

Energy Efficiency Measures (EEM)
PAS 2035:2019

Retrofit Design (EWI)

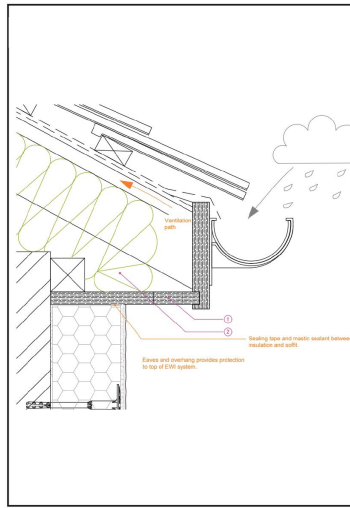
For

71 Edgeboston Road
Birmingham
B66 4LF

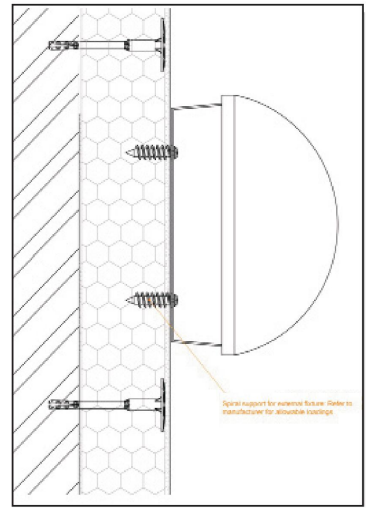
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Design Rev1

REAR ELEVATION



11. Roof need to be extended on Rear side elevation in order to accommodate 90mm EWI.



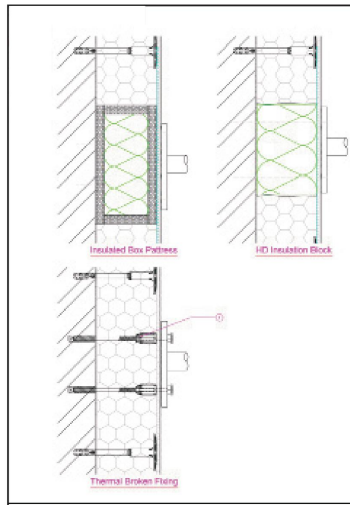
12. All lightweight items to be removed and re-installed on the face of the EWI, in this case light and camera systems which need to be carried out by a qualified electrician.

Notes:

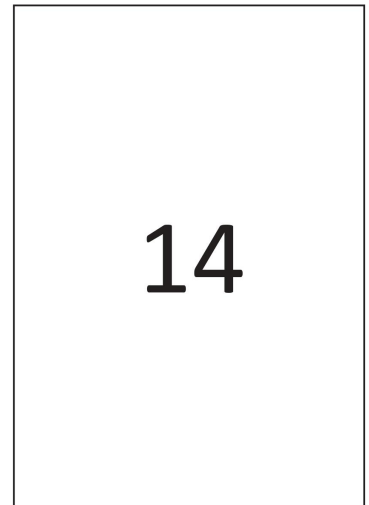
Rainwater and soil, vent and waste pipework, shall be temporarily disconnected and removed from the substrate, by the Contractor and reconnected to maintain services. Extend any pipework or sleeves to accommodate additional width of insulation plus rendering and reconnect on completion of the Works.

Where gullies are positioned too close to the wall below DPC level to accommodate the insulation thickness they must be repositioned to suit the new location of the downpipe.

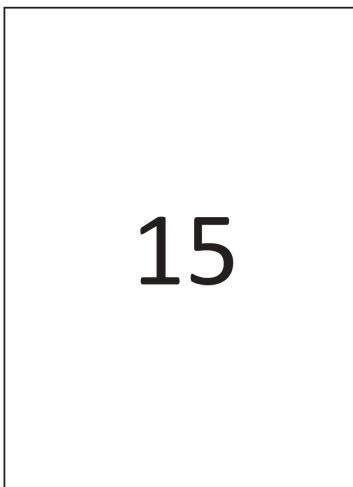
Where drain positions are close to the existing substrate such that it is not possible to accommodate the full insulation thickness, a swan neck fitting may be used to connect to the repositioned SVP. The swan neck fitting must be arranged so that there is no break in continuity of the main wall EWI and starter track.



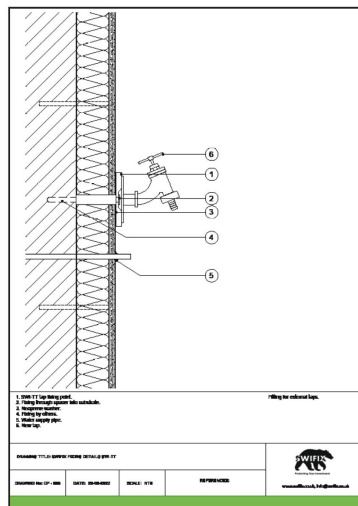
13. Heavy item to be removed and re-installed on EWI face (Satellite dish).



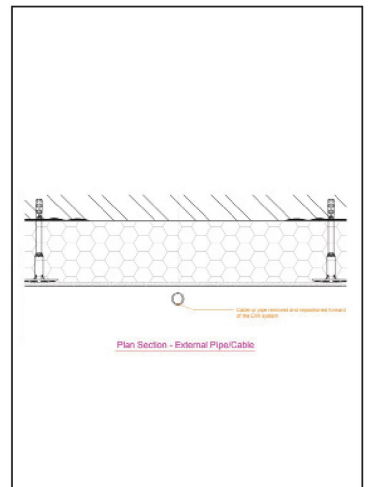
14. Soil pipe may be removed and re install after the EWI depending on its condition and space available.



15. Ideally, fence panel should be removed and shortened to allow installation of EWI. If fence cannot be removed, then install starter track around it, leaving a 10mm gap. Area left exposed to have aerogel installed.



16. External tap to be extended in order to accommodate 90mm EWI. Correct Fixings to be used.

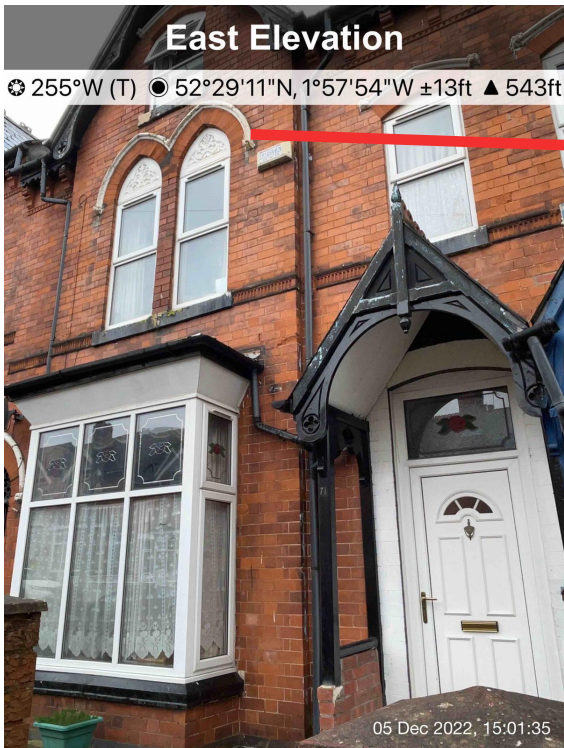


17. Pipes to be removed, extended and repositioned by plumber in order to accommodate 90mm EWI. Refer to detail.

EXTENT OF EWI

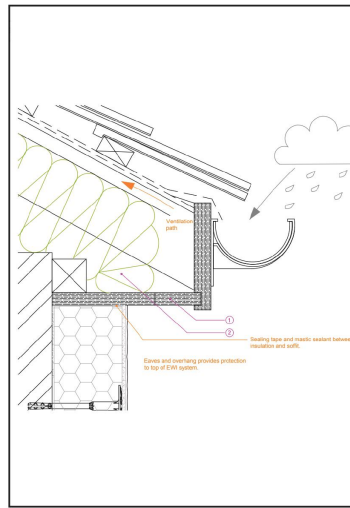


Side wall (Alley way) will be insulated by using 50mm insulation boards and 50mm XPS boards below DPC
Rear wall with extended part (Kitchen) will be insulated with 100mm insulation and roof require extension to shade the EWI

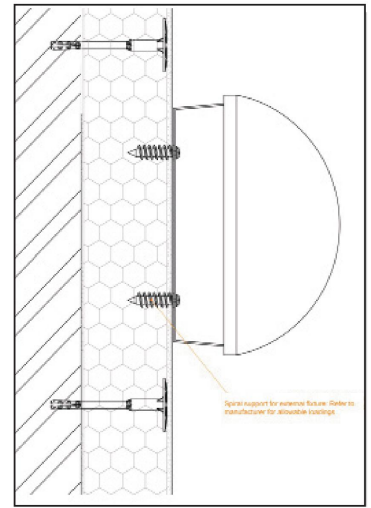


Front window design will be kept as it is and 20mm or 50mm insulation will be used around the design to keep the continuity of insulation. It'll also be advised to use 25mm insulation boards inside where EWI is not possible. Insulation will continue to the ground below the DPC level and 50mm XPS boards will be used. All guttering will be replaced if found broken or blocked and no other solution available.

FRONT ELEVATION



01. Roof does not need to be extended on front elevation in order to accommodate 90mm EWI.



02. All lightweight items to be removed and re-installed on the face of the EWI, in this case alarm systems which need to be carried out by a qualified electrician.

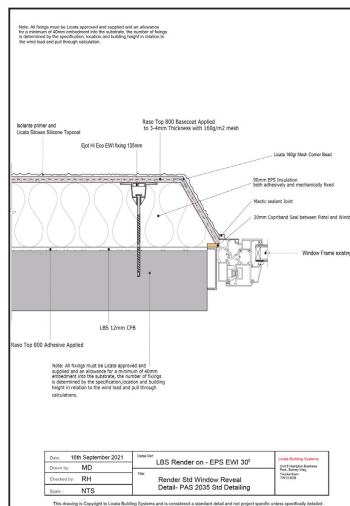
Notes:

Plumbers to remove and re-install all plumbing accordingly.

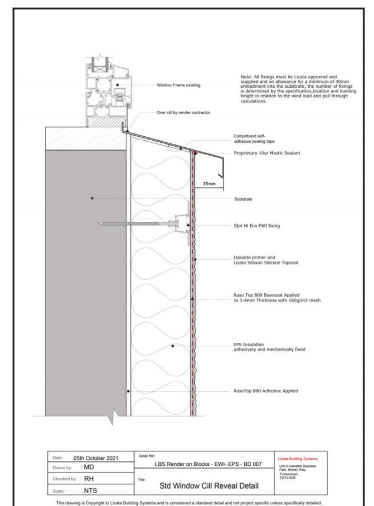
Electricians needed for all wire and alarm system removal and re-installation.

Any cables or pipes penetrating the EWI must be sleeved. This will prevent any future cracks from happening.

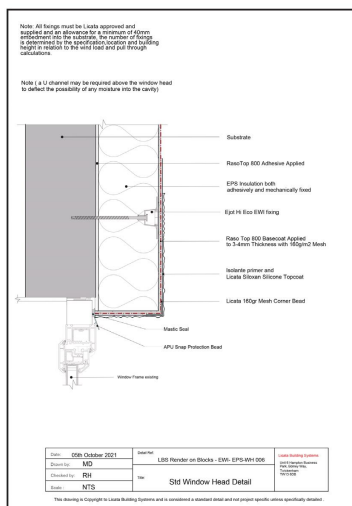
Thermally broken fixings to be used through out project.



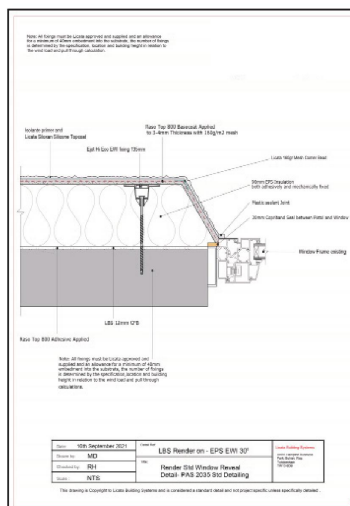
03. Window Reveal detail.



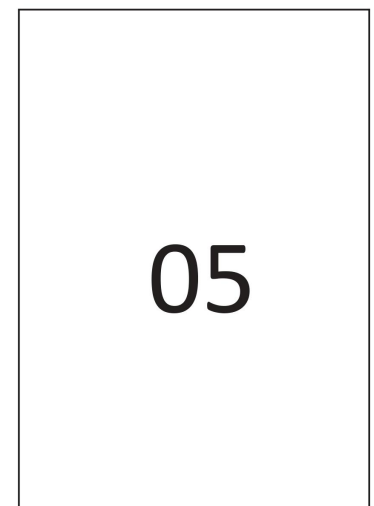
03.1 Window Sill Detail



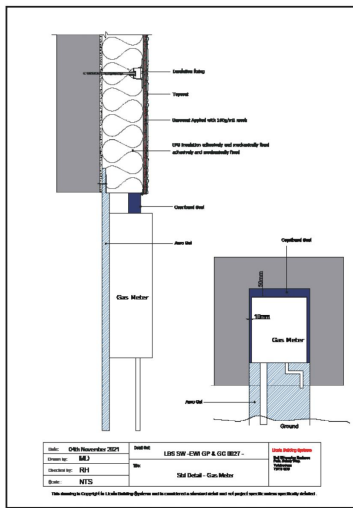
03.2 Window Head detail



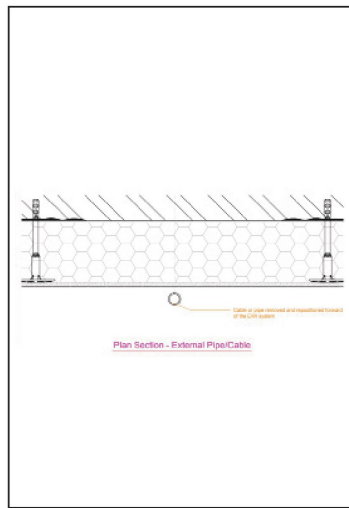
04. EWI to be chamfered on reveal in order to accommodate bay window and allow the window to function as normal.



05. Hand rail needs to be removed and re-installed once the 90mm EWI is complete

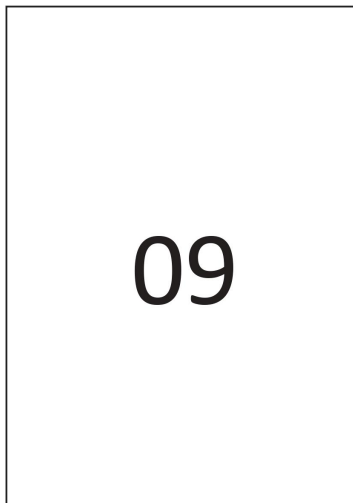


06. Gas meter box: Stop and Start EWI around gas meter box. Aerogel to be installed behind meter box if sufficient space. If not place Aerogel in areas which are left exposed.

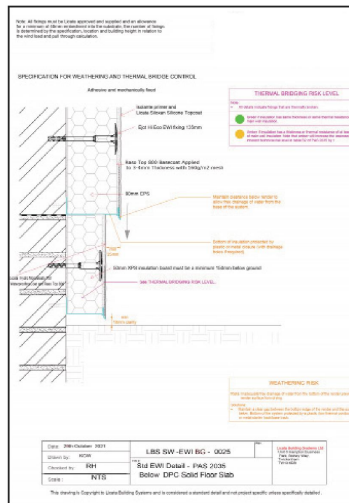


07. Pipes to be removed, extended and repositioned by plumber in order to accommodate 90mm EWI. Refer to detail.

Front wall design will be covered and external features will be as per new design and plain silicon render.



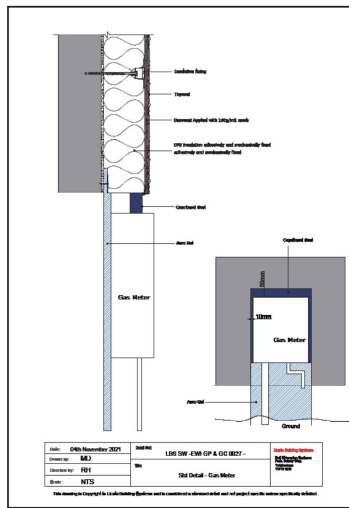
09. 50mm XPS insulation should be installed below the DPC level.



09. Starter track to be installed above DPC level. XPS is to be used where possible. DPC must not be bridged. No visible air bricks on the ground level site manager to check and confirm

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18. Hand rail needs to be removed and re-installed once the 90mm EWI is complete



19. Gas meter box: Stop and Start EWI around gas meter box. Aerogel to be installed behind meter box if sufficient space. If not place Aerogel in areas which are left exposed.

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20. Vent shall be extended with PVC ducting and a grille fixed to the external face of the EWI. This should be carried out on all vents throughout project. All vents should be sealed with silicon.

VENTILATION

Room	Trickle Vents	Undercuts	Exhaust	Mould & damp	Comments
Living Room	N	Y	N/A	N	Trickle vent /undercuts needed. Required ventilation will be installed to meet the standard of pas2030.
Kitchen	N	N	N	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
Bathroom 1	N	Y	Y	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
W.C	Y	Y	Y	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
Bedroom 1	Y	Y	N/A	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
Bedroom 2	N	Y	N/A	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
Bedroom 3	Y	Y	N/A	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.
Bedroom 4	Y	Y	N/A	N	Undercut needed. Required ventilation will be installed to meet the standard of pas2030.

Internal ventilation summary

There is no evidence of mould or damp in the property.

While openable windows may offer adequate opportunities for purge ventilation, some rooms do not have sufficient background ventilation. To address this issue, rooms lacking background ventilation must be equipped with either trickle vents or a PIV system should be considered for the entire property. However, before installing trickle vents, the contractor must verify if the window type and frame thickness are appropriate for the installation.

Working extractor fans are present in the bathrooms, but there is no extractor fan in the kitchen, and there is no evidence of the achieved flow rate in either room. According to regulations, mechanical extractor fans in the kitchen must have a flow rate of at least 13l/sec, while those in the bathroom should have a minimum flow rate of 8l/sec. If the required flow rates are not being achieved, the fans should be upgraded.

In summary, the survey data shows that the ventilation of this property is inadequate. The inadequacies detailed in the table above must be rectified as part of the EEM works.

Subfloor ventilation

Any obstructed air bricks should be unblocked as part of the works.

Energy Efficiency Measures (EEM)

PAS 2035:2019

Retrofit Specification

for

**71 Edgeboston
Road
Birmingham
B66 4LF**

Design Rev1

1. Introduction

This document is produced to redesign the External elevation of 71 Edgboston and may change the external look and features of the property to improve its energy efficiency by installing external wall and RIR insulation by Ecogenius Ltd and contractors.

The Design Specification has been produced in accordance with the requirements of PAS 2035 and takes into account the scope of the project set out in the Intended Outcomes (**As provided by the Retrofit Assessor**)

The risk pathway for has been assessed by the Retrofit Assessment as Path B, and therefore the design requirements for Path B have been applied.

A Medium Term Improvement Plan will be provided for the property (by the Retrofit Co-ordinator) which sets out future potential energy efficiency and carbon reduction measures to reduce the energy costs further.

The property is not situated in an area susceptible to flooding and therefore this document does not address mitigation of flood risk.

2. Assessment and Pre-Existing Defects

The property is a 4-bedroom, owner occupied, Mid-terrace house. It is of solid brick construction and was built around 1900-1930. It is not a Listed Building of historical interest, nor is it located in a Conservation Area or World Heritage Site

The design specification has been produced following completion of a Retrofit Assessment undertaken by a qualified Retrofit Assessor. The reference documents which are to be read in conjunction with this report are the Condition Report, Energy Report and RdSAP inputs. The assessment included photographic records collected during the assessment survey.

The documentation has been reviewed and is deemed sufficient to prepare a Retrofit Design conforming to Clause 8 of PAS 2035:2019.

Defects

There was no evidence of mould, condensation or water ingress identified from the assessment which require rectification prior to the EEM installation works.

3. Design Scope

The list of improvements in Clause 1 of PAS 2035:2019 have been considered and the following Energy Efficiency Measures (EEMs) are considered to be technically applicable to this project, which forms the Design Scope

PAS 2035 Scope	Project Design Scope
Improve the insulation of the elements of the building fabric (exposed floors, walls, roofs, windows and external doors) and reduce thermal bridging	External Wall Insulation (EWI), with appropriate detailing to reduce thermal bridging. Solid Floor insulation is relevant to the dwelling archetype but is not within the scope of the project. Loft insulation is not considered as part of this design scope.
Improve the air-tightness of the building envelope;	EWI with appropriate detailing to improve air tightness of the building fabric
Establish a safe dynamic moisture equilibrium through each element of the building fabric;	EWI with appropriate detailing to address moisture
Improve the resistance of the building envelope to water penetration in order to maintain the thermal properties of the building fabric and the capability of the building envelope to manage moisture in a manner suited to its construction;	EWI, together with appropriate detailing to improve resistance of the building envelope to water penetration
Provide or upgrade ventilation to ensure good internal air quality and minimize the risk of condensation;	Assessment of ventilation to confirm adequacy for the improved building fabric
Minimize the risks associated with vapour or other products, for example volatile organic compounds (VOCs), released within buildings subsequent to their air-tightness being improved	Assessment of ventilation to confirm adequacy for the improved building fabric
Minimize the risks associated with overheating;	Assessment of worse-case properties of each property archetype to demonstrate mitigation of overheating risk.
Provide efficient heating and cooling systems with responsive, intelligent or “smart” controls, including systems that use low or zero carbon (LZC) technologies;	Not within the scope of the current project
Provide efficient fixed lighting with appropriate controls;	Not within the scope of the current project
Provide efficient appliances and equipment to reduce electricity use and minimize internal heat gains;	Not within the scope of the current project
Provide locally generated renewable electric power systems that use LZC technologies;	Not within the scope of the current project
Provide on-site energy storage to improve the usefulness of energy generated by LZC technologies;	Not within the scope of the current project
Provide on-site energy storage to improve the usefulness of energy generated by LZC technologies;	Not within the scope of the current project
Provide metering and monitoring systems to promote the efficient use of energy.	Not within the scope of the current project

4. External Wall Insulation Design Specification

This section specifies the design specification for the EWI installation, and should be read in conjunction with Retrofit Design document which contain the references to EWI Pro standard details and are cross referenced to the junctions and interfaces relevant to this property.

Insulation above DPC level

EWI Pro EXTERNAL WALL INSULATION SYSTEM - 90mm thick EPS insulation to achieve an overall external wall U-value of 0.3 W/m²K to comply with Table 4.3 of Building Regulations Approved Document Part Lia. The 90mm thick EPS EWI shall extend from the underside of the roof soffit/verge to DPC level.

Insulation below DPC level

50mm XPS to be used below DPC level where possible.

Weatherproof Finish

A weatherproof finish shall be applied to the EWI in accordance with the end-client's aesthetic requirement, installed strictly in accordance with the manufacturers requirements.

Site Installation and Junction Detailing

The installation of EWI shall be compliant with the requirements of PAS2030 and shall conform to the SWIGA Thermal Bridging and Weathering Details, LICATA Standard Construction Details and Licata's M10 NBS Specification.

Any cables or pipes penetrating the EWI must be sleeved. This will prevent any future cracks from happening.

Planning Implications.

There are no planning implications.

5. U-Values and Condensation Risk Analysis

Use of standard EWI Pro details together with the adequate ventilation, limit the risk of condensation and unwanted heat loss through thermal bridging.

The target u-value for the external wall is 0.3W/ m²K in calculations provided by EWI Pro.

Safe Operation of Combustion Appliances

Provided detailing specified in sections 4-5 is followed, the scope of the retrofit design has no impact on the safe operation of combustion appliances

6. Overheating

The overheating risk is judged to be low given the property archetype and the potential for cross ventilation. Provided ventilation inadequacies listed in section 7.1 are addressed, no further specific design measures are proposed to address overheating.

7. Testing, Commissioning and Handover

Handover documentation meeting the requirements of PAS 2030 B4-I7 shall be provided and explained to the client at handover and is the responsibility of the Retrofit Co-ordinator.