



Comhairle Contae Thiobraid Árann
Tipperary County Council



An Roinn Iompair
Department of Transport

Tipperary County Council

Chomhairle Contae Thiobraid Árann

Service Requirements

for

Topographical Survey Services

for

Clonmel Link Roads

REPORT CONTROL SEET

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Table of Contents

1. INTRODUCTION	1
1.1. General.....	1
1.2. European Mutual Recognition	1
1.3. The Survey Contractor	1
2. PURPOSE AND SCOPE	2
2.1. Background.....	2
2.2. Aim of the Survey	2
2.3. Location/ Survey Area	2
2.4. Scope.....	2
2.5. Survey Methods	3
2.6. Use of the Survey Information.....	3
2.7. Site Access	3
3. GENERAL REQUIREMENTS	4
3.1. Health and Safety	4
3.2. Control	5
3.3. Detail to be Surveyed.....	5
3.4. Presentation.....	6
3.5. General.....	6
3.6. Working in Overgrown Areas.....	6
3.7. Identification of Field Operatives	6
4. PROJECT INFORMATION.....	7
4.1. Client.....	7
4.2. Existing Mapping.....	7
4.3. Traffic Safety and Management.....	7
4.4. Contract Drawings	7
5. SURVEY CONTROL.....	8
5.1. Survey Control Requirements.....	8
5.2. Horizontal Control Network	8
5.3. Vertical Control Network.....	10
5.4. Topographical Survey Control Report	11
6. NEW MAPPING	12
6.1. Scale.....	12
6.2. Features / Detail to be Surveyed	12
6.3. Layering	15
6.4. Labelled Strings	15
6.5. Accuracy of Features / Detail to be Surveyed.....	15
6.6. Longitudinal and Cross Sections.....	16
6.7. Presentation.....	16

7.	PRESENTATION OF DRAWINGS	17
7.1.	General.....	17
7.2.	Drawing Format	17
7.3.	Grid	17
7.4.	New Mapping.....	17
8.	PRESENTATION OF DIGITAL DATA.....	18
8.1.	Supply of Digital Data	18
8.2.	Supply of 3D Laser Scanner Outputs.....	18
9.	PRODUCTS TO BE DELIVERED	19
9.1.	Digital Drawings & Point File	19
9.2.	Digital Data.....	19
9.3.	Final Survey Reports and Schedules.....	19
10.	APPENDICES	20

APPENDIX A Symbols for 1:500 Mapping

APPENDIX B Special Requirements for Traffic Management

APPENDIX C Contract Drawings

APPENDIX D Construction of Permanent Ground Markers

APPENDIX E Location of Permanent Ground Marker's

APPENDIX F Guidelines for Digital Data

APPENDIX G Safety, Health & Welfare Questionnaire

APPENDIX H List of Proposed Sub Contractors

1. INTRODUCTION

1.1. General

- 1.1.1. This specification is for the use of survey firms engaged in work for design organisations responsible for the administration of Topographical Survey Services.

1.2. European Mutual Recognition

- 1.1.2. Except where the specified standard implements or is technically equivalent to a Harmonised European Standard or to a European Standard adopted for use within the European Communities after 31 December 1985, any requirement for products or materials to comply with an Irish or British Standard shall be satisfied by compliance with
- (i) a relevant standard or code of practice of a national standards institution or equivalent body of any states of the European Economic Area.
or
 - (ii) a relevant international standard recognised in any states of the European Economic Area.
or
 - (iii) a relevant specification acknowledged for use as a standard by a public authority of any states of the European Economic Area.
or
 - (iv) traditional procedures of manufacture of any states of the European Economic Area where these are the subject of a written technical description sufficiently detailed to permit assessment of the goods or materials for the use specified
or
 - (v) a European Technical Approval (ETA) issued in accordance with the Construction Products Directive 89/106/EEC (or, until procedures are available for the issue of ETAs, a specification sufficiently detailed to permit assessment) for goods or materials of an innovative nature or subject to innovative processes of manufacture and which fulfil the purpose provided for by the specified standard, provided that the proposed standard, code of practice, specification, technical description or European Technical Approval provides in use levels of safety, suitability and fitness for purpose equivalent to those required by the specified standard in so far as they are not inconsistent with the Essential Requirements of the Construction Products Directive (89/106/EEC).

1.3. The Survey Contractor

Organisations considered for Contracts under this specification.

2. PURPOSE AND SCOPE

2.1. Background

Tipperary County Council (TCC) is proposing to carry out the planning and detailed design for two link roads through predominantly green fields with some small areas of roadway also included.

Refer to Drawing No.s N24-LINKROADS-000-02, N24-LINKROADS-000-03 for the extent of Topographical Survey Required.

The design is for two new link roads through the townlands of Ardgeeha Upper, Ardgeeha Lower, Boherduff and Carrigeen on the edges of Clonmel Town, Co. Tipperary.

Link Road 1 design will consist of new carriageway with footways and cycleways both sides, drainage, public lighting, junctions etc linking the existing R688 Cashel Road via the L3623-1 Longfield Road through green fields to the existing Fethard Road (R689).

Link Road 2 design will consist of new carriageway with footways and cycleways both sides, drainage, public lighting, junctions etc through green fields connecting the Fethard Rd (R639) to the L3623-0 Carrigeen Business Park Road.

2.2. Aim of the Survey

The aim of the detailed Topographical Survey is to obtain appropriate data to enable TCC to undertake a detailed road design, including carriageway, footpath & cycleway, cut/fill embankments, verges, road junctions, drainage, public lighting, services, signing and lining, connections to existing entrances and roads etc.

2.3. Location/ Survey Area

The extent of the required Topographical Survey is shown on Drawing Nos. XXXX, 'Topographical Survey Extents' contained in Appendix C.

The area of survey is to include the entire area shown hatched in red to enable TCC to determine the most suitable carriageway design connecting the start (Cashel Rd R688/Longfield Rd), middle (Fethard Rd R689) and end point (L3623-0) Carrigeen Business Park) in relation to the existing topography.

2.4. Scope

To carry out a detailed topographical survey to be used by TCC to facilitate road design.

The Survey shall:

- i. Establish and survey a control network that will enable mapping to be produced as detailed in Section 5.
- ii. Carry out a ground or airborne survey as described in Section 6 and as deemed suitable by the Tenderer.
- iii. Prepare a Digital Terrain Model and Digital Surface Model and other digital information as detailed in Section 8.

The Topographical Survey needs to include, but is not limited to:

All relevant features of the existing ground including greenfield and existing roadways the centreline, existing edges of pavement, hard shoulders, break lines, kerb lines, footpaths, ditches, verges, embankments, culverts, street furniture, signing & lining, drainage, driveway entrances and junctions.

3D laser Scanning technology is proposed for the entirety of the survey.

2.5. Survey Methods

The Topographical Survey shall be undertaken by **ground survey or airborne survey methods** as necessary to ensure survey control and feature accuracy requirements set out in chapters 5 and 6 of this specification. This survey should be supplemented in all cases by a conventional topographical survey, to survey all areas under vegetation and to manually locate all of those features listed in section 6.2.8 of this document.

In addition to this, as set out in Appendix B of this document, Tipperary County Council will require the survey contractor to propose a surveying methodology which will negate the need for any persons involved in surveying activity to operate outside of the works area.

Further to these requirements, the successful Tenderer must submit a detailed description of the Survey Methods proposed, in order to achieve horizontal and vertical accuracy of control points, survey features on hard and soft surfaces, including a list of all equipment to be used for all areas of the survey. Evidence that all equipment is calibrated in accordance with quality assurance procedures must also be submitted by the Successful Tenderer.

2.6. Use of the Survey Information

The survey information will be used for the design of road carriageway, footway, cycleway, pavement, drainage, services, junctions etc, in the surveyed areas.

2.7. Site Access

It is strongly recommended that the Tenderer should examine both sites prior to submitting the quotation and satisfy themselves as to the feasibility of carrying out the works as required, strictly within the parameters set out in this document.

3. GENERAL REQUIREMENTS

3.1. Health and Safety

- 3.1.1. All activities performed during the course of work undertaken by the Survey Contractor on this Contract shall be in accordance with the requirements of the Safety, Health and Welfare at Work (Construction) Regulations, 2013 (S.I. No. 291 of 2013), and any amendment thereof.
- 3.1.2. All Traffic Management is to be provided by the Contractor for the survey in compliance with Chapter 8 of the latest issue of the Traffic Signs Manual published by Department of Transport Tourism & Sport and strictly within the parameters set out within Appendix B of this document. All proposals for traffic management shall be approved by Tipperary County Council and An Garda Síochána.
- 3.1.3. The Contractor must complete, at tendering stage, the Safety, Health and Welfare Questionnaire in Appendix G. The Contractor must comply with the safety rules listed below:
- The Contractor must have a written Method and Safety Statement and valid insurances before commencing the Works.
 - The Contractor must prepare site specific hazard analysis, risk assessments and safe systems of work before commencing Work.
 - The Contractor's staff must be in possession of valid Safe Pass Cards and CSCS cards, specific emphasis should be given to duty holders relevant to Health & Safety at Roadworks.
 - The Contractor must ensure that only trained and competent personnel undertake work on site.
 - Provide competent workers and competent and adequate supervision of their employees and activities.
 - The Contractor must inform Tipperary County Council contact person of any intention to bring subcontractor personnel onto site.
 - The Contractor must ensure that all equipment brought on site is in safe condition and has valid statutory certification, where necessary.
 - The Contractor must not use any equipment or the service of personnel belonging to or engaged by Tipperary County Council without prior approval being granted by an appointed County Council Official.
 - The Contractor must provide and wear personal protective equipment appropriate to the area/task where they are working.
 - The Contractor must ensure that access equipment used by him/her is installed and maintained in accordance with current standards and regulations.
 - The Contractor must ensure that all portable electric hand tools are run off 110 volt systems. Step-down transformers must be used.
 - The Contractor must take care for their own health and safety and also the safety of others affected by the work they are doing, and must observe all statutory safety and health precautions.

- The Contractor must report all accidents and dangerous occurrences immediately to the Tipperary Council contact person and must co-operate in any investigation into the circumstances of the incident.

3.2. Control

- 3.2.1. Horizontal and vertical control points shall be marked in such a manner that their location shall allow effective future use. Their construction shall be sufficient to withstand at least 5 years of normal usage, taking into account the surroundings at each location. The types of material used shall be such that their impact upon the environment and any normal activities at each location is minimised.
- 3.2.2. Connection to the Ordnance Survey of Ireland (OSI) **Irish Transverse Mercator (ITM)** Coordinate System, in accordance with Section 5 is required.
- 3.2.3. A Control Report shall be produced in accordance with Section 5.
- 3.2.4. All survey control stations shall be referenced to the surrounding detail. The Survey Contractor shall prepare location Drawings in AutoCAD for each control station such that it can be relocated without the need of survey instrumentation.

3.3. Detail to be surveyed

- 3.3.1. The nature and type of features to be surveyed are set by the scale of the survey and the purpose for which the survey information is required as detailed in previous paragraphs. Lists of features to be surveyed are set out in Sections 6 & 7 of this Specification.
- 3.3.2. Features shall be represented in accordance with the feature symbol tables in Appendix A.
- 3.3.3. The line or point to be surveyed on a feature shall be at the feature's intersection with the ground surface unless otherwise required in this Specification or in Appendix A.
- 3.3.4. The ground surface shall be surveyed such that any point interpreted from this information shall be within the tolerance specified of the actual ground surface location for the area and type of surface involved. These tolerances are given in Section 5.
- 3.3.5. Where side roads connect with the survey area, a sufficient length of the side road shall be surveyed that will allow the designers to determine the existing road alignment in both the horizontal and vertical planes.

3.4. Presentation

- 3.4.1. All survey contract information shall be presented in a format and manner which allows for ease of use and permits additional copies to be made as necessary, excepting any limitations which may be imposed in respect of the copyright of data from third parties.
- 3.4.2. All final products from the source data shall be supplied on stable media. All products supplied shall be intelligible and usable for the purpose specified.

3.5. General

- 3.5.1. The survey Contractor shall conform to all requirements of any private or Public Utility Service Company or Statutory Authority involved as far as access to their facilities is concerned.
- 3.5.2. The survey Contractor shall ensure that written permission is obtained from the Client for any works which in the opinion of the survey Contractor are likely to cause damage to property.
- 3.5.3. The survey Contractor shall make provision to carry out any Traffic Safety and Management requirements necessary to undertake the Survey on public roads in accordance with all relevant statutory regulations. Details of these requirements are included in Appendix B.
- 3.5.4. All source survey information shall be safely held by the survey Contractor for a period of seven years from the date of completion of the survey contract.

3.6. Working in Overgrown Areas

- 3.6.1. The amount of cutting of shrubbery, hedging etc. should be kept to the minimum required to obtain the necessary information and no lasting damage is to result. At all times, the integrity of the boundaries shall be preserved.

3.7. Identification of Field Operatives

- 3.7.1. Field operatives shall have identification badges clearly displayed which shall include personnel name, photograph, company name, logo and date. Any employees of sub-contractors working in the field during the Contract duration shall be provided with a badge by the Contractor identical in appearance to the Contractors badges.

4. PROJECT INFORMATION

4.1. Client

4.1.1.

Project Promoted by:

Tipperary County Council

Principal Contact for the Survey

Ms Louise Farrell

Address:

Roads Capital Department
Tipperary County Council
Emmet Street
Clonmel
Co Tipperary

Tel: 076 106 5000

Email: louise.farrell@tipperarycoco.ie

4.2. Existing Mapping

- 4.2.1. Digital Ordnance Survey Ireland Maps (ITM Format) will be issued to the successful Contractor prior to commencement of work on site.

4.3. Traffic Safety and Management

- 4.3.1. Details of requirements for Traffic Safety and Management – see Appendix B. Traffic Management to be within the parameters set out in Appendix B and in compliance with Chapter 8 of the Traffic Signs Manual.

4.4. Contract Drawings

- 4.4.1. Schedule of Contract Drawings – see Appendix C

5. SURVEY CONTROL

5.1. Survey Control Requirements

- 5.1.1. Horizontal and vertical control frameworks shall be established to satisfy the requirements of new mapping as specified in Section 6 of the Specification.

5.2. Horizontal Control Network

5.2.1. Framework

- 5.2.1.1. The Horizontal Control Network shall consist of a framework of permanent ground markers that provides a suitable foundation for the production of a reliable and accurate topographical survey. The framework shall be comprised of the following elements:

At least **5 (five)** Primary Control Points directly connected into the Ordnance Survey of Ireland Active Network at the R688 Cashel Road, the R639 Fethard Road and L3623-0 Carrigeen Business Park Road.

Secondary Control Points tied into the Primary Control Points and located at a nominal distance of 100m apart.

Minor Control Points shall be established as required for mapping purposes.

The Horizontal Control Network will be designed in such a way as to enable the re-establishment, in terms of the Ordnance Survey of Ireland (OSi) Coordinate Systems, of any or all of the permanent control markers should they happen to be destroyed. As such the Horizontal Control Network, in terms of geometry, baselines and observation times, will comply with the principles of good network design and shall be approved by the Client prior to commencing the survey work on-site.

5.2.2 Location of Permanent Ground Markers

- 5.2.2.1. The Primary and Secondary Control Points shall be defined by permanent ground markers.

- 5.2.2.2 The location of each permanent ground marker shall be determined as follows.

- a. Permanent ground markers which are classified as Primary Control Points shall have 80% clear visibility above 10 degrees and be ideally clear of obstructions above 15 degrees elevation. The impact of possible vegetation growth around the site and on the horizon shall also be taken into account. Each station should be at least 20m (and preferably 50m) clear of obstacles such as buildings, electrical supply systems and radio masts that may cause GPS multipath problems.
- b. Permanent ground markers classified as Secondary Control Points shall be placed with due consideration given to sky visibility and possible multipath effects. Inter-visibility should be considered but not at the cost of the stability, security and sky visibility of the station. The Secondary Control Points shall be located such that the road-works construction set-out can be undertaken from them.

- 5.2.2.3 Minor control points shall not be permanently marked.

5.2.3 Construction of Permanent Ground Markers

- 5.2.3.1 Permanent Ground Markers for Primary Control Points shall be stable for a period of 5 years and shall be constructed as shown in Fig 2 of Appendix D.
- 5.2.3.2 Permanent Ground Markers for Secondary Control Points shall be stable for a period of 5 years and be of a construction which conforms to the types illustrated in Appendix D.

5.2.4 Survey Grid

- 5.2.4.1 The coordinate system to be used for the project is the **Irish Transverse Mercator (ITM)**. The Project Control Network will be processed and adjusted in terms of the Irish Transverse Mercator coordinate system and reported on as such.

The Control Report will include a Summary of Coordinates in Irish Transverse Mercator coordinates.

- 5.2.4.2 A description of the coordinate system used shall be defined on each survey plan or data file.

5.2.5 Accuracy Acceptance Criteria

- 5.2.5.1. The acceptance criteria specified below will relate each set of control points to the higher coordinate system; as such the Primary Control Network will be directly related to the Ordnance Survey of Ireland Active Network.
- 5.2.5.2. Adjacent Control Points shall be observed by direct measurement.
- 5.2.5.3. The adjustment of the network will be performed by means of a least squares network adjustment. The network design must reflect this requirement through the inclusion of redundant observation baselines to each station such that the statistical analysis is a realistic representation of the inherent errors of the network.
- 5.2.5.4. The adjusted control coordinates and associated error residuals to be used for comparison to the acceptance criteria, will be those derived from the fully constrained network in terms of the Irish Transverse Mercator coordinate system. The error residual is a value that represents the uncertainty in the coordinates of the control point in respect of the higher order control network.
- 5.2.5.5. The maximum horizontal distance error between permanent survey control stations shall not exceed $\pm 0.5\sqrt{K}$ (mm), where K (M) is the distance in metres between the two points being considered. The height difference between any adjacent permanent ground markers shall not be in error by more than $(10\sqrt{K})$ mm, where K is the distance in Kilometres between the two points being considered.
- 5.2.5.6. When comparing coordinates and their associated error residuals, derived from the least squares adjustment, the residuals shall not exceed the following permitted errors:

a. Primary Control Points

$e = 5$ millimetres

$p = 0.05$

b. Secondary Control Points

$e = 5$ millimetres

$p = 3$

5.2.6 Schedule of Control Points

- 5.2.6.1. A schedule shall be prepared, and submitted to the Client in both digital and hard copy, giving the following information:
- The control point designation.*
 - Control point coordinates in Irish Transverse Mercator coordinate systems.*
 - The control point height value*
 - A description of the mark.*
 - The Ordnance Survey of Ireland Active Network Stations used.*

5.2.7. Location Diagrams

- 5.2.7.1. A location diagram shall be prepared for each permanent ground marker on a standard form, an example of which is shown in Appendix E, to be included in the final surveyreport.

5.2.8. Control Network Diagram

- 5.2.8.1. A simple plan shall be prepared of the Project Control Network including all baselines observed and connections to the Ordnance Survey of Ireland Active Network and then be submitted to the Client in both digital and hard copy

5.3. **Vertical Control Network**

5.3.1. Framework

- 5.3.1.1. The Vertical Control Network will be coincident with Horizontal Control Network.

5.3.2. Datum

- 5.3.2.1. All levels shall be in terms of the Ordnance Survey of Ireland - Malin Head Vertical Datum.
- 5.3.2.2. The local datum will be realised by direct observation between the Primary Control Network and the Ordnance Survey of Ireland Active Network. The elevation of each primary control point will be derived by applying the Ordnance Survey Geoid Model 2015 (OSGM15) to the ellipsoidal height of the station after the Horizontal Control Network has been constrained in the horizontal plane during the least squares adjustment process as described in section 5.2.
- 5.3.2.3. From the fixed elevations of the primary control points, which define the local datum, the secondary control point elevations can be derived. The contractor is free to choose the levelling methodology that they feel is best suited to achieve the accuracies as defined in section 5.3.3.

5.3.3. Accuracy Acceptance Criteria

- 5.3.3.1. See section 5.2.5 for the definition of the Accuracy Acceptance Criteria.

- 5.3.3.2. When comparing elevations and their associated error residuals or levelling run misclosures they shall not exceed the following permitted errors.

a. Primary Control Points

$e = 5 \text{ millimetres}$

$p = 0.05$

b. Secondary Control Points

$e = 5 \text{ millimetres}$

$p = 4$

c. Minor Control Points

Minor Control Points will be levelled in such a way that topographical features observed from them conform to the mapping accuracies as defined in this specification.

5.4. Topographical Survey Control Report

- 5.4.1. On completion of the fieldwork and adjustment, one hard copy and one soft copy of a comprehensive Topographical Survey Control Report shall be prepared detailing the survey methodology, a full network adjustment report, checks applied and any issues encountered. It should be demonstrated that the results achieved are in compliance with this Specification.
- 5.4.2. One hard copy and one soft copy of this report, together with copies of the Horizontal Control Network diagram, schedule of stations, and station location diagrams shall be submitted to TCC for approval.

6. NEW MAPPING

6.1. Scale

- 6.1.1. The survey shall be performed to produce new mapping at a **scale of 1:500**

6.2. Features / Detail to be Surveyed

- 6.2.1. Features such as centreline of carriageway (crown when applicable), Hard Shoulders, Edge of Pavement, Boundaries (including Entrance Walls), Kerbs (top & bottom), Footpaths, Culverts, Utilities, etc. must be joined as continuous 3-Dimensional Strings (with levels) suitable for input to AutoCAD Civil 3D 2022.

- 6.2.2. The Topographical Survey Extents are shown on Drawing No. N24-LINKROADS-000-02 and N24-LINKROADS-000-03, contained in Appendix C of this Specification.

6.2.3. Control Points

The following features and details shall be surveyed:

- a. *Primary control stations;*
- b. *Secondary control stations;*
- c. *Any minor control stations or other temporary survey stations required to complete the survey;*

6.2.4. Roads

Cross-sections (including spot levels) shall be produced at an interval not greater than 10m for the existing roads. ***Cross-sections are required at closer intervals where depressions are present across the existing pavement including rutting, wheel tracks, break lines, cracking and previously repaired sections of pavement such that the precisions set out in Section 6.5 are maintained throughout the survey area.***

The following is a non-exhaustive list of features and details shall be surveyed and mapped:

- a. Centreline of carriageway
- b. Crown Line of Existing Carriageway, where present
- c. Hard shoulder/Hard Strip line
- d. Bus & car parking bays
- e. Edge of pavement or kerb line
- f. Verge adjacent to pavement (minimum 3 points per cross section at each side and at break lines)
- g. Drainage Ditches/Channels (Top & Bottom Levels)
- h. Top and bottom of Road Embankments

Cont,

- i. Top and bottom of kerbs and back of footpaths
- j. Kerbs to be surveyed at closer intervals to pick up details such as curves and drop kerbs at entrances (**showing type and size**).

The features and details listed in (a – j) above shall also be surveyed for the side roads & accesses intersecting the survey area.

6.2.5. Boundary Features

The following features and details shall be surveyed and mapped:

- a. Fences – showing type, height and width
- b. Gates – Showing lengths
- c. Walls – showing type, height and width
- d. Stiles
- e. Hedges – showing type, height and width
- f. All Other Boundaries – showing type

6.2.6. Buildings / Structures

The following features and details shall be surveyed and mapped:

- a. Open sides of buildings / sheds
- b. Bridges
- c. Culverts

At Bridges and Culverts, the following features shall be surveyed and mapped:

- a. Internal structure dimensions & levels
- b. External structure dimensions & levels (including height of parapet walls)
- c. Entry and exit to the structure
- d. Any manholes and gullies including cover levels and invert levels
- e. Any evident damage or defects in the structure
- f. Invert levels
- g. Soffit levels

6.2.7 Green Areas

At Green areas, the following features shall be surveyed and mapped:

- a. Drainage Ditches/Channels (Top & Bottom Levels).
- b. Visible utilities apparatus (pylons, poles, manhole covers etc.);
- c. All terrain break lines relating to outcrops or depressions.
- d. Spot levels based on a 10m grid and additionally at 10m intervals along the extents of the survey

6.2.7. Private / Business / Agricultural Entrances

Provide plan detail and elevation at all entrances (private, business, field, etc.) A minimum of **Three (3) points are required on the centreline of each entrance**; one at the edge of the existing public road, one at entrance / gate and one mid-way. Entrance Walls must be joined as 3-Dimensional Polylines (levels required at the bottom of wall). **Additional points are required at all drainage features such as drainage channels and gullies.**

Detailed Topographical Features shall be provided outside the following properties and shall include boundaries, footpaths, services, drainage channels & gullies and spot levels at 1m internals.

6.2.8. Street Furniture and Other Service Features

The following features and details shall be surveyed and mapped:

- a. *Road Signage (showing type, height and width)*
- b. *Overhead ESB Power Lines (showing power line levels)*
- c. *Overhead Eircom Lines (showing line levels)*
- d. *Drains, Gullies and Manholes (Cover & Invert levels)*
- e. *Drainage Channels adjacent to Houses / Businesses.*
- f. *Filter drains in median and verges*
- g. *Inspection Covers*
- h. *Fire Hydrants*
- i. *Water Meters*
- j. *Stopvalves and Stopcocks (also at private house entrances)*
- k. *Sluice / Air Valves*
- l. *Public Lighting / Lamp Posts (including micro / mini pillars)*
- m. *ESB / Eircom Poles*
- n. *Notice Boards*
- o. *Traffic Signals and Control Boxes*
- p. *Vehicle Detector Pads*
- q. *Safety Barriers & Pedestrian Guard Rails (showing type, height and width)*
- r. *Bollards (showing type, height and width)*
- s. *Marker Posts (showing type, height and width)*
- t. *Street Litter Bins*
- u. *Flower Pot Hanging Poles*
- v. *Pedestrian Crossing*
- w. *Traffic Islands, including Roundabouts*

6.2.9. Line Markings

Provide plan details of the current line markings, including road centrelines, hard shoulders, markings at junctions, stop lines, arrows, letters, hatched areas, yellow boxes, bus bays and any other symbols. A description of the line type must be included for each section, i.e. continuous, broken (including the length of line / gap) or hatched marking. **The line type, colour, breaks between continuous / broken lines and lines with road studs must be clearly shown.**

6.2.10. Spot Levels

Spot Levels along all linear features shall be recorded including those listed in 6.2.3, 6.2.4, 6.2.5, 6.2.6 and 6.2.7 above. Spot Levels shall also be provided at the service features listed in 6.2.8 above. Spot Levels within Green Areas shall be provided at close intervals to pick up all surface changes

6.2.11. Wooded Areas / Trees

- a. Provide details of trees including type, location, level, and girth of tree trunk at 1m above ground.

6.2.12. Watercourses

All watercourses outside of the general area specified for the Digital Terrain Model shall be recorded in accordance with the general requirements for breaklines along top and bottom of banks plus invert and water levels at 5m intervals, so that the full hydraulic channel of the watercourse is recorded within the DTM. The survey points shall be taken as cross-sections of the watercourse so that the widths of the watercourse at the top and bottom of the bank are recorded as surveyed cross-sections. Cross-sections shall include bed levels, bank levels and ground levels up to 20m from the top of the bank of the main channel. The survey points shall be at all changes of slope or at intervals of not more than 5m, whichever is smallest.

6.3. Layering

- 6.3.1. The layering convention shall be in accordance with design standards.

6.4. Labelled Strings

- 6.4.1. Strings are to be labelled in accordance with design standards and a listing of the standard labels used shall be provided.

6.5. Accuracy of Features / Detail to be Surveyed

- 6.5.1. The maximum closing error for all distances between points used to determine the location of the grid and permanent ground markers shall not exceed 1/30,000 when checked by precise measurement. For distances between adjacent permanent ground markers of less than 300 metres the maximum error shall not be greater than $\pm 10\text{mm}$.

The relative accuracy of the three dimensional co-ordinates of all points in the digital ground model shall be within the following tolerances:

- Horizontal Control: **All areas $\pm 3\text{mm}$**
- Vertical Control: **On solid ground / surface $\pm 3\text{mm}$
On grassed surface $\pm 10\text{mm}$**

The height difference between any two points used as permanent bench marks shall not be in error by more than $\pm 10 \times k \text{ mm}$, where k is the square root of the distance in kilometres between the points being considered or $\pm 5\text{mm}$ whichever is the lesser.

6.6. Longitudinal and Cross Sections

- 6.6.1. The Contractor shall clearly set out on any road carriageways within the site the Chainage Point 0.000m and chainage points at intervals of 100m parallel to the road centreline or road crown, on the channel line, subject to the approval of Tipperary County Council.

Sufficient levels shall be surveyed so that the ground configuration, including all discontinuities, is represented on the survey drawing. Depressions across the existing ground including rutting, wheel tracks, break lines, cracking and road patches shall be surveyed at close internals.

The contractor is to ensure that all points required to create an accurate 3 dimensional (3D) ground model that represent the surveyed area surface are surveyed.

6.7. Presentation

- 6.7.1. The presentation of surveyed information shall be as defined in Sections 7 and 8.

7. PRESENTATION OF DRAWINGS

7.1. General

The final drawings shall show all the required details specified in Section 6 of this specification.

7.2. Drawing Format

The layout of the survey drawings shall be as agreed with the Client. The Format of the Drawings shall be in AutoCAD dwg format.

Adjoining drawings shall have an appropriate overlap.

7.3. Grid

The National Grid shall be shown on all drawings at 100 metre intervals by symmetrical crosses at grid intersections and with ticks at the sheet edges. The grid values shall be shown at the sheet edges.

7.4. New Mapping

All surveyed detail specified in Sections 6 & 7 of this Specification shall be represented.

8. PRESENTATION OF DIGITAL DATA

8.1. Supply of Digital Data

Digital data shall be supplied for Digital Ground Modelling purposes.

All digital data supplied shall conform to the same standards of accuracy specified in Sections 5, 6 & 7 and in Appendix F.

Digital Data for Digital Ground Modelling (DGM)

Digital data to be provided shall include a complete Digital Ground Model of the entire survey in 'AutoCAD Civil 3D 2022' format and the raw text file suitable for importing into AutoCAD Civil 3D 2022 (64 bit) in "PENZD (Space delimited) code format. Included with this file will be the associated AutoCAD Civil 3D 'Feature and Point Style Sets' used to create the model. This model shall consist of unbroken feature strings and contour strings in 3D. Contour strings are required at 0.5m intervals.

Features as described in Sections 6 & 7 must be joined as continuous 3D Strings (Polylines) suitable for importing into AutoCAD Civil 3D 2016.

Coordinates and Levels will be in terms of the Irish Transverse Mercator, see Section 5 of this specification for details. Levels shall be obtained by direct measurement to each point except where the ground surface is built over or where the ground surface is obscured by thick vegetation.

The supply of all digital data shall be in **Irish Transverse Mercator (ITM)** coordinate system.

8.2. Supply of 3D Laser Scanner Outputs

Further to the requirements of 8.1, the following shall **also** be returned for each of those areas of the Survey identified for 3D Laser Scanning:

- I. A point cloud presented in .las format representing a Digital Surface Model (DSM) for each of the areas identified.
- II. A point cloud presented in .las format representing a Digital Terrain Model (DTM) for each of the areas identified. All returned points identified as representing ground level should be included in this file.
- III. A screened point cloud representing a Digital Terrain Model (DTM) for each of the areas identified. The point density shall be such that a minimum of 20 points per square metre is returned. In this regard, it should be noted that the data should be screened to remove any redundant points, i.e. points that will not materially change the profile of the topographical survey by yielding a difference in level of not more than 3mm. This file should be provided in .las format and also as a series of comma delimited text files in the sequence of x,y,z limited to a maximum of 1million points per file.

9. PRODUCTS TO BE DELIVERED

9.1. Digital Drawings & Point File

Supply of Digital Data as indicated in Section 8 of this Specification.

9.2. Digital Data

Media Type

Data shall be supplied on the following:

- | | | |
|----|---|-----------------------------|
| a. | <i>Medium</i> | <i>CD/DVD-ROM/External</i> |
| b. | <i>Compatible with operating system</i> | <i>Microsoft Windows 11</i> |

Coverage

When writing data sets to the medium, the files shall comply with the following:

If the files are too large to fit onto one media volume then the information can be split into individual files spanning several volumes with the media sequentially numbered.

Annotation

Where multiple media and/or multiple data sets are supplied, the Survey Contractor shall supply a list of all media, stating individual contents.

Each media item shall be individually labelled with the Project title, reference number, and date. In addition each item shall be uniquely referenced in the form 'Item 1 of 9'.

9.3. Final Survey Reports and Schedules

One soft copy of the Final Survey Reports (.doc word format) and Drawings (dwg. AutoCAD Format) for the scheme shall be submitted to TCC for Approval.

The **Topographical Survey Control Report** shall describe the methods, techniques and equipment used in the survey, the parameters used in the transformations, and the closing errors in both the plan and level nets and in the connections to Ordnance Survey Ireland control. This report shall include the items specified in Section 5.4 of this Specification.

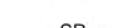
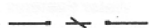
The survey contractor shall safely retain all source survey information for a period of seven years from the date of completion of the contract.

10. APPENDICES

APPENDIX A Symbols for 1:500 Mapping

The following symbols are to be used for 1:500 mapping in addition to that stated below.

Conventional Feature Symbols to be used for 1:500 Scale mapping.

Building..... 	Street Furniture	Public House..... PH
Building (open sided)..... 	Inspection Cover.....  IC	Flag Staff..... •FS
Glasshouse..... 	Manhole..... ◦MH	Mile Post or Stone..... •MP,MS
Foundations..... 	B.T. Inspection Cover.....  BT	Drain..... = Dr
Ruin..... 	Gully..... G	Basement Light.....  BL
Passage..... 	Kerb outlet..... KO	Footbridge.....  F Br
Sloping Masonry..... 	Grating..... Gr	Signal Post..... •SP
Walls (under 200mm).....  Wall	Hydrant..... •Hyd	Overhead Lines (with description)  Power Line
Walls 200mm and over.....  R / W	Coal Chute..... -CC	Overhead Lines (with description)  Gantry
Retaining Wall.....  R / W	Road Sign..... •RS	Public Utility Prefixes
Fences (with description).....  R / W	Guide Post..... •GP	Electricity EI
Chestnut Paling..... C/P	Sign..... •Sign	Gas G
Close Boarded..... C/B	Street Name Plate..... — NP	Water W
Corrugated Iron..... C/I	Bollard..... •B	Hedge..... 
Interwoven..... Iwn	Pedestrian Crossing.....  PC	Gate..... 
Iron Railings..... I/R	Lamp Post..... •LP	Stile..... 
Paling..... Pal	Letter Box..... •LB	Stump..... •S
Post & Chain..... P/C	Traffic Signal..... •TS	Individual Tree..... 
Post & Rail..... P/R	Vehicle Detector Pad..... VDP	Slopes with height Greater than 1m 
Post & Wire Mesh Fence... P/W	Telephone Call Box.....  TCB	Cliff Face..... 
Post & Barbed Wire..... B/W	Police Call Box.....  PCB	Erosion..... 
Roads	Police Telephone Pillar..... PTP	Marsh..... 
Kerbs..... 	Electricity Sub Station...  EI Sub Sta	
Edge of Surfacing..... 	Electricity Pylon.....  EI Pylon	
Footpath..... 	Electricity Pole..... •EP	
Track..... 	Telegraph Pole..... •TP	
Water Features	Post..... •P	
Canal..... 	Trough.....  Tr	
Stream..... 	Chimney.....  Chy	
Ditch..... 	Vent Pipe..... •VP	
Sluice..... 	Stop Tap..... •SP	
Weir..... 	Stop Valve..... •SV	
Culvert..... 	Gas Valve..... •GV	
Grip (Land Drain)..... =====	Water Meter..... •WM	
Spring..... •Spr	Marker..... •Mkr	
Well.....  W	Bus Stop..... •BS	
	Reflector Post..... •RP	
	Belisha Beacon..... •BB	
	British Telecom or.....  Box	
	Electricity Box (Pillar)	

Survey Information Signs

* Ground Control Point.....	
Permanent Ground Marker.....	
Permanent Bench Mark.....	
O.S. Trig. Station.....	
O.S. Bench Mark.....	 BM 176.91
Standard Spot Height.....	+ 278.51
Higher Precision Spot Height..	+ 278.516
* When Ground Control Points are coincident with PGM's the symbol used shall be agreed with the Survey Advisor	

APPENDIX B Special Requirements for Traffic Management

Traffic Safety and Management Requirements

- 1) The Survey Contractor shall be responsible for the planning, design, implementation, maintenance and removal of traffic safety and management measures required in order to facilitate and complete the survey.
- 2) The Survey Contractor shall comply at all times with the requirements of Chapter 8 of the Department of the Transport Traffic Signs Manual, current edition and 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. The traffic management plan submitted by the contractor in advance of commencement on site shall be approved by TCC and An Garda Síochána.
- 3) The successful Survey Contractor shall liaise as necessary with An Garda Síochána, Tipperary County Council and any other relevant Utility Providers and Third Parties.
- 4) Traffic Management is to be supervised at all times by a competent person who has successfully completed the three day Signing, Lighting and Guarding at Roadwork's Course.
- 5) The Contractor shall submit to TCC detailed traffic management plans. The traffic management plans shall include the following information as a minimum:
 - (i) Drawings showing traffic management layout, including:
 - a. Geometric Design
 - b. Roadworks speed limits (if proposed by the Contractor);
 - c. Position of traffic signals and signs;
 - d. Safety Zones
 - e. Location and Width of Lanes;
 - f. Working Areas;
 - g. Access and Exit locations for Contractor's things;
 - h. Temporary Barriers;
 - i. Crossovers;
 - j. Contra-flow arrangements;
 - k. Provision for emergency services & Vulnerable roads users;
 - l. Protection/diversion of services, supplies and the like;
 - m. Signing
 - (ii) Timing of operations.
- 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.
- 7) Traffic Restrictions are to be confined to the following times:
 - Monday to Friday (Excluding Public Holidays) – 09:30 and 16:30
- 8) All vehicles used on Site shall be fitted with a roof mounted amber flashing beacon as a minimum. The use of a vehicles hazard warning lights shall not be acceptable on Site.
- 9) All necessary traffic safety precautions shall be undertaken by the Survey Contractor to ensure the safety of all traffic and pedestrians using the existing roads adjacent to the Survey Site and connecting minor roads during the execution and completion of the survey, and all precautions shall be taken to minimise disruption to the local residents. The Survey Contractor shall

maintain access at all times to land and property affected by or adjacent to the survey site. He shall pay particular attention to side road junctions, domestic, commercial and farm premises adjacent to the Survey Site.

- a) The Survey Contractor shall ensure that no item of plant, goods or equipment (including stores or offices) shall be placed or parked on the public roadway or its verges in a manner which shall / may result in danger to the personnel on the Survey Site or members of the public, or which shall / may restrict sight distances on all accesses to the Site or on public roads. *Traffic Management proposals should take cognisance of all connecting side roads and direct accesses.*
- 10) The Contractor shall provide and maintain access to all existing properties adjacent to the Works.
- 11) In the event of a traffic accident occurring adjacent to the survey site, the Survey Contractor shall immediately contact the Gardaí and Tipperary County Council informing them of the following:
- (i) Location of the accident
 - (ii) 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.
- 12) Liaison with Traffic Gardaí shall be through the following offices:

Contacts	Contact
Clonmel Garda Station, Emmet St., Clonmel, E91 H799	Tel: 052 6177647
Tipperary County Council, Emmet St, Clonmel, E91 N512	Tel: 0818 06 5000
Tipperary County Council, Contact Person for Contract	Tel: 087 3820722

- 13) All drivers including those delivering plant and materials must be given clear instructions regarding the traffic arrangements applicable at any particular time.
- 14) The Survey Contractor shall be responsible for maintaining the running traffic carriageway and **all pedestrian and/or cycle routes** adjacent to the survey site in a clean and safe condition at all times.
- 15) The Survey 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 once the abnormal loads have passed through the survey site.

The Successful Survey Contractor will be asked to submit his detailed Traffic Management Plan for approval to TCC and details of his programme with respect to Traffic Management within the following timescales:

- a) *prior to the Date for Commencement; and*
- b) *at least 7 days prior to partial lane closures (if any)*

The successful survey contractor will also be asked to submit the following for approval prior to commencement of the survey:

- **Company Employers Liability, Public Liability & Professional Indemnity Insurance Details.**
(Insurance Details must also include for Traffic Management)

Further relevant information relating to the site:

- a) *Notwithstanding that traffic management will be influenced by the proposed survey methodology; the minimum level of traffic management to be applied, when operators are required to step onto the roadway, is a **Static Manual Controlled Shuttle System**. A generic layout is presented in Fig. AB 1.*
 - b) *All on-road surveying is to be undertaken within the Works Area. In this regard, narrow lane widths are likely to restrict access to the centre line and crown in many areas. A survey methodology enabling remote recording of the centreline is likely to be required in such conditions.*
 - c) *Pedestrian Footways where present are to be maintained at all times. Movement of cyclists should also be given detailed consideration. Generic Layouts for provision of pedestrians and cyclists are shown on Fig AB 2.*
- **Table AB 1 presents a non-exhaustive list of site specific Constraints which are likely to influence temporary traffic management design. It is strongly recommended that the person responsible for the temporary traffic management visits the site prior to submitting their tender.**

Site Name	Posted Speed Limits	Estimated AADT	Estimated % HGV	Potential for Cyclist Activity	Other Notable Features
<i>R688 Cashel Road</i>	<i>50kph</i>	<i>10,435</i>	<i>5%</i>	<i>Medium</i>	<i>T Junction at Longfield Avenue</i>
R689 Fethard Road	<i>50kph</i>	<i>11,014</i>	<i>4%</i>	<i>Low</i>	<i>Roundabout on R689 Fethard Rd</i>
Longfield Road/Avenue	<i>50kph</i>	<i>N/A</i>	<i>N/A</i>	<i>Low</i>	<i>T Junction with R688 Cashel Road</i>
Carrigeen Business Park	<i>50kph</i>	<i>N/A</i>	<i>N/A</i>	<i>Low</i>	

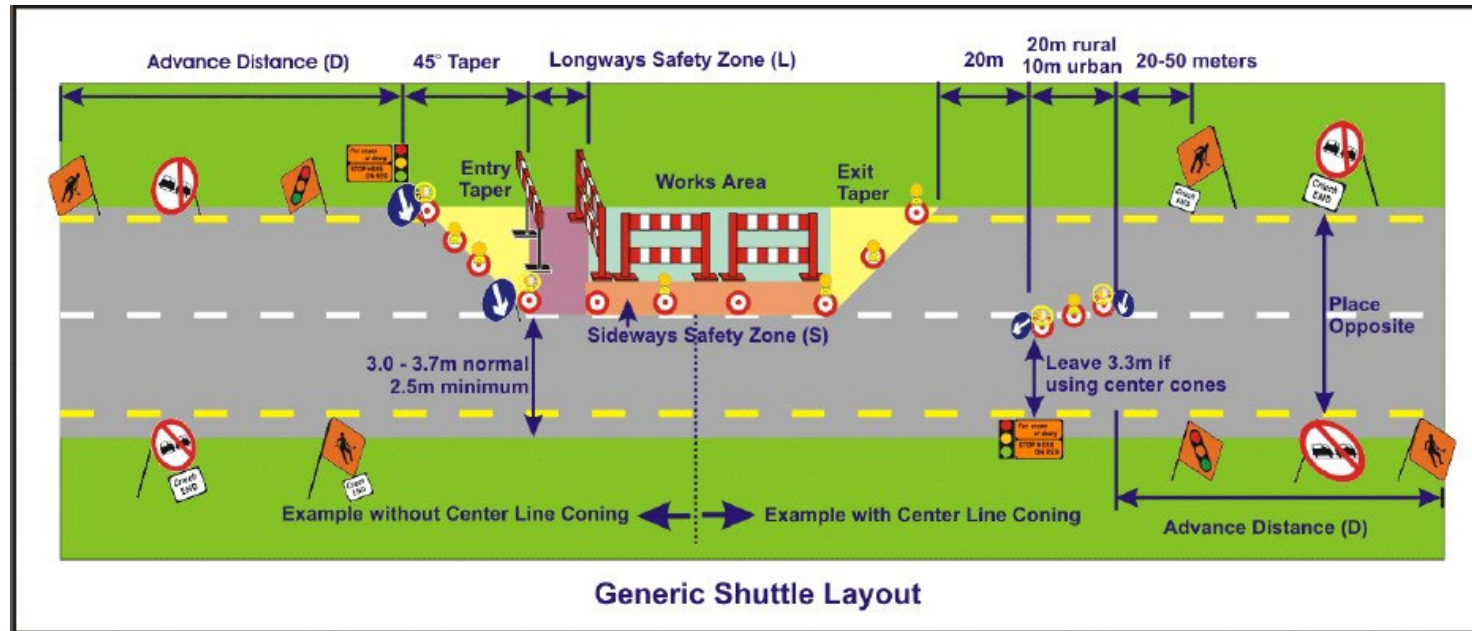


Fig AB 1 – Generic Shuttle Layout.

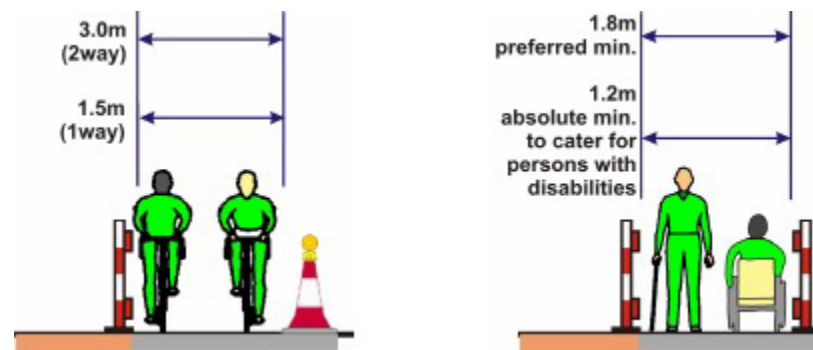


Fig AB 2 – Requirements for Pedestrians and Cyclists

APPENDIX C Contract Drawings

Drawing No.	Drawing Title
N24-LINKROADS-000-01	Site Location
N24-LINKROADS-000-02	Survey Area 1
N24-LINKROADS-000-03	Survey Area 2

APPENDIX D Construction of Permanent Ground Markers

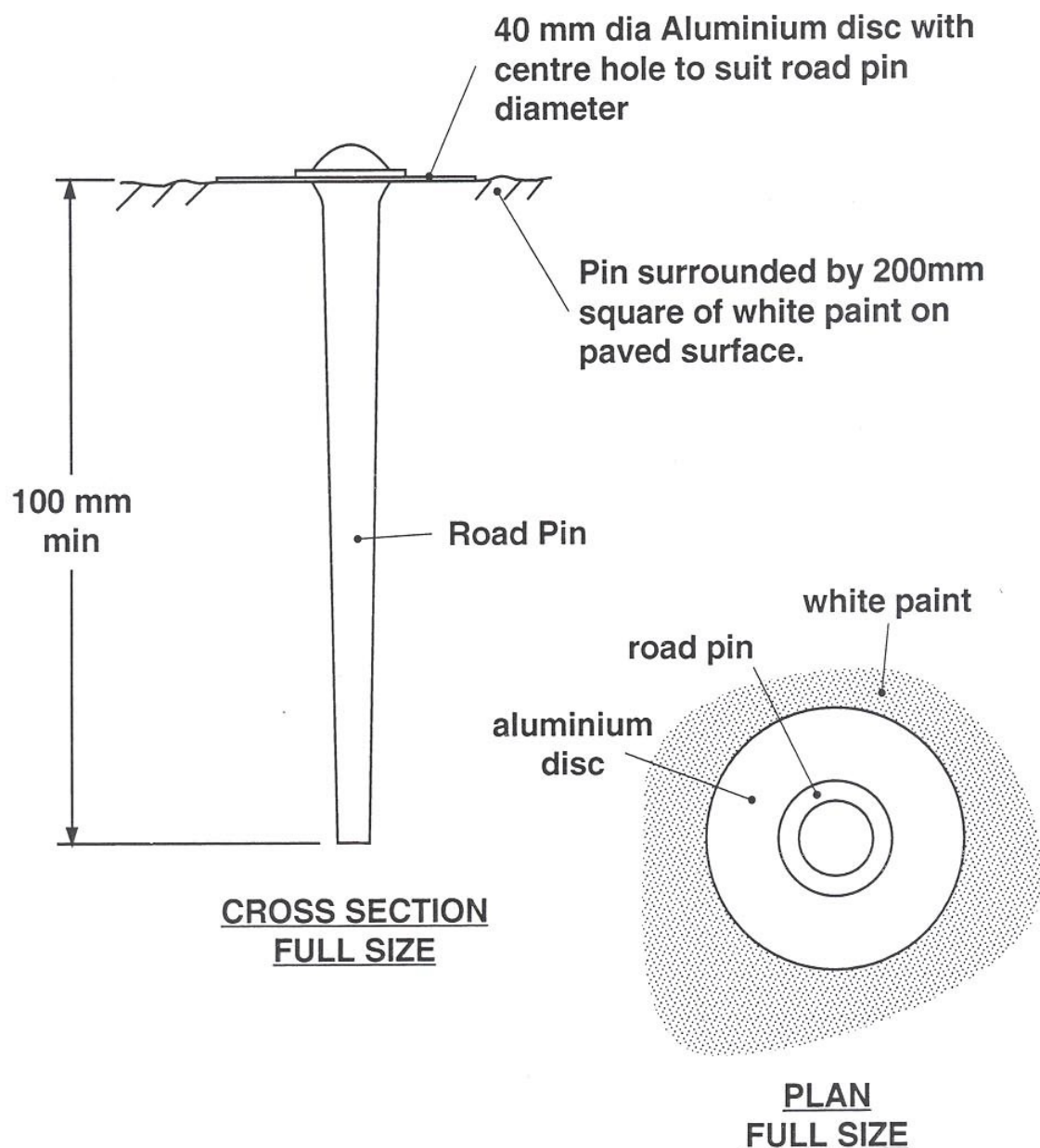


Fig. 1

PERMANENT GROUND MARKER TYPE 1
(FOR DENSE, VERY STABLE PAVED SURFACES)

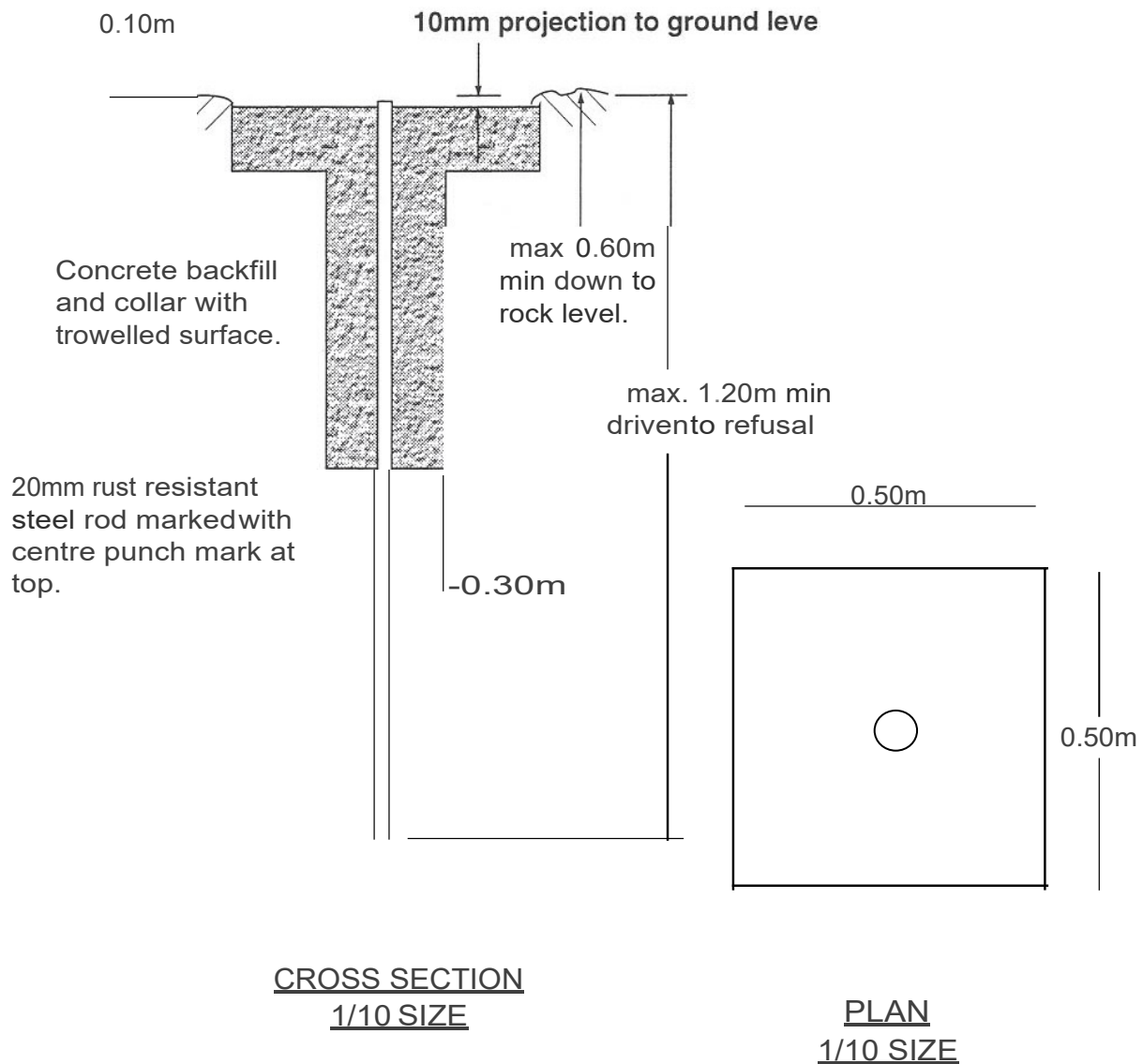


Fig. 2

PERMANENT GROUND MARKER TYPE 2.
(FOR NON AGRICULTURAL SITES AND
UNPAVED SURFACES)

APPENDIX E Location of Permanent Ground Markers

PERMANENT GROUND MARKER RECORD SHEET			Page of
Location:			Contract No:
PGM No./ Name			
Description of PGM			
Arbitrary/ N.G. Coords	E	N	Ht
Detailed Location Diagram			
Marker Established by.....		Date.....	
Record Prepared by		Date.....	
Revisited by		Date.....	
Remarks			

APPENDIX F Guidelines for Digital Data

DEFINITIONS

This Appendix concerns the transfer of digital data from the Survey Contractor's system. To avoid ambiguity, the following definitions shall apply.

3D Laser Scanning

3D scanning is the process of capturing digital information about the shape of an object with equipment that uses a laser or light to measure the distance between the scanner and the object.

Attribute

Characteristics and/or descriptions attached to a feature. A feature may have none, or many attributes.

Cartographic Model

A data set, the primary requirement of which is to produce a graphic output. Coding is often limited to information for drafting purposes, such as line or symbol type, and often includes data such as grid and border, titles etc.

Clean Data

A data set with unique junction points.

Data Set

A part of a transfer set which may be homogeneous (i.e. a noise survey data set), or a geographical subset.

Digital Ground or Terrain Model (DGM or DTM)

A data set usually representing the ground surface (i.e. 'base earth', excluding buildings). The model is most often defined by a regular grid of 'posts', each of which has a height. Additional data may include break lines to record heights for definite changes of slope.

Digital Surface Model (DSM)

A data set usually representing the ground surface and including topography and all natural or manmade features.

Feature

A point or line defined by two or three dimensional co-ordinates. By definition, a point has no dimensions but may require an orientation and/or scale attribute for output as a symbol. Curves are features defined by a series of straight lines, or a series of points with a regular or complex curve attribute.

Field

A field is a unique unit of data, e.g. a height co-ordinate field.

Geographic Model

A data set which explicitly includes the relationships (topology) associated with the geometry. It will sometimes include attributes which are not spatial (i.e. ownership). This form of model is most suitable for analysis in a geographical information system.

Headers and Terminators

The first and last records of a data set. They usually contain information to explicitly identify the start and finish of a data set.

Null Height

A height entry which is interpreted as no value. Usually an impossible value such as -999m.

Record

A logical group of fields which is written with a terminator character.

Symbol

A graphic representation of a feature (usually a point). Not usually inherent in the data themselves, but a result of interpretation by the processing software and/or definition by the user.

Transfer Set

The complete data for the project, including supporting information.

Unique Junction Points

Clean data occur when any junction point has only one set of co-ordinates (2 or 3-D as appropriate): i.e. in graphic terms there are no under- or over-shoots. Normally, points will only be added to create a 'crossing' or 'T' junction where one would sensibly occur to complete a polygon (such as a fence and wall etc). A junction would be illogical between a river and fence, or an overhead line and road.

Volume

A physical item of media. A transfer set may be written to several volumes.

REQUIREMENTS FOR AUTOCAD CIVIL 3D 2022**F.1 Method**

The data shall be presented by the Contractor in a form suitable for input to the AutoCAD Civil 3D 2022 String Digital Ground Model and for correct analytical operations and interpretation by the AutoCAD Civil 3D system.

The AutoCAD 'Feature and Point Style Sets' used to create the Digital Ground Model shall be supplied.

The DGM shall contain the detail necessary to produce maps at 1:500 scale as defined in Section 6 of the Specification.

F.2 Models

The ground surface over the required area shall be simulated by continuous strings of co-ordinated information along characteristic lines on the terrain. The model shall consist generally of three dimensional (3D) strings. Derived data for strings shall not be used except as permitted under Clause F.7.

Text strings shall be used to describe features (e.g. house name, road names, tree types) but shall not be used for items labelled as point strings. Use of the correct string label for a point string assigns the correct text to the feature. Separate text strings shall be used for each type of feature.

F.3 Strings Labelling

All strings shall be labelled using a suitable convention.

F.4 Grids

The co-ordinates of the DGM shall be in terms of the Project Coordinate System.

F.5 Area of DGM

The area and content of the DGM shall be the same as that described elsewhere in the Specification for the 1:500 scale Topographical Survey and illustrated on the Survey Reference Plans.

F.6 3 Dimensional Strings

3D strings shall be recorded as a series of three dimensional co-ordinates representing all significant features on the ground.

Strings forming curved features shall have sufficient points to ensure compliance with the standard of accuracy required by Clause F.7. The strings shall be supplied as either the original surveyed points alone or in combination with generated intermediate points including generated level information which shall nonetheless comply with the stated accuracy. The Contractor shall supply a schedule of all strings containing generated points. The schedule shall contain the model name, string label, point sequence number, co-ordinates and level of such points.

F.7 Accuracy & Definition of 3D Strings

The levels and co-ordinates of recorded points shall be correct to within the tolerances stated in Section 6 of the Specification. 90% of these must be within the stated tolerances when a representative sample of points is checked by measurement from the Project Control Network.

The spacing of points along 3D strings shall be such that the maximum vertical and horizontal errors of interpolated points shall not exceed those stated in Section 6 of the Specification.

F.8 General String Details

A string may start or finish at any point providing it is not more than 10m outside the boundary of the model for which the data is being recorded. If a string would logically start or finish at a point which is not more than 10m outside the boundary of the model, the boundary may be adjusted to accommodate the string.

Continuity between models shall be provided by mathematically precise matching at model boundaries. Where a string stops at another string boundary there must not be any gap between the two strings.

Null levels shall not be given to any points on a string used to define the level (Z) co-ordinate in the model except where directed by the Design Organisation.

If a string passes outside a model by more than 10m and then loops back into the model, another string must be started prior to re- entry into the model, and the loop section recorded with the data for the adjoining model. Strings shall abut in a mathematically precise manner to maintain continuity. If a string is a closed loop within the model, or within 10m of the model boundary, then it shall be closed with mathematical precision. No string shall have more than 500 points without agreement by the Client.

Any contour or feature shall be represented throughout its whole length by one string, subject to the above clause regarding the number of points in a string.

F.9 Transcription

The computer input shall be prepared from the original fieldwork values without any intermediate manual transcription.

F.10 Verification of Data

The Contractor shall verify or have verified the Point data using AutoCAD Civil 3D prior to submitting AutoCAD Civil 3D proof plots of the verified input to demonstrate this. Any errors found in this process shall be corrected by the Contractor before the computer input and plots are delivered to the Client. Any errors subsequently found shall be corrected by the Contractor.

F.11 Delivery of Computer Input

The Contractor shall be responsible for the delivery to the Client of the computer input in an undamaged state.

APPENDIX G Safety, Health and Welfare Questionnaire

This Questionnaire must be completed and returned with your Tender.

Note: Failure of the Contractor to successfully complete or where the Contractor has been assessed as not fulfilling the requirements, the Contractor will be excluded from proceeding further within the tendering procedure.

Certificate of Competence

1. This company declares that it is competent to perform the works as required by the Local Authority and has a thorough knowledge of the requirements of the current Safety, Health & Welfare at Work Act, Regulations, Codes of Practice and Guidance.
2. This Company declares that the information provided in this questionnaire is an accurate summary of the company's current Safety and Health Management system.

Registered Company Name: _____

Company Registration Number: _____

The year the Company was registered: _____

Average No. of Employees in the last 12 months: _____

Registered Company Address: _____

24 Hour Tel No: _____ Fax: _____ Email: _____

Completed by: _____ Position in company: _____

Contact Number: _____ Date: _____

Signed: _____ Signed: _____

Position: _____ Position: _____

Note: All answers are to be categorised as per this questionnaire and where any supporting documents are being used to provide the answers, reference is to be made to the specific subsections

Safety Health & Welfare Management

1.	Have you previously carried out Work which is comparable in size and nature to this proposed Work? List your top five jobs over the past twelve months	Yes/No
2.	Is a copy of your Safety Statement enclosed with this tender? Is your Safety Statement: • Up to-date • Does it include legislative requirements • Is it signed by the Head of your Company • Does the safety statement set out the company's commitment to safety, health & welfare and the responsibilities of individuals within the company • Does the safety statement describe your arrangements for ensuring relevant work equipment borrowed or hired-in is accompanied by all appropriate training (including induction training), inspection and maintenance records • Who is your Nominated Safety Officer? _____	Yes/No Yes/No Yes/No Yes/No Yes/No
3.	How often do you show your Safety Statement to your Staff:	
4.	State how your Safety policy is brought to the attention of all your employees:	
5.	Does your company have specific arrangements for the implementation of the Safety Statement? Is this detailed in your Safety Statement?	Yes/No Yes/No
6.	Is there a procedure in place for the provision, use and maintenance of personal protective equipment? Is this detailed in your Safety Statement?	Yes/No Yes/No
7.	Does your company have a hazard identification/risk assessment procedure in place? Is this detailed in your Safety Statement?	Yes/No Yes/No
8.	Are there procedures for maintaining, inspecting and assessing the hazards of plant & machinery operated/hired, or owned by the company for use on and off site?	Yes/No
9.	Is your company in a position to provide traffic management services?	Yes/No
10.	Are the following procedures detailed in your Safety Statement: • Work inspection system • Machine inspections • Maintenance inspection • Regular inspection	Yes/No Yes/No Yes/No Yes/No
11.	Are there procedures for dealing with emergencies?	Yes/No

Site Management

12.	Is your company willing to co-ordinate with the Project Supervisor(s) prior to work commencing and during the performance of the Work?	Yes/No
13.	Are you familiar with the process of preparing Safety Statements?	Yes/No

Health & Safety Performance

14.	Have your company's employees been involved on any accidents, which were required to be notified to the Health & Safety Authority over the past three years? If Yes, please provide details: _____ _____ _____	Yes/No
15.	Has your company or individuals employed by your company been prosecuted for any breaches of Health & Safety Legislation within the past three years? If Yes, please provide details: _____ _____ _____	Yes/No
16.	Has any prohibition, improvement or other enforcement notice/order been issued against your company in the past three years? If Yes, please provide details: _____ _____ _____	Yes/No
17.	Have there been any dangerous occurrences?	Yes/No

Health & Safety Training, Instruction & Information

18.	Have all your supervisors attended Health & Safety courses within the past three years?	Yes/No
19.	Have all your operatives received appropriate training for their work and in general health & safety aspects of your type of work?	Yes/No
20.	Are records maintained of all training and any certification or licences obtained and induction undertaken for employees of your company?	Yes/No
21.	Provide evidence that all employees have completed the Safety Pass Scheme. Details enclosed?	Yes/No
22.	Provide evidence that all relevant persons have completed the CSCS Scheme as per Schedule 4 of 2013 Construction Regulations. Details enclosed?	Yes/No
23.	Outline the level of training that your Managers & Employees have received: _____ _____ _____	
24.	Is it your company's policy to carry out site specific training for all employees?	Yes/No
25.	Is it your company's policy to carry out site specific Induction training for all employees?	Yes/No

APPENDIX H List of Proposed Sub Contractors

(To be completed by the Tenderer)

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

7. _____