Longside Primary School

Cavity Wall Tie Inspection

November 2016
CONTROL SHEET

CLIENT: Aberdeenshire Council

PROJECT TITLE: Cavity Wall tie inspection at Longside Primary School

REPORT TITLE: Cavity Wall tie inspection at Longside Primary School

PROJECT REFERENCE: 114941

Issue and Approval Schedule:

<table>
<thead>
<tr>
<th>ISSUE 1</th>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
<td></td>
<td></td>
<td>Nov 16</td>
</tr>
<tr>
<td>Reviewed by</td>
<td></td>
<td></td>
<td>Nov 16</td>
</tr>
<tr>
<td>Approved by</td>
<td></td>
<td></td>
<td>Nov 16</td>
</tr>
</tbody>
</table>

Revision Record:

<table>
<thead>
<tr>
<th>Issue</th>
<th>Date</th>
<th>Status</th>
<th>Description</th>
<th>By</th>
<th>Chk</th>
<th>App</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Introduction

Fairhurst were instructed by Aberdeenshire Council to undertake an inspection of the existing wall cavity and wall ties within the external wall at Longside Primary School. An intrusive survey was carried out on the 15th of November 2016. Works involved removing localised pockets of block work outer leaf at roof eaves at 4 locations around the building.

1. Parapet at main entrance on East elevation.
2. Internal ground floor plant room on South elevation.
3. Internal bin store ground plant room on South elevation.
4. Internal mezzanine plant room to rear of games hall.

General Building Description

The school and Nursery are located off Inn Brae Road Longside. The building is single storey steel frame building, games hall is a steel frame building and integrate into the overall building scheme.

The external envelope walls are constructed with render block masonry and block inner leaf with an upper light weight cladding panel system.

Roof construction is a light weight system consisting of steel purlins supporting insulated panel roofing system. Roof cladding system wrap around the building eaves which is consistent detail around the building perimeter.

Summary of drawing information supplied

Prior to undertaking survey works we were supplied with the following drawings:

- Ramsay & Chalmers Masonry East and West Elevation drawing (B2659/309)
- Ramsay & Chalmers Masonry North and South Elevation drawing (B2659/310)
- Ramsay & Chalmers High level cladding details (B2659/311A)

Inspection Procedure

Inspection of the cavity and ties were carried out at 4 locations around the exterior elevation and internally of the building perimeter using a scaffold platform.

Inspection focused on the following key items:

1. Inner masonry leaf head restraint detail.
2. How the outer leaf was restrained at eaves levels.
3. Location of walls ties.
4. Wall ties embedment depths.
**Site Observation and Results**

**Location 1 Parapet at main on East Elevation:**

Based on inspection wall construction at this location is 100mm outer render block, 120mm wide cavity and 100mm block inner leaf.

Generally the wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf. With the 1\textsuperscript{st} tie starting 3 courses down.

![Picture 1: Location of exploratory works](image1)

1325mm high with the 1\textsuperscript{st} tie starting 670mm down.

**Picture 1: Location of exploratory works**

![Picture 1: Parapet detail](image2)

Timber framing and OSB restraining top of parapet.

**Picture 1: Parapet detail**
Location 2 Ground floor plant room on South Elevation:

Based on inspection wall to be 140mm with wall start ties exceed 900mm c/c vertically.

Contractor racked out mortar joint. Wall start ties exceed 900mm c/c vertically.

Picture 1 Junction between internal party wall and external perimeter wall.
Location 3 Ground floor bin store on South Elevation:

Based on inspection wall construction at this location is 100mm outer render block, 120mm wide cavity and 100mm block inner leaf.

Generally the wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf. With the 1st tie starting 2 courses down.

Picture 1: Wall head detail

- Wall tie 270mm long with a embedment depth of 70mm inner leaf and 60mm into outer leaf.
- Wall tie 225mm from u/s of steel beam with 2 outer courses blocks above the last tie.
- No soft joint and head restraint ties. Block work built tight to U/S of beam.
Location 4 Mezzanine plant room to rear of games hall

Based on inspection internal wall construction at this location is a collar jointed wall 140mm, 5mm cavity.

Picture 1: Wall head detail

No soft joint and head restraint ties. Block work built tight to U/S of beam.

Picture 2: Wall tie detail

1st wall tie 560mm from u/s of steel beam with an embedment depth of 75mm
Location 4 Mezzanine plant room to rear of games hall

Based on inspection wall construction at this location is 100mm outer render block, 50mm wide cavity and 100mm block inner leaf.

Wall tie spacing varies exceeds 450mm c/c vertically and exceed 900mm c/c horizontally between inner and outer leaf. With the 1st tie starting between 2 and 4 courses down.

No soft joint and head restraint ties. Block work built tight to U/S of beam.

Wall ties 150mm long with embedment depth of 50mm into both courses.

Picture 1: Wall head detail

Picture 2: Wall tie detail
Conclusion/Concerns

1. Where wall ties have been encountered the depth of embedment is adequate.

2. There are no head restraint ties to the inner leaf in all locations where we investigated.

3. Table below summarising the locations of upper most ties relative to the U/S of internal steel beams and distance to top of outer leaf.

<table>
<thead>
<tr>
<th>Locations</th>
<th>Distance form U/S of steel</th>
<th>Height from tie to top of outer leaf</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>-</td>
<td>670mm</td>
</tr>
<tr>
<td>2.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>3.</td>
<td>225mm</td>
<td>550mm</td>
</tr>
<tr>
<td>4.</td>
<td>560mm</td>
<td>560mm</td>
</tr>
<tr>
<td>5.</td>
<td>Max 900mm</td>
<td>Max 900mm</td>
</tr>
</tbody>
</table>

It appears the single storey building outer leaf is not tied back to existing structure and propose the following remedial works to help restrain the block outer leaf (please see details 1 below):

- Stainless steel self-tapping fixing to tie out leaf back to steel work.

Details 1: Proposed remedial detail at typical roof overhang locations
Internal head restraint detail

At locations invested where no head restraint ties were found, we will require verification that all wall panels were designed as unrestrained and have sufficient capacity to resist required wind loads including local effects.

Remedial wall ties at main entrance

At this location wall ties were found to be 3 courses from top of wall and would recommend that Helifix Dryfix or equivalent remedial wall ties are installed 225mm down from top of parapet.
Remedial works at Ground floor plant room on South Elevation:

Joint to be repointed and stainless steel straps to be installed at 450mm c/c vertically

Remedial work at mezzanine plant room to rear of games hall
Helifix Dryfix or equivalent remedial wall ties are installed for the 1st two courses from U/S of beam around perimeter of plant room.