APPROVED CONTRACTOR

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ELECTRICAL INSTALLATION CERTIFICATE

Issued in accordance with British Standard 7671 - Requirements for Electrical Installations by an Approved Contractor or Conforming Body enrolled with NICEIC, Warwick House,Houghton Hall Park, Houghton Regis,Dunstable,LU5 5ZX

DETAILS OF THE CLIENT

Client / Address: CCJV , Junction 12, M1, Toddington Postcode: LU5 6HP

DETAILS OF THE INSTALLATION

Address: M1 E/1 @ M/P 50/0B (G4) Postcode:

The installation is: New ✔ / An addition / An alteration

Extent of the installation covered by this certificate: Power installation supplies to CECLB, CCTV, FTMS and Gantries.

DESIGN

I/We, being the person(s) responsible for the design of the electrical installation (as indicated by my/our signature(s) below), particulars of which are described above, having exercised reasonable skill and care when carrying out the design, hereby CERTIFY that the design work for which I/we have been responsible is, to the best of my/our knowledge and belief, in accordance with BS 7671 amended to JANUARY 2008 (date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671, as amended (Regulations 120.3,133.5):

The extent of liabilty of the signatory/signatories is limited to the work described above as the subject of this certificate.
For the **DESIGN** of the installation:

** *(Where there is divided responsibility for the design)*

Signature Date 14/03/2012 Name (CAPITALS) Designer 1

Signature Date 14/03/2012 Name (CAPITALS) ** Designer 2

CONSTRUCTION

I/We, being the person(s) responsible for the construction of the electrical installation (as indicated by my/our signature below), particulars of which are described above, having exercised reasonable skill and care when carrying out the construction, hereby CERTIFY that the construction work for which I/we have been responsible is, to the best of my/our knowledge and belief, in accordance with BS 7671 amended to JANUARY 2008 (date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671, as amended (Regulations 120.3,133.5):

The extent of liabilty of the signatory is limited to the work described above as the subject of this certificate.
For the **CONSTRUCTION** of the installation:

Signature Date 14/03/2012 Name (CAPITALS) Constructor

INSPECTION AND TESTING

I/We, being the person(s) responsible for the inspection and testing of the electrical installation (as indicated by my/our signatures below), particulars of which are described above, having exercised reasonable skill and care when carrying out the inspection and testing, hereby CERTIFY that the work for which I/we have been responsible is, to the best of my/our knowledge and belief, in accordance with BS 7671 amended to JANUARY 2008 (date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671, as amended (Regulations 120.3,133.5):

The extent of liabilty of the signatory/signatories is limited to the work described above as the subject of this certificate.
For the **INSPECTION AND TESTING** of the installation:

Signature Date 14/03/2012 Signature Date 14/03/2012

Name (CAPITALS) Inspector Name (CAPITALS) Qualified Supervisor†

DESIGN, CONSTRUCTION, INSPECTION AND TESTING *

* This box to be completed only where the design, construction, inspection and testing have been the responsibility of one person.

I, being the person responsible for the design, construction, inspection and testing of the electrical installation (as indicated by my signature below), particulars of which are described above, having exercised reasonable skill and care when carrying out the design, construction, inspection and testing, hereby CERTIFY that the said work for which I have been responsible is to the best of my knowledge and belief, in accordance with BS 7671, amended to (date) except for the departures, if any, detailed as follows:

Details of departures from BS 7671, as amended (Regulations 120.3,133.5):

The extent of liabilty of the signatory is limited to the work described above as the subject of this certificate.
For the **DESIGN** , the **CONSTRUCTION** and the **INSPECTION AND TESTING** of the installation:

Reviewed by

Signature Date 18/05/2012 Signature Date 18/05/2012

Name (CAPITALS) Name (CAPITALS) Qualified Supervisor††

† *Where the inspection and testing have been carried out by an Approved Contractor, the inspection and testing results are to be reviewed by the registered Qualified Supervisor.*

†† *Where the design, the construction, and the inspection and testing have been the responsibility of one person, the inspection and testing results are to be reviewed by the registered Qualified Supervisor.*

Please see the 'Notes for Recipients' on the reverse of this page

Duplicate (To be retained by the contractor)

NICEIC APPROVED CONTRACTOR

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ICN2/0125922

PARTICULARS OF THE ORGANISATION(S) RESPONSIBLE FOR THE ELECTRICAL INSTALLATION

DESIGN (1) Organisation † SERCO

Address: Cavendish House, Clearwater Park, Stockton on Tees

Postcode: TS17 6QY

NICEIC Enrolment No (where appropriate)

Branch number: (if applicable)

DESIGN (2) Organisation †

Address:

Postcode:

NICEIC Enrolment No (where appropriate)

Branch number: (if applicable)

†CONSTRUCTION Organisation ERH Communications Ltd

Address: Communications House, Grange Industrial Estate, Cwmbran

Postcode: NP44 8HQ

NICEIC Enrolment No (Essential Information) 042643

Branch number: (if applicable)

INSPECTION AND TESTING Organisation † ERH Communications Ltd

Address: Communications House, Grange Industrial Estate, Cwmbran

Postcode: NP44 8HQ

NICEIC Enrolment No (where appropriate) 042643

Branch number: (if applicable)

SUPPLY CHARACTERISTICS AND EARTHING ARRANGEMENTS

Tick boxes and enter details, as appropriate

✣System Type(s)

TN-S	N/A							
TN-C-S	✔							
TN-C	N/A							
TT	N/A							
IT	N/A							

✣Number and Type of Live Conductors

		a.c.	✔			d.c.	N/A
1-phase (2 wire)	N/A	1-phase (3 wire)	✔	2 pole	N/A		
2-phase (3 wire)	N/A			3 pole	N/A		
3-phase (3 wire)	N/A	3-phase (4 wire)	N/A	other			
Other							

Nature of Supply Parameters

Nominal Voltage(s): $U^{(1)}$	230	V	U_0 (1)		V
Nominal frequency, f (1)	50	Hz			
Prospective fault current, I_{pf} (2)(3)	1.08	kA			
External earth fault loop impendance, Z_e (2)(3)	0.22	Ω			
Number of supplies	1				

Notes:
(1) by enquiry
(2) by enquiry or by measurement
(3) where more than one supply, record the higher or highest values
(4) by measurement

✣ Characteristics of Primary Supply Overcurrent Protective Device(s)

BS(EN) 1361

Type

Rated current 100 A

Short-circuit capacity 33 kA

PARTICULARS OF INSTALLATION AT THE ORIGIN

Tick boxes and enter details, as appropriate

✣Means of Earthing

Distributor's facility: ✔

Installation earth electrode: N/A

Details of Installation Earth Electrode (where applicable)

Type: (eg rod(s), tape etc)

Location:

Electrode resistance, R_A: (Ω)

Method of measurement:

✣Main Switch or Circuit-Breaker

** (applicable only where an RCD is suitable and is used as a main circuit-breaker)*

Type: BS(EN)	60947/3	Voltage rating	250	V
No of Poles	2	Rated current, I_n	100	A
Supply conductors material	Copper	RCD operating current, $I_{\Delta n}$*		mA
Supply conductors csa	25 mm²	RCD operating time (at $I_{\Delta n}$)*		ms

Maximum Demand (Load) Amps

Protective measures against electric shock:

Protective Bonding Conductors

Earthing conductor			Main protective bonding conductors			Bonding of extraneous-conductive-parts (✔)			
Conductor material	Copper		Conductor material	Copper		Water service	N/A	Gas Service	N/A
Conductor csa	16	mm²	Conductor csa	10	mm²	Oil service	N/A	Structural steel	✔
Continuity/ connection verified	✔		Continuity/ connection verified	✔		Lightning protection	N/A	Other incoming service(s)	N/A

COMMENTS ON EXISTING INSTALLATION

In the case of an alteration or additions see Section 633 NONE

Note: Enter 'NONE' or, where appropriate, the page number(s) of addional page(s) of comments on the existing installation.

NEXT INSPECTION

§ Enter interval in terms of years, months or weeks, as appropriate

I/We the designer(s), RECOMMEND that this installation is further inspected and tested after an interval of not more than § SIX YEARS

† *Where the Approved Contractor responsible for the construction of the electrical installation has also been responsible for the design and the inspection and testing of that installation, the 'Particulars of the Organisation responsible for the Electrical Installation' may be recorded only in the section entitled 'CONSTRUCTION'*

✣ *Where a number of sources are available to supply the installation, and where the data given for the primary source may differ from other sources, a separate sheet must be provided which identifies the relevant information relating to each additional source.*

Please see the 'Notes for Recipients' on the reverse of this page

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ICN2/0125922

SCHEDULE OF ITEMS INSPECTED

† See note below

PROTECTIVE MEASURES AGAINST ELECTRIC SHOCK

Basic and fault protection

Extra low voltage

N/A SELV N/A PELV

Double or reinforced insulation

✔ Double or Reinforced Insulation

Basic Protection

✔ Insulation of live parts ✔ Barriers or enclosures

✔ Obstacles ** ✔ Placing out of reach **

Fault protection

Automatic disconnection of supply

✔ Presence of earthing conductor

✔ Presence of circuit protective conductors

✔ Presence of main protective bonding conductors

✔ Presence of earthing arrangements for combined protective and functional purposes

✔ Presence of adequate arrangements for alternative source(s), where applicable

✔ FELV

✔ Choice and setting of protective and monitoring devices (for fault protection and/or overcurrent protection)

Non-conducting location **

N/A Absence of protective conductors

Earth-free equipotential bonding**

N/A Presence of earth-free equipotential bonding

Electrical separation

✔ For one item of current using equipment

✔ For more than one item of current using equipment**

Additional protection

✔ Presence of residual current device(s)

✔ Presence of supplementry bonding conductors

***** for use in controlled supervised/conditions only***

Prevention of mutual detrimental influence

✔ Proximity of non-electrical services and other influences

✔ Segregation of Band I and Band II circuits or Band II insulation used

✔ Segregation of safety Circuits

Identification

✔ Presence of diagrams, instructions, circuit charts and similar information

✔ Presence of danger notices and other warning notices

✔ Labelling of protective devices, switches and terminals

✔ identification of conductors

Cables and Conductors

✔ Selection of conductors for current carrying capacity and voltage drop

✔ Erection methods

✔ Routing of cables in prescribed zones

✔ Cables incorporating earthed armour or sheath or run in an earthed wiring system, or otherwise protected against nails, screws and the like

✔ Additional protection by 30mA RCD for cables concealed in walls (where required,in premises not under the supervision of skilled or instructed persons)

✔ Connection of conductors

✔ Presence of fire barriers, suitable seals and protection against thermal effects

General

✔ Presence and correct location of appropriate devices for isolation and switching

✔ Adequacy of access to switchgear and other equipment

✔ Particular protective measures for special installations and locations

✔ Connection of single-pole devices for protection or switching in line conductors only

✔ Correct connection of accessories and equipment

✔ Presence of undervoltage protective devices

✔ Selection of equipment and protective measures appropriate to external influences

✔ Selection of appropriate functional switching devices

SCHEDULE OF ITEMS TESTED

† See note below

✔ External earth fault loop impendance,Z_e

✔ Installation earth electrode resistance, R_A

✔ Continuity of protective conductors

N/A Continuity of ring final circuit conductors

✔ Insulation resistance between live conductors

✔ Insulation resistance between live conductors and Earth

✔ Protection by seperation of circuits

✔ Basic protection by barrier or enclosure provided during erection

✔ Insulation of non-conducting floors or walls

✔ Polarity

✔ Earth fault loop impendance,Z_s

✔ Verification of phase sequence

✔ Operation of resudual current devices

✔ Functional testing of assemblies

✔ Verification of voltage drop

SCHEDULE OF ADDITIONAL RECORDS* (See attached schedule)

Page No(s)

Note: Additional page(s) must be identified by the Electrical Installation Certificate serial number and page number(s).

† *All boxes must be completed. '✔' indicates that an inspection or a test was carried out and that the result was satisfactory. 'N/A' indicates that an inspection or a test was not applicable to the particular installation*

* *Where the electrical works to which this certificate relates includes the installation of a fire alarm system and/or an emergency lighting system (or a part of such system), this electrical safety certificate should be accompanied by the particular certificate(s) for the system(s).*

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SCHEDULE OF CIRCUIT DETAILS FOR THE INSTALLATION

CIRCUIT DETAILS

TO BE COMPLETED IN EVERY CASE	TO BE COMPLETED ONLY IF THE DISTRIBUTION BOARD IS NOT CONNECTED DIRECTLY TO THE ORIGIN OF THE INSTALLATION*
Location of distribution board: 50/0 B	Supply to distribution board is from: No of phases: Nominal voltage: V
Distribution board designation: 50/0 B EI	Overcurrent protective device for the distribution circuit: Associated RCD (if any): BS(EN) Type: BS(EN) Rating: A RCD No of poles: $I_{\Delta n}$ mA

Circuit number and phase	Circuit designation	Type of wiring (see code)	Reference method	Number of points served	Circuit conductors: csa Live (mm²)	Circuit conductors: csa cpc (mm²)	Max. disconnection time permitted by BS 7671 (s)	Overcurrent protective devices BS (EN)	Type No	Rating (A)	Short-circuit capacity (kA)	RCD Operating current, $I_{\Delta n}$ (mA)	Maximum Z_s permitted by BS 7671 (Ω)
1	CECLB @ 50/3 B	02	D	1	70	70	5	88		63	80		0.82
2	CECLB @ 50/3 B	02	D	1	50	50	5	88		63	80		0.82
3	CECR @ 50/3 A	02	E	1	50	50	5	88		63	80		0.82
	CECLB												
1	HSM CCTV @ M/P 50/4 B	02	D	1	10	10	5	88		16	80		4.18
	CECR												
1	HSM CCTV @ M/P 50/3 A	02	D	1	10	10	5	88		16	80		4.18
2	HSM CCTV @ M/P 50/4 A	02	D	1	10	10	5	88		16	80		4.18
3	AMI LBS1 G4	01	E	1	2.5	2.5	5	60898	C	6	6		3.83
4	AMI LBS2 G4	01	E	1	2.5	2.5	5	60898	C	6	6		3.83
5	AMI LBS3 G4	01	E	1	2.5	2.5	5	60898	C	6	6		3.83
6	AMI LBS4 G4	01	E	1	2.5	2.5	5	60898	C	6	6		3.83
7	MS4 G4	01	E	1	10	10	5	60898	C	20	6		1.15

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↑ See Table 4A2 of Appendix 4 of BS 7671

CODES FOR TYPE OF WIRING								
A	B	C	D	E	F	G	H	0 (Other - please state)
Thermoplastic insulated/ sheathed cables	Thermoplastic cables in metallic conduit	Thermoplastic cables in non-metallic conduit	Thermoplastic cables in metallic trunking	Thermoplastic cables in non-metallic trunking	Thermoplastic /SWA cables	Thermosetting /SWA cables	Mineral-insulated cables	

* In such cases, details of the distribution (sub-main) circuit(s), together with the test results for the circuit(s), must also be provided, on continuation schedules.

See next page for Schedule of Test Results

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SCHEDULE OF TEST RESULTS FOR THE INSTALLATION

TEST RESULTS

TO BE COMPLETED ONLY IF THE DISTRIBUTION BOARD IS NOT CONNECTED DIRECTLY TO THE ORIGIN OF THE INSTALLATION

Characteristics at this distribution board

Confirmation of supply polarity

* See note below

Z_s * Ω Operating times of associated RCD (if any) At $I_{\Delta n}$ ms

I_{PF} * kA At $5I_{\Delta n}$ ms

Test instruments (serial numbers) used:

Earth fault loop impedance	ERH 339	RCD	
Insulation resistance	ERH 339	Other	
Continuity	ERH 339	Other	

Circuit number and phase	Circuit impedances (Ω)					Insulation resistance				Polarity	Maximum measured earth fault loop impedance, Z_s * See note below	RCD operating times		Test button operation
	Ring final circuits only (measured end to end)			All circuits (At least one column to be completed)		Line/Line †	Line/Neutral †	Line/Earth †	Neutral/Earth †			at $I_{\Delta n}$	at $5I_{\Delta n}$ (if applicable)	
	r_1 (Line)	r_n (Neutral)	r_2 (cpc)	$R_1 + R_2$	R_2	(MΩ)	(MΩ)	(MΩ)	(MΩ)	(✓)	(Ω)	(ms)	(ms)	(✓)
1	N/A	N/A	N/A	0.27			> 100	> 100	> 100	✓	0.09			
2	N/A	N/A	N/A	0.20			> 100	> 100	> 100	✓	0.19			
3	N/A	N/A	N/A	0.5			> 100	> 100	> 100	✓	0.42			
1	N/A	N/A	N/A	0.37			> 100	> 100	> 100	✓	0.75			
1	N/A	N/A	N/A	0.15			> 100	> 100	> 100	✓	0.41			
2	N/A	N/A	N/A	0.28			> 100	> 100	> 100	✓	0.63			
3	N/A	N/A	N/A	0.79			> 100	> 100	> 100	✓	0.32			
4	N/A	N/A	N/A	0.84			> 100	> 100	> 100	✓	0.42			
5	N/A	N/A	N/A	0.94			> 100	> 100	> 100	✓	1.45			
6	N/A	N/A	N/A	0.97			> 100	> 100	> 100	✓	1.48			
7	N/A	N/A	N/A	0.42			> 100	> 100	> 100	✓	0.90			

Duplicate (To be retained by the contractor)

* Note: Where the installation can be supplied by more than one source, such as primary source (eg public supply) and a secondary source (eg standby generator), the higher or highest values must be recorded.

TESTED BY

Signature: Position:

Name: (CAPITALS) Date of testing: 14/03/2012

See previous page for Schedule of Circuit Details