Civic Engineers

Job Title
Highland School RAAC Survey – Charleston Academy

Prepared for
Highland Council and Watts Property Service

Report Type
RAAC Survey Final Report

Date
18 August 2023

Contents

RAAC Survey Final Report

Prepared by	[redacted]
Reviewed by	[redacted]
Civic Job No.	2967
Issued	17.08.23
Revised	REV A – 18.08.23

1. Introduction

1.1 Survey Background

An inspection of Charleston Academy, located at Charleston View, Inverness IV3 8ET, 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:

- Assembly Hall/Kitchen and Storerooms
- Technical/Art and Home Economics
- Second floor (Science floor)
- Library and Admin areas
- Separate Community Building and gym hall

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	Technical Base Art Staff Base Corridor from tech to home economics Ends of science floor Admin area
Medium Risk	RAAC panels with insufficient bearing Remedial works required within the next year.	Science Classrooms Rutherford Lab (first science classroom on LHS)

		Largest Music Room Medical Room Art Staff Base
Low Risk	Sufficient bearing and no sign of water ingress	Ground floor main hall Ground floor mathematics wing Ground floor technical classrooms First floor east wing First floor fitness, hall and changing rooms.

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 Corridor Remedials

Within the corridor areas, 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. Additional tie beams are installed at regular centres between existing primary steelwork and/or masonry walls to support water damaged RAAC panels at intermediate points due to the reduction in strength.

2.1.2 Tech Woodwork Room Remedials

Remedial work within the technical woodwork room is as per the corridor remedials.

2.1.3 Admin Area

The staff admin area on the first floor where printers are located has been temporarily propped with access restricted until such time that permanent works can be installed. Measures required within the admin area are as per those outlined for corridor remedials.

2.1.4 No access zones.

The art staff base, first floor medical room, second floor toilets, second floor staff room, stores and associated corridors are considered as high-risk items; however, remedial works to these areas are proposed under phase 2 works. Due to the high-risk category, all aforementioned areas will be closed to staff and pupils with access only permitted for contractors undertaking remedial works. These areas are noted on the drawings included within appendix B.

2.2 Phase 2 – Remedial Works

Phase 2 works typically comprise of increasing the bearing width utilising the same details as phase 1 works. Areas of critical risk which were not able to be completed as part of the phase 1 works, due to time constraints, will be captured as part of phase 1 works. In these locations tie beams are to be installed for intermediate support of water damaged panels, in addition to new angles to achieve minimum bearing.

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.

Following a review of design intent details, the steel fabricator proposed details based on steel section sizes which could be sourced within the timescale of the programme. Fabricator details have been reviewed by Civic Engineers and deemed to be acceptable.

Fabricator details are included within Appendix C.

4. Next steps

At the time of writing, all phase 1 critical remedial works have been undertaken with pupils and staff returning for the new school term.

Coordination between the contractor, Highland council and the Charleston head teacher to take place to agree programme of works for phase 2 remedial works. It is anticipated that phase 2 remedial works will commence in the science block with programme beyond this to be discussed directly with the school. 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 established and agreed between Civic Engineers and the steel fabricator. 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 were considered critical and 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 are covered by one SER certificate and a single stage warrant application.

Appendix A – Civic Engineers Letter Report

Civic Engineers

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Our Ref: 2967/CIV01/ICJ/Charleston
14 July 2023

Client Address: neil.mcdougall@highland.gov.uk
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FAO Neil McDougall - Property Inspections Management Officer Highland Council

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Highland Council Schools - Charleston Academy, Charleston View, Inverness IV3 8ET

Following an inspection by Fairhurst (Ref [redacted]/TS/145347.01) dated 6th June 2022 RAAC roof and wall panels were identified. Copy of the report has been appended (Appendix D) 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:

- Assembly Hall/Kitchen and Storerooms
- Technical/Art and Home Economics
- Second floor (Science floor)
- Library and Admin areas
- Separate Community Building and gym hall

2: Existing Structure

The following historical drawings were provided on 27th June 2023 by Neil McDougall of Highland Council and a selection of these drawings are included for reference within Appendix C of this report.

Typically, throughout the classrooms and labs in the various depts there is no suspended ceiling and so it the condition f the panels is visible. In the admin areas and corridors typically, there is suspended ceiling tiles some of which indicate water staining indicating there is water ingress to the structure above.

Of particular note is that the roof makeup on all the flat roofs is identified as '126mm Siporex conc. roof slabs' and the wall units are identified as '200mmSiporex wall panels'. Typically, the panels have been coated in an asbestos covering and any works which would involve disturbing the asbestos coating needs appropriate RAMS taking into consideration the available asbestos reports.

The main and community building is steel framed with various sizes of steel rafters supporting the Siporex roof panels on the top flange. The bearing of the panels in various locations appears to less than the recommended 75mm. Generally, the steelwork appears to be in good order.

3: Observations

IStructE risk assessment criteria for RAAC panels has been included in Appendix A of this report for reference. Photos are in Appendix B and layouts in Appendix C.

Defect Ref.	Description	Assessed Risk	Recommendation
N.1	Bearing length appears to be less than 75mm throughout (Tech Dept) Refer Photographs N.1.	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.2	Bearing length appears to be less than 75mm throughout (Tech Dept) Refer Photographs N.2.	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**

N.3	Water damage to Siporex panels (Tech Dept) Refer Photographs N.3.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.4	Water damage to Siporex panels (Tech Dept) Refer Photographs N.4.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.5	Bearing length appears to be less than 75mm throughout (Science Dept) Refer Photographs N.5.	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.6	Bearing length appears to be less than 75mm throughout (Art Dept) Refer Photographs N.6.	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.7	Water damage to Siporex panels (Science Dept) Refer Photographs N.7.	**Critical Risk**	
N.8	External view of Siporex Wall panels (Art Dept) Refer Photographs N.8.	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.9	Deviations in Siporex Wall panels may indicate water ingress (Art Dept) Refer Photographs N.9.	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.10	Internal view of Siporex Wall panels with water damage (Science Dept) Refer Photographs N.10.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.11	Water staining on ceiling tiles indicates potential water ingress (corridor to Home Economic Dept) Refer Photographs N.11.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.12	Visible water staining on Siporex panels (Science Dept)	**Critical Risk**	**Requires remedial action urgently – remedial detail to**

	Refer Photographs N.12.		**be developed at next inspection (w/c 17.07.23)**
N.13	Visible water staining on Siporex panels (Science Dept toilets) Refer Photographs N.13.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.14	Water staining on ceiling tiles indicates potential water ingress (Staff Room) Refer Photographs N.14.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.15	Water staining on ceiling tiles indicates potential water ingress (Admin Area) Refer Photographs N.15.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.16	Extensive water staining to ceiling tiles (Admin area) Refer Photographs N.16.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.17	Water staining to ceiling however roof construction appears to be profiled metal deck in main hall (Assembly Hall) Refer Photographs N.17.	**Low Risk**	**Requires inspection occasionally – say 3 year period unless condition changes**
N.18	External siporex wall panels (kitchen block) Refer Photographs N.18.	**Medium Risk**	**Requires inspection regularly – say annually unless condition changes**
N.19	Extensive water staining to ceiling tiles (Community/gym block) Refer Photographs N.19.	**Critical Risk**	**Requires remedial action urgently – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.20	Siporex roof panels identified in ceiling void (Community/gym block) Refer Photographs N.20.	**High Risk**	**Requires remedial action asap – remedial detail to be developed at next inspection (w/c 17.07.23)**
N.21	Newer Front extension constructed as steel framed (Community/gym block) Refer Photographs N.21.	**Low Risk**	**Requires inspection occasionally – say 3 year period unless condition changes**

4: Next Steps

1. Note about the ongoing roof works given the assessment undertaken - sent yesterday and below.
2. Suspended ceilings tiles showing water staining to be popped in the corridor between Home Economics and Tech drawing depts
3. Suspended ceilings showing water staining to be taken down in the staff and admin areas – if they are tiles which can be popped that's fine but as there is likely to be remedial works done it may save time to remove them now as there is quite a lot of staining.
4. 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 as some water ingress was noted inside on the walls on the second floor in the science block
5. Any information that surrounds the equipment (extractor fans) that have been placed on the Home Economics roof would be helpful – was a structural survey undertaken before the equipment was installed . I understand this area is no longer used so it could just be a case of locking the area and putting signage up that access is restricted and PPE should be worn.
6. High level access in the tech dept to inspect the panels 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 best we can install intermediate beams to improve the bearing and support the panels.

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

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 - Bearing length appears to be less than 75mm throughout (Tech Dept)

Photo N.2 – Bearing length appears to be less than 75mm throughout (Tech Dept)

Photo N.3 – Water damage to Siporex panels (Tech Dept)

Photo N.4 - Water damage to Siporex panels (Tech Dept)

Photo N.5 - Bearing length appears to be less than 75mm throughout (Science Dept)

Photo N.6 - Bearing length appears to be less than 75mm throughout (Art Dept)

Photo N.7 - Water damage to Siporex panels (Science Dept)

Photo N.8 – External view of Siporex Wall panels (Art Dept)

Photo N.9 – Deviations in *Siporex Wall panels may indicate water ingress (Art Dept)*

Photo N.10 - Internal view of Siporex Wall panels with water damage (Science Dept)

Photo N.11 – Water staining on ceiling tiles indicates potential water ingress (corridor to Home Economic Dept)

Photo N.12 – Visible water staining on Siporex panels (Science Dept)

Photo N.13 - Visible water staining on Siporex panels (Science Dept toilets)

Photo N.14 - Water staining on ceiling tiles indicates potential water ingress (Staff Room)

Photo N.15 - Water staining on ceiling tiles indicates potential water ingress (Admin Area)

Photo N.16 – Extensive water staining to ceiling tiles (Admin area)

Photo N.17 – Water staining to ceiling however roof construction appears to be profiled metal deck in main hall (Assembly Hall)

Photo N.18 – External siporex wall panels (kitchen block)

Photo N.19 - Extensive water staining to ceiling tiles (Community/gym block)

Photo N.20 – Siporex roof panels identified in ceiling void (Community/gym block)

Photo N.21 – Newer Front extension constructed as steel framed (Community/gym block)

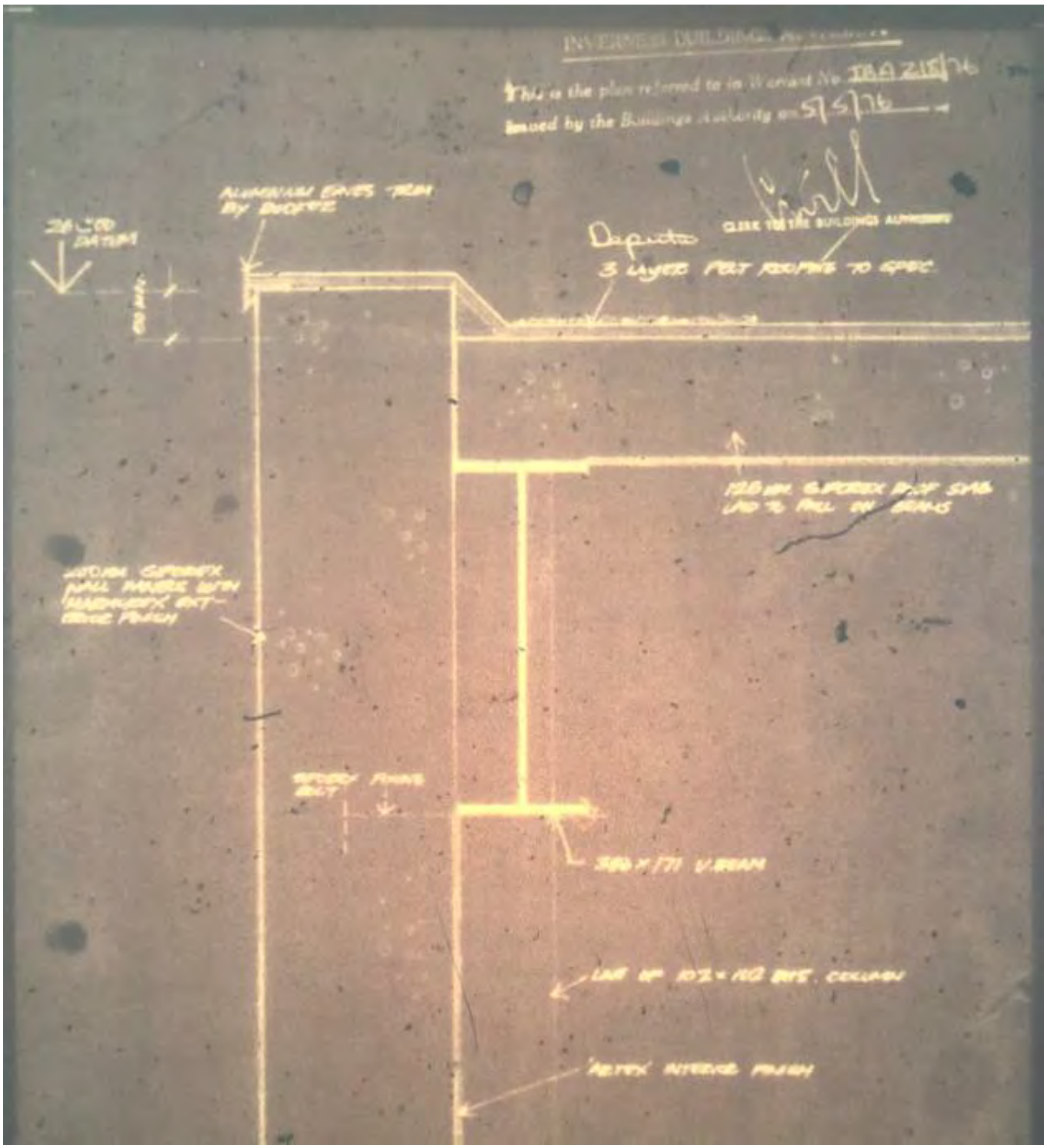

Photo N.22 – Indicating 126mm siporex roof slab, 200mm siporex wall panels

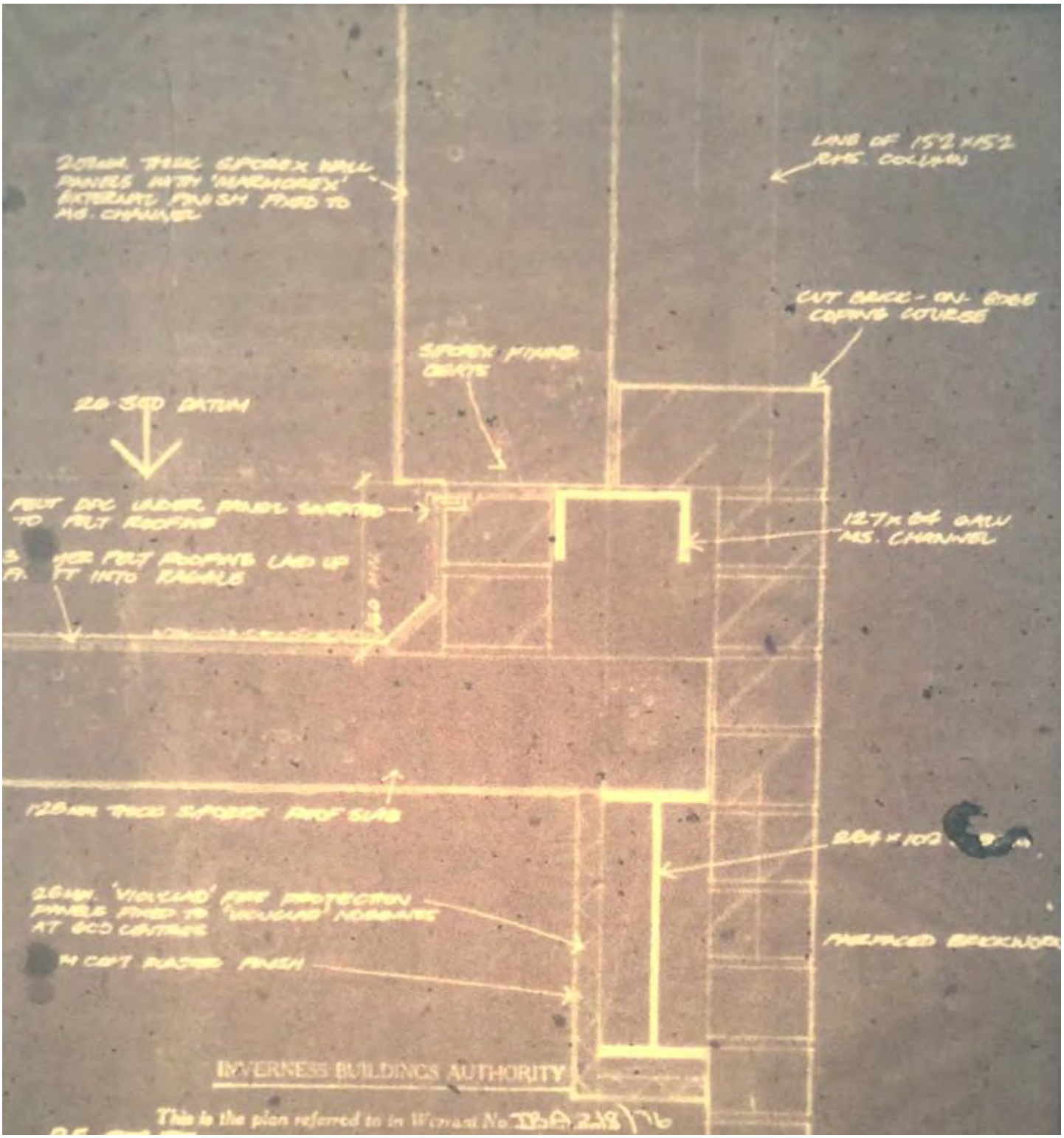

Photo N.23 – Indicating 152x152 RHS Column, 264x102UB & 127x64Channel

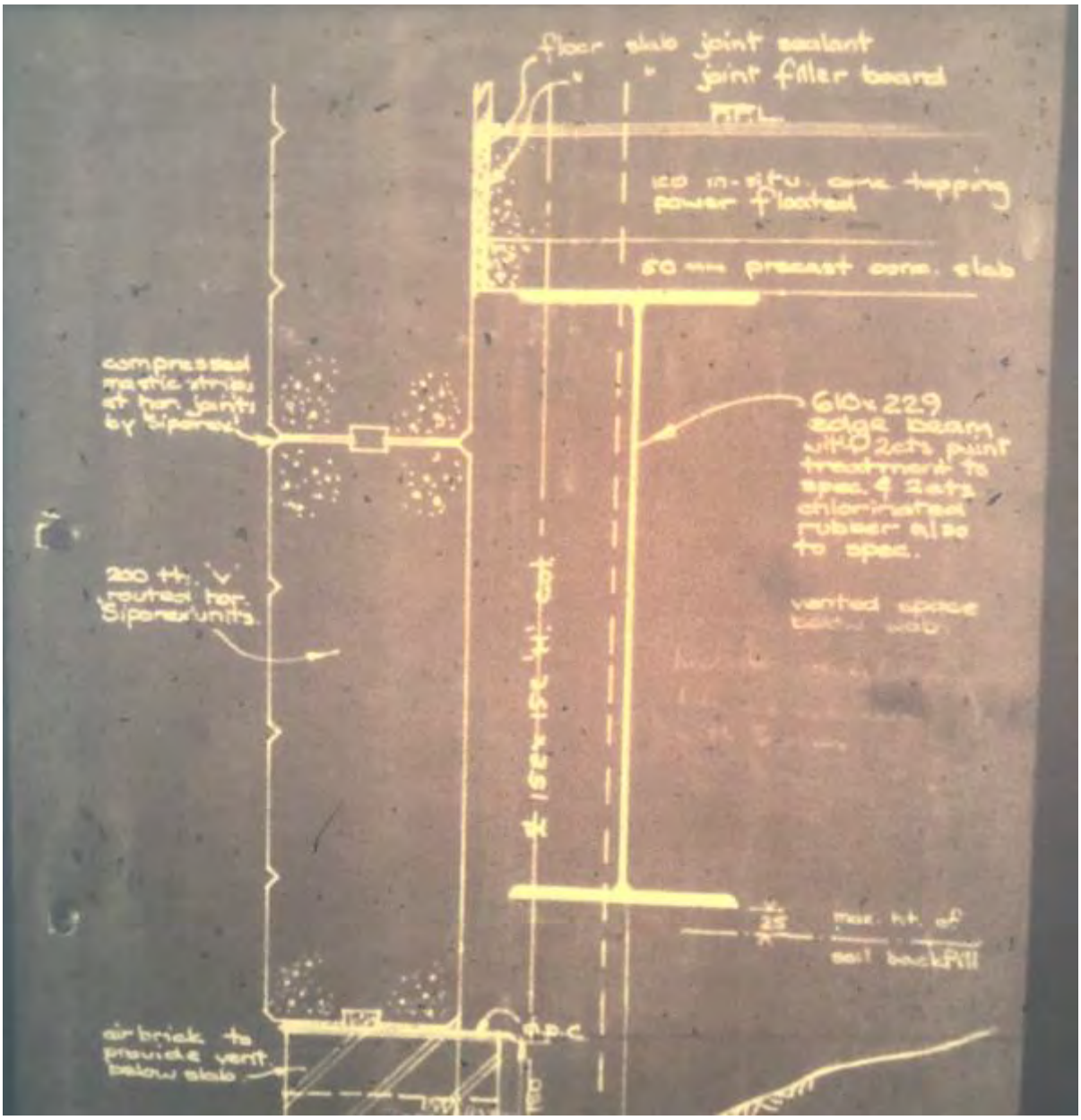

Photo N.24 – Indicating 152x152 H Column, 610x229UB edge beam & 200mm Siporex wall units

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FAIRHURST

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Our Ref: [redacted]**TS/145347.01**

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

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WESTHILL

Dear Sir

134609: STRUCTURAL INSPECTION OF "RAAC" ROOF AND WALL PANELS. CHARLESTON ACADEMY, INVERNESS.

REPORT 01.

With reference to the above project and your instructions to carry out a Structural Inspection of the above property, we can confirm that our [redacted] visited the above site on Wednesday 11th and Thursday 12th August (accompanied by your John Ashford) and reports as follows:

Introduction

In August 2021, The Highland Council commissioned Fairhurst to inspect and assess the condition of the Reinforced Autoclaved Aerated Concrete (RAAC) Siporex roof and wall panels including the supporting structure at Charleston Academy.

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.

Also referenced is a Structural Inspection Global (Structural) Report carried out by Fairhurst for the Highland Council in September 2018, for the purposes of a Feasibility Assessment.

This earlier inspection was to ensure that the existing structural fabric was suitable and able to provide an adequate life expectancy period for the client, should future extension proposals for the school be adopted.

(Continued...)

Our Ref: [redacted]TS/145347.01
Date: 6 June 2022

Structure Description

The school building is located on Charleston View, in the Kinmylies area of Inverness. The original school was established in 1978 with a detached community complex/ gym hall addition. The main school comprises a combination of one, two & three storey buildings and is a typical example of 1970's construction with several flat roofs.

Generally, the construction appears to be Siporex roof panels spanning between transfer beams onto a primary steel frame structure. The floor construction is precast concrete/ in-situ RC suspended slabs which are supported by steel transfer beams; these transfer beams appear to be supported by steel columns, which are embedded within the internal walls. The steel frame is clad with Siporex wall panels externally and blockwork internally. The internal partition walls are of solid brick; these walls appear to be finished in plaster render. Parts of 'Block B' and 'Block C' are raised above external ground level creating an underpass below the building. The steel columns (forming the primary steel frame) continue down through the floor construction, and are founded beneath the external ground level.

There are two main stair cores which serve 'Block B'; these stair cores are also constructed in steel frame, clad in Siporex panels finished internally with blockwork.

Inspection Findings

The weather at the time of our visits was cloudy and overcast with occasional light showers and sunny spells.

Areas with No ceiling tiles

The inspection targeted signs of current/historic water ingress and deflection of the panels.

Areas with ceiling tiles

In areas where ceilings tiles were present, water staining was visible in a number of rooms and particularly corridors. Where tiles could be easily accessed they were removed to allow further inspection of the underside of the Siporex panels.
There was evidence of previous leaks and repairs particularly in areas where central heating pipework was present in the ceiling voids.

Roof deflections

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 not undertaken as no access to roof level was available. However an external visual inspection of various roofs was carried out where suitable vantage points allowed and no excessive deflections and rainwater ponding was found.

Internally the underside of Siporex roof panels could be clearly seen in areas with no suspended ceiling and polystyrene tiles. No excessive deflection was visible.

(Continued…)

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Our Ref: [redacted]TS/145347.01
Date: 6 June 2022

Conclusions & Recommendations

There is evidence of historic water leaks through the Siporex roof panels mainly at rainwater downpipes. There doesn't appear to be any live leaks.

There was no evidence of excessive deflection to the underside of the roof panels inspected.

We would recommend that the roof drainage outlets are inspected and cleaned annually and that a structural inspection is carried out in two years' time.

Yours sincerely

[redacted]

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

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FAIRHURST

Our Ref: [redacted]TS/145337.01
Date: 6 June 2022

Appendix A – Photographs

Photo No 1 – Typical view of the underside of exposed Siporex panels

Photo No 2 – Typical view of the underside of exposed Siporex panels

Photo No 3 – Water staining on the underside of panels above a suspended ceiling

Photo No 4 – Evidence of leaking at rainwater downpipes

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Our Ref: [redacted]TS/145337.01
Date: 6 June 2022

Photo No 5 – Weathering to outside of Siporex wall panels

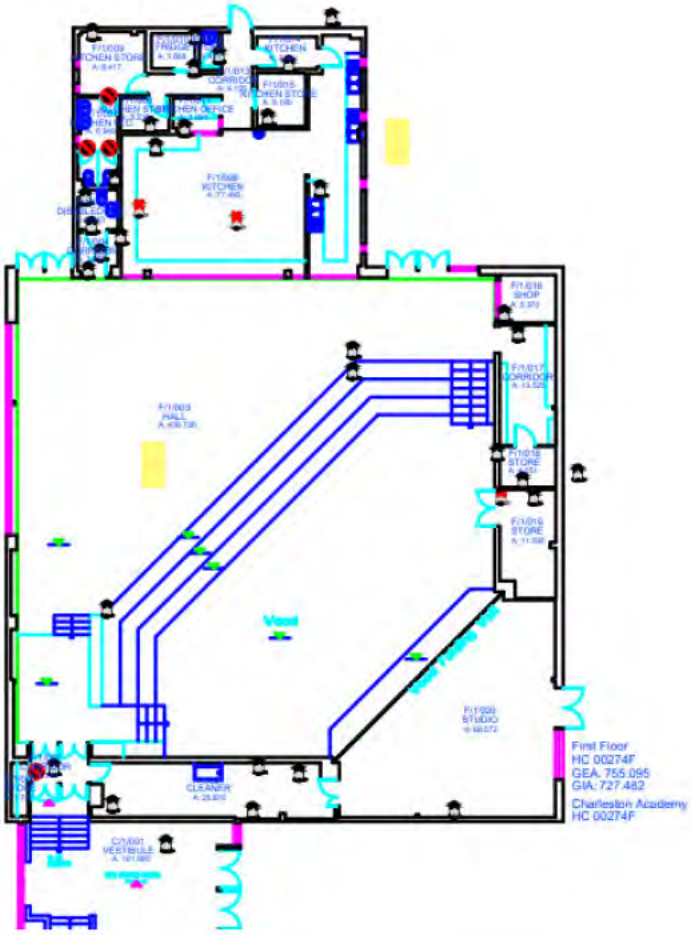


Photo N.25 – Assembly Hall/Kitchen/Store Layout

Photo N.26 – Tech/Art Dept Layout

Photo N.27 – Home Economics Dept Layout

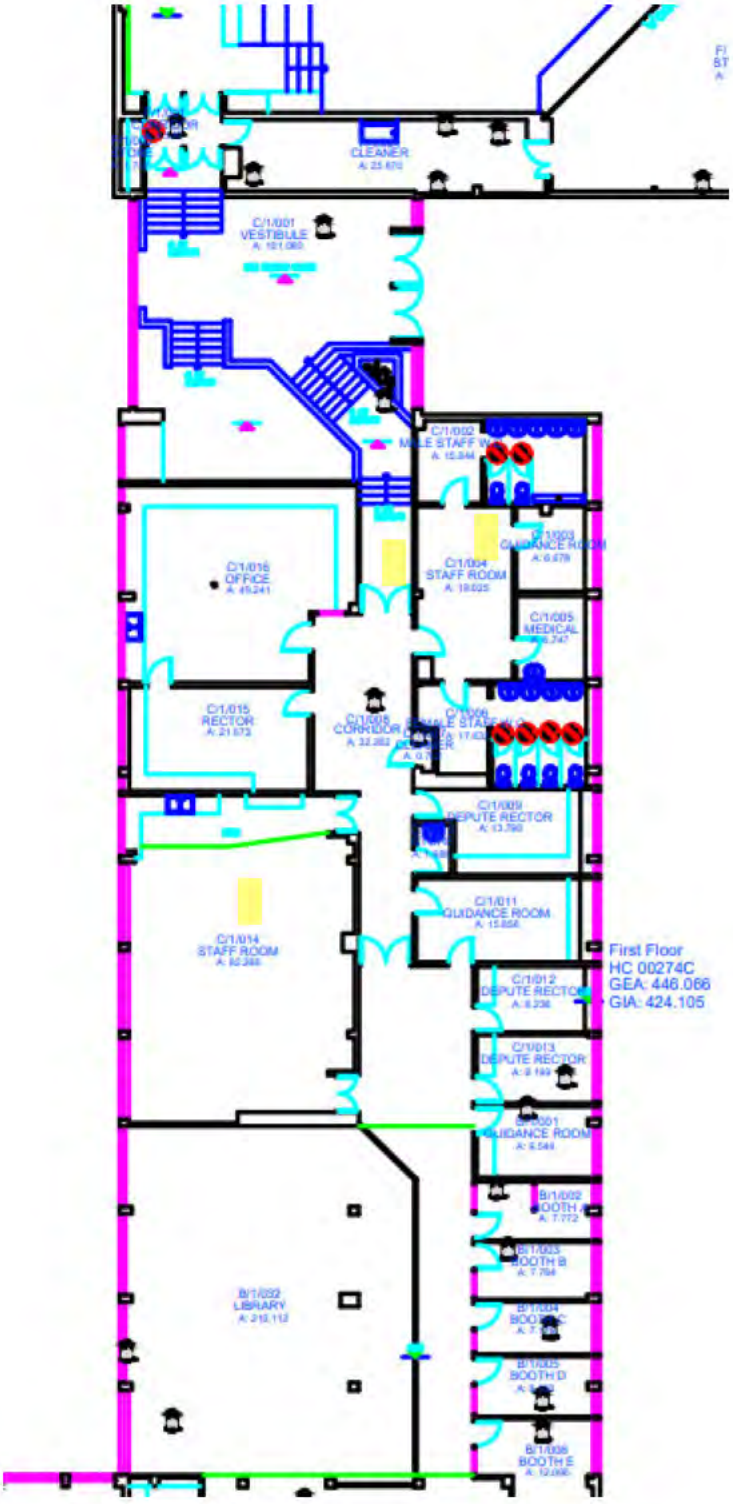


Photo N.28 – Library, Staff Room/Admin Layout

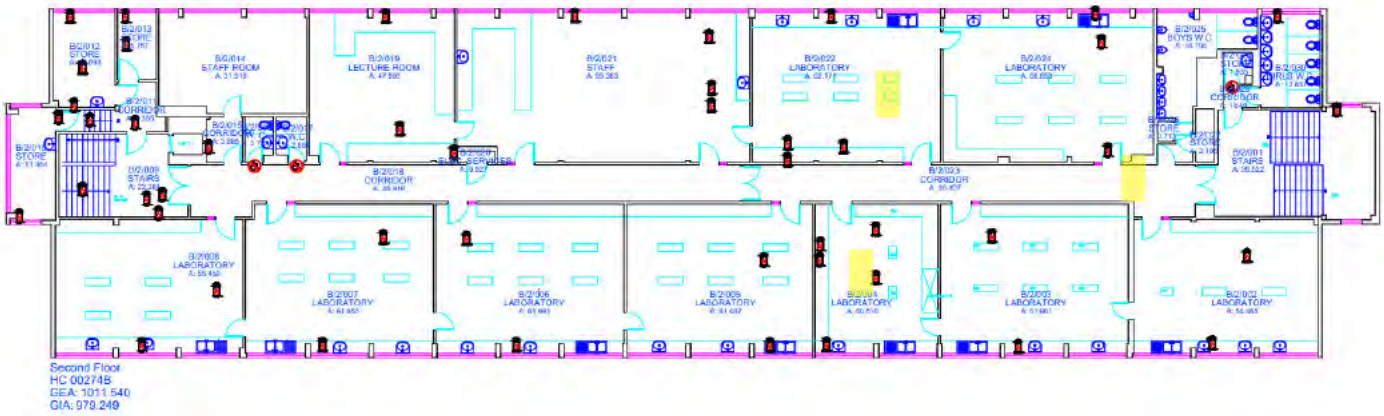


Photo N.29 – Second Floor Science Floor Layout

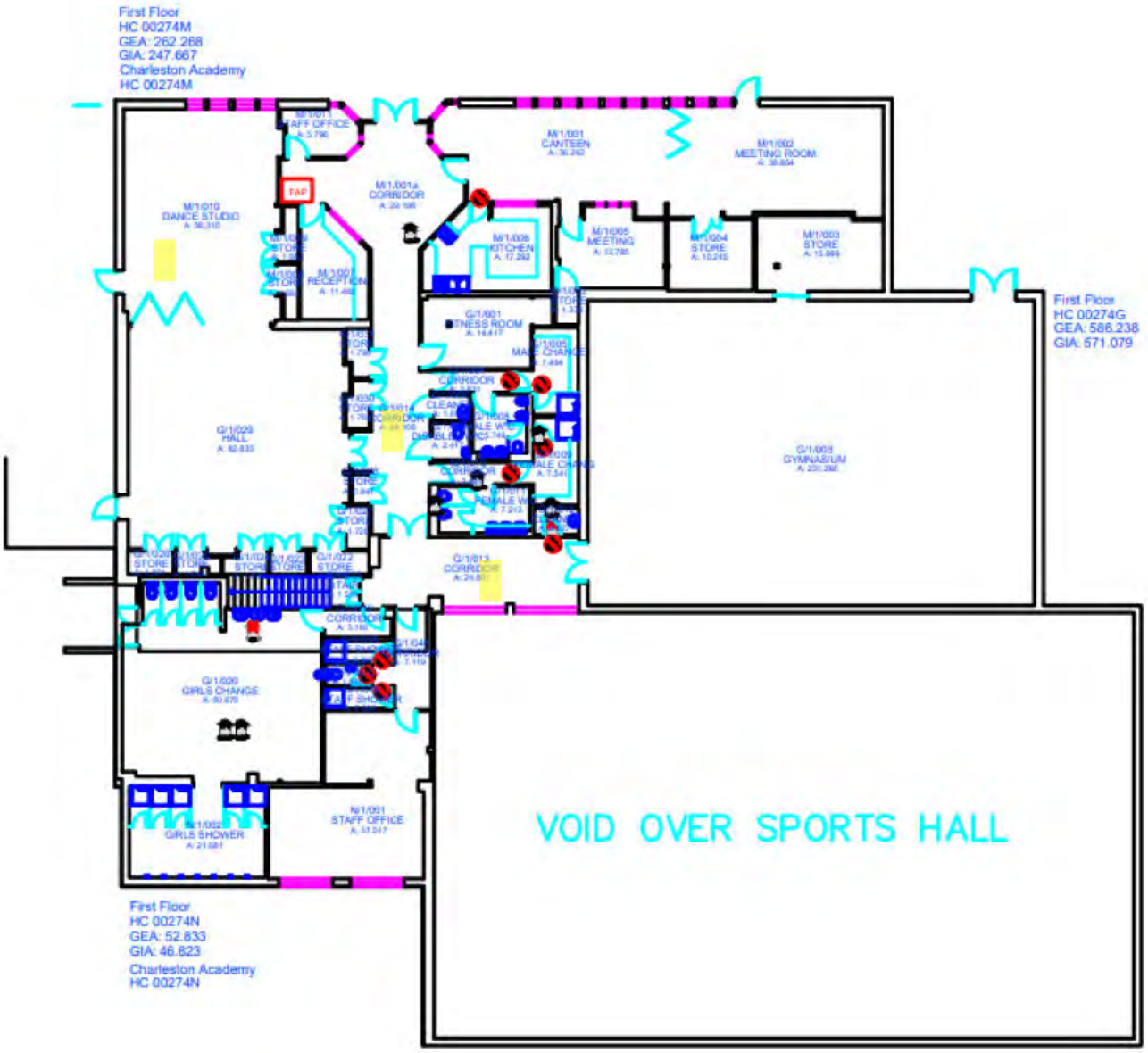
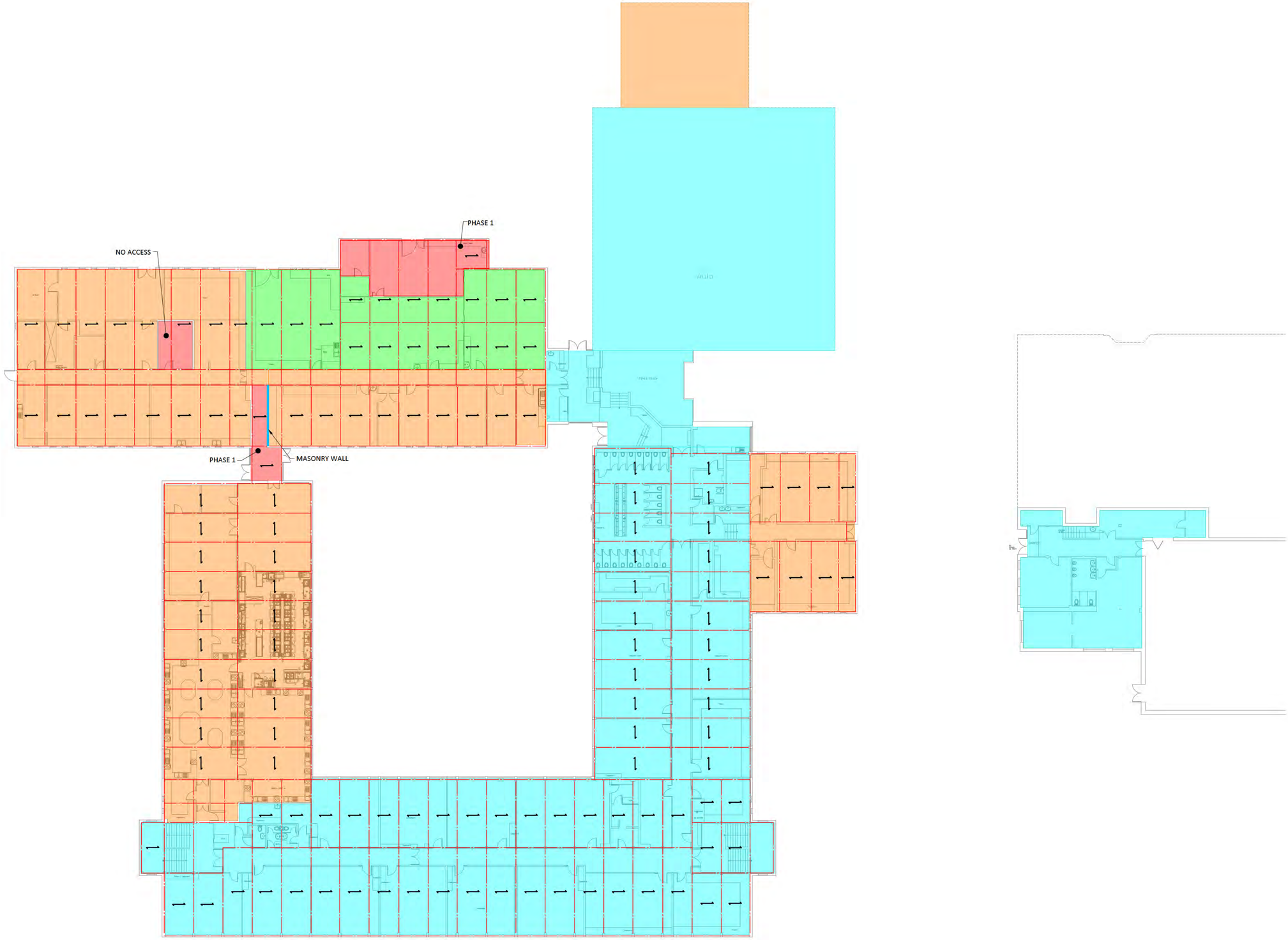


Photo N.30 – Community Block

Appendix B – Civic Engineers Remedial Work Drawings



PLAN ON EXISTING GROUND FLOOR

Scale 1:200

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.

Notes and Keys

1. REFER TO SKETCH No. S-00030 FOR PLAN ON MIDDLE FLOOR ROOF.
2. REFER TO SKETCH No. S-00040 FOR PLAN ON TOP FLOOR ROOF.
3. REFER TO SKETCH No. S-00040 FOR NEW SUPPORT DETAILS.

LEGEND

- CRITICAL RISK - RAAC WATER DAMAGE
- HIGH RISK - RAAC WITH INSUFFICIENT BEARING
- LOW RISK - RAAC WITH SUFFICIENT BEARING
- NO RACC PRESENT
- ASSUMED LOCATION OF EXISTING STEELWORK. LOCATION TBC ON SITE
- EXISTING MASONRY WALL
- SPAN DIRECTION OF RAAC ROOF PANELS

Date	Rev	Description	Drawn	Chkd
11.08.23	C01	ISSUED FOR CONSTRUCTION		
26.07.23	P01	ISSUED FOR INFORMATION.		

Civic Engineers
MANCHESTER
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LEEDS
GLASGOW
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Project

HIGHLAND COUNCIL
CHARLESTON ACADEMY

Title

GROUND FLOOR ROOF SUPPORT REMEDIAL WORKS

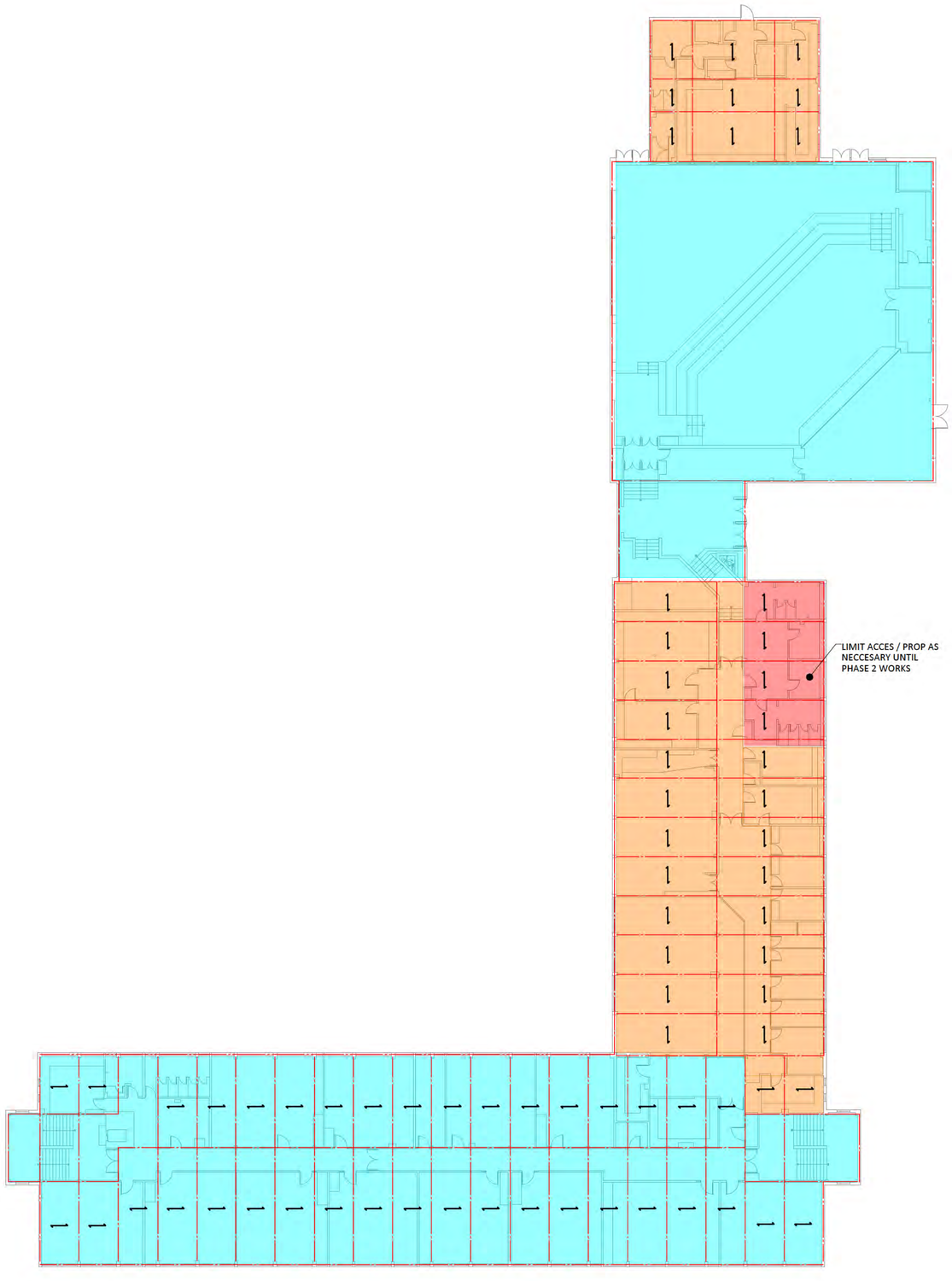
Status

SKETCH

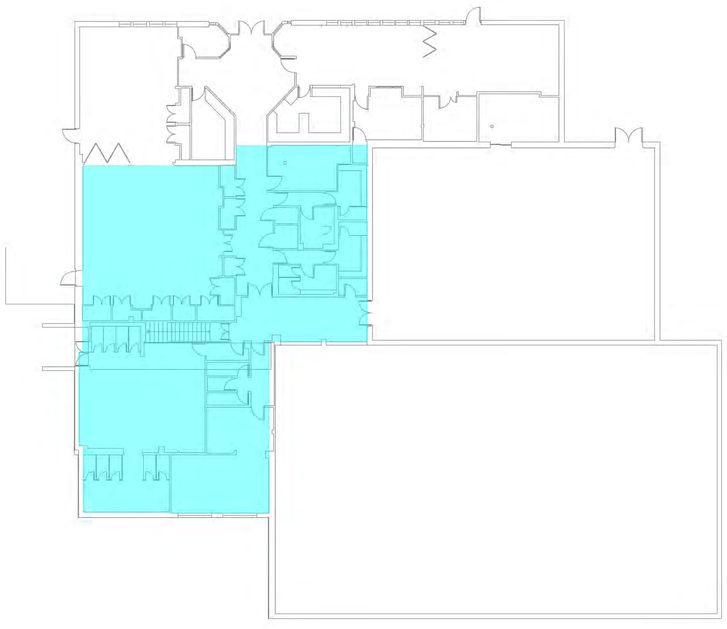
Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
SHOWN	2967	JUL 23			S0

Drawing Number: 2967-CIV-XX-XX-SK-S-00020

Revision: C01



PLAN ON EXISTING MIDDLE FLOOR
Scale 1:200



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.

Notes and Keys

1. REFER TO SKETCH No. S-00020 FOR PLAN ON GROUND FLOOR ROOF.
2. REFER TO SKETCH No. S-00040 FOR PLAN ON TOP FLOOR ROOF.
3. REFER TO SKETCH No. S-00040 FOR NEW SUPPORT DETAILS.

LEGEND

- CRITICAL RISK - RAAC WATER DAMAGE
- HIGH RISK - RAAC WITH INSUFFICIENT BEARING
- NO RACC PRESENT
- ASSUMED LOCATION OF EXISTING STEELWORK. LOCATION TBC ON SITE
- SPAN DIRECTION OF RAAC ROOF PANELS

Date	Rev	Description	Drawn	Chkd
11.08.23	C01	ISSUED FOR CONSTRUCTION		
26.07.23	P01	ISSUED FOR INFORMATION.		

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MANCHESTER
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LEEDS
GLASGOW
www.civicengineers.com

Project
HIGHLAND COUNCIL
CHARLESTON ACADEMY

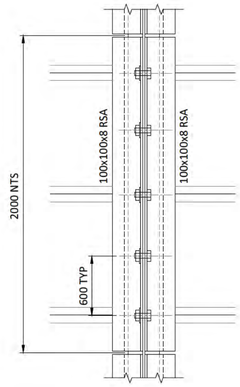
Title
MIDDLE FLOOR ROOF SUPPORT
REMEDIAL WORKS

Status
SKETCH

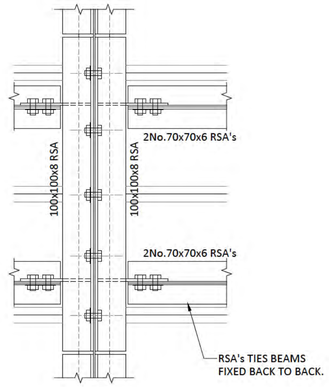
Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
SHOWN	2967	JUL 23			S0

Drawing Number
2967-CIV-XX-XX-SK-S-00030

Revision
C01



SETION 1-1
Scale 1:10



SETION 2-2
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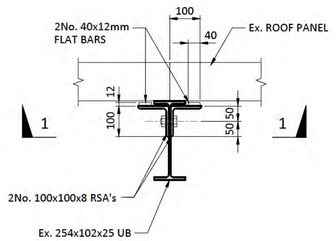
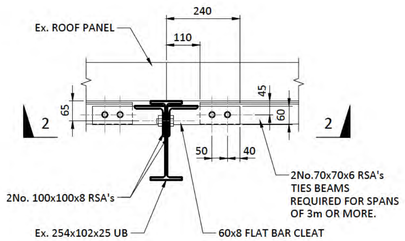
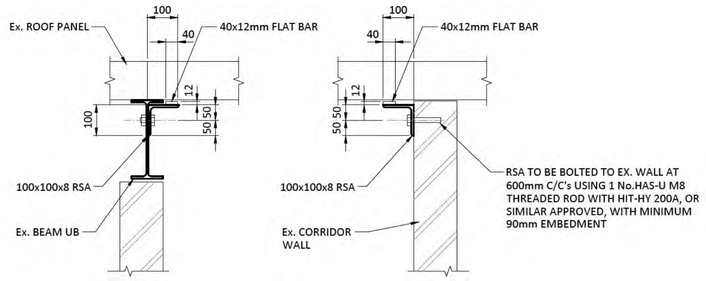


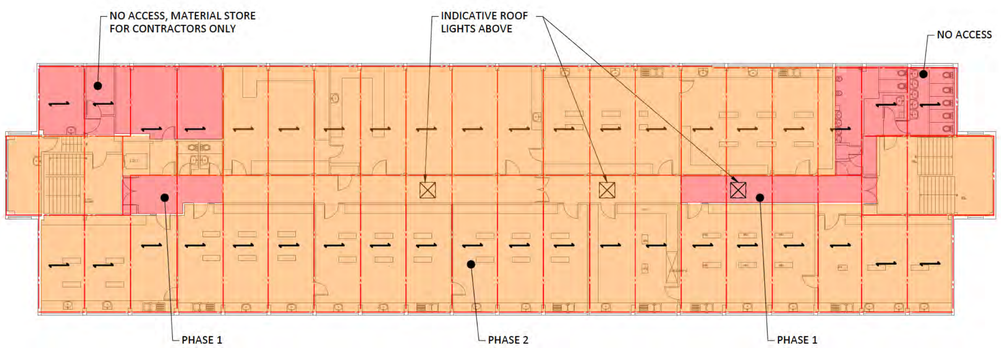
TECH ROOM SUPPORT DETAIL OPTION 1
Scale 1:10



TECH ROOM SUPPORT DETAIL OPTION 2
Scale 1:10



CORRIDOR SUPPORT DETAILS
Scale 1:10



PLAN ON EXISTING TOP FLOOR
Scale 1:200

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.
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4. All discrepancies should be reported to the project manager prior to the commencement of the works.

Notes and Keys

1. REFER TO SKETCH No. S-00020 FOR PLAN ON GROUND FLOOR ROOF.
2. REFER TO SKETCH No. S-00030 FOR PLAN ON MIDDLE FLOOR ROOF.

LEGEND

- CRITICAL RISK - RAAC WATER DAMAGE
- HIGH RISK - RAAC WITH INSUFFICIENT BEARING
- ASSUMED LOCATION OF EXISTING STEELWORK. LOCATION TBC ON SITE
- SPAN DIRECTION OF RAAC ROOF PANELS

Date	Rev	Description	Drawn	Chkd
11.08.23	C01	ISSUED FOR CONSTRUCTION		
26.07.23	P01	ISSUED FOR INFORMATION.		

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www.civicengineers.com

Project
HIGHLAND COUNCIL
CHARLESTON ACADEMY

Title
TOP FLOOR ROOF SUPPORT
REMEDIAL WORKS & SUPPORT DETAILS

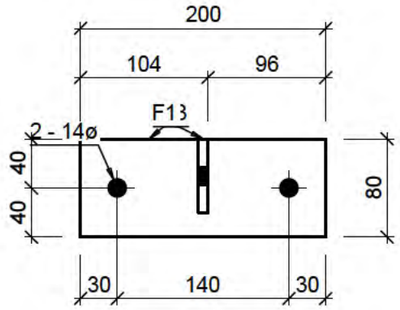
Status
SKETCH

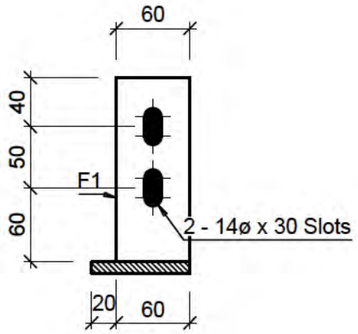
Scale @ A1	Project Number	Date Created	Drawn	Checked	Suitability
SHOWN	2967	JUL 23			S0

Drawing Number: 2967-CIV-XX-XX-SK-S-00040
Revision: C01

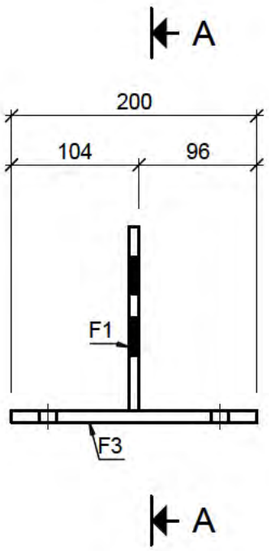
Appendix C – Steel Fabricator Drawings

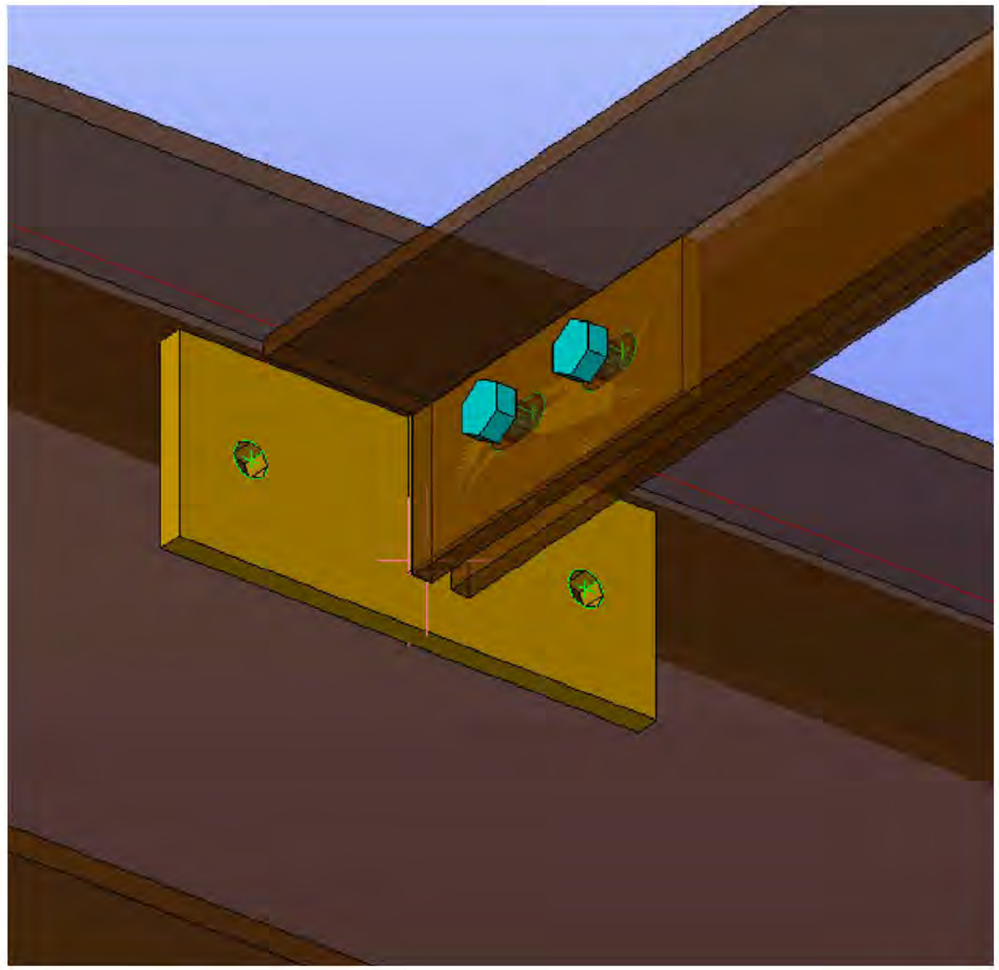
LOT	QTY
	2





A - A





2 or 4 No. Mkd PL3 (Zinc Phosphate Primer) Brackets for end of small room at end for connection to beam

Mark	Quantity	Profile	Length	Material	Area (m²)	Weight (kg)
PL3	2	Values for ONE assembly				
F1	1	FL60X8	150.0	S275JR	0.02	0.57
F3	1	FL80X10	200.0	S275JR	0.04	1.26
Totals for ONE assembly					0.06	~~1.82~~

General Notes

1. This drawing must not be scaled.
2. U.O.S, this project is to conform to: Execution Class 2 of EN 1090-2
3. U.O.S, all tolerances' are to conform to: BS EN ISO 1090-2 Annex D
4. U.O.S, all welds are to BS EN ISO 15613:2004, WPS: DMH 001 (Fillet) DMH 003 (V-Butt)
5. Drawings are to be initialed and dated by the appropriate personnel and returned to your supervisor.
6. For project specific material grades and coating requirements, please see part drawings.

IF IN DOUBT - ASK!

FABRICATED BY:	DATE:	WELDED BY:	PLANT No.	DATE:	INSPECTED BY:	DATE:

Index	Date	Description	Author

DMH Blacksmiths Ltd
5 Carsegate Road, Inverness IV3 8EX
01463 233736
contact@dmhltd.co.uk

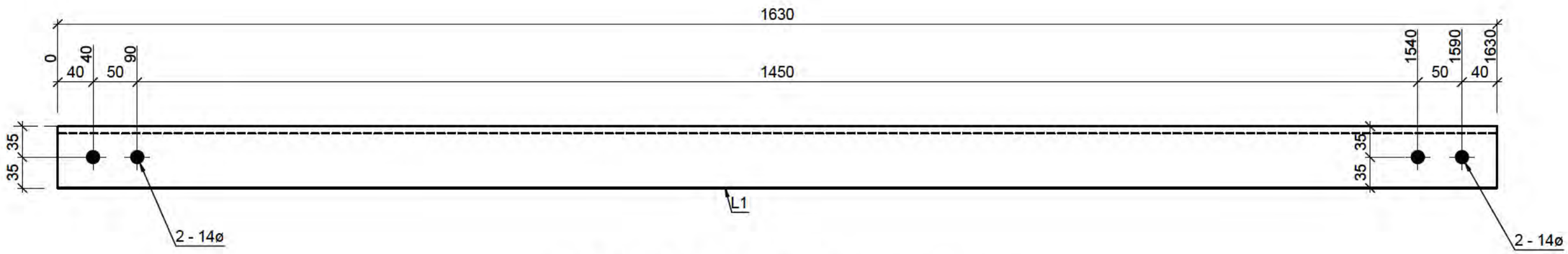
DMH

CONTRACT: Charleston Technical Store

DESCRIPTION: End Plate

DRAWN BY	DATE	SCALE	JOB No.	DRG No.	Rev.
■	08/08/2023	1:5	10954 P1	[A] - PL3	Rev0

LOT	QTY
	28



28 No. Mkd L1 (Zinc Phosphate Primer)

Mark	Quantity	Profile	Length	Material	Area (m²)	Weight (kg)
L1	28	Values for ONE assembly				
L1	1	RSA70x70x8	1630.0	S275JR	0.46	13.69
Totals for ONE assembly					0.46	13.69

General Notes

1. This drawing must not be scaled.
2. U.O.S, this project is to conform to: Execution Class 2 of EN 1090-2
3. U.O.S, all tolerances' are to conform to: BS EN ISO 1090-2 Annex D
4. U.O.S, all welds are to BS EN ISO 15613:2004, WPS: DMH 001 (Fillet) DMH 003 (V-Butt)
5. Drawings are to be initialed and dated by the appropriate personnel and returned to your supervisor.
6. For project specific material grades and coating requirements, please see part drawings.

IF IN DOUBT - ASK!

FABRICATED BY:	DATE:	WELDED BY:	PLANT No.	DATE:	INSPECTED BY:	DATE:

Index	Date	Description	Author

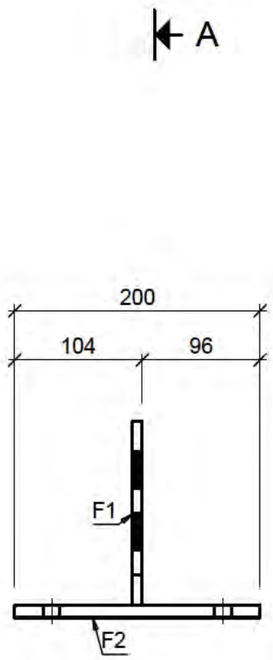
DMH Blacksmiths Ltd
5 Carsegate Road, Inverness IV3 8EX
01463 233736
contact@dmhltd.co.uk

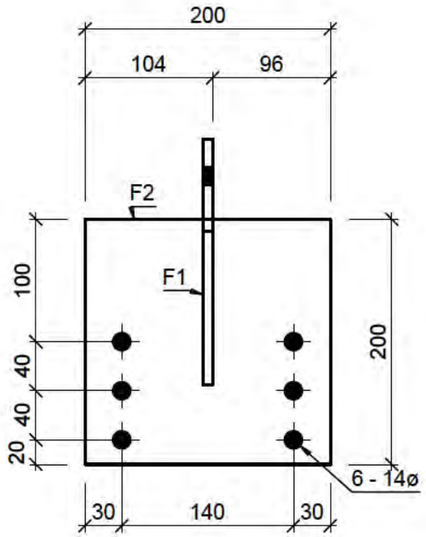
CONTRACT: Charleston Science Corridor

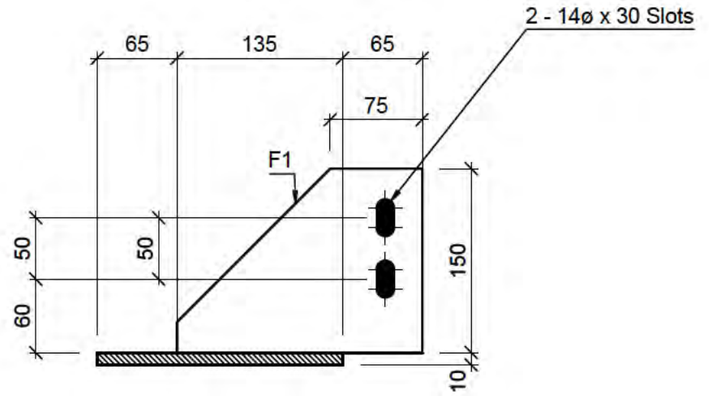
DESCRIPTION: Angle

DRAWN BY	DATE	SCALE	JOB No.	DRG No.	Rev.
■	08/08/2023	1:5	10954 P3	[A] - L1	Rev0

LOT	QTY
	14







A - A

14 No. Mkd PL1 (Zinc Phosphate Primer)

Mark	Quantity	Profile	Length	Material	Area (m²)	Weight (kg)
PL1	14	Values for ONE assembly				
F1	1	FL150X8	200.0	S275JR	0.05	1.39
F2	1	FL200X10	200.0	S275JR	0.09	3.14
Totals for ONE assembly					0.14	4.53

General Notes

1. This drawing must not be scaled.
2. U.O.S, this project is to conform to: Execution Class 2 of EN 1090-2
3. U.O.S, all tolerances' are to conform to: BS EN ISO 1090-2 Annex D
4. U.O.S, all welds are to BS EN ISO 15613:2004, WPS: DMH 001 (Fillet) DMH 003 (V-Butt)
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6. For project specific material grades and coating requirements, please see part drawings.

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Index	Date	Description	Author

DMH Blacksmiths Ltd
5 Carsegate Road, Inverness IV3 8EX
01463 233736
contact@dmhltd.co.uk

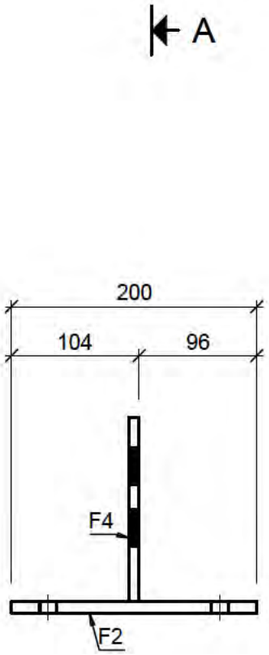
DMH

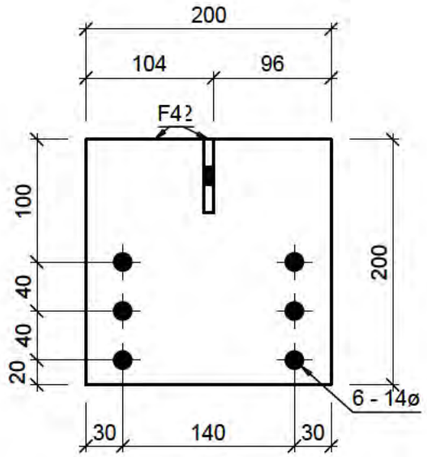
CONTRACT: Charleston Science Corridor

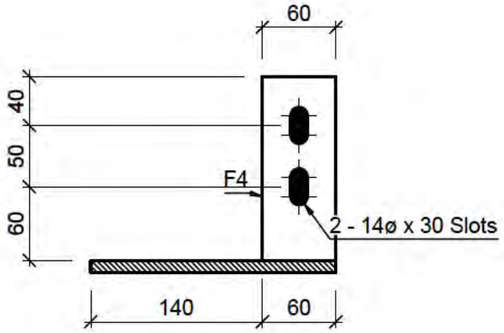
DESCRIPTION: End Plate

DRAWN BY	DATE	SCALE	JOB No.	DRG No.	Rev.
■	08/08/2023	1:5	10954 P3	[A] - PL1	Rev0

LOT	QTY
	14







A - A

14 No. Mkd PL2 (Zinc Phosphate Primer)

Mark	Quantity	Profile	Length	Material	Area (m²)	Weight (kg)
PL2	14	Values for ONE assembly				
F4	1	FL60X8	150.0	S275JR	0.02	0.57
F2	1	FL200X10	200.0	S275JR	0.09	3.14 3.71
Totals for ONE assembly					0.11	

General Notes

1. This drawing must not be scaled.
2. U.O.S, this project is to conform to: Execution Class 2 of EN 1090-2
3. U.O.S, all tolerances' are to conform to: BS EN ISO 1090-2 Annex D
4. U.O.S, all welds are to BS EN ISO 15613:2004, WPS: DMH 001 (Fillet) DMH 003 (V-Butt)
5. Drawings are to be initialed and dated by the appropriate personnel and returned to your supervisor.
6. For project specific material grades and coating requirements, please see part drawings.

IF IN DOUBT - ASK!

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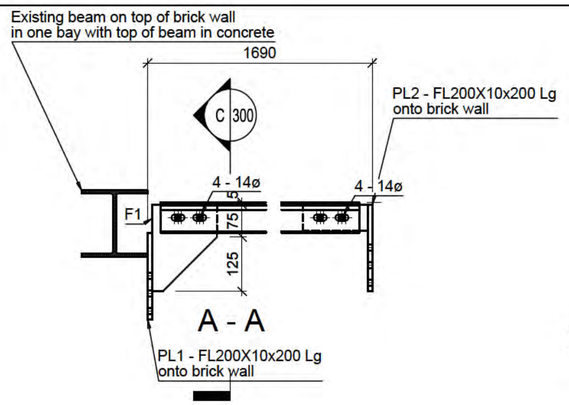
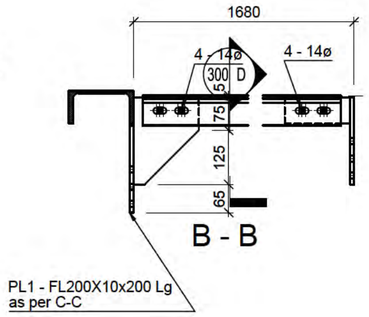
Index	Date	Description	Author

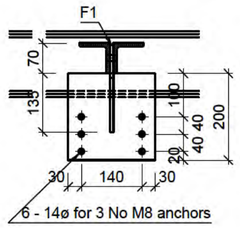
DMH Blacksmiths Ltd
5 Carsegate Road, Inverness IV3 8EX
01463 233736
contact@dmhltd.co.uk

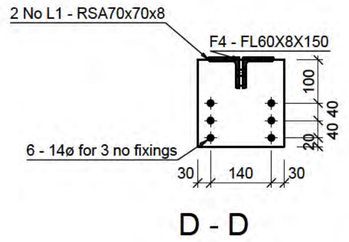
CONTRACT: Charleston Science Corridor
DESCRIPTION: End Plate

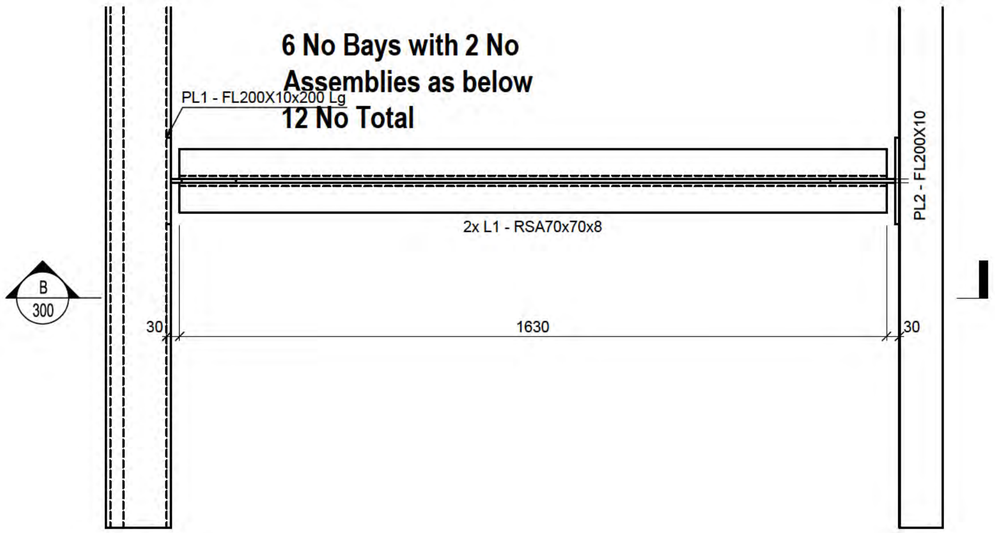
DRAWN BY	DATE	SCALE	JOB No.	DRG No.	Rev.
■	08/08/2023	1:5	10954 P3	[A] - PL2	Rev0

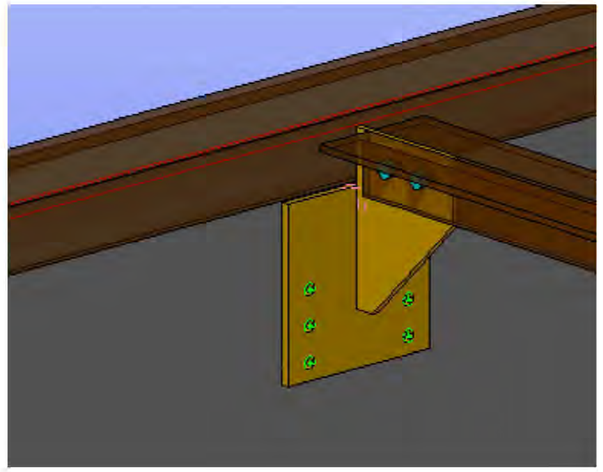


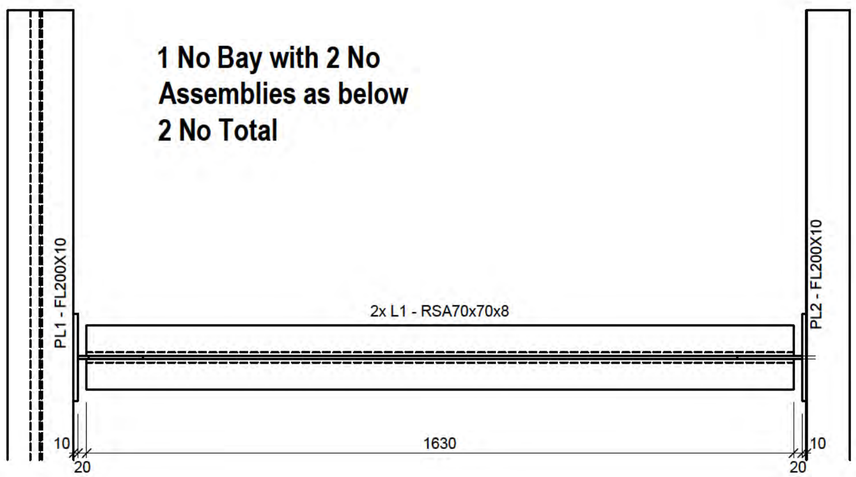


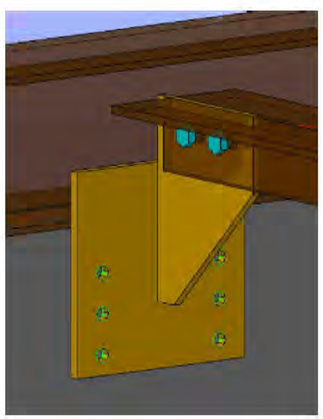


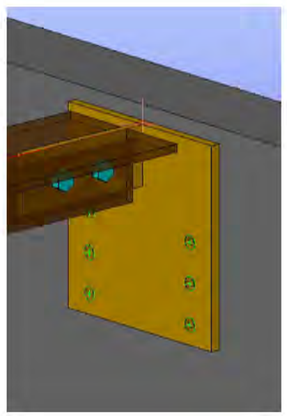












Plan on Bearing Arrangements (1:10)
7 No Bays each with 2 No Support Assemblies

GENERAL NOTES

1. This drawing must not be scaled.
2. U.O.S, this project is to conform to:
   Execution Class 2 of EN 1090-2
3. U.O.S, all tolerances' are to conform to:
   BS EN ISO 1090-2 Annex D
4. U.O.S, all welds are to BS EN ISO 15613:2004, WPS:
   DMH 001 (Fillet)
   DMH 003 (V-Butt)
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6. For project specific material grades and coating requirements, please see part drawings.

IF IN DOUBT - ASK!

Index	Date	Description	Author

REVISIONS

DMH Blacksmiths Ltd
5 Carsegate Road, Inverness IV3 8EX
01463 233736
contact@dmhltd.co.uk

CLIENT
Highland Council/Morrisons

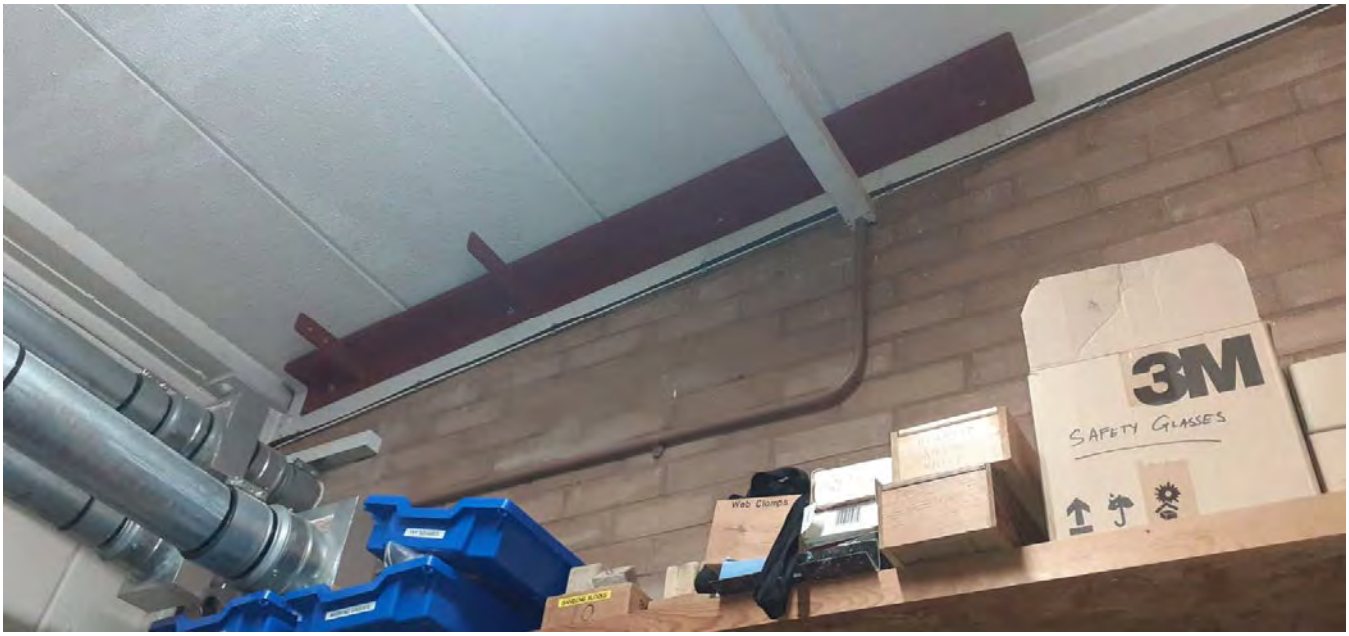
PROJECT
Charleston Science Corridor

DRAWING TITLE
Roof Panel Supports
for 7 Bays to increase bearing for slabs

DRAWN BY	CHECKED BY	DATE	SCALE
■		08/08/2023	As Noted

PROJECT No.	DRAWING No.	REV
10954 P3	[G] - 300	Rev0

Appendix D – Remedial Works Insitu Record Photographs




EXIT
No smoking

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