CONSULTING ENGINEERS

mechanical & electrical services specification

MIDSOMER NORTON TOWN PARK

REVISION A

TENDER ISSUE – APRIL 2019

PRELIMINARIES

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MECHANICAL SPECIFICATION

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ELECTRICAL SPECIFICATION

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specification.

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PARTICULAR PRELIMINARIES

section one.

PARTICULAR PRELIMINARIES

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1.01 introduction

This part of the Specification should be read in conjunction with other sections of this Specification, the Main Contract Conditions, Preliminaries and Contract Drawings. This is a Performance Specification and all design responsibility lies with the Contractor.

Where specific items are not covered within this Document, the installations should comply with Standard Specifications 034 and 036 formerly (M&E) No. 1 and No. 3.

Supporting outline design drawings are provided to highlight general principles and services concepts proposed for the Project.

1.02 description

The works detailed in this Specification are for the Mechanical and Electrical Services to be provided in Midsomer Norton Town Park of Gullock Tyning in Midsomer Norton for the Town Council.

It shall be noted that the Contractor has complete design responsibility for the conceptual and detailed design, as well as the integration of all of the engineering services including the sizing and selection of the services, plant and equipment.

1.03 conditions of contract

The general conditions of the Contract are laid down elsewhere. This Specification covers a particular specialist work package and will entail the Contractor working with specialist Sub-Contractors as stated.

The Engineering Services work shall be carried out to a Programme agreed between the Contractor and the Principal Contractor.

Payment terms shall be in accordance with the Contractor's agreement with the Principal Contractor.

1.04 appointment of mechanical and electrical contractor

The Principal Contractor shall engage specialist contractors at the earliest possible point in the Project to ensure that all of the requirements of this Specification are met.

The Contractor shall be or use a specialist to undertake the various elements of the work who are members of the following bodies:

Mechanical Work	Street Works Accredited to lay services in the Pubic Highway
Electrical Work	NIC EIC Contractor

With respect to this Specification the term 'The Contractor' shall mean the Specialist Contractor tendering for this work.

1.05 site

The Contract relates to work at:

Midsomer Norton Town Park
Gullock Tyning
Midsomer Norton
Bath
BA3 2UH

1.06 definitions

Employer (Client):

Midsomer Norton Town Council
Town Hall
The Island
Midsomer Norton
Radstock
BA3 2HQ

Architect:

New Leaf Studio Chartered Landscape Architects
1.17 Paintworks
Bath Road
Arnos Vale
Bristol
BS4 3EH

Services Engineer:	BJP Consulting Group Limited The Well House Manor Courtyard Stratton-on-the-Fosse Bath BA3 4QF
Principal Designer: (H & S Specialist)	New Leaf Studio Chartered Landscape Architects 1.17 Paintworks Bath Road Arnos Vale Bristol BS4 3EH
Quantity Surveyor:	TBC
Structural & Civil Engineer:	TBC
The Principal Contractor:	TBC

1.07 scope of works

The works shall produce a fully integrated Mechanical and Electrical Engineering Services installation in accordance with the details and criteria laid down in this Specification and accompanying drawings, including (but not restricted to) the following: -

(a) Mechanical Services
(b) Electrical Services
(c) Full Cleaning, Commissioning & Testing
(d) Documentation of the Installation
(e) 12 Months' Maintenance and Call Out

The Contractor shall accommodate the Programme constraints of the Principal Contractor to efficiently progress the whole of the works. The Contractor shall where necessary, use temporary services to accommodate the Programme.

The Contractor must obtain all necessary permissions, wayleaves and licenses to undertake the works including arrangement of any necessary road closures etc.

1.08 site conditions

The Contractor shall visit the site to obtain knowledge of the site conditions, no additional costs shall be allowed for want of knowledge or failure of the Contractor to observe this precaution.

As part of the site visit, the Contractor should fully inspect the Scope of Works and be solely responsible to ensure he has sufficient information, resources, equipment etc. to complete the works within the Programme.

Failure to comply with this recommendation shall not be accepted as an excuse for inadequate cost allowance in the submission, the Tender or execution of the works.

The visit shall be arranged through the Principal Contractor.

1.09 hazardous materials

Under The Control of Asbestos Regulations 2018, it is a legal requirement that Asbestos Awareness Training is given to all those whose work could foreseeably expose them to asbestos containing materials. This requirement shall apply to the Contractor (and all operatives and sub-Contractors) tendering for the works.

The Contractor should obtain from the Client or Principal Contractor information on the location and condition of asbestos containing materials where this will affect their work so that it can be planned safely.

A Contractor who unexpectedly discovers any asbestos, or suspected asbestos, must report this to the Principal Contractor immediately and detail any discrepancy between the actual condition of material and the information given to the Contractor. The Contractor shall withdraw all personnel from the affected area until advised that it is safe to continue.

It is the responsibility of the Contractor to identify this and other potential emergencies that could occur on site. A Hazards Plan shall be prepared by the Contractor that demonstrates the Contractor has considered health and safety risks on the Project along with the procedures to respond to any incident.

The Hazards Plan should include events that are likely to occur on the Project or site, such as, the discovery of unexpected hazardous materials, high winds, structural collapse and environmental emergencies.

The Contractor must be prepared for, and be able to notify (in an approved manner) the entire site workforce about the emergency and the proper evacuation or procedural protocols.

1.10 codes of practice/regulations/standards

The Contractor shall design, supply, install, connect, test and commission the whole of the installation to the entire satisfaction of the Engineer and in compliance with all relevant statutory requirements or Regulations/Codes of Practice current at the date of Tender, in particular the following: -

(a) Standard Specifications 034 & 036 formerly (M&E) No. 1 and No. 3

(b) The Construction (Design and Management) Regulations 2015

(c) 18th Edition of the IET Wiring Regulations for Electrical Installations (BS 7671)

(d) Electricity at Work Regulations 1989

(e) Electricity Supply Regulations

(f) Health and Safety at Work Act 1974

(g) Relevant and current British Standards and British Standard Codes of Practice, Acts, Bylaws, Regulations

(h) Water Act

(i) The Gas Safety (Installation and Use) Regulations 1998

(j) The Environmental Protection Act

(k) HVCA Specifications DW144 and HVCA TR/17 and TR/10

(l) Any special regulations issued by the Local Supply Authority

(m) The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation

(n) Building Regulations Part L Latest Edition

(o) Building Regulation Approved Documents

(p) CIBSE Guides

(q) The National Joint Utilities Group (NJUG) recommendations and guidance.

1.11 design and drawings

It is the Contractor's responsibility develop the design in conjunction with any Architectural, Structural and Civil Engineering (or any other relevant) drawings, details or existing arrangements. Any drawings accompanying this Specification are intended to assist Tenders to be prepared and shall not be used as a part of the design.

The Contractor is responsible for the full design coordination and detailing of the works, associated Builder's Work, temporary works and phasing.

1.11.01 interface with existing and new services etc.

Any existing gas and water mains, high and low voltage supply cables, communications cables and data cabling underground, through and around the site are to be diverted, amended or re-connected.

It shall be the responsibility of the Contractor to identify and locate these and any other service that shall or may be affected by the construction. The Contractor must ascertain the systems/buildings that are served by or serve these services and undertake any necessary diversion/protective works.

When the Contractor has identified all of the services, he shall peg out all routes using wooden pegs at maximum 15m centres. The pegs used shall be colour coded to identify service type. At road crossings and through car parks, etc., paint spots shall be used.

The marking out shall also be plotted on the Site Plan to accurately establish the services locations with respect to any proposed construction.

The Contractor shall then plan out the revised routes. Working in conjunction with his verified survey, the Contractor shall accurately set out on a scale drawing of the proposed services routes.

It is essential that the Contractor carefully checks and indicates the ground cover over the retained and diverted services both at the time that the work is undertaken (existing ground levels) and with the proposed levels when all works have been completed.

The Contractor shall specifically highlight the following areas on the Drawing:

- Services passing under existing roads/vehicle access.
- Services passing under proposed roads/vehicle access.
- Services passing within 3 M of any proposed construction.
- Services passing within 3 M or through any existing construction.
- Services passing within 1 M or crossing any underground services.
- Services passing within 8m of the main river / and flood defence structures.

For each situation, and otherwise where needed, the Contractor shall identify special measures necessary to protect the services during the diversion works.

The proposed diversion and/or new supply scheme details are to be submitted to the Project Manager for agreement in principle, before any detailed design work is undertaken. The Contractor shall allow a period of 7 working days in his programme for the Engineer to consider the proposal.

All access chambers, etc, must be installed to align with future roadway/kerb lines, etc.

In undertaking this work, no work or system shall be affected during normal working hours. This shall be deemed to include any necessary re-commissioning of the service/system affected.

If this work entails work to any essential services, the Contractor shall arrange for the service to be maintained at all times.

1.11.02 calculations and design

It is incumbent on the Contractor to ensure that the whole of the services installations are truly designed such that a fully integrated and well-planned installation is achieved.

The Drawings provided clearly indicate, in detail, the requirements of the Client and replicate/enhance the information within the Specification.

The design approach adopted by the Contractor must clearly demonstrate the following features and attributes:

(a) The future operation and maintenance of the installations must be carefully considered. It is a specific requirement under the Construction (Design and Management) Regulations that the design takes reasonable steps to ensure the Health and Safety of those maintaining the installation; however, in this instance the Contractor must go further.

The Contractor shall ensure that access to all equipment, valves, pumps, etc. is not only adequate but allows easy access for regular maintenance. For example, the need to take step ladders to change filters on an air handling unit or isolate a particular pipe run shall not be accepted, such difficulties must be designed out.

Equipment and plant layouts must be planned in a logical manner such that a Maintenance Engineer can easily and quickly identify circuit configurations, which valves isolate a particular circuit, which isolator controls a particular machine, etc.

Equipment selections and locations must avoid tortuous or hazardous routes for the replacement of any heavy or bulky equipment. Particular attention must be given to ensure that replacement equipment or any lifting equipment necessary for the servicing/replacement of equipment can be safely and easily taken to the required area.

(b) The design approach must produce as simple a solution as possible, a solution that offers easy commissioning and long-term reliability.

(c) As far as is possible, the design should be repetitive with standard arrangements/solutions for similar requirements.

In this respect, the Contractor shall, as far as possible, utilise one manufacturers' range for a particular item of equipment, for example pumps, air handling units, grilles/diffusers, switchgear, etc.

In many instances, the Particular sections of this Specification clearly identify the use of manufacturers or contractors, which the Client employ as part of their Term Contract Agreements or preferred suppliers lists. These selections are deliberate and where indicated these must be adhered to.

(d) The solution should show responsible environmental stewardship; this shall include consideration of energy efficient design/equipment selection, the minimum use of CFC/s, etc.

(e) As far as possible, the installation must be inherently safe, for example, plant frost protection should not be reliant on the Building Energy Management System operating correctly, pipes should not pass over electrical switchgear, etc.

(f) The design must be fully co-ordinated with other services and the structure to avoid clashes. The final solution should not only be effective and efficient but also aesthetically pleasing.

(g) All of the services outside of designated plant areas must be concealed and hidden from view. This shall preclude bulkheads, duct encasement below ceilings or surface mounted conduits, cables ducts, pipes, etc. All services must be restricted to the false ceiling voids or designated service risers.

(h) Where possible all plant equipment selected shall be registered with ECA (Enhanced Capital Allowance) Scheme to enable the Client to recover proportionate capital costs.

The Contractor is to adopt the design criteria and calculation techniques recommended by:

- Chartered Institute of Building Services Engineers (CIBSE)
- Institution of Engineering and Technology (IET)
- Building and Engineering Services Association (B&ES)
- Relevant British Standards

All calculations shall be submitted to the Project Manager for his comments. The Contractor must allow two weeks in his design programme for such comments to be made and adequate time to incorporate any comments made. A further submission incorporating any necessary changes shall be made with a further week for the Project Manager's consideration. The commenting on or acceptance of any calculations shall not imply or give approval to these calculations; it remains the responsibility of the Contractor to ensure the accuracy of his calculations.

If the Contractor chooses to utilise a computer based calculation method such as Hevacomp, Amtech or Cymap, then full data input sheets shall be included with the results.

1.11.03 electrical calculations

The following electrical calculations are expected, as a minimum:

(a) Cable Sizing, Volt Drop, Current Rating, Loop Impedances, Fault Levels Discrimination.

(b) Submain Design Comments.

(c) Maximum Demand Assessment.

(d) Trunking Capacities.

(e) Conduit Capacities.

There shall be a minimum 25% expansion capacity in all elements of the installation.

1.11.04 mechanical calculations

The following mechanical calculations are expected, as a minimum:

(a) Pipework Sizing for CWS.

All calculations will be made available before M&E work begins on site.

Pipe sizing calculations will be based on a mains pressure of a minimum of 1 barg.

External conditions shall be taken as -3°C 100%rh in the winter and 28°C 60%rh in the summer.

1.11.05 building regulations & (BREEAM) compliance

The Contractor is wholly responsible for satisfying Building Regulations and where applicable, achieving the required BREEAM score.

The Contractor shall provide all necessary calculations and certification to demonstrate compliance including (but not limited to) SBEM & SAP Calculations.

1.11.06 design and installation drawings

The Contractor is to produce and issue for the Project Manager's comment the following drawings in the following sequence:

(a) issue 1

Preliminary Schematics of each service.

Preliminary External Services Layouts.

(b) issue 2

Final and fully sized Schematics of each service.

Fully co-ordinated general arrangements (Max 1:50) for each service, including drawings for pipework, trunking access conduits, ductwork and lighting.

Schedules of Equipment connection details.

External services layouts.

(c) Issue 3

Installation drawings for all plant areas.

Co-ordination drawings (Max 1:50)

All methods of fixing/suspension.

Control panel wiring diagrams (Specialists provision).

Switchgear wiring diagrams.

Distribution board schedules.

Builder's work details, including details of all plant bases/access ladders, etc. These drawings must all include all sizing and the requisite information for commissioning, including all design flow rates, etc.

Drawings (two sets) shall be submitted to the Project Manager for his comment at all stages. The Contractor must allow two weeks in his design programme for the Project Manager's comments for the Issue 2 information and one week for Issue 3 details. The commenting on, or acceptance of, any drawing shall not imply or give approval to them; it remains the responsibility of the Contractor to ensure the accuracy and integrity of his design.

All drawings shall be in A1 format or smaller.

1.12 the construction (design and management) regulations

The Contractor's attention is particularly drawn to his responsibilities under these Regulations.

The Contractor's responsibilities include, but are not restricted to: -

(a) Co-operate with the Principal Designer (or his H & S specialist).

(b) Obtain from his Sub-Contractors all relevant information that relates to Health and Safety at Work, that is a consequence of their work.

(c) Obtain from his Sub-Contractors all relevant information that is necessary for inclusion in the Project Health and Safety File. This is likely to include detailed Method Statements for installation procedures.

The Project Health and Safety Plan have been created by the Principal Designer. The Contractor must satisfy himself that he has adequate information in this regard before submitting his Tender, as no additional payments will be made because of want of knowledge in this regard.

1.13 permit to work, risk assessments and method statements

The Contractor shall comply with any management procedures that the Client or site has in place and must obtain a Permit to work for either the isolation or interruption of any systems, services or specific hazardous activities and must also ensure the Principal Contractor, Client and/or Building Manager is aware of the Permit to work.

Where isolation Permit to work is required there must be sufficient consultation, exchange of information and planning between all parties concerned prior to the work commencing, in order to facilitate the Permit to work process and minimise disruption to the building and its occupants.

A Permit to work will only be issued if the appropriate control measures, identified by risk assessments, are put in place.

Permits are issued for either the isolation or interruption of systems or services or specific hazardous activities.

An “Isolation" Permit to work is required, for work on, or affecting, the following systems (or as agreed with the Client or Principal Contractor):

- Electrical Services
- Mechanical Services
- Water Supplies

A "Hazardous Activities" Permit to work is required for (or as agreed with the Client or Principal Contractor):

- Hot Work (tasks such as welding, brazing, or cutting that produce heat)
- Confined Space (an area with limited means of entry or exit that is large enough for a person to enter and perform work).
- Excavations
- Asbestos

In the event of the Contractor carrying out higher risk work or unusual work activities, the Contractor shall issue full risk assessments and method statements.

Such documentation should be site and work specific, relevant (not generic), succinct and submitted to the Principal Contractor, Client and/or Building Manager prior to work commencing.

In the event of the need to deviate from the stated method statement, no further work is to be carried out until a revised method statement has been prepared and submitted.

1.14 fixed price tender

The Tender shall be fixed price Tender and no adjustment shall be made for fluctuations in price of materials, rates of wages or contributions, or any other matter whatsoever, and such fluctuations shall be at the sole risk of the Tenderer who should ensure that any work he may be permitted to sublet in accordance with these conditions is sublet on the same conditions. Any orders for Sub-Contractors and for suppliers under these conditions shall be placed on the same fixed price unless otherwise directed by the Engineer.

1.15 payment for tendering

No payment shall be made for Tenders.

1.16 acceptance of tender

The Principal Contractor does not bind himself to accept the Tender.

1.17 alternative offers

Where the Specification states equal and approved, the Tenderer may select an alternative supplier and offer the alternative as a potential saving within the Tender documentation.

The Tender return shall be based on the specified equipment, any alternative shall be stated in a schedule of alternatives with the potential saving to the Contract clearly indicated. The Contractor shall be responsible for the suitability of all plant and equipment. Any concerns regarding equipment specified must be raised at tender stage, otherwise is shall be deemed as accepted by the Contractor.

Changes to the supply of alternative equipment shall not be accepted after confirmation at Tender Stage.

If the Contractor uses any alternative supplier then it is his responsibility to integrate such equipment into the scheme and adjust the design as necessary, and absorb any consequential costs.

Any such changes to the design must be approved in writing by the Engineer before any installation commences.

1.18 priced schedules

The Contractor must forward, within four days after he shall have received notice that the Principal Contractor is considering his Tender, a fully priced Schedule of Rates equating to the full Tender Sum and including all incidental charges.

The rates shall indicate the unit rate for each item of plant and supplying and fixing each element of the services.

This shall not relieve the Contractor of his responsibility to provide sufficient materials for the works, even if quantities are not sufficiently allowed or items omitted. This requirement shall not imply acceptance of Tender.

The Schedule of Rates shall be used as the basis of any variations to the Engineering Services element of the Contract and must be inclusive of all mark-ups, Contractor's discount etc.

1.19 sub-contractors

The Contractor shall seek written consent of the transfer, assignment or sub-letting of any part of the work involved in this Contract, and to submit any proposed sub-letting details when returning the Tender documents at Tender Stage.

The Contractor must take full responsibility for the co-ordination, supervision and administration of all his Sub-Traders delivery of all associated materials and goods, in accordance with the Work Programme. Approval of Sub-Contracts will not relieve the Contractor of his responsibilities under this Contract.

1.20 supervision

The Contractor shall employ a competent Foreman who shall have charge of the works and who shall be accessible to receive instructions in the absence of the Contractor's Project Engineer/Manager.

The Engineer shall have the right to require the withdrawal of any such person whose general conduct or handling of the job is, in the Engineer's opinion, not satisfactory.

1.21 co-ordination

The Contractor shall be responsible for the co-ordination of all installation work within his Contract with all other services, structures and architectural features to avoid clashes etc.

It is crucial for the success of this Project that the approach to the installation is well planned; the Contractor must therefore carefully programme the works well in advance.

1.22 progress chart

Immediately upon signing the Contract, the Contractor shall draw up a fully detailed Progress Chart, indicating the times required for the execution of the works.

1.23 site meetings

The Contractor shall be required to have an authorised representative in attendance at any Site Meeting which may be held and to which his attendance is requested. The Contractor, or the Engineer, shall normally confirm in writing when time permits, or by telephone/verbally, notice of such meetings.

1.24 existing information

Any drawings or information which is either issued to the Contractor or he obtains from any other source, which purport to indicate any details of existing installations or services shall not be relied upon. The Contractor, from site survey, must verify all information that he requires.

1.25 working hours, car parking and messing facilities

The Contractor shall establish with the Principal Contractor the working hours, car parking and messing facilities to be made available. The Contractor shall allow sufficient funds within his Tender to cover any elements not included by the Principal Contractor.

1.26 damage to property

During the course of removal of existing material or the installation of new, the Contractor shall exercise every precaution to avoid unnecessary damage to the existing roads, buildings and trees etc. Should any damage result from the negligence of his employees or those of his sub-contractors or suppliers etc., he shall be responsible for making it good or meeting the cost thereof, to the satisfaction of the Engineer.

It is the Contractor's responsibility to conduct a photographic survey and to lodge the images with the Engineer, before works commence.

1.27 redundant and disused materials and equipment

The Contractor shall safely remove and dispose of all redundant and disused materials and equipment strictly in accordance with the requirements of the Environmental Protection Act.

Before removal, materials and equipment shall be offered to the Client for retention.

1.28 software and equipment conformity

All computer based and software driven equipment containing time, day, month or year format shall contain the relevant coding such that a change in the year, month, day configurations shall not result in failure of the system or loss of the correct date. The Contractor will be responsible for checking with all respective equipment/specialist suppliers prior to final ordering/procurement of equipment, to ensure conformity.

1.29 'as installed' drawings

During the process of the works, the Contractor shall prepare and maintain duplicate copies of draft 'As Installed' Drawings. These Drawings shall be kept on site and marked up by the Foreman to indicate: -

All positions, runs, sizes and types of service , trunking, cables, ducts, pipes etc. This shall include the services installed and the systems that they are connected to, existing and new.

Drawings shall be clearly marked 'As Fitted' or 'As Installed' with the prints coloured with distinctive colours for different services etc. All drawings shall also be provided on a memory stick compatible with AutoCAD Release 2010.

1.30 O&M manual and users operating guide

The Contractor shall provide a fully indexed and cross referenced electronic O&M Manual incorporating electronic copies of all record drawings.

The manuals shall include full details of all of the installation and include all maintenance schedules, procedures and processes.

The manual shall be in the form of an interactive PDF document.

The Manual shall be in accordance with the BSRIA Building Manuals and Building User Guides.

The Contractor shall, in addition to the O&M Manual, contribute to a Users Operating Guide / Log Book in accordance with CIBSE TM31 giving clear and simple instructions on the basic operation of the systems.

This is not intended to be a detailed technical manual, but should also indicate a concise approach to understanding the systems, its operation and provide useful contact details and maintenance issues/periods.

1.31 provisional sums and contingencies

The Contractor shall allow within his Tender Provisional Sums and Contingencies as indicated in the Tender Summary.

1.32 training

The Contractor shall allow for a 2 hour training session for the Client, covering the operation and maintenance of the entire installation. Where specialist equipment is installed, the manufacturer's representative shall be in attendance to assist with the training.

Specifically with the controls installation, the Contractor shall allow an additional visit to that specified to refresh the Client on the system operation. This shall be in addition to that indicated in the Particular Specification.

All training shall be certified and the user will be required to sign confirmation that they have understood the training given. Certificates shall be lodged in the O&M Manual.

Training sessions shall be videoed and the video file lodged in the O&M manual.

1.33 twelve months defects and maintenance period

The defects liability period shall be 12 months. During this period, the Contractor shall carry out all necessary breakdown and routine maintenance, replacement of faulty equipment, servicing etc., all at no extra cost.

All Mechanical and Electrical Services Systems and Plant installed (including any free issued to the Contractor) under this Contract shall also be covered by a 12 Months Maintenance Agreement, which shall commence from the date of the Certificate of Practical Completion.

All of the above conditions, preliminaries, site security rules etc. shall all apply for the duration of the Maintenance Agreement.

The Contractor shall ensure that sufficient spares (spare breakers etc.) are provided to maintain the plant during the Defects Liability Period.

Bespoke servicing tools and any specialist keys shall be provided and lodged with the Client.

The Contractor shall undertake the maintenance works in accordance with the Maintenance Schedules in the Operating and Maintenance Manuals he produces for the Contract, which will be held by the Client.

(a) records

The Contractor shall create a detailed record system, which will identify each item of plant and equipment and record all inspections, faults, repairs etc. experienced with the equipment. The final classifications are to be agreed with the Services Engineer.

The Record shall detail the time and date of all site visits, duration of visit, work done and identify the Service/Maintenance Engineer in attendance.

The Plant Record is to be kept on site at all times.

At the end of the 12 month Maintenance period, the Contractor shall provide updated and current certificates for the Fire Alarm, Gas, Electricity and Emergency Lighting Installations

(b) call outs

The Contractor shall provide 24 hour, 365 days/year Emergency Call Out Service by which any plant failure alarm or a request, made by telephone or e-mail, shall cause a Service/Maintenance Engineer to attend site on the next working day.

The Contractor shall ensure that the Service/Maintenance Engineer sent to site has the skill and experienced with the installed systems to diagnose and repair the fault with the minimum of guidance.

If it is necessary to undertake work outside normal working hours due to the requirements of the Client then this too will be at no cost to the Client and must be arranged to suit the Client.

section two.

MECHANICAL SERVICES PARTICULAR SPECIFICATION

section two.

MECHANICAL SERVICES PARTICULAR SPECIFICATION

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2.01 general

The Project concerns the design, supply and installation of the Mechanical Services of a proposed water stand pipe at Midsomer Norton Town Park adjacent to Gullock Tyning in Midsomer Norton, which is managed by the Midsomer Norton Town Council.

The stand pipe will be incorporated in a combined electrical and water feeder pillar, the water connection will come with a hose outlet connection. The feeder pillar will be provided with a dedicated mains water supply from a new connection on the Public Highway.

Capacity in the water supply is to be provided for a potential additional outlet within the vicinity of the Park.

The Contractor shall refer to the Indicative Services Layout drawing along with this Specification and adhering to the Specification design criteria. The design shall be supported with calculations reflecting the requirement of this Specification.

2.02 scope of works

The Mechanical Services installation shall be installed, tested and commissioned in accordance with the relevant British and European Standards as appropriate, the Main Contract Conditions and Preliminaries, the Electrical Services Specifications and Drawings and the Mechanical Particular Preliminaries and Mechanical Services Drawings.

The extent of the work includes (but is not restricted to) the following:-

(a) Provision of new Incoming Water Services

(b) Design of water installation

(c) Below ground ducting and access chamber for future water supplies

(d) Water installation to feeder pillar

(e) Testing, Commissioning and Certification

(f) “As Fitted” Drawings, Operating and Maintenance Manuals

(g) Builder's work

(h) 12 Months' Maintenance

2.02.01 standards of work

The Contractor shall install the system described to the entire satisfaction of the Engineer and in compliance with the Regulations/Codes of Practice set out in Clause 1.10 of the Preliminaries.

2.03 description of mechanical services

2.03.01 Contractors Installation

The Mechanical Contractor shall provide a suitably sized incoming mains water supply for the 1 No. feeder pillar at the approximate position as shown on the Indicative Services Layout Drawing. The buried mains water pipe shall be sized to have a second feeder pillar installed, if required, at a later date.

The Contractor shall extend from the new connection a buried MDPE pipe in one continuous length, as much as practicably possible, from the new connection to the feeder pillar.

The mains water connection shall enter the feeder pillar from below ground through suitably sized ducting to accommodate the pipe and insulation. The ducting shall run from the base trench level to ground level and be sealed at either end to stop the ingress of weather, dirt and vermin. The insulation shall cover all above ground pipework and below ground pipework to the base trench level.

Once inside the feeder pillar, the Mechanical Contractor shall convert to copper and provide a double check valve and 15mm bib tap with hose connection. The pipework assembly should be adequately bracketed to the backboard of the feeder pillar. The Contractor shall carefully plan the installations to ensure adequate access for installation and maintenance.

The Contractor shall include for a valve chamber adjacent to the stand pipe at the general position as indicated on the Indicative Services Layout Drawing. The chamber will be sized accordingly to include for a pressure reducing valve (set to 3 bar), stopcock and an accessible tee with a further stopcock, closed and capped for a future connection including civil works provision for ease of a future connection. Any pipework and valves within the chamber is not considered to be concealed and therefore be treated as such and insulated.

The contractor shall also provide a separate empty duct in the same chamber as the new connection and will terminate in a draw pit adjacent to the Somer Centre as indicated on the Indicative Services Layout drawing. This empty ducting shall contain a draw line and be flexible twin wall blue pipe duct, this duct will provide a route for a future water supply to the Somer Centre.

All works shall be carried out in accordance with the Water Regulations and BS: 6572 - *Blue polyethylene pipes up to nominal size 63mm for below ground use for potable water.* (Barrier pipe to be used)

The Contractor shall check for any cross-site services on the route of the new main and make provision for their diversion or avoidance.

The Principal Contractor shall include for all associated Builder's work for the water connection, based on the drawings provided.

The Principal Contractor shall obtain the appropriate licences and wayleaves to dig on the Public Highway, including the footway and verge. The Principal Contractor is to liaise with the Highway Authority to ensure compliance with the terms of the New Roads and Street Works Act, 1991.

The Contractor shall note that the Drawings are for Tender purposes only and shall allow for carrying out all site measurements necessary to ensure access and accommodation of the relevant equipment.

2.03.02 Bristol Water works

The water supply shall be taken from the new connection supplied by Bristol Water on the Public Highway at the junction between Ham Gardens and Rackvernal Road as indicated on the External Site Services Layout Drawing.

Bristol water will provide a connection to the mains water supply and boundary box complete with meter and a further double check valve fitted within 3m of their new connection. The Contractor shall flush, clean and chlorinate the communication pipe prior to connection.

Initial checks and enquiries have been carried out by BJP to obtain customer estimate breakdown from Bristol Water. The Bristol Water reference number for these works is **69755.** The Contractor should liaise with Bristol Water for the location of the new connection point, testing requirements and on the completion of the work.

Contact: Bristol Water New Supplies Team
Tel: 0345 602 8022
Email: Newsupplies@bristolwater.co.uk

The Principal Contractor shall allow for all attendances and charges associated with the procurement of the incoming water supply, including any connection charges, and notification.

2.04 design, planning and excavation of trenches, graded backfill and reinstatement

2.04.01 trench design

The Contractor shall liaise with the Architect to agree the detailed design and route of the trenches that are to be used for the water service distribution. The trench will be required from the Bristol Water connection to the feeder pillar location.

The pipe shall be installed within a pre-excavated trench by the Principal Contractor, with a minimum 750mm and maximum 1,200mm cover. If this requirement cannot be met, then Bristol Water must be notified, the pipe must be installed as deep as practicable below the finished ground level and be adequately protected against damage from freezing and any other cause.

The route for the trenches shall be generally as indicated on the Drawings and in accordance with The National Joint Utilities Group (NJUG) recommendations and the details in all sections of this Specification.

As the trenches are also to be used to accommodate public utility services (Low Voltage Electrical Supply and Water), the Contractor shall agree with the utility companies any specific requirements that they may have.

When the trench excavation work is within 8m of a main river or flood defence structure then the contractor shall liaise with Environment Agency. “Services crossing a river within an existing structure” are deemed as exempt from obtaining an environmental permit although this should be confirmed by the contractor and the exemption must be registered with the Environment Agency before any work is carried out. The contractor must operate within the description and conditions of the exclusion.

2.04.02 trench plan and route

The route for the trench shall be coordinated with the existing road, landscape, buildings, dimensioned drawings for the trench and details of the other Builder’s Work.

The trench route shall, in particular, be determined by the following:

(a) Avoidance of Tree Protection Zones
(b) Avoidance of Existing Buildings and Structures
(c) Avoidance of Existing Services and Drains
(d) Avoidance of Proposed Buildings and Structures
(e) Avoidance of Newt Protection Zones
(f) Minimising Excavations of Existing Levels Whilst Retaking Correct Coverage in the Final Arrangement

(g) Minimising Site Disruption During the Works
(h) Accommodating the Requirements of Sub-Contractors/Utilities
(i) Maintaining Flexibility for the Site Future Use and Extension for Further Phases
(j) To Protect Services Left in Temporary Locations for Future Connection
(k) Creating the Most Economical Solution

When the trench route has been planned, the Contractor shall mark the route with pegs/paint and scan it to locate any existing and uncharted services.

Any existing services shall be exposed by hand digging and the Contractor shall propose an avoidance plan.

2.04.03 back filling and markers

The services in the trench shall come with a sand bed and be backfilled with selected fill, strictly in accordance with the pipe/cable/duct manufacturer's recommendations.

Where the requirements of the utility companies vary from this, their requirements shall be met.

Over each of the piped services, the Contractor shall lay marker tapes designed to allow identification and location of pipes. The warning tapes shall contain traceable elements within the mesh or tape that can be located by cable avoidance tools.

The tapes shall be colour coded in accordance with the relevant BS.

2.04.04 chambers

A chamber shall be provided for the future tee connection and associated valves.

The chamber shall be generally in the position shown on the Indicative Services Layout Drawing.

The prefabricated sectional chamber shall be manufactured from 100% recyclable polypropylene, manufactured from a structural twin wall construction with a nominal overall wall thickness of not less than 50mm, able to withstand a vertical loading of 40 tonnes free-standing.

All of the duct entries into the chamber sections shall be preformed within the manufacturing process. The chamber shall be manufactured to ISO 9001:2000. The chamber shall conform to load testing class D400 EN124 and also to BS5834 side impact tests.

The chamber lids shall have universal ductile iron locking frames designed to accept anti-slip composite covers.

Anti-slip composite covers shall be manufactured under ISO 9002 approval and meet the load requirements of EN 124 Class B 125. The surface shall have a mean wet SRV value of not less than 76 with security lock down facility.

Chambers shall be minimum 750 x 750mm and of a depth to suit the pipe arrangement.

Where piped services pass through an access chamber, the services shall be sleeved.

The Chambers shall be by Naylor Ducting, their Integrated Ducting System or equal and approved.

2.05 pipework, fittings, valves and bracketry

2.05.01 <u>below ground</u>

The Contractor shall supply and install a buried mains cold water pipe in MDPE Protecta-Line manufactured by GPS PE Pipe Systems, where possible the pipe should be laid in one continuous length.

The Contractor must ensure that the pipework is suitable for the system pressures and must only use electrofusion welded jointing systems manufactured by GPS PE

Pipe Systems and installed in accordance with the pipe manufacturer's instructions and recommendations.

All below ground valves shall be AVK Pentovalve Series 1111/01 MDPE ¼ turn mains stop valves or equal and approved to BS 5433 and WRAS approved.

2.05.02 above ground

Above ground fittings and valves shall be carried out in light copper tube to BS EN 12449 and BS EN 1057. All tube and fittings must bear the BS 'Kite' mark. The backflow preventer RPZ Valve model BA295S and pressure reducing valve model No. D06F shall be manufactured by Honeywell or equal and approved. The Bib tap shall be brass bodied and manufactured by Pegler Yorkshire or equal and approved. All valves shall be fitted in accordance with the water bylaws and manufacturer's recommendations.

The pipework shall be adequately supported in such a manner as to permit free movement due to expansion and contraction. Pipework supports shall be arranged as near as possible to joints and changes in direction, with supporting assemblies adequately sized to carry the weight.

Above ground pipework shall be supported by means of backplate/munzen ring brackets - Crane Figs: 529 or 530 with 515 backplate.

2.06 insulation

The thermal insulation shall be installed to the relevant British and European Standards as appropriate, the Main Contract Conditions and Preliminaries, the Specification and Drawings.

Thermal Insulation shall be applied to the pipes and all fittings inside the feeder pillar as well as to the rising pipe feeding the pillar. The exposed pipes in the chamber shall also be insulated.

Pipes must be isolated to ensure frost/freezing protection.
The thermal insulation shall not be applied until the pipework installations have all been tested.

Insulation materials and finishes shall be inherently proof against rotting, mould and fungal growth and attack by vermin, be non–hygroscopic and in all respects be suitable for continuous use throughout the range of operating temperatures and within the environment indicated.

The Contractor shall be responsible for the work being carried out in accordance with this Specification and the manufacturers' recommendations and in a neat and proficient manner, to the satisfaction of the Engineer.

Any work not of acceptable standard shall be removed and replaced at no cost to the Contract. All insulation materials and finishes shall be installed in accordance with the manufacturers' recommendations. No insulation material containing CFC or HCFC components shall be accepted.

2.06.01 types of insulation

The thermal insulation shall be from a manufacturer's range, specifically manufactured for external use. Armaflex Tuffcoat as manufactured by Armacell or equal and approved.

Insulation for bends and fittings shall be formed from mitred and trimmed pipe insulation sections, cut to ensure that a good contact with the surface to be insulated is made.

Insulation thickness shall be enough to prevent freezing to -10°C for 12 hours.

All valves and fittings shall be similarly protected with removable jackets.

2.07 builder's work

The Contractor shall determine the Builder's Work requirements associated with this installation. He shall provide this to the Principal Contractor.

The Principal Contractor shall be responsible for sealing all holes after installation to prevent the ingress of weather, dirt and vermin.

2.08 manuals and drawings

The Contractor shall provide, at the completion of the Contract, a detailed Schematic indicating pipe routes, pipe sizes etc. as a record of the installation. This should be provided as an "As Fitted" Drawing in AutoCad LT 2008.

2.08.01 service and guarantee

Upon completion of the installations, the Contractor shall place the system in complete operation condition, subject to the approval of the Engineer.

The Contractor’s Specialist’s Technicians may be required to be present on various different dates for testing and calibration to the satisfaction of the Engineer, therefore, full allowance shall be made in this Tender for all additional visits that are required to conform with the Programme of Work.

2.09 balancing, commissioning and tests

The Contractor shall test and commission the mechanical services and issue certificates of completion. The pipework systems must be flushed with clean water and chlorinated after installation, after disinfection of the systems, further flushing with clean water is required before connection to the Bristol Water connection.

All systems shall be tested in accordance with the relevant codes and standards and certificates issued.

2.09.01 tests

The Contractor shall test the water pipes before backfilling in line with the recommendations of BS 8558 and in accordance with the Water Research Council test method Type 1 or 2. They shall provide test sheets proving its compliance with the Water Regulations and relevant British Standards, prior to connection to the main water system.

(a) general

The tests are to be carried out in the presence of the Engineer or his representative and the Contractor is required to give notice to the Engineer in writing when he anticipates testing any part or parts of the installations.

The Contractor shall rectify any leaks or defects disclosed by tests at his own cost and the tests shall be repeated until the installation is to the satisfaction of the Engineer.

Water pipes shall have all debris and dirt removed. Flushing shall be at least two pipe volumes to waste at sufficient flow to lift all sediment. Heavy sediment/dirt may require mechanical cleaning by forcing chlorinated swabs through the pipe before flushing. It is wholly the responsibility of the Contractor to sufficiently flush and cleanse the pipes.

(b) hydraulic pressure tests

The water piping installation shall be tested by the Contractor for a period of not less than 24 hours, during which time all parts must remain dry. The pressure tests are to be 1.5 times the pipework maximum working pressure (as stated by the pipework manufacturer) working pressure. The pressure test shall be certified and Bristol Water invited to witness the test.

(c) systems flushing, cleaning and chlorination

The entire cold water installation shall be flushed and cleaned by a specialist firm prior to connection in accordance with the requirements of this Specification, BS EN 806, BS 8558 and the WRAS Water Regulations Guide. The Contractor must incorporate all necessary injection and drain points necessary for the chlorination of the system. The entire system shall be chlorinated before connection to the Bristol water connection.

The chlorination shall be independently certified, and Bristol Water issued with the relevant documentation to allow the connection to be made live.

2.09.02 maintenance and user instruction manuals

Draft Maintenance and Instruction Manuals are to be handed to the Engineer on completion of work, describing the mechanical equipment. The Contractor shall provide two bound copies of the agreed Operation and Maintenance Manuals, including copies of all Test and Commissioning Certificates, at handover. Two electronic copies shall also be produced and provided along with CAD drawings in AutoCAD LT 2008 format on CD.

2.09.03 final drawings and work instructions

During the progress of the work, the Contractor shall keep a separate record of any alterations and additions and exact route of mains etc. and at the completion of the works, he shall provide the ‘As Fitted’ drawings.

section three.

MECHANICAL SERVICES TENDER SUMMARY

section three.

MECHANICAL SERVICES TENDER SUMMARY

1.0 measured works

1.1	Preliminaries	£
1.2	Cold Water Services.....	£
1.3	Insulation.....	£
1.4	Manuals and Drawings	£
1.5	Balancing, Commissioning and Tests.....	£

Sub Total for measured works…….. £_____

2.0 twelve month's maintenance

3.1 Twelve Month's Maintenance .....£

TOTAL TAKEN TO MAIN BILL OF QUANTITIES ……£_____

Signed .....Position.....

Company ……

Address ……...

……

section four.

ELECTRICAL SERVICES PARTICULAR SPECIFICATION

section four.

ELECTRICAL SERVICES PARTICULAR SPECIFICATION

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4.01 description of work

4.01.01 the requirement

This Section of this Performance Specification is for the design, supply and installation of the Electrical Supply and Distribution for the proposed feeder pillars at Midsomer Norton Town Park of Gullock Tyning in Midsomer Norton, which is managed by Midsomer Norton Town Council.

The main feeder pillar shall be provided with a three phase LV electrical supply from the existing DNO LV network and three phase distribution board.

The LV electrical supplies shall be provided from the main feeder pillar to a smaller feeder pillar mounted adjacent to house the required quantity of commando sockets with individual circuit protection.

Capacity shall be provided in the main feeder pillar for additional electrical supplies in the future as required. The works described in this specification shall be referred to as Phase 1 and additional electrical supplies in the future as Phase 2.

The Contractor shall refer to the Indicative External Site Service Layout Drawing in conjunction within this Specification identifying the services design criteria and quantities. These shall be developed with supporting calculations to produce design layouts reflecting these particular requirements.

The Electrical Services installation shall be fully designed, installed, tested and commissioned by the Contractor in accordance with the relevant British and European Standards, Codes of Practice and Regulations as appropriate, the Main Contract Conditions and Preliminaries, the Mechanical Services Specifications and Drawings and the Electrical Particular Preliminaries and Electrical Services Drawings.

The work detailed in this Specification shall include, but not be limited to, the following principal requirements:

(a) Design of the Electrical Distribution and Installation
(b) DNO Three Phase LV Electrical Supply and Fused Cut-Out

(c) Co-ordinating and Liaising with the DNO and Town Councils preferred Energy Supplier for the Metering Installation
(d) Main Feeder Pillar
(e) Meter Tails
(f) Distribution Board
(g) Sub Main Distribution
(h) Trunking and Conduit Systems
(i) Below Ground Twin Wall Black Flexible Pipe Ducts and Access Chamber for Electrical Supplies in the future with Draw Cords
(j) Small Power Installation
(k) Juno Feeder Pillar with Commando Sockets and individual Circuit Protection
(l) Commando Extension Cables with plug and socket
(m) Lighting Installation
(n) Surge Protection
(o) Earthing and Bonding and TT Type Earthing System
(p) Builders Work to be provided by the Principal Contractor
(q) Testing, Commissioning and Certification
(r) Record Drawings, Operating and Maintenance Manuals
(s) 12 Months Maintenance

4.02 incoming electrical supply and metering

4.02.01 the requirement

During the outline design stage, a demand assessment has been carried out for the proposed Midsomer Norton Town Park.

The new 80A three phase and neutral (TPN) LV electrical supply shall be provided and terminated in the proposed new feeder pillar in the location indicated on the External Site Services Layout Drawing.

The work shall be carried out by the Distribution Network Operator (DNO), in this instance Western Power Distribution (WPD). The Electrical Contractor shall include for these works and too liaise with WPD, fully manage the works and make provision for all necessary site attendance.

An enquiry has been raised with a quotation provided by WPD for the new LV electrical supply.

Contact: Western Power Distribution
Midsomer Norton / Radstock Planning Team
Tel: 01761 405176 / 405131 / 405150
Planner: Daniel Solomon - Planner
Email: dsolomon@westernpower.co.uk

The general cable route and intake location are identified on the WPD Proposal Drawing, and new 45kVA three phase electrical supply quotation enquiry ref. 3343498, scheme no. 1265742/1 dated 1 April 2019 – Daniel Solomon.

The Principal Contractor shall include all necessary Builder's work and site attendance for the new supply works that fall within the site boundary. Also to include for all necessary traffic management, road closures, temporary works, etc. as required.

Builder's work beyond the site boundary will be carried out by Western Power Distribution.

The kWh energy meter shall be arranged by the Town Council through their preferred energy supplier.

The Contractor shall allow for co-coordinating and liaising with the local DNO and Town Councils preferred energy supplier to ensure that the works are carried out in accordance with the agreed Programme and ensure all work is carried out in line with the particular requirements laid down by the DNO.

The Contractor shall include for the cable connections between the energy meter and proposed Distribution Board within the main feeder pillar. The meter tails shall be provided as LSF/LSF single core cables and shall be installed within galvanised trunking.

The Contractor shall carefully plan the works and detail a schedule of events culminating with proposed date for the LV supply to Midsomer Norton Town Park.

4.02.02 the design and installation

The new three phase electrical supply has been sized to meet the expected demands of the Park.

The Contractor shall based the design on a 80A (45kVA) three phase electrical supply to be provided for the Park.

In accordance with the 18th Edition of the IET Wiring Regulations, the design of the below ground containment within the site boundary shall be based on the following parameters at each LV intake position:

(a) Nominal Voltage at Connection Point 400 volts, 3 phase, 4 wire.

(b) Nominal Frequency at 50Hz.

(c) Maximum Prospective Short Circuit Fault Current at the origin is not expected to exceed 25kA.

(d) Earth fault loop impedance at the origin is expected not to exceed 0.73 Ω.

(e) Protective device at the origin - expected to be 80A.

(f) Maximum demand assessed as 45 kVA.

(g) Acceptable Power factor for Import capacity 0.95 lag to unity.

(h) Type of earthing to be installed – TT Earthing System to be provided by the Electrical Contractor.

The Contractor shall include to fully liaise with Western Power Distribution for the Non-Contestable and Contestable connection works to obtain the new supply.

Initial checks and enquiries have been carried out by BJP to obtain a customer connection estimate breakdown. The WPD reference number for this enquiry is 3343498, scheme number 1265742/1.

The Contractor may use this information to obtain further details from WPD. Final responsibility for all applications and payments lie with the Contractor. Any information used that has been obtained by BJP in the initial enquiry stage is preliminary only, if it used by the Contractor this will be entirely at their own risk.

The Contractor shall also allow for all site attendances associated with the incoming low voltage electrical supply to be provided by WPD.

The low voltage electrical supply and final connections shall be required prior to the application for the installation of the kWh energy meter.

The new low voltage electrical supply shall be brought in from Gullock Tyning, with the point of connection to be sourced from the existing below ground LV infrastructure.

The electrical supply cable shall enter the main feeder pillar below ground through 100mm diameter twin wall flexible pipe duct and terminate into the 80A (45KVA) rated three phase cut-out to be provided.

The Contractor to be appointed shall liaise with Town Council and their preferred energy supplier and manage the installation of the kWh energy metering as part of their works.

Western Power Distribution shall install the new electrical supply from the existing infrastructure in Gullock Tyning using below ground joints to the new isolation supply point within the proposed feeder pillar.

Builder’s work external to the Park that falls outside the site boundary shall be carried out by the DNO.

All trenching within the site boundary associated with the provision of the new low voltage electrical supply shall be carried out by the Principal Contractor.

The Principal Contractor shall Cat Scan all areas using a cable avoidance tool and hand dig adjacent live services prior to the service route been excavated.

The Electrical Contractor shall determine the full extent of the Builder's work requirements associated with this installation. He shall provide this information to the Principal Contractor.

The Principal Contractor shall generally include all associated Builder's Work for the service connection. This shall include trenching, flexible twin wall black pipe duct installation and holes through and into the proposed main feeder pillar. The Contractor shall include for the back filling, reinstatement of the ground, landscaping, seeding of the grassed areas, kerbs etc. to meet the requirements of the DNO and to the satisfaction of the Architect/Engineer.

The Principal Contractor shall also be responsible for making good and sealing of all holes after installation to prevent the ingress of weather and vermin.

4.03 main feeder pillar

4.03.01 the requirement

To provide a feeder pillar in the Park to house the incoming three phase low voltage electrical supply, cut-out, energy meter, three phase distribution board, earthing bar and surge protection.

This shall be sufficient in size to house the aforementioned equipment for the Park.

Access shall be provided from the base of the feeder pillar through twin wall black flexible pipe ducts of sufficient size for the proposed and future low voltage electrical supply cables.

4.03.02 the design and installation

The Contractor shall provide a feeder pillar within the Park.

Exact final location shall be approved by the Town Council prior to installation.

The feeder pillar shall be as manufactured by Lucy Zodion Limited from the fortress range or equal approved. Approximate minimum dimensions indicated on the service pillar detail.

Lucy Zodion Limited
Email sales@lucyzodion.com
Phone 01422 317337

The feeder pillar shall be constructed from mid steel hot dipped galvanised finish, complete with double doors, flush hinges, door seals gasketted to IP65, wedge locks fitted as standard, 18mm plywood backboard, detachable roof and root section.

The feeder pillar shall also be provided complete with internal gland plate, infill panel for root section, tubular heater kit/thermostat, LED lighting kit and 13 Amp socket outlet kit.

External signage, danger warning labels and document pockets are to be provided inside each door recess.

Twin wall black flexible pipe ducts of sufficient size shall be provided from the base of the main feeder pillar for the following:

(a) New incoming low voltage electrical supply to be provided by WPD.

(b) The low voltage electrical supply to the proposed smaller feeder pillar to be mounted adjacent.

(c) Access inspection chamber to be provided in front of the feeder pillar for further low voltage electrical supplies in the future. Allowance to be made for 3no pipe ducts between the feeder pillar and access chamber.

The Contractor shall configure and plan the internal electrical installation within the proposed main feeder pillar and final connections to the distribution board. The Contractor shall provide a Schematic Drawing and Power Layout for information on the setting out of the plant and equipment.

The Electrical Contractor shall determine the full extent of the Builder's work requirements associated with this installation. He shall provide this information to the Principal Contractor.

The Principal Contractor shall generally include all associated Builder's work for the installation of the main feeder pillar. This shall include excavations, the concrete base and penetrations for the proposed flexible pipe ducts into the main feeder pillar. The Contractor shall include for the back filling, reinstatement of the ground and seeding of the grassed areas.

The Principal Contractor shall also be responsible for making good and sealing of all holes after installation to prevent the ingress of weather and vermin.

4.04 sub main distribution

4.04.01 the requirement

To provide a system of electrical power distribution from the Lucy feeder pillar to the Juno feeder pillar to be mounted adjacent. This shall be sufficient in extent, capacity and voltage for all appliances and outlets for the Park.

The system design shall be in accordance with the Electricity at Work Regulations and BS7671 - 18th Edition of the IET Wiring Regulations. The system installed must be inherently safe and must be in strict compliance with Health and Safety Legislation.

The Contractor shall carefully design and co-ordinate the distribution arrangement within the feeder pillars.

An integral circuit protective conductor shall be provided within the submain cable.

Record Drawings and O&M Manuals shall indicate the 'spare way' allocation available.

All calculations related to fault current, discrimination, cable sizes etc shall be forwarded to the Engineer for verification prior to commencement on site.

The maximum volt drop from supply cut-out to final outlet shall not exceed the values in Appendix 4, table 4Ab of BS7671. Generally, the submain volt drop shall not exceed 1.5%.

4.04.02 the design and installation

(a) distribution board

The Contractor shall provide a distribution board within the Lucy feeder pillar to serve the Park.

The distribution board shall be from the following manufacturers or equal approved:

Schneider Electric – Acti 9 Isobar B Type Distribution Board range
Eaton MEM – Memshield 3 Type B Distribution Board range

The distribution board shall be of standard configuration for the general small power and lighting, of the miniature circuit breaker type (MCB) 10kA to BS 3871, complete with main RCCB incomer, hinged lockable cover and common key.

The MCBs shall be combined with 30mA RCD units (RCBO's) for all final sub-circuits serving socket outlets, small power and lighting.

The cover, door and access into the distribution board shall be gasketted in accordance with IP20.

Spare ways shall utilise manufacturers' blanking plates.

Distribution board shall be Type B, 6 Way TPN for the low voltage electrical supplies.

At the distribution board, a typewritten list shall be completed and fitted to identify the individual circuit reference, connected load and description of the connected load. The MCBs/RCBO's shall correspondingly be identified and reference the typewritten list.

The Contractor shall ensure that there is sufficient space available in the feeder pillar for mounting the distribution board and the final location shall be agreed with the Contract Administrator.

In all cases, all neutral connections shall be made to a neutral bar within the distribution board and each neutral shall have an individual terminal. Similarly, earthing connections shall be made to an earthing bar within the distribution board with each earth having an individual terminal.

Connection to neutral and earth bars shall be made in such a manner that they correspond to phase connectors and conductors. These connectors shall be appropriately marked with cable ring markers to indicate the circuit number and phase of the connection.

Masking plates of incombustible and hard insulating material shall be fitted to the interior of the distribution board to prevent accidental contact with live metal.

(b) surge protection

Electronic protection shall be provided at the source of the incoming electrical supply to the feeder pillar using a surge protection device for Type 1 level protection and shall limit current to 25kA.

(c) submain cable installation

The submain cable from the Lucy feeder pillar to the Juno Feeder Pillar to be mounted adjacent shall be XLPE insulated SWA LSF sheathed cables to BS 5467 routed through the proposed below ground flexible pipe duct and enter through the base of the Juno Feeder Pillar.

The submain cable shall be fully rewirable or withdrawable after installation.

An integral circuit protective conductor of the same size shall be provided with the submain circuit and shall be connected in addition to the SWA.

All terminations shall be carried out using crimp type connectors.

The submain cable shall be identified at each termination point with non-destructible labels.

Conductors shall be suitably identified with numbered and lettered ferrules.

4.05 design planning and excavation of trenches graded backfill and reinstatement - electrical supply ducts and access inspection chambers

4.05.01 the requirement

To provide from the Lucy Feeder Pillar a system of below ground flexible pipe ducts of sufficient size and quantity, for the proposed incoming low voltage electrical supply, sub-main circuit to the Juno Feeder Pillar and allowance for connection to the proposed access inspection chamber for future electrical supply connections.

4.05.02 the design and installation

(a) trench design

The Contractor shall liaise with the Architect to agree the detailed design and route of the trenches that are to be used for the services distribution.

The route for the trenches shall be generally as indicated on the Drawings and in accordance with The National Joint Utilities Group (NJUG) recommendations and guidance.

As the trenches are also to be used to accommodate public utility services (Low Voltage Electrical Supply and Water), the Contractor shall agree with the utility companies any specific requirements that they have.

(b) trench plan and route

The routes for the various trenches shall be coordinated with the proposed road, landscape, buildings, dimensioned drawings for the trench and details of the other Builder's Work.

The trench route shall in particular be determined by the following:

(a) Avoidance of Tree Protection Zones
(b) Avoidance of Existing Buildings and Structures
(c) Avoidance of Existing Services and Drains
(d) Avoidance of Proposed Buildings and Structures
(e) Avoidance of Newt Protection Zones
(f) Minimising Excavations of Existing Levels Whilst Retaking Correct Coverage in the Final Arrangement
(g) Minimising Site Disruption During the Works
(h) Accommodating the Requirements of Sub-Contractors/Utilities
(i) Maintaining Flexibility for the Site Future Use and Extension for Further Phases
(j) To Protect Services Left in Temporary Locations for Future Connection
(k) Creating the Most Economical Solution

When the trench route has been planned, the Contractor shall mark the route with pegs/paint and scan it to locate any existing and uncharted services.

Any existing services shall be exposed by hand digging and the Contractor shall propose an avoidance plan.

When the trench excavation work is within 8m of a main river or flood defence structure then the contractor shall liaise with Environment Agency. “Services crossing a river within an existing structure” are deemed as exempt from obtaining an environmental permit although this should be confirmed by the contractor and the exemption must be registered with the Environment Agency before any work is carried out. The contractor must operate within the description and conditions of the exclusion.

(c) back filling and marker tapes

The services in the trench shall be bedded on sand and covered, strictly in accordance with the pipe/cable/duct manufacturer’s recommendations.

Where the requirements of the utility companies vary from this, their requirements shall be met.

Over each of the piped / cabled service, the Contractor shall lay marker tapes designed to allow identification and location of the pipes / cables. The warning tapes shall be printed with the service type and contain traceable elements within the mesh or tape that can be located by cable avoidance tools.

The tapes shall be colour coded and printed in accordance with the relevant BS.

(d) inspection chambers and draw pits

Access chambers shall be located at every 30m of the trench run, at junctions and at changes of direction.

Chambers shall also be installed where services are terminated for future extension in a subsequent phase.

The Contractor shall provide and install 1no access inspection chamber for the connection of 3no below ground twin wall black flexible pipe ducts from the Lucy Feeder Pillar for future electrical supply connections in the Park. The access inspection chamber shall be provided in the position shown on the Indicative Layout Drawing.

The prefabricated sectional chambers shall be manufactured from 100% recyclable polypropylene. The chambers shall be manufactured from a structural twin wall construction with a nominal overall wall thickness of not less than 50mm. The chamber shall be able to withstand a vertical loading of 40 tonnes free-standing.

All of the duct entries into the chamber sections shall be preformed within the manufacturing process and the chambers shall have the facility of an in built integral cable retention system. The chamber shall be manufactured to ISO 9001:2000. The chamber shall conform to load testing class D400 EN124 and also to BS5834 side impact tests.

The chamber lids shall have universal ductile iron locking frames designed to accept anti-slip composite covers.

Anti-slip composite covers shall be manufactured under ISO 9002 approval and meet the load requirements of EN 124 Class B 125. The surface shall have a mean wet SRV value of not less than 76 with security lock down facility.

Chambers shall be minimum 750 x 750 and have stacked sections to meet the required depth to suit and terminate the service duct arrangement for future low voltage electrical supplies.

Where piped services pass through an access chamber, the services shall be sleeved.

The chambers shall be sized not small than indicated on the Drawings with sufficient clearance for the cables to be drawn through at each access point.

The Access Inspection Chambers shall be by Naylor Ducting, their Integrated Premium Access System or equal and approved.

(e) cable flexible pipe ducts

Black BS EN61386 cable ducts shall be twin wall corrugated ducts and installed in 6 metre lengths with all components for a complete sealed installation.

The ducts shall be jointed in accordance with the manufacturers' recommendations to create a snag free duct to draw cables through.

The ducts must be suitable for carrying high voltage, low voltage and communications cables including fibre optic.

All cable ducts shall be left with 6mm draw cords.

The ducts shall be compatible with the chamber system and be by Naylor Ducting, their Integrated Metro Twin Wall Ducting System or equal and approved.

A proprietary duct seal shall be applied to all duct ends to protect against water ingress.

The Contractor shall provide and install 1no below ground twin wall black flexible pipe duct of sufficient size into the base of the Lucy Feeder Pillar for the proposed main incoming low voltage electrical supply.

The Contractor shall provide and install 1no below ground twin wall black flexible pipe duct of sufficient size from the base of the Lucy feeder pillar and into the base of the Juno Feeder Pillar for the low voltage electrical supply.

The Contractor shall provide and install 3no below ground twin wall black flexible pipe ducts of sufficient size from the base of the Lucy Feeder Pillar to terminate into the proposed access inspection chamber for future electrical supply connections in the Park.

The Contractor shall determine the full extent of the Builder's work requirements associated with this installation of the below ground flexible pipe ducts and access inspection chamber. He shall provide this information to the Principal Contractor.

The Principal Contractor shall generally include all associated Builder's work for the installation. This shall include trenching of areas, excavations, concrete base, back filling, reinstatement of the ground and seeding of the grassed areas.

The Principal Contractor shall also be responsible for making good and sealing of all holes after installation to prevent the ingress of weather and vermin.

4.06 final circuit wiring

4.06.01 the requirement

To provide a final circuit wiring installation to the proposed power and lighting and electrical equipment within the main feeder pillar sufficient in all ways of extent, capacity and voltage for all appliances and outlets.

The system design shall be in accordance with the Electricity at Work Regulations and BS7671 - 18th Edition IET Wiring Regulations, the system installed must be inherently safe and must be in strict compliance with Health and Safety Regulations.

4.06.02 the design

The installation within the main feeder pillar shall be carried out using LSF multicore insulated and sheathed cables with stranded conductors to BS 7211, enclosed in heavy gauge steel conduit and trunking. Conduit and trunking runs within the feeder pillar shall be arranged to make the best use of the space.

The minimum cable size used for the lighting shall be 1.5mm^2.

The minimum cable size used for the small power shall be 2.5mm^2.

The systems shall be completely rewirable after installation.

All cables shall be fitted with identification ferrules at each connection point and, where run in trunking, identified at salient positions along their length. Individual circuit cables shall be grouped together.

Separate circuit protective conductors shall be provided for each final circuit, sized in accordance with Table 54.7 of the IET Wiring Regulations.

Cables for other systems shall be as detailed under the relevant sections.

The maximum volt drop from transformer to final outlet shall not exceed the values defined in Appendix 4, table 4Ab of BS7671. The final sub circuit volt drop generally shall not exceed 2.0%.

4.07 cable trunking system

4.07.01 the requirement

The Contractor shall provide a flexible and rewireable cable management system within the main feeder pillar. The system shall have sufficient capacity for current and future needs.

The Contractor shall size all trunking and conduits in accordance with BS7671, taking into account all grouping/space factors etc.

The Contractor shall carefully plan all containment routes to minimise the quantity required and provide a neat, unobtrusive installation giving careful consideration to other plant and equipment to be located within the feeder pillar.

The trunking shall be provided with all necessary approved fixings and shall be installed strictly to manufacturers' recommendations.

4.07.02 the design

All trunking shall be hot dipped galvanised finish, complete with cable retaining straps, tinned copper earth bonding straps and fire barriers.

All trunking shall be complete with the manufacturer's accessories necessary to effect changes in levels, direction or dimensions and functions. Site constructed accessories will not be acceptable.

The trunking system shall form part of the cable containment systems within the feeder pillar.

Trunking shall be single compartment and provided to reduce the amount of conduit runs and shall remain fully accessible for future use.

All trunking shall be provided with 50% spare capacity in excess of the space factor, for future cabling requirements.

The Electrical Contractor shall be responsible for carefully planning and co-ordinating the trunking routes.

Main trunking and cable containment systems shall be of Legrand manufacture or equal approved.

4.08 power installation

4.08.01 the requirement

The Contractor shall provide a system of electricity power supplies to all areas, plant and equipment, sufficient in all ways of extent, capacity and voltage to all appliances and outlets within the main feeder pillar and external to the feeder pillar.

The system design shall be in accordance with the Electricity at Work Regulations and BS7671 - 18th Edition of the IET Wiring Regulations, the system installed must be inherently safe and must be in strict compliance with Health and Safety legislation.

All outlets shall be engraved to indicate the item served. Stick-on labels will not be accepted.

4.08.02 the design

(a) power installation

Power supplies to equipment shall be radial circuits fed from the new distribution board within the main feeder pillar. Each circuit shall be served from an RCBO of the appropriate rating and type.

(b) small power system

A 13 Amp switch socket outlet kit to BS1363, shall be provided within the main feeder pillar.

A tubular heater kit with IP rated tubular heater, integral adjustable thermostat, galvanised steel wire mesh guard and 13 Amp switch fused connection unit shall be provided within the main feeder pillar.

The wiring accessories shall be surface mounted Metalclad type as manufactured by MK or Legrand Limited.

All circuits shall be protected by 30mA RCBOs at the distribution board.

Wiring shall be as specified elsewhere and cable sizes shall be 2.5mm^2 minimum. Where two or more circuits are grouped, cable sizes shall be increased accordingly.

All fixed equipment shall be served by a dedicated radial circuit, e.g.: socket outlet and tubular heater.

All single phase power outlets shall be connected to the same phase as the lighting within the feeder pillar.

(c) Juno feeder pillar

The Contractor shall provide and install the Juno Feeder Pillar adjacent to the main Lucy Feeder Pillar.

The exact final location shall be approved by the Town Council prior to installation.

The feeder pillar shall be as manufactured by DW Windsor from the Juno Feeder Pillar range reference Juno 6.

DW Windsor
Contact Guy Bolton – Special Projects Co-Ordinator
Email GuyBolton@dwwindsor.co.uk
Phone 01992 474600

The feeder pillar shall be 325mm diameter x 1300mm high, flanged base plate 420mm diameter and fabricated root section from the Juno range, constructed from galvanised steel finished in standard RAL colour TBC.

The feeder pillar shall be provided complete with 2no single door compartments, flush hinges, door seals gasketted to IP67, locks.

The upper compartment shall be configured with 63A SPN main switched isolator, 4no 16 Amp rated 2P+E IP67 rated angled panel mounted MK commando socket outlets each to have individual 16A rated 30mA RCBO circuit protection.

The lower compartment will be configured with a ¾ inch bib tap hose union point. The mains cold water supply and final tap outlet connection shall be carried out by the Mechanical Contractor.

The Electrical Contractor shall also provide 4no. 25 metre 2.5mm² 3-core HO7 black rubber flexible extension cables each with 230v 16A rated blue commando socket and plug for connection to the Juno 6 feeder pillar. The extension cables shall be issued to the Town Council.

Danger warning labels and document pockets are to be provided inside each door recess.

Twin wall black flexible pipe ducts of sufficient size shall be provided from the base of the Juno 6 multi-purpose feeder pillar for the following:

(i) The low voltage electrical supply from the Lucy main feeder pillar.

(ii) The proposed mains cold water supply provided by the Mechanical Contractor/Bristol Water.

The Contractor shall determine the Builder's work requirements associated with this installation. He shall provide this to the Principal Contractor.

The Principal Contractor shall also be responsible for making good and sealing of all holes after installation to prevent the ingress of weather and vermin.

4.09 lighting installation

4.09.01 the requirement

The Contractor shall provide lighting within the main feeder pillar.

The system design shall be in accordance with the Electricity at Work Regulations and BS7671 - 18th Edition of the IET Wiring Regulations, the system installed must be inherently safe and must be in strict compliance with Health and Safety legislation.

The switch shall be engraved to indicate the item served. Stick-on labels will not be accepted.

4.09.02 the design

The Contractor shall provide interior lighting within the main feeder pillar to provide a complete interior lighting installation to achieve a uniform energy efficient, aesthetically pleasing, comfortable and safe environment and meet the specific demands of the particular space/area.

The Contractor shall provide the lighting within the feeder pillar, giving due regard for energy conservation methods, ease, flexibility and simplification of controls.

The luminaire shall generally be complete with LED technology having a colour rendering index Group 1B and a colour temperature of 4000K.

The light switching shall be surface mounted Metalclad type and manufactured by MK, MEM, Crabtree or Legrand Limited, from their 10A rated Gridswitch range.

The lighting circuit shall be fed from the new distribution board within the main feeder pillar. The circuit shall be served from an RCBO of the appropriate rating and type.

The wiring installation shall be as indicated for final sub circuits elsewhere in the Specification. The minimum cable size used shall be 1.5mm^2.

No wiring shall be routed through the luminaire. All cabling shall be enclosed within conduits and/or cable trunking.

4.10 earthing and bonding

4.10.01 the requirement

(a) To provide a low impedance earth fault path to achieve automatic disconnection times within specified limits and to provide protection against indirect contact with exposed conductive parts.

(b) All earthing and bonding shall comply with BS 7430, Electricity at Work Regulations, BS7671 – 18th Edition of the IET Wiring Regulations and Local Supply Authority's requirements for earthing arrangements.

4.10.02 the design

(a) A main solid copper earthing bar shall be provided in the Lucy Feeder Pillar adjacent to the distribution board and connected to a common earth electrode. The copper bar shall be provided with disconnecting link from the earth electrode.

(b) The earthing arrangement shall be TT type of earthing system to be provided through a common earth electrode.

(c) Main equipotential bonding shall be carried out to:

i. Electrical Installation
ii. Lucy Main Feeder Pillar
iii Juno Feeder Pillar

(d) Permanent labels shall be fixed directly to each connection and cable.

4.11 builder's work

The Contractor shall determine the full extent of the Builder's work requirements associated with this installation. He shall provide this information in full to the Principal Contractor.

The Principal Contractor shall generally include all associated Builder's work for the installation. This shall include trenching of areas, excavations, concrete base, back filling, reinstatement of the ground and seeding of the grassed areas.

The Principal Contractor shall also be responsible for making good and sealing of all holes after installation to prevent the ingress of weather and vermin.

4.12 manuals and drawings

The Contractor shall provide, at the completion of the Contract, Operation and Maintenance Manuals and Record Drawings of the installed electrical services as detailed in Section 1 of this Specification.

4.13 labelling

The distribution board shall be labelled to indicate the board reference, and shall be fitted with numbered phase discs.

Each new conductor shall be provided with a corresponding ferrule type label at connection to the distribution board terminal. The board shall be provided with a circuit chart in accordance with BS 7671 and shall be permanently fixed in a frame.

The submain complete with CPC shall be identified/labelled by using tie-wraps or self-adhesive Traffolite labels at all termination points – source and destination for each.

Each conductor shall be provided with a corresponding ferrule type label at connection to the distribution board terminals.

All isolators and fused connection units shall be engraved to indicate the equipment served. Stick on labels shall not be accepted.

Each accessory plate i.e. light switch, socket outlet, FCU shall be provided with an adhesive circuit reference identifying DB, circuit that corresponds with the Record Drawings.

The exact labelling format for each element of the Electrical Services shall be approved by the Engineer during installation.

4.14 testing and commissioning

The Contractor is reminded of the requirements of the Contract Document, Specification, Regulations, Codes of Practice, etc. in connection with Testing, Commissioning and Hand-over, which will be rigorously enforced.

Test certificates, test results and readings for all systems shall be issued and included in the O&M Manuals.

This shall include the NICEIC/ECA Electrical Testing to BS7671.

All test certification shall be produced using computer software and both electronic and paper copies are required.

The test certificates shall be accurately produced, legible and issued to the Engineer.

The completed test certificates shall be submitted to the Engineer at least a week prior to handover.

4.15 provisional sums and contingency

The Contractor shall include the sum indicated in the Tender Summary as a Provisional Sum. This sum shall be expended in part, or as a whole, or not at all as directed by the Engineer.

section five.

ELECTRICAL SERVICES TENDER SUMMARY

section five.

ELECTRICAL SERVICES TENDER SUMMARY

1.0 measured works

1.01	Preliminaries	£
1.02	Design of the Electrical Distribution and Installation	£
1.03	WPD Three Phase LV Electrical Supply and Fused Cut-Out	£
1.04	Main Lucy Feeder Pillar	£
1.05	Management of the Meter Installation and providing the Meter Tails	£
1.06	Distribution Board	£
1.07	Sub Main Distribution	£
1.08	Trunking and Conduit Systems	£
1.09	Below Ground Twin Wall Black Flexible Pipe Ducts and Access Chamber with Draw Cords	£
1.10	Small Power Installation	£
1.11	Juno 6 Feeder Pillar and Extension Cables	£
1.12	Lighting Installation	£
1.13	Surge Protection	£
1.14	Earthing and Bonding and TT Earthing System	£
1.15	Testing and Commissioning	£
1.16	Record Drawings and O&M Manuals	£

Sub Total for measured works…….. £_____

2.0 provisional sums

2.1	General Contingency	£ 1,000.00

Sub Total for Provisional Sums …… £ 1,000.00

3.0 twelve month's maintenance

3.1	Twelve Month's Maintenance	£

GRAND TOTAL ..... £_____

Signed .....Position.....

Company ……

Address ……...

……