

EXTERNAL SERVICES STANDARD NOTES

CABLE INSTALLATION INTO DUCTS:

INSTALL CABLES INTO NEWLY PROVIDED AND CLEANED DUCT. USE LUBRICANTS, RECOMMENDED BY THE CABLE MANUFACTURER IN WRITING, TO ASSIST DRAWING PROCESS.
FLARE CABLE IF DRUMS ARE NOT SUITABLE FOR JACKING AT INTERMEDIATE DRAW PITS WITH EXIT DUCT MORE THAN 15' OFF LINE OF ENTRY DUCT. FLARE CABLE BEFORE ENTERING OR LEAVING COMPREHENSIVE SYSTEM OF CORNER PLATES, ROLLER AND BLOCKS. USE MAXIMUM PRACTICAL SIZE OF TURNS WHEN FLARING AND ENSURE DIRECTION IS CORRECT.
DO NOT EXCEED MANUFACTURERS INSTALLATION TENSION ON CABLE AND ENSURE THE PULLING TENSION IS TAKEN ON CABLE ELEMENTS DESIGNED FOR THAT PURPOSE. THAT IS SARKMUK OR CONDUCTOR CORES AND NOT ON OTHER ELEMENTS, SUCH AS PLASTIC SHEATH OR CONDUCTOR INSULATION.
DO NOT ALLOW CABLES BEING PULLED INTO DUCTS TO TWIST. USE APPROPRIATE SNIWEL BETWEEN PULLING BOND AND CABLE STOCKING OR SIMILAR APPLIANCE.
BIND TREFOIL GROUPS OF SINGLE CORE CABLES INSTALLED INTO A SINGLE DUCT AT 1M INTERVALS. INSTALL EARTH OR PROTECTIVE CONDUCTORS INTO THE SAME DUCT AS THE ASSOCIATED CABLE WHERE PRACTICAL. THROUGH MANHOLES, DRAW PITS AND JOINTING CHAMBERS. BIND THE TWO CABLES TOGETHER. PULL ALL CABLES IN ONE DUCT AS A GROUP. ENSURE GROUP DOES NOT THWIP OR CRASH OVER. REPORT ANY DAMAGE TO CABLE SHEATH DURING INSTALLATION AND CARRY OUT ANY INSTRUCTED WORK TO REMEDY THE DAMAGE. SEAL BETWEEN CABLE AND DUCT ENDS AFTER CABLE INSTALLATION. ENSURE CABLE ENDS IN JOINTING CHAMBERS ARE TEMPORARILY SEALED WHERE REQUIRED.

SECURITY SYSTEMS NOTES

THE PURPOSE OF THIS DRAWING IS THAT THE CLOSED CIRCUIT TELEVISION SYSTEM AND COMPONENTS PROVIDED ARE IN COMPLIANCE WITH IT. WILL DELIVER THE WHOLE IN ACCORDANCE WITH NATIONAL CYCLING CENTRE (NCC) & MANCHESTER CITY COUNCIL (MCC) POLICIES AND BE PERTINENT TO THE NATURE OF THIS PROJECT AND IT'S SURROUNDINGS.

THESE SYSTEMS UTILISE THE STRUCTURED CABLING SYSTEM AND ACTIVE NETWORK INFRASTRUCTURE TO PROVIDE CCTV AND TELECOMMUNICATIONS PURPOSES. PROVIDE A CCTV NETWORK AND FIBRE OPTIC NETWORK FACILITY TO ENABLE TRANSMISSION INTO THE NCC DATA COMMS ROOM. PROVIDE ALL EQUIPMENT AND LICENCES NECESSARY TO ENABLE REMOTE MONITORING BY LOCAL SURVEILLANCE COMPANIES.

ANY CONDUIT OR TRUNKING MUST SUPPORT THE FUNCTION OF THE CABLING SYSTEM AND PROVIDE PROTECTION, ADEQUATE SEPARATION DISTANCE AND PRESENTATION AS REQUIRED BY THE CABLING AND EMC DESIGN.

SECURITY DATA AND VOICE CABLING SHOULD BE SECURED WITHOUT DEFORMATION OF THE OUTER JACKET AND WITH A NON-COMPRESSIVE SECURING TIE.

ALL CABLE ROUTES MUST CARRY A PERMANENT AND VISIBLE IDENTIFIER WHICH IS CODED AS PART OF THE ADMINISTRATION SYSTEM.

INSTALL ALL FIRE STOPPING SYSTEMS IN ACCORDANCE WITH THE MANUFACTURERS WRITTEN INSTRUCTIONS AND THE TEST / ASSESSMENT / CERTIFICATION EVIDENCE PROVIDED BY THE INSTALLER / MANUFACTURER OF THE PENETRATION SEAL.

SUPPORT CENTRES FOR SERVICES PASSING THROUGH PENETRATION SEALS SERVING FIRE BARRIERS TO BE THE SAME AS THOSE COVERED BY THE TEST / ASSESSMENT / CERTIFICATION EVIDENCE PROVIDED BY THE INSTALLER / MANUFACTURER OF THE PENETRATION SEAL.

INSTALLATION:

INSTALL, COMMISSION AND SET TO WORK DATA COMMUNICATIONS SYSTEMS IN ACCORDANCE WITH THE CABLING SYSTEM STANDARDS. THE MANUFACTURER'S RECOMMENDATIONS AND TELECOMMUNICATIONS SERVICE PROVIDERS REGULATIONS.

CABLE INSTALLATION:
INSTALL CABLES AS REQUIRED. PROTECT CABLES FROM MECHANICAL DAMAGE. INSTALL IN ACCORDANCE WITH BS 7671 REQUIREMENTS FOR ELECTRICAL INSTALLATIONS. IET WIRING REGULATIONS.
BS EN 50173-1: ALARM SYSTEMS, INTRUSION AND HOLD-UP SYSTEMS. JOINTING - NO JOINTS PERMITTED.
SUPPORT INTERMEDIATE WIRING IN CONDUIT AND STEEL TRUNKING.

STRUCTURED CABLING INSTALLATION:
PLAN AND INSTALL THE CABLING SYSTEMS BS EN 50173-1, BS EN 50173-2, BS EN 50173-3, BS EN 50173-4, BS EN 50173-5, BS EN 50173-6 and BS EN 50174-1, BS EN 50174-2, BS EN 50174-3.

WORKMANSHIP FOR CONDUIT
DRAW IN BOXES.
PROVIDE DRAW-IN BOXES IN CONDUIT AT MAXIMUM INTERVALS OF 10 METRES OR AFTER BENDS AND/OR SETS TOTALING 180°.

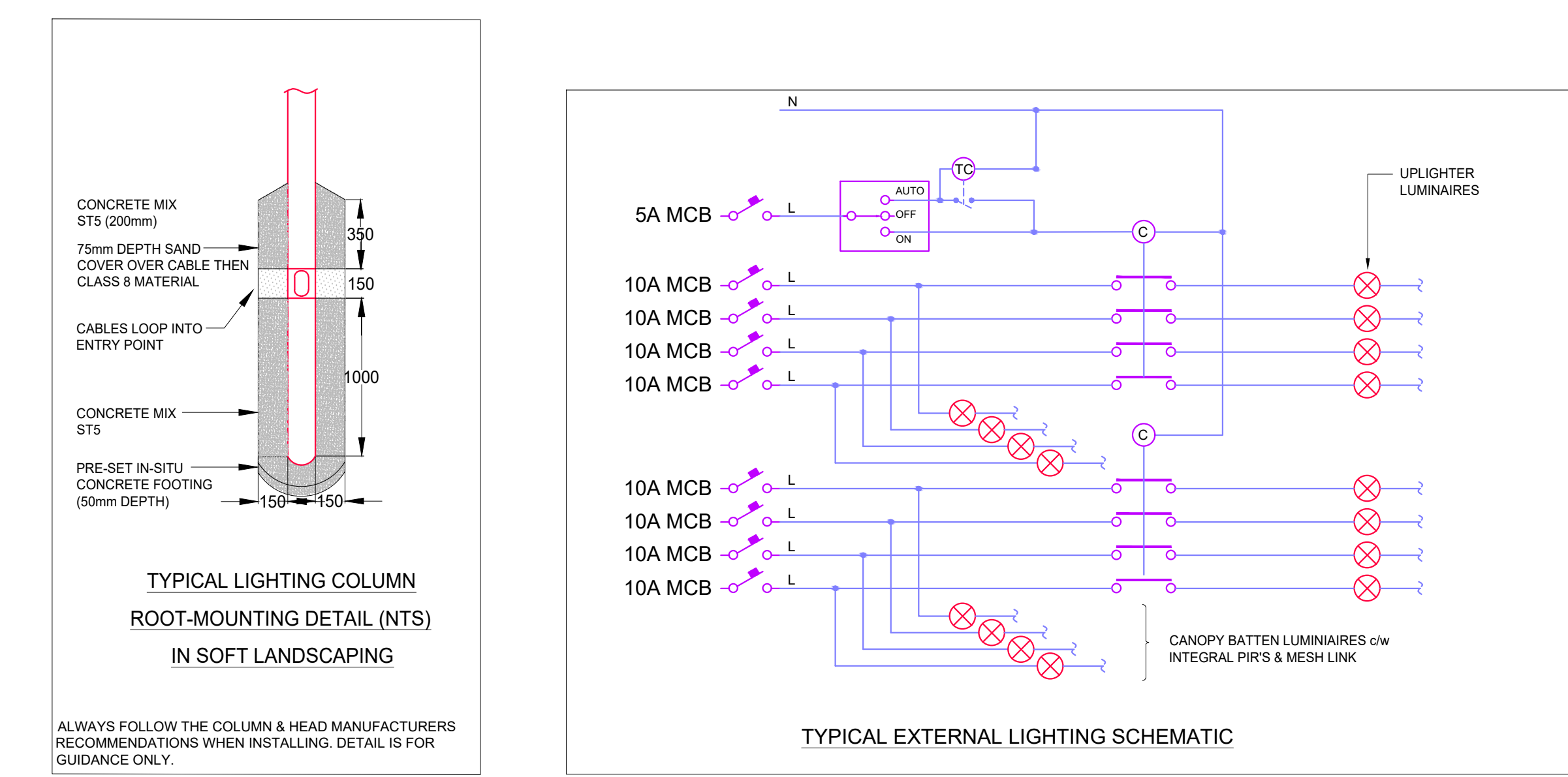
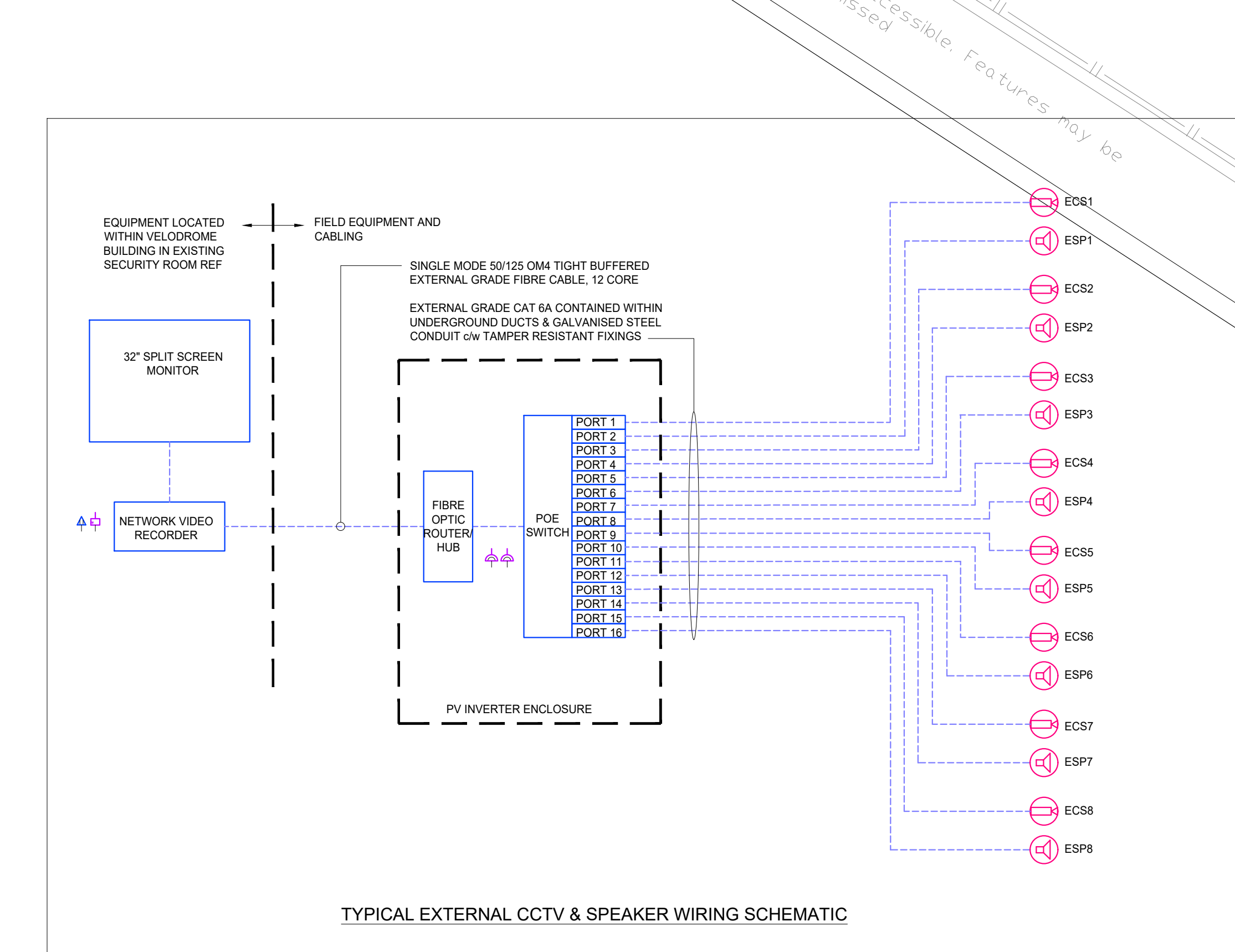
WORKMANSHIP FOR TRUNKING
ARRANGE TRUNKING TO ALLOW ACCESS TO WIRING. LOCATE COVERS ON TOP OR SIDES OF TRUNKING IF PRACTICABLE. ARRANGE ACCESS SO COVERS ARE ON A CONTIGUOUS FACE AND CABLES CAN BE Laid IN THROUGHOUT THE LENGTH OF THE TRUNKING. NOTIFY WHERE EITHER CONDITION CANNOT BE ACHIEVED.

FIXING TRUNKING:
ENSURE TRUNKING IS INDEPENDENTLY FIXED AND SUPPORTED FROM BUILDING FABRIC. OBTAIN APPROVAL FOR PROPOSED FIXINGS/ SUPPORTS.

SUPPORT TRUNKING IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS BS 7671 (IET WIRING REGULATIONS) AND THE LATEST EDITION OF GUIDANCE NOTE 1 SELECTION AND ERECTION PUBLISHED BY THE IET.

ENSURE CONDUIT IS NOT UNDER MECHANICAL STRESS. FIX CONDUIT BOXES INDEPENDENTLY OF CONDUIT. MAKE ALLOWANCE FOR ANY ADDITIONAL MECHANICAL LOADING SUPPORTED BY CONDUIT BOXES WHERE PROTECTION IS SPECIFIED AS IP44 OR GREATER. ENSURE FIXINGS OF CONDUIT BOXES ARE SUITABLE TO MAINTAIN DEGREE OF PROTECTION.

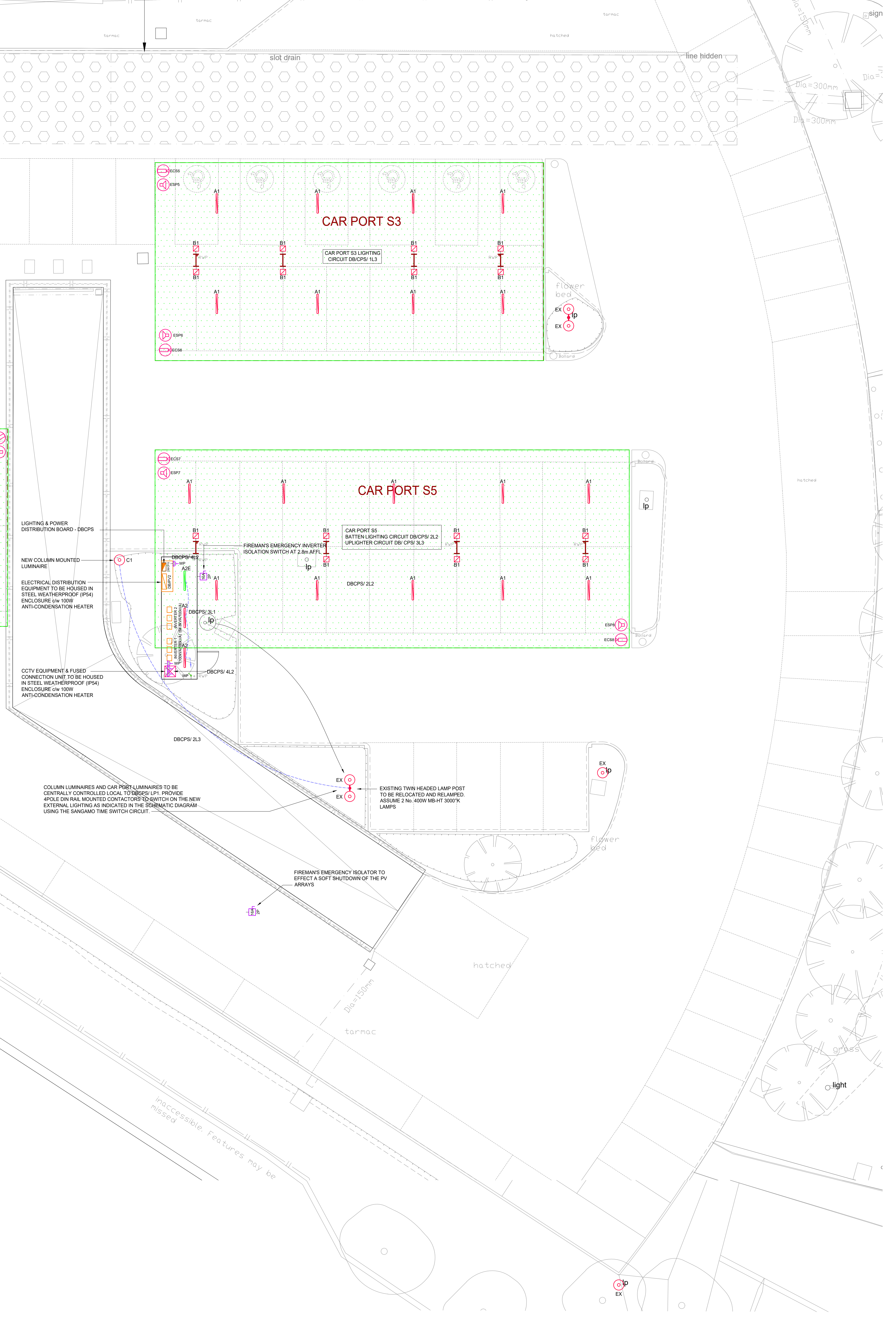
CCTV SYSTEM REQUIREMENTS:



LEGEND OF SYMBOLS

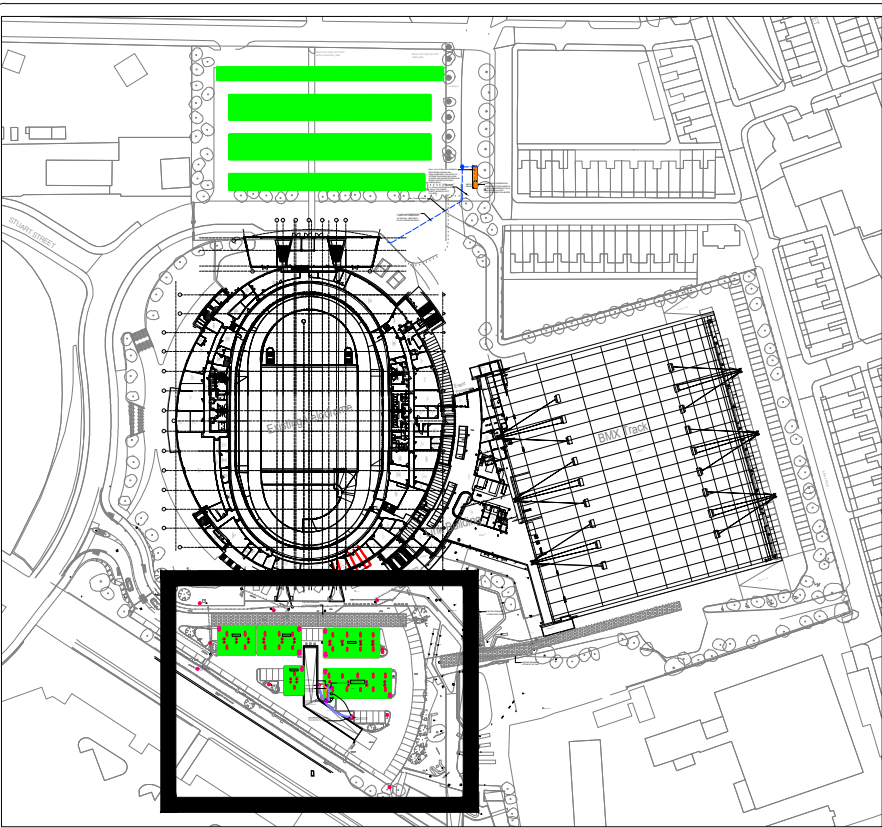
- EX DENOTES EXISTING EQUIPMENT
- A1 NEW THORN AQUAFORCE PRO LED LUMINAIRE SUPPLIED AND INSTALLED BY EVO ENERGY, 1100mm, 21W, 2000lm, 4000°K LED
- A2 THORN AQUAFORCE PRO LED BATTEN LUMINAIRE, A20PRO S LED4000-840 PM WB HF, 1100mm 35.2W, 4420lm, 4000°K, IP66, DUST AND MOISTURE RESISTANT LED LUMINAIRE. ELECTRONIC, FIXED OUTPUT CONTROL, GEAR, WITH WIDE BEAM DISTRIBUTION, CLASS II ELECTRICAL LIGHT GREY POLYMETHYLENE THIOPLATE, DIFFUSER, HIGH TRANSMISSION OPAL, POLYMETHYLMETHACRYLATE WITH REFRACTION PRISMS, AMBIENT TEMPERATURE -20°C TO +35°C, COMPLETE WITH 4000K LED.
- A2E AS A2 BUT COMPLETE WITH INTEGRAL NMS EMERGENCY BATTERY PACK
- B1 SYLVANIA "START FLOOD" FLAT COLUMN MOUNTED FLOODLIGHTS CONFIGURED TO UPLIGHT THE CANOPIES MOUNTED AT 2.9M APL. THE PRODUCT INCLUDES 1 M PRE-WIRED STRIPPED CABLE AND FITTING BRACKET FOR QUICK AND EASY INSTALLATION FOR SURFACE MOUNTING, BLACK (RAL9007) HOUSING, WHITE REFLECTOR, 2000 LM, 18 W, 111 LMW, 4000K, NON-DIMMABLE, CR-80, IP66, IK06, CLASS II, LIFESPAN L70-B50: 90000 HRS, 110 X 123 X 26mm (L X W X H), WEIGHT: 0.36KG.
- C1 HOLOPHANE CITYMAX COLUMN MOUNTED LUMINAIRE COMPLETE WITH 8in COLUMN, 148W, 21.236lm, 3000°K, CR R480, 6w BOROSILICATE GLASS DIFFUSERS PROVIDING A SYMMETRICAL LIGHT DISTRIBUTION, ALUMINUM BODY, MANUAL CONTROL
- EX EXISTING HOLOPHANE TWIN HEADED COLUMN WITH VISTA GRANDE LUMINAIRE FITTED (DISCONTINUED). ASSESS LAMP RATING PRIOR TO ORDERING REPLACEMENT
- EP PHOTO ELECTRIC CELL
- EX CONTACTOR, 4POLE, 20A RATED CONTACTS, AC COIL
- Y LIGHT SWITCH
- CSK HANWHA 2MP NETWORK 40X PTZ CAMERA, XNP-6400R. EXTERNAL CCTV CAMERA 6w INFRARED ILLUMINATOR FOR LOW LIGHT CONDITIONS, AUTO IRS
- AXIS C1310-E NETWORK HORN SECURITY LOUDSPEAKER, POE COMPATIBLE, 6w INTEGRAL DIGITAL SIGNAL PROCESSOR
- TC SANGAMO RPT3 0550 24 HOUR, 3 PIN TIME SWITCH WITH 1 ON / OFF OPERATION AND 100% BATTERY RESERVE. TIME SWITCH TO BE SET WITH 11PM CURFEW UNLESS CLIENT ADVISES OTHERWISE

EXISTING DRAINAGE ATTENUATION TANK



0 This drawing may have been reduced original scale = 100m

Reference Drawings Legend Notes



LIGHTING & LIGHTING CONTROL STANDARDS NOTES

THIS DRAWING SHALL BE READ IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATION NOTES, DRAWINGS AND EQUIPMENT SCHEDULES. CATALOGUE NUMBERS INDICATED ON DRAWINGS ARE FOR GUIDANCE ONLY. THE CONTRACTOR MUST OBTAIN ALL REFERENCE NUMBERS FROM THE MANUFACTURER AND PROVIDE A TECHNICAL SUBMITTAL FOR COMMENT BY THE ENGINEER FOR ALL LUMINAIRES PRIOR TO PROCUREMENT.

COORDINATE ALL ELECTRICAL WORKS ASSOCIATED WITH THE CANOPIES AND PV INVERTER ENCLOSURES WITH EVO ENERGY.

CORPLY WITH THE FOLLOWING - REQUIREMENTS FOR ELECTRICAL INSTALLATIONS (IET WIRING REGULATIONS) BS 7671:

LUMINAIRE STANDARDS
SUPPLY LUMINAIRES WITH PHOTOMETRIC DATA IN ACCORDANCE WITH BS EN 1303-1.
SUPPLY LUMINAIRES IN ACCORDANCE WITH BS EN 1303-2.
FIXED GENERAL PURPOSE LUMINAIRES TO BE 400, 100, 100 (BS EN 1303-1)
LUMINAIRES FOR ROAD AND STREET LIGHTING TO BE 100, 100 (BS EN 1303-1)
LED MODULES FOR GENERAL LIGHTING TO BE EN 60521.

INSPECTION AND TEST PROCEDURE:
a. CORPLY WITH BS 7671 (IET WIRING REGULATIONS), PROVIDE COMPLETION CERTIFICATES IN ACCORDANCE WITH BS 7671 (IET WIRING REGULATIONS).
b. CARRY OUT SITE TESTING AND INSPECTION AND PROVIDE TEST CERTIFICATES FOR PROBABLY INSTALLATIONS. RECORD ALL RESULTS AND READINGS. PROVIDE COPIES OF ANY TEST AND INSPECTION REPORTS TO THE CLIENT.
c. CHECK CORRECT OPERATION OF DEVICES. CONFIRM INTERLOCKS AND SEQUENCES OPERATE CORRECTLY. PROVIDE TEST EQUIPMENT AND CONDUITS AS COMPARTMENTS. TESTS AND AFTER ANY FAULTS. INSTALLATIONS FOLLOWING CORRECTIVE MEASURES. CHECK AND CONFIRM CORRECT SEQUENCING IN MULTIPHASE CIRCUITS.

IDENTIFICATION - GENERAL
APPLY IDENTIFICATION NOTICES IN ACCORDANCE WITH BS 7671 (IET WIRING REGULATIONS) (CLUSE 6) AND APPENDIX 1 TO ALL ELECTRICAL CABLES PLANT AND EQUIPMENT.
a. PHASE COLOR: BROWN, BLACK, GREY
b. PHASE MARKING: - L1, L2, L3
c. FIX USING MATERIALS COMPATIBLE WITH THE NOTICES AND FINISHING SURFACE. OBTAIN APPROVAL PRIOR TO MANUFACTURE OF ALL NOTICES. PROVIDE SAMPLE FOR APPROVAL.
d. APPLY IDENTIFICATION MARKINGS IN ACCORDANCE WITH BS 7671 (IET WIRING REGULATIONS) (CLUSE 9) TO ALL CONDUCTOR TERMINATION POINTS.
e. IN ALL TERMINATIONS OR JOINTS TO AN EXISTING INSTALLATION, IDENTIFY CONDUCTORS AND TERMINALS AS BS 7671 APPENDIX 7.

LABELS: LABEL ALL ELECTRICAL PLANT AND EQUIPMENT USING SAFETY SIGNS IN BS EN 60701.

DISTRIBUTION BOXES IDENTIFICATION:
IDENTIFY EVERY OUTGOING WIRE WITH A REMOVABLE CIRCUIT CHART IN A TRANSPARENT PLASTIC ENVELOPE PERMANENTLY FITTED INSIDE DISTRIBUTION BOARD COVER. CLEARLY INDICATE IN THYPO SCRIPT, CIRCUIT IDENTIFICATION NUMBER, CABLE SIZE, FUSE OR CIRCUIT BREAKER RATING AND A DESCRIPTION OF THE SUPPLIED AND AREA SUPPLIED BY CIRCUIT.

CABLE IDENTIFICATION: PROVIDE ALL CABLES WITH LABELS FIXED AT EACH END OF CABLE. ENSURE LABELS SHOW CIRCUIT REFERENCE NUMBER OF CABLE.
OFF-SITE PAINTING AND ANTI-CORROSION TREATMENTS - GENERAL REQUIREMENTS
PROTECT ALL EQUIPMENT AND LUMINAIRES AGAINST CORROSION. PROTECT FERROUS METALS WITH COATINGS AT WORKS. PROVIDE ALL ITEMS FOR DECORATIVE FINISHING FINISHED TO SUIT BASE MATERIAL AND FINISH.

LIGHTING AND POWER - PRODUCT/FACTORY MATERIALS
SUPPLY LAMPS AND LUMINAIRES AS SCHEDULED IN THE ELECTRICAL SPECIFICATION AND SCHEDULES. SAFETY SUPPORT FOR COMPONENTS - PROVIDE SECONDARY SUPPORT FOR TRANSLUCENT COVERS. OVERLAYS, DIFFUSERS, GRILLS AND FINISHES TO BE PROVIDED AS SPECIFIED IN THE ELECTRICAL SPECIFICATION AND SCHEDULES.
PHOTOMETRIC PERFORMANCE: ENSURE LUMINAIRES OF SIMILAR TYPE HAVE SAME PHOTOMETRIC PERFORMANCE AS PUBLISHED DATA WITHIN THE TOLERANCES SPECIFIED BY BS EN 1303-1.

EMERGENCY LIGHTING LUMINAIRES: CORPLY WITH BS EN 1838-2:2.

LUMINAIRE EFFICACY: THE SYSTEM IS DESIGNED TO ACHIEVE AN AVERAGE INTIAL CIRCUIT OF AT LEAST 6 LUMENS CIRCUIT WATT FOR FIXED LIGHTING EQUIPMENT. PROVIDE LUMINAIRES WITH A MINIMUM COLOUR RENDERING INDEX (CRI) OF 90.

LAMPS AND LUMINAIRE INSTALLATION:
1. INSTALL LUMINAIRES IN HORIZONTAL PLANE UNLESS OTHERWISE SHOWN.
2. ENSURE LUMINAIRES ARE CLEAN.
3. ENSURE CLASSIFICATION OF LUMINAIRES IS APPROPRIATE.
4. SUPPORT LAMPS AND LUMINAIRES.
5. WHERE LUMINAIRE IS SUPPORTED FROM CONDUIT, PROVIDE A CONDUIT BOX FORMING AN INTEGRAL PART OF CONDUIT SYSTEM AT EACH POINT OF SUSPENSION. WHERE CONDUIT ENTERS LUMINAIRE, PROVIDE A CONDUIT BOX FORMING AN INTEGRAL PART OF CONDUIT SYSTEM AT EACH POINT OF SUSPENSION. WHERE CONDUIT ENTERS LUMINAIRE, PROVIDE A CONDUIT BOX FORMING AN INTEGRAL PART OF CONDUIT SYSTEM AT EACH POINT OF SUSPENSION. WHERE CONDUIT ENTERS LUMINAIRE, PROVIDE A CONDUIT BOX FORMING AN INTEGRAL PART OF CONDUIT SYSTEM AT EACH POINT OF SUSPENSION.
6. SUPPORT LUMINAIRES DIRECTLY FROM BUILDING FABRIC.
7. DO NOT SUPPORT LUMINAIRES DIRECTLY FROM ANY FLAMMABLE NON-METAL OR HEAT SENSITIVE MATERIALS.
8. ENSURE SUSPENSIONS ARE VERTICAL UNLESS OTHERWISE SHOWN.

CONNECTION TO LUMINAIRES:
CONNECT CIRCUIT WIRING TO LUMINAIRES. USE GROMMET WHERE CABLES ENTER LUMINAIRE BODY. CONNECT THE EARTHING TERMINAL OF CLASS LUMINAIRES TO THE CIRCUIT PROTECTIVE CONDUCTOR OF THE SUPPLY CIRCUIT. CUT-LOCK WIRING WITHIN LUMINAIRE, AT 300mm MINIMUM.

ELECTRICAL ACCESSORY INSTALLATION: PROVIDE CPIC BETWEEN EARTH LUG ON METAL BOX AND ACCESSORY EXCEPT FOR PLASTIC ACCESSORIES. ENSURE THERE IS NO DAMAGE TO ACCESSORIES DURING INSTALLATION. PROTECT SURFACE MOUNTED ACCESSORIES FROM PAINTING. INSTALL FRONT PLATES OF FLUSH MOUNTED ACCESSORIES AFTER PAINTING. ALLOW ACCESSORIES TO BUILDING FINISHES. MOUNT GROUPED ACCESSORIES IN LINE. FINISHES AND EXISTANT APPEARANCE. ARRANGE CONDUIT AND TRUNKING PLUMB WHERE VERTICAL. NEATLY PARALLEL WITH OTHER SERVICES RUNNING AND THE STRUCTURE.

ACCESS: LOCATE COVERS ON TOP OR SIDES OF TRUNKING TO ALLOW ACCESS TO WIRING.
PROTECTIVE CONDUCTORS: USE CABLE PROTECTORS THROUGHOUT. DO NOT USE CONDUIT OR TRUNKING AS PROTECTIVE CONDUCTORS.

CABLE INSTALLATION: ARMOURED CABLE HANDLE AND INSTALL CAREFULLY TO PREVENT DAMAGE TO SHEATH AND ARMOURING. DO NOT INSTALL P-CABLE AND ARMOUR TEMPERATURE ARE, OR HAVE BEEN FOR THE LAST 14 HOURS, BELOW 7° F. GALVANIZED STEEL GUARDS WHERE CABLES ARE LIABLE TO MECHANICAL DAMAGE. BOND ARMOUR TO EQUIPMENT AND MAIN EARTHING SYSTEM. MAKE VOLTAGE PROOF CONNECTIONS TO APPROPRIATELY SEALED LAND AND TERMINAL BOXES. PROVIDE CPIC-BRIDGE.

CABLE INSTALLATION - THERMOPLASTIC PVC-BRAIDED CABLES: DO NOT INSTALL CABLES WHEN TEMPERATURE IS HIGH OR BELOW FREEZING. DO NOT INSTALL CABLES IN CONTACTS WITH BODIES.

CABLES Laid DIRECTLY IN THE GROUND: BEFORE LAYING CABLES, ENSURE THAT BOTTOM OF TRENCH IS EVEN AND FREE FROM SHARP STONES, ROOTS, ETC. LAY CABLES ON A 75mm BED OF SAND.
WHERE TWO OR MORE CABLES ARE Laid IN THE SAME TRENCH, SPACE AS BS 7671 (IET WIRING REGULATIONS) AND ENA REPORTS. COVER EACH CABLE WITH 10MM OF SAND OVERLAP WITH CABLE MARKER TAPE TO BS EN 1303-1. MARK EACH CHANGE IN DIRECTION OF CABLES WITH A PRECAST CONCRETE SILE, SIZE 80 X 80 X 20mm THICK, IMPRESSED WITH LV CABLE AND Laid LEVEL WITH FINISHED GROUND LEVEL.

CABLES ENTERING BUILDINGS FROM BELOW GROUND: SEAL BOTH ENDS OF PIPE DUCT TO A DEPTH OF NOT LESS THAN 150mm WITH AN APPROVED WATER-RESISTANT, NON-CRACKING, WATER-RESISTANT COMPOUND. A PROPRIETARY MOLDING DUCT, 8.5mm DIA.

TESTING BURIED CABLES: TEST CONTINUITY AND INSULATION OF BURIED CABLES IMMEDIATELY BEFORE AND AFTER BACK-FILLING. TEST CONTINUITY AND INSULATION OF BURIED CABLES PRIOR TO HANDOVER.

T1	TENDER ISSUE	CM	CM	May 22
P2	CCTV equipment updated. Upgrading added to columns	CM	CM	May 22
P1	Preliminary	CM	CM	MAR 22
Revision	Description	Drawn	Checked	Date
Revisions				



Project
NATIONAL CYCLING CENTRE
Prost Street, Manchester, M11 4DQ

The Provision of SOLAR CAR PORTS, SOUTH CAR PARK - LIGHTING & SECURITY LAYOUT

Scale/Size	Drawn	Designed	Software
1:100 @ A0	CM	CM	AutoCAD
Date	FEB 22	Date	FEB 22
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Walmesley Associates Ltd
Gulldhal House, Gulldhal Street,
Preston - PR1 3NU

Tel: 01257 232252
web: www.walmesleyassociates.co.uk
email: info@walmesleyassociates.co.uk

Project number	Drawing number	Revision
1631	1631 / E7	T1