



Site Earthworks and Waste Transfer Station,
Isles of Scilly

Tender Document

Site Development

On Behalf of

The Council of the Isles of Scilly

<p>Date: August 2015 Our Ref: JER6282 RPS 2420 The Quadrant Aztec West Almondsbury Bristol BS32 4AQ Tel: (0)1291 621 821 Fax: (0)1291 627 827 Email: rpsw@rpsgroup.com</p>		

Quality Management

Prepared by:	Jason Tose	
Authorised by:	John Basford	
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Drawings

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JKK8520-02	Drainage Details
JKK8520-03	Construction Details
JKK8520-05	Cut and Fill Layout
JKK8520-06	Engineering Layout
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JKK8520-205	Recycling and Storage Building Steelwork Arrangement
JKK8520-206	Open Storage Bays Steelwork Arrangement
JER6282-LAY-002	Palisade Fencing 1
JER6282-LAY-002	Palisade Fencing 2
BRM07665-XX-E-6301	Site External Lighting Layout

Appendix

Electrical Design Brief

1 Contract Data

1.1.1 The employer is:

The Council of the Isles of Scilly

Town Hall

St Mary's

Isles of Scilly

TR21 0LA

1.1.2 RPS Planning and Development Ltd is acting on behalf of The Council of the Isles of Scilly in relation to this contract. The following details apply:

Ahlim Hashim – Project Manager

RPS Planning and Development

2420 The Quadrant

Aztec West

Almondsbury

Bristol

BS32 4AQ

1.1.3 The works involve construction of a Waste Transfer Station and associated earthworks.

1.1.4 The site is as identified on drawing JKK8520 - 01 enclosed. Please note the phase plan in JKK8520 - 01 defines the phase 1 and 2 works areas. Contractors are not required to deliver any works that are detailed on the other plans that fall inside of the phase 1 works area (these are purely illustrative and provide a greater understanding of the overall redevelopment of the site). The only exception to this is in relation to the foul drainage pumping station which sits just inside the phase 1 area (to the left of the zebra crossing). Contractors should include the price of items relating to this installation in their tender.

1.1.5 The start date 1st November 2015

1.1.6 A programme for completion of 4 months is anticipated. Tenderers to provide a programme of works for agreement.

- 1.1.7 The period for reply is provided in the ITT.
- 1.1.8 The defects period runs for 12 months after Completion
- 1.1.9 The defects correction period is 6 weeks (unless otherwise agreed with the employer)
- 1.1.10 The retention is 5%
- 1.1.11 The minimum amount of cover for the third insurance stated in the Insurance Table is 5 million pounds sterling
- 1.1.12 The minimum amount of cover for the fourth insurance stated in the Insurance Table is 10 million pounds sterling
- 1.1.13 The conditions of contract are the '**NEC3 Engineering and Construction Short Contract (June 2005)**' as amended April 2013 and the following additional conditions.

1.1.14 Payment item 51

The item is amended for payment within 30 days of assessment date in accordance with the following:

Prompt Payment

1. Where the Contractor submits an invoice to the Authority in accordance with paragraph 50, the Authority will consider and verify that invoice in a timely fashion.
2. The Authority shall pay the Contractor any sums due under such an invoice no later than a period of 30 days from the date on which the Authority has determined that the invoice is valid and undisputed.
3. Where the Authority fails to comply with clause 1 and there is an undue delay in considering and verifying the invoice, the invoice shall be regarded as valid and undisputed for the purposes of clause 2 after a reasonable time has passed.
4. Where the Contractor enters into a Sub-Contract, the Contractor shall include in that Sub-Contract:
 - a) Provisions having the same effect as clauses 1-3 of this paragraph; and
 - b) A provision requiring the counterparty to that Sub-Contract to include in any Sub-Contract which it awards provisions having the same effect as clauses 1-4 of this paragraph.
 - c) In clause 4, "Sub-Contract" means a contract between two or more suppliers, at any stage of remoteness from the Authority in a subcontracting chain, made wholly or substantially for the purpose of performing (or contributing to the performance of) the whole or any part of this Agreement.

1.1.15 Additional clause 90.6 to conform to the Public Contract Regulations.

The Council of the Isles of Scilly retains the right to terminate this contract at any time where it has been demonstrated to the satisfaction of the Council that the contractor, supplier or service provider awarded this contract misrepresented their position in relation to any qualitative selection or pre-qualification process during the contract award procedure. In these circumstances, the Council will notify the contractor in writing of the breach of this condition and the need to

terminate the contract with immediate effect. This clause is without prejudice to any other remedies that the Council might pursue or obligations that it is required to discharge. (*Reason 9*).

The Council of the Isles of Scilly shall have the right to terminate this contract in the event that a ruling is issued by an appropriate legal body that judges the procurement process undertaken in the awarding this contract to have seriously infringed obligations that the Council has in relation to any treaties or regulations that the Council should have had regard to. In these circumstances, the Council will notify the contractor in writing at the soonest possible point following the judgement to commence appropriate discussions to discontinue the contract. (*Reason 10*)

- 1.1.16 The Specification is given in 5.3 below and also incorporated on the drawings listed in section 5.2 below.
- 1.1.17 Tenderers are required to hold their price for 90 days
- 1.1.18 In addition to completing the pricing summary at section 4 (recreated at D.5.1 of the ITT), tenderers shall be required to complete the Pricing Schedule included in the tender pack. Tenderers should provide as detailed a response as possible in this document to aid the Council in understanding how the tenderers fee has been developed.
- 1.1.19 Tenderers are required to detail any items that are specifically excluded from their tender submission. These items including a description, unit rate and totals should be recorded in a copy of the table located in the ITT at D.5.2. If it becomes necessary to draw on any of the items excluded from the tender sum the contractor will be required to seek authorisation from the Project Manager prior to any expenditure being incurred
- 1.1.20 Any works, either in the main tender sum or listed as excluded items, that are not executed in the delivery of the contract shall not be charged to the authority

2 The Contractors Offer

2.1.1 The Contractor is

Name

Address.....

Telephone

E-mail address

2.1.2 The contractor offers to provide the works in accordance with the conditions of contract for an amount to be determined in accordance with the conditions of contract.

2.1.3 The offered total of the Prices for the works is

2.1.4 Signed on behalf of the contractor

Name

Position

Signature..... Date

3 The Employer's Acceptance

3.1.1 The employer accepts the Contractors Offer to provide the Works

3.1.2 Signed on behalf of the employer

Name

Position

Signature.....Date

4 Price List

Item Number	Description	Unit	Quantity	Rate	Price / £
1	Site set-up.(includes fencing, site security, etc.) and any general enabling works identified and required for the main works				
2	Process and recover legacy materials from on-site stockpiles for use in the works				
3	Earthworks to establish required site levels including required landscaping works				
4	Slab construction. Construction of new slab areas and construction of tie in to existing slab areas, curbing thermoplastic white lining, etc.				
5	Design and build 42m x 22 m portal frame waste transfer and processing building, internal and external storage bays, including suitable foundations and connection to the existing water, electricity and telephone/data supplies and installation of suitable internal lighting.				
6	Site closed drainage collector system connecting to the existing outlet on the boundary of the HWRC. Closed foul drainage system connected to the existing foul main.				
7	All required M&E including site internal and external lighting,				

	main building and welfare facility connections				
8	Supply of modular welfare facility and commissioning ready for occupation and use				
9	Landscaping works				
10	Supply and install boundary fence to the whole site including the HWRC. Supply and install site entrance gates as specified.(Provisional quantity subject to actual site measure)	metre	450		
11	Disposal of hazardous material (provisional) (Quantity is an estimate only)	tonne	50		
12	On-site disposal of Japanese Knotweed and associated excavation as specified				
13	Disposal of unsuitable non-hazardous material (provisional)(Quantity is an estimate only)	tonne	1500		
The total of the Prices					£

5 Works Information

5.1 Description of the Works

5.1.1 The works covered by this contract are at the Porthmellon Waste Management Site

5.1.2 The scope of works generally comprise the following:-

Redevelopment of Porthmellon Waste Management Site (Phase 2) including:

- Concrete hardstanding with tie in to existing surfacing and phase 1 (HWRC) surfacing
- An open fronted portal frame waste processing/transfer building
- External waste storage bays with vertical concrete dividers
- Modular welfare facility
- Surface water drainage system to tie into the existing outlet
- Foul water drainage system
- Associated utility provision (M&E) and connection to 415v 3 phase electrical and potable water mains services
- Processing and re-use or recovery of legacy waste materials on site
- Earthworks to establish site levels and re-profiling and extension of existing perimeter bund
- Management of Japanese Knotweed and associated potentially impacted soils with managed disposal within the site boundaries and landscaping areas.
- Disposal of excess and hazardous materials from the processing of waste materials

5.2 Drawings & Documents

5.2.1 The following identifies the drawings associated with the tender requirements and documents that are provided separately but should be read in conjunction with this tender document.

5.2.2 Drawings

- **JKK8520-01** **Engineering Layout Revision A**
- **JKK8520-02** **Drainage Details**
- **JKK8520-03** **Construction Details**
- **JKK8520-05** **Cut and Fill Layout**
- **JKK8520-06** **Engineering Layout**
- **JKK8520-07** **External Works Layout**
- **JKK8520-205** **Recycling and Storage Building Steelwork Arrangement**
- **JKK8520-206** **Open Storage Bays Steelwork Arrangement**
- **JER6282-LAY-003** **Palisade Fencing 1**

- **JER6282-LAY-004 Palisade Fencing 2**
- **BRM07665-XX-E-6301 Site External Lighting Layout**

5.2.3 Documents

- **Waste Material Reuse Feasibility Study and Risk Assessment July 2013**
- **Porthmellon Waste Site, St Marys Ecology**
- **Planning Decision Notice**
- **Site Survey (pdf and dwg formats)**
- **Managing Japanese Knotweed on Development Sites**
- **Environmental Permit EPR/HP3539EQ**
- **Environmental Permit EPR/BB3407MC**
- **Moorwell Water (drawing)**
- **Moorwell Sewers (drawing)**
- **Approximate locations of water and power at Porthmellon waste site (sketch)**
- **Former overhead cables approximate underground route (sketch)**
- **Moorwell_Topo1109.DWG**
- **Asbestos Protocol**
- **JER6282 ECO 003**

5.3 Specifications

The site has a significant stockpile of construction and demolition waste and incinerator bottom ash and soil/green waste (the “legacy waste”). The attached report by SLR Consulting “**Waste Material Feasibility Study and Risk Assessment July 2013**” provides details of the contents of the stockpile. Please note that there should be no general municipal waste within the stockpile, however, if any general municipal waste accumulations are discovered they shall be reported to the Client’s Project Manager who will instruct on a disposal route. A topographic survey, shown on **Moorwell_Topo1109**, carried out in 2013 is attached (.pdf and CAD formats).

- 5.3.1 There is a small stand of Japanese Knotweed approximately 10m long at the base of the existing bund near the incinerator (please see the ecology report **Porthmellon Waste Site, St Marys Ecology** and drawing **JER6282 ECO 003**). The growth and the surrounding area shall be excavated and the resulting spoil and vegetation shall be encapsulated in a root barrier membrane cell formed adjacent to its existing location which shall be central in the base of the screening bund all in accordance with the methodology and guidance given by the Environment Agency document “**Managing Japanese knotweed on development sites**”. The location of any burial of Japanese Knotweed spoil and vegetation within the site shall be accurately recorded by the contractor and confirmed to the Council.

- 5.3.2 The processing of the legacy waste shall be carried out in accordance with an **Environmental Permit No. EPR/HP3539EQ (please pay particular attention to the pre-operations conditions in Table S1.3)** . Once processed the treated legacy material shall be sampled and tested to confirm its physical properties i.e. grading and composition, so that appropriate compaction methods can be used in engineering the fill.
- 5.3.3 The legacy material shall be processed utilising appropriate screening equipment to maximise the quantity reclaimed for re-use in the construction of the works. An appropriate area will be required on site for the stockpiling of all reclaimed material prior to use in the works. The area will also accommodate a suitable crusher to produce appropriate aggregate. The location of the stockpile area shall be nominated by the contractor and agreed with the Council's Project Manager prior to commencement of the Works. All natural stone pieces of a size greater than approximately 300mm x 300mm x 300mm shall be laid by in a separate stockpile for collection by the Council. All other brick, stone and concrete shall be crushed into secondary aggregates unless otherwise instructed by the Project Manager. The grading of the crushed material may vary and will be carried out to maximise its re-use potential. All hazardous and non-hazardous material that cannot be crushed or reused on site shall be removed and disposed of appropriately under current legislative requirements. Contaminated Waste shall be transported and disposed of in accordance with the **Hazardous Waste Regulations (England and Wales) 2005 (as amended)**.
- 5.3.4 The report mentioned in 5.3.1 indicates the presence of asbestos within the legacy waste. . Asbestos risk shall be mitigated to at least the standards discussed in the Asbestos Protocol. Additionally the contractor will be required to carry out a risk assessment and provide a method statement, to be approved by the Council and the Environment Agency, giving details of how asbestos will be screened from the any waste to be exported for disposal in landfill waste, how it will be stored, transported and disposed of (see environmental permit EPR/HP3539EQ table S1.3 P02).
- 5.3.5 Incinerator Bottom Ash (IBA) will also be found in the legacy material. This material shall be screened to remove metals and other contaminating material prior to its re-use. Contractors should note the requirement to inform the Environment Agency (see environmental permit EPR/HP3539EQ table S1.3 P03).
- 5.3.6 The contractor shall maximise the use of recovered legacy materials for construction of the screening bund and in engineering the site base. The use of recovered legacy materials in this manner shall be carried out in accordance with an **Environmental Permit EPR/BB3407MC**. Fill material utilised in the construction of the screening bund shall be compacted in accordance with best engineering practice to ensure stability of the structures and minimal settlement over time. The finished levels of the screening bunds shall have a tolerance of +250mm to the specified levels.
- 5.3.7 The form of the site bunding is to accommodate site won materials. It is proposed that residual green waste presently within the site will be used as surface 'mulch' to the bunds. Whilst formal

landscaping is not a requirement in order to promote site greening it is proposed that bund faces will be hydroseeded with a 100 % Rye grass at a rate of 3.5 g / m². Any changes to the seeding mix will be agreed with the Clients Project Manager.

- 5.3.8 There are known areas (as identified in the Waste Material Reuse Feasibility Study and Risk Assessment) where asbestos has been identified mixed in the legacy waste. The contractor is expected to coordinate with Council staff, other contractors and visitors on site to ensure that opportunities for exposure are fully mitigated.
- 5.3.9 The contractor shall provide and install a welfare building in the position shown on drawing JKK8520_07. For the avoidance of doubt, this building forms part of the permanent infrastructure of the site. The building shall be of a modular design with a minimum 40 m² mess room together with separate male and female toilet, hand washing and shower facilities. The mess room shall incorporate a kitchenette facility with a sink and kitchen units, a hot and cold water supply and connection to the foul sewer and 4 no. 240v double electricity sockets. The toilets shall consist of a male section with 2 no. cubicles, 2 no. urinals, 2 no. hand basins, 1 no. hand dryer and 1 no. fully equipped shower cubicle and a female section with 1 no. cubicle, 1 no. hand basin, 1 no. hand dryer and 1 no. fully equipped shower cubicle. The toilets shall be provided with both hot and cold water supplies. Provision shall be made for connection to all required mains utilities (electricity, potable water and foul sewer) by the most direct routes, final locations to be agreed on site.
- 5.3.10 The contractor shall supply and install a 2.4m high steel palisade panel fence with posts set in concrete to the manufacturer's specification around the whole boundary of the site including both the HWRC and the Waste Transfer Station. A double leaf palisade gate shall be installed at the entrance to the site from Moor Well Lane. All fencing and gates shall conform to BS 1722-12:2006. The fence and gates shall be green (RAL6005) in colour.
- 5.3.11 Manually operated arm barriers shall be provided at the entrance to the transfer station area adjacent to the site office and also at the access point located on the drawing JKK8520_07 shown as a "zebra crossing" to the north-east of the site office. This should comprise a 7 m span barrier that can be locked in both the raised and lowered positions. It should have a lowered position of nominally 1052 mm above the finished road surface. It should be of aluminium, construction with a powder coat finish in white with red fascia stripes. The final locations to be agreed with the Clients Project Manager.
- 5.3.12 The contractor shall provide and construct a portal framed building in accordance with general layout, specification and instructions provided on drawing JKK8520-205. Utilities, power (415v 3 phase), telephone/data and water, shall be installed and connected to existing supplies shown on the drawings in the tender pack. Pipework and cables final routing from the site boundary shall be agreed on site.
- 5.3.13 The detailed technical specifications are incorporated and referenced on the drawings identified in section 5.2.

5.3.14 In addition to the technical works the Contractor shall arrange and provide for 1 No. set of digital photographs for progress photographs to be taken at daily intervals throughout the period of the contract. Photographs to be taken from 2 locations to be agreed with the client's representative on commencement of works. Photographs to be taken with a minimum 10 M pixel camera.

5.4 Constraints on how the Contractor Provides the Works

5.4.1 No information concerning this Contract may be released by the Contractor to anyone else, except to such persons and to such extent as may be necessary for the performance of the Contract, without the prior consent and approval of the Project Manager.

5.4.2 The Contractor shall undertake the role of Principal Contractor under the Construction (Design and Management) Regulations 2015 and shall allocate resources to enable him to comply with the requirements and prohibitions imposed on him by or under the relevant statutory provisions. The information for the Health and Safety File is to be available within 28 days of completion of the Works to enable the Project Manager to compile the document for handing to the Employer at Completion.

5.4.3 The Principal Designer is RPS, 2420 The Quadrant, Aztec West, Almondsbury, Bristol, BS32 4AQ; contact Jason Tose 01454 853 000.

5.4.4 It is the responsibility of the Contractor not to interfere with the day to day routine of the site. During the works, it is necessary for waste collection, acceptance, containment and collection of waste for export to the mainland to continue on site. In particular deliveries of materials should be timed where possible to avoid the busiest period of waste inputs into the sites and should be agreed in advance with the Site Manager. Alongside these ongoing activities there are two other contracts that have been awarded. These are for the development of the Household Waste and Recycling Centre at the North of the end site and the Demolition of the Incinerator at the South end of the site. One or both of these contracts may potentially conflict with the programme for this contract. Where applicable the contractors lead on-site representative is to coordinate with the lead representative of the other contractors to ensure that the overall redevelopment of the site is not compromised by their activities

The broad programme for these works is as follows:

	July	Aug	Sept	Oct	Nov	Dec	Jan
1. ON SITE WASTE & RECYCLING OPERATIONS <i>ongoing</i>							
2. INTERIM WASTE REMOVAL CONTRACT <i>ongoing</i>							
3. HOUSEHOLD WASTE & RECYCLING CENTRE							

The waste site is operational from Monday to Friday - 8.30am to 5.00pm. There are 7 waste and recycling operatives and a waste site supervisor. Operational Services works from the buildings adjacent to the North end of the site, on Moorwell Lane and share welfare facilities with the waste and recycling operatives.

At the commencement of the HWRC works (phase 1), waste types will be received and contained on the hard standing adjacent to the decommissioned incinerator. The HWRC works allow for the concreting of the area in front of the existing workshop at the front end of the programme for that development. Once ready, containment of waste and recyclable materials will be moved to this area as space allows.

Waste & Recycling Operations includes daily collections of residual waste that is brought back to the site. An average of 20 tonnes of 'black bag' residual waste is brought to the site each week. This rises to approximately 60 tonnes per week in the summer and there are also peaks during the other school holidays and big events. Currently the waste is deposited from the collection vehicle onto a hard standing at the base of the incinerator. From there it is contained in bulk bags using a 360 swing shovel and hopper system. There are up to 40 filled bags on site at one time. Once the HWRC works are completed, this operation will move to the HWRC area.

UES Ltd are contracted to remove and dispose of residual waste. This takes place up to twice a week. 20 bags are collected on a Tuesday and again on a Thursday (as per the Gry Maritha schedule). Access to site and weighbridge to collect and weigh the bags required – normally between 7am and 9am or between 5pm and 6pm depending on the marine shipping schedule. During the duration of the contract this will be picked up from the temporary storage area located at the HWRC.

Mixed glass bottle and Tin/Can banks are brought to site by local hauliers from 5 bring site locations on St Marys on an as needs basis. The glass bottles are processed on site using a glass crusher located in the building within the area marked as HWRC described as 'Existing Workshop' on the site map. The tins/cans are contained in skips and sent to the mainland for processing.

All waste types from the off-islands of Bryher, St Agnes and St Martins is brought to the site in bulk bags (residual waste and glass bottles), skips and plastic Dolavs on a weekly basis.

For all other types of waste:

Where possible, different waste types are separated and contained within skips or 'Dolavs'.

Commercial Green and Construction and Demolition waste will not be accepted at the site at least for the duration of the project.

Residential green waste and Construction and Demolition Waste will be accepted, stored for a short period of time before being transferred to a third party for disposal or .

The Waste Site opens every week day for the acceptance of waste from residents and businesses.

Residential: Tuesdays and Thursday 13:00 to 16:45

Commercial: Mondays and Wednesdays 13:00 to 16:45

Fridays 13:00 to 15:45

The weighbridge (as indicated on the map) must be accessible during opening times to allow for the accurate recording of the types and amounts of waste entering the site.

- 5.4.5 The contractor shall provide with their submission, a sketch of the site indicating where they will initially locate their operating compound.
- 5.4.6 The contractor shall be required to provide, maintain and subsequently remove a suitable electricity supply to suit their own requirements at their own cost
- 5.4.7 A potable water supply is available from the site operations compound to which the Contractor can connect at their own cost. The contractor shall make arrangements for carrying and storing water as necessary for the Works.
- 5.4.8 The Contractor shall ensure that water does not accumulate on or adjacent to the surfaces of the Works. To ensure this, temporary watercourses, ditches, drains, pumping or other means of maintaining the Works free from water, shall be provided by the Contractor, complying with all statutory requirements and in agreement with the Project Manager.
- 5.4.9 Any provisions required as part of temporary works for construction but not part of the permanent works will be removed / reinstated on completion unless agreed to the contrary with the Project Manager.

Site Restrictions/Key Conditions

- 5.4.10 The following highlight some of the key restrictions/issues for the site but do not cover all the Conditions set out in the Planning Permission and the Environmental Permit and should only be used as a guide. It is the responsibility of the Contractor to ascertain the conditions relevant to their works, contained in the Planning Permission and Environmental Permit.
- 5.4.11 The Porthmellon Waste Management Site operates in accordance with Lawful Development Certificate P/13/032 approved by The Council of the Isles of Scilly on 17th July 2013. The Council is in the process of applying for consent to erect the building required by this contract.
- 5.4.12 The Contractor is to facilitate requirements of CQA as a result of Regulator requirements. This will be via production of expected work programmes (Section 5.5) and notification to the Project Manager of key work activities.

5.5 Requirements for the Programme

- 5.5.1 The programme shall establish the sequence of all activities for the construction of the Works incorporating the requirements of all Sub-Contractors, statutory authorities / regulators and

others engaged direct by the Employer whose work is dependent upon or has a bearing upon the progress of the Works including durations for ordering and delivery of major construction materials and durations for drawing preparation, manufacture and delivery of materials relating to Sub-Contractors, and statutory authorities.

- 5.5.2 The Contractor shall include sufficient time within the programme for Sub-Contractors, Regulators and statutory authorities to test, validate and commission their works.
- 5.5.3 The contractor shall make allowance in his programme and phasing of the works to allow the other contracts, described in 5.4.4 above, to be completed without hindrance to those contracts or to this contract. The contractor shall include in their programme a written explanation of how they will arrange the works to interface with the ongoing operations and other contracts.
- 5.5.4 The Contractor must also indicate, in consultation with the Project Manager, on their programme the latest dates by which they require final information or Approval from the Project Manager.
- 5.5.5 Site progress meetings will be held when required by the Project Manager and at a minimum of monthly intervals. They shall be attended by representatives of the Contractor.

5.6 Services and other things provided by the Employer

- 5.6.1 No services and other things are to be provided by the Employer other than access to the identified site.
- 5.6.2 Service Plans provided within the pre-construction information pack (PCIP) are an indication only and the contractor must satisfy themselves that all pipework, services and electric cables have been identified before works commence.
- 5.6.3 The Site Services and where appropriate, DSEAR drawings, are provided within the PCIP. The contractor will be required to satisfy for themselves the location of overhead and underground electric cables present on and adjacent to the Working Areas. The Contractor shall take all necessary precautions to avoid damage to, and safety hazards from, these cables. These precautions shall, at a minimum, be in accordance with the appropriate 'Health and Safety Executive' Guidance Notes.

6 Site Information

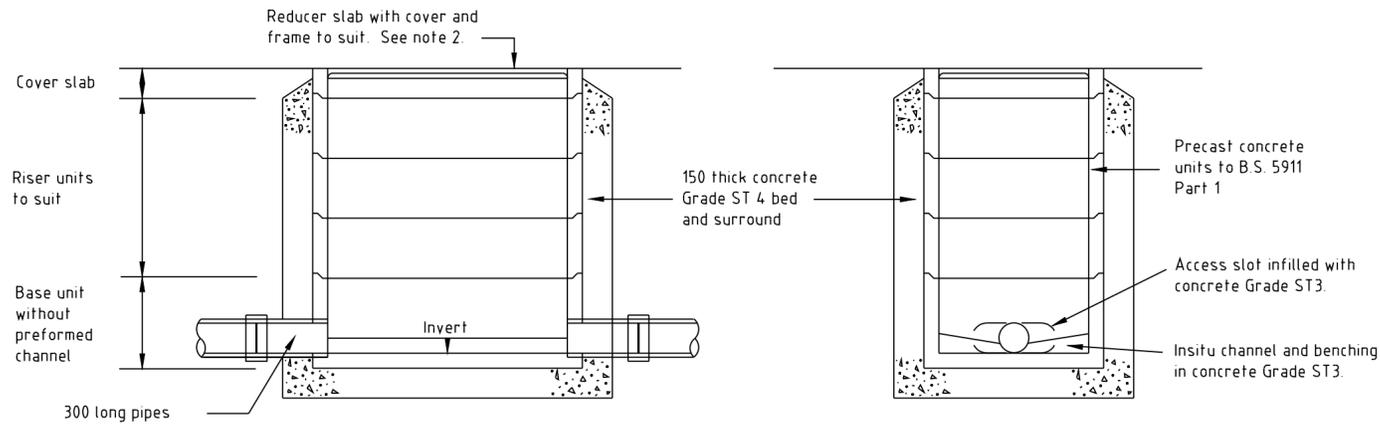
- 6.1.1 The following provides details of site information and should be read in conjunction with the drawings listed in section 5.2. It is the responsibility of the contractor to satisfy themselves of the accuracy of the site information.
- 6.1.2 The contractor shall be deemed to have inspected the site and surroundings and to have satisfied themselves as to the means of access, loading constraints, rights of way, public access, nature and conditions of the existing property and generally of any conditions and restrictions which in any way may influence their tender.
- 6.1.3 Arrangements to visit and inspect the site and buildings shall be made with the Council during normal office hours.
- 6.1.4 The contractor is to confine their operations to the area of the site, or such other areas as the Project Manager may specifically direct.
- 6.1.5 The Contractor shall not use the site for any purpose other than that of carrying out the Works.
- 6.1.6 The Contractor shall be deemed to have made due allowance here or in their prices for local conditions, the nature and accessibility of the site, the nature and extent of the operations and storage space for materials, including all additional handling and transporting, due to site conditions and the nature of the ground. The Porthmellon Waste Management Site is located to the south-east of Hugh Town on the Island of St. Mary's, Isles of Scilly. The Site is accessed from Telegraph Road (A3111) turning on to Moor Well Lane and is the principal waste management site for the Isles of Scilly. The site is an operational waste management site.
- 6.1.7 Landfilling at the site started in 1965 (approximately), with waste tipped directly onto the relatively flat Lower Moors. Wastes accepted at the site include domestic, commercial and industrial waste, including garden, farm and inert waste (demolition materials, rubble and glass). It is understood that historically much of the combustible waste was typically burnt at the site. However, since 1978 the waste has been incinerated and the incinerator ash (IBA) has been deposited at the site. Consequently over time, large stockpiles of IBA have built up across the site. In addition, stockpiles of soil and green waste, loose vegetation, construction and demolition waste and bulky waste have accumulated at the site. These historic deposits are collectively referred to as 'legacy waste'.
- 6.1.8 The site is in close proximity to an Industrial Estate immediately to the north and the residential properties of Hugh Town to the south and west. Further industrial and commercial premises lie to the west of the site.
- 6.1.9 The hospital is located to the south-west of the site. Five Islands School is located approximately 60 m to the north-west of the site and Carn Gwaval Primary School located approximately 100 m to the south-east of site. St Mary's Island airport is located approximately

730 m to the south-east of the site. Allotment gardens are located adjacent to the west and south-west of the site.

- 6.1.10 To the north and east of the site the land is low lying and is an ecologically sensitive wetland area that has been designated a Site of Special Scientific Interest (SSSI).
- 6.1.11 The site is located on alluvium deposits consisting of clay, silt, sand and gravel from the Holocene period and underlain by the Isles of Scilly Intrusion, a granite rock from the Permian – Carboniferous period. The alluvial deposit is classed as a secondary aquifer, but in this case is believed to effectively act as an aquitard with relatively low permeability given the silty clay present. Confined below the alluvium are glacial deposits and granite. A local groundwater abstraction (Joaney's Well) is located within the glacial deposits at a distance of approximately 400 m from the Site. The site does not lie within a Source Protection Zone (SPZ).
- 6.1.12 Porthmellon Bay is located approximately 85 m to the north-west of the site, Porthcressa Bay lies approximately 405 m from the site to the south-west and Old Town Bay approximately 390 m from the site to the south-east.
- 6.1.13 Numerous surface water ditches/drains are located to the east and south-east of the site and relate to the low lying marsh lands of the Lower Moors SSSI.
- 6.1.14 The site is not located within a flood zone, however, the flood prediction map made available by the Environment Agency details that the site is partly located in, and surrounded by, land at risk from a 1 in 200 year flood.
- 6.1.15 The site is split into two operational areas. A new household waste recycling centre is presently under construction as a phase 1 works in advance of works associated with this tender. Construction could be concurrent with this contract and the Contractor should make allowance for this eventuality.
- 6.1.16 Throughout the duration of the contract the site shall remain an active waste management site for the purposes of the reception and transfer of waste for which the Employer is required to make provision for. The Contractor shall remain inside of the working areas, unless otherwise directed to do so by the Project Manager, and not cause disruption to the Employer's normal operations, and shall produce in conjunction with the Project Manager a traffic management plan. At all times waste management site traffic shall have priority over the Contractor's construction traffic.
- 6.1.17 **Hours of Work** - The maximum working hours permitted shall be:
- Monday to Saturday - 0800 to 1800 hrs
 - Sundays and Bank or Public Holidays - No works involving the use of machinery
- 6.1.18 The above working hours are for engineering works only. Works outside of the agreed hours may only take place if prior permission is granted by the Project Manager.

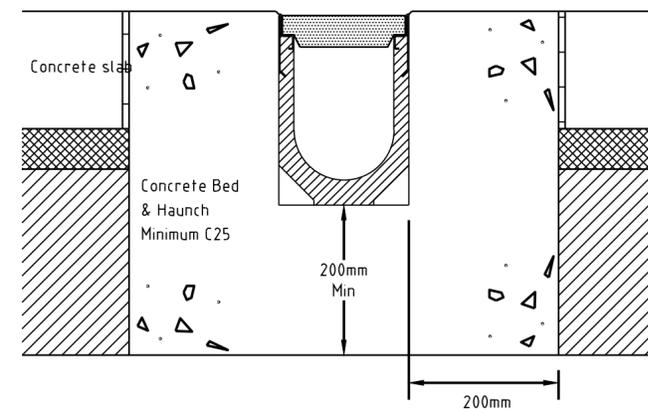
6.1.19 The Contractor shall ensure that access by unauthorised persons to their site compound and all areas in which they are carrying out work is prevented.

Drawings



DEPTH m	MINIMUM CHAMBER SIZE mm x mm
0 - 1	600 x 450
1 - 2	1200 x 750 with step irons

**RECTANGULAR PRECAST
CONCRETE MANHOLE**



NOTES

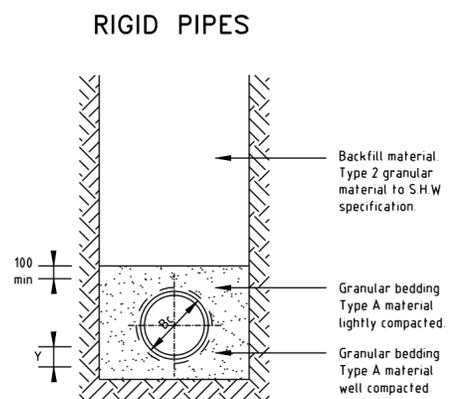
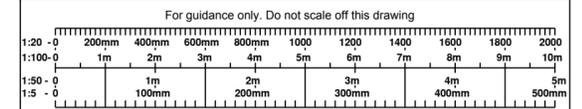
All drainage channels shall be installed strictly in accordance with the manufacturers instructions

ROAD DRAIN CHANNEL ACO 100

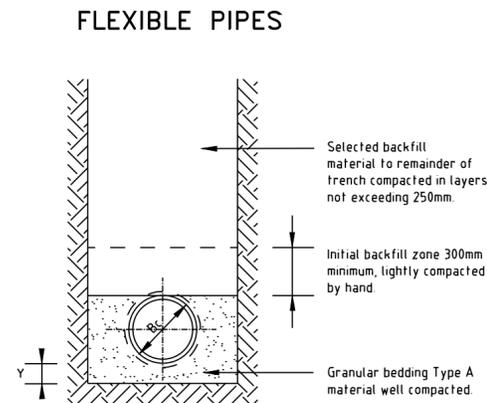
A ISSUE FOR CONSTRUCTION IM KMC 27.02.15

P1 FIRST ISSUE IM TD 19.12.14

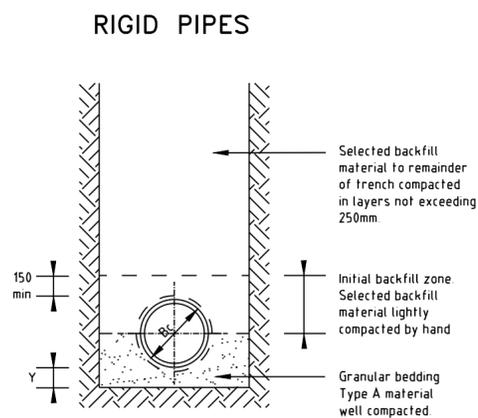
Rev	Description	By	Ckd	Date



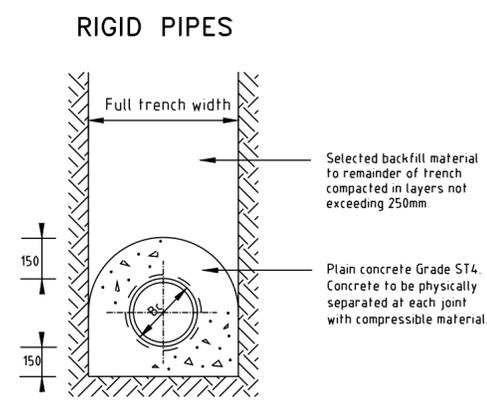
CLASS S BEDDING
(On Trafficked areas)



CLASS S BEDDING

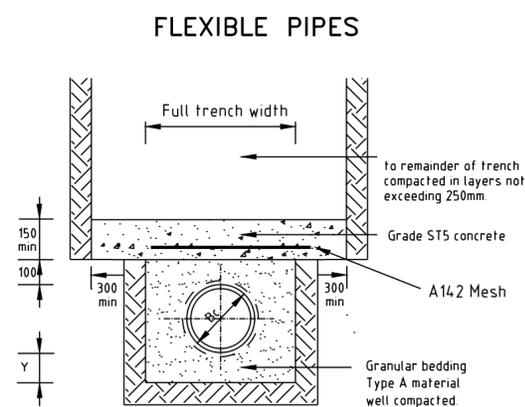


CLASS B BEDDING
(Non-trafficked areas)



CLASS A BEDDING

For cover to pipes of less than 100m in paved areas, and less than 0.45m in open spaces.



CLASS A BEDDING

For cover to pipes of less than 0.90m in paved areas, and less than 0.60m in open spaces.

TRENCH WIDTHS

Pipe Dia	Trench width max.	Y
100	600	100
150	600	100
225	700	100
300	750	100

GRANULAR BEDDING

Nominal bore of pipe (mm)	Alternative Aggregate sizes (mm)	
	Single sized	Graded
100	10	-
150	10 or 14	14 to 5
225-300	10, 14 or 20	14 to 5 or 20 to 5

Granular bedding for pipes and backfilling material for temporary drains (trench sub-drains) shall consist of aggregates from natural sources to BS EN 12620 and BS EN 12620-1 or sintered pulverised fuel ash complying with the relevant provisions of BS 3892, sized in accordance with the above table

Selected fill material, whether selected from locally excavated material or imported, shall consist of uniform, readily compactible material, free from vegetable matter, building rubbish and frozen material, or materials susceptible to spontaneous combustion, and excluding clay of liquid limit greater than 80 and/or plastic limit greater than 55 and materials of excessively high moisture content. Clay lumps and stones shall be retained on 100mm and 40mm sieves respectively.



Noble House
Capital Drive, Linford Wood, Milton Keynes MK14 6QP
T:+44 (0)1908 669898 E: rpsmks@rpsgroup.com F:+44 (0)1908 669899

Client

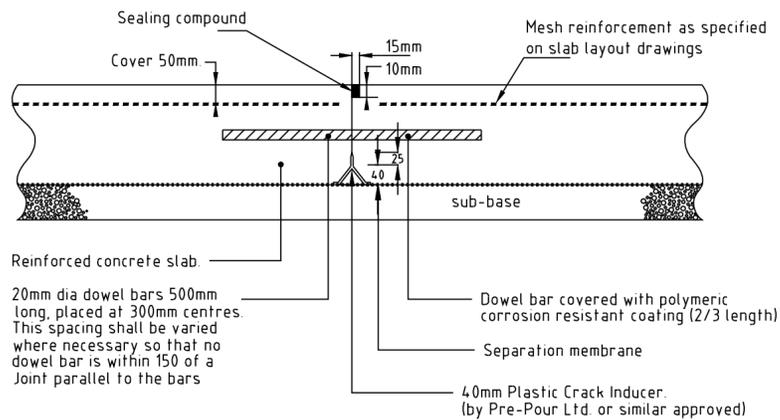
Project Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly

Title Drainage Details

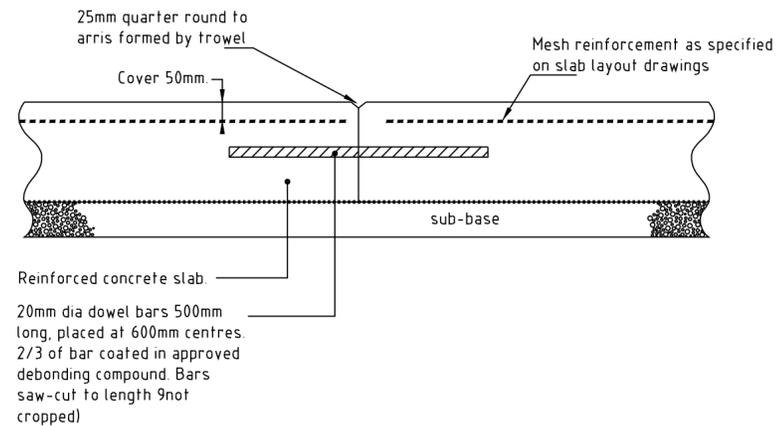
Status Construction Scale NTS @A1 Date Created 02.01.15

Project Leader KMc Drawn By IM Checked by KMc

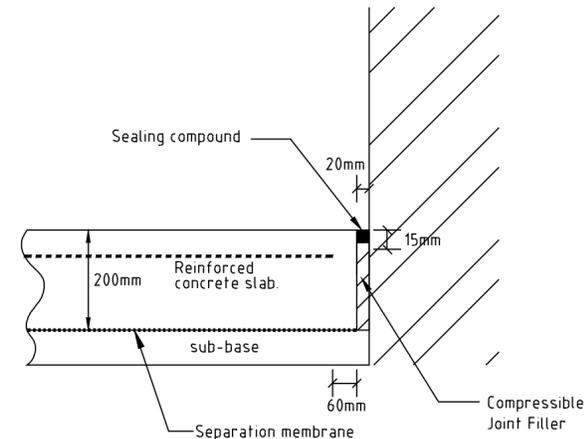
Drawing Number JKK8520 _02 Rev A



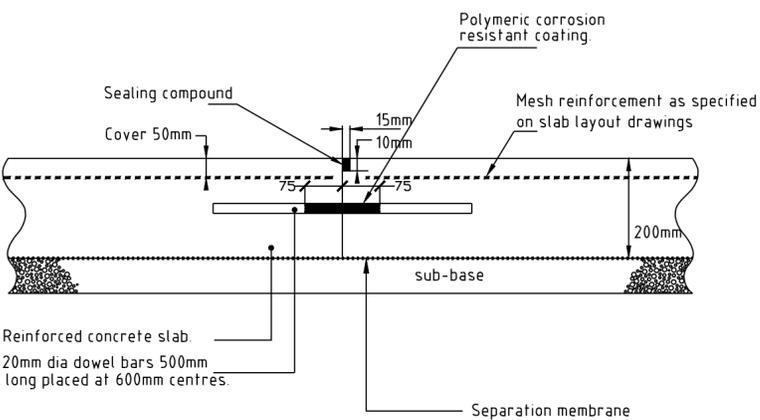
CONTRACTION JOINT – C.J. – WITH SAWN GROOVE



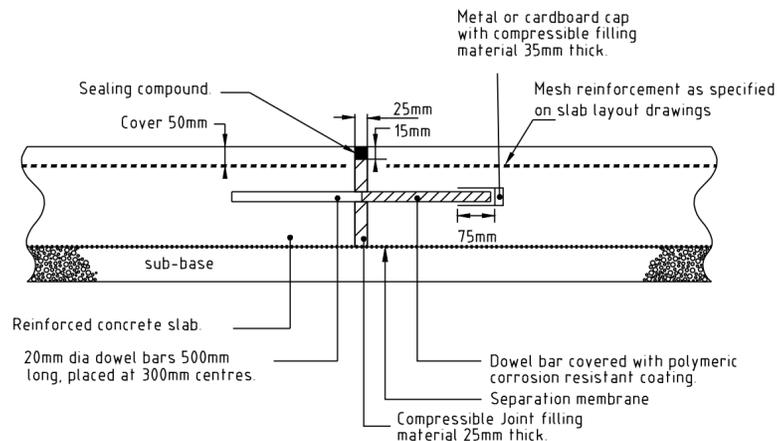
DEBONDED LONGITUDINAL JOINT – D.L.J.



ISOLATION JOINT – I.J.



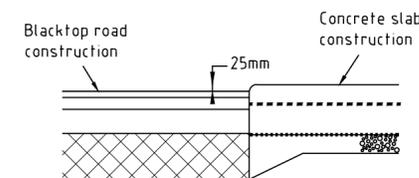
LONGITUDINAL JOINT – L.J.



EXPANSION JOINT – E.J.

NOTES:

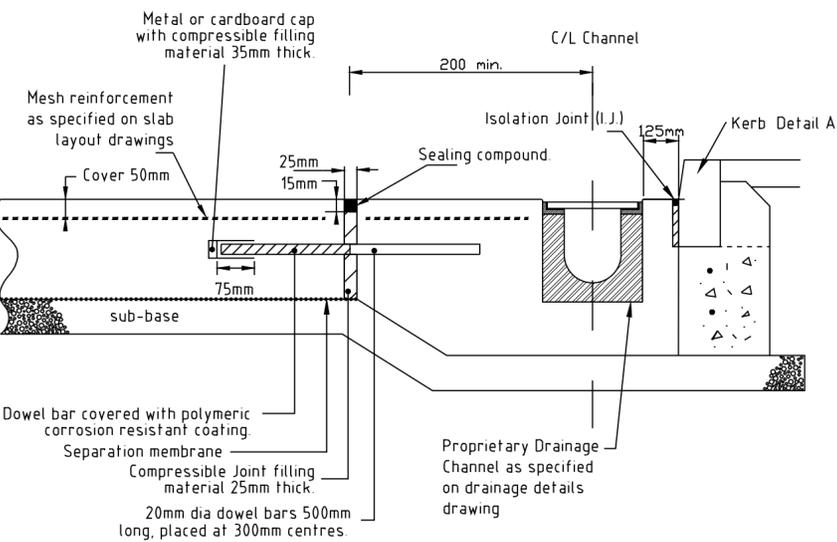
- Concrete to be C28/35 to BS EN 206-1:2000, BS 8500-1:2006 & A1:2012
- Sealing compound to be Colpor 200PF by FOSROC or similar approved.
- Separation membrane to be 1200 gauge polythene.
- Polymeric coating to be cold applied bitumen, by RIW or similar approved.
- Cover to all fabric/reinforced at Joints to be 50mm.



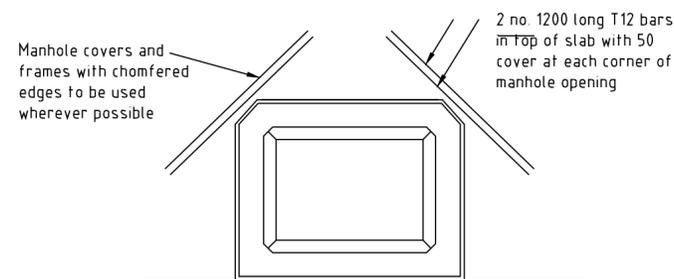
BLACKTOP ROAD AT DROP OFF /CONCRETE ROAD AT SKIP AREA

NOTES

- Concrete mixes are designed mixes in accordance with the relevant clauses of BS:5328, Parts 2, 3 & 4.
- DTP specification refers to the Manual of Contract Documents for Highways Works, Volume 1.
- Refer to layout plan for any variations to road.
- Kerb foundations shall not be less than 150mm thick, and shall be seated on or in the sub-base, this depends on pavement construction thickness.
- All kerbs shall be laid on a 25mm bed of mortar designation (i). Refer to Clause 6.15 of the Specification
- Adequate bond shall be provided between foundation and haunch. Preferred method of bonding to be by means of steel reinforcement hoops at 900mm centres or any other method to be approved by the engineer.
- Mortar joints between kerbs not to be provided unless specified by the engineer. Gaps between kerbs to be 1 to 2mm, where mortar jointing is specified.
- Kerb backing normally brought up to 50mm below top of kerb, but where final surface of footway is slab paving, kerb backing shall finish 75mm below top of kerb.
- 250mm type 2 sub-base material to cl.804 of Highway Agency Specification. If CBR value less than 3% then depth of sub-base to be increased to 450mm.
- The minimum total carriageway construction thickness shall not be less than 450mm



DRAIN CHANNEL EXPANSION JOINT – D.E.J.



Note:
Openings in concrete slab should be positioned in the corners of bays, either alongside or astride a transverse joint and have chamfered corners.

TYPICAL MANHOLE DETAIL AT CONCRETE SLAB LOCATION

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Notes

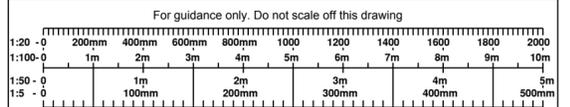
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B DETAIL A REMOVED IM KMC 01.05.15

A ISSUE FOR CONSTRUCTION IM KMC 27.02.15

P1 FIRST ISSUE IM TD 19.12.14

Rev	Description	By	Ckd	Date



Noble House
Capital Drive, Linford Wood, Milton Keynes MK14 6QP
T:+44 (0)1908 669898 E: rpsmks@rpsgroup.com F:+44 (0)1908 669899

Client
Council of the Isles of Scilly

Project
Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly

Title
Construction Details

Status	Scale	Date Created
Construction	NTS @A1	02.01.15

Project Leader	Drawn By	Checked by
KMc	IM	KMc

Drawing Number	Rev
JKK8520 _03	B

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Prismoidal Volume Calculations

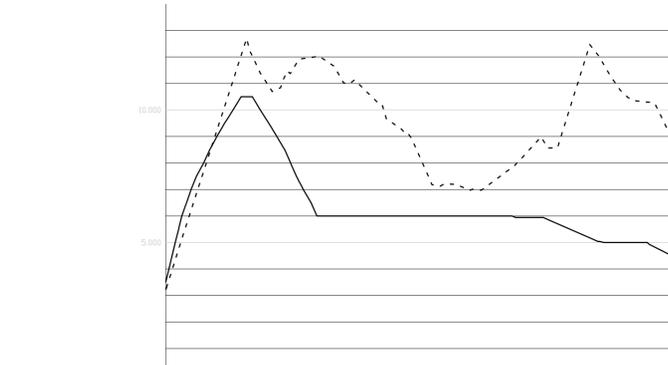
Summary of Total Volumes of Cut/Fill:

PGM1 (Existing) model		PGM2 surface relative to PGM1 surface	
Total	Gross:	Cut	Fill
PGM2 (Proposed) model	Nett:	1890.0	9.0
		1881.0	

Key
 — Proposed
 - - - Existing

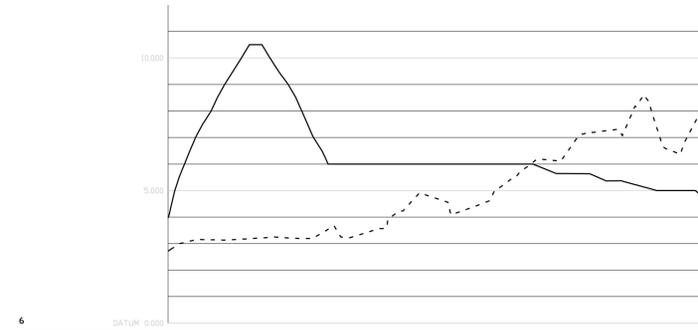


Plan Layout
Scale 1:1000



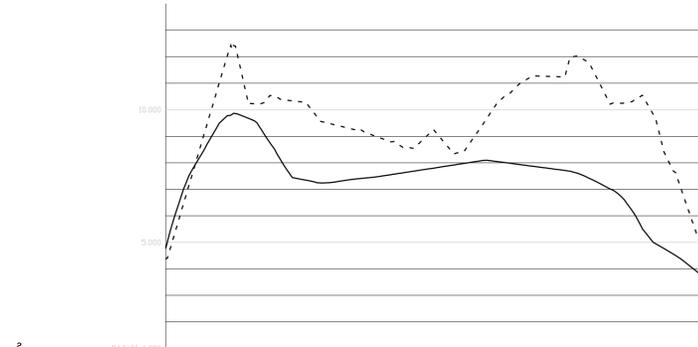
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EX LEVELS MODEL LEVEL	3.295	9.426	10.737	11.892	10.576	7.324	7.024	8.782	12.379	10.317	8.915
PRO LEVELS MODEL DRAFT	3.900	9.112	9.330	6.000	6.000	6.000	6.000	5.945	5.186	5.000	4.500

AREA OF CUT: 296.556
 FILL: 4.886
 VOLUME OF CUT: 2592.265
 FILL: 37.730



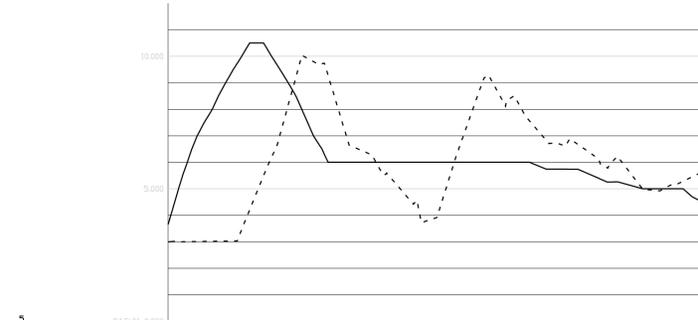
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EX LEVELS MODEL LEVEL	2.712	3.133	3.248	3.508	3.567	4.747	4.561	6.198	7.216	8.567	12.676	10.825
PRO LEVELS MODEL DRAFT	3.973	8.759	9.764	6.095	6.000	6.000	6.000	5.908	5.605	5.156	4.834	4.500

AREA OF CUT: 59.264
 FILL: 216.311
 VOLUME OF CUT: 680.177
 FILL: 1640.159



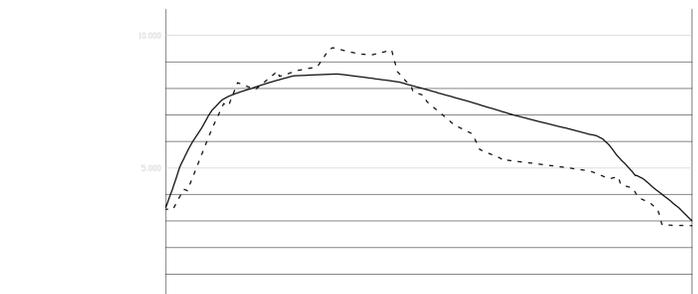
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EX LEVELS MODEL LEVEL	4.370	10.925	10.925	9.526	8.975	9.137	9.476	11.271	11.726	10.539	8.403	10.814
PRO LEVELS MODEL DRAFT	4.765	9.449	8.670	7.240	7.473	7.779	8.088	7.826	7.417	5.536	3.926	3.624

AREA OF CUT: 223.610
 FILL: 2.761
 VOLUME OF CUT: 1002.959
 FILL: 293.070



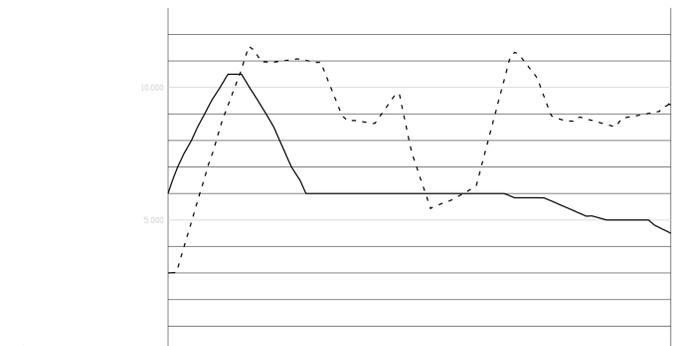
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EX LEVELS MODEL LEVEL	2.999	3.025	6.390	9.423	5.731	3.885	9.223	7.158	6.313	4.974	5.546	10.825
PRO LEVELS MODEL DRAFT	3.654	8.693	9.853	6.093	6.000	6.000	6.000	5.858	5.512	5.000	4.508	4.500

AREA OF CUT: 77.165
 FILL: 116.792
 VOLUME OF CUT: 1520.689
 FILL: 708.879



OFFSET	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	94.954
EX LEVELS MODEL LEVEL	3.440	7.819	8.462	9.217	9.319	7.396	5.640	5.160	4.890	3.820	2.823
PRO LEVELS MODEL DRAFT	3.900	7.439	8.246	8.527	8.354	7.918	7.344	6.780	6.274	4.617	3.000

AREA OF CUT: 16.513
 FILL: 71.145
 VOLUME OF CUT: 0.000
 FILL: 0.000



OFFSET	0.000	10.000	20.000	30.000	40.000	50.000	60.000	70.000	80.000	90.000	94.954
EX LEVELS MODEL LEVEL	3.000	8.612	10.924	10.328	8.929	5.488	7.632	12.254	8.728	8.990	9.337
PRO LEVELS MODEL DRAFT	6.013	10.057	8.485	6.000	6.000	6.000	6.000	5.840	5.151	5.000	4.500

AREA OF CUT: 243.304
 FILL: 33.408
 VOLUME OF CUT: 2689.737
 FILL: 170.231

A FIRST ISSUE IM KMC 12.06.15

Rev	Description	By	Ckd	Date
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Sherwood House,
 Sherwood Avenue, Newark, Nottinghamshire, NG24 1QQ
 T: +44 (0)1636 605 700 E: rpsnewark@rpsgroup.com

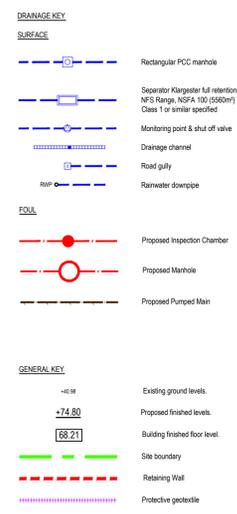
Client **Council of the Isles of Scilly**

Project **Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly**

Title **Cut and Fill Sections - Phase 2**

Status	Scale	Date Created
Preliminary	AS SHOWN @ A1	02.01.15
Project Leader	Drawn By	Checked by
KMC	IM	

Drawing Number	Rev
JKK8520 _05	A



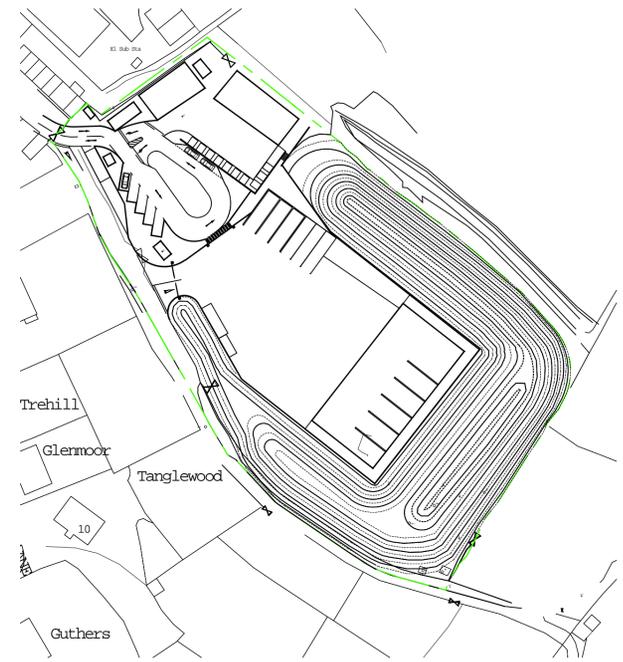
- NOTES:**
- Surface water from the site is discharging to existing ditch at assumed level. Survey of the ditch to be carried out and the levels to be confirm.
 - Surface water sewers design to accommodate storm event 1 in 30 years for whole site (Phase 1 & Phase 2).
 - Invert levels of outfall sewers are to be checked before commencing drainage works.
 - All materials and workmanship in connection with non adoptable drainage works to comply with BS EN 752 "Drain and Sewer Systems Outside buildings" and the "Building Regulations 2002, Section H - Drainage and Waste Disposal".
 - Private drainage to be constructed in accordance with BS 8301 1985 "Building Drainage" & Section H of the Building Regulations 2002 and any other Specification required by the contract.
 - Private drainage to be 100 dia. unless shown otherwise. Pipes to be laid and bedded in accordance with the manufacturers instructions. All pipes on adoptable laterals beneath public highway to be min.150 dia. extra strength vitrified clay.
 - Manhole covers are indicative and should be adjusted to suit finished levels. Covers should be fixed parallel to kerb lines.
 - Covers and frames to be :
 - Yards and Roads - Class D400 (ductile iron to BS EN 124)
 - Other trafficked areas - Class C250 (ductile iron to BS EN 124)
 - Non trafficked areas - Class B125 (ductile iron to BS EN 124)
 - Where the crown of the pipe is within 300mm of the underside of the building slab, concrete encasement should be used integral with the slab.
 - Sulphate Resisting concrete shall be used in accordance with BRE Special Digest Parts 1-4, if required by the soil conditions.
 - The symbols on the drainage key do not indicate the shape nor size of the feature to which they relate.

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rehill
Glenmoor
Tanglewood



Proposed Engineering Layout Phase 2
Scale 1:250

Proposed Site Layout Phasing Plan
Scale 1:1000

A FIRST ISSUE		TD	IM	12.06.15
Rev	Description	By	Ckd	Date



Sherwood House,
Sherwood Avenue, Newark, Nottinghamshire, NG24 1QQ
T: +44 (0)1636 605 700 E: rpsnewark@rpsgroup.com

Client Council of the Isles of Scilly

Project Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly

Title Engineering Layout - Phase 2

Status	Scale	Date Created
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NOTES:

1. Final joints layout to be agreed between contractor and RPS.
2. For typical construction details refer to dwg. JKK8520_03.
3. All external concrete areas to have heavy brush finish with trowelled margins at joint location. Brush finish to provide grooves parallel to the slope of pavement.
4. All works are to be carried out in accordance with the requirements of the Manual of Contract Documents for Highway Works, Volume 1 Specification and to the approval of the local highway authority where the works are to be executed within areas of public highway.
5. All road markings and signage works to comply with The Traffic Signs Regulations and General Directions 2002.



Denotes 200mm thick concrete slabs with heavy brush finish to the following specification:

1. Concrete strength class to be C28/35 at 28 days max. to BS EN 206-1:2000 and BS 8500-1:2006 & A1:2012.
Minimum cement content to be 330kg/m³.
Nominal aggregate size to be 20mm.
Air content to be 5%.
2. C385 mesh reinforcement with 50 min. top cover and main bars parallel with long joint.
3. 1200 gauge polythene slip membrane.
4. 250mm Type 2 granular sub-base material to Cl. 804 of Highway Agency Specification for Highway Works and divided for slip layer. If CBR value is less than 3% then depth of sub-base to be increased to 450mm.

GENERAL KEY

- C.J. Contraction Joint
- L.J. Longitudinal Joint
- I.J. Isolation Joint
- D.L.J. Debonded longitudinal joint
- E.J. Expansion Joint

- Site boundary
- Existing concrete slab
- Existing tarmac road construction
- Proposed finished levels

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Sherwood Avenue, Newark, Nottinghamshire, NG24 1QQ
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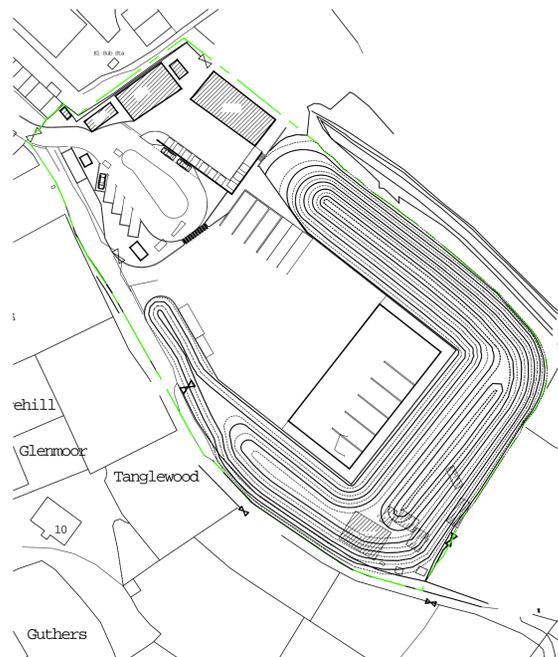
Client **Council of the Isles of Scilly**

Project **Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly**

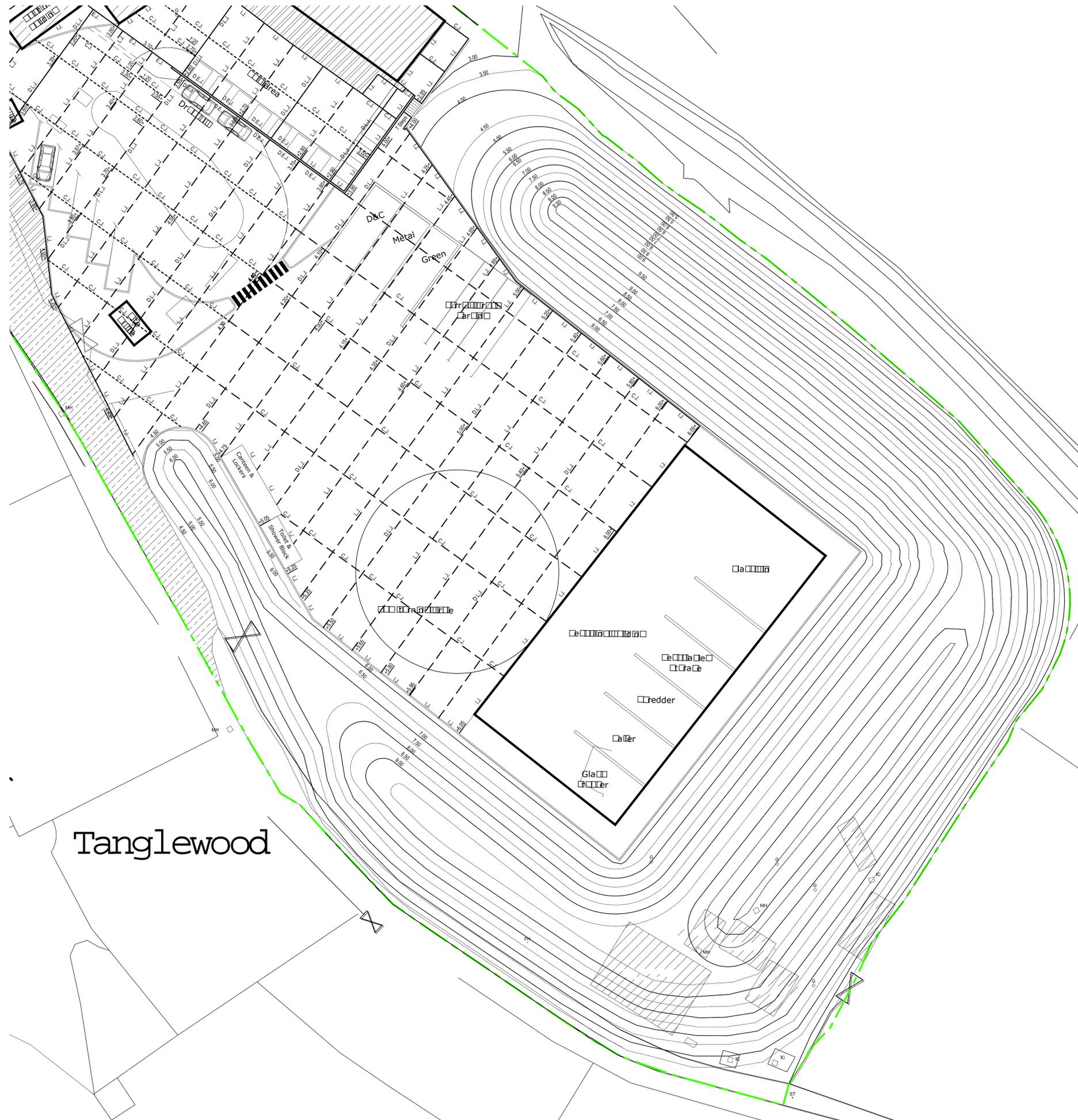
Title **External Works Layout - Phase 2**

Status	Scale	Date Created
Preliminary	AS SHOWN @ A1	02.01.15
Project Leader	Drawn By	Checked by
KMc	IM	KMc

Drawing Number	Rev
JKK8520 _07	A



Proposed Site Layout Phasing Plan
Scale 1:1000



Slab Layout Phase 1
Scale 1:250

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4. ALL STEELWORK ERECTION TO BE TO BS 5531 AND THE NATIONAL STRUCTURAL STEELWORK SPECIFICATION FOR BUILDING CONSTRUCTION. THE CONTRACTOR RESPONSIBLE FOR THE ERECTION OF STEELWORK IS TO ENSURE THE STABILITY OF THE STRUCTURE AT ALL TIMES DURING ERECTION BY THE USE OF TEMPORARY BRACING AND STRUTS AS NECESSARY.
5. FABRICATION OF STEELWORK TO BE IN ACCORDANCE WITH BS 5950 - PART 2. ALL STEELWORK SHALL COMPLY WITH THE FOLLOWING:
 - BS EN 10025 - HOT ROLLED SECTIONS
 - BS EN 10210 PART 1 - HOT ROLLED STRUCTURAL
6. ALL PROPRIETARY ITEMS TO BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
7. PURLINS AND SHEETING RAILS TO BE SUPPLIED WITH SAG RODS AND BRACES AS PER THE DESIGN AND THE MANUFACTURER'S RECOMMENDATIONS.
8. HOLDING DOWN BOLTS AND BASE PLATES TO BE GROUTED UP WITH NON-SHRINK GROUT 'CONCREXTRA GP' OR SIMILAR APPROVED.
9. ALL BOLTS TO BE TO BS 4190 (GRADE 4.6) OR BS 3692 (GRADE 8.8) AND TO BE SHERADIZED OR BRIGHT GALVANISED.
10. ALL BOLTS TO BE IN 2mm CLEARANCE HOLES UNLESS STATED OTHERWISE.
11. FABRICATION MUST TAKE INTO CONSIDERATION DEAD LOAD DEFLECTION TO ENSURE THE SPECIFIED ROOF PITCH AFTER CONSTRUCTION.
12. STEELWORK TO BE PROVIDED WITH A PROTECTIVE COATING WHICH WILL GUARANTEE A MINIMUM OF 25 YEARS TO FIRST MAINTENANCE, SUITABLE FOR 'ENVIRONMENT CATEGORY C4'.
13. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS, N.H.B.C. STANDARDS CHAPTER 6.4, BS2688, BRE DEFECT ACTION SHEETS 25, 57 AND 99, AND JOB SPECIFICATIONS(S).
14. CONFLICTING INFORMATION SHOWN ON THE ENGINEER'S DRAWINGS, OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER, AND THAT PROVIDED BY OTHERS, MUST BE REFERRED TO THE ENGINEER BEFORE THE AFFECTED WORK PROCEEDS.
15. IN CASE OF ANY DISCREPANCIES IN DRAWINGS OR DETAILS, REFER TO ENGINEER FOR CLARIFICATION, UNILATERAL DECISIONS BY THE CONTRACTOR WILL NOT BE ACCEPTED.
16. ALL BUILDING STEELWORK INCLUDING STEEL TO STEEL CONNECTIONS ARE TO BE DESIGNED & DETAILED BY THE STEELWORK CONTRACTOR.
17. CONTRACTOR TO UNDERTAKE SUFFICIENT FURTHER GROUND INVESTIGATION TO CARRY OUT GROUND FLOOR SLAB AND BUILDING FOUNDATION DESIGN.
18. ROOF CLADDING/WALL CLADDING ARE TO BE DESIGNED IN ACCORDANCE WITH THE GENERAL ARRANGEMENT INFORMATION INDICATED ON THIS DRAWING AND ARCHITECTURAL DRAWING.
19. MAXIMUM FINISHED RIDGE HEIGHT OF THE BUILDING IS 7m.

P2 NOTES AMENDED. RS SH 15.06.15

P1 FIRST ISSUE RS SH ??.06.15

Rev	Description	By	Ckd	Date



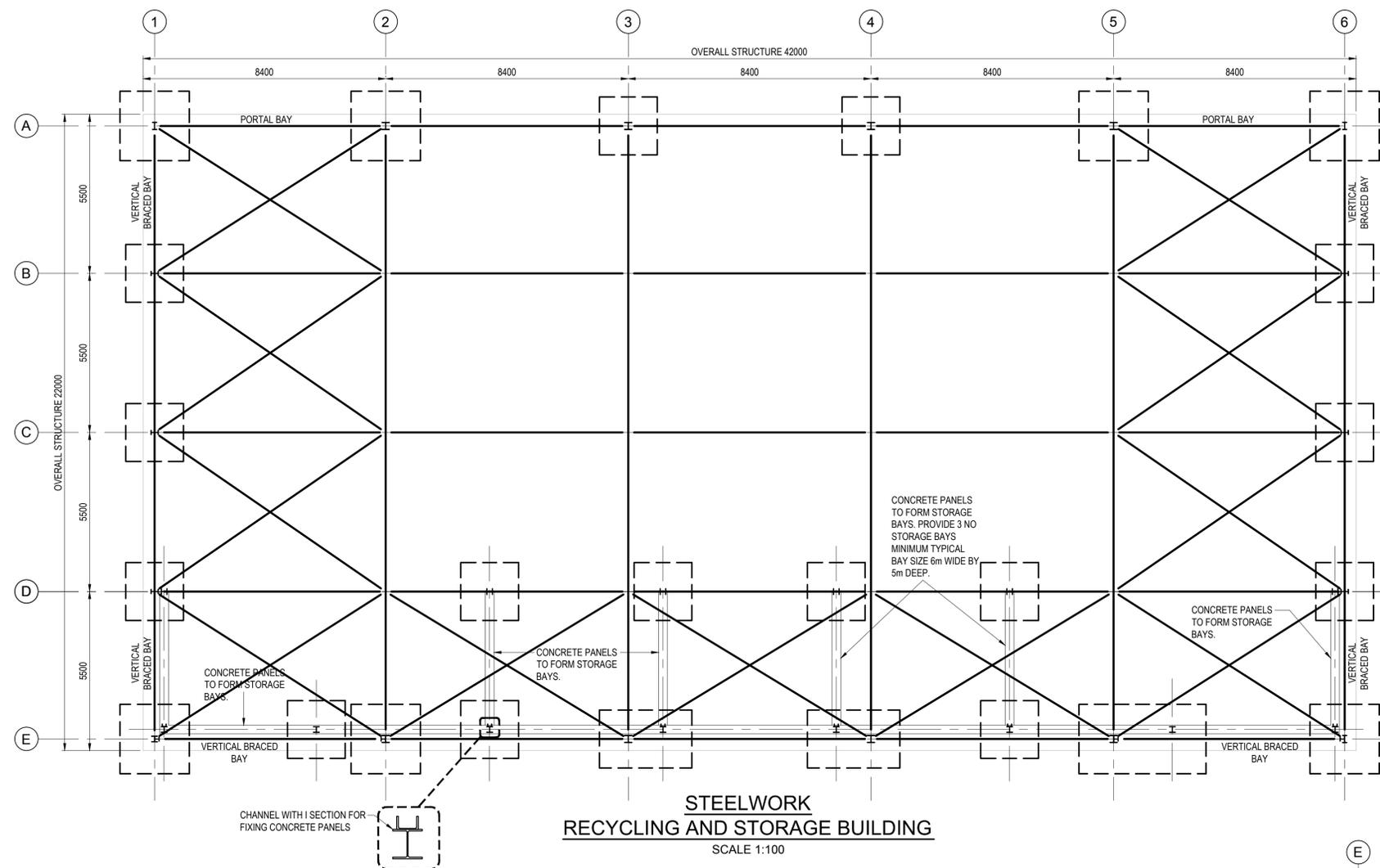
Noble House
Capital Drive, Linford Wood, Milton Keynes MK14 6QP
T:+44 (0)1908 669898 E: rpsmk@rpsgroup.com F:+44 (0)1908 669899

Client COUNCIL OF THE ISLES OF SCILLY

Project PORTHMELLON WASTE MANAGEMENT FACILITY, ST. MARY'S, ISLES OF SCILLY
Title RECYCLING AND STORAGE BUILDING STEELWORK ARRANGEMENT

Status PRELIMINARY Scale 1:100 @A1 Date Created 10 JUNE 2015
Project Leader ABH Drawn By RS Checked By SH

Drawing Number JKK8520 _205 Rev P2



NOTE:
ARRANGEMENT OF ROOF BRACING IS INDICATIVE - SUBJECT TO AGREEMENT BETWEEN CONTRACTORS STEELWORK DESIGNERS & RPS.

ALL STEELWORK TO BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE GENERAL ARRANGEMENT INFORMATION INDICATED ON THIS DRAWING AND THE SPECIFICATION.

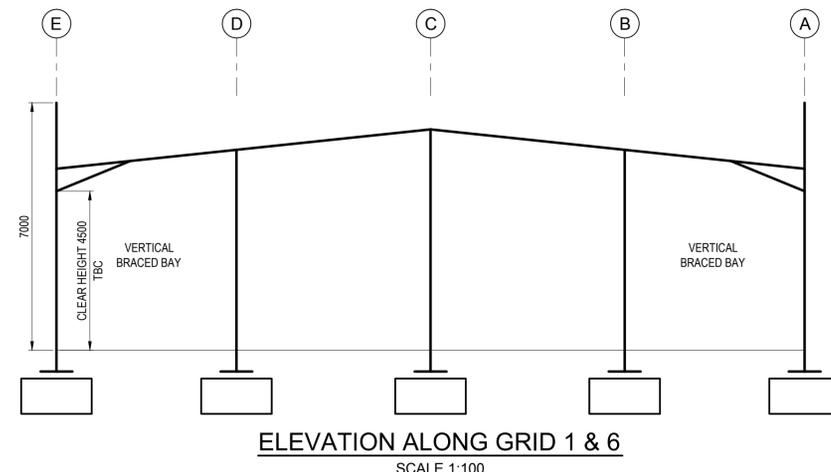
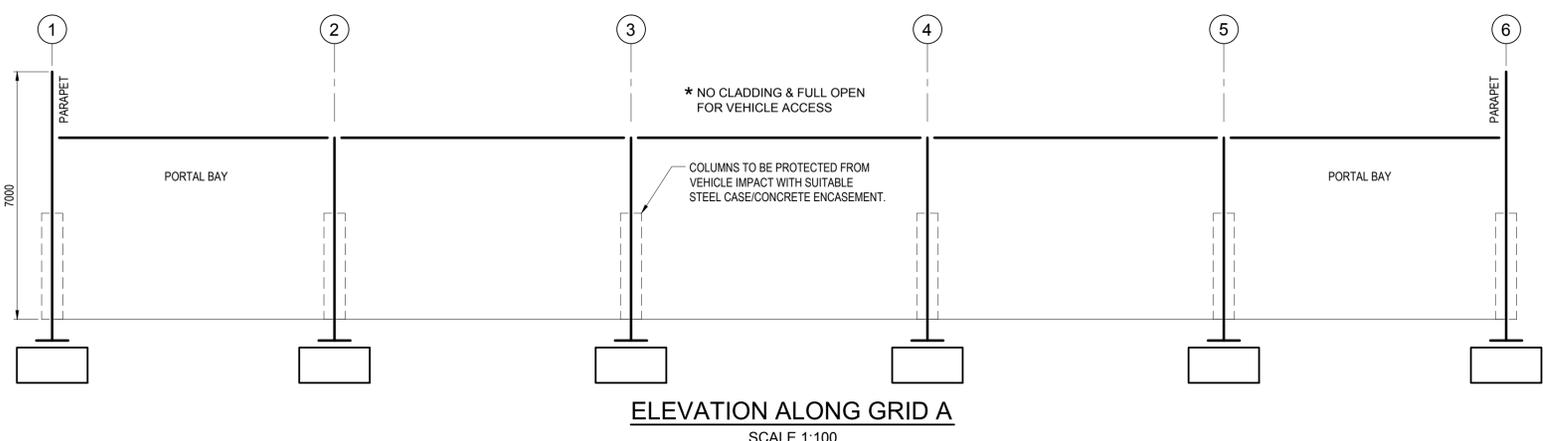
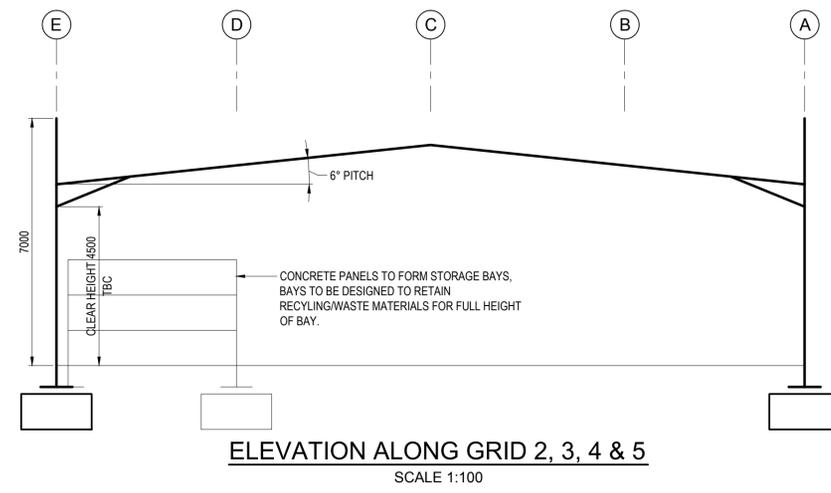
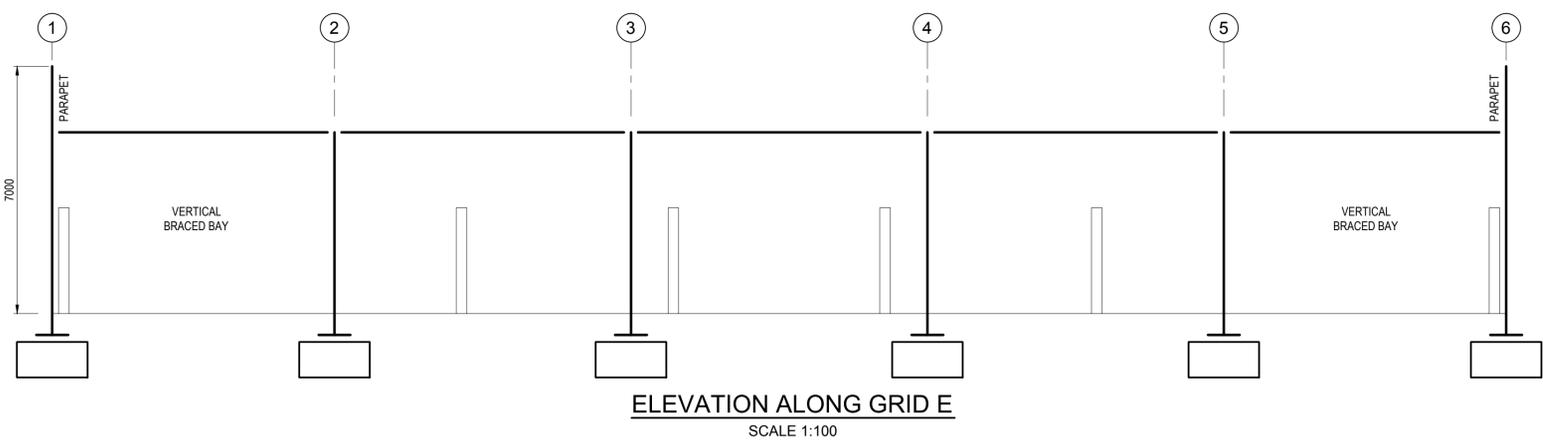
BUILDING FOUNDATION AND GROUND FLOOR SLAB TO BE DESIGNED AND DETAILED BY CONTRACTOR IN ACCORDANCE WITH THE GENERAL ARRANGEMENT INFORMATION INDICATED ON THIS DRAWING. CONTRACTOR TO UNDERTAKE SUFFICIENT FURTHER INVESTIGATION TO ALLOW FOUNDATION/GROUND FLOOR SLAB DESIGN.

NOTE:
FOR CALCULATION OF OVERTURNING FORCES OF FIRE BOUNDARY CONDITION SERVICE LOADING 0.15 kN/m² (TO BE CONSIDERED) AS APPROPRIATE BASED ON THE SITE.

NOTE:
BUILDING TO HAVE TRAPEZOIDAL METAL CLADDING, FINAL COLOUR AND FINISH TO BE AGREED WITH CLIENT AND RPS PRIOR TO CONSTRUCTION.

NOTE:
WIND LOADING ANALYSIS AND DESIGN OF STEELWORK TO INCLUDE CONSIDERATION OF EFFECT OF HIGH WINDS AS NO DOORS TO BE PROVIDE TO BUILDING. WORST CASE CONDITIONS TO BE INCLUDED IN THE STRUCTURAL DESIGN OF PRIMARY AND SECONDARY STEELWORK AND CLADDING/FIXINGS.

DESIGN LOADING FOR STEELWORK DESIGN
- SNOW LOADING TO BE DETERMINED IN ACCORDANCE WITH BS 6399 BUT NOT LESS THAN 0.6 kN/m²
- WIND LOADING TO BE DETERMINED IN ACCORDANCE WITH BS 6399
NOTE: LOADINGS AND COMBINATIONS SUBJECT TO AGREEMENT BETWEEN CONTRACTORS STEELWORK DESIGNERS AND RPS.



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NOTES:

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3. DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL OTHER RELEVANT DRAWINGS AND SPECIFICATIONS.
4. ALL STEELWORK ERECTION TO BE TO BS 5531 AND THE 'NATIONAL STRUCTURAL STEELWORK SPECIFICATION FOR BUILDING CONSTRUCTION'. THE CONTRACTOR RESPONSIBLE FOR THE ERECTION OF STEELWORK IS TO ENSURE THE STABILITY OF THE STRUCTURE AT ALL TIMES DURING ERECTION BY THE USE OF TEMPORARY BRACING AND STRUTS AS NECESSARY.
5. FABRICATION OF STEELWORK TO BE IN ACCORDANCE WITH BS 5950 - PART 2. ALL STEELWORK SHALL COMPLY WITH THE FOLLOWING:
 - BS EN 10025 - HOT ROLLED SECTIONS
 - BS EN 10210 PART 1 - HOT ROLLED STRUCTURAL
6. ALL PROPRIETARY ITEMS TO BE INSTALLED IN STRICT COMPLIANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
7. HOLDING DOWN BOLTS AND BASE PLATES TO BE GROUDED UP WITH NON-SHRINK GROUT 'CONBEXTRA GP' OR SIMILAR APPROVED.
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11. STEELWORK TO BE PROVIDED WITH A PROTECTIVE COATING WHICH WILL GUARANTEE A MINIMUM OF 25 YEARS TO FIRST MAINTENANCE, SUITABLE FOR 'ENVIRONMENT CATEGORY C4'.
12. ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH RELEVANT BUILDING REGULATIONS, N.H.B.C. STANDARDS CHAPTER 6.4, BS5268, BRE DEFECT ACTION SHEETS 25, 57 AND 99, AND JOB SPECIFICATIONS(S).
13. CONFLICTING INFORMATION SHOWN ON THE ENGINEERS DRAWINGS, OR DISCREPANCIES BETWEEN THE INFORMATION GIVEN BY THE ENGINEER, AND THAT PROVIDED BY OTHERS, MUST BE REFERRED TO THE ENGINEER BEFORE THE AFFECTED WORK PROCEEDS.
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15. ALL BUILDING STEELWORK INCLUDING STEEL TO STEEL CONNECTIONS ARE TO BE DESIGNED & DETAILED BY THE STEELWORK CONTRACTOR.
16. CONTRACTOR TO UNDERTAKE SUFFICIENT FURTHER GROUND INVESTIGATION TO CARRY OUT GROUND FLOOR SLAB AND BUILDING FOUNDATION DESIGN.

OPEN STORAGE BAY FOUNDATION & GROUND FLOOR SLAB TO BE DESIGNED AND DETAILED BY CONTRACTOR IN ACCORDANCE WITH THE GENERAL ARRANGEMENT INFORMATION INDICATED ON THIS DRAWING. CONTRACTOR TO UNDERTAKE SUFFICIENT FURTHER INVESTIGATION TO ALLOW FOUNDATION/GROUND FLOOR SLAB DESIGN.

ALL STEELWORK TO BE DESIGNED BY THE CONTRACTOR IN ACCORDANCE WITH THE GENERAL ARRANGEMENT INFORMATION INDICATED ON THIS DRAWING AND THE SPECIFICATION.

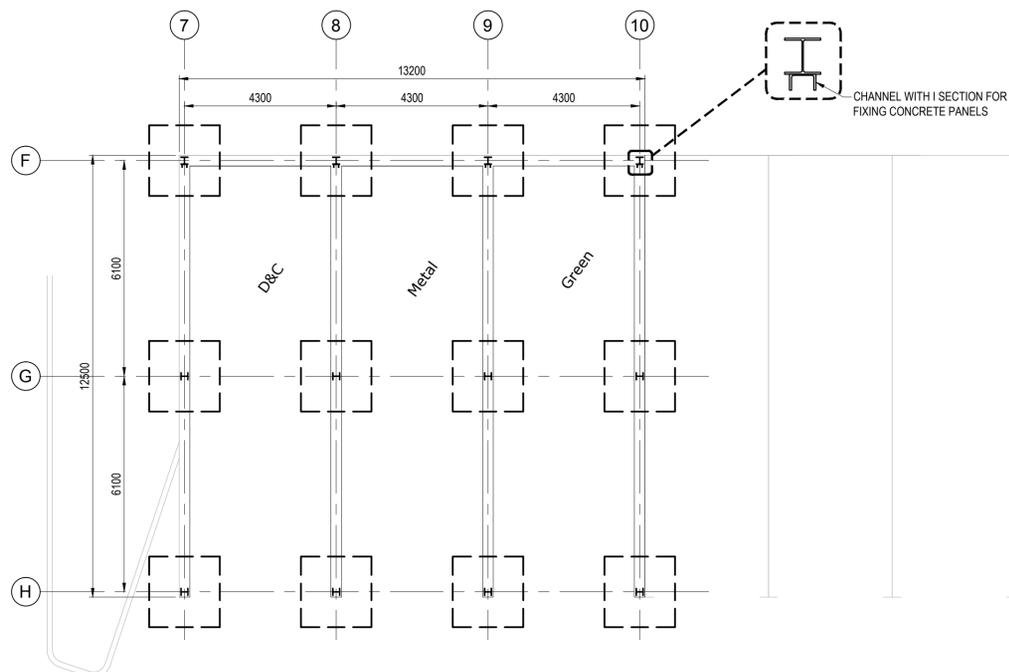
NOTE:
WIND LOADING ANALYSIS AND DESIGN OF STEELWORK TO INCLUDE CONSIDERATION OF EFFECT OF HIGH WINDS. WORST CASE CONDITIONS TO BE INCLUDED IN THE STRUCTURAL DESIGN OF PRIMARY AND SECONDARY STEELWORK AND CLADDING/FIXINGS.

NOTE:
ALTERNATIVELY PROPRIETARY PRECAST CONCRETE L OR T SECTIONS COULD BE CONSIDERED BOLTED TO THE TOP OF REINFORCED CONCRETE YARD SLAB TO CONTRACTORS DESIGN & DETAIL.

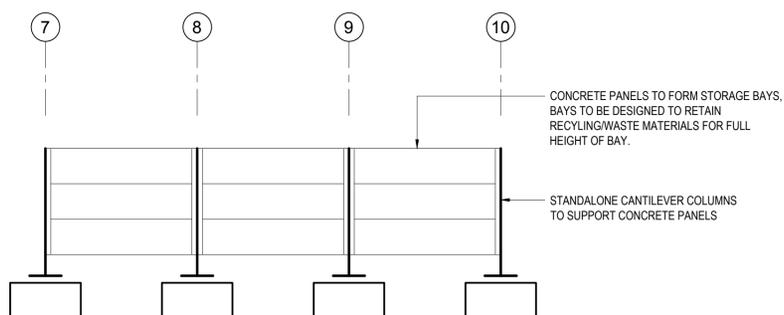
DESIGN LOADING FOR STEELWORK DESIGN

- SNOW LOADING TO BE DETERMINED IN ACCORDANCE WITH BS 6399 BUT NOT LESS THAN 0.6 kN/m²
- WIND LOADING TO BE DETERMINED IN ACCORDANCE WITH BS 6399

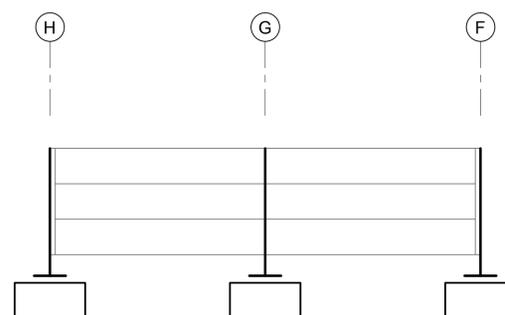
NOTE: LOADINGS AND COMBINATIONS SUBJECT TO AGREEMENT BETWEEN CONTRACTORS STEELWORK DESIGNERS AND RPS.



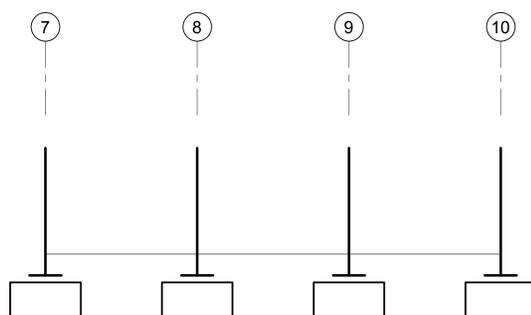
**STEELWORK LAYOUT
OPEN STORAGE BAYS**
SCALE 1:100



ELEVATION ALONG GRID F
SCALE 1:100



ELEVATION ALONG GRID 7, 8, 9 & 10
SCALE 1:100



ELEVATION ALONG GRID H
SCALE 1:100

P1	FIRST ISSUE	RS	SH	15.06.15
Rev	Description	By	Ckd	Date



Noble House
Capital Drive, Linford Wood, Milton Keynes MK14 6QP
T: +44 (0)1908 669898 E: rpsmk@rpsgroup.com F: +44 (0)1908 669899

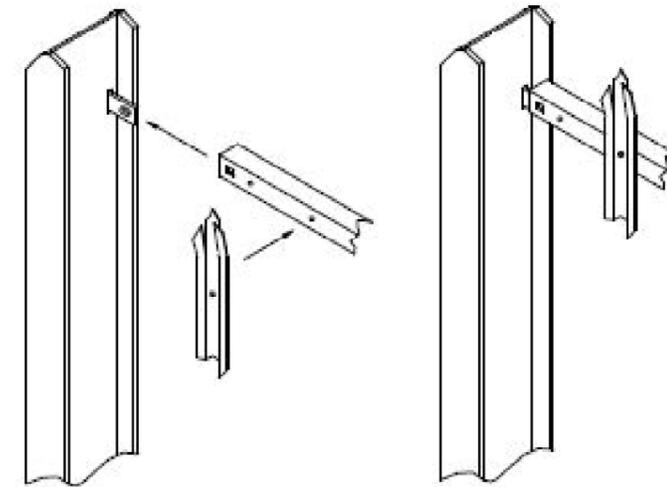
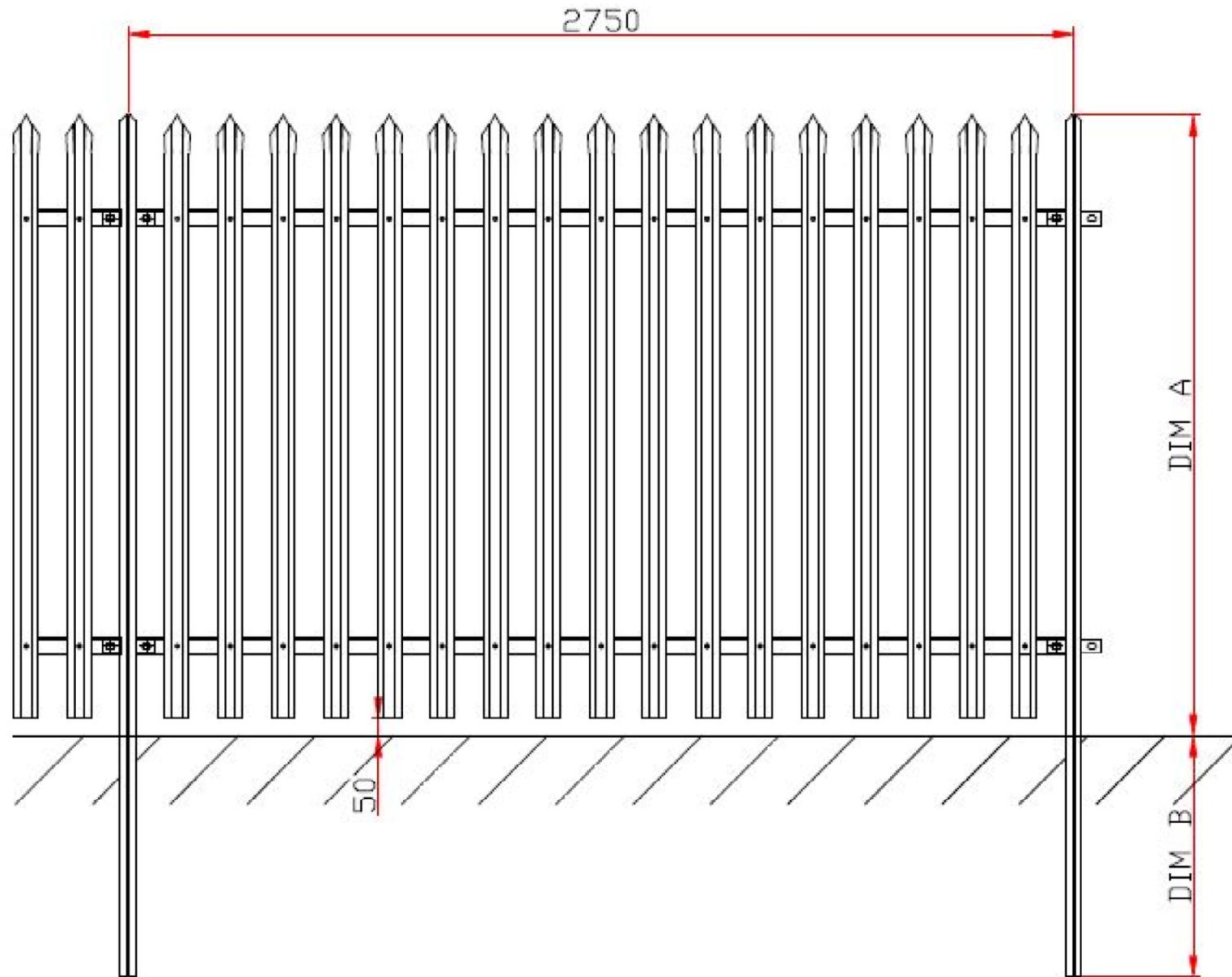
Client **COUNCIL OF THE ISLES OF SCILLY**

Project **PORTHMELLON WASTE
MANAGEMENT FACILITY,
ST. MARY'S, ISLES OF SCILLY**

Title **OPEN STORAGE BAYS BUILDING
STEELWORK ARRANGEMENT**

Status	Scale	Date Created
PRELIMINARY	1:100 @A1	10 JUNE 2015
Project Leader	Drawn By	Checked by
ABH	RS	SH

Drawing Number	Rev
JKK8520 _206	P1



DIM A	DIM B	POSTS	ANGLES	PALES
2400	750	102x44	50x50	"W" & "D"

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Notes

Compliant with the requirements of BS 1461:2509 and 1722-12:2006

Rev	Description	Date	Initial	Checked



2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

T: +44(0)1454 853 000 E: rps@rpsgroup.com F: +44(0)1454 205 820

Client **COUNCIL OF THE ISLES OF SCILLY**

Project **PORTHMELLON WASTE MANAGEMENT FACILITY**

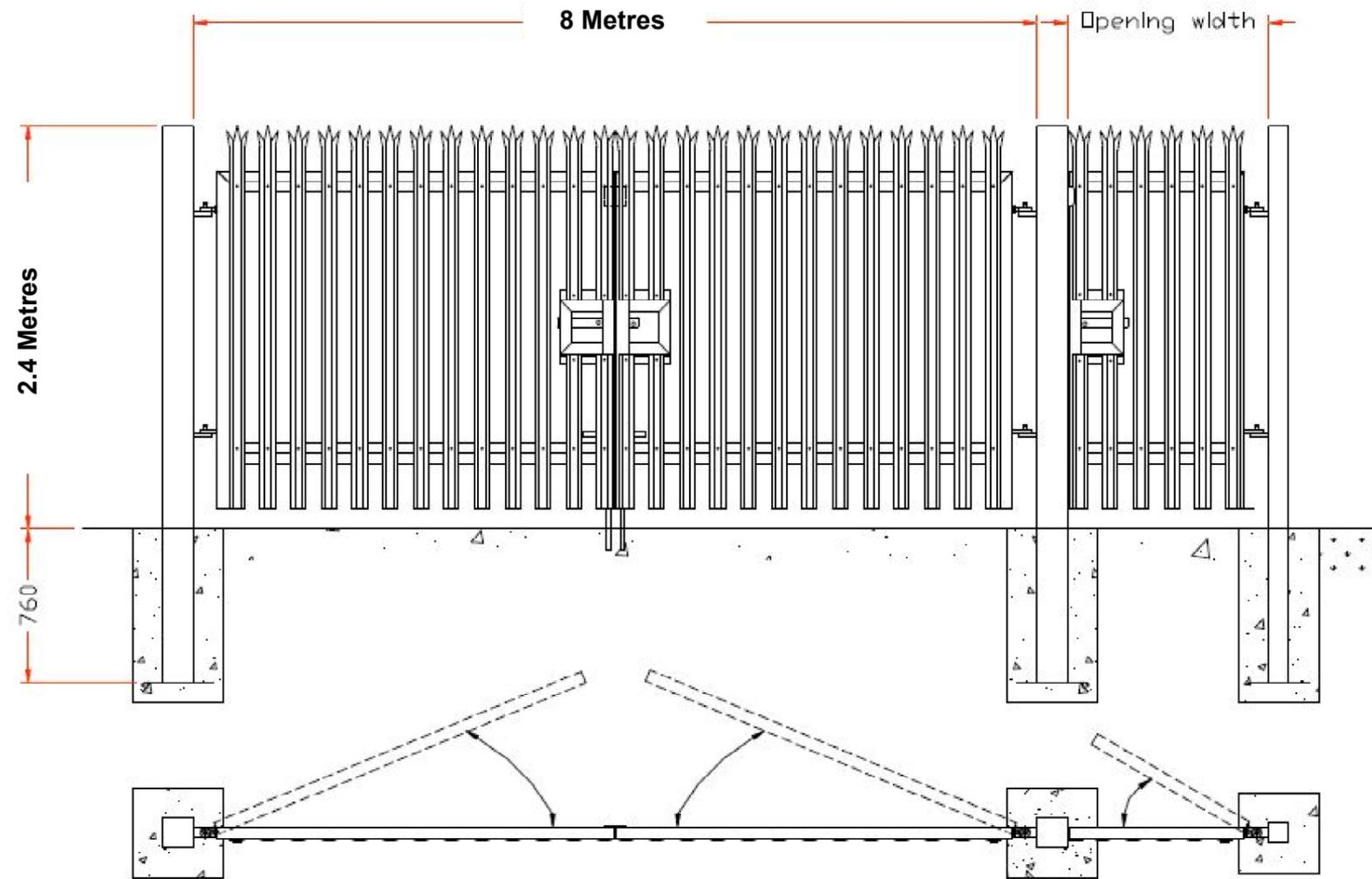
Title **PALISADE FENCING PANEL 1**

Status **PRELIMINARY** Drawn By **JGB** PM/Checked By **JT**

Job Ref **JER6282** Scale @ **A3** Date Created **JUN 15**

Drawing Number **JER6282-LAY-003** Rev **-**

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Materials

- Posts 150x150x5 SH
- Frame 60x60X3 SHS
- Sub Frame 50x50X5 RSA
- Infill D Section Palisade Pale

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Rev	Description	Date	Initial	Checked



2420 The Quadrant
Aztec West
Almondsbury
Bristol
BS32 4AQ

T: +44(0)1454 853 000 E: rps@rpsgroup.com F: +44(0)1454 205 820

Client **COUNCIL OF THE ISLES OF SCILLY**

Project **PORTHMELLON WASTE MANAGEMENT FACILITY**

Title **PALISADE FENCING PANEL 2**

Status **PRELIMINARY** Drawn By **JGB** PM/Checked By **JT**

Job Ref **JER6282** Scale @ **A3** Date Created **JUN 15**

Drawing Number **JER6282-LAY-004** Rev **-**

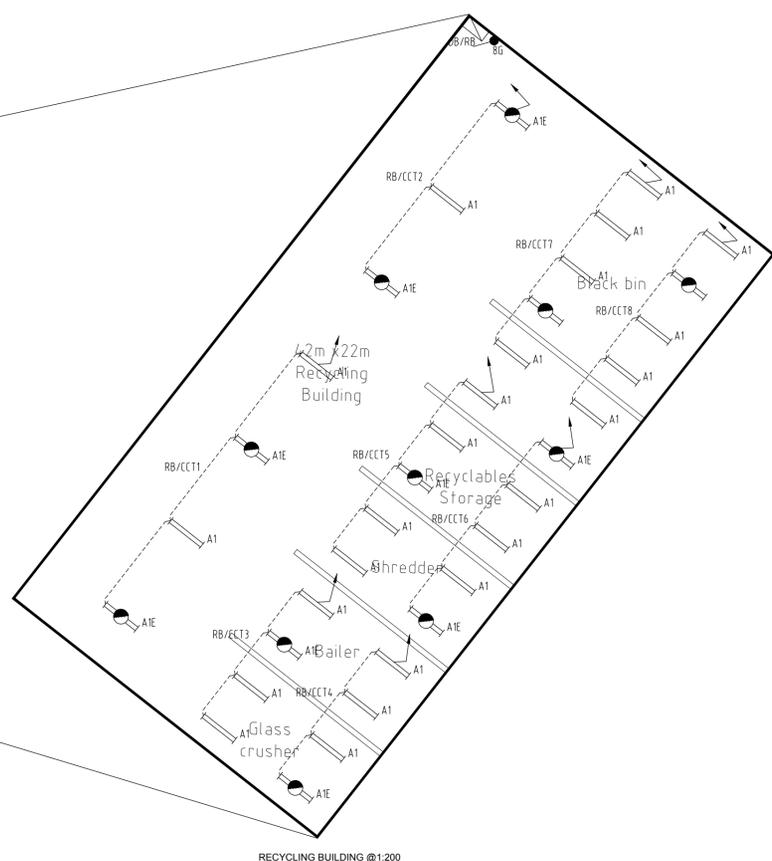
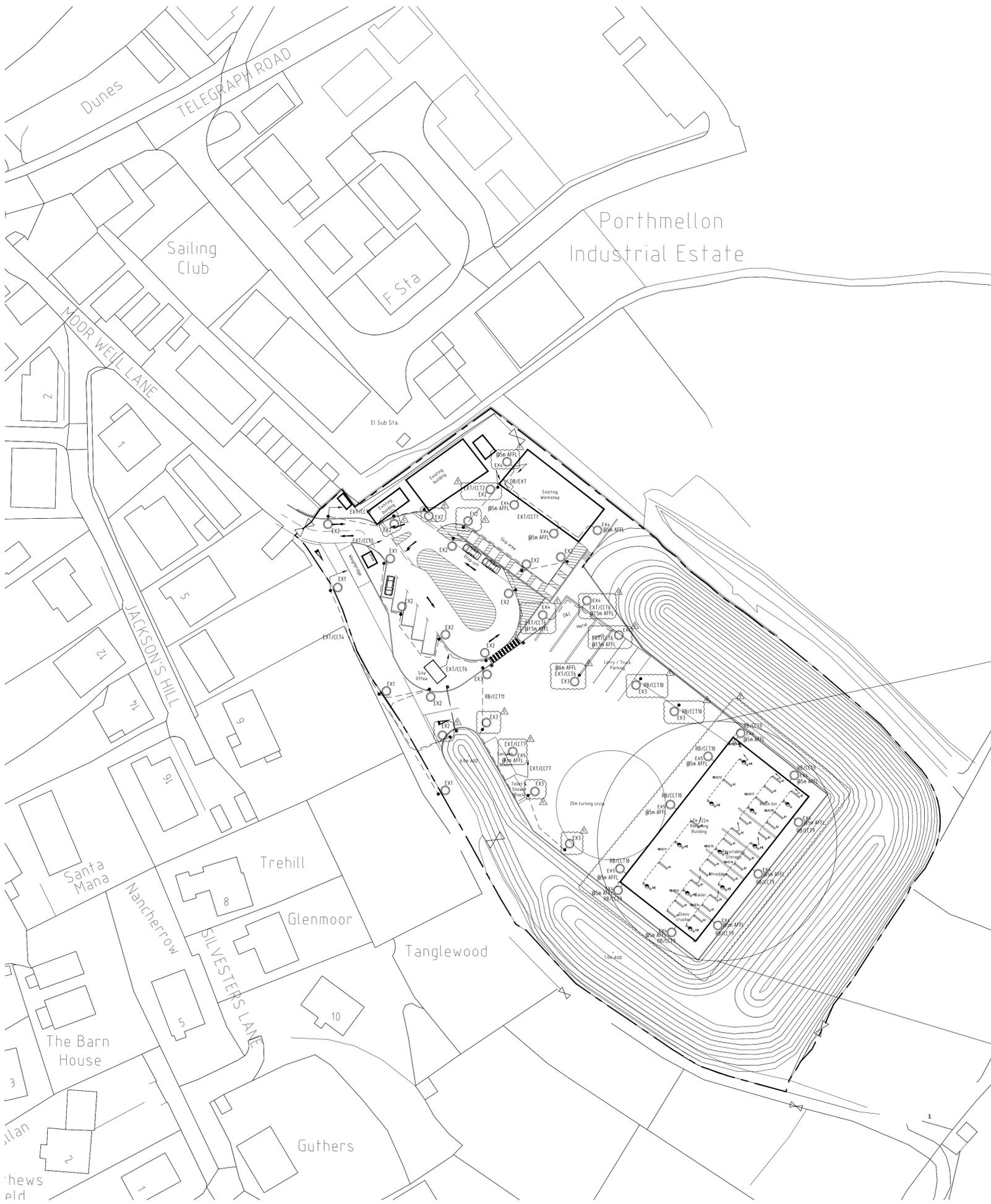
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LEGEND

- EX1 1X15W LED ROAD LANTERN POST TOP MOUNTED ON 6M COLUMN. COLUMNS TO BE HEAVY DUTY WHERE CCTV CAMERAS ARE MOUNTED. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- EX2 1X29W LED ROAD LANTERN POST TOP MOUNTED ON 6M COLUMN. COLUMNS TO BE HEAVY DUTY WHERE CCTV CAMERAS ARE MOUNTED. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- EX3 1X69W LED FLOODLIGHT POST TOP MOUNTED ON 6M COLUMN. COLUMNS TO BE HEAVY DUTY WHERE CCTV CAMERAS ARE MOUNTED. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- EX4 1X23W LED WALL MOUNTED FLOODLIGHT. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- EX5 1X69W LED WALL MOUNTED FLOODLIGHT. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- A1 CEILING MOUNTED 4x54W T5 FLUORESCENT. LUMINAIRE DETAILS AS PER LUMINAIRE SCHEDULE
- A/E AS ABOVE INCORPORATING EMERGENCY LIGHTING
- DISTRIBUTION BOARD
- NG ONE WAY LIGHT SWITCH
N DENOTES NO. OF GANG



Rev	Description	By	Ckd	Date
C	Revised lighting layout to suit latest civil engineer's engineering layout JKK8520-06 Rev A.	BT	JRS	18.06.15
B	Lighting Layout for Workshop Store and Recycling Building and Circuit References Added	BT	JRS	16.01.15
A	Preliminary Issue	BT	JRS	19.12.14



Noble House,
Capital Drive, Lindford Wood, Milton Keynes MK14 6QP
T: +44 (0)1908 669898 E: rpsmk@rpsgroup.com F: +44 (0)1908 669899



Project Porthmellon Waste Management Facility, St. Mary's, Isles of Scilly
Title Site External Lighting Layout

Status Preliminary Scale 1:500 @A1 Date Created Dec '14
Project Leader JRS Drawn By BT Checked by JRS

Drawing Number BRM07665 XX-E-6301 Rev C

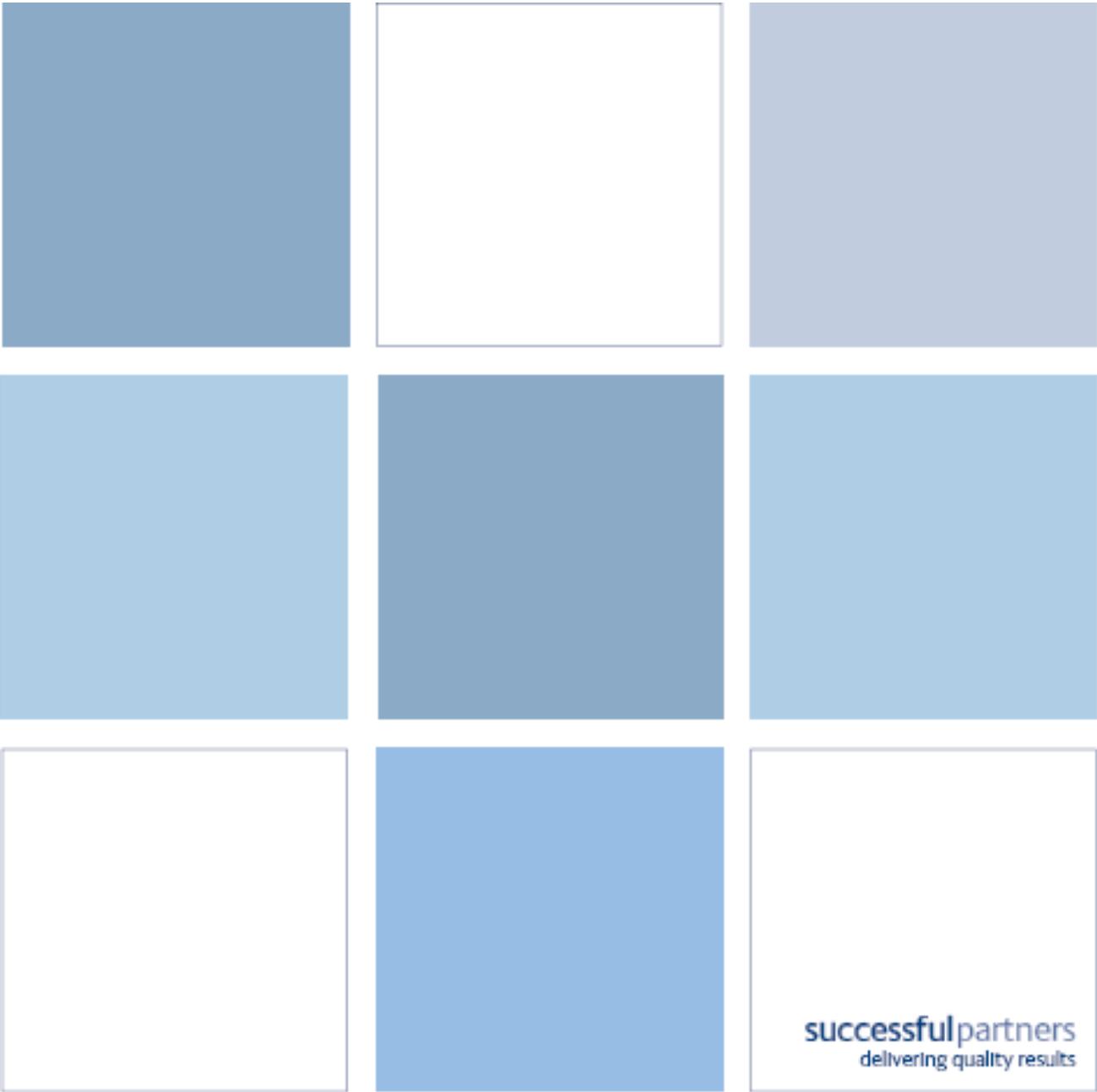
APPENDIX – ELECTRICAL DESIGN BRIEF



Electrical Design Brief

for

Porthmellon Waste Management Facility



ELECTRICAL SERVICES

DESIGN BRIEF

AT

Porthmellon Waste Management Facility,
Isles of Scilly.

RPS PROJECT No: BRM 07665

REVISION - 17-DECEMBER-2014

REVISION A 16-JANURARY-2015

REVISION B 24-FEBURARY-2015

REVISION C 19-June-2015

Author

John Sheaf

Qualifications

I.Eng MIET ACIBSE

Signature



Checked/Authorised

Danielle Sims

Qualifications

BEng(Hons) CEng MCIBSE

Signature



Contents

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1. Preface	1
2. Building Services Design Brief	2
3. General Specification Clauses	7
4. Proposed Luminaire Schedule	37



1. Preface

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2. Building Services Design Brief

Proposed External Lighting Scheme

Generally

The lighting proposals have been developed to design guidance contained within CIBSE Lighting Guide 6 "The Outdoor environment" and particularly with respect to outdoor work and storage areas, BS EN 12464-2 "Lighting of work places - Part 2: Outdoor work places" and BS EN 13201-2 "Road Lighting – Part 2: Performance requirements".

This defines preferred levels of maintained horizontal illuminance as follows:-

<u>Area or Task</u>	<u>Illumination</u>
Short term handling of large units	20 Lux
Traffic areas of slowly moving vehicles	10 Lux
Walkways exclusively for pedestrians	5 Lux
Access Road (Class S4)	5 Lux

The proposed lighting scheme has been designed to provide a site average lighting level within the HGV movement area of 20 lux and an average lighting level within the public offloading area of 10 lux.

The proposed lighting systems employ's street lantern technology providing no upward light output.

All lighting will be operated via ambient daylight level photocell controls, together with operational times to ensure that lights are extinguished at site closing time.

Drp BRM07665/XX-E6301

- Our lighting calculation method does not include a prediction for Sky Glow level and therefore direct illuminations to the sky is only assessed as being controlled by selection of lanterns having zero upwards light output ratio.
- The lighting system therefore provides a well illuminated space which unfortunately when viewed from the boundary, will be of a greater apparent brightness than that produced by the surrounding area lighting.
- The light reflected to the sky will of course relate to the final reflectance factors of the primary concrete surface of the ground slab.
- As previously confirmed all lighting will be extinguished in accordance with the planning approval.
- Minor security lighting will be provided to the operational office/cabin/workshops and will comprise energy efficient low wattage fluorescent luminaires.



External Lighting Scheme

Correlation for Design Proposals with The Institute of Lighting Engineers "Guidance Notes for the reduction of light pollution"

Various methods are suggested for reduction of unnecessary light

A1 *Do not "over light"*

The average lighting levels incorporated within the design proposals are in line with those recommended with CIBSE Lighting Guide 6 "The Outdoor Environment"

A2 *Switch off lights when not required*

As previously confirmed.

All lighting will be operated via ambient daylight level photocell controls, together with operational times to ensure that lights are extinguished at site closing time.

A3 *Use lighting equipment that minimises the upward spread of light*

Lanterns as selected have a photometric performance characteristic for upward light output ration equal to zero.

A4 *Keep glare to a minimum by ensuring that the main beam angle of all lights is directed towards any potential observer is kept below 70deg*

The proposed lighting systems employ current generation street lanterns with controlled photometric performance throughout. The column heights are 6.0 metres at the perimeter.

The aim being to produce a properly lit lighting scene providing reasonable uniformity levels Between horizontal and vertical illumination levels with the aim to reduce as far as possible conflict between vehicle and pedestrian movement within a potentially congested area.

A5 *For road lighting installations, light near to and above the horizontal should be minimised to reduce glare and visual intrusion*

As stated previously the luminaires specified employ shallow flat glass optics with limit the upward light ratio to zero.

Environmental Zones

We believe it is acceptable to view the site as falling within the **Zone E2** category with limited population (housing) site locally.

The lighting design aims to direct all lantern output into the site to minimise spillage onto adjacent properties including the access road.

The lighting system therefore aims to provide a well illuminated space to facilitate a safe operating environment for HGV and public vehicle and pedestrian movement.

Scope of works

The proposed upgrading of the existing recycling facility will provide a modern split level arrangement giving freedom of access to all user groups.

Phase 1

The lower area will be for HGV vehicles to load segregated waste streams that have been collected in the skip area and prepare them for transportation to the Recycling Building or off-site facilities for re-use.

The raised area will be for public vehicle access, parking, unloading and emptying of bulk waste into skips.

Phase 2

The transfer station will be an operational yard where HGV vehicles offload waste into a stockpile area and for heavy machinery to offload/collect waste to/from the Recycling Building.

The site of the proposed development lies within a rural zone and lighting has been designed to achieve Rural Lighting Category E2. LED luminaire that produce no UV are bat friendly and are specified for the site external lighting.

Columns

The design has focused on minimising the height of the columns the light spillage from the facility. The majority of the lighting columns are 6m high.

Floodlights

All floodlights located in the site are set at 0° above horizontal to reduce back spill light from the luminaire on to adjacent housing area. Floodlights are between 5 to 9m high. All luminaire in the transfer station are floodlights in order to reduce the number of luminaires required and some are wall mounted to reduce columns required.

This combination of lighting column heights and luminaries will provide a safe zone for members of the public and operational staff where there will be vehicle parking and unloading. These column heights will provide an optimum more uniform light delivery to ensure the safety within the operational area. With lantern and floodlight optics that will provide excellent optical and directional lighting to reduce light overspill.

The Electrical Contractor shall provide the external lighting installation as shown on Drawing No BRM07665/XX-E/6301 which shall confirm to the following:

- The installation shall be carried out utilising XLPE/SWA/PVC cables laid in ducts and trenches are shown on the relevant drawings. No allowance shall be made for in Contractors tender for trenching, ducting or concreting but he shall allow for attendance with regard to the actual erection of the columns.

RPS

- The actual trenching etc. will be carried out by the main contractor. Prior to complete backfilling the contractor shall lay Heptape warning tape at a depth of 300mm above the cable.
- The external lighting shall be switched by contactor(s) installed in the main switchroom. The coil of the contactor being switched by Quartz controlled time switch labelled "EXTERNAL LIGHTING" and photocell.



Proposed Internal Lighting Scheme

Generally

The lighting proposals have been developed to design guidance contained within SLL Code for Lighting 2012 and applicable CIBSE Guides.

This defines preferred levels of maintained horizontal illuminance as follows:-

<u>Area or Task</u>	<u>Illumination</u>
Recycling Building, Working area	300 Lux at floor level
Workshop/Store	300 Lux at floor level

The general lighting within the buildings will be provided by surface/suspended mounted linear fluorescent corrosion resistant luminaires and will be controlled by local wall mounted switches.

Wiring to these luminaires shall emanate from the respective distribution board in each building in LSF single core cable enclosed in trunking/lighting trunking to which the luminaires are fitted to. Due to the nature of the work undertaken in the buildings it is not proposed to provide any automatic lighting controls.

Emergency luminaires shall consist, of the normal luminaires converted by the use of 3-hour non-maintained inverter/battery units. The inverter/battery units shall be fitted within the luminaire construction.

All this is as indicated on **Drg BRM07665/XX-E6301**.

Self-contained 3-hour maintained illuminated exit signs will be provided for escape routes to all areas.

External luminaires immediately adjacent to the final exits from the building shall also be provided with emergency conversions.

Emergency lighting test key switches shall be provided adjacent to the normal lighting switch or adjacent to the respective distribution board in each area to enable testing of the emergency lighting. Key switches shall be incorporated within the same switch plate as the normal lighting switch wherever possible.

Cables shall be sized according to the latest IET wiring regulation.

The electrical contractor shall however check all cable sizes once all the general power requirements are known and the sub-mains feeding the various distribution boards have had the sizes fixed.

3. General Specification Clauses

CROSS-LINKED POLYETHYLENE INSULATED CABLE INSTALLATIONS

General

Armoured cross-linked polyethylene (XLPE) insulated cables shall be manufactured in accordance with BS 5467.

Un-armoured cross-linked polyethylene insulated cables shall be manufactured in accordance with I.E.C.502.

Conductors shall be high conductivity annealed copper or high purity aluminium, as specified, and shall be in accordance with BS 6360.

Copper conductors shall be stranded circular and compacted for single core cables, and shaped stranded for multi-core cables of 50mm² and above. Aluminium conductors shall be stranded circular and compacted for single core cables, and shaped solid for multi-core cables.

The neutral conductor shall be of the same cross-section as the phase conductor unless otherwise specified.

All cables shall be XLPE insulated, PVC bedded, galvanised steel wire armoured, PVC sheath overall and 600/1000 volt grade.

If armoured single core cable is specified, the armour shall be non-magnetic (i.e., aluminium wire or strip).

The outer sheath of 6,350/11,000 volt grade cable shall be coloured "red".

Where cable installed under this specification is to be fire resistant in either a power supply or control application i.e. related to firefighting or life safety systems, then compliance with BS 8519 is regarded as mandatory. The category of cable (1, 2 or 3 – 30, 60 or 120 mins) shall be related to the specific application as set out in the standard.

All cables installed under this specification shall be BASEC Approved. All cable supplied should be traceable back to its origin of manufacture. Therefore, cable drum serial numbers, etc should be logged on site to facilitate an audit trail, and such information should also be included in the O&M documentation.



Core Identification

Each conductor core insulation shall be identified by numbers, or by colours, at the option of the manufacturers, in accordance with the following sequence:

Number of Cores	Colours
Two	Phase - Brown
	Neutral - Blue
Three	Phase - Brown
	Phase - Black
	Phase - Grey
Four	Phase - Brown
	Phase - Black
	Phase - Grey
	Neutral - Blue

Routing

Cables shall be run between termination points in continuous lengths. Joints will not be allowed unless specified or approved.

All low voltage cables laid direct in the ground shall be laid at a depth of 600mm and blinded with a radial thickness of at least 100mm of sand. All high voltage cables shall be laid in a similar manner but at a depth of 900mm. The presence of underground cables shall be indicated by marker tapes laid directly above the cables after the trench has been backfilled, the tapes being approximately 300mm below the surface level. The tapes shall

be manufactured from high grade polythene 150mm wide by 0.1mm gauge, coloured yellow with the words "electric cable below" along its length.

Cables which follow the same route and are laid in the ground shall be in horizontal formation with spacing between cables where possible of not less than 150mm with the exception of single-core cables which shall be run in trefoil formation and touching along their entire length. Each group of cables shall be indicated by separate marker tapes.

Adequate cable markers of approved design shall be used to indicate the route of buried cables at intervals of not more than 75 metres and at points where change of direction occurs. Where markers are of a free-standing post type, they shall be not less than 150mm wide x 800mm high x 75mm thick, be indelibly marked 'Electrical Cable' and 300mm shall be exposed above ground.

The cables shall be marked at each end and at access points by a label indicating the cable size and circuit.

Cables under roads and rail crossings shall be run in conduits of either vitrified clay having a plastic sleeve to BS EN ISO 2556, BS EN ISO 9397, BS EN ISO 11443, BS ISO 18553, BS EN 763 and BS EN 578 to form a push fit joint, pitch fibre or proprietary corrugated plastic. The conduits shall have a minimum diameter of 100mm, have bends to suit the cables and extend 1m on either side of the road or rail crossing. Where corrugated plastic conduits are used, conduits shall be installed in straight sections between draw-in points and the length between draw-in points shall be limited to suit the expected sizes of cable to be drawn in.

Cables under floors or through walls shall be run in conduits of either vitrified clay having a plastic sleeve to BS EN ISO 2556, BS EN ISO 9397, BS EN ISO 11443, BS ISO 18553, BS EN 763 and BS EN 578 to form a push fit joint, pitch fibre or proprietary corrugated plastic. The conduits shall have a minimum diameter of 100mm and the bends to suit the cables. Where corrugated plastic conduits are used, conduits shall be installed in straight sections between draw-in points and the length between draw-in points shall be limited to suit the expected sizes of cable to be drawn in.

Cable conduits and ducts that terminate in buildings shall be sealed with a permanently plastic weatherproof sealing compound in conjunction with hardwood bushes to prevent the ingress of water, foreign matter and vermin. Any spare conduits and ducts shall be similarly sealed.

Cables shall be installed only when both the cable and ambient temperature are at or above a temperature of 5°C and have been so kept for the previous 24 hours, or when special precautions have been taken to maintain the cable at or above this temperature to avoid risk of damage during handling.

Unless otherwise specified, cables run in air, including engineering service ducts, shall be fixed with aluminium alloy or approved non-inflammable claw cleats with galvanised back-straps using galvanised bolts conforming to BS 4190 with maximum spacing between supports as detailed in Section 522.8 of BS 7671+A1. Cleats for cables up to and including 50mm dia. shall be fixed by a single bolt and above 50mm dia. by 2 bolts. The correct size of cleat fixing stud shall be provided to suit the cable size to ensure that the stud does not extend appreciably beyond the tightened nut. Excess pressure of cleats on P.V.C. - insulated cables shall be avoided to prevent deformation of the plastic sheathing to BS EN ISO 2556, BS EN ISO 9397, BS EN ISO 11443, BS ISO 18553, BS EN 763 and BS EN 578. Suitable

supporting steelwork and/or galvanised cable tray shall be provided where cables cross open spaces. Such steelwork shall be protected by a rust inhibiting paint.

In addition to the above, all cables shall be installed in accordance with manufacturer's instructions/requirements.

Installation Bending Radius

Cables shall not be bent during installation to a radius smaller than 8 times the overall diameter of the cable.

Jointing and Terminating

General

The jointing and terminating of all cables shall be performed by an experienced cable joiner trained and fully conversant with modern techniques and once the cable is cut for the purpose of making a joint or termination the work involved shall be completed without interruption; if for any reason the work cannot be completed then the cable ends shall be sealed immediately with P.V.C. tape.

All cable joints and terminations shall be supplied except the termination to the Supply Authority's service cable box. All switchgear supplied by others will be complete with cable boxes but not terminating materials.

All joints shall be made in cast iron or moulded plastic boxes to BS EN ISO 2556, BS EN ISO 9397, BS EN ISO 11443, BS ISO 18553, BS EN 763 and BS EN 578, purpose made for XLPE/PVC/SWA/PVC sheathed cables. All joints shall be selected from the cable manufacturer's selection chart suitable for the size of cable and type of joint required. The complete jointing technique shall be carried out strictly in accordance with the manufacturer's recommendations, and particular attention should be paid to the installation of earth bonding clamps in joints and terminations, to ensure that each armour wire or strip contributes equally to the conductance of the bonding connection, and that the resistance across a connector is not higher than that of the equivalent length of connected armour of the cable.

Where cables are terminated outside buildings or in damp situations compound filled boxes shall be used.

Particular attention shall be paid to ensure earth continuity of the cable armouring, cast iron boxes being provided with armour clamps and moulded plastic boxes to BS EN ISO 2556, BS EN ISO 9397, BS EN ISO 11443, BS ISO 18553, BS EN 763 and BS EN 578 with armour clamps and a copper strip. After completion of the joints, cast iron boxes shall be painted with two coats of bitumastic paint.

Cable jointing using cold-pour resin compound and heat-shrink cable joints shall be carried out in accordance with BS 6910: Parts 1 and 2, for the voltage range up to 1000V ac and 1500V dc.



a) **XLPE Insulated, Armoured, PVC Sheathed Cable with Copper Conductors**

Joints shall be of the indented compression type made by means of a hydraulic compression ramhead and suitable compression dies according to the core size of the cable, with strict adherence to the cable manufacturer's recommendations on accessories, ferrules, compression pressures and jointing techniques.

Terminations shall be made using the indented compression method with sockets of soft tinned copper, shaped to match the profile of the conductor core. Suitable approved aluminium cable glands with earth tag washers shall be used and the glands protected with PVC shrouds. Clamps around the armour for earth bonding will not be accepted.

All metal to metal contacts at termination points, gland to armour contacts and dissimilar metal contacts shall be smeared with an approved grease.

b) **Cable Glands**

All cable glands for terminations shall be manufactured in brass or aluminium as applicable, and shall be in accordance with BS EN 50262. All glands shall be provided with locknuts, earth tags and PVC shrouds.

c) **Through Joints**

Through joints shall not be allowed in any cables without prior written approval from the Services Engineers.

Cabling Glanding

Cables shall be terminated/glanded into equipment and distribution boards as follows:

- i) All conductors (including neutral) via a single aperture, bush or gland.
- ii) Should single core cables be routed through an aperture of a cable ladder, then care shall be taken to ensure each cable conductor, including the neutral of a circuit, be routed via the same aperture.

The above is to avoid the effects of circulating eddy currents. Any queries shall be raised with the Engineer prior to setting to any works.



LOW SMOKE AND FUME (LSF) CABLES

General

Low smoke and fume (LSF) cables shall be manufactured from materials which have been tested in accordance with: BS 6724 and BS 7629.

Where cable installed under this specification is to be fire resistant in either a power supply or control application, i.e. related to firefighting or life safety systems, then compliance with BS 8519 is regarded as mandatory. The category of cable (1, 2 or 3 – 30, 60 or 120 mins) shall be related to the specific application as set out in the standard.

All cables installed under this specification shall be BASEC Approved. All cable supplied should be traceable back to its origin of manufacture. Therefore, cable drum serial numbers, etc should be logged on site to facilitate an audit trail, and such information should also be included in the O&M documentation.

Routing

Cables shall be run between termination points in continuous lengths. Joints will not be allowed unless specified or approved.

All low voltage cables laid direct in the ground shall be laid at a depth of 600mm and blinded with a radial thickness of at least 100mm of sand. The presence of underground cables shall be indicated by marker tapes laid directly above the cables after the trench has been backfilled, the tapes being approximately 300mm below the surface level.

The tapes shall be manufactured from high grade polythene 150mm wide by 0.1mm gauge, coloured yellow with the words "electric cable below" along its length. Concrete interlocking cable tiles shall be installed to cover all mains and sub-mains distribution cables laid in the ground.

Cables which follow the same route and are laid in the ground shall be in horizontal formation with spacing between cables where possible of not less than 150mm with the exception of single-core cables which shall be run in Trefoil formation, with each trefoil group separated by a minimum distance of 300mm. Neutral cables shall be laid between Trefoil groups. Each group of cables shall be indicated by separate marker tapes.

The cables shall be marked at each end and at access points by a label indicating the cable size and circuit.

Cables under roads shall be run in conduits of either vitrified clay having a plastic sleeve to BS EN 50086-2-4 to form a push fit joint, pitch fibre or proprietary corrugated plastic. The conduits shall have a minimum diameter of 100mm, have bends to suit the cables and extend 1m on either side of the road.

Where corrugated plastic conduits are used, conduits shall be installed in straight sections between draw-in points and the length between draw-in points shall be limited to suit the expected sizes of cable to be drawn in.

Cables under floors or through walls shall be run in conduits of either vitrified clay having a plastic sleeve to BS EN 50086-2-4 to form a push fit joint, pitch fibre or proprietary corrugated plastic.

The conduits shall have a minimum diameter of 100mm and the bends to suit the cables. Where corrugated plastic conduits are used, conduits shall be installed in straight sections between draw-in points and the length between draw-in points shall be limited to suit the expected sizes of cable to be drawn in.

Cable conduits and ducts that terminate in buildings shall be sealed with a permanently plastic weatherproof sealing compound in conjunction with hardwood bushes to prevent the ingress of water, foreign matter and vermin. Any spare conduits and ducts shall be similarly sealed.

Cables shall be installed only when both the cable and ambient temperature are at or above a temperature of 5°C and have been so kept for the previous 24 hours, or when special precautions have been taken to maintain the cable at or above this temperature to avoid risk of damage during handling.

Unless otherwise specified, cables run in air, including engineering service ducts, shall be fixed with aluminium alloy or approved non-inflammable claw cleats with galvanised back-straps using galvanised bolts conforming to BS 4190 with spacing between supports to comply with BS 7671:2008+A1:2011 and the manufacturer's recommendations. Cleats for cables up to and including 50mm dia. shall be fixed by a single bolt and above 50mm dia. by 2 bolts.

The correct size of cleat fixing stud shall be provided to suit the cable size to ensure that the stud does not extend appreciably beyond the tightened nut. Excess pressure of cleats on P.V.C. - insulated cables shall be avoided to prevent deformation of the plastic sheathing. Suitable supporting steelwork and/or galvanised cable tray shall be provided where cables cross open spaces. Such steelwork shall be protected by a rust inhibiting paint.

In addition to the above, all cables shall be installed in accordance with manufacturer's instructions/requirements.

Installation Bending Radius

Cables shall not be bent during installation to a radius smaller than eight times the overall diameter of the cable.

Jointing and Terminating

a. General

The jointing and terminating of all cables shall be performed by an experienced cable joiner trained and fully conversant with modern techniques and once the cable is cut for the purpose of making a joint or termination the work involved shall be completed without

interruption; if for any reason the work cannot be completed then the cable ends shall be sealed immediately with P.V.C. tape.

All cable joints and terminations shall be supplied except the termination to the Supply Authority's service cable box. All switchgear supplied by others will be complete with cable boxes but not terminating materials.

All joints shall be made in cast iron or moulded plastic boxes, purpose made for XLPE/LSF/SWA/LSF sheathed cables. All joints shall be selected from the cable manufacturer's selection chart suitable for the size of cable and type of joint required.

The complete jointing technique shall be carried out strictly in accordance with the manufacturer's recommendations, and particular attention should be paid to the installation of all bonding clamps in joints and terminations, to ensure that each armour wire or strip contributes equally to the conductance of the bonding connection, and that the resistance across a connector is not higher than that of the equivalent length of connected armour of the cable.

Where cables are terminated outside buildings or in damp situations compound filled boxes shall be used.

Particular attention shall be paid to ensure earth continuity of the cable armouring, cast iron boxes being provided with armour clamps and moulded plastic boxes with armour clamps and a copper strip. After completion of the joints, cast iron boxes shall be painted with two coats of bitumastic paint.

Cable jointing using cold-pour resin compound and heat-shrink cable joints shall be carried out in accordance with BS 6910: Parts 1 and 2, for the voltage range up to 1000V ac and 1500V dc.

b. XLPE Insulated, Armoured, LSF Sheathed Cable with Copper Conductors

Joints shall be of the indented compression type made by means of a hydraulic compression ramhead and suitable compression dies according to the core size of the cable, with strict adherence to the cable manufacturer's recommendations on accessories, ferrules, compression pressures and jointing techniques.

Terminations shall be made using the indented compression method with sockets of soft tinned copper shaped to match the profile of the conductor core.

Suitable approved brass cable glands with earth tag washers shall be used and the glands protected with PVC shrouds. Clamps around the armour for earth bonding will not be accepted.

All metal to metal contacts at termination points, gland to armour contacts and dissimilar metal contacts shall be smeared with an approved grease.

c. Cable Glands

All cable glands for terminations shall be manufactured in brass and shall be in accordance with BS EN 50262. All glands shall be provided with locknuts, earth tags and PVC shrouds.



Single Core Cables

Single core cables shall be 450/750 volt rated and shall have copper conductor insulated with a cross linked LSF material.

The cables shall comply in full with BS EN 50525-3.

Single core, armoured cables shall have aluminium wire armour and conform to the same standards as multi-core armoured cables.

Multi-Core Cables

Multi-core cables shall be 600/1000 volt rated and shall be XLPE insulated, LSF compound bedded, galvanised steel single wire armoured or un-armoured as required, and LSF compound sheathed to comply fully with BS 6724.

Cabling Glanding

Cables shall be terminated/glanded into equipment and distribution boards as follows:

- i. All conductors (including neutral) via a single aperture, bush or gland.
- ii. Should single core cables be routed through an aperture of a cable ladder, then care shall be taken to ensure each cable conductor, including the neutral of a circuit, be routed via the same aperture.

The above is to avoid the effects of circulating eddy currents. Any queries shall be raised with the Engineer prior to setting to any works.

CABLES IN CONDUIT AND TRUNKING

General

Cables to be drawn into conduits or trunking shall be selected in relation to working temperature in accordance with the following table:-

Working temperature:	Cable:
not exceeding 65°C	450/750V grade PVC to BS 6004:2012, BS EN 50525-1:2011 HO7V-R/HO7V-U
not exceeding 80°C	85°C rubber compound insulated to BS EN 50525-1:2011
not exceeding 145°C	150°C rubber compound insulated to BS EN 50525-1:2011

The elastomer-insulated cables shall be identified throughout the length of the cable by the legends 'Heat Resisting 85' for 85°C rubber insulated and 'Heat Resisting 150' for 150°C rubber insulated either printed on a tape within the cable, or printed, indented, or embossed externally, the gap between the end of one legend and the beginning of the next not exceeding 300mm.



Only multi-strand conductor cables shall be used for installation within conduit and trunking. The number of cables drawn into any conduit or trunking shall only be such an amount so as to comply with Section 522.8 of BS 7671+A1.

Circuit cables shall not be drawn in until the conduit or trunking of that circuit is completed and the building weatherproof. Conduits shall not be dismantled for wiring operations.

During installation cables shall be combined to facilitate drawing-in and possible replacements. Cable joints shall not be used unless specified on written approval.

Cables of A.C. circuits installed in steel conduit or trunking shall always be so bunched that the cables of all phases and the neutral conductor, if any, are contained in the same conduit or trunking.

Except in lighting installations including emergency circuits, cables from separate distribution boards shall be run in separate and individual conduit and trunking wire-ways. Normal and emergency supply cables from different distribution boards feeding the same lighting points may (subject to detail design) occupy the same wire-way, providing they are separately identified and insulated to the higher voltage present.

Where cables of several circuits occupy the same trunking the cables of each circuit shall be bound together by clips or other approved means. Circuits shall be further grouped and bound to provide easy means of identification.

Cables and Installations

Cables associated with an installation shall not be installed in shared wire-ways associated with another installation. That is to say, any installation shall be arranged such that it is separate physically and electrically, particularly in respect of cable wire-ways.

TRUNKING INSTALLATIONS

Cable Trunking

All cable trunking shall be manufactured by a single Company who shall be accredited to the requirements of BS EN ISO 9002 for manufacture.

General



The trunking shall be supplied in standard lengths, each length including a coupling sleeve, and be free from all sharp edges and projections.

The lids of all trunking shall be drip proof and a tight fit securely fixed to the trunking by an approved means that will avoid damage to the cables. Self-tapping screws or fixed bridge pieces shall not be used to hold the cover in position.

Flush type covers shall be fitted when trunking is installed flush with the building fabric. The finished edge of the trunking shall finish flush with the finished surface.

Vertical trunking shall be fixed to the building structure at intervals of 1.2m or as specified in the Schedules or drawings.

Horizontal trunking shall be either suspended by hanger fittings and conduit or mild steel rod or supported by mild steel or angle iron brackets. Suspensions and supports which will be visible shall be painted to match the trunking.

No suspensions or fixings shall intrude into the internal space unless otherwise specified.

Where trunking passes through walls and partitions the cover shall terminate at either side of the wall at a point 80mm from the wall. Between the removable covers a fixed section of cover shall be installed through the wall.

Manufacturers' standard fittings shall be used. Only where these are inadequate to meet special local situations will fabricated fittings be accepted. Where special fittings or sections of trunking are fabricated, they shall be prepared and finished to the same standard as manufactured standard items.

All trunking shall be provided with internal fire barriers in accordance with Section 527-02 of BS 7671+A1. Internal fire barriers shall be made by binding the cables and filling the spaces with suitable fire resistant material.

Trunking shall be run in vertical and horizontal directions except where it is desirable to follow the line of a constructional feature, in which case approval shall be obtained.

In vertical runs cable support pins shall be fitted at intervals not exceeding 5m for P.V.C. insulated cable or in accordance with Section 522.8 of BS 7671+A1 for other types of cables.

In horizontal runs cable retaining straps or holders shall be provided at intervals of not more than 1m where the lid is on the under-side of the trunking.



Connections between trunking and any equipment or apparatus shall be by means of flanged couplings, screwed conduit coupler with smooth bore bush or fixed insulated flame resistant 'FR-2' type spacer pieces with fixed grommets. Direct attachment of trunking to equipment or apparatus without couplings or involving the need to cut the return edge of the trunking shall not be permitted.

Where trunking connects directly to distribution boards, the cable entry point(s) shall be sized to accommodate cabling from all used and spare ways.

At constructional expansion joints the trunking shall be provided with a sliding coupling complete with flexible earth continuity tape.

Where conduits are connected to multi-compartment trunking, the trunking shall be drilled to allow the conduits to pass right through to the appropriate section, should direct access to a compartment not be possible.

Steel Trunking (Not Bus Bar or Rising Mains Trunking)

Trunking and connectors shall comply with BS 4678: Part 1, Class 3 finish unless otherwise specified.

A copper earth bonding link shall be fitted between adjacent lengths of trunking and between all trunking fittings and adjacent trunking, and supplied by the trunking manufacturer, arranged on the outside of the trunking and fittings on all surface trunking (see separate clause on Floor Trunking). These links are to be relied upon for earth continuity and must be of a size to comply with Section 543 of BS 7671.

Steel thicknesses shall be at least 1.0mm for 50mm x 50mm trunking, 1.2/1.4mm for trunking above 50mm x 50mm and up to 150mm x 150mm and 1.6mm for trunking of 150mm x 150mm and above.

Where two or more services, required to be segregated in accordance with Section 528 of BS 7671:2008+A1:2011, are installed in a common trunking they shall be effectively segregated by earthed steel partitions.

Trunking shall not be used on an outdoor installation unless the trunking and accessories have a hot dipped galvanised finish. In such an installation the trunking must not be installed in a position liable to give ingress to driving rain.



Lighting Trunking

The type of lighting trunking shall be as specified and the position of runs and luminaires shall be as shown on the drawings.

Where the weight of a luminaire is supported by cable trunking the fixing of the trunking shall be adequate for the purpose. The support of luminaires from the trunking shall be by means of proprietary clamps or brackets. Where the trunking is visible the supports and proprietary fixings shall be painted to match the trunking.

DISTRIBUTION BOARDS

General

The Schedules or drawings specify whether distribution boards are to be provided with fuses or miniature circuit-breakers (M.C.B.). All spare fuseways shall be provided with fuses, M.C.B's or manufacturers standard blanking pieces.

All distribution boards shall be provided with a fully rated neutral bar with an outgoing way per fuse or MCB, together with a multi-way earthing bar with one outgoing way per fuse of MCB. A facility shall be provided for additional earthing terminals for compliance with Section 543.7 to BS 7671.

Each distribution fuseboard board, miniature circuit breaker board and consumer unit, shall be identified by an externally fitted, engraved multi-layered phenolic plastic label inscribed with the board reference number and supply origin as shown in the Schedules and Drawings.

Each label shall also be provided with the following information externally fitted to the access door:

- i. The reference and current rating of the device serving the equipment.
- ii. The location and reference of the device via which the equipment derives its electrical energy.
- iii. The voltage present.
- iv. The cable size, type and number of cores serving the equipment.



Within each distribution board a full circuit chart shall be provided on the rear of the door and this shall identify the following:

- i. Circuit reference.
- ii. Protective device rating and type.
- iii. Phase conductor CSA.
- iv. Circuit protective conductor CSA.
- v. Circuit type.
- vi. Circuit location.
- vii. Apparatus served.
- viii. Provision so that the circuit details can be modified at a later date.

The chart shall be encapsulated within an ABS plastic laminate.

In each distribution board there shall be an approved label which may be a card enclosed in a non-flammable transparent plastic envelope securely fixed to the inside of the door. The label shall show the number of each way, its reference as indicated in the Schedules or drawings, the rating of the fuse link or M.C.B., the cable size and the apparatus connected.

The label shall be so arranged that the circuit details can be modified at a later date. The ways shall be clearly identified either by the M.C.B. or fuse-bases and carriers being indelibly numbered in an approved manner or by the label. This may be by means of a numbered plan or a printed statement to the effect that the numbering of the ways is from left to right.

Instructions shall be obtained for any mounting heights that are not particularly specified.

All fixing materials, including any necessary steelwork, shall be supplied.

Where a surface distribution board is used in a concealed installation, the cables and conduits shall be brought into a flush adaptable box located behind the board and enter the board through a bushed aperture(s) in the back. The size of the aperture(s) in the back of the distribution board, and



the number and size of conduits serving the adaptable box shall be calculated on the basis that all outgoing ways are utilised. (Spare ways shall be assumed to be ring main circuits.)

Distribution Fuseboards

Distribution fuseboards shall be robust construction manufactured from rust protected steel to IP4X standard.

Enclosures with rated units from 20 amp to 100 amp shall be welded construction. Larger rated units shall have additional cast corner pieces.

All boards shall be fully gasketed complete with top and bottom end plates and internal fixing holes.

Distribution board doors shall be equipped with barrel-type locking devices and door latches or knurled finger operated screws.

Each board shall be provided with a minimum of two keys, which shall be common to all boards.

Busbar, main terminals and all live parts of the distribution board shall be fully shrouded.

Fuse units shall have skirted fuse carriers to prevent contact with live parts when withdrawing or inserting a carrier.

Where specified, switch disconnectors shall be provided, matching the pattern, colour and manufacturer of the distribution board.

Switch disconnectors shall be close coupled directly below the distribution board unless otherwise specified.

Switch disconnectors shall be identified by an external engraved multi-layered phenolic plastic label inscribed with reference number, the supply origin and size/number of cores of the supply cable.

Switch disconnectors shall be tested to BS EN 60946-3 and meet the constructional requirements.

Switches shall be quick make and break type, suitable for use on AC or DC. Units shall have removable internal contact assemblies and padlocking facilities.



All distribution boards shall be in compliance with the latest national and international standards.

BS 88: 2010 HRC Carriers

BS HD 60269-2:2010

BS EN 60269-1

ASTA 20 Certified Fuse Links

Fuse Units Availability Types A to D

Insulation Voltage 660 Volt AC 500 Volt DC

Miniature Circuit-Breaker Boards

Standard SPN DP 100A 125A 200A TPN.

M.C.B. distribution boards shall be manufactured from rust protected sheet steel with painted finish and be provided with heavy gauge removable top and bottom gland plates and internal fixing holes.

Boards shall be provided with fully shrouded busbars and neutral bar and the pan assemblies shall be fully removable.

The distribution board door shall be equipped with barrel type locking devices and latches.

Each board shall be provided with a minimum of two keys, which shall be common to all boards.

Where specified, switch disconnectors, RCCB or MCCB disconnectors, shall be located as an integral part of the board.

Where larger disconnectors are specified, they shall be provided matching the pattern, colour and manufacturer and close coupled directly below the distribution board.



All distribution boards shall be in compliance with the latest national and international standards:

BS 5486: Parts 13

BS EN 60439-3

BS EN 60439-3 Distribution Board

BS EN 60898-2:2006 Types B, C, D

BS EN 60947-2 15 kA MCB's

BS EN 60947-3 Switch Disconnectors

BS EN 61008 RCCB

BS EN 61009 RCBO

BS EN 60947-2

IEC 60947-2 MCCB

Consumer Units

Consumer units shall be metal construction, as specified.

They shall be provided with totally encapsulated busbar providing a safety rating of IP2XB and an internal IP rating to be BS EN 60529.

All M.C.B. consumer units shall be in compliance with the latest national and international standards.

BS EN 60439-3

CM 16 Test Consumer Unit



BS EN 60947-2 15 kA MCB's

BS EN 61008 RCCB

BS EN 61009 RCBO

BS EN 60946-3 Switch Disconnecter

LIGHTING INSTALLATIONS

Luminaires

All luminaires listed in the lighting schedule shall comply with BS EN 60598 and be supplied and installed complete with lamps. Where a choice of colour of either metalwork or glasswork is available for the luminaires and none is specified, the colour will be specified at a later date.

All fluorescent luminaires shall be complete with a fused terminal block. The fused terminal block shall include a suitable size fuse, protective terminal cover and terminals, sized to suit installed cables specified elsewhere.

If different colour finishes alter the price of the luminaires the standard finish shall be the basis on which the tender is made unless otherwise specified.

When tubes are inserted in luminaires the tube details shall face downwards.

Installed luminaires shall not be used for temporary lighting without the Services Engineer's approval.

All diffusers, louvres and glassware for luminaires shall be cleaned, immediately prior to handover.

All lamps and luminaires shall be disposed of by an approved Contractor.



Lighting Points

i. Wiring

The minimum size of cable for lighting circuits shall be 1.5 sq.mm.

Circuit wiring in lighting trunking shall be looped into P.V.C. flexible terminal blocks suitable for the temperature at which they will operate.

Circuit wiring in conduit, with luminaires mounted on the conduit system, shall terminate within the luminaire using heat resisting cables or sheath.

Circuit wiring in conduit, with luminaires mounted remote from the conduit system, shall terminate at a luminaire supporting coupler (LSC) to BS 7001. Final connection shall be by means of flexible cable.

Wiring to all luminaires shall be non-hygroscopic and heat resisting.

Where continuous lines of surface mounted luminaires are specified, through wiring will be permitted provided that the proposed method of erection, lining up and connection of the luminaires is acceptable. If this is not the case, then a separate loop-in conduit or M.I.M.S. system shall be made to each luminaire. Continuous runs shall be mounted true and in a straight line with no gap between adjacent luminaires.

If through wiring is permitted this shall be fixed clear of the control gear in the luminaires and where this is not possible high temperature P.V.C. wiring shall be used. All holes through luminaires for through wiring shall be bushed and an insulated 1.5 sq.mm earth wire shall be run between all the luminaires in the run.

Wiring to the lampholders of tungsten filament luminaires which are not equipped with cool wiring devices or suspended from ceiling roses shall be silicone-rubber-insulated and braided or glass fibre insulated capable of withstanding a temperature of 140°C.

Flexible pendant drops shall be white circular heat-resisting P.V.C. insulated and sheathed cable of conductor cross sectional area not less than 0.75 sq.mm, unless otherwise specified.

Wiring to luminaires shall also be in accordance with the particular manufacturers recommendations.



ii. Erection of luminaires

Decorative luminaires shall be suspended by the manufacturer's pendant sets which shall include all necessary suspension wires.

Luminaires shall be mounted at the heights given in the Schedules or drawings.

Fluorescent luminaires shall have fixing and cable entry arrangements on two centres to suit the luminaires. The fixing arrangement shall be suitable for use with conduit boxes.

For luminaires in suspended ceilings the cabling or conduit system shall terminate in a BS box above the ceiling. From the conduit box to the luminaire either of the following methods of wiring may be used.

- a) An internal threaded dome cover with a cable gland for flexible cord shall be fixed to the BS box and a flexible cord shall be run from the dome cover to the fitting.
- b) A multi terminal ceiling rose with socket and plug attachment shall be fitted to the box and a flexible cord run to the luminaire. The flexible cord shall be secured to the luminaire by use of a suitably sized compression gland.

Flexible cords shall be 3-core 0.75 sq.mm. in 6 amp circuits, 1.0 sq.mm in 10 amp circuits, and 1.5 sq.mm in 16 amp circuits. The third core of the flexible cord shall be used for earth continuity and shall be securely fixed to the conduit box and luminaire.

For surface mounted luminaires the cabling or conduit system shall terminate in a BS box to which the luminaire is fitted.

Suspended fluorescent and industrial-type tungsten luminaires shall be suspended by rigid conduit from ball-and-socket dome covers or drop rods. Such dome covers shall be fitted with flexible copper connectors between the ball and the socket.

Where suspended fluorescent luminaires are specified they shall be suspended to suit the lighting calculations but generally subject to a minimum mounting height of 2400mm.

Approved angle blocks shall be provided for luminaires suspended from or mounted on sloping surfaces.

Break-joint rings of approved colour shall be provided wherever the diameter of the ceiling rose or plate from which a luminaire is suspended or the diameter of the gallery or the width of the spine of



a surface mounted luminaire does not exceed the diameter of the aperture in the ceiling for the associated conduit box by at least 10mm. If this requirement causes a break-joint ring to be provided for any luminaire, then break-joint rings shall be used for all other similar luminaires in the same room or area.

Fluorescent luminaires which are to be mounted end to end in continuous rows shall be provided with all necessary jointing pieces for the battens and diffusers or reflectors. The manufacturer shall be informed of the precise quantities required at the time of ordering to avoid delay. Battens for which special jointing pieces are not provided shall be butted together and connected by means of smooth bore bushes and locknuts tightened up to ensure that no gap appears between adjacent battens. End caps shall be fitted only at the ends of rows.

All luminaires shall be carefully stored before erection and, prior to handover, any damaged paintwork made good and the complete luminaires cleaned.

M.I.M.S. Cables at Lighting Points

Lighting points shall not be used as M.I.M.S. cable junction boxes for the through-connection of switch wires. Not more than three connectors will be permitted at any lighting point.

Strap wires for two-way or intermediate switching shall be connected directly between switches and not through lighting points.

From each ganged switching position, cables to lighting points shall be limited to single and twin core cables or a multi-core cable shall be taken to a separate junction box from which separate cables shall be run to a point in each switched group of lights. Such a junction box shall be used in a concealed installation only if it can be fixed in a concealed but accessible position e.g., behind a demountable ceiling panel.

The junction box used for this purpose shall be complete with lid and porcelain multiple connector blocks with sufficient ways to suit the number of connections necessary. The connector block shall be fixed to the base of the box using M4 bolts and nuts. All terminals in this connector block shall be adequately marked for identification, securely fixed within the box.

When a system of dry construction is used the junction box and cable glands need not be used.



Ceiling Roses

Ceiling roses shall comply with BS 67 and be of approved manufacture. They shall be coloured white having a moulded plastic base suitable for direct mounting on to a conduit box and three terminals, plus earth terminal, the 'live' terminal being shrouded.

Plug-in ceiling roses shall be coloured white having a moulded plastic base suitable for direct mounting onto a conduit box and a 2 amp, 3 pin socket, (4 pin if emergency circuit connection required) plug and locking cover. The base shall have three (or four) terminals plus earth terminal, the 'live' terminals being shrouded.

Lampholders

Lampholders shall comply with BS EN 61184 and be effectively earthed where of metal.

Where lampholders are screwed direct to conduit systems they shall be brass, unless they are installed in a bathroom or toilet when they shall be insulated.

Lampholders which are not electrically continuous shall be complete with Home Office pattern skirts.

Lampholders used in conjunction with P.V.C. sheathed cables shall be provided with a cable grip.

Batten lampholders shall be suitable for direct mounting on circular conduit boxes.

Unless otherwise specified lampholders for emergency lighting systems shall be SBC, positioned to such a way as to place the lamp specified in its normal position.

Lamps

The sizes, types and colours of lamps are shown on the Schedules or Drawings.

Tungsten filament lamps shall have coiled coil filaments where they are available, and unless otherwise specified those of ratings up to 200 watts shall be pearl, or silicone coated.



Tungsten filament lamps up to and including 150 watts shall be fitted with bayonet caps 200 watt lamps with Edison screw caps and lamps exceeding 300 watts with Goliath Edison screw caps except when the fitting specified requires otherwise.

Lamps for use at a voltage other than 230v shall be fitted with caps which prevent them from being used in 230v lampholders.

Local Lighting Switches

Lighting switches shall be manufactured in accordance with BS 3676 and shall be of the type and ratings shown in the Schedules or Drawings. The mounting height to the centre of the switch shall be 1.0m to meet DDA requirements unless otherwise specified, and where the structure and furnishings permit, the distance from the edge of the architrave to the near edge of the switch shall be 150mm.

Where several switches on one phase are shown at one position, a ganged box shall be used. Different phases shall not be ganged in one box unless each phase is segregated in a separate compartment which is covered by a separate internal warning plate.

Where possible the arrangement of switches in ganged boxes shall be similar in plan to the lighting points which they control. Switches not so arranged shall be labelled in an approved manner to indicate the circuits controlled.

Sunk switches shall be mounted in sheet steel or malleable cast iron boxes of minimum depth 37mm fitted with adjustable grids to allow for variations in the thickness of plaster.

The faceplates of sunk switches shall be fixed square and flush with the wall. Fixing rings shall not be the only means of securing the faceplates.

The swing of all doors shall be checked on site before marking out any chases for switch positions.

Surface mounted switches connected to surface conduits shall be fitted to either malleable cast iron or pressed steel boxes with cover plates giving protection to the switching mechanism.

Watertight switches shall be in malleable cast iron boxes with spout nipple entries.

Lighting switches installed in ducts shall be of the weatherproof type.



Ceiling switches shall be fixed to circular BS boxes using break-joint rings. The switches shall be white or ivory coloured, and fitted with silent interiors.

In rooms where inflammable gases are used, switches and controls for electrical plant on perimeter walls shall be of the flush pattern fitted with brass plates of the finish specified in flush steel or malleable cast iron boxes.

Any requirement in such rooms for sparkless switches will be particularly specified, and where they are required, they shall be of the same pattern of switch module, switchplate, box and finish as the other switches in the same area or room.

All switches for use in hazardous and explosive gas atmospheres shall be suitable for the area they are to be installed.

The installation of earth connections for lighting switches shall be as detailed in the Earthing and Bonding Section of this specification.

Emergency Lighting Test Switches

Emergency lighting test switches shall be manufactured in accordance with BS 3676 and shall be of the secret key gridswitch type complete with neon indicator which shall be illuminated when the keyswitch is in the 'Test' position.

The cover plate shall be engraved 'Emergency Lighting Test Switch' in red letters approximately 3mm high.

The mounting height to the centre of the switch shall be 1.0m to meet DDA requirements unless otherwise specified, and where the structure and furnishings permit, the distance from the edge of the architrave to the near edge of the switch shall be 150mm.

Different phases shall not be ganged in one box unless each phase is segregated in a separate compartment which is covered by a separate internal warning plate.

Where possible the emergency lighting test switches shall form part of the switchplate for the general lighting. Where this is not possible, the emergency lighting test switches shall be located adjacent to the general lighting switches. The arrangement of the test switches shall be similar in plan to the lighting points which they control. Switches not so arranged shall be labelled in an approved manner to indicate the circuits controlled.



Sunk switches shall be mounted in sheet steel or malleable cast iron boxes of minimum depth 37mm fitted with adjustable grids to allow for variations in the thickness of plaster.

The faceplates of sunk switches shall be fixed square and flush with the wall. Fixing rings shall not be the only means of securing the faceplates.

The swing of all doors shall be checked on site before marking out any chases for switch positions.

Surface mounted switches connected to surface conduits shall be fitted to either malleable cast iron or pressed steel boxes.

Emergency Lighting

The following statutory documents apply to emergency lighting:-

1. Health and Safety at Work Act 1974.
2. Fire Precautions Act 1971.
3. Fire Certificates (Special Premises) Regulations 1976.

Other special conditions will apply relating to Local Fire Officer and Local Authority requirements, and the like and these will be detailed in the Specification where applicable. The equipment shall comply with the following British Standards:-

BS EN 60598-2-22	Luminaires.
BS EN 61558-1 & BS EN 60742	Safety isolating transformers for industrial and domestic purposes.
BS EN 61558	Safety of power transformers, power supply units and similar.
BS EN 13032-1:2004:	Photometric measurements.
BS EN 61184	Specification for bayonet lampholders.
BS EN 61347-1 & 61347-2 &	Ballasts for operation of tubular fluorescent lamps.



BS EN 60921

BS 1853 Tubular fluorescent lamps.

BS 5266:2011 Code of Practice for emergency lighting of premises.

BS EN 61347 Lamp Control gear.

The installation of all equipment and wiring shall comply with all other relevant sections of this Specification.

For the purpose of this section of the specification, the definitions of all plant, equipment and materials, included on the drawings and in this specification, shall be as those defined in BS 5266:2011 and BS EN 1838.

On completion of the installation of the emergency lighting system, or part thereof, an inspection and test certificate shall be given in accordance with Appendix A of BS 5266: 2011 Part 1 and BS EN 1838. The Services Engineer shall be advised at least two weeks before the tests are being undertaken to enable the various authorities to witness the tests.

Emergency Lighting Luminaire Conversions

Unless specified elsewhere within the drawings or specification all general lighting luminaires which are required to have either integral or remote emergency conversion packs fitted, shall be fitted with such conversions by the specified manufacturer at the works prior to delivery and carry the 'CE' mark.

Luminaires which have been converted to emergency version by any organisation other than the original manufacturer of the luminaire will not be accepted without the express written consent of the Services Engineer being given prior to the conversion taking place upon completion these luminaires shall carry the 'CE' Mark.



EXTERNAL LUMINAIRES AND COLUMNS

Responsibility

Unless otherwise specified the Main Contractor shall be responsible for excavation, erection of the columns, concreting and backfilling, and the correct alignment of the columns.

Excavation

Holes shall be excavated to the appropriate planting depth. Root depths where the ground is consolidated and where no underground obstructions require the use of raft or crank roots, shall comply with the manufacturer's recommendations with a minimum depth of 900mm. In normal well consolidated soil the width of the hole shall be sufficient only for the baseplate or flags where these are used. The maximum width of flags placed under the base of concrete columns shall be approximately twice the width of the column base.

Erection

Prior to erection the excavation shall be cleared of obstructions, water, rubble or loose soil. Any bare or corroded patches of steel column roots shall be cleaned and treated with bituminous paint. Base plates where provided shall be fitted securely and when used for earthing shall be bonded to the column. Base stones or flags shall be placed in position where appropriate. Columns shall be correctly aligned in the vertical position with door openings facing away from oncoming traffic unless otherwise specified.

When the columns have been erected the excavations shall be back-filled with concrete tamped at 150mm intervals to 450mm from the ground surface. A minimum of 2 - 50mm diameter earthenware ducts shall pass through the concrete base to provide access for the cables to the column.

Columns shall be erected prior to cabling and the earth surrounding them shall not be disturbed for at least seven days.

Concrete

Foundation concrete shall be made with BS Normal or Rapid-hardening cement. Aggregate shall comply with BS EN 12620 and shall not be larger than 40mm. The mix proportion by volume shall be:-

Coarse aggregate	-	5
Fine aggregate	-	2.5
Cement	-	1

When all-in aggregate is used the proportion by volume shall be:-

All-in aggregate	-	7
Cement	-	1

The ratio by volume of water to cement in all mixes shall not be more than 0.6.



Cabling

Cables serving standards must loop into and out of the standards except where otherwise stated.

The cables shall follow the route shown on the drawings and unless otherwise detailed shall be laid direct in the ground at a depth of 600mm and blinded with a radial thickness of at least 100mm of sand. The presence of underground cables shall be indicated by marker tapes laid directly above the cables after the trench has been backfilled, the tapes being approximately 300mm below the surface level. The tapes shall be manufactured from high grade polythene 150mm wide by 0.1mm gauge, coloured yellow with the words "Electric Cable Below" printed along its length.

Wiring between the cut-out, lantern and control switch if not specified shall be 2.5 sq.mm P.V.C. insulated and sheathed.

Control Switches

Control switches shall be of the weatherproof rotary type, all wiring being inside the column.

Base Compartment

A control gear compartment shall be provided in all columns, to contain the specified cut-outs and the cable sealing chambers complete with armour clamps.

Access to the compartment shall be by means of large weatherproof door with locking device to resist unauthorised entry.

A baseboard for the control gear shall be fitted inside the compartment. The baseboard shall be manufactured from a material which is non-hygroscopic.

Steel Columns

Steel columns shall comply with BS EN 40-3 and BS EN 40-4.

The exterior of the column and any metal attachment shall be painted after erection in accordance with the specification.

Unless otherwise detailed, steel columns of 8 metre height or above shall include a factory fitted multi frequency damper. All cables routed through these columns shall be provided with a protective sleeve to prevent chaffing or other damage to the cable during installation and normal usage.

Where the steel column is similar to or higher than the surrounding structure they are to be earthed in accordance with BS EN 62305-3, 'Protection against Lightning – Physical damage to structures and life hazard'

The earth electrode shall be fitted with its terminal connection in an inspection chamber. Inspection chambers shall be in pre-cast concrete with a heavy cover permanently marked



'Earth Electrode'. The cover shall be arranged so that it is flush with the finished ground level.

Concrete Columns

Concrete columns shall be of pre-stressed reinforced concrete and shall comply with BS EN 40-3.

Joints between concrete column section shall be pointed in accordance with the manufacturer's instructions with material to match the column colour.

Aluminium Columns

Columns shall comply with BS EN 40-3.

The exterior of the column and any metal attachments shall be painted after erection in accordance with the specification.

Unless otherwise detailed, aluminium columns of 8 metre height or above shall include a factory fitted multi frequency damper. All cables routed through these columns shall be provided with a protective sleeve to prevent chaffing or other damage to the cable during installation and normal usage.

Where the column is similar to or higher than the surrounding structure they are to be earthed in accordance with BS EN 62305-3, 'Protection against Lightning – Physical damage to structures and life hazard'

The earth electrode shall be fitted with its terminal connection in an inspection chamber.

Inspection chambers shall be in pre-cast concrete with a heavy cover permanently marked 'Earth Electrode'. The cover shall be arranged so that they are flush with the finished ground level.

Column Lanterns

These shall be of the manufacture and type specified in the Schedules, supplied complete with the necessary column top mounting spigot to match the specified column.

All lighting columns shall be served by a switched 230V supply automatically controlled through a contactor and a solar dial time clock.

Belisha Beacons and Illuminated Signs

The Sub-Contractor shall install all necessary cabling and terminate same in the items shown.

These shall be served by a continuous 230V A.C. supply.



Photocells

Photocell control units shall be IP65 rated as a minimum and of polycarbonate type enclosure and comply with BS 5972.

The photocell unit shall have a 'Switch On' lighting level of 70 lux and be pre-calibrated to switch on with a 10 minute warm-up period of discharge lamps. It shall also be suitable for use with fluorescent and tungsten lighting.

The voltage operating range of the photocell shall be no greater than 198 volts to 264 volts and the 'Switch Off' lighting level shall be 105 lux.

Mounting details of the photocell shall be specified on the associated drawings and/or in the particular section of this Specification. The photocell shall be installed with all necessary mounting accessories.



4. Proposed Luminaire Schedule

Ref	Description
EX1	1x15W LED IP66 IK08 road lantern with 12No. 4000K LED at 350mA post top mounted complete with Narrow Road optic and flat glass diffuser on 6m column
EX2	1x29W LED IP66 IK08 road lantern with 12No. 4000K LED at 700mA post top mounted complete with Narrow Road optic and flat glass diffuser on 6m column
EX3	1x69W 4000K LED IP66 IK08 floodlight with 30No. 4000K LED at 700mA post top mounted complete with flat glass diffuser on 6m column
EX4	1x23W 4000K LED IP66 IK08 floodlight with 10No. 4000K LED at 700mA wall mounted complete with flat glass diffuser
EX5	1x69W 4000K LED IP66 IK08 floodlight with 30No. 4000K LED at 700mA wall mounted complete with flat glass diffuser
A1	4x54W 4000K T5 fluorescent IP65 luminaire with polycarbonate diffuser and aluminium reflector
A1E	As above with 3 hour emergency pack