CONTROL SHEET

CLIENT: Aberdeenshire Council

PROJECT TITLE: Cavity Wall tie inspection at Oldmeldrum Academy

REPORT TITLE: Cavity Wall tie inspection at Oldmeldrum Academy

PROJECT REFERENCE: 114941

Issue and Approval Schedule:

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Revision Record:

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Introduction

Fairhurst were instructed by Aberdeenshire Council to undertake an inspection of the existing wall cavity and wall ties within the external wall at Oldmeldrum Academy. An intrusive survey was carried out on the 18th–19th of Oct 2016. Works involved removing localised pockets of block work outer leaf at roof eaves at 6 locations around the building. Please refer to Fig 1. Location plan for exploratory survey works.

Fig 1. Site location plan for exploratory survey works.
**General Building Description**

Oldmeldrum Academy is located off Colpy Rd. The building comprises of 1 to 2 storey braced steel frame. 10-12m high games halls are steel frame building and integrate into the overall building scheme. The Internal upper floors are composite metal decking or pre-cast.

The internal walls are block work and the external envelope walls are constructed with render block masonry and cream brick/block work.

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 wall tie detail drawing (dwg No. A9516 – QA78)

**Inspection Procedure**

Inspection of the cavity and ties were carried out at 6 locations around the exterior elevation of the building perimeter using a MEWP platform lift and 1 internally using scaffold access.

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 eaves on West elevation

Based on inspection wall construction at this location is 100mm outer rendered block, 80mm wide cavity and 100mm inner leaf.

Generally the wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf.

Location 1 picture of opening up works

![Location 1 picture of opening up works](image)

No head restraint ties. With the first tie starting 225mm down from top of wall.

Picture 2 typical head Restraint detail
Location 2 eaves on North elevation

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

Generally to the underside of steel truss wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf.

Picture 1 picture of opening up works

Wall tie fixed to steel work into outer leaf. Embedment depth of 50mm.

Assumed no head restraint ties with first tie starting 225mm down from u/s of steel

Picture 2 bottom cord of gable truss

140mm inner leaf
Picture 3: wall ties arrangement to between gable steel truss and out leaf.

- 3 courses of block work not tied back to internal structure.
- Wall tie fixed to diagonal steel work.
- 100mm block outer leaf
Location 3 eaves on East elevation of plant room

Based on inspection wall construction at this location is 100mm outer block, 80mm wide cavity and 100mm inner leaf.

Generally the wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf.

Picture 1 opening up works

Picture 2 wall ties around opening in elevation
Location 4 eaves on North elevation of games hall

Based on inspection wall construction at this location is 100mm outer block, 150mm wide cavity and 140mm inner leaf.

Generally the wall ties are spaced, 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf.

3.5 outer leaf courses of block work with no ties back to internal structure.

Wall ties starts 560mm down from U/S of beam.
Existing tie are 225mm long with an embedment depth of 40mm into outer leaf.
Appears no block work head restraint ties were installed.

Picture 1 typical wall head restraint
Location 5 eaves on West elevation of games hall

Based on inspection wall construction at this location is 100mm outer block, 150mm wide cavity and 100mm inner leaf.

Generally the wall ties are spaced at 450mm c/c vertically and 900mm c/c horizontally between inner and outer leaf.

![Wall ties starts 330mm down from U/S of beam. Appears no block work head restraint ties were installed](image)

Picture 1 typical wall head restraint/tie arrangement
Appears no block work head restraint ties were installed
Location 6 Gable on West elevation of plant room

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

Picture 1 internal wall tie to steel work within plant room space.
Picture 2 wall tie to steel work

1st wall tie starts 4 courses down.

Picture 3 wall tie between inner and outer leaf

1st wall tie from steel column located 225mm down and 660mm from face of steel column. Embedment depth 60mm.
Picture 4 view of external plant room louver on West Elevation

Typical cladding detail, 1.5mm pressed metal angle fixed to cladding and block outer leaf at 900mm c/c
Wall construction 100 inner leaf, 100 cavity and 100mm outer leaf.

1st wall start 330mm down from u/s of steel beam. Wall ties generally at 450mm c/c vertically and 900mm c/c horizontally.

No internal block head restraint tie.

Steel columns with no ties to block would leaf.

1 course of outer leaf block to the pressed metal angle fixed to cladding.

Picture 5 view of eaves adjacent to louver

Picture 6 view of cavity adjacent to louver
Location 7 viewing gallery in games hall

Picture 1 Junction between games hall/plant room wall and access corridor.
Conclusion/Concerns

1. Where wall ties have been encountered the depth of embedment is adequate except at Location 4 eaves on North elevation of games hall.

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>
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<th>Distance form U/S of steel</th>
<th>Height from tie to top of outer leaf</th>
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<tr>
<td>1.</td>
<td>-</td>
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**Internal head restraint detail**

At locations investigated 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.

**Location 4 eaves on North elevation of games hall**

At this location wall ties were found to have poor embedment, therefore we would recommend that Helifix Dryfix or equivalent remedial wall ties are installed for the first 6 courses of block work form under side of beam (please see picture below showing extent of works)

![Picture: Remedial wall ties at survey location 4]
Remedial works to viewing gallery in games hall

Helifix remedial bars installed at 450mm c/c vertically on both internal returns.
Remedial works to louvers on West and North Elevation of games hall

Helifix remedial ties to be installed all around louvers on both elevations.

Helifix remedial ties around free edges to be installed are 225mm c/c horizontally and vertically for the 1st four courses.

Stainless steel straps to be installed at 450mm c/c vertically to tie inner leaf to the steel column (both sides).
**Louver restraint on games hall elevations:**

At locations investigated where louvers are supported off out leaf, we will require verification that all wall panels were designed as unrestrained and have sufficient capacity to resist required wind loads including local effects induced by the louver.

**Further information required to conclude extent of remedial works:**

1. Typical cladding over hang detail to be supplied.
2. Details and elevation of roof trusses.
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