FLI structures

Advice Note:

Corrosion Of Tower Legs and HD Bolts at Foundation Level.

FLI Document Reference: FLI 2025/004

Revision:	01
Modification:	Initial release
Date:	14/01/2025
Prepared by:	Trevor Burden
Checked by:	David Rutland
Status:	For issue

Advice Note:
Corrosion Of Tower Legs and HD Bolts at Foundation Level.

1.0 Introduction

As many telecoms towers approach or exceed their design life yet remain in service, it has become apparent that corrosion at the base of tower legs is becoming a significant risk to structural integrity. This advice note sets out the issue, action required and possible remedial measures.

2.0 Description

In recent years, many instances of corroded legs and Hold Down Bolts have been reported. Some have led to structural failure with the subsequent collapse of towers.

The primary cause of this corrosion is lack of adequate maintenance, whereby detritus and salts are allowed to build up around tower legs creating ideal conditions for corrosion. Other factors are proximity to the coast or salted roads. In addition, some tubular stubs lack internal grout allowing water to build up internally over time, causing corrosion of the invisible internal space.

Corroded tubular legs
(the internal space was also corroded).

Corroded Angle Stubs.

Corroded Hold Down Bolts.

Build-up of Detritus with Corroded Nuts.

Advice Note:
Corrosion Of Tower Legs and HD Bolts at Foundation Level.

3.0 Maintenance

It is essential that these critical locations of towers are inspected and cleaned regularly and thoroughly so that any corrosion is identified and remediated early on.

4.0 Mitigation

As a preventative measure or where superficial corrosion exists and after remedial actions, mitigation measures should be put in place to minimise the risk of further corrosion, such as:

Grouting Hold down bolts to encase them in a protective environment and negate any detritus buildup. (consideration should also be given to preloading the HD Bolts to mitigate against fatigue)

Grouting the internal space of base stubs to protect against water buildup and associated corrosion.

Forming “pyramids” around tube and angle stubs so that rainwater naturally washes detritus away.

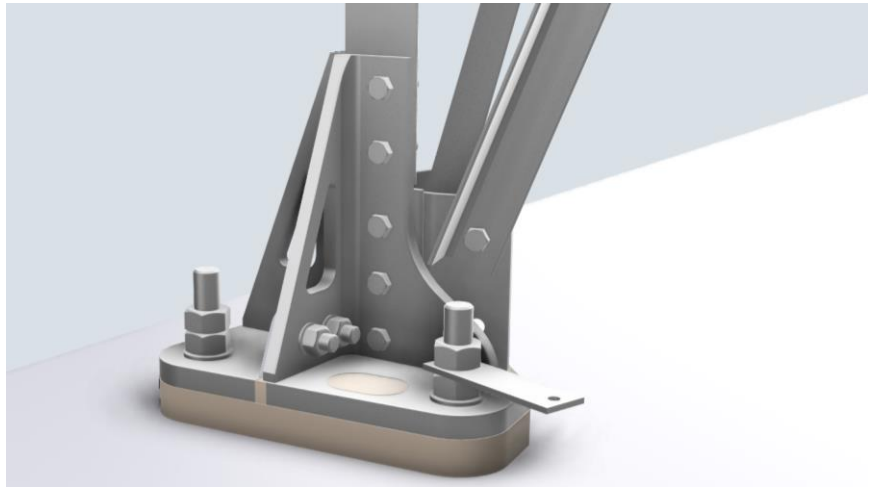
Ideally these measures would be actioned during build, but they can put in place during service, where appropriate. Naturally, a robust inspection and assessment should take place before retrofitting such measures, to ensure no defects are inadvertently lost to view and maintenance, without first remediating.

FLI structures

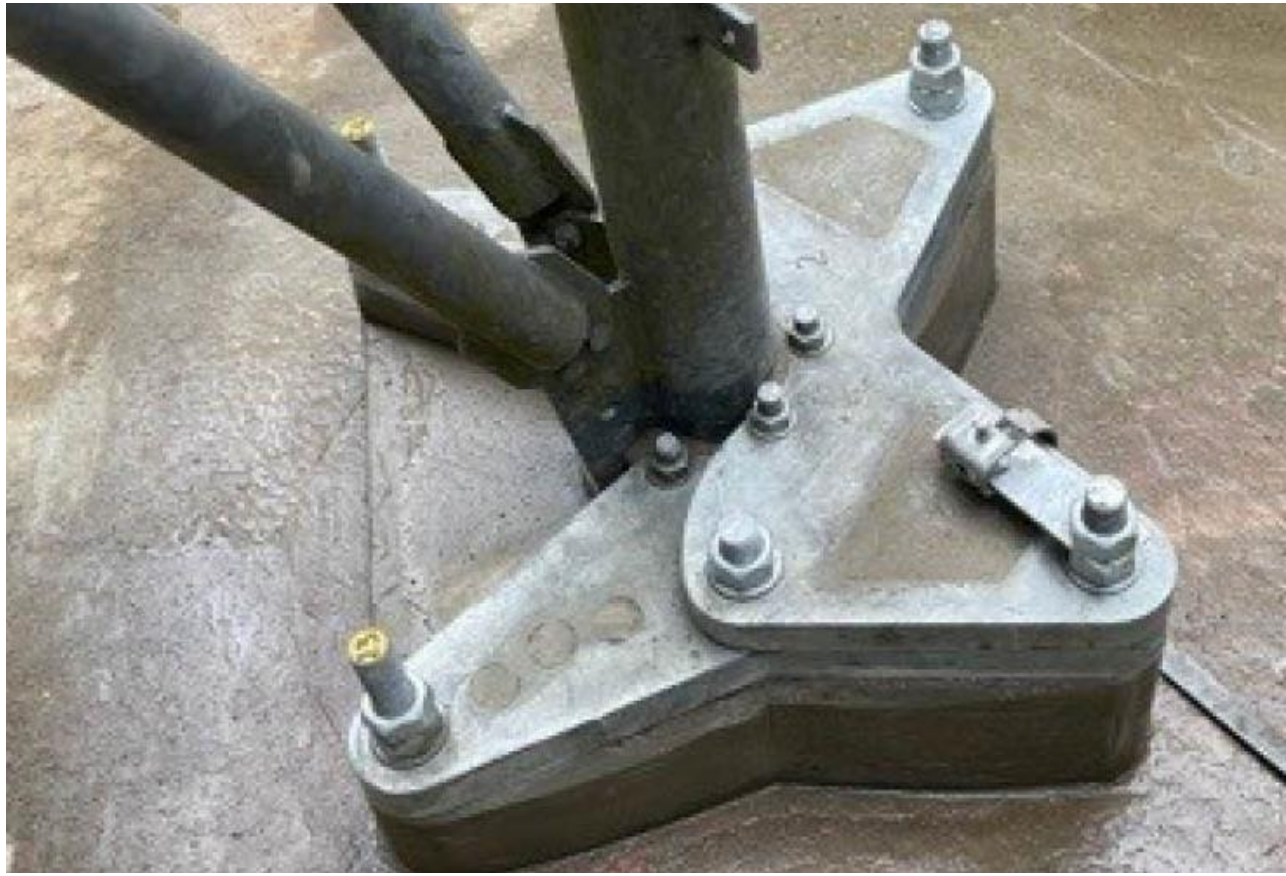
Francis & Lewis International Ltd
sales@fli.co.uk Web: www.fli.co.uk
Waterwells Drive, Waterwells Business Park, Gloucester, GL2 2AA, England
+44 (0)1452 722200

5.0 Remediation

Where corrosion is significant to the extent that capacity is affected, multiple remediation measures are available, depending on the circumstances, and FLI have solutions to all the common situations. Typically, these take the form of by-pass or strengthening solutions. Two examples below, more shown at https://www.fli.co.uk/telecoms/aged-structures/



Angle Stub strengthening Solution



Tubular Stub By-pass Solution