Civic Engineers

Job Title
Highland School RAAC Survey – Nairn Academy

Prepared for
Highland Council and Watts Property Service

Report Type
RAAC Survey Final Report

Date
21 August 2023

Contents

RAAC Survey Final Report

Prepared by	[redacted]
Reviewed by	[redacted]
Civic Job No.	2967
Issued	21.08 23
Revised	

This report is the copyright of Civic Engineers and is for the sole use of the person/organisation to whom it is addressed. It may not be used or referred to in whole or in part by anyone else without the express agreement of Civic Engineers. Civic Engineers do not accept liability for any loss or damage arising from any unauthorised use of this report. Civic Engineers is a trading name of Civic Engineers (Caledonia) Ltd (registered number 10843357), which is a limited company registered in England, registered address Carver's Warehouse, 77 Dale Street, Manchester M1 2HG

© Civic Engineers 2023

1. Introduction

1.1 Survey Background

An inspection of Nairn Academy located at Duncan Dr, Nairn, IV12 4RD, by Fairhurst in June 2022 identified the presence of RAAC panels forming walls and roofs throughout the school.

A review of archive drawings and the Fairhurst report confirmed Siporex (RAAC) panels have been used throughout the building with 126mm thick panels forming roofs and 200mm panels forming walls.

1.2 Survey Extents

A non-intrusive survey was carried out by [redacted] of Civic Engineers on 5th July 2023 to determine condition and extent of defects of RAAC panels. Defects have been categorised *Institution of Structural Engineers guidance note Reinforced Autoclaved Aerated Concrete (RAAC) Investigation and Assessment – Further Guidance April 2023* with risks categorised as critical, high, medium, or low.

Civic Engineers survey covered the following areas of the school:

- Canteen/Kitchen and Storerooms
- Gym halls
- Classrooms at ground floor
- Technical/Art and Home Economics Depts
- First floor (Classrooms and Admin areas)
- Reception and Admin areas

A record of defects is noted within Civic Engineers letter report included within Appendix A.

2. Survey Results

Following review of the defects noted and exposure of soffits covered by suspended ceilings, areas of the school with RAAC panels were categorised as either high, medium or low risk regarding need for remedial works.

Risk Category	Risk Description	Location
High Risk	RAAC panels with water damage. Immediate remedial works required	South elevation walls – refer drawings for location
Medium Risk	RAAC panels with insufficient bearing Remedial works required within the next year.	Games hall Dining hall Classroom directly south of dining hall

		All ground floor areas between dining hall and gym block Home economics staff base and stores
Low Risk	Sufficient bearing and no sign of water ingress	Gymnasium Extension Science Block Main Building all locations not noted as medium risk

Drawings of each floor with risk category annotated are included within Appendix B. Location of existing structure and anticipated span directions is also noted on plans. Should any structure encountered on site vary from that noted on drawings, Civic Engineers should be notified for review.

2.1 Phase 1 – Critical Remedial Works

As noted in Table 1, areas of high risk require immediate remedial works to be made safe and allow the space to be accessed. Critical works pertain to panels where water ingress is evident, in addition to insufficient bearing.

2.1.1 External Wall Panels

A length of RAAC panels forming the external wall of the south elevation were noted to show significant cracking, spalling of concrete, and appeared out of plumb in some locations. Where possible, panels should be repaired or otherwise removed and replaced as they are currently at risk of structural failure.

2.1.2 Temporary Fencing

Due to the programme of works, external walls panels were unable to be repaired prior to staff and pupils returning to the school. Access to school grounds adjacent to the defective external wall panels has been restricted by the erection of a temporary fence until such time that a permanent fence is constructed or RAAC panels are repaired.

2.1.3 Permanent Fencing

Currently the timeline for repair of panels is unknown and specification of repairs is yet to be determined therefore it is understood that the local authority will proceed with erecting permanent fencing creating an exclusion zone around defective panels. Civic Engineers will review design proposals provided by local authority and/or their subcontractor and design new foundations to support the permanent structure.

2.2 Phase 2 – Remedial Works

Details have been presented to ensure RAAC panels achieve the minimum required bearing of 75mm. Remedial details comprise new lengths of rolled steel angles positively fixed to either existing steelwork or masonry walls, with steel packer plates affixed to the top horizontal leg of angles, providing an increase in available bearing. Where panels are exhibiting signs of water

ingress, additional angles are proposed at intermediate points along panels to reduce the overall span of panels.

3. Contractor Proposals

Civic Engineers provided design intent details for remedial works to ensure panels achieved minimum requirement of 75mm bearing and that additional support at intermediate points of panels was provided where panels were noted to show signs of water ingress.

Civic Engineers are awaiting fabricator proposed details for review however, it is anticipated that remedial details will be as per agreed details utilised within Charleston Academy.

A variation on existing details is required where new rolled steel angles are to be fixed to the top chord of existing trusses. At this location, angles are proposed to be fixed to the existing truss via self-tapping tek screws at regular centres to allow for a simpler install on site. Fabricator details will be reviewed by Civic Engineers prior to works commencing on site.

4. Next steps

At the time of writing, a temporary heras fence has been erected around the elevations where wall panels are considered high risk creating an exclusion zone should any panels fail in the short term. Remedials works these panels are anticipated to be undertaken at a later date however, the temporary fence will be replaced with a more robust fencing detail to maintain the exclusion zone until such time that repair works on panels are carried out. Civic Engineers will be responsible for review of proposed fencing product and design of any necessary foundations to support this.

Coordination between the contractor, Highland council and the head teacher of Nairn Academy to take place to agree programme of works for phase 2 remedial works. The contractor will be working closely with the school to ensure minimal disruption to the school and its occupants during the school term.

Remedial details have been agreed in principle between Civic Engineers and the steel fabricator however, formal fabrication drawings are yet to be received. Following opening up works throughout the school and review of existing structure, should any agreed details not be achievable, the fabricator will notify Civic Engineers for review. Any change to existing details or requirement for new details will be coordinated with Civic Engineers and the steel fabricator to implement a cost and time effective solution.

As works are considered urgent will be carried out as a matter of urgency, a retrospective building warrant will be applied for from the local authority. Civic Engineers will be coordinating a retrospective building warrant package alongside accompanying SER certificate upon completion of the phase 2 works. It is proposed that all works, including permanent fencing structure, are covered by one SER certificate and a single stage warrant application.

Appendix A – Civic Engineers Letter Report

Civic Engineers

Glasgow
Virginia Court
35 Virginia Street
Glasgow G1 1TN
—
+44 (0)141 370 1829

Our Ref: 2967/CIV02/ICJ/Nairn
14 July 2023

Client Address: neil.mcdougall@highland.gov.uk
[redacted]@watts.co.uk

FAO Neil McDougall - Property Inspections Management Officer Highland Council

[redacted]
Watts Property Service
St James Tower,
7 Charlotte St,
Manchester
M1 4DZ

Highland Council Schools - Nairn Academy, Duncan Dr, Nairn, IV12 4RD

Following an inspection by Fairhurst (Ref: [redacted]/TS/134609.02) dated 6th June 2022 RAAC roof and wall panels were identified. Copy of the report has been appended (Appendix C) for reference.

No comment has been made within the Fairhurst report of bearing length of Siporex (RAAC) panels and I would note that the guidance on acceptable bearing was updated in April 2023 by the IStructE where it states that less than 75mm is considered unacceptable.

1: Methodology

[redacted] of Civic Engineers visited site on 5th July 2023.

Weather conditions were sunny with intermittent showers.

Neil McDougall of Highland Council and [redacted] of Watts Property Services team were in attendance and escorted throughout the survey.

Generally, our review of the structure was carried out in accordance with the Institution of Structural Engineers guidance note *Reinforced Autoclaved Aerated Concrete (RAAC) Investigation and Assessment – Further Guidance April 2023* for investigating and reporting on structures containing RAAC.

The key parts of the on site review were:

- Recording of cracks or other defects
- Recording of any evidence of water ingress
- Recording of any adverse builderswork post installation e.g. penetrations
- Local tap testing for signs of debonding concrete
- Recording of any obvious excessive deflections or ponding

Extent of survey

No intrusive investigations or material testing has been carried out to inform this appraisal and Civic Engineers have not had sight of the investigations previously carried out on the roof structure. The survey included the following areas:

- Canteen/Kitchen and Storerooms
- Gym halls
- Classrooms at ground floor
- Technical/Art and Home Economics Depts
- First floor (Classrooms and Admin areas)
- Reception and Admin areas

2: Existing Structure

The following historical drawings were provided on site on 5th July 2023 and taken for review. These will be included in the next stage of the report on completion of a full review.

It is likely that the roof makeup is identified as 126mm Siporex conc. Roof slabs and 200mm Siporex wall panels as this building was constructed at a similar time as to Charleston Academy in Inverness.

3: Observations

IstructE risk assessment criteria for RAAC panels has been included in Appendix A of this report for reference. Photos are included in Appendix B and Layouts in Appendix D.

Defect Ref.	Description	Assessed Risk	Recommendation
N.1	Photo N.1 water staining to ceiling tiles in corridor. See photo N.1	**Critical Risk**	**Ceiling tiles to be removed and panel condition assessed. Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.2	Castellated beams supporting Siporex panels – flange appears to be 165mm. See photo N.2	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.3	Soffit of Siporex panels has been damaged during removal of asbestos coating. See photo N.3	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**

N.4	Bearing of panels appears to be less than 75mm. See photo N.4	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.5	Pipework through panel is supported with correct bridle detail but bearing is less than 75mm. See photo N.5	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.6	Geometry of rooms mean the panels are not parallel to supporting beam – unclear on whether bearing length is more than 75mm across whole length See photo N.6	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.7	Wall panels internally show no water ingress. See photo N.7	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.8	Flat roofs externally have moss and vegetation throughout which will trap moisture and makes it difficult to inspect the integrity of the roof sheeting below. See photo N.8	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.9	Siporex roof panels supported on top chord of truss in canteen area – bearing appears less than 75mm. No water ingress visible See photo N.9	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.10	Castellated beams supporting Siporex panels – flange appears to be 165mm. No water ingress visible See photo N.10	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.11	Siporex roof panels supported on top chord of truss in gym area – bearing appears less than 75mm. No water ingress visible See photo N.11	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**

N.12	Water ingress at service pipe location no bridle to support slab penetration. See photo N.12	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.13	Castellated beams supporting Siporex panels in Tech workshop – flange appears to be 165mm. No water ingress visible See photo N.13	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.14	External Siporex wall panels no visible water ingress typically See photo N.14	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**

4: Next Steps

1. Drone survey of the roof to be undertaken to get a full understating of any standing water, identify any deflections and assess the condition of the roof – if the drone could also do the wall panels that would also be useful.
2. Suspended ceilings tiles showing water staining to be popped throughout – It can be just one in each the area for now until we agree a remedial detail.
3. High level access in the canteen and gym halls to inspect the trusses and finalise a detail for increasing the bearing length, which looks to be less than 75mm – it would be worthwhile having a fabricator on site to agree how this can be safely done.
4. I have the archive drawings which we will go through scan and return when back for next visit.
5. Check the span to depth ratios of the longer panels as some are spanning in excess of 5m.
6. The castellated long span beams which are typical throughout the classrooms seem to have 165mm wide flanges which would mean that the bearing is over 75mm each side and therefore acceptable so long as no water damage to planks.

If you have any queries, or require any further information, please do not hesitate to contact me.

Yours sincerely,

[redacted]

[redacted]
Director
For Civic Engineers

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

Appendix A – Risk Classification

Assessment Category	Risk Category	
Red	Critical Risk	Requires urgent remedial works which may include taking out of use or temporary propping to allow the safe ongoing use of a building. Depending on the extent, this may be part or all of the building. Combined with awareness campaign for occupants including exclusion zones.
	High Risk	Requires remedial action as soon as possible. Combined with awareness campaign for occupants, which may include exclusion zones, signage, loading restrictions and the need to report changes of condition, e.g., water leaks, debris, change in loading etc
Amber	Medium Risk	Requires inspection and assessment on a regular basis, e.g., annually Combined with awareness campaign for occupants, which may include signage, loading restrictions and the need to report changes of condition, e.g., water leaks, debris etc
Green	Low Risk	Requires inspection and assessment occasionally, say 3-year period depending on condition. Combined with awareness campaign for occupants, which may include signage, loading restrictions and the need to report changes of condition, e.g., water leaks, debris etc

Table 1 – Risk Categories

4.1.1 Support Condition

Support / bearing condition	Risk Category
Bearing investigated and found to lack required transverse reinforcement	Red (Critical)
Cut or modified panels, including where cut panels are supported on proprietary hangers	Red (Critical)
Bearing <75mm with transverse anchorage reinforcement	Red
>75mm with transverse anchorage reinforcement	Green

Table 2 – Support/Bearing Risk Category

Risk assessment if water ingress is observed				
Deflection	Major Cracking or spalling	Minor cracking/ or spalling within 500mm of support	Minor cracking or spalling away from the supports	No visible defect
Deflection >span/100	Red	Red	Red	Red
Span/100<Deflection<span/200	Red	Red	Red	Red
Span/200<Deflection<span/250	Red	Red	Amber	Amber
Deflection<span/250	Red	Red	Amber	Amber

Risk assessment if NO water ingress is observed				
Deflection	Major Cracking or spalling	Minor cracking/ or spalling within 500mm of support	Minor cracking or spalling away from the supports	No visible defect
Deflection >span/100	Red	Red	Red	Red
Span/100<Deflection<span/200	Red	Red	Amber	Amber
Span/200<Deflection<span/250	Red	Amber	Green	Green
Deflection<span/250	Red	Amber	Green	Green

Table 4 – Risk Category with NO water Ingress

Appendix B – Photographs

Photo N.1 water staining to ceiling tiles in corridor

Photo N.2 Castellated beams supporting Siporex panels – flange appears to be 165mm

Photo N.3 Soffit of Siporex panels has been damaged during removal of asbestos coating

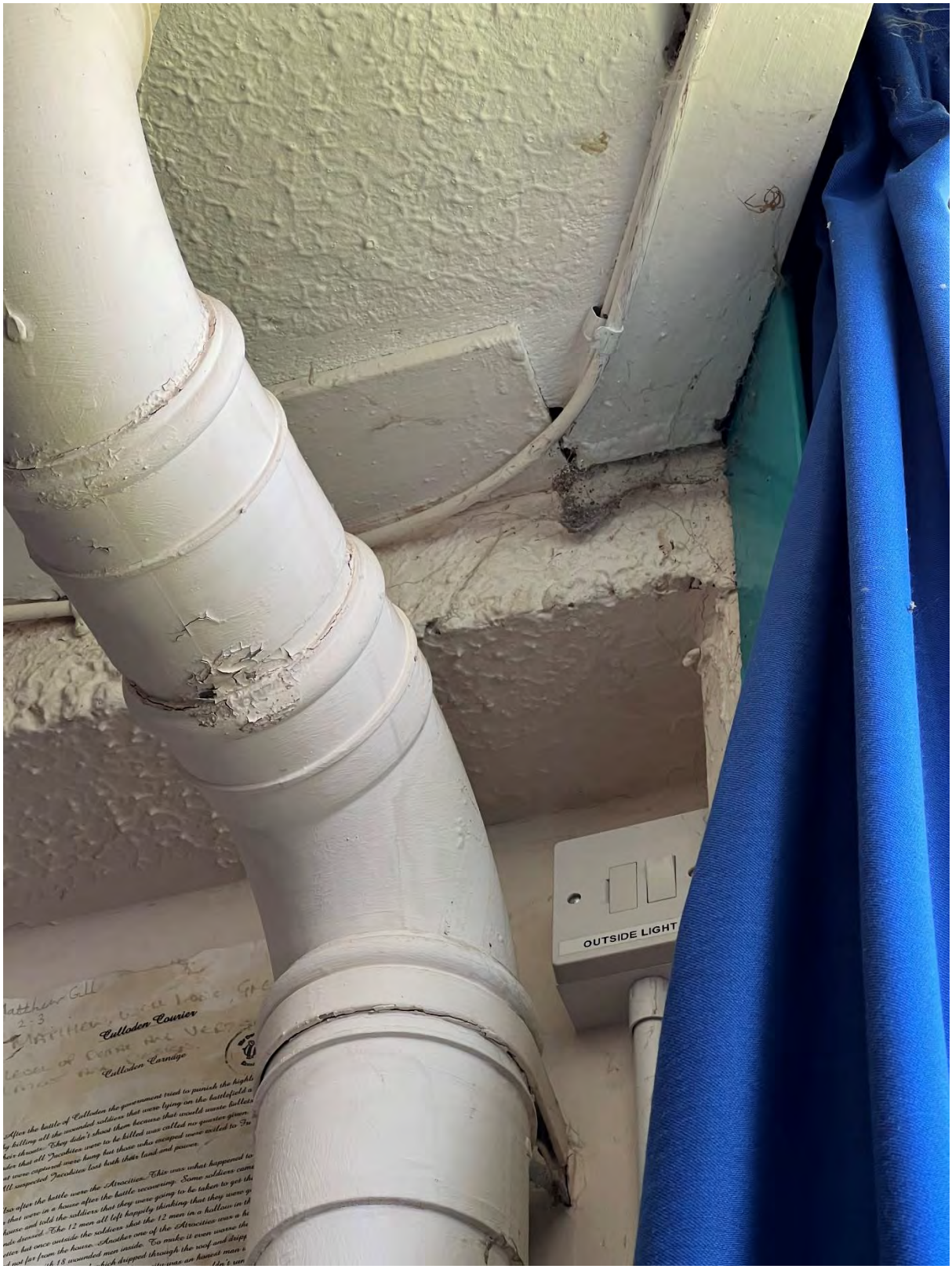


Photo N.4 Bearing of panels appears to be less than 75mm

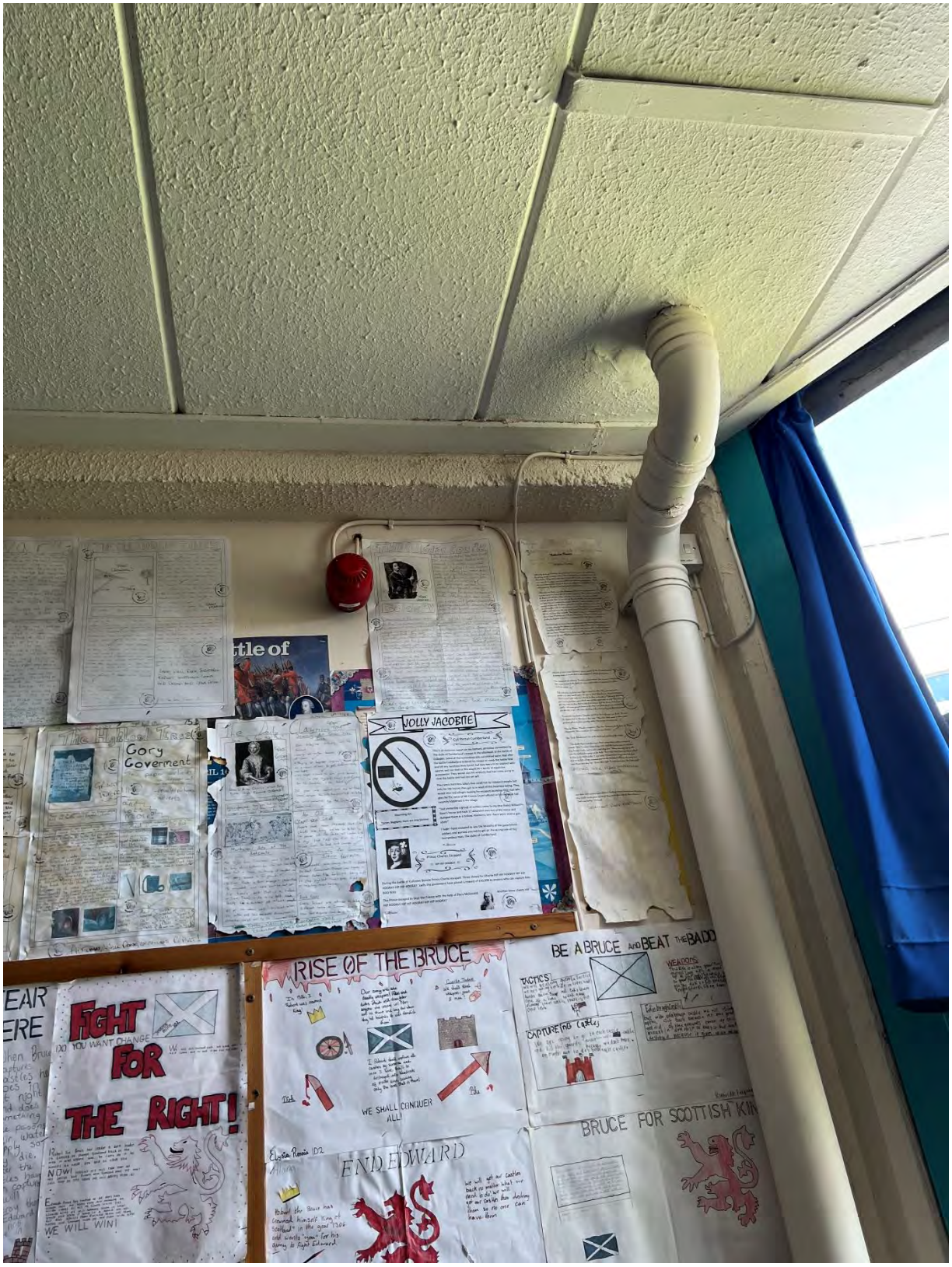


Photo N.5 pipework through panel is supported with correct bridle detail

Photo N.6 Geometry of rooms mean the panels are not parallel to supporting beam – unclear on whether bearing length is more than 75mm across whole length

Photo N.7 Wall panels internally show no water ingress

Photo N.8 Flat roofs externally have moss and vegetation throughout which will trap moisture

Photo N.9 Siporex roof panels supported on top chord of truss in canteen area – bearing appears less than 75mm

Photo N.10 Castellated beams supporting Siporex panels in gym – flange appears to be 165mm

Photo N.11 Siporex roof panels supported on top chord of truss in gym area – bearing appears less than 75mm

Photo N.12 water ingress at service pipe location no bridle to support slab penetration

Photo N.13 Castellated beams supporting Siporex panels in Tech workshop – flange appears to be 165mm

Photo N.14 External Siporex wall panels

celebrating 120 years of engineering excellence

FAIRHURST

Etive House
Beechwood Business Park
Inverness IV2 3BW

TEL: 01463 724544 FAX: 0844 381 4412
Email: inverness@fairhurst.co.uk
Website: www.fairhurst.co.uk

Our Ref: [redacted]TS/134609.02

Date: **6 June 2022**

Mr John Ashford
(Property and Facilities Management)
Property and Housing
Highland Council Headquarters
Glenurquhart Road
Inverness
IV3 5NX

SENT BY EMAIL ONLY

ABERDEEN
BIRMINGHAM
BRISTOL
DUNDEE
EDINBURGH
ELGIN
GLASGOW
HUDDERSFIELD
INVERNESS
LEEDS
LONDON
NEWCASTLE
PLYMOUTH
SEVENOAKS
TAUNTON
THURSO
WATFORD
WESTHILL

Dear Sir

134609: STRUCTURAL INSPECTION OF "RAAC" ROOF AND WALL PANELS NAIRN ACADEMY, DUNCAN DRIVE, NAIRN.

REPORT No 2

With reference to the above project and your instruction to Fairhurst to carry out a Structural Inspection of the above property, we can confirm that our [redacted] visited the above site on Monday 9th and Tuesday 10th August 2021 (accompanied by your John Ashford) and we are pleased to report as follows:

Introduction

In October 2019 The Highland Council received reports that rainwater was ponding on the flat roofs of Nairn Academy and areas of water ingress were present internally throughout the property.

Fairhurst were subsequently instructed to carry out a survey and report on the condition of the Reinforced Autoclaved Aerated Concrete (RAAC) roof panels and the supporting structure.

Instructions were to determine the condition of the Reinforced Autoclaved Aerated Concrete (RAAC) roof panels and the supporting structure. RAAC products are prestressed panels which were introduced to the UK in the late 1950s. They are constructed from a very lightweight aerated concrete mixed with silica, ground blast-furnace slag or pulverised fuel ash, and contain embedded reinforcement which is protected from corrosion by a bituminous or cement latex coating applied prior to casting.

Information paper 'BRE IP10/96' – "Reinforced Autoclaved Aerated Concrete Planks Designed before 1980" has been referenced for guidance on inspecting the RAAC roof panels and assessing their overall condition.

This current condition update and survey will be referred to as Report (Aug21) and should be read in conjunction the previous Report (Oct19).

(Continued…)

Chairman: R B McCracken Senior Partner: K Bryson
Partners: A R Milne G L Bruce D J Clayton I McKay N M McSpadden A J Scott-Kiddie S J Holmes J Liu G J Allan A R Blair N McGarry A Simmons F McMillan R L Gray H D O'Neill D N Townsend D J Fletcher M A Brown A K Fleming
Fairhurst is the trading name of Fairhurst Group LLP, a limited liability partnership registered in Scotland, with the registered number SO387086 and registered office at 43 George Street, Edinburgh EH2 2HT

A copy of The Highland Council's layout plan showing areas of ponding/water ingress is appended to the Report (Oct19).

Description

Nairn Academy was constructed in 1976 and comprises a mixture of single and two storey framed construction with flat felt and asphalt roofs. The roof comprises 260mm thick precast RAAC panels supported off intermediate steel beams and steel trusses at approximately 4.0m centres. The RAAC roof panels have been finished internally with a mixture of Artex plaster and suspended ceiling tiles. The wall construction is a mixture of RAAC panels and exposed brickwork. Extensions to the building have been constructed using more modern methods and as such were not inspected.

Inspection Findings

On Monday 9th Oct, weather was dry and cloudy whilst on Tuesday 10th it was cloudy with several showers.

One of the recommended investigations within 'BRE IP10/96' was to carry out an inverted level survey using a dumpy optical level to determine the deflections of the RAAC panels.
This exercise was carried out for Report (Oct19) and it was found that deflections of the RAAC roof panels were minimal and well within recommended limits for this type of construction.
With the favourable results from Report (Oct19), the inverted level survey was deemed not to be required for Report (Aug21)

Gym Hall (internal)

A combination of roof and wall RAAC Panels, loadbearing face brick, and 8 bays of steel trusses supported on SHS steel columns formed the main structure of the gym.
A scissor lift was used to access the higher wall locations and underside of panels (ceiling level)
Each bay to both elevations was inspected as was each bay at ceiling level.

Signs of minor previous painting/waterproofing repairs was visible at the top of walls.
Several minor vertical hairline cracks were evident in a few wall panels but with no clear pattern.
Some minor damage and cracking to tops of panels was visible.

There was some minor cracking to brickwork at fixing points.
Pointing was loose/missing from some brickwork mortar joints

(Continued…)

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Paintwork peeling.

No leaks or damp spots.
No downpipes leaking.

Small leak in water pipe at top of wall.

Gym Hall walls (External)

Access was by ladder only.

External walls generally consist of double brick cavity wall from base up to a height of approx. 3.5m, above which RAAC panels span vertically to roof level.
The North facing wall is similar but with additional lean-to storage units, harled with a dry dash.

The South facing elevation and West facing gable panels, are both showing signs of weathering.

Several small hairline cracks are present with previous repairs obvious.

Minor spalling is visible at the base of panels with several broken edges around joints to brickwork.

Paintwork is peeling and in poor condition, as is the interface/joint between vertical RAAC panels and top of the brickwork.

South facing wall panels exhibit several scores and damaged at base level.

The roofing felt is loose with gaps in places where it interfaces with the base of wall panels.

Some wall panel joints exhibit minor cracking

Gym Hall Roof (External)

The roof was relatively dry with only minor surface water ponding.

Some areas exhibit minor moss growth

The majority of the drain outlets are blocked/restricted with organic growth (moss)

Remaining roof areas

There was less surface water present and ponding on the remainder of the roof than was reported in Report (Oct19)

(Continued…)

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Most of the drain outlets were clear of surface water but the organic growth over drain heads was still excessive. Signs of previous blockages at outlet locations were frequent.

No level survey was carried out on this inspection, but in viewing/inspecting the large clear areas no excessive deflections were noted.

Main School Building (Internal)

There are two type of ceiling finish in the main school building.

- Exposed siparex painted panels, where underside of panels were clearly seen
- Lightweight ceiling tiles (polystyrene) which require to be removed/displaced to visually inspect the underside of the siparex roof panels.

No ceiling tiles

It was agreed to start the internal inspection by visually inspecting all ceilings which were exposed (i.e. no ceiling tiles over) from ground floor level.

Any future evidence of roof leaks are to be investigated when they occur depending on the severity.

With Ceiling tiles

Areas with suspended ceiling tiles were visually inspected for signs of water damage and staining. Areas showing signs of recent leakage had tiles removed where access was safely available for further inspection.

There were several areas showing signs of both historic and recent leakage.

Conclusions and Recommendations

There are a number areas of the external roof affected by moss and vegetation growth which is hindering the flow of rainwater to downpipe locations as well as potentially adding additional loads from rainwater ponding onto the roof. We would recommend that the roof is cleared of all vegetation and a suitable maintenance regime is adopted to prevent excessive growth in the future.

The majority of rainwater drainage outlets are blocked with vegetation that is preventing rainwater discharging from the roof. All downpipes and associated surface water drainage pipes should be thoroughly cleaned to ensure suitable drainage runs are restored.

As previously reported, the falls on the roof are insufficient/non-existent, to mitigate this we would strongly recommend that a regime of squeegeeing ponding rainwater towards the downpipe locations is put in place especially after heavy rainfall events but more generally as part of a monthly maintenance programme.

(Continued…)

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

SENT BY EMAIL ONLY

FAIRHURST

Our Ref: [redacted]TS/134609.02
Date: **6 June 2022**

It was noted that there is slight water ingress to a number of roof penetrations, in particular around internal downpipes. We would recommend that the waterproofing detail around the defective roof penetrations are inspected by a specialist and repaired/replaced as required.

We trust this report meets with your requirements, however if you have any queries please do not hesitate to contact us.

Yours sincerely

[redacted]

[redacted]

Senior Structural Engineer
Email [redacted]@fairhurst.co.uk
Tel [redacted]

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Appendix A - Photographs

Photo No 1 – Inside Games Hall Roof & Walls

Photo No 2 – External Walls To Games Hall

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Photo No 3 – Roof & Wall Panels With Support Steelwork

Photo No 4 – Wall Panels Above Lower Brickwork At Gable End

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Photo No 5 – Lower Roof From Above Games Hall

Photo No 6 – Roof Areas With Water Present

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Photo No 7 – Games Hall Roof With Minor Organic Growth

Photo No 8 – Other Areas Showing Organic Growth With Water Present

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

Photo No 9 – Underside Of Roof Panels Easily Checked Where No Ceiling Tiles Present

Photo No 10 – Historic Staining From Leaking Pipework

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

civicengineers.com
Manchester / London / Leeds / Glasgow

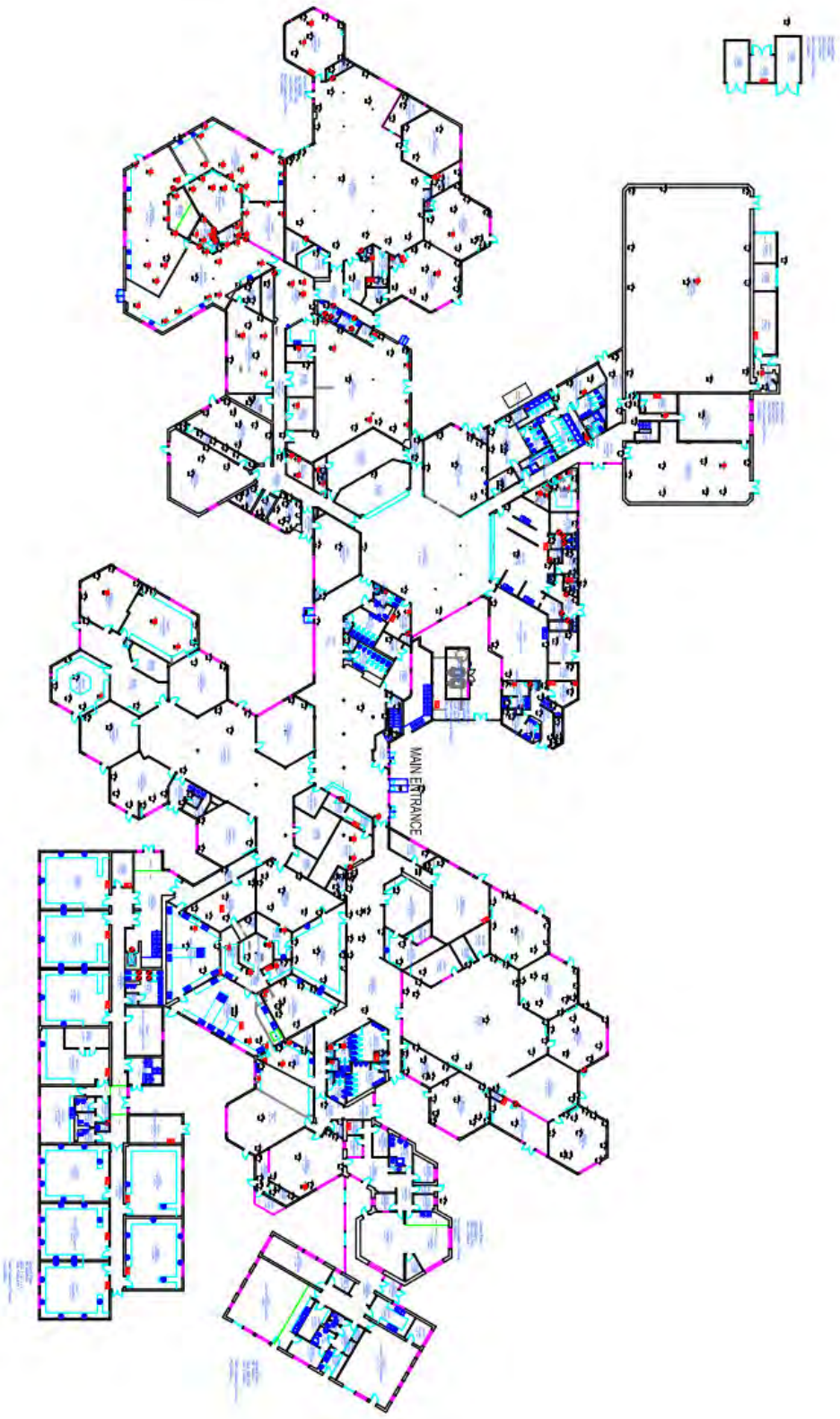
Photo No 11 – Earlier Repairs From Stormwater Drains & Water Pipes

Photo No 12 – Some Panels Showing No Previous Damage Or Repairs

Civic Engineers (Caledonia) Limited (registered number 10843357)
Registered in England and Wales at: Carvers Warehouse, 77 Dale Street, Manchester M1 2HG

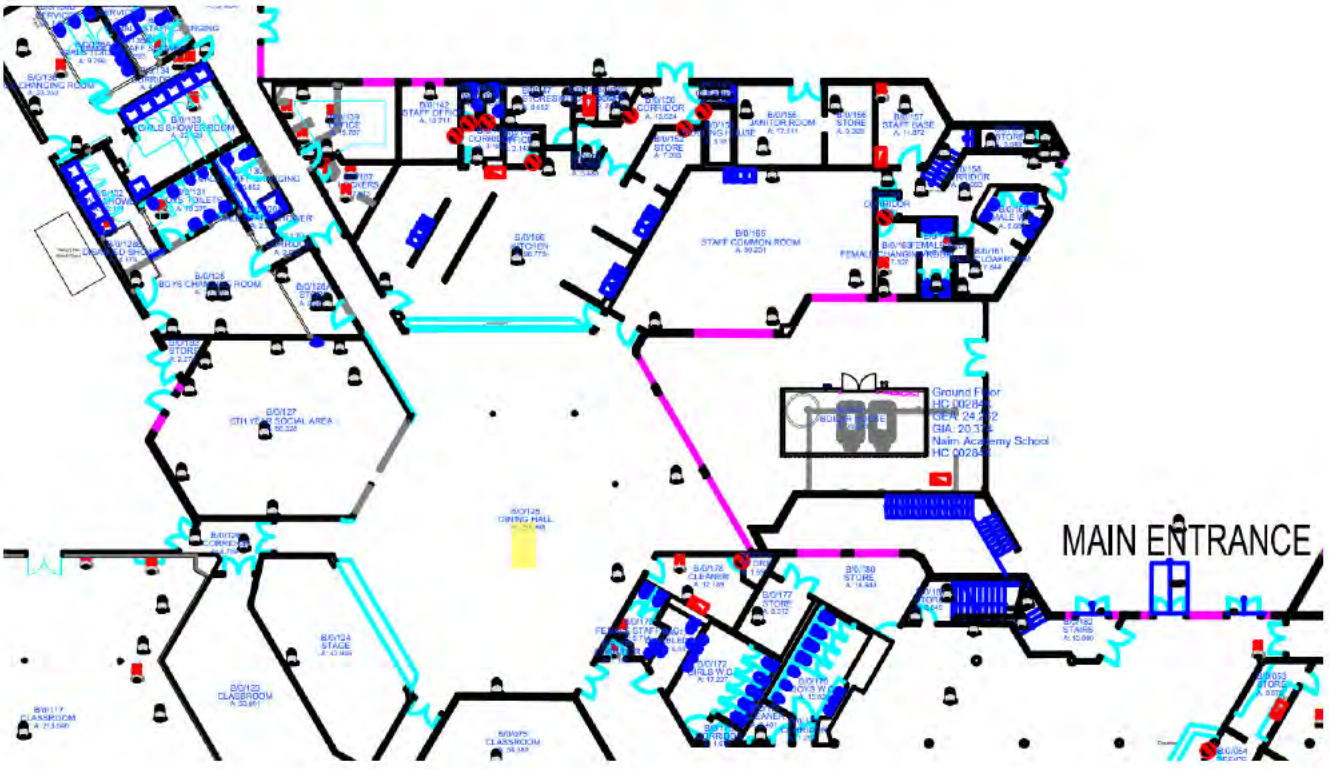
civicengineers.com
Manchester / London / Leeds / Glasgow

Appendix D – Floor Plans

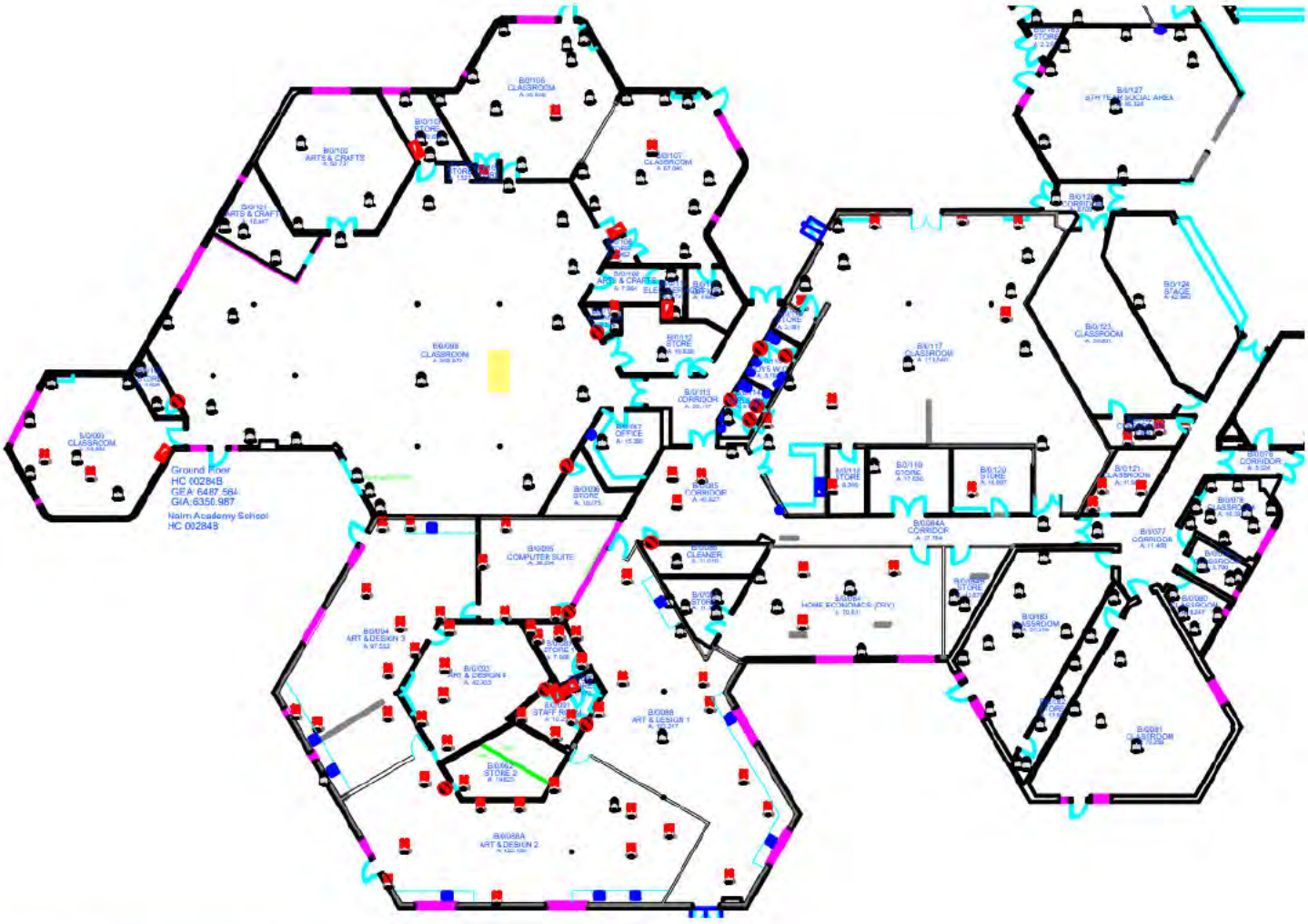


N.15 Ground Floor Layout

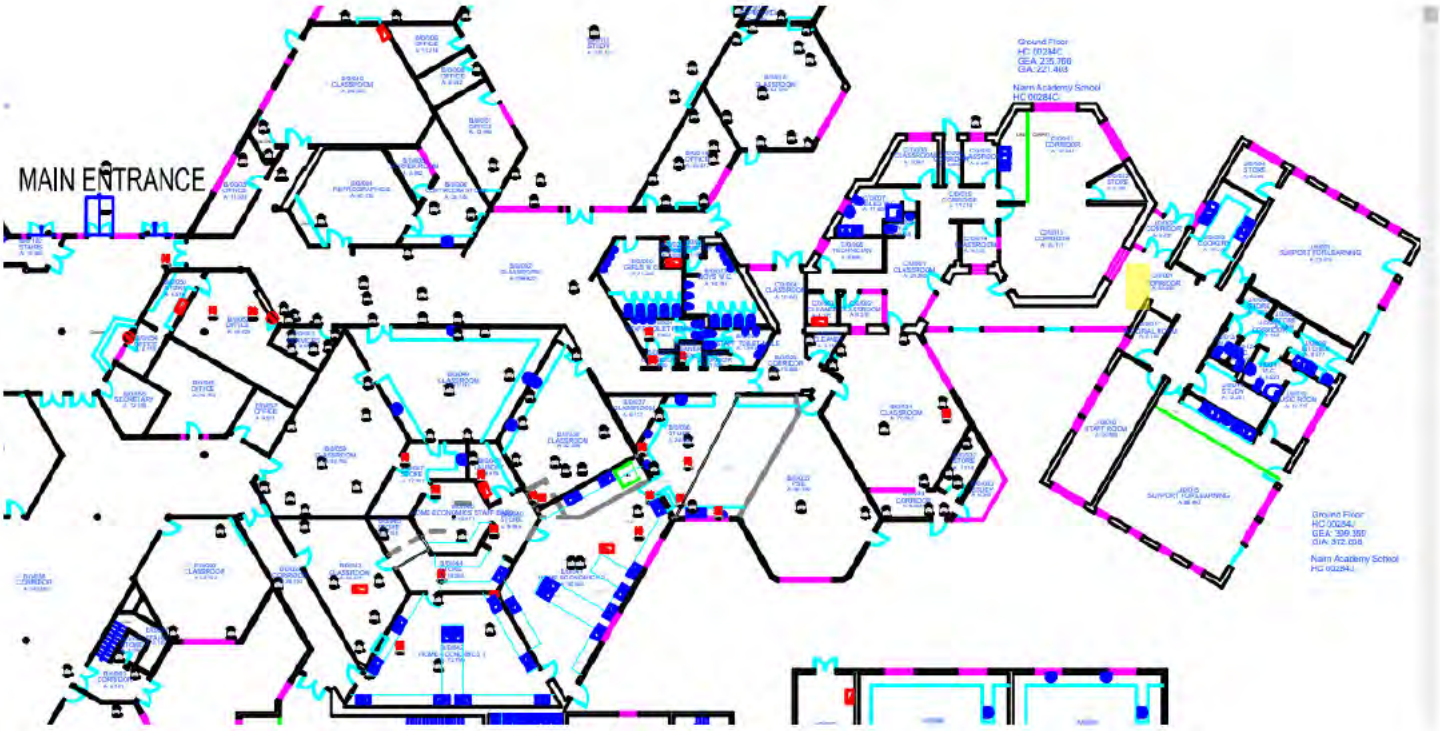
N.16 Gym and Games Hall Layout



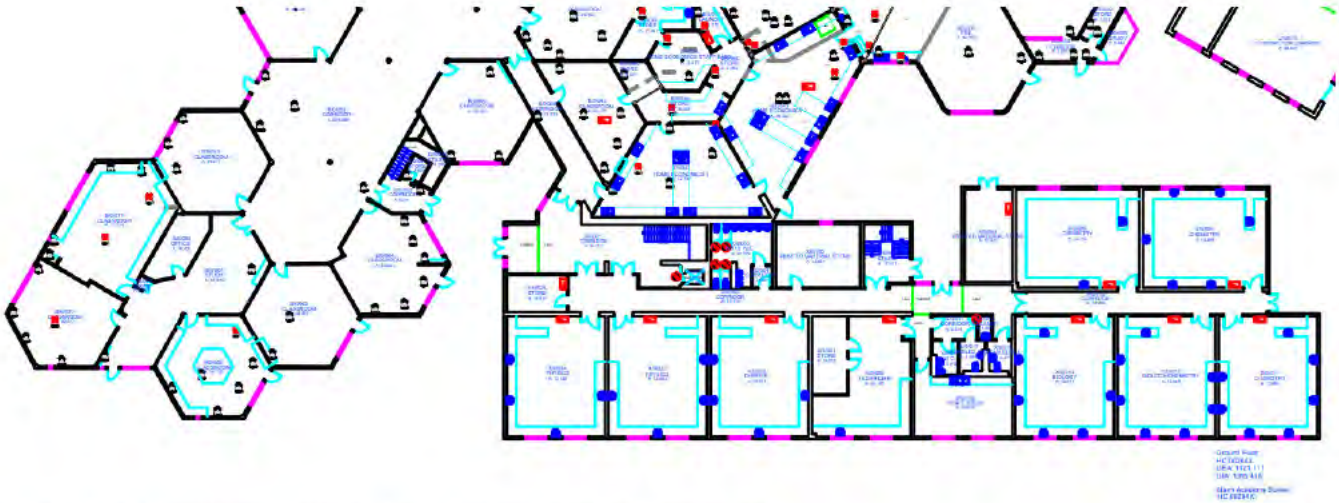
N.17 Dining Hall/Kitchen Layout



N.18 Arts, Technical and Home Economics Layout

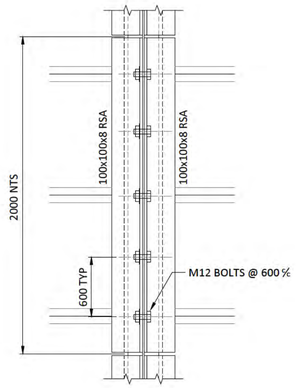


N.19 Home Economics, Admin and Learning Support Layout

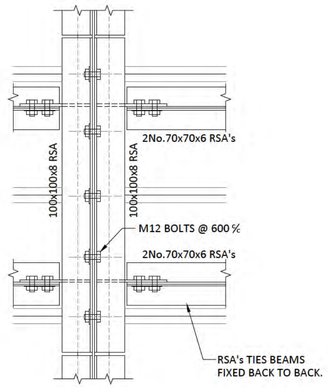


N.20 Typical Classrooms Layout (New Science block not surveyed)

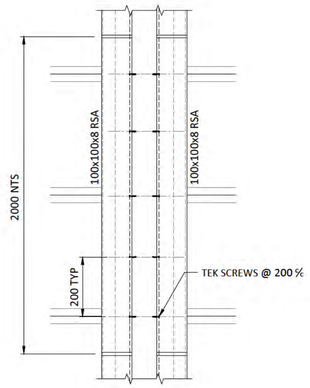
Appendix B – Civic Engineers Remedial Work Drawings



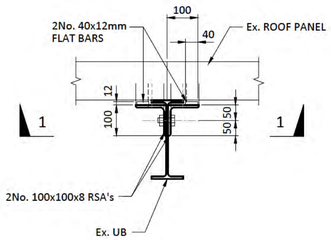
SETION 1-1
Scale 1:10



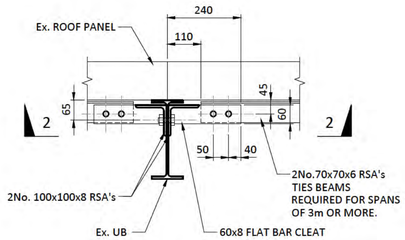
SETION 2-2
Scale 1:10



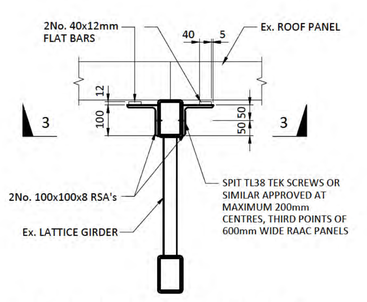
SETION 3-3
Scale 1:10



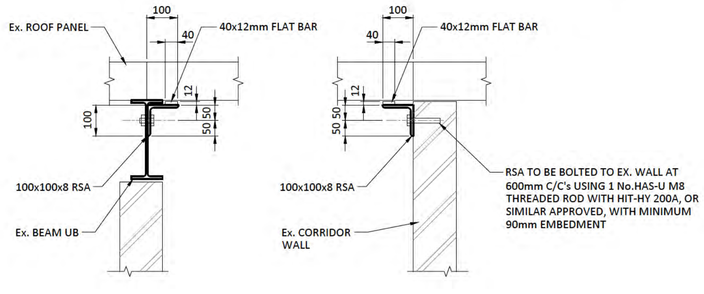
BEAM SUPPORT DETAIL OPTION 1
Scale 1:10



BEAM SUPPORT DETAIL OPTION 2
Scale 1:10



SUPPORT DETAIL AT GIRDERS
Scale 1:10



CORRIDOR SUPPORT DETAILS
Scale 1:10

Standard Notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
4. All discrepancies should be reported to the project manager prior to the commencement of the works.

© CIVIC ENGINEERS LIMITED

Notes and Keys

1. REFER TO SKETCH No. S-00110 FOR EXTERNAL ENVELOPE FRAME DETAILS.
2. REFER TO SKETCH No. S-00120 FOR PLAN ON GROUND FLOOR ROOF SUPPORT.
3. REFER TO SKETCH No. S-00130 FOR PLAN ON TOP FLOOR ROOF SUPPORT.

Date	Rev	Description	Drawn	Chkd
26:07:23	P01	ISSUED FOR INFORMATION.		

Civic Engineers
MANCHESTER
LONDON
LEEDS
GLASGOW
www.civicengineers.com

Project
HIGHLAND COUNCIL
NAIRN ACADEMY

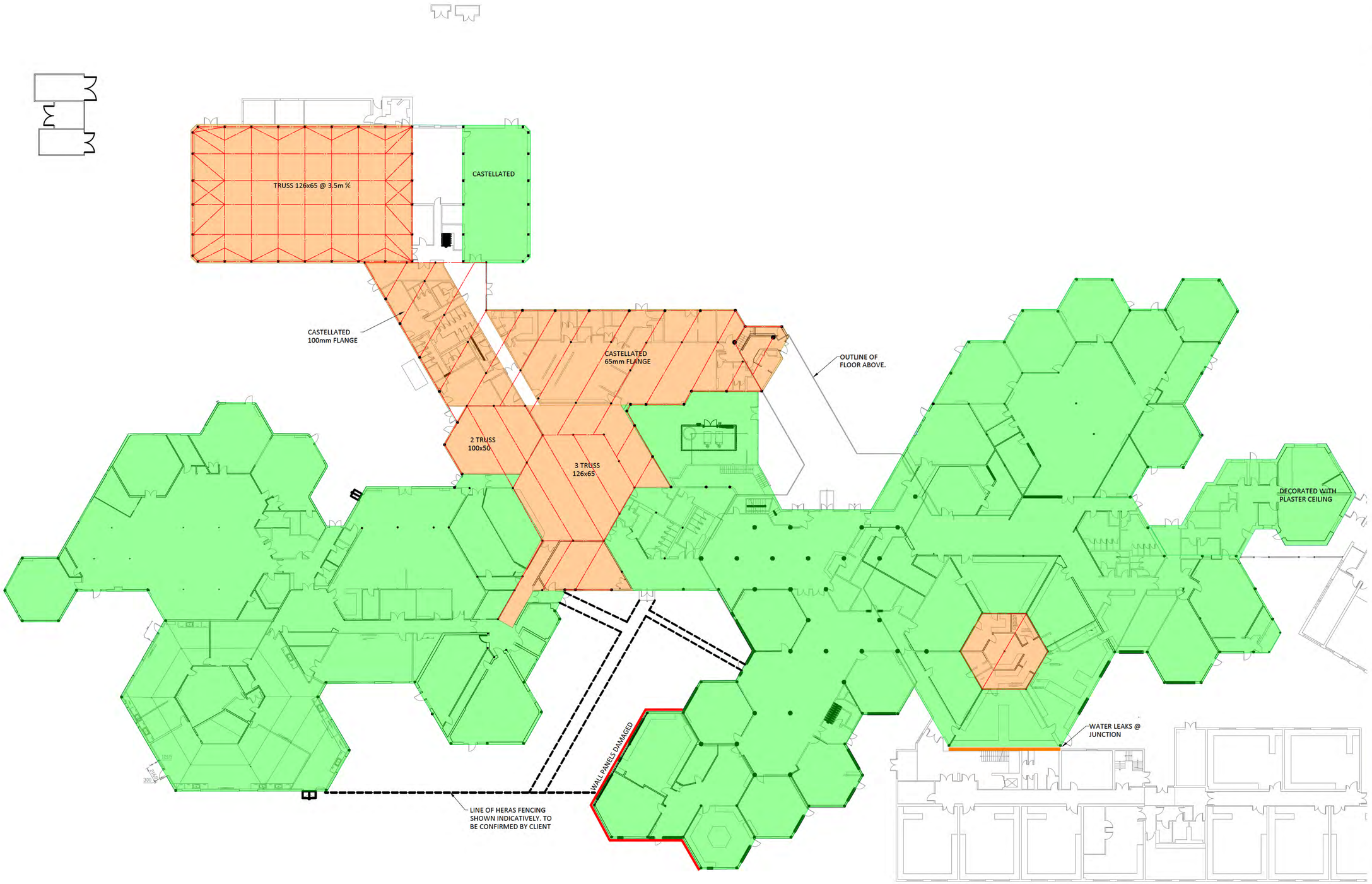
Title
NEW STEELWORK SUPPORT DETAILS

Status
SKETCH

Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
1:5	2967	JUL 23			S0

Drawing Number
2967-CIV-XX-XX-SK-S-00111

Revision
P01



PLAN ON EXISTING GROUND FLOOR

Scale 1:250

Standard Notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
4. All discrepancies should be reported to the project manager prior to the commencement of the works.

© CIVIC ENGINEERS LIMITED

Notes and Keys

1. REFER TO SKETCH No. S-00110 FOR EXTERNAL ENVELOPE FRAME DETAILS.
2. REFER TO SKETCH No. S-00111 FOR STEELWORK SUPPORT DETAILS.
3. REFER TO SKETCH No. S-00130 FOR PLAN ON TOP FLOOR ROOF SUPPORT.

LEGEND

- CRITICAL RISK - RAAC WATER DAMAGE
- HIGH RISK - RAAC WITH INSUFFICIENT BEARING
- LOW RISK - RAAC WITH SUFFICIENT BEARING
- ASSUMED LOCATION OF EXISTING STEELWORK. LOCATION TBC ON SITE
- DENOTES INDICATIVE LINE OF PROPOSED HERAS FENCING

Date	Rev	Description	Drawn	Chkd
26:07:23	P01	ISSUED FOR INFORMATION.		

Civic Engineers
MANCHESTER
LONDON
LEEDS
GLASGOW
www.civicengineers.com

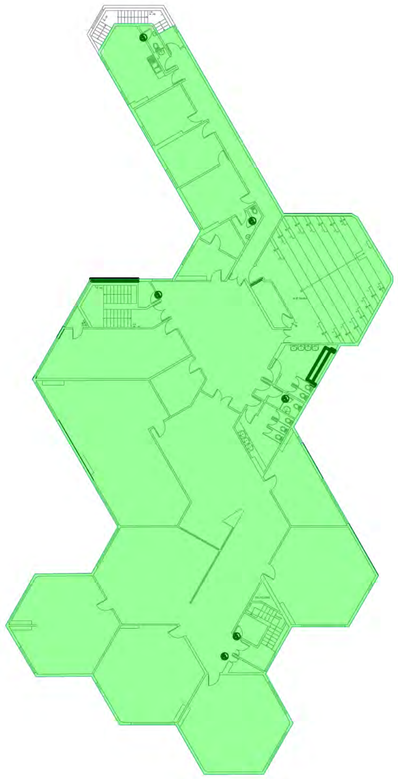
Project
HIGHLAND COUNCIL
NAIRN ACADEMY

Title
GROUND FLOOR ROOF SUPPORT
REMEDIAL WORKS

Status
SKETCH

Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
1:100	2967	JUL 23			S0

Drawing Number: 2967-CIV-XX-XX-SK-S-00120
Revision: P01



PLAN ON EXISTING TOP FLOOR

Scale 1:100

Standard Notes

1. This drawing is to be read in conjunction with all relevant Architect's and Engineer's drawings and the specification.
2. This drawing should not be scaled.
3. All dimensions are to be verified by the contractor on site.
4. All discrepancies should be reported to the project manager prior to the commencement of the works.

© CIVIC ENGINEERS LIMITED

Notes and Keys

1. REFER TO SKETCH No. S-00110 FOR EXTERNAL ENVELOPE FRAME DETAILS.
2. REFER TO SKETCH No. S-00111 FOR STEELWORK SUPPORT DETAILS.
3. REFER TO SKETCH No. S-00120 FOR PLAN ON GROUND FLOOR ROOF SUPPORT.

LEGEND	
	LOW RISK - RAAC WITH SUFFICIENT BEARING

Date	Rev	Description	Drawn	Chkd
26:07:23	P01	ISSUED FOR INFORMATION.		

Civic Engineers

MANCHESTER
LONDON
LEEDS
GLASGOW

www.civicengineers.com

Project

HIGHLAND COUNCIL
NAIRN ACADEMY

Title

TOP FLOOR ROOF SUPPORT
REMEDIAL WORKS

Status

SKETCH

Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
1:100	2967	JUL 23			S0

Drawing Number	Revision
2967-CIV-XX-XX-SK-S-00130	P01

Civic Engineers

Manchester

Carver's Warehouse
77 Dale Street
Manchester M1 2HG

+44 (0)161 228 6757

London

Reeds Wharf
33 Mill Street
London SE1 2AX

+44 (0)20 7253 2977

Leeds

Unit 02/01 Tower Works
Globe Road
Leeds LS11 5QG

+44 (0)113 2025 130

Glasgow

35 Virginia Street
Glasgow G1 2PT

+44 (0)141 370 1829