary discharge arrangement. Any damage so caused shall be made good by the Contractor at his own expense.

8 Temporary Roadways

- 8.1 The Contractor shall provide and maintain all necessary temporary roads, paths, gangways, access facilities, fire escape routes, hardstandings, etc., into or around the site for lorries, carts, barrows, etc., including any necessary excavation, building inclines, making up levels, etc., for the proper execution of the work and take up and clear away on completion or when no longer required and make good all works disturbed and leave the site clean.
- 8.2 All necessary temporary fences, gates, barriers and the like shall be provided and cleared away on completion of the Works, including making good and reinstating all work disturbed.

APPENDIX 1/23: Substances Hazardous to Health

1 General Requirements

- 1.1 All works shall be carried out in accordance with the Health and Safety at Work (Construction) Regulations 2013 and any subsequent relevant legislation.
- 1.2 The Contractor shall provide the Employer's Representative with a copy of his Safety Statement and shall revise it as necessary in light of any revised or additional obligations required by law. The statement shall include the Contractor's detailed procedures to be followed in the event of any accident including minor incidents.
- 1.3 The Contractor shall be required to provide temporary screening. This temporary screening shall protect members of the general public in close proximity to the works including motorists and other road users.
- 1.4 The screening shall be of sufficient construction to protect the public from substances potentially hazardous to health which are being used by the Contractor, or are a result of the works.
- 1.5 Once erected, the screening shall reduce the concentrations of these substances within the air to levels which are below European Union guidelines and in accordance with the 2021 Code of Practice for the Safety, Health and Welfare at Work (Chemical Agents) Regulations 2001-2021 and the Safety, Health and Welfare at Work (Carcinogens) Regulations (2001-2019). Any monitoring necessary shall be the responsibility of the Contractor.
- 1.6 The following list details materials which may require such particular precautions:
 - (a) Concrete dust
 - (b) Cement dust
 - (c) Stonework dust
 - (d) Silane/Siloxane/Coating
 - (e) Spray applied waterproofing
 - (f) Paint
 - (g) Combined waterproofing and slip wearing course
 - (h) Earthworks dust
 - (i) Asbestos fibres
- 1.7 This list is not fully comprehensive and further materials will fall within the scope of this requirement.
- 1.8 For minor cutting with hand tools a fine water spray should be used.
- 1.9 Live carriageways are to be protected from dust or spray

arising from Site clearance (or construction) which might otherwise reduce visibility.

- 1.10 The Contractor shall submit to the Employer's Representative his proposals for complying with the above requirements 14 days in advance of the use of the potentially hazardous Chemical Agent.
- 1.11 The Contractor shall take particular care in dealing with any existing asbestos material encountered during the course of the Works particularly handling/removal and disposal and shall take due account of the requirements of the following documents:
 - The Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations, 2006 – 2010;
 - HSA guidelines on material containing asbestos and HSA information sheet.
- 1.12 All work shall be carried out with due regard to the Safety, Health and Welfare at work (Construction) Regulations 2013 or any subsequent relevant legislation.
- 1.13 The Contractor shall give the Employer's Representative not less than 14 days' notice of his intention to commence work using or generating any of the materials identified in UK DMRB Departmental Advice Note SA 8/94 Use of Substances Hazardous to Health in Highway Construction. Such notice shall include details of the proposed measures to ensure that the recommendations for the protection of the public given in SA 8/94 are met. Compliance with this Appendix does not relieve the Contractor of his statutory duties to protect members of the public from exposure to substances hazardous to health.
- 1.14 The Contractor must ensure that the below prohibited materials are not to be used in connection with the project.
 - High alumina cement in structural elements.
 - Wood wool slabs in permanent formwork to concrete or in structural elements.
 - Calcium chloride in admixtures for use in reinforced concrete.
 - Materials which are controlled or transitional substances under Regulation (EC) No. 1005/2009 OJ L 286 and any materials or combination of materials which contain or use such materials in their manufacture or operation.
 - Aggregates for use in reinforced concrete which do not comply with BS EN 12620 and/or aggregates for use in concrete which do not comply with BS EN 1992-1-1+A1.
 - Silicate bricks or tiles.

- Concrete, which does not comply with the provisions of BS EN 1992-1-1+A1.
- Pitch polymer damp-proof courses in horizontal locations.
- Urea formaldehyde foam or materials which may release formaldehyde in quantities which may be hazardous with reference to the limits set at the time of incorporation by the Health & Safety Authority.
- Lead, lead paint or any material containing lead which may be ingested, inhaled or absorbed except where copper alloy fittings containing lead are specifically required in drinking water pipe work by any relevant current statutory requirements.
- Slip bricks.
- Vermiculite plaster.
- Lightweight or air entrained concrete blocks.
- Sand and gravel for use in cement based products from a source not certified as lignite free.
- Materials which are generally composed of minerals fibres either man made or naturally occurring which have a diameter of 3 microns or less and a length of 200 microns or less or which contain fibres not sealed or otherwise stabilised to ensure that fibre migration is prevented.
- Any timber treated with pentachlorophenol.
- Insulation material where chlorofluorocarbons (CFC's) are used in their manufacture or application;
- Hardwood unless taken from sources which are regulated and managed in a sustainable way.
- Any other substances not in accordance with Irish Standards and Codes of Practice and/or good practice at the time of specification and/or incorporation within the development.
- Any of the products containing Cadmium that are referred to in the Environmental Protection Agency Act.
- In addition to and separate from the foregoing banned materials any other substances or combination of substances or procedures publicised prior to the time of specification or use as the case may be in any Building Research Establishment Limited ("BRE") Publications issued as part of the BRE Professional Development Service which the BRE recommend or not use for billing purposes or the type of buildings comprised in the development or which the BRE identifies harmful to the health and safety or those constructing or using buildings of the type comprised in the Development and any products which use such substances or combination of substances or procedures in their operation.

- Asbestos or Asbestos related products as defined in the Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations 2006-2010

2 Restrictions in Relation to Traffic Management Measures

- 2.1 The Contractor shall not store or arrange unloading of any substances considered hazardous to health at or near any traffic management safety zones or systems.
- 2.2 Where any burning of road markings is to be undertaken on public roads, this shall be undertaken during off peak hours, excluding school opening and closing times in the locality.

3 Restrictions in Relation to Working Practices

- 3.1 The Contractor shall take all reasonable precautions to use substances that are not known to be hazardous to health for use in the construction of the contract. Where the use of such substances is unavoidable, the Contractor shall ensure that all employees are advised of the proper methods for use of such substances and the consequences of not following recommended use.
- 3.2 These substances shall be stored in accordance with the manufacturer's recommendations.
- 3.3 Where potentially hazardous substances are encountered during excavations or any part of the works, the Contractor should seek the advice of a specialist subcontractor regarding the identification, treatment and disposal of such substances
- 3.4 The Contractor shall ensure that all hazard sheets for materials to be used in the works are displayed prominently in the stores, and that all employees can read and understand these sheets. In any event, the Contractor shall ensure that toolbox talks address the subject of all materials to be used in the works and their potential risks.
- 3.5 Suitable PPE equipment shall be provided by the Contractor to his staff at all times.

APPENDIX 1/24: Quality Management System

The following shall be the list of accepted Quality Management Schemes referred to in Sub-Clause 104.3 and 104.4 of the Specification.

1. **Description:** **Application of Road Markings**

Certification

bodies: (to the approval of TII)

Specification: Road marking materials shall be in accordance with the 1200 Series of the Specification and shall be manufactured to comply with all of the appropriate requirements of one of the following British and Irish Standards:

BS 3262	Hot-applied thermoplastic road marking materials, Part 2: Specification for road performance;
IS EN 1436	Road marking materials. Road marking performance for road users
IS EN 1871	Road marking materials. Physical properties;
BS EN 1423	Specification for solid glass beads for use with road marking compounds and for other industrial uses.
BS EN 1790	Specification for permanent preformed road markings

BS PD 6518 Prefabricated temporary road marking materials for use at road works.

Note: 1. The manufacture of road marking materials to BS 3262, BS EN 1436, BS EN 1871 and BS EN 1790 shall be subject to product certification requirements (refer to Appendix 1/25 – Marked Schemes).

7. Description: Traffic Sign Manufacture

Certification bodies: (to the approval of TII)

Specification: Signs to TS 4 and to Series 1200 of the Specification.

8. Description: Temporary Traffic Management

Static Temporary Traffic Management on Public Roads for On-line Works Incorporating Contraflow Operations

Certification bodies: (to the approval of TII)

Specification: Traffic management shall be in accordance with the 100 Series of the Specification, the Drawings referred to in the Contract and Chapter 8 of the Traffic Signs Manual.

Note: 1. This Scheme requires training on an approved course. All traffic management operatives are required to carry a registration card indicating what types of traffic management they have been trained to carry out.

10. **Description:** **Production of Asphalt Mixes**

Certification bodies: (to the approval of TII)

Specification: The supply of asphalt shall comply with the Specification, in particular the 900 Series and the relevant Clauses of Series 1100 and the following Standards.

IS EN 13108	Bituminous Mixtures: Material Specifications
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BS 594987	Asphalt for roads and other paved areas – Specification for transport, laying, compaction and type testing protocols
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BS 598	Sampling and examination of bituminous mixtures for roads and other paved areas Part 100. Methods for sampling for analysis Part 101. Methods for preparatory treatment of samples for analysis. Part 102. Analytical test methods.
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Part 103. Method for the
recovery of soluble bitumen
for examination.

12. Description: Supply of Geotextiles

Certification bodies: (to the approval of TII)

Specification: Geotextiles shall comply with Series 600 of
the Specification.

APPENDIX 1/25: Product Certification Schemes

- The following shall be the list of accepted product certification schemes accepted in the Contract and referred to in Clauses 104.4 and 104.6 of the Specification.

Marked Schemes IIRS Product Certification Scheme
 IAB Certification Scheme
 UK Kite mark/Safety mark
 Other equivalent, to the satisfaction of the
 Employer's Representative

Table 1/25.1 – List of Accepted Product Certification Schemes

Title	Specification Series
Pipes for drainage and service ducts	500
Chambers- concrete manhole steps, covers, grates and frames	500
Gullies and pipe junctions - cast iron and steel	500
- precast concrete	
Permanent Traffic Signs	1200
Thermoplastic road marking materials	1200
Traffic delineators	1200
Temporary traffic cones and cylinders	1200

APPENDIX 1/26: Irish Agrément Board Roads and Bridges Certificates

1. The following shall be a list of types of work, goods or materials for which proprietary products shall be required to have either an Irish Agrément Board Roads Certificate or a British Board of Agrément Certificate or an appropriate equivalent certificate issued by Members of the European Union of Agrément (UEAtc):

Table 1/26.1 – Work, Goods or Materials Requiring Agrément Certificates

Description	Specification Series
Pipes for Drainage and for Service Ducts other than those listed in Tables 5/1	500
Permanent Shuttering For Road Gullies	500
Fin Drains and Constituent Materials of Edge of Pavement Drainage	500
Geotextiles used to Separate Earthworks Materials	600
Binders, Binder Modifiers And Enhanced Binders	900
Bituminous Sprays	900
Prefabricated Temporary Road Marking Material	1200
Reflecting Road Studs	1200

2. Details of products conforming to the above requirements are listed in the Index of Current Publications that may be obtained from the Publications Department, Irish Agrément Board.
3. Where types of work, goods or material for which proprietary products are required to have an Irish Agrément Board Certificate, a British Agrément Board Roads and Bridges Certificate or an appropriate equivalent certificate issued by Members of the European Union of Agrément (UEAtc) shall be acceptable.
4. Types of work, goods or material other than those listed may be required to have a British Agrément Board Roads and Bridges Certificate at the instruction of the Employer's Representative.

APPENDIX 1/70: General Obligations

Fire Precautions

1. The Contractor shall take all necessary precautions to prevent personal injury, death, and damage to the Works or other property from fire. The Contractor shall comply with the Joint Code of Practice '*Fire Prevention on Construction Sites*' published by the Building Employer's Confederation and the Loss Prevention Council.
2. A temporary fire evacuation system shall be maintained for the duration of the Works, and the Contractor shall ensure that all persons working on Site or who may have authority to visit Site from time to time are aware of this system and receive any instruction that may be appropriate.
3. Smoking shall not be permitted on the Site or within site hutting, etc., at any time.
4. Burning on Site of materials shall not be permitted.
5. The Contractor shall obtain the consent, in writing, of the Employer's Representative, before storing or using plant, equipment or materials involving risk of fire or posing any hazard to any person including third parties. The methods employed in storing or using such plant, equipment or materials, and the location of site, shall be as approved.

Prevention of Infestation

6. The Contractor shall ensure that the risk of infestation is minimised by adequate arrangements for disposal of food or other waste or materials attractive to pests. If infestation occurs the Contractor shall, at his own expense, take such action as the Employer's Representative may instruct on the advice of the relevant local authority or statutory body.
7. The Contractor is to ensure that all holes, excavation pits, manholes, drains, etc. are covered up and sealed after each

working day, including replacement of manhole covers to prevent the escape of vermin.

Disposal of bituminous waste

8. All leftover bituminous waste materials shall be disposed off-site appropriately to licenced facilities as required in line with environmental and all other relevant legislation.

Temporary Works

9. The Contractor shall be responsible for and ensure the adequacy, stability and structural integrity of the Works during the Contract, with particular regard to the erection sequence and temporary condition of the various elements of construction where different from the final design condition.
10. Temporary overloading is to be prevented during distribution and storing of materials at all times.
11. The Contractor shall provide, maintain and be responsible for designing, providing, erecting, altering, adapting and maintaining as necessary all temporary needling, shoring and strutting, etc., required for the proper protection and safety of footways, highways and all adjoining property or parts hereof during the execution of the Works.
12. All temporary supports are to be removed on completion and all work disturbed to be made good and reinstated to the satisfaction of the Employer's Representative.
13. The Contractor is to pay all fees and charges (including rates and taxes) to Statutory Authorities or other bodies for all temporary works.

APPENDIX 1/71: As-Built Records

1. As-built drawings shall be supplied to the Employer's Representative by the Contractor in both pdf and AutoCAD or other computerised format acceptable to the Employer's Representative. Three printed paper copies of each drawing shall also be provided.
2. The drawings and other information listed in the following sections of this Appendix shall be provided as appropriate to facilitate the production of the safety file for the project. The drawings and other information shall be compiled and delivered to the Employer's Representative by the Contractor on completion of the work package. The term completion in this context shall normally be the date on which the Contractor shall apply by notice to the Employer's Representative for a Certificate of Substantial Completion of the Works unless otherwise approved in writing by the Employer's Representative. The format, media and numbers of copies of the drawings and other information shall be consented to in writing with between the Employer and the Contractor. The format shall contain an index listing all drawings and other information provided with particular reference to information that shall be in other records for cross reference purposes.
3. Where the project involves alterations or additions to roads or other features outside the Area Provided by the Employer, the information appertaining to such shall be in a separate file or separately identified so that it can be passed to the "owner" of the road or feature (this would also include Accommodation Works undertaken on other than private domestic properties). In such cases it shall not be acceptable to cross-refer to other records and the file or part shall be a standalone document. This shall be particularly so for Structures where information to DN-STR-03001 of the TII Publications (Standards) shall need to be separately provided.
4. The project shall be referenced to the general road network (to meet the written requirements of the Employer) in order that it can be easily accessed and updated when future works or maintenance are undertaken.

As Built Drawings

- (1) Works Drawings
 1. General arrangement drawings referenced to the Irish Transverse Mercator Reference covering:
 - (a) horizontal alignment including land boundaries to a scale of 1:2500 or 1:1000 in urban areas and
- (2) Drainage
 1. Drawings showing the following information:

- (a) drawings showing types and locations of manholes and catchpits, including details of proprietary systems if used and gullies, gratings and frames.
- (3) Pavement
 - 1. Drawings showing the following information:
 - (a) plans giving extent of surfacing including type of materials, thicknesses and mix Design for black top pavements and details of joints/mix Design and reinforcement for concrete pavements.
- (4) Road Markings and Traffic Signs
 - 1. Drawings showing the location and details including materials, foundations lighting and power supply where applicable.
- (5) Utility Companies Equipment
 - 1. Drawings showing location, depth, size and type of equipment installed as part of the Works.
 - 2. Drawings showing location, depth, size and type of existing equipment encountered during the Works.

Execution and Completion Methods

- (1) Reference shall be made to the structural records for information, which may be relevant if a Structure has to be extensively modified, [for example where a Structure has been post tensioned].
- (2) Provide information on methods of execution where special techniques were necessary, for example dewatering or ground freezing.
- (3) Describe any significant health and safety problems not anticipated that arose during execution and the steps taken to overcome them.

Materials

- (1) Provide details of materials and products used in the execution and completion of the Work. This shall list all suppliers by name, address and material product supplied. Where products or materials are covered by the Safety, Health and Welfare at Work (Chemical Agents) Regulations – full details of the product or material specification shall be given. Where sub-contractors were responsible for operations involving the installation or application of products or materials, names and addresses shall be given. This information in respect of Structures is contained in the

structural records prepared in accordance with DN-STR-03001 of the TII Publications (Standards).

Maintenance Facilities/Procedures

- (1) Full information on maintenance facilities, procedures and manuals for Structures are available in the structural records prepared in accordance with DN-STR-03001 of the TII Publications (Standards).
- (2) A maintenance manual shall be provided for any plant, machinery or equipment forming part of the permanent Works Items which is not required as part of a Structure. The manual shall detail the methodology for comprehensive testing, routine maintenance, fault repair and testing.
- (3) Details shall be provided of any features incorporated into the project to facilitate future maintenance operations to be undertaken other than on Structures, for example access.

APPENDIX 2/3: Retention of Material Arising from Site Clearance

1. Material excavated from the Site that may be potentially reused for other elements of the construction works, shall be stored for re-use in a safe and tidy manner. Where material that is reusable for civil engineering construction works is won from the Site – concrete, gravels etc, this should ideally be used in the construction of the Site.
2. Where it is agreed between the Employer's Representative and the Contractor that the reuse of such materials is not feasible for this Contract, the Contractor shall dispose of this surplus material in compliance with the relevant legislation regarding the disposal of construction and demolition waste.
3. The Contractor's attention is drawn to the National Construction and Demolition Waste Council Website www.ncdwc.ie for information regarding the sourcing of recycled materials for use in the construction of the facility.

APPENDIX 2/5: Hazardous Materials

1. The Contractor shall make arrangements for any hazardous material to be removed from site by a specialist waste disposal contractor and disposed to an appropriately licensed facility in accordance with the Irish Waste Management Regulations. All hazardous wastes removed from the site must be adequately packaged in accordance with the requirement for transporting dangerous goods (S.I. 288 of 2007) and in compliance with the ADR (European Agreement Concerning the International Carriage of Dangerous Goods by Road). No material shall leave the Site without the acceptance of the Employer's Representative. The Contractor shall keep records of material removed and shall obtain the Employer's Representative's authentication of the records.
2. The Contractor shall ensure that appropriate measures are taken to safeguard the health of the Contractor's operatives and the general public for the duration of the works.
3. In the event that hazardous materials are discovered on the site, the Employer's Representative is to be informed immediately.
4. The Employer's Representative has the right to request that tests be carried out on any suspected hazardous materials to determine their exact nature.
5. Under certain circumstances, specialist contractors may be required to remove the hazardous materials from site. The Contractor shall seek the acceptance of the Employer's Representative where the services of a Specialist Sub-contractor are to be engaged. The Contractor shall ensure that the Specialist Sub-contractor, if any, shall comply with all relative legislation regarding the required permits and licensing for the disposal of hazardous materials.
6. Hazardous materials arising from site clearance and/or excavations shall be disposed of only at licensed sites.
7. The Contractor shall note the following non-exhaustive list of legislation, which applies to Employers and Employees when working in the vicinity of Asbestos;
 - European Communities (Protection of Workers) (Exposure to Asbestos) Regulations (as amended);
 - Safety, Health and Welfare at Work (Exposure to Asbestos) Regulations (as amended)

Others;

 - The Safety, Health and Welfare at Work Act 2005;
 - The Safety, Health and Welfare at Work (Chemical Agents) Regulations (as amended);
 - The Safety, Health and Welfare at Work (Carcinogens) Regulations (as amended)

8. It should be noted in particular that the European Communities (Protection of Workers) (Exposure to Asbestos) Regulations (as amended) require that employers must seek to eliminate, reduce, enclose, or at a last resort to use personal protective equipment. The requirement to implement safe working procedures shall be determined by a risk assessment to determine primarily the type of Asbestos.
9. It is a requirement of the Contract that the Contractor carries out all works associated with the implementation of the above legislation and all other relevant legislation. This includes not only for the protection of workers during the removal phase but also the safe disposal of asbestos materials (in whatever form) to a disposal site in accordance with the Local and National guidelines / legislation governing the Safe Disposal of Asbestos materials.
10. Reference shall also be made to Appendix 1/23.

APPENDIX 5/1: Drainage Requirements

1. Manholes, where required shall be constructed to CC-SCD-00502 (Chamber Type A), CC-SCD-00504 (Chamber Type C), CC-SCD-00505 (Chamber Type D), CC-SCD-00506 (Chamber Type E), CC-SCD-00509 (Chamber Type F), CC-SCD-00526 (In-line outlet to triangular surface water channel).
2. Concrete pipes shall be Class 120 and have a spigot and socket joints with rubber rings fittings (fitted in accordance with manufacturer's specification) to comply with IS EN 1916 and IS 6.
3. Plastic pipes shall have ultimate pipe stiffness (STES) in excess of 1,400 N/m², tested in accordance with BS 4962. Resistance to impact shall comply with BS 4962, except that the striker used in the test shall have a mass of 1kg and a 25mm hemispherical radius.
4. The Contractor shall submit test certificates to the Employer's Representative prior to the installation of any plastic pipes.
5. Joints in surface water drains shall be watertight as specified in Clause 504.3 and in filter drain partly tight as specified in Clause 504.6 of the Specification.
6. All drains shall be air tested in accordance with Clause 509.2 of the Specification.
7. Cleaning of existing chambers, gullies and drains is to be carried out to Clause 509.5 of the Specification.
8. Chambers for drains shall be tested for water tightness as agreed with the Employer's Representative.
9. Gullies shall be Pre-Cast (untrapped) constructed to CC-SCD-00510 with 150mm thick concrete base and surround. Concrete shall be either grade ST4 or as per the manufacturer's requirements.
10. 150mm gully connectors shall be provided between gully pots and adjacent carrier drains. These shall be 150mm diameter uPVC

spigot and socket flexible jointed gully connections with Type Z bed and surround and backfilled with selected excavated material.

11. Gully gratings shall have a minimum clear waterway area of 900cm².
12. All gully gratings shall be Type R and Class D400 in accordance with IS EN 124.
13. All gully gratings to be provided with a lockable mechanism. The opened unit should provide a minimum rectangular clear opening of 400 mm x 250 mm. Minimum frame depth for gullies in carriageway to be 150 mm.
14. Class D 400 units shall incorporate a permanent non-rock feature either triangular point suspension or machined faces.
15. All chamber covers to be provided with a locking mechanism. Where the mass of the frame exceeds 15kg, suitable lifting holes or hooking points in the frames to be provided. These should be located to give a balanced lift. Any lifting holes within the bedding area of the frame should be taken into account when determining the minimum bearing area of the frame. Suitable keyways to be provided in each cover as detailed in BS 7903. Minimum frame depth for manholes in carriageway to be 150 mm.
16. Bolts supplied for loosely coupling sections of covers and grating shall be steel hexagon headed, complying with the requirements of ISO 4016, 4018 and 4034. They shall not be less than size M16 complete with Hexagon nut and shall be provided with means to prevent undue tightening of unit sections.
17. The Contractor shall record and mark with suitable stakes all land drains disturbed or damaged in carrying out the Works and shall submit daily schedules of these to the Employer's Representative stating size and type of drain, details and location of reinstatement or connection into new drain or ditch.
18. Cross drains to convey ditches and watercourses shall be provided at locations shown on drawings provided by the Employer's Representative. Bed Type Z shall be used at all cross drain locations.

19. All joints in drainage culverts shall be watertight.
20. Back of wall drainage shall consist of a 300mm thick section of 20mm nominal size aggregate to Cl. 513 of the Specification along with a 150mm OD perforated uPVC pipe with single sized gravel fill with either a geotextile or no fines concrete surround.
21. Pipes shall be cut by a method which provides a clean square profile, without splitting or fracturing the pipe wall, and which causes minimal damage to any protective coating. Where necessary, the cut ends of pipes shall be formed to the tapers and chambers suitable for the type of joint to be used and any protective coatings shall be made good, and the ends sealed.

Chambers and Manholes

1. All surface water drainage manholes shall comply with the requirements of BS 5911-3, IS EN 1917, IS 420 and Clause 507 of the Specification. All manholes shall be tested for water tightness to the satisfaction of the Employer's Representative.
2. All manholes covers shall be lockable, with the cover removed from the locked end. Frames must be laid and oriented to allow easy removal of covers.
3. Adjustment, renewal, installation etc. of manhole covers, gully frames and other ironwork shall be set or reset to the final levels prior to the laying of the uppermost surface course, or in areas where no surfacing works are being undertaken, to the level of the adjacent verge.
4. Manholes, gullies, etc. shall be set flush with the adjoining finished surface. Old mortar shall be removed and the frames shall be bedded on 2:1 cement mortar on top of additional engineering brick, as necessary, finished in a header course.
5. An epoxy resin mortar of an approved type shall be used where traffic is required to run over the cover within seven days of execution. The use of Polyester type mortars will be permitted provided the thickness of any layer does not exceed 12mm.

6. Adjustment to levels of manholes will be made using standard precast concrete units. Where standard precast rings have been used to form manholes or catchpits, a maximum of five courses of brick (old and new) will be allowed. Greater adjustment will require the installation of a new precast ring similar to existing rings.
7. Chamber covers, gratings and frames shall be manufactured from spheroidal graphite (ductile) cast iron and comply with I.S. EN 124 and Class D400 shall be used as a minimum standard for ironwork. The minimum chamber cover opening is 600mm diameter. A 300mm wide protective concrete surround shall be included for all chamber covers in grassed areas.
8. Foundations to chambers shall be of mix C35 concrete with steel mesh to BS 4483 Ref A252, 40 millimetre cover from top of foundation, laid on 50 millimetre thick blinding concrete C15. Precast manhole bases will also be permitted. These will have 150 mm thick reinforced bases laid on 50 millimetres thick blinding concrete C15 or 75 millimetre thick blinding sand.

APPENDIX 5/7: Drainage and Service Ducts: TII Publications Standard Construction Details

1. The following TII SCD's are to be adopted in the works:

Table 5/7.1 – Adopted TII SCD's for Drainage

SCD	Title
CC-SCD-00501	Chamber Types
CC-SCD-00502	Chamber Type A (Block or In Situ Concrete Manhole)
CC-SCD-00504	Chamber Type C (Precast Concrete Manhole)
CC-SCD-00505	Chamber Type D (Precast Concrete Manhole)
CC-SCD-00506	Chamber Type E (Precast Concrete Manhole)
CC-SCD-00509	Chamber Type F (Precast Catchpit)
CC-SCD-00510	Precast Concrete Gully
CC-SCD-00512	Gully Grating

APPENDIX 6/2: Requirements for dealing with Class U2 Unacceptable Material

1. General

- 1.1. For the purpose of this Contract, Unacceptable Material Class U2 shall be as defined in Specification Clause 601.3 (i), where hazardous chemical properties shall be defined as containing biodegradable (putrescible) material (i.e. capable of producing landfill gas), containing leachate, capable of producing leachate, containing radioactive materials, asbestos or containing petroleum products, and / or defined as hazardous wastes under the Waste Management Acts and Regulations.

2. Measures for Dealing with Class U2 Unacceptable Material

- 2.1. Class U2 Unacceptable Material is not anticipated, however there is a risk that it will be encountered.
- 2.2. A method statement shall be submitted by the Contractor to the Employer's Representative for acceptance detailing how this or any other potentially contaminated material will be sampled and tested. The Contractor shall carry out sampling and testing based on a grid spacing and to depths appropriate to the risk, extent and degree of contamination anticipated. Further samples to reduce the grid spacing may be taken after the initial analysis if required by the Employer's Representative or relevant Authority.
- 2.3. In the event that the Contractor encounters or suspects the presence of any Unacceptable Material Class U2, he shall cease any excavation work in that area immediately and notify the Employer's Representative. The Contractor shall make arrangements to have the material inspected by an approved Sub-Contractor, specialising in the identification, sampling and testing of such material. In the event that the material is confirmed as Class U2 material the Contractor shall proceed in accordance with the measures listed below.
- 2.4. The Contractor shall submit a Method Statement to the Employer's Representative and the Employer detailing his proposals for dealing with the Class U2 material. The Employer will, if satisfied with the proposals, provide written permission to proceed with the treatment of the U2 material.

For removal and replacement of the U2 material, the Contractor shall make arrangements for the Class U2 material to be excavated and removed off site by either a specialist waste disposal contractor accepted by the Employer, or by the Contractor's own personnel under the

supervision of a specialist waste disposal contractor and disposed of to an appropriately licensed landfill or recovery site with the appropriate waste permission in place such as an EPA licence or a local authority waste permit in accordance with the current Irish Waste Management legislation and associated statutory instruments. No such material shall leave the Site without the acceptance of the Employer's Representative.

- 2.5. The Contractor shall keep records of the materials removed and shall obtain the Employer's Representative's acceptance of the records.
- 2.6. Groundwater, leachate and surface water flow from the area of the U2 material shall be strictly controlled by an arrangement of a series of grips and sumps, and pumped to dedicated storage tanks to the acceptance of the Employer's Representative's.
- 2.7. The pumped water will be sampled and tested to determine the required treatment before it can be discharged to the receiving watercourse. The water is not to be discharged to a receiving watercourse without the acceptance of the Employer's Representative or the Employer.
Groundwater/leachate from contaminated areas shall be contained by a method to be agreed with the Employer's Representative and pumped to the dedicated storage facilities (e.g. tanks, attenuation ponds, attenuation pipelines etc.). The Contractor shall carry out such treatment on the groundwater/leachate as the Employer may require to bring the water to such a standard as to permit its return to the receiving watercourse.

APPENDIX 6/5: Geotextiles Used to Separate Earthworks Materials

Locations required

1. Geotextiles geogrids and geocomposites shall be provided at locations identified by the Employers Representative. Geotextiles are required for separation of drainage material from earthworks fill or original ground.
2. Geogrids and geocomposites are required to provide basal reinforcement to access tracks where located on soft ground as shown on the Series 600 Drawings.

Geotextile requirements

1. The Contractor shall submit a proposal for the geotextile to be used based on Clause 609 of the Specification and the following requirements:
2. The material on which the geotextiles are installed upon shall be free of any sharp protrusions which may damage the fabric. The geotextile shall be in continuous contact with the surface on which it is installed and shall not bridge or be stretched over hollows or lumps.
3. In accordance with Clause 609 (2) of the Specification, the Contractor shall provide evidence to the ER that the geotextiles shall be sufficiently durable when installed in contact with the materials to be separated. The geotextiles shall be resistant to the long-term effects of damp, cementitious materials. The Contractor shall be required to provide Manufacturer's data to substantiate performance in this respect. The material shall maintain its integrity for a life period of at least 120 years.
4. The geotextiles shall be inert to all chemicals naturally found in soils of the type anticipated on site and shall have no solvents at ambient temperature. It shall not be susceptible to hydrolysis, shall be resistant to aqueous solutions of salts, acids and alkalis, and shall be non-biodegradable.
5. The geotextiles shall be manufactured in accordance with the Quality Assurance requirements of ISO 9001. The Contractor shall provide evidence that the Manufacturer's Quality Assurance System has been certified to conform with ISO 9001 by an External Authenticating Authority.
6. Adjacent sheets of the geotextiles shall be overlapped or joined according to the Manufacturer's recommendations and with a minimum overlap of 300mm. Returns for anchorages and turn-ups at edges shall be according to Manufacturer's recommendations and shall be not less than 500mm.

Geotextile properties

1. Geotextile separation membrane between drainage material and earthworks fill or existing ground (Geotextile Type A) shall meet the criteria set out in Table 6/5.1.

Table 6/5.1 – Geotextile separation membrane – (Geotextile Type A)

Property	Requirements	Test
CBR Puncture Resistance	2000N minimum	EN ISO 12236
Tensile Strength	>13.0kN/m	EN ISO 10319
Tensile at 5% Elongation	>4.0kN/m	EN ISO 10319
Flow rate	≥10 litres/m ² /s	EN ISO 11058
Characteristic Pore Opening Size (O ₉₀)	50 to 200µm	EN ISO 12956

2. Geotextiles shall be installed in accordance with the Manufacturer's specifications. Geotextiles shall be protected at all times against mechanical or chemical damage and shall not be uncovered between manufacture and incorporation in the Works. Unless demonstrated otherwise by performing resistance to weathering tests in accordance with EN 12224, all geotextiles shall be completely covered within three days of installation.
3. The earthworks fill or drainage fill material shall be placed in an advancing face, with plant working on top of previously placed fill.
4. Geotextiles used in the Works shall comply with Clause 609 (3).
5. The Contractor shall provide test results confirming that all relevant materials comply with Clause 609 (3) and have been tested according to the frequency set out in Appendix 1/5.
6. Additional geosynthetics may be specified for the works by the Employer's Representative as required.

Geogrid/nonwoven composite requirements & properties

1. Where used, geogrid nonwoven-composites shall be designed on a case by case and on a site specific basis.
2. For pricing purposes Geogrid/nonwoven composite shall comply with the following requirements.

Table 6/5.2 – Geogrid/nonwoven composite

Property	Test Method	Unit	
Geogrid			
Raw Material	-	-	Polypropylene (PP) white
Mass per unit area	EN ISO 9864	g/m ²	240
Max tensile strength md /cmd **	EN ISO 10319	kN/m	≥ 40 ≥40
Elongation at nominal strength, md/ cmd**	EN ISO 10319	%	≤7 / ≤7
Tensile strength at 1% elongation md / cmd**	EN ISO 10319	kN/m	8/8
Tensile strength at 2% elongation md / cmd**	EN ISO 10319	kN/m	16/16
Tensile strength at 5% elongation md / cmd**	EN ISO 10319	kN/m	32/32
Aperture size, md x cmd **	-	mm x mm	Approx. 31 x 31
Production Specific elongation	-	%	0
Geotextile			
Raw Material	-	-	Polypropylene (PP) white
Mass per unit area	EN ISO 9864	g/m ²	≥150
Max tensile strength md /cmd **	EN ISO 10319	kN/m	7.5/11.0
Elongation at nominal strength, md/ cmd**	EN ISO 10319	%	40/30
Puncture Force	EN ISO 12236	N	≥ 1500
Characteristic Opening size	EN ISO 12956	µm	90
Water permeability - V _{LH50} index - Flow rate _{H50}	EN ISO 11058	m/s l/(m ² s)	9,0 x 10 ⁻² 90
Detector tested	-	-	yes
Roll dimensions, width x length	-	m x m	4.75 x 100

Geogrid

- Where used, geogrid shall be designed on a case by case and on a site specific basis as requested by the Employers Representative.
- For pricing purposes Geogrid/nonwoven composite shall comply with the following requirements.

Table 6/5.3 – Geogrid

Property	Test Method	Unit	
Geogrid			
Raw Material	-	-	Geogrid PET
Coating			Bituminous
Weight	EN ISO 9864	g/m ²	~270
Ultimate tensile strength -longitudinal -transversal	EN ISO 10319	kN/m	≥ 50 ≥ 50
Tensile strength @ 3% strain -longitudinal -transversal	EN ISO 10319	kN/m	≥12 ≥12
Strain at ultimate tensile strength -longitudinal - transversal	EN ISO 10319	%	12 12
Mesh size of the geogrid		mm	40 x 40
Heat Resistance		Degrees Celcius	Up to 190
Standard Dimensions: -Length -Width		m	5.00 150.00

- Geogrids/geocomposites shall be installed in accordance with the Manufacturer's specifications. Geogrids shall be protected at all times against mechanical or chemical damage and shall not be uncovered between manufacture and incorporation in the Works. All geogrids shall be completely covered within three days of installation.

Number of samples

- Testing requirements are set out in Appendix 1/5. The Geotextile Manufacturer shall provide quality assurance test data for the material supplied to site.

2. Additional testing of geotextiles shall be undertaken as directed by the ER when visual assessment raises concerns about the acceptability for intended use.

APPENDIX 7/1: Permitted Pavement Options

General

1. The location of areas to be paved will be provided by the Employer's Representative.
2. The full width of the road surface is to be paved. Paving shall be in accordance with BS 594987.

Grid for Checking Surface Levels of Pavement Courses

1. For checking compliance with proposed levels, measurement of surface levels will be taken at points to be selected by the Employer's Representative at 10m centres longitudinally and at 2m centres transversely. At junctions the grid point spacing shall be 2.5m centres for 10m either side of the centreline of the junction. In any length of pavement, compliance with the requirements of Table 7/1 shall be regarded as met when not more than one measurement in any consecutive ten longitudinally, or in any transverse line exceeds the tolerances permitted in the table, but this measurement shall not exceed 6mm more than the tolerance for the layer concerned.
2. A copy of the levels as required by clause 702.4 shall be presented by the contractor to the Employer's Representative for acceptance before he/she grants permission for the following layers to be laid. Any layers out of Specification shall be rectified in accordance with clause 702.10 before the following layers can be laid.

Regulating Course

1. The regulating course, where required, shall conform to the requirements of Cl. 2.2 of the 900 Series of the Specification.

Pavement Details:

1. Details of the required pavement will be issued with each specific work package:

1	Location: <i>TBC by the Employers</i> <i>Representative for each work package</i>	<i>General Requirement</i>
2	Grid for checking surface levels of pavement courses, if different from the requirements of CI 702.4: Long Dim: Trans Dim:	as per CI 702.4 and as per information pack provided by the Employer's Representative for each work package.
3	Surface regularity (CI 702.7 and CI 702.8): Category of Road Long Reg: Trans Reg:	as per information pack provided by the Employer's Representative for each work package.
4	Requirements for coarse aggregates – (Series 900 CI 3.2.2, 5.2.2, 6.2.2, 8.4.1.1, 8.6.1.1): Polished Stone Value (PSV), Aggregate Abrasion Value (AAV)	Min 60 PSV and as per information pack and specification provided by the Employer's Representative for each job/work package. As per information pack and specification provided by the Employer's Representative for each job/work package.
5	Requirements for pre-coated chippings – Polished Stone Value (PSV) for general use mixtures,	Min 60 PSV and as per information pack and specification provided by the Employer's Representative for

	PSV for mixtures for roundabouts, Aggregate Abrasion Value (AAV) (Series 900 CL 4.2.4):	each job/work package. Min 65 PSV as per information pack and specification provided by the Employer's Representative for each work package. As per information pack and specification provided by the Employer's Representative for each job/work package.
6	Requirement for testing for PSV using the friction after polishing test: (NRA HD 300 Clause 2.26)	Yes
7	Freezing and Thawing (soundness) category if different from the requirements of Series 900 Tables 1, 4, 7, 10 and 17 etc.	as per relevant Series 900 Tables as appropriate: & as per information pack provided by the Employer's Representative for each work package
8	Compaction control and extraction of cores if different from the requirements of Series 900 Cls 10.1.9, 10.1.9.1, 10.1.9.2, 10.1.9.3, 10.1.9.4.:	as per relevant section in Series 900 Cl.10.1.9, 10.1.9.1, 10.1.9.2 and 10.1.9.3, 10.1.9.4 & as per information pack provided by the Employer's Representative for each work package
9	Sealant to be applied to the whole of any freestanding edge on the outside of the finished pavement on the low	Yes, or as advised by the Employer's

	side of the camber (Series 900 CL 10.1.8):	Representative for each work package
10	Requirements for monitoring resistance to permanent deformation of SMA as per Series 900 Cl. 10.1.10.3:	Yes, or as advised by the Employer's Representative for each work package
11	Requirements for monitoring resistance to permanent deformation of HRA as per Series 900 Cl. 10.1.10.2:	Yes, or as advised by the Employer's Representative for each work package
12	Sub-base material may be spread in more than one layer as per Cl. 802.4:	No or as advised by the Employer's Representative for each work package
13	Additional tests to those required by IS EN 13108-20, IS EN 13108-21 or Series 900 Cl. 1.2 and 1.3:	None or as advised by the Employer's Representative for each work package

APPENDIX 7/2: Excavation and Reinstatement of Existing Surfaces

General Requirements

1. No excavation will be permitted within the proposed carriageway following completion of the surface course.
2. Tie-in details of the proposed flexible pavement shall be as indicated on CC-SCD-00703 and CC-SCD-00704.
3. If reclaimed asphalt contains more PAH's and/or phenol than a certain limit value (0.1 %), it is considered as "asphalt containing tar" and should be regarded as hazardous waste.
4. In the case of asphalt containing tar, if the milling waste is considered hazardous, disposal of material is required in accordance with Appendix 2/5.
5. The disposal of Class U2 material is to be in accordance with Appendix 6/2.
6. Testing of coal tar is to be in accordance with BS EN 15529. If the material is deemed to be coal tar, the material must be exported to a suitable plant.

APPENDIX 7/4: Bituminous Sprays

1. Bond coats are to be applied as per Clause 10.1.4 of the Specification 900 Series.
 - Location: Pavement Works
 - Type of binder: As per Cl. 10.1.4 of 900 Series;
 - Rate of Spread of Bond Coat: As per Table 16 of 900 Series;
2. A bituminous bond coat shall be provided:
 - On all planed surfaces immediately prior to the placing of inlays/overlays and regulating material;
 - Between the binder and surface courses over the extents of the works;
 - Where bituminous surfaces are left exposed for more than 4 weeks in the case of the base material;
 - Where the surface has been soiled by construction traffic and/or other vehicular traffic (in this case, the Contractor shall thoroughly clean the surface course with a suction road sweeper prior to application).
3. No trafficking of the bond coat shall be permitted.

APPENDIX 7/5: Road Pavements: TII Publications Standard Construction Details

1. The following TII SCD's are to be adopted in the works:

Table 7/5.1 – Adopted TII SCD's for Pavement

Clause No.	SCD
701	CC-SCD-00701
701	CC-SCD-00702
701	CC-SCD-00703
701	CC-SCD-00704
701	CC-SCD-00705
701	CC-SCD-00706

APPENDIX 7/9: Cold-Milling (Planing) of Bituminous Bound Flexible Pavement

1. Areas where existing flexible pavement is to be planed are as indicated on drawings provided by the Employer's Representative.
2. Refer to Appendix 7/2 for depths of planing.
3. Areas to be planed shall be swept in accordance with Clause 10.1.1.1 of the 900 Series of the Specification prior to planing.
4. Areas of pavement which have been planed shall be suction swept and shall have a bond coat applied in accordance with Appendix 7/4 prior to overlay.
5. Fine-milling of the existing surface will not be permitted without the acceptance of the Employer's Representative.

APPENDIX 12/1: Traffic Signs: General

General

1. All traffic signs shall conform in all respects with the Department of Transport's Traffic Signs Manual and TS4: Guidelines, Certification scheme, and specification for the construction of traffic signs (2012).
2. The approximate locations of the permanent traffic signs are shown on drawings provided by the Employer's Representative for each job/works package.
3. All sign face materials shall be Class Ref 2 retro reflective material complying with the requirements of IS EN 12899-1.
4. The mounting heights specified for each sign listed in the Signs Schedule of this Appendix shall be adhered to unless otherwise agreed with the Employer's Representative.
5. The minimum lateral clearance for each sign listed in the Signs Schedule of this Appendix shall be 600mm from the edge of pavement unless otherwise agreed with the Employer's Representative.
6. Minimum cover of 150mm to be provided from the top of all sign foundations to finished ground level, unless otherwise agreed with the Employer's Representative.
7. Final position of all traffic signs to be confirmed with the Employer's Representative.
8. All permanent prescribed or standard traffic signs are fully detailed in the Schedule of Permanent Traffic Signs, included in this Appendix.
9. Junction definition posts (TSM Ref. F 902) shall comply with the requirements of CC-SCD-01204.

Temporary Traffic Signs

1. All temporary signs for road works shall comply with Chapter 8 – “Temporary Traffic Measures and Signs for Roadworks” of the Traffic Signs Manual as published by the Department of Transport.
2. Verges shall be levelled and vegetation trimmed or cleared to accommodate all temporary signs in an upright position and to achieve satisfactory visibility as required by the Traffic Signs Manual. The Contractor shall maintain the verge accordingly for the duration of the temporary sign installations. Clearance of vegetation shall be kept to a minimum necessary to achieve the satisfactory visibility.
3. The Contractor shall be responsible for covering (in a manner approved by the Employer’s Representative) and uncovering any existing signs which become inaccurate or misleading as a result of the introduction of any Traffic Management System. The material used to cover the signs shall be opaque. Hessian shall not be used for this purpose.

Tipperary County Council Branding & Signage:

1. TCC require the supply, installation/erection and maintenance of temporary lightweight and durable coriboard signage in the following sizes please:
 - 2no. 750mm x 750mm signs
 - 2no. 900mm x 900mm signs

All signage should be in accordance with the Traffic Signs Manual and shall be easily affixable to traffic cones/hoarding or fencing etc. The signs also need to facilitate bespoke coloured images/text/branding etc.

Wording to be confirmed with the Employers Representative but may consist of the following or similar messaging in both Irish and English with an agreed contract phone number:

“ XXX working on behalf of Tipperary County Council.

Thank you for your patience

T: YYYY YYYYYY”

2. Tipperary County Council branding, logos etc. shall also be provided by the Employers Representative. The Employers Representative shall have final sign off regarding signage layout, logos and symbols etc.
3. It is important that the Tipperary County Council Brand Mark is used correctly and consistently in all applications. It is also essential that the Brand Mark is only ever reproduced using the master artwork supplied by the Employers Representative and the instructions for use are adhered to at all times. The following are examples of what not to do with the Brand Mark.
 4. A Do not alter the proportions and position of the Brand Mark in any way.
 5. B Do not change or adjust the colours of the Brand Mark.
 6. C Do not stretch or distort the Brand Mark.
 7. D Do not recreate the typeform of the Brand Mark.
 8. E Do not reproduce the Brand Mark on backgrounds which compromise its clarity and legibility
9. When using the Tipperary County Council Brand Mark in conjunction with other logos, the Tipperary Logo shall have the same prominence and is sized appropriately to match the shape and size of the other logos displayed. The logos should be arranged in a 'tramline'.
10. Tipperary County Council Brand Mark shall appear on the left (first) and apart from other logos.
11. To ensure consistency in the appearance of the visual identity of Tipperary County Council, a corporate colour palette has been created. The palette consists of two primary colours and four complementary colours, which can be used in a variety of different combinations to suit the diverse range of printed materials that are produced on behalf of the Council.
12. With regard to typography, Verdana is the standard family of fonts to be used for all externally produced printed communication material. With its clean lines, it is a universally embraced font which has been chosen to reflect a progressive and modern organisation. It also complies with international legibility standards.
13. For most corporate communication, the Brand Mark should be placed in the top left corner at all times

APPENDIX 12/3: Traffic Signs – Road Markings and Studs

1. Reference should be made to the Department of the Transport Traffic Signs Manual.
2. Figure numbers referred to in Appendix 12/3 relate to the Traffic Signs Manual.
3. This Appendix 12/3 shall be read in conjunction with any drawings/details supplied by the Employer's Representative for each individual job/work package.
4. The quality of the material and the workmanship shall comply with the requirements of all relevant European Standards including EN 1423, EN 1424, EN 1436 and EN 1871. Any aspects of the work and materials not covered by the European Standard shall comply with the Works Requirements as set out below.
5. Unless otherwise instructed by the Employer's Representative, all markings shall be reflectorized by the application of glass beads to the surface of the marking material.
6. In the case of reflectorized markings solid glass beads, 400 g/m² to 500 g/m², shall be applied by pressure concurrently with the laying of the line with sufficient velocity to ensure retention in the surface of the line. The solid glass beads so sprayed shall give uniform cover and immediate reflectivity over the whole surface of the marking. (On screed applied markings where pressure application is not practicable, gravity application will be permitted).
7. The Contractor shall note that the above mentioned solid glass beads which are to be applied to the surface of the markings are in addition to the solid glass bead content incorporated within the body of the mix for reflectorized markings.
8. The Contractor shall not carry out any work when the weather conditions or the road conditions (e.g. dampness, dust, cold) are such that the quality of the work might be adversely affected. In particular, application of markings shall not be carried out when the road temperature is less than 5°C. Where the Employer's Representative is of the opinion that such adverse conditions exists, he/she may instruct the contractor to suspend the works, but this shall not relieve the contractor of the obligation to suspend the work in the first place where such adverse weather conditions or road conditions exist. In addition, the Contractor shall remove loose debris, mud and all other materials likely to affect adhesion between the thermoplastic road marking material and the road surface.
9. The Contractor shall ensure that the horizontal alignment of the applied marking is +/- 5mm and to the satisfaction of the

Employer's Representative in respect of straightness of the line and the smoothness of curvature. The Contractor must, in advance of being awarded the contract, satisfy the Employer's Representative as to his capability of carrying out the work as and from the starting date of the contract.

10. The Contractor shall, when requested by the Employer's Representative, supply name(s) of the manufacturer(s) from whom it is intended to purchase thermoplastic material, glass beads, road studs for use in the works.
11. The Contractor shall supply to the Employer's Representative certification that the proposed materials and the method of application of markings to the road conform to the Works Requirements as outlined above. For this purpose, the Contractor shall obtain from an agency approved by the Employer's Representative, a report containing:-
 - (a) The certified analysis, from a laboratory with a current ISO Certificate for the specific purpose, of each grade of thermoplastic material the Contractor proposes to use, and
 - (b) The results of an examination of the application equipment the Contractor proposes to use. This examination shall be carried out by a company approved to do so by the Employer's Representative. (In the event that a company has an up to date ISO Certification for maintenance of road marking machinery and apparatus including control devices this will be accepted as complying with this requirement on submission of such Certification to the Employer's Representative for verification.)
12. The submitted report shall relate to certification carried out within the previous six months. Any subsequent change in the source of thermoplastic material or the method of application shall be certified as acceptable by Employer's Representative. All costs associated with such certification(s) shall be borne by the Contractor.
13. The methods of testing shall be in accordance with IS EN 1436 or with those approved by Employer's Representative.
14. All the necessary costs associated with such a certifications shall be borne by the contractor.
15. Notwithstanding the above the Employer's Representative may at any stage request independent analysis of the material and/or equipment. The costs in these circumstances shall be borne by the Contractor if the materials or equipment fail and by the Employer in the event of full compliance.
16. Edge markings of chevron hatching or cross-hatching are to be provided with 10 mm-25 mm drainage gaps at 4 m intervals.

The road marking material will have the following characteristics:

1. The minimum period of guarantee shall be for 3 years after completion of markings and shall apply to markings laid on all cement-bound and bituminous-bound road surfacings including surface dressings.
2. All markings in this Contract shall be laid under guarantee and shall be applied to the thickness specified in the Contract.
3. The following properties of the markings are required to be covered by the guarantee:
4. Durability;
5. Reflectivity;
6. Skid Resistance;
7. Luminance Factor;
8. Chromaticity
9. Notwithstanding the above verification tests, the Contractor shall be required to carry out verification tests at any time during the period of guarantee if the Employer's Representative considers that the properties of the markings are less than the minimum values specified above. The costs of such testing will be borne by the Contractor if the results of the tests show that the markings fail to comply with the prescribed minima. The costs of such testing shall be borne by the Employer if the Contractor can demonstrate to the satisfaction of the Employer's Representative that the requirements of the Works Requirements have been complied with in full.
10. The average value of the above properties shall be established for each line adequate to guarantee that all markings are correct.
11. During the 3 year period of guarantee the Contractor shall be required to replace or renew markings which fail to comply with one or more of the minimum values of the marking properties listed above. Renewal of failed markings shall be carried out to the original Works Requirements for both scabbling and marking quality and depth. The guarantee period will recommence on such renewal. All costs associated with this testing, replacement or renewal of markings during the period of guarantee shall be borne by the Contractor. Testing will be in accordance with Appendix 1/5.
12. On application and during the period of guarantee, these properties, when measured in situ in an approved manner, shall not be less than the values stated below.

Durability:

1. At least 90 per cent of the marked areas shall contain a uniform coating of marking material through which the underlying surfacing has not penetrated. Discontinuities, due to wear, shall not be accepted in continuous lines and at least 75 per cent of each marked segment of a broken line shall remain intact.

Reflectivity:

$R4^a \geq 200 \text{ mcd/m}^2$. 1x, following application of longitudinal markings.

$R3^a \geq 150 \text{ mcd/m}^2$. 1x, 12- 24 months following application.

$R2^a \geq 100 \text{ mcd/m}^2$. 1x, 24- 36 months following application.

When measured by the digital retrometer LTL. 2000 in accordance with Annex B of IS EN 1436.

Skid Resistance:

50 B.P.N. when measured by the British portable pendulum apparatus.

Or

SRT > 50, in accordance with Annex D of IS EN 1436.

Luminance Factor:

White Material...B4: $\beta \geq 50$

Yellow Material...B2: $\beta \geq 30$

when measured in accordance with Annex C of IS EN 1436

Chromaticity:

Refer results to the requirements of EN 1436

2. The procedures for carrying out the above tests shall be in accordance with those approved by The Employer or other agency approved by the Employer's Representative.
3. The Contractor shall measure the values of the above properties on applied markings in accordance with the Appendix 1/5 of the Works Requirements. The tests shall be carried out in the presence of the Employer's Representative or his/her representative. The sections on which such measurements are taken shall be randomly selected and representative of a marked length of road. The test report shall detail site locations, road type description, weather condition, values recorded for all test results and the average result for each section. The report will also specify areas which do not comply with the requirements stated above. The Contractor is required to specify the location of all test sections. The report will include the Contractor and any Sub-Contractor who may have worked on that section.
4. At least five observations/measurements shall be taken to establish average values of the above properties for the

representative length of road. During the period of guarantee the Contractor shall replace or renew markings which fail to comply with one or more of the minimum values of the marking properties listed above. All costs associated with this testing, replacement or renewal of markings during the period of guarantee shall be borne by the Contractor.

5. The Contractor shall make available samples in accordance with the requirements of Appendix 1/6, on demand by the Employer's Representative or his/her representatives.
6. The material shall be in powder form packaged in 25kg bags and clearly marked with the batch number and date of manufacture.
7. All markings shall be applied to the road surfacing to a minimum thickness of $4\text{mm} \pm 0.5\text{mm}$. The following properties of the markings are required to be covered by the guarantee:

Screed Lines

1. All screed lines shall be 4.0 mm.

Reflecting road studs

1. The existing road studs shall not be re-used but shall be removed and returned to the Employer as per Appendix 2/3.
2. Centreline marking studs shall be:
Permanent, Type 3 non-depressible reflector inserted in embedded road stud complying with IS EN1463-1. They shall be installed as recommended by the manufacturer and as approved by the Employer's Representative.
3. Edge marking studs shall be:
Permanent, Type 3 non-depressible reflector inserted in embedded road stud complying with IS EN1463-1. They shall be installed as recommended by the manufacturer and as approved by the Employer's Representative.

Photometric:

1. Class PRP1 is the minimum coefficient of luminance intensity R value.

Dimensions:

1. **Class H1** for height.
2. **Class HD1** for horizontal dimensions.

Colorimetric:

1. Class NCR1 for chromaticity, for the stud types above as specified in IS EN 1463-1.

2. Where existing road studs are removed, they shall be reinstalled or replaced within 3 working days of their removal unless otherwise agreed with the Employer's Representative.

Performance of Road Studs

1. Both Type 3 studs must remain in place and retain at least 50% of their reflective face over the duration of the guarantee period. Road Studs will be tested in accordance with Appendix 1/5. Road Studs failing the tests must be replaced within 3 weeks of notification by the Employer's Representative.

Sequence of Operation

1. All stud removal and replacement shall be completed prior to commencement of road marking operations on adjoining sections of roadway. Where existing road studs are removed, they shall be reinstalled or replaced within 3 working days of their removal unless otherwise approved by the Employer's Representative.

Removal of Road Markings

1. A suitable method for the removal of road markings which will not cause adverse damage to the existing pavement surface is to be used.

Road Stud Spacing

1. Road stud spacing is as per pricing document and as advised by the Employers Representative for each work package under this contract.