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A specification of works for drainage works in Cranleigh Cemetery

Address: Cranleigh Cemetery, Dewlands Lane, Cranleigh, GU6 7AD

Client: Cranleigh Parish Council

Reference: CDS- CC-1002

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## 1 Specification of works

The Invitation to Tender, Preliminaries, Specification Document and the Bills of Quantities should be read in conjunction with the Conditions of Contract, the Design Drawings and other information in the procurement package.

The main elements of the works required will consist of the following:-

- Installation of drainage in the form of lateral, collector and carrier drains, excavation of a detention basin, installation of a hydrobrake, creation and reinstatement of spoil bund, cutting through hedge line and making good, cutting through pathway with services running underneath and making good, letting water into a receiving ditch securing in a headwall and making good.

### 1.1 **Summary of preliminaries (see full preliminaries for details of contacts, permissions and exclusions)**

The full preliminaries should be read in conjunction with this specification. Where any ambiguities may occur between the preliminary summary in the specification and the full preliminaries, the full preliminaries take precedence.

The contractor must, before quoting, ascertain the nature of the site, the extent and nature of the types of work required and all local conditions and restrictions likely to affect the execution of the work.

The contractor should ensure an assessment is made of any vehicle size limitations that may affect access to the site or operation within the site to deliver materials, plant and equipment or limit in any way the execution of the works. The contractor is to take account of this assessment when submitting the Tender. In this case access is limited to the main cemetery site entrance from Dewlands Lane, where an archway across the entrance will restrict the size of plant that can enter the site.

The contractor must also satisfy himself as to the accuracy of all dimensions, levels and dimensions contained within the contractor's documents and any variation be forwarded to the CA before any works commence or any plant is placed on site.

No claims or increases in cost will be considered on the grounds of lack of knowledge of site conditions, site access, and the nature of the site, the required construction works and risks to property, workforce and general public.

**Important Notes: The works are within an active cemetery. Disruption to working will occur when burials are planned during the work period. No work will be possible during a burial which will normally take no longer than 1 hour. The outfall lies just beyond the cemetery boundary. To connect to this outfall, a pipe will need to be run underneath a public footpath which will require closure and diversion for these works. The footpath also has a range of services running under it which will need to be protected during the works so this must be allowed for in pricing as these works will need to be hand dug.**

**Care will be needed to protect existing graves and cemetery infrastructure.**

## **1.2 General**

The Contractor shall provide all labour, plant, tools, vehicles and materials necessary to complete the execution of the works, which shall conform to this specification and the design drawings provided by the CA and any subsequent revisions notified by the CA.

Any vandalism or malicious damage to contractor's plant or equipment will be covered by the contractors' own insurance.

The working areas and site compound will need to be securely fenced off and adequately signed to prevent public access using Heras or similar style fencing.

The site shall not be used for any purpose other than carrying out the works. There will be no advertising boards allowed near to, or on site that may attract vandals or other unwanted visitors.

## **1.3 Nuisance**

The contractor is expected to show due consideration to the local residents, neighbours and general public at all times.

The contractor will take all necessary precautions to protect against noise, dust, rubbish and pollution. All waste material will be removed off site on completion of the works to the satisfaction of the CA and there will be no burning of any residues on site.

## **1.4 Protection**

The contractor and its suppliers shall protect against damage to existing boundaries including fencing, gates, gate posts, trees, graves, memorials and hedge lines. Particular attention should be paid to the site access route and the outfall route under the adjacent footpath. Damage to existing kerbs and surfacing shall be made good by the contractor to the satisfaction of the CA. Where tracked plant is likely to permanently mark existing surfaces or iron work the contractor is, at his own expense, to use protection boards and or road plates to protect the surfaces either permanently for the duration of the works or for temporary access periods as required.

Where plant crosses internal roadways or paths within or without the site the roadways must be protected and crossing points well fenced. Any damage to the roadways, car park area, turning areas, passing bays, hedges, graves, memorials or trees shall be made good by the contractor to the satisfaction of the Client.

Any site damage however caused by the contractor or its suppliers will be rectified at the contractors' own expense to the satisfaction of the Client. The external footpath and associated services must be protected and repaired to the same standard and colour of materials as the current footpath has been constructed to.

## **1.5 Temporary works and services**

Permanent paths and roads near the site are to be used provided that they are adequately maintained as thoroughfares with any nuisance or site clearance restrictions applied. Provision of alternative routes into and out of the site, including turning restrictions onto and off Dewlands Lane is to be in accordance with Chapter 8 of the Road Traffic Signs Manual or otherwise agreed with the CA.

The contractor shall thoroughly clean and make good all roads and paths after use and leave in an unimpaired condition at the end of each working day. **This is very important in respect to the internal cemetery roads which must be kept clean.**

The contractor is to liaise with the CA on an appropriate basis with regards to vehicular movement on site. Heavy plant delivery and collection times are to be notified to the CA 48 hours in advance to ensure access problems can be minimised.

No deliveries or plant movement is to be made before 8.00 am and after 6.00 pm Mon to Fri and before 9.00 am or after 4.00 pm on Saturday. There shall be no working or deliveries on Sundays. The Contractor shall at his own expense be responsible for the erection and maintenance of fencing to secure the works in accordance with CDM regulations. The Contractor has responsibility to ensure that all groundworks are protected from the public using suitable safety fencing approved by the CA.

The cost of repairing and replanting the hedge over the period of the works should also be taken into account when pricing.

The works under and through the adjacent footpath must be managed in accordance with council instructions and CDM requirements.

## **1.6 Site clearance**

The contractor is responsible for the clear up and removal from site, on a day-to-day basis and at the end of the contract of all debris and excavated material not forming part of the works, leaving the area around the works clean and safe at the end of each working day.

No mud should be left on ANY footpaths or roads within the proximity of the development area with particular attention given to the internal cemetery roads, car park, and the entrance from Dewlands Lane. The contractor shall at his own expense provide a road sweeper to maintain a clean site access route and adjoining roads if requested to do so by the CA.

## **1.7 Utility services**

In the event of damage to any utility services during the course and execution of the works, the Contractor is to notify the CA and the appropriate Service Authority immediately and make arrangements for the damage to be repaired and made good without delay to the satisfaction of the Service Authority. **The contractor shall allow for a services search as part of the mobilisation costings and must not begin works on site until such a search has been completed and displayed on site. Any damages to services will be at the contractors cost and strict liability will belong to the contractor. Services (telephone, water and electricity) run under the adjacent footpath through which the outfall pipe must be run. These services along with any others must be protected during the works and the utility companies consulted ahead of the completion of any method statements and risk assessments.**

## **1.8 Setting out**

The working area shall be clearly marked on site using suitable temporary markers such as posts, tape and temporary spray paints. Access routes onto and off the site shall be clearly marked and fenced and sensitive working areas close to hedges, retained trees, graves, memorials and fencing shall be marked as appropriate. The marked out works area shall be approved by the CA and Client ahead of works commencing.

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## 2 Works

### 2.1 Establishment of an outfall and installation of a headwall in the receiving ditch

Small purpose-built headwalls shall be installed into the receiving ditch using cement filled sandbags placed around the sides and along the top of the outfall pipe. The pipe shall be secured on a concrete coping stone or similar set on a layer of 100 mm deep dry-mix concrete. The ditch is shallow so the headwall must be in keeping with the ditch size. All surplus spoil shall be removed from site to the easement area within the cemetery.

The pipe running from the detention basin to the outfall headwall shall be let through the adjacent hedge taking care to minimise damage to the hedge by thrust boring under the hedge if possible. Allowance shall be made to replant the hedge with trees of the same age if they die post works.

The pipe shall be run through the path to the ditch digging by hand and machine with great care and in accordance with guidance issued by the utility companies who own services running under the path who must be consulted ahead of producing a method statement and ahead of works commencing. The path must be repaired to the same construction profile and specification standard as the current pathway. **Any damage to the services under the path will be the strict liability of the contractor who will make good or cover the cost of repair work at their expense.**

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## 3 Drainage

All drainage operations shall be carried out by equipment fitted with low ground pressure tyres to minimise as fully as possible compaction of the graded surface during the drainage works. This work must be done in dry conditions to minimise soil compaction and creating a smeared soil surface even if this means waiting for the right conditions.

The outfall is the ditch on the far side of the adjacent public footpath outside the cemetery boundary. An appropriate method statement for this work will be required.

The route from the boundary hedge to the outfall is over land owned by the council. All operations on this land must comply with the requirements of the council.

### 3.1 Installation of new machine-trenched 80 mm lateral drains (Drawing Number CDS\_CRA\_LGH\_01\_Drainage Plan)

#### 3.1.1 Trenching and pipe laying

The trench shall be cut at an even grade and depth as specified unless on site investigations require a variance in depth to achieve a connection to ongoing drains already in the ground. The trench shall be evenly cut and no wider than 120 mm unless excavated with a digger rather than a trencher. Normally the drain should be trenched using a disk or chain type trencher. Only in exceptional circumstances should trenches be dug with an excavator and for as small a section as possible. Where dug with an excavator a trenching bucket should be used and the width of the trench kept to a minimum.

The pipes shall be 80 mm diameter perforated plastic pipe laid evenly in the base of the trench. The spacing shall be at 6.0m. The pipe shall comply with BS4962. The drains shall be 500 mm deep.

### **3.1.2 Connections**

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let, unsecured into other pipes.

### **3.1.3 Backfill (gravel)**

The trenches shall be filled over the pipes with gravel over the pipe to a nominal depth of 200 mm below final ground level. The gravel used shall be clean 2-6 mm chert / flint gravel. It shall not contain limestone chippings.

### **3.1.4 Backfill (rootzone)**

The trench shall then be filled level with the surface, compacted and topped up with the following material:

- A medium / coarse sand soil mix comprising 80% sand to 20% BS 3882:2015 quality light textured topsoil.
- The root zone material used should have a minimum infiltration rate of 150 mm hr when at maximum compaction.
- The rootzone material shall have a minimum 15% air-filled porosity when tested at 20 cm tension and maximum compaction.
- Allowance should be made for two further topping up operations.

### **3.1.5 Reinstatement of the drain runs**

The drain runs shall be reinstated by overseeding with the same seed mix as used in Item 4.2 at a rate of 40 g m<sup>2</sup>. Prior to re-seeding, the drain runs shall be fertilised with a suitable pre-seeding fertiliser.

## **3.2 Installation of new machine-trenched 150 mm collector drains (Drawing Number CDS\_CRA\_LGH\_01\_Drainage Plan)**

### **3.2.1 Trenching and pipe laying**

The trench shall be cut at an even grade and depth as specified unless on site investigations require a variance in depth to achieve a connection to ongoing drains already in the ground. The trench shall be evenly cut with space in the base such that pipes can be evenly laid. The pipes shall be 150 mm diameter perforated plastic pipe laid evenly in the base of the trench. The pipe shall comply with BS4962. The drains shall be no less than 600 mm deep.

### **3.2.2 Connections**

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let, unsecured into other pipes.

### **3.2.3 Backfill (gravel)**

The trenches shall be filled over the pipes as specified on Drawing Number CDS\_CRA\_LGH\_01\_Drainage Plan with gravel over the pipe to a nominal depth of 200 mm below final ground level. The gravel used shall be clean 2-6 mm chert / flint gravel. It shall not contain limestone chippings.

#### **3.2.4 Backfill (rootzone)**

The trench shall then be filled level with the surface, compacted and topped up with the following material:

- A medium / coarse sand soil mix comprising 80% sand to 20% BS 3882:2015 quality light textured topsoil.
- The root zone material used should have a minimum infiltration rate of 150 mm hr when at maximum compaction.
- The rootzone material shall have a minimum 15% air-filled porosity when tested at 20 cm tension and maximum compaction.
- Allowance should be made for two further topping up operations.

#### **3.2.5 Reinstatement of drain runs**

The drain runs shall be reinstated by overseeding with the same seed mix as used in Item 4.2 at a rate of 40 g m<sup>2</sup>. Prior to re-seeding the drain runs shall be fertilised with a suitable pre-seeding fertiliser.

### **3.3 Installation of new 100 mm carrier drain (Drawing Number CDS\_CRA\_LGH\_01\_Drainage Plan)**

A carrier drain will be installed from the hydrobrake set into the detention basin to the outfall. This will run down the edge of the cemetery and will run close to an existing hedge and existing memorials. This may require the use of narrow machinery and hand digging in some locations. The contractor must undertake a site visit ahead of pricing to ensure they have taken this into account when pricing.

#### **3.3.1 Trenching and pipe laying**

The trench shall be cut at an even grade and depth to a minimum of 0.60m deep. The trench shall be evenly cut with space in the base such that pipes can be evenly laid. The pipes shall be 100 mm diameter solid, twin-wall plastic pipe laid evenly in the base of the trench. The pipe shall comply with BBA/HPAS.

Part of the run involves running through a Macadam footpath. The trench line shall be marked onto the road footpath surface ahead of time and once approved the macadam shall be cut cleanly and excavated carefully to the required depth. The width of the removed section should be sufficient to allow a vibrating plate to be used to compact the new Macadam used in the repairs. Care should be taken to avoid damaging the underlying services and much of the trench will need to be hand dug in accordance with the approved method statement agreed with the utility companies beforehand. Following installation, the pathway surface and surrounds should be reinstated to the same specifications as initially used to construct the path in respect to stone sub-base and Macadam base, binder and wearing courses. The macadam used should be fresh, hot Macadam. The joints to the remaining footpath surface should be jointing compound to effect a full seal with the surrounding surface.

**Services run beneath the footpath. A full risk assessment and method statement for this element of the works shall be submitted with the tender return. The utility providers shall be notified of the**



**planned work ahead of the start date and all method statements shall be compliant with advice received and agreed with the utility companies. If required by the utility companies, an engineer may be on site during the works to supervise.**

### **3.3.2 Connections**

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let, unsecured into other pipes.

### **3.3.3 Backfill**

The trench shall then be filled level with the surface, compacted in 200 mm deep layers with site-won material. Subsoil should be placed first with a minimum of 200 mm of site-won topsoil placed to bring the trench back to surface level. Allowance should be made for two further topping up operations.

### **3.3.4 Reinstatement of drain runs**

The drain runs shall be reinstated by overseeding with the same seed mix as used in Item 4.1.2 at a rate of 40 g m<sup>2</sup>. Prior to re-seeding the drain runs shall be fertilised with a suitable pre-seeding fertiliser.

## **3.4 Roadside drainage**

### **3.4.1 Trenching and pipe laying**

The trench shall be cut at an even grade and depth as specified unless on site investigations require a variance in depth to achieve a connection to ongoing drains already in the ground. The trench shall be evenly cut and no wider than 120 mm unless excavated with a digger rather than a trencher. Normally the drain should be trenched using a disk or chain type trencher. Only in exceptional circumstances should trenches be dug with an excavator and for as small a section as possible. Where dug with an excavator a trenching bucket should be used and the width of the trench kept to a minimum.

The pipes shall be 80 mm diameter perforated plastic pipe laid evenly in the base of the trench. The pipe shall comply with BS4962. The drains shall be 500 mm deep.

Part of the run involves running through a Macadam footpath. The trench line shall be marked onto the road footpath surface ahead of time and once approved the macadam shall be cut cleanly and excavated carefully to the required depth. The width of the removed section should be sufficient to allow a vibrating plate to be used to compact the new Macadam used in the repairs. Care should be taken to avoid damaging the underlying services and much of the trench will need to be hand dug in accordance with the approved method statement agreed with the utility companies beforehand. Following installation, the pathway surface and surrounds should be reinstated to the same specifications as initially used to construct the path in respect to stone sub-base and Macadam base, binder and wearing courses. The macadam used should be fresh, hot Macadam. The joints to the remaining footpath surface should be jointing compound to effect a full seal with the surrounding surface.

**Services run beneath the footpath. A full risk assessment and method statement for this element of the works shall be submitted with the tender return. The utility providers shall be notified of the planned work ahead of the start date and all method statements shall be compliant with advice received and agreed with the utility companies. If required by the utility companies, an engineer may be on site during the works to supervise.**

### **3.4.2 Connections**

Pipes shall be joined using purpose-made, proprietary junctions. In no case shall pipes be let, unsecured into other pipes.

### **3.4.3 Backfill (gravel)**

The trenches shall be filled over the pipes with gravel over the pipe to a nominal depth of 200 mm below final ground level. The gravel used shall be clean 2-6 mm chert / flint gravel. It shall not contain limestone chippings. For the section below the footpath in the existing burial area the backfill shall be gravel to the surface and the gravel shall be compacted back into the drain to be around 20 mm below the grass surface at any point.

### **3.4.4 Backfill (soil) section from road gully to outfall**

The trench shall then be filled level with the surface, compacted and topped up with site won topsoil.

## **3.5 Inspection chambers**

The pipes must be let into the chambers and sealed to prevent water leaking from around the sides by caulking the joint using waterproof or granolithic cement. The chambers shall be concrete and should be sectional precast either rectangular or circular and all precast components should comply to BS 5911-3:2002. Plastic chambers shall not be used.

The chambers shall be set on pre-cast slabs laid on 100 mm depth of dry mix concrete. In all cases the lid should be secured on a steel frame that is secured in concrete mix ST4 and comply with BS EN 124:1994 Class B125. In all cases the lids should be circular and heavy enough to prevent casual lifting without keys.

The final finished level of the chamber lid and surrounds should be at least 10 mm below the existing sword surface to allow mowing over the top of the chamber but no deeper than 20 mm such that a trip hazard is avoided.

The areas around each chamber must be reinstated using the same seed and fertiliser as detailed in Section 4.2.

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## **4 Reinstatement of drain runs**

### **4.1 Topping up drain runs**

The drain runs shall be topped up to ensure they are not more than 10 mm lower than the surrounding land. Allowance should be made for two topping-up operations.

### **4.2 Seeding**

The drains shall be drilled in three directions using a suitable seed mix designed for general amenity areas such as Germinal A19, Barenbrug e9, Rigby Taylor Super Root or similar. The grass should be dimple-sown and covered in rootzone material. The overall seeding rate should be 45-50 g m<sup>2</sup>. The

contractor should send details of the seed to be used ahead of the works commencing for approval by the CA.

The seed mix shall have a germination certification of over 95% and certified purity of not less than 95%.

### **4.3 Hedge tree replacement (provisional item)**

Where the carrier drain runs under the hedge there is a risk that some of the trees in the hedge line may die off as a result. If this happens the dead trees shall be removed and replanted with an equivalent number of the same type of tree 2m high. The fence line shall be secured using temporary fencing until the new trees have been established.

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## **5 Detention Basin**

### **5.1 Construction of a detention basin**

A detention basin measuring 5m by 11m with a maximum depth of 1.0m will be constructed as shown in Drawing Number CDS\_ CRA\_LGH\_01\_Drainage Plan. The basin will be naturalised by varying width and depth to create a feature with varied habitat value. This shall include the following works:

- The topsoil shall be stripped to a depth of 250 mm to a temporary store whilst the subsoil is excavated and shaped to the design formation level.
- Excavate the remaining subsoil (approx. maximum depth of 0.75m to give a total maximum depth in the basin of 1.0m. Remove subsoil to a store on site as directed by the client.
- The subsoil shall then be ripped and an application of 20 kgs of prilled gypsum made to the base of the basin.
- The topsoil shall then be replaced to an even depth, graded, cultivated and a seedbed created.
- The basin shall then be seeded with Germinal RE3 – water meadow mix at a rate of 5 g m<sup>2</sup>.
- The basin shall be shaped to have side slopes of with a gradient of no more than 1 in 4 and at least two areas of at least 3m width with a gradient of 1 in 5 to allow easy access to the basin for maintenance works.

### **5.2 Installation of a hydrobrake chamber**

Flow from the detention basin into the outfall ditch will be limited by the use of a hydro-brake chamber to restrict flow to 4.7 l sec. The hydrobrake chamber shall be from Hydro-brake international installed in accordance with the manufacturer's instructions. Inflow from the detention basin shall be via a 150 mm diameter, twin wall solid pipe which must be caulked into the chamber using a waterproof or granolithic cement to effect a watertight seal.

The head between the hydro-break inflow and outflow must be 0.5m.

The outflow pipe shall be a 100 mm diameter, solid pipe to outfall in the ditch via a new headwall set into the ditch side as previously described.

### **5.3 Headwall connection to the detention basin and from the detention basin to the hydro-brake chamber**

The inflow and outfall pipes must be let into suitable pre-cast concrete headwalls which shall be secured into the detention basin bank. The headwalls should be large enough to securely sit within the detention basin bank and heavy enough to resist flow scour during high flow flood events. The base of the headwalls shall be seated on a 100 mm thick bed of dry mix concrete.

The pipes shall be caulked into the headwalls to effect a water-tight seal using water-proof or granolithic cement.

The final design of headwalls will need to be approved by the client prior to installation.

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## **6 Completion**

At completion, the contractor shall provide a complete set of as-built drawings to the client in both PDF and DWG format regardless of which final option has been included.