OPW
Oifig na nOibreacha Poiblí
Office of Public Works

Specification for culvert repair and ancillary works (Phase 2),
Peoples Gardens,
Phoenix Park,
Dublin 8.



Document Verification

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		Name	Alexander Fennell	Ian Wolfe	Ian Wolfe
		Signature	Alexander Fennell (10/1126 17:58:55 GMT)	Ian Wolfe (10/1126 18:03:27 GMT)	Ian Wolfe (10/1126 18:06:30 GMT)

1.0 GENERAL REQUIREMENTS

1.1 General

The Drawings shall be read in conjunction with the Specification, and the matters referred to, shown or described in any of the former are not necessarily repeated in the latter.

All works shall, unless otherwise stated, be undertaken in full compliance with the specifications for Roadworks as published by the National Roads Authority (TII) and all references to clause numbers relate to TII specifications.

1.2 Scope of the Works

The Works require the excavation, disposal and removal of existing collapsed brick culverts and gardens, removal of playground railings and equipment, and pedestrian paths, and the laying of new precast culverts, landscaping and reinstatement of gardens, playground railings and equipment, pedestrian paths, and ancillary works to Peoples Gardens, Phoenix Park, Dublin 8.

Works will require the diverting of live surface water culvert for duration of site works.

These areas are shown on attached Drawings 3251-DR-003 T0, 3251-DR-004 T0, which should be read in conjunction with this document. One contract will be awarded for all of the proposed works.

Approximate quantities for the entire works are as follows: -

(i)	Excavation (including existing footpaths 200m^2)	345 m^3
(ii)	Existing playground railing removal/replacement	70 m
	Associated uprights	24 no.
(iii)	Existing playground equipment removal/replacement	11 no.
	Bins	3 no.
(iv)	Drainage – new precast culvert installation	75 m
(v)	New access point/manhole on new precast culvert	1 no.
(vi)	Collar joints required between existing and new culvert	1 no.
(vii)	Lining to existing brick culvert	100 m
(viii)	Landscaping	280 m^2
(ix)	Footpath reconstruction	200 m^2
(x)	Replacement playground concrete edge kerbing	70m
(xi)	European Larch board path edging	100m

All stripped/excavated excess unused material to be disposed of off-site.

Contractors are advised to visit site prior to tender submissions

Works will require the diverting of live surface water drainage culvert for duration of site works.

Contractor responsible for reliability and security of all associated drainage diversion equipment for duration of works including out of hours.

1.3 List of Contract Drawings

The contract drawings accompanying this Specification are listed as follow,

(i) Drg. No. 3251-DR-003 T0 Culvert works Details and Layout – Sheet 1

(ii) Drg. No. 3251-DR-004 T0 Culvert works Details – Sheet 2

2.0 DETAILED SPECIFICATION

Reference Drawing Numbers 3251-DR-003 T0, 3251-DR-004 T0 attached for overall layout and details.

Works will require the diverting of live surface water drainage culvert for duration of site works.

Contractor responsible for reliability and security of all associated drainage diversion equipment for duration of works including out of hours.

2.1 Railing and Play Equipment Removal

Contractor to carefully remove approximately 70m of existing railing, and 24 no. uprights to playground as indicated on drawing 3251-DR-003 T0, consisting of posts and panels. Contractor to also carefully remove 11no. furniture and play equipment fixings and 3 no. bins (1no. bin in gardens). Railings and equipment to be temporarily stored for security and reinstallation in nearby OPW Peoples Gardens compound.

Any damage to any element of railings or furniture and play equipment fixings to be replaced / repaired by contractor, to the satisfaction of OPW Phoenix Park Management, at contractors own expense.

2.2 Excavation

2.2.1 Excavate out approximately 345m^3 of existing gardens, pedestrian paths, overburden, playground area, and collapsed brick culvert, to minimum average approximate depth of 2,000mm, as indicated on drawing 3251-DR-003 T0.

Excavated rubble material to be removed and disposed of off-site. Excavated subsoil material to be stored on site for reuse as fill material. Excess unusable material to be disposed of off-site.

Any excavated topsoil to be stored on site at direction of Phoenix Park Horticultural staff for re-use.

Excavate trench ensuring correct size and shape to accommodate new precast sections.

Carefully trim formation to required depth and gradient making allowance for thickness of bedding.

Excavate local hard or soft areas of trench bottom to mitigate against any uneven settlement and replace with well compacted backfill selected for uniform support.

Prepare level base, compacting substrate and foundation material to create a stable and even surface.

Any excavation work to take precautions not to hit culverts or other existing services in the area. Contractor to notify Engineer immediately of any discovery of unmapped services.

Any tree roots encountered during excavation are to be saw cut and cauterised under advice of Phoenix Park Horticultural staff.

Make good, level, roll and clean surface to exposed subbase.

2.2.2 Footpaths

Excavation to include for saw cut and excavation of approximately 200m^2 of existing footpaths structure of average depth of 220mm. All stripped/excavated materials to be removed and disposed of off-site.

Any tree roots encountered during excavation are to be saw cut and cauterised under advice of Phoenix Park Horticultural staff.

2.3 Drainage

2.3.1 Supply and lay approximately 75m of new precast drainage culvert, to falls as required, to tie in with existing precast concrete, and historic egg shaped brick culvert, as indicated on drawing 3251-DR-003 T0, 3251-DR-004 T0.

Site Preparation:
Prepare level base compacting substrate and foundation material to create a stable and even surface.

Supply and lay UGM Bc material, complying with TII specification for roads, bedding layer on top of compacted base over the full width of the trench to a minimum depth of 200mm having first removed any protective layer.

The sub-base material to be placed and spread evenly over the sub grade in such a manner to avoid damage to prepared sub grade. Spreading shall be undertaken either concurrently with placing or without delay. A grading bucket without teeth or equivalent to be used.

Compaction of sub-base shall be completed as soon as possible after material has been spread.

The method of compaction of sub-base material to be in accordance with Clause 802 of TII specification for Road Works depending on type of compaction plant used and the thickness of the layer laid.

Blind the surface with fine material to assist levelling.

Inspect precast culvert sections for defects or damage prior to installation ensuring sections meet quality standards.

Use appropriate machinery to lower culvert section. Ensure proper alignment and leveling of each section to create a continuous culvert structure.

Seal culvert joints to ensure sealed, watertight bond. Check all joints to ensure that the strip is continuous.

2.3.2 1 no. in-situ collar joint required between new precast culvert and existing egg shaped brick culvert interfaces, as per detail on drawing 3251-DR-003 T0 & 3251-DR-004 T0.

With timber centering in place to prevent unravelling of existing brickwork, saw cut existing egg-shaped brick culvert – 600mm widest point at top, tapering to 450mm at bottom, height 1,000mm, for flush connection with new precast drainage culverts.

New precast box culverts to be 1,000mm internal height x 500mm internal width. Cover to A393 mesh reinforcement to be min. 40mm, concrete strength class C32/40, exposure class XC2 (external surfaces), XD2 (internal surface). (XD2 is to allow for the presence of deicing salt in the surface water runoff)

Fluting / in-site casting required to blend existing egg shaped brick culvert with new precast box culvert for fluid storm water flow and to prevent scouring.

Gradually backfill area around new culvert with suitable fill material in layers not exceeding 200mm. Compact each layer to prevent settling and ensure the culvert remains stable.
(Excavated suitable subsoil material on site to also be used)

Additional backfill material on top of the culvert sections to provide adequate cover material to distribute loads.

Restore the surface above the culvert, footpaths, playground railings etc., gardens and landscaping, as per original condition, as per OPW Phoenix Park specification.

2.3.3 **Access Point**
Contractor to supply and install 1 no. access chamber to new precast culvert, as indicated on Drawing No. 3251-DR-003/004 T0.

Manhole cover to D400 EN 124 / EN 1433. Concrete brick to IS EN 771-3 – 2011, set in 1:3 (cement sand mortar). Step irons to EN 13101:2002.

2.3.4 **Culvert Lining**
Supply and insert along existing egg shaped brick culvert, approximately 100m of Glass Reinforced UV CURE GRP liner, or similar, for length of existing brick culvert between existing manholes, as indicated on drawing 3251-DR-003 T0.

2.4 Landscaping Reinstatement
Contractor to reinstate approximately 280m^2 of excavated gardens and parkland, as indicated on Drawing No. 3251-DR-003 T0.

The appointed contractor will use the existing excavated sub soil to back fill the excavated areas. The finished level will be a 50mm layer of screened top soil to blend in with existing contours within the gardens and parkland.

Reseeding will be undertaken by OPW Phoenix Park team.

Reinstatement of playground play surface to be undertaken by others. Subsurface to be reinstated to formation level to new playground play surfacing.

2.5 Footpath Reinstatement

Construct approximately 200m^2 of new footpath, as indicated on Drawing No. 3251-DR-003 T0, as per sections 2.5.1 - 2.5.3 below.

Surfacing works to be completed to TII Specification for Road Works 900 Series - Road Pavements - Bituminous Materials (October 2023) and BS 594987 (2024).

2.5.1 Paths require edging be constructed using European Larch Board (c. 100m), as per detail, to give neat finish to surfacing. Dress edges with topsoil to provide neat finish.

2.5.2 Supply and lay terram geotextile layer, or similar, to exposed subgrade.

Supply lay and compact 150mm depth of crushed stone in accordance with UGM Bc of the TII Specification in excavated areas.

Sub-base build up to be UGM Bc material complying with relevant clauses of TII specification for roads.

The sub-base material to be placed and spread evenly over the sub grade in such a manner to avoid damage to prepared sub grade. Spreading shall be undertaken either concurrently with placing or without delay. A grading bucket without teeth or equivalent to be used.

Compaction of sub-base shall be completed as soon as possible after material has been spread.

The method of compaction of sub-base material to be in accordance with Clause 802 of TII specification for Road Works depending on type of compaction plant used and the thickness of the layer laid.

Footpath width shall be an average of 3 metres, or to match existing.

2.5.3 Supply, lay and compact of 80mm depth of Polymer Modified Stone Mastic Asphalt (PMSMA) with 10mm nominal size, mixture designation “SMA 10 Surf PMB 65/105-60 des” to TII specification.

The surface course to be supplied, laid and compacted in accordance with TII Specification for Road Works 900 Series and BS 594987.

Smooth off edges of compacted material to ensure uniform surface joints with existing road surface. Bitumen seals to all new construction joints.

Where required inside edge to asphaltic concrete surfaces to be constructed using European Larch Board, as per detail in drawing 3251-DR-003 T0, to give neat finish to surfacing. Dress edges with topsoil to provide neat finish.

The vertical alignment of the finished surface shall not depart from the agreed level by more than ± 10mm and at any point the maximum deviation of the surface under a straight edge shall not be greater than 5mm in 3m.

Finished surface to finish flush with reinstated gardens level and laid to a cross fall of approx. 1:40 to drain to grass area.

2.6 Concrete Kerbs

2.6.1 Supply and lay approximately 70m of new precast square top concrete edging kerb, to match existing, installed in compliance with IS EN 1340, as indicated on drawing No. 3251-DR-004 T0. The kerbs shall be 150mm x 50mm precast concrete kerb.

2.6.2 Laying of Kerbs

Kerbs to be haunched underneath with an average depth of 100mm, and behind to 100mm, and 50mm from top surface, with ST4 C16/20 concrete. Kerbs to be laid flush with playground. Kerbs to be flush jointed. Alignment of kerbs not to be greater than 3mm out of line. Disturbed road surface alongside kerbs to be made good with Marshall asphalt, or other suitable material as agreed by Engineer.

2.6.3 Construction details

When laying small straight kerbs to radii the mortar joints may be laid to a taper to accommodate the radius of a curve subject to aesthetic considerations. Otherwise a proprietary tapered unit may be employed. A string line should be accurately set out along the carriageway channel to the required level of the top of the units. Units should then be laid on fresh concrete or mortar bed and adjusted to line and level. Allowances should be made on curves for the string line being in a series of straight lines. The final kerb alignment should be checked to ensure that it follows a smooth curve both horizontally and vertically.

Alignment of kerbs should never be greater than 3mm out of line. Some minor visual adjustment may be necessary when the kerbs are laid, especially on curves and when linking with other edge details. Kerbs should be laid accurately to line and level.

Kerbs shall be laid so that 75-100mm of the face shows proud above the final road surface except at pedestrian crossing points where they shall be no more than 6mm proud above the final road surface.

2.7 Railing and Play Equipment Removal

2.7.1 Contractor to carefully replace approximately 24 no. uprights to playground as indicated on drawing 3251-DR-003 T0, consisting of posts and panels.

2.7.2 Contractor to carefully replace approximately 70m of existing railing, to playground as indicated on drawing 3251-DR-004 T0, consisting of posts and panels.

2.7.3 Contractor to also reinstate 11no. furniture and play equipment fixings, and 3no. bins (1no. bin in gardens), as indicated on drawing 3251-DR-003 T0.

Any damage to any element of railings or furniture and play equipment fixings to be replaced / repaired by contractor, to the satisfaction of OPW Phoenix Park Management, at contractors own expense.

Contractors are advised to visit site prior to tender submissions

3.0 SITE INFORMATION

3.1 Location

The site is located within the Phoenix Park, Dublin 8.

3.2 Access

Access to the site is available from the public roads.

The Contractor shall note the following requirements with regard to site access:

(i) Maintain access to all properties within the Phoenix Park at all times.

(ii) All construction traffic shall enter and leave the Park via Parkgate Street entrance only.

The Contractor shall be responsible for repairing all accidental damage caused by the Contractor or his agents to any roadway or structure adjacent to or on the site for the duration of the contract.

3.3 Heritage and Discoveries

Should any historical objects be uncovered during the course of the Works, the Contractor shall report same immediately to the Engineer who will confer with the relevant Authorities.

All fossils, coins, articles, structures and other remains or things of antiquity or curiosity discovered on the site of the Works shall be the absolute property of the employer. The Contractor shall take all precautions to prevent his workmen or any other persons from removing or damaging any such articles or things. Due to the heritage status of the Phoenix Park an Archaeologist will be engaged by the client to monitor drainage excavation works.

3.4 Programme of Proposed Works

A programme is required to be submitted. This Programme shall include the following:

(a) A Bar Chart or other graphical technique showing proposed work programme.

(b) A Critical Path Network analysis.

Following approval by the Engineer the contractor shall proceed with the works in accordance with this program. The contractor is directed to be mindful of Section 3.4 above in this regard.

3.5 Services

Such information as may be given on the Engineer's Drawings as to the existence, present condition, form and dimensions of existing services including pipes, cables, ducts, manholes, plant, etc. is given in good faith. The Engineer will not be liable for any discrepancy therein. It is based on records of the Employer and the various utilities. There may be departures from the routes shown and services may exist for which no records are held.

The Contractor shall take all reasonable precautions to identify and avoid damage to any drains, electricity mains, telephone ducts, ducts, manholes, water, gas and other service pipes which may be met while carrying out the Works and must adequately protect, support and maintain them in working order as required by the Engineer and the individual utility owners.

Should the Contractor damage any services he shall immediately inform the Engineer and the appropriate utility authority and seek instructions from the utility authority for rectification of all damage. All rectification of damage shall be entirely at the Contractor's expense.

3.6 Site Organisation and Working Hours

The Contractor shall maintain an adequate site organisation under the full-time control of an experienced and suitably qualified agent able to assume complete responsibility for all civil works.

The Contractor shall properly organise and resource for the works in order to fulfil the agreed programme. This shall include co-ordination and supervision of all sub-contractors.

Any failure to co-ordinate the works which results in details, workmanship or other aspects not being complete to the satisfaction of the Engineer will be rectified entirely at the Contractor's expense.

The Contractor shall be permitted to work during normal daylight hours Monday to Saturday. **Some restrictions may occur within the Phoenix Park. The Contractor shall liase with the Engineer and OPW Phoenix Park management regarding any possible site constraints relating to works to be carried out during these times.**

The Contractor shall be permitted to work additional hours provided he first receives approval to do so from the Engineer in writing. The request shall detail the type of work to be carried out, the health and safety requirements provided for night working (including task lighting and noise control), and details of all personnel and supervision to be provided on work outside normal hours.

3.7 General Facilities and Equipment

The Contractor shall provide suitable workshops, storage, messing, washing and toilet accommodation and all general facilities necessary for the works and in accordance with the latest legislation. The use of these facilities shall be extended to all sub-contractors.

3.8 Contractor's Responsibility for Facilities

The Contractor shall be solely responsible for making his own arrangements for the Constructional Plant and for the supply, security, storage and use of all materials required for the works. Neither the Engineer, nor the Employer can provide any guarantees on the availability of facilities.

3.9 Temporary Buildings

Before the erection of any temporary site buildings the Contractor shall obtain approval from the Engineer of the size, type, location and drainage arrangements thereof and other services. The Contractor shall be responsible for maintenance of the buildings and site for the duration of the contract.

3.10 Safety and Adequacy of Plant and Temporary Works

The Contractor shall be solely responsible for the safety, adequacy and maintenance of all Constructional Plant and Temporary Works. No approval by the Engineer of the Contractor's Construction Plant and Temporary Works shall relieve the Contractor of any of his responsibilities for the sufficiency and efficiency of the same or from any other of his responsibilities and obligations under the contract.

3.11 Facilities for Inspection by the Engineer

The Contractor shall at all times provide the Engineer adequate and necessary assistance in the execution of his duties in checking measurements and levels and carrying out tests and other duties for this purpose. The Contractor shall also provide the Engineer with safe access to any location requiring checking measurements or inspection.

3.12 Setting Out and Topographic Surveys

The Contractor shall set out the Works and shall submit to the Engineer for approval details of the equipment and methods, which he proposes adopting for the accurate setting out of the Works.

The Contractor shall give the Engineer sufficient notice of his intention to set out or fix levels for any part of the Works, to enable the Engineer to arrange for any checking required. Work shall be suspended to plant and equipment moved as required, to facilitate checking.

Contractor to provide sketch of proposed setting out and to stake out proposed setting out on site for inspection and approval of Engineer.

3.13 Safety Statement

The Contractor shall provide a Safety Plan before commencing any work. This plan shall include details of what precautions the Contractor will take to ensure safety on site. The Contractor shall cordon off his immediate working area from the rest of the site where the Employer's personnel may be working, and from the general public.

The Contractor shall comply with all relevant statutory Safety Health and Welfare, regulations in accordance with the Conditions of Contract.

3.14 Fire Precautions

All work performed by the Contractor that is likely to give rise to fire hazards, such as the use of naked flames in enclosed or restricted areas shall be carried out in such a way as to ensure the safety and protection of the Works and of all personnel and property. Where it is necessary to use any naked flames or welding equipment and while combustible materials are being used, adequate protection

shall be provided to all other adjacent materials and personnel. Suitable fire extinguishers shall be readily available at the positions where such work is proceeding.

3.15 Inclement Weather

The Contractor shall protect the whole of the works from damage by inclement or cold weather.

The Contractor will be expected to avail himself of all reasonable means to aid construction of the Works and Temporary Works in inclement or cold weather and to use his best endeavours to prevent or minimise any delays arising there from.

3.16 Residential Accommodation

No residential accommodation will be permitted on the site for the Contractor's work people whether employed directly or indirectly. The Contractor shall be responsible for the prevention of temporary dwellings being located on the site of the works. This shall apply to dwellings for his own workforce, sub-contractors or dwellings belonging to third parties.

3.17 Avoidance of Noise, Nuisance and Pollution

The Contractor shall take all reasonable precautions to keep public roads and hard standings clear of all spillage from his traffic and shall clear promptly any spillage that occurs. Any damage caused to public roads and hard standings, other than from wear and tear, shall be repaired to the satisfaction of the Engineer. The Contractor shall ensure that all personnel employed by him or under his control are made fully aware of the measures to be taken and that these are meticulously observed.

The maximum permissible sound pressure at the boundary of the nearest premises to the works site shall not exceed 60dB(A).

When, for reasons of works safety or security, plant and equipment is operating at night or if night work is permitted, the maximum permissible sound pressure shall not exceed 40dB(A) at the boundary of the nearest premises.
The Contractor shall be cognisant of the background noise level (e.g. existing street noise). Any noise emission from construction activities shall be added to this background noise to determine the sound pressure levels.

The Contractor shall ensure that all plant and machinery to be used is adequately maintained in accordance with the manufacturer's recommendations. All such plant and machinery shall be fitted with effective exhaust silencers and shall be operated in a manner so as to reduce noise emissions as far as is practicable. Pneumatically operated percussive tools shall be fitted with approved mufflers or silencers that shall be kept in good repair. Machines that are in intermittent use will be shut off or throttled back to a minimum.

A minimum of seven days before commencing a particularly noisy operation, e.g. drilling, the Contractor shall effectively communicate to the local residents and business community the likely duration and noise level of the operation. As part

of the communication the Contractor will give the name and telephone number of the Contractor's Agent should problems or complaints arise.

3.18 Disposal of Wastes

The Contractor shall make adequate arrangements to the satisfaction of the Engineer for the disposal of all debris, sub-soil, water and sewage and all other waste materials arising or connected with the works.

No waste material shall be disposed of in the Phoenix Park unless otherwise agreed with the Engineer.

3.19 Advertising

The Contractor shall not, without the prior approval of the Engineer, exhibit or permit to be exhibited any advertisement on the Site, the Works, the Constructional Plant or the Temporary Works. All notices at the site shall be subject to the approval of the Engineer before they are put up.

3.20 Cost of Compliance

Unless expressly stated otherwise, the cost of compliance with this Specification shall be deemed to be included in the rates and prices in the detailed estimate.

3.21 Method of Working

Constructional plant used in the execution of the Works shall be of a design and be used in a manner approved by the Engineer. The Engineer may at any time withdraw his approval and the Contractor shall immediately adopt another method of working, and if such change shall be required to achieve satisfactory progress or workmanship, the Contractor shall have no claim against the Employer for costs incurred by him in changing the method of working or in the provision and use of other plant.

3.22 Sub-Contracting

The Contractor will be required to submit details of any Sub-Contractors, which he intends to employ on the Works. The Contractor should not assume that he will receive approval for the employment of Sub-Contractors, and where the Engineer is not completely satisfied with any proposed Sub-Contractor he will refuse permission to the Contractor to employ him as a Sub-Contractor.

The Contractor shall be responsible for the correlation of all the various sub-contractors' work and for their proper progress in the appropriate order to ensure a speedy completion of the whole project. Any additional costs caused by incorrect or insufficient information being given, or by the Contractor not keeping the sub-contractors informed of all alterations, shall be borne by the Contractor. The Contractor shall ensure that all sub-contractors are fully conversant with and are bound by the terms and conditions of the main contract.

3.23 Materials and Workmanship

All materials used in the Works shall be subject to inspection and tests as provided for in the Conditions of Contract and Specification. The Contractor shall submit test results in accordance with the appropriate Irish Standards or other approved standards as required.

The Works shall be carried out by competent personnel skilled in their various trades and the workmanship shall conform with the detailed requirements of this Specification and the appropriate sections of applicable or relevant Codes of Practice or Standards.

Proprietary products shall be used, installed or erected in accordance with the recommendations of the manufacturer.

3.24 Samples and Testing of Materials.

Samples of all materials proposed to be used, together with details of their origin shall be submitted to the Engineer free of charge unless the Contractor shall obtain from the Engineer specific permission to dispense with samples in the case of any particular materials. Samples are to be delivered sufficiently in advance of bulk deliveries to allow for any test required and no bulk materials are to be delivered to the Works until the Engineer's written approval has been obtained. The quantities of samples submitted shall be those appropriate taking account of the tests required as listed in the relevant Clauses hereunder or in the appropriate Irish or British Standard.

Subsequent to the Engineer's approval of the use of any material further samples from the bulk of the material may be selected by the Engineer and in the event of those samples failing to come up to the standard of the approved sample the whole of the consignment from which the further sample was taken shall forthwith be removed from the site.

With the exception of the testing of aggregates and concrete the Employer will carry out free of charge to the Contractor all tests ordered by the Engineer from samples delivered to them or from samples obtained from the site. The Contractor shall, however, arrange with the suppliers of materials free of cost to the Employer for all tests and inspections, which are provided for in the relevant current European, Irish or British Standards to be carried out at the place of manufacture. The manufacturers shall send the test certificates direct to the Engineer. The Contractor shall give the Engineer at least 7 days notice of the date when the materials are to be tested in order that the Engineer can arrange to be present if so desired.

All materials intended for use in the permanent works shall be subject to inspections and tests in accordance with the Conditions of Contract and this Specification.

The testing of materials for which no specific provision is made elsewhere in the Specification shall be tested either at the place of manufacture or fabrication or on site in order to determine to the satisfaction of the Engineer, whether they comply with the requirements of the Specification.

3.25 Alternative Designs

Should the Contractor propose any alternative designs for any part of the Works it shall be entirely his responsibility to produce adequate design calculations and

drawings to satisfy the Engineer that the alternative is acceptable, and to enable the section of the Works to be constructed or fabricated.

No claims for additional payment or for extension of time of the Contract will be considered or granted because of delays caused by checking or approval by the Engineer or the Employer of any alternative proposals submitted by the Contractor.

3.26 Photographs

The contractor shall maintain a photographic record of the works, copies of which shall be supplied to the Engineer on a weekly basis. The contractor shall particularly photograph underground works such as, filter drains, pipelines, road bases etc prior to backfilling / covering.

4.0 Traffic Management

Traffic management plan to reflect any impact on traffic circulation in Phoenix Park. Contractor to liaise with Phoenix Park stakeholders before any commencement of works on site to agree final traffic management plan and site safety / public access issues.

(a) Signage.

The Contractor shall provide, erect and maintain on the site all traffic signs necessary to forewarn users of impending dangers.

All signs shall be luminous and clearly visible at night. Lettering shall consist of bold black letters on an orange-yellow background. The signs shall be kept in a clean and clearly legible condition and shall be located facing and clearly visible to approaching traffic. The tender shall provide for sufficient sandbags or other counter weight to prevent sign movement due to wind.

(b) Traffic Safety and Control.

The Contractor shall not commence the work that affects public roads until all traffic safety measures necessitated by the work are fully in place.

(c) Traffic Management Plan.

During the course of the works the contractor must follow the traffic management plan submitted with this tender, indicating how they proposes to manage traffic.

The Contractor shall be permitted to work during normal daylight hours Monday to Saturday. **Some restrictions may occur at weekdays with regard to traffic management within the park. The Contractor shall liaise with the Engineer regarding any possible road closure requirements relating to works to be carried out during these times.**

5.0 EARTHWORKS & EXCAVATION.

5.1 Site Clearance General.

The contractor shall initially grub up and remove spoil, debris, scrub, and structures scheduled for removal from the site to prepare the site for construction.

Upon completion of the works the contractor shall clear all surplus debris and material from the site and leave in a clean state to the satisfaction of the Engineer.

5.2 Surplus Materials Removal from Site.

Surplus materials and debris arising from site clearance and excavation work shall become the property of the Contractor unless specified otherwise. The Contractor shall remove from the site debris and materials not for reuse at his own expense.

5.3 Soils and Rocks.

The definition of soils and rocks shall be as described in B.S. 5930.

5.4 Topsoil.

Topsoil shall mean soil capable of supporting plant growth. The Contractor shall excavate any topsoil from the areas indicated to be developed, and from temporary working areas, to a minimum depth of 200mm and preserve for reuse. The Contractor shall stockpile excavated topsoil in temporary spoil heaps. The location of temporary spoil heaps shall be agreed in advance with the Engineer. The Contractor shall keep the topsoil separate from other materials.

5.5 Backfilling Topsoil Spread and Level.

When backfilling in grass areas, the Contractor shall spread and level topsoil in areas indicated to a minimum depth of 150mm or as directed by the Engineer.

5.6 Foundation Excavation.

The Contractor shall excavate to the dimensions, levels, lines and profiles above and shown on the drawings, or as directed by the Engineer.

5.7 Additional Excavation.

Any additional excavation required to accommodate the temporary support of sides of excavations shall be provided and backfilled at the Contractor's expense.

5.8 Unauthorised Excavation.

The Contractor shall backfill unauthorised or excess excavations with approved filling at no expense to the Employer.

5.9 Rock Excavation.

The excavation of rock shall be by ripping or by hydraulic percussion breakers only. Blasting shall not be permitted.

5.10 Planking and Strutting.

The Contractor shall support sides of excavations as necessary and in accordance with statutory requirements.

5.11 Excavations Free from Water.

The Contractor shall keep excavations free from water. The Contractor shall arrange for the rapid dispersal of water from the earthworks or completed formation during construction, or which enters the earthworks from any source. Where practicable, the water shall be discharged into the permanent outfall of

the pipe drainage system. Adequate means for trapping silt shall be provided on temporary systems discharging into permanent drainage systems.

5.12 Temporary Sumps.

Where temporary sumps are required the Contractor shall construct them clear of excavations for permanent work and shall fill them with suitable filling when no longer required.

6.0 CONCRETE WORK.

6.1 Lean Mix Concrete

Lean mix concrete shall be ST2 as specified by I.S. EN 206-1:2013
Characteristic Compressive cube strength after 28 days = 12.0 N/mm^2
Cement type = Portland Cement CEM 1 to I.S. EN 197-1
Aggregate: - Nominal Size = 20mm
Cement Content: - 240 Kg

6.2 Ready-Mixed Concrete.

All concrete used on site shall be supplied ready mixed from an approved supplier. No mixing of concrete shall be carried out on site without the express approval of the Engineer's Representative. Provide concrete suppliers designed mixes for approval prior to commencement of concrete work on site. Normal Portland Cement (NPC) shall be used and shall comply with I.S. EN .197-1

All ready-mixed concrete shall comply with the provisions of I.S. EN 206-1:2002 except where modified herein.

Addition of water after the concrete arrives on site shall not be permitted.

6.2 Delivery Docket.

Before discharging ready-mixed concrete at point of delivery the Contractor shall provide to the Engineer's Representative a delivery docket from the Supplier for each batch of concrete. This docket shall contain the following minimum information:

(a) Serial number.
(b) Name of ready-mixed concrete depot.
(c) Date.
(d) Truck number.
(e) Name of purchaser.
(f) Name of delivery site.
(g) Quantity of concrete.
(h) Description of concrete mix including grade, type of cement, nominal maximum size of aggregate, workability, free water/cement ratio, cement content and minimum density.
(j) Time of loading.

7.0 REINSTATEMENT.

7.1 General.

The Contractor shall be responsible for the temporary and permanent reinstatement of all surfaces, boundaries, services, structures and entities affected by the works and for the maintenance of same throughout the contract and maintenance period. The Contractor shall reinstate any surfaces adjacent to the works, which have been damaged due to carrying out of the works.

The Contractor shall keep reinstated surfaces in good repair by regularly making up any defect in the surfaces with appropriate surfacing materials.

7.2 Walls and Fences.

Walls and fences damaged as a result of the works shall be rebuilt to at least their original condition.

7.3 Land Drains, Culverts & Road Drainage.

All Lands Drains, Culverts and Road Drainage damaged as a result of the works shall be reinstated to their original condition and shall be sufficiently well formed to allow efficient run off of surface water at contractor's expense.

7.4 Grass Areas.

After placement of topsoil the entire surface area shall be rotovated and levelled with the topsoil reduced to a fine tilt. Following this, a grass seed mixture of 8 parts Frances Perennial Ryegrass, 8 parts Talbot Perennial Ryegrass, 7 parts Perma Perennial Ryegrass and 1 part Huia White Clover shall be sown at the rate of 30Kg/ha together with 10:10:20 fertiliser at 200Kg/ha.

Sowing shall be carried out only during the periods September/October and April/May. Sufficient allowance shall be made for any subsidence likely to occur. Should any excessive subsidence occur such further topsoil and/or turf as may be required from time to time shall be added to bring the surface to the level of the adjoining undisturbed surface. If necessary the Contractor shall make provision to return to site to sow grass seed.

An experienced Agricultural or Landscape Contractor approved by the Engineer shall carry out the rotovating and sowing.