THE ENGINEERING COUNCIL OF SOUTH AFRICA

PRACTICE NOTES ARISING FROM CONTRAVENTION OF ECSA's RULES OF CONDUCT FOR REGISTERED PERSONS.

PUBLISHED BY ECSA TO MINIMISE THE RISK OF RECURRENCE

Practice Note No. 2015/4:

Inadequate assessment of timber roof structure, followed by unacceptable remedial work

BACKGROUND

The Owner of a coastal home was the Complainant in the matter with the Respondent being a Registered Engineering Technologist. During occupation of the two units of the home by tenants various defects became manifest – mostly being leakage through the roof to the interior of the units. The Owner, who resided far from the units, commissioned a local home maintenance firm to inspect the roof and quote for repairs. After repairs were done the Owner required an Engineer's Certificate confirming the repairs had been done correctly.

A certificate was issued by the Respondent but it transpired the standard of the repair work was unacceptable as the problems persisted; a claim by the Owner to the insurers of the property was rejected. An investigation by a specialist appointed by ECSA on receiving the complaint, revealed numerous deficiencies in the original design, which had not been addressed in the repairs, and which were not acceptable.

Arising from the above it was found the Respondent had been found guilty of contravening a number of ECSA's Rules of Conduct, particularly at Clause 3.

DETAILS OF THE PROBLEM

The Owner used a local home maintenance company to assess the condition of the existing roof structure and quote for carrying out the requisite repairs, The Owner also requested that use be made of the services of an Engineer to advise on the correct manner to proceed with the roof repairs.

The Respondent duly attended a site inspection with the maintenance company representative and recorded a number of observations. Those relating to condition of the roof included:

- Visible (approx. 75mm) deflection of trusses spanning across an open plan area, and exceeding span/240 or 40mm
- No visible deflection of trusses across smaller rooms, being supported by internal walls
- Evidence of unsuccessful previous attempts to rectify or strengthen the roof trusses (no details given)
- There appeared to be no firewall between the two units.

The Respondent went on to make recommendations for the remedial work, which included:

- Remove roof tiles to reduce load on the trusses, with one unit vacated at a time.
- Brick up the firewall to provide support to a proposed laminated beam to be erected under long-spanning trusses.
- Build up a brick pier into the roof space to provide support to the laminated beam at its opposite end.
- Jack up the long-spanning trusses and position a laminated timber beam under the apex of each truss of size 511mm deep x 65mm wide or 444mm deep x 90mm wide.
- Re-use existing brandering, provide white PVC underlay and repack tiles.
- Fit storm clips to bottom two rows of tiles on each side of the roof.

The quotation by the home maintenance company representative took the above recommendations into account but specified a laminated beam of size 320mm deep x 114mm wide. If the roof structure required replacing, the cost would be approximately double that of the quotation.

The Respondent signed a Certificate in terms of the National Building Regulations confirming the structural system had been completed in accordance with the application in respect of which approval was granted in terms of Section 7 of the National Building Regulations and Building Standards Act.

Subsequent to this the tenants in the unit advised the Owner that problems with the roof were continuing, including possible damage to the roof. The Owner submitted a claim to the Insurers of the units, which was rejected. The Insurers advised that following an inspection by their service provider, the damage sustained did not fall within the scope of the policy cover, with the chief reason for leakage being lack of maintenance. The service provider's report condemned the repairs, requiring *inter alia*:

- Repack part of the roof.
- Correctly repair seven trusses.
- Realign slipped apex connection (members out of line).
- Replace nail plates not hammered across joints.
- Avoid wedges under battens to level roof.
- Correct roof covering tiles, needing another batten and extra tiles each side of ridge.

After receiving the complaint ECSA commissioned a specialist Engineer to investigate and report on the matter. The investigation confirmed the deficiencies as referred to above and the report included the following findings:

i. Poor fabrication and embedment of nail plates.
ii. Randomly sized nail plates with random orientations.
iii. Internal walls used as internal supports
iv. Trusses undersized to span 10.45m over full width of unit.
v. Ridge tiles not adequately covering roof tiles.
vi. No rafter or web runner bracing for long term stability.
vii. Laminated beam inadequate and overstressed.
viii. Site application nail plates not 30% longer than machine plates.
ix. SABS 0243 (Design, Fabrication & Erection of timber roof trusses) not complied with.

It was concluded the original truss fabrication and erection was of very poor quality. The remedial work recommended by the Respondent was inadequate to stabilise the roof in the long term. It was not inspected by the Respondent prior to issuing a stability completion certificate, who had chosen to rely on the builder's integrity. Finally, new trusses should have been manufactured and installed in the roof.

With regard to ECSA's Rules of Conduct for Registered Persons it was apparent to the investigators that the Respondent had transgressed the following Rules of Conduct:

Rules 3(1) a, b, c ……..Competency
Rules 3(2) a, b, h ……..Integrity
Rules 3(3) a, b ……..Public Interest
Rule 3(5) a ……Dignity of the Profession

WHAT LESSONS CAN BE LEARNED?

The design, fabrication and erection of timber roof structures using nail plate is a specialised area of structural engineering and should not be undertaken lightly. This applies particularly to the assessment of the condition of existing roof structures and the design and specification of remedial works.

Lessons to be learned from transgression of Rules of Conduct in the above project also apply generally, and are summed up as follows:

1. Always exercise due skill, care and diligence in fulfilling your obligations towards clients, contractors and the public. Do not condone nor take responsibility for substandard materials or workmanship.

2. Ensure you do not undertake work for which you have insufficient competence to perform. This risks dangerous outcomes and prevents carrying out the work win accordance with the norms of the profession. This applies especially when investigating deficient work done by others.

3. Never sign a completion certificate without having first inspected the work personally to ensure it has been done satisfactorily and you are able to

assume honest responsibility for the certification. Never rely on the observations or opinions of others in this regard.

4. At all times ensure that your conduct is in keeping with the dignity, standing and reputation of the profession, without misrepresenting your capabilities and experience in any way.

Disclaimer

The contents hereof are published for general information only and are not intended as specific professional advice, legal or otherwise. Every situation should be considered separately and specific professional advice in relation thereto should be sought.

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