



An Roinn Iompair
Department of Transport



N63 MOUNT TALBOT TO ATHLEAGUE PAVEMENT IMPROVEMENT SCHEME

ROSCOMMON COUNTY COUNCIL

VOLUME A WORKS REQUIREMENTS

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DOCUMENT CONTROL SHEET

N63 MOUNT TALBOT TO ATHLEAGUE PAVEMENT IMPROVEMENT SCHEME

Volume A Works Requirements

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Index of Contract Documents

1. Instructions to Tenderers
2. **VOLUME A: WORKS REQUIREMENTS**
3. Volume B: Tender and Schedule
4. Volume C: Pricing Document

1. SITE INFORMATION

The scheme will involve the rehabilitation of approximately 2.88 km of pavement on the N63 National Primary Route between Mount Talbot and Athleague in Co. Roscommon. The site traverses the townlands of Mount Talbot, Lismaha, Cloondarah, Araghty Co. Roscommon. Refer to RN24003-04-P5-PS-LP.

2. SCOPE OF THE WORKS

The scope of the Works can be ascertained by examining the contract documents as a whole. As a guide, the scheme comprises, but is not limited to:

- Site clearance works.
- Inlay/overlay works on approximately 2.88km of single carriageway.
- Construction and overlay works to all side roads.
- Construction and tie in joints to previously repaired areas.
- Topsoiling on existing verges.
- Accommodation works.
- Installation of road markings on the new pavement surface.
- Various ancillary works.

Preamble to the Specification

1. The Specification referred to in the Contract shall be the 'Specification for Road Works', published by Transport Infrastructure Ireland (TII) on the TII Publications website <http://www.tiipublications.ie/> as Volume 1 of the Manual of Contract Documents for Road Works 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 Specification for Road Works the Numbered Appendices shall always prevail.
6. Any reference in the Contract to a Clause number or Appendix shall be deemed to refer to the corresponding Substitute Clause number or Appendix listed in Appendix 0/1 or 0/2.
7. Where a Clause is altered, any original Table/Figure referred to in the Clause shall apply unless the Table/Figure is also altered. Where a Table/Figure is altered, any reference in a Clause to the original Table/Figure shall apply to the altered Table/Figure.
8. Where a Clause in the Specification 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 Specification that is not used shall be deemed not to apply.
10. References in the Specification to "Standard Construction Details" shall be taken to refer to "Standard Construction Details" as published by Transport Infrastructure Ireland (TII) on the TII Publications website <http://www.tiipublications.ie/> as Volume 4 of the Manual of Contract Documents for Road Works 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 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 Specification and Appendices to the Specification, 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”

APPENDICES

APPENDIX 0/1: CONTRACT-SPECIFIC ADDITIONAL, SUBSTTUTE AND CANCELLED CLAUSES AND TABLES INCLUDED IN THE CONTRACT

List of Additional Clauses, Tables and Figures

Clause No. (etc.)	Title	Written on Page No. following
CC-SPW-00100 116.6 AR	Privately and Publicly Owned Services or Supplies	5
CC-SPW-00100 137 AR	Safety File Contents	6
CC-SPW-00200 202.8 AR	Existing Vegetation	7
CC-SPW-00200 206 AR	Invasive Species	7

List of Substitute Clauses, Tables and Figures

Clause No. (etc.)	Title	Rewritten on Page No. following

List of Cancelled Clauses, Tables and Figures

Clause No. (etc.)	Title

Additional Clauses, Tables and Figures

Clause No. (etc.)	Title and written text

Substitute Clauses, Tables and Figures

Clause No. (etc.)	Title and written text

Clause No. (etc.)	Title and written text
CC-SPW-00100 116.6 AR	Privately and Publicly Owned Services or Supplies
CC-SPW-00100 116.6.1 AR	Prior to and during the construction of the Works, the Contractor shall liaise with and adhere to the requirements of the various Authorities and Utilities who are affected by the Works. These shall include but not be limited to: • Electricity Supply Board (Overground and Underground Low to Medium Voltage); • Eir (international, national, regional and local circuits) • Roscommon County Council (sewers, water pipelines and existing road network) • Irish Water • Privately owned watermains • Privately owned sewers
CC-SPW-00100 116.6.2 AR	The Contractor shall, on appointment, assume full responsibility for liaison and shall arrange where necessary, for temporary and/or permanent diversion of any service underground or overground and co-ordinate any service alterations to facilitate construction of the Works. The Contractor shall include for the programming consequences of all temporary and permanent diversions in his own construction programme to the satisfaction of the Employer's Representative and each of the Authorities and Utilities. The Contractor shall also carry out his own investigations concerning the location of all overground and underground services and shall make provisions in his rates for all precautions necessary and all restrictions which may be caused to his operations due to their proximity. The Contractor shall notify all the relevant Authorities and Utilities sufficiently (min. 2 weeks) in advance of his excavation Works at each location so that all necessary precautions may be taken.
CC-SPW-00100 116.6.3 AR	The requirements of each Authority and Utility insofar as they are known are set out herein and described in detail on the drawings mentioned and within this Specification. It shall be a condition of this Contract that the Contractor shall be solely responsible for the safeguarding and diversion of all services affected by the Works.
CC-SPW-00100 116.6.4 AR	The Contractor shall be solely responsible for liaison during construction. The Contractor shall issue formal orders for all necessary diversions to Eir, ESB and all other Authorities and Utilities. The Contractor shall order ducting, pipelines and fittings only after checking the requirements with the various utilities. All discussion/meetings between the Contractor and the Authorities and Utilities shall be notified in advance to the Employer's Representative. The Employer's Representative may attend such discussions/meetings. The content of any communications between the Contractor and utilities shall be notified simultaneously to the Employer's Representative.

Clause No. (etc.)	Title and written text
CC-SPW-00100 137 AR	Safety File Contents
CC-SPW-00100 137.1 AR	The Contractor shall be required to comply fully with the following regulations: • The Safety, Health and Welfare at Work Act, 2005 and all other applicable legislation • Health and Welfare at Work (Construction) Regulations 2013 (SI No. 291 of 2013) The Project Supervisor Design Process for the project is being undertaken in this Contract by Roscommon County Council, Áras an Chontae, Roscommon, Co. Roscommon. The Contractor shall, in accordance with the requirements of the Regulations provide the following information for inclusion in the Safety File, but not limited to: Part A – As Built Drawings The Contractor shall provide the Employer’s Representative with all information required to compile and complete the As-Built drawings. The As-Built drawings shall be an updated revision of the drawings listed in Volume A2 of the Works Requirements in AutoCAD format. The As-Built drawings shall incorporate all as-constructed details including any Contractor designs. The As-Built topographical survey is to be supplied in 3D AutoCAD format with each feature on a separate layer. Survey points shall be supplied at a maximum 10m spacing and shall include all new construction features and existing fences, walls and gates within or immediate to the area provided by the Employer. Part B – Design Information The following information shall be provided as appropriate: • Design information for Contractor Designed Structures • Design information relating to Contractors Design Structural Elements and Other Features • Copies of all surveys and investigations, topographical surveys, drainage surveys, etc. • Road Safety Audits (for element for which the Contractor was responsible for design). Part C – Materials Provide details of materials and products used in the project. This shall list all suppliers by name, address and material product supplied. Where products or materials are covered by the Safety and Welfare at Work (Chemical Agents) Regulations 2001 (SI No. 619 of 2001), full details of the product or material specification shall be given. Where subcontractors 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 with BD62 of the UK DMRB.

Clause No. (etc.)	Title and written text
	Part D – Maintenance Facilities/Procedures • Full information on maintenance facilities, procedures and manuals for structures will be included in the structural record prepared in accordance with BD 62 of the UK DMRB. • A maintenance manual shall be provided for any plant, machinery or equipment forming part of the permanent Works for the project which is not required as part of a structure. The manual shall detail the methodology for comprehensive testing, routine maintenance, fault repair and testing. • Details shall be provided of any features incorporated into the project to facilitate future maintenance operations to be undertaken other than on structures e.g. access • Demolition requirements and method statements, for example tensioned material such as safety barrier or hazardous material. Part E – Other Information Any other information for inclusion in the Safety File and any additional information reasonably required by the PSDP or PSCS to allow fulfilment of obligations under the Regulations.
CC-SPW-00200 202.8 AR	Existing Vegetation
CC-SPW-00200 202.8.1 AR	The Contractor shall ensure that all trees and shrubs not affected by the Execution and Completion of the Works shall not be harmed in any way. Temporary fencing shall be erected around those existing individual trees, groups of trees and areas of shrubs as identified on site by the Employer's Representative during the execution and completion of the Works. This protective fencing shall be continuously maintained in good condition at the expense of the Contractor and shall not be removed until Substantial Completion of the Works unless otherwise permitted by the Employer's Representative. Within the areas protected by temporary fencing, no materials shall be stored and no machinery shall be used, all necessary operations being carried out by hand. The existing soil levels shall be maintained within the fenced areas around all existing trees. The Contractor shall not cut, fell, trim or lop any tree or branch unless specified otherwise or instructed by the Employer's Representative, whose prior written approval shall be sought before commencement of any such work. Final cuts shall be clean and into living wood and located to avoid the formation of moisture holding pockets.
CC-SPW-00200 206 AR	Invasive Species
CC-SPW-00200 206.1 AR	The Contractor shall comply with "Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads" published by the TII.

Clause No. (etc.)	Title and written text
	In the event that any noxious weeds and non-native invasive plant species is brought into the area provided by the Employer for the Works during the Contract, the Contractor shall treat, remove and dispose of all.

APPENDIX 0/2: CONTRACT-SPECIFIC MINOR ALTERATIONS TO EXISTING CLAUSES, TABLES AND FIGURES INCLUDED IN THE CONTRACT

Clause No. (etc.)	Alterations to be made
CC-SPW-00100 116	Privately and Publicly Owned Services or Supplies Clause 116:4. Delete the sentence “Details of such work, preliminary arrangements made by the Employer’s Representative, any orders already placed are given in Appendix 1/16”. Also insert at the end “Clause 116:6. The Contractor shall make good any damage resulting from his operations and shall indemnify the Employer against any claims for damage for drains, sewers, mains, cables, water pipes, fittings, boxes and the like or other property caused by the execution and completion of the Works.”
CC-SPW-00100 117	Traffic Safety and Management Insert at end of Sub Clause 1 “and the Department of Transport Traffic Signs Manual.”

APPENDIX 0/3: LIST OF NUMBERED APPENDICES REFERRED TO IN THE SPECIFICATION AND INCLUDED IN THE CONTRACT

LIST A: LIST OF APPENDICES REFERRED TO IN THE SPECIFICATION FOR ROAD WORKS

Used	Not Used	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				
	✓	E	1/1	Accommodation and Equipment for The Employer's Representative
	✓	E	1/2	Vehicles for the Employer's Personnel
	✓	E	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
	✓	E	1/8	Operatives for the Employer's Representative
✓		E	1/9	Control of Noise and Vibration
	✓	E	1/10	Principal Structures to be Designed by the Contractor
	✓	E	1/11	Structural Elements and Other Features to be Designed by the Contractor
✓		E	1/12	Setting Out and Existing Ground Levels
✓		E	1/13	Programme of Design and Execution and Completion of the Works
✓		E	1/14	Monthly Statements
✓		E	1/15	Accommodations Works
✓		E	1/16	Privately & Publicly Owned Services & Supplies

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
Used	Not Used	Compiled/ Completed By	Appendix No.	Title
✓		E	1/17	Traffic Safety & Management
✓		E	1/18	Temporary Diversions for Traffic
✓		E	1/19	Routeing of Vehicles
	✓	E	1/20	Recovery Vehicles for Breakdowns
	✓	E	1/21	Information Boards
	✓	E	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 Agrément Board Roads and Bridges Certificates
SITE CLEARANCE				
	✓	E	2/1	List of Buildings, etc., to be Demolished
	✓	E	2/2	Filling of Trenches and Pipes
✓		E	2/3	Retention of Material Arising from Site Clearance
	✓	E	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: NRA Road Construction Details
ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)				
	✓	E	4/1	Safety Barriers
	✓	E	4/2	Pedestrian Restraint Systems
	✓	E	4/3	Safety Barrier Terminals
	✓	E	4/4	Safety Barrier Maintenance
	✓	E	4/5	Anti-Glare Screens
	✓	E	4/6	Safety Barriers: NRA Road Construction Details
	✓	E	4/7	Vehicle Parapet Systems
DRAINAGE AND SERVICE DUCTS				
✓		E	5/1	Drainage Requirements

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E	5/2	Service Duct Requirements
Used	Not Used	Compiled/ Completed By	Appendix No.	Title
✓		E	5/3	Surface Water Channels and Drainage Channel Blocks
✓		E	5/4	Fin Drains and Narrow Filter Drains and Geotextiles for Filter Drains
	✓	E	5/5	Combined Drainage and Kerb Systems
	✓	E	5/6	Linear Drainage Channel Systems
	✓	E	5/7	Drainage and Service Ducts: NRA Road Construction Details
	✓	E	5/8	Thermoplastics Structural Wall Pipes and Fittings
	✓	E	5/9	Attenuation
EARTHWORKS				
✓		E	6/1	Requirements for Acceptability & Testing of Earthworks Materials
✓		E	6/2	Requirements for Dealing with Class U2 Unacceptable Material
✓		E	6/3	Requirements for Excavation, Deposition, Compaction (other than Dynamic Compaction)
Not Used	Not Used	Not Used	6/4	Not Used
	✓	E	6/5	Geotextiles Used to Separate Earthworks Materials
	✓	E	6/6	Fill to Structures & Fill Above Structural Foundations
	✓	E	6/7	Sub-formation & Capping & Preparation & Surface Treatment of Formation
✓		E	6/8	Topsoiling, Grass Seeding and Turfing
	✓	E	6/9	Earthwork Environmental Bunds, Landscape Areas, Screening Mounds, Strengthened Embankments
	✓	E	6/10	Ground Anchorages, Crib Walling and Gabions
	✓	E	6/11	Swallow Holes & Other Naturally Occurring Cavities & Disused Mine Workings
	✓	E	6/12	Instrumentation & Monitoring
	✓	E	6/13	Ground Improvement
ROAD PAVEMENTS – GENERAL				
✓		E	7/1	Permitted Pavement Options

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
✓		E	7/2	Excavation & Reinstatement of Existing Surfaces
	✓	E	7/3	Surface Dressing Product (End Performance)
✓		E	7/4	Bituminous Sprays
Used	Not Used	Compiled/ Completed By	Appendix No.	Title
Not Used	Not Used	Not Used	7/5	Road Pavements: NRA Road Construction Details
	✓	E	7/6	Breaking Up or Perforation of Existing Pavement
	✓		7/7	Geogrids
Not Used	Not Used	Not Used	7/8	Not Used
✓		E	7/9	Cold Milling (Planing) of Bituminous Bound Flexible Pavement
	✓	E	7/10	Microsurfacing
	✓	E	7/11	High Friction Surfacing
	✓	E	7/12	Low Energy Bound Mixtures
	✓	E	7/21	Recipe Surface Dressing
KERBS, FOOTWAYS AND PAVED AREAS				
✓		E	11/1	Kerbs, Footways and Paved Areas
	✓	E	11/2	Access Steps
✓		E	11/3	Kerbs, Footways and Paved Areas: NRA Road Construction Details
TRAFFIC SIGNS				
✓		E	12/1	Traffic Signs: General
	✓	E	12/2	Traffic Signs: Reflective Markers
✓		E	12/3	Traffic Signs: Road Markings & Studs
✓		E	12/4	Traffic Signs: Cones, Cylinders, FTD's & Other Traffic Delineators
	✓	E	12/5	Traffic Signs: Traffic Signals
	✓	E	12/6	Traffic Signs: Special Sign Requirements on Gantries
	✓	E	12/7	Traffic Signs: Preparation and Finish of Metal and Other Surfaces
ROAD LIGHTING COLUMNS & BRACKETS				

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

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E	16/10	Diaphragm Walls
	✓	E	16/11	Hard/Hard Secant Pile Walls
	✓	E	16/12	Hard/Soft Secant Pile Walls
	✓	E	16/13	Contiguous Bored Pile Walls
	✓	E	16/14	King Post Walls
	✓	E	16/15	Steel Sheet Piles
	✓	E	16/16	Integrity Testing of Wall Elements
Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E	16/17	Instrumentation for Piles and Embedded Walls
	✓	E	16/18	Support Fluid
STRUCTURAL CONCRETE				
	✓	E	17/1	Concrete – Classification of Mixes
	✓	E	17/2	Concrete – Impregnation and Coating Schedule
	✓	E	17/3	Concrete – Surface Finishes
	✓	E	17/4	Concrete – General
STRUCTURAL STEELWORK				
	✓	E	18/1	Requirements for Structural Steelwork
PROTECTION OF STEELWORK AGAINST CORROSION				
	✓	E/C (P)	19/1	(Specification for Road Works) Sheet No. Form BE/P1 (New Works) Paint System Sheet
	✓	E/C	19/2	(New Works) Requirements for Other Work
	✓	C (P)	19/3	(Specification for Road Works) Form BE/P2 Paint Data Sheet
	✓	C (P)	19/3*	(Specification for Road Works) Form BE/P3 Paint Sample Despatch List: Sheet 1
	✓	C (P)	19/3*	(Specification for Road Works) Form BE/P3 Paint Sample Despatch List: Sheet 2
	✓	E	19/4	(New Works) General Requirements
	✓	E/C (P)	19/5	(Specification for Road Works) Form BE/PE1 (Maintenance) Paint System Sheet 1
	✓	C (P)	19/6	(Specification for Road Works) Form BE/P1 (Maintenance) Paint System Sheet 2

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E/C	19/7	(Maintenance) Requirements for Other Work
	✓	E	19/8	(Maintenance) General Requirements
WATERPROOFING FOR CONCRETE STRUCTURES				
	✓	C (P)	20/1	Form PWS Proprietary Waterproofing System Data Sheet (1991 & Annex 'A')
	✓	E	20/2	Waterproofing for Concrete Structures
BRIDGE BEARINGS				
	✓	E	21/1	Bridge Bearing Schedule
Used	Not Used	Compiled/ Completed By	Appendix No.	Title
BRIDGE EXPANSION JOINTS AND SEALING OF GAPS				
	✓	E	23/1	Bridge Deck Expansion Joint Schedule
	✓	E	23/2	Sealing of Gaps Schedule (other than in Bridge Deck Expansion Joints)
BRICKWORK, BLOCKWORK AND STONEMWORK				
	✓	E	24/1	Brickwork, Blockwork and Stonework
	✓	E	24/2	Brickwork, Blockwork and Stonework: NRA Road Construction Details
SPECIAL STRUCTURES				
	✓	E	25/1	Requirements for Corrugated Steel Buried Structures
	✓	E	25/2	Requirements for Reinforced Soil and Anchored Earth Structures
	✓	E	25/3	Requirements for Reinforced Clay Brickwork Retaining Walls of Pocket Type and Grouted Cavity Construction Structures
MISCELLANEOUS				
	✓	E	26/1	Ancillary Concrete
	✓	E	26/2	Bedding Mortar
	✓	E	26/3	Cored Thermoplastic Node Markers
WATERMAINS, UTILITIES AND ACCOMMODATION WORKS				
	✓	E	27/1	Requirements for Watermains
	✓	E	27/2	Watermains: NRA Road Construction Details
TRENCHLESS INSTALLATION OF ROAD DRAINAGE & SERVICE DUCTS				

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E	28/1	Trenchless and Minimum Dig Techniques
CCTV SURVEY OF ROAD DRAINAGE SYSTEMS				
	✓	E	29/1	CCTV Survey of Road Drainage Systems

LIST B: LIST OF APPENDICES DEVISED FOR THIS CONTRACT

Used	Not Used	Compiled/ Completed By	Appendix No.	Title
	✓	E	30/1	Landscaping and Planting

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT**1 Contract-specific Drawings Supplied to Each Tenderer**

Drawing No.	Title
RN24003-04-P5-PS-WR-001 to RN24003-04-P5-PS-WR-002	List of Works Requirements Drawings
RN24003-04-P5-PS-LP	Project Location & Scheme Extents Map
RN24003-04-P5-PS-APE-001 to RN24003-04-P5-PS-APE-004	Area Provided by the Employer
RN24003-04-P5-PS-DRS-001 to RN24003-04-P5-PS-DRS-004	Drainage and Service Ducts
RN24003-04-P5-PS-EAR-001 to RN24003-04-P5-PS-EAR-010	Alignment Plan and Profile
RN24003-04-P5-PS-EAR-011 to RN24003-04-P5-PS-EAR-014	Earthworks (Topsoil and Edge Fill)
RN24003-04-P5-PS-PAV-001 to RN24003-04-P5-PS-PAV-009	Cross Sections
RN24003-04-P5-PS-PAV-010 to RN24003-04-P5-PS-PAV-013	Pavement Type Plan
RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-017	Milling and Reconstruction Areas
RN24003-04-P5-PS-PAV-018	Typical Cross Sections
RN24003-04-P5-PS-KFP-001 to RN24003-04-P5-PS-KFP-004	Kerbing Footways and Paved Areas
RN 24003-04-P5-PS-TSM-001 to RN24003-04-P5-PS-TSM-004	Traffic Signs and Road markings
RN24003-04-P5-PS-DIV-001	Proposed Diversion Route

2 Standard Drawings**2(i) Supplied to Each Tenderer**

Drawing No.	Title	Volume No.

2(ii) Inspected by tenderers

The following drawings are made available for inspection by Tenderers at:

.....

between the following date

and at the following times

One copy will be supplied to the Contractor

Drawing No.	Title	Aspect required if not whole Drawing

2(iii) Brought into the Contract by Reference

The Standard Construction Details (SCD) in TII Publications (Standards) contain the following drawings brought into the Contract by reference. Unless otherwise stated below the whole drawing is brought into the Contract.

Drawing No.	Title	Date	Aspect/Alternative(s) Required if Not Whole Drawing
CC-SCD-00501	Chamber Types	03/15	
CC-SCD-00510	Precast Concrete Gully	03/15	
CC-SCD-00511	In-situ Concrete and Blockworks Gullies	03/15	
CC-SCD-00512	Gully Grating	03/15	
CC-SCD-00521	Surface Water Drains - Trench and Bedding Details	03/15	
CC-SCD-00523	Drainage Channel Blocks Types A, B and C	03/15	
CC-SCD-00562	Trench Cross-Sections Under Non-Trafficked Areas	03/15	
CC-SCD-00701	Free Pavement Edge Detail	03/15	
CC-SCD-00703	Transverse Joint Between New Construction and Existing Road	09/10	
CC-SCD-00704	Longitudinal Joint Between New Construction and Existing Road	12/10	
CC-SCD-02753	Domestic Entrance	03/00	
CC-SCD-02754	Field Access	06/13	

Drawing No.	Title	Date	Aspect/Alternative(s) Required if Not Whole Drawing
CC-SCD-00501	Chamber Types	03/15	

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

Notes:

- 1 Tests comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See sub-Clause 105.4).
- 2 (IL) indicates that an Irish Laboratory Accreditation Board (ILAB) test report or certificate shall be required. IAB indicates that an Irish Agrément Board Certificate, or British Agrément Board Certificate shall be required.
- 3 Unless otherwise shown in this Appendix tests for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
- 4 Cube strength tests are not required for concrete complying with Clause 2602.
- 5 Unless otherwise shown in this Appendix test certificates for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
- 6 The scope of the testing covered in Table 1/1 should not be regarded as exhaustive. Routine tests carried out by manufacturers and suppliers in compliance with an Irish or British Standard or other standard or specification are not included but where a standard or specification makes provision for a test certificate this is indicated in the table.
- 7 Where the quantity of material used in the Works is less than any quantity described under 'Frequency of Testing' then the quantity described under 'Frequency of Testing' shall be read as the quantity used in the Works.
- 8 Details of material acceptability and compaction tests to be carried out by the Contractor are given in Table 6/1 in Appendix 6/1 of the Specification and Table 1/1 below.
- 9 Should alternative materials or products be used to those included in the Work Requirements, additional tests may be required.

Table 1/5.1 Minimum Requirements of 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)		
310	Environmental Noise Barriers				
	Post Foundations	Load test on site	As required in Sub-Clause 310.29 of the TII Specification for Road Works		Evidence of design calculations required
		Deflection test on site	As required in Sub-Clause 310.28 of the TII Specification for Road Works		
	Preservation of Timber	Moisture Content	As required in sub-clause 310.14 of the TII Specification for Road Works	Required	Quality management scheme applies
	Vandal resistance	Destruction testing	As required in Appendix 3/2 of the Specification		See sub-clause 310.11

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
311	Preservation of timber	Moisture content	As required in sub-Clause 311.2 of the TII Specification for Road Works	Required for each batch	Quality management scheme applies

Series 400

407	Anchorage in drilled holes	On-site tensile load test	As required by sub-Clause 407.3 of the TII Specification for Road Works	Required	See sub-Clause 407.1-4 of the Specification for Road Works
	Road Restraint System	As required by the system manufacturer	As required by the system manufacturer		As required by the system manufacturer
	Ground Conditions	In situ testing (sub-Clause 407.6 & 7 of the TII Specification for Road Works)	Every 50m (min. 2 per road restraint system length)		Contractor shall supply a Certificate from an independent Chartered Engineer

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 500						
501	Pipes for drainage and service ducts					
	Vitrified clay					Product Certification Scheme applies
	Concrete – PC/SRC	Not exceeding 900mm dia.				
	Concrete- Pre-stressed					
	Iron - Cast					
	Iron Ductile					
	UPVC					
	Plastics (see Table 5/1)					
	Corrugated steel		(Manufacturer's tests)		Required (AASHTO)	
	Corrugated steel bitumen protection					
	Concrete PC/SRC exceeding 900mm dia.		(Manufacturer's tests)	As per Clause 509.10 of the TII Specification for Road Works	Required	
	Other materials				Required	NSAI Agrément Certificate or equivalent required

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
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		
		Water Soluble Sulphate (WS) content (IL)	5 per source		
		Resistance to fragmentation (IL)	1 per source		
506	Sealing existing drains				
	Concrete				
	Grout				

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
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	Watertightness of joints		Air test	All pipelines with watertight joints	Required	
512	Backfill to pipe bays		Grading	1 per 50 tonnes (min of 3)		
			Water Soluble Sulphate (WS) content (IL)	5 per source		
513	Permeable backing to earth retaining structures					
		Granular Material	Piping Ratio (as Cl 513)	1 per 100 tonnes (min of 3)		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			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		
			Oxidisable sulphides (OS) content and total potential sulphate (TPS) content (IL)			
			Grading and fines content	1 per week (min of 3)		
			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 of the TII Specification for Road Works is required
		(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 of the TII Specification for Road Works is required
518	Thermoplastic structured wall pipes and fittings	(Manufacturer's tests)		Required	INAB (or equivalent) certification applies
519	Geotextiles for filter drains	(Manufacturer's tests)	1 per source	Required	Certification that the system complies with Clause 519 of the TII Specification for Road Works is required

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 600						
601 631 to 633 635 to 637 640	Acceptable material					
	Class	General Description				
	1	General granular fill	Grading	1 test per 1,000m³ for each source		
			Uniformity Coefficient	1 test per 1,000m³ for each source		
			MCV	As Required		
			MC	1 test per 1,000m³ for each source		
		1C only	LA Coefficient (IL)	1 test per 1,000m³ for each source (min of 2 total per source)		
	2	General cohesive fill	Grading	1 test per 1,000m³ for each source		Refer to Requirements in Appendix 6/1 of the Specification
			Plastic Limit	1 test per 1,000m³ for each source		
			MC	1 test per 500m³ for each source		
			MCV	1 test per 500m³ for each source		
			Undrained Shear Strength	1 test per 1,000m³ for each source (min of 2 total per source)		

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	1 test per 1,000m ³ for each source (min of 2 total per source)		
				Grading (IL)	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		
				Grading	1 test per 500m ³ (min of 1 per day during topsoiling works)		

Clause	Work, Goods or Material				Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)				(Class 6C Only)	Moisture Content (IL)	1 test per 2,000m ³ for each source		
				(Class 6A & 6C Only)	Slake Durability (IL)	1 test per 1,000m ³ for each source (min of 2 total per source)		
				(Class 6F1, 6F2 & 6F3)	Grading	1 test per 500m ³ for each source		
					Optimum MC (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 source		
					Slake Durability (IL)	1 test per 1,000m ³ for each source		
					Total Sulfur Content (IL)	1 test per source (source approval)		
					Class RA (asphalt) content (IL)	2 per source		
					Bitumen Content (IL)	2 per source		

Clause	Work, Goods or Material				Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)				(Class 6G)	Grading	1 test per 250m ³ for each source (min of 2 total per source)		
					LA Coefficient (IL)	1 test per 500m ³ for each source (min of 1 total per source)		
				(Class 6H Only)	Grading	1 test per 200m ³ for each source		
					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)	1 test per 200m ³ for each source		
					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)		

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 sulfides (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)		
				(Class 6I & 6J Only)	Grading	1 test per 200m ³ for each source		
					Uniformity Coefficient	1 test per 500m ³ for each source		
					MC (IL)	1 test per 200m ³ for each source		
					MCV (IL)	1 test per 200m ³ for each source		
					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)		

Clause	Work, Goods or Material				Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)					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 sulfides (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)		
					Microbial Activity (IL)	1 test per source (source approval)		
					LA Coefficient (IL)	1 test per 200m ³ for each source		
					Slake Durability (IL)	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)				(Class 6K, 6L & 6M)	Grading	1 test per 200m ³ for each source		
					Plastic Limit (IL)	1 test per 500m ³ for each source		
					Resistivity (IL)	1 test per source (source approval)		
					Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)		
					Oxidisable sulfides (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 & 6M Only)	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		

Clause	Work, Goods or Material				Test	Frequency of Testing	Test Certificate	Comments
601 631 to 633 635 to 637 640 (Cont'd)					MCV (IL)	1 test per 200m ³ for each source		
					LA Coefficient (IL)	1 test per 200m ³ for each source (min of 1 total per source)		
				(Class 6N1, 6N2 & 6P)	Grading	1 test per 200m ³ for each source		
					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 (IL)	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		
					MC	1 test per 200m ³ for each source		
					MCV (IL)	1 test per 200m ³ for each source		
					pH Value (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)					Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source (min of 1 test per week)					
					Oxidisable sulfides (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					
					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:			
								Water soluble sulfate content (IL)	1 test per 200m3 for each source (min of 1 total per source)		
								Oxidisable sulfides (IL)	Source approval and 1 test per 500m3 for each source (min of 1 test per week)		
								Chloride Ion Content (IL)	1 test per 200m3 for each source (min of 1 total per source)		
	pH Value (IL)	1 test per 200m3 for each source (min of 1 total per source)									

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 Material with the addition of the following:			
				Water soluble sulfate content (IL)	Source approval and 1 test per 500m ³ for each source		
				Oxidisable sulfides (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 elements			Water soluble sulfate content (IL)	1 test per 250m ³ (min of 1 test per location)		
				Oxidisable sulfides (IL)	1 test per 250m ³ (min of 1 test per location)		
602.20	Material within 350mm of designed final surface of road or central reserve.			Frost Heave (IL)	1 test per 5,000m ³ (min of 1 total per source)		
609	Geotextiles Used to Separate Earthworks Materials			Durability	1 test per source/supplier		Refer to Requirements of Appendix 6/5 or 6/9 of the Specification as Appropriate

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
609 (Cont'd)		Tensile Load	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)		
		Pore Size	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 ²		
	End Product Compaction	Optimum MC (IL)	1 test per each class of material and each source		
		Field Dry Density (IL)	1 test per 250m ³		
618	Topsoiling and grass seeding	Rate of spread of fertiliser	1 test per 1,000m ²		
		Rate of spread of seeding			
		Chemical analysis of fertiliser	1 per source		
		Grass seed germination and purity (Manufacturer's test)	1 per source	Required prior to sowing	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
622	Earthworks for reinforced earth and anchored earth structures	Redox Potential	5 locations within the affected area		
	Reinforcing Elements	Coefficient of friction	1 test for each type of element with each type of fill		
	Anchor Elements	Adhesion			
624	Ground Anchorages	Proof Loading	Every anchor		
626	Gabions	Gabion mesh	Source Approval	Required	
642	Earthworks materials adjacent to structures	Constrained soil modulus (M*)	3 on each side of structure		
614	Lime and Cement Improvement - U1	Water soluble sulfate content	Source Approval		
		Organic Content	Source Approval		
		Rate of spread	1 per 500m ²		
General	Sub-grade	Plate Bearing Test (CBR Testing)	1 per 50m (per lane) or as agreed by the Employers Representative		Refer to Appendix 6/7 of the Specification
	Subformation (Bottom of capping layer)	Plate Bearing Test (CBR Testing)	1 per 50m (per lane) or as agreed by the Employers Representative		Refer to Appendix 6/7 of the Specification
	Formation (Top of capping layer)	Plate Bearing Test (CBR Testing)	1 per 50m (per lane) or as agreed by the Employers Representative		Refer to Appendix 6/7 of the Specification

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 800					
801 802 804 805 806 807 808 809	Unbound mixtures placed within 500mm of cement bound materials, concrete pavements, structures or products	Water soluble sulfate (WS) content (IL)	1 per 200m ³ for each source (min of 5 total per source)	Required	
		Oxidisable sulphides (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 sulfides (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		
		Los Angeles Coefficient (IL)	2 per year		
		Methylene Blue (IL)	1 per week		
		Water absorption (IL)	As required by the Employers Representative		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
801		Magnesium Sulphate Soundness (IL)	1 per 2 years	Required	
802		Types A, B, C & D granular material	OMC (IL)		
804			2 per year		
805		Types B, C, D & E granular material	Moisture Content		
806			1 per 1000 tonnes or minimum of 2 per day		
807		Types A & C granular material	Liquid Limit (IL)		
808			1 per week		
809 (Cont'd)		Type C granular material	CBR (IL)		
			Density (IL)		
		Type C granular material	Percentage of crushed or broken particles and of totally rounded particles in coarse aggregates	1 per month	
		Type A granular material	Plasticity index (IL)	1 per week	
810	Cement Bound Mixtures	Water soluble sulphate (WS) content (IL)	1 per 200m ³ for each source (min of 5 total per source)	Required	
821		Oxidisable sulphides (OS) content (IL)	1 per 200m ³ for each source (min of 5 total per source)		
822		Tests for control and checking of HBM	Tests specified in Table 8/15 and Table 8/16		
823		Coefficient of linear expansion (IL)	As required by the Employers Representative		
824		Tests for laboratory mixture design	As specified in Clause 826 of the TII Specification for Road Works		
825					
826					

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 900					
2.2	Constituent materials				
3		Bond and tack coats	Requirements per Tables 15	As per Type Test report applicable to the Contract	Required Constituent materials include aggregate, binder, fillers, additives, chippings, pre-coated chippings, reclaimed asphalt, and all other materials that comprise the product. For products not covered by a Harmonised Technical Specification, material properties to be tested at the beginning of the contract to verify the values declared. Tables refer to those contained in TII Series 900.
4					
5					
6		Bituminous mixtures	Requirements per Tables 1, 2, 4, 5, 7, 8, 10, 11 & 14	As per Type Test report applicable to the Contract	
7.2			Clause 4.2.4 of the TII Specification for Road Works for pre-coated chippings		
7.3					
8.1					
8.4					
8.6					
9		Aggregate for Surface Courses – Bituminous Mixtures	Friction After Polishing Test (IS EN 12697-49)	1 test per property per source (source approval)	
		Surface dressing	Requirements per Tables 15, 17 & 18	As per Type Test report applicable to the Contract	
		Surface Dressing - Aggregate	Friction After Polishing Test (IS EN 12697-49)	1 test per property per source (source approval)	
		High friction surfacing – binders	Requirements per Table 23a	1 test per property per source (source approval)	

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
		High friction surfacing – manufactured aggregates	Requirements per Table 23b			
		High friction surfacing – natural aggregates	Requirements per Table 23c			
		Low energy bound mixtures – Paving Grade and Polymer Modified Bitumens	Requirements per Table 14	1 test per property per source (source approval)		
		Low energy bound mixtures – Virgin Aggregates and Virgin Filler	Requirements per Table 24a			
		Low energy bound mixtures – Cationic Bitumen Emulsions	Requirements per Table 24b			
		Permanent repair material systems	Requirements per Table 26a	1 test per property per source (source approval)		
		Emergency repair material systems	Requirements per Table 28a	1 test per property per source (source approval)		
		Reclaimed asphalt	Requirements per Tables 13a & 13b	As per Type Test report applicable to the Contract		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
3 4 5 6 8.1	Product Composition				
	Bituminous mixtures – All mixtures	Grading (IL)	A minimum of 1 per 600 tonnes or minimum 2 per five day period or part thereof whichever is greater.	Required	IS EN 13108-21 Factory Production Control (FPC) procedures apply. The samples shall be taken in conjunction with the product manufacturer. Portions of the same samples shall be split between the manufacturer, contractor and the Employer's Representative to enable subsequent test results to be compared.
		Binder content (IL)			
	Low energy bound mixtures	Combined grading (IL)	1 per day	Required	The samples shall be taken in conjunction with the product manufacturer. Portions of the same samples shall be split between the manufacturer, contractor and the Employer's Representative to enable subsequent test results to be compared.
		Binder content (IL)			
8.4 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)		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
910	Works	Bituminous mixtures - All mixtures	Temperature of mixture at time of delivery	Per delivery	
			Layer thickness	1 pair of cores every 1,000 linear metres laid per lane.	Measurement taken for each core extracted for in situ air void analysis.
			Temperature of mixture at time of rolling	Continuously	
			Air void content (IL)	1 pair of cores every 1,000 linear metres laid per running lane.	Cores taken from the wheel tracks. A minimum of three pairs of cores shall be taken
			Water sensitivity (IL)	1 per Contract	
		Bituminous mixtures – Containing >10% reclaimed asphalt	Recovered penetration (IL)	As required per Series 900	Required
			Recovered softening point (IL)		
			Indirect tensile strength (IL)		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Moisture induced sensitivity test conditioning (IL)			Requirement is to make available to the Employer's Representative
			Rheology (IL)			Requirement is to make available to the Employer's Representative
		Bituminous mixtures - Asphalt Concrete base and binder course specific	Permanent Works – In situ air void content within 100mm of joint (IL)	1 pair of cores every 250 linear metres laid per running lane	Required	Cores centred 100mm from the final joint position.
			In situ air void content at refusal (IL)	1 pair of cores every 1,000 linear metres laid per running lane		Cores taken from the wheel tracks.
			Resistance to permanent deformation (IL)	6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre		Cores taken from the wheel tracks.
			Stiffness (IL)	1 pair of cores every 1,000 linear metres laid per running lane		Cores taken from the wheel tracks.
		Bituminous mixtures - Asphalt Concrete surface course specific	Macrotexture - Volumetric Patch (IL)	10 over 50 metres lane length	Required	Refer to Series 900 for requirements regarding minimum test coverage.

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
		Bituminous mixtures - Hot Rolled Asphalt surface course specific	Resistance to permanent deformation (IL)	6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre	Required	Cores not to be taken from the wheel tracks.
			Rate of Spread of Chippings for shoulder-to-shoulder cover	At Contract start		Refer to Series 900 for requirements of repeating measurements.
			Rate of Spread of Chippings for mechanical chipping spreader	1 per 100m or 1 per day		Refer to Series 900 for requirements of repeating measurements.
			Macrotexture - Volumetric Patch (IL)	10 over 50 metres lane length	Required	Refer to Series 900 for requirements regarding minimum test coverage.
		Bituminous mixtures - Stone Mastic Asphalt binder course specific	Resistance to permanent deformation (IL)	6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre	Required	Cores taken from the wheel tracks.
		Bituminous mixtures - Stone Mastic Asphalt surface course specific	Macrotexture - Volumetric Patch (IL)	10 over 50 metres lane length	Required	Refer to Series 900 for requirements regarding minimum test coverage.

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments	
			Resistance to permanent deformation (IL)	6 cores from the first kilometre length of material from each source; 1 core from each subsequent running lane kilometre		Cores not to be taken from the wheel tracks.	
		Bituminous mixtures - Porous asphalt surface course specific	Relative hydraulic conductivity (IL)	Every 1,000 linear metres laid per lane and fraction thereof*	Required		
		Bond and Tack Coat	Rate of spread of binder	1 every 20,000 square metres or 1 ever month, whichever is greater			
			Accuracy of spread of binder	1 every 6 months			
		Surface Dressing	Rate of spread of binder	As required per Series 900			
			Accuracy of spread of binder				
			Rate of spread of chipping				
			Accuracy of spread of chipping				

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Volumetric patch (IL)	10 over 50 metres lane length	Required	Refer to Series 900 for requirements regarding minimum test coverage.
		High friction surfacing	Volumetric patch (IL)	10 over 50 metres lane length	Required	Refer to Series 900 for requirements regarding minimum test coverage.
			Surface shear strength of installed system (IL)	2 per substrate type		At least 1 test measured in the wheel track zone. Test locations at least 20 metres apart.
		Low energy bound mixtures	Moisture content (IL)	1 core every 50 linear metres laid per lane.	Required	
			Relative in-situ density (IL)			
			Air voids content (IL)			
			Indirect tensile stiffness modulus (IL)	1 pair of cores every 250 linear metres laid per lane.		1 core per pair taken from the wheel track zone.
		Repair systems (PRMS, LSRS, ERMS)	Volumetric patch (IL)	1 per discrete area	Required	Methodology described in IS EN 13036-1 should be followed with number of test measurements to suit size of repair.

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1000						
1001	Cement types as stated in sub-Clause 1001.3 of the TII Specification for Road Works				Required	Certificate to be provided monthly for each type of cement. Quality management and product certification schemes apply
	Cements (all types) Ground granulated blastfurnace slag	Chloride content	Monthly	Tests to be carried out by the manufacturer and results included on the test certificates required above		
		Sulphate content	Monthly			
		Acid-soluble alkali content	Daily (PC) Weekly (PFA ggbs)			
	Aggregates	Grading and fines content	1 per delivery (min 1 weekly per source)	Results of routine control tests by the manufacturer/ supplier to be provided. Product certification scheme applies		
		Shell content (IL) (Only required where marine aggregates are used)	Monthly			
		Flakiness index (IL)	Monthly			
		Resistance to fragmentation (IL)	Every 6 months			
		Chloride ion content (IL)	Daily			
		Acid soluble sulphate content (IL)	Monthly			

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
1001 (Cont'd)		Fine aggregate	Acid-soluble material (IL)	Monthly		
	Water		Tests specified in IS EN 1008	As required by the Employers Representative		
			Chloride content	Monthly		
			Sulphate content	Monthly		
			Acid-soluble alkali content	Weekly		
	Admixtures		Chloride content	1 per consignment	Required (BS 934-2)	
			Sulphate content	1 per consignment	Required	
			Acid-soluble alkali content	1 per consignment		
1002 1003 1004 1044	Concrete	Air content test (IL)	As required in Table 10/9 of the TII Specification for Road Works	Required		
		Density of in situ Concrete cores (IL)	As required in Table 10/9 of the TII Specification for Road Works			
		Cube strength (IL)	As required in Table 10/9 of the TII Specification for Road Works			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1005	Consistence	Compaction index (IL)	As required in Table 10/9 of the TII Specification for Road Works		
		Vebe (IL)			
1011	Dowel bars			Required (BS 4449)	Product certification scheme applies
1012	Tie bars				
	Dowel bars and supporting cradles	Load test	1 per arrangement		
	Sheathed dowel bars	Bond stress	4 bars		
	Cranked tie bars (coated)	Bend test	4 bars		
		Salt fog cabinet	4 bars		
1015	Joint filler board	Weathering test	3 per source		Normally undertaken by manufacturer
		Compression and recovery	4 per source		
		Extrusion	1 per source		
	Cork filler board	Immersion in water	2 per source		
		Immersion in acid	2 per source		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1016 1017	Applied sealants	Initial Penetration	1 per 1000m or 1 per day	Required (BS EN 14188-1, BS 2499-2, BS 5212-1, BS 5212-2) (IS EN 13880-2, IS EN 13880-3, and BS 4254)	
		Resilience	1 per 1000m or 1 per day		
	Compression seals			Required (ASTM D2628) (BS 2752)	
		Compression set	1 per type of seal	(BS 4443-4, Method 10 and IS EN ISO 2440) (IS EN ISO 1856) (BS 903: Part A16 or IS ISO 1817)	
		Immersion in oil	1 per type of seal		
	Self expanding cork seal	Tests specified in Clause 1017	1 per type of seal	Required	
1026 1044	Surface macrotexture	BS EN 13036-1 Volumetric Patch Technique (IL)	1 per day (set of 10)	Required	
1027	Aluminised curing compound	Efficiency Index	1 per source		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1100						
1101	Precast concrete kerbs, channels, edgings and quadrants		Bending strength	Minimum of 8 per 1000 units of each product (IS EN 1340)	Required	
1102	In situ asphalt kerbs		Grading	1 test per 500 metres laid	Required	
			Binder Content			
1104	Precast concrete flags		Bending strength	Minimum of 8 per 1000 units of each product (IS EN 1339)	Required	
	Bedding	Granular material				
		Mortar				
1107	Concrete block paving		Compressive strength	Minimum of 8 per 1000 units of each product (IS EN 13389)	Required	
1108	Clay pavers		Bending strength	Minimum of 8 per 1000 units of each product (IS EN 1344)	Required	
			Skid resistance	Minimum of 8 per 1000 units of each product (IS EN 1344)		
1109	Cellular grass paving systems					NSAI Agrément certificate or equivalent scheme applies

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1200					
1202	Permanent traffic signs	Test specified in the Standard/ Specification given in Clause 1202 of the TII Specification for Road Works		Required	I.S. EN 12899-4 Factory Production Control procedures apply.
1213	Permanent traffic cones and traffic cylinders	Part 7 of I.S. EN 13422		Required	Quality management and product certification schemes apply
1215	Traffic signals				Quality management scheme applies. Statutory approval of equipment applies
		Cables			Product certification scheme applies
		Controllers <i>[Other equipment]</i>	Tests specified in Appendix 12/5 of the Specification.		
		Cabling	Tests a, b, c, e, f, g, h, j as defined in sub-Clause 1424.2	Required	Certification that the installation complies with the National Rules for Electrical Installations is required.

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1216	Thermoplastic road marking materials	Tested for the requirements of the specification in accordance with I.S. EN 1436 initially on application and as detailed during the guarantee period.		Required	Quality management and product certification schemes apply.
1217	Retroreflecting road studs	Test specified in the Standard/ Specification given in Clause 1217 of the TII Specification for Road Works		Required	Quality management and product certification schemes apply

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1300					
1305	Anchorage for use in drilled holes	Tensile load (Manufacturer’s tests)		Required	To provide well attested and documented evidence
1306	Anchorage in drilled holes to columns with flange plates	Loading test on site	1 per batch of as required by the Employers Representative		
1310	Welding	Welding procedures (manufacturer’s tests)	(Every seven years)		Quality management scheme applies
		Welding qualification (Manufacturer’s tests)	(Every two years)		
		Production testing (Manufacturer’s tests)	(Clause 1310 (7.1.4) of the TII Specification for Road Works)		
	Welded joints	Destructive testing			
1313	GFRP laminates	Loss on ignition	1 per 200 production columns		
		Colour fastness	1 per batch		
		Electric strength			
		Water absorption			
		Impact strength			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1314	Brackets for laminating GFRP lighting columns				
		Polyurethane foam	Bulk density	1 per batch	
			Surface hardness		
			Apparent bulk density	2 per batch	
			Impact strength		
		Flexural stress			
Series 1400					
1421	Cable				Product certification scheme applies
1424	Lighting Units	Tests specified in Clause 1424 of the TII Specification for Road Works	Each unit	Required	Product certification scheme applies. Certification that the installation complies with the National Rules for Electrical Installations is required
	Networks	Tests specified in Clause 1424 of the TII Specification for Road Works	Each network	Required	Certification that the installation with the National Rules for Electrical Installations is required

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1500					
1506	Multipair communications cable			Required	Certification that each completed cable complies with the specification given in Appendix 15/1
	Fibre optic communications cable			Required	Certification that each completed cable complies with the specification given in Appendix 15/1
	Power supply cable for communications systems			Required	Certification that each completed cable complies with the specification given in Appendix 15/1
1518	Motorway communications and power cable	Tests specified in the specification given in Appendix 15/1	Each cable (Stage 1). As required in Appendix 15/1 (Stage 2)		Results to be reported in accordance with the specification
	Motorway optical fibre communications cable	Tests specified in the specification given in Appendix 15/1	Each cable (Stage 1). As required in Appendix 15/1 (Stage 2)		Results to be reported in accordance with the specification
	CCTV co-axial cable	As required by the Employers Representative			
1523	Detector loops				
		Cable			Required

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
1523 (Con'd)		Epoxy resin			Required	Certification that the epoxy resin complies with Clause 1523 is required
		Feeder cable			Required	Certification that completed cables comply with the specification stated in Appendix 15/1 is required
		Joints	Pull test (4 kgf)	Each crimp		
		Installation	Series resistance	Each loop	Required	Certification in accordance with Clause 1523 is required
			Insulation resistance			
			Inductance			
1530	Pipes for motorway communications ducts					
		UPVC				Product Certification Scheme applies
		Plastics (see Table 5/1)				
		Other materials				Required
	Thermoplastic structured wall pipes and fittings		Manufacturer's Tests		Required	INAB (or equivalent) certification applies

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1530 (Cont'd)	Pipe bedding	Grading and fines content (<i>Washing and sieving method to be used</i>)	1 per week(min of 3)	Required	Results of routine control tests from the factory production control system operated by the producer to be provided – see Annex C of IS EN 13242.
		Water Soluble Sulphate (WS) content (IN)	5 per source		
		Resistance to fragmentation (IL)	1 per source		
1532	Chambers	Precast concrete			Product certification scheme applies
		Corrugated galvanised steel	Manufacturer's Tests	Required	Product certification scheme applies
		Manhole steps			Product certification scheme applies
		Steel fitments			
		Covers, grates and frames			Product certification scheme applies
		Cover bolts			Quality management scheme applies

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments	
1533	Cable ducts					
		Mandrel test	Test specified in Clause 1533	Each duct	Required	Certificate that each length of duct between chambers satisfies the mandrel test is required.
		Air test	Test specified in Clause 1533	Each duct	Required	Certificate that each length of duct between chambers satisfies the air test is required.

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1600					
1601	Soil samples In situ soil tests			Required	Refer to Series 600 of the TII Specification for Road Works
1602 to 1606 1610 To 1615	Concrete Grout Reinforcement Prestressing Steelwork Welding Protection against corrosion			Required	Refer to Series 1700, 1800, 1900 of the TII Specification for Road Works
1606	Coatings for protection against corrosion	Adhesion	As required in Appendix 16/6 of the Specification.		
1607	Reduction of friction on piles				
1608	Integrity testing				
1616	Dynamic testing				
1609	Static load testing of piles			Required	
1612	Self hardening slurry mixes				
1617	Instrumentation				
1618	Support fluids	To be proposed by the Contractor			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1700					
1702 1703 1704	Cement types as stated in sub-Clause 1702.1 of the TII Specification for Road Works.			Required	Certificate to be provided monthly for each type of cement. Quality management and product certification schemes apply.
	Cements (all types)	Chloride content	Monthly		Tests to be carried out by the manufacturer and results included on the test certificates required above
	Ground granulated blastfurnace slag	Sulphate content	Monthly		
		Acid-soluble alkali content	Daily (PC) Weekly (PFA ggbs)		
	Aggregates	Grading and fines content	1 per delivery (min 1 weekly per source)		Results of routine control tests by the manufacturer/ supplier to be provided. Product certification scheme applies
		Shell content (IL) (Only required where marine aggregates are used)	Monthly		
		Flakiness index (IL)	Monthly		
		Resistance to fragmentation (IL)	Every 6 months		
		Drying shrinkage (IL)	Monthly		
		Chloride content (IL)	Daily		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments		
1702 1703 1704 (Cont'd)			Sulphate content (IL)	Monthly				
			Blastfurnace slag		Bulk density (IL)		1 per 500 tonnes	
					Stability (IL)		1 per 500 tonnes	
					Sulphur content (IL)		1 per 500 tonnes	
	Water		Tests specified in IS EN 1008	Monthly				
			Chloride content	Monthly				
			Sulphate content	Monthly				
			Acid-soluble alkali content	Weekly				
	Admixtures		Chloride content	1 per consignment	Required (IS EN 934-2)			
			Sulphate content	1 per consignment	Required			
			Acid-soluble alkali content	1 per consignment				
	1707	Concrete		Cube strength (IL)	Prestressed concrete – 2 cubes from 12m³ or 2 batches whichever represents the lesser volume	Required	Contractor to cast and test sufficient copies to demonstrate cube strength before transfer	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1707 (Cont'd)			Reinforced Concrete - 2 cubes from 24 m³ or 4 batches whichever represents the lesser volume		
			Mass Concrete – 2 cubes from 50 m³ or 50 batches whichever represents the lesser volume		
			Additional cubes for special purposes		
		Cube strength identity testing as described in Appendix 17/4 (IL)	2 cubes from each of 2 samples of each batch		
		Density	Each batch		
		Modulus of elasticity			
	Fresh concrete	Consistence (IL) [The method should be stated in Appendix 17/1]	Each batch		
		Air content	Each batch		
		Cement content	Each batch		
		Water/cement ratio			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1709	Silane			Required for each delivery	Certificate that the silane complies with Clause 1709 of the TII Specification for Road Works is required (CI 1709.2)
		Refractive Index	Three samples		
		Trial panels			
1710	Concrete packing Mortar packing Epoxy resin bonding agent		Each batch		
	Precast concrete manufactured off Site	Cube strength (Manufacturer's tests)			Contractor to make available records of tests by manufacturer
1711	Grouting and Duct Systems for Post-tensioned Tendons				CARES Scheme for Supply and Installation of Post-tensioned Systems In Concrete Structures or an equivalent scheme is required. Quality management and product certification schemes for cement apply
		Full scale trials			See sub-Clause 1711.1 of the TII Specification for Road Works and Appendix 17/6 of the Specification
		Air pressure tests			See sub-Clause 1711.3 of the TII Specification for Road Works and Appendix 17/6 of the Specification

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
1711 (Cont'd)			Duct assembly verification tests			See sub-Clause 1711.3 of the TII Specification for Road Works and Appendix 17/6 of the Specification
			Wall thickness of ducts after tensioning			See sub-Clause 1711.3 of the TII Specification for Road Works and Appendix 17/6 of the Specification. Contractor should provide evidence of testing
			Fluidity	See Table 17/7		
			Bleeding			
			Volume change			
			Cube strength			
			Sieve			
			Sedimentation			See sub-Clause 1711.8 and sub-Clause 1711.9 and Table 17/8 of the TII Specification for Road Works
		Admixtures			Required	Quality management and product certification schemes apply Data on their suitability, including previous experience should be made available. See sub-Clause 1711.10 of the TII Specification for Road Works

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1712	Reinforcement				Product certification scheme applies
	Steel bars			Required (BS 4449 & IS EN 10080)	
	Steel wire			Required (BS 4482 & IS EN 10080)	
	Steel fabric			Required (BS 4483 & IS EN 10080)	
	Stainless steel			Required (BS 6744)	
1713	Fabricated reinforcement			Required	Certification that fabricated reinforcement complies with the routine inspection/testing requirements of BS 8666 is required if the fabrication is not covered by a product certification scheme listed in Appendix 1/25 of the Specification.
1716	Reinforced jointing systems	Permanent elongation Characteristic strength (Manufacturer's tests)		Required for each type of connection	NSAI Agrément certificate or equivalent scheme to apply

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1717	Reinforcement metal arc welding	Welding procedure approval (BS 7123)	As required in BS 7123		Tests should be carried out by an independent testing body specified in BS 8666
		Welder approval (BS 7123)			
1718	Prestressing Tendons				Product certification scheme applies CARES (PT6-PT8)
				Required (BS 5896)	
				Required (BS 4486)	
		Seven-wire Strand		Required (BS 5896)	
		Pre-stressing steel (all types)	Proof load Breaking load Elongation Ductility Relaxation Modulus of elasticity	As required by the Employers Representative	

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
1718 (Cont'd)		Super strand to BS 5896 or other than lowest strength 3-7 mm dia. wires to BS 5896	0.1% proof load Breaking load	Each reel		
1724	Post-tensioning anchorages		Tests in accordance with IS EN 13391 (Manufacturer's tests)		Required (IS EN 13391)	Product certification scheme applies CARES Scheme
1726	Stainless steel bar				Required (BS 6744)	Product certification scheme applies
1727	Inspection and testing of structures and components		As required by Appendix 17/4 of the Specification.	As required in Appendix 17/4 of the Specification.	Required	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 1800					
1805.2	Metallic products	Inspection documents to EN10204	All Metallic Products	Required according to IS EN 1090-2:2008+A1:2011, Table 1	
1805.3.4	Special properties of constituent products	Testing to identify internal discontinuities or cracks in zones to be welded as specified in Appendix 18/1	As required in Appendix 18/1 of the Specification.		
1806.4.4	Check of the capability of cutting processes that are likely to produce local hardness	Testing in accordance with IS EN ISO 6507	As required		
1806.5.4 d)	Check of the hardness and geometry of hollow section components subject to bending by cold forming	Check of the hardness, testing in accordance with IS EN ISO 6507	As required		
1807.4.1.2	Qualification of welding procedures (Processes 111, 114, 12, 13 and 14)	Tests specified in IS EN ISO 15614-1 or IS EN ISO 15613	As required in IS EN ISO 15614-1 or IS EN ISO 15613		Results to be reported in accordance with IS EN ISO 15614-1 or IS EN ISO 15613
1807.4.1.2 (3)	Qualification of welding procedures for joints with restricted access	Tests specified in IS EN ISO 15613	As required in IS EN ISO 15613		Results to be reported in accordance with IS EN ISO 15613
1807.4.1.3	Qualification of welding procedures for other welding processes	Tests specified in the standards listed in IS EN 1090-2:2008+A1:2011, Table 13	As required in the standards listed in IS EN 1090-2:2008+A1:2011, Table 13		Results to be reported in accordance with the standards listed in IS EN 1090-2:2008+A1:2011, Table 13. Note the requirement in IS EN 1090-2:2008+A1:2011, 7.5.12 relating to stud weld procedure testing.

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1807.4.1.4	Validity of welding procedure qualification	Additional tests specified in ISEN 1090-2:2008+A1:2011, 7.4.1.4 for a welding procedure qualified in accordance with IS EN ISO 15614-1, which is undertaken by a welding process that has not been used	As required in IS EN 1090-2:2008+A1:2011, 7.4.1.4		Results to be reported in accordance with IS EN ISO 15614-1
1807.4.1.4 (1)	Validity of welding procedure qualification	Welding production test in accordance with the qualification standard for the process concerned	As required		Results to be reported in accordance with the qualification standard for the process concerned
1807.4.2	Qualification of welders and welding operators	Tests specified in IS EN ISO 9606-1 (welders) or IS EN ISO 14732 (welding operators)	As required in IS EN ISO 9606-1 or IS EN ISO 14732 as appropriate	Required	Certificate to be in accordance with IS EN ISO 9606-1 or IS EN ISO 14732 as appropriate
1807.4.2	Qualification of welders of hollow section branch connection with angles less than 60°	Specific qualification test. Tests specified in IS EN ISO 9606-1.	As required		
1807.4.2 (1)	Qualification of welders of joints with restricted access	Specific qualification test. Tests specified in IS EN ISO 9606-1.	As required		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1807.5.1.1	Verification that joint preparation in steel grades higher than S460 are free from cracks	Testing in accordance with IS EN ISO 3452-1 (penetrant) or IS EN ISO 17638 (Magnetic particle)	As required		
1807.5.1.1 (1)	Qualification of welding procedures where prefabrication primers are to be left on the fusion faces.	Tests specified in IS EN ISO 15614-1 or IS EN ISO 15613 using such prefabrication primers	As required in IS EN ISO 15614-1 or IS EN ISO 15613		Results to be reported in accordance with IS EN ISO 15614-1 or IS EN ISO 15613
1807.5.4 (1)	Welding of joints in hollow sections, full penetration butt welds with restricted access	Pre-production weld test conforming to IS EN ISO 15613.	As required		
1807.5.6 (3)	Verification of ground surface are free of cracks following removal of temporary welded attachments	Testing in accordance with IS EN ISO 17638 (Magnetic particle)	As required		
1807.5.9.2 (1)	Verification of the absence of surface cracking in continuity welds in permanent steel backing	Testing in accordance with IS EN ISO 3452-1 (penetrant) or IS EN ISO 17638 (Magnetic particle)	As required		
1807.5.18	Welding of bridge decks	Production tests in accordance with IS EN 1090-2:2008+A1:2011, 12.4.4 c)	As required		
1808.5.3 (1)	k value check for the Torque method	Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H	Daily		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1808.5.4 (2)	k value check for the combined method	Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H	Daily		
1808.5.5 (1)	Preload check for HRC method	Test in accordance with IS EN 1090-2:2008+A1:2011, Annex H	Each assembly lot		
1808.9	Use of special fasteners and fastening methods	Procedure tests for special fasteners and fastening methods as specified in Appendix 18/1	As required in Appendix 18/1 of the Specification.		
1810.1 (5)	Slip resistant connections	Slip factor test in accordance with IS EN 1090-2:2008+A1:2011, Annex G	As required in Appendix 18/1 of the Specification.		
1810.1 (10)	Verification of the preparation carried out before overcoating galvanized components	Test as specified in Appendix 18/1	As required in Appendix 18/1 of the Specification.		
1812.2.1 (1)	Specific testing of constituent products not covered by standards.	Tests as specified in Appendix 18/1	As required in Appendix 18/1 of the Specification.		
1812.2.1 (2)	Mechanical fasteners	Sample testing as specified in 1812.2.1 (2)	As required in 1812.2.1 (2)		Results to be reported in accordance with 1812.2.1 (2). Testing not required if mechanical fasteners supplied by a NHSS 3 registered Organisation. See 1800.5.2
1812.2.1 (3)	Mechanical fasteners	Suitability testing as specified in 1812.2.1 (3)	As required in 1812.2.1 (3)		Results to be reported in accordance with 1812.2.1 (3).

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1812.4.1	Inspection before and during welding	None destructive testing methods selected in accordance with IS EN ISO 17635	As required in IS EN 1090-2:2008+A1:2011, 12.4.1		
1812.4.2.2	Inspection after welding – Scope of inspection	Supplementary none destructive testing determined by the manufacturer, according to the nature of the work in normal production.	As required in IS EN 1090-2:2008+A1:2011, 12.4.2.2		See 1812.4.2.2 (6)
1812.4.2.2 (1)	Inspection after welding - Specific inspection of welds	Supplementary none destructive testing in accordance with 1812.4.2.2	As required by 1812.4.2.2 (1) to (5)		
1812.4.3 (1)	Welded shear studs	Production tests as specified in IS EN ISO 14555, 14.2	As required in 1812.4.3 (1)		Results to be documented in accordance with 1812.4.3 (4)
1812.4.3 (2)	Welded shear studs	Hammer test as specified in 1812.4.3 (2)	Every welded shear stud		
1812.4.3 (3)	Welded shear studs	Simplified production tests as specified in IS EN ISO 14555, 14.3	As required in 1812.4.3 (3)		Results to be documented in accordance with 1812.4.3 (4)
1812.4.4 (1)	Production tests on welding	Production tests on welding as specified in 1812.4.4 (1)	As required in 1812.4.4 (1)		Results to be reported in accordance with the relevant standard

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1812.4.4 (2)	Production tests on welding using run-off coupon plates	Production tests on run-off coupon plates as specified in 1812.4.4 (2)	As required in 1812.4.4 (2)		
1812.7.4	Other acceptance tests	Test requirements for components erected to a specific load as specified in Appendix 18/1	As required in Appendix 18/1 of the Specification.		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
Series 1900						
1903	Abrasives		Grading	All members		
			Hardness			
1909	Galvanised Coatings		Test specified in IS EN ISO 1461	All members		
	Thermally sprayed aluminium metal coatings		Tests specified in IS EN ISO 2063	All members		
		Aluminium coating material			Required in accordance with IS EN ISO 14919	
1910	Thermally sprayed aluminium metal coating		Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or ‘ASTM D4541-Type III’	At the start of the works and		
	Thermally sprayed aluminium metal coating (excepted areas)		Grid test specified in IS EN ISO 2063	All members		
1911, Table 19/2B	Hot dip galvanised coating to fasteners		Tests specified in IS EN ISO 10684	All members		
1912	Paints					
		‘A’ and ‘B’ Samples	Provision of samples for ‘A’ and ‘B’ sample tests			Samples selected in accordance with Clause 1912
			Specific gravity	As required by rate of ‘A’ and ‘B’ sampling		

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
			Colour match	As required by rate of 'A' and 'B' sampling		
1914	Coating System					
		Minimum film thicknesses	Minimum dry film thickness measurements in accordance with IS EN ISO 2808	Required – representative testing		
		Adhesion	Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or ASTM D4541 – Type III	Required – representative testing		
		Defects	Visual assessment supplemented by appropriate testing	Required		
		Defects – pin-holing or porosity	Low or high voltage detectors in accordance with ASTM G62-07	Required – representative testing excluding corners, bolted joints or welds		
1972	Abrasives		Grading	All members		
			Hardness			
1974	Thermally sprayed aluminium metal coatings		Tests specified in IS EN ISO 2063	All members		
		Aluminium coating material			Required in accordance with IS EN ISO 14919	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
1975	Thermally sprayed aluminium metal coating	Pull off adhesion test in accordance with IS EN ISO 4624, IS EN ISO 2063 or 'ASTM D4541-Type III'	At the start of the works and		
	Thermally sprayed aluminium metal coating (excepted areas)	Grid test specified in IS EN ISO 2063	All members		
1978	Paints				
	'A' and 'B' Samples	Provision of samples for 'A' and 'B' sample tests			Samples selected in accordance with Clause 1978
		Specific gravity	As required by rate of 'A' and 'B' sampling		See NG 1978, 7; Appendix 19/4, Note 4;
		Colour match	As required by rate of 'A' and 'B' sampling		See NG 1978, 7

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2000					
2003	Permitted waterproofing systems				NSAI Agrément Certificate or equivalent applies
	Additional bituminous protection	Tests specified in IS EN 13108-4	1 per 15 tonnes		Sampling to comply with IS EN 13108-4
	Stability value	Tests specified in BS 594897	1 per 15 tonnes		
2004	Permitted waterproofing systems				NSAI certification or equivalent applies
2008 2009	Waterproofing membrane	Tensile strength, elongation at break (BS ISO 37)			Tests results to be provided to the Employer's Representative (Clause 2008.2 of the TII Specification for Road Works)
		Tear strength (BS ISO 34-1)			
		Deck adhesion (Clause 2008.5 of the TII Specification for Road Works)	Three tests per 500m ² of sprayed membrane		
		"Holiday Test"			

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2100					
2101	Complete Bridge bearings	Tests specified in Appendix 21/1 of the Specification	As required in Appendix 21/1 of the Specification		
Series 2400					
2401	Masonry cement			Required (IS EN 413-2)	Quality management scheme applies
		Chloride content	Monthly		Test to be carried out by the manufacturer and results included on the test certificate
2402	Sand			Required per consignment (IS EN 13139)	
		Chloride content	Monthly		Test to be carried out by the manufacturer and results included on the test certificate
2404	Mortar admixtures			Required (IS EN 934-3)	Product certification scheme applies
2405	Lime			Required (IS EN 459-1)	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
2406	Bricks				Product certification scheme applies
	Clay	Active soluble salt content (IS EN 772-5) Compressive strength (IS EN 772-1) Water absorption (IS EN 772-7) Freeze/thaw resistance			
	Calcium silicate			Required IS EN 771-2)	
	Concrete			Required (IS EN 772-2)	
2407	Blocks				
	Concrete			Required (IS EN 772-2)	
2408	Manufactured Stone	In accordance with IS EN 771-5		Required	
2410	Stainless Steel				
2411	Wire/fabric			Required (IS EN 10088-1)	
	Bars			Required (BS 6744)	

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2500					
2501	Materials for corrugated steel buried structures				Type approval applies
	Steel plate			Required as appropriate to the standard or specification listed in NRA BD 12 and Appendix 25/1 of the Specification.	NSAI Agrément Certificate or equivalent applies
	Nuts and bolts				
	Metal coating				
	Protective coating				
	Paved invert system				
2502	Materials for reinforcing elements, prefabricated facing and capping units, and washers				NSAI Agrément Certificate or equivalent applies
	Carbon steel strip			Required (IS EN 10025-1 and IS EN 10025-2)	Silicon content and mechanical properties to be stated on the certificate
	Stainless steel strip			Required (IS EN 10029, IS EN 10048, IS EN 10051 and IS EN ISO 9445)	Mechanical properties to be stated on the certificate

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
2502 (Cont'd)	Reinforcing bar for anchor elements			Required (IS EN 10080 and BS 4449)	Tests scheduled for welding and galvanizing of anchor elements under Series 1700 and Series 1900 respectively are required.
	Materials for fasteners				
	Steel alloy			Required (IS EN ISO 898-1, IS EN ISO 4016, IS EN ISO 4018 and IS EN ISO 4034)	Tests for galvanizing scheduled under Series 1900 are required
	Stainless steel			Required (IS EN 10088-1, IS EN ISO 3506-1 and IS EN ISO 3506-2)	
	Bolts, screws and nuts			Required (IS EN ISO 898-1 and IS EN ISO 4016, IS EN ISO 4018 and IS EN ISO 4034)	Tests for galvanizing scheduled under Series 1900 are required
2503	Materials for Reinforced Clay Brickwork Retaining Walls of Pocket-type and Grouted Cavity Construction				

Clause	Work, Goods or Material		Test	Frequency of Testing	Test Certificate	Comments
2503 (Cont'd)		Clay bricks	Compressive strength (IS EN 772-1) Water absorption (IS EN 772-7) Freeze/thaw resistance	1 set of tests per type of brick		

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2600					
2601	Bedding mortar materials			Required for each batch	Certification in accordance with Clause 2601 of the TII Specification for Road Works is required
	Bedding Mortar	Flow cone test	Each batch		Laboratory tests (IL)
		Flow between glass plates			
		Compressive strength			
		Expansion test			
		Water absorption			
		Elastic stability	1 per source		
		Flow cone test Compressive strength	Each load		Site control tests
2604	Plastic coating to fencing posts, gates and ancillaries	Impact test Adhesion Retention of adhesion Salt spray Accelerated weathering (Manufacturer's tests)		Required (BS 1722-16)	Records of all tests to be available for inspection

Clause	Work, Goods or Material	Test	Frequency of Testing	Test Certificate	Comments
Series 2700					
2703	Polyethelene Pipes				
	Butt fusion joints	Tensile test to WIS 4-32-08	As required in Appendix 27/1 of the Specification.		Test Report to be made available to the Engineer's Representative
	Electrofusion joints	Double cantilever cleavage test to WIS 4-32-08	As required in Appendix 27/1 of the Specification.		Test Report to be made available to the Engineer's Representative
2708	Integrity of pipes, joints and fittings	Pressure drop test to IS EN 815	As required in Appendix 27/1 of the Specification.		Test Records to be made available to the Engineer's Representative
2709	Watermain disinfection	Chlorine residual test	All members		Test Records to be made available to the Engineer's Representative
		Bacteriological testing	All members		Test Records to be made available to the Engineer's Representative

Notes to Table 1/5.1

1. 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.
2. Where sub-formation and formation levels coincide, testing shall be carried out at the formation frequency.

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE EMPLOYER'S REPRESENTATIVE

The following samples are to be provided or made available by the Contractor for testing by the Employers Representative:

Clause	Sample Description	Frequency Of Sampling	Delivery Location	Comments
SPW-00500 Series	Samples of Aggregates	1 sample per 250 m ³	On Request of Employer's Representative	
SPW-00800 Series	Samples of Road Pavements Unbound Materials	1 per 500 tonnes or minimum of 2 per week	On Request of Employer's Representative	
SPW-00900 Series	Samples of Bituminous Mixtures including Cores and other Samples	1 per 500 tonnes or minimum of 2 per week	On Request of Employer's Representative	
SPW-01200 Series	Thermoplastic Road Marking Material	Up to 100kg	On Request of Employer's Representative	Employer's Representative to be notified of changes to batches, supplier
SPW-01200 Series	Retroreflecting Road Studs	Up to 10 no. of each Type	On Request of Employer's Representative	Employer's Representative to be notified of changes to batches, supplier
SPW-01200 Series	Glass Beads	Up to 50kg	On Request of Employer's Representative	Employer's Representative to be notified of changes to batches, supplier

Notes:

- 1 Samples comparable to those specified in this Appendix will be necessary for any equivalent work, goods or materials proposed by the Contractor (See sub-Clause 105.4).
- 2 Unless otherwise shown in this Appendix samples of work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the Works.
- 3 Unless otherwise scheduled under Clause 2602 samples of concrete complying with that Clause are not required.
- 4 (IL) indicates INAB laboratory accreditation is required for sampling.

APPENDIX 1/7: SITE EXTENT AND LIMITATIONS ON USE

EXTENT OF THE SITE

1. The extent of the Site shall include inter alia:
 - i. The lands made available by the Employer as shown on Drawing Nos. RN24003-04-P5-PS-APE-001 to RN24003-04-P5-PS-APE-004 listed in Appendix 0/4 of the Specification.
 - ii. Areas required for traffic management measures by the Contractor in compliance with Clauses 1/17 and 1/18 of the Specification.
 - iii. 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.
 - iv. The Contractor shall keep open and maintain access facilities to properties for all landowners during the course of the Works.

LIMITATIONS ON THE USE OF THE SITE

2. Where public roads are included within the extent of the Site, the Contractor shall maintain adequate traffic routes across, within and through the Site, or temporary diversions for traffic in accordance with Appendix 1/17 & Appendix 1/18 of the Specification.
3. The Contractor is limited in the use of public roads as a means of access to the Site as stated in Appendix 1/19.
4. The Site shall be used solely for the execution of the Works.
5. The Contractors attention is drawn to Appendix 1/9 of the Specification concerning limitations on noise and vibration. The normal working hours on the Site are defined below in Table 1.7.1 with no working on Sundays and public holidays, unless otherwise restricted to comply with traffic management restrictions in appendices 1/17, 1/18 and 1/19.

Table 1.7.1

Location	Working Hours Days/Times
Mainline Ch.0 – Ch.2880	Monday to Friday between 0700 and 1900 hours

Works other than pumping from excavations, watching, emergency work necessary for the safety of the Works, shall not be executed outside normal working hours. Exceptionally, the Employer's Representative's consent for work outside these hours may be given after necessary consultation and written approval. A minimum of 7 days' notice shall be required from the Contractor when seeking such consent. 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. In cases where overtime and shift work are approved, the hauling of spoil and deliveries of materials to the Works shall be prohibited outside normal working hours.

The extent of day and night works as set out in Table 1.7.1 above may be amended, subject to agreement with the Employer's Representative, on site in order to respond to changes to the existing site conditions and/or traffic volumes using the existing N63 network.

6. The Contractor shall note and have regard to the presence of other contractors on parts of and

adjacent to the site.

7. 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. 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. The Contractor shall reinstate all areas of land which have been temporarily occupied to the satisfaction of the affected landowner, occupier and the relevant Authorities, Utilities Service Providers and Private Utility Services and other companies.
8. Access for pedestrians, cyclists and vehicular traffic shall be maintained to all properties affected by the Works.
9. Accommodation Works on lands not made available by the Employer shall be executed and completed as soon as possible so that inconvenience to the property owners and occupiers shall be minimized. No site accommodation is to be erected on such lands or close to entrances to such lands unless agreed otherwise with the landowner(s).
10. 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.
11. The Contractor shall comply with “Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads” published by the TII. In the event that any noxious weeds and non-native invasive plant species is brought into the area provided by the Employer for the Works during the Contract, the Contractor shall treat, remove and dispose of all.
12. Notwithstanding the other provisions of the Contract the Contractor shall not have exclusive use of the Site and shall be aware that third parties may be operating within the extent of the Site. Without limiting the previous sentence, those areas defined in Appendix 1/13 of the Specification and within this Appendix 1/7 shall not be for the sole use of the Contractor.
13. The Contractor’s use of the Site shall be limited to the constraints and restrictions contained within this Appendix 1/7, Appendix 1/13, Appendix 1/17, and Appendix 1/19 of the Specification.
14. The Contractor shall be aware of the commercial premises that are present along the site extents and shall undertake to maintain adequate access to these premises at all times.

ADJACENT WORKS

15. None known.

LICENCES

16. The disposal of unacceptable/surplus material must be to properly licensed tips in accordance with Planning, Waste and all other relevant legislation. It is the responsibility of the Contractor to obtain all licenses, permits, permissions etc. required and to allow for this in the programme.

ADDITIONAL PARTICULAR LIMITATIONS ON THE USE OF CERTAIN LANDS

17. N/A

ARCHAEOLOGICAL INVESTIGATIONS

18. None known.

INVASIVE SPECIES

19. None known. The Contractor shall comply with the requirements of item number 11 above.

APPENDIX 1/9: CONTROL OF NOISE AND VIBRATION

1. Noise

- 1.1 The Local Authority has informally agreed that the following measures would be appropriate and these are given as a guide; however it is for the Contractor to decide whether to seek the Local Authority's formal consent to his proposed methods of work and to the steps he proposes in order to minimise noise.
- 1.2 All Contractor's Things used on the Works shall be the quietest of its type practical for carrying out the work required and shall be maintained in good condition with regard to minimising noise output.
- 1.3 All Contractor's Things shall be operated and maintained in accordance with the manufacturer's recommendations including the use and maintenance of any specific noise reduction measures.
- 1.4 All necessary measures shall be employed including the use of mufflers on pneumatic tools, the use of effective exhaust silencers, the use of non-reciprocating plant and the use where practical of effective sound reducing enclosures to ensure all plant used in connection with the Works operates with the minimum of noise.
- 1.5 Machines, which are used intermittently, shall be shut down or throttled back to a minimum during those periods when they are not in use.
- 1.6 Normal working hours on Site shall be as given in Appendix 1/7 of the Specification.
- 1.7 Compressors shall be of the 'sound reduced' models fitted with properly lined and sealed acoustic covers which will be kept closed whenever the machines are in use and all pneumatic tools shall be fitted with suitable silencers.
- 1.8 Where the Employer's Representative has provided written Consent to exceptional working under the other provisions of this Contract, any Contractor's Things such as generators or pumps, which are required to work outside of the hours 0700 - 1900, Monday to Friday and 0800 – 1630 on Saturdays, shall be surrounded by an acoustic enclosure to the written approval of the Employer's Representative which shall restrict the noise levels to the levels given in Table 1.9.1 of this Appendix 1/9 of the Specification.
- 1.9 The Contractor shall organise his operations with regard to the positioning of Contractor's Things and the location of haul routes, so as to minimise noise impacts on adjacent properties.
- 1.10 The Contractor shall remove from the site of the execution and completion of the Works any item of Contractor's Things, which in the opinion of the Employer's Representative shall be ineffectively silenced.
- 1.11 The Contractor shall be responsible for the measurement and control of the noise levels on and adjacent to the Site. The Contractor shall supply, construct, maintain, move or remove such equipment as may be necessary to enable the measurement of the noise levels on or adjacent to the Site and to comply with the noise limits given in Table 1.9.1. The noise levels in Table 1.9.1 are the maximum permissible noise levels at buildings during construction.

- 1.12 The ambient noise level, L_{eq} (refer to note (ii) of Table 1.9.1 of this Appendix 1/9 of the Specification) from all sources when measured 2.0 metres above the ground at noise control stations, as set out in Annex E of BS5228: Part 1, shall either not exceed the appropriate level given in the schedule or not exceed by more than 3dB(A) the existing ambient noise level L_{eq} (refer to note (iii) of Table 1.9.1 of this Appendix 1/9 of the Specification) at the noise control stations measured over the same period, whichever level is greater.
- 1.13 The maximum sound level at any noise monitoring locations shall not exceed the level given in the Table 1.9.1 of this Appendix 1/9 of the Specification.

Table 1.9.1 – Total Noise Levels at Monitoring Locations

Schedule		Maximum Permissible Noise Levels at Noise Control Stations During Execution	
Period	Hours	Activity Noise level, $L_{Aeq,1hour}$ measured at Noise Control Stations: dB(A)	Maximum Sound Level measured at Noise Control Stations: $L_{pA's}$ dB(A) (iv)
Monday to Friday	07:00 – 19:00	70	80
Monday to Friday	19:00 – 22:00	60	65
Monday to Friday	22:00 – 07:00	50	55
Saturdays	08:00 – 16:30	65	75
Sundays and Public Holidays	09:00 – 16:30	60	65
All unattended Contractor's Things outside the above working hours		45	55

Notes to Table 1.9.1:

- (i) Noise levels relate to free field conditions. Where noise control stations are located 1m from facades of buildings, the permitted noise levels can be increased by 3 dB(A).
 - (ii) The ambient noise level, L_{eq} , at a noise control station is the total L_{eq} from all the noise sources in the vicinity over the specified period.
 - (iii) The existing ambient noise level, L_{eq} , at a noise control station is the total L_{eq} from all the noise sources in the vicinity over the specified period prior to the commencement of the Works.
 - (iv) Maximum sound level shall be the highest value indicated on a sound level meter which meets the requirements of BS EN 60651 type 1 or 2 set to SLOW response and frequency weighting A.
- 1.14 Exceptionally the Contractor may be given approval to carry out Works which exceed the noise levels in Table 1.9.1 subject to a request with 14 days' notice of the date and timing of the Works being provided to the Employer's Representative. This request shall include supporting information of the Works to be undertaken, the expected noise levels and the measures that will be put in place to mitigate the additional noise nuisance. The Employer's Representative, following consultations with Roscommon County Council and any other interested bodies, shall respond to the Contractor's request within ten days of receipt of the request.
- 1.15 The noise levels scheduled for periods outside the normal working hours shall only be permitted when consent has been given to exceptional working.

2. Vibration Control

- 2.1 Vibration generated by the Contractor's activities shall not adversely affect the structural and serviceability performance of any building and structure outside the boundaries of the Site. Non-blast vibration emanating from any part of the Works when measured at, or adjacent to, the foundation of any building and expressed as the peak particle velocity shall not exceed the values set out in Table 2 the TII Guidance Document *Guidelines for the Treatment of Noise & Vibration in National Road Schemes*.
- 2.2 Ground borne vibrations shall not be permitted at sites of freshly placed concrete, i.e. concrete less than 48 hours old.
- 2.3 The Contractor shall select methods of working and items of plant so that the maximum measured ground vibrations do not exceed the following peak particle velocities:

Table 1.9.2 Intermittent Vibration Structure Type	Max PPV (mm/sec) - Intermittent Vibration		
	Frequency < 10 Hz	Frequency 10-50 Hz	Frequency 50-100 Hz
Residential Properties and similar structures (unoccupied)	8	12.5	20
Residential Properties (occupied)	4	8.5	10
Steel and Reinforced Concrete Structures	15	30	40
Robust Underground Services	15	30	60
Elderly & Dilapidated Services	10	20	40

Table 1.9.3 Continuous Vibration Structure Type	Max PPV (mm/sec) - Continuous Vibration		
	Frequency < 10 Hz	Frequency 10-50 Hz	Frequency 50-100 Hz
Residential Properties and similar structures (unoccupied)	2.5	5	7.5
Residential Properties (occupied)	2.0	4.5	5.0
Steel and Reinforced Concrete Structures	7.5	15	20
Robust Underground Services	7.5	15	30
Elderly & Dilapidated Services	5.0	10	20

- 2.4 The Contractor shall employ the best practical means to minimise vibration produced by his activities, including Contractor's Things selection and maintenance, and shall comply with the recommendations in BS 5228 (Noise and Vibration Controls on Construction and Open Sites; Part 1: Code of Practice for basic information and procedures for noise and vibration control).

APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS

The information will be supplied to the successful Contractor along with the letter of acceptance.

1 Schedule of Information on Setting Out

- i) The Contractor shall be fully responsible for the setting out of the Works and shall be supplied with the information necessary (outputted from the AutoCAD Civil 3D design package) to establish the lines and levels of the Works.
- ii) The Contractor shall set out the Works by reference to Ordnance Survey Datum (Malin Head), to which all levels quoted on the drawings refer. Horizontal alignment shall be determined in accordance with Irish Transverse Mercator (ITM) co-ordinates, to which all reference to Eastings and Northings in the Contract Documents refer.
- iii) In the event of contradictions between the data contained in the AutoCAD Civil 3D output and the drawings, the Contractor shall notify the Employer's Representative immediately.
- iv) 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.
- v) Where the Contractor establishes subsidiary permanent control markers, such markers shall be of a substantial type and construction, to the approval 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.
- vi) The Contractor shall, unless otherwise stated in Appendix 1/12, within 1 week prior to commencement of Works, carry out a check of the coordinates and levels of all permanent ground markers and permanent bench marks described in Appendix 1/12 and shall supply the Employer's Representative with their position and level in order that they may be checked and revised if necessary. The Contractor shall identify and bring to the attention of the Employer's Representative any markers that are missing. The Contractor shall comply with any specific requirements for setting out described in Appendix 1/12.
- vii) The Contractor shall, at least one week prior to commencement of Works, set out cross sections on a 10m grid as agreed with the Employer's Representative to include the centreline (at longitudinal intervals of 10 metres) together with the yellow line (where it exists) and the road edge and level these points. These cross sections will be provided by the Employer's Representative. The Contractor shall agree levels with the Employer's Representative prior to commencement of Works. These points shall be maintained for the duration of the Works and shall be set out by the Contractor for each layer so that levels can be checked in a joint survey with the Employer's Representative prior to the contractor proceeding to the next layer of construction.
- viii) The Contractor shall keep updated schedules and drawings of all bench marks (which shall be based on Ordnance Datum at Malin Head) used in the setting out and shall make these available to the Employer's Representative when required.
- ix) The Contractor shall ensure that where necessary, in order to maintain his programme, lines and levels are set out in such time as to enable Statutory Undertakers plant and other

publicly or privately owned services or supplies to be installed, altered or removed.

- x) The design, execution and completion of the Works shall ensure that a smooth transition is provided to existing footways/driveways/carriageway levels.
- xi) Station points are available for setting out purposes and can be obtained from Roscommon County Council Road Design Department.

APPENDIX 1/13: PROGRAMME OF DESIGN AND EXECUTION AND COMPLETION OF THE WORKS

1 Works Program

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

The programme must show plant and labour resources, as well as anticipated outputs for each activity and required each flows. The critical path analysis referred to above shall be provided to the Employer’s Representative. This will include all works to be done by subcontractors and a letter from them indicating their programme of works.

In programming the Works the Contractors attention is drawn to the normal working hours and limitations stated in Appendix 1/7 and Appendix 1/9 respectively.

2 Schedule of Stated Constraints

The Contractor should liaise with ESB, Eir, Irish Water and Roscommon County Council to ensure that all existing services do not affect his programme for works. The Contractors attention is drawn to the overhead power lines crossing the site. The Contractor shall comply with the requirements of “Code of Practice for Avoiding Danger from Overhead Electricity Lines”, published by ESB Networks and approved by HAS.

The Contractors attention is drawn to the time requirements of the relevant public service providers in Appendix 1/16 and shall take account of this in programming the works.

This list of Constraints is not exhaustive and all others suggested or implied by the Work Requirements or considered prudent by the Contractor following his inspection of the Site shall be taken into account by him in formulating his programme.

- (i) Phasing of the Works and limitations on use of the Site in Appendix 1/7.
- (ii) Traffic Safety and Management and Temporary Diversions as required by the Specification and Appendices 1/17 and 1/18.
- (iii) The Contractor shall only be permitted to work between mainline Ch.0 to Ch.2880 between the hours of 07.00 and 19.00 hours Monday to Friday. Exceptionally, the Employer’s Representative’s consent for work outside these hours may be given after necessary consultation and written approval. A minimum of 7 days’ notice shall be required from the Contractor when seeking such consent.
- (iv) Constraints imposed through working on or adjacent to a live carriageway.
- (v) Constraints imposed on construction activities due to maintenance at all times of any right of way through or across the Works, the maintenance of access to properties and businesses, the maintenance of pedestrian/cyclist movements through the Site, and the maintenance of safe crossing points for pedestrians and cyclists.
- (vi) Constraints imposed by the Contractor carrying out additional investigations, trial pits, slit trenching and the like prior to commencing Works on Site to verify the exact position of existing Geogrid/steel mesh.

- (vii) With relation to all privately and publicly owned services and supplies. The Contractor shall liaise with the relevant Authorities, Utilities and Service Providers and Private Utility Service Providers and others in this regard; contact details are contained in Appendix 1/16.
- (viii) Constraints imposed through working with existing live services the maintenance of services and supplies to individual properties throughout the duration of the Contract and the programming in conjunction with the relevant Authorities, Utilities and Service Providers and Private Utility Service Providers as outlined in Appendix 1/16 and Clause 116.
- (ix) Before any Works to or adjacent to services are carried out, proposals for protection, diversions and temporary support to services shall be agreed and approved by the relevant Authorities, Utilities and Service Providers and Private Utility Service Providers and the Employer's Representative.
- (x) Constraints imposed by permitted access routes as described in Appendix 1/19.
- (xi) Particular attention is drawn to the existing overhead and underground Eir, ESB and public lighting cables which are located at various locations within the site. The Contractor will need to carefully plan and co-ordinate works in the vicinity of these cables.
- (xii) Constraints imposed by the requirements that existing alignments at tie-in points for road pavements, drainage and other works shall be verified by the Contractor and any discrepancy notified the Employer's Representative two weeks prior to commencing Works in the area.
- (xiii) Constraints arising from the Site Extent, limitations on use and restricted possession of the Site and the presence of other contractors on or adjacent to the Site.
- (xiv) Constraints on earthworks listed in Appendix 6/1 and the impact of these constraints on all construction activities and Traffic Management.
- (xv) Constraints imposed by the requirements that no private accesses shall be curtailed in any way until execution of alternative accesses has been completed by the Contractor.

3 Traffic Safety and Management

The Contractors attention is drawn to the requirements of Appendix 1/17. Traffic safety and management should be carried out at the locations the Contractor considers necessary. The Contractor shall also include for the construction, maintenance and removal of these and all additional measures he considers necessary to comply with this requirement. He shall also take account of all disruptions to the Works that might occur as a result of complying with the Traffic Safety and Management requirements.

4 Road Closures

In order to construct the works the Contractor may consider it appropriate to close a public road. All applications relating to Road Closures, authorisation signs or signals must be submitted to the Employer's Representative in writing and require the following notice:

for temporary diversions -	6 weeks
for making road closures -	6 weeks
for temporary traffic signals -	4 weeks

No private accesses shall be stopped up until execution of alternative accesses has been completed by the Contractor.

5 Program Detail

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

Level 1

Submitted in accordance with the Conditions of Contract Clause 4.9 and any subsequent revision.

Roadworks – in lengths not exceeding 0.5km for main route and for each side road, link road and slip road:

- Mobilisation
- Installation and commissioning of traffic management measures
- Site Clearance
- Earthworks
- Drainage
- Works for Eir, ESB and Other Utilities Providers
- Works for Roscommon County Council and Irish Water
- Planing, Subbase, Base Course, Binder Course and Surface Course showing the quantity of each type of material to be placed each day.
- Traffic Signs and Road Markings
- Accommodation Works
- Soiling, Landscaping and Finishing Works

APPENDIX 1/14: MONTHLY STATEMENTS

1. The monthly statements submitted by the Contractor to the Employer's Representative in accordance with the Conditions shall, whenever dealing with matters covered by the Pricing Document, be set out under Part and Section headings similar to those in the Pricing Document and shall separately identify each item and specify quantity, unit, rate and value. The contractor shall allow the Employer's Representative to inspect invoices for goods or materials included in the statement pursuant to Clause 11.1 (4) as may be required.
2. The Contractor shall comply with sub-clause 11.7 of the Conditions with regard to Value Added Tax.

APPENDIX 1/15: ACCOMMODATION WORKS

1. The Schedule of Accommodation Works is included in this appendix and is shown on Drawings RN24003-04-P5-PS-PAV-010 to RN24003-04-P5-PS-PAV-13 of the Works Requirements Drawings.
2. The Contractor shall complete the Accommodation Works in an expeditious manner and within the time stated for the completion of the works in the Appendix to the Form of Tender. The Contractor shall give the Employer's Representative at least ten days' notice of the date on which he intends to start Accommodation Works. **Note: All accommodation works must be completed prior to the contractor leaving the site.**
3. The Contractor shall take precautions to avoid damage to land and property outside of the authorised site, and on completion of the accommodation works, the Contractor shall at his own cost, repair and make good to the satisfaction of the Employer's Representative any such damage resulting from both temporary occupation of land necessary for the carrying out of the work and gaining access to the site of the accommodation works. All unauthorised work carried out by the Contractor outside of the authorised site shall be at the Contractor's own expense and with the written approval of the landowner concerned.
4. The Contractor shall take all necessary precautions to safeguard all existing buildings and works from damage by construction activity, plant operation, blasting operations, ground movement and settlement, and all other activities associated with the execution of the Contract.
5. The Contractor shall make all necessary records (photographic or otherwise) of existing structures and other properties that could be affected by execution of the works prior to the commencement of construction.
6. The contractor shall ensure that where his works cause any existing access or gate to be blocked, alternative access shall be provided to the satisfaction of the Employers Representative and the affected landowner and at no extra cost to the contract.
7. All unauthorised work carried out by the Contractor outside of the authorised site shall be at the Contractor's own expense and with the written approval of the landowner(s) concerned.
8. Where disturbed, field drains shall be reinstated and properly connected into the existing or new drainage systems to the satisfaction of the Employer's Representative following agreement with the landowner. All open watercourses shall be maintained and linked into the drainage system specified. On no account shall roadwork construction be permitted to create ponding or wet areas in affected fields adjacent to land acquisition boundaries.

HOUSE AND COMMERCIAL PROPERTY FRONTS

9. When any paving operation passes an entrance onto the carriageway, Clause 804 material shall be placed and rolled in a manner that will provide a temporary slope from the existing entrance to the new carriageway level. When the carriageway has received the surface course, all entrances shall be completed as described below.
 - Clean existing house property front and remove loose material.
 - Carry out proposed kerbing works as per Kerbing, Topsoiling and Screening drawings.
 - Deposit and compact Clause 804 in area between carriageway edge and wall/boundary of property to the proposed finished carriageway level.
 - Place and compact 40mm of Cl. 3.1.9.

10. Clause 3.1.9, Close Graded Asphalt Concrete:
AC 10 Close Surf, 70/100 des to be used at Accommodation Works, unless otherwise stated.

FIELD ENTRANCES

11. When any paving operation passes an entrance onto the carriageway, Clause 804 material shall be placed and rolled in a manner that will provide a suitable slope from the existing entrance to the new carriageway level.

Schedule A – Accommodation Works

Ref.	Location	Accommodation Works Required	Area (m ²)	Drawing. No.
HE 01	House Entrance Ch 590 to 600 LHS	Pavement Type B	42	RN24003-04- P5-PS-PAV-010
FE 01	Field Entrance Ch 850 to 860 RHS	Pavement Type D	32	RN24003-04- P5-PS-PAV-011
HS 01	Hard Standing Entrance Ch 990 to 1000 LHS	Pavement Type C	82	RN24003-04- P5-PS-PAV-011
HE 02	House Entrance Ch 990 to 1000 RHS	Pavement Type B	115	RN24003-04- P5-PS-PAV-011
FE 02	Field Entrance Ch 1170 to 1180 RHS	Pavement Type D	106	RN24003-04- P5-PS-PAV-011
HE 03	House Entrance Ch 1230 to 1250 RHS	Pavement Type B	117	RN24003-04- P5-PS-PAV-011
HE 04	House Entrance Ch 1250 to 1260 RHS	Pavement Type B	40	RN24003-04- P5-PS-PAV-011
FE 03	Field Entrance Ch 1360 to 1370 RHS	Pavement Type D	41	RN24003-04- P5-PS-PAV-011
FE 04	Field Entrance Ch 1480 to 1490 RHS	Pavement Type D	13	RN24003-04- P5-PS-PAV-011
FE 05	Field Entrance Ch 1560 to 1570 RHS	Pavement Type D	20	RN24003-04- P5-PS-PAV-012
HS 02	Hard Standing Entrance Ch 1680 to 1690 LHS	Pavement Type C	68	RN24003-04- P5-PS-PAV-012
HE 05	House Entrance Ch 1690 to 1760 RHS	Pavement Type B	230	RN24003-04- P5-PS-PAV-012
FE 06	Field Entrance Ch 1760 to 1770 LHS	Pavement Type D	13	RN24003-04- P5-PS-PAV-012
FE 07	Field Entrance Ch 1930 to 1940 LHS	Pavement Type D	14	RN24003-04- P5-PS-PAV-012
FE 08	Field Entrance Ch 1930 to 1940 RHS	Pavement Type D	14	RN24003-04- P5-PS-PAV-012
FE 09	Field Entrance Ch 2110 to 2120 RHS	Pavement Type D	16	RN24003-04- P5-PS-PAV-012
FE 10	Field Entrance Ch 2130 to 2140 RHS	Pavement Type D	38	RN24003-04- P5-PS-PAV-012
FE 11	Field Entrance Ch 2130 to 2140 LHS	Pavement Type D	15	RN24003-04- P5-PS-PAV-012
FE 12	Field Entrance Ch 2200 to 2230 LHS	Pavement Type D	14	RN24003-04- P5-PS-PAV-012

Ref.	Location	Accommodation Works Required	Area (m ²)	Drawing. No.
HE 06	House Entrance Ch 2200 to 2250 RHS	Pavement Type B	170	RN24003-04- P5-PS-PAV-012
HE 07	House Entrance Ch 2440 to 2450 RHS	Pavement Type B	67	RN24003-04- P5-PS-PAV-013
HS 03	Hard Standing Entrance Ch 2560 to 2600 LHS	Pavement Type C	90	RN24003-04- P5-PS-PAV-013
HS 04	Hard Standing Entrance Ch 2700 to 2720 RHS	Pavement Type C	89	RN24003-04- P5-PS-PAV-013
HS 05	Hard Standing Entrance Ch 2830 to 2850 LHS	Pavement Type C	141	RN24003-04- P5-PS-PAV-013

APPENDIX 1/16: PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES

1. This Appendix contains details of services and supplies affected by the Works, details of preliminary arrangements that have been made with Statutory Undertakers and others for the alteration of services affected by the Works, and details of any orders already placed.
2. The Contractor shall make arrangements with the Statutory Undertakers and others concerned, for the co-ordination of his work with all work which needs to be done by them or their contractors concurrently with the Works. Compliance with the periods of notice given in this Appendix does not relieve the Contractor of his obligations.
3. The Contractor shall take measures for locating services prior to commencing Works on site and for support and full protection of pipes, cables and other apparatus during the progress of the Works and for keeping the Employer's Representative informed of all arrangements he makes with owners of privately owned services, Authorities, Utilities and Public Authorities as appropriate and for ensuring that no existing mains and services are interrupted without the written consent of the appropriate Authority, Utility or management of other publicly or privately owned service or supply.
4. The Contractor shall be responsible for all temporary diversions of mains or services whether listed in this appendix or not.
5. Should any leakage or damage to any service be discovered, the Contractor shall immediately notify the Employer's Representative and the owners of the service and the Contractor shall afford every facility for repair or replacement of the apparatus affected.
6. Construction traffic, including all traffic at site accommodation areas, shall only be permitted to traverse buried services after protective measures to be agreed with the Employer's Representative have been implemented. The Contractor shall restrict construction traffic to approved designated crossing points only.
7. Private services to individual properties have not generally been listed or shown on the Drawings. The Contractor shall make arrangements with the Statutory Undertakers and others concerned for the phasing of all necessary disconnections and diversion of private services affected by the Works.
8. Disconnected apparatus shall be removed by the Contractor only with the prior consent of the Authority concerned.
9. The names, addresses and telephone numbers of the authorities serving in the locality are listed below.

Table 1.16.1 Utility Providers Contact Details

Name	Address	Contact
Roscommon County Council, Roads Section	Roads Section, Áras an Chontae, Roscommon, Co. Roscommon.	John Mockler Phone: 090 6637100
Roscommon County Council, Water Services Section	Water Services Section, Áras an Chontae, Roscommon, Co. Roscommon.	Vincent Walsh Phone: 090 6637100
Eir	Mervue, Galway.	Martin O'Connell Phone: 091 757676
ESB Athlone Region	Garrycastle, Athlone, Co. Roscommon. ESB Emergency	Kevin Campbell Phone: 090 6479304 1850 372 999
ESB Networks	Castle Street, Roscommon.	Sean Staunton Phone: 087 2472126
Irish Water	Irish Water, Golden Mile Industrial Est., Breaffy Road, Castlebar, Co. Mayo.	Irish Water 24 Helpline 1850 278 278
Roscommon Water Services	South Roscommon Operations Water & Waste Water Roscommon County Council	Deirdre Fallon Phone : 0906637100

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT

Traffic Safety and Management Requirements

1. **The Contractor shall be responsible for the planning, design, implementation, maintenance and removal of traffic safety and management measures required in order to facilitate the work. Please note : All VMS boards required for the diversion should be included in the TM requirements.**
2. The Contractor shall provide, erect and maintain on the Site, at such positions on the approaches to the Site and at each location where traffic diversions are required or identified by the contractor as necessary to carry out the works in a safe manner, all traffic signs and traffic control signals necessary for the direction and control of traffic. The temporary traffic signs shall conform to TS4 – Guidelines, Certification Scheme, and the Specification for the Construction of Traffic Signs (DOE 2006) and Chapter 8 of the Department of Transport Traffic Signs Manual or any amendments thereof for the time being in force. The signs shall be reflectorised or adequately illuminated by night in a manner approved by the Employer’s Representative and the Contractor shall keep these signs clean and legible at all times. The Contractor shall reposition, cover or remove signs as required during the progress of the Works.
3. The Contractor shall comply at all times with the requirements of Chapter 8 of the Department of Transport Traffic Signs Manual, current edition, Guidance for the Control and Management of Traffic at Road Works (Second Edition 2010) prepared by the Local Government Management Services Board and any additional requirements detailed in the Design Manual for Roads and Bridges.
4. The Contractor shall submit the initial traffic management proposal to the Employer for approval. He shall amend the traffic management where directed by the Employer to comply with the requirements of the contract and he shall further develop it as set out herein under and finalise its inception through the PSCS and Employer’s Representative. The PSDP shall additionally be consulted prior to its inception.
5. The Contractor shall submit one week prior to the commencement of each traffic management phase of the works to the Employer’s Representative detailed traffic management plans, including the following information as a minimum:
 - i) Phasing of the works at each location;
 - ii) 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

- iii) Timing of operations.
 - iv) Road lighting.
 - v) Names and contact telephone numbers for the traffic safety and control officer(s)
6. Drawings showing the Contractor's Traffic Management plans 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.
7. All traffic management measures employed by the Contractor shall be suitable for use by all vehicles types.
8. The Contractor shall ensure that movement of traffic is not significantly disrupted during the execution of the Works and that traffic delays are kept to a minimum. The Contractor shall provide and maintain access to all existing properties adjacent to the Works. 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. Unless otherwise agreed with the Employers Representative, traffic lights are not permitted to be used on the road outside permitted contract hours and as defined in Appendix 1/13, or other times as determined by the Employers Representative, for the sole purposes of allowing the pavement surface to be prepared for trafficking during HRA laying operations The Contractor shall ensure the pavement material has adequately cooled and hardened before the road is opened to traffic. Unless otherwise agreed by the Employer's Representative, the road shall not be opened to traffic if its surface temperature exceeds 25 degrees C unless the maximum temperature within the laid material has fallen below 35 degrees C.
9. 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 after the abnormal loads have passed through the Works.
10. Heavy Goods Vehicles used on Site by the Contractor, his Sub-Contractors or suppliers must be fitted with an audible reversing warning device.
11. 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.
12. The Contractor's traffic management proposals shall take account of the work area required for paving and the location of construction joints.

Notice Requirements

13. The Contractor shall be subject to the full statutory procedures outlined in the Temporary Closing of Roads Regulations. The period of closure shall be the minimum to facilitate construction of the works. All applications relating to road closures, lane occupations, signs or signals must be submitted to Employer's Representative in writing and require the following notice:

For making road closures	6 weeks
For non-prescribed signs	4 weeks
For temporary traffic signals	4 weeks

Maintenance Requirements

14. 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.

15. 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.
16. Roads shall be kept clean and clear of any mud and debris.

Traffic Accidents and Emergencies

17. In the event of a traffic accident occurring adjacent to any of the Works, the Contractor shall immediately contact the Gardaí and the Employer's Representative informing them of the following:
 - a) Location of the accident
 - b) 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.

Liaison with Gardaí shall be through the following office(s):

Roscommon Garda Station (090) 6638311 Abbey Street, Roscommon Town Co. Roscommon.	District HQ: Roscommon (090) 6638311	Divisional HQ: Roscommon (090) 6638311
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18. 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.
19. All drivers including those delivering plant and materials must be given clear instructions regarding the traffic arrangements applicable at any particular time.

Minimum Provisions for Vehicular Traffic

20. The Contractor shall comply at all times with the requirements of Chapter 8 of the Department of Transport Traffic Signs Manual, current edition.
21. Where the Contractor, following risk assessment, is of the opinion that Chapter 8 of the Traffic Signs Manual does not adequately detail measures for particular layouts or work methods, he will develop such particular layouts and work methods taking account of the principles and guidance of Chapter 8, other relevant guidelines, and any specific industry best practice or code of practice documentation. These particular layouts and work methods shall be developed jointly with the PSCS and notified in sufficient detail to the PSDP and Employer's Representative.
22. Where the existing available carriageway width is sufficient, a minimum road width of 5m for

Level 1 roads and 6m for Level 2 roads is required at all times during the course of the Works.

23. Where the existing available carriageway width is not sufficient to maintain 2-way traffic, alternate one-way (shuttle) working will be permitted provided:
- An optimal carriageway width of 3.3m is maintained. A minimum width of 3.0m may be used where space is restricted; widths less 3.0m will require HGV's and buses to be marshalled past the Works. If only cars and light vehicles are present the minimum lane width may be reduced to 2.5m.
 - The Contractor shall refer to and comply at all times with the requirements of Chapter 8 of the Department of Transport Traffic Signs Manual, current edition in terms of lane width requirements, delay times and the planning of TTM options.
24. 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.
25. The overall length of road subject to shuttle working shall be designed to satisfy the requirements of Chapter 8 of the Department of Transport Traffic Signs Manual, current edition. The geometry of the road including bends and junctions shall be taken account of when planning and implementing the TTM operations and speed limits particular to the Works.

Temporary Binder Layer Surface

26. In respect of the use of Binder Layer material as a temporary surfacing material as outlined in circular 5/2007 the following requirements shall apply:
- Such binder layers which are carrying roadway traffic should receive the final surface course as soon as is practicable. The Contractor should plan work so as to avoid the need to have traffic travelling on such binder layers for long periods.
 - Pending the application of the final surfacing course adequate signage to alert drivers to the temporary nature of the road surface should be provided. It is essential to maintain the necessary signage in place until the surface layer has been applied.
 - The Department of Transport's Chapter 8 identifies appropriate signage for such situations. This includes an orange diamond shaped sign indicating "slippery road" (Sign WK 072) which should be repeated at regular intervals (approximately at 200m centres or after a junction whichever is the lesser distance). A supplementary plate indicating "Unfinished Road Surface" or a "Cautionary Speed" plate may be used in conjunction with Sign WK 072.
 - Refer to paragraphs 8.2.3.26 to 8.2.3.30 inclusive of Chapter 8 of the Department of Transport Traffic Signs Manual, current edition.

Pedestrian Traffic

27. 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.

Commercial Premises

28. The Contractor shall be aware of any commercial premises that are present along the site extents and shall undertake to maintain adequate access to these premises at all times during the Works.

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

Description	Predicted 24 Hour Annual Average Daily Traffic (AADT)	Eighty-Five Percentile Speed of Cars (kph)	Speed Limit (kph) if Proposed [State whether Mandatory or Advisory]	Type(s) of Traffic Control	Special Facilities [Pedestrian, Equestrian etc.]	Whether to be kept Open or Closed
N63	4000	Unknown	80kph (Mandatory) Reduced to 55kph (Cautionary) during works	As per requirements of Appendix 1/17	None	Open
Adjoining side roads at all locations	Unknown	Unknown	80kph (Mandatory) 50kph (Cautionary during Works)	As per Contractors Traffic Management Plan	None	Open
All residences/businesses entering onto the works	Unknown	Unknown	-	Notify all residences/businesses of day-to-day changes in traffic management	As per landowners needs	Open

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

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

Authority: Roscommon County Council
 Address: Áras an Chontae,
 Roscommon,
 Co. Roscommon.
 F42 VR98.

Tel No.: (090) 6637100

APPENDIX 1/18: TEMPORARY DIVERSIONS FOR TRAFFIC

General

1. The Contractor shall design and construct and where necessary, remove on completion of the works, temporary diversions as necessary to facilitate his traffic safety and management proposals. The Contractor's design proposals for temporary diversions shall be submitted to the Employer's Representative at least two weeks before work on the relevant diversion is intended to commence. No work shall commence on the diversion until the Employer's Representative's consent has been obtained.
2. All carriageways shall have a bituminous wearing surface, with road markings and signing as appropriate in accordance with the "Traffic Signs Manual" (Department of Transport). The carriageway shall have a sufficient crossfall to shed water and shall be superelevated on curves. Road geometry and pavement construction shall be designed by the Contractor to a standard appropriate to the road being diverted and the traffic thereon. The carriageway surface water run-off shall be removed by an adequate drainage system.

Temporary Diversions for Traffic Specified by Employer's Representative:

3. For reasons of safety and practicability during construction, it is anticipated that a full road closure will be implemented as part of the SMA works. A proposed diversion route for HGV's and through traffic on the N63 is required as shown on drawing RN24003-04-P5-PS-DIV-001.
4. **The road closure will be required to facilitate the repair sections and surfacing on the mainline carriageway.** subject to agreement with the Employer's Representative during the Works.
5. As per the requirements of Appendix 1/17, the Contractor shall be subject to the full statutory procedures outlined in the Temporary Closing of Roads Regulations. The period of closure shall be the minimum to facilitate construction of the works. Taking account of his proposed construction programme, the Contractor should take cognisance of the 6 weeks' notice period before the road closure can be enforced/ he should notify the Employer's Representative as soon as is practicable as to when he expects to require the road closure to be in operation.
6. This Contractor is required to design, maintain and remove the road closure. The Contractor is required to ensure that appropriate signage, as agreed with the Employer's Representative, is maintained in place during the course of the Works and is required to repair any accidental or wilful damage.
7. The Contractor is required to have 3 no. VMS in advance and during the road closure giving warning and information at locations where detours are needed, The VMS will be required on the N63 approaching L2309 junction Ballygar, between FBD and Mc Neills roundabouts in Roscommon and at the R357 junction the exact location to be agreed with the Employer's Representative. The Contractor should also have signage to inform the public of the detour route.

Temporary Diversions Proposed by the Contractor:

8. The proposed diversions are shown on RN24003-04-P5-PS-DIV-001 in the works requirement drawing pack.
9. Notice Requirements:

At least 4 weeks before proposing any temporary traffic diversions, the Contractor shall consult and comply with Roscommon County Council and the Gardaí and shall then submit his detailed traffic management plan to the Employer's Representative for his comments. The Contractor shall supply to Roscommon County Council and the Garda Síochána details of the following for each temporary road diversion:

- 4.1 Phasing of the Works;
- 4.2 Drawings showing traffic management layouts including as follows:
 - position of traffic signs (including variable message signs) and signals;
 - width of lanes;
 - parking areas;
 - safety zones; and
 - entry points for Site and Off-site areas vehicles, and the like

See also Notice Requirements in Appendix 1/17.

APPENDIX 1/19: ROUTING OF VEHICLES

Permitted Access Routes to and from the Site

1. Access to and from the Site shall be by sharing road space with through traffic. Site access/egress points shall be designed taking into account existing traffic volumes and anticipated type and volumes of site generated traffic.
2. Construction generated traffic is not permitted on the regional/local road network except with written approval from the Employer's Representative and subject to any conditions applied by the local authority.
3. The Contractor, his Sub-Contractors and suppliers shall access the site via the National Road network only for all purposes in connection with the Works (including import of acceptable materials, disposal of unacceptable materials and other haulage) unless otherwise agreed in writing with the Employer's Representative and authorised by the local roads authority. (Note: Road building traffic shall include sub-base and pavement materials delivery vehicles).
4. Where the local roads authority considers that the Contractors' proposed use of any local or regional road is not consistent with the normal use of that road and has the potential to damage the road, the Contractor will at a minimum be required to undertake, at his own cost, a pre and post construction video survey of those parts of the regional/local road network proposed to be used. The local road authority will only authorise the use of the regional/local road network following receipt of a cash payment equal to the value of the potential damage to the regional/local roads arising from the Contractor's use of those roads. The value of the damage will be calculated by the local roads authority. The cost of repairs needed to those regional/local roads arising from the Contractor's use of those roads will be deducted from the value of the potential damage and the balance will be returned to the Contractor. The local roads authority may impose any further conditions it considers to be necessary on receipt of a proposal from the Contractor.
5. The Contractor is deemed to have inspected and examined the Site and its surroundings at Tender Stage and to have satisfied himself as to the nature and means of access to the Site. In the event of the Contractor not being satisfied with the Permitted Access Routes to and from the Site, the Contractor is obliged under the Contract to provide for all expenses and charges for temporary wayleaves required by the Contractor in connection with access to the Site.

The use of Permanent Works by Construction Traffic

6. The finished pavement forming part of the permanent Works may be used to carry construction traffic only when the Contractor has taken measures to protect it from damage.
7. 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.
8. 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.

Movement of Machinery and Plant across Public Roads

9. The Contractor shall take care to avoid damage to roads, footpaths, grass margins, and other surfaces within or outside of the authorised site, and shall be liable for the cost of repairing, to the satisfaction of the Employer's Representative and the owner, all such damage caused by his operations. The Contractor shall take precautions to prevent spillage of diesel fuel or other solvents. He 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. Any damage so caused shall be made good by the Contractor at his own expense.
10. 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.

Temporary Structures for Construction Traffic Spanning Areas Used by the Public

11. None

APPENDIX 1/23: SUBSTANCES HAZARDOUS TO HEALTH

All work shall be carried out with due regard to the Health Safety and Welfare at work (Construction) Regulations 2013 or any subsequent relevant legislation.

The Contractor shall provide the Employer's Representative with a copy of his Safety Statement and shall revise it as necessary. As part of his overall Safety Statement for the use of hazardous substances, the Contractor shall include for secure separation from the remainder of his workforce and the general public from areas where the following substances and any other substances hazardous to health is being used:

- a) Petrochemicals
- b) Paints containing toxic elements
- c) Nuclear density meter

The above substances shall only be utilised by personnel trained in their use and all required safety apparatus and protective clothing shall be worn by those operatives.

Warnings to the remainder of the workforce and the general public of the use of these substances shall be provided and the area of application shall be securely sealed off.

Compliance with Clause 123.5 does not confer immunity from relevant legal requirements

No hazardous substance which has been identified with this road construction contract. However if any other such materials are discovered upon excavation for the road construction, appropriate measures should be instructed into place;

- 1.1 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. Restrictions in relation to traffic management measures- these should include safety zones or lane closures. Measures should be taken to protect members of the public.
- 1.2 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.
- 1.3 Once erected, the screening shall reduce the concentrations of these substances within the air to levels which are below European Union guidelines. Any monitoring necessary shall be the responsibility of the Contractor.
- 1.4 The following list details materials which may require such particular precautions:
 - (a) Concrete dust
 - (b) Cement dust
 - (c) Bituminous dust arising from planning
 - (d) Silane/Siloxane
 - (e) Spray applied waterproofing
 - (f) Polyurethane resins
 - (g) Volatile materials (i.e. Primers, paints, sealants, etc.)
 - (h) Paint
 - (i) Earthworks Dust
 - (j) Use of explosives during rock excavation
 - (k) Concentrations of chlorine during watermain flushing.

This list is not fully comprehensive and further materials will fall within the scope of this requirement. Monitoring to be undertaken by the Contractor and supervision by the Employer's Representative.

- 1.5 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 material.
- 1.6 All work shall be carried out with due regard to the Health, Safety and Welfare at work (Construction) Regulations 2013 or any subsequent relevant legislation.
- 1.7 The Contractor shall provide the Employer's Representative with a copy of his Safety Statement and shall revise it as necessary in the 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.
- 1.8 The Contractor shall take due care in dealing with existing asbestos cement watermains, particularly during cutting and disposal and shall comply with the requirements of the HSA, the EPA and current legislation in relation to the handling, storage and disposal of asbestos materials.

APPENDIX 1/24: QUALITY MANAGEMENT SYSTEM

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

1 Description: Manufacture of Portland Cement

Certification	BSI	The Certification & Inspection Dept.
Body:	389 Chiswick High Road or London W4 4AL	National Standards Authority of Ireland (NSAI), Glasnevin, Dublin 9

Specification: Cement shall be in accordance with the 500, 900, 1000, 1700, 2400 Series of the TII Specification for Works and shall be manufactured to comply with all of the appropriate requirements of one of the following Standards:

- | | | |
|---------------|---|---|
| BS 12 | - | Specification for Portland cement. |
| BS 146 | - | Specification for Portland blastfurnace cements. |
| BS 1370 | - | Specification for low heat Portland cement. |
| BS 4027 | - | Specification for sulphate-resisting Portland cement. |
| BS 4246 | - | Specification for high slag blastfurnace cement. |
| BS 6588 | - | Specification for Portland pulverised fuel ash cements. |
| IS EN 197-1 | - | Composition, specification & conformity criteria for common cements. |
| IS EN 15167-1 | - | Ground granulated blast furnace slag for use in concrete, mortar and grout. Definitions, specifications and conformity criteria |

2 Description: Supply and Erection of Fences

Certification	BSI	The Certification & Inspection Dept.
Body:	389 Chiswick High Road or London W4 4AL	National Standards Authority of Ireland (NSAI), Glasnevin, Dublin 9

Specification: General fencing shall be in accordance with the 300 Series of the TII Specification for Works and the following British Standard or Irish Equivalent:
BS 1722 - Specification for fences.
Part 1 to 13

Safety fencing shall be in accordance with the 400 Series of the TII Specification for Works and the drawings referred to in the Contract.

3 Description: Vehicle Safety Barriers (National scheme applies)

Certification	To the approval of the TII
Body:	

Specification: Safety barriers shall be in accordance with Series 400 of the TII Specification for Works and drawings referred to in the Contract and shall be manufactured to comply with all the appropriate requirements of the following standards

IS EN 1317	Road restraint systems. Performance classes impact test acceptance criteria and test methods for crash cushions
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4 Description: Temporary Traffic Management

Certification To the approval of the TII
Body:

Specification: Traffic management shall be in accordance with Series 100 of the TII Specification for Works and Chapter 8 of the Traffic Signs Manual

Note: This scheme requires training on an approved course including Signs, lighting and guarding course, Traffic Management Design Course and High-Speed roadway operative's course in accordance with paragraph 8.5.1.7 of the Traffic Signs Manual.

5 Description: Manufacture of Industrial Fasteners and Associated Items

Certification BSI The Certification & Inspection Dept.
Body: 389 Chiswick High Road or National Standards Authority of
London W4 4AL Ireland (NSAI), Glasnevin, Dublin 9

Specification: Nuts, bolts and fixings shall be in accordance with the 300, 400, 500, 1300, 1800, 2200 and 2500 Series of the TII Specification for Works and shall be manufactured to the requirements of the following standards:

IS EN 1317	-	Road Restraint Systems
BS 3410	-	Specification for metal washers for general engineering purposes.
BS 4320	-	Specification for metal washers for general engineering purposes, Metric Series.
BS 4395	-	Specification for high-strength friction grip bolts and associated nuts and washers for structural engineering.
BS 4933	-	Specification for ISO metric black cup and countersunk head bolts and screws with hexagon nuts.
ISO 898	-	Mechanical properties of fasteners Part 1: Bolts, screws and studs Part 2: Nuts with specified proof load values.
ISO 4014	-	Hexagon head bolts Product grades A and B
ISO 4016	-	Hexagon head bolts Product grade C
ISO 4017	-	Hexagon head screws Product grades A and B
ISO 4018	-	Hexagon head screws Product grade C
ISO 4032	-	Hexagon nuts, style 1 Product grades A and B
ISO 4034	-	Hexagon nuts Product grade C

Alternatively, nuts, bolts and fixings shall be manufactured to the dimensions and tolerances of the Standards listed above, using materials to the following Standards:

BS 6105	-	Mechanical properties for corrosion-resistant stainless steel fasteners
ASTM A325-89	-	Specification for High Strength Bolts for Structural Steel Joints

Note: 1. Where the Contractor can demonstrate that the fastener required is made by fewer than three firms within this Scheme, the requirement to comply with the Scheme shall not apply.

2. Where the Contractor obtains fasteners from a stockist, the stockist shall be registered under Part 1 of the BSI Registered Stockist System. The System requirement shall be Level A, Quality Assured Material with Lot Traceability (P00012). Where the Contractor can demonstrate that the fastener required is supplied by fewer than three stockists within this System, the requirement to comply with the System shall not apply.

6 Description: Timber Preservation

Certification	BSI		The Certification & Inspection Dept.
Body:	389 Chiswick High Road	or	National Standards Authority of
	London W4 4AL		Ireland (NSAI), Glasnevin, Dublin 9

TRADA Quality Assurance Services Ltd
 Stocking Lane
 Hughenden Valley
 High Wycombe
 Buckinghamshire HP14 4NR

Specification: Chemicals used and timber preservative treatment to be carried out shall comply with Clause 311 of the TII Specification for Works.

Note: Timber used for general fencing shall be treated by firms registered by these bodies, and firms shall only obtain chemical specialities used in treatment from a registered source.

7 Description: Application of Road Markings

Certification	BSI		The Certification & Inspection Dept.
Body:	389 Chiswick High Road	or	National Standards Authority of
	London W4 4AL		Ireland (NSAI), Glasnevin, Dublin 9

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

BS 3262 - Hot-applied thermoplastic road marking materials
 Part 2: Specification for road performance
 BS 6044 - Specification for pavement marking paints.
 BS 6088 - Specification for solid glass beads for use with road marking compounds and for other industrial uses.

8 Description: Installation and Maintenance of Traffic Signals

Certification	BSI		The Certification & Inspection Dept.
Body:	389 Chiswick High Road	or	National Standards Authority of
	London W4 4AL		Ireland (NSAI), Glasnevin, Dublin 9

NICQA Ltd
 112 12 Midland Road
 Luton LU2 0BL

Specification: All construction works shall be in accordance with the relevant clauses of the TII Specification for Works for the installation of traffic signals. Equipment shall be manufactured to comply with all of the appropriate requirements of BS 505.

9 Description: Traffic Sign Manufacture

Certification	BSI		The Certification & Inspection Dept.
Body:	389 Chiswick High Road	or	National Standards Authority of
	London W4 4AL		Ireland (NSAI), Glasnevin, Dublin 9

Specification: All construction works shall be in accordance with the relevant clauses of the 1200 series of the TII Specification for Works

APPENDIX 1/25: PRODUCT CERTIFICATION SCHEMES

The following is the list of accepted product certification schemes referred to in sub-Clauses 104.3 and 104.4 of the TII Specification for Works.

1 Marked Schemes

1.1 Kitemark or Irish Standard Mark ISM

Certification Body: BSI
389 Chiswick High Road
London W4 4AL

or

The Certification & Inspection Dept.
National Standards Authority of Ireland,
Glasnevin, Dublin 9

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
EN 1317	Vehicle Restraint Systems	400
EN 124	Gully tops and manhole tops for vehicular and pedestrian areas. Design requirements, type testing, marking, quality control	500
EN 598	Ductile iron pipes, fittings, accessories and their joints for sewerage applications. Requirements and test methods	500
BS 12	Portland Cement	500, 900, 1000, 1600, 1700, 2400
BS 65	Specification for vitrified clay pipes, fittings and ducts, also flexible mechanical joints for use solely with surface water pipes and fittings.	500
BS 437	Specification for cast iron spigot and socket drain pipes and fittings	500
BS 1247	Manhole steps Part 1: Specification for galvanised ferrous or stainless steel manhole steps Part 2: Specification for plastic encapsulated manhole steps	500
BS 3506	Specification for unplasticised PVC pipe for industrial uses	500
BS 3656	Specification for asbestos-cement pipes, joints and fittings for sewerage and drainage	500
BS 4346	Joints and fittings for use with unplasticised PVC Pressure pipes	500
BS 4962	Specification for plastics pipes and fittings for use as subsoil field drains	500
BS 5481	Specification for unplasticised PVC pipe and fittings for gravity sewers	500
BS 5911	Precast concrete pipes, fittings and ancillary products. Part 100: Specification for unreinforced and reinforced pipes and fittings and fittings with flexible joints	500
BS 5911	Part 103: Specification for prestressed non-pressure pipes and fittings with flexible joints	500
BS 5911	Part 110: Specification for ogee pipes and fittings (including perforated)	500
BS 5911	Part 114: Specification for porous pipes	500
BS 5911	Part 200: Specification for unreinforced and reinforced manholes and soakaways of circular cross section	500

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
IS EN 933	Tests for Geometrical Properties of Aggregates - Part 1: Determination of Particle Size Distribution	600 / 800 / 1700
BS 1377	Methods of test for soils for civil engineering purposes. http://shop.bsigroup.com/ProductDetail?pid=000000000030338088	600 / 800
IS EN 197	Cement - Part 1: Composition, Specifications and Conformity Criteria for Common Cements	800 / 1000 / 1600 / 1700 / 2600
IS EN 206	Concrete - Specification, Performance, Production and Conformity	1000 / 1100 / 1700 / 2600
IS EN 15167	Ground Granulated Blast Furnace Slag for use in Concrete, Mortar and Grout	1000 / 1700
IS EN 450	Fly ash for Concrete	1000 / 1700
IS EN 934	Admixtures for Concrete, Mortar and Grout	1000 / 1700 / 2400
IS EN 12620	Aggregates For Concrete	1000 / 1600 / 1700
IS EN 10080	Steel For The Reinforcement Of Concrete	1000 / 1700
IS EN ISO 11600	Building Construction – Jointing Products	1000 / 2300
BS 4449	Steel for the reinforcement of concrete. Weldable reinforcing steel. Bar, coil and decoiled product. Specification. http://shop.bsigroup.com/ProductDetail?pid=0000000030334783	1000 / 1700
BS 4482	Steel wire for the reinforcement of concrete products. Specification. http://shop.bsigroup.com/ProductDetail?pid=0000000030163781	1000 / 1700
BS 4483	Steel fabric for the reinforcement of concrete. Specification. http://shop.bsigroup.com/ProductDetail?pid=0000000030163782	1000 / 1700
	Permanent Traffic Signs	1200
BS 6044	Specification for pavement marking paints	1200
BS 3262	Hot-applied thermoplastic road marking materials	1200
BS 6087	Specification for flexible joints for grey or ductile cast iron drainpipes and fittings (BS 437) and for discharge and ventilating pipes and fittings (BS 416)	500
BS 6088	Specification for solid glass beads for use with road marking compounds and for other industrial uses	1200
IS EN 10025	Hot Rolled Products Of Structural Steels	1300 / 1600 / 1800
BS 5080	Structural fixings in concrete and masonry. Method of test for tensile loading http://shop.bsigroup.com/ProductDetail?pid=000000000000293436	1300 / 1700
EN 60920	Ballasts for tubular fluorescent lamps. General and safety requirements	1400
EN 60921	Ballasts for tubular fluorescent lamps. Performance requirements	1400

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
EN 60922	Auxiliaries for lamps. Ballasts for discharge lamps (excluding tubular fluorescent lamps). General and safety requirements	1400
EN 60923	Auxiliaries for lamps. Ballasts for discharge lamps (excluding tubular fluorescent lamps). Performance requirements.	1400
EN 61048	Auxiliaries for lamps. Capacitors for use in tubular fluorescent and other discharge lamp circuits. General and safety requirements	1400
EN 61049	Specification for capacitors for use in tubular fluorescent and other discharge lamp circuits. Performance requirements	1400
EN 60155	Glow starters for fluorescent lamps	1400
EN 60598	Luminaires for road and street lighting	1400
IS EN 1992	Eurocode 2: Design of Concrete Structures	1600 / 1700
IS EN 12350	Testing Fresh Concrete	1600 / 1700
IS EN 13670	Execution of Concrete Structures	1700
IS EN 1990	Eurocode – Basis of Structural Design	1700 / 1800
IS EN 13055	Lightweight Aggregates	1700
IS EN 14889	Fibres for Concrete	1700
IS EN 1008	Mixing Water for Concrete	1700
IS EN 196	Methods of Testing Cement	1700
BS 6744	Stainless steel bars. Reinforcement of concrete. Requirements and test methods. http://shop.bsigroup.com/ProductDetail?pid=000000000030320588	1700 / 2400
BS 8666	Scheduling, dimensioning, bending and cutting of steel reinforcement for concrete. Specification. http://shop.bsigroup.com/ProductDetail?pid=000000000030172666	1700
IS EN 1090	Execution of Steel and Aluminium Structures	1800
IS EN ISO 8501	Preparation of Steel Substrates Before Application of Paints and Related Products - Visual Assessment of Surface Cleanliness	1800 / 1900
IS EN 14399	High-strength Structural Bolting Assemblies for Preloading	1800
PD 6703	Structural bearings. Guidance on the use of structural bearings. http://shop.bsigroup.com/ProductDetail?pid=000000000030173533	1800 / 2100
IS EN 11124	Preparation of Steel Substrates Before Application of Paints and Related Products - Specifications for Metallic Blast-cleaning Abrasives	1900
IS EN 11126	Preparation Of Steel Substrates Before Application Of Paints And Related Products - Specifications For Non-metallic Blast-cleaning Abrasives	1900
IS EN 8503	Preparation of Steel Substrates Before Application of Paints and Related Products - Surface Roughness Characteristics of Blast-cleaned Steel Substrates	1900
IS EN ISO 12944	Paints And Varnishes - Corrosion Protection Of Steel Structures By Protective Paint Systems	1900
IS EN 10684	Fasteners - Hot Dip Galvanized Coatings	1900
IS EN 13108	Bituminous Mixtures - Material Specifications	2000

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
BS ISO 37	Rubber, vulcanized or thermoplastic. Determination of tensile stress-strain properties. http://shop.bsigroup.com/ProductDetail?pid=000000000030196867	2000
BS ISO 34	Rubber, vulcanized or thermoplastic. Determination of tear strength. Small (Delft) test pieces http://shop.bsigroup.com/ProductDetail?pid=000000000030304386	2000

2 Other Marked Schemes

2.1 Electric Cables

Certification Body: British Approvals Service for Cables (BASEC) or The Certification & Inspection Dept. National Standards Authority of Ireland

360 Silbury Boulevard
Milton Keynes
Bucks MK9 2AF

Glasnevin, Dublin 9.

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
BS 6004	Electrical cables, PVC insulated, non-armoured cables for voltages up to and including 450/750V, for electrical power, lighting and internal wiring	1400
BS 6346	Electrical cables, PVC insulated, armoured cables for voltages of 600/1000V and 1900/3300V	1400

2.2 Reinforcing and Prestressing Steel

Certification Body: UK Certification Authority for Reinforcing Steels (CARES) or The Certification & Inspection Dept. National Standards Authority of Ireland

Pembroke House
21 Pembroke Road
Sevenoaks
Kent TN13 1XR

Glasnevin, Dublin 9.

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
BS 4449	Steel for the reinforcement of concrete. Weldable reinforcement steel. Bar, coil and decoiled production. Specification.	1000 1700 2500
BS 4466	Specification for scheduling, dimensioning, bending and cutting of steel reinforcement for concrete. (Except that the Contractor or the manufacturer of pre-cast concrete products may opt to obtain straight bars from a firm within the Scheme and cut and bend them on the Site or at the pre-casting works respectively provided the levels of inspection and quality assurance specified in BS 4466 are maintained)	1700
BS 4482	Steel wire for the reinforcement of concrete products. Specification.	1000 1700
BS 4483	Steel fabric for the reinforcement of concrete. Specification.	1000 1700
BS 5896	Specification for high tensile steel wire and strand for the prestressing of concrete	1700

3 Non-Marked Schemes

3.1 Ready Mixed Concrete

Certification Body:	The Quality Scheme for Ready Mixed Concrete Wolsey House 3 High Street Hampton Middx TW12 2SQ	or	The Certification & Inspection Dept. National Standards Authority of Ireland Glasnevin, Dublin 9.
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Specification: The supply of ready mixed concrete shall comply with the TII Specification for Works, in particular the 1000 Series and 1700 Series Specification.

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
BS 12	Specification for Portland cement	500 1000 1700
BS 146	Specification for Portland blast furnace cements	1000 1700
BS 882	Specification for aggregates from natural sources for concrete	500 1000 1100 1700 2600
BS 1014	Specification for pigments for Portland cement and Portland cement products	1700
BS 1047	Specification for air-cooled blast furnace slag aggregate for use in construction	1000 1700
BS 1305	Specification for batch type concrete mixers	1000 1700
BS 1881	Testing concrete Part 106: Methods for determination of air content of fresh concrete	1000 1700 2600
BS 3148	Methods of test for water for making concrete (including notes on the suitability of the water)	1700 2400 2600
BS 3797	Specification for lightweight aggregates for masonry units and structural concrete	1700
BS 3892	Pulverised fuel ash Part 1: Specification for pulverised-fuel ash for use with Portland Cement	500 1000 1700
BS 4027	Specification for sulphate-resisting Portland cement	1700 2400
BS 4246	Specification for high slag blast-furnace cement	1700
BS 5075	Concrete admixtures Part 1: Specification for accelerating admixtures, retarding admixtures and water reducing admixtures Part 2: Specification for air-entraining admixtures	1000 1700

BS No, Irish Standard or Euronorm	Title	TII Specification for Works Series
	Part 3: Specification for super-plasticising admixtures	
BS 5328	Concrete Part 1: Guide to specifying concrete Part 2: Methods for specifying concrete mixes Part 3: Specification for the procedures to be used in producing and transporting concrete Part 4: Specification for the procedures to be used in sampling, testing and assessing compliance of concrete	1000
BS 6588	Specification for Portland pulverised-fuel ash cements	1000 1700
BS 6699	Specification for ground granulated blast furnace slag for use with Portland cement	1000 1700

APPENDIX 1/26: IRISH AGRÉMENT BOARD ROADS AND BRIDGES CERTIFICATES**1 General Requirements**

- 1.1 Approved Body: Irish Agrément Board,
NSAI,
Glasnevin,
Dublin 9

- 1.2 The following shall be a list of types of work, goods or materials for which proprietary products shall be required to have either a NSAI Certificate or equivalent:

Description	TII Specification for Works Series
Pipes for drainage and/or service ducts other than those listed in Tables 5/1 and 5/2	500
Permanent shuttering for road gullies	500
Fin drains and constituent materials for edge of pavement drainage	500
Prefabricated Temporary Road Marking Material	1200
Reflecting Road Studs	1200
Traffic Signal and Control Equipment	1200
Concrete Coating Material	1700
Paint Formulations	1900
Waterproofing of concrete bridge decks	2000
Waterproofing of buried concrete surfaces	2000
Anchorage for metal parapets	2200
Bridge deck expansion joints	2300

- 1.3 Details of products conforming to the above requirements are listed in the Index of Current Publications which may be obtained from the Publications Department, Irish Agrément Board.
- 1.4 Where types of work, goods or materials for which proprietary products are required to have an Irish Agrément Board Roads and Bridges Certificate, a British Agrément Board Roads and Bridges Certificate shall be acceptable.

APPENDIX 2/1: LIST OF BUILDINGS ETC., TO BE DEMOLISHED**List of Building etc., to be Demolished**

Location	Description	Drawing No.	Requirements

APPENDIX 2/3: RETENTION OF MATERIALS DUE TO SITE CLEARANCE**Retention of Material arising from SITE CLEARANCE**

Description	Location	Delivered to:	Requirements
Road Planings	Extents of Works	Removed to authorised facility	To be disposed of by contractor
Road Studs	Extents of Works	Roscommon County Council Depot as agreed with Employers Representative	To be stored for re-use
Gully Gratings	Extents of Works	Roscommon County Council Depot as agreed with Employers Representative	To be stored for re-use

APPENDIX 2/5: HAZARDOUS MATERIALS

1. The Contractor must ensure that all hazardous waste is handled, collected, transferred and disposed of in compliance with the Waste Management (Hazardous Waste) Regulations (1998) and any subsequent amendments. The Contractor shall outline methodology in this regard in his Waste Management Plan.

Hazardous Chemical Substances

2. The Contractor shall undertake the labelling of dangerous chemical substances. All dangerous chemical substances shall be stored in an appropriate container and in accordance with the manufacturer's instructions. Access to such substances shall be restricted to key authorised personnel. Operatives working with dangerous chemical substances shall be adequately trained in their use and shall be provided with appropriate personal protective clothing and equipment.
3. The contractor shall be aware of the contents of the material safety data sheet for each product specified in the contract and make provisions where required. The Contractor shall take measures to ensure the safety of members of the public and his employees who may come in contact with high temperature materials used by the Contractor in the construction of the Works. Plant used on the contract that use Liquid Petroleum Gas shall will comply with the relevant safety standards. The Contractor will take all necessary steps to minimize the risk of fire or explosion. The Contractor shall liaise with the relevant bodies that may be impacted upon by the scope of the works.
4. The Contractor shall liaise with and conform to the requirements of the relevant Authorities for the handling and disposal of hazardous material found in Site clearance.

Biological Hazards

5. Measures shall be put in place for the safe disposal of contaminated material arising from the execution of the works. Contaminated material may include spent chemical containers, wastage or excess chemical materials, materials contaminated through spillage or contact with dangerous chemical or biological substances.

1. APPENDIX 3/1: FENCING, GATES AND STILES

Not Used.

2. APPENDIX 3/2: FENCING – Standard Construction Details

Clause No.	Road Construction Detail Drawing No.	Title
306.1	CC-SCD-00301	Timber Post & Mesh Fence
306.1	CC-SCD-00304	Timber Post & Wire Fence
308.1	CC-SCD-00309	Steel Single Field Gate
308.1	CC-SCD-00310	Steel Double Field Gate
308.1	CC-SCD-00313	Hinges for Single Field Gate
306.3	CC-SCD-00319	Mammal Resistant Fencing
306.1	CC-SCD-00302	Stud Fencing Type A

APPENDIX 5/1: DRAINAGE REQUIREMENTS

1 General Requirements

- 1.1 The mainline carriageway drainage shall be located as shown on Drawings RN23003-04-P5-PS-DRS-001 to RN23003-04-P5-PS-DRS-004 inclusive. Schedules of drainage requirements are provided in Table 5.1.1 below.
- 1.2 Construction & dewatering of drains – the Contractor shall allow and be responsible for the control of groundwater in all excavations and in all temporary situations during execution of the Works. It shall be noted that pumping into existing watercourses or sewers shall only be permitted upon provision of a detailed Method Statement and its subsequent approval by the Employer's Representative.
- 1.3 All road crossings shall be surrounded in concrete regardless of cover.
- 1.4 Drain sizes and lengths – pipe sizes for carrier drains and filter drains shall be in accordance with the Tables of this Appendix 5/1 of the Specification. The minimum pipe diameter for gully connections shall be 150 mm. The maximum distance between accesses on length of pipe shall be 100 metres.

2 Trench and Bedding Details

- 2.1 The allowable bedding types for carrier pipes shall be in accordance with CC-SCD-00521.
- 2.2 Drainage pipes in filter drains shall be Twin Wall Corrugated pipes. Drainage pipes in carrier drains shall be Twin Wall Corrugated pipes or Class H spigot and socket concrete pipes. All pipes shall comply with Table 5/1 of the TII Specification for Works. Pipes and fittings other than those included in Table 5/1 of the TII Specification for Works shall be permitted provided that they hold a current Irish Agrément Board Roads and Bridges Certificate (or equivalent) stating that they are a suitable alternative for the usage specified in Table 5/1 of the TII Specification for Works.
- 2.3 All pipes under carriageway lanes, hard shoulders, entrances and hard strips shall be encased in concrete in accordance with CC-SCD-00521 Surface Water Drains, Trench and Bedding Details Type Z.

3 Values of Pipe Stiffness and Impact Resistance for Plastic Pipes

- 3.1 Requirements for impact resistance shall comply with BS 4962

4 Grading Limits for Filter Backfill Materials

- 4.1 Filter drains shall be backfilled with filter material to Clause 505 of the TII Specification for Works.

5 Connections to Existing Drainage

- 5.1 All existing drains or channels which are permanently severed by the Works shall be tied into the new drainage in accordance with Clause 506 of the TII Specification for Works.
- 5.2 Existing land drains and mole drains which are permanently severed by the Works shall be tied into the new drainage in accordance with Clause 511 of the TII Specification for Works.
- 5.3 All existing pipework within 1m of carriageway formation level which will become redundant shall either be excavated and removed from site or grouted up.

- 5.4 All existing pipework over 1m below formation level and greater than 375 mm internal diameter which will become redundant shall be completely infilled with pulverised fuel ash cement grout or equivalent approved.

6 Requirements for Gullies

- 6.1 Gullies shall be trapped in accordance with Standard Construction Details CC-SCD-00510 or CC-SCD-00511.
- 6.2 All gully connections shall receive concrete bed and surround unless otherwise specified.
- 6.3 Gully gratings shall have a minimum clear waterway area of 90,000mm². Gully gratings and frames shall be in accordance with IS EN 124. Gratings and frames shall be D400 and shall be in accordance with Standard Construction Detail CC-SCD-00512.
- 6.4 All gully gratings and frames shall be positioned with grating bars running perpendicular to the kerb and incorporate a captive hinge system to prevent unauthorised removal. Gratings shall be hinged in the direction of travel. Gully gratings shall be cycle friendly.

7 Subgrade, Verge, Filter Drainage and Over-The-Edge Drainage

- 7.1 Sub-grade drains are provided to maintain the integrity of the sub-grade and long-term performance of the carriageway and hard shoulders. The Contractor shall provide sub-grade drainage as specified. Sub-grade drainage shall be installed prior to placing of pavement layers.
- 7.2 Filter drains, verge drains, surface water channels or swales are provided to prevent water collection on, or water logging of, paved or unpaved areas. The Contractor shall provide such drainage as specified.
- 7.3 Where filter drains in the road verge are designed to intercept surface run-off, the top surface of the filter material shall be between 35 millimetres and 45 millimetres below the adjacent finished verge or carriageway level. The exposed stone shall be in accordance with Clause 505 of the TII Specification for Works - Type A crushed rock (gravel shall not be permitted) for a depth of 150 millimetres. This filter material shall extend to the carriageway edge.
- 7.4 Over the edge drainage shall be installed to maintain the integrity of the road structure and long-term performance of the carriageway and hard shoulders. Refer to Table 5.1.1 below and Drawing Nos. RN24003-04-P5-PS-DRS-001 to RN24003-04-P5-PS-DRS-004 for over the edge drainage locations.

8 Pipe Details

- 8.1 All surface water pipes shall be laid to straight or smooth flowing horizontal alignments conforming to the alignment of the carriageway. Curved alignments shall only be permitted where maintenance operations are not compromised.
- 8.2 The pipe runs comprising the road drainage shall have constant gradients between chambers.
- 8.3 The road drainage network will be fully accessible for maintenance by jetting and will be provided with chambers for this purpose.

- 8.4 Concrete spigot and socket pipes shall be Class H with rubber rings fittings (fitted in accordance with manufacturers specification) to comply with IS EN 1916 and IS 6. Joints in filter drains shall comply with Clause 504.6 of the TII Specification for Works.
- 8.5 Twin Wall Corrugated 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.
- 8.6 Carrier drains shall be in accordance with Standard Construction Detail CC-SCD-00521 Surface Water Drains – Trench and Bedding Details. Trench to be backfilled with CI.505 materials and reinstated as per requirements of Appendix 7/2. In carriageways the trench shall be in accordance with CC-SCD-00521 Surface Water Drains – Trench and Bedding Details, Type Z. Joints in surface water drains shall comply with Clause 504(4).

9 Other Details

- 9.1 Catchpits, chambers and in-line outlet to Surface Water Channels shall have a diameter of not less than 1050mm. Maintenance inspection chambers with a depth of less than 1m are not considered to be access chambers.
- 9.2 Chamber covers, gratings and frames shall be manufactured from spheroidal graphite (ductile) cast iron and comply with I.S. EN 124:2015 with the following proviso:
- Class A15 shall not be permitted within the new carriageway verges, slopes or areas adjacent to the new carriageway boundary fence;
 - Class C250 shall be used as a minimum standard of ironwork situated within any area of carriageway verges, slopes or areas adjacent to the new carriageway boundary fence.
 - Class D400 shall be used as a minimum standard for ironwork situated within any area of pavement.
- 9.3 Chambers shall be constructed in accordance with Standard Construction Detail CC-SCD-00502 and CC-SCD-00514. Chamber fittings shall be constructed in accordance with CC-SCD-0513 Chamber Fittings – Ladder, Typical Arrangement Handhold and Safety Chain.
- 9.4 Headwalls are to be in accordance with CC-SCD-00553.
- 9.5 The sides of trenches, pits, etc., shall, where necessary, be adequately supported to the satisfaction of the Employer's Representative. The Contractor shall take all precautions necessary for the safety of adjoining structures and buildings by opening and shoring short trench lengths. All pipes in or under new embankments shall be laid only when the embankment has been formed and compacted to formation level under paved areas, to finished earthworks level in other areas, or to a level which will give a minimum cover of 1.2m to the pipes whichever is the lowest. In the case of culverts below new embankments the culvert shall be laid before commencing construction of the embankment.
- 9.6 Where rock is met with in trenches, it shall be excavated and trimmed to prescribed level of underside of concrete bed to pipeline. Explosives may not be used to loosen rock in trenches.
- 9.7 Trenches and pits shall be kept free from water until any concrete therein is sufficiently set. The Contractor shall construct any necessary sumps or temporary drains or puddle clay dams and provide all necessary pumping to keep trenches and pits free of water.

10 Items to be Adjusted

- 10.1 Where the adjustment or replacement of existing frames and covers or gratings is required, the units shall be taken up and refixed or replaced with new units complying with sub-Clauses 9 to 15 of Clause 507 (Chambers), to TII Specification for Works Series CC-SPW-00500 – Drainage & Service Ducts. The frames and covers or gratings shall be laid on a mortar bed complying with sub-Clause 17 of Clause 507. The finished thickness of the mortar bed shall be between 10 mm and 25 mm and shall be set flush with the new surface. Any additional adjustments shall be by modifying the brickwork in compliance with sub- Clause 507.3 or by using a frame of a suitable depth.
- 10.2 Where the adjustment or replacement of existing frames and gratings or kerb type gully covers is required, the units shall be taken up and refixed or replaced with new units complying with sub-Clauses 4 and 5 of Clause 508 (Gullies & Pipe Junctions), 6 mm below the adjoining road surface on a mortar bed complying with sub-Clause 507.17. The thickness of the mortar bed shall be between 10 mm and 25 mm. Any additional adjustment shall be made by modifying the brickwork in compliance with sub- Clause 507.3 or by using a frame of suitable depth.

Clause 507.3: Brickwork and Block work shall comply with the 2400 Series and be built with mortar designation (i) in English bond. The joints of brickwork where exposed shall be finished as specified for un pointed joints in the 2400 Series. The ends of all pipes shall be neatly built into the brickwork and finished flush with mortar designation (i).

Clause 507.17: Frames for chamber covers and gratings shall be set in cement mortar designation (i) complying with Clause 2404 or a proprietary quick setting mortar of equivalent strength.

Covers and gratings located within the carriageway, hardshoulder or hardstrip shall be set in a mortar with the following properties:

- (i) The material shall be non-shrink;
- (ii) The material shall have a minimum workable life of 15 minutes;
- (iii) The compressive strength of the material shall exceed 30N/mm² in 3 hours;
- (iv) The tensile strength of the material shall exceed 5N/mm² in 3 hours;

11 Testing and Cleaning

- 11.1 At the time of completion of all works covered by the Contract, the Contractor shall ensure, to the satisfaction of the Employer's Representative, that cleaning of existing chambers, gullies and drains be carried out in accordance to Clause 509.5, no CCTV required of the TII Specification for Road Works.

12 Water Tables

- 12.1 Existing water tables are to be cleaned along the edge of carriageway on both sides. New water tables to be put in areas to be agreed with the Employer's Representative on site. Average dimensions are 2.5m x 1.5m x 0.30m.

Table 5.1.1 Water Tables

Location	Description	Volume
To be agreed on site with Employer's Representative (see drawing RN24003-04-P5-PS-DRS-001 to RN24003-04-P5-PS-DRS-004 for indicative locations)	37 no. water tables	62m ³
	TOTAL	62m³

Table 5.1.1 Pipe Schedule

Pipe Run Reference	Upstream (Start)	Downstream (End)	Drain Type	Pipe Dia. (mm)	Pipe Length (m)	Gradient (1 in __)	Trench and Bedding Details (as per CC-SCD-00521)
FD01	FDM 01A	FDM01	100mm HDPE Narrow Filter pipe	100	20	Site	Type 8
Pipe Run 01	G01	C02	150mm HDPE surface water pipe	150	17	Site	Type Z
FD02	FDM 03	FDM 02	100mm HDPE Narrow Filter pipe	100	60	Site	Type 8
FD03	FDM 04	FDM 03	100mm HDPE Narrow Filter Drain	100	70	Site	Type 8
Pipe Run 02	G02	Outfall	150mm HDPE surface water pipe	150	43	Site	Type Z
Pipe Run 03	G03	Outfall	150mm HDPE surface water pipe	150	10	Site	Type Z
Pipe Run 04	G04	Outfall	150mm HDPE surface water pipe	150	10	Site	Type Z
FD04	FDM05	Outfall	100mm HDPE Narrow Filter Drain	100	22	Site	Type 8
FD05	FDM06	Outfall	100mm HDPE Narrow Filter Drain	100	23	Site	Type 8
Pipe Run 05	G05	FDM06	150mm HDPE surface water pipe	150	16	Site	Type Z
Pipe Run 06	G06	G05	150mm HDPE surface water pipe	150	14	Site	Type Z
Pipe Run 07	G07	G06	150mm HDPE surface water pipe	150	40	Site	Type Z
Pipe Run 08	G08	Outfall	150mm HDPE surface water pipe	150	10	Site	Type Z
Pipe Run 09	G09	C03	150mm HDPE surface water pipe	150	27	Site	Type Z
Pipe Run 10	G10	Outfall	150mm HDPE surface water pipe	150	10	Site	Type Z

Table 5.1.2 Manhole Schedule

Manhole Reference	Chainage	Invert Level	Cover Level	Cover Type	Depth	Manhole Type Reference
FDM 01	Ch.10R	Site	Site	D400	Site	A 975 x 1350
FDM 01A	Ch.30R	Site	Site	D400	Site	A 975 x 1350
FDM 02	Ch.620L	Site	Site	D400	Site	A 975 x 1350
FDM 03	Ch.680L	Site	Site	D400	Site	A 975 x 1350
FDM 04	Ch.750L	Site	Site	D400	Site	A 975 x 1350
FDM 05	Ch.1660L	Site	Site	D400	Site	A 975 x 1350

FDM 06	Ch.1660R	Site	Site	D400	Site	A 975 x 1350
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Table 5.1.3 Gully Schedule

Gully Reference	Location	Connecting Pipes		Carrier Pipe Dia. (mm)	Gully Type	Depth 0m to 2m	
		Length (m)	Dia. (mm)			Length (m)	Avg. Depth to Invert (m)
G.01	Ch. 610 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.02	Ch. 990 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.03	Ch. 1230 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.04	Ch. 1290 L	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.05	Ch. 1676 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.06	Ch. 1690 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.07	Ch. 1730 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.08	Ch. 2200 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.09	Ch. 2380 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-
G.10	Ch. 2435 R	See Table 5.1.1	See Table 5.1.1	150	Precast Conc.	See Table 5.1.1	-

APPENDIX 5/2: SERVICE DUCT REQUIREMENTS

General Requirements

1. Ducts and chambers for Statutory Authorities and others shall be located as indicated on utility and drainage Contract Drawings.
2. Ducts shall be manufactured from 100% virgin material.
3. All pipes, bends, coupling, etc. provided shall be from a single manufacturer.
4. All ducts shall be suitable for the depth of burial and the types of cables to be pulled through them.
5. Ducts shall be of 'Normal' duty in accordance with IS EN 50086-2.
6. Ducts shall comply with IS EN 50086-2 in terms of duct deformation (<5% deformation requirement for 450N loading on 200mm sample) and impact resistance requirements (no crack for 5kg striker, 12 samples and 570mm fall height>28 Joules).
7. Ducts shall have a smooth low friction inner surface completely free of ripples, sharp edges and protrusions. Friction coefficient <0.28
8. Duct ovality to be 2.00mm max.
9. Ducts shall be constructed in 6.6m lengths (approximately) with a socket at one end and a corresponding spigot at the other with the plain end bevelled to allow easy jointing of ducts on site.
10. Ducts shall have a circumferential mark to indicate the correct push-in distance for duct jointing for spigot and socket joints.
11. Long radius bends only shall be used with a minimum Duct Bend Radius of 1.2m for all bends.
12. The colour coding of service ducts shall generally conform to I.S. 370:2007 as follows:

Service	Colour
MV Electricity	Red
LV Electricity	Red
Public Lighting	Red
Telecommunications (ESB)	Red
Telecommunications (Eircom)	Grey
Watermain	Blue
TII Service Ducts	Black

13. In addition to colour coding, the ducts shall be stamped with the words "Danger Electricity Cables", "Public Lighting", "Telecommunications Cables", etc. as appropriate, printed in large block capitals continuously along their length, to be agreed with the Employer's Representative. Legends shall be minimum 18mm high black lettering at maximum 1m intervals.
14. Materials shall contain pigments and UV stabilisers to provide maximum colour stability and weathering. All pigments shall be of high purity and shall resist leeching in contact with soil acids.
15. Services ducts for Statutory Undertakers and others, shall be installed in accordance with the requirements indicated on the relevant drawings in the Contract and in accordance with the TII Specification for Road Works.
16. The standard TII Standard Construction Details in respect of service ducts and cable chambers shall be deemed to apply except where modified or superseded by the drawings and Specification.
17. This Appendix 5/2 shall be read in conjunction with Appendix 1/16, which provides additional specific requirements in respect of each of the particular services.
18. All underground cables shall be fully ducted along their entire length.

Duct Handling and Storage

19. Care should be taken when loading/unloading ducts to avoid damage to the ducts. Any damaged or defective ducts shall be marked in a conspicuous manner and removed from site.
20. Ducts shall be stored on a smooth flat horizontal surface, supported by side supports at intervals of not more than 1.5m and fully in accordance with the manufacturer's recommendations. Ducting supplied in factory strapped bundles may not require side supports, however care should be taken when removing strapping when tension may be released.
21. Socket ducts shall be stacked in layers in accordance with manufacturer's recommendations and with the socket at alternate ends of each layer. The socket on one layer should project beyond the duct spigots on the layer below so that the ducts are evenly supported along their length.
22. Duct stacks shall not exceed 7 layers with a maximum height of 2m.
23. The method of stacking shall be such as to ensure that the integrity of the ducts is maintained and that distortion is avoided.
24. Ducts shall not be stored in a place where they are likely to be in contact with surface water or other foreign matter which could make its way into the ducts.
25. Ducts shall not be stored in total (builder's provider's yard and site etc.) for a period longer than 1 year.

Excavation, Bedding and Surround for Service Ducts

26. All excavations for service ducts shall be carried out by the Contractor to Clause 502 of the Specification.
27. Bedding and surrounding of ducts shall be carried out in accordance with Clause 503 of the Specification.
28. Material for the bedding and surround to all ducts and multi-ducts shall be clean and sharp and conforming to I.S. EN 12620:2008.
29. Ducts shall be evenly and solidly bedded and all sand shall be compacted to the degree specified without voids to ensure adequate support. Particular care shall be taken to ensure that sand is compacted into the spaces in between any multi-ducts.
30. Ducts shall be laid in accordance with the requirements of CC-SCD-00561 and CC-SCD-00562 unless otherwise stated.
31. Bedding and surround to ducts passing under road pavement and field accesses shall be Type A bedding and surround in accordance with CC-SCD-00561.

Duct Laying

32. Each duct shall be carefully examined immediately prior to laying and any damaged or defective ducts shall be marked in a conspicuous manner and removed from site.
33. All duct systems shall be installed so that no undue strain is placed on cables when pulled. Cable manufacturer's recommendations shall be followed.
34. Ducts shall be aligned as straight as possible in the horizontal and vertical directions. All sweeps shall be as gradual as possible and jointed above ground prior to installation.
35. The location and arrangement of the various duct banks shall generally be as indicated on the Drawings in the Contract, but the precise positions/lines of the duct banks shall be agreed between the Contractor and the Employer's Representative on commencement of the Works.
36. Ducts shall not be laid in trenches where water is lying in the bottom.
37. Every effort must be made to prevent dirt ingress into the ducts. Allowing dirt to enter ducts on the basis that the dirt should be removed later during the duct cleaning process is not acceptable.
38. Bricks or other hard packings shall not be used as temporary duct supports.
39. For ducts in trefoil formation, the ducts shall be bound together with duct ties at 3m intervals or more frequently as required to maintain the duct formation.

40. Ducts shall be laid on the bedding with the sockets towards the duct layer. The spigot end and inside of the duct to be joined shall be thoroughly cleaned with a dry rag. A duct shall be temporarily inserted to prevent ingress of soil or foreign material prior to joining.
41. Ducts shall be laid so as to drain naturally towards one or both ends, where adequate provision for drainage shall be made. Adequate precautions shall be taken to prevent the cable duct system acting as a storm-water or ground water drainage system. A minimum fall of 1 in 200 shall be provided for drainage purposes.
42. Ducts shall be laid with the legend facing upwards.
43. The spigot end of the duct shall be pushed into the socket initially by hand and then driven in to achieve proper engagement by tapping with a hammer against a suitable wooden batten placed across the remote socket. Full engagement is when the indicator on the duct seals properly. Joints shall be made in such a manner as to avoid any sharp internal edges that may interfere with cabling operations.
44. Cutting of ducts shall be with a suitable non-electrical hand cutting tool. All cut ends shall be square to the axis of the duct and all burrs removed before use. Cutting of occupied ducts, if required, shall be carried out with extreme care.
45. Ducts not required to enter a jointing chamber shall by-pass the chamber either to the side or beneath the chamber. In certain circumstances and with the approval of the Employer's Representative, ducts may pass through the chambers uninterrupted
46. Ducts for road crossings shall be straight and wherever possible perpendicular to the axis of the road.

Crossing of Electricity Ducts

47. A minimum radial clearance of 300mm between the outer services of ducts shall be provided where telecommunications or traffic ducts cross electricity ducts. Wherever possible, the telecommunications or traffic ducts shall cross above the electricity ducts.
48. Where it is not possible to provide the minimum 300mm clearance, a reduced separation may be agreed with the Employer's Representative on the basis that mechanical protection overlaid with marker warning strip shall be inserted between the crossing ducts. This mechanical protection may be in the form of concrete blocks or tiles, or hot dip galvanised steel plating to be submitted for the consent of the Employer's Representative.

Duct Cleaning and Testing

49. Immediately following the installation of any duct run, the interior of the duct shall be thoroughly cleaned by twice drawing an approved brush through the ducts, once in each direction. The cleaning procedure shall be in accordance with the manufacturer's recommendations and shall be agreed with the Employer's Representative.
50. Following cleaning and prior to backfilling, the ducts shall be tested by drawing a cylindrical wooden/iron mandrel through them in accordance with the TII Specification for Road Works.
51. The mandrel shall be cylindrical, polished hardwood or iron, 300mm long having spherical ends and a diameter equal to the internal diameter of the ducts -10% or the internal diameter of the ducts -10mm, whichever is larger.
52. Mandrels should pass through the whole length of the completed ducts when testing.

Draw Ropes and Duct Plugs / Caps

53. Immediately after cleaning and testing, each individual duct run shall be fitted with a single strong continuous piece of polypropylene draw rope free of knots with a design life of not less than 20 years.

54. Draw ropes used in ESB ducts shall be 12mm polypropylene rope with a certified safe breaking load of 1.5 tons. Draw ropes in all other ducts shall be 10mm diameter polypropylene rope free of knots with a minimum 8kN breaking strength. The types of draw ropes used shall be submitted to the Employer's Representative for approval prior to installation.
55. A surplus of 2 meters of draw rope shall be left neatly coiled at each end of each duct run, with the ends suitably and effectively secured to prevent accidental withdrawal of the rope.
56. After installation of the draw ropes a plastic purpose-made plug or cap shall be placed in/over all open ends of ducts to prevent ingress of water and/or foreign materials.

Marker Tape and Identification

57. Marker tape shall be laid directly above each section of duct at a depth of 300mm above the top of the duct.
58. Marker tape should provide full lateral cover over the ducts and should be in vertical alignment with the duct run. For large duct configurations, more than one width of tape may be necessary to cover the extra width of the duct section.
59. Marker tape shall be manufactured from high quality material to an approved international or national standard in order to assure its long-term performance with regard to physical integrity and readability.
60. Marker tape shall be marked with the relevant lettering detailed above for individual services in large black block capitals continuously along its length.
61. Marker tape including a metal foil strip shall not be used.
62. Permanent marker blocks and location posts shall be installed as required in accordance with CC-SCD-00560.

Cable Chambers

63. Cable chambers shall be provided where required to facilitate cable entry to panels, at intersections, at changes of direction and at regular intervals on straight runs to facilitate the future installation and maintenance of cables.
64. Cable chamber locations are indicated on the Drawings in the Contract. Dimensions and construction type are detailed in the Specification and Standard Details. However, the Contractor shall be responsible for the final positioning, setting out and sizing of each cable chamber to ensure co-ordination of the whole of the works and compliance with the Works Requirements.
65. Construction of the cable chambers shall generally be in accordance with the Standard Detail drawings and relevant standard TII Standard Construction Details for cable draw pits in footways and verge, (CC-SCD-00564), modified as required to suit the particular requirements in terms of the quantity, arrangement and spacing of ducts entering the chamber, minimum cable bending radius requirements etc., unless stated otherwise.
66. Adequate and safe access/egress to the cable chambers shall be provided to facilitate the installation and future maintenance of cables.

Frames and Covers to Cable Chambers

67. Frames and covers to cable chambers shall comply with the requirements of IS EN 124.
68. The material used in frame and cover manufacture shall be ductile iron grade 500-7 of ISO 1083:1987 or equivalent standard.
69. The covers shall have a secure lockable system and should prevent material entry.
70. All covers shall provide a clear opening to the size specified.
71. Cable chamber frames and covers shall be set square to structure or kerb lines.
72. Frames and covers to access chambers shall be Class D400.

Specific Requirements for ESB Ducts

73. None.

Specific Requirements for Eir Ducting

74. None.

Public Lighting

75. None.

Public water supply

76. None.

Accommodation Works

77. None.

Table 5.2.4 Schedule of existing lids to be adjusted/reset.

No.	Location	Description	Height to be raised (mm)	Other Requirements
Existing Water Utility Covers				
FH01	Ch. 300R	Fire Hydrant	0	Adjust existing to match new surface
DWM01	Ch. 305R	Domestic Water Metre	0	Adjust existing to match new surface
DWM02	Ch. 375R	Domestic Water Metre	0	Adjust existing to match new surface
DWM03	Ch. 420R	Domestic Water Metre	0	Adjust existing to match new surface
DWM04	Ch. 551R	Domestic Water Metre	0	Adjust existing to match new surface
SV01	Ch. 590R	Sluice Valve	0	Adjust existing to match new surface
SV02	Ch. 590R	Sluice Valve	0	Adjust existing to match new surface
SV03	Ch. 605R	Sluice Valve	0	Adjust existing to match new surface
DWM05	Ch. 1700R	Domestic Water Metre	0	Adjust existing to match new surface
DWM06	Ch. 2390R	Domestic Water Metre	0	Adjust existing to match new surface

Manhole				
C01	Ch. 440R	Grated Manhole	0	Adjust existing to match new surface
EIR01	Ch. 490R	Eircom Chamber	0	Adjust existing to match new surface
C02	Ch. 595R	Grated Manhole	0	Adjust existing to match new surface
C03	Ch. 2415R	Grated Manhole	0	Adjust existing to match new surface
C04	Ch. 2435R	Grated Manhole	0	Adjust existing to match new surface

Gullies				
EGY01	Ch.25L	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY02	Ch.38L	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY03	Ch.125R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and

				grating with new lid as per CC-SCD-00512 to new surface
EGY04	Ch.125R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY05	Ch.350R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY06	Ch.365L	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY07	Ch.380R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY08	Ch.395L	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY09	Ch.390R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY10	Ch.460R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY11	Ch.510R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY12	Ch.535R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY13	Ch.565R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface
EGY14	Ch.605R	Chamber	0	Replace existing gully chamber with a new precast chamber as per CC-SCD-00510 and grating with new lid as per CC-SCD-00512 to new surface

APPENDIX 5/3: SURFACE WATER CHANNELS AND DRAINAGE CHANNEL BLOCKS

Surface water channels constructed shall be Precast Kerb Units as per CC-SCD-00523 Type B.

Drainage channel blocks constructed shall be CC-SCD-01109 Type 3 constructed as shown on drawings RN24003-04-P5-PS-DRS-001 to RN24003-04-P5-PS-DRS-004.

Table 5.3.1 Schedule of Drainage Channels

Ref. No.	Start Chainage (m)	End Chainage (m)	Location	Type	Length (m)	Comments
DC 01	350R	595R		CC-SCD-00523 Type B	245	Install New precast concrete channels to new surface
DC 02	610R	640R		CC-SCD-00523 Type B	30	Install New precast concrete channels to new surface
DC 03	990R	1010R		CC-SCD-00523 Type B	20	Install New precast concrete channels to new surface
DC 04	1230R	1250R		CC-SCD-00523 Type B	20	Install New precast concrete channels to new surface
DC 05	1250L	1290L		CC-SCD-00523 Type B	40	Install New precast concrete channels to new surface
DC 06	1690R	1755R		CC-SCD-00523 Type B	65	Install New precast concrete channels to new surface
DC 07	2200R	2250R		CC-SCD-00523 Type B	50	Install New precast concrete channels to new surface
DC 08	2360R	2440R		CC-SCD-00523 Type B	80	Install New precast concrete channels to new surface

APPENDIX 5/4: FIN DRAINS AND NARROW FILTER DRAINS AND GEOTEXTILES FOR FILTER DRAINS

Filter drains constructed shall be in accordance with CC-SCD-00540 Drain Type 8, in locations as shown on drawing RN24003-04-P5-PS-DRS-001 to RN24003-04-P5-PS-DRS-004.

Table 5.4.1 Schedule of Filter Drains

Ref No.	Start Chainage (m)	End Chainage (m)	Location	Type	Pipe Diameter (mm)	Length (m)	Comments
FD01	Ch.10R	Ch.30R	Mainline	CC-SCF-00540 Drain Type 8	100	20	As per Table 5.1.2
FD02	Ch.620L	Ch.680L	Mainline	CC-SCF-00540 Drain Type 8	100	60	As per Table 5.1.2
FD03	Ch.675L	Ch.745L	Mainline	CC-SCF-00540 Drain Type 8	100	70	As per Table 5.1.2
FD04	Ch.1640L	Ch.1660L	Mainline	CC-SCF-00540 Drain Type 8	100	22	As per Table 5.1.2
FD05	Ch.1640R	Ch.1660R	Mainline	CC-SCF-00540 Drain Type 8	100	23	As per Table 5.1.2

APPENDIX 5/7: DRAINAGE AND SERVICE DUCTS: TII STANDARD CONSTRUCTION DETAILS

TII Publication No.	Date	Description
CC-SCD-00510	03/15	Precast Concrete Gully
CC-SCD-00512	03/15	Gully Grating
CC-SCD-00514	03/15	Typical Chamber Details
CC-SCD-00521	03/15	Surface Water Drains – Trench and Bedding Details
CC-SCD-00561	03/15	Trench Cross-Sections Under Trafficked Areas
CC-SCD-00562	03/15	Trench Cross-Sections Under Non-Trafficked Areas
CC-SCD-01109	12/10	Precast Kerb Units

APPENDIX 6/1: REQUIREMENTS FOR ACCEPTABILITY & TESTING OF EARTHWORKS MATERIALS

Overview

1. The Earthworks for the Contract shall be carried out between the “Extents of Contract” indicated on the Contract Drawings and to the Construction Details specified.
2. The Contractor shall note that his earthworks must be placed and carried out taking account of the following particular constraints in addition to all others specified or implied in the contract documents.
 - a. Maintaining traffic flow along the route at all times.
 - b. The disposal of unacceptable/surplus material to properly licensed tips in accordance with Planning, Waste and all other relevant legislation. It is the responsibility of the Contractor to obtain all licenses, permits, permissions etc. required and to allow for this in the programme.
 - c. Maintaining access for domestic and other traffic movements to the adjacent properties/land, public access and pedestrian access for the duration of the contract.
 - d. Complying with the requirements of the Statutory bodies, Telecom companies, sanitary services, group water scheme, etc. required as part of the roadworks contract.
 - e. Other miscellaneous works such as drainage, etc. required as part of the roadworks construction.
 - f. Accommodation works requirements
 - g. Requirements in relation to the treatment of invasive species encountered along the scheme extents.

General

3. The permitted classes, acceptable limits and material properties required for acceptability for fill material are given in Table 6/1 of the Specification. Grading requirements are given in Table 6/2 of the Specification. It should be noted that under no circumstances shall the use of crushed concrete be allowed for use as a constituent material of any of the acceptable Classes of fill shown in Table 6/1.

Disposal of Class U1 Unsuitable Material and Suitable Material surplus to requirements

4. Unacceptable Material Class U1, and any suitable material surplus to requirements encountered on this scheme shall be removed and disposed of by the Contractor. The Contractor shall obtain the necessary licences/exemptions to dispose of this material in accordance with current Planning, Waste and all other relevant legislation.

General Embankment Fill

5. Embankments shall be constructed of Class 6C selected fill unless otherwise specified in the Works Requirements.
6. Class 5A and Class 5B material shall be used for topsoil. For specific topsoil and landscaping details refer to Appendices 6/8 of the Specification.
7. Where standing water is present in the bottom of excavations the Contractor shall place Class 6A material to a minimum level 0.25m above the standing water.

Classification & Testing of Materials

8. The classification and determination of acceptability of the earthworks materials shall be the responsibility of the Contractor. The Contractor shall also be responsible for the testing of earthworks materials in accordance with Appendix 1/5 of the Specification.
9. Sampling (and testing, as appropriate) of earthworks materials shall be carried out by the Contractor at the point of excavation for site won materials and at the point of deposition for imported materials. Point of excavation shall mean Earthworks Area or as agreed by the Employer's Representative. An Earthworks Area is defined as a section of the Works that comprises dominantly one of the following; cut, fill or at-grade earthworks. In some Earthworks Areas there may be minor components of cut, fill or at-grade earthworks.
10. The Contractor shall maintain accurate records of the chainage the samples are taken and where materials are placed in the permanent works. These records shall include but not be limited to approx. road chainage and depth below original ground level. Copies of these records shall be regularly submitted to the Employer's Representative.
11. (IL) indicates that an Irish Accreditation of Laboratories (ILAB) test report or certificate is required.
12. The permitted classes, acceptable limits and material properties required for acceptability for fills appropriate to this Contract are given in Table 6/1 of the TII Specification for Works. Grading requirements for each class of material are given in Table 6/2 of the TII Specification for Works. The compaction requirements are given in Table 6/4 of the TII Specification for Works.
13. Where the Employer's Representative is of the opinion that the classification of the site arisings or imported material has changed since sampling, the Contractor may be required to repeat the classification tests to check the materials acceptability. The location of trial pits for classification work shall be agreed with the Employer's Representative.
14. The Contractor shall provide copies of all classification test results and acceptability testing to the Employer's Representative prior to placement of the material but not more than five days from completion of the testing or as agreed by the Employer's Representative.
15. Compaction of fill material shall comply with Clause 612 of the TII Specification for Works – Method Compaction.

Acceptability of Materials

16. All excavated materials (excluding Topsoil Class 5A) are to be treated as unacceptable material Class U1 or U2 (reference to be made to Appendix 6/2 of the Specification) even if the excavated material meets the classification requirements in Table 6/1 of TII Specification for Works and Appendix 6/1 of the Specification unless otherwise agreed by the Employer's Representative and the Employer.

Groundwater

17. The Contractor shall allow and be responsible for the control of groundwater in all temporary excavations and in all temporary situations during execution of the Works, and it shall be noted that pumping into existing watercourses or sewers shall only be permitted upon provision of a detailed Method Statement and its subsequent approval by the relevant authorities.

18. The Contractor shall take all necessary measures to prevent any surface runoff from the construction works flowing directly into any of the watercourses, both existing and proposed, on the Site. The Contractor shall provide measures to channel surface water runoff to specific discharge points where silt traps, screens and any other measures deemed necessary by the Employer's Representative shall be employed to prevent any excessive clouding of the watercourses.
19. Where pumping is undertaken, and discharge is into an existing watercourse, a Method Statement of the intended operation (which shall include the Contractor's methodology to limit silt, debris and other contamination entering the watercourse) shall be presented to the Employer's Representative for approval a minimum of 14 days in advance of commencing such works.

Class 4 Material

20. Class 4 material may be used as fill in the verge area on embankments between the upper side of capping material and the Earthworks outline where safety barriers are not required. Class 4 material can also be used to infill voids and other non-structural areas requiring reshaping. An MCV > 4 shall be required for Class 4 landscape fill.

Peat / Organic Soils

21. Peat and organic soils are unsuitable for use and shall be disposed of off-site to a licensed tip provided by the Contractor.

Testing of Class 6N/6P material

22. Class 6N/6P material shall be compacted to an end product specification where the nature of the material allows this. The target shall be 95% of the maximum dry density determined in accordance with Clause 4.3 of BS 1377 part 4. This test is carried out on material passing the 37.5mm sieve. The Contractor shall monitor compaction on site by in situ density testing.

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U2 UNACCEPTABLE MATERIAL**General**

1. For the purpose of this Contract, Unacceptable Material Class U2 shall be as defined in Clause 601.3 of the Specification, where hazardous chemical properties shall be defined as containing biodegradable (putrescible) material (i.e., capable of producing landfill gas) or containing leachate or capable of producing leachate or containing asbestos or containing petroleum products.
2. Areas of U2 material that have been identified specifically within the Contract Scheme include bituminous materials where the existing roads must be removed. The materials have hazardous chemical or physical properties requiring special measures for its excavation, handling, storing, transportation, deposition and disposal.

Provisional Measures for Dealing with Unacceptable Material Class U2

3. In the event that the Contractor encounters any area where the presence of Unacceptable Material Class U2 is suspected, the Contractor shall cease any excavation work in that area immediately. The Contractor shall make arrangements to have an approved Sub-Contractor, specialising in the identification of such material, carry out testing and sampling on suspected hazardous material. Good site practices should be observed. The presence of landfill gases cannot be ruled out, derived from the decay of organic waste. When excavating in these soils, it would be prudent to monitor air quality.
4. Where this material is identified as Class U2, the Contractor shall make arrangements for this material to be excavated and removed off site by a specialist waste-disposal Contractor approved by the Employer's Representative. The material shall be disposed of at a properly licensed landfill site subject to the approval of the appropriate Waste Regulation Authority. No material shall leave the site without the approval of the Employer's Representative. The Contractor shall keep records of the materials removed and shall obtain the Employer's Representative's authentication of the records.
5. Excavations into or adjacent to landfill wastes may encounter concentrations of landfill gas or other hazardous substances. The Contractor shall take all measures necessary to protect site staff, adjacent landowners and members of the public from any harmful effects arising from his operations.
6. The Contractor shall prepare appropriate Method Statements and safety plans to cover any such operations which will be subject to the approval of the Employer's Representative.
7. Groundwater/leachate from contaminated areas shall not be discharged to public or private surface water or foul sewers, nor to watercourses without prior approval from the appropriate authority. Should groundwater or leachate be found in contaminated areas, it shall be contained so as to prevent contamination of uncontaminated ground, prior to disposal off site.

APPENDIX 6/3: REQUIREMENTS FOR EXCAVATION, DEPOSITION, COMPACTION (OTHER THAN DYNAMIC COMPACTION)

General

1. All waste material arising from the Works shall be dealt with in compliance with the relevant legislation and regulations including without limitation the Waste Management Acts, 1996–2011, the Environmental Protection Agency Acts, 1992–2011, Planning and Development Acts, 2000–2017, The Roads Acts, 1993–2015 and European Communities (Waste Directive) Regulations 2011 each as amended and supplemented and in force for the duration of the Works and the Contractor shall be deemed to have provided for and allowed for all costs associated with lawfully dealing with waste material in the Tender Sum. For the avoidance of doubt the Contractor shall prepare, and comply with the provisions of, a Waste Management Plan for the project as detailed in the guidelines contained in the TII Publication “GE-ENV-01101 - The Management of Waste from National Road Construction Projects”.
2. All materials will be compacted in accordance with Clause 612.
3. Earthworks, the location of the areas to be excavated are shown in the Works Requirements Drawings.

Description of the Works

4. The Contractor shall note that the construction must be planned and carried out taking account of the following constraints:
 - Maintaining traffic flows, particularly along the existing road, as specified in Appendix 1/17
 - The limitation on the extent of site
 - The limitations on noise and vibration as required in Appendix 1/9.
 - Tying into the existing N63
 - The disposal of unsuitable materials.
 - Other miscellaneous works such as drainage, etc., required as part of the roadwork's construction.
5. Excavating must be carried out in accordance with Clause 602 of the TII Specification.

Dealing with Water

6. The Contractor shall not allow water to accumulate in any part of the Works. Water arising from or draining into the Works shall be drained or pumped to an approved disposal point.
7. Any drainage sumps required shall, where practicable, be sited outside the area excavated for the permanent Works, and shall be refilled with concrete mix ST1 to Clause 2602 to the level of the underside of the adjacent permanent Works. The Contractor shall take all necessary precautions to prevent any adjacent ground from being adversely affected by loss of fines through any dewatering process.

Disposal of Materials

8. The Contractor shall, before commencing any part of the Works, submit to the Employer's Representative, a list of locations of tips off site that he proposes to use for the disposal of materials arising from the temporary and permanent works. The list shall be updated to represent actual practice until issue of the Maintenance Certificate. The Contractor shall whenever required

produce to the Employer's Representative information to show that the disposal sites have current licences or planning consents as appropriate together with details of any conditions or constraints upon their use and that the nature of materials for disposal together with the manner rates and timings of the disposals are acceptable to the waste regulation and disposal authorities, the licensed waste managers, and the local planning authorities, as appropriate. The Contractor will be required to provide copies of all Controlled Waste Transfer Notes relating to the disposal of materials arising from the temporary and permanent works.

Trial Holes

9. Trial holes will be required by the contractor to locate existing services.

APPENDIX 6/7: SUB-FORMATION & CAPPING & PREPARATION & SURFACE TREATMENT OF FORMATION

Capping and Sub-formation

1. Capping shall be Class 6F2.
2. The sub-formation shall, immediately before laying capping on areas of completed sub-formation, have a surface tolerance within +20mm and -50mm relative to designed level.
3. On site testing in accordance with Appendix 1/5 shall be required to confirm CBR values on sub-formation and formation and shall be carried out as follows:
 - One plate load tests in accordance with BS1377 every 25m staggered.
 - One laboratory CBR test is required for every 50m staggered
4. A minimum CBR value of 15% at formation level (top of capping) is required. One plate load test in accordance with BS1377 every 25m staggered shall be carried out.
5. A minimum CBR value of 2% at sub-formation level (bottom of capping) is required.
6. Where conditions and sub-formation materials are consistent, the Employer's Representative may instruct a lesser frequency of testing.
7. The excavation tolerances at sub-formation level (underside of capping) in non-rock cuttings shall have surface tolerances relative to its designed level equal to that of formations as specified in Clause 616.1 of the TII Specification for Works.

Defect Areas

8. Capping shall be provided at defect locations where it is necessary upon inspection and some may also be required after the carriageway dig out to stabilise prior to sub base laying.
Roscommon County Council's Employer's Representative to confirm once open excavations are viewed.
9. Excavation will continue to achieve the required design. The excavation shall have clean cut vertical sides and all loose material shall be removed.
10. The material shall be disposed of as per Appendix 6/1 above.
11. The excavations shall be inspected and approved by the Employer's Representative prior to reinstatement.
12. Capping shall comply with Clause 613 of the Specification. Capping shall be constructed with selected granular material, Class 6F2 and comply with Table 6/1 of the specification and Clause 613 of the Specification.
13. Materials will be compacted in accordance with Clause 612 of the Specification.
14. The vertical faces of all bituminous bound layers shall be primed in accordance with Clause 920 prior to reinstatement of the excavation.
15. The excavation shall be reinstated as per Appendix 7/1.

APPENDIX 6/8: TOPSOILING, GRASS SEEDING AND TURFING**Topsoil**

1. Areas of topsoiling are shown in Drawings RN24003-04-P5-PS-EAR-011 to RN24003-04-P5-PS-EAR-014.
2. Topsoiling shall be imported, Class 5B material.
3. The areas to be grassed shall receive Treatment I as defined in sub-clause 618.4(i).
4. Areas to be grassed/ verges shall be topsoiled using Treatment I of 618.4(i). All areas to receive topsoil shall be harrowed to a depth of 50mm and raked prior to topsoil placement.
5. Topsoil shall be deposited to the following thickness, unless otherwise instructed by the Employer's Representative.

Planting Type	Min. Topsoil Thickness (mm)	Max. Topsoil Thickness (mm)
Areas of Seeding	50	150

6. The method of topsoil deposition shall be to the approval of the Employer's Representative.
7. Tracked vehicles are prohibited from travelling on areas that have been newly topsoiled.
8. Where depth of topsoiling is greater than 150mm, Class 4 material is to be used to regulate these areas.

Seeding

9. Areas of seeding are shown in RN24003-04-P5-PS-EAR-011 to RN24003-04-P5-PS-EAR-014.
10. The areas of seeding shall receive treatment as defined in sub-clause 618.7.

APPENDIX 7/1: PERMITTED PAVEMENT OPTIONS

1. The contractor shall rehabilitate the existing pavement to the depths and specification in the tables below and shown in the Works Requirements Book of Drawings.
2. All longitudinal surface joints shall be under the line of road markings unless otherwise directed by the Employer's Representative.
3. Materials, placement methods shall conform to the TII Specification for Road Works Series 900.
4. The carriageway shall be surfaced to the depths and specifications shown in the tables below.
5. Transverse joints between new and existing pavement shall be in accordance with Standard Construction Details CC-SCD-00703.
6. Carriageway Edge Details shall be in accordance with Standard Construction Details CC-SCD-00701, Pavement Type 1B.
7. The works shall be carried out in line with IS EN 13808.
8. Asphalt Concrete mixtures shall comply with the TII Specification for Road Works Series 900. Assessment and Verification of Constancy of Performance shall be carried out to System 2+ in accordance with IS EN 13108-1. The DoP, CE Mark, Type Testing and FPC information detailed under Series 000 and Clause 1 of the Series 900 shall be provided.
9. Each AC, HRA and SMA mixture shall comply with the requirements regarding constituents, composition and installation in the Works as laid out in the TII Specification for Road Works Series 900, Clauses 1 to 10 and the Tables in Clause 11.

Requirements for Regulating Course Materials (Clause 2.2)

10. Where the existing road surface is to be overlaid by new flexible construction the existing surface shall be reshaped by means of cold-milling and/or regulating courses.
11. Regulating courses shall correspond to one of the materials permitted for the pavement option chosen in accordance with SPW-00900 Clause 11 Table 16.

The following table should be used to obtain factors for permitted material and aggregates:

	Density Factors for:	
	Coarse Limestone Aggregate	Coarse Granite Aggregate
Stone Mastic Asphalt	2.4 per tonne/m ³ certified	2.5 per tonne/m ³ certified
Dense Macadam Asphaltic Concrete	2.3 per tonne/m ³ certified	2.4 per tonne/m ³ certified
Rolled Asphalt	2.3 per tonne/m ³ certified	2.4 per tonne/m ³ certified

Table 7a: Pavement Type A: N63 Mount Talbot to Athleague Pavement Improvement Scheme (60mm Inlay/Overlay)

1	Location: Ch. 0m – Ch. 2880m; – Side Roads			General Requirements	
2	Grid for checking surface levels of pavement courses, if different from the requirements of CL 702.4: Long dim: Trans dim:			N/A N/A	
3	Category of Road Surface regularity (CL 702.7 and CL 702.8): Long Reg.: Trans Reg.:			A 300m 20m	
4	Requirements for coarse aggregates - Polished Stone Value (PSV), Aggregate Abrasion Value (AAV) (Series 900 CL 3.2.2, 5.2.2, 6.2.2, 8.4.1.1, 8.6.1.1):			Min. PSV: Max. AAV:	
5	Requirements for pre-coated chippings - Polished Stone Value (PSV) for general use mixtures, PSV for mixtures for roundabouts, Aggregate Abrasion Value (AAV) (Series 900 CL 4.2.4):			Min. PSV: 60 Max. AAV: 16	
6	Requirement for testing for Polished Stone value using the friction after polishing test (NRA HD 300 Clause 2.25)			Yes	
7	Freezing and thawing (soundness) category if different from the requirements of Series 900 Tables 1, 4, 7, 10 and 17:			N/A	
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.			N/A	
9	Requirements for monitoring resistance to permanent deformation of HRA (Series 900 Cl. 10.1.10.1)			Yes	
10	Sealant to be applied to the whole of any freestanding edge on the outside of the finished pavement on the low side of the camber (Series 900 CL 10.1.8):			Yes	
11	Any tests additional to those required by IS EN 13108–20, IS EN 13108–21 or the relevant SRW (Series 900 CL 1.2 and 1.3): Flakiness Index Test as per IS EN 933-3, PSV and AAV Compliance Test as per IS EN1097-8, Macrotexture Aggregate Measurement Test as per IS EN 13036-1			Yes Refer to DN-PAV-03074	
12	Whether subbase material may be spread in more than one layer (CL 802.4).			No	
Pavement Course		Clause	Mixture Designation/Materials	Thickness (mm)	Particular Requirements
Surface Course		5.1.13	SMA 14 surf PMB 65-105-60	40mm	
Binder Course					
Base		5.1.9	SMA 10 bin 70/100 des Regulating Layer	20mm (Minimum)	SRW Series 900, Cl. 2.2 and Cl.11 Table 16
Sub-Base					
Total Pavement Thickness (excluding Sub-Base)				60 mm	

Notes:

1. Bond coat to be applied to all surfaces including HBM layers.

Table 7b: Pavement Type B: M63 Mount Talbot to Athleague Pavement Improvement Scheme

1	Location: Accommodation Works House Entrances			General Requirements	
2	Grid for checking surface levels of pavement courses, if different from the requirements of CL 702.4: Long dim: Trans dim:			N/A N/A	
3	Category of Road Surface regularity (CL 702.7 and CL 702.8): Long Reg.: Trans Reg.:			B N/A	
4	Requirements for coarse aggregates - Polished Stone Value (PSV), Aggregate Abrasion Value (AAV) (Series 900 CL 3.2.2, 5.2.2, 6.2.2, 8.4.1.1, 8.6.1.1):			N/A	
5	Requirements for pre-coated chippings - Polished Stone Value (PSV) for general use mixtures, PSV for mixtures for roundabouts, Aggregate Abrasion Value (AAV) (Series 900 CL 4.2.4):			N/A	
6	Requirement for testing for Polished Stone value using the friction after polishing test (NRA HD 300 Clause 2.25)			No	
7	Freezing and thawing (soundness) category if different from the requirements of Series 900 Tables 1, 4, 7, 10 and 17:			N/A	
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.			N/A	
9	Requirements for monitoring resistance to permanent deformation of HRA (Series 900 Cl. 10.1.10.1)			No	
10	Sealant to be applied to the whole of any freestanding edge on the outside of the finished pavement on the low side of the camber (Series 900 CL 10.1.8):			Yes	
11	Any tests additional to those required by IS EN 13108–20, IS EN 13108–21 or the relevant SRW (Series 900 CL 1.2 and 1.3): Flakiness Index Test as per IS EN 933-3, PSV and AAV Compliance Test as per IS EN1097-8, Macrotexture Aggregate Measurement Test as per IS EN 13036-1			N/A	
12	Whether subbase material may be spread in more than one layer (CL 802.4).			No	
Pavement Course		Clause	Mixture Designation/Materials	Thickness (mm)	Particular Requirements
Surface Course		5.1.9	SMA 10 bin70/100 des	40mm	
Binder Course		804	Granular Material Type B	As Required	
Base					
Sub-Base					
Total Pavement Thickness (excluding sub base)				As Required	

Table 7c: Pavement Type C: M63 Mount Talbot to Athleague Pavement Improvement Scheme

1	Location: Farm Entrances and Hardstanding Areas			General Requirements	
2	Grid for checking surface levels of pavement courses, if different from the requirements of CL 702.4: Long dim: Trans dim:			N/A N/A	
3	Category of Road Surface regularity (CL 702.7 and CL 702.8): Long Reg.: Trans Reg.:			B N/A	
4	Requirements for coarse aggregates - Polished Stone Value (PSV), Aggregate Abrasion Value (AAV) (Series 900 CL 3.2.2, 5.2.2, 6.2.2, 8.4.1.1, 8.6.1.1):			N/A	
5	Requirements for pre-coated chippings - Polished Stone Value (PSV) for general use mixtures, PSV for mixtures for roundabouts, Aggregate Abrasion Value (AAV) (Series 900 CL 4.2.4):			N/A	
6	Requirement for testing for Polished Stone value using the friction after polishing test (NRA HD 300 Clause 2.25)			No	
7	Freezing and thawing (soundness) category if different from the requirements of Series 900 Tables 1, 4, 7, 10 and 17:			N/A	
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.			N/A	
9	Requirements for monitoring resistance to permanent deformation of HRA (Series 900 Cl. 10.1.10.1)			No	
10	Sealant to be applied to the whole of any freestanding edge on the outside of the finished pavement on the low side of the camber (Series 900 CL 10.1.8):			Yes	
11	Any tests additional to those required by IS EN 13108–20, IS EN 13108–21 or the relevant SRW (Series 900 CL 1.2 and 1.3): Flakiness Index Test as per IS EN 933-3, PSV and AAV Compliance Test as per IS EN1097-8, Macrotexture Aggregate Measurement Test as per IS EN 13036-1			N/A	
12	Whether subbase material may be spread in more than one layer (CL 802.4).			No	
Pavement Course		Clause	Mixture Designation/Materials	Thickness (mm)	Particular Requirements
Surface Course		7.2	Single Surface Dressing	As Required	
Binder Course		804	Granular Material Type B	As Required	
Base					
Sub-Base					
Total Pavement Thickness (excluding sub base)				As Required	

Table 7d: Pavement Type D: M63 Mount Talbot to Athleague Pavement Improvement Scheme

1	Location: Field Entrances			General Requirements	
2	Grid for checking surface levels of pavement courses, if different from the requirements of CL 702.4: Long dim: Trans dim:			N/A N/A	
3	Category of Road Surface regularity (CL 702.7 and CL 702.8): Long Reg.: Trans Reg.:			B N/A	
4	Requirements for coarse aggregates - Polished Stone Value (PSV), Aggregate Abrasion Value (AAV) (Series 900 CL 3.2.2, 5.2.2, 6.2.2, 8.4.1.1, 8.6.1.1):			N/A	
5	Requirements for pre-coated chippings - Polished Stone Value (PSV) for general use mixtures, PSV for mixtures for roundabouts, Aggregate Abrasion Value (AAV) (Series 900 CL 4.2.4):			N/A	
6	Requirement for testing for Polished Stone value using the friction after polishing test (NRA HD 300 Clause 2.25)			No	
7	Freezing and thawing (soundness) category if different from the requirements of Series 900 Tables 1, 4, 7, 10 and 17:			N/A	
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.			N/A	
9	Requirements for monitoring resistance to permanent deformation of HRA (Series 900 Cl. 10.1.10.1)			No	
10	Sealant to be applied to the whole of any freestanding edge on the outside of the finished pavement on the low side of the camber (Series 900 CL 10.1.8):			Yes	
11	Any tests additional to those required by IS EN 13108–20, IS EN 13108–21 or the relevant SRW (Series 900 CL 1.2 and 1.3): Flakiness Index Test as per IS EN 933-3, PSV and AAV Compliance Test as per IS EN1097-8, Macrotexture Aggregate Measurement Test as per IS EN 13036-1			N/A	
12	Whether subbase material may be spread in more than one layer (CL 802.4).			No	
Pavement Course		Clause	Mixture Designation/Materials	Thickness (mm)	Particular Requirements
Surface Course		804	Granular Material Type B	As Required	SRW Series 800
Binder Course					
Base					
Sub-Base					
Total Pavement Thickness (excluding sub base)				As Required	

**Table 7g: Pavement Schedule Spreadsheet:
M63 Mount Talbot to Athleague Pavement Improvement Scheme**

Chainage	Location	Pavement Type	Area (m ²)
0 to 2880	Main Carriageway	Pavement Type A	17306

APPENDIX 7/2: EXCAVATION AND REINSTATEMENT OF EXISTING SURFACES

1. All existing road studs in any section of pavement to be overlaid shall be removed prior to any surfacing taking place.
2. Road studs buried by previous overlay activities shall be removed prior to any surfacing taking place.
3. All voids left in the existing surface as a result of removing existing road studs/buried road studs shall be swept completely clean and shall be free of all debris etc. The void shall be filled with AC 10 close surf 70/100 des and compacted with a 50mm x 50mm square headed steel rammer prior to any surfacing taking place.
4. All gullies, pots and chambers which are not being retained shall be removed prior to any surfacing taking place.
5. All voids left in the existing surface as a result of removing gullies, pots and chambers shall be filled with Cl.804 prior to any surfacing taking place.
6. All exposed cold milled surfaces on the day of been cold milled must be laid with the appropriate regulation depth, Live traffic on exposed cold milled surface should be avoided.

Cold Milling and Areas Requiring Repairs

7. Cold milling is required to achieve the required design levels at various locations along the road. Refer to Drawing RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-017 for details.
8. The items for milling shall, in accordance with the TII Requirements for Measuring and Pricing, include for:
 - a) Re-shaping and rolling,
 - b) Shaping to cambers, falls and crowns,
 - c) Multiple handling of material,
 - d) Loading into transport,
 - e) Disposal of material (as CC-RMP-00600 paragraph 39),
 - f) Working around drainage channels, chamber covers, gully gratings, expansion joints and the like,
 - g) Ramps,
 - h) Removing road studs not required for reuse,
 - i) Surface preparation and cleaning.
 - j) Cutting out and removal of materials by other means,
 - k) Water supply and damping down,
 - l) Electronic detection sweep, referencing and reports,
 - m) Pulverisation, and regrading of material to be re-used in the production of ex situ Low Energy Bound Mixtures

Tie –ins

8. Locations of existing paved areas which require to be trimmed, regulated and reinstated to match levels where new and existing pavements abut are located at either end of the scheme.
9. For typical details of transverse and longitudinal joints between new and existing pavements see Standard Construction Details CC-SCD-00703 and CC-SCD-00704. The over break requirement in paved areas shall be mechanically cut to form clean straight lines and shall be sufficient to remove all damaged and defaced surfacing.
10. The cut edges in flexible construction, including the exposed parts of kerbs below final pavement level and metalwork, shall be primed in accordance with Series 900, Clause 10.1.8.

Main Carriageway – Locations Requiring Repair

No.	Location	Area	Removal Depth	Material
Repair Area 01	Ch.105– Ch.125 Northbound lane	45m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. - Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 02	Ch.390– Ch.430 Southbound lane	100m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. - Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 03	Ch.500– Ch.540 Full width	243m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. - Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 04	Ch.580– Ch.600 Northbound lane	52m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. - Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 05	Ch.650– Ch.750 Full width	655m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. - Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.

No.	Location	Area	Removal Depth	Material
Repair Area 06	Ch.900– Ch.930 Full width	206m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 07	Ch.970– Ch.990 Southbound lane	88m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 08	Ch.1090-Ch.1280 Full width	1222m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 09	Ch.1370-Ch.1410 Full width	232m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 10	Ch.1670-Ch.1770 Full width	558m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 11	Ch.1820-Ch.1870 Northbound lane	108m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.

No.	Location	Area	Removal Depth	Material
Repair Area 12	Ch.2110-Ch.2180 Northbound lane	133m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 13	Ch.2200-Ch.2220 Southbound lane	40m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 14	Ch.2270-Ch.2340 Full width	394m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 15	Ch.2450-Ch.2460 Northbound lane	45m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 16	Ch.2570-Ch.2600 Full width	206m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.
Repair Area 17	Ch.2640-Ch.2700 Full width	422m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.

No.	Location	Area	Removal Depth	Material
Repair Area 18	Ch.2760-Ch.2800 Full width	253m ²	350 mm	- Excavate/Cold Mill top 350mm - Lay 150mm UGM A Granular material - Lay 100mm AC32 dense base 70/100 des base layer. - Lay 60mm Regulation layer. Lay 40mm SMA 14 surf PMB 65-105-60 surface course to new road level.

Total Area of Locations Requiring Repair = 5002m²

See drawing RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-017 for details of these locations

APPENDIX 7/4: BITUMINOUS SPRAYS

General

1. All bituminous layers (**to include existing surface and freshly laid surface**) are to receive bond coat prior to overlay. Bond coats to be Cationic Bitumen Emulsion in accordance with Series 900 Clause 10.1.4 and Table 15 and applied as per the TII Specification and the manufacturer's recommendations.

Table 7/4

Location	All bituminous layers (to include existing surface and freshly laid DBM) are to receive bond coat prior to overlay.
Type of binder	Sprayed Cationic Bituminous Emulsions (C65BP3) as per Table 15 of SRW Series 900 (CC-SPW-00900).
Rate of Spread	As per requirements of Series 900 Clause 10.1.4
Other special requirements	

Note: Any bond coat required between the layers of Regulation, Base, Binder Course and Surface Course is to be included in the price of the layer to be applied.

It should be noted that the TII Requirements for Measuring and Pricing only permits the measurement of one surface area of bond coat for inclusion in the Pricing Document despite the fact that multiple layers of tack coat will be required.

APPENDIX 7/7: GEOGRIDS

General

1. Pavement reinforcement grids shall be installed at locations specified on drawings RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-17, and as per table 7/7.
2. Geotextiles and geotextile related products shall comply with CC-SPW-00900.
3. The geogrid shall comply with the minimum requirements of as per CC-SPW-00900.
4. Geogrid products shall be glass or polymer fibre; knitted and coated or impregnated with a bitumen compound. The tensile strength declared under CE marking shall be a minimum of 50kN/m in both directions. They can include a self-adhesive coating
- 5.

Table 7/7 Geogrid Locations

Start Chainage	End Chainage	Location	Area (m ²)
Ch.500	Ch.540	Full Width	243
Ch.650	Ch.750	Full Width	655
Ch.900	Ch.930	Full Width	206
Ch.1090	Ch.1280	Full Width	1222
Ch.1370	Ch.1410	Full Width	232
Ch.1670	Ch.1770	Full Width	558
Ch.2270	Ch.2340	Full Width	394
Ch.2570	Ch.2600	Full Width	206
Ch.2640	Ch.2700	Full Width	422
Ch.2760	Ch.2800	Full Width	253

Total Geogrid Area = 4391m²

APPENDIX 7/9: COLD MILLING (PLANING) OF BITUMINOUS BOUND FLEXIBLE PAVEMENT

1. Refer to RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-017 for specific locations where cold-milling is required. Excavation and reinstatement of existing surfaces shall be carried out in accordance with Appendix 7/2.
2. Cold milling operations should be carried out in accordance with Clause 2.1 of CC-SPW-00900.
3. Transverse joints between new road construction and existing roads shall be to CC-SCD-00703.
4. Longitudinal joints between new road construction and existing roads shall be to CC-SCD-00704.
5. The Contractor shall choose whether to profile plane or constant depth plane each area in order to achieve the pavement design specified in Appendix 7/1.
6. Sweeping of all areas shall be carried out 48 hours prior to cold milling in accordance with CC-SPW-00900 Clause 10.1.1.1.

Schedule: Sweeping Areas Prior to Cold Milling	
Drawing No.	Location
RN24003-04-P5-PS-PAV-014 to RN24003-04-P5-PS-PAV-017	All Locations: Contractor to sweep all areas where cold milling is required as per CC-SPW-00900 Clause 10.1.1.1.

7. The surrounding bituminous pavement to all chamber covers and gullies shall be removed by hand to prevent any damage or displacement.
8. Cold milling of the existing pavement is to be carried out using a fine-milling technique, where the line spacing is less than 8mm.
9. The immediate vertical face of all longitudinal joints in all bituminous pavement layers shall be cut using a rotary cutting disc (road saw). The use of cold milling machines such as a 'Bobcat' will not be permitted for use in the cutting of longitudinal joints.

APPENDIX 7/11: HIGH FRICTION SURFACING

Not Used.

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS

General:

1. The locations of the kerbs, footways and paved areas are shown on drawings RN24003-04-P5-PS-KFP-001 to RN24003-04-P5-PS-KFP-004.

Kerbing:

2. Precast kerbing shall generally be constructed in accordance with CC-SCD-01101 Type A and Type D in the case of dropped kerbs.
3. Where the kerbing is dropped it shall be constructed in accordance with CC-SCD-01101 Type D and CC-SCD-01103. A raised lip of 25mm shall be used for vehicular accesses and 0-6mm shall be used for pedestrian crossings. A transition between CC-SCD-01101 Type A and Type D shall be ramped as per CC-SCD-01103.
4. Existing kerbs shall be cut to get a clean joint.
5. New Kerbs shall be required as tabulated.

Start Chainage	End Chainage	Length (m)	Type
Ch.590m	Ch.600m	10	Type B
CH.980m	Ch.1010m	26	Type B

Total Kerbing Length = 36m

Concrete Footways:

6. Concrete footways shall be generally in accordance with CC-SCD-01105 Type 1. They shall comprise of 100mm thick sub-base to Cl.804, with 125mm concrete class C30 concrete to Clause 1106 reinforced with A142 steel mesh in all locations other than vehicular accesses. At the locations of vehicular accesses, the footways shall comprise of 150mm C30 concrete to Clause 1106 and reinforced with A393 steel mesh.

Total Area of Concrete Footway = 0m²

APPENDIX 11/3: KERBS, FOOTWAYS AND PAVED AREAS: TII STANDARD CONSTRUCTION DETAILS

TII Publication No.	Date	Description
CC-SCD-01101	12/10	Precast Kerbs
CC-SCD-01103	03/20	Dropped Kerb Ramp
CC-SCD-01105	03/00	Concrete Footway
CC-SCD-01109	12/10	Precast Kerb Units

APPENDIX 12/1: TRAFFIC SIGNS: GENERAL

1. Traffic Signs shall comply with:
 - The Traffic Signs Manual, published by the Department of Transport
 - TS4 Guidelines, Certification Scheme and Specification for the Construction of Traffic Signs issued by the Department of Transport, Tourism and Sport

Regulatory signs in the Design shall comply with the requirements of:

- The Roads Traffic Signs Regulations 1997
- The Road Traffic (Signs) (Amendment) Regulations 1998
- The Road Traffic (Signs) (Amendment) Regulations 2003
- The Road Traffic (Signs) (Amendment) Regulations 2004
- Road Traffic (Speed Limit – Traffic Signs) Regulations 2005
- The requirements for the conversion to “Metric Speed Limits” as identified by the TII.

Note: Any proposals to use non-standard or alternative systems or products, as being equivalent must be in accordance with Appendix 1/25.

2. All traffic signs shall be reflectorised with Class RA2 material in accordance with EN 12899_1:2007.
3. The size of Warning and Regulatory signage is dependent on the design speed of the road in question. Mounting heights of all signs also vary in respect of the location that they are sited. This information is detailed in the sign schedule below.
4. All foundations shall be excavated and backfilled with concrete on the same day. No excavation shall be left open overnight. The foundations shall be sealed off from Public access using suitable barriers until reinstatement of the surface is complete.
5. Any pockets formed in concrete foundations to receive the posts shall be cleaned out immediately prior to erection. Pockets are to be formed by use of concrete sleeves with a diameter of $\geq 100\text{mm}$ greater than that of the poles to be inserted in the sleeve. The use of other tubing material will not be accepted. Sleeving shall be anchored in the foundation so as to stop rotation of the sign in pocket. The posts shall be placed centrally in the pockets and be bedded on mortar designation (i) complying with the Specification for Road Works & Bridges and the pockets shall be filled up to finished foundation level with 20N/mm^2 concrete.
6. All posts used shall be galvanised steel posts and shall be in accordance with TS4.
7. Any proposals to install posts/supports at centers other than those specified on the Contract Drawings must be agreed in advance with the Employer's Representative.
8. Post/supports shall be installed such that they do not protrude above the top of the sign face, and such that brackets and pole caps can be attached directly to the post/support without any cutting.
9. Where retention sockets are specified, they shall be installed flush with the surrounding ground surface (e.g. traffic island) and shall not protrude above ground level.
10. Where new signs are to be installed behind an existing safety barrier system, care must be taken to ensure that the performance of the barrier system is not compromised (e.g. sign supports should not be installed within the barrier system's working width).

11. The materials and workmanship for thermoplastic road markings shall comply with the requirements of "Guidelines and Tender Documentation for Road Marking Materials" published by the Department for Environment and Local Government, January 2000 (Referred to below as "The Guidelines") except insofar as the provisions of this specification modify or supersedes the above, in which case the provisions of this specification shall prevail.

APPENDIX 12/3: TRAFFIC SIGNS: ROAD MARKINGS & STUDS

GENERAL

1. The locations of Road Markings and Road Studs are shown on drawing nos. RN24003-04-P5-PS-TSM-001 and RN24003-04-P5-PS-TSM-004.
2. The materials and workmanship for thermoplastic road markings shall comply with the requirements of "Guidelines and Tender Documentation for Road Marking Materials" published by the Department for Environment and Local Government, January 2000 except insofar as the provisions of this specification modify or supersedes the above, in which case the provisions of this specification shall prevail.
3. Reference shall be made to the Department of the Transport Traffic Signs Manual. All road markings and studs are fully detailed in the Schedule of Road Studs and the Schedule of Road Markings (See Tables 12.3.1, 12.3.2, 12.3.3, 12.3.4)
4. Figure numbers referred to in Appendix 12/3 of the Specification relate to the Traffic Signs Manual.

ROAD MARKINGS

Normal application of Thermoplastic Road Markings:

5. 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 this specification.
6. All existing longitudinal markings shall be prepared. As a minimum this preparation shall consist of scabbling to ensure:
 - o New finished thickness of marking over road surface will be a maximum of 5mm.
 - o All loose material or previous non bonded recovery line is removed.
 - o All loose debris shall be removed by vacuum sweeper following this work.
7. New extruded thermoplastic markings shall be of an application depth of $4 \pm 0.5\text{mm}$. The following properties of the markings are required to be covered by guarantee.
 - All screed lines shall be 4.0 mm.

Traffic Signs: Road Markings and Studs

8. The Contractor shall lay the appropriate thickness of marking as specified in the Contract or following consultation with and as directed by the Employer's Representative.
9. Unless otherwise directed by the Employer's Representative, all markings shall be reflectorized by the application of glass beads to the surface of the marking material.
10. In the case of reflectorized markings solid glass beads, 400 g/m^2 to 500 g/m^2 , 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).

11. 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 reflectorised markings.
12. Where directed by the Employer's Representative, the Contractor shall apply a 50/50 blend of 70 pen bitumen in a volatile solvent such as dichloromethane applied with a brush, roller or portable sprayer and spread at a rate of 14 square metres to the litre. The solvent shall be allowed to evaporate before the thermoplastic is applied.
13. 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 exist, 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.
14. 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.
15. 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.
16. 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 specification 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.)
17. 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 the Employer's Representative or other approved agency before use. All costs associated with such certification(s) shall be borne by the Contractor.
18. The methods of testing shall be in accordance with IS EN 1436 2008 or with those approved by Transport Infrastructure Ireland (TII) or other agency approved by the Employer's Representative.

19. All necessary costs associated with such certifications shall be borne by the Contractor.
20. Notwithstanding the above, the road authority 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 authority in the event of full compliance.
21. In any location where there is less than 0.6m of hard strips, a suction sweeper must be used so as to ensure it is clear of debris or loose material before lining or stud works commence.

Thermoplastic Road Markings under Guarantee

22. 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 surfacing including surface dressings.
23. All markings in this Contract shall be laid under guarantee and shall be applied to the thickness specified in the Contract.
24. The following properties of the markings are required to be covered by the guarantee:-
 - Durability
 - Reflectivity
 - Skid Resistance
 - Luminance Factor
 - Chromaticity
25. The average value of the above properties shall be established for each line adequate to guarantee that all markings are correct.
26. 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. 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.
27. 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 Employers Representative considers that the properties of the markings are less than the minimum values specified. 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 Roscommon County Council if the Contractor can demonstrate to the satisfaction of the Employers Representative that the requirements of the specification have been complied with in full.

Durability:

28. 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 ≥ 200 mcd/ m². 1x, following application of longitudinal markings.

R3^a ≥ 150 mcd/m². 1x, 12- 24 months following application.

R2^a ≥ 100mcd/m². 1x, 24- 36 months following application.

when measured by the digital retrometer LTL. 2000 in accordance with Annex B of IS EN 1436:1998

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 1436:1998

Luminance Factor:

White Material...**B4:β ≥ 50**

Yellow Material...**B2:β ≥ 30**

when measured in accordance with Annex C of IS EN 1436:1998

Chromaticity:

Refer to results in Table 6 of EN 1436: 1998; testing method is in Annex C.

29. The procedures for carrying out the above tests shall be in accordance with those approved by Transport Infrastructure Ireland or other agency approved by the Employer's Representative.
30. The Contractor shall measure the values of the above properties on applied markings in accordance with Appendix 1/5 of the Specification. The tests shall be carried out in the presence of the Employer's 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.
31. 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.
32. The Contractor shall make available samples in accordance with Appendix 1/6, on demand by the Employer's Representative or his representatives.
33. The material shall be in powder form packaged in 25kg bags and clearly marked with the batch number and date of manufacture.

Removal of Road Markings

34. High Pressure Water Blasting is to be used for the complete removal of markings from the Pavement surface or as instructed by the Employer's Representative.

ROAD STUDS

Reflecting Road Studs

35. Permanent reflecting road studs shall be:

- Type 1 – Embedded non depressible rated P3A PRP1 in accordance with BS EN 1463-1:2009 which meets the requirements of direction 57 of the Traffic Signs Regulations and General Directions:2002. They shall be installed as recommended by the manufacturer and as approved by the Employer's Representative. The depressible insert shall be manufactured from rubber.

Temporary reflecting road studs shall be:

- Type 2 – reflecting, complying with BS EN 1463- 1:2009. They shall be installed by adhesion to the road surface as recommended by the manufacturer and as approved by the Employer's Representative.

Permanent road studs shall be Type 1 unless Type 2 studs are specifically requested by the Employer.

Photometric:	Class PRP1 is the minimum coefficient of luminance intensity R value,
Dimensions:	Class H1 for height, Class HD1 for horizontal dimensions,
Colorimetric:	Class NCR1 for chromaticity,

for the stud types above as specified in EN 1463-1:2009.

Temporary reflecting road studs shall be

Non-depressible reflecting stud, complying with BS EN 1463-1:2009. They shall be installed as recommended by the manufacturer and as approved by the Employer's Representative.

Photometric:	Class PRP1 is the minimum coefficient of luminance intensity R value,
Dimensions:	Class H1 for height, Class HD1 for horizontal dimensions,
Colorimetric:	Class NCR1 for chromaticity,

for the stud types above as specified in BS EN 1463-1:2009.

36. 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.

Where reflecting road studs are provided as part of a raised profile marking, the studs shall be offset on the trafficked side of the marking.

Road Studs under Guarantee

37. The period of guarantee shall be 2 years after completion of works and shall apply to all road studs.

Performance of Road Studs

38. Both Type 1 and Type 2 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 months of notification by the Employer's Representative in cases of sporadic failure or within 3 weeks in case of substantial failures.

Removal of Road Studs, Rubber Inserts or Prismatic Reflectors

39. Existing road studs shall be removed, from the road by cutting around its edge and its subsequent removal. Loose material and grouting material used to fix the old stud shall be removed.
40. The cavity resulting from the removal of the old stud shall be heated, dried and loose material removed with the aid of compressed air.
41. Following heating drying and removal of loose material, the base of the cavity shall be lined with 12 mm of A2 grade bitumen or otherwise as approved by the Employer's Representative. The cavity shall then be filled to the level of the existing road surface with 14 mm chippings. The voids in the chippings shall then be filled with A2 grade bitumen or otherwise as approved by the Employer's Representative to a level 5 mm below the finished surface. Filling of the cavity resulting from removal of the road stud shall be completed immediately. The replacement studs shall be installed at the new location not less than 150 mm from the filled cavity.
42. Road Studs, intended for reuse, shall be thoroughly cleaned and all loose and hardened material removed from the studs in a manner approved by the Employer's Representative. Such studs shall have new inserts installed prior to installation in the road surface.
43. Where roads studs are found to have missing or damaged inserts/reflectors, the housing should be cleaned, and a new insert/reflector fitted. It is the Contractor's duty to source replacement inserts for all approved Type 1 studs. Where the Contractor is failing to source replacement inserts, he shall remove and replace with an approved Type 1 stud at no extra cost to the Employer. Replacement prismatic reflectors in cast iron housing will require manufacturer approved adhesives to set the reflectors in position. All previous adhesive residues should be removed prior to the installation of any new reflector. The Contractor is required to notify the Employer's Representative of areas where he intends to replace studs or inserts at the outset of the Contract. Road studs designated by the Employer's Representative as not having their reflective surface an inadequate distance above the carriageway, resulting in a reduced preview distance of the road ahead are to be removed and reinstall in their entirety. The Contractor shall insure that road studs are installed and removed in accordance with the manufacturer's instructions and the road surface is not unduly damaged by this process. Reinstatement of resulting voids will be so as to provide a surface of similar performance characteristics to the surrounding carriageway.

Sequence of operation

44. 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.

Table 12.3.1 Road Studs Schedule

Direction	Colour	Location	Start Ch.	End Ch.	Spacing (m)	No.
Bi-Directional	White	Mainline Centreline	0	70	6	12
Bi-Directional	White	Mainline Centreline	70	560	6	82
Bi-Directional	White	Mainline Centreline	630	630	6	12
Bi-Directional	White	Mainline Centreline	630	2880	6	375
Bi-Directional	Yellow	Carriageway Edge (LHS)	0	2880	12	214
Bi-Directional	Yellow	Carriageway Edge (RHS)	0	2880	12	162
Bi-Directional	Yellow/ Green	Carriageway Edge (RHS) Junction Ch 200	200	500	12	26
Bi-Directional	Yellow/ Green	Carriageway Edge (RHS) Junction Ch 600	600	900	12	26
Bi-Directional	Yellow/ Green	Carriageway Edge (RHS) Junction Ch 1685	1685	1985	12	26
Bi-Directional	Yellow/ Green	Carriageway Edge (LHS) Junction Ch 1745	1435	1735	12	26

Table 12.3.2 Road Lining Schedule

Marking Type	Colour	Line Width (mm)	Line Length (mm)	Gap Length (mm)	Location	Start Ch.	End Ch.	Length (m)	Total Line Length (m)	Traffic Signs Manual Ref. Fig
Continuous	White	150	-	-	Centreline	0	75	75	75	RRM 001
Broken	White	150	3000	1000	Centreline	75	225	113	150	RRM 002D
Broken	White	150	3000	3000	Centreline	225	565	170	340	RRM 002B
Broken	White	150	3000	1000	Centreline	565	630	49	65	RRM 002D
Continuous	White	150	-	-	Centreline	630	1677	1047	1047	RRM 001
Broken	White	150	1000	1000	Centreline	1677	1687	5	10	RRM003C
Continuous	White	150	-	-	Centreline	1687	1730	43	43	RRM 001
Broken	White	150	1000	1000	Centreline	1730	1740	5	10	RRM 003C
Continuous	White	150	-	-	Centreline	1740	2365	625	625	RRM 001
Broken	White	150	3000	9000	Centreline	2365	2660	74	295	RRM002A
Continous	White	150	-	-	Centreline	2365	2660	295	295	RRM 001
Broken	White	150	4000	2000	Centreline	2660	2770	74	110	RRM 002C
Broken	White	150	3000	9000	Centreline	2770	2880	28	110	RRM002A
Continuous	White	150	-	-	Centreline	2770	2880	110	110	RRM 001
Broken	Yellow	150	2000	2000	HardShoulder (LHS)	0	2880	1440	2880	RRM 025
Broken	Yellow	150	2000	2000	HardShoulder (RHS)	0	2880	1440	2880	RRM 025

Table 12.3.3 Junction Lining Schedule

Junction Ch.200 RHS	Colour	Line Width (mm)	Line Type	Length (m)	Traffic Signs Manual Ref. Fig
Continuous	white	200	Stop Line	10	7.35 (RRM 001/RRM 017)
Continuous	white	150	Centreline	25	
Junction Ch.600 RHS	Colour	Line Width (mm)	Line Type	Length (m)	Traffic Signs Manual Ref. Fig
Continuous	white	200	Stop Line	15	7.35 (RRM 001/RRM 017)
Continuous	white	150	Centreline	25	
Junction Ch.1685 RHS	Colour	Line Width (mm)	Line Type	Length (m)	Traffic Signs Manual Ref. Fig
Continuous	white	200	Stop Line	10	7.35 (RRM 001/RRM 017)
Continuous	white	150	Centreline	25	
Junction Ch.1735 LHS	Colour	Line Width (mm)	Line Type	Length (m)	Traffic Signs Manual Ref. Fig
Continuous	white	200	Stop Line	10	7.35 (RRM 001/RRM 017)
Continuous	white	150	Centreline	25	

Table 12.3.4 Text Lining Schedule

Marking Type	Location	Chainage	Height (mm)	Text / Symbol	Traffic Signs Manual Ref.
Letter Marking	Junction Ch.200 RHS	Ch.200	1600	STOP	M 114
Letter Marking	Junction Ch.600 RHS	Ch.600	1600	STOP	M 114
Letter Marking	Junction Ch.1685 RHS	Ch.1685	1600	STOP	M 114
Letter Marking	Junction Ch.1735 LHS	Ch.1735	1600	STOP	M 114

**APPENDIX 12/4: TRAFFIC SIGNS: CONES, CYLINDERS, FTDs AND OTHER TRAFFIC
DELINEATORS**

- a. Traffic cones, cylinders, traffic delineators shall conform to the current edition of the Traffic Signs Manual, Chapter 8.

APPENDIX 15/1: MOTORWAY COMMUNICATIONS

Not Used

ANNEX A: MODEL FORMS

Performance Bond¹

(Clause 1.5)

Bond No.

BOND AMOUNT: €

THIS BOND is made on **BETWEEN**

- | | | |
|-----|--|----------------------|
| 1. | <i>The Contractor</i> | <input type="text"/> |
| | <i>Registered office of Contractor</i> | <input type="text"/> |
| 2. | <i>The Surety</i> | <input type="text"/> |
| | <i>Registered office of Surety</i> | <input type="text"/> |
| and | | |
| 3. | <i>The Employer</i> | <input type="text"/> |
| | <i>Principal office of Employer</i> | <input type="text"/> |

BACKGROUND

- A. The Employer and the Contractor have or will enter into a contract for

Description of Works

(the **Contract**).

- B. The Contractor has agreed to furnish a performance bond to the Employer.
C. Terms defined in the Contract have the same meaning in this Bond.

IT IS AGREED AS FOLLOWS:

1. If the Contractor's obligation to complete the Works is terminated under clause 12.1 of the Conditions the Surety will, subject to this Bond, pay the Employer any amount for which the Contractor is liable under clause 12.2.11 of the Conditions.
2. If the Contractor breaches the Contract the Surety will, subject to this Bond, pay the Employer any amount for which the Contractor is liable to the Employer as damages for breach of the Contract, as established under the Contract, taking into account all sums due to the Contractor under the Contract.
3. The liability of the Surety under this Bond will not exceed € . This amount will be reduced by half on issue of the Certificate of Substantial Completion of the Works under the Contract.
4. No alteration in the Contract or in the extent or nature of the works to be done under it, and no allowance of time under the Contract, and no forbearance or forgiveness concerning the Contract by the Employer, will in any way release the Surety from liability under this Bond.
5. The Surety will be released from its liability under this Bond 450 days² after the certificate of Substantial Completion of the Works has been issued, except in relation to any breach by the Contractor or termination that has occurred before that date, written notice (including particulars of the breach or termination) of which has been given to the Surety earlier than 4 weeks after this expiry date.

¹ If the Contractor and/or Surety is/are not incorporated in Ireland, execution will be in accordance with the law of its jurisdiction of incorporation for execution in Ireland.

² If not otherwise specified, read as 450 days.

6. The Contractor undertakes to the Surety to perform its obligations under the Contract. This undertaking does not limit any rights or remedies of the Employer or the Surety.
7. The Employer may, but is not required to, provide to the Surety a copy of any notice that the Employer gives to or receives from the Contractor under clause 12 of the Conditions.
8. The decision of a court or arbitrator in a dispute between the Employer and the Contractor will be binding on the Surety as to all matters concerning a breach of the Contract, termination under the Contract, and the Contractor's liability.
9. If the Surety is called on to pay the Employer's loss following a termination under clause 12.1 of the Conditions, the Surety may suggest a completion contractor to the Employer, provided the proposed completion contractor is acceptable to the Employer.
10. The Surety will not be liable under this Bond for a breach or termination caused solely and directly by war, invasion, act of foreign enemies, hostilities (whether war is declared or not), terrorism, civil war, rebellion, revolution, or military or usurped power.
11. The Employer may assign the benefit of this Bond, without the Surety's or the Contractor's consent, by giving written notice to the Surety.
12. This Bond is governed by and construed according to Irish law and the parties submit to the jurisdiction of the Irish courts to determine all matters concerning it.
13. Money payable by the Surety under this Bond will be paid in euro in Ireland.
14. The Surety appoints

Name of Agent:

Address of Agent:

as its agent for service of legal proceedings. The Surety confirms that the named agent has been irrevocably appointed and the failure of the agent to notify the Surety of receipt of a document will not invalidate any proceedings or the service of the document.⁴

Given³ under the Contractor's common seal

Affix Contractor's common seal

*Signatures of persons authorised
to authenticate the seal*

OR

Signed, sealed and delivered by

Name of attorney

Signature of attorney

As lawful attorney of the Contractor under a power of attorney dated

Affix attorney's personal seal

In the presence of

³ If the Contractor and/or Surety is/are not incorporated in Ireland, execution will be in accordance with the law of its jurisdiction of incorporation for execution in Ireland.

⁴ An address in Ireland is required when the Surety does not have a registered office in Ireland.

<i>Name of witness</i>	
<i>Signature of witness</i>	
<i>Witness's occupation</i>	
<i>Witness's address</i>	

OR

Signed on behalf of

<i>Name of Contractor</i>	
<i>Signature of authorised person</i>	

In the presence of

<i>Name of witness</i>	
<i>Signature of witness</i>	
<i>Witness's occupation</i>	
<i>Witness's address</i>	

OR (if the Contractor is an individual)

Signed, sealed and delivered by

<i>Name of Contractor</i>	
<i>Signature of Contractor</i>	
<i>Affix personal seal</i>	

In the presence of

<i>Signature of witness</i>	
<i>Name of witness</i>	
<i>Witness's occupation</i>	
<i>Witness's address</i>	

OR

Signed by

Name of Contractor

--

Signature of Contractor

--

In the presence of

Name of witness

--

Signature of witness

--

Witness's occupation

--

Witness's address

--

OR (if the Contractor is a joint venture, execution must be by each member, using the blocks below)

Joint Venture Member 1

Given under the common seal of

Name of joint venture member 1

Affix common seal

*Signatures of persons authorised
to authenticate the seal*

OR

Signed, sealed and delivered by

Name of attorney

Signature of attorney

As lawful attorney of joint venture member 1 under a power of attorney dated

Affix attorney's personal seal

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

OR

Signed on behalf of

Name of joint venture member 1

Signature of authorised person

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

Joint Venture Member 2

Given under the common seal of

Name of joint venture member 2

Affix common seal

*Signatures of persons authorised
to authenticate the seal*

OR

Signed, sealed and delivered by

Name of attorney

Signature of attorney

As lawful attorney of joint venture member 2 under a power of attorney dated

Affix attorney's personal seal

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

OR

Signed on behalf of

Name of joint venture member 2

Signature of authorised person

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

Joint Venture Member 3

Given under the common seal of

Name of joint venture member 3

Affix common seal

*Signatures of persons authorised
to authenticate the seal*

OR

Signed, sealed and delivered by

Name of attorney

Signature of attorney

As lawful attorney of joint venture member 3 under a power of attorney dated

Affix attorney's personal seal

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

OR

Signed on behalf of

Name of joint venture member 3

Signature of authorised person

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

Given under the Surety's common seal

Affix Surety's common seal

--

*Signatures of persons authorised
to authenticate the seal*

--

OR

Signed, sealed and delivered by

Name of attorney

--

Signature of attorney

--

As lawful attorney of the Surety under a power of attorney dated

--

Affix attorney's personal seal

--

In the presence of

Name of witness

--

Signature of witness

--

Witness's occupation

--

Witness's address

--

Appointment of Project Supervisor¹

THIS AGREEMENT is made on BETWEEN

1. The **Client**

Whose principal office is at

and

2. The **Project Supervisor**

Whose registered office is at

BACKGROUND

A. By a contract (the **Contract**) made on or about ², the Client, as employer, has appointed ³ as contractor (the **Contractor**) for

Name of Contract

(the **Works**).

B. This Agreement is collateral to the Contract.

C. Terms defined in the Contract have the same meaning in this Agreement. The terms **competent person** and **relevant statutory provisions** are construed according to section 2 of the Safety, Health and Welfare at Work Act 2005 and any amendment to it.

IT IS AGREED AS FOLLOWS:

1. The Client appoints the Project Supervisor as project supervisor for the construction stage according to the Safety, Health and Welfare (Construction) Regulations 2013 and any amendment to them (the **Construction Regulations**) for the project comprising the Works
⁴
(the **Project**).
2. The Project Supervisor's appointment starts on the date of this Agreement and continues for as long as, under the Construction Regulations, the Client is required to have a project supervisor for the construction stage for the Project, unless the appointment is terminated earlier.
3. The Project Supervisor accepts the appointment.
4. The Project Supervisor shall perform all of its duties under the Construction Regulations as project supervisor for the construction stage for the Project.
5. The Project Supervisor represents and warrants to the Client that the Project Supervisor is and will continue to be a competent person to carry out its duties under this Agreement and the Construction Regulations and has allocated and will allocate sufficient resources to enable itself to comply with the requirements and prohibitions imposed on the Project Supervisor by this Agreement and under the relevant statutory provisions. In this Agreement, **competent person** and **relevant statutory provisions** are construed according to section 2 of the Safety, Health and Welfare at Work Act 2005 and any amendment to it.

¹ If the Project Supervisor is not incorporated in Ireland, execution will be in accordance with the law of its jurisdiction of incorporation for execution in Ireland

² Date of letter of acceptance

³ Insert "the Project Supervisor" or the name of the Contractor, as appropriate.

⁴ Specify any additional scope for which this Project Supervisor is to be appointed – for example, a process installation.

6. The Project Supervisor represents and warrants to the Client that the time allowed by the Contract for the completion of the Works is appropriate and sufficient to enable the Project Supervisor to perform its duties under this Agreement and the Construction Regulations.
7. The Project Supervisor represents and warrants to the Client that the information provided by the Client to the Project Supervisor about the state or condition of the Site (as defined in the Contract) and any premises on it is appropriate and sufficient to enable the Project Supervisor to perform its duties under this Agreement and the Construction Regulations.
8. The Project Supervisor shall ensure that it is insured by insurances in the same terms as the insurances the Contractor is required to have under clauses 3.6 and 3.7 of the Conditions of the Contract, and that those insurances comply with all the requirements of the Contract, and are kept in force for the same period as required by the Contract, and include cover for death or injury resulting from the Project Supervisor's performance or non-performance of its duties under this Agreement and the Construction Regulations.
9. Payment for the Project Supervisor's service is provided for under the Contract. Accordingly, the Client is not liable under this Agreement for the Project Supervisor's fees or expenses.
10. If the Project Supervisor breaches its obligations or warranties under this Agreement, or if the Contractor's duty to complete the Works is terminated under the Contract, the Client may terminate the Project Supervisor's appointment under this Agreement.
11. Without limiting its obligations under the Construction Regulations, the Project Supervisor shall give the Client all documents it prepares in the course of and for the purpose of performing its duties under this Agreement (**Project Supervisor's Documents**). If the Project Supervisor's appointment under this Agreement terminates, the Project Supervisor shall give all Project Supervisor's Documents to the Client immediately. Ownership of and copyright in the Project Supervisor's Documents shall become the Client's when the Project Supervisor delivers them to the Client, or the appointment is terminated, whichever is earlier. The Project Supervisor shall indemnify the Client against any liability resulting from the use or copying of the Project Supervisor's Documents infringing the property (including intellectual property) rights of any person.
12. This Agreement is governed by and construed according to Irish law. The parties submit to the jurisdiction of the Irish courts in relation to all matters concerning it.

Given under the Client's seal

Affix Client's seal

*Signatures of persons authorised
to authenticate the seal*

OR

Signed on behalf of the Client

Signature of authorised person

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

Given under the Project Supervisor's common seal

Affix Project Supervisor's common seal

Signatures of persons authorised to authenticate the seal

OR

Signed, sealed and delivered by

Name of attorney

Signature of attorney

As lawful attorney of the Project Supervisor under a power of attorney dated

Affix attorney's personal seal

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

OR

Signed on behalf of

Name of the Project Supervisor

Signature of authorised person

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

OR (if the Project Supervisor is an individual)

Signed, sealed and delivered by

Name of Project Supervisor

Signature of Project Supervisor

Affix personal seal

In the presence of

Signature of witness

Name of witness

Witness's occupation

Witness's address

OR

Signed by

Name of Project Supervisor

Signature of Project Supervisor

In the presence of

Name of witness

Signature of witness

Witness's occupation

Witness's address

Rates of Pay and Conditions of Employment Certificate

To:	<i>The Employer</i>		
	<i>Address of Employer</i>		
	<i>For the attention of</i>		
Date:			
From:	<i>The Contractor's Representative</i>		
Regarding:	<i>The Contract</i>		
	<i>Period of interim statement</i>	From	To

A Dhaoine Uaisle

We refer to the above Contract.

Terms defined in the Conditions of the Contract have the same meaning in this certificate.

The Contractor certifies that, in respect of the work to which the interim statement referred to above relates, clause 5.3 of the Contract has been observed by the Contractor and the employers of all work persons on the Site. This certification includes, but is not limited to, the following:

- the rates of pay and the conditions of employment (including in relation to pension contributions) of each work person comply with all applicable statutory provisions, and those rates and conditions have been no less favourable than those for the relevant category of work person in any employment agreements registered under the Industrial Relations Acts 1946 to 2004
- all wages and other money due to each work person have been paid in accordance with the Payment of Wages Act 1991 and have not been more than 1 month in arrears or unpaid
- payments due to be paid on behalf of each work person (including pension contributions, where applicable) have been paid
- all pension contributions and other amounts due to be paid on behalf of each work person, have been paid
- all deductions from payments to work persons required by law have been made and paid on, as required by Law
- in relation to the employment of work persons on the Site, the Safety, Health and Welfare at Work Act, 2005 and all employment law including the Employment Equality Act 1998, the Industrial Relations Acts 1946 to 2004, the National Minimum Wage Act 2000, regulations, codes of practices, legally binding determinations of the Labour Court and registered employment agreements under those Laws have been observed.

Is mise, le meas

Signed by

<i>Name of Contractor</i>	
<i>Signature of Contractor i.e Contractor's Representative</i>	

Bond – Conciliator’s Recommendation

(Clause 13 of PW-CF1 to PW-CF5 inclusive)

To: *The Beneficiary*

*Address of
Beneficiary*

Date:

Regarding: *The Contract for*

Dated

(the **Contract**)

between

The Contractor

Address of Contractor

and

The Employer

*Principal office of
Employer*

From:

The Surety

*Registered office of
Surety*

A dispute has arisen under the Contract and the appointed conciliator has recommended that

€ (the **Award Amount**) be paid to .

Clause 13.1.11, (Clause 13.2.11 of PW-CF1 to PW-CF4 inclusive of cited version 2.0 or later), of the conditions of the Contract provides that if a conciliator recommends payment of money, the party concerned must pay the amount recommended if the other party first provides a bond. This is that bond.

In consideration of your paying the Award Amount to We, the Surety, undertake to pay to you, without further proof or conditions and without deduction or set-off, any amount or amounts up to the Award Amount on receipt of your demand in writing.

Unless a demand has been made, our liability under this Bond will expire on the earlier of:

- when you confirm to us in writing that the dispute that was the subject of the adjudication has been finally determined by an arbitrator or court, which has finally determined that is entitled to the Award Amount net of any amounts owed to you.
- the date 550 days after the date of this Bond.

Any demand must be in writing addressed to and either:

- be accompanied by your declaration that as a result of the award of an arbitrator or decision of a court, is not entitled to the Award Amount net of any amounts owed to you or
- be made more than 500 days after the date of this Bond.

You may make one or more drawings under this Bond.

This Bond will become operative on payment by you of the Award Amount.

We will not be released in any way or discharged by time, indulgence, waiver, alteration, release or compromise or any other circumstances that might operate as a release of a guarantor at law or in equity.

This Bond is governed by and construed according to Irish law and the parties submit to the jurisdiction of the Irish courts to determine all matters concerning it.

We appoint

<i>Name of Agent</i>	
<i>Address of Agent</i>	

as our agent for the service of legal proceedings. We confirm that the named agent has been irrevocably appointed and the failure of the agent to notify us of receipt of a document will not invalidate any proceedings or the service of the document.¹

Given² under our common seal

<i>Affix common seal</i>	
<i>Signatures of persons authorised to authenticate the seal</i>	

OR

Signed, sealed and delivered by

<i>Name of attorney</i>	
<i>Signature of attorney</i>	
<i>As lawful attorney of the Surety under a power of attorney dated</i>	
<i>Affix attorney's personal seal</i>	

In the presence of

<i>Name of witness</i>	
<i>Signature of witness</i>	
<i>Witness's occupation</i>	
<i>Witness's address:</i>	

¹ An address in Ireland is required when the Surety does not have a registered office in Ireland.

² If the Surety is not incorporated in Ireland, execution will be in accordance with the law of its jurisdiction of incorporation for execution in Ireland.