SPECIFICATION

GENERAL

THIS PROJECT IS TO BE UNDERTAKEN IN TWO PHASES.
PHASE 1 - ROOF PREPARATION WORKS AND INSTALLATION OF RAISED SUPPORT ROOF AND INSTALLATION OF LIGHTNING PROTECTION AND MANSAFE SYSTEM IN READINESS FOR THE PV INSTALLATION.
PHASE 2 - INSTALLATION OF PV ARRAY AND ASSOCIATED CABLING, INVERTERS AND OTHER ITEMS TO PROVIDE A COMPLETE WORKING INSTALLATION.

THIS SPECIFICATION IS SPECIFICALLY ASSOCIATED WITH PHASE 2 OF THE WORKS

TERMS OF CONTRACT GENERALLY IN ACCORDANCE WITH CAMDEN STANDARD WORKS.

THE ELECTRICAL INSTALLATION SHALL COMPLY WITH BS7671 - REQUIREMENTS FOR ELECTRICAL INSTALLATIONS IEE WIRING REQUIREMENTS 2008(AND AMENDMENTS) AND SECTION TWO (STANDARD SPECIFICATION) OF TGA CONSULTING ENGINEERS SPECIFICATION. A COPY WILL BE MADE AVAILABLE UPON REQUEST.

THE ELECTRICAL INSTALLATION AND ASSOCIATED BUILDERS WORK SHALL BE CARRIED OUT BY THE MAIN CONTRACTOR.

PV LAYOUT ON TGA DRAWING IS AN INDICATIVE SCHEME. CONTRACTOR TO CONFIRM FINAL PV SYSTEM SCHEME WITH LONDON BOROUGH OF CAMDEN BEFORE PROCEEDING WITH ANY WORKS ON SITE .

CABLE DISTRIBUTION AND METHODOLOGY
GENERAL INSTALLATION METHOD
THE SUB-MAINS CABLING FROM INVERTERS SHALL BE CARRIED OUT USING 3 No. X 4 CORE 25 mm^2 XLPE/SWA/PVC CABLES + 16 mm^2 PVC CPC SECURED ON GRP CABLE TRAY MOUNTED TO 41mm x41mm UNISTRUT.
SUB-MAINS CABLING SHALL BE EVEN SPACED ON 200mm CABLE TRAY SECURED USING METAL CABLE TIES.
CABLES SHALL BE LABELLED AT THE INVERTER AND AT THE PV DISTRIBUTION BOARD WITH TRAFFOLYTE LABELS. LABELS SHALL BE FIXED USING 2 No. HOLES AND FIXED ALONG THE LENGTH OF THE CABLE USING 2 No. BLACK UPVC TIE WRAPS.
HORIZONTAL MOUNTING OF THE CABLE TRAY SHALL BE CHEMICALLY FIXED TO THE ROOF OF DEANE HOUSE. VERTICAL MOUNTING OF THE CABLE TRAY FROM TOP OF DEANE HOUSE ROOF TO TOP OF ROOF WITH PLANT ON GREENWOOD PLACE SHALL BE SECURED USING M8 ANCHOR BOLTS.
THE OBJECTIVE SHALL BE TO PROVIDE A SURFACE MOUNTED INSTALLATION ON DEANE HOUSE ROOF THEN RUN VERTICALLY DOWN THE OUTSIDE WALL TO THE LOWER LEVEL GREENWOOD PLACE ROOF. HERE THE CABLES AND TRAY WILL BE SURFACE MOUNTED RISING UP TO SECOND FLOOR LEVEL BEFORE BEING FLUSH MOUNTED WITHIN THE CLADDING TO THE ROOF. THE CABLES WILL THEN BE SURFACE MOUNTED ACROSS THE ROOF TO THE PV DISTRIBUTION BOARD AS INDICATED ON THE DRAWING. THE CONTRACTOR SHALL ALLOW FOR WITHIN HIS QUOTATION FOR 1 No. CRANAGE HIRE TO GET ALL OF HIS EQUIPMENT ONTO THE ROOF.

PV SYSTEM
A PV SPECIALIST SHALL BE CONTRACTED TO DESIGN, SUPPLY INSTALL AND CARRY OUT ALL THE WORKS ASSOCIATED WITH THE PV SYSTEM.
PV ARRAYS SHALL BE INSTALLED ON A MOUNTING SYSTEM FIXED TO THE STEEL FRAMEWORK INSTALLED ON CONCRETE PEDESTALS.
PV SYSTEM OUTPUT SHALL DELIVER A MINIMUM OF 65.61 kWp AND CONSIST OF PV PANELS, CONTAINMENT FOR DC CABLING, INVERTERS, TERMINATION OF CABLING .
DC CABLING CONTAINMENT SHALL BE SECURED ON THE STEEL GRATING.
SUB MAIN CABLES TO THE GREENWOOD CENTRE PV DB SHALL BE INSTALLED ON 200mm GRP TRAY SUSPENDED FROM THE STRUCTURAL FRAMEWORK VIA 6mm THREADED ROD AND 41mm x 41mm UNISTRUT.
PV SPECIALIST SHALL COMPLETE ALL WORKS INCLUDING TESTING & COMMISSIONING AND APPLICATION TO THE DNO FOR G59/G83 CERTIFICATION AS APPLICABLE.
PV SPECIALIST SHALL PROVIDE A CHART WHICH SHOWS THE TIME PERIOD OVER WHICH THE COST OF THE PV INSTALLATION WILL BREAK EVEN.

THE FOLLOWING PV SPECIALIST COMPANY HAS BEEN APPOINTED WITH REGARDS TO THIS PROJECT:
UK SOLAR GENERATION
QUOTATION REF: UKSG180215
CONTACT: RUSSELL LYNE - 0203 589 6070 / 07886 846 360

THE PV SPECIALIST SHOULD BE EMPLOYED AS THE MAIN CONTRACTOR FOR ALL OF THEIR WORK ASSOCIATED WITH THE PV INSTALLATION.

EARTHING AND BONDING
THE WHOLE OF THE INSTALLATION AND ALL EQUIPMENT CONNECTED THERETO SHALL BE EFFECTIVELY EARTHED AND BONDED IN ACCORDANCE WITH BS 7671:2008 17TH EDITION OF THE IEE REGULATIONS (AND AMENDMENTS), SUPPLY AUTHORITY REGULATIONS AND SECTION 7.2 (GENERAL TECHNICAL CLAUSES).

INSPECTION AND TESTING
THE ELECTRICAL CONTRACTOR SHALL EMPLOY AN INDEPENDENT SPECIALIST CONTRACTOR TO EXECUTE ALL TESTING AND COMMISSIONING WORKS.

BEFORE ENERGISING ANY PART OF THE INSTALLATION, THE CONTRACTOR SHALL FULLY INSPECT AND TEST THE COMPLETED WORK, TO VERIFY THAT THE REQUIREMENTS OF THIS SPECIFICATION AND BS 7671, 2008 (17TH EDITION OF THE IEE REGULATIONS) HAVE BEEN FULLY MET.
THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL THE NECESSARY INSTRUMENTS FOR TESTING THE INSTALLATION, IN ACCORDANCE WITH THE REGULATIONS, AND ANY EXTRA TESTS CALLED FOR IN THIS SPECIFICATION. EVIDENCE OF ACCURACY SHALL BE PROVIDED BY THE CONTRACTOR FOR ALL TEST INSTRUMENTS. FAILURE TO PROVIDE SUCH EVIDENCE WILL INVALIDATE THE TEST. FINAL TESTING SHALL BE CARRIED OUT IN THE PRESENCE OF THE EMPLOYER AND THREE COPIES OF THE TEST RESULTS, THE COMPLETION CERTIFICATE AND THE INSPECTION CERTIFICATE, AS DESCRIBED IN THE REGULATIONS, SHALL BE SUPPLIED BY THE CONTRACTOR.
THE INSTALLATION WILL NOT BE ACCEPTED UNTIL SUCH CERTIFICATES HAVE BEEN ISSUED / APPROVED.
TESTS REQUIRED ARE AS FOLLOWS:
(I) CONTINUITY OF CIRCUIT CONDUCTORS
(II) CONTINUITY OF PROTECTIVE CONDUCTORS
(III) MEASUREMENT OF INSULATION RESISTANCE
(IV) MEASUREMENT OF EARTH FAULT LOOP IMPEDANCE
(V) MEASUREMENT OF PROSPECTIVE SHORT CIRCUIT CURRENTS AT THE LOCATIONS OF ALL PROTECTIVE DEVICES.

AS INSTALLED" DRAWINGS AND MAINTENANCE MANUALS
DURING THE PROGRESS OF THE CONTRACT, THE CONTRACTOR(S) SHALL RECORD ON DRAWINGS, IN AN APPROVED MANNER, THE INFORMATION NECESSARY FOR PREPARING THE INSTALLATION RECORD DRAWINGS.
THE MARKED-UP DRAWINGS SHALL BE MADE AVAILABLE TO THE CONSULTING ENGINEER FOR INSPECTION AND CHECKING AT ANY TIME DURING THE CONTRACT.
INSTALLATION RECORD DRAWINGS SHALL CLEARLY INDICATE:-

A) THE POSITION OF NEW AND EXISTING PLANT AND APPARATUS.
B) THE SIZE, TYPE AND ROUTES OF ALL NEW CABLES, ETC.
C) EARTH LOOP IMPEDANCE INTERNAL TO THE INSTALLATION.
D) PROSPECTIVE SHORT CIRCUIT AT THE ORIGIN AND OTHER KEY POINTS OF THE INSTALLATION.

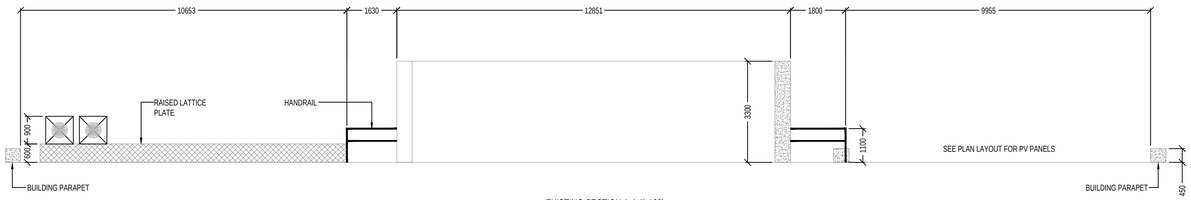
INSTALLATION DRAWINGS
INSTALLATION DRAWINGS SHALL BE PRODUCED WHICH, IN THE OPINION OF THE SERVICES ENGINEER, ARE NECESSARY FOR THE PROPER EXECUTION OF THE WORKS AND THE CO-ORDINATION OF ALL TRADES.
THE FOLLOWING CONSTITUTE THE MAIN REQUIREMENTS BUT DO NOT REDUCE THE SERVICES ENGINEERS RIGHT TO CALL FOR ADDITIONAL INFORMATION IF THIS IS SHOWN TO BE NECESSARY.
- CO-ORDINATION DRAWINGS
- LAYOUTS SHOWING ALL TRAY RUNS
- MANUFACTURERS WORKING DRAWINGS
- COMPREHENSIVE WIRING DIAGRAMS OF/AND FOR ALL ELECTRICAL EQUIPMENT AND INSTALLATIONS
- ROUTES OF MAIN CABLES
- ALL BUILDERS WORK REQUIREMENTS.

THE PRODUCTION OF THE INSTALLATION DRAWINGS MUST SUIT THE CONTRACT PROGRAMME IN LINE WITH PHASE 1 OF THESE WORKS.
THE DRAWINGS SHALL BE PRODUCED AT A TIME TO ALLOW A PERIOD OF TWO WEEKS FOR INITIAL CONSIDERATION BY THE DESIGN TEAM AND A FURTHER ONE WEEK FOR FORMAL ISSUE OF THE DRAWINGS. WORK SHALL NOT BE COMMENCED UNTIL DRAWINGS HAVE BEEN FORMALLY ISSUED.
ANY WORK COMMENCED PRIOR TO ISSUE OF SATISFACTORY INSTALLATION DRAWINGS WILL BE CARRIED OUT ENTIRELY AT THE CONTRACTORS OWN RISK.
DURING THE PROGRAMME OF WORKS THE INSTALLATION DRAWINGS ARE TO BE MARKED UP BY THE CONTRACTOR TO REFLECT THE PROGRESS BEING MADE ON SITE, INCORPORATING ANY VARIATIONS AND ALTERNATIONS ETC.
THESE MARKED UP DRAWINGS WHICH WILL FORM THE BASIS OF THE AS INSTALLED DRAWINGS TO BE MADE AVAILABLE FOR INSPECTION UPON REQUEST.
NO CLAIMS WILL BE ENTERTAINED FOR ABORTIVE WORK CAUSED BY FAILURE TO ISSUE SATISFACTORY INSTALLATION DRAWINGS AT THE RELEVANT TIME.
THE INSTALLATION DRAWINGS MUST BE FULLY CO-ORDINATED WITH THE OTHER SERVICES INCLUDING THE MECHANICAL SERVICES, DRAINAGE SYSTEM, STRUCTURAL AND BUILDING DETAILS.

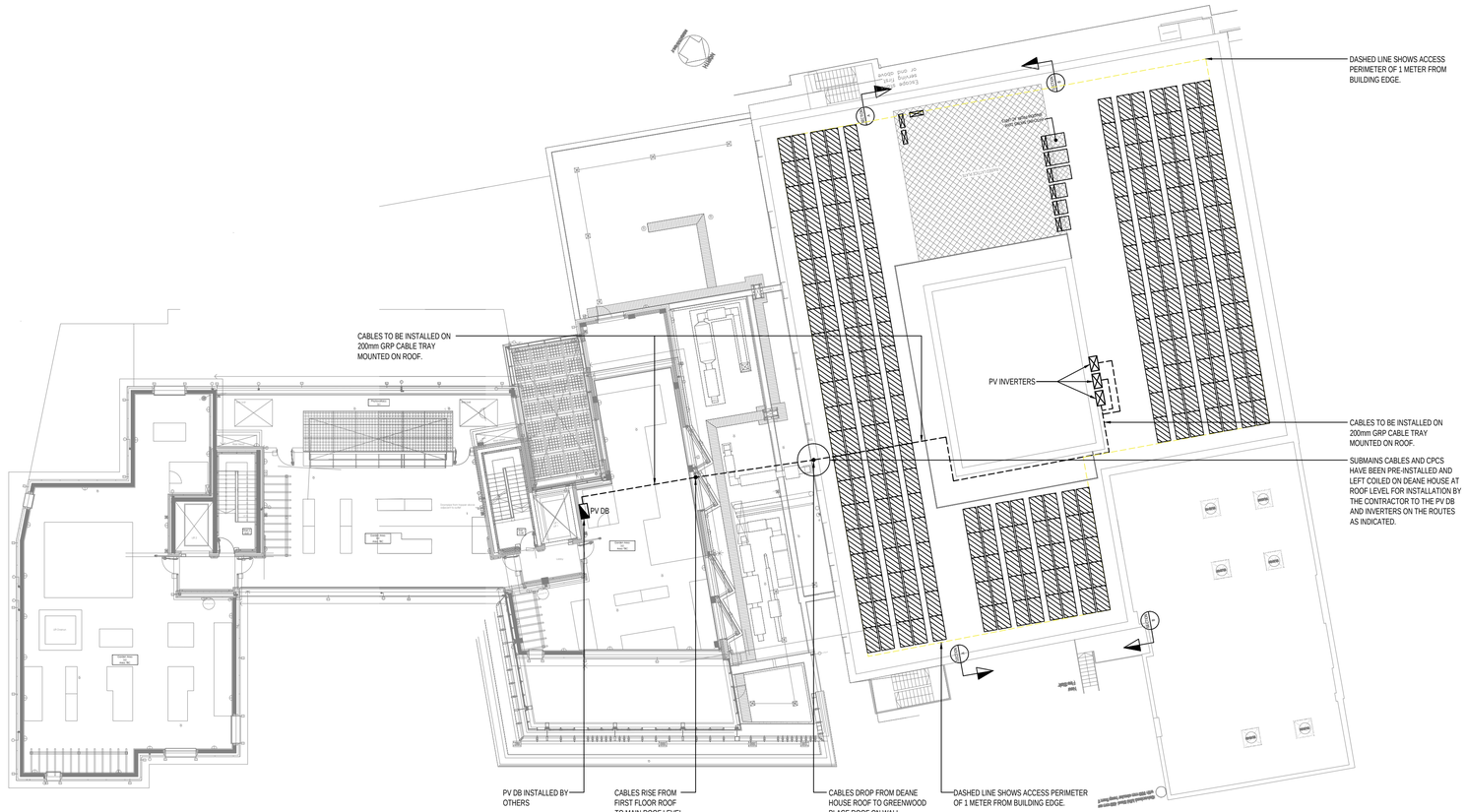
'AS INSTALLED' DRAWINGS SHALL BE PROVIDED PRIOR TO THE ISSUE OF THE PRACTICAL COMPLETION CERTIFICATE.
THE 'AS INSTALLED' DRAWINGS SHALL BE PROVIDED AS AUTOCAD 2015 DWG FILES ON CD.
DETAILED INSTRUCTIONS ON CREATING SUCH FILES FROM AUTOCAD 2015 ARE AVAILABLE ON REQUEST.
1 NO. PRINTED COPY OF THE FINAL DRAWINGS TO BE PROVIDED AS PART OF THE OPERATING AND MAINTENANCE MANUALS.

SCHEDULE OF WORK
DEANE HOUSE
- INSTALLATION OF CONTAINMENT SYSTEM TO ROOF (BY PV CONTRACTOR)
- INSTALLATION OF SUB-MAINS CABLING FROM EXISTING PV DB/ISOLATORS TO INVERTERS (BY MAIN CONTRACTOR)
- INSTALLATION OF NEW PV PANELS/ INVERTERS (BY PV SPECIALIST)
- TERMINATION OF CABLING IN INVERTERS (BY PV SPECIALIST)
- TEST, COMMISSION AND O&M MANUALS.

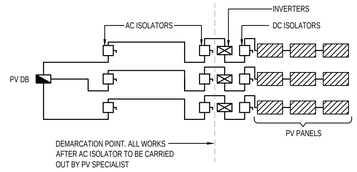
GREENWOOD PLACE
- TERMINATION OF CABLING IN PV DISTRIBUTION BOARD (BY MAIN CONTRACTOR)
- TEST, COMMISSION AND O&M MANUALS.

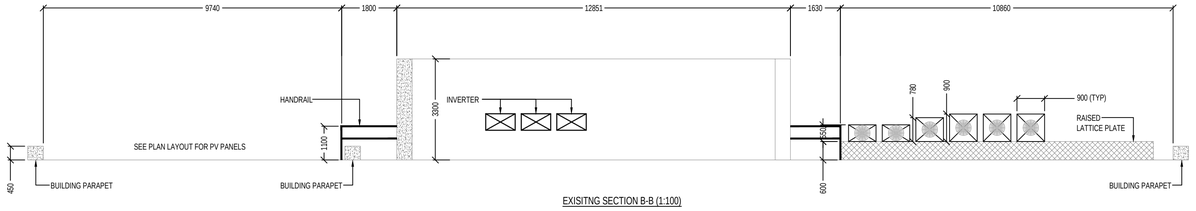


EXISTING SECTION A-A (1:100)



LEGEND
PHOTOVOLTAIC SOLAR PANEL
DISTRIBUTION BOARD





EXISITNG SECTION B-B (1:100)

A1

WIP	S0	INITIAL STATUS OR WORK IN PROGRESS
SHARED	S1	ISSUED FOR CO-ORDINATION
	S2	ISSUED FOR INFORMATION
	S3	ISSUED FOR INTERNAL REVIEW AND COMMENT
	S4	ISSUED FOR STAGE APPROVAL
	S5	N/A
	S6	ISSUED FOR PIM AUTHORISATION
	S7	ISSUED FOR AIM AUTHORISATION
	D1	ISSUED FOR COSTING
	D2	ISSUED FOR TENDER
	D3	ISSUED FOR CONTRACTOR DESIGN
	D4	ISSUED FOR MANUFACTURE/PROCUREMENT
PUBLISHED	A1, A2, etc*	ACCEPTED AS STAGE COMPLETE
	B1, B2, etc*	PARTIALLY SIGNED OFF
	CR	AS CONSTRUCTION RECORD
* INTEGER INDICATES RIBA STAGE COMPLETION		

DRAWING STAGE DEFINITIONS (BSRIA BG6/2014)

STAGE 2	CONCEPT DRAWING
STAGE 3	DEVELOPED DESIGN DRAWING
STAGE 4A	TECHNICAL DESIGN DRAWING
STAGE 4B	COORDINATED WORKING DRAWING
STAGE 4C	COORDINATED WORKING DRAWING (SPECIALIST INPUT)
STAGE 5	INSTALLATION DRAWING/RECORD DRAWING

REV	DATE	DESCRIPTION	DRAWN	APP
C02	31/05/18	REVISED SPECIFICATION	GK	HM
C01	09/05/18	REVISED CABLE TRAY SIZE	SR	HM
-	04/05/18	TENDER ISSUE	GK	HM

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Project
GREENWOOD PLACE
LONDON BOROUGH OF CAMDEN

Title
ELECTRICAL ENGINEERING SERVICES
DEANE HOUSE
PHOTOVOLTAIC SOLAR PANEL LAYOUT
ROOF LEVEL

Architect
-

Client
CAMDEN COUNCIL

Suitability: Code D2 — Description FOR TENDER

Revision:	Scale:	TGA Proj No:	Stage:
C02	1:200	7832	3

Drawing Reference:
Project-Originator-Zone-Level-Type-Role-Classification-Number
DH-TGA-Z0-RF-DR-E-62-0001