



GWERSYLLT WELSH MEDIUM SCHOOL , WREXHAM

PROPOSED EXTERNAL WORKS

CONTRACT NO: PS822

Contract Document

Volume 1

External Works Information

Employer

Wrexham County Borough Council
The Guildhall
Wrexham
LL11 1AY

April 2012

Name of Tenderer

GWERSYLLT WELSH MEDIUM SCHOOL , WREXHAM
PROPOSED EXTERNAL WORKS

CIVILS WORKS INFORMATION

VERSION	DATE	PREPARED BY:
A		 (J Valentine)

CONTENTS

1. LOCATION
2. DESCRIPTION OF THE CIVILS WORKS
3. ENGINEERING DESIGN AND SPECIFICATION OF THE CIVILS WORKS
4. SPECIFICATION
5. STANDARD DETAILS

1. LOCATION

The site to be investigated is land adjacent to Delamere Avenue & Alyn Waters Country Park in Gwersyllt, Wrexham. Post Code: LL11 4NG (see location plan in Appendix A).

The site is owned by the Local Authority and is a 'greenfield' site which is open to the community for recreation purposes.

The Proposed site for the new Primary School is located approximately two miles from Wrexham town centre on the southern boundary of Alyn Waters Country Park with existing shared vehicular/pedestrian access from Park Wall Road. Boundaries for the proposed school site are delineated by the A541 junction with High Street, Delamere Avenue, the access road onto Alyn Waters and a bund backing onto a substantial area of former landfill.

The site has a complex topography with north, west and partly south boundaries steeply sloping towards the centre of the site and the central part of the site gently sloping towards east with approximately 3.0m change in level between the west and east boundaries. Historical maps have not revealed any previous buildings on the site within the last century. The site was part of Gwersyllt Park in the 19th century and was subsequently utilised for Mining. There is a high probability that made ground will be present on the site, either in the form of re-worked sand/gravels or possibly inert or ash type waste material. Records show that the area was excluded from use for landfill.

North

The North boundary of the site is formed by the substantial embankment and a belt of mature trees that separate the proposed land from the adjacent Alyn Waters Country Park.

East

The East boundary of the site is adjacent to the existing cricket and former bowls and tennis grounds with Cricket Club, Changing Pavilion and Army Cadets buildings in close proximity to the site.

South

The South boundary of the site is adjacent to Delamere Avenue - a single carriageway. The street has a residential character to one side with rows of 2 storey semi-detached houses built around the 1970's and a low level stone wall on the other side of the road separating it from the proposed land.

West

The West boundary of the site is delineated by the A541 junction with High Street which has 8 meters difference in levels between High Street and the land for the proposed school. Currently the site is separated physically from the roads by the large embankment and bushes

2. DESCRIPTION OF THE CIVILS WORKS

The works include:

- (i) Earthworks and ground reprofiling;
- (ii) Removal of fencing and stonewalls;
- (iii) Scottish Power mains works;
- (iv) Alterations to the kerbline and traffic calming measures;
- (v) Hard play areas;
- (vi) Sustainable drainage/ soakaways;
- (vii) Carpark, delivery area and bus drop off point;
- (viii) New football pitch and hard play sports area;
- (ix) New fencing to school boundary;
- (x) Landscaping

3. ENGINEERING DESIGN AND SPECIFICATION OF THE CIVILS WORKS

The Works shall comply with the requirements of the "Specification for Highway Works," published by HMSO as Volume 1 of the Manual of Contract Documents for Highway Works, augmented by any Supplementary Clauses included elsewhere within this Document.

4.

SPECIFICATION

PREAMBLE TO THE SPECIFICATION

1. The Specification referred to in the Tender shall be the “Specification for Highway Works” published by HMSO as Volume 1 of the Manual of Contract Documents for Highway Works, as modified and extended by the following:
 - (i) Appendix 0/1: Contract-specific Additional, Substitute and Cancelled Clauses and Tables;
 - (ii) Appendix 0/2: Contract-specific minor alterations to existing Clauses and Tables.
 - (iii) The Numbered Appendices listed in Appendix 0/3.
 - (iv) Appendix 0/5: Special national alterations of the Overseeing Department of Scotland, Wales and Northern Ireland.

Appendix 0/4 contains a list of the Drawings.

2. The relevant publication date of each page of the Specification for Highway Works is given in the Schedule of Pages and Relevant Publication Dates.
3. An Additional Clause as indicated by a suffix “AC” in Appendix 0/5 is an alteration originating from the Overseeing Department of Scotland, Wales and Northern Ireland. An Additional Clause, as indicated by a suffix “AR” in Appendix 0/1, is a Contract-specific alteration.
4. A Substitute Clause, as indicated by the suffix “S” in Appendix 0/5 is an alteration originating from the Overseeing Department of Scotland, Wales or Northern Ireland. A Substitute Clause, indicated by a suffix “SR” in Appendix 0/1, is a Contract-specific alteration.
5. A Cancelled Clause as indicated by a suffix “C” in Appendix 0/5 is an alteration originating from the Overseeing Department of Scotland, Wales or Northern Ireland. A Cancelled Clause, indicated by a suffix “CR” in Appendix 0/1, is a Contract-specific alteration.
6. Insofar as any of the Numbered Appendices may conflict or be inconsistent with any provision of the Specification for Highway Works the Numbered Appendices shall always prevail. Additionally, Numbered Appendices 0/1 and 0/2 shall take precedence over Numbered Appendix 0/5.
7. 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 and 0/2 or 0/5.
8. Where a Clause is altered any original Table referred to in the Clause shall apply unless the Table is also altered. Where a Table is altered any reference in a Clause to the original Table shall apply to the altered Table.
9. 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.
10. Any Appendix referred to in the Specification that is not used shall be deemed not to apply.

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

1. The Specification shall be amplified and extended following additional clauses. (Note "A" denotes an additional clause and "AR" denotes a Regional or Schematic specific addition).

171A Approval from Authorities

Where the *Contractor* requires any approval from Authorities in addition to approval from the *Project Manager*, such former approval shall be obtained by the *Contractor* in writing and duplicate copies shall be submitted to the *Project Manager* with the request for the latter's approval and, in any event, not less than fourteen days prior to the commencement of the work affected.

172A Use of Mains Water

If the *Contractor* uses water abstracted from a Main supply he shall be responsible for obtaining all necessary licences and permissions in advance and he shall also be liable for payment of any charges incurred.

173AR Wheel Washing

The *Contractor* shall provide whatever facilities are necessary for washing and cleaning the wheels of all vehicles leaving the site to ensure that no mud, slurry or other debris is deposited on the public highway. The *Contractor* shall ensure that no oil or fuel deposits are allowed to percolate into the ground or enter the adopted drainage system by the inclusion of an interceptor.

174A Use of and Damage to Lands, etc

Where for any purpose in connection with the Contract the *Contractor* requires to make use of any road other than a highway repairable for the inhabitants at large, or of any land outside the limits of the land provided by the *Employer*, he shall make his own arrangements, which shall be to the satisfaction of the *Project Manager*, with the owners, occupiers or tenants of any such roads or land.

The *Contractor* shall pay all costs arising from the use of such road, and shall, on completion of the works, reinstate them to the satisfaction of the owners, occupiers, or tenants, and the *Project Manager*. The same shall apply for any temporary haul roads constructed by the *Contractor* for access across the site.

175A Protection of the Public and Access to Frontages

The *Contractor* shall provide for and maintain and remove on completion all apparatus necessary for the protection of the public and for access at all times, adjoining properties, comprising barriers, lights, gangways, hardcore approaches, etc.

176AR Trespass

No workmen employed upon works are to be allowed to trespass upon adjoining properties. The necessary permissions must be obtained by the *Contractor* to ensure that these instructions are carried out. The *Contractor* will be required to indemnify

**APPENDIX 0/1: CONTRACT SPECIFIC, ADDITIONAL, SUBSTITUTE AND
CANCELLED CLAUSES AND TABLES INCLUDED IN THE
CONTRACT (CONTINUED)**

the *Employer* from any claim or action for damage on account of trespass or other misconduct of his employees.

177AC Use of Standards

Any requirement of the Contract that any material or article shall comply with any specified standard, whether a British Standard, other named standard or otherwise, shall be satisfied by compliance with a suitably relevant national or governmental standard of any member state of the European Communities, or a suitable relevant international standard recognised in such member state, provided that in either case the standard in question offers guarantees of safety, suitability and fitness for purpose equivalent to those offered by the Standard which is specified in the Contract.

Any requirement of the Contract to use material or any article which is defined by reference to a named supplier or manufacturer or a specified Quality Assurance scheme or Agreement Certificate, or which is registered with or has otherwise received the approval of the Overseeing Department of the Department of Transport shall be satisfied using material or an article which has received equivalent approval in another member state or the European Communities providing that the material or article in question is as safe, suitable and fit for the relevant purpose as material or an article complying with the requirement as set out in the Contract.

178AC Existing Trees, Stumps and Roots

1. Before beginning work, the *Contractor* shall contact the *Project Manager* and / or the *Employer's* Aboricultural Officer giving him seven days notice of a meeting on site to review all work procedures, access routes, storage areas and tree protection measures. Development shall be carried out in strict accordance with the agreed measures.
2. Where trees are to remain as a permanent feature or overhang the site, the *Contractor* must take adequate precautions to prevent damage to the reserved trees during the works and ensure the following rules are adhered to: -
 - i) No trees, shrubs or hedges, other than those identified on the drawings, shall be cut down, topped, lopped or uprooted without the prior permission of the *Project Manager* and/or the Local Planning Authority, nor shall trees be wilfully damaged.
 - ii) No fires to be lit below branches.
 - iii) No generators or static machinery to be operated below branches.
 - iv) The erection of fencing for the protection of trees and shrubs to remain on site shall be undertaken before any equipment, machinery or materials are brought onto the site for the purposes of the development, and shall be maintained until all equipment, machinery and surplus materials have been

**APPENDIX 0/1: CONTRACT SPECIFIC, ADDITIONAL, SUBSTITUTE AND
CANCELLED CLAUSES AND TABLES INCLUDED IN THE
CONTRACT (CONTINUED)**

removed from the site. The above mentioned fencing shall consist of 2m high Heras fence or other approved fence erected at the full extent of each tree and shrub. Nothing shall be stored or placed in any area fenced in accordance with this condition and the ground levels within those areas shall not be altered, nor shall any excavations be made without the written permission of the *Project Manager* and / or the Local Planning Authority.

- v) No branches to be removed unless tree pruning is specified in which case the work should be entrusted to a specialist firm of tree surgeons and carried out to BS 3998 (1966) "Recommendations for Tree Work".

If any damage to the trees is caused by the *Contractor's* labour, equipment or materials the *Contractor* must carry out the necessary remedial work at his expense as directed by the *Project Manager*.

179AC Control of Groundwater in Excavations

The *Contractor* shall assess the requirements for and take all necessary measures to maintain excavations free of ground water during construction of the temporary and permanent *works*. The methods used to control ground water shall be chosen to avoid damage to adjacent structures, services, installations and previously constructed sections of the *works*, and in general de-watering by pumping from within the excavation will not be acceptable.

The *Contractor* shall submit his general proposals for maintaining excavations free of ground water, and specific proposals for any excavation below the anticipated water table. Approval of these methods by the *Employer* shall not relieve the *Contractor* of his responsibilities under this and other clauses of the Contract.

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

APPENDIX NO.	TITLE
	PREAMBLE TO THE SPECIFICATION
0/1	Contract-specific Additional, Substitute and Cancelled Clauses, Tables and Figures Included in the Contract
0/2	Contract-specific Minor Alterations to Existing Clauses, Tables and Figures Included in the Contract
0/3	List of Numbered Appendices Referred to in the Specification and Included in the Contract
0/4	List of Drawings Included in the Contract
0/5	Special National Alterations of the Overseeing Organisations of Wales
	PRELIMINARIES
1/4	Working and Fabrication Drawings
1/5	Testing to be Carried out by the <i>Contractor</i>
1/6	Supply and Delivery of Samples to the Overseeing Organisation
1/7	Site Extent and Limitations on Use
1/11	Structural Elements and Other Features to be Designed by the <i>Contractor</i>
1/12	Setting Out and Existing Ground Levels
1/16	Privately and Publicly Owned Services and Supplies
1/17	Traffic Safety and Management
1/18	Temporary Diversions for Traffic
1/19	Routeing of Vehicles
	SITE CLEARANCE
2/1	List of Buildings, etc., to be Demolished or Partially Demolished
	FENCING
3/1	Fencing, Gates and Stiles
	SAFETY FENCES, SAFETY BARRIERS & GUARDRAILS
4/1	Road Restraints Systems (Vehicle & Pedestrian)
	DRAINAGE AND SERVICE DUCTS
5/1	Drainage Requirements
5/70	Stormwater Source Control Systems
	EARTHWORKS
6/1	Requirements for Acceptability and Testing etc. of Earthworks Materials
6/2	Requirements for Dealing with Class U1B and Class U2 Unacceptable Materials
6/8	Topsoiling

APPENDIX 0/3: LIST A: LIST OF NUMBERED APPENDICES REFERRED TO AND INCLUDED IN THE CONTRACT (CONTINUED)

	ROAD PAVEMENTS – GENERAL
7/1	Permitted Pavement Options
7/4	Bond Coats, Tack Coats and Other Bituminous Sprays (Sheets 1, 2 and Binder Data Sheet)
7/9	Cold-Milling (Planing) of Bituminous Bound Flexible Pavement
	KERBS, FOOTWAYS AND PAVED AREAS
11/1	Kerbs, Footways and Paved Areas
	TRAFFIC SIGNS
12/1	Traffic Signs: General
12/3	Traffic Signs: Road Markings And Studs
	STRUCTURAL CONCRETE
17/1	Concrete – Classification of Mixes
17/3	Concrete – Surface Finishes
	MISCELLANEOUS
26/70	Street Furniture
	LANDSCAPE AND ECOLOGY
30/1	General
30/2	Weed Control
30/5	Grass Seeding, Wildflower Seeding and Turfing
30/6	Planting – Soft Landscaping

APPENDIX 0/4: LIST OF DRAWINGS INCLUDED IN THE CONTRACT

1. Contract-specific Drawings Supplied to Each Tenderer

DRAWING NUMBER	DRAWING TITLE
	<u>WCBC's</u>
11701/D/200	Site Clearance
11701/D/800	Statutory Undertakers Apparatus – Existing
11701/D/1100	Proposed Kerbing, Footways, Carriageway & Fencing
11701/D/1200	Proposed Signs & Lines
	<u>Atkins Dwgs</u>
5104033-WA-C-101	Proposed Drainage Layout Overview
5104033-WA-C-105	Standard Details 2 of 6
5104033-WA-C-106	Standard Details 3 of 6
5104033-WA-C-107	Standard Details 4 of 6
5104033-WA-C-108	Standard Details 5 of 6
5104033-WA-C-109	Standard Details 6 of 6
5104033-WA-C-110	Proposed SUDS Layout
5104033-WA-C-112	Proposed Surface Water Layout
5104033_120_02B	Proposed Contours
	<u>The Ark Co.</u>
02-107-01	Hard & Soft Landscaping Layout
02-107-02	Planting Proposals to main entrance
02-107-03	Planting Proposals – wider site area
	STANDARD DETAIL DRAWINGS
11/01/02A	Traffic Calming Flat Top Hump Detail
11/04/01A	Tactile Paving at Pedestrian Crossings
11/04/02A	Pedestrian Crossing Tactile Paving
11/10/06A	Bus Stop Kerbs – Sheet 1 of 3
11/10/06A	Bus Stop Kerbs – Sheet 2 of 3
11/10/06A	Bus Stop Kerbs – Sheet 3 of 3
-	Football Pitch Dimensions
-	4m Mesh Gate
	3m Mesh Gate
	Single Mesh Gate
	2m high Mesh Fence

PRELIMINARIES**APPENDIX 1/4: WORKING AND FABRICATION DRAWINGS**

1. The *Contractor* shall submit for the *Project Manager's* approval the following working and fabrication drawings: -

SERIES	DESCRIPTION OF WORK	PERIOD OF APPROVAL
100	Site Traffic Safety and Management to meet the requirements of Clause 117, Appendix 1/17	1 week

PRELIMINARIES

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

Clause	Works Goods and Materials	Test	Frequency of Testing	Test Certificate	Comments
Series 1700					
1702	Cement				
1703					Certificate to be provided monthly for each type of cement Quality management and product certification schemes apply
1704					
	Sulphate-resisting Portland			Required (BS 4027)	
	Cements (all types)	Chloride content	Monthly		Tests to be carried out by the manufacturer and results included on the test certificates required above
	Aggregates	Grading	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 (N)	Monthly		
		Flakiness index (N)	Monthly		
		10% fines value (N)	Monthly		
		Drying shrinkage (N)	Monthly		
		Chloride content (N)	Daily		
		Sulphate content (N)	Monthly		
	Water	Tests specified in BS 3148	Monthly		

		Chloride content	Monthly		
		Sulphate content	Monthly		
		Acid-soluble alkali content	Weekly		
1707	Concrete	Cube strength (N)			Contractor to cast and test sufficient additional cubes to demonstrate cube strength before transfer.
			Reinforced concrete – two cubes from 20m ³ or 20 batches whichever represents the lesser volume.		
	Fresh concrete.	Density.			
		Modulus of elasticity			
		Workability (slump or compacting factor or Vebe) (N)	Each batch.		
		Air content.	Each batch.		
		Cement content.			
		Water/cement ratio.			
1712	Reinforcement				
	Steel fabric			Required (BS4483)	
					Certification that fabricated reinforcement complies with the routine inspection/testing

					requirements of BS4466 is required if the fabrication is not covered by a product certification scheme listed in Appendix B
Series 2400					
2401	Masonry cement			Required (BS5224)	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 (BS1199 and 1200)	
		Chloride content	Monthly		Test to be carried out by the manufacturer and results included on the test certificate.
2403	Water	Tests specified in BS3148	1 per source		
2404	Mortar admixtures			Required (BS4887) (BS5075)	Product certification scheme applies.

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. (N) indicates that a NAMAS test report or certificate is required.
3. Unless otherwise shown in this Appendix, tests for work, goods or materials as scheduled under any one Clause are required for all such work, goods or materials in the *works*.
4. Cube strength tests are not required for concrete complying with Clause 2602.
5. Unless otherwise shown in this Appendix test certificates for work, goods or materials as scheduled under any one clause are required for all such work, goods or materials in the *works*.

PRELIMINARIES

APPENDIX 1/6: SUPPLY AND DELIVERY OF SAMPLES TO THE *PROJECT MANAGER*

This schedule lists the frequency of sampling that will be carried out by the *Project Manager*, at his discretion, with assistance from the *Contractor* where required.

In the majority of cases the samples will be taken and transported to an approved NAMAS registered laboratory by a member of the *Project Manager's* staff. The exception to this is in the case of rolled asphalt surface course (design mix) to Clause 911, where blocks will need to be compacted by asphalt plant staff and delivered to the Laboratory for strength testing.

The list does not cover source approval but relates to materials used in the *works* once approval has been granted.

CLAUSE	SAMPLE DESCRIPTION	FREQUENCY OF SAMPLING	DELIVERY LOCATION	COMMENTS
503	Pipe bedding	1 per 200 tonnes	Site	
505	Filter medium backfill	1 per 200 tonnes	Site	
702	Surface Regularity	All Basecourse and Wearing Course	Site	
803 / 1105	Sub-base	1 per 400 tonnes	Site	
903 – 914 916 – 925 926 – 930 930 – 942	Bituminous mixtures	1 per 75 tonnes	Site	
927	Compacted bituminous material	As required in BS 4987: Part 2	Site	<i>Contractor</i> to make good core holes

CLAUSE	SAMPLE DESCRIPTION	FREQUENCY OF SAMPLING	DELIVERY LOCATION	COMMENTS
1707	Concrete	Reinforced: - 2 cubes per 20m ³ or 20 batches whichever represents the lesser volume	Site	Each batch test for workability and if applicable air content

PRELIMINARIES

APPENDIX 1/7 : SITE EXTENT AND LIMITATIONS ON USE

1) Extent of the site

The extent of the site boundaries shall be as shown on Drawing No. 11701/D/200, excluding the lengths of highway necessary for the Contractor's traffic signs and the temporary signing, traffic management and diversions.

2) Limitations on the Use of the Site

The Contractor must investigate the implications of Appendix 1/16, ,Privately & Publicly Owned Services & Supplies and allow for these within his programme of Works.

The Contrator must maintain access to the properties on Delamere Avenue, the bowling green, cricket ground and sports club to the east of the site at all times. Also the playground off Delamere Avenue to the south of the site.

The Contractor shall, at all times, provide and maintain secure fencing around the construction site to prohibit the trespass of pedestrians.

The Contractor must provide and maintain a permanent hard surfaced pedestrian footway, with a minimum width of 2 metres This footway will be securely fenced where it passes through the construction site to ensure that pedestrians cannot access the site.

PRELIMINARIES

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

1. The *Contractor* will be responsible for design of the following: -
 - a) Pedestrian & Traffic Safety and Management
 - b) Routing of Vehicles
 - c) Routing of Pedestrians
 - d) Site Compound Layout
 - e) Dust Suppression Measures
1. The *Contractor* is responsible for programming the works.

PRELIMINARIES

APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS

Setting Out

a) General

The *Contractor* shall, in accordance with the information included in the Contract, with the approval of the *Project Manager*, set out, mark and maintain until they are no longer required, all reference lines, templates, bench marks and markers, permanent or temporary, necessary for the setting out and checking of the Works. The *Contractor* shall keep updated schedules and drawings of such information which he shall supply the *Project Manager* as the setting out proceeds.

All setting out dimensions and existing ground levels shall be verified by the *Contractor*.

Temporary bench marks and co-ordinated survey markers shall be agreed with the *Project Manager* prior to commencement of the works.

Where setting out markers are likely to be disturbed during the Works, the *Contractor* shall, subject to the prior approval of the *Project Manager*, transfer such markers to an adjacent point.

The *Contractor* shall not commence either general site clearance or fencing before obtaining the approval of the *Project Manager* to the setting out of the site boundaries.

b) Horizontal Alignment

The proposed horizontal alignment shall be as shown on the Drawings.

c) Benchmarks

1. The position and level of Contract Benchmarks shall be agreed on site. Contract Benchmarks shall be sited for each section or phase of the Works such that access to them is within the Works Areas and that at no time will site personnel be required to cross a live carriageway to reach them.
2. If any of the Benchmarks become displaced during the Contract then the *Contractor* shall re-establish them immediately at his own expense and provide the *Project Manager* with the amended position and level details.
3. The *Contractor* shall, within 1 week, establish and maintain works benchmarks of approved design so that the distance between adjacent benchmarks shall not exceed 100m and the agreed levels shall be recorded thereon. Any discrepancy with Ordnance bench marks in the area which are shown on the Contract Drawings must be reported to the *Project Manager* in writing and his agreement obtained to the works bench mark levels.

d) Notice of Operations

Notwithstanding the *Project Manager's* approval of the *Contractor's* programme no operation shall be carried out without the full and complete notice in writing being given to him sufficiently in advance of the time of the operations to enable him to make such arrangements as he may deem necessary for inspection. The *Contractor* shall give the *Project Manager* at least twenty-four hours notice of his intention to set out lines or levels for any parts of the Works, in order that arrangements may be made for checking if considered necessary.

PRELIMINARIES

APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS (CONTINUED)

e) As-Built Drawing

The *Contractor* shall provide an as built survey drawing showing finished contours, drainage details (e.g. invert levels, cover levels, gradients, etc.) and other relevant details. This shall be provided to the CDM Co-ordinator for inclusion in the Health and Safety File (if applicable).

All levels and co-ordinates shall be related to Ordnance Datum wherever possible.

The As-Built Drawing must be presented in the following formats: -

- a) 3D DXF plan in AutoCAD 2006 format on disk;
- b) 3 No. 2D plans in AutoCAD 2006 format with original plans supplied on disk.

Survey data recorded must be initially downloaded by the Contractor and analysed and corrected as necessary before passing it on in the agreed format.

A schedule of permanent control stations shall be supplied giving the following information: -

- a) Station description;
- b) Plan co-ordinates;
- c) Level value.

A plan shall be provided for each control station giving measurements from permanent features to aid future location of the station.

The survey must include the following information:

- (i) Roads, Tracks, Footpaths – kerb lines or edge of surfacing to carriageways as applicable, extents of any dropped kerbs, footways, pedestrian crossings, steps, traffic islands, carriageway crown lines, changes of paved surface materials, surface markings (e.g. bus stop bays, loading areas, parking bays, double-yellow lines, etc.
- (ii) Buildings / Structures – all permanent buildings, outbuildings, names and numbers of all buildings, trades or premises, etc.
- (iii) Boundary features – fences (showing type and height), gates, stiles, hedges (showing type, height and width), walls (showing type, height and width), boundary markers, etc.
- (iv) Street furniture and visible service features e.g. call boxes, letter boxes, bus stops, lighting columns, telecommunication poles, electricity poles, vent pipes, road signs, road and street name boards, hoardings, notice boards, traffic signal and control boxes, vehicle detector pads, drains or gullies, fire hydrants, stop valves/ stop cocks, manhole and inspection covers, barriers, bollards, marker posts, trees, shrubs, planters, etc.
- (v) Spot levels – of verges, pavements, kerbs, channels, centre-line of roads at 10m intervals, storm water gullies, manholes, inspection covers, ducts, conduits, etc.
- (vi) New drainage runs (indicating pipe diameter, invert levels, foul or surface water, pipe material).

PRELIMINARIES

APPENDIX 1/12: SETTING OUT AND EXISTING GROUND LEVELS (CONTINUED)

f) Existing Levels

The *Contractor* shall, within 1 week, satisfy himself as to the accuracy of the original ground levels provided. Any discrepancy shall be reported to the *Project Manager* and if required a survey carried out prior to any excavation or filling operations.

PRELIMINARIES

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

1. Details of the services adjacent to and within the area of the *works* are indicated on Drawing No. 11701/D/01.
2. The *Contractor* shall make arrangements with the Public and Private Utilities and others concerned, for the co-ordination of his work with all work that needs to be done by them or their contractors concurrently with the *works*. Compliance with the periods of notice given in this Appendix does not relieve the *Contractor* of his obligations.
3. Private services to individual properties have not been listed or shown on the Drawings. The *Contractor* shall make arrangements with the Public and Private Utilities and others concerned for the phasing of all necessary disconnections and diversion of private services affected by the *works*.
4. The *Contractor* shall only remove disconnected apparatus with the prior consent of the relevant utility.
5. The names, addresses and telephone numbers of the utilities serving the locality are listed below:

Name	Address	Tel No
SP Power Systems (Manweb)	Power Systems (Wales Region), MANWEB plc, Rhostyllen, Wrexham LL14 4DU Contact: John Williams	01978 832020
British Gas - TRANSCO	North Wales and the Marches, Marchwiel, Wrexham, LL13 0UW Contact: Paul Williams (Network Assistance)	01978 290290
Dee Valley Water	Packsaddle, Wrexham Road, Rhostyllen, Wrexham, LL14 4EH	01978 846946
BT	Plant Protection Plant Alterations Room 15, Llandegai Technology Parc, Bangor Gwynedd LL57 4SS Contact: John Tilsley	0800 917 3993 01248 355541
Welsh Water	Connection Clerk PO Box 10, Treharris CF46 6XZ	01443 331155
Wrexham County Borough Council (Highways)	Operational Manager (Streetscene & Highways) Ruthin Road, Wrexham Contact: Paul Fairclough	01978 296009

6. The *Contractor* shall contact each of the utilities in order to obtain details of any proposed works affecting the site.

PRELIMINARIES

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

7. Public and Private Utilities

The *Contractor* shall take any and all measures necessary reasonably required by any Public or Private Utility Authority for the full protection of its mains, pipes, cables and other apparatus during the progress of works and shall construct and provide to the satisfaction of the Utility concerned all works necessary for the prevention of damage or interruption of services. If in the execution of the works, by reason of any subsidence or any act of neglect or default of the *Contractor*, any damage to any apparatus or any interruption of any service is caused, the *Contractor* shall bear and pay the cost reasonably incurred by the Utility concerned in making good such interruption. Approval or checking of the suitability of the design and or the construction of the protection by the *Project Manager* or the *Supervisor* shall not in any way relieve the *Contractor* of any of his responsibilities under the Terms and Conditions of the Contract.

The *Contractor* shall, at all times during the progress of the works, afford facilities to properly accredited agents of any Public or Private Utility for access to all or any of their apparatus situated in or under the site as may be necessary for inspection, reporting, maintaining, removing, renewing, or altering such apparatus in connection with the construction of the works or for any routine purpose.

The positions of Public and Private Utilities mains, services, drains and sewers shown on the drawings have been based upon information supplied by those Utilities and extracted from the records of the various bodies and must be regarded as approximate only.

The *Project Manager* does not guarantee either the accuracy of the information or the location of such apparatus and no warranty must be implied as to the position, depth, size or gradient thereof.

The *Contractor's* attention is drawn to the possibility of disused services to the properties previously on the site and already demolished. The *Contractor* shall liaise with Public Utilities and shall carry out trial holes as necessary to ascertain their location. If these unused services or any other services affect the works, the *Contractor* shall immediately notify both the appropriate Utility and the *Project Manager*.

The *Contractor* shall also be responsible for liaison with all the interested parties and for co-ordinating the works for provision of services to signs and street lighting.

The *Contractor* should take proper cognisance of any notes for guidance issued by the various Utilities.

As soon as practicable after the Contract commencement the *Contractor* shall locate and mark the position of Statutory Undertakers' mains and services, private mains, services and sewers and Public Authorities mains and sewers within, on and adjacent to the site of the Works. Location of services is to be within an accuracy of 10% in depth in plan i.e. 1m deep means accuracy of 100mm in position.

The *Contractor* shall locate and mark on the ground with pegs, paint, chalk or other means the position of the services. These markings shall then be maintained by the *Contractor* for the duration of the Contract unless otherwise instructed by the *Project Manager*.

PRELIMINARIES

APPENDIX 1/16: PRIVATELY AND PUBLICLY OWNED SERVICES AND SUPPLIES (CONTINUED)

8. Services and Supplies affected by the Works

The *Contractor* shall ascertain which services and/or supplies by Public and Private utilities will be affected by the works and take action to promote discussions with those parties to ensure that any interference etc, is kept to the minimum.

9. Alteration and Addition of Mains and Services

Should any mains or service be uncovered during the course of the works or be found to foul any new permanent structure, the *Contractor* shall inform the *Project Manager* who will give notice to the Undertaker concerned of any alterations or diversion that is in his opinion necessary. The *Employer* will pay all fees and charges for any such alterations that are properly due to any undertaker in respect of any order for such alterations given by the *Project Manager*.

No claim for interference or delay will be admitted with regard to work carried out by Public Utility Undertakers, with whom the *Contractor* shall co-ordinate his works.

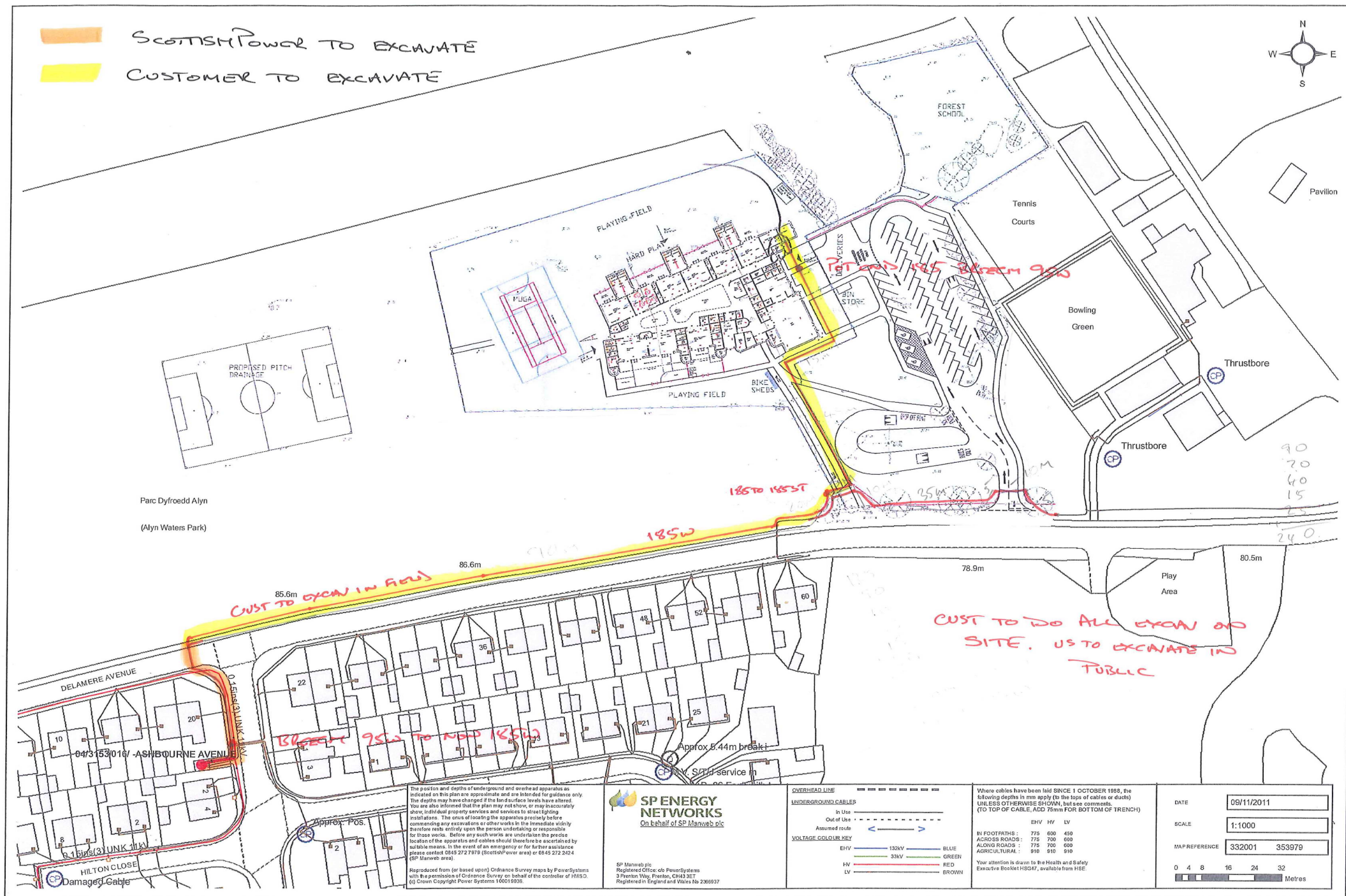
The *Employer* will not be held responsible for the cost of diversion or any mains, ducts, cables, pipes and the like that do not foul any of the permanent constructional works.

If applicable, details of preliminary arrangements that have been made with Statutory Undertakers and others for the alteration of services affected by the *Works* are listed in this Appendix.

PROPOSED WORKS FOR STATUTORY UNDERTAKERS

TABLE 2

SERVICE AND LOCATION	DESCRIPTION	DWG NO.	NOTICE REQUIRED TO COMMENCE	TIME FOR COMPLETION	NOTES
<u>Electricity</u> <u>SP Power Systems</u> <u>Delamere Avenue</u>	Installation of new mains service to school. Works to include on & off-site. See enclosed plan proposals.	Enclosed within this Appendix	To be agreed	To be agreed between Utility and Contractor. Contractor to liaise.	Contractor to carry out all excavations and reinstatement within school grounds. Utility to install cables and carry out jointing works. Contractor to liaise with Works paid for by WCBC in advance.



PRELIMINARIES

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT

The *Contractor* shall inform the *Project Manager* of the name and telephone numbers, (day and night), of the person nominated to be responsible for traffic safety and management where applicable.

1. Traffic Safety and Management Requirements

- 1.1 Temporary road lighting and signing shall be agreed with the *Project Manager*, the Police and Local Authority.
- 1.2 The *Contractor* shall properly phase the works to comply with any traffic orders that may have been or are being made, such that minimum disruption will be caused by any traffic arrangements by him, either on or off site.
- 1.3 The *Contractor* shall arrange that any large deliveries, delivery or removal of Equipment or machinery etc. be timed so as to cause a minimum inconvenience to other parties and traffic.
- 1.4 The *Contractor* shall produce drawings showing traffic management arrangements and indicating the location of temporary traffic signals, pedestrian crossings, guard rails or other protective measures etc.
- 1.5 The *Contractor* shall nominate a person/s on his staff who will be responsible for the control of traffic movement and to act as Traffic Officer.
The responsibilities of the Traffic Officer shall include liaison with the *Project Manager*, Highway Authorities and the Police Authority concerning the following matters: -
 - a) Controlling traffic at all times during the works when traffic restrictions are in operation.
 - b) Ensuring the smooth operation and maintenance of temporary traffic signals during the removal and installation of the new signals.
 - c) Ensuring that all Equipment is inspected and maintained.
 - d) Temporary highway crossings and accesses
 - e) Dealing with traffic in emergencies
- 1.6 The *Contractor* will inspect any temporary traffic management systems on a daily basis and remedy any faults found. The *Contractor* should note that during peak periods of traffic flow, it shall be necessary for any traffic signal installations to be manually controlled and monitored.
- 1.7 All vehicles loading and unloading must stand entirely within the Site boundary and must be able to enter and leave the Site in a forward direction and the *Contractor* shall ensure that the Site is adequately equipped with wheel washing facilities.
- 1.8 The *Contractor* shall ensure the occupants of adjoining or adjacent properties have free, unrestricted access at all times.
- 1.9 Should the *Contractor* propose any footway diversions these shall be properly signed, delineated by safety barriers, and surfaced. Signing of these diversions shall be the responsibility of the *Contractor*. Any loose joints between existing and proposed surfaces shall be made safe with temporary surfacing. Where diversions involve negotiating kerb upstands temporary ramps must be provided and surfaced to facilitate disabled access.

PRELIMINARIES

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (CONTINUED)

2. Traffic Orders

Notice required by the *Project Manager* to arrange for:

- (i) Authorising temporary traffic signals – 8 weeks;
- (ii) Authorisation for road closures or restriction, etc – 8 weeks

3. Contractor's Name Boards

Contractor's name boards clearly stating daytime and night-time emergency telephone contacts shall be displayed in at least 2 prominent locations on the site.

4. i) Working Hours

The *Contractor* will be permitted to work between the following hours: -

0800 - 1800 Monday to Friday
0800 - 1300 Saturday

Any extension to these hours, in particular night working, will be subject to the *Project Manager's* approval.

ii) Traffic Management Maintenance Log

The *Contractor* shall keep a daily log detailing the time of the daily traffic management maintenance, the work necessary to remedy any faults and the name of the person making the inspection. This log is to be available to the *Project Manager* at all times.

The *Contractor* shall note in his log any events, works or happenings that might have a bearing on the operation of the works. They shall also record all unforeseen events/happenings having a bearing on the works.

5. Notice Requirements

The *Contractor* shall notify the *Project Manager* of his need to:

- a) Amend traffic signs
- b) Gain authorisation for non-prescribed signs
- c) Use temporary traffic signals
- d) Erect temporary barriers etc.

at least 14 days prior to the required commencement of the works (except for emergency works).

6. The *Contractor* shall be responsible for liaising with the Police, the Local Highway Authority, emergency services or any other pertinent authority or organisation and for advising them of the timing and duration of any proposals.

PRELIMINARIES

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (CONTINUED)

7. Control of Dust

- i) The *Contractor* shall take all necessary steps to avoid creating a dust nuisance. If in the opinion of the *Project Manager* the *Contractor* is not dealing adequately with the control of dust, the *Project Manager* may instruct the *Contractor* to carry out such additional measures as the *Project Manager* considers necessary, at the *Contractor's* expense.
- ii) The *Contractor* shall keep all roads, accesses, rights of way, etc, leading to, from or crossing the Site free from mud, slurry or other hazardous substance deposited through his operations. The *Contractor* shall promptly remove at his expense any such substance deposited through his operations.
- iii) The *Project Manager* shall have the authority to close such crossings and exits if the *Contractor* does not promptly remove any such deposited substances.
- iii) Unless otherwise directed by the *Project Manager* the *Contractor* shall install wheel washing or other approved facilities at all exits from the Site and shall ensure that all vehicles leaving the site are adequately cleaned.
- v) The *Contractor* shall take appropriate measures to ensure that no material is allowed to enter any drain or sewer.
- vi) Compliance with this sub-clause shall not relieve the *Contractor* of any of his duties, responsibilities, obligations or liabilities under the Contract, by-laws or statutory provisions.

8. Works on Public Highways

Works must be undertaken in such a way that hazards to both workforce (including supervisory staff and the *Project Manager's* staff) and the public is minimised.

The minimum clearance between any area in which work is being undertaken and any part of the trafficked carriageway shall be as specified in Chapter 8 of the Traffic Signs Manual 2006. Equipment or materials shall not intrude into any area reserved for the passage of pedestrians, cyclists or other traffic. Equipment or materials shall not be left on the verge, hard strip or central reserve of any highway except when adequately marked, signed and lit to the approval of the *Project Manager*. Equipment or materials shall not be left on islands or on visibility splays at any time.

Vehicles and Equipment shall not be parked on the highway unless within a properly marked area, and they shall not be parked in any safety area or buffer zone.

All site personnel including supervisory staff and visitors) must wear high visibility garments, incorporating retro reflective markings when they are on or above those parts of the work within the public highway including those parts of the Works protected by signs and cones.

The *Contractor* shall be responsible for ascertaining and complying with the regulations and guidelines of the relevant Highway Authority with regard to signing and coning etc and working hour restrictions on trafficked highways.

PRELIMINARIES

APPENDIX 1/17: TRAFFIC SAFETY AND MANAGEMENT (CONTINUED)

9. Care of Public Highways

1. Subject and without prejudice to the Conditions of Contract the *Contractor* shall:
 - (ii) Take all reasonable measures necessary to avoid damage to the public highway.
 - (iii) Be responsible for all repairs necessary as a consequence of his failure to comply with sub-clause (i) of this Clause and shall submit to the *Project Manager* for approval his proposed methods of repair.
2. Sections of carriageway closed during the course of the *Works* shall be vigorously cleaned of all deposits that have built up since the closure before they are re-opened to traffic.
3. Highways including footpaths, cycle tracks and bridleways are the responsibility of the Wrexham County Borough Council, Guildhall, Wrexham.
Tel: 01978 292000

10. Accesses to be Maintained

Any access to adjoining properties shall be maintained throughout the *works* unless agreed otherwise with the *Project Manager*.

Temporary footway diversions shall be properly signed, fenced and surfaced. Signing of footway diversions and access routes will be the responsibility of the *Contractor*.

Any loose joints between existing and proposed surfaces shall be made safe with temporary surfacing. Where diversions involve negotiating kerb up-stands temporary ramps shall be provided and surfaced to facilitate disabled access.

11. Important Information

It should be noted that in the event of emergency evacuation being required from any adjoining properties safe unobstructed egress must be available at all times.

Tenderers should be aware of the implications of the above in the design of their temporary works, and in the programming of their works, all of which should be included within their Method Statements. The cost of including for the implications should be included within the tender generally.

PRELIMINARIES

APPENDIX 1/18: TEMPORARY DIVERSIONS FOR TRAFFIC

Where works are being undertaken adjacent to or within the public highway, the *Contractor's* attention is drawn to the following: -

1. Diversion of Pedestrian Routes
 - a) Pedestrian routes shall be protected in accordance with Chapter 8 of the "Traffic Signs Manual 1991" and the "Safety at Street Works and Road Works - A Code of Practice" (HMSO) and the "New Road and Street Works Act" (1991).
2. Diversion of Vehicular Routes
 - a) Consent must be sought from Wrexham County Borough Council, Operational Manager (Highways Infrastructure) (contact Geraint Bryn Jones, Tel. 01978 291770) for any temporary diversion of traffic and/or road closure for the period of the Contract. A minimum six weeks period of notice is required for the implementation of a Temporary Traffic Regulation Order/Notice.
3. The *Contractor* shall give a minimum of two weeks notice to the North Wales Police before the implementation of a traffic management scheme.
4. The *Contractor* shall remove each temporary diversion for traffic as soon as it is no longer required.
5. The minimum width of footway to be provided for pedestrian routes shall be 1.8m (where allowable).
6. All vehicle and pedestrian routes shall be clearly signed.
7. Access for emergency vehicles shall be maintained at all times.
8. Any areas where construction operations are taking place shall be enclosed with a 2m high temporary security fence approved by the Project Manager to separate the working area from vehicular and pedestrian routes

PRELIMINARIES

APPENDIX 1/19: ROUTEING OF VEHICLES

1. The *Contractor* shall define and agree with the *Project Manager* entry / exit points for the Site and shall also agree and implement any one way system etc, necessary for the smooth operation and flow of Site traffic and to promote minimum interference/inconvenience with local traffic.
2. The *Contractor* shall produce a drawing showing the agreed Site traffic system and shall ensure that all persons or companies visiting, delivering or working on the Site are aware of the scheme utilised.
3. Any use of permanent works by Construction traffic must conform to conditions laid down in the contract and all relevant British Standards and Codes of Practice. Use of permanent works shall also be agreed with the *Project Manager*.
4. The *Contractor* shall properly plan and operate any scheme to enable the regular or frequent movement of plant or machinery across public roads and shall obtain all permissions / approvals necessary for such operations to the satisfaction of the *Project Manager*.
5. The *Contractor* shall provide sleepers or other approved protection to all drains, pipes or ducts whenever he requires moving plant or vehicles across such drains, pipes or ducts and shall reinstate at his own expense any such drains, pipes or ducts which become damaged or disturbed.
6. The *Contractor* shall properly plan and operate any scheme to enable the regular or frequent movement of plant or machinery below overhead power lines and shall obtain all permissions / approvals necessary for such operations to the satisfaction of the *Project Manager*.
7. Vehicle routes must take into account pedestrian movement within the site and access/egress into/from the site.

SITE CLEARANCE

APPENDIX 2/1 - LIST OF BUILDINGS, ETC. TO BE DEMOLISHED OR PARTIALLY DEMOLISHED

1. General

- 1.1 The Contractor shall be responsible for the disconnection of electricity supplies to all the lighting columns, illuminated signs, feeder pillars etc.
- 1.2 (a) Road traffic signs shall not be removed until such time that the new traffic signs have been erected and are operational.
- 1.3 The Contractor shall be responsible for filling the voids resulting from the removal of site clearance objects etc., with lean mix concrete.

2. List Of Buildings / Structures To Be Partially Demolished

Address	Description	Drawing No.	Requirements
Frontage on Delamere Avenue	Stone boundary wall.	11701/D/200	The extent of the wall shown on the drawing together with its foundations to be excavated and removed and the resultant void backfilled with MOT type 1 material. The ends of the retained wall to be made good.

- 2.1 Whilst undertaking demolition works, the Contractor shall provide adequate protection to the following:
- i. all adjacent services
 - ii. existing trees and shrubs
 - iii. all adjacent properties
 - iv pedestrians and all road users
- 2.2 All material arising from demolition shall be removed off site to a licensed tip.

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES

1. This Appendix shall be read in conjunction with the information and details on the contract drawings.
2. The *Contractor* shall provide and erect 2m high sectional panel security fencing around the perimeter of the site and any additional areas indicated on the drawings.
3. The *Contractor* shall erect such hoardings etc, as are necessary and required by the *Project Manager* or Specification to protect adjoining properties from dust, noise etc.
4. All temporary timber fencing shall be treated with wood preservative according to the manufacturer's instruction.
5. The *Contractor* shall maintain all temporary fencing, hoarding etc, in good condition until its removal. This shall include the replacement/repair of missing or damaged sections.
6. Unless instructed otherwise, temporary fencing/hoardings shall remain in place until hand over, and shall then be removed and disposed of by the *Contractor*, who shall leave the remaining site in a tidy and orderly condition – all to the satisfaction of the *Project Manager*.

Permanent Fencing and Gates

7. Refer to Drawing No's. 11701/D/1100 for the location of fencing, gates, benches, etc.
8. Fences, gates, barriers and stiles shall be supplied and erected in accordance with BS 1722, manufacturer's recommendations and standard detail drawings.
9. **a) Fence Type : 2m high weld mesh perimeter fencing.**

Panels – 6mm vertical wire between two 8mm horizontal wires. Panels fixed to rolled hollow section posts using stainless steel security fixings and a full length clamp strip.

Panels manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 2030mm
Panel Length: 2.52m
Posts : RHS 60 x 40mm
Post set at : 2.52m centres

Fence Type Reference : IAE DUEX 868

To be supplied by: IAE Fencing
Mossfield Road
Adderley Green
Stoke-on-Trent
Staffordshire ST3 5BW
Tel. 08451 777200
Fax. 08451 777600

Or Equal Approved.

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

b) Gate Type: 2m high weld mesh vehicular gate.

Panels manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 2030mm
Width : 3035mm
SHS 80 x 80mm Hang Posts
SHS 60 X 60 / 60 x 40mm Gate frame
RSF 60 x 6mm Clamp flat
RSF 40 x 6mm Clamping bar

Gate Type Reference : IAE DUEX 868

To be supplied by:IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300

Or Equal Approved.

c) Gate Type: 2m high weld mesh vehicular gate.

Panels manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 2030mm
Width : 4000mm
SHS 80 x 80mm Hang Posts
SHS 60 X 60 / 60 x 40mm Gate frame
RSF 60 x 6mm Clamp flat
RSF 40 x 6mm Clamping bar

Gate Type Reference : IAE DUEX 868

To be supplied by:IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300

Or Equal Approved.

d) Gate Type : 2m high weld mesh pedestrian self-closing gate.

Panels manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 2030mm
Width : 1230mm

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

SHS 80 x 80mm Hang/Slam Posts
SHS 60 X 60 / 60 x 40mm Gate frame
RSF 60 x 6mm Clamp flat
RSF 40 x 6mm Clamping bar

Gate Type Reference : IAE DUEX 868

To be supplied by: IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300

Or Equal Approved.

e) Fence Type : Bow top perimeter fencing

1.2m high bow top fencing.
Panels manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 1200mm
Panel Length: 2800mm
Vertical bars: 12mm diameter
Rails: 40 x 10mm flt
Bar centres: 96mm
Panel fixing: Loose angle cleats
Posts: 50 x 50 RHS

To be supplied by: IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300

Or Equal Approved.

f) Gates Type : Bow top vehicular gate

1.2m high Double Leaf Bow Top vehicular gates, width: 3167mm between posts.
Manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 1200mm
Overall Width : 3000mm
Posts: 70 x 70mm RHS
Hang Stiles: 40 x 15mm RSF
Slam Stiles: 40 x 12mm RSF
Rails: 40 x 10mm RSF
Bows: 12mm dia solid bar
Angle cleats: 54 x 54 x 8mm, 30mm wide

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

Fixings: M10 cup sq. bolts & permacones.

Gate Type Reference : IAE DUEX 868

To be supplied by: IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300

Or Equal Approved

g) Gates Type : Bow top vehicular gate

1.2m high Double Leaf Bow Top vehicular gates, width: 6m between posts.
Manufactured to comply with BS 1722: Part 9.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green
Height: 1200mm
Overall Width : 6000mm
Posts: 70 x 70mm RHS
Hang Stiles: 40 x 15mm RSF
Slam Stiles: 40 x 12mm RSF
Rails: 40 x 10mm RSF
Bows: 12mm dia solid bar
Angle cleats: 54 x 54 x 8mm, 30mm wide

h) Gates Type : Bow top pedestrian gate

1.2m high pedestrian self-closing gate, width: 1100mm between posts.
Manufactured to comply with BS EN 1176 (playground equipment).
Type: "Prosafe" hydraulic dual action self-closing gate with integral stop.
Finish: Galvanised and Polyester Powder Colour Coated
Colour: Green

To be supplied by: IAE Fencing
Brookhouse Industrial Estate
Cheadle
Stoke-on-Trent
Staffordshire ST10 1SR
Tel. 01538 755888
Fax 01538 751300
Or Equal Approved.

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

i) Fence & Gate Type : Palisade Fencing and Gate to Bin Store

Pales -Contractors choice. Pale tops to be round and notched. To be galvanized and powder coated green.

Height to be 1800mm. Centre of posts to be 2.75m maximum. Bottom of fencing should have a maximum ground clearance of 50mm and additional rail fixed to pales 100mm from bottom.

Double bin store gate 1800mm wide to match palisade fencing, complete with locking bolts and holes for padlock.

Method of setting posts: Holes as manufacturers recommendations to a depth of 1 third of the fence completely filled to ground level with concrete.

Embedded length: 625mm.

Completely filled to ground level with concrete.

See Dwg No. 11701/D/ 1100 for details and location.

The Contractor shall allow for complete installation and an allowance made for either core drilling, installation of sleeve and backfill with epoxy cement, or alternatively a concrete base foundation.

10. Temporary Fencing around Construction Exclusion Zone

1. The Contractor shall provide and erect temporary Heras fencing around the perimeter of the Construction Exclusion Zone (CEZ) as shown on Dwg. No. TE11701/D/200, for the duration of the works to ensure that no construction vehicle will enter the CEZ. This will also separate the working area from pedestrian movements etc., as part of his obligations under the terms of The Health & Safety at Work Act, The Construction Regulations Act, the General Conditions of Contract etc.
2. All temporary Heras fencing shall be 2.5m high.
3. The Contractor shall maintain all temporary fencing in good condition until its removal. This shall include the replacement/repair of missing or damaged sections.
4. Unless instructed otherwise any temporary fencing shall remain in place until hand over and shall then be removed and disposed of by the Contractor, who shall leave the remaining site in a tidy and orderly condition - all to the satisfaction of the Engineer.
5. The cost of providing temporary fencing shall be included in the rates generally.

WREXHAM COUNCIL OWNED TREE STRATEGY POLICY DOCUMENT



CONDITIONS FOR WORK IN CLOSE PROXIMITY TO COUNCIL TREES

Key related documents:

Wrexham Council Owned Tree Strategy 2008-2013
LPG No.17 Trees and Development

Related policy	Aim
T1 & T3	To protect council owned trees & create a strategic approach to their management

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

Wrexham County Borough Council, Environment Department, conditions for works in close proximity to council owned trees.

Who this guidance is for

This document has been produced in conjunction with the Wrexham Council Owned Tree Strategy and is designed to provide **guidance for anyone intending to carry out construction, excavation or repair work above or below ground in close proximity** to council owned trees.

As a general guide work in close proximity will be **anything within 1M** of the edge of the tree canopy (see drawing, P4). It has been produced in order to protect council trees during works.

This document should be used in conjunction with BS5837: Trees in Relation to Construction 2005. It should be part of the initial design process in order to minimise costly and foreseeable design alterations that can be avoided.

Utility companies are required to adopt the guidelines set out in the National Joint Utilities Group (NJUG) publication Volume 4, 'Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees (Issue 2) Operatives Handbook'. A copy of this can be obtained from the council or www.njug.org.uk/publication/52.

BEFORE YOU GO ANY FURTHER DO THE FOLLOWING:

- Consider if the works be carried out in a location that won't affect trees? If not, can specialist equipment be used to reduce any impacts on trees?
- Notify the Council Arboricultural Section on 01978 729634 or 729641 or email treeinspections@wrexham.gov.uk.
- Contact the Planning Arboricultural Officer on 01978 252529.

Important Notes:

- For Planning Applications, trees subject to Tree Preservation Orders or trees that are within a designated Conservation Area, contact the Planning Arboricultural Officer. This document is not Planning Guidance.
- Failure to notify us may lead to criminal proceedings.

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

Wrexham County Borough Council, Environment Department, conditions for works in close proximity to council owned trees.

Terms and definitions

AO

(Arboricultural Officer) Employed by the council for expert advice relating to all tree matters.

RPA

(Root protection area) An area calculated in square metres by an arboriculturalist to provide sufficient protection of the tree root system. This will be indicated and provided on a plan.

CEZ

Construction exclusion zone. Area designated to protect above and below ground tree parts in which no construction or excavation works can take place without express permission of the AO. This will be indicated and provided on a plan. Fencing of 2.5m height of 'Herras' or similar type will surround this area until all works are completed.

Tree Roots

Responsible for the uptake of water and nutrients, storage of food for growth and the stability of a tree. Damage to roots will have an impact on tree health or stability.

Fibrous Roots

Fine roots required for the uptake of water essential to maintain the living parts of a tree. Removal of clumps of these roots can cause significant deterioration in tree health.



Structural roots

Responsible for anchoring the tree in the ground. Severance or removal of these roots causes root and stem decay and sometimes complete tree failure.



FENCING

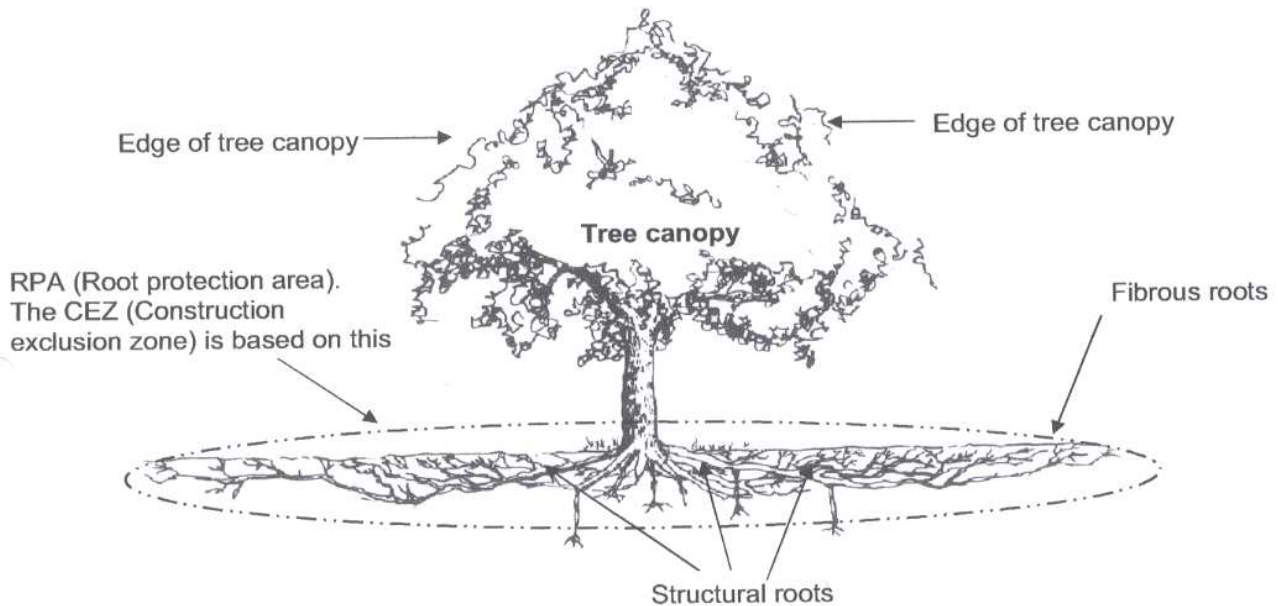
APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

Wrexham County Borough Council, Environment Department, conditions for works in close proximity to council owned trees.

Canopy

Branches radiating from the trunk and leaves on branches form the tree canopy.

Drawing to show terms and definitions.



Policy Guidance Notes

Pre-construction phase

- P1. Prior to any work commencing protective (herras) or similar fencing 2.5 Metres in height will need to be installed based on the root protection area (RPA). The placement of fencing will be indicated on a plan provided by the council. Fencing must be in place prior to any works taking place ready for the arboricultural officer (AO) to inspect.

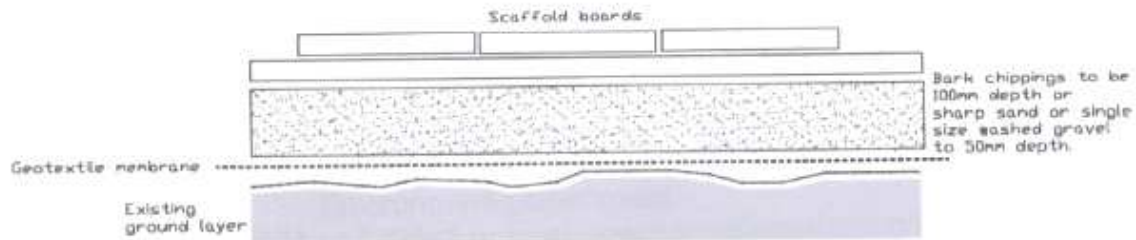
Protective fencing must remain in place until all work is completed and all associated materials and equipment are removed from site.

- P2. Where incursion to the RPA is necessary a temporary surface may be required to prevent disturbance or compaction of the soil.
- i) For tracked or wheeled vehicles, ground protection must be specified by an engineer in consultation with the AO.
 - ii) For pedestrian traffic. Ground protection must consist of a porous geotextile material on which a compressible layer can be added such as sharp sand with scaffold boards or similar on top (see drawing below).

FENCING

APPENDIX 3/1: FENCING, GATES AND STILES (CONTINUED)

Wrexham County Borough Council, Environment Department, conditions for works in close proximity to council owned trees.



Construction phase

- C1. No storage of equipment, materials or chemical based solutions is permitted within the RPA / CEZ.
- C2. No vehicular access within CEZ without prior agreement with the AO.
- C3. No burning of materials or fires within 10 Metres of the RPA / CEZ.
- C4. No disturbance of the soil including level changes or compaction within the RPA / CEZ without prior consultation with the AO.
- C5. No storage of temporary buildings, sheds or offices within the RPA.
- C6. All underground utilities must be routed outside the RPA or where this is not possible in consultation with the AO.
- C7. No changes will take place that will alter the amount of water infiltration surrounding or within the RPA without the consent of the AO.

Protection of tree roots

In order to reduce any significant damage to tree roots within the RPA all soil stripping and excavation must be carried out by hand digging only. Where construction is within the RPA the use of specialist engineering solutions may be required. This will be discussed and agreed with the AO in consultation with an engineer.

- R1. Unless instructed otherwise, all hand digging within the RPA must be under the supervision of the AO.
- R2. All tree roots uncovered must be wrapped immediately in dry sacking until backfilling takes place. Tree roots must not remain exposed.
- R3. Clumps of fibrous roots must not be severed and need to be retained as in R2.
- R4. Severance of structural roots 25mm or more in diameter is not permitted without prior permission of the AO.
- R5. If roots are accidentally damaged the tree owner **must** be notified and given the opportunity to inspect the damage before it is covered over.

SAFETY FENCES, SAFETY BARRIERS & GUARDRAILS
APPENDIX 4/1 : ROAD RESTRAINT SYSTEMS (VEHICLE AND PEDESTRIAN)

1 – Pedestrian Guardrail – see Dwg. No. 11701/D/1100

1. Contractor to allow for loading, off-loading, handling, storage, assembly and full installation within footway areas, as indicated on the drawings.
2. The exact locations for pedestrian post and guardrails will be confirmed on Site.
3. Posts and panels will be installed according to manufacturers specification.
4. The Contractor should allow for complete installation and allowance for either core drilling to a depth ne. 350mm and of a diameter ne. 120mm and backfill with epoxy cement or alternatively concrete base foundation.

Manufacturer Details

1. Supplier : Hugh Logan Engineering Limited
 Tel: 01623 6292995, Fax: 01623 629275
2. Panels to be 'OB1' complete with sections of circles, with V4 splays.
3. Finish to be hot dipped galvanised to BSEN ISO 1461 (1999).
4. Panels to be 1.045m high.

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/1 : DRAINAGE REQUIREMENTS

GENERAL

1. Pipes for drainage shall be plastic in accordance with Table 5/1.
2. Foul Sewer Works shall be constructed by a Contractor approved by Welsh Water.
3. The locations, sizes and types of pipe are shown on Atkins drawings,
4. Granular bedding material shall comply with Table 5/3.
5. Surface water joints shall be partly waterproof.
6. All gullies are to be trapped and high density polyethylene (HDPE) with a nominal internal diameter of 450mm, depth 914mm with 178mm dia. outlet spigots for connection to fittings incorporating ring steal sockets for clay pipe system, 178mm dia. (BS EN 295). The road gullies are to comply with DETR and MCD for HW, Vol 3, Dwg no. F13 of the HCD. A minimum thickness of 150mm of concrete to surround gully.
7. The depth of cover to gully outlet pipe shall be a minimum of 750mm in carriageway areas.
8. Gully connections to be 150mm diameter standard strength vitrified clay pipes with Type Z bedding (see HCD dwg no F1)
9. Sulphate resisting Portland cement is required for all precast concrete, in situ concrete and mortar.
10. Manholes are to be provided with a Grade A double triangular cover and frame to BS497: Part 1: 1976, Ref MA-60.
11. All gully gratings and frames shall be to BSEN 124 : 1994, Reference D400 unless otherwise specified on the dwgs.
12. All gully gratings shall be end hinged at the end nearest the oncoming traffic and shall be captive within the frame.

ACO MULTIDRAIN M100D – Carpark Entrance

- Manufacturer: ACO Water Management: Civils & Infrastructure, Div of ACO Technologies plc
 - Web: www.aco.co.uk
 - Email: customersupport@aco.co.uk
 - Tel: +44 (0)1462 816666
 - Fax: +44 (0)1462 815895
 - Address: ACO Business Park, Hitchin Road, Shefford, Bedfordshire SG17 5TE.
 - Product reference: M100D.
- Channel:
 - Type of fall: Constant invert.
 - Joints: Roddable trap, PVC-U.
 - Size: 110 mm diameter in footpath / 160 mm diameter in road.
 - Accessories: Sump unit with sediment bucket, Drainlock security locking assembly.
- Gratings:
 - Load class C250 (Cars and light vans): Slotted galvanized steel grating in highway, 'Heelguard™' resin composite grating (black) in footpath.

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

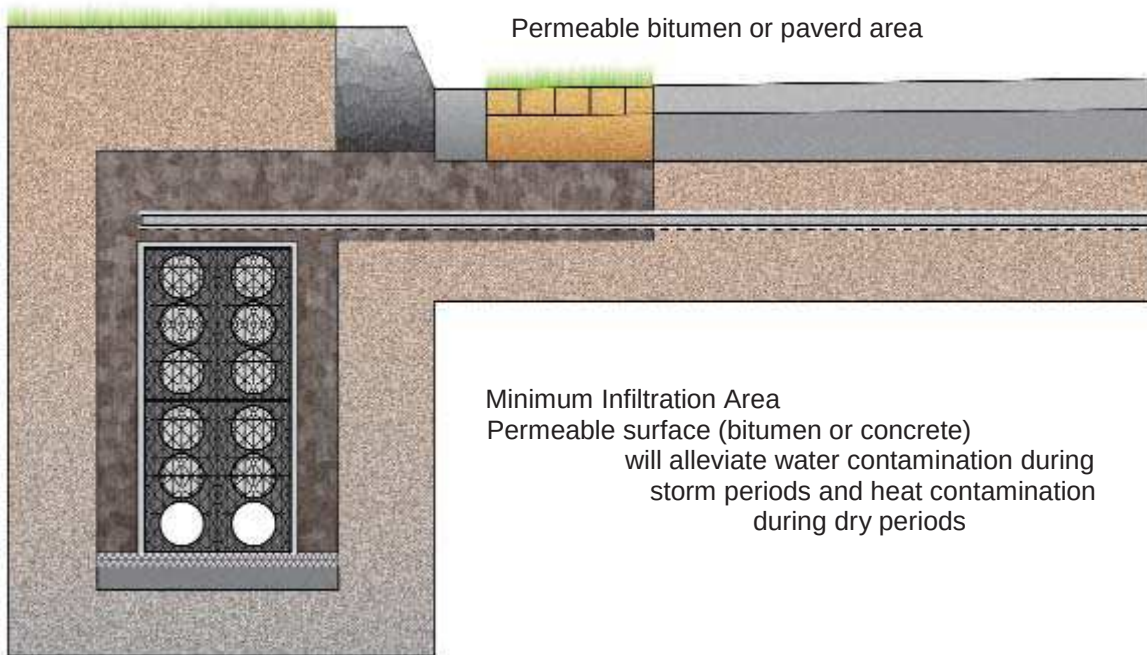
1. SOAKAWAY SYSTEM - PLASTICS UNITS MODULAR GEO-CELL

See dwgs :- 5104033-WA-C-108, 110 & 112

Overall dimension required as pluvial soakaway – 25 x 10m

Standard Pluvial Cube Module – 500 x 500 x 1075 each.

Typical Detail



Installation Steps

1. Excavate the pipe trench and lay the inlet pipe to the required fall and install silt traps in appropriate locations in the pipe run.
2. Excavate the hole or trench to the required dimensions to modular units, and any external inspection chamber(s) and / or silt trap(s).
3. Ensure that the base plan dimensions of the hole allows sufficient working space for the site operatives to manoeuvre the units and geotextile into position.
4. Ensure that the base of the excavation is flat and level, batter back the sides of the excavation to a safe angle, and ensure that the safe access is provided for the site operatives.
5. Remove any soft spots from the excavation and replace with compacted granular material.
6. **For Soakaway**, lay 100mm coarse sand bedding to the base of the excavation and level.
7. **For Soakaway**, lay the geotextile, Geotex 225ff, over the base and up the sides of the excavation with minimum 200mm overlap joints between strips.
8. Ensure there is a minimum 200mm over-run of geo-textile at the end of the modular unit.
9. Inspect geotextile for damage.
10. Assemble the module tanks to required dimensions. The illustrations show the correct relationships, orientation, and sequence of connection of each panel to form a basic full module tank (500 x 500 x depth).
11. Assemble the Pluvial Cube Modules in orientation as per drawing.
12. To receive the 110mm inlet pipe (and outlet/ inspection pipe as required). Insert tank connector and, using geotextile, form a wrap around apron of the tank connector spigot and secure using tape or jubilee clip. Ensure a minimum 50mm of spigot remains exposed. Ensure all inlets and outlets are sealed with welded preformed pipe flanges.
13. Continue with the geotextile encapsulation of the Pluvial Cube tank.

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

14. Fold the corners of the geotextile over-run at each end of the infiltration tank as shown, wetting all corners.
15. Complete the encapsulation by wrapping the geotextile horizontally around the tank and tape into position.
16. Connect inlet / outlet / vent pipe and inspection chambers using appropriate adaptors.
17. Backfill around excavation using type 1 or 2 sub base or selected granular material, and compact in layers of not less than 150mm. The first 500mm of any installation should be compacted by hand.
18. Use a coarse sand protection layer over the top of the Pluvial Cube tanks and geotextile and the back fill to the required depth using Type 1 or 2 sub base material. If the area is to be trafficked. Where the area is to be landscaped then as-dug material may be used provided sharp or large solid matter is removed.
19. The area should then be compacted using suitable compaction equipment in accordance with specification for highway Works.

2. BIO-RETENTION – See drawings 5104033-WA-C-107 & 110

For Landscaping Proposals – See Drawing No's 11701/D/300, 301 & 302

For outlet headwalls see Drawing 109 and para 5 of this Appendix

Filter medium

Filter medium shall be a mixture composed as in the table below in accordance with CIRIA 697.

Component	Proportion in soil mixture
Sand	35 – 60%
Silt	30 – 50%
Clay	10 – 25%
Organic matter	0 – 4%
Topsoil	–

Soil pH shall be in the region 5.2-7, shall be uniform, free from stones, stumps, roots and all other course objects greater than 50mm.

Sands Layer

Sand layer shall be clean sand and consist of sand with a grain size of 0.5mm to 1mm.

Gravel Underdrain Layer

Gravel underdrain layer shall consist of 2mm-5mm aggregate in accordance with BS 882.

Geo-textile Membrane

Geo-textile membrane shall be Terram T1000, or similar based on BS EN 13252:2001.

Observation Pipe

Observation pipe shall be a 150mm PVC-U pipework, securely capped to prevent vandalism.

Construction

Bio-retention areas should ideally be constructed at the end of development, to minimise erosion and sediment generation, and a dense and vigorous vegetative cover should be established over the contributing pervious catchment area before runoff is accepted into the facility. If this is impractical, bio-retention areas should be protected from runoff by using silt fences or straw bales as recommended in the CIRIA publication C532 *Control of water pollution from construction sites*, (Masters-Williams *et al*, 2001). To minimise the risk of premature system failure the following points should be closely monitored during the construction of bioretention areas:

- care should be taken not to compact the soils below the bio-retention area, and particularly the filter and soil planting bed, as this will reduce infiltration capacities

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

- to excavate a bio-retention area, a backhoe excavator should be used and construction plant should avoid running over the bio-retention area
- mulch should not be piled up around plants as this will cause disease and encourage pests
- care should be taken to ensure that geotextiles are not clogged or torn during construction
- if soil for the filter layer is imported, soil testing should be carried out: the test should include a particle size distribution, pH and organic matter test for each retention area.

3. HARD PLAY SPORTS AREA – See Drawing 5104033-WA-C-101, 105, 109 & 110

For details of open textured asphalt surfacing refer to Appendix 11/1.

Lateral drains to be installed at 5m centres. Trenches to be lined with geotextile and be a min of 450mm deep by 300mm wide and contain 100mm dia perforated plastic drainage pipe.

Trench to be backfilled with 6-10mm clean stone or gravel.

Lateral drains to connect to a 225mm solid wall collector drain along the eastern boundary of the pitch to then enter a surface water manhole with a 225mm outlet to a Geocell Soakaway.

Geocell soakaway to be 2 x 2 x 1.5m and constructed in accordance with para 1 of this Appendix.

4. GRASSED FOOTBALL PITCH - See Drawing 5104033-WA-C-101, 105, 109 & 110

Lateral drains to be installed at 10m centres. Trenches to be lined with geotextile and be a min of 600mm deep by 300mm wide and contain 100mm dia perforated plastic drainage pipe.

Trench to be backfilled with 6-10mm clean stone or gravel.

Lateral drains to connect to a 225mm solid wall collector drain along the eastern boundary of the pitch to then enter a surface water manhole with a 225mm outlet to a Geocell Soakaway.

Geocell soakaway to be 2 x 2 x 2m and constructed in accordance with para 2 of this Appendix.

5. SWALES

SWALES – See Drawings 5104033-WA-C0-109 & 110

Top Soil

150mm topsoil of loamy sand or sandy loam texture, with less than 5% clay content, a corrected pH of 6 to 7, and at least 2% organic matter.

There are 2 types of Grass seeding – See Drawing 11701/D/300 to 302 for landscape details.

Standard Grass seeding shall comply with the relevant provisions of MCHW1Clauses 3005.1 to 3005.11 subject to the following:

- Grass seed to be conventionally sown at a rate of 20g/m².
- Grass seed mix shall comprise of:

20% Perennial Ryegrass

10% Highland Bent

20% Chewings Fescue

40% Slender Creeping Red Fescue

10% Smooth Stalked Meadow Grass

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

Geo-textile Membrane

Geo-textile membrane shall be Terram T1000, or similar based on BS EN 13252:2001.

Construction

Swales should not receive any runoff until vegetation in the system is fully established and construction at the site has reached a state where sediment from the site will not cause siltation of the swale. This can be achieved either by:

- (a) Diverting flows until the vegetation is well rooted.
- (b) Placing an erosion control blanket (eg jute, straw or geosynthetic mats) over the freshly applied seed mix or:
- (c) Using bare earth as a temporary cover during the wet season. These areas should be seeded with a suitable grass mix as soon as the weather is conducive to seed germination.

If more than 30 per cent of the planted area is bare after four weeks, reseeding or replanting should be considered to achieve 90 per cent coverage. If sediment from construction work accumulates on a swale, it should be cleared and the swale fully rehabilitated before the drainage system is adopted by the organisation carrying out the maintenance. Care must be taken that design levels and slopes for inlets and swale base and sides are constructed accurately to avoid runoff bypassing swale inlets, ponding in the swale base and flow channelling. Care should be taken not to compact the soil below a swale as this will reduce its capacity for infiltration.

OUTLET HEADWALLS - To Swales and Bio Retention

- Concrete base: In situ concrete (general) - Thickness: 200 mm.
- Splash plate: In situ concrete (general), 600 x 600 x 150 mm.
- Vermin grating: 25 mm maximum mesh to extend 75 mm beyond pipe opening on all sides, fish-tail straps for building-in and hinges in mild steel, galvanized to BS EN ISO 1461 after manufacture.

INLET HEADWALLS - From Swales and Bio-retention

- Concrete base: In situ concrete (general) - Thickness: 200 mm. Top of base: 300 mm (minimum) below inlet pipe invert, to form silt trap.
- Vermin grating: 25 mm maximum mesh to extend 75 mm beyond pipe opening on all sides, fish-tail straps for building-in and hinges in mild steel, galvanized to BS EN ISO 1461 after manufacture.
- Debris grille: 40 x 10 mm frame, 12 mm diameter vertical bars at 60 mm spacing, fish-tail straps for building-in and hinges in mild steel, galvanized to BS EN ISO 1461 after manufacture.

6. PARKING BAYS IN CARPARK

Permeable concrete block paving **Based on drawings 5104033-WA-C108 & 110**

Products

Paving Blocks

The surfacing shall comprise paving blocks manufactured by a member of Interpave, in accordance with BSEN1338:2003 – '*Concrete paving blocks – Requirements and test methods*' BSI 2003. They shall be manufactured and marketed for permeable pavements. Originally blocks 80mm thick were used for all types concrete block permeable pavements but thinner concrete blocks are now available that are suitable for specific loadings and

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

applications. It is recommended that advice from the block paving manufacturer is sought on suitable block thicknesses for particular applications.

Laying Course

The laying course material must be sufficiently coarse to allow the free vertical flow of water and to prevent its intrusion into the underlying coarse graded aggregate, yet sufficiently fine to permit the accurate installation of the paving blocks. Typically, the laying course and jointing material should fall within the Particle Size Distribution envelope of Table below, but advice should be sought from the block paving manufacturer on specific gradings suitable for their products/systems. The material should comply with the requirements of a material of type 2/6.3 Gc 80/20 according to BS EN 13242:2002. *'Aggregates for unbound and hydraulically bound materials for use in civil engineering works and road construction'* as shown in Table 11. Note that the term 2/6.3 means that the material has particle sizes that are predominantly within the range of 2mm to 6.3mm. This is the way in which aggregates, including fine aggregates, are designated in BS EN 13242:2002 which states: *"This designation accepts the presence of some particles which are retained on the upper sieve (oversize) and some which pass the lower sieve (undersize)"*, i.e. there is a small proportion of material that is greater than 6.3mm and less than 2mm.

BS sieve size, (mm)	Percentage passing
14	100
10	90-100
6.3	80-99
2	0-20
1	0-5

Sub Base

Typically the coarse graded aggregate (CGA) material should fall within the Particle Size Distribution envelope of Table below but advice should be sought from the block paving manufacturer on specific gradings suitable for their product/systems. CGA should comply with the requirements of BS EN 13242:2002 – *'Aggregates for unbound and hydraulically bound materials for use in civil engineering work and road construction.'* The material should be designated Type 4/20 (4mm minimum and 20mm maximum particle size). Details on the availability and suitability of these materials should be obtained from local aggregate suppliers. In order to be able to sustain the effects of traffic under both dry and wet conditions, the CGA should meet the physical requirements shown below

BS sieve size, (mm)	Percentage passing
14	100
10	90-100
6.3	80-99
2	0-20
1	0-5

DRAINAGE AND SERVICE DUCTS
APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

Properties	Category to BS EN 13242 (BSI, 2003) or BS 12620 (BSI, 2002b)
Grading	Grading 4/40, Gc 85-15, GTc 20/17.5.
Fines content	f4
Shape	FI20
Resistance to fragmentation	LA30
Durability: Water absorption to BS EN 1097-6:2000, Clause 7 For WA.2%, magnesium sulphate soundness	WA242 MS18
Resistance to wear	MDE20
Acid-soluble sulphate content: aggregates other than air-cooled blast-furnace slag	AS0.2
air-cooled blast-furnace slag	AS1.0
Total sulphur: aggregates other than air-cooled blast-furnace slag	</ = 1% by mass.
air-cooled blast-furnace slag	</ = 2% by mass.
Volume stability of blast-furnace and steel slags: air-cooled blast-furnace slag	Free from dicalcium silicate and iron disintegration (BS EN 13242, (BSI, 2003), 6.4.2.2).
steel slag	V5
Leaching of contaminants	Blast furnace slag and other recycled materials should meet the requirements of the Environment Agency Waste Acceptance Criteria for inert waste when leachate tested in accordance with BS EN 12457,3 (BSI, 2002a).

Geo-textile Membrane

Geo-textile membrane shall be Terram T1000, or similar based on BS EN 13252:2001.

Construction

The following guidance should be considered when constructing a pervious pavement structure:

1. Any sub-grade soft spots should be excavated and back-filled with suitable well compacted material. The formation should be prepared by trimming to level and compacting in accordance with Specification for Highways Works, to a tolerance of +20 to – 30 mm. If sub-grade improvement is employed, testing will be needed to demonstrate that the design CBR values have been consistently achieved.
2. Transportation and construction process. Care should be taken to avoid segregation but, if this occurs, corrective action must be taken. This can be minimised by using an angular, crushed material with high surface friction. Unlike material for conventional pavements, those for permeable pavements must not be compacted to minimise voids. This could result in surface movement when construction traffic passes over. It may be desirable to undertake site trials to determine the appropriate construction methodology. The sub-base should be laid in 100–150 mm layers and compacted to ensure that the maximum density is achieved for the particular material type and grading, without crushing the individual particles, or reducing the void ratio below the design value, within a tolerance of +20 mm to –15 mm of the design level.
3. Geotextiles should be laid in accordance with manufacturers' instructions and with overlaps between adjacent strips of 300 mm without any folds or creases. It is recommended that specialist advice be sought from the manufacturer or supplier of the geosynthetic filter.
4. Generally, concrete block pavements should be constructed in accordance with BS 7533: Part3: 2005, Code of Practice for laying precast concrete paving blocks and clay pavers for flexible pavements, the technical sections for which are available for download on the Interpave website at www.paving.org. Advice should be sought from

DRAINAGE AND SERVICE DUCTS

APPENDIX 5/70: STORM WATER SOURCE CONTROL SYSTEM

the specific manufacturer on any product specific requirements, laying and jointing materials, block patterns and block laying procedures. In accordance with good practice, the block surface layer should be fully compacted and jointed to within 1 m of the laying face at the end of each day. Other pavement surfaces should be constructed according to the relevant British Standards and/or the surface manufacturer's guidance.

Preventing impermeable contaminants such as soil and mud from entering the pavement surface and sub-base both during and after construction is imperative to ensure that the pavement remains permeable throughout its design life. Construction equipment should be kept away from the area and silt fences, staged excavation works and temporary drainage swales which divert runoff away from the area should all be considered to manage these risks. Landscaping activities should be carefully designed and carried out to prevent deposition of topsoil, turf and other materials on the surface of the pavement. Infiltration surfaces must not be compacted and should be protected at all times.

7. FOOTBALL PITCH DRAINAGE

As detailed also on Dwg No.05104033-WA-C109

The area of the proposed pitch will require general re-grading in order to provide a level surface and sub-surface gradients to facilitate drainage falls.

The existing topsoil to a nominal depth of 150mm should be stripped and regraded.

Drainage gravel trenches to be installed complete with lateral drains to be 100mm dia perforated plastic at 10m centres @ 600mm depth and 200mm wide to connect into main collector drains, 225mm plastic pipes on east side of the pitch.

150mm of imported topsoil to be laid and seeded (for seeding see Appendix 30/5)

The lateral drains should start 2m outside the touchlines. Laterals should be at a constant depth following the natural slope.

Apply 85mm depth of medium / fine sand (to BS822) before the imported topsoil.
Gravel in drains and slits :- 6-9mm dia

Pipe bedding: Granular material to BS EN 12620, size 4/10.
Recycled content of granular material: 50% (minimum) to BS EN ISO 14021.

Seeding to be in Type – A9 (General Outfield)

EARTHWORKS

APPENDIX 6/1 : REQUIREMENTS FOR ACCEPTABILITY AND TESTING ETC. OF EARTHWORKS MATERIAL

1. The Supervisor will classify and determine the acceptability of earthworks materials at the point of excavation.
2. The requirements for Contractor testing are given in Appendix 1/5.
3. The Contractor shall refer to the relevant demolition and earthwork drawings, including any associated section drawings when determining areas of fill and excavation.
4. No blasting will be allowed.
5. Cutting faces of excavations for foundations, retaining walls and other buried structures shall be kept to the minimum dimensions required to allow the installation and removal of shuttering etc.

Undercutting of existing structures will not be allowed and any special measures required to maintain their integrity shall be agreed with the Engineer and appropriate action taken by the Contractor.

Undercutting of cutting slopes shall not be permitted.

The Contractor shall supply and fix all trench boxes, struts, braces etc, necessary for the support and protection of excavations.

6. Compaction of materials is proposed to be by method compaction for the type of on site materials. However, due to the variability in material types, this is to be a minimum compaction requirement. Minimum performance requirements also form part of this specification.

The Contractor should confirm the suitability of compaction plant, passes, layer thicknesses etc in achieving the performance requirements, either through:

- a) Trial compaction on various materials prior to excavation.
- b) Monitoring of compaction by in situ density tests.

7. Compaction of fill materials shall be in accordance with the following:

Material Type	Minimum Compaction Requirement (Ref. Department of Transport Spec. Table 6/4)	Minimum Performance Requirements
Class 1A	Method 2	90% of maximum dry density of BS 1377 : Part 4 (45 kg)
Class 1B	Method 3	90% of maximum dry density of BS 1377 : part 4 (4.5kg)
Class 2A	Method 1*	Dry Density corresponding to 5% air voids at placed moisture content
Class 2B	Method 2	Dry Density corresponding to 5% air voids at placed moisture content
Class 2C	Method 2	Dry Density corresponding to 5% air voids at placed moisture content

* See Specification for Highway Works Table 6/1 for exceptions

EARTHWORKS

APPENDIX 6/2: REQUIREMENTS FOR DEALING WITH CLASS U2 UNACCEPTABLE MATERIAL (CONTINUED)

1. It is not anticipated that any Class U2 material will be encountered within the works. Should any U2 material be excavated it must be treated and disposed of in accordance with the 'Special Waste Regulations 1996'. Amended Version 2 November 2001.
- i). Unacceptable material Class U2 shall be: -

Any materials having hazardous chemical or physical properties requiring special measures for its excavation/collection, handling, storage, transportation, deposition or disposal.

All excavated concrete and surfacing shall be classed as U1A material
- ii) The *Contractor* shall notify the *Project Manager* and the local Environmental Health Officer upon discovery of any Class U2 materials other than that already identified with the contract, and agree with them the details for its disposal, which shall include the methods for collecting, handling, transportation and disposal of the said material at a destination/site also agreed with the Environmental Health Officer and WRA. Issue of appropriate Waste Transfer tickets shall be required.
- iii) The *Contractor* shall agree with all appropriate authorities the methods to be employed when dealing with special drainage and for sealing exposed faces of contaminated materials.

EARTHWORKS
APPENDIX 6/8: TOPSOILING

- 1 A large amount of topsoil Class 5A is anticipated. The quantity of topsoil shall be supplemented as required by imported Class 5B material.
- 2 Topsoil is to be deposited to a thickness of 200mm to all reinstated slopes and verges where areas are to seeded or turfed. Within areas of landscaping topsoil shall be deposited to a thickness of 400mm.
- 3 Topsoil shall be in accordance with BS3882 and shall be medium loam mixture, not of clay or of sandstone origin, with a pH of between 6.5 and 7.5. It shall be free of stones, consolidated lumps, perennial weeds, roots, sticks and other extraneous matter. Prior to any topsoil being approved for use on site a sample shall be analysed by the Project manager. For the purposes of this standard the following definition applies: Stone – Any hard inorganic particle larger than 2mm that cannot be readily broken down by washing with water.
- 4 See also appendix 30/6.

ROAD PAVEMENTS
APPENDIX 7/1

A - Carriageway : Car Park Construction (Flexible Surfacing)

Grid for checking levels of pavement courses (Clause 702.4):

Longitudinal dimension: 10m

Transverse dimension: 2m

LAYER	CLAUSE	MATERIAL	GRADE OF BINDER	THICKNESS (mm)	SPECIAL REQUIREMENTS
Surface Course	912	AC 10 surf 100/150	40/60 pen	30	10mm Nominal Size
Binder Course	906	Dense Bitumen Macadam	100/150 pen	75	20mm Nominal Size
Base	903	Dense Bitumen Macadam	100/150 pen	100	40mm Nominal Size
Sub-base	803	Recycled Type 1 Granular	-	200	Clause 1030 & B SEN 206-1, BS8500-2, B SEN 13877-2
Geotextile	-	Scotlay 6120 (Or Equal Approved)	-	-	See Appendix 6/5
TOTAL PAVEMENT THICKNESS				405	

ROAD PAVEMENTS – GENERAL
APPENDIX 7/1: Continued

B - Carriageway : Car Park Construction (Permeable Concrete Block Paving)

See also Appendix 5/70

Grid for checking levels of pavement courses (Clause 702.4):

Longitudinal dimension: 10m

Transverse dimension: 2m

	CLAUSE	MATERIAL	GRADE OF BINDER	THICKNESS (mm)	SPECIAL REQUIREMENTS
Surface Course	-	Permeable Concrete Block Paving	-	80	blocks laid in herringbone pattern with 2 stretcher course surround.
Laying Course	-	2-6mm clean stone	-	50	BS EN 13242:2002
Geotextile	-	Inbitex	-		See Appendix 5/70
Upper Sub-base	-	5-20mm clean stone	-	100	BS EN 13242:2002 Recycled Type 1 Granular
Geotextile	-	SC Intergrid	-	-	-
Lower Sub-base	-	10-63mm clean stone	-	250	BS EN 13242:2002 Recycled Type 1 Granular
Geotextile	-	SC heavy duty membrane (or equal approved)	-	-	Under lower sub-base. Joints welded. See Appendix 5/70
Sand protection	-	Coarse sand	-	50	At formation to protect the SC heavy duty membrane
TOTAL PAVEMENT THICKNESS				530	

Permeable Concrete Block Paving

Tufthorn Avenue, Coleford, Gloucestershire, GL16 8PR

Tel: 01594 836999 Fax: 01594 810577

e-mail: designservices@formpave.co.uk

technical@formpave.co.uk

admin@formpave.co.uk

sales@formpave.co.uk

web-site: www.formpave.co.uk

Manufacturer: Formpave Limited,

Or Equal Approved.

Size: 100 mm wide x 200 mm long x 80mm deep

Colour: Golden Brindle

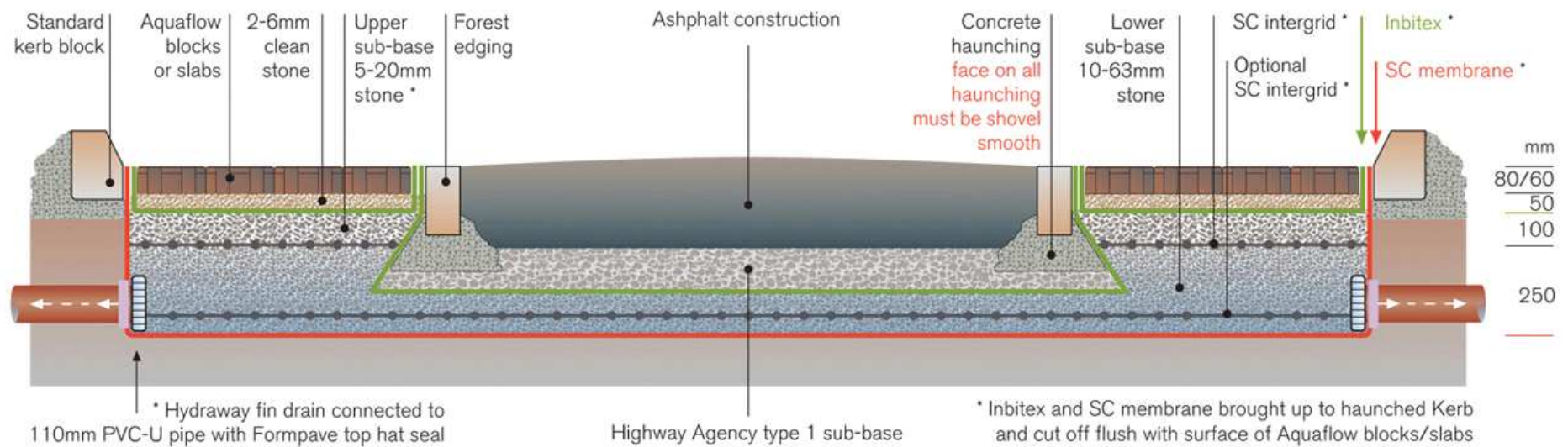
Laying pattern: Herringbone pattern with 2 rows of stretcher course all round

Finish: Standard

Sample Area: Approximately 2m x 2m to be approved by the *Project Manager* prior to laying

Aquaflow paving in conjunction with asphalt road surfaces

Tanked system section Aquaflow pavement with undersealing membrane



The Illustration features the Tanked system for Infiltration replace SC membrane with Inbitex.

ROAD PAVEMENTS – GENERAL
APPENDIX 7/1: Continued

Carriageway : Traffic Calming Features – Flat Top Hump

Flat Top Hump to be constructed as per Standard Detail Drawing No. 11/01/12/A.

	CLAUSE	MATERIAL	GRADE OF BINDER	THICKNESS (mm)	SPECIAL REQUIREMENTS
Surface Course	912	AC 10 surf 100/150	40/60 pen	40	10mm Nominal Size
Binder Course	906	Dense Bitumen Macadam	100/150 pen	75	20mm Nominal Size
TOTAL PAVEMENT THICKNESS				115	

Pavement - Resurfacing of existing carriageway (Provisional)

1. Grid for checking levels of pavement courses (CI 702.4)

Longitudinal dimension :10.0m

Transverse dimension : 2.0m

2. Surface regularity (CI 702.7) : 300m, Category of road is A

Layer	Material	Thickness (mm)	Special Requirements
Surface Course	Dense macadam Surface Course	40	To Clause 942
Total Pavement Thickness		40mm	

ROAD PAVEMENTS

APPENDIX 7/4: BOND COATS, TACK COATS AND OTHER BITUMINOUS SPRAYS

- | | | |
|----|----------------------|--|
| 1. | Location: | Overlaying existing pavements and Cold milled areas. |
| 2. | Type of Binder: | Bitumen cationic emulsion |
| 3. | Binder Grade: | KI-40 to BS 434: Part 1 |
| 4. | Rate of Spread: | 0.35 to 0.55 l/m ² |
| 5. | Permitted additives: | None |
| 6. | Blinding Material: | None |

ROAD PAVEMENTS

APPENDIX 7/9: COLD-MILLING (PLANING) OF BITUMINOUS BOND FLEXIBLE PAVEMENT (Provisional)

Area of existing Delamere Avenue to be planed to a constant depth of 40mm, matching existing profile.

Cold-milling areas include areas under and surrounding proposed traffic calming features.

KERBS, FOOTWAYS & PAVED AREAS

APPENDIX 11/1: KERBS, FOOTWAYS AND PAVED AREAS

A - Pavement - Hard Play Area – (Porous Asphalt)

1. Grid for checking levels of pavement courses (CI 702.4)

Longitudinal dimension :10.0m

Transverse dimension : 2.0m

2. Surface regularity (CI 702.7) : 300m

Layer	Material		Thickness (mm)	Special Requirements
Surface Course	6mm Open grade porous macadam	100/150 pen	20	Permeability – BS7044 Section 2.5 Method 4
Binder course	14mm Open grade porous macadam	100/150 pen	150	Permeability – BS7044 Section 2.5 Method 4
Base	Low fines Type 3 Unbound Mixture to Clause 805		280	Mix to comply with BS EN 13285 Aggregate properties to BS EN 13242 SC intergrid 50mm from base
Total Pavement Thickness		450mm		

B - Games Area

The following court specification is based on the requirements of Sport England and the performance requirements are taken from their document “A guide to the design, specification and construction of Multi Use Games Areas (MUGAs)”

Areas of Play Area Design are shown on Drawing 11701/D/1100

LAYER	MATERIAL	GRADE OF BINDER	THICKNESS (mm)	SPECIAL REQUIREMENTS
Surface Course	6mm Open grade porous macadam	100/150 pen	30	Permeability – BS7044 Section 2.5 Method 4
Binder Course	14mm Open grade porous macadam	100/150 pen	80	Permeability – BS7044 Section 2.5 Method 4
Geotextile	SC intergrid	-	-	Within sub-base
Sub-base	Low fines Type 3 Unbound Mixture to Clause 805		150	Mix to comply with BS EN 13285 Aggregate properties to BS EN 13242 SC intergrid 50mm from base
Geotextile	Scotlay 6120 (or equal approved)	-	-	See Appendix 6/5
TOTAL PAVEMENT THICKNESS			260	Excludes drainage, see note below.

Note:- Beneath this construction is drainage in the form of a 100mm diameter porous pipe within Type B filter material. See HCD F2 detail type H. Pipe to be set with a minimum 100mm depth of cover from the bottom of the sub-base to top of pipe with a 1 in 100 fall. Pipes set at 10m centre however, it should be noted that tennis court net support posts with

KERBS, FOOTWAYS AND PAVED AREAS

APPENDIX 11/1: Continued

1m square foundations will be installed and drainage should be carefully arranged to avoid clashing with the foundations.

Performance requirements

Principal Sports	Tennis, mini-tennis, basketball			
Secondary Sports	Netball			
Property	Test Method	Test condition	Requirement	Note
Slip resistance	ITF CS/02/01	Dry or wet	Greater than 60	1
Permeability	BS 7044 Section 2.5 Method 4	N/A	Greater than 100mm/h at practical completion and for the following 24 moths	
Surface regularity	ITF CS08/01 & CPCMTC	N/A	$\leq 8\text{mm}$ under a 3m straight edge Number of permitted deviation above 8mm in PPA: 4 Number of permitted deviations above 8mm in TPA: 8	2
Gradients	N/A	N/A	Single plane with fall no greater than 1% (ideally $\leq 0.83\%$)	3
Deviation from design level	N/A	N/A	$\pm 25\text{mm}$	

Notes

1. Wet conditions should be produced using the procedure detailed in BS 7044 Part 4 Appendix C.
2. Deviations are considered to be localised undulations 1000mm or less in length. Deviations over 1000mm shall be considered multiple deviations.
3. Where-ever possible a MUGA should be build with a fall across the principal direction of play.

Surfacing requirements

Macadam surface

There shall be no ridges, changes in the playing surface texture or bay joints that result in erratic ball behaviour. Bay joints shall, as far as possible, accord with play lines and be longitudinal along the length of the court(s) with no discernible cross-joints.

Colour coating

Non-pigmented macadam shall be coloured with proprietary water based polyurethane textured court paints. The Contractor's Proposals shall include colour swatches of the paint to allow approval of the proposed colours by the Employer. A minimum of two coats of paint shall be applied in transverse directions to provide a uniform appearance. The quality of the paints shall ensure that there are no significant signs of fading, flaking or cracking for a period of three years.

KERBS, FOOTWAYS AND PAVED AREAS

APPENDIX 11/1: Continued

Line Marking

Line markings shall be in accordance with the relevant sports governing body rules. Unless stated in rules all lines shall be 50mm wide and applied using at least two coats of paint. When measured with a calibrated steel tape all line markings shall be within 20mm of their true position as specified in the appropriate rule. Markings shall not deviate by more than 10mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform.

Testing on Completion

As the total area of the MUGAs exceed 1500m² the facilities shall be tested as detailed in the following schedule.

Property	Testing requirements
Slip resistance	Shall be determined in at least seven locations including all court colours and line marking colours. Test shall be made under wet conditions
Permeability	The permeability rate of the surface shall be determined in not less than two locations.
Regularity	The entire area shall be assessed
Gradients	The principal gradients of the MUGA shall be measured and the design levels calculated.
Levels	Levels shall be taken on a 10m grid to determine deviation from design level.

Warranty

The Contractor shall provide a written warranty that the properties of the combined surface and foundation construction shall be retained within the limits given in this document for a period of 12 months or throughout the period stated in this document, whichever is greater, subject to correct maintenance and the stated patterns of usage.

C – Footway Construction - See Drawing No. 11701/D/1100

Layer	Material	Grade of Binder	Thickness (mm)	Special Requirements
Surface Course	Dense bitumen macadam to Clause 909	300 pen	20	BS 4987: Part 1 : Clause 7.5 Min PSV 53
Binder Course	DBM to Clause 906	200 pen	60	To BS4987: Part 1: 1988, Clause 6.5
Sub Base	Granular Type 1		200	Clause 803
Total Pavement Thickness			280	

Footways and paved areas shall be laid in accordance with the relevant British Standard amended as follows: -

Sub-grade	±10 mm
Sub-base	±10 mm

KERBS, FOOTWAYS & PAVED AREAS (CONTINUED)
APPENDIX 11/1

Base	± 5 mm
Finished surface	± 3 mm

The maximum deviation under a 3 m straight edge placed in any position shall be 5 mm.

D – Tactile Paving – Blister – Uncontrolled Crossings See Drawing No. 11701/D/1100

Layer	Material	Thickness (mm)	Special Requirements
Surface Course	Buff Concrete Blister Tactile Slabs, 400 x 400 sq	65	Bedding as specified
Bedding Course	Class 1 mortar bed	20-30	BS7533
Base	AC32 Dense Base 100/150	50	To BS594987:2007
Sub Base	Granular Type 1	200	Clause 803
Total Pavement Thickness		345	

Laying

- Tactiles to be butt jointed.
- No allowance has been included within the Bill of Quantities for any wastage on site due to cutting/breakages etc.

E – Tactile Paving - Ladder & Tramline – Cycleways – See Drawing No. 11701/D/1100

Layer	Material	Thickness (mm)	Special Requirements
Surface Course	Buff Concrete Tactile Slabs	65	
Bedding Course	Class 1 mortar bed	25-30	To BS7533
Base	AC32 Dense base 100/150	50	To BS594987:2007
Sub Base	Granular Type 1	200	Clause 803
Total Pavement Thickness		345	

Sizes - 400 x 400 x 65mm

Colour – Buff

Finish – Ladder and Tramline surface

KERBS, FOOTWAYS & PAVED AREAS (CONTINUED)
APPENDIX 11/1

F - Tactile Paving - Lozenge – Platform Warning – See Drawing No. 11701/D/1100

Layer	Material	Thickness s (mm)	Special Requirements
Surface Course	Buff Concrete Tactile Slabs	65	
Bedding Course	Class 1 mortar bed	25-30	To BS7533
Base	AC32 Dense base 100/150	50	To BS594987:2007
Sub Base	Granular Type 1	200	Clause 803
Total Pavement Thickness		345	

- Contractor is responsible for offloading the slabs into his site compound and therefore must make allowances within his rates for machine handling when required.
- No allowance has been included within the Bill of Quantities for any wastage on site due to cutting/breakages etc.

G. Reinforced Grass Path to Log Cabin and Teaching Area -

Product – Gridforce GF50, 500 x 500mm (or similar approved)
50mm deep cell tile. Separation membrane to be laid on sub grade.
150mm deep Type 3 sub base to Clause 805
30mm +/- 5mm Sharp sand
Topsoil to BS3882:2007. Gridforce to be 5mm above the soil then soaked and seeded.
Seed to be sown at a rate of 50 grams/m². See para 9 Appendix 30/1 for seed specification.

KERBS, FOOTWAYS & PAVED AREAS (CONTINUED)
APPENDIX 11/1

KERB DESIGN GROUP REF : KB1

Carriageway, Car Park and Bus Turning Area

1. **Kerbs – To BS7263 Part 1**
 - a) Material Precast Concrete
 - b) Shape Type HB2
 - c) Dimensions 125 bed x 255 depth x length (nominal 900mm) (125mm upstand) in all areas except for the carriageway where they are to be between 75 & 100mm)
2. **Laying**
 - a) Kerbs are to be laid straight or to curves exceeding 12 metres radius.
 - b) Kerbs are to be laid to curves not exceeding 12 metres radius.
3. **Bedding Course**

ST2 Concrete to BS7263 Part 2
4. Ref KB1 to include for Transitions, Drop Kerbs, Angle kerbs and Quadrants

KERBS, FOOTWAYS & PAVED AREAS (Continued)
APPENDIX 11/1

KERB DESIGN GROUP : KB2

1. **Kerbs – Ref KB2 – To BS7263 Part 1**
 - a) Material Precast Concrete
 - b) Shape Type BN
 - c) Dimensions 125 bed x 255 depth x length
2. **Laying**
 - a) Kerbs are to be laid straight or to curves exceeding 12 metres radius.
 - b) Kerbs are to be laid to curves not exceeding 12 metres radius.
3. **Bedding Course**

ST2 Concrete to BS7263 Part 2.
4. Ref KB2 to include for Transitions, Angle kerbs, Quadrants and Drop Kerbs.

KERBS, FOOTWAYS & PAVED AREAS (Continued)
APPENDIX 11/1

KERB DESIGN GROUP : BSK

1. **Kerbs – Ref BSK – To BS7263 Part 1**
 - a) Material Precast Concrete Access Kerbs 180 with marker bump
 - b) Shape As standard details 11/10/06A Sheets 1-3
 - c) Dimensions 180high x 1m length
2. **Laying**
 - a) Kerbs are to be laid straight or to curves exceeding 12 metres radius.
 - b) Kerbs are to be laid to curves not exceeding 12 metres radius.
3. **Bedding Course**

ST2 Concrete to BS7263 Part 2.
4. Ref BSK to include for Transitions and Drop Kerbs.

KERBS, FOOTWAYS & PAVED AREAS (Continued)

APPENDIX 11/1

KERB DESIGN GROUP : EF1

1. **Kerbs – Ref To BS7263 Part 1**

- a) Material Precast Concrete
- b) Shape Flat Top
- c) Dimensions 50 bed x 255 depth x length (nominal 900mm) (0mm upstand)

2. **Laying**

- a) Kerbs are to be laid straight or to curves exceeding 12 metres radius.
- b) Kerbs are to be laid to curves not exceeding 12 metres radius.

3. **Bedding Course**

ST2 Concrete to BS7263 Part 2

SERIES 1200 TRAFFIC SIGNS

APPENDIX 12/1 : TRAFFIC SIGNS: GENERAL

1. For traffic sign locations refer to drawing number **11701/D/1200**.
The exact locations will be determined by the contractor on site to the approval of the Engineer.

BILINGUAL SIGNS

All traffic signs should be designed in accordance with Chapter 7 of the Traffic Signs Manual 2003 with the following Welsh Assembly Government provisions: -

- On directional signs, pairs of bilingual destinations should be ranged left and separated from other bilingual or mono lingual destinations by 4 stroke widths. When two or more lines of legend are used for either language, the legends are centred for each language and then the two blocks of legend are ranged left.
- On informatory signs including supplementary plates, the legends are all centred and the two languages are separated by 3 stroke widths.
- The order of languages shall be English above Welsh.
- The Welsh translation for bilingual signs shall be checked and approved by the Engineer, following fabrication and prior to erection.

MATERIALS OF MANUFACTURE

5. **Internally illuminated signs**
These shall be fabricated from a vandal-resistant material such as GRP or other material approved by the Engineer, and shall comply with the requirements of Chapter 11, Appendix V and Chapter 13, Section 6 of the Traffic Signs Manual.
6. **Externally illuminated and non illuminated signs**_(including cover plates)
Unless otherwise specified these shall be manufactured either from sheet aluminium, of not less than 11 swg or 3mm thickness or from extruded aluminium plank sections.

STIFFENING AND FRAMING

7. All stiffening and framing shall be in aluminium section of equivalent strength (section modulus) to that of the mild steel tabulated in Chapter 13 of the Traffic Signs Manual.
8. For details of foundation types refer to the Traffic Signs Schedule and to the Standard detail drawings of the Contract Documents.
9. Signs shall be erected in accordance with the recommendations in the Traffic Signs Manual Chapter 13.
10. The foundations for the posts shall be as described in the Contract and where the sign has an area in excess of 10 square metres or the posts have a diameter in excess of 100mm, all excavation shall be approved by the Engineer before the sign is erected and immediately prior to the placement of the concrete.
11. Where illuminated signs have a base housing the post with the housing shall, wherever practicable, be the one furthest from the carriageway edge but where this is not possible the control access opening shall face away from the direction of travel.

SERIES 1200 TRAFFIC SIGNS
APPENDIX 12/1 : TRAFFIC SIGNS: GENERAL (Cont)

12. The Contractor shall ensure that the posts and bases do not cause any interference with existing drains or services.
13. Any overbreak in foundation shall be filled with mass concrete to the same specification as the foundation.

POSTS

14. Posts for all signs shall be as described in the Schedule.
15. Steel posts specified may be circular or rectangular hollow section or rolled steel joists and shall comply with BS 4 or BS 4848 as appropriate.
16. All steel posts shall be protected against corrosion by factory applied hot dip or electrolyte galvanising to a coating thickness not less than that required by BS 729.
17. All sign posts shall be supplied with hot dip or electrolytic galvanising factory applied protection to British Standards. The part of the post extending from the butt end to the minimum height of 150mm above the ground line shall be coated with heavy duty black bituminous or other approved heavy duty protective material to provide a continuous coating both internally and externally to a minimum thickness of 0.25mm on the external surfaces.
Following erection of the post any damaged area shall be wire brushed and spot primed with a cold galvanising process. The post should then receive a pre-treatment (etch) primer followed after a lapse of four hours but within twelve hours, by the application of an approved undercoat. On completion of the painting the Contractor shall ensure the access door and locks are free from paint and operating normally. No painting shall be carried out during extremes of temperatures, wet, humid or foggy conditions.
18. Posts should not extend above the top of the sign except in the circumstances given in paragraph 13.14 chapter 13 of the Traffic Signs Manual or unless an extension is necessary for the attachment of a lighting fitting. Where post lengths are given in the Signs Schedule a minor increase (maximum 100mm) in the required mounting height will be permitted to ensure compliance with this paragraph. Any greater increase must receive the specific approval of the Engineer.
19. All open-ended posts, tubes or other hollow sections used in construction shall be effectively capped with weather-resisting plastic material so as to prevent the ingress of water.
20. Where metal posts on 2 separate sign assemblies are connected together with electrical conduit, (e.g. 2 sets of Direction Signs) a rust-proofed mild steel strap 38mm x 5mm thick is to be supplied immediately adjacent to the conduit and so arranged that the 2 posts will be securely clamped together to prevent damage to the conduit and cable by differential movement.
21. All posts sited in footways shall be marked with a white band between 140mm and 160mm in depth, the lower edge of the band being between 1.5m and 1.7m above the level of the footway in the immediate vicinity.

SERIES 1200 TRAFFIC SIGNS
APPENDIX 12/1 : TRAFFIC SIGNS: GENERAL (Cont)

SIGN NUMBERING

The reference number of the sign assembly shall be painted or stamped on the reverse side of the sign in the bottom left hand corner. The height of the characters shall not be greater than 15mm.

TRAFFIC SIGNS AND ROAD MARKING

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

1. Road markings shall comply with the Traffic Signs Regulations and General Directions 2002 and shall be laid to accord with advice in the Traffic Signs Manual, unless otherwise stated.

See location of markings on Dwg No. 11701/D/1200.

2. All white road markings shall be screed applied reflective thermoplastic material Class A, unless otherwise specified. Road marking material to incorporate solid glass beads and have a surface application of solid glass beads applied evenly at a rate of 400-500 g/m².
3. All yellow road markings shall be screed applied thermoplastic Class A, unless otherwise specified.
4. Football Pitch & Sports Area Line Marking shall be in accordance with the relevant sports governing body rules. Unless stated in rules all lines shall be 50mm wide and applied using at least two coats of paint. When measured with a calibrated steel tape all line markings shall be within 20mm of their true position as specified in the appropriate rule. Markings shall not deviate by more than 10mm from a line joining their ends, nor include any sudden steps. Line edges shall be parallel and uniform.
5. See enclosed Sign Schedule within this Appendix.
6. Road markings on **block paving** are to have appropriate adherence properties. PREMARK or equal approved should be used. The product should be applied in accordance with manufacturers recommendations. PREMARK is a preformed, ready-to-use thermoplastic road marking. The prefabricated markings can be applied to road surfaces all year round.

Application of PREMARK is fast and easy because application requires only one person, a broom and a gas burner. Sweep off the surface, ensure it is dry using the gas burner, apply the PREMARK and use a gas burner to fix in place, 'fusing' the thermoplastic road marking to the road surface.

Combining PREMARK® preformed thermoplastic road markings and Viaxi® primer ensures a long lifetime and durability of the markings. Viaxi primer is a solvent-free epoxy primer, which is specially designed for use with PREMARK thermoplastic road markings on cobble stones, prefabricated paving slabs and new concrete which is fully cured. The Viaxi primer is a two-component material with high sealing properties against moisture and it gives strength to weak and porous surfaces. Viaxi primer acts as a binder between the surface and PREMARK markings and creates a strong and durable adhesion between the two.

Removal of existing markings to be by lancing or other approved method. If lancing is used, it should be carried out in full compliance with COSHH regulations.

Sign Details							Posts & Lighting				Siting Details					Remarks
Ref No.	Diag No (X ht.)	Description/ Sketch	H	W	Area	Refl	Illumination	No.	Dia.	Len.	Fdn. type	Sp (m)	M.H (m)	Cl. (m)	For Traffic From	

1	674	20mph speed limit zone	1015	700	0.71	MCP	-	-	76mm	3.45	S2	-	2.4	0.45		Back to back with Sign Ref 2
2	675	End of 20mph speed limit zone	1055	725	0.8	MCP	-	-	76mm	3.45	S2	-	2.4	0.45		On post with Sign Ref 1
3	674	Segregated pedestrian/cycle route	450 dia		0.63	MCP	-	-	76mm	3.45	S2	-	2.4	0.45		
4	966	Cyclists dismount	450	300		MCP	-	-	76mm	3.45	S2	-	2.4	0.45		On post with Sign Ref 3
5	953.3	Buses only	450	300		MCP	-	-	76mm	3.45	S2	-	2.4	0.45		On post with Sign Ref 3
6	810	One way	375	255		MCP	-	-	76mm	3.45	S2	-	2.4	0.45		

Scheme :- Proposed Welsh Medium School - External Works, Delamere Avenue												Drawn By JLV		Date Apr 2012		
Proposed signs												Checked By JLV		Date		
Traffic Sign Schedule Sheet 201 of 1 Sheets						For siting of Signs refer to Contract Drawings										

STRUCTURAL CONCRETE

APPENDIX 17/1: SCHEDULE FOR THE SPECIFICATION OF DESIGNED CONCRETE

1. Bin Store Base

See Drawing No. 11701/D/1100 for the location of the bin store.

Size of slab:- 3.3 x 2.05 x 0.2 m.

Concrete to be Class ST5, sulphate resistant cement

Reinforcement to be one layer of A193 mesh with 50mm cover.

2. Horizontal Rainwater Storage Tank Base

See Drawing No. 11701/D/1100 for the location of the rainwater storage tank.

Size of slab:- 8.5 x 2.30 x 0.3 m.

Concrete to be Class C35D with 20mm aggregate and 300kg/m³ sulphate resistant cement content. Reinforcement to be one layer of A393 mesh with 75mm cover.

3. Cycle Shelter

See Drawing No. 11701/D/1100 for the location of the cycle shelter.

Size of slab:- 3 x 5 x 0.2 m.

Concrete to be Class ST5, sulphate resistant cement

Reinforcement to be one layer of A193 mesh with 50mm cover.

4. Log Cabin Base

See Drawing No. 11701/D/1100 and Landscape Dwgs for the location of the log cabin.

Size of slab:- 4.5 x 6.2 x 0.3 m.

Concrete to be Class C35D with 20mm aggregate and 300kg/m³ sulphate resistant cement content. Reinforcement to be one layer of A393 mesh with 75mm cover.

5. Concrete Headwall

See Drawing No. 5104033-WA-C-109 & 110 for the location of the headwalls for the Swales.

Concrete to be Class ST5, sulphate resistant cement

STRUCTURAL CONCRETE
APPENDIX 17/3 : CONCRETE : SURFACE FINISHES

1. All concrete finishes shall be trowel finish.

MISCELLANEOUS

APPENDIX 26/70: STREET FURNITURE

BENCHES

1. Bench Type S1

Type: "Ollerton" M3 Curved benches
Finish: Stainless Steel Slats
Size: 2970mm outer length and 1885 inner length. 120 deg bench on a 900mm
Weight: 69kg
Installation: Root fixed, as per manufacturer's recommendations. Each bench has three legs which should be set in 450x450x450mm. Gen 1 mass concrete.
Supplier: Marshalls Or Equal Approved

CYCLE RACKS

2. Cycle Rack Type CR1

Type: "Sheffield Toastrack" (BXMW/GS)
Finish: Galvanised and powder coated
Colour: Green
Size: 800 centres 3250 length 750 width 800 height (10 CYCLES)
Installation: As per manufacturer's recommendations.
Supplier: Broxap Ltd Or Equal Approved

CYCLE SHELTER

3. Cycle Shelter Type CS1

Type: "Sofco" (BXMW/SOF) complete with standard security lighting (mains fed)
Finish: Galvanised and powder coated
Colour: Green
Size: Width: 2140, Height: 2150, Length: 4100
Installation: As per manufacturer's recommendations.
Supplier: Broxap Ltd. Or Equal Approved

CYCLE HELMET LOCKERS

4. Cycle Helmet Locker Type CH1

Type: Ecolock Helmet Locker (Horizontal) (BXMW/HLC/5H)
Finish: Galvanised and powder coated
Colour: Green
Size: Overall Width: 1780 Height: 380 Depth: 450
Installation: As per manufacturer's recommendations.
Supplier: Broxap Ltd. Or Equal Approved

LITTER BINS

5. NOVA waste bin (or similar approved).
Manufactured in fully galvanized mild steel sections. With all stainless steel fittings including single bar hinge mechanism and slam locks.
Capacity – 120 litres
Stock Code: 1321/364/101
Finished in RAL 9007 (Metalic silver)
Method of fixing: Root foxed legs into 450mm x 450mm x 450mm concrete base
Manufacturer :-

MISCELLANEOUS

APPENDIX 26/70: STREET FURNITURE (Continued)

Anglesey Bollards Ltd (or similar approved)

Contact Details :- Tony Taylor

Telephone: 01248 410222 • Facsimile: 01248410111 • Mobile: 07920400772

E-mail: tony@angleseybollard.com • Website: www.angleseybollard.com

SPORTSWALL

6. Sportswall 3000AB², Width 11.54m, Angle Return 2m, Goal Size 3m x 2m, Height 3m.
Supplier : Agoraspace
Web Site : www.agorespace.com
Tel : 0344 36 09 64

LOG CABIN

7. Type : 'The Dean 68mm Log Cabin Range', 4m x 5.85m.
External stain to be Cuprinol Garden Shades "Willow" colour. Applied strictly to manufacturers instructions.
Supplier : Cabin UK', (01273) 241724 (or similar approved)
Link page : <http://www.cabinsuk.co.uk/logcabins/dean.html>
Additions to be added to cabin : Standard block upvc ½ round gutter either side with downpipe on each going into water butt.

Lighting :
Photovoltaic panel and lighting kit to the log cabin.
Supplier : 'Solar Shop'
www.solarshop.co.uk/solar-mate-II.htm
Tel: 01256 352502
'Solar Mate II' to include 10 watt roof mounted panel, 2 x 12v lights, wall switches, cabling, fuses, roof mounting kit, car battery (sealed) of 75 or 85Ah rating to complete the system.
Size 397 x 278mm and weighs 1.6kg
Covers an area of up to 32m².
Photovoltaic to be mounted on southern side of roof. All internal wiring to be contained in white pvc conduit.

LANDSCAPE & ECOLOGY

APPENDIX 30/1 : GENERAL

1.0 Cultivation

- 1.01 Topsoiling will be spread to a depth of 150mm for areas to be seeded, and 450mm for areas to be shrub planted
- 1.02 If areas to be seeded are weed infested, they shall be treated with a glyphosate based herbicide a fortnight before cultivation takes place, in line with the manufacturers instructions and in compliance with the Pesticides Act and in accordance with the COSHH Regulations.
- 1.03 Areas to be seeded or turfed shall be cultivated by the Landscape Contractor to a depth of 100 mm, removing all weeds, stones and other extraneous material from the topsoil and off site. The topsoil shall be graded to remove minor hollows and ridges and bring it to a uniform and even grade at the correct finish level which, unless otherwise stated, shall be 25 mm above adjoining paving and shrub beds and 150 mm below DPC after reasonable consolidation. The surface of the topsoil shall be cultivated to a fine tilth and all stones above 50 mm diameter picked off and removed from site.
- 1.04 Areas to be shrub planted shall be cultivated by the Landscape Contractor to a depth of 250 mm removing all weeds, stones and other extraneous materials from the topsoil and off site. The topsoil shall be graded to remove minor hollows and ridges and bring it to a uniform and even grade at the correct finish level which, unless otherwise stated, shall be 150 mm below DPC or level with adjoining paving after reasonable consolidation.
- 1.05 If shrub planting is delayed and weed growth is active, shrub beds shall be sprayed with a glyphosate based herbicide a fortnight before cultivation takes place, in line with the manufacturers instructions and in compliance with the Pesticides Act and in accordance with the COSHH Regulations, and dead weeds removed prior to cultivation.

2.0 General Information

- 2.01 Planting shall take place in conjunction with the building programme, but must not be carried out when the ground is frozen or waterlogged, or during periods of persistent wind.
- 2.02 All plants shall conform to;
 - BS 3939 Part 1: Trees & Shrubs
 - BS 3939 Part 2: Roses
 - BS 3939 Part 4: Forest Trees
 - BS 3939 Part 5: Poplars & Willows
 - BS 3939 Part 9: Bulb corm & Tubers
 - BS 3939 Part 10: Ground Cover Plants
- 2.03 All plants shall conform with the Horticultural Trade Association (HTA) document 'Handling and establishing landscape plants' in terms of lifting, packing, storage and transport.
- 2.04 Enough plants shall be labelled so that when planted, one plant of each species in each shrub bed, and every tree, has a label.

LANDSCAPE & ECOLOGY
APPENDIX 30/1 : GENERAL (CONTINUED)

3.0 Bare Rooted Shrubs & Trees Planted as Transplants

3.01 *Stock*

All stock shall be supplied in accordance with the plant schedule on the approved landscape drawing; all stock must meet the specified form, habit, and height requirements. There shall be a high proportion of fine fibrous growth on all plants.

3.02 *Care of plants*

Care shall be taken to ensure that roots are not exposed to frost or allowed to dry out prior to planting. Any damage roots shall be pruned off using secateurs before planting ensuring that there is still sufficient root left on the plant such that it may reasonably be expected to take.

3.03 *Planting*

For each plant a hole shall be dug sufficient to take all the roots without them touching the bottom or sides of the hole. The side of the hole shall be fork dug to prevent smearing. The plant should be held in the ground to the same depth as in the nursery (as shown by soil mark on the stem) and the hole backfilled with topsoil, shaking the soil around the roots and heeling the soil in during the backfilling.

3.04 *Pruning*

Multi stemmed stock shall be cut back to 150-200mm above the ground at time of planting. As necessary any broken or damaged material shall be removed from stock, in accordance with horticultural best practice, if the required pruning work is excessive the Contractor should consider replacing the stock.

4.0 Containerised Shrubs & Containerised Herbaceous Stock

4.01 *Stock*

All stock shall be supplied in accordance with the plant schedule on the approved landscape drawing; all stock must meet the specified form, habit, and height requirements. All stock shall have root growth throughout the whole of the container, but not such that the plant is 'pot bound'

4.02 *Planting*

For each plant a hole shall be dug to take the whole of the root and its growing medium. The sides of the hole shall be fork dug to prevent smearing. Plant containers shall be removed prior to planting and disposed of off site by the Landscape Contractor. The shrub shall be placed into the hole so that the top of the roots to ensure that the shrub and its growing medium are firm in the ground. Any damage shall be pruned off using secateurs

4.03 *Planting self-clinging climbing plants*

Self-clinging climbers shall be supplied and planted as above, planting positions located 15cm from adjacent walls and/or fences. Supporting canes shall be carefully removed after planting. Shoots shall be carefully separated from each other, spread against wall/fence following the direction of growth, and positions noted and marked if necessary. Nails with flexible lead heads shall be driven into nearest available mortar joint (in the case of walls). Shoots shall then be placed against nails and the flexible head shall be bent over, to secure the shoot lightly, taking care to avoid damage and allowing for settlement of the topsoil.

LANDSCAPE & ECOLOGY

APPENDIX 30/1 : GENERAL (CONTINUED)

4.04 ***Containerised herbaceous plants***

Containerised herbaceous plants shall be of bushy form, of a height as specified on the plant schedule and shall have root growth throughout the whole of the container, but not such that the plant is 'pot bound'. They shall be planted as detailed in Section 4.02 above.

5.0 **Bare Rooted & Rootballed Trees**

5.01 ***Bare Rooted Stock***

According to specified form, trees shall either have a sturdy, reasonable straight stem and a well balanced, branching head (standards & similar), or they shall have a well defined, straight and upright central leader, well furnished with lateral shoots (feathered trees). Any grafted trees shall be healthy and well developed, and a 150mm of ground level. Root growth shall be healthy and well developed, and a minimum radius of viable root (well spaced on at least one quadrant of the stem) shall be 10% of the overall height of the tree (e.g. 250mm on a tree 2.5m tall).

5.02 ***Planting Bare Rooted Stock***

For each tree a hole shall be dug sufficient to take all the roots without them touching the sides of bottom. The side of the hole shall be well broken up with a fork to aid root penetration into the surrounding soil. The tree stake is to be driven into the bottom of the hole and the tree held in position so that it is at the same depth as in the nursery. The hole shall be backfilled with topsoil avoiding the inclusion of plant matter, alien material and any stone greater than 50mm in diameter. Soil is to be shaken around the roots and firmed in by foot during backfilling. Any damage or crossing lateral branches shall be pruned off at the time of planting using secateurs and removed from site.

Where tree planting takes place into existing turf, turves shall be carefully replaced following planting and trimmed to produce a 1m diameter circle of topsoil around the trunk. This area shall be mulched and maintained in a weed-free condition during the Maintenance Period

5.03 ***Bare Rooted Tree Stake***

Each tree shall be staked using a good quality pointed softwood timber stake of 75-100mm diameter, pointed at one end. The length of the stake is to be such that, when firmly fixed in the ground, it supports the lower 1m of the tree, sawing excess off it necessary. The stake is to be driven firmly into undisturbed ground to the side of the tree so that when fixed to the ties, the stem of the tree can be attached without distorting it.

5.04 ***Bare Rooted Tree Ties***

Each tree shall be secured to its stake by two rubber tree ties, one at the top of the stake and the other 400mm above the ground. Tree ties are to be complete with rubber spacers to ensure that the tree cannot rub against the stake.

5.05 ***Rooted Tree Stock***

Due to the size and nature of rootballed tree stock an separate planting specifications shall be issued for the specific project, this shall include a written specification and drawn planting details illustrated pit preparation, guying, irrigation and root barriers if required.

LANDSCAPE & ECOLOGY
APPENDIX 30/1 : GENERAL (CONTINUED)

6.0 Containerised Trees

6.01 *Stock*

All trees shall be of the height specified, and have a sturdy reasonably straight stem with a well balanced branching head. Any grafted trees shall only be accepted when grafted within 150mm of ground level. All trees shall have root growth throughout the whole of the container, but not such that the tree is 'pot bound'. Containers shall be of the size specified.

6.02 *Planting*

For each tree a hole shall be dug to take the whole of the root and its growing medium. The sides of the hole shall be fork dug to prevent smearing. Tree containers shall be removed prior to planting and disposed of off site by the Landscape Contractor. The tree shall be placed into the hole of that the top of the growing medium is at ground level, and topsoil shall then be backfilled around the roots to ensure that the shrub and its growing medium are firm in the ground. Any damage shall be pruned off using secateurs.

6.03 *Tree Stakes*

Each tree shall be staked using two good quality timber stakes of 75-100mm diameter. The length of the stake is to be such that when firmly fixed in the ground it supports the lower 1m of the tree, sawing excess length off if necessary. These stakes are to be driven firmly into the ground to either side of the planting pit to matching depth, positioned so that when they are connected to a timber cross bar the stem of the tree can be attached without destroying it.

6.04 *Guying System*

Where tree staking is not considered appropriate and a guying system has been specified the Platipus system, or similar approved, should be used in accordance with a root protection material, such as Platimat, or similar approved.

6.05 *Tree Ties*

Each tree shall be secured to the crossbar using a hessian or nylon tie passed through a rubber buffer between the tree crossbar, placed so that the tree cannot rub against the crossbar.

7.0 Watering

7.01 Immediately after planting all plants shall be well watered in at the rate of at least 1 gallon per shrub and 5 gallons per tree, or to field capacity, dependant on existing ground saturation levels.

7.02 Water is to be applied at a rate, which allows it to percolate into the soil around the roots so that it is not lost as surface runoff, using a watering can with a fine rose attachment or a hosepipe with a sprinkler fitted.

LANDSCAPE & ECOLOGY

APPENDIX 30/1 : GENERAL (CONTINUED)

8.0 Mulch

- 8.01 Mulch is to be applied to planting beds unless otherwise specified on the landscape drawing.

After all other work is complete any trampled areas of shrub bed shall be lightly forked and then medium grade bark mulch applied to shrub bed to a minimum depth of 50mm. Mulch shall also be applied to a depth of 50mm to the base of trees planted in turf, to a radius of 500mm around the base of the tree. Care must be taken not to bury ground cover plants with the mulch. The ground surface must be moist before mulch is applied. A sample of mulch is to be approved before any spread on site.

9.0 Seeding

- 9.01 Operations shall be planned for sowing in the Spring or late Summer, i.e. from the beginning of April to mid May, or from August to the end of September.
- 9.02 Prior to seeding, fertilizer shall be applied at the rate of 50 gm/m sq, using NPK granular fertilizer in the proportions 10:50:10.
- 9.03 The following seed mix shall be sown at the rate of 35 gm/m sq:
- 60% Cert. Darius, Perennial Ryegrass
 - 35% Cert. Rufilla Slender Creeping Red Fescue
 - 5% Cert. Avalon Velvet Bent

Mixture A22 as supplied by: British Seed Houses Ltd:

Camp Road,		Portview Road,
Witham St Hughs	and	Avonmouth,
Lincoln LN6 9QJ		Bristol BS11 9JH
01522 868714		0117 982 3691

Note – For football seed the mix is to be A9 (General Outfiled)

Each bag of seed is to be well agitated before opening to ensure through and even mixing of the seed.

Sowing is to be carried out by suitable seeding or other approved means in two operations at right angles, the seed well raked in and afterwards rolled to an approved finish.

- 9.04 The grass is to be cut when a growth of 75mm high has been attained, the blades of the mower to be set at a height of 30mm above ground level and cuttings taken off site. A second cut is to be made when growth has again reached 75mm high and cuttings taken off site. Any bare patches showing after the first cut are to be re sown. Prior to the maintenance clause commencing the grassed areas are to be inspected and approved.

10.0 General Maintenance

- 10.01 Unless otherwise stated, the Landscape Contractor will be responsible for the maintenance of grass, trees and shrubs for 1 year following practical completion, as described below.
- 10.02 Where in the following section reference is made to remove material, such as litter, grass cuttings, weeds, dead plants and pruning, this means that materials shall be removed from site and disposed at the Contractors Licensed Tip.

LANDSCAPE & ECOLOGY
APPENDIX 30/1 : GENERAL (CONTINUED)

11.0 Maintenance: Seeding & Turfed Areas

- 11.01 Grass is to be mown at fortnightly intervals during the growing seasons, which for the purpose of pricing, is taken to be March-October inclusive. Mowing operations shall be adjusted as necessary to avoid periods of wet weather. In areas where bulbs/corms have been planted for naturalising into grass, the beginning of mowing operations shall be deferred until their foliage has substantially died down.
- 11.02 Before mowing commences, all areas to be mown shall be inspected, and all debris removed (e.g. stones, cans, litter and all other rubbish). Any moveable obstructions e.g. seats, signs, traffic cones etc. Shall be carefully removed to facilitate cutting, and replace before the Contractor leaves the site. Any 'mole hill' spoil is to be raked, levelled and brushed into the surface before mowing commences.
- 11.03 Grass is to be cut to a height of 30-40mm, ensuring that the total area is mown evenly, with no rubbing or ridging. All grass cutting, including any that spread onto adjoining footpaths, drives or other hard surfaces, are to be removed.
- 11.04 No margin of grass is to be left uncut alongside fences, walls, hedges, obstacles or obstructions.
- 11.05 At every alternative mowing operation, grass is to be cut along all edges of shrub beds, tree positions, paving, walls, fences and other obstacles, using long handles shears or an approved mechanical device. All edges are to be clean, straight and tidy with no jagged edges. All clippings are to be removed.
- 11.06 At the first and last visit of the season, all edges are to be cut using a half moon tool inserting to the full depth of the blade. Supported edges (adjacent kerbs, paths etc.) to be cut at 90°, unsupported edges (against shrub beds, tree positions etc.) at 60°. All weed growth, grass etc. Protruding to be skimmed off. All weeds, soil and grass cut away are to be removed.

12.0 Maintenance: Bare-Rooted, Root-Balled & Containerised Trees

- 12.01 Tree positions to be attended to three times during the growing season (April-September inclusive to coincide with grass edging operations) and during the dormant season (October-March inclusive). At each visit the following operations are to be carried out.
- 12.02 All trees shall be checked and firmed up in the ground as necessary.
- 12.03 Any damage shoots or branches shall be pruned off plants using secateurs, cutting back to above a live, outward facing bud or shoot.
- 12.04 Tree stakes and ties shall be checked, stakes firmed up as necessary, and ties adjusting to prevent rubbing on trunk. Any missing ties shall be replaced and lopsided trees straightened.

Any dead trees shall be reported to the site supervisor, and removed, the resulting hole to be filled and lunched or turfed, to match the surrounding area. Replacement planting to be carried out during the winter visit.

LANDSCAPE & ECOLOGY

APPENDIX 30/1 : GENERAL (CONTINUED)

12.05 Where trees are planted in grassed areas, weed growth on top of, or through, the mulch shall be eliminated with a suitable translocated glyphosate based herbicide, in accordance with manufacturer's instructions, in line with the manufacturers instructions and in compliance with the Pesticides Act and the COSHH Regulations. Dead weed material shall be removed during the following visit to site.

12.06 In any areas where the depth of the mulch layer has fallen below 50mm, extra mulch shall be added to bring the total depth back to 50mm.

13.0 Maintenance: Mulching Shrub Beds.

13.01 Mulched shrub beds to be attended to three times during the growing season (April-September inclusive to coincide with grass edging operations) and once during the dormant season (October-March inclusive). At each visit the following operations are to be carried out.

13.02 Before work commences, all areas shall be inspected, and all debris removed (e.g. stones, cans, glass, litter and all other rubbish).

13.03 All plants shall be checked and firmed up I the ground as necessary.

13.04 Any damaged shoots or branches shall be pruned off plants using secateurs, cutting back to above a live, outward facing bud or shoot.

13.05 Any dead shrubs shall be reported to the site supervisor, and removed, the resulting hole to be filled and the surface mulched. Replacement planting to be carried out during the winter visit.

13.06 Weed growth on top of, or through, the mulch shall be eliminated with a suitable translocated glyphosate based herbicide, in accordance with manufacturer's instructions, in line with the manufacturers instructions and in compliance with the Pesticide Act and the COSHH Regulations. Dead weed materials shall be removed during the following visit to site.

13.07 In any areas where the depth of the mulch layer has fallen below the 50mm, extra mulch shall be added to bring the total depth back to 50mm.

14.0 Contractor's Liability for Replacement

14.01 All plants which die during the year following planting from any cause excluding vandalism shall be replaced by the Landscape Contractor at his own expense during the next planting season. Plants damaged by vandalism during the replacement period shall be noted by the Landscape Contractor and the cost for replacement submitted to Wilson Bowden Developments Ltd.

14.02 All grassed areas for which the Landscape Contractor has been responsible under Section 10 & 11 are to be regarded/reseeded/re-turfed as necessary if they fail to establish to give a close, even sward within the Maintenance Period, at the Landscape Contractors own expense.

LANDSCAPE & ECOLOGY

APPENDIX 30/2 : WEED CONTROL

1. A weed killing regime will be required throughout the maintenance period of the Contract.
2. Newly sown grassed areas will require an appropriate delay of 4-6 months until it is well established.
3. The Contractor is to allow for up to 3 treatments.
4. The area required for weed control is stated on the contract drawings
5. Weed killing to be in accordance with Clause 3002.
6. Weed Control Generally

All herbicides to be used must have been approved for the use specified by DEFRA, Department for Environment, Food and Rural Affairs, for use in amenity horticulture, in accordance with the Control of Pesticides Regulations 1986. Recognised Certificates of Competence are required by contractors using pesticides applications carried out on the site for retention by the Supervising Officer at the end of the contract period. He shall make such information available to the Supervising Officer upon request at any time during the contracting period. All chemicals proposed for use during the contract are to be notified to the Supervising Officer prior to use and must be listed in the current Agricultural Chemicals Approved Scheme.

7. Notice to Public Re: Spraying

It is the contractor's responsibility to ensure that the owners or users of the properties which adjoin areas to be sprayed are informed of spraying operations. Signs posted where the operatives are spraying will be adequate for this purpose.

8. Herbicides

All herbicides are to be applied in strict accordance with the manufacturer's instructions as stated on the product label. Contractor's employees must take notice of the precautions stated on the product label. The contractor shall provide and make available for inspection containers for measuring quantities of herbicides. No herbicides to be used within the canopies of any existing trees without prior discussion with the council Arboricultural Officer (AO).

Spray equipment shall be fitted with a pressure regulating device and an approved spray nozzle.

Pressure settings and types of nozzle must be correct for the herbicide in use, as stated in the

product label. Guards shall be fitted to spray equipment where appropriate to prevent drift onto

other plants. Equipment shall be free of leaks and shall be cleaned thoroughly before and after

use.

The contractor must ensure that all chemicals are locked up in a separate storage compartment in

vehicle, or within a lockable container in 'pick ups'. The storage locker must be of a construction

which will contain the entire contents of the locker should damage or spillage occur. This locker

must therefore have a sealed lid. The locker must also bear a standard black and yellow hazard

LANDSCAPE & ECOLOGY

APPENDIX 30/2 : WEED CONTROL (CONTINUED)

warning marker and be clearly labelled 'Pesticides'. The storage and transport of pesticides, in dilute or concentrate form, will not be permitted in or on the contractor's vehicles outside such a container.

LANDSCAPE & ECOLOGY

APPENDIX 30/5 : GRASS SEEDING, WILDFLOWER AND MAINTENANCE

1. Site Specific – Eco Area

A) **Swales** – Wild Flower Mix - Seed to British Seed Houses RE3 'River flood plain/water meadow mix'. Spread – 5g/m².

Link Reference - <http://www.bshamenity.com/products.php?mc=wild-flowers&cat=regional-environmental-mixtures>

B) **Wildflower Planting**

Wildflower plug plants to e BTCV 'Long season meadow' collection.

Spread – 50 plugs/10m²

Link - <http://shop.btcv.org.uk/shop/stock?l=level3;lid=850;sid=947>

C) **Football Pitch Seeding**

A9 General Outfield – Sowing Rate 35g/m²

CADIX Perennial Ryegrass	40%
CORAIL Strong Creeping Red Fescue	30%
GALLIUS Perennial Ryegrass	20%
PARSIFAL Smooth Stalked Meadow Grass	10%

2. Seeding Works - General

All top growth shall be cut, collected and removed off Site to tip. The surfaces shall be thoroughly cultivated by approved means to a minimum depth of 100mm and brought to a condition suitable for blade grading.

Minor grading shall be carried out in accordance with the descriptions in the specification.

Cultivation shall be repeated as required to ensure the whole area has been evenly cultivated to the specified depth.

The final preparation of the seed bed shall be carried out during suitable weather and ground conditions – work shall be postponed if the ground is waterlogged, in a plastic condition or in a state which would result in the breakdown of the natural crumb structure of the soil. Any area which, prior to seeding, becomes compacted or disturbed shall be re-cultivated and re-levelled as directed by the Supervising Officer at the Contractors own expense.

The Contractor shall bring the area to be seeded to a fine tilth using approved means. The seedbed shall be approximately 25mm deep and be free from stones or any other debris exceeding 25mm in any one dimension.

Herbicides suitable for the general operations described are given below but actual production selection, health and safety measures, mixing, application notes, timing of operations and method of application are to be at the final discretion of the contractor in the actual circumstances encountered.

3. Approval of the Seed Bed

No seeding shall be carried out until the surfaces have been approved by the Supervising Officer.

LANDSCAPE & ECOLOGY

APPENDIX 30/5 : GRASS SEEDING, WILDFLOWER AND MAINTENANCE (CONTINUED)

4. Pre-seed Fertiliser

On specified areas the Contractor shall apply a pre-seeding fertiliser to the approved seedbed. Application rates and type of fertiliser to use shall be specified by the Supervising Officer. Following the application of fertiliser the area shall be lightly raked or chain harrowed to incorporate the fertiliser into the surface. Unless instructed otherwise by the Supervising Officer, a period of 3-7 days shall elapse before the grass seed is sown.

5. Grass Seed and Mixtures

The Contractor shall provide an approved grass seed mixture in accordance with the specification. Seed shall be sown at the rate of 35 - 50 grams/m² unless instructed otherwise by the Supervising Officer, in two transverse directions and in two applications by approved means. On small areas where machine distribution is impractical, seed shall be sown by suitable hand equipment. After sowing the ground shall be lightly cross harrowed or raked in two transverse directions. The Contractor shall allow for carrying out of light rolling operation which shall be done only on the instruction of the Supervising Officer.

6. Watering

The Contractor shall include within the rates for grass seeding any watering which may be required during dry periods to aid the establishment of the grass.

7. Initial Maintenance

The Contractor shall carry out an initial cut of the seeded areas followed by two subsequent cuts.

Before the initial cut is made the Contractor shall carry out a stone pick to the seeded area. All stone exceeding 25mm in any one direction shall be removed from Site.

The first cut shall be carried out when the grass is approximately 75mm high and it shall be cut with a rotary mower to leave 25mm to 50mm growth.

Following the initial cut, all grass seeded areas shall be cut a further two times with a suitable cylinder mower, removing 25mm top growth at each cut and leaving 25mm to 30mm growth.

This shall be carried out in accordance with the general mowing specification.

8. The Defects Correction Period

Without prejudice to all other of the Councils rights under the Contract, the Defects Liability Period shall be a minimum period of twelve calendar months from the date of the Practical Completion and shall apply to all work carried out under this Specification. Any defects which appear within the Defects Liability Period and which in the sole opinion of the Supervising Officer are due to materials or workmanship not being in accordance with the Specification or which are due to frost occurring before completion of the works, shall be made good or replaced by the Contractor at his own expense.

LANDSCAPE & ECOLOGY

APPENDIX 30/5 : GRASS SEEDING, WILDFLOWER AND MAINTENANCE (CONTINUED)

9. Defects

Lawns and Grass Areas - bare patches or areas of poor growth shall be re-cultivated and reseeded; excessive settlement affecting the surface levels shall be reworked and brought to a level. All work carried out under the defects liability period shall be carried in accordance with the Supervising Officers instructions. All newly grassed areas which, in the opinion of the Supervising Officer, are not satisfactory for reasons which were in the control of the Contractor shall be made good to the Supervising Officers satisfaction at the Contractors own expense.

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING

1. See Dwg. No. 09723/D/50A for location of proposed tree and shrub planting.
2. Planting operations will be in accordance with BS 4043:1989 / BS 4428:1989 and in accordance with the HTA Handling and Establishing of Landscape Plants revised edition March 2002 published by the JCLI or as indicated by the Councils Arboricultural Officer (AO).

3. Existing Plants and Trees

No existing trees, shrubs or other plants shall be removed or cut without written instructions. The contractor shall take all precautions to protect, in the course of his work, all existing plant material from malicious or accidental damage and shall ensure that no branches shall be cut and no roots over 20 mm diameter shall be severed from existing trees, without express prior permission from the council AO. Vehicles will not be permitted on areas to be planted with trees or on areas with existing trees. Any soil compaction caused will need to be alleviated according to the council AO. Where access is unavoidable the contractor must arrange adequate ground protection measures.

4. Settlement

The contractor must take all reasonable care not to damage treated or other areas by allowing heavy vehicles, tractors, dumpers or other plant machinery to unnecessarily traverse the finished works. Should there be any violation of this clause, the contractor must make good any damage whatsoever entirely at his own expense when so required to do so.

5. General : Trees and Shrubs

All plants to be BS 3936:1992 part 1 and part 4:2007. Planting of all nursery stock shall be to BS 4428:1989.

Plant material shall be of the size and type specified. All plant material shall be free from pests and diseases, any torn or lacerated roots shall be pruned before planting. Do not water plant material if frost is forecast within 24 hours. Bare-rooted materials should not be allowed to dry out or freeze in any circumstances.

TREE PLANTING

For location, Quantities & Specification of shrubs to be planted are shown on Dwg No's 02/107/01 to 03.

6. Setting Out

Planting pit locations & dimensions will be supplied on a plan in most cases or described accordingly. Approval from the Councils AO is needed prior to planting and where instructed pits will be marked on the ground accordingly by the Contractor/Council planting team/Councils Engineer or AO prior to excavation for inspection.

7. Drainage Assessment

Prior to any tree planting it is necessary to establish the ability of the tree pit to drain away excess water. For large pits or trenches it will be necessary to install this system every 2-3 metres. Once the tree pit is excavated and the bottom of the pit is forked/broken up to the required 300mm depth insert a 90mm diameter by 600mm pipe vertically into the pit bottom until half the pipe is submerged. Fill the pipe with water to the brim and cover over leaving for 24 hours. If on inspection the hole or holes have

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

retained water it may be necessary to install a drainage system so contact with the AO or Engineer is essential.

8. Unsuitable Planting Conditions

Work will not be carried out while the weather conditions are unsuitable. The Councils AO will advise the Engineer or Clerk of Works if the conditions are suitable or not. All planting will be carried out only when the ground is free from frost and water logging (see clause 12 for timing of planting).

9. Notice to Landscape and Arboricultural Officers

The Contractor must make advance arrangements with the Councils AO to give them the opportunity to be present during:

- a) Tree pit excavation
- b) Inspection of drainage assessment
- c) Planting of the trees
- d) Application of watering
- e) Each site visit during the 12 month maintenance period.

10. Trees - Suppliers

Suppliers must adequately and carefully pack trees and protect against mechanical damage, extremes of temperature and drying out using appropriate methods described in the HTA's Handling and Establishing of Landscape Plants revised edition March 2002 published by the JCLI.

12. Timing of Planting

Planting shall take place between November and early March for root balled or wrapped trees. Container grown trees can be planted at any time in the year but must be watered in if carried out whilst in leaf.

13. Pre-delivery Tree Inspection (Contractors Attention Only)

Prior to delivery of the trees to site, the Contractor shall request that the nursery provide a digital image of the intended trees for inspection by the Engineer or AO. Where indicated it may be necessary for the AO or Engineer to inspect the trees in the nursery prior to lifting and delivery, Contractors must ask the AO if this is necessary.

14. Storage

Trees not planted on the day of delivery will have the roots covered and protected in order to avoid frost damage, to adequately prevent drying out. Trees will be stored in a place where damage will be avoided. Root-balled or wrapped trees will not be stored for longer than 5 days. Container grown trees will be watered as necessary if in leaf.

15. Failure of Trees

Trees that are dead or beyond repair will be replaced in accordance with clause 12.

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

16. Preparation of Tree Planting Pits

Safety & Excavation

Existing material must be excavated and stored in a safe manner or off site until the tree planting and back-filling of tree soil has been completed. Each tree pit area has to be protected at all times from public access with the relevant fencing and public warning signs in accordance with the New Roads & Street Works Act 1991 where working within the Highway. No tree pit will be left uncovered over night.

The Contractor at the request of the AO, Engineer or Landscape Officer will be required to produce a site specific risk assessment for planting.

17. Backfilling Material

Backfilling of the tree pits around the root area will be the excavated tree soil material unless instructed differently by the AO or Landscape Officer as detailed in clause 18.

Surplus Material is to be removed from site and disposed of appropriately. No Organic matter or fertilizer is to be applied to any tree pit unless instructed differently by the AO.

Important Note: When backfilling it is important to ensure the backfill material is firmed in around the root zone or ball.

18. Pit Sizes/Dimensions

Tree pit sizes will be as large as practicably possible according to site limitations at the time of installation. Individual pit size will be no smaller than specified in BS4428: 1989 or BS4043: 1989 (see clause 24) unless agreed differently by the AO. Where groups of trees are planted in close proximity to one another create a single large pit or trench as instructed by the AO and Engineer.

Important Note. Sides & the bottom of any tree pit must be forked to a depth of 300mm to break up sub-soil to maximise potential root development, establishment & drainage. Care must be taken not to glaze the sides of the pit whilst excavating as this forms a solid 'wall' which inhibits drainage.

19. Drainage (Contractors Attention Only)

With reference to BS4428, 3.5. Where the drainage assessment (see clause 7) reveals drainage is not adequate the installation of an internal plastic drainage system is necessary. This system must lead water away from the tree pit into an area in which drainage can occur. Ripping of the pan surface to improve drainage may be possible and must be discussed with the AO and Engineer prior to planting.

Drains are placed above the impervious layer 1 to 1.5m below the soil surface with a fall of 50 to 300mm per 10m and must be between 50 to 100mm in diameter with three to four 3mm holes per 100mm. The drain needs to be wrapped in Hessian or a synthetic filter material and enclosed with a 50mm layer of gravel.

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

Some plastic pipes are perforated around the complete circumference. In silty soils it is necessary to place a plastic sheet on the top side of the pipe to avoid infiltration of fine soil particles then the pipe is contained as above. Pipes are laid with the perforations face down into the soil where perforations are $\frac{1}{3}$ of the circumference of the pipe.

20. Planting Methods

Planted in accordance with BS4043:1989, with pit dimensions at least 500mm greater than the root-ball and as deep as the root-ball. Once the tree is in place a minimum of 300mm from the top of the root-ball wrapping or wire basket will be removed.

21. Watering & Tree Maintenance (also see Shrub planting clause 15)

Watering regime for trees should be 30 litres per tree per week, once a week from 1st May to 31st August when temperature is in excess of 25 degrees and there has been no significant rainfall for a period of 4 days.

22. Root Protection Barrier

Contractor to install tree root protection barrier between Scottish Power trench and proposed new tree planting area.

Greenleaf Reroot 1000 (or similar approved) to be installed between the proposed Scottish Power main and the new trees on the school / playing field.

Type :- Ribbed. 30m rolls. Thickness 1mm.

Overlap rolls to be min of 100mm. Reroot jointing tape to be used on both sides.

Available from Greenleaf, Tel: Sales and service: 01424 717797, Technical assistance: 01424 433233, Sales Fax line: 01424 533003.

SHRUB PLANTING

1. Shrub planting to be in accordance with Clause 3006.

2. Location, Quantity & Specification of shrubs to be planted are shown on Dwg No's 02/107/01 to 03.

3. General Layout of Planting

All areas of planting shall be marked out to correspond with the drawings and only after the layout of the beds have been approved by the Supervising Officer in conjunction with WCBC's Landscape Designer, shall planting take place. In all cases the WCBC's Landscape Designer reserves the right to adjust the exact positions as planting proceeds.

4. Planting time to be late October through to the end of March. Strictly no planting will be permitted during the summer months.

5. Care of Plants on Site

Planting must be carried out as soon as possible after the plants are delivered to the site. Where delay is incurred, plants must be protected against damage. Plants with bare roots should be heeled in as soon as received or otherwise protected from drying out. Container grown stock is to be unloaded from delivery crates set closely together, protected from wind and watered to stop pots drying out. Bare root stock allowed to dry out will be rejected.

If planting is delayed for more than one week, bundled plants are to be unpacked, bundles opened and each group of plants heeled in separately and clearly labelled. If

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

at any time the surface of the bar root becomes dry the roots are to be thoroughly soaked. All planting to be carried out only when the ground is free from frost and waterlogging.

6. Pit Planting

Where whips/shrubs/herbaceous plants are to be pit planted. The backfill material to be 50% approved topsoil thoroughly mixed with 50% approved peat free compost as specified. For Whips and shrubs the pit to be 300 x 300 x 300 mm For herbaceous plants the pit to be 150 x 150 x 150 mm. Allow 1 no 12 gm slow release 'Sierra Grotab' planting tablet per plant.

7. Planting of Containerised and Root Balled Stock

All plants and plant operations shall be to BS 3936:1992 Part 1, BS 3936:2007 Part 4, BS 3936:1990 Part 10 and BS 4428:1989.

	Diameter	Depth
Transplants and shrubs	300 mm	300 mm
Feathered trees and specimen conifers	600 mm	450 mm

Where necessary increase these dimensions to ensure that pits are at least 75 mm deeper than root system and wide enough to accommodate roots when fully spread. Break up bottom of pit to a depth of 150 mm.

If weather conditions allow, the contractor shall plant containerised material immediately upon delivery on site. If weather conditions are adverse, the contractor shall unpack all plants from transportation vessels as soon as they are delivered on site. They shall be laid out singly, upright and on flat ground, if the weather shows signs that frost is forecast for the following 24 hours.

The container shall be removed prior to planting and shall be removed from site by the contractor to an approved tip. The surface of the rootball shall be slightly disturbed before planting. The contractor shall take care not to disturb the rootball structure while planting and backfilling and shall fully cover the rootball with soil upon completion of planting to prevent drying out.

Care must be taken to avoid damage to the plants. Any damage shall be cut cleanly with a knife or secateurs. Any plant so damaged will be replaced by the contractor at his own expense.

When planting, the contractor shall ensure that each shrub is planted with the 'best side' facing forward.

8. Placement of Topsoil

Topsoil to be in accordance with BS 3882:2007. Ground shall be cultivated to a minimum depth of 450 mm so as to remove any impediment to internal drainage and create a satisfactory growing medium. Any area inaccessible for mechanical cultivation or adjacent to existing vegetation shall be hand cultivated to give the same results.

Any debris or rubbish which may have accumulated on the formation level or in excavated tree pits shall be removed. Topsoil shall be spread to the areas to a depth of 450mm, after approval by the Supervising Officer, using suitable means and ensuring

that, allowing for settlement, the final levels are achieved. The placement operation shall include lightly consolidating the topsoil. The level of topsoil is to be 25mm above

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

adjacent paved areas, kerbs etc. All loose or projecting stones exceeding 50 mm in any dimensions shall be removed.

No work shall be carried out in unsuitable weather conditions or in circumstances which, in the opinion of the Supervising Officer, would affect final surface levels, the quality of finish or cause any damage to the soil structure.

9. Minor Grading of Areas

After top-soiling, the areas shall be graded with a light blade grader or other suitable means to achieve a uniform and even grade at the correct finished levels. All bumps and hollows shall be removed to avoid possible ponding.

Finished levels of topsoil for any grass seeding areas shall be 25mm above adjoining paving or kerb trims with a cambered edge to topsoil. Grading shall only be carried out during suitable weather and ground conditions. Any area that in the opinion of the Supervising Officer has been excessively compacted during and because of the grading operations carried out by the Contractor shall be loosened by harrowing or forking.

10. Fertilisers

Where specified, National Growmore shall be incorporated into all planted bed borders, and shrub pits, at a rate of 70g per square metre.

11. Failure of Shrub Planting

Post practical completion assessment of the planting is to be carried out by the Supervising Officer in conjunction with the Landscape Designer, as specified in this section. Any shrubs that are dead, dying or otherwise defective at the end of the Defects Liability Period will be regarded as defects due to materials or workmanship not in accordance with the Contract. They must be replaced by approved equivalent shrubs at the next suitable planting season unless otherwise instructed. This will not apply if the defects are caused by malicious damage after Practical Completion.

TREES AND SHRUBS MAINTENANCE AND DEFECTS

12. Watering & Tree Maintenance

Trees and shrubs will be maintained for a 1 year period (during the defects correction period) by the Contractor. Responsibility for tree maintenance lies with the Contractor and should be carried out under the guidance and regime specified by the Arboricultural Officer.

It shall be the contractor's responsibility to ascertain the availability of nearby hydrant connections for mains water and to gain the relevant Water Authority's permission to use this supply. Any charges for the supply of water are to be included within the contractor's prices when tendering.

The contractor shall allow for the provision of water, water carts or hoses with a fine hose attachment or sprinkler which shall be allowed to run until the full depth of topsoil in the plant beds have reached full absorption on each occasion.

Watering regime for trees should be 30 litres per tree per week, once a week from 1st May to 31st August when temperature is in excess of 25 degrees and there has been no significant rainfall for a period of 4 days.

The contractor is to include in his tender the cost of compliance with this clause so that the cost of visits can be deducted in whole or part if not required.

LANDSCAPE & ECOLOGY

APPENDIX 30/6 : PLANTING (CONTINUED)

13. The Defects Correction Period

Without prejudice to all other of the Councils rights under the Contract, the Defects Liability Period shall be a minimum period of twelve calendar months from the date of the Practical Completion and shall apply to all work carried out under this Specification. Any defects which appear within the Defects Liability Period and which in the sole opinion of the Supervising Officer are due to materials or workmanship not being in accordance with the Specification or which are due to frost occurring before completion of the works, shall be made good or replaced by the Contractor at his own expense.

14. Organic Mulches

Bark mulch to be chipped conifer bark, size range 25 – 75mm in accordance with clause 3006/53 and 55.

5.

STANDARD DETAILS