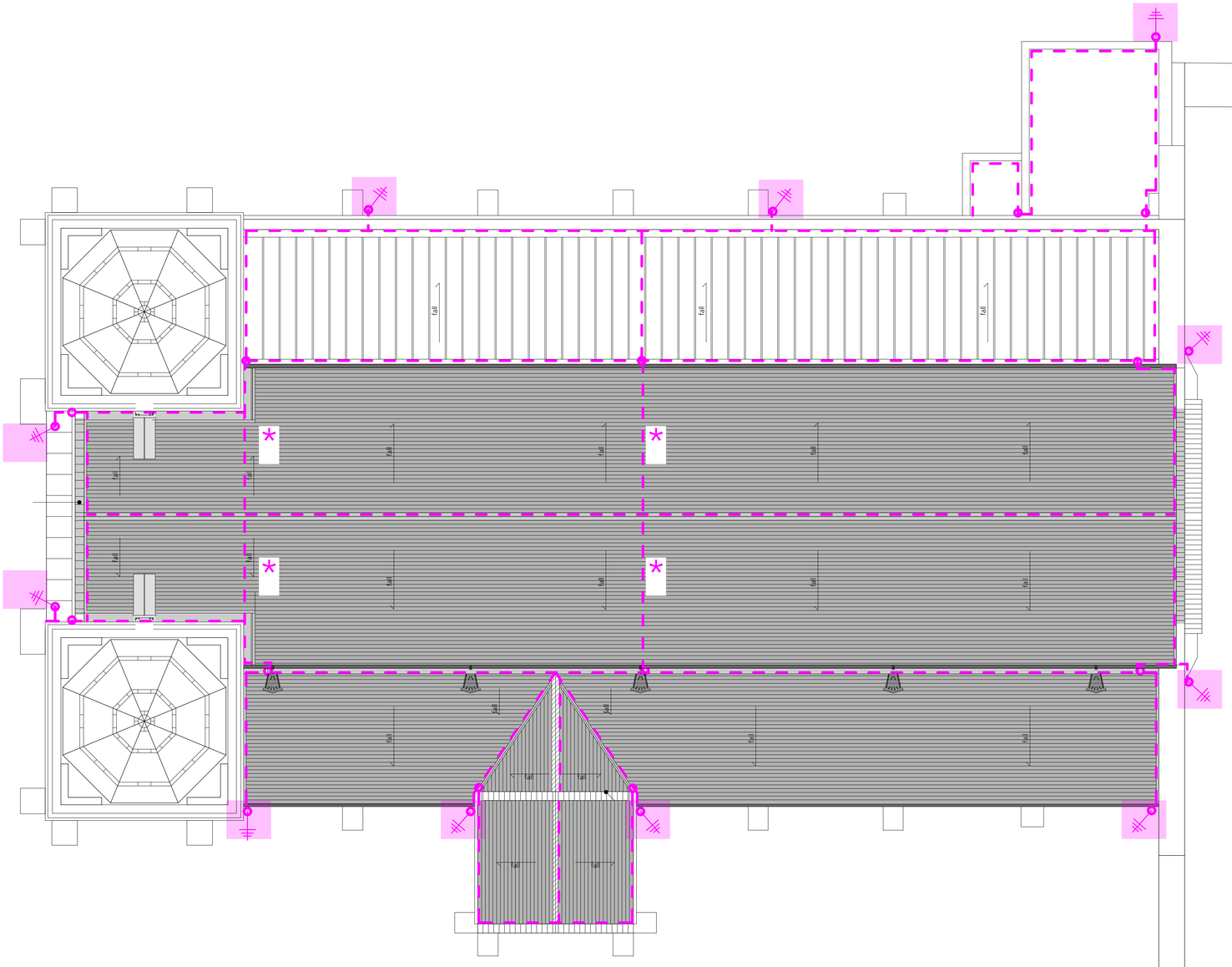


PROPOSED ROOF PLAN: LIGHTNING PROTECTION LAYOUT, DESIGN INTENT

Scale

0m 5m 10m 20m 30m north

LIGHTNING PROTECTION KEY

either 25 x 3mm aluminium tape or 8mm rod air termination, PVC sheathed

either 25 x 3mm aluminium tape or 8mm rod down conductor, PVC sheathed

denotes 300 x 300mm copper lattice earth mat c/w inspection pit, highlighted as given the ground is a schedule monument and will be disturbed, this will be subject to an Archeology watching breif

NOTE:
- all roof tape / rods to be concealed, under lead flashing and slate edges, only two roof routes to run above the slate, marked with a *
- all drops to run tight behind the rainwater pipes for concealment, lightning protection contractor to screw fixings using long length drill bits
- the use of earthing mats to be reviewed for each location
- all drops to follow the profiles of the stonework and also be profiled to suit
- read in conjunction with drawings 1566_L(6-)002, 003 ,004 & 005 Elevations
- the stone towers are excluded from this phase of works as no access will be available beyond the Nave roof, however there does exist one drop per tower and connected behind the Nave roof west gable skew stones. An allowance to be made for a test pit to each drop as at present none exist.

At any point where the ground requires to be excavated / disturbed, this must be done in the presence of the Archaeologist to record and collect any findings. No works to the ground must happen without the watching brief being in place. The contractor MUST coordinate and programme with the Archaeologist.
Any ground breaking works will comprise of hand excavations and no deeper than 150mm at a time, excavated layers must not exceed this, until the required depth is achieved. Time must be allocated for any recording and collection (if required) by the archaeologist.

LIGHTNING PROTECTION INSTALLATION

General

The lightning protection system is a contractor design portion, the accompanying drawings and specification are design intent for the contractor to complete the design in accordance with the recommendations of BS EN 62305 Parts 1,2,3 & 4 Protection against Lightning, BS 7430:2011, BS7671 IET Wiring Regulations.

St Machars Cathedral has a Category A Listing and the burial ground surrounding it is a Schedule Ancient Monument, therefore it is of great historical importance and great care must be adopted in all works carried out.
All contractors undertaking any works are to take cognisance of the building's Category 'A' Listed Status.
All possible care and protection should be taken to ensure that any damage to the historic building fabric is eliminated during the course of the works.

The installation of the lightning protection system must:
- Be carried out in line with the proposed roofing works, therefore multiple visits will be required for the entire installation as the roofing works will only be permitted to be done in sections at a time (for stripping and re-slating)
- All roofing tapes / rods to be concealed under lead flashing and slates, the only visible sections will be those dropping from the eaves on the masonry stonework and then they will require to be routed behind the rainwater pipe drops. Where rainwater pipe drops do not exist, the exact route must be determined with the CA's agreement.
- Both stone towers have in the past received a level of protection, one tape per tower, and the towers are exclude from this work, as there is no access available. However, the existing drops must be picked up and merged with the new system.
- Due to the ground status as a Schedule Ancient Monument and unrecorded locations of graves around the church perimeter, the means of earthing into the ground will have to be agreed on site for each point. However, the costing for using either rods or earth lattice mats are to be included as an alternative within the tender pricing. Therefore both are to be priced fully and a choice made when the locations are determined.
- Each tendering lightning protection contractor MUST visit the site during the tender period and satisfy themselves as to the existing provision of electrics within and around the building. The content of any electrical work within this project is very limited to lighting in the attic space and minor adjustments at the entrance doors. This must be carried out by the lightning protection contractor to establish the SPD,s provision and include within the tender pricing – this will be deemed to have been carried out.
- As part of the lightning protection contractor's visit during the tender period, they must establish a means of making the equipotential bond between the lightning protection system and the main earth bar. This must determine the at least one of the down contractors locations and a means of making the route between the two points – PLEASE NOTE THAT ALL ROUTING OF CABLES, ETC MUST BE CARRIED OUT WITH GREAT CARE TO THE BUILDING FABIRC AND BE CONCEALED.
- The tender price must include for 'powered access' based on the lightning protection contractor's site visit when establishing the above. Please note that any powered access will be subject to approval with the CA, the statements made above regarding care and concealment are to be taken seriously and will be imposed.
- Any equipment required for the installation of the lightning protection system must be highlighted to the CA along with sizes, preferred locations and any limitations on positioning. All equipment must be concealed.
- Samples of all tapes, rods and colours plus all equipment to be made available, prior to works commencing, for selecting and discussing any on site issues for routing or locating.

The materials for the component parts of the lightning protective system shall be those detailed in BS EN 62305. Care shall be taken in the selection of bonding clamps to prevent corrosion from the action of dissimilar metals.

The installer shall take full account of the environmental conditions at the site and the materials used in the building construction to supply a lightning protection system that will provide trouble free life of at least 25 years.

All components shall be from one manufacturer.

The installer shall submit technical details of the system, including fixings, materials, etc to the CA for comment on the architectural and coordination issues associated with the installation. Metallic roofing and cladding shall be verified as being electrically continuous and bonded to the lightning protection system.

Dependent on the type of system specified elsewhere, all metallic projections and plant or equipment on or above the main surface of the roof structure shall either be bonded to the lightning protection system or provided with a secondary metallic structure mounted either adjacent or above the equipment which will then be connected to the lightning protection system. All bonding connections shall be covered in grease to prevent corrosion.

Conductors shall be run parallel and perpendicular to the structure.

Any extended metal running vertically through the structure shall be bonded to the lightning conductor at the top and bottom, unless the clearances are in accordance with BS EN 62305.

All underground joints shall be carried out using an exothermic process and protected against corrosion. Above ground joints shall be made using gunmetal or phosphor bronze fittings and fixtures. All above ground joints shall be accessible for inspection.

Joints between dissimilar metals shall be protected by proprietary inhibitor paste and taped with bitumastic bandage to prevent corrosion as agreed with the Architect.

Any building weatherproofing shall not be impaired.

Testing joints shall be provided in a convenient position for testing, approximately 1 metre above ground level.

Earth electrodes, refer to the key.

Earth impedance testing shall be carried out during the construction so as to ensure earthing impedance for each earth complies with BS EN 62305 and BS 7430.

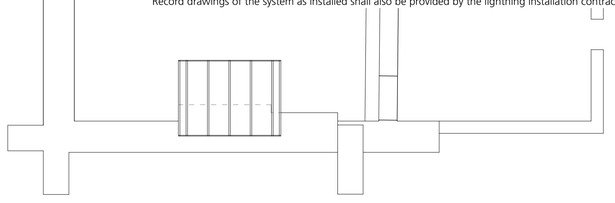
Bonds to extraneous metalwork shall be carried out individually to each element such that the disconnection of any bond shall not affect the earthing of any other element of the system.

The lightning protection all elements colour finish shall be submitted to Architect prior to commencement of the works.

On completion of the installation, the whole system shall be tested in accordance with BS EN 62305. Copies of the test results shall be forwarded to the Architect for approval.

The installer shall allow for a retest of the system prior to the expiry of the defects liability period and as agreed with the Architect.

Record drawings of the system as installed shall also be provided by the lightning installation contractor.



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Job Title:
1566: Fabric Repairs
The Cathedral Church of St Machar, ABERDEEN

Drawing Title:
Scheduled Monument Consent
Plan: Lightning Protection Layout

Drawing Status:
SCHEDULED MONUMENT CONSENT

Drawing Number:
1566_L(SM)004

Scale:	Date:	Drawn:
1:100 @ A1	December 2019	GP

Revisions: