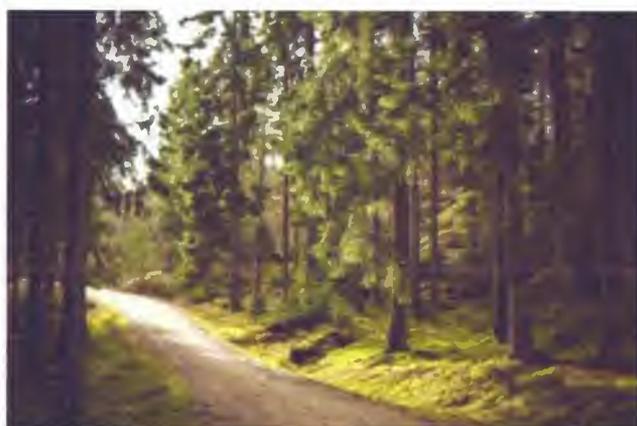


CONSTRUCTION OF ALL ABILITY TRAIL AT THETFORD FOREST



CONTRACT REF: FEE/FC2013/6/MT2



term service short contract

MINI COMPETITION OPPORTUNITY

CONTRACT DATA

SCHEDULE OF REQUIREMENT FOR TASK ORDER

The <i>works</i> are	Construction of approx. 4km length all ability 'heritage' trail at Thetford Forest	
The <i>site</i> is	High Lodge Visitor Centre, Thetford Forest	
The <i>starting date</i> is	Subject to grant of external funding. To be confirmed.	
The <i>completion date</i> is	To be confirmed	
The Pre Tender Meeting Date is	Provisionally Wednesday 2 nd November	
The Pre Tender Meeting Location is	Oak Lodge, High Lodge, Thetford Forest	
The <i>period for reply</i> is	3	weeks.
The <i>defects date</i> is	26	weeks after Completion.
The <i>defects correction period</i> is	4	weeks.
The <i>delay damages</i> are	Not Applicable	
The <i>assessment day</i> is the	1 st day	of each month.
The <i>retention</i> is	5%	



CONTRACT DATA

THE CONTRACTOR'S OFFER

The Contractor is

Name

Address

Telephone

E-mail address

The percentage for overheads and profit added to the defined cost for people is: _____ %.

The percentage for overheads and profit added to other Defined Cost is:

The Contractor offers to Provide the Works in accordance with the *conditions of contract* for an amount to be determined in accordance with the *conditions of contract*.

The offered total of the prices is:

Signed on behalf of the Contractor

Name

Position

Signature

Date

The Employer accepts the Contractor's Offer to Provide the Works

Signed on behalf of the Employer

Name

Position

Signature

Date



contract data

price list

1. PREAMBLE

1.1. METHOD OF MEASUREMENT

1.1.1. RATES

- 1.1.1.1. The Civil Engineering Standard Method of Measurement does NOT apply to the Bill
- 1.1.1.2. Qualified Tenders will not be evaluated. However, should the contractor wish to caveat his unqualified submission this may be accompanied by a clearly annotated qualified tender subject to full and satisfactory clarification being communicated to the employer prior to evaluation
- 1.1.1.3. The rate entered against any item is deemed to cover all work needed to provide the requirements described including materials except where they are specifically stated as being supplied by others.
- 1.1.1.4. Interpretation of the description of items should be made with reference to the Contract drawings and the specification.
- 1.1.1.5. The measurement of work is to be computed net from the drawings and there will be no allowance for wastage. The only exception to this is for excavation and fill where the actual quantity justifiably involved will be measured on site.
- 1.1.1.6. Items against which no price is entered such as temporary works dependent on contractor method shall be deemed to be covered by the other rates and prices in the Bill of Quantities.
- 1.1.1.7. The Contractor will be deemed to have satisfied himself that the quantities and rates in the Bill adequately cover the work detailed on the drawings.
- 1.1.1.8. The Contractor will be deemed to have allowed for the costs of carrying out the provisions of The Instructions to Tenderers within the overall tender price.
- 1.1.1.9. The contractor shall include within his rates for the setting out of the works.
- 1.1.1.10. The contractor shall include within his rates for all temporary works required to construct the permanent works including shoring of trenches and excavations.
- 1.1.1.11. The contractor shall include within his rates for dealing with any groundwater in excavations.
- 1.1.1.12. Any Dayworks shall be paid in accordance with the plant rates submitted by the contractor
- 1.1.1.13. The contractor shall allow within his rates for all site supervision and management

1.2. PRICE LIST – FOR COMPLETION

1.2.1. PROTOCOL FOR COMPLETION OF PRICE LIST

- 1.2.1.1. A blank price list in the form of an excel spreadsheet is attached. It is the contractor's responsibility to check his submission fully before tendering

contract data**works information****2. DESCRIPTION OF THE WORKS****2.1. GENERAL REQUIREMENT****2.1.1. QUANTITY AND LOCATION**

2.1.1.1. The contract relates to the construction of approx. 4km of 2.5m wide granular all ability trail at High Lodge, Thetford Forest

2.1.2. TERMS OF CONTRACT

2.1.2.1. This mini tender opportunity is offered under the terms and conditions specified in FEE/FC2013/6 unless otherwise superceded in this document

2.1.3. DESIGN & SPECIFICATION

2.1.3.1. The Employer requires full compliance with the specification presented hereafter to ensure that all potential Tenderers submit prices on the same basis.

2.1.4. DESIGN PRINCIPLES

2.1.4.1. The overriding principle to be applied to trails built in the rural environment and specifically within sensitive landscapes is one of least environmental and / or aesthetic impact whilst still achieving engineering integrity, fitness for intended purpose and long term sustainability.

2.1.4.2. All trail routes have been expressly located and designed to minimise landscape impact whilst achieving appropriate criteria in terms of horizontal and vertical alignment for the specified user group.

2.1.4.3. The essential requirements of sustainable, safe, economically viable trails can be defined as follows:

- Constructed on appropriately prepared subgrade
- Incorporating appropriate drainage for the topography and soil type which serves the dual purpose of both discharging storm water off the construction and drawing down the water table in the subgrade in order to keep the pavement dry
- Constructed using a granular pavement comprising well graded, durable water bound aggregates laid to a depth appropriate to the strength of the indigenous subgrade
- Finished profile to be shaped or 'cambered' in such a way that surface water is shed off the finished pavement without generating undue erosion of surface dressing
- Pavement to be blinded with a dressing of aggregate dust approx 6mm – down to provide a suitable running surface for cycles, wheelchairs etc.
- Materials to be laid at appropriate moisture content to facilitate compaction of the water bound matrix of approved aggregates.

2.1.4.4. The nature of the Forest Enterprise estate at Thetford is such that there are potentially significant local environmental, archaeological or arboricultural constraints which preclude against an idealised specification at certain locations along the length of particular trails.

2.1.4.5. The following document outlines alternative generic specifications and methods to be implemented dependent on the circumstances and level of sensitivity at particular locations.

- 2.1.4.6. Specifications 1 – 6 presented in the table below outline the variations on generic principles to be applied to all trail build. The order they are presented in the table generally escalates as constraints (ie value of trees adjacent to trail) increase.
- 2.1.4.7. Contractor plant is to be appropriately sized for the corridor and where soft subgrades are identified low ground pressure machinery may be appropriate in order to facilitate progress



figs 1 & 2: typical granular multi – user trails constructed through historic trees at Westonbirt Arboretum

Specification	Constraints	Site Circumstances
1	None	Idealised construction where the route width is unconstrained by veteran trees or other habitats. Achieves all criteria identified in design principles and primarily because of good drainage design will best facilitate sustainable, easily maintained trails at appropriate cost. Important to endeavour to implement this specification where trails are to be built on poorly drained impermeable soils
2	Low	Default construction where available width through trees is constrained. Depth of excavation to remove organic soil will vary according to the value and proximity of the trees in the trail corridor but nominally 100 – 150mm. Drainage where required achieved by perching construction above ground level and incorporating a cambered pavement which will shed water informally to surrounding area. Lack of formal drainage less critical when trails are built on free draining soils
3	Medium – generally aesthetic on poorly drained open pasture	Tray construction as '2' in wet areas requiring positive drainage but implemented where full formation with open v – ditches as defined in specification 1 is either impractical or undesirable for aesthetic reasons. The installed filter drain can be dressed with topsoil to mitigate appearance
4	High	No dig alternative to 2 and 5 where trees are deemed of higher value but not exceptional significance to the extent that specification 5 would be necessary. The incorporation of both geotextile and 2D geogrid is designed to spread the load exerted by the pavement on the root plate.
5	Low / Medium	Construction required when widening and improving existing hard paths to achieve appropriate multi – user specification. Will general involve excavating a 0.5 – 1.0m wide tray adjacent to the existing hard surface and regulating with 75 – 100mm Type 1 Sub base surface

		dressing comprised of 15mm of 6mm – dust
6	None	Limited work to scarify surface to remove potholes, followed by regrading and regulation with max 100mm Type 1 sub base if required

3. SPECIFICATION GENERAL – MATERIALS

3.1. EMPLOYERS ADOPTED SPECIFICATION

3.1.1. SPECIFICATION FOR HIGHWAY WORKS

- 3.1.1.1. The employers adopted specification shall be the 'Specification for Highways Works' unless otherwise indicated in this document

3.2. STANDARDS AND SUBMISSION OF MATERIALS

- 3.2.1.1. As soon as possible after the Contract has been awarded, the Contractor shall submit to the Employer for his approval a list of his proposed suppliers and samples of materials required for the execution of the Works for inspection.
- 3.2.1.2. The materials subsequently supplied shall conform to the quality of samples which have been approved by the Employer.
- 3.2.1.3. Names of additional suppliers and sources may be submitted by the Contractor during the execution of the Contract, but no source of supply shall be changed without the Employer's approval.
- 3.2.1.4. The contractor shall provide a relevant COSHH assessment for all materials supplied to the works and demonstrate that the information contained therein is communicated to employees.
- 3.2.1.5. Wherever, in respect of any British Standard (BS), a BSI Kitemark Certification Scheme is available, all materials required to comply with that Standard, or the containers of such materials, shall be marked with the BSI Certification Trade Mark (the Kitemark). The mark of conformity of any other third party certification body accredited by the National Accreditation Council for Certification Bodies or an equivalent mark shall be an acceptable alternative to this requirement.

3.3. STORAGE OF MATERIALS

- 3.3.1.1. Materials and components shall be stored at pre agreed locations and in such a manner as to preserve their quality and condition to the standards required by the Contract
- 3.3.1.2. Granular materials shall be handled in such a manner that no segregation, contamination or other deterioration of the material can occur.
- 3.3.1.3. Materials and components shall be handled in such a manner as to avoid any damage or contamination, and in accordance with all applicable recommendations of the manufacturers.
- ##### 3.3.2. PIPES FOR LAND DRAINAGE AND TEMPORARY DRAINS
- 3.3.2.1. Pipes, joints and fittings for land drainage and temporary drains shall comply with the relevant provisions of the appropriate British Standard, as set out below:-

Type	BS
Plastic pipes for use as light duty sub-soil drains	4962

3.3.3. PIPE SURROUND MATERIAL

3.3.3.1. Pipe surround material shall be processed granular and as-dug bedding, sidefill and surround materials for buried pipelines shall comply with BS882

3.3.4. GRANULAR SUB BASE MATERIAL

3.3.4.1. Material used in the construction / maintenance of trails pavements shall be crushed rock or in exceptional circumstances approved recycled materials meeting the same criteria. In most situations these will be sourced from commercial quarries but may exceptionally be as dug materials won on the FC Estate. Every effort should be made to source suitably indigenous material which is an appropriate fit in the landscape whilst meeting the engineering specification defined below for grading and durability

3.3.4.2. Granular sub - base material shall be natural sands, gravels, or crushed rock compliant with 'Specification for Highway Works' clause 803 (Type 1 or Type 2) eg:

BS 410 Test Sieve	Percentage by Mass Passing	
	Type 1	Type 2
75mm	100	100
37.5mm	85-100	85-100
10mm	40-70	45-100
5mm	25-45	25-85
600µm	8-22	8-45
75µm	0-10	0-10

3.3.4.3. The particle size shall be determined by the washing and sieving method of BS 812

3.3.4.4. The material shall have a Stewart Impact test value of 20 or less

3.3.4.5. The material passing the 425 micron BS sieve shall be non-plastic as defined in BS 1377: Part 2 and tested in compliance therewith.

3.3.5. RECYCLED MATERIALS

3.3.5.1. The environment inherent to Forestry Commission property supports significant biodiversity and is environmentally sensitive. The level of sensitivity varies according to location but as a principle recycled materials may not be used without the permission of the Employer or his representative.

3.3.6. GRANULAR DRAINAGE MATERIAL

3.3.6.1. The material shall comply with the grading requirements of the 20mm nominal single-sized aggregates given in BS 882: Table 4; Coarse aggregates.

3.3.6.2. The use of a limestone-derived material will not be permitted.

3.3.7. GEOTEXTILE SEPARATION FABRIC

3.3.7.1. Geotextile fabric Geosynthetics 'Treetex' or similar shall comply with the following:-

- Constructed of thermally-bonded or woven, continuous filament, synthetic polypropylene, polyethylene or polyester core/nylon sheets
- Mean pore size (O_{50}) - exceeding 75 microns.
- Thickness - about 1mm.
- Tensile strength - not less than 1.5 kN at an extension not exceeding 30% when tested

on a 200mm wide strip.

- Load at 5% extension - not less than 0.5 kN when tested on a 200mm wide strip.
- Resistant to all naturally occurring acid and alkali soils.
- Resistant to attack by bacteria, fungi, vermin, etc, and be non-biodegradable

3.3.8. 2D GEOGRID

- 3.3.8.1. Biaxial extruded polypropylene geogrid 'Interlock 20' by Geosynthetics or similar approved laid to manufacturers instructions and as defined in this document

3.4. CONCRETE (GENERAL)

3.4.1. DESIGNATED MIX FOR FOUNDATIONS EDGING & KERBS)

- Mix GEN1 to BS 5328.
- The concrete will be unreinforced
- Nominal maximum size of aggregate: 20 mm.
- Admixtures: An accelerator or retarder may be used.

3.4.2. PLACING AND COMPACTING:

- 3.4.2.1. At time of placing ensure that all surfaces on which concrete is to be placed are clean, with no debris and free from water.
- 3.4.2.2. Place while sufficiently plastic for full compaction. Do not add water or retemper mixes. The temperature of concrete at time of placing must be not less than 5 °C. Do not place against frozen or frost covered surfaces.
- 3.4.2.3. Fully compact to full depth (until air bubbles cease to appear on the top surface), especially around corners of form-work and at joints.

3.4.3. CURING AND PROTECTING:

- 3.4.3.1. Prevent surface evaporation from concrete surfaces as specified below by covering with polyethylene sheeting as soon as practicable after completion of placing and compacting, removing only to permit any finishing operations and replacing immediately thereafter:
- 3.4.3.2. Surfaces that will be exposed to frost or pedestrian use, regardless of weather conditions: not less than 10 days
- 3.4.3.3. Other structural concrete surfaces: not less than 5 days.
- 3.4.3.4. Adequately protect concrete from shock, indentation and physical damage.

4. SPECIFICATION GENERAL (CONSTRUCTION)

4.1.1. SETTING OUT

- 4.1.1.1. The Contractor shall set out all critical works as defined by the employer for approval at least 24 hrs before commencement of associated works.

4.1.2. SITE CLEARANCE AND EXCAVATION

- 4.1.2.1. The contractor shall carry out his operation in such a manner as to avoid damage to, or deterioration of, the final surfaces of excavations.
- 4.1.2.2. Forestry Commission will fell and remove all trees on land to be occupied by the Permanent Works. The Contractor shall be responsible for grubbing up all stumps and roots and either placing beyond the extremities of the trail construction or moving to an approved tip on site where so directed by the Employer.
- 4.1.2.3. Trees, shrubs, undergrowth, hedges and structures outside the working area for the



permanent works shall not be interfered with in any way. Adequate precautions shall be taken to prevent damage to trees, shrubs, undergrowth or hedges where they are to be maintained. In the event of a specific tree being identified as being of high value, the contractor shall provide an appropriate, easily visible barrier in compliance with BS 5837 in order to prevent accidental damage as a result of his operation.

- 4.1.2.4. All excavations shall be to the widths, depths, lengths and slopes as shown on the drawings or described in the specification or to such alternative depths and dimensions as may be directed by the Employer.
- 4.1.2.5. Surplus subsoil resulting from excavation within the area of the Permanent Works shall be broadcast to the sides of the excavated area or is to be transported to locations agreed on site with Employer when so directed.
- 4.1.2.6. Excavation for drainage to comply with clause 502 and 602. Trenches shall be excavated in straight lines or regular curves. Trench bed to be as natural fall of ground

4.1.3. EXCAVATION AND STORAGE OF TOPSOIL

- 4.1.3.1. Topsoil shall mean the top layer of soil that can support vegetation.
- 4.1.3.2. Topsoil shall be removed from the trail width and other areas when prescribed and, where required for re-use, shall be stockpiled adjacent to the works or transported to agreed locations and kept free from weeds.
- 4.1.3.3. Topsoil must be stripped from all areas of the works including areas over which machinery will be moving, prior to commencement of any other works in each area.
- 4.1.3.4. Temporary stockpiles for topsoil shall not exceed 1.0 metre in height and shall be so formed that water will not lie on the surface. Any temporary stockpiles will be located to suit the Contractor's own programme of works, but must not be placed over the root protection areas of any trees which are to be protected or conserved.
- 4.1.3.5. Topsoil stockpiles shall not be contaminated by contact with subsoil, cement, lime, petrol, oil or any other harmful materials. Topsoil shall not be buried by subsequent operations or compacted in any way as this would irreversibly damage its structure.
- 4.1.3.6. The Contractor shall thoroughly examine the bottom of all excavations and shall call the attention of the Employer to any soft, unsound or weak ground contained within the formation area. Following inspection by the Employer and after the issue of his written instruction for the same, such areas shall be dug out and replaced by material approved by the Employer. The Contractor shall not commence construction of the pavement until the formation has been approved by the Employer.

4.1.4. TRAIL GRADIENT

- 4.1.4.1. The trail will be macro designed by the Employer in order that the alignment achieves approved all ability longitudinal gradient criteria not exceeding 5%. During the course of the works the contractor must ensure that localised gradients remain within this specification.

4.1.5. FORMATION LEVEL

- 4.1.5.1. Formation level shall be defined as the top level of the capping layer (if required) or of the prepared subgrade.
- 4.1.5.2. Camber / Crossfall - Because of the need to cater for wheelchairs cambers and crossfalls cannot be oversteep. Formations shall normally be cambered with 4% fall from the crown, or with a 4% crossfall sloping where directed by the Employer. On steep side slopes cross fall to slope inwards.
- 4.1.5.3. Earthworks shall be constructed to the design widths, levels and line shown on the plans, sections and schedules. Trails shall only be built on natural undisturbed ground; ie not on fill, except for on embankments over culverts. The embankment fill material shall be rock



- as described below and placed in layers that can be effectively compacted; allowing for it to reach its natural angle of repose.
- 4.1.5.4. If rock is encountered on the alignments, it shall be removed by digging or breaking by machine
 - 4.1.5.5. Trail side drains where there is a formation shall be constructed to the profiles shown on the sections and shall have a depth not less than 100mm below the formation edge. They shall have a longitudinal fall of not less than 2%. A minimum 5m long filter zone shall be provided each side of any natural watercourses encountered on the route.
 - 4.1.5.6. Earthworks and formations shall be shaped to the specified camber or falls and be free of standing water. Trail formations shall be compacted where possible and made free of any ruts and unsuitable material by removal. It shall be kept in this condition to the satisfaction of the FC Representative, until constructed upon.
 - 4.1.5.7. Trailside batters shall be cut to a stable and even slope free of overhangs and loose rock to the satisfaction of the FC
 - 4.1.5.8. Representative. All excavated material and stumps shall be spread evenly onto the ground adjacent to trail; without impeding drainage and / or access to and from that ground.
- 4.1.6. **COMPACTION OF FORMATION**
- 4.1.6.1. Formations are generally to be shaped and compacted to the required camber or crossfall to allow water runoff prior to placing of aggregates unless otherwise instructed due to proximity of sensitive trees and requirement for minimum dig specification 4
- 4.1.7. **DRAINAGE**
- 4.1.7.1. Drainage will be as informal as possible in keeping with the intention to minimise impact on the rural landscape. The general principle is to shed water to shallow ditches or to surrounding soil as shown on contract drawings. The final position and number of any culverts which might be installed to be to the approval of the Employer following inspection of formation prior to laying of capping / pavement materials.
- 4.1.8. **CULVERT INSTALLATION**
- 4.1.8.1. Culverts for watercourses crossing the road at an angle shall be kept on the same line as the watercourse.
 - 4.1.8.2. No culvert for a natural stream crossing or forest drain shall be placed on fill. The culvert invert shall be laid below bed level; the bed being regulated as necessary by excavation or by filling of local hollows with bedding materials well compacted into place.
 - 4.1.8.3. All culverts shall be laid in the natural undisturbed ground unless otherwise agreed by the Employer.
 - 4.1.8.4. Watercourses and drains shall be kept clear of lop and top and other debris.
 - 4.1.8.5. Trenches for culverts shall be excavated down to firm ground with all mineral soil removed. The minimum depth of cover shall be one and a half times the diameter.
 - 4.1.8.6. Excavations of trenches shall be adequately supported or battered and benched at all times. Sheet piling and other supports shall be removed as filling proceeds. Excavations requiring backfilling shall remain open only for the minimum period necessary.
 - 4.1.8.7. The maximum excavated width of trenches for the installation of culverts shall be the diameter plus 600mm.
 - 4.1.8.8. During bedding and pipe laying, the excavation shall be banded to avoid inundation. If pumping is required to remove excess water then the discharge should pass through settlement ponds and / or filters before re - entering the watercourse.
 - 4.1.8.9. Pipe to extend min 500mm beyond batter profile.
 - 4.1.8.10. Pipe diameter to be specified by Employer; Polypipe RD300X6 or similar approved to

BS4660 / 4962

- 4.1.8.11. Culverts to be laid to 'Type S' specification as detailed in 'Specification for Highway Works'. Bedding / backfilling to be in accordance with clause 503, 504 and 505. Bedding / backfill to be graded granular material deposited and compacted in compliance with Clause 612. The material shall be single-sized aggregate of nominal size 20mm as specified in Table 5/3NI of 'Specification for Highway Works' for granular materials to BS 882
- 4.1.8.12. Backfilling shall be undertaken, immediately after the required operations preceding it have been completed, with DOT Type 1 crushed aggregate (or other material as approved by the Employer), fully compacted as described below. Materials of compacted thickness greater than 225mm shall be laid in two or more layers. The greatest thickness of any such layer shall be 110mm and the lowest layer shall be the thickest layer. Compaction shall be completed as soon as possible after the material has been spread and in accordance with the requirements for the individual materials, by rollers with their vibratory mechanism operating or vibratory compacting plates
- 4.1.8.13. Culvert ends shall be blended into the surrounding earthworks profile so as not to be prominent. This shall be achieved by either:- the outfall end of the cross-culvert being cut at a chamfer at the angle of repose of the surrounding ground, or by large stones and turf arising from the excavated alignment being stacked around and over the culvert end as head and tail walls

4.1.9. TRAIL WIDTHS

- 4.1.9.1. The effective trail surface widths are nominally as defined below. "Effective width" denotes full depth construction. Feathered edges are not included in the surface width.

- nominally 2.5 metres but varied to suit localised site conditions

4.1.10. PAVEMENT MATERIALS - GENERAL

- 4.1.10.1. All pavement materials shall be placed in accordance with the general conditions for unbound granular sub-base materials specified in clauses 703,704 and 705 of 'Specification for Highway Works'.
- 4.1.10.2. Pavement materials to be compacted to clause 803 and 804 in layers not exceeding 100mm with a minimum of 3 passes of a 6/40 tonne vibrating roller or similar approved.

4.1.11. PAVEMENT DESIGN

- 4.1.11.1. Generic trail pavement designs are as indicated on the contract drawings. The differing elements for specification purposes are outlined separately.
- 4.1.11.2. All elements shall consist of a capping layer (where required) laid on the sub-formation; a pavement layer and a surfacing layer. The function of the capping layer is either to strengthen the formation or to make up levels to an appropriate formation level
- 4.1.11.3. Pavement thicknesses are based on a minimum subgrade CBR of 3. This must be assessed and agreed with the Employer before any trail construction takes place. Soft spots are to be dug out and replaced with material approved by the Employer.

4.1.12. CAPPING LAYER

- 4.1.12.1. Where ground conditions dictate a capping layer of min 100mm compacted depth of 75mm down crusher run shall be included

4.1.13. BASE AND WEARING COURSES

- 4.1.13.1. The minimum fully compacted depth of base course shall be nominally 100 mm composed of MOT Type 1 sub base defined in 'Specification for Highway Works' Clause 803 . This will vary according to the need or otherwise for a capping layer and will be specified according to site circumstances such as the requirement for low fines aggregate in Specification 4



- 4.1.13.2. The wearing course shall normally consist of min 15 mm minimum compacted thickness of local approved aggregate graded 6mm to dust laid wet to aid compaction
- 4.1.13.3. The FC Representative shall approve all materials prior to use. Sample piles of material will be made available as a priority during the mobilisation period and for the duration of the contract.
- 4.1.13.4. The finished wearing course surface shall be uniform, sealed and shaped to the required camber.

4.1.14. PROFILE AND COMPACTION

- 4.1.14.1. Trail materials shall be laid to the specified camber and profile. The materials shall be laid and compacted without segregation of the constituent sizes. They shall be laid in a manner preventing damage to the trail formation or rutting of the uncompacted layer.
- 4.1.14.2. Laid pavement to be well compacted with a minimum of 3 passes of a 2.5 tonne vibrating roller or similar approved. Dependent on the sensitivity of the particular location the Employer may instruct the contractor to moderate the level of compaction.

4.1.15. TOPSOIL PLACEMENT TO TRAILS

- 4.1.15.1. Infrastructure subject to high recreational activity will require necessarily increased standards of 'finish' adjacent to the completed works, specifically the dressing of disturbed areas with topsoil as the following clauses.
- 4.1.15.2. The Contractor shall replace existing topsoil with approved imported topsoil in the event of topsoil being improperly conserved.
- 4.1.15.3. Following trimming of all areas of Permanent Works to the required profile, the topsoil previously set aside shall be evenly spread over the disturbed areas to a minimum depth of 150mm. Finished levels after settlement to be flush with all paved areas to allow for shrinkage and / or settlement, married in with adjoining soiled areas
- 4.1.15.4. Topsoil shall be handled and placed in the driest conditions possible. Do not handle topsoil during or after heavy rain
- 4.1.15.5. The contractor shall not firm, consolidate or compact topsoil when laying. A friable texture of separate visible particles should be preserved wherever possible.
- 4.1.15.6. Disturbed areas to be seeded shall be prepared to a fine tilth with stones > than 75mm removed. The ground shall then be raked and seeded with an approved seed mix at a rate of 35gm/m

4.1.16. OPTIONAL GRASS SEEDING TO TRAILS

- 4.1.16.1. Soil for dressing the sides to be excavated alongside and left finished compacted to allow water to run off from the sides, to receive seeding.
- 4.1.16.2. Spoil tipped areas to be seeded shall be prepared to a fine tilth with stones > 75mm removed. The ground shall be raked and seeded with the following seed mix or otherwise as instructed at a rate of 35 gm/m² (after an application of slow release fertiliser):
- 6kg Profit or Portstewart perennial ryegrass
 - 3kg S48 Timothy or Farol Timothy
 - 1/2kg Alice White clover
 - 1/2kg Menna Wild White clover
 - 4kg Magella or Andes perennial ryegrass

5. SPECIFICATION VARIATIONS

5.1. ADAPTATION OF ILLUSTRATED SPECIFICATIONS

5.1.1. HYBRID SPECIFICATION ACCORDING TO SITE CIRCUMSTANCES



- 5.1.1.1. This outline specification for tender purposes should be read in conjunction with the drawings and the Designers Risk Assessment. The Contractor is to produce and maintain the SHE file throughout the works, detailing risk assessments, method statements and describing the phasing of works. The Engineer and Principal Designer should be kept informed of the proposed method of working and notified of planned and unplanned significant changes.
- 5.1.1.2. The following specifications are indicatively those to be applied in specific circumstances along the defined route and are to be cross referenced with the Price List
- 5.1.1.3. Dependent on site circumstances at a particular location depth of excavation may influence a variation in specification as illustrated
- 5.1.1.4. As an example Specification 2 identifies topsoil excavation to form tray of approx 150mm whereas Specification 4 is 'No Dig'. It may be the case that for specification 4, 'minimal' excavation between 0 - 150mm may be permissible following on site approval from the Employer
- 5.1.1.5. In order to accurately establish the particular approach at a specific location the Employer and the Contractor will walk the route together prior to commencement and clearly peg the extent of agreed specifications

5.1.2. DEFAULT AND PROVISIONAL SPECIFICATIONS

- 5.1.2.1. Specifications 1 & 2 are likely to be the default for the majority of the route as defined. Specifications 3, 4, 5 and 6 and associated bill items in the price list are provisionally included for use as required

5.2. SPECIFICATION 1 – FULL FORMATION CUT

5.2.1. APPLICATION

- 5.2.1.1. Applicable to trail build within an unconstrained corridor on primarily impermeable soils requiring positive drainage





Fig 3 - Typical section through trail constructed incorporating full formation cut

5.2.2. SPECIFICATION & METHOD

- 5.2.2.1. Grub up all stumps and side cast clear of trail corridor. Excavated stumps to remain in situ as future 'dead wood' habitat
- 5.2.2.2. Strip organic material to nominal depth of 150mm across entire width of formation and stockpile adjacent to the trail alignment in preparation for reuse as landscaping mitigation
- 5.2.2.3. Excavate to reduce levels and to form illustrated formation profile to include 'v' ditch drainage. In order to mitigate against ground damage the formation should be excavated incrementally to avoid exposure to inclement weather. Where there is high potential for overnight rainfall the contractor should plan to introduce the capping layer before the end of the working day. Dependent on the level of risk the contractor should also consider the requirement for low ground pressure machinery such as tracked dumpers
- 5.2.2.4. The Contractor shall thoroughly examine the bottom of all excavations and shall call the attention of the Employer to any soft, unsound or weak ground contained within the formation area. Following inspection by the Employer and after the issue of his written instruction for same, such areas shall be dug out and replaced by material approved by the Employer, nominally approved 75mm crusher run specified 6F2. The Contractor shall not commence construction of the pavement until the formation has been approved by the Employer.
- 5.2.2.5. All culverts to be installed prior to laying of geotextile / pavement materials in compliance with clauses 4.1.8 contained in this document.
- 5.2.2.6. Dependent on local soil conditions the approved formation to be overlain with non - woven geotextile separation fabric 'ecotex' or similar prior to introduction of pavement materials.
- 5.2.2.7. Geotextile to be overlain with approved pavement materials as defined below:
 - min 150mm or otherwise instructed DTp Type 1 granular subbase produced in accordance with SHW Clause 803 laid and compacted to max 1:40 (2.5%) crossfall or min 1:50 (2%) camber
 - surface dressing of approved 15mm depth 6mm to dust laid and compacted wet to replicate base course crossfall or camber
- 5.2.2.8. All pavement materials to be compacted to refusal with min t20 vibrating roller
- 5.2.2.9. On completion of pavement topsoil previously set aside to be dressed back to edges of trail construction and all other disturbed areas and raked by hand to form a fine tilth

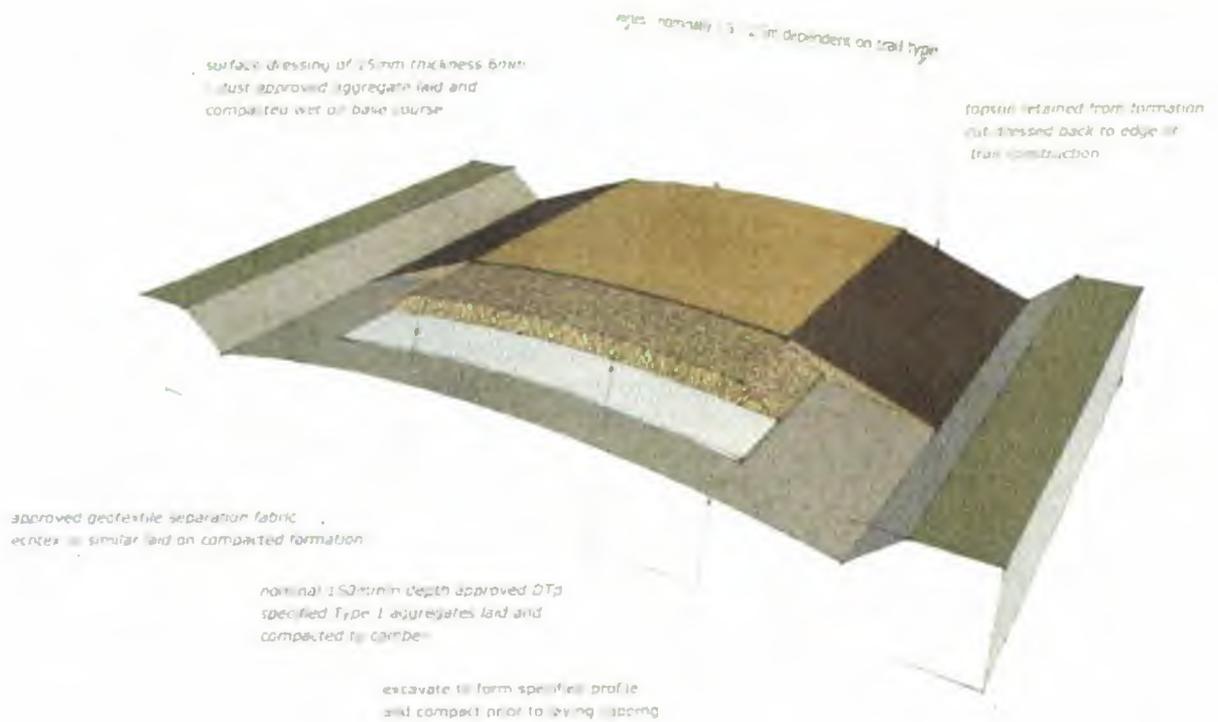


Fig 4 - Isometric illustration through trail constructed incorporating full formation cut



Fig 5 - Newly constructed 'formation' construction within woodland on the Quantock Hills. Note that the subgrade at this location was particularly poor and required formal drainage in the form of v ditches in order to be sustainable



Fig 6 - Completed trail on the Quantock Hills approx 8 weeks after construction showing regeneration of vegetation to trail edges



- commence construction of the pavement until the formation has been approved by the Employer.
- 5.3.2.5. All culverts to be installed prior to laying of geotextile / pavement materials in compliance with clauses 4.1.8 contained in this document.
 - 5.3.2.6. Dependent on local soil conditions the approved formation to be overlain with non - woven geotextile separation fabric 'ecotex' or similar prior to introduction of pavement material
 - 5.3.2.7. Geotextile to be overlain with approved pavement materials as defined below:
 - min 150mm or otherwise instructed DTp Type 1 granular subbase produced in accordance with SHW Clause 803 laid and compacted to max 1:40 (2.5%) crossfall or min 1:50 (2%) camber
 - surface dressing of approved 15mm depth 6mm dust laid and compacted wet to replicate base course crossfall or camber
 - 5.3.2.8. All pavement materials to be compacted to refusal with min t20 vibrating roller
 - 5.3.2.9. On completion of pavement topsoil previously set aside to be dressed back to edges of trail construction and all other disturbed areas and raked by hand to form a fine tilth

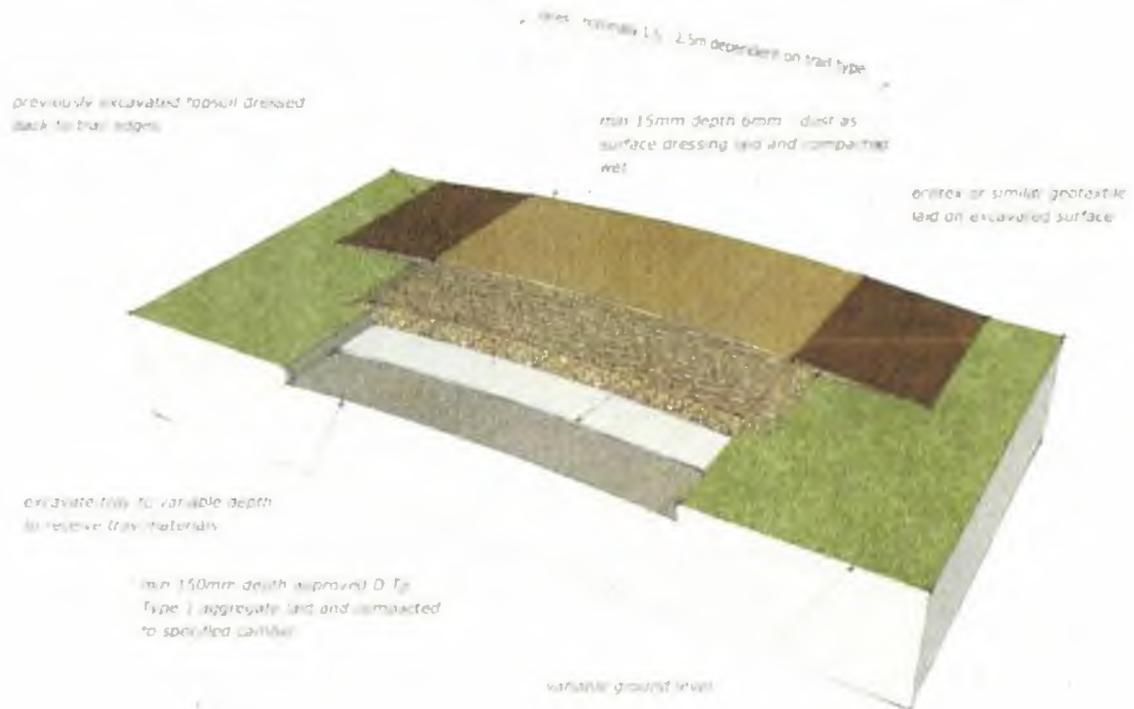


Fig 8 – Isometric section through trail built using 'tray' construction



Fig 9 - Excavation for shallow 'tray' construction within mature trees at Westonbirt Arboretum



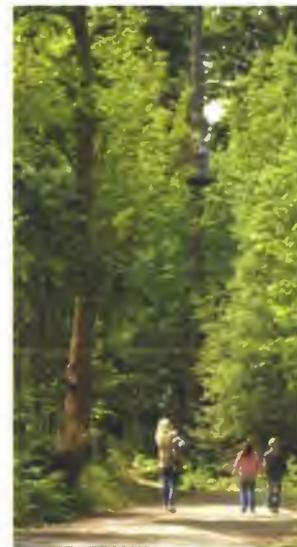
Fig 10 - Backfill of tray with Type 1 Aggregates at Westonbirt Arboretum



Fig 11 - 'blue' trail tray construction, Bedgebury Pinetum



Fig 12 - multi user 'tray' construction in restricted corridor



5.4. SPECIFICATION 3 - 'TRAY' CONSTRUCTION WITH FILTER DRAINAGE

5.4.1. APPLICATION

- 5.4.1.1. Specification shall be as SPECIFICATION 2 with the following additions and primarily be used in locations where drainage is critical but open v - ditches inappropriate

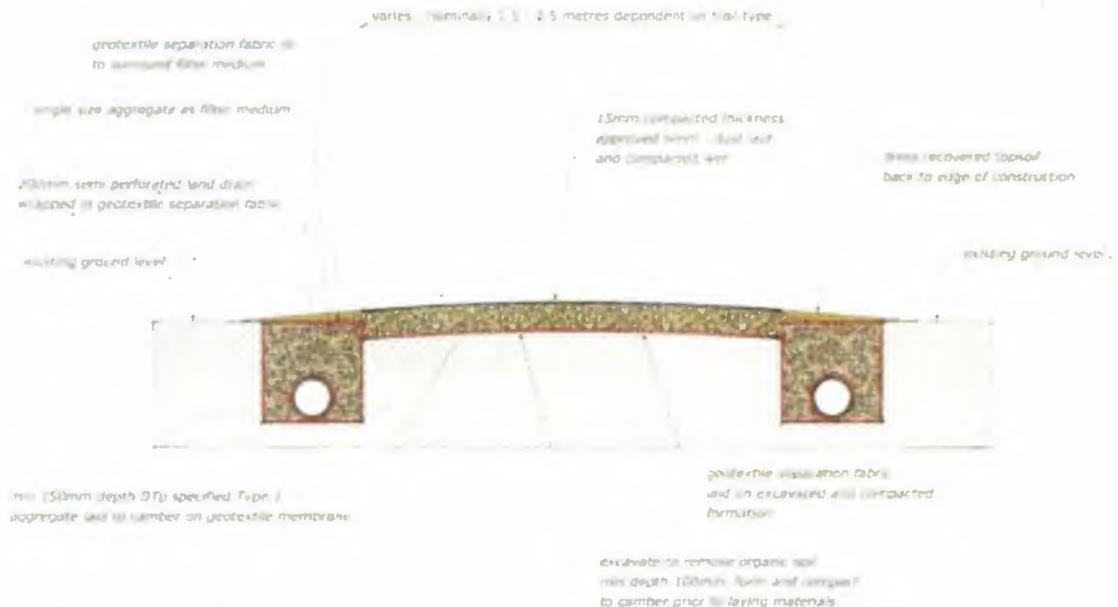


Fig 13 - tray construction with filter drainage

5.4.2. SPECIFICATION & METHOD

5.4.2.1. Tray constructed as Clauses defined in 5.3 contained in Specification 2 but with the following additional clauses:

5.4.3. FILTER DRAINAGE

5.4.3.1. NB - Filter drains may only be required to one side of construction

5.4.3.2. All trenches shall be lined with geotextile prior to placing perforated drainage pipes and backfill.

5.4.3.3. Nominally 150 mm diameter (or as otherwise specified) perforated land drainage pipes shall be laid to min falls of 1 in 100 and wrapped in geotextile prior to installation

5.4.3.4. Bedding / backfilling to be in accordance with clause 503, 504 and 505. Type M. Bedding / backfill to be granular material deposited in compliance with Clause 612. The pipe surround material shall be single sized aggregate of nominal size 25 mm as specified in Table 5/3NI of 'Specification for Highway Works' for granular materials to BS 882.

5.4.3.5. Filter drains shall be discharged through 150 mm dia unperforated pipes (Polypipe or similar approved to BS4660 / 4962) at appropriate locations

5.4.3.6. Pipe joints to be made using appropriate collars / jointing rings. Any cut ends to be at right angles.

5.4.3.7. Backfill to trenches containing link pipes, between french drains and soakaways shall be MoT Type 1 material unless otherwise instructed

5.4.4. SOAKAWAYS

5.4.4.1. If soakaways are required to outfalls of land drainage pipelines excavated material shall be disposed of locally on site or removed from site to a registered tip as instructed by the

Employer.

- 5.4.4.2. All excavations shall be lined with geotextile prior to placing granular backfill.
- 5.4.4.3. Soakaways shall be filled with single size aggregate of nominal size 50mm as specified in Table 5/3NI of 'Specification for Highway Works' for granular materials to BS 882.

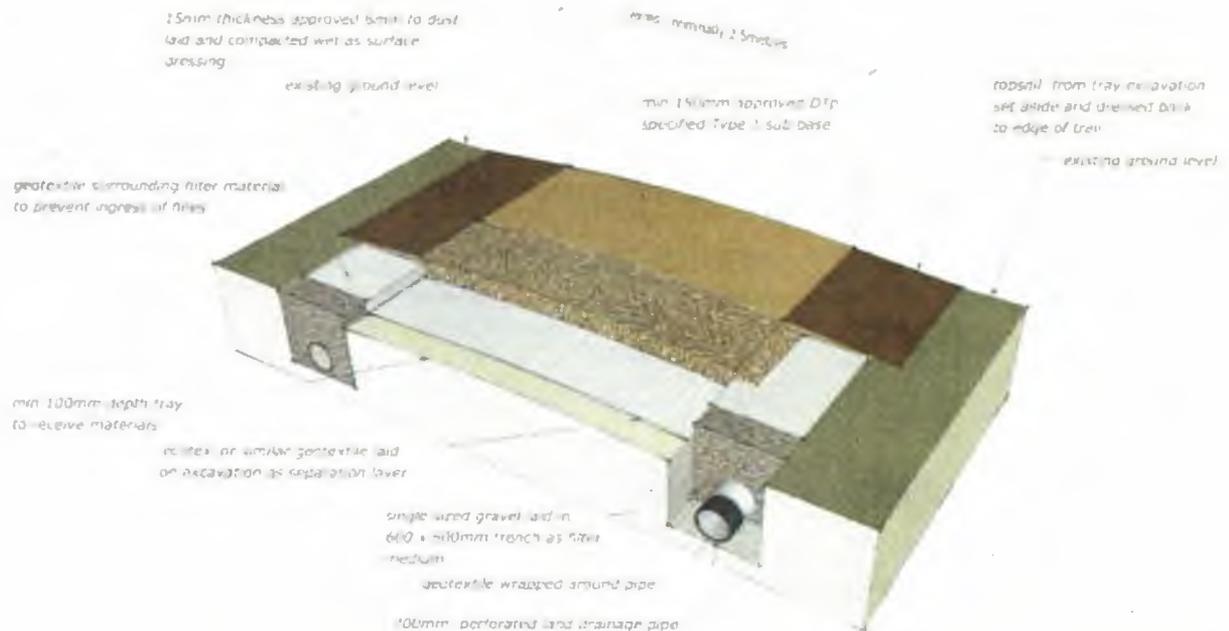


Fig 14 – isometric illustration through tray construction with filter drainage

5.5. SPECIFICATION 4 – 2D GEOGRID, MINIMUM OR NO DIG

5.5.1. APPLICATION

- 5.5.1.1. 'No dig' construction within RPA and where roots are <150 mm below surface
- 5.5.1.2. Applicable to locations of higher sensitivity than specification 2 where minimum or no dig is required with additional spreading of pavement load as protection of root systems

compliance with clauses 4.1.8 contained in this document.

- 5.6.2.6. Dependent on local soil conditions the approved formation to be overlain with non - woven geotextile separation fabric 'ecotex' or similar prior to introduction of backfill material
- 5.6.2.7. Backfill tray with 75mm crusher run or otherwise approved material to level of adjacent stoned surface
- 5.6.2.8. Overlay with regulating and surface dressing courses as follows
 - min 75mm or otherwise instructed DTp Type 1 granular subbase produced in accordance with SHW Clause 803 laid and compacted to max 1:40 (2.5%) crossfall or min 1:50 (2%) camber
 - surface dressing of approved 15mm depth 6mm to dust laid and compacted wet to replicate base course crossfall or camber
- 5.6.2.9. All pavement materials to be compacted to refusal with min t20 vibrating roller
- 5.6.2.10. **On completion of pavement topsoil previously set aside to be dressed back to edges of trail construction and all other disturbed areas and raked by hand to form a fine tilth**

5.7. SPECIFICATION 6 – REPROFILING OF EXISTING ROUTES

5.7.1. APPLICATION

- 5.7.1.1. Applied to lengths of existing trail or road which form part of the route but are potholed and surfaced inappropriately for cycle or other recreational traffic

5.7.2. SPECIFICATION AND METHOD

- 5.7.2.1. With appropriate depth machine mounted tines scarify pavement surface to depth of pothole
- 5.7.2.2. Regrade scarified materials to form camber and compact with t20 vibrating roller
- 5.7.2.3. If required overlay with regulating and surface dressing courses as follows
 - min 75mm or otherwise instructed DTp Type 1 granular subbase produced in accordance with SHW Clause 803 laid and compacted to max 1:40 (2.5%) crossfall or min 1:50 (2%) camber
 - surface dressing of approved 15mm depth 6mm to dust laid and compacted wet to replicate base course crossfall or camber
- 5.7.2.4. All pavement materials to be compacted to refusal with min t20 vibrating roller

5.8. RESIN BONDED PAVING - GENERAL

5.8.1. MATERIALS GENERALLY:

- 5.8.1.1. Not less than 2 weeks before starting work submit to the Supervisor the name of each supplier of material. Keep a test certificate for each manufacturing batch of bituminous material delivered, certifying compliance with this specification and the relevant British Standard and giving complete information on the composition of each mix. Test certificates should be kept available for inspection.

5.8.2. ACCEPTANCE OF SUB-BASE

- 5.8.2.1. Before starting work ensure that:
 - The base is sound, free of debris, mud and soft spots, and suitably close textured.
 - The levels and falls of the sub-base are as detailed, within the specified tolerances of ± 20 mm (vehicular areas) and ± 12 mm (pedestrian areas).
 - Kerbs and edgings are complete, adequately bedded and haunched and to the required levels.



5.8.3. LAYING GENERALLY:

- 5.8.3.1. Remove all loose material, foreign matter and standing water from surfaces to receive paving materials. Form neat junctions with adjacent work and prevent damage of other finished materials. Keep clean all channels, kerbs, inspection covers etc.
- 5.8.3.2. Keep new paving free from traffic until it has cooled to atmospheric temperature. Do not allow rollers to stand on paving at any time. Do not use finished paving as a building platform or for storing, mixing or preparing materials.
- 5.8.3.3. Lines and levels of finished surface to be smooth and even, with regular falls to prevent ponding. Finished surface of paving to have an even overall texture. Leave in a clean state on completion.
- 5.8.3.4. COLD WEATHER: Do not use frozen materials or lay paving on frozen or ice covered surfaces. Do not lay coated macadam if the temperature of the laying surface is below 2 °C.
- 5.8.3.5. LEVELS of finished surface to be within 10 mm of required levels (+6 mm -0 mm adjacent to gullies and manholes).
- 5.8.3.6. REGULARITY: Where appropriate in relation to the geometry of the surface, the variation in gap under a 3 m straightedge (with feet) placed anywhere on the surface to be not more than:
 - Roadbase [25] mm
 - Basecourse [13] mm
 - Wearing course [10] mm
 - Where a straightedge cannot be used the surface must be of a comparable standard of accuracy when judged by eye.

5.9. PROPRIETARY PAVING (RESIN BOUND GRAVEL TO SHELTER AREA)

5.9.1. APPLICATION

- 5.9.1.1. Applicable to specific area of high usage adjacent to timber shelter. Note that shelter is likely to have been constructed at the time this contract is enacted

5.9.2. SPECIFICATION AND METHOD

- 5.9.2.1. Granular sub-base:
 - Thickness 150mm.
 - Lay and compact roadbase materials to BS 4987: Part 2.
- 5.9.2.2. Basecourse: Dense bitumen macadam basecourse shall comply with clause 906 of 'Specification for Highway Works' and with BS 4987: Part 1
 - Aggregate to be 20mm continuously graded.
 - Binder to be petroleum bitumen complying with BS 3690: Part 1. The grade of binder shall comply with BS 4987: Part 1
 - The penetration of the binder to be grade 100.
 - Thickness min 50mm
- 5.9.2.3. Wearing course: nb supplier identified below is indicative. Contractor may submit alternative to approval
 - 6mm-dust Natural 'Butts Lake' gravel
 - Texture: Medium (35% mix)
 - Thickness: 20mm



- Binder: 10% Ecoplas polymerised 55/107
- Colour: Clear EC1214
- Primer: Bituchem polybit emulsion, spread at the rate of 0.4 litres/m²
- Manufacturer and reference: Naturatex by Colourpave. Tel. 01594 826768 or other pre – approved prior to commencement

5.10. PRECAST CONCRETE BLOCK PAVING FOR EDGING TO RESIN BOND SURFACES (SHELTER AREA)

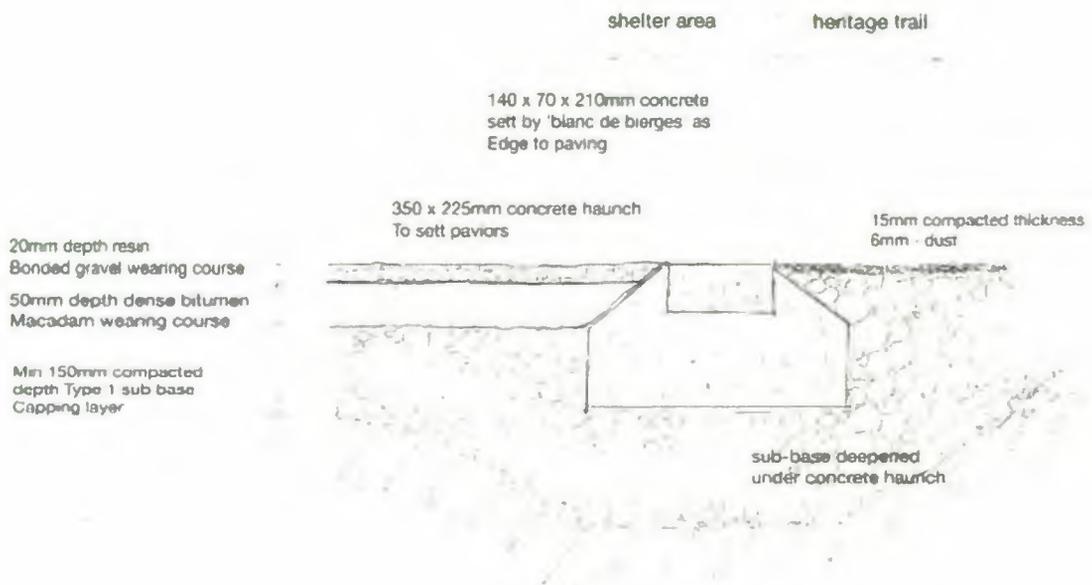


Fig 17 – Sett pavior edge restraint to resin bound surfaces at shelter location

5.10.1. TO BS 7263: PART 1.

- Manufacturer and reference: Blanc de Bierges, Tel. 01733 202566
- <http://blancdebierges.com/technical-data>
- Type/size: 210x140x70 mm
- Finish/colour: Natural colour 'Straight edge sett'
- Location: edge of footpaths and dividing different paving finishes
- Joints: 10mm mortar joints



- 5.10.1.1. LAYING Where necessary cut units neatly and accurately with a masonry saw and without spalling to give neat junctions. Bed units in mortar, true to line and level along top and front faces, on accurately cast foundations and secure with a continuous haunching of concrete. Allow bedding to set before placing haunching. Keep exposed faces of units clean and free from concrete and mortar droppings.
- 5.10.1.2. ADVERSE WEATHER: Do not cast foundations, lay units or place haunching if the temperature is below 3 °C on a falling thermometer or 1 °C on a rising thermometer. Adequately protect foundations, bedding and haunching against frost and rapid drying by sun and wind.
- 5.10.1.3. CONCRETE FOR FOUNDATIONS AND HAUNCHING: To BS 5328, Designated mix as section illustrated on drawings.
- 5.10.1.4. ACCURACY: Maximum deviations:
- Level: ± 6 mm
 - Horizontal and vertical alignment: 3 mm in 3 m.

5.1. PROPRIETARY PAVING (RESIN BOUND GRAVEL TO HAULAGE ROUTE CROSSING POINTS)

5.1.1. APPLICATION

- 5.1.1.1. Applicable to areas identified on plan where forest haulage routes cross the trail.





Fig 18 – Plan view of forest road crossings

5.1.2. SPECIFICATION AND METHOD

5.1.2.1. Granular sub-base:

- Thickness 3000mm.
- Lay and compact roadbase materials to BS 4987: Part 2.

5.1.2.2. Basecourse: Dense bitumen macadam basecourse shall comply with clause 906 of 'Specification for Highway Works' and with BS 4987: Part 1

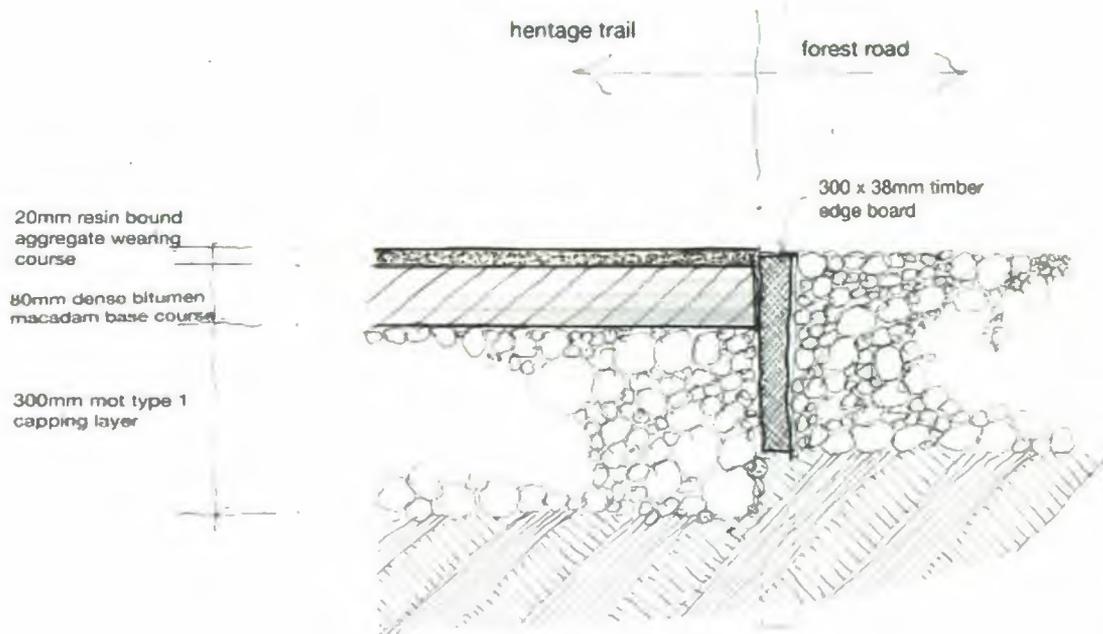
- Aggregate to be 20mm continuously graded.
- Binder to be petroleum bitumen complying with BS 3690: Part 1. The grade of binder shall comply with BS 4987: Part 1
- The penetration of the binder to be grade 100.
- Thickness min 80mm

5.1.2.3. Wearing course: nb supplier identified below is indicative. Contractor may submit alternative to approval

- 6mm-dust Natural 'Butts Lake' gravel
- Texture: Medium (35% mix)
- Thickness: 20mm
- Binder: 10% Ecoplas polymerised 55/107
- Colour: Clear EC1214
- Primer: Bituchem polybit emulsion, spread at the rate of 0.4 litres/m²
- Manufacturer and reference: Naturatex by Colourpave. Tel. 01594 826768 or other pre – approved prior to commencement

5.1.3. EDGES TO PAVING

5.1.3.1. Provide and install 300 x 38mm treated softwood edge boards as edge restraint to paved areas



Text Label

Fig 19 - Edge restraint to resin bond surfaces at road crossings

drawings (trail specification drawings contained in document)

Drawing number	Revision	Title
Drawing No 1		Trail Route & Crossing Points
Drawing No 2		Trail Route & Lengths
Drawing No 3		Material & Compound Locations / recreational routes
Drawing No 4		Shelter
Drawing No 5		HLF Heritage Trail + Utilities
Drawing No 6		HLF Trail with Infrastructure
Drawing No 7		HLF Heritage Trail + Heritage impact zones
Drawing No 8		Drawing No 8 - Ecological Constraints Plan

contract data

works information

6. CONSTRAINTS ON HOW THE CONTRACTOR PROVIDES THE WORKS

6.1. PRE TENDER HEALTH AND SAFETY INFORMATION

- 6.1.1.1. This Pre Tender Health and Safety Plan provides information which the contractors may use to plan their work. Contractors are required to plan and resource their activities to maintain the highest standards of Health and Safety.
- 6.1.1.2. The contractor appointed to carry out the works shall be appointed to the role of 'Principal Contractor' within the revised meaning of the Construction (Design and Management) Regulations 2015 or 'CDM Regulations'. The Contractor shall then assume and execute the 'Principle Contractor' role under the regulations
- 6.1.1.3. A Designers Hazard / Risk Assessment based on the Tender Documents is provided in Appendix A. In conjunction with the principle hazards identified in this plan it is intended to form the basis of the contractor's hazard identification / risk assessment and method statements for works procured within this contract. Additional hazards may be identified by the contractor and these should be included in the Construction Health and Safety Plan which must be in place prior to the start of site works.
- 6.1.1.4. The specific health and safety procedures for the site operations procured within this contract will be co-ordinated by the Principal Contractor and included in the phased development of the Health and Safety Plan. (Contractor will finalise the H & S plan to suit his work methods before work commences)

6.2. OTHER INFORMATION

6.2.1.1. Local Hospitals

- The nearest Accident and Emergency Department can be located by reference to the attached website

<http://www.nhs.uk/Service-Search/UrgentCare/UrgentCareFinder?Location.Id=0&Location.Name=m259tg&Location.Latitude=53.5226020812988&Location.Longitude=-2.29566717147827&IsAandE=True&IsPharmacy=False&IsUrgentCare=False&IsOpenNow=False&MileValue=10>

6.2.2. SITE - WIDE ELEMENTS

- 6.2.2.1. The forest environment is used extensively by the public for recreation. The contractors Method Statements and Risk Assessments should be clear in indicating the control measures that he will put in place to minimise risk to the general public through his activities.
- 6.2.2.2. Site plans will be provided. The contractor will be required to annotate the plan with information concerning arrangements for access and areas used for parking, manoeuvring, storage (including oils & fuels in 110% double bunded tanks) and all other materials brought to site including welfare arrangements



6.2.3. CONTINUING LIAISON AND HEALTH AND SAFETY FILE

6.2.3.1. Feedback as to Health and Safety issues from the Contractor shall be via relevant contract meetings as required and / or requested by either party in addition to written communication. Information required by the Principal Designer from the Principal Contractor will include:

- General details of construction methods and materials used
- Unexpected hazards encountered during the works

6.2.3.2. Remnant hazards in respect of maintenance, cleaning and / or demolition (if appropriate)

6.2.3.3. Where works are of appropriate complexity details of agreed changes made from the design drawings in order that 'as built' drawings can be produced by the designer

6.2.3.4. The project is notifiable under CDM 2015 and as such the Principal Designer and Principal Contractor are obliged to supply information for inclusion in the Health and Safety File. The format of the Health and Safety File will be in accordance with the CDM Regulations 2015 Guidelines Appendix 5

6.2.3.5. Design changes that are undertaken during the contract should be notified to all parties with a description and / or general arrangement drawing and a suitable risk assessment.

6.2.3.6. The Principal Contractor is required to develop the Health and Safety Plan prepared by the Principal Designer in accordance with the CDM Regulations to include Risk Assessments and Method Statements for specific elements of the works

6.2.4. NOTIFICATION OF PROJECT TO HSE

6.2.4.1. Preliminary notification has been submitted to HSE under CDM Regulations in the form of an F10 return. This will be updated once the Principal Contractor is appointed

contract data

works information

7. REQUIREMENTS FOR THE PROGRAMME

7.1. PROGRAMME OF WORKS AND CONSTRUCTION SEQUENCE

7.1.1. PRESENTATION OF PROGRAMME

7.1.1.1. The Programme of Works to be submitted by the Contractor to the Supervisor, shall be in the form of a bar / Gantt chart diagram illustrating construction sequences, plant utilisation and materials deliveries, which shall be updated fortnightly. This should include details for securing the site & establishing compound & working areas.

contract data

works information

7.2. SERVICES AND OTHER THINGS PROVIDED BY THE EMPLOYER

7.2.1. TABLE

Item	Date by which it will be provided
7.2.1.1. The employer will provide information on all known hazards and constraints relevant to the site as part of the pre commencement process. This will usually be in the form of a 'constraints' map	Prior to commencement of contract
7.2.1.2. The employer will fell and cut all trees to approx. 2m length and stockpile on site for subsequent relocation outwith the working area	Prior to commencement of contract or at the specific request of the contractor if works are impeded



contract data

site information

8. THETFORD FOREST

8.1. GROUND CONDITIONS AND OTHER LIMITING FACTORS

8.1.1. TOPOGRAPHY AND SITE DESCRIPTION

- 8.1.1.1. The site location is adjacent to High Lodge Visitor Centre and is within Thetford Forest Park
- 8.1.1.2. The majority of the trail is located within primarily pine woodland on flat or gently undulating topography

8.1.2. STRATA ENCOUNTERED

- 8.1.2.1. Breckland Forest SSSI lies between Bury St Edmunds in Suffolk and Swaffham in Norfolk. The majority of the site is within Thetford Forest Park, the largest commercial forest in lowland England. Breckland is characterised by its climate and its soils. Its climate is described as semi-continental, being the driest region of the British Isles and subject to great extremes of temperature. The soils are complex, but are typically very sandy free-draining mixes of chalk, sand, silt, clay and flints

8.1.3. ACCESS

- 8.1.3.1. The Contractor shall refer to the contract drawings for full details of access arrangements, land available to Contractor, etc. The Contractor shall confine his operations within those limits. There are a number of public and permissive rights of way crossing or adjacent to the site. These are indicated on the drawings.
- 8.1.3.2. Members of the public use the site for leisure pursuits. The Contractor must ensure that his works do not interfere with these activities, and that adequate measures are taken to exclude the public from construction work. This to include the provision of suitable fencing erected to the satisfaction of the Supervisor

8.1.4. LEVELS AND REFERENCE POINTS

- 8.1.4.1. The Contractor shall supply to the Employer details of the value and location of the temporary bench marks and reference points that he proposes to use.

8.1.5. PROTECTION AGAINST ENVIRONMENTAL DAMAGE

- 8.1.5.1. Thetford Forest is designated as an SPA (Special Protection Area) under the EC Wild Birds Directive (79/409/EEC) which was adopted in 1979 and aims to protect wild birds that are rare across Europe.
- 8.1.5.2. Protected under this legislation are the Nightjar (a species that uses open spaces within woodland) , Stone curlew (a bird of open areas) and Woodlark (a bird of woodland edge), all of which are migratory species that nest on the ground. Within the High Lodge block, Nightjar and Woodlark breed and are present as summer visitors resulting in restrictions on works between 1st March and 30th September and as such FC (as is the case with any landowner of designated land) has a duty to protect and conserve these species.
- 8.1.5.3. Thetford Forest is also designated as a Site of Special Scientific Interest (SSSI), also for Woodlark and Nightjar, as well as for five rare plant species, its unusual invertebrate assemblage, also for Red Squirrels, and some of the unique geological formations found in across the forest. As a result the constraints as defined by this contract are present to allow us to manage the site within our legal obligations in agreement with Natural



England.

- 8.1.5.4. In order to ensure the Forestry Commission remains in full compliance with the terms of the Wild Birds Directive within the SPA no site works will commence until the conclusion of the breeding bird season on 30th September 2017
- 8.1.5.5. The Contractor shall take all necessary precautions to avoid causing any unwarranted damage or disturbance to any ecological constraints that may be present on the site. All directions, instructions & methods for working adjacent to respective habitats & protection zones are to be strictly adhered to by the Contractor. Appropriate Wildlife legislation shall apply.
- 8.1.5.6. It is identified that contaminated ground will be encountered when carrying out excavation. The contractor must work strictly to EA Guidelines and will export specifically identified areas of contamination to a registered tip as quantified in the Price List
- 8.1.5.7. The Contractor shall take all necessary precautions to avoid causing any unwarranted damage to existing & new: roads, accesses, tracks, lands, properties, services, buildings, fences, trees and all other features and, during the currency of the Contract, shall deal promptly with any complaints by owners or occupiers. The Contractor shall repair any damage caused by them during the contract period at their own expense to the satisfaction of the Supervisor.
- 8.1.6. **ELECTRICITY DISTRIBUTION ON THE SITE**
 - 8.1.6.1. The contractor shall be responsible for the provision of any temporary mains power supply. He shall be responsible for all negotiation and payment to the supply provider
 - 8.1.6.2. All electrical installations forming part of the Temporary Works shall comply with the relevant provisions of the 'Regulations for Electrical Installations' (I.E.E. Wiring Regulations – 17th Edition), published by the Institution of Electrical Supervisors.
- 8.1.7. **SERVICES TO SITE**
 - 8.1.7.1. The Contractor shall make arrangements for any water supply, electricity supply, telephone or other services that he may require for the construction of the Works.
- 8.1.8. **ATTENDANCE ON EMPLOYER'S REPRESENTATIVE**
 - 8.1.8.1. The Contractor shall provide at any time such labour as is necessary to assist the Supervisor in the following. Checking the setting out of the lines and levels of the works, measuring and determining the amount of work done, supervising, inspecting, testing, or otherwise checking and examining the Contractor's work.

APPENDIX A - CONSTRUCTION PHASE – DESIGNERS RISK ASSESSMENT

Introduction

The Contractor's management team will need to consider the risks highlighted in this risk assessment document, and take action as appropriate. The risk mitigation measures highlighted reflect suggestions made by the writer, and are not intended to bind the Contractor to implementing all or any of the suggested risk mitigation measures. The Contractor is free to implement alternative risk mitigation measures in order to satisfactorily address the risks highlighted herein.

In preparing the Construction Phase Health and Safety Plan the Contractor will have to prepare their own risk assessments and method statements to ensure risks are appropriately controlled.

This risk assessment does not purport to identify all relevant risks and hazards, only those significant additional risks relating to the design (if any) as identified by the writer that might not be obvious to a competent contractor. There will of course be other risks and hazards associated with the project that should be obvious to a competent contractor and no attempt has been made to highlight such risks within this document.

This document makes no attempt to assign contractual responsibility for meeting the cost of dealing with any of the risks / hazards identified should they occur during the course of the contract.

CONSTRUCTION PHASE – DESIGNERS RISK ASSESSMENT

Item / Activity	Identified Specific Significant Design Hazard	Possible Consequences / Risk Control Measures suggested by Designer	Residual Risks	Cleaning & Maintaining Information
General Working	Protection to Public	<p>Possible Consequences: Injury to members of the public as a result of being hit by machinery or falling into excavations, general trips, slips, falls, injury caused by interfering with unattended plant.</p> <p>Suggested Risk Control Measures: All work areas to be suitably cordoned / barriered off and demarked with hazard identification signage. No members of the public to be allowed within the work area. All vehicular movements within areas accessed by the public are to be controlled and appropriate measures (e.g. banksmen) to be employed whilst manoeuvring.</p>	Providing proper precautions are put in place to segregate public from the works, the residual risks are considered to be low.	Not applicable
General Working	Protection to Wildlife and Habitats	<p>Possible Consequences: Damage to wildlife habitats / possible prosecution.</p> <p>Suggested Risk Control Measures: Contractor to adhere to Client's requirements for protecting wildlife and habitats. Work areas, storage and traffic routes to be agreed. Client to advise of areas that require additional measures / protection during the works. Advice to be given in site induction / toolbox talks</p>	Client to monitor residual risk and advise Contractor as necessary.	Not applicable
General Working	Overhead Cables	<p>Possible Consequences: Damage to, and loss of, services. Electrocution</p> <p>Suggested Risk Control Measures: Contractor to be aware of presence of overhead cables on the site. Contractor is to consider height of plant / equipment to be used around overhead cables. Consider erecting temporary protection or safety clearance goalposts where vehicles will have to pass beneath cables.</p>	Providing the Contractor takes appropriate mitigation measures. The residual risks are considered low.	Not applicable.
Plant and Equipment	Vehicular Movements	<p>Possible Consequences: Injury to public, site personnel and site visitors. Damage to environment.</p> <p>Suggested risk mitigation measures:</p>	Providing adequate precautions are taken there should be a low residual risk.	Not Applicable

		<p>Advice given in site induction / toolbox talks</p> <p>Vehicular movements around the site are to be planned and suitable routes to be agreed. All Site Rules are to be adhered to.</p> <p>Contractor to be especially mindful that the whole site is currently accessible by the public. Segregation to be provided where possible to keep pedestrians and vehicles separated. Banksmen to be used where vehicles and pedestrians cannot be segregated.</p> <p>Care to be taken when moving across landscaped areas. Potential for vehicles to become stuck or 'bogged down'.</p> <p>Care to be taken not to disturb any wildlife and / or cause damage to habitats.</p> <p>Banksman to be used during manoeuvring of vehicles.</p>		
Rural Site Location	Emergency Procedures	<p>Possible consequences:</p> <p>Due to rural nature of site there are potentially long response times by the emergency services, This could seriously delay treatment of an injured person.</p> <p>Suggested risk control measures:</p> <p>Due to rural nature of site, Contractor is to make provision for Emergency Procedures should they arise. Adequate First Aid equipment should be available on site to cope with potentially long response times by the emergency services. Contractor to put in place procedures for dealing with emergencies.</p>	Potential long response time for emergency services.	Not applicable
Excavation	Excavating near or on top of existing buried services	<p>Possible consequences:</p> <p>Explosion. Electrocutation. Loss of service. Damage to services</p> <p>Suggested risk control measures:</p> <p>The Client will endeavour to provide drawings showing 'known' services. However, this information may not be exhaustive nor accurate and the contractor is to scan for services themselves before any excavation which might expose / hit services. Contractor to be aware of the locations of these services and to excavate carefully (consider hand digging) in these areas. Any areas where proposed excavations are within 5m of a 'known' underground service require precise location of the underground service via hand excavation.</p>	The likelihood of finding an unknown buried service is considerably reduced, however the consequences remain high.	All known buried services and previously unknown services which are discovered during the works must be recorded on the 'As Built' drawings.
Woodland Site Location	Working near trees	<p>Possible consequences:</p> <p>Damage to tree health. Falling trees / branches</p>	The likelihood of unsafe trees being present is reduced,	Not applicable.

		<p>Suggested risk control measures: Visually inspect trees in the vicinity of the working area at the start of each working day and after storm weather. If any damage to trees / branches is apparent, stop working in the vicinity and inform the Site Manager.</p>	however the impact remains high.	
Plant and Equipment	Re-fuelling	<p>Possible consequences: Damage to wildlife habitats / possible prosecution.</p> <p>Suggested risk control measures: Adhering to any advice in the Works Information, devise refuelling and fuel storage plan and agree this with the Site Manager. Ensure that re-fuelling only takes place at agreed locations and following safe methods. Ensure that a spill control kit is immediately available and that staff carrying out re-fuelling are trained in its use.</p>	Providing adequate precautions are taken there should be a low residual risk.	Not applicable.
Cleaning and Maintenance	Culvert Cleaning	Occasionally culvert blockages may require water jetting or other remote method of pipe cleaning. Under no circumstances should anyone be required to enter a culvert / pipe. All pipe cleansing work is to be planned with proper consideration and precautionary measures given to water levels. The proper use of suitable rodding/jetting equipment and wearing the correct PPE will reduce the risk of injury and or infections during the cleaning of below ground drainage.	Residual risks are to be controlled by the Operation and Maintenance team.	None required.