Supporting Documentation
Willaston Christ Church - Reordering

Note to parish

This bundle includes all the supporting documentation to your faculty application as required under Rule 5.5 of the Faculty Jurisdiction Rules 2015.

List of documentation

	Revision P, 754-P-401 Revision P and 754-P-411 Revision P, all received 11/10/2022	
13	Mechanical and Electrical Services Strategy for Refurbishment Report of Bob Costello Associates Ltd dated July 2021, received 11 October 2022	116
14	Mechanical and Electrical Services Client Requirements and Design Strategy of Bob Costello Associates Ltd dated 13 October 2022, received 13 October 2022	161
15	Photographs received 19 October 2022	171
16	Table of Existing and Proposed Uses received 24 February 2023	173
17	Options drawings of Kepczyk Pearce Sanderson dated February 2023 numbered OA01, OA02, OA03 and OA04 received 24 February 2023	191
18	Options Appraisal: Response to DAC Advice Following Review on 13 January 2023 received 24 February 2023	195

Correspondence

19	Correspondence between DAC office and parish dating from 28 February 2018 to 28 March 2023	197

Consultation

20	Correspondence between DAC office and consultees dating from 22 June 2021 to 15 December 2022	224

Caroline Hilton, DAC Secretary 6 June 2023

Statement of Significance

Guidance on completing this form can be found on the ChurchCare website at
http://www.churchcare.co.uk/churches/guidance-advice/statements-of-significance-need

Section 1: Brief history and description of the church building(s), contents, churchyard and setting

1.1 Brief history and description of the church buildings and contents

Consecrated in 1855, Christ Church, designed by architects Fulljames and Waller, is of local red sandstone construction with a slate roof. The north aisle extension and new vestries (architect Bernard Miller) were added and the chancel arch widened in 1925. The vicar of Neston, the Revd. Robert Yarker instigated the building of the church as a Chapel of Ease to the parish church at Neston and was one of the prime benefactors. It is reported that his main object was to build a church at Willaston that should be an architectural beauty and design worthy of the House of God. (B Carne and M J Crossley-Evans in an article about Thomas Fulljames, the architect). A large stone font in memory of the vicar of Neston was donated when the church was opened. His wife is commemorated in the East Window.

Duncan Graham Esq. JP, a Liverpool merchant and inhabitant of the Lydiate (in Willaston) became patron of the living in 1865, providing a new vicarage and appointing the first vicar. He was an important benefactor to the church, adding, around 1890, the lynchgate, a vestry, lighting and the great West Window, a memorial to his son, Walter. He is commemorated in one of the Nave South windows. A rich variety of stained glass windows date from the mid-19th century till 2000. A summary description of the windows is provided within Appendix (i).

The building was grade II listed in 1999.

There remain 20 pews set out either side of the main aisle each with a seating capacity of 6 adults i.e. the pews provide seating for up to 120 adults. In practice, it is likely that in most circumstances only 5 adults would occupy each pew giving a seating capacity of 100. The dark coloured pews are plain and many tend to creak. Although the floor occupied by the pews is plain timber boarded, the main aisle and north aisle extension are of parquet flooring; the aisles are carpeted.

The choirstalls and reading desk (vicar's stall) were designed in 1905 by Douglas and Minshull. Their plain rear pew ends show where they would have been fitted against the chancel arch before it was widened in 1925. The oak pulpit, altar rail, altar table, reredos and panelling (round the chancel walls) were added gradually following the alterations carried out in 1925. The organ (by Nicholson of Worcester) was installed

in 1926 and was refurbished (by Wells of Liverpool) in a major overhaul in time for the millennium.

The lighting inside the church is provided by 3 rows of 4 lamps suspended from the roof beams and probably dates from the 1920s refurbishment. These lights are now supplemented by flood lights sited higher in the roof.

In the north extension there are two vestries; one (originally a choir vestry) is fitted with a sink and water heater, the other serves primarily as a vestry for the vicar. There is also a toilet with wash basin and water heater.

Outside at the east end of the church, access is available down a flight of steps to the boiler room with a cupboard housing the organ bellows and a pumped rain water sump in the adjacent basement area originally built as coal cellar. An adjoining building at ground floor level houses the air pump and duct to the organ bellows along with the gas meter (recently changed to a smart meter).

Central heating is provided by a conventional flue gas boiler connected to twin 6" diameter heating pipes which run at floor level around the perimeter. There are some radiators in the north aisle and in the vestibule and vestries. An over-door heater/air-curtain sited directly above the main door is used if required to supplement the central heating as people enter or leave the building before or between services. There is next to no insulation in the building and achieving a comfortable temperature in winter can take a long time.

Church contents comprise chiefly: oak sanctuary chairs, altar cross etc, processional cross, lecterns, old bell, ewer, candle stands, piano, old altar table, oak table, chairs, folding chairs and stand, folding tables and stands, bookcases, name boards, banners, flags and pictures. In vestry: wardrobe, desk, chair and safes.

1.2 Churchyard and setting

The church occupies a prominent position in the village centre. From the main road, a path leads up to and around the church building which stands in a large graveyard with sandstone walls chiefly along 3 sides with some fencing on the west side where there are adjacent houses with gardens. There are two field gates, a lychgate (1889) with yew trees either side (with Tree Preservation Order), hawthorn and beech hedging within the graveyard on the north side. A copper beech (with Tree Preservation Order), and other mature beech and sycamore trees stand along the eastern boundary and there are ash trees in the north east corner with benches nearby.

The graveyard is well tended and there are two Commonwealth war graves. The war memorial, built in 1921, is incorporated within the church graveyard but in an elevated location close to the roadside at the south west corner. It was given a grade II listing in

2020. A church notice board also faces the main road and a flag pole is sited in the centre front of the church.

The Scout Hut, built in the 1970s following the expansion of the village and the village school, is sited on land at the north west corner and is in a state of dilapidation.

Protective wire mesh is fitted over the majority of the stained-glass windows; some smaller windows are protected with clear polycarbonate sheeting. Limited external lighting is provided and the church is floodlit from the front.

There are opportunities to improve the ecology of the churchyard by fixing nesting boxes, setting aside areas for wild flowers and to improve accessibility for all by providing better paths and more seating.

Section 2: The significance of the church (including its contents and churchyard) in terms of:
i) Its special architectural and historical interest
ii) Any significant features of artistic or archaeological interest

2.1 Special architectural and historic interest

Moderate–High
There are some good examples of stained glass windows including the Resurrection Window by C E Kempe and Son. (see Appendix (i) for details)

Moderate
Christ Church is a small, pretty, red sandstone Grade II listed Victorian church consecrated in 1855 and set in its own grounds in a central, rural village location. The building was expanded in 1925 and shows some Art Deco influence. The additions included the north aisle, vestries and toilet. There have been few significant changes since. An interesting feature is the steep-pitched slate nave roof, with bell-cote and the slightly lower chancel roof with wheel-cross on gable end.

The bell-cote is situated on the roof where the nave and chancel divide but the mechanism for the original bell was faulty and the bell was ultimately removed in 1935 and stored inside the church after a different bell was installed in a frame on the roof of the vestibule in 1933.

Entrance to the church is on the south side via an original timber framed porch and solid oak door. Rear entrance to the church is by a solid oak door. The rear vestibule houses the bell rope.

Internally, the nave is characterised by the original dark coloured wooden pews. An original stone font is sited near to the main entrance door. The chancel arch was widened in 1925, revealing more clearly the choirstalls and reading desk (vicar's stall) and there was the gradual addition of oak furniture and furnishings: pulpit, sanctuary chairs, altar table and altar rail, reredos and oak panelling. The altar table stands on a marble dais. The sanctuary floor is of black and white marble tiles. The chancel floor is of red terracotta tiles as is the exterior porch floor. There is a good organ.

Outside in the churchyard, there are two Commonwealth war graves and a war memorial. The war memorial was grade II listed in 2020.

2.2 Significant features of artistic or archaeological interest

Moderate-High
The appearance of the church within its own walled churchyard entered through a lychgate, set well back and on ground several feet higher than buildings on the main road gives it a prominent position. It is flood-lit at night.

Inside, several of the windows are of artistic interest.

Low
There are no known areas or features of archaeological interest within the church or grounds.

Section 3: Assessment of the impact of the proposals on the significance defined in Section 2

Moderate
Removal of pews - The removal of all nave and north aisle pews will produce an open, accessible and flexible worship space. The pews will be replaced with good quality, easily stacked and storable chairs. Some repair to the walls and floor and redecoration will be required. As an historical link to the past, one pew will be retained and installed beneath the west window.

Relocation of the font – Following consultee input, the font will now not be relocated to a centralised position under the West Window.

New accessible toilet with baby changing and kitchenette facilities - The provision of toilet and kitchenette facilities in the North Aisle is considered essential in order to be able to offer hospitality to the church congregation and wider community.

Upgrade of mechanical and electrical services - The opportunity to upgrade the heating, lighting and audio-visual equipment and to consider Wi-Fi, CCTV and fire safety systems will offer a greatly improved experience for church users. It will also enable sustainable choices to be made wherever possible. As an historical link, two lighting fittings will be retained.

Low- Moderate
New meeting room and relocation of accessible toilet facilities in North extension. The provision of a meeting room and toilet facilities in the North extension will offer a much-needed self-contained space for small group meetings.

The introduction of an accessible toilet and baby changing in the NW corner will enclose the two windows in the adjacent photograph.

Appendix (i)

Stained glass windows – a summary

East Window: 1855. Attributed by Pevsner to Artist William Wailes
Sanctuary South: Given by James Gerrard in 1855
Chancel South: Circa 1890? Artist W B Simpson & Son
Nave South (1): 1902 Artist Herbert Bryans? (signature not evident)
Nave South (2): 1920 Artist Herbert Bryans
West Window: Circa 1890 Artist W B Simpson & Son
North Aisle (1): Circa 1897 Artist W B Simpson & Son? (signature not evident)
North Aisle (2): 1980 William T Davies, Irby
North Aisle (3): 1975 Artist Chapel Studios, Kings Langley
North Aisle (4): Circa 1905 Artist C E Kempe and Son
North Aisle (5): Circa 1980 Arts Chapel Studios, Kings Langley
North Aisle (6): 2000 Artist William T Davies, Irby
Above Chancel Arch: 1855? Small decorative window.
Sanctuary North: 1855 Given by James Gerrard
There are two plain windows at Nave South (3) and North Aisle West End
Numbering above measured clockwise from East Window.

Statement of Needs

Guidance on completing this form can be found on the ChurchCare website at
http://www.churchcare.co.uk/churches/guidance-advice/statements-of-significance-need

This document must be accompanied by the Standard Information Form 1A

Section 1. General information

This should provide an overview of the parish and the current use of the building.

In addition to Christ Church, the Parish includes a primary school, scout hut, Methodist church and a (Community) Memorial Hall. The population of Willaston is around 2,364 people. The building is currently used for regular Sunday services, monthly communion, church groups, meetings and is open for private prayer on Tuesdays and Saturdays.

Section 2. What do you need?

Briefly explain your needs (not your proposals). Append any brief for your architect*.

- A space which enables a multitude of service styles, including traditional Communion Services as well as fresh expressions like Cafe Church;
- An accessible and welcoming building without barriers for those with physical, visual and other impairments e.g. improved Audio Visuals and accessible toilet;
- A food preparation area or Kitchen to allow us to offer other hospitality as we seek to build community;
- Better heating, improved insulation, electrics, lighting that can support worship and other uses;
- Flexible seating, tables and storage to facilitate a variety of events. Space for smaller groups;
- Sustainable solutions that make it easier to maintain the fabric of the church as well as producing excellent church facilities and generating supporting income from such use. It is intended that the building would have enough flexibility to use both entrances to enable separate use of the two main spaces.

*Architect's Brief uploaded to 'Supporting documents & images'

Section 3. The proposals
Set out what you are proposing to do in order to meet the needs set out in section 2.

Briefly, the proposal comprises:

1. Removal of existing pews from the Nave and making permanent of removal from North Aisle;
2. Re-positioning of the Font;
3. Provision of kitchenette and accessible toilet with baby changing in NW corner;
4. Re-arrangement of space in North Extension to provide large flexible meeting space/vestry area plus separate accessible toilet and baby changing;
5. Provision of new M&E, heating, audio-visual services and consideration of new fire safety systems;
6. Provision of storage, new seating etc
7. Redecoration & cleaning.

(further details are provided in the **Options Appraisal**)

Section 4. Why do you need it and why do you need it now?

Justify your proposals by explaining why you can't meet your needs without making changes. Also include anything which may have prompted the proposals.

These proposals will enable completion of the plan to make new provision for community facilities through re-ordering of Christ Church. These new facilities replace those lost when the church hall was sold off about 11 years ago. This was included in the local authority planning permission for demolition and sale of the land (CW&C 11/01660/CAC and 11/01661/FUL refer.)

The justification for the proposals can be found in the files:

- **Options Appraisal**
- **Pew Removal**

Section 5. Justification

If the proposals are likely to harm the significance outlined in the Statement of significance, explain how the proposals would result in public benefits which outweigh such harm (public benefits include matters such as liturgical freedom, pastoral wellbeing and putting the church to viable uses that are consistent with its role as a place of worship and mission).

Apart from the construction of an accessible toilet with baby changing in the NW corner of the North Aisle and rearrangement of spaces in the North Extension, the 'harm' to the significance is really limited to the removal of all non-Chancel pews.

The detailed discussion and justification of this is made in the document **Pew Removal** which also proposes alternative seating provision.

Form 9
(Rule 8.2)
Licence for temporary minor re-ordering

In the Consistory Court of the Diocese of Chester

The Venerable Michael Gilbertson **Archdeacon of Chester**

Parish of Willaston

Church of Christ Church

To Revd Stephen Bazely
and to the Parochial Church Council

You have applied for authority to carry out a scheme of temporary minor re-ordering and I am satisfied that it is expedient to give a licence authorising the scheme.

I now give you my licence authorising you to implement the scheme of temporary minor re-ordering described below and subject to the conditions that are specified.

This licence expires on 26 December 2017

The Scheme
The scheme of temporary minor re-ordering authorised by this licence comprises:
Temporary removal of 10 pews from the north aisle of the church and the making good of the floor and wall in the affected area

This work is in accordance with the letter and photographs attached to the e-mail of Revd Stephen Bazelydated 20 September 2016

Conditions
This licence is subject to the following conditions:

1. The removed pews to be stored safely and securely in appropriate conditions for the duration of the period of temporary reordering.
2. The work to be under the direction and subject to the inspection of the church architect

Signed: M.R. Gilbertson Date: 26.9.2016
Archdeacon of Chester

(Copies of this licence are sent to the Diocesan Registrar and to the Diocesan Advisory Committee.)

Notes

1. If you wish to continue with the scheme after the expiry of this licence you must submit a petition for a faculty in respect of the scheme to the diocesan registry (and display public notices in accordance with Part 6 of the Faculty Jurisdiction Rules) not less than 2 months before this licence expires. Prior to that you should have sought the advice of the Diocesan Advisory Committee.

2. If you submit a petition within the time mentioned in paragraph 1, the scheme will be deemed to continue to be authorised by this licence until the petition is determined by the court.

3. If you do not submit a petition for a faculty in respect of the scheme, when the licence expires you must immediately restore the position to that which existed before the scheme was implemented.

4. On the expiry of this licence, the archdeacon will send a notice asking whether a faculty has been applied for and, if not, whether the position has been restored to that which existed before the scheme was implemented. The minister (or if there is then no minister, the churchwardens) must return the completed form to the archdeacon within 14 days.

Christ Church, Willaston Re-ordering Programme

Our ITT to candidate architects in December 2019 set out our re-ordering needs in the context of the Mission & Vision of Christ Church and against the background of a Community Audit and Statement of Significance of the building as it stands today.

Our church building needs were summarised as:

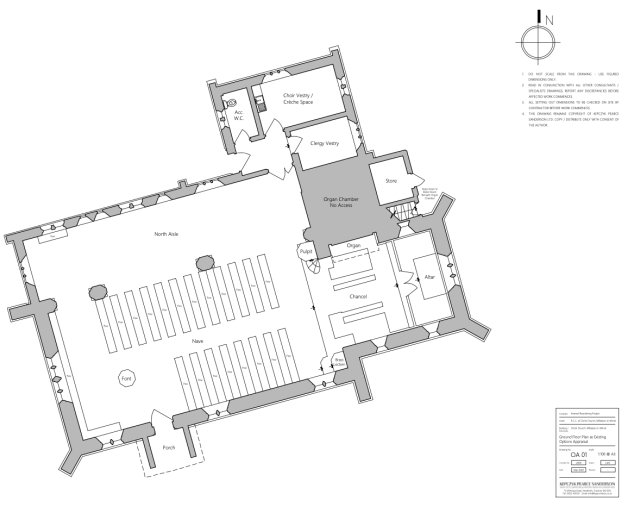
- A space which enables a multitude of service styles, including traditional Communion Services as well as fresh expressions like Cafe Church;
- An accessible and welcoming building without barriers for those with physical, visual and other impairments e.g. improved Audio Visuals and accessible toilet;
- A food preparation area or Kitchen to allow us to offer other hospitality as we seek to build community;
- Better heating, improved insulation, electrics, lighting that can support worship and other uses;
- Flexible seating, tables and storage to facilitate a variety of events. Space for smaller groups;
- Sustainable solutions that make it easier to maintain the fabric of the church as well as producing excellent church facilities.

In consultation with Mark Pearce, the selected architect, we assumed:

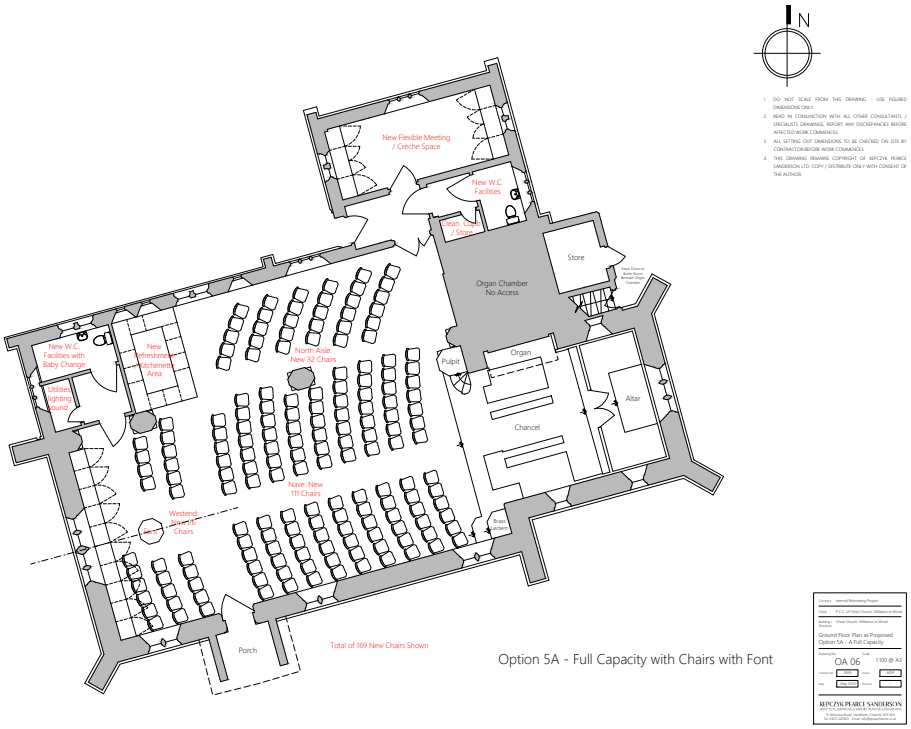
1. The nave would be cleared of pews;
2. The chancel would not be changed fundamentally though consideration may be given to the reduction in the number of choir stalls;
3. All adaptations would be limited to the interior of the Church and enable us to maintain the ability to meet the challenges of the future as a place of worship and community use.

To satisfy our needs within these constraints – we explored several possible approaches and tested them through rigorous review. Each had strengths and weaknesses which were documented to be included in a full faculty application. After commissioning a measured survey, which was completed in February 2020, we have selected one approach and developed it further as our preferred option. This preferred option is shown configured for five types of use to demonstrate its flexibility.

Current Layout

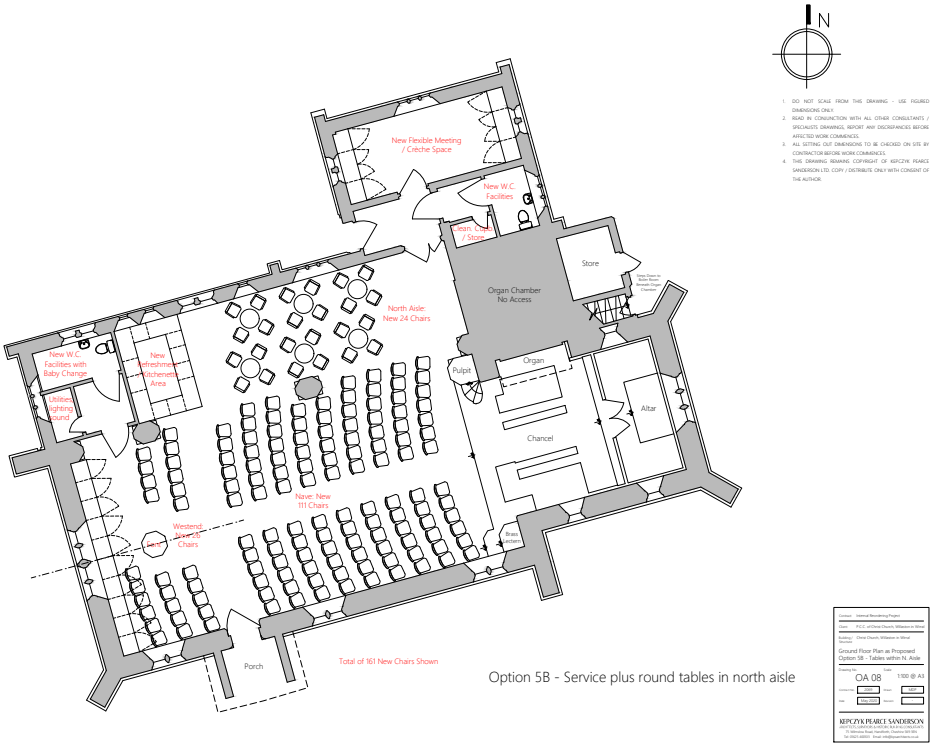


5A Full Capacity



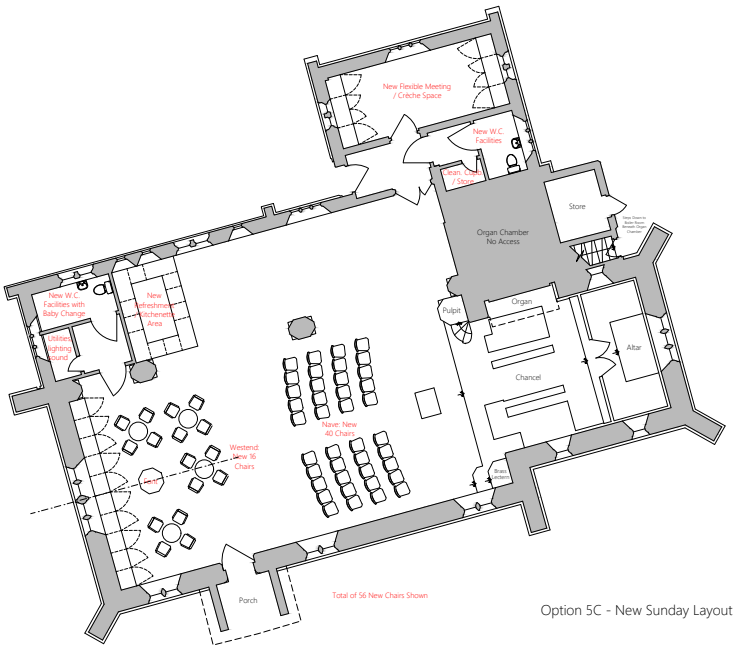
Option 5A - Full Capacity with Chairs with Font

5B Large Service plus hospitality



Option 5B - Service plus round tables in north aisle

5C Small Sunday Layout – Traditional HC Service (40) / Café Church (16)



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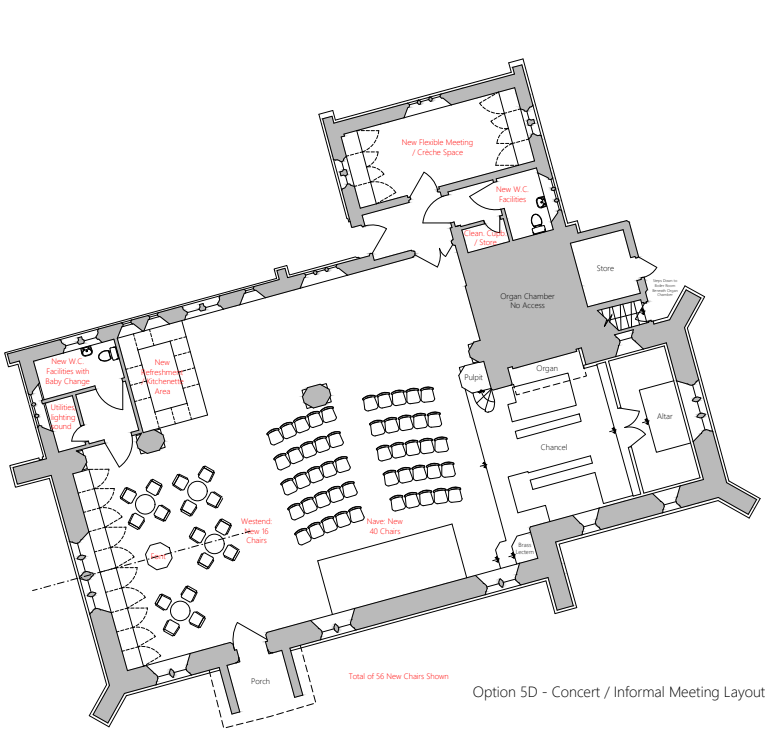
Option 5C - New Sunday Layout with Font

5D Concert/Informal Meeting Layout



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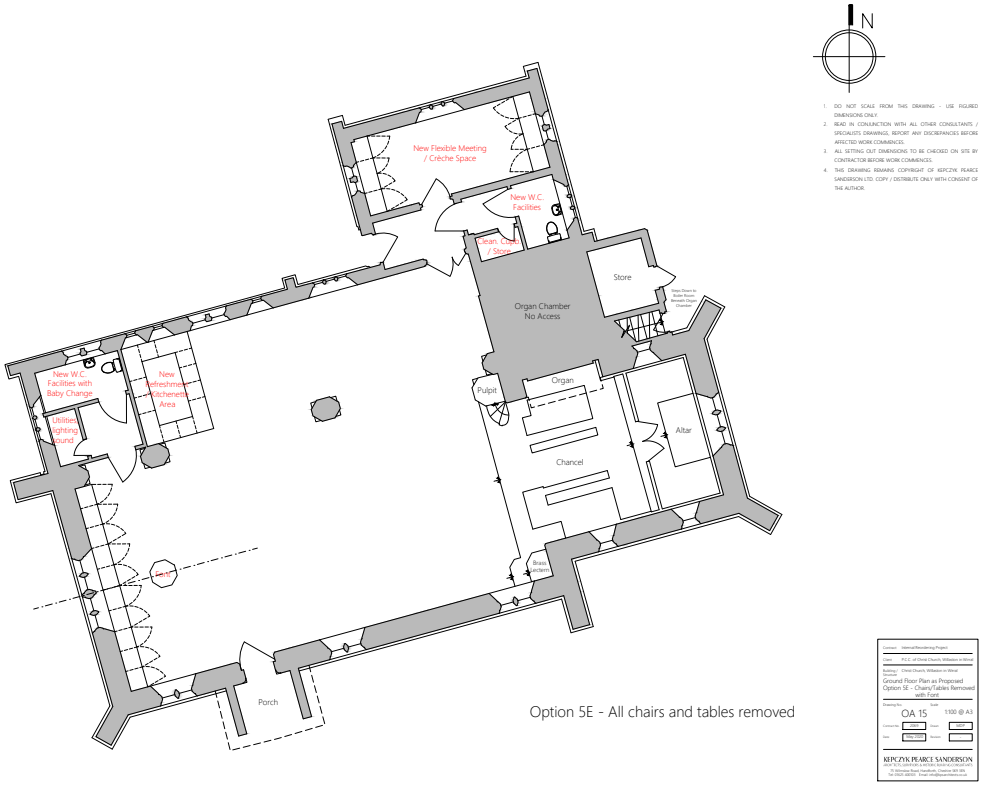
Option 5D - Concert / Informal Meeting Layout with Font

5E All Chairs & Tables away – Blank Canvas



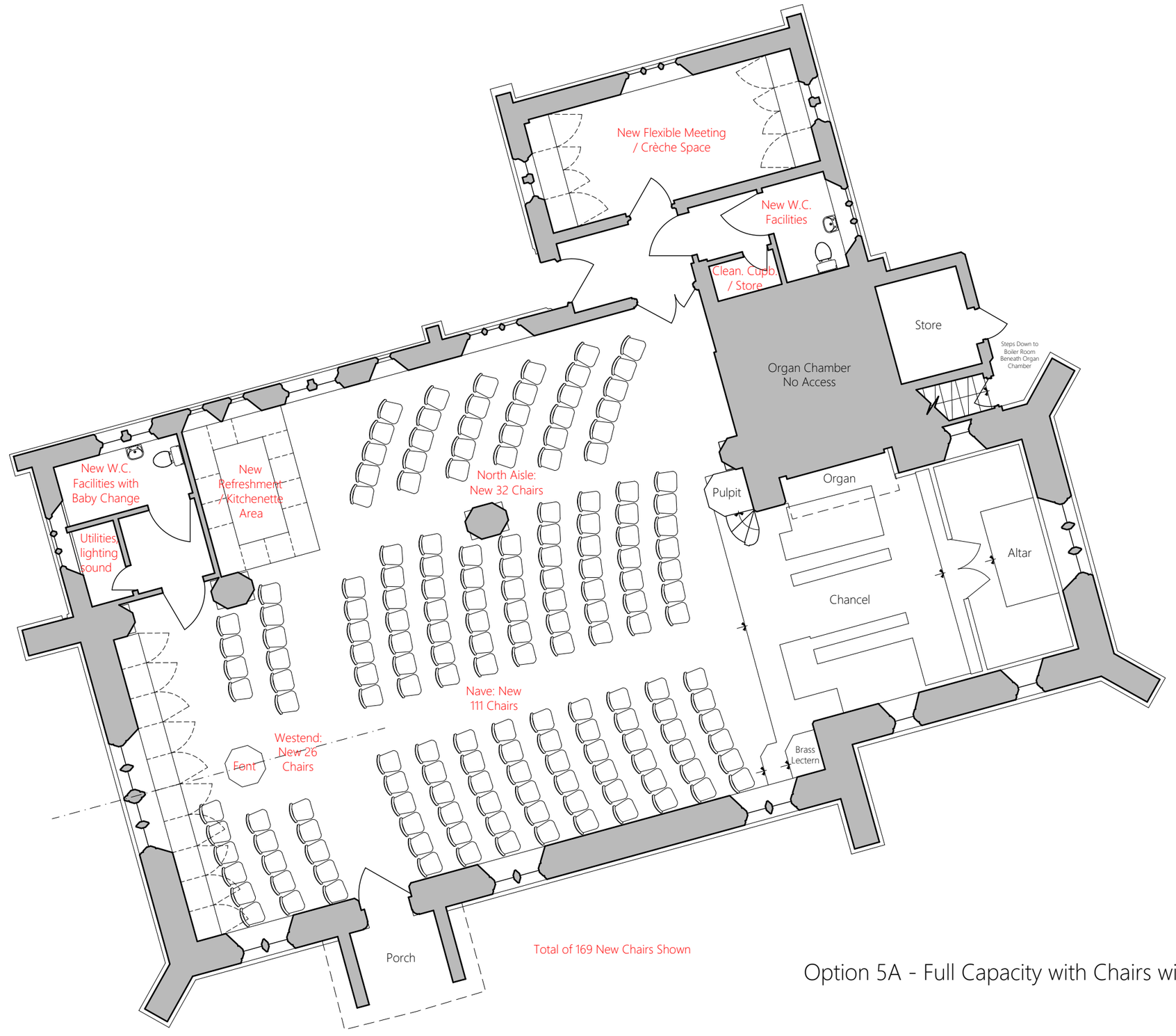
Design Notes:

1. High flexibility; zero impact on Chancel; low impact on items of historical significance; refreshment/kitchenette area; additional accessible wc with baby change; separately accessible meeting room with adjacent accessible wc with baby change.
2. Heating, PA, lighting & media needs part of detailed design stage.
3. Font currently not in use – some impact on space use flexibility.
4. Clergy vestry facilities probably provided as part of new flexible meeting space.
5. High level of designed storage to support chair storage.

Known Key Factors:

1. QI (June 2020) likely to indicate damp issues in North Aisle north wall and North Extension north wall – should be fixed before commencing re-ordering.
2. Current gas central heating has completely failed – building currently unusable in cold weather – solution not found before 'lock-down'.

Tim Boulton MBA BEng MIET
Programme Manager – Christ Church, Willaston Re-ordering
07734 322991



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Option 5A - Full Capacity with Chairs with Font

Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed
Option 5A - A Full Capacity

Drawing No.: OA 06

Scale: 1:100 @ A3

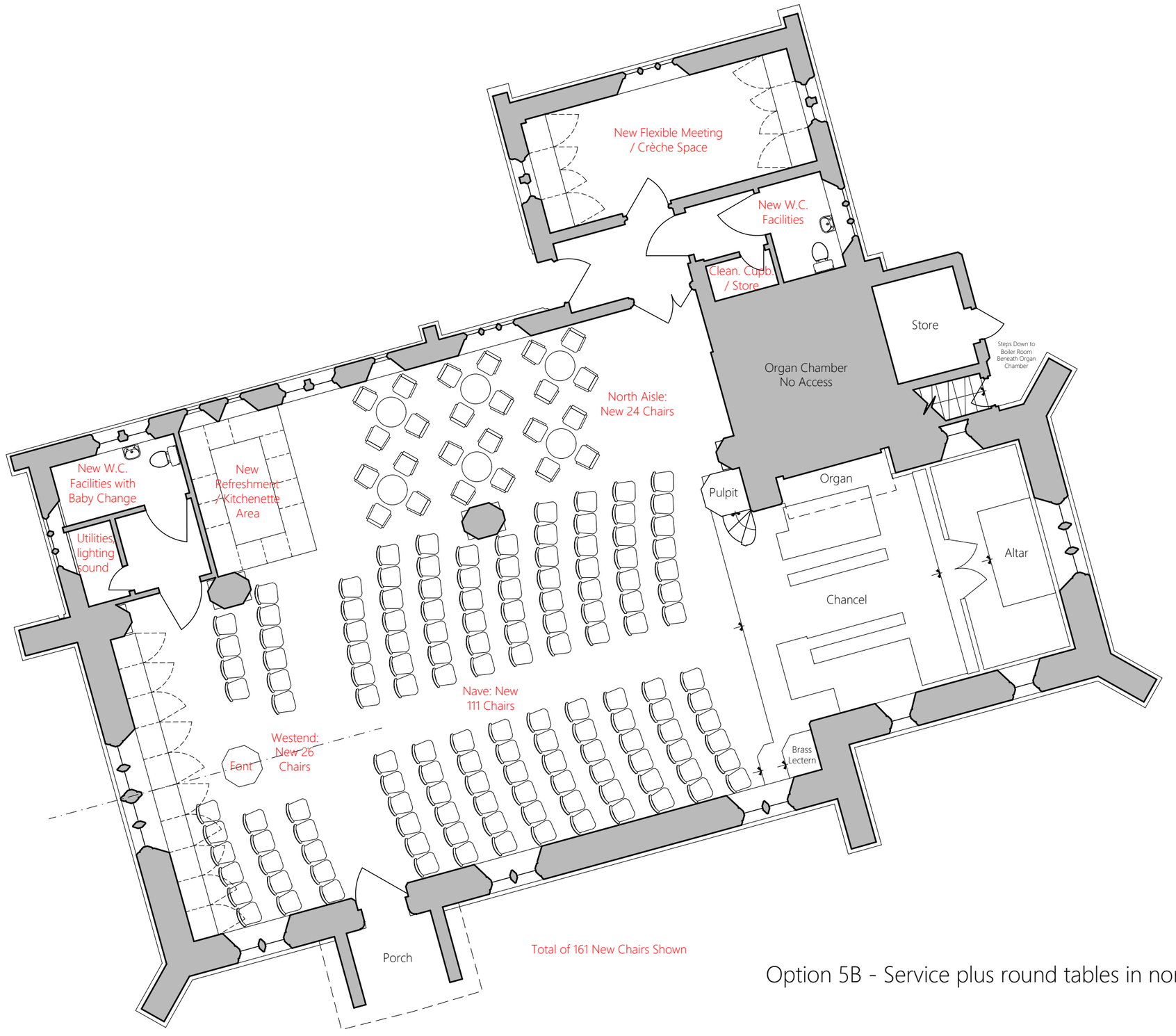
Contract No.: 2069

Drawn: MDP

Date: May 2020

Revision: -

KEPCZYK PEARCE SANDERSON
ARCHITECTS, SURVEYORS & HISTORIC BUILDINGS CONSULTANTS
75 Wilmslow Road, Handforth, Cheshire SK9 3EN
Tel: 01625 400103 Email: info@kpsarchitects.co.uk



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4.

Option 5B - Service plus round tables in north aisle

Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed
Option 5B - Tables within N. Aisle

Drawing No.: OA 08

Scale: 1:100 @ A3

Contract No.: 2069

Drawn: MDP

Date: May 2020

Revision: -

KEPCZYK PEARCE SANDERSON
ARCHITECTS, SURVEYORS & HISTORIC BUILDING CONSULTANTS
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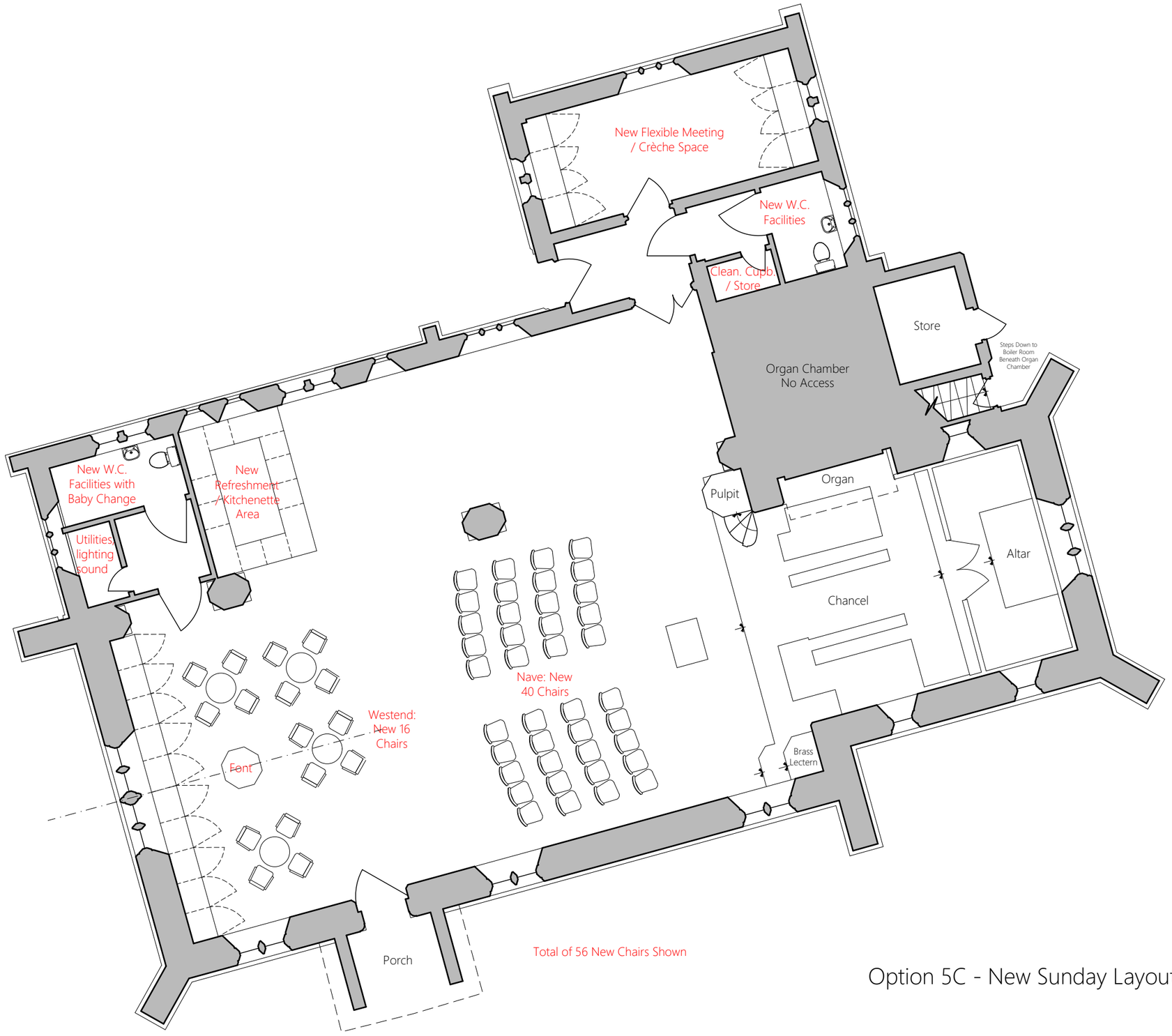

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4.

Option 5C - New Sunday Layout with Font

Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed
Option 5C - New Sunday Layout with Font

Drawing No.: OA 12

Scale: 1:100 @ A3

Contract No.: 2069

Drawn: MDP

Date: May 2020

Revision: -

KEPCZYK PEARCE SANDERSON
ARCHITECTS, SURVEYORS & PROJECT MANAGEMENT CONSULTANTS
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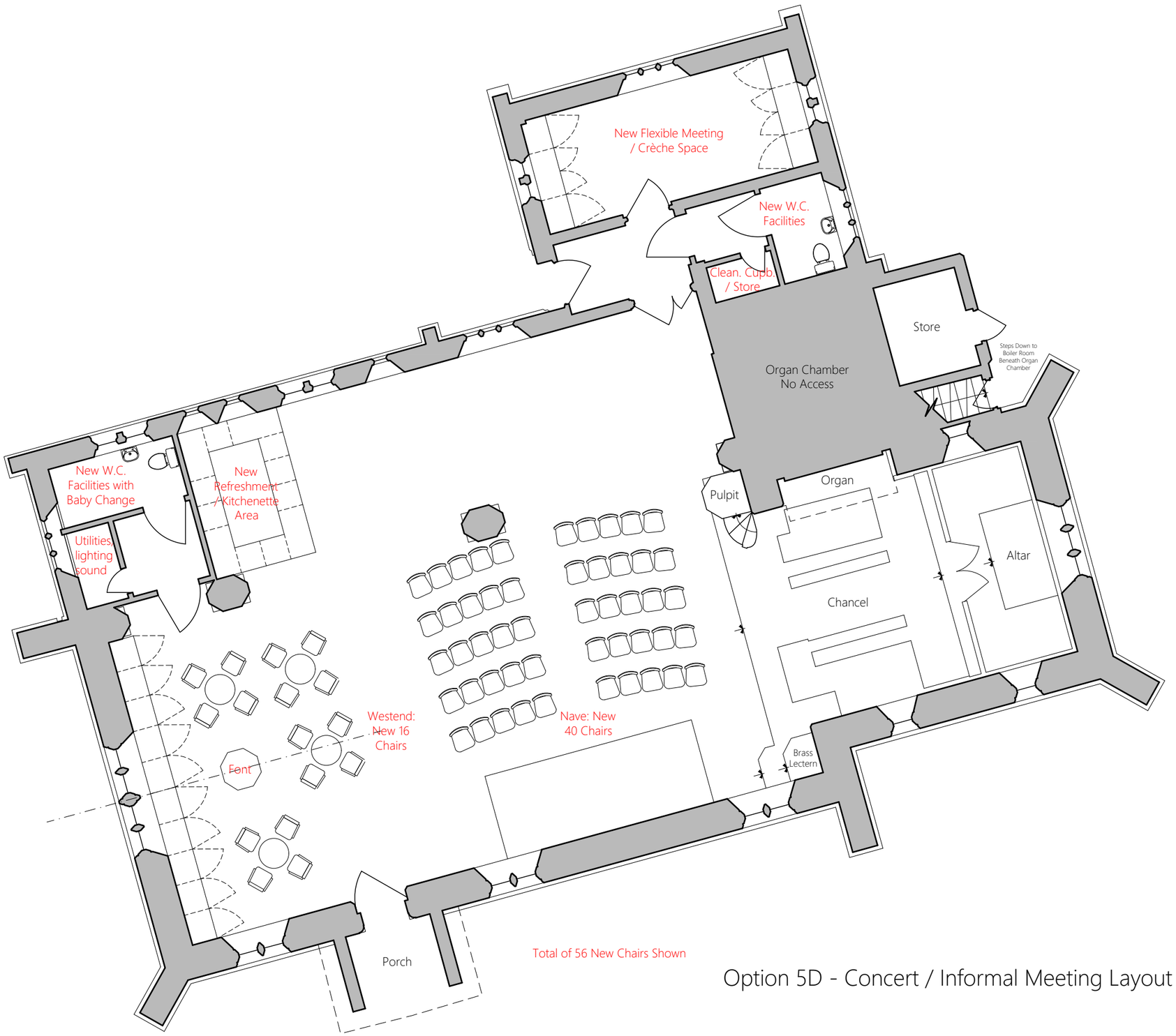

Option 5D - Concert / Informal Meeting Layout with Font

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Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed
Option 5D - Concert / Informal with Font

Drawing No.: OA 13

Scale: 1:100 @ A3

Contract No.: 2069

Drawn: MDP

Date: May 2020

Revision: -

KEPCZYK PEARCE SANDERSON
ARCHITECTS, SURVEYORS & PROJECT MANAGEMENT CONSULTANTS
75 Wilmslow Road, Handforth, Cheshire SK9 3EN
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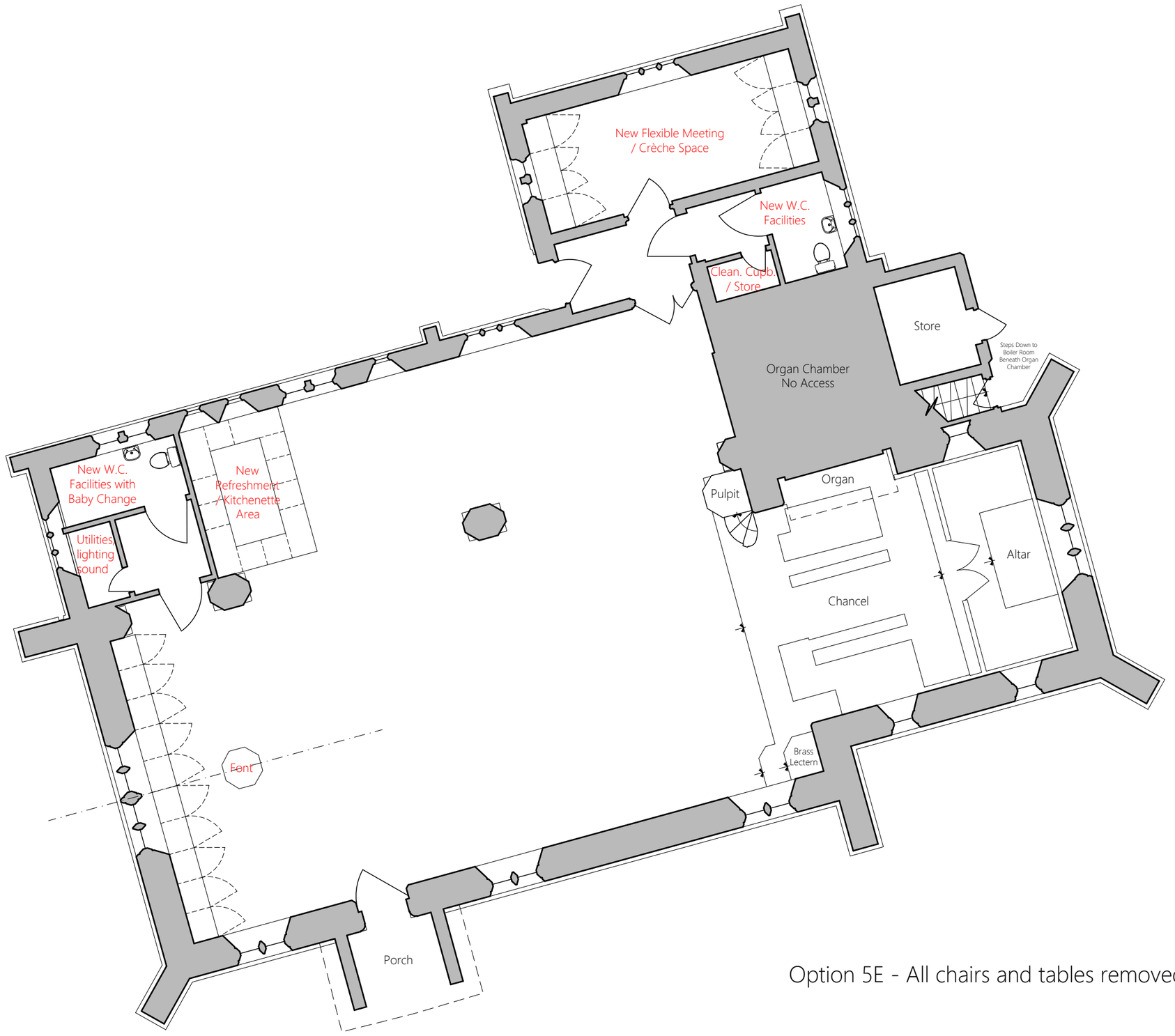

Option 5E - All chairs and tables removed

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Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed
Option 5E - Chairs/Tables Removed with Font

Drawing No.: OA 15

Scale: 1:100 @ A3

Contract No.: 2069

Drawn: MDP

Date: May 2020

Revision: -

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Christ Church Community Audit
Summary Document

In 2017 we began a community Audit, the first step towards developing the fabric and facilities at Christ Church. We pray the results of this work will help us to better Love God, Love Others and Make Disciples.

The audit contained statistics and information about our community, results of a survey from 2017, information about our Church and concluded with our vision and needs. Visit christchurchwillaston.com/church-improvements to read it in full and find out the latest information about the project.

Key points from the Community Audit:

From the Statistics

Economics

- Although many people are well off economically there is not a total absence of poverty.
- 9% of households live in fuel poverty (2012).
- 19% of residents say that their day-to-day activities are limited (2011).

Community

- 12% of all households with dependent children are lone parent households
- 29% of households have someone living alone with 28% of which aged 65 and over.
- 66% of UK adults feel they have nobody to talk to about their problems, which include mental health, relationships or money. Based on a survey of 2,500 people carried out by the Time to Change project and backed by Mind and Rethink Mental Illness.

From our Survey

- Willaston is seen as a very desirable village with a real sense of community, friendliness and safety. With great facilities, proximity to other settlements and to open countryside.
- People wanted to see the church grow and be more effective in serving and making Jesus known as well as connecting more with the community and school.
- People also wanted social spaces to make up for the loss of the Church Hall and British Legion, as well as better facilities for young people/teenagers.
- Many respondents felt that the church plays an important part at the centre of the community, as a 'hub' and 'focal point' with the potential to become more of a community facility too. It is acknowledged that many turn to the church in times of need for help and care as well as christenings, weddings & funerals.
- A desire for others to be more involved in community activities, either reflects a change in social engagement or possibly that the appropriate activities are not currently being offered.

The people of the Church

The people who make up the church are located both within and outside the parish, usual Sunday attendance is around 67 people, of which the majority are aged over 70 with 7% aged under 16. Of those under 16 80% are between the ages of 0-6.[1] Although there is a focus on our Sunday services, we also meet at other times in various groups, as well as supporting the village school and Scouting groups.

The Church building

- The decoration, heating, lighting, electrics and toilet facilities are all in need of refurbishing or replacing.
- The main body of the church with its pews is inflexible and restricts access to pushchairs and wheelchairs.
- The limited hospitality we can provide is ad hoc.
- Reducing running and maintenance costs is a vital aspect to the sustainability of the Church.

We want to address all of these issues and create a welcoming, sustainable and flexible church building for future generations, both for worship and community use.

[1] Average attendance from Jan - March 2018 and age details from October 2017

Our Vision

We have developed a new mission during 2019 to Love God, Love Others and Make Disciples. A mission, vision and set of values which are helping us to set our priorities and also guide us as we consider the needs for the church building.

Our Vision

We want to live our whole lives for our Heavenly Father. Sharing Jesus, praying and growing in faith, by the power of the Holy Spirit. Through Jesus we will love and care for all, promoting justice, so that we become the heart of the community. A welcoming church where all are represented and valued.

Our Values

Living our whole lives for God, Building Community, Loving, caring and promoting justice, Trusting God in prayer, Proclaiming Christ and Growing as Disciples

Our needs

- A space which enables a multitude of service styles, including traditional Communion Services as well as fresh expressions like Cafe Church.
- An accessible and welcoming building without barriers for those with physical, visual and other impairments e.g. improved Audio Visuals and accessible toilet.
- A food preparation area or Kitchen to allow us to offer other hospitality as we seek to build community.
- Better heating, improved insulation, electrics, lighting that can support worship and other uses.
- Flexible seating, tables and storage to facilitate a variety of events.
- Space for smaller groups.
- Sustainable solutions that make it easier to maintain the fabric of the church as well as producing excellent church facilities.

Conclusions

We need age specific provisions, with 14% of the population aged under 15, 54% aged 16-64 and 32% aged over 65. We want to bring people together as a large number of people are living alone and feel that they have no one to speak to about their problems, which include mental health, relationships and money. We want to have an improved facility for both worship and community events, with appropriate spaces for people and groups to connect.

Visit christchurchwillaston.com/church-improvements for more information.

Christ Church, Willaston
Re-ordering Programme

Options Appraisal

OFS ref: 2020-052669

Tim Boulton
Programme Manager
26 June 2020
V2

Background

Our ITT to candidate architects in December 2019 set out our re-ordering needs in the context of the Mission & Vision of Christ Church and against the background of a Community Audit and Statement of Significance of the building as it stands today.

Our church building needs were summarised as:

- A space which enables a multitude of service styles, including traditional Communion Services as well as fresh expressions like Cafe Church;
- An accessible and welcoming building without barriers for those with physical, visual and other impairments e.g. improved Audio Visuals and accessible toilet;
- A food preparation area or Kitchen to allow us to offer other hospitality as we seek to build community;
- Better heating, improved insulation, electrics, lighting that can support worship and other uses;
- Flexible seating, tables and storage to facilitate a variety of events. Space for smaller groups;
- Sustainable solutions that make it easier to maintain the fabric of the church as well as producing excellent church facilities.

In consultation with Mark Pearce, the selected architect, we assumed:

1. The nave would be cleared of pews;
2. The chancel would not be changed fundamentally though consideration may be given to the reduction in the number of choir stalls;
3. All adaptations would be limited to the interior of the Church and enable us to maintain the ability to meet the challenges of the future as a place of worship and community use.

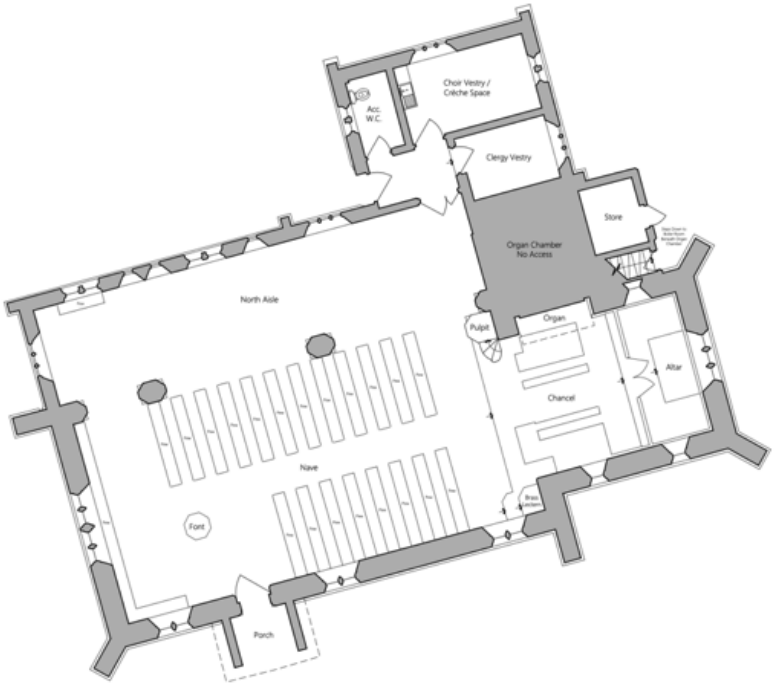
To satisfy our needs within these constraints – we explored four possible approaches and tested them through rigorous review through using the JotForm remote voting platform. Each had strengths and weaknesses which are documented here – mostly in verbatim form.

Having selected the forth option as our preferred approach, we worked to optimise it and produced an Option 5.

It is this fifth option that was adopted as preferred by the PCC on 19th June 2020 and has been drawn up in 5 examples as ‘use cases’ to aid communication and as input to the detailed design stage.

Reflection:
Although our overriding consideration has been to meet the present and future needs of Christ Church, Willaston, we have sought to achieve this without more disturbance to historic artefacts than we felt justified by the benefits generated. Hence, no disturbance to the oak choir pews/vicar’s stall nor removal of the font is proposed.

Option 0 – The Current situation

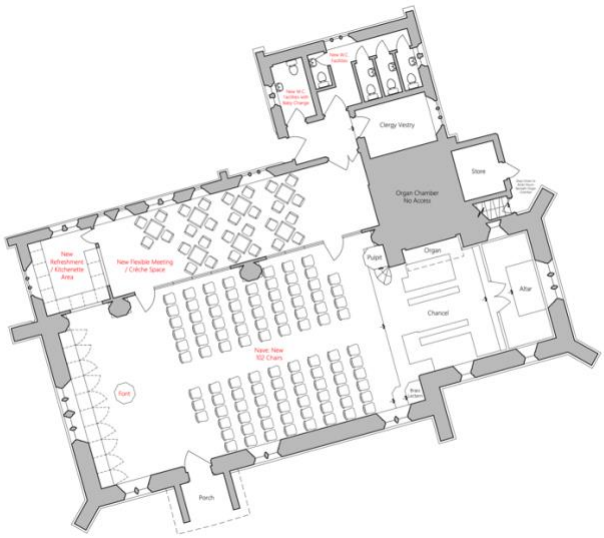


Problems:

- Inflexible – layout only suitable for 'traditional' service formats;
- Uncomfortable pews with difficulty to access for wheelchair-users;
- Heating ineffective and inefficient (currently broken);
- No toilet at rear of nave – difficulty to access facilities without passing all the pews first;
- Poor lighting and inadequate sound reinforcement. Some use of projection, but this is sub-standard quality with a single temporary screen;
- Some experimentation with temporary hospitality facilities – this has had some minor success, but current electrics not adequate and no hand-washing or sink facilities – hospitality facilities needs to be 'designed in';
- The small rear room is too small for a meeting room and is inadequate for creche;
- The single toilet, whilst a reasonable size, requires refurbishment;
- Little or no opportunity to let for community use as in such poor order and not attractive & up to date.

Note: There has been some experimentation with temporary re-ordering of the north aisle under Archdeacon's licence from 2016: this application incorporates application 2017-010908 with this faculty to make this change permanent.

Option 1



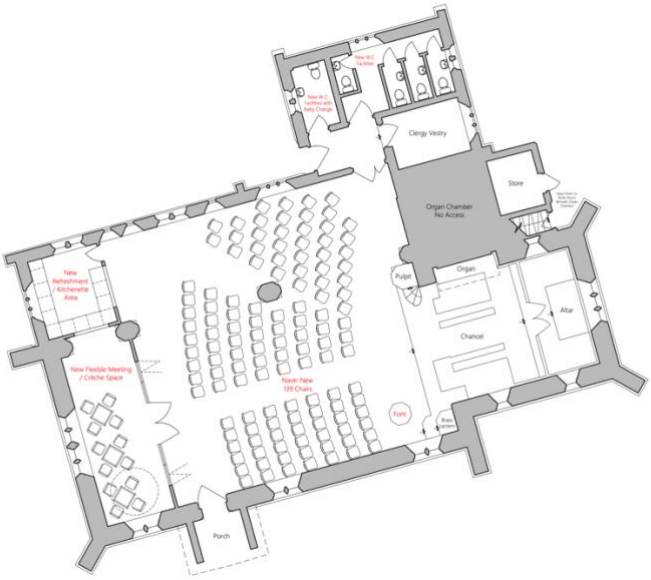
Key likes:

- Large kitchenette area with access to East and South.
- The seating area for tables and chairs, it is a separate area that can be used for various activities
- Suitable space for a group meeting/classroom.
- Storage option at west end, really vital to keep the place flexible.
- Flexible open space at West end.
- Keeps the chancel area which I think is very important
- No additional dais, keeps the floor space open.
- Clergy vestry. Would need seriously refitting though!
- more toilets help our inclusivity

Key dislikes:

- No performance space. No improvement on what we have now.
- Small worship space, as pre-1925. A backwards step.
- Excessive number of space occupying toilets.
- Toilet location is poor when need to use arises during a service.
- No dedicated meeting rooms.
- The vicar's vestry we could use that space to better effect
- The walls for the new seating area as need to keep the space flexible as possible
- Not sure about the dais as takes up a lot of space
- Separation of fellowship space from worship space is unfriendly and not inclusive
- Separation of fellowship space from Worship could reduce capacity for weddings funerals etc.
- Closing off the north isle, seems unnecessary, makes accessing the back rooms difficult.
- not sure about closing off N aisle - effect of light, sound insulation. Would be hard/expensive to implement door arrangement and another barrier for wheelchair access
- Loss of 'full church' for services such as funerals, school services, Remembrance etc

Option 2



Key likes:

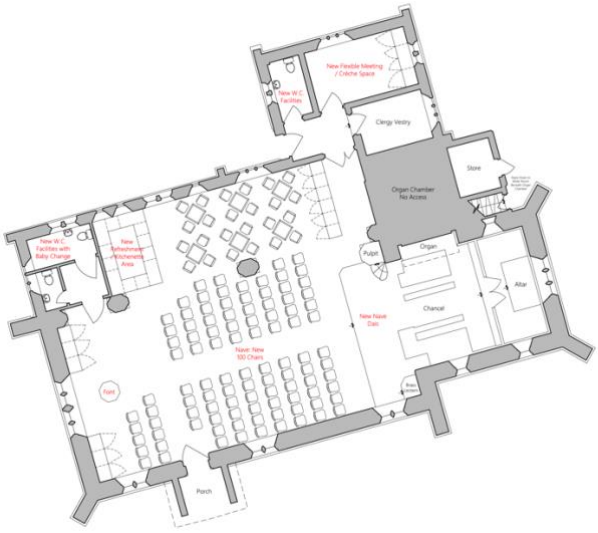
- Clergy vestry. Would need seriously refitting though!
- A good-sized kitchen area, well placed and able to use the light from 2 windows whilst preserving a view of them
- Good worship space, although not as good as we have at the moment.
- Largest amount of seating for congregation/audiences.
- Maintains open feel and good seating numbers
- More capacity could help for large events and festivals.
- Rear / West End meeting room / space
- I like the idea of a space at the back, a room which could be used for a creche where you could still see the service
- A good meeting room at rear - could be heated without heating main space. However, it is impractical as creche as WC/changing is too far away.
- Flexible seating area as will give versatility as to how sit and direction of seating
- Keeping the chancel area as I would like and think it would be important to many members of the congregation.

Key dislikes:

- No performance space. No improvement on what we have now.
- Chancel requires 'uncluttering'
- Dias area as again taking up valuable space
- Theatre seating layout has blank spots.
- A sea of chairs with no intimacy.
- If the gallery was implemented, the spiral staircase would reduce the meeting space by a third
- Too many toilets, yet none is easily accessible from main space.
- Too many toilets, no meeting space outside the main body of the church.
- Small servery space. Hides west window. Better left open.
- Worship space hampered by repositioning of font and lack of space to rear.

- Partitions reduce flexibility of space.
- No storage space!! A big problem!
- Not as much storage highlighted on plan than in other options
- North aisle seating has obscured view of chancel/altar.
- The enclosed seating area at the back as come in, doesn't give a lot of seating for the space it takes up
- Fellowship space is hard to heat as it is the full height of the Nave.
- The position of the font at the front of church - would not want to move the lectern

Option 3



Key likes:

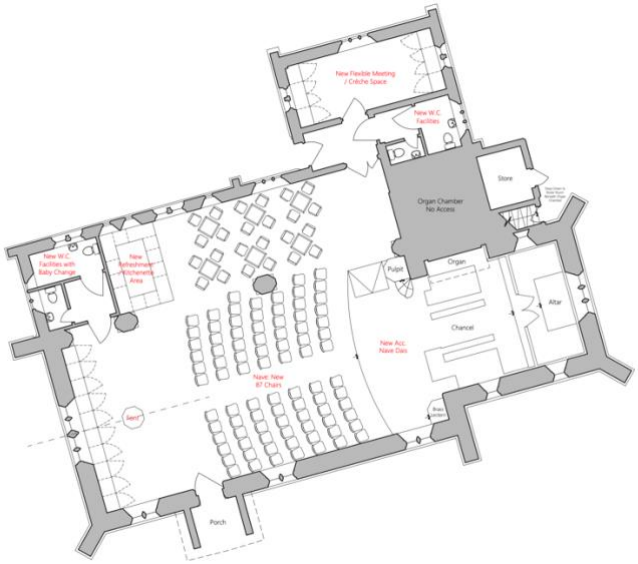
- Raised performance space. Enables people to see what's happening. If demountable, could also be used against South wall.
- Nave dais: very useful for performances, music/plays etc.
- Reasonable number of Nave seats.
- The open plan seating area so can keep the space flexible
- Flexible meeting place in Annex which isolates nave from any noisy activities; quiet area for prayer and/or private meetings.
- Clergy vestry. Would need seriously refitting though!
- Using the existing choir vestry as a small meeting room we need more usable space
- Small but adequate kitchen and servery area.
- Toilets in two places are preferable.
- Good to have an accessible toilet at rear of main worship space - but not two. This could be electrics/storage cupboard.
- Storage cupboards at the back an essential storage space
- Retention of font at back
- Less disruptive to install.
- Flexible use of N aisle - could be for social use or additional seating for main events whilst maintaining light/airy feel

Key dislikes:

- Choir vestry. Too small for a meeting room.
- Small worship space, as pre-1925, although font is set well back and some extra space available in servery area.
- Choir vestry/vicar's vestry/toilet. No improvement on what we have now.
- Only one, small meeting room [North annex].
- Keeping the vicar’s vestry as it is not necessary
- The dais area it takes up too much space
- Dais, too big and would be in the way a lot of the time.
- The Font, better to have a mobile one.
- No disabled provision to chancel not inclusive

- Row of cupboards where an altar could be installed in the future, as a Lady Chapel - prohibits further / future development
- Cluttered Chancel - need to consider removing pews and simplifying - this could allow a ramp and/or rail to be incorporated.
- Not sure about any fixed storage at east end of north aisle - could be place for chair storage perhaps?

Option 4



Particular likes:

- Large dais for concerts, plays (e.g. nativity) children's presentations etc.
- Ramp allows chancel to be accessible to all.
- Keeping the chancel as it is now, as again it can give flexibility to the worship style, is fitting for the church and I believe important to many members.
- Better disabled access at Chancel step
- The seating area with no walls so space is flexible
- All permanent seating has good view of chancel/altar.
- Fewer permanent seats so easier to move/store if larger floor space needed for some activities e.g. social, exhibitions.
- Making one room out of the vestries to give us a better sized flexible room
- Separate and easily heated meeting room
- Reasonable sized new meeting room, sound-separated, heating-separated with light from 3 windows which can also be used as vestry if needed.
- Better use of existing vicar's vestry space - but should be 1 WC plus storage (cleaning equipment)?
- Larger vestry suitable for combined clergy vestry and meeting space.
- The catering area that can be accessed from more than one side this gives flexibility
- Flexible open space at West end of nave with access to kitchenette and toilets.
- Toilets available in worship space and vestry areas.
- Good placement of additional WC in current vicar's vestry - but second WC not needed - could be place for cleaning cupboard (safe probably better in adjacent meeting room?)
- Flexible interchangeable space
- Larger room at the rear of the church, whilst maintaining a toilet in the same area.
- Flexible space
- Retention of font at the back
- Amount of storage, vital to keep things flexible.

Particular dislikes:

- Small worship space, as pre-1925, although font could be set further back and some extra space found in servery area.
- Cluttered Chancel - need to consider removing pews and simplifying - this could allow a ramp and/or rail to be incorporated.
- Relatively small number of permanent seats if for an increasing congregation (though could be an advantage with our existing sized congregations; more togetherness).
- A dais is useful - but not as a permanent feature as it takes away useful space. A modern demountable one that could be arranged as needed would be better.
- No dedicated clergy vestry.
- The number of toilets at the front of the church as do not feel we need this number and can use the space better
- Font, we should have a mobile one. Will get in the way where ever it is.

Summary

RATINGS

In order to obtain a relative view of each option from each PCC Re-ordering Team respondent, the following scoring mechanism was used:

Excellent = +2
Good = +1
OK = 0
Dislike = -1
Strongly dislike = -2

Respondent	Option 1	Option 2	Option 3	Option 4	Favourite
A	-1	-2	0	+2	4
B	-1	-1	+1	0	3
C	0	-2	0	+1	4
D	-1	-1	+1	+1	3
E	-2	+1	0	+1	2
F	-2	0	+1	+1	4
G	-2	-1	+1	+2	4
TOTAL	**-9**	**-6**	**+4**	**+8**	**4**

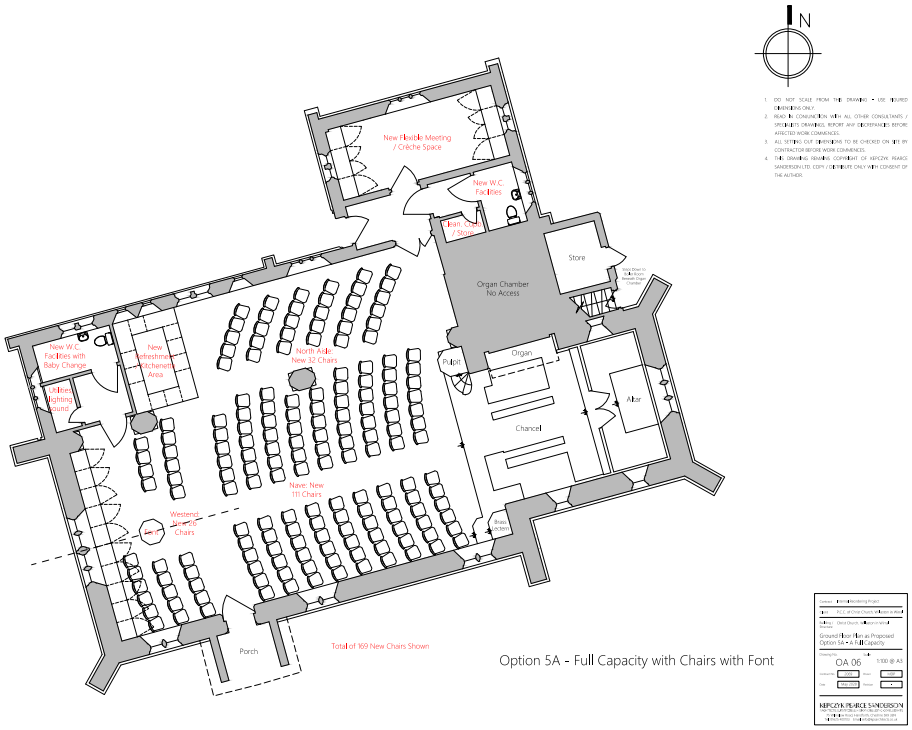
Conclusion

Option 4 was the clear favourite – being ahead overall as well as being in first place for four of seven team members.

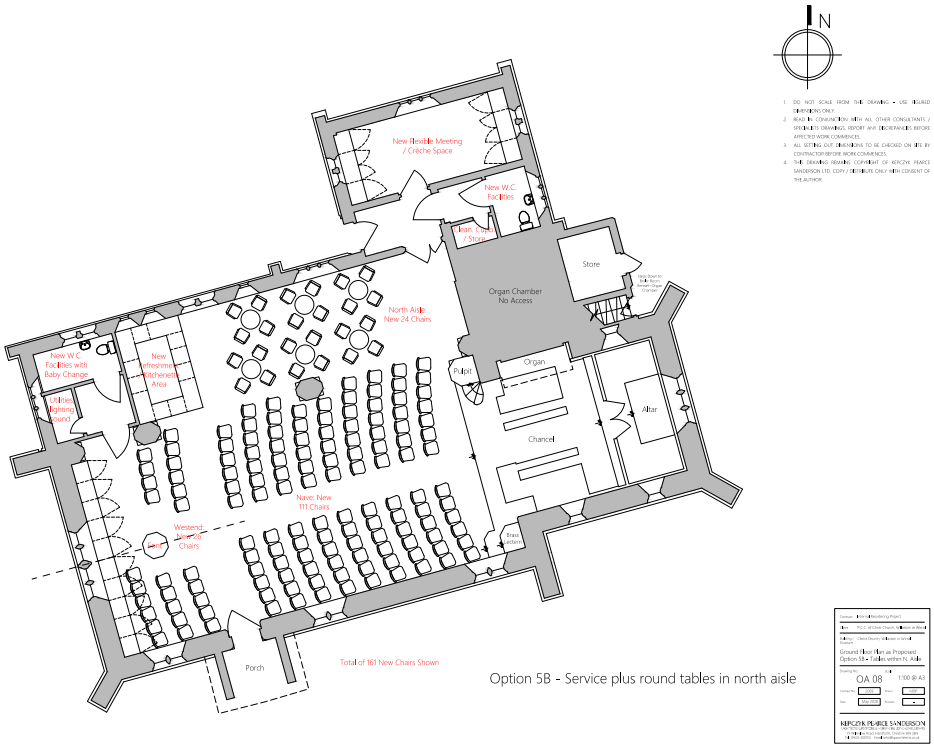
We developed Option 4 further through further review to produce an Option 5, shown on the next pages in 5 example ‘use-cases’.

Option 5 – as endorsed by the PCC on 19 June 2020

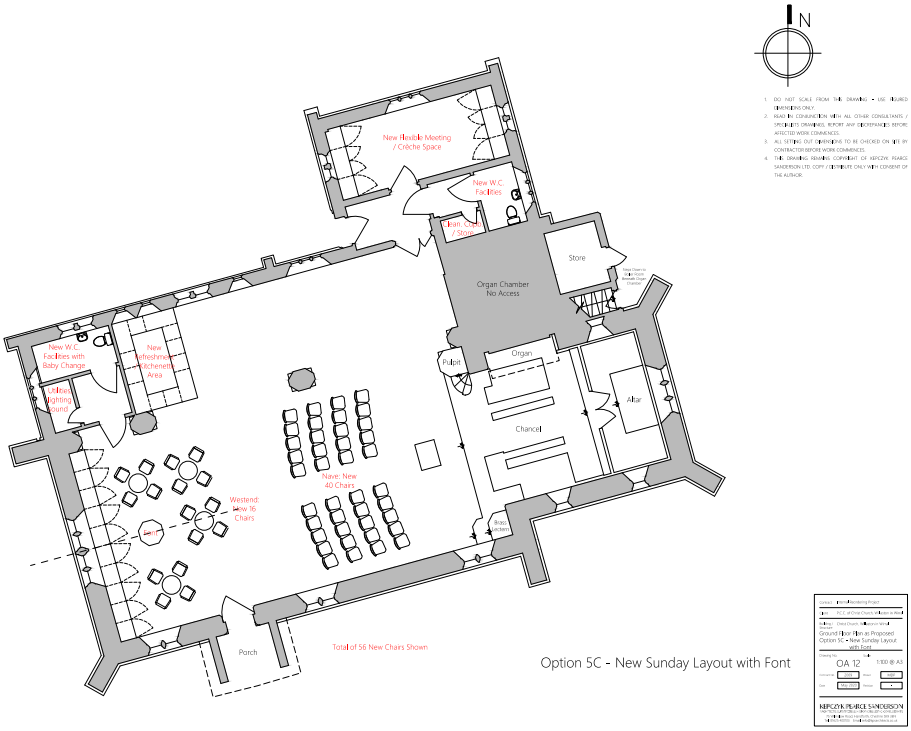
5A Full Capacity (172)



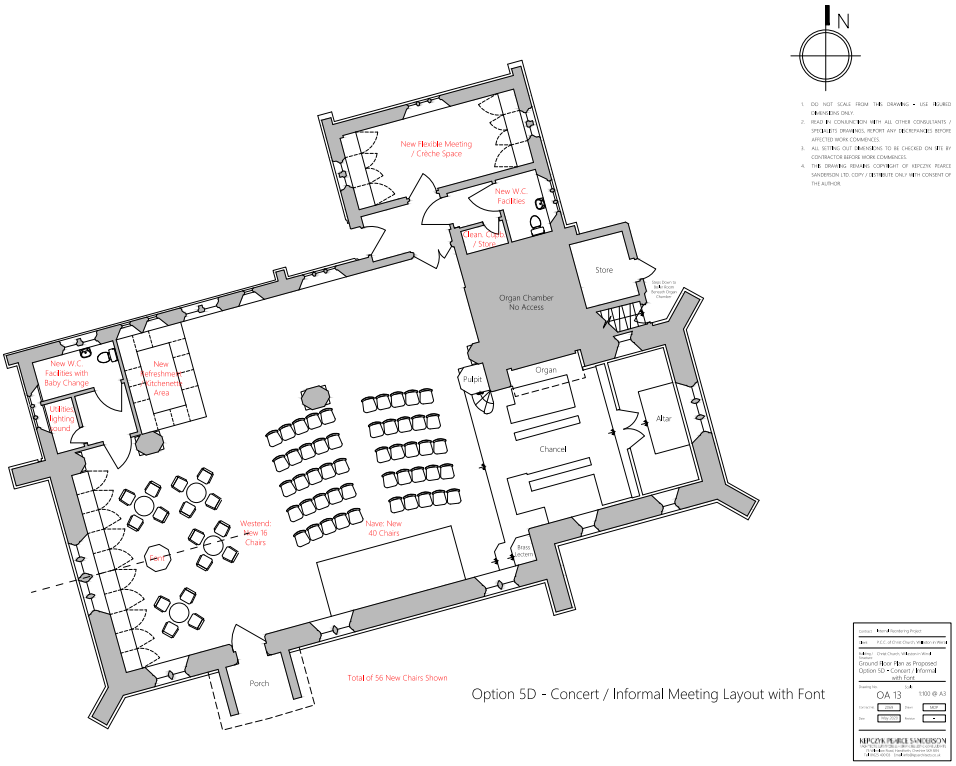
5B Large Service plus hospitality (164)



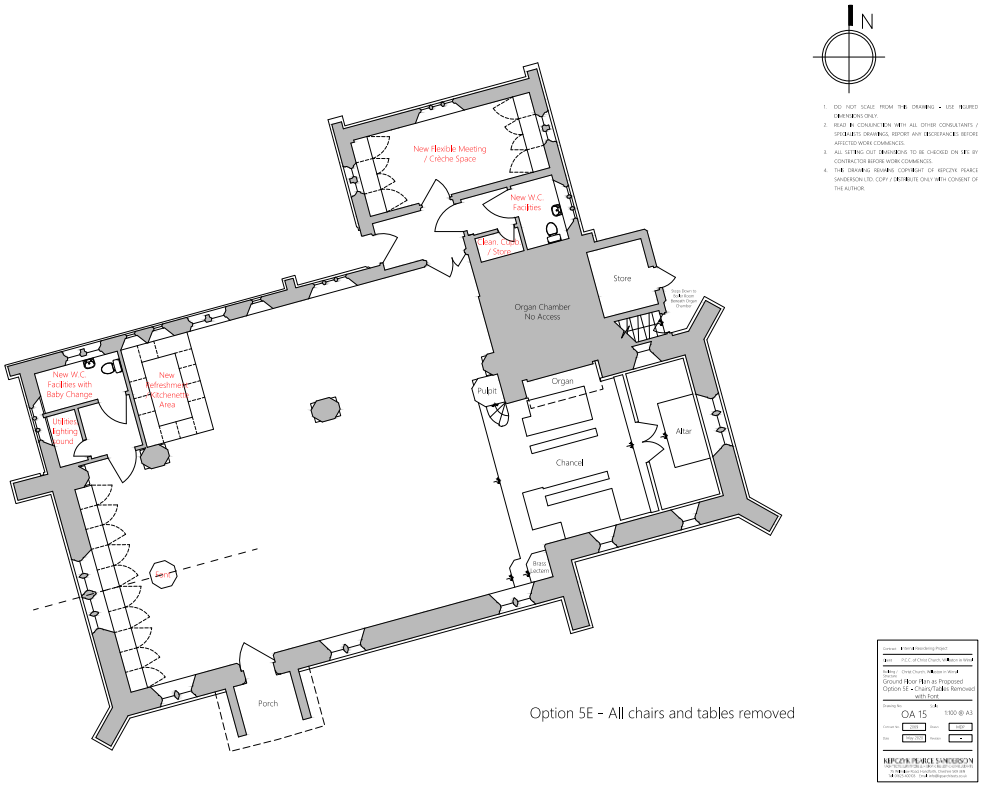
5C Small Sunday Layout – Traditional HC Service (40) / Café Church (16)



5D Concert (50) /Informal Meeting Layout (16)



5E All Chairs & Tables away – Blank Canvas



Design Notes:

1. High flexibility; zero impact on Chancel; low impact on items of historical significance; refreshment/kitchenette area; additional accessible wc with baby change; separately accessible meeting room with adjacent accessible wc with baby change.
2. Large, welcoming space, easy for families to park buggies.
3. Regular parish communion services (layout 5C) to use new communion table at floor level for easier access and better inclusion.
4. Heating, PA, Fire Safety, lighting, media & comms needs part of detailed design stage.
5. Font not in normal use – some impact on space use flexibility, but retained as historical link to church benefactor.
6. Clergy vestry facilities provided as part of new flexible meeting space. Appropriate secure storage to be considered at detailed design stage.
7. High level of designed storage to support chair storage.
8. Removal of all pews in nave and replacement with good quality stackable and storable chairs. (See separate document: '**Pew Removal**')

Note: All plans 5A-5E uploaded separately to case file as well as shown in this document.

Christ Church, Willaston
Re-ordering Programme

Pew Removal

OFS ref: 2020-052669

Tim Boulton
Programme Manager
27 September 2022
V6

Introduction

For those wanting to remove the congregational pews from the nave of a church building, it is helpful to understand why they came to be there is the first place.

Christ Church, Willaston was completed as a Chapel of Ease to the parish church in Neston in 1855. Chapels of ease were often built in parishes covering subsidiary settlements to ease access for church participation for those with little transport, often agricultural workers, and was the first stage of church growth. In the case of Willaston, the second stage – being established as a parish church in its own right, came with the induction of its first vicar 10 years later in 1865.

Permanent church seating is a relatively new thing emerging since the Protestant Reformation. However, it was slowly introduced with the growing emphasis on preaching. In the early 1800s, most seating was owned or rented. This eventually led to a position where there was little 'free' seating in churches across the land and box-pews labelled with family names reinforced social standing in the communities whilst limiting available seating! Along came the Charter Movement – who thought that attaining a target of 20% of seating which was 'free' (neither rented or owned) was progress. The government of the day made some money available in celebration of the triumph in the Battle of Waterloo and the building of a series of 'Charter Churches' resulted from a total government investment of £1m. Although in the relevant period, and Thomas Fulljames, the original Christ Church architect, was apprenticed to Thomas Rickman who gained significantly from this scheme; it is not clear if the building of Christ Church, Willaston benefitted in this way. Nevertheless, a plan held in Lambeth Palace Library, unearthed during this project, shows the original 1855 layout with 24 of the 30 Nave pews labelled as 'free'. My calculation shows that this building achieved 80% of the seats being open to all from its beginning. Quite an achievement for inclusion in 1855!

Our conclusion is that those who founded Christ Church, Willaston were clear in wanting to open their building to all to share God's unique offer of salvation to everyone against the prevailing pressures of the time. In 2020, our opportunity to open our church buildings in a manner that reinforces its timeless message brings new challenges – one we must rise to meet.

Reasons to remove the pews

There are 9 main reasons for this re-ordering to include the removal of pews in the Nave:

1. **To fulfil the Vision & Mission of the church**

   Our mission is to:
   Love God, Love Others, Make Disciples
   Which comes from the great commission in Matthew 28:19, and the greatest commandment in Matthew 22:37-39.

   Our Vision
   We want to live our whole lives for our Heavenly Father. Sharing Jesus, praying and growing in faith, by the power of the Holy Spirit. Through Jesus we will love and care

for all, promoting justice, so that we become the heart of the community. A welcoming church where all are represented and valued.

Our Values

Living for God – Whole life worship

Learning to see every waking moment of our lives as a chance to worship and live for God our Father, as well as gathering to celebrate and honour Jesus together through a broad range of services, supporting each other as we live for God.

Building Community – Fellowship

Building each other up in Jesus, using our God given gifts to serve others. As we play a central role in our community, providing safe, welcoming and diverse opportunities for people to encounter and discover Christ.

Loving, Caring and promoting Justice

Loving and caring for one another, for our community and seeking justice. Praying and acting to help those in need.

Trusting God in Prayer

Helping one another to trust God, to give Him thanks and praise. To lay all of our lives, concerns and needs before God in prayer. Praying to our Father God in times of joy and pain, alone and with others.

Growing as Disciples

To enable people to become disciples, and to grow as fully devoted followers of Jesus. Seeking to listen to Jesus everyday though the Bible and prayer and encouraging one another so that we continue to grow as disciples of Christ.

Proclaiming Christ

Boldly and creatively proclaiming the good news of Jesus, with everyone near and far. Speaking about Jesus and how knowing him has changed our lives.

What this means in practice, is that we want to be able to engage with all in every way we can think of – and others we have yet to discover to communicate the life of God! We want to be able to innovate how we communicate our faith in Jesus, we want to help the helpless, defend the defenceless, love the unlovely…it goes on…We want to worship in traditional ways, yet we want to be challenged to worship in new ways too: so that our whole lives speak of God's glory. We want to develop meaningful relationships within our local community, growing in trust and interdependence.

2. **Retaining pews will not allow the flexibility to meet our Needs** to fulfil our Vision. These Needs are:

- A space which enables a multitude of service styles, including traditional Communion Services as well as fresh expressions like Cafe Church (see layouts 5A-5E);
- An accessible and welcoming building without barriers for those with physical, visual and other impairments e.g. improved Audio Visuals and accessible toilet;
- A food preparation area or Kitchen to allow us to offer other hospitality as we seek to build community;
- Better heating, improved insulation, electrics, lighting that can support worship and other uses;
- Flexible seating, tables and storage to facilitate a variety of events. Space for smaller groups;
- Sustainable solutions that make it easier to maintain the fabric of the church as well as producing excellent church facilities.

3. **Our pew-removal pilot has been successful** – When 20 pews were first removed on a temporary basis under an archdeacon's licence in 2016 (see document **Temporary Licence**), there had been three Sunday morning services. Moving to two Sunday services (one formal, one less formal) and creating a parish breakfast in the break between the two services had several benefits:
    a. **Having light refreshments together helped bring people together**: the first service people would tend to stay and chat – and more of the second service folk would arrive early – it began to feel like one church;
    b. **It helped bridge the generational divide**, encouraging a mix of people and the church is becoming more welcoming and inclusive as a result;
    c. Over time, people began to **share more of their lives**, challenges and joys;
    d. We were able to experiment with sharing hospitality with a 'pop-up' kitchenette – this has been very popular and has contributed to **overcoming loneliness**, particularly among some of the elderly. Nevertheless, developing this further without proper facilities is too hard – no mains water or drainage, and power outlets that can provide water heating or PA – but not both at the same time!

    We have done other things like held church meetings (although hampered by heating problems in the winter months), hosted a Christmas Tree Festival, and experimented with using the space flexibly to 'do café church' as an early form of Fresh Expression. Probably the best moments (for me) have been when we have new people visit and especially when this is the result of developing close links with the parish primary church school. Removing these pews has been a really important change but its value to our mission is still hindered as we still have the nave pews limiting flexibility. It is very clear that the mission of the church is thwarted by the lack of flexible space and the other issues mentioned in this paper.

4. **Viability of the church as an organisation in Willaston** - Running a large building is a significant cost for a small worshipping community. At present Christ Church, Willaston is not managing to pay all its parish share to the diocese – the burden of an inefficient, out of date building facility is both a drain on available resources and an inhibitor of growth. Being able to hire out parts of the building for community events will generate additional income as well as meeting a local need for more community space since the closure of the Church Hall and the Royal British Legion Services Club.

5. **Sustainability** – the more the building is used, the more affordable is becomes to maintain a higher average air temperature all year round. It is known that large swings of temperature and humidity (hymn-singing!) contribute to roof rot – particularly at junctions of timber with cold masonry. In order to receive the maximum use, the building must have a significant area that can be configured in different ways for different purposes. Removing the pews is the only way of achieving this.

6. **Access & Inclusion** – The elderly and infirm find it difficult getting into and out of narrow pews. It is quite common to find people dropping walking sticks and trying to retrieve them with great difficulty. Wheelchair users are 'parked' at the rear of church or in the aisle alongside family & friends. There have been examples of the elderly collapsing whilst sitting or kneeling in pews – the constraints of easy access to them could reduce the ability of providing potentially life-saving assistance.

7. **The pews are of low historic value** – Whilst Historic England includes an entry of over 300 words about Christ Church, Willaston and that it does mention the oak choir stalls in the chancel, there is no mention at all of the congregational pews!

8. **The pews are now too small** - constructed for people of the 1850s, no longer fit people in the 2020s where the average male is 11cm taller.

9. **The pews are of low quality** - a basic construction, with no decorative features. Although the re-use of some of the wood will be considered as part of the detailed design, it is unlikely to be suitable. See photographs below:

Therefore we are seeking to permanently remove all the congregational pews from the nave and the north aisle of the church building but retaining one of the pews as an historical link and placing it below the west window.

Replacement seating

The new seating would be the Howe 40/4 high quality chair, similar to those used in Chester and many other cathedrals and churches.

One advantage of this choice is that it is light to handle and can be stacked on safe dollies when not in use. This will reduce the need for storage along the west wall and enable the retained congregational pew to be featured directly under the west window.

Christ Church, Willaston in Wirral

Specification for Internal Reordering Project
(Including Fabric Repair Works)
October 2022

KEPCZYK PEARCE SANDERSON
ARCHITECTS, SURVEYORS & HISTORIC BUILDING CONSULTANTS

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A 36 Facilities / Temporary Work / Services

Fabric Repair Works

GENERALLY

580 SCAFFOLDING IF REQUIRED TO ACCESS EAST WALL OF NAVE

- Method statement: The contractor shall submit a brief method statement with his tender which describes the nature and location of the proposed scaffolding so that the architect can satisfy themselves that it is adequate and properly located.

- Design: The design of all scaffolding will be the responsibility of the contractor and is to be in accordance with the recommendations of BS EN 12811-1:2003 'Code of Practice for Access and Working Scaffolds' or as updated.
- As the work involved is to a listed building, the scaffold should essentially be regarded as independent of the existing structure and designed accordingly. Where tying to the existing structure cannot be avoided the positions and type of any such ties shall be submitted and agreed with the contract administrator prior to the erection of any scaffold. No additional costs will be granted after the acceptance of any tender where this requirement has been overlooked.
- Compliance with the various acts and regulations listed in BS EN 12811-1:2003 is the responsibility of the contractor.
- Compliance with all aspects of health and safety during erection, using and dismantling is the responsibility of the contractor.
- The design of the scaffold is to take account of the requirements of all trades which will require access, use as a working platform or storage. No claims will be entertained for additional scaffold or for amending scaffold already erected to suit the requirements of trades contained within the specification.
- The design of the scaffolding will take into account any specific requirements of the consultants appointed to assess the proposals.

- Proposals: The contractor is to submit his proposals for the scaffold on or before the date for possession and not less than seven days before commencement of the scaffold.
- The contractor's proposals are to include clear drawings and structural calculations in duplicate, sufficient to prove the stability of the proposed temporary structures in accordance with BS EN 12811-1:2003.
- These drawings will clearly indicate positions where any scaffold is to be tied back to the fabric of the building.
- No scaffolding shall be commenced on site until the contractor's proposals have been submitted and agreed with the architect. Agreement of the contractor's proposals does not relieve the contractor of his responsibilities to ensure full compliance of all requirements.

- Programme: Prior to commencement of any scaffolding the contractor shall submit a programme indicating the commencement date, completion date and period for dismantling for each area of scaffolding.
- Scaffold may be required for inspection purposes prior to confirmation of scope of work and the contractor is to indicate this period on his programme and ensure that his proposals are submitted early enough to ensure that this period is not compromised.
- The programme is to take account of all the requirements of the sub-contractors who require the use of the scaffold.

- Supervision: The contractor is to exercise particular care in supervising the erection and dismantling of the scaffold to ensure that no damage occurs to the fabric of the building.
- It should be noted that in many instances damage to the historic fabric cannot easily be rectified. Any damage due to scaffold use, erection or dismantling will be rectified at the contractor's expense.

- Security: All external scaffolding shall be designed and erected so as to prevent unauthorized access by sheeting (whether plywood or steel) to a minimum height of five meters. Areas of sheeting and fencing are to be confirmed prior to erection.
- Ladders to the lower lift are to be removed at night.
- Any areas that may be accessible from adjoining structures, roofs, etc. are to be similarly protected by boarding or by other approved means.

- Protection: All surfaces at ground level are to be suitably protected to prevent the scaffold damaging existing external finishes. Ensure any architectural features or areas prone to damage are suitably protected.

C 20 Demolition

Accessible W.C. (Ceiling, Wall, Door, etc.), M&E Services, Timber Floorboards, Joists and Pews

5 SURVEY

- Scope: Before starting deconstruction / demolition work, examine available information and carry out a survey of:
  - the structure or structures to be deconstructed / demolished,
  - the site on which the structure or structures stand, and
  - the surrounding area.
- Report and method statements: Submit, describing:
  - form, condition and details of the structure or structures, the site and the surrounding area,
  - type, location and condition of features of historical, archaeological, geological or ecological importance,
  - type, location and condition of adjoining or surrounding premises that might be adversely affected by removal of the structure or structures or by noise, vibration and / or dust generated during deconstruction / demolition,
  - identity and location of services above and below ground, including those required for the contractor's use and arrangements for their disconnection and removal,
  - form and location of flammable, toxic or hazardous materials, including lead-based paint, and proposed methods for their removal and disposal,
  - form and location of materials identified for reuse or recycling and proposed methods for removal and temporary storage,
  - proposed programme of work including sequence and methods of deconstruction / demolition,
  - details of specific pre-weakening required,
  - arrangements for protection of personnel and the general public including exclusion of unauthorized persons,
  - arrangements for control of site transport and traffic.

15 BENCHMARKS

- Unrecorded benchmarks and other survey information: Give notice when found. Do not remove marks or destroy the fabric on which they are found.

20 FEATURES TO BE RETAINED

- General: Keep in place and protect the following: the font and the wood block / parquet flooring are to be protected and stored.

25 LOCATION OF SERVICES

- Services affected by the works: Locate and mark positions.
- Mains services marking: Arrange with the appropriate authorities for services to be located and marked.

30 DISCONNECTION OF SERVICES ARRANGED BY CONTRACTOR

- Responsibility: Before starting deconstruction / demolition arrange with the appropriate authorities for disconnection of services owned by those authorities and removal of associated fittings and equipment.

31 DISCONNECTION OF SERVICES ARRANGED BY EMPLOYER

- Responsibility: The employer will arrange disconnection of services and removal of fittings and equipment owned by those authorities prior to deconstruction / demolition.
- Timing: Do not start deconstruction / demolition until disconnections are completed.

32 DISCONNECTION OF DRAINS

- General: Locate, disconnect and seal disused foul and surface water drains.
- Sealing: Permanent and within the site.

35 LIVE, FOUL AND SURFACE WATER DRAINS

- General: Protect drains and fittings still in use. Keep free of debris and ensure normal flow during deconstruction / demolition work.
- Damage: Make good damage arising from deconstruction / demolition work. Leave clean and in working order at completion of deconstruction / demolition work.

40 SERVICE BYPASS CONNECTIONS

- General: Provide as necessary to maintain continuity of services to occupied areas of the site on which the deconstruction / demolition is taking place and to adjoining sites / properties.
- Notice: Give adequate notice to adjoining owners and all affected occupiers if shutdown is necessary.

45 SERVICES TO BE RETAINED

- Damage to services: Give notice and notify relevant service authorities and / or owner / occupier regarding damage arising from deconstruction / demolition.
- Repairs to services: Complete as directed and to the satisfaction of the service authority or owner.

50 WORKMANSHIP

- Standard: Demolish structures in accordance with BS 6187.
- Operatives: Appropriately skilled and experienced for the type of work. Holding, or in training to obtain, relevant CITB Certificates of Competence.
- Site staff responsible for supervision and control of work: Experienced in the assessment of risks involved and methods of deconstruction / demolition to be used.

55 SITE HAZARDS

- Precautions: Prevent fire and / or explosion caused by gas and / or vapour from tanks, pipes, etc.
- Dust: Reduce by periodically spraying with an appropriate wetting agent or contain.
- Lead dust: Submit method statement for control, containment and clean-up regimes.
- Site operatives and general public: Protect from vibration, dangerous fumes and dust arising during the course of the works.

60 ADJOINING PROPERTY

- Temporary support and protection: Provide. Maintain and alter, as necessary, as work proceeds. Do not leave unnecessary or unstable projections.
- Defects: Report immediately on discovery.
- Damage: Minimize. Repair promptly to ensure safety, stability, weather protection and security.
- Support to foundations: Do not disturb.

75 PARTLY DECONSTRUCTED / DEMOLISHED STRUCTURES

- General: Leave partly in a stable condition with adequate temporary support at each stage to prevent risk of uncontrolled collapse. Make secure outside working hours.
- Temporary works: Prevent overloading due to debris.
- Access: Prevent access by unauthorized persons.

76 ASBESTOS-CONTAINING MATERIALS – UNKNOWN OCCURENCES

- Discovery: Give notice immediately of suspected asbestos-containing materials when discovered during deconstruction / demolition work. Avoid disturbing such materials.
- Removal: Submit statutory risk assessments and details of proposed methods for safe removal.

78 UNFORESEEN HAZARDS

- Discovery: Give notice immediately when hazards, such as unrecorded voids, tanks, chemicals, etc. are discovered during deconstruction / demolition.
- Removal: Submit details of proposed methods for filling, safe removal, etc.

85 SITE CONDITION AT COMPLETION

- Debris: Clear away and leave the site tidy on completion.

95 RECYCLED MATERIALS

- Materials arising from deconstruction / demolition work: Can be recycled or reused elsewhere in the project, subject to compliance with the appropriate specification and in accordance with any site waste management place.

C 41 Repairing / Renovating / Conserving Masonry

Fabric Repair Works

POINTING OF ASHLAR MASONRY

150 GENERAL

- Contractor's attention is drawn to the fact that in some cases the joints are extremely fine and will demand a great deal of care and attention on site for the preparation, filling and pointing.

160 SAMPLE PANELS

- 500 mm x 500 mm sample areas of repointing are to be produced for architect approval prior to commencing.

170 PREPARATION

- All joints are to be raked out to a depth of 25 mm. Extreme care is to be taken to avoid damage to the arris of the stone. Under no circumstances shall chisel and bolsters be used. Under no circumstances will the use of mechanical tools be permitted (disc cutters, etc.). Joints are to be flushed out using clean water until the water runs clear. Where very fine joints are encountered a large hypodermic syringe shall be used to flush the joints. The tenderer is to allow for the insertion of a backing 'rod'. The item is to be confirmed during the preparation of the sample area. The backing rod is to be fine waxed string or string coated with petroleum jelly, stretched and twisted several times prior to inserting to the back of the prepared joint with a knife blade.

190 PROGRESS

- The works are to be coordinated such that preparation is carried out to agreed areas and made available for inspection by the architect / employer's representative. The contractor is to give at least 48 hours' notice for inspection. No filling of joints is to proceed until preparation has been inspected and approved by the architect. Filling and pointing is to be carried out in small areas such that all operations in one area can be completed within the working day with due notice being paid to any potential adverse weather conditions. The work is to be kept clean from mortar spillage at all times. When pointing commences only areas which can be successfully completed during the normal working day are to be attempted giving due regard to the weather conditions / forecast. Completed areas are to be protected until cured.

200 CLEANING

- Clean down all areas on completion using clean water and bristle brushes only. Acid cleaners are not to be used.

REPLACEMENT AND INSERTIONS

320 MATERIALS

330 STONE

- Stone is to be selected to match existing in texture and colour. Wherever possible stone is to be obtained from the original quarry.
- Representative samples shall be provided for final selection. Samples should be from all areas of the quarry currently being exploited as there may be colour / texture variations between beds within the quarry. Where dressed stone is to be used then samples of new stone with a dressed face shall also be provided for approval. Whilst provisional orders may be placed no confirmation shall be issued until samples have been approved by the architect.
- All stone shall be free from vents, cracks, fissures, mineral veins, discolouration and clay pockets. No stone for the project should contain any defect which will adversely effect the strength or appearance of the stone.

340 DOWELS AND CRAMPS

- All dowels and cramps are to be as manufactured by Ancon Ltd and are to be manufactured in austenitic stainless steel to BS 1449 Part 2 1983.
- Bronze cramps may also be used subject to prior written approval.

360 WATER

- Water for the works shall be clean and fresh without pollutants. Where an existing water supply is available within the building this may only be used with the employer's permission. In other cases, a lockable stand pipe shall be erected to the approval of the local water authority.

370 MORTAR

- Hydraulic lime mortar as per Section Z 21.

380 INSPECTION AND DRAWINGS

390 ACCESS

- In any project involving masonry repairs the tender drawings will have been prepared from visual inspection, usually without the benefit of access scaffold. The contractor is to allow in his programme a period of two weeks for confirmation of the scope of the works to each area after the completion of the access scaffold to that area of work.
- The contractor is encouraged to be represented during the inspection in order that he may contribute in any discussion regarding alternative methods of repair.

400 NOTICE

- The contractor is to give 48 hours' notice to the architect of the completion of the access scaffold to each area.

410 CONFIRMATION

- Confirmation of the scope of the work will be the issue of revised drawings and confirmed by an Architect's Instruction following completion of the inspection from the access scaffold.

420 SCAFFOLD

- The contractor shall ensure that all access scaffold is complete and in accordance with the specification and that handover certificates have been issued before inviting inspection. Inspection will not be carried out if the scaffold is not in accordance with the specification.

430 DRAWINGS

- In most cases all working drawings will be provided by the architect. Where fabrication drawings are required to be prepared by the contractor for specialist areas, the contractor shall submit duplicate copies of the drawings at least two weeks before confirmation of the order for the stonework being required. No cutting of the stonework shall commence until the drawings have been approved in writing by the architect.

440 PROGRAMME

- The contractor shall provide a programme of work based upon the tender drawings before commencement of work on site. This programme shall indicate separately the erection sequence for the access scaffold, inspection period, order period and works on site for each area of work.

450 PROTECTION, STORAGE AND CLEANING

460 PROTECTION OF WORK AREA

- Where large areas of masonry repairs are to be undertaken, the scaffold / work area is to be fully protected using a translucent non-combustible sheet such as Monaflex fixed to the outside of the scaffold / hoarding.

470 PROTECTION OF THE FABRIC

- Where appropriate, any existing windows are to be protected with ply or particle board in the areas adjacent to any area of work. Other features identified on the drawings are to be protected from damage.
- Where scaffold is erected, internal fittings shall be adequately protected.

480 STORAGE

- Stone should be stored in stacks on battens protected from moisture and freezing. Adequate care is to be taken to ensure that no damage occurs to the stone during storage or handling.

490 LIFTING

- The contractor shall provide adequate lifting gear to unload and handle stones into position.

500 PROTECTION OF FINISHED WORK

- Cover arrises, moulds, carving and other finished work to protect from accidental damage. Protection is to be maintained until completion of all work in that vicinity.

510 CLEANING OF WORK

- Keep facework clean and free from staining at all times.
- Clean off and rub down all stonework as scaffold is taken down.

520 LAYING OF STONE

530 NATURAL BED

- New stonework shall be prepared such that the natural bed is:
  - horizontal for plain walling works,
  - vertical and at right angles to wall face for cornices and other projecting stones,
  - horizontal in quoin stones or end stones; these shall be specially selected to ensure that they are compact non-laminated stones.
- Further bedding details are contained in BRE publications for the relevant type of stone.

540 BEDDING

- All stones shall be laid on a full and even bed of lime mortar as per Section Z 21 unless specified elsewhere.

550 JOINTS

- Horizontal and vertical joints are to match the existing joint size unless instructed differently by the architect.

560 FACE

- Stones are to be placed such that their face is flush with the plane of the original stonework. Where new stone is being inserted adjacent to old worn surfaces the new stone shall be set to the face of the nearest unworn surface.

570 WORKMANSHIP

- All work shall comply with the general recommendations of BS 5390 Section 5 Work on Site.
- Masonry repairs are to be undertaken only by an approved stonemason who is a member of The Heritage Contractors Section of the Stone Federation. Non-registered companies or unqualified personnel will not be permitted to work on site.

580 REPAIRS TO STONEWORK

590 GENERAL

- All repairs will be identified during the inspection and will be indicated on the drawings.
- All areas for repair are to be marked up from the drawings on site by the contractor and agreed with the architect prior to commencing cutting out.

600 CUTTING OUT

- Cutting out decayed stonework to permit new stones of the specified depth for the appropriate repair to be inserted:
    - cutting out can be carried out by mechanical means provided that extreme care is taken to ensure that the adjoining stones are not damaged,
    - the stones should be cut to the central sections only by mechanical means ensuring that the perimeter is undamaged,
    - the stone is then to be cut back by hand to the required depth.
- If any damage occurs to adjoining stones then the stone is to be replaced at the contractor's expense and at the discretion of the architect.

610 TEMPORARY SUPPORT

- Stonework above the course being cut out or dressed back shall be fully supported during the course of the works.
- Support should be by adequately sized timber props secured and wedged.
- Care should be taken to ensure that no damage is caused by the props to the adjoining stonework.

620 EXISTING FERROUS CRAMPS

- Where iron cramps are encountered during the course of the works, they are to be brought to the attention of the architect. Unless instructed otherwise, they are to be removed and replaced with non-ferrous cramps.

630 CLEANING OUT

- All areas cut out to be cleared of debris, mortar, etc. and washed clean. Care is to be taken not to saturate the stone.
- Any defects noted in the stone after cutting back or in the masonry backing are to be reported to the architect.

640 MOISTENING

- Wherever new masonry is to be inserted, the adjoining stones are to be moistened to ensure that the mortar does not 'snatch'. Do not saturate the stone.

650 WHOLE BLOCK REPLACEMENT

670 PREPARATION

- The existing stone block is to be cut out to its full depth and the backing masonry inspected.

680 INSTALLATION

- New stone is to be inserted on a bed and backing of lime mortar as per Section Z 21. Mortar is to be kept back 25 mm from the face of the stone to allow for later pointing.

F 10 Brick / Block Walling

Infill Door Opening to Accessible W.C.

TYPES OF WALLING

110A CLAY FACING BRICKWORK FOR INFILLING DOOR OPENING

- Bricks: To BS EN 771-1.
  - Manufacturer: Contractor's choice.
  - Product reference: Not applicable.
  - Recycled content: Not applicable.
  - Special shapes: None.
- Mortar: As per Section Z 21.
  - Mix: 1:3 NHL 3.5 hydraulic lime : sharp well-graded sand.
  - Additional requirements: None.
- Bond: Stretcher.
- Joints: Flush and nominal 10 mm in width.
- Features: Not applicable.

WORKMANSHIP GENERALLY

430 CONDITIONING OF CLAY AND CALCIUM SILICATE BRICKS AND CLAY BLOCKS

- Bricks and blocks delivered warm from manufacturing process: Do not use until cold.
- Absorbent bricks in warm weather: Wet to reduce suction. Do not soak.

440 CONDITIONING OF CONCRETE BRICKS / BLOCKS

- Autoclaved concrete bricks / blocks delivered warm from manufacturing process: Do not use.
- Age of non-autoclaved concrete bricks / blocks: Do not use until at least four weeks old.
- Avoidance of suction in concrete bricks / blocks: Do not wet.
  - Use of water retaining mortar admixture: Submit details.

500 LAYING GENERALLY

- Mortar joints: Fill vertical joints. Lay bricks, solid and cellular blocks on a full bed.
- AAC block thin mortar adhesive and gypsum block adhesive joints: Fill vertical joints. Lay blocks on a full bed.
- Clay block joints:
  - Thin layer mortar: Lay blocks on a full bed.
  - Interlocking perpends: Butted.
- Bond where not specified: Half lap stretcher.
- Vertical joints in brick and concrete block facework: Even widths. Plumb at every fifth cross joint.

535 HEIGHT OF LIFTS IN WALLING USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- Quoins and advance work: Rack back.
- Lift height (maximum): 1.2 m above any other part of work at any time.
- Daily lift height (maximum): 1.5 m for any one leaf.

545 LEVELLING OF SEPARATE LEAVES USING CEMENT GAUGED OR HYDRAULIC LIME MORTAR

- Locations for equal levelling of cavity wall leaves: As follows:
  - every course containing vertical twist type ties or other rigid ties,
  - every third tie course for double triangle / butterfly ties,
  - courses in which lintels are to be bedded.

560 COURSING BRICKWORK

- Gauge: Four brick courses including bed joints to 300 mm.

635 JOINTING

- Profile: Consistent in appearance.

645 ACCESSIBLE JOINTS NOT EXPOSED TO VIEW

- Jointing: Struck flush as work proceeds.

671 FIRE STOPPING

- Avoidance of fire and smoke penetration: Fit tightly between cavity barriers and masonry. Leave no gaps.

690 ADVERSE WEATHER

- General: Do not use frozen materials or lay on frozen surfaces.
- Air temperature requirements: Do not lay bricks / blocks:
  - in cement gauged mortars when at or below 3°C and falling or unless it is at least 1°C and rising,
  - in hydraulic lime : sand mortars when at or below 5°C and falling or below 3°C and rising,
  - in thin joint mortar glue when outside the limits set by the mortar manufacturer.
- Temperature of walling during curing: Above freezing until hardened.
- Newly erected walling: Protect at all times from:
  - rain and snow,
  - drying out too rapidly in hot conditions and in drying winds.

ADDITIONAL REQUIREMENTS FOR FACEWORK

710 THE TERM FACEWORK

- Definition: Applicable in this specification to all brick / block walling finished fair.
  - Painted facework: The only requirement to be waived is that relating to colour.

750 COLOUR CONSISTENCY OF MASONRY UNITS

- Colour range: Submit proposals of methods taken to ensure that units are of consistent and even appearance within deliveries.
- Conformity: Check each delivery for consistency of appearance with previous deliveries and with approved reference panels; do not use if variation is excessive.
- Finished work: Free from patches, horizontal stripes and racking back marks.

760 APPEARANCE

- Brick / block selection: Do not use units with damaged faces or arrises.
- Cut masonry units: Where cut faces or edges are exposed cut with table masonry saw.
- Quality control: Lay masonry units to match relevant reference panels.
  - Setting out: To produce satisfactory junctions and joints with built-in elements and components.
  - Coursing: Evenly spaced using gauge rods.
- Lifts: Complete in one operation.
- Methods of protecting facework: Submit proposals.

780 GROUND LEVEL

- Commencement of facework: Not less than 150 mm below finished level of adjoining ground or external works level.

800 TOOTHED BOND

- New and existing facework in same plane: Bond together at every course to achieve continuity.

830 CLEANLINESS

- Facework: Keep clean.
- Mortar on facework: Allow to dry before removing with stiff bristled brush.
- Removal of marks and stains: Rubbing not permitted.

G 20 Carpentry / Timber Framing / First Fixing

105 TIMBER PROCUREMENT

- Timber (including timber for wood-based products): Obtained from well managed forests / plantations in accordance with:
  - the laws governing forest management in the producer country or countries,
  - international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Documentation: Provide either:
  - documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied or,
  - evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.

150 STRENGTH GRADING OF TIMBER

- Grader: A company currently registered under a third party quality assurance scheme operated by a certification body approved by the UK Timber Grading Committee.

160 GRADING AND MARKING OF SOFTWOOD

- Timber of a target / finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20 % with no reading being in excess of 24 % and clearly marked as 'DRY' or 'KD' (kiln dried).
- Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
- Structural timber members cut from large graded sections: Regraded to approval and marked accordingly.

PRODUCTS

260 STRUCTURAL SOFTWOOD FOR STRUCTURAL USE GENERALLY

- Grading standard: To BS 4978, BS EN 14081-1 or other national equivalent and so marked.
  - Timber of a target / finished thickness less than 100 mm and not specified for wet exposure: Graded at an average moisture content not exceeding 20 % with no reading being in excess of 24 % and clearly marked as 'DRY' or 'KD' (kiln dried).
  - Timber graded undried (green) and specified for installation at higher moisture contents: Clearly marked as 'WET' or 'GRN'.
- Strength class to BS EN 338: C 24.
- Treatment: None required.

270 UNGRADED SOFTWOOD FOR INTERNAL NON-STRUCTURAL USE

- Quality of timber: Free from decay, insect attack (except pinhole borers) and with no knots wider than half the width of the section.
- Surface finish: Regularized.
- Treatment:
  - Preservative treatment: None required.
  - Design service life: 40 years.
  - Fire retardant treatment: Not applicable.

311 PLYWOOD FOR INTERNAL CEILINGS AND UNDERLAYS

- Standard: To an approved national standard.
- Thickness: 22 mm for ceilings and 6 mm for underlays.
- Appearance class to BS EN 635: III.
- Bond quality to BS EN 314-2: Class 3.
- Finish: Unsanded.
- Treatment:
  - Preservative treatment: Organic solvent impregnation as per Section Z 12 and Wood Protection Association Commodity Specification C 8.
  - Design service life: 40 years.
  - Fire retardant treatment: Not applicable.

WORKMANSHIP GENERALLY

402 CROSS SECTION DIMENSIONS OF NON-STRUCTURAL SOFTWOOD

- Dimensions: Dimensions in this specification and shown on drawings are finished sizes.
- Maximum permitted deviations from finished sizes: As stated in BS EN 1313-1:
  - Clause 6 for sawn sections,
  - Clause NA.2 for further processed sections.

420 WARPING OF TIMBER

- Bow, spring, twist and cup: Not greater than the limits set down in BS 4978 or BS EN 14081-1 for softwood or BS 5756 for hardwood.

430 SELECTION AND USE OF TIMBER

- Timber members damaged, crushed or split beyond the limits permitted by their grading: Do not use.

435 NOTCHES, HOLES AND JOINTS IN TIMBER

- Notches and holes: Position in relation to knots or other defects such that the strength of members will not be reduced.
- Scarf joints, finger joints and splice plates: Do not use without approval.

440 PROCESSING TREATED TIMBER

- Cutting and machining: Carry out as much as possible before treatment.
- Extensively processed timber: Retreat timber sawn lengthways, thickness, planed, ploughed, etc.
- Surfaces exposed by minor cutting / drilling: Treat with two flood coats of a solution recommended by main treatment solution manufacturer.

450 MOISTURE CONTENT

- Moisture content of wood and wood-based products at time of installation: Not more than:
  - Covered in generally unheated spaces: 24 %.
  - Covered in generally heated spaces: 20 %.
  - Internal in continuously heated spaces: 20 %.

510 PROTECTION

- Generally: Keep timber dry and do not overstress, distort or disfigure sections or components during transit, storage, lifting, erection or fixing.
- Timber and components: Store under cover, clear of the ground and with good ventilation. Support on regularly spaced, level bearers on a dry firm base. Open pile to ensure free movement of air through the stack.
- Trussed rafters: Keep vertical during handling and storage.

760 TEMPORARY BRACING

- Provision: As necessary to maintain structural timber components in position and to ensure complete stability during construction.

770 ADDITIONAL SUPPORTS

- Provision: Position and fix additional studs, noggings and / or battens to support edges of sheet materials and wall / floor / ceiling mounted appliances, fixtures, etc. shown on drawings.
- Material properties: Additional studs, noggings and battens to be of adequate size and have the same treatment, if any, as adjacent timber supports.

775 JOISTS GENERALLY

- Centers: Equal and not exceeding designed spacing.
- Bowed joists: Installed with positive camber.
- End joists: Positioned about 50 mm from masonry walls.

780 JOISTS ON HANGERS

- Hangers: Bedded directly on and hard against supporting construction. Do not use packs or bed on mortar.
- Joists: Cut to leave not more than 6 mm gap at each end. Rebated to lie flush with underside of hangers.
- Fixing to hangers: A nail in every hole.

785 TRIMMING OPENINGS

- Trimmers and trimming joists: Not less than 25 mm wider than general joists.

K 10 Plasterboard Dry Linings / Partitions / Ceilings

TYPES OF DRY LINING

15 LINING ON TIMBER STUD PARTITION WALLS

- Substrate: 18 mm WBP on studs at approximately 400 mm centers.
- Lining: 12.5 mm plasterboard.
  - Recycled content: Not applicable.
- Fixing: Screws at 230 mm centers.
- Finishing: 3 mm skimmed plaster with painted finish.
  - Primer / sealer: As recommended by board manufacturer for paint finish.
  - Accessories: Metal beads / stops recommended by board manufacturer.

25 LINING ON TIMBER FRAMED CEILINGS

- Substrate: 47 mm x 100 mm timber joists.
- Lining: 12.5 mm plasterboard.
  - Recycled content: Not applicable.
- Fixing: Screws at 230 mm centers.
- Finishing: 3 mm skimmed plaster with painted finish.
  - Primer / sealer: As recommended by board manufacturer for paint finish.
  - Accessories: Metal beads / stops recommended by board manufacturer.

65 DRY LINING GENERALLY

- General: Use fixing, jointing, sealing and finishing materials, components and installation methods recommended by board manufacturer.
- Standard:
  - Gypsum plasterboard to BS EN 520.
  - Gypsum fibre board to BS EN 15283-2.
  - Evidence of compliance: All sheets to be CE marked. Submit Declaration of Performance (DoP).
- Cutting gypsum boards: Neatly and accurately without damaging core or tearing paper facing. Minimize cut edges.
- Two layer boarding: Stagger joints between layers.
- Finishing: Neatly to give flush, smooth, flat surfaces free from bowing and abrupt changes of level.

67 SKIM COAT PLASTER FINISH

- Plaster type: As recommended by board manufacturer.
  - Thickness: 2 - 5 mm.
- Joints: Fill and tape except where coincident with metal beads.
- Finish: Tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks.

69 INSTALLING BEADS / STOPS

- Cutting: Neatly using mitres at return angles.
- Fixing: Securely using longest possible lengths, plumb, square and true to line and level, ensuring full contact of wings with substrate.
- Finishing: After joint compounds / plasters have been applied, remove surplus material while still wet from surfaces of beads exposed to view.

70 ADDITIONAL SUPPORTS

- Framing: Accurately position and securely fix to give full support to:
  - partition heads running parallel with but offset from main structural supports,
  - fixtures, fittings and services,
  - board edges and lining perimeters.

80 MINERAL WOOL INSULATION

- Fitting insulation: Closely butted joints and no gaps. Prevent slumping.
- Electrical cables overlaid by insulation: Size accordingly.

K 13 Proprietary Plastic Cladding

Altro Whiterock PVC Sheeting to Area B

145 PLASTIC SHEET WALL CLADDING

- Material: Virgin polyvinyl chloride (PVC-U).
- Thickness: 2.5 mm.
- Sheet size: 1,220 mm x 3,000 mm.
- Finish: Satin.
- Colour: To be confirmed.
- Accessories: Liaise with manufacturer for details of all available jointing and trim options along with wall to floor detailing options.
- Execution: Altro Whiterock should be installed in accordance with the manufacturer's installation guidance.
- Adhesive: Fully bonded to substrate using quality, polyurethane all-over adhesive with 5 mm notched trowel to ensure hygienic, robust and long-term solution, in accordance with the manufacturer's installation guidance.
- Recyclability: 100 % recyclable. Clean, adhesive-free off-cuts to be removed from site and taken to an Altro Recowall collection point for recycling.

K 20 Timber Board Flooring / Sarking / Linings / Casings

TYPES OF FLOORING / SARKING / LININGS / CASINGS

110 TIMBER BOARD FLOORING

- Substrate: New screed as per Section M 10.
- Boards:
  - Species: Oak engineered boarding – submit samples for architect approval.
  - Quality: Prime grade with 6 mm wear layer and 20 mm thickness.
  - Finished face width (exposed width after fixing): 190 mm.
  - Finished thickness: 20 mm pre-finished with Treatex hard wax stain.
  - Edge profile: Tongued and grooved.
  - Moisture content at time of fixing: 9 – 13 %.
- Fixing: Floating. Allow for clips, an intermediate polyfoam layer and an extra moisture barrier layer (0.20 mm polyethene membrane) as per Drawing No. 2069 FA 02.
- Pattern: Boarded.

WORKMANSHIP

310 WORKMANSHIP GENERALLY

- Protection during and after installation: Keep boards dry. Protect from dirt, stain and damage until completion.
- Boards to be used internally: Do not install until building is watertight.
- Methods of fixing and fasteners: As per Section Z 20.
- Moisture content of timber supports at time of fixing boards: Not more than 18 %.

330 MOISTURE CONTENT OF TIMBER

- Conditions during and after installation: Control ambient temperature and humidity conditions to maintain moisture content at average level specified in BS EN 942 Table B.1. for the relevant service condition until completion.
- Test for moisture content: When instructed using an approved moisture meter.

370 FIXING BOARDS

- Environmental conditions: Do not fix boards when ambient temperature is at or below 0° C or above 30° C.
- Generally: Fix boards securely to each support to give flat true surfaces free from undulations, lipping, splits and protruding fasteners.
- Wood movement: Position boards and fixings to prevent cupping, springing, excessive opening of joints and other defects.
- Heading joints: Tightly butted and central over supports and at least two board widths apart on any one support.
- Edges: Plane off proud edges.
- Exposed nail heads: Neatly punch below surface.

L 10 Windows / Rooflights / Screens / Louvres

New Internal Window to Area A

GENERAL

110 EVIDENCE OF PERFORMANCE

- Certification: Provide independently certified evidence that all incorporated components comply with specified performance requirements.

115 TIMBER PROCUREMENT

- Timber (including timber for wood-based products): Obtained from well managed forests / plantations in accordance with:
  - the laws governing forest management in the producer country or countries,
  - international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Documentation: Provide either:
  - documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied or,
  - evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.

120 SITE DIMENSIONS

- Procedure: Before commencing work on designated items take site dimensions, record on shop drawings and use to ensure accurate fabrication.
- Designated items: New internal window to Area A.

PRODUCTS

250 TIMBER WINDOWS

- Standard: To BS 644.
- Manufacturer: A company currently registered under a third party quality assurance scheme.
- Exposure category to BS 6375-1.
- Design wind load: 2000 Pa.
- Operation and strength characteristics: To BS 6375-2.
- Timber: Generally to BS EN 942.
  - Species: European oak.
  - Class: J10.
  - Moisture content on delivery: 12 – 19 %.
- Preservative treatment: Not required.
- Finish as delivered: Primer and undercoat as per Section M 60.
- Glazing details: Bead fixed single glazing.
  - Beading: Internal oak beading.
- Ironmongery / Accessories: To be agreed.
- Fixing: Built in with cramps as per Clause 780.
- Weatherseals: All windows to be fitted with weatherseals; submit proposals for architect approval.

EXECUTION

730 PRIMING / SEALING

- Wood surfaces inaccessible after installation: Prime or seal as specified before fixing components.

750 BUILDING IN

- General: Not permitted unless indicated on drawings.
  - Brace and protect components to prevent distortion and damage during construction of adjacent structure.

760 REPLACEMENT WINDOW INSTALLATION

- Standard: To BS 8213-4.

765 WINDOW INSTALLATION GENERALLY

- Installation: Into prepared openings.
- Gap between frame edge and surrounding construction:
  - Minimum: 1 mm.
  - Maximum: 3 mm.
- Distortion: Install windows without twist or diagonal racking.

780 FIXING OF WOOD FRAMES

- Standard: As per Section Z 20.
- Fasteners: Stainless steel wood screws.
  - Spacing: When not predrilled or specified otherwise, position fasteners not more than 150 mm from ends of each jamb, adjacent to each hanging point of opening lights and at maximum 450 mm centers.

810 SEALANT

- Manufacturer: Adshead Ratcliffe & Co Ltd.
  - Webiste: www.arbo.co.uk
  - Email: arbo@arbo.co.uk
  - Product reference: Arbokol 1000.
- Colour: To be agreed on site.
- Primer: Arbo Primary 925.

820 IRONMONGERY

- Fixing: Assemble and fix carefully and accurately using fasteners with matching finish supplied by ironmongery manufacturer. Do not damage ironmongery and adjacent surfaces.
- Checking / adjusting / lubricating: Carry out at completion and ensure correct functioning.

L 20 Doors / Shutters / Hatches

10 TIMBER PROCUREMENT

- Timber (including timber for wood-based products): Obtained from well managed forests / plantations in accordance with:
  - the laws governing forest management in the producer country or countries,
  - international agreements such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Documentation: Provide either:
  - documentary evidence (which has been or can be independently verified) regarding the provenance of all timber supplied or,
  - evidence that suppliers have adopted and are implementing a formal environmental purchasing policy for timber and wood-based products.

52 TIMBER DOORS AND FRAMES

- Timber: Generally to BS EN 942.
  - Species: European oak.
  - Class: J10.
  - Moisture content on delivery: 9 – 13 %.
- Preservative treatment: Not required.
- Finish as delivered: Primer and undercoat as per Section M 60.
- Assembly:
  - Adhesive: PVAC to BS EN 204, Class D4.
  - Joinery workmanship: As per Section Z 12.
- Fixing: Plugged and screwed.
  - Spacing: When not predrilled or specified otherwise, position fixings not more than 150 mm from ends of each jamb, adjacent to each hanging point and at maximum 600 mm centers.
- Weatherseals: All doors to be fitted with weatherseals; submit proposals for architect approval.

85 FIXING IRONMONGERY GENERALLY

- Fasteners: Supplied by ironmongery manufacturer.
  - Finish / corrosion resistance: To match ironmongery.
- Holes for components: No larger than required for satisfactory fit / operation.
- Adjacent surfaces: Undamaged.
- Moving parts: Adjusted, lubricated and functioning correctly at completion.

L 40 General Glazing

New Internal Window to Area A

10 WORKMANSHIP AND POSITIONING GENERALLY

- Glazing:
  - Generally: In accordance with BS 6262 series.
  - Integrity: Wind and watertight under all conditions. Make full allowance for deflections and other movements.
- Standards:
  - Generally to BS 952 and to relevant parts of:
  - BS EN 572 for basic soda lime silicate glass,
  - BS EN 1096 for coated glass,
  - BS EN 12150 for thermally toughened soda lime silicate glass,
  - BS EN ISO 12543 for laminated glass.
- Quality: Free from scratches, bubbles and other defects.
- Dimensional tolerances: Panes / sheets to be accurately sized.
- Material compatibility: Glass / plastics, surround materials, sealers, primers and paints / clear finishes to be compatible. Comply with glazing / sealant manufacturer's recommendations.

30 PREPARATION

- Surrounds, rebates, grooves and beads: Clean and prepare before installing glazing; ensure compliance with any certified installation requirements.

50 BEAD FIXED SINGLE GLAZING TO AREA A

- Pane material: Safety glass.
- Surround / bead: Oak.
  - Preparation:
  - Bead location: Inside.
  - Bead fixing: Screw.
- Glazing compound: Single.
- Glazing installation:
  - Glass: Located centrally in surround using setting and location blocks and distance pieces.
  - Finished thickness of back bedding after inserting glazing (minimum): 3 mm.
  - Front bedding: Applied to fill voids.
  - Beads: Bedded in glazing compound and fixed securely.
  - Visible edge of glazing compound: Finish internally and externally with a smooth chamfer.

M 10 Cement Based Levelling / Wearing Screeds

TYPES OF SCREEDS

20 TŶ-MAWR LIME SCREED

- Tŷ-Mawr Sublime Insulated Limecrete Floor System: See overleaf.

21 BONDED CEMENT : SAND SELF-LEVELLING SCREED TO AREAS RECEIVING EITHER VINYL FLOORING OR CARPET FLOOR COVERING

- Substrate: In-situ concrete slab.
- Screed construction: Fully bonded.
- Thickness:
  - Nominal: 35 mm.
  - Minimum: 25 mm.
  - Maximum: 40 mm.
- Mix:
  - Proportions (cement : sand): 1 : 3 – 4.5.
- Finish: Smooth floated finish as per Clause 70.
  - To receive: Either vinyl flooring or carpet floor covering as per Section M 50.

ROLES AND RESPONSIBILITIES

- Before the screed is laid, the screeding sub-contractor, the flooring sub-contractor and the architect are to agree the positions of all movement joints. The responsibility for the formation of the movement and shrinkage joints is with the screeding sub-contractor. The responsibility for the installation of proprietary movement joints, over the screed, is with the floor finishes sub-contractor.
- Movement joints as per Clause 57 to BS 8204. The contractor is to ensure adequate time is allowed for the screed to cure and dry. A provisional period of thirty days is the basic requirement. More time will be required where the space is poorly ventilated and the temperature is low. Testing of the screed to determine the residual moisture content is essential prior to the commissioning of the underfloor heating system.

GENERALLY / PREPARATION

23 SUITABILITY OF SUBSTRATES

- General:
  - suitable for specified levels and flatness / regularity of finished surfaces. Consider permissible minimum and maximum thicknesses of screed.
  - sound and free from significant cracks and gaps.
- Concrete strength: To BS 8204-1 Table 2.
- Cleanliness: Remove plaster, debris and dirt.
- Moisture content: To suit screed type. New concrete slab to receive fully or partially bonded construction must be dried out by exposure to the air for a minimum of six weeks.

25 PROPRIETARY LEVELLING / WEARING SCREED

- General: Materials, mix proportions, mixing methods, minimum / maximum thicknesses and workmanship must be in accordance with recommendations of screed manufacturer.
- Standard: To BS 8204-3.

27 CONDUITS UNDER FLOATING SCREED

- Haunching: Before laying insulation for floating screed, haunch up in 1 : 4 cement : sand on both sides of conduits.

29 CONDUITS CAST INTO OR UNDER SCREED

- Reinforcement: Overlay with reinforcement selected from:
  - 500 mm wide strip of steel fabric to BS 4483 reference D 49 or
  - welded mesh manufactured in rolls from mild steel wire, minimum 1.5 mm diameter to BS 1052 – mesh size 50 mm x 50 mm.
- Placing reinforcement: Mid-depth between top of conduit and screed surface.
  - Minimum width of reinforcement: 300 mm.
- Minimum screed cover over conduit: 25 mm.

30 FULLY BONDED CONSTRUCTION

- Removing mortar matrix: Shortly before laying screed expose coarse aggregate over entire area of hardened base.
- Texture of surface: Suitable to accept screed and achieve a full bond over complete area.
- Bonding coat: Polymer modified cement slurry.

41 FLOATING CONSTRUCTION

- Insulation:
  - Type: 75 mm.
  - Installation: Lay with tight butt joints. Continue up at perimeter abutments for full depth of screed.
- Separating layer:
  - Type: Polyethylene sheet.
  - Installation: Lay over insulation and turn up at perimeter abutments. Lap 100 mm at joints.

42 ADVERSE WEATHER

- Screed surface temperature: Maintain above 5° C for a minimum of four days after laying.
- Hot weather: Prevent premature setting or drying out.

45 AGGREGATES AND CEMENTS

- Sand: To BS EN 13139.
  - Grading limits: In accordance with BS 8204-1 Table B.1.
- Coarse aggregates:
  - Standard: To BS EN 12620.
- Cement:
  - Cement types: In accordance with BS 8204-1 Clause 5.1.3.

47 ADMIXTURES

- Standards: In accordance with BS 8204-1 Table 1.
- Calcium chloride: Do not use in admixtures.

50 MIXING

- Water content: Minimum necessary to achieve full compaction.
- Mixing: Mix materials thoroughly to uniform consistency in a suitable forced action mechanical mixer.

52 COMPACTION

- General: Compact thoroughly over entire area.
- Screeds over 50 mm thick: Lay in two layers of equal thickness. Roughen surface of compacted lower layer then immediately lay upper layer.

55 JOINTS IN LEVELLING SCREEDS

- Laying screeds: Lay continuously using 'wet screeds' between strips or bays. Minimize defined joints.
- Daywork joints: Form with vertical edge.

56 STRIP MOVEMENT JOINTS FOR DOOR THRESHOLDS

- Manufacturer: Contractor's choice with architect approval. Colour to match abutting floor finish.
  - Product reference: Contractor's choice. Submit samples for architect approval.
  - Size: 5 mm.
- Installation: Set securely into screed to exact finished floor level. Extend joints through to substrate.
  - Secure fixing to substrate: As recommended by manufacturer.

60 JOINTS IN POLYMER MODIFIED WEARING SCREEDS

- Bay sizes (maximum): 4.5 m.
- Location of bay joints: Over construction / movement joints in base slab.

FINISHING / CURING

65 FINISHING GENERALLY

- Timing: Carry out all finishing operations at optimum times in relation to setting and hardening of screed material.
- Prohibited treatments to screed surfaces:
  - Wetting to assist surface working.
  - Sprinkling cement.

70 SMOOTH FLOATED FINISH

- Finish: Even texture with no ridges or steps.

75 TROWELLED FINISH TO LEVELLING SCREEDS

- Floating: Even texture with no ridges or steps.
- Trowelling: Uniform smooth surface free from trowel marks and other blemishes and suitable to receive specified flooring material.

80 TROWELLED FINISH TO WEARING SCREEDS

- Floating: Even texture with no ridges or steps.
- Trowelling: Successively trowel at intervals, applying sufficient pressure to close surface and give a uniform smooth surface free from trowel marks and other blemishes.

90 CURING

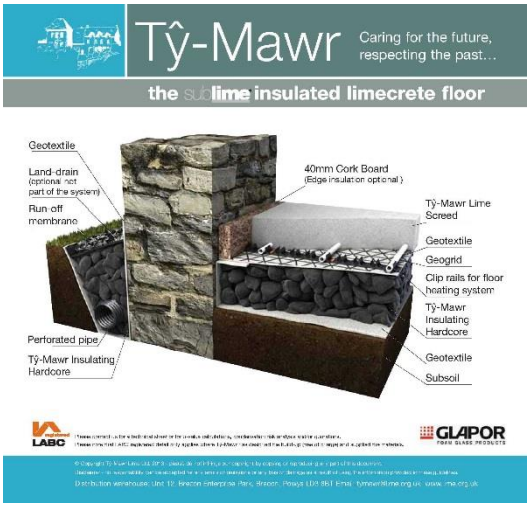
- General: Prevent premature drying. Immediately after laying protect surface from wind, draughts and strong sunlight. As soon as screed has set sufficiently closely cover with polyethylene sheeting.
- Curing period (minimum): Keep polyethylene sheeting in position for no less than five days.
- Drying after curing: Allow screed to dry gradually. Do not subject screed to artificial drying conditions that will cause cracking or other shrinkage-related problems.
- The screed must be allowed a minimum of five days to cure and fifteen days to dry. Assume thirty days when programming but do not rely upon this guidance. The screed's relative humidity is to be tested prior to the commissioning of the heating or the laying of any floor finishes. The test results are to be provided to architect.

110 SLIP-RESISTANCE TESTING OF WEARING SCREEDS

- Test:
  - to the relevant parts of BS 13036-4 using a TRL pendulum,
  - make arrangements for test to be witnessed / certified by architect.
- Report: Submit include slip-resistance values in wet and dry states.

NBS PLUS

Manufacturer: TyMawr
Product name: Sublime Insulated Limecrete Floor System



Product summary:

Limecrete floor slab for ground bearing applications.

Product general description:

Features:

- A lightweight, breathable, insulating floor suitable for underfloor heating.
- Suitable for use in historic properties where a dense concrete slab maybe inappropriate. However it is equally appropriate for use in new build as an ecological alternative to concrete.
- The screed is suitable for use for most domestic and light industrial situations.
- It is compatible with wet or electrical underfloor heating systems onto which flagstones, timber floors (ventilated) or tiles can be laid – contact Ty-Mawr Lime Ltd for further information.
- A calculation form is available from Ty-Mawr Lime Ltd to assist in the design of a floor build up to meet current Building Regulations, the resulting designed floor if supplied by Ty-Mawr Lime Ltd has
- LABC (Local Authority Building Control) Registered Detail approval.

Sub base:

Ground to be compacted and levelled with no sudden irregularities. Any soft spots should be excavated and carefully backfilled with a competent material.

Product specification clause

Product reference:

Sublime Insulated Limecrete Floor System

Product properties:

- Thickness:
  – Glapor Recycled Foamed Glass gravel:

- As calculated by Ty-Mawr Lime Ltd. Minimum depth of 120mm
  – Ty Mawr Lime screed:

- 100mm

End of product specification clause

As standard:

System components:

– Membrane layer:

- Lay geotextile to be overlapped at joints by minimum 1 metre.
- Membrane to be turned up at edges adjoining walls by minimum specified depth of substrate.

– Substrate/ Insulating layer:

- Lightweight loose fill insulating aggregate (Glapor Recycled Foamed Glass (RFG) gravel): Put in marker posts to indicate level of loose fill, as per floor specification. Lay to allow for a compaction ratio of 1.3:1 by measurement, e.g. Loose fill to 195mm and compact to 150mm.
- Material is distributed with a shovel or rake. It is important to ensure that an even fill depth is achieved over the whole installation area. Should the compacted fill depth exceed 30 cm height, the installation must take place in several layers.
- Compaction is executed with a light plate vibrator (~80 - 120 kg, approx frequency 100 Hz). Compaction is finished when the target level is reached. Further compacting increases the material wear and brings no advantage in load bearing capacity. Remove posts and level off.

– Membrane layer:

- The initially laid geotextile overlap is folded over the compacted fill.
- Cover insulation layer with geotextile to be overlapped at joints by minimum 1 metre.
- Membrane upturned at edges adjoining walls by minimum specified depth of slab.

– Grid layer:

- If underfloor heating is required a Geogrid is laid flat into the geotextile to take clip rails for underfloor heating pipes.

– Ty Mawr Lime Screed (carrying underfloor heating pipes if required):

- Lime: Singleton Birch Secil NHL5 or Castle NHL5.
- Ty Mawr Recycled Screed aggregate: as specified.
- Screed fibres at 1kg per tonne of aggregate
- Proportions: 3:1 aggregate: lime by volume.
- Flatness/ Surface regularity: Sudden irregularities are not permitted.
- Add sufficient water to make a stiff but pourable mix. Pour, level and float the floor in the conventional manner.
- Use cork edge insulation where underfloor heating systems are installed.

Options:

No optional features

Approvals:

- Organisation: LABC
  – Standard/ Certificate:
  – Details: LABC Registered Detail, conditional on design and supply by Ty-Mawr Lime Ltd.

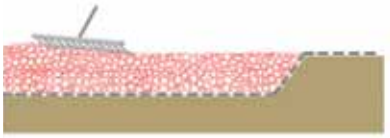
Tŷ-Mawr sublime®

registered LABC

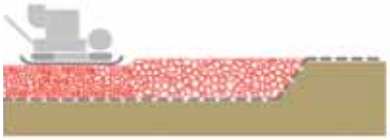
Preparation of existing floor

Lay Geotextile

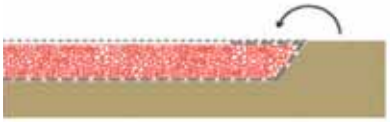
Deposit Tŷ-Mawr Insulating Hardcore foam glass gravel



Distribute the Tŷ-Mawr Insulating Hardcore



Compact Tŷ-Mawr Insulating Hardcore



Fold back Geotextile and lay Geogrid

- Remove the existing floor, excavate to required depth (as calculated by Tŷ-Mawr) with care, do not undermine foundations, level and compact the surface. This should be done as accurately and consistently as possible for best results plus even small variations over a large floor area will significantly effect the amount of material ultimately required.
- Assess ground water issues consult architect/engineer to provide suitable drainage if required.
- Lay the geotextile membrane over the soil, overlapping the joints by 1 metre. Run the geotextile up the walls far enough to fold back onto the Tŷ-Mawr Insulating Hardcore foam glass gravel layer.
- Put in marker posts to indicate the final level of Tŷ-Mawr Insulating Hardcore foam glass gravel after compaction, as per the specification for your floor.
- Bags can be emptied manually or with the help of crane, telescopic handler etc.
- It is best to deposit Tŷ-Mawr Insulating Hardcore glass foam gravel from the back to the front so that the already distributed material no longer needs to be manipulated.
- The material is normally distributed with a rake or shovel. It is important to ensure that an even fill depth is achieved over the whole installation area. For deep fill areas the installation and compaction must take place in layers of maximum depth 300mm.
- Compaction is executed with a plate vibrator (~80 - 120kg, approx frequency 100 Hz), or a steamroller (static, ~5t - ~6.5t).
- Compaction is finished when the target level is reached. Further compacting increases the material wear and brings no advantage in load bearing capacity and will reduce thermal performance.
- Fold back the excess Geotextile around the edges over the compacted Tŷ-Mawr Insulating Hardcore.
- Lay the second layer of geotextile and the Geogrid over the surface of the compacted Tŷ-Mawr Insulating Hardcore ready for the fixing of the underfloor heating clip rails.
- Fold back the excess Geotextile around the edges ‘before’ laying the Geogrid, i.e. Fold back the excess of the second Geotextile.
- If required, screed can be used to weigh down geogrid to prevent rucking.

Tŷ-Mawr
sublime®

The heating pipes

- We would recommend the use of a clip rail system or aluminium composite pipe for your underfloor heating pipe work. The clip rails can be attached to the Geogrid using cable ties the pipes can then be clipped into place as per your heating system's manufacturer/ designer's specification' or similar.
- Alternatively, heating pipes can be fixed directly to the geogrid using cable ties (although this will place the pipes lower in the screed layer). (NB. Plastic tray type fixings will compromise the breathability of your floor)

Tŷ-Mawr Lime Screed

- Lay edge insulation around perimeter walls to the depth of the screed, used as a screeding board (depending on edge insulation choice).
- Put shuttering in place to the thickness of the screed.
- Mix 3 parts of the Tŷ-Mawr Screeding Aggregate to 1 part of the recommended Tŷ-Mawr Hydraulic Lime Binder (by volume) and the synthetic fibres (at a ratio of 1kg per tonne dry screed mix), add sufficient water to make a stiff but pourable mix.
- **MIX FOR 20 MINS AFTER THE ADDITION OF ALL OF THE WATER.**
- Lay and tamp to the shuttering level, float the floor to an appropriate finish for the floor covering specified.
- After 24 hrs brush the surface of the floor using a stiff brush to remove any sinter skin (this is particularly important if laying tiles or slabs onto the screed).

Protecting the floor

- Ensure the floor does not dry/cure too quickly or too slowly. As with all lime products ensure the room is well ventilated with ambient temperatures between 10 and 18 degrees, while at the same time making sure that no direct heat/ventilation is applied to avoid spot drying.
- In warm dry weather you will need to wet down the lime screed (do not saturate) to help prevent the product drying too quickly. Wetted hessian can be laid over the surface with plastic sheeting over the top – this will keep moisture in.
- Do not turn on underfloor heating or undertake any heavy work on the floor until it is thoroughly set and dry.
- Between the months of October and March lime work should be carried out with caution, especially externally. The chemical reactions with hydraulic lime products slow down as the temperature falls, and will stop below 5 degrees. At around 2 degrees the lime will start to become irrevocably damaged.

Floor finishes

Various coverings are appropriate but please consult your building consultant/architect for precise installation instructions. It is desirable but not essential that the floor finish is 'breathable' e.g. unglazed tiles (laid using Tŷ-Mawr floor tile bedding grout, please see application guide), stone slabs (which can be laid on a sand:lime mortar) or timber flooring. (This should be laid when the screed is fully cured and dry. We would recommend an air gap be maintained between lime screed and floor boards. This air gap can prevent timber from warping if moisture is still present, however, it can affect the performance of underfloor heating systems).

Commissioning underfloor heating

This should be carried out in accordance with BS EN 1264 Part 4: Introducing Heat Through Underfloor Heating. The screed or tile bedding should also be at least 4 weeks old, start off with temperatures of 25°C, this can be increased every other day by 5°C until 50°C has been reached. This slower process avoids any cracking of the screed.

Every care has been taken to provide concise but comprehensive installation instructions, however, this is no substitute for employing a professional with experience in laying floors. Lime requires tending and the right environment to carbonate/set otherwise it is very similar to laying a conventional concrete slab and screed. We are happy to provide telephone support if you have any concerns and if appropriate, visit the site.

Please note

Care should be taken to ensure that the right components are used in the right layers (check the aggregate sizes if in any doubt) and in the right mix ratios. Any variation in mix ratios or depths laid will effect the quantity of material required. Care should be taken to be precise as possible.

Health and Safety Information

WARNING

Skin Irritation 2 H315 Causes skin irritation.

STOT SE 3 H335 May cause respiratory problems.

DANGER

Eye Damage 1 H318 Causes serious eye damage.

Precautionary Statements

P102 Keep out of reach of children.
P280 Wear protective gloves, eye protection/face mask.
P305 + P351 + P310 If in eyes rinse cautiously with water for several minutes and immediately get medical assistance.
P352 + P352 If on skin, wash affected parts immediately with plenty of soap and water.

Units 5 & 12, Brecon Enterprise Park, Brecon,
Powys LD3 8BT Tel: 01874 611350 Fax: 01874 622774
Email: tymawr@lime.org.uk www.lime.org.uk

Tŷ-Mawr
sublime®

Our first LABC & LABSS Registered breathable, insulated floor system.

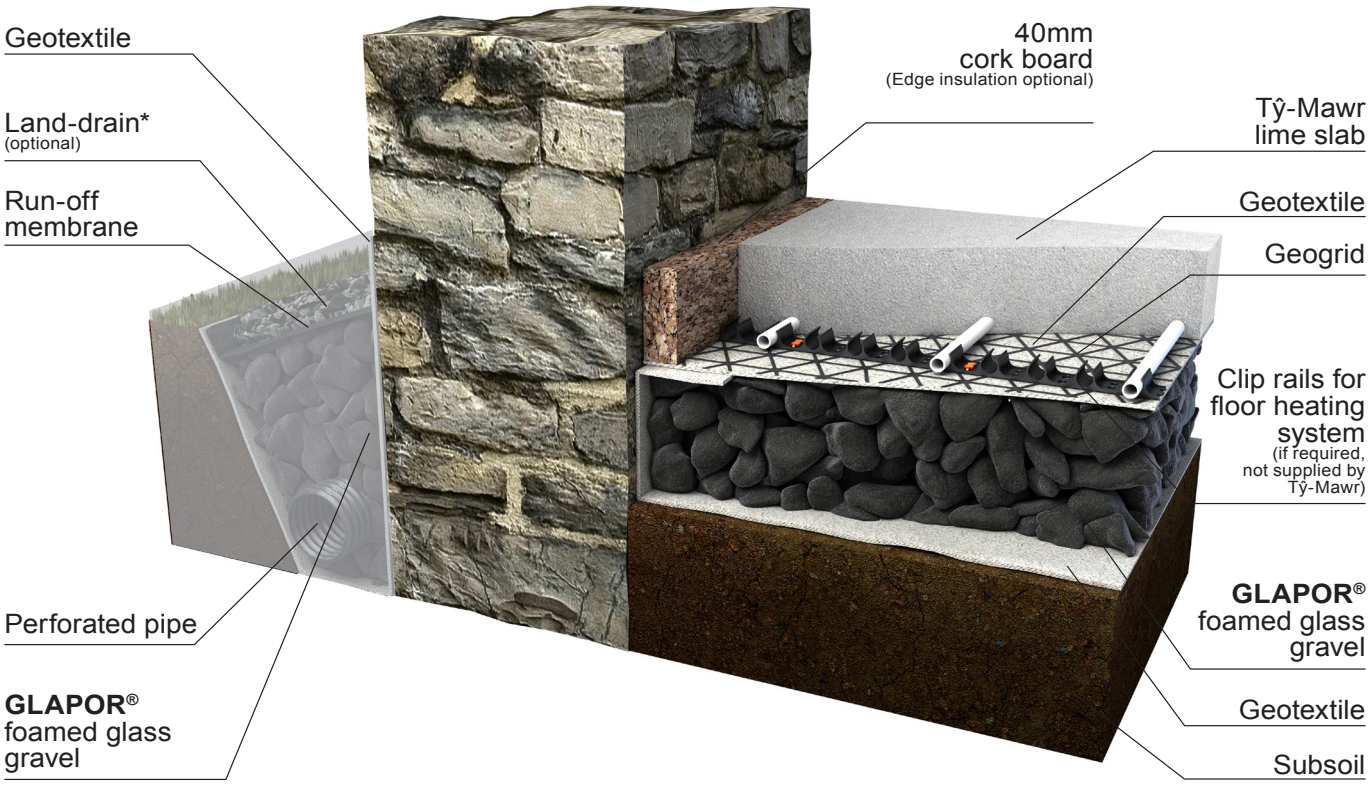
LABC registered detail streamlines Building Regulations applications saving time and money.

From the birth of our innovative Limecrete flooring system, launched in 1998 as a breathable, lightweight alternative to cement-based concrete, we at Tŷ-Mawr have been selecting and testing various materials and combinations of materials to both simplify the installation process and improve the 'green' credentials of our floors.

Following developments in the manufacturing process of the GLAPOR® foamed glass gravel and extensive testing of our recycled lime slab product we are proud to announce the launch of our first breathable, insulated floor system which can be used with or without underfloor heating - 'sub**lime**®'.

The sub**lime**® floor's breathability makes it ideal for use within existing solid wall properties and its excellent environmental credentials along with its simplicity and ease of installation makes sub**lime**® an equally appropriate choice for new builds and extensions!

GLAPOR® foamed glass gravel is the most structurally and thermally superior product we have ever supplied for floor applications. By using GLAPOR® foamed glass gravel within the insulation layer of your floor savings can also be made on installation costs due to its ability to compact to a weight bearing surface. GLAPOR® foamed glass gravel is manufactured using 100% recycled glass.



Please call to discuss if a radon barrier is required.

PLEASE NOTE: The shaded part of the above diagram is not part of the registered detail.

The external land drain is your first defence against moisture flowing towards the building. An internal land drain is optional and only required if there has been evidence of moisture in the past that might require management.

sublime® insulatedlimecretefloor

registered LABC Registered Details

LABSS Registered Details

Tŷ-Mawr

sub**lime**®

The sublime**® systemcan be designed for use with or without underfloor heating.**

Installing the underfloor heating pipes within a higher density thermally conductive layer eliminates the need for two layers (slab and a screed). As a result, the sublime**® floor offers many significant benefits and savings:**

Advantages of the sub**lime**® floor system

- **Reduced overall excavation depths:** When compared to conventional Limecrete systems using a lightweight insulating slab layer plus a higher density screed layer to contain the underfloor heating.
- **Reduced wet trades and processes:** As only one wet mixed layer is required over the **GLAPOR**® glass gravel, it saves on labour and the cost of materials when compared to previous systems.
- **Reduced curing times:** By eliminating the need for two layers curing times are reduced by approximately 3 weeks.
- **Improved energy efficiency and response times of under floor heating systems:** As the insulation material is now directly beneath the heat source the heat drift associated with other systems is significantly reduced.
- **Reduced material quantities and therefore reduced delivery costs.**
- **LABC & LABSS Registered detail:** (Updated April 2016*) Recognised in all local authority areas in England, Scotland and Wales, the registered detail will help to streamline and simplify the planning application and building control process for your project.
- **Winner of the Wales Regional LABC Building Excellence Award 2013 'Best Technical Innovation'.**

N.B sub**lime**® slab requires 20 mins mix time after the addition of all of the water. Please plan accordingly prior to materials being delivered on site.

Customer confidence in our systems is vital which is why at Tŷ-Mawr we invest heavily in product testing and certification. Our sub**lime**® floor system, like the Limecrete system before it, carries its LABC Registered detail.

Our team are able to design your floor to meet the needs of your specific building, ensuring that you get the best performance for your building and as well as meeting building regulations if required. For more information, visit www.lime.org.uk and complete our simple online form to get a free calculation of compnents for your floor.

Courtesy: Limecrete Company, www.limecrete.co.uk

Compressive and Flexural Strength

Research carried out by the University of Glamorgan

Age	Compressive Strength (N/mm2)	Flexural Strength (N/mm2)	Density
28	4.2	-	2140
56	6.1	3.8	2020
90	7.2	4.7	1990

Our research has suggested that the considerations applicable to cementitious concretes with regard to expansion joints are not applicable to lime based concretes. Hydraulic Lime generates little heat during the initial chemical hydraulic set and limecrete has a good flexural strength to compressive strength ratio. These properties mean that huge savings can be made in terms of the labour and equipment usually required to fabricate dowelled and induced contraction joints in cement concrete ground bearing slab. For further information contact limecrete@lime.org.uk

registered LABC Registered Details

LABSS Registered Details

Distribution Units 5 and 12, Brecon Enterprise Park, Brecon, Powys LD3 8BT Tel: 01874 611350 Fax: 01874 622774
Email: tymawr@lime.org.uk www.lime.org.uk

Tŷ-Mawr

GLAPOR CELLULAR GLASS GRAVEL

Technical Data SG 600 P

APPLICATIONS:
Load-bearing thermal insulation:
For under floor and foundation slabs;
For under surfaces subject to traffic;

Lightweight levelling fill:
For parking roofs and used flat roofs, for gardening and landscaping
For civil engineering; for vault fills;

Lightweight insulation fill for applications according to – DIN EN 13055-2

CE
2010

Properties	Value	Unit	Test standard
Composition	100	%	High-quality recycled glass
Frost resistant	yes		EN 13055-2, B
Anti-capillary fill			
Porosity, compressed fill	Approx. 15	Vol. %	
Alkali resistance	passed		DIN V 18004
Bulk density	95 - 120	kg/m³	EN 1097-3
Weight, compressed fill	125 - 155	kg/m³	compression 1,3:1
Particle size distribution, bulk	16 – 63	mm	EN 933-1
Flotation, compressed fill	7,5	kN/m³	compression 1,3:1
Water permeability coefficient	$7{,}5*10^{-1}$	m/s	DIN 18130-1
Thermal conductivity, compressed fill, λ	0,078	W/(mK)	EN 12667 / EN 12939
Specific heat capacity	850	J/kgK	
Compaction factor	1,3 :1	Factor	
Minimum installation thickness, compressed	12	cm	
Deviation from planeness	+/-2	cm	
Rated compression strength f_{cd}	≥275	kPa	DIN EN 826
Compressive strength $f_{c,Nenn}$ with 10 % compression	≥600	kPa	DIN EN 826
5 % Quantile value of compression strength $f_{c,\ 0,05}$	≥620	kPa	DIN EN 826
Absorbable horizontal forces of the gravel layer			
Permissible rated compression strength	≤ 30% of the existing normal strength		
Combustibility – Material class	A1	Class	EN 13501-1
Smoke and drip formation	None		
Particle softening point	700	°C	
Delivery form:	Big Bag 1,5 m³ and 3 m³ in loose form		

ADVICE: Our specifications correspond to our state of knowledge at the time of printing . We reserve the right for technical changes. **Status:** 12.04.2015

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M 20 Plastered / Rendered / Roughcast Coatings

TYPES OF COATINGS

50 GYPSUM PLASTER SKIM COAT TO PLASTERBOARD

- Plasterboard manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Plaster type: As recommended by board manufacturer. Plaster finish to BS EN 13279-1 Class B.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
  - Thickness: 2 - 5 mm.
  - Finish: Smooth.

60 LIME / SAND PLASTER RENEWAL

- Substrate: Existing brickwork / stonework.
  - Preparation: Brush clean as necessary.
- Lime manufacturer: St. Astier or similar approved by the architect.
  - Product reference / type: Lime putty as per Clause 481.
- Undercoats: Render coat and float coat of feebly hydraulic lime putty and medium grade sand.
  - Mix: 1 : 2 - 3 with hair reinforcement, 6 Kg per cubic metre.
  - Sand: To BS EN 13139 medium grading to architect approval.
  - Thickness (excluding dubbing out and keys): Render coat 8 - 10 mm thick and float coat 6 mm thick.
- Final coat:
  - Mix: 3 : 2 feebly hydraulic lime putty and fine sand.
  - Sand: To BS EN 13139 fine grading to architect approval.
  - Thickness: Final coat 3 mm thick. Three parts lime putty to two parts sand, applied in thin coats and finished to a plain float finish.
  - Finish: Smooth finish as per Clause 777.
- Accessories: None.
- Other requirements: Dub out as necessary to finish flush with existing wall finishes. Work into and around areas of detail, such as wall shafts, bases, capitals, string courses and other features, and finish plaster flush with adjacent surfaces to provide a smooth seamless finish.

481 READY PREPARED LIME PUTTY

- Type: Slaked directly from CL 90 quicklime to BS EN 459-1 using an excess of water.
  - Maturation: In pits / containers that allow excess water to drain away.
  - Density of matured lime putty: 1.3 - 1.4 Kg / Litre.
- Maturation period before use (minimum): 90 days.
- Storage: Prevent drying out or wetting. Protect from frost.

492 HAIR REINFORCEMENT

- Manufacturer / Supplier: To be confirmed from examination on site.
  - Product reference: To be confirmed.
- Proportions (approximate): 6 Kg hair to 1 m^3 coarse stuff.
- Condition: Clean, free from grease and other impurities. Well teased before adding to the mix.
- Distribution: Evenly throughout with no balling into lumps.
- Storage period for haired mortar (maximum): Four weeks.

500 COLD WEATHER PROTECTION

- Internal work: Take precautions to prevent damage to internal coatings when air temperature is below 3°C.
- External work: Avoid when air temperature is at or below 5°C and falling or below 3°C and rising.

PREPARING SUBSTRATES

510 SUITABILITY OF SUBSTRATES

- General: Suitable to receive coatings. Sound, free from contamination and loose areas.
- Soundness: Free from loose areas and significant cracks and gaps.
- Cutting, chasing, making good, fixing of conduits and service outlets and the like: Completed.
- Tolerances: Permitting specified flatness / regularity of finished coatings.
- Cleanliness: Free from dirt, dust, efflorescence and mould and other contaminants incompatible with coatings.

520 EXISTING DAMP AFFECTED PLASTER / RENDER

- Plaster affected by rising damp: Remove to a height of 300 mm above highest point reached by damp or 1 m above DPC, whichever is highest.
- Perished and salt contaminated masonry:
  - Mortar joints: Rake out.
  - Masonry units: Submit proposals.
- Drying out substrates: Establish drying conditions.

566 REMOVING DEFECTIVE EXISTING PLASTER

- Plaster for removal: Loose, hollow, detached, soft, friable, badly cracked, affected by efflorescence or otherwise damaged.
  - Hollow, detached areas: Remove where detached from wall. Refer to Drawing No. 2069 FA 02 for approximate extent, reflected in provisional quantities allowance in BOQ.
- Stained plaster: Remove.
- Removing defective plaster. Cut back to a square sound edge.
- Faults in background (structural deficiencies, damp, etc.): Submit proposals.
- Cracks:
  - Fine hairline cracking / crazing: Leave.
  - Other cracks: Cut out to a width of 75 mm (minimum) and fill.
- Dust and loose material: Remove from exposed substrates and edges.

APPLICATION

710 APPLICATION GENERALLY

- Application of coatings: Firmly and in one continuous operation between angles and joints. Achieve good adhesion.
- Appearance of finished surfaces: Even and consistent. Free from rippling, hollows, ridges, cracks and crazing.
  - Accuracy: Finish to a true plane, to correct line and level, with angles and corners to a right angle unless specified otherwise and with walls and reveals plumb and square.
- Drying out: Prevent excessively rapid or localised drying out.
- Keying undercoats: Cross scratch (plaster coatings) and comb (render coatings). Do not penetrate undercoat.

715 FLATNESS / SURFACE REGULARITY

- Sudden irregularities: Not permitted.
- Deviation of plaster surface: Measure from underside of a straight edge placed anywhere on surface.
    - Permissible deviation (maximum) for plaster not less than 13 mm thick : 3 mm in any consecutive length of 1,800 mm.

720 DUBBING OUT

- General: Correct substrate inaccuracies.
- New smooth, dense concrete and similar surfaces: Dubbing out prohibited unless total plaster thickness is within range recommended by plaster manufacturer.
- Thickness of any one coat (maximum): 10 mm.
- Mix: As undercoat.
- Application: Achieve firm bond. Allow each coat to set sufficiently before the next is applied. Cross scratch surface of each coat.

725 UNDERCOATS GENERALLY

- General: Rule to an even surface. Cross scratch to provide a key for the next coat.
- Undercoats on metal lathing: Work well into interstices to obtain maximum key.
- Undercoats gauged with Portland cement: Do not apply next coat until drying shrinkage is substantially complete.

777 SMOOTH FINISH

- Appearance: A tight, matt, smooth surface with no hollows, abrupt changes of level or trowel marks. Avoid water brush, excessive trowelling and over polishing.

781 PLASTERBOARD BACKINGS

- Additional framing supports:
    - Fixtures, fittings and service outlets: Accurately position to suit fasteners.
    - Board edges and perimeters: To suit type and performance of board.
- Joints:
    - Joint widths (maximum): 3 mm.
    - End joints: Stagger between rows.
    - Two layer boarding: Stagger joints between layers.
- Joint reinforcement tape: Apply to joints and angles except where coincident with metal beads.

782 BEADS / STOPS

- Location: External angles and stop ends.
- Materials:
    - External render: Stainless steel.
    - Internal plaster / render: Stainless steel.
- Fixing: Secure and true to line and level.
    - Beads / stops to external render: Fix mechanically.

M 40 Stone / Concrete / Quarry / Ceramic Tiling / Mosaic

5 TILED SPLASHBACKS

- Tiles: Linear Matt Bone Ceramic Wall Tile.
  - Manufacturer / supplier: Topps Tiles.
  - Product reference: 694102. Linear Matt.
  - Colour: Bone.
  - Size: 300 mm x 100 mm.
- Recycled content: Not applicable.
- Other requirements: Matching finish strip tiles beneath window cills.
- Background / base: Wall plaster.
  - Preparation: None.
- Intermediate substrate: Not required.
- Bedding: Adhesive bed notched trowel method as per Clause 50.
  - Adhesive: Mapei white wall tile adhesive or similar.
- Joint width: 5 mm.
- Grout: Unibond white wall tile grout or similar.
  - Type / classification: CG1.
- Accessories: Stainless steel edge beads.

15 NEW BACKGROUNDS / BASES

- Background drying times (minimum):
  - Brick / block walls: Six weeks.
  - Rendering: Two weeks.
  - Gypsum plaster: Four weeks.
- Base drying times (minimum):
  - Concrete slabs: Six weeks.
  - Cement : sand screeds: Three weeks.

20 EXISTING BACKGROUNDS / BASES GENERALLY

- Efflorescence, laitance, dirt, loose and defective material: Remove and make good defective areas with materials compatible with background / base and bedding.
- Deposits of oil, grease and other materials incompatible with the bedding: Remove.
- Tile, paint and other nonporous surfaces: Clean.
- Wet backgrounds: Dry before tiling.
- Paint with unsatisfactory adhesion: Remove so as not to impair bedding adhesion.

25 NEW PLASTER

- Plaster primer: Apply if recommended by adhesive manufacturer.

30 FIXING GENERALLY

- Adhesive: Compatible with background / base.
- Cut tiles: Neat and accurate.
- Fixing: Provide adhesion over entire background / base and tile backs.
- Final appearance: Before bedding material sets, make adjustments necessary to give a true regular appearance to tiles and joints.
- Deviation of surface: Measure from underside of a 2 m straightedge with 3 mm thick feet placed anywhere on surface. The straightedge should not be obstructed by the tiles / mosaic and no gap should be greater than 6 mm (i.e. a tolerance of + 3 mm).
- Surplus bedding material: Clean from joints and face of tiles / mosaics.

35 SETTING OUT

- Joints: True to line, continuous and without steps.
  - Joints on walls: Horizontal, vertical and aligned round corners.
  - Joints in floors: Parallel to main axis of space or specified features.
- Cut tiles: Minimise number, maximise size and locate unobtrusively.
- Joints in adjoining floors and walls: Align.
- Joints in adjoining floors and skirtings: Align.

50 ADHESIVE BED - NOTCHED TROWEL METHOD TO WALLS

- Application: By 3 mm floated coat of adhesive to dry background. Comb surface.
- Tiling: Press tiles firmly onto float coat.

70 GROUTING

- Sequence: Grout when bed / adhesive has set sufficient to prevent disturbance of tiles.
- Joints: 6 mm deep (or depth of tile if less). Free from dust and debris.
- Grouting: Fill joints completely, tool to profile and clean off surface. Leave free from blemishes.
- Polishing: When grout is hard, polish tiling with dry cloth.

M 50 Rubber / Plastics / Cork / Lino / Carpet Tiling / Sheeting

15 LINOLEUM TILES TO AREA A, AREA B AND AREA C

- Base: New concrete screed.
  - Preparation: Concrete surface must be clean, smooth and dry.
- Fabricated underlay: Apply liquid DPM over new concrete screed.
- Flooring roll to BS EN ISO 24011: Linoleum tiles.
  - Manufacturer: Forbo Flooring Systems.
  - Product reference: Modular Marmoleum.
  - Style: Marbled.
  - Material: Linoleum.
  - Recycled content: 43 %.
  - Size: To be confirmed.
  - Thickness: 2.5 mm.
  - Colour and pattern: To be confirmed.
- Adhesive: Eurocol 414 Euroflex Lino Plus or Eurocol 611 Eurostar Lino Plus.
- Seam welding: Welding rod in colour to match sheet flooring.

16 CARPET TILING TO AREA D

- Base: New concrete screed.
  - Preparation: Concrete surface must be clean, smooth and dry.
- Fabricated underlay: Apply liquid DPM over new concrete screed.
- Carpet tiles to BS EN 1307: Pile carpet tiles.
  - Manufacturer: Forbo Flooring Systems.
  - Product reference: Tessera Perspective.
  - Style: Tufted cut and loop pile.
  - Material: Nylon.
  - Recycled content: 65.93 %.
  - Size: 500 mm x 500 mm.
  - Thickness: 6.1 mm.
  - Colour and pattern: To be confirmed.
- Adhesive: 542 Eurofix Tack plus solvent-free release system.

40 LAYING COVERINGS ON NEW WET LAID BASES

- Base drying aids: Not used for at least four days prior to moisture content test.
- Base moisture content test: Carry out in accordance with BS 5325 Annex A or BS 8203 Annex A.
- Commencement of laying coverings: Not until all readings show 75 % relative humidity or less.

45 EXISTING FLOOR COVERING REMOVED

- Substrate: Clear of covering and as much adhesive as possible. Skim with smoothing compound to give smooth and even surface.

56 PLYWOOD UNDERLAY

- Standard: An approved national standard.
- Bonding quality: To BS EN 314-2 Class I.
- Appearance: To BS EN 635 Class I.
- Finish: Sanded.
- Thickness: 6 mm.
- Sheet size: 2,400 mm.
- Substrate: Existing floorboards securely fixed and level with no gross irregularities or protruding fasteners.
- Laying sheets:
  - Cross joints: Staggered with none coincident with joints in base.
  - Joint width: 0.5 mm – 1 mm.
- Fasteners: 25 mm annular ring shanked or twisted shank nails or divergent staples.
  - Location: Commencing at center of one side of each sheet at 150 mm grid centers over area and 100 mm centers along perimeter set in 12 mm from edge.
  - Placement: Driven with heads set flush with surface and not projecting through underside of base. Not deformed.

60 SETTING OUT TILES

- Method: Set out from center of area / room so that wherever possible:
  - tiles along opposite edges are of equal size,
  - edge tiles are more than 50 % of full tile width.

65 LAYING COVERINGS

- Base / substrate condition: Rigid, dry, smooth and free from grease, dirt and other contaminants.
- Use a primer where recommended by adhesive manufacturer. Allow to dry thoroughly.
- Adhesive: As specified, as recommended by covering manufacturer, as approved.
- Conditioning of materials prior to laying: As recommended by manufacturer.
- Environment: Before, during and after laying, provide adequate ventilation and maintain temperature and humidity approximately at levels which will prevail after building is occupied.
- Finished coverings: Accurately fitted, tightly jointed, securely bonded, smooth and free from air bubbles, rippling, adhesive marks, stains, trowel ridges and high spots.

71 EDGINGS AND COVER STRIPS

- Manufacturer: Gradus.
  - Product reference: SC Range.
- Material / finish: Brushed stainless steel.
- Fixing: Secure (using matching fasteners where exposed to view) with edge of covering gripped.

79 SKIRTINGS

- Type: Meranti.
- Manufacturer: Submit proposals for architect approval.
- Product reference: Submit proposals for architect approval.
- Fixing: Securely bond with mitered corners.

80 COVED SKIRTINGS TO LINOLEUM TILES

- Type: Integral coved skirtings with stainless steel trims.
- Manufacturer: Forbo Flooring Systems to match sheet flooring.
- Product reference: Submit proposals for architect approval.
- Fixing: Securely bond with mitered corners.

85 WASTE

- Spare covering material: Retain suitable material for patching. On completion submit pieces for selection. Hand over selected pieces to employer.

M 60 Painting / Clear Finishing

COATING SYSTEMS

130 GLOSS PAINT TO NEW RAINWATER GOODS

- Manufacturer: Dulux or equal approved.
- Surfaces: Cast iron.
  - Preparation: Degrease the surface where necessary with ICI oil and grease remover, wash down and allow to dry. Power or hand tool clean to St3 BS 7079 Part A1: 1989.
- Initial coats: Prime all bare metal with one coat of Dulux Trade Metalshield Zinc Phosphate Primer, applied to give a minimum wet film thickness of 115 microns, giving a minimum dry film thickness of 50 microns.
- Finishing coats: Two coats of Dulux Trade Metalshield Gloss Finish, each applied to give a minimum wet film thickness of 80 microns per coat, giving a minimum dry film thickness of 40 microns per coat.
- Concealed metal surface:
  - General: Apply additional coatings to surfaces that will be concealed when component is fixed in place.
  - Components: Interior of rainwater pipes – allow for paint dipping and draining of all rainwater good components to ensure all surfaces are covered, including the interior of the rainwater pipes.

140 EMULSION PAINT TO NEW PLASTERBOARD WALLS

- Manufacturer: Dulux or equal approved.
  - Product reference: Contractor's choice.
- Surfaces: Plasterboard.
  - Preparation: Submit method statement.
- Initial coats: 10 % thinned primer (mist coat).
  - Number of coats: One.
- Undercoats: As recommended by manufacturer.
  - Number of coats: One.
- Finishing coats: Matt vinyl.
  - Number of coats: Two.

145 INTERNAL PAINT TO NEW LIME PLASTERED WALLS

- Manufacturer: Keim Mineral Paints Ltd
  - Website: www.keimpaints.co.uk
  - Email: sales@keimpaints.co.uk
  - Product reference: Keim Optil.
- Primer: Keim Granital Dilution to lime plasters.
  - Number of coats: Two.
  - Colour: To be colour matched to the existing (off-white).

150 EGGSHELL PAINT TO INTERNAL JOINERY

- Manufacturer: Dulux or equal approved.
  - Product reference: Contractor's choice.
- Surfaces: New and existing joinery.
  - Preparation: Submit method statement.
- Initial coats: Wood primer for new joinery.
  - Number of coats: One.
- Undercoats: As recommended by manufacturer.
  - Number of coats: One.
- Finishing coats: Eggshell.
  - Number of coats: Two.

160 HARD WAX STAIN FINISH TO NEW OAK PANELLING

- Manufacturer: Treatex or equal approved.
  - Product reference: Clear Hardwax Oil.
- Surfaces: European oak.
  - Preparation: Wood surface must be dust and dirt-free and thoroughly dry. Clear Hardwax Oil is ready to use; do not thin. Ensure product is at room temperature before use and stir well.
- Coats: Clear Hardwax Oil.
  - Number of coats: Two.
  - Application: Apply with brush or roller to evenly apply. On doors pay particular attention to end grain (on end grain apply wet on wet until product is no longer absorbed by the wood). Allow to dry for approximately three – six hours with good ventilation and then apply second coat. Submit samples for architect approval.

GENERAL

215 HANDLING AND STORAGE

- Coating materials: Deliver in sealed containers, labelled clearly with brand name, type of material and manufacturer's batch number.
- Materials from more than one batch: Store separately.

280 PROTECTION

- 'Wet paint' signs and barriers: Provide where necessary to protect other operatives and general public, and to prevent damage to freshly applied coatings.

PREPARATION

400 PREPARATION GENERALLY

- Standard: In accordance with BS 6150.
- Refer to any pre-existing health and safety files or construction phase plans where applicable.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation and obtain approval before commencing work.
- Preparation materials: Types recommended by their manufacturer and the coating manufacturer for the situation and surfaces being prepared.
- Substrates: Sufficiently dry in depth to suit coating.
- Efflorescence salts: Remove.
- Dirt, grease and oil: Remove. Give notice if contamination of surfaces / substrates has occurred.
- Surface irregularities: Remove and provide smooth finish.
- Joints, cracks, holes and other depressions: Fill flush with surface and provide smooth finish.
- Dust, particles and residues from preparation: Remove and dispose of safely.
- Water-based stoppers and fillers:
    - Apply before priming unless recommended otherwise by manufacturer.
    - If applied after primer: Patch prime.
- Oil-based stoppers and fillers: Apply after priming.
- Doors, opening windows and other moving parts:
    - ease, if necessary, before coating,
    - prime resulting bare areas.

420 FIXTURES AND FITTINGS

- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation and obtain approval before commencing work.
- Removal before commencing work: Any surface mounted fixtures and fittings (ironmongery, cover plates, grilles, vents, etc.).
- Replacement: Refurbish as necessary and refit when coating is dry.

440 PREVIOUSLY COATED SURFACES GENERALLY

- Preparation: In accordance with BS 6150 Clause 11.5.
- Contaminated or hazardous surfaces: Give notice of:
  - coatings suspected of containing lead,
  - substrates suspected of containing asbestos or other hazardous materials,
  - significant rot, corrosion or other degradation of substrates.
- Suspected existing hazardous materials: Prepare risk assessments and method statements covering operations, disposal of waste, containment and reoccupation and obtain approval before commencing work.
- Removing coatings: Do not damage substrate and adjacent surfaces or adversely affect subsequent coatings.
- Loose, flaking or otherwise defective areas: Carefully remove to a firm edge.
- Alkali affected coatings: Completely remove.
- Retained coatings:
  - Thoroughly clean to remove dirt, grease and contaminants.
  - Gloss coated surfaces: Provide key.
- Partly removed coatings:
  - Additional preparatory coats: Apply to restore original coating thicknesses.
  - Junctions: Provide flush surface.
- Completely stripped surfaces: Prepare as for uncoated surfaces.

500 WOOD PREPARATION

- General: Provide smooth even finish with lightly rounded arrises.
- Degraded or weathered surface wood: Take back surface to provide suitable substrate.
- Degraded substrate wood: Repair with sound material of same species.
- Heads of fasteners: Countersink sufficient to hold stoppers / fillers.
- Resinous areas and knots: Apply two coats of knotting.
- Defective primer: Take back to bare wood and reprime.

550 PLASTER PREPARATION

- Nibs, trowel marks and plaster splashes: Scrape off.
- Overtrowelled 'polished' areas: Provide suitable key.

622 ORGANIC GROWTHS

- Dead and loose growths and infected coatings: Scrape off and remove from site.
- Treatment biocide: Apply appropriate solution to growth areas and surrounding surfaces.
- Residual effect biocide: Apply appropriate solution to inhibit reestablishment of growths.

APPLICATION

711 COATING GENERALLY

- Application standard: In accordance with BS 6150 Clause 9.
- Conditions: Maintain a suitable temperature, humidity and air quality during application and drying.
- Surfaces: Clean and dry at time of application.
- Thinning and intermixing of coatings: Not permitted unless recommended by manufacturer.
- Overpainting: Do not paint over intumescent strips or silicone mastics.
- Priming coats:
  - Thickness: To suit surface porosity.
  - Application: As soon as possible on same day as preparation is completed.
- Finish:
  - Even, smooth and of uniform colour.
  - Free from brush marks, sags, runs and other defects.
  - Cut in neatly.
- Doors, opening windows and other moving parts: Ease before coating and between coats.

730 WORKSHOP COATING OF CONCEALED JOINERY SURFACES

- General: Apply coatings to all surfaces of components.

740 STAINING WOOD

- Primer: Apply if recommended by stain manufacturer.
- Application: Apply in flowing coats and brush out excess stain to produce uniform appearance.

N 10 General Fixtures / Furnishings / Equipment

76 MIRRORS TO AREA A AND AREA C

- Material: Class C safety glass to BS 6206.
- Quality: Free from tarnishing, discolouration, scratches and other defects visible in the designed viewing conditions. Reflection undistorted.
- Size: 1,000 mm (height) x 550 mm (width).
- Backing: Aluminium foil.
- Edges: Square-edged.
- Fixing: CP dome top wood screws with polyethylene sleeves and washers.
- Installation: Accurately with sides vertical.

EXECUTION

91 MOISTURE CONTENT OF WOOD AND WOOD BASED BOARDS

- Temperature and humidity: During delivery, storage, fixing and through to handover, maintain conditions to suit specified moisture contents of timber components.
- Testing: When instructed, test components with approved moisture meter to manufacturer's recommendations.

92 INSTALLATION GENERALLY

- Fixing and fasteners: As per Section Z 20.
- Services: As per mechanical and electrical engineer's specification.

93 SEALANT BEDDING AND POINTING

- Application: As per Section Z 22.
- Pointing: Between units and splashbacks and joints between units and floor.

COMPLETION

96 GENERAL

- Ironmongery: Check, adjust and lubricate to ensure correct functioning.

97 APPLIANCES

- Test: Ensure that all functions and features work correctly.
- Documentation: Submit guarantees and instruction manuals.

N 11 Domestic Kitchen Fittings, Furnishings and Equipment

Suitability of all products to be checked and confirmed prior to ordering.

15 FITTED KITCHEN UNITS

- Manufacturer: Howdens Joinery Company.
  - Product reference: To be confirmed by architect.
- Dimensions: To BS EN 1116.
- Surfaces / finishes: To BS 6222-3.
- Material: To be confirmed by architect.
- Finish and colour: To be confirmed by architect.
- Other: Include for under counter integrated fridge. Submit proposals for architect approval.

25 KITCHEN WORKTOP

- Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Material: Stainless steel with solid core base (i.e. plywood). Submit samples for architect approval.

35 SINKS, TAPS, TRAPS AND WASTES

- Sink: [Catering Sink Single Bowl and Double Drainer]
  - Manufacturer: Leisure Sinks.
  - Product reference: LR11601TH/ Linear Stainless Steel Inset Sink or equal approved.
  - Configuration: Single bowl and double drainer.
  - Material: Stainless steel.
  - Colour and finish: Polished.
- Tap / chainstay / overflow holes: No chainstay or overflow hole.
- Tap: Swan neck tap.
  - Manufacturer: Bristan.
  - Product reference: MZ SNK EF C Monza Easyfit Mono Sink Mixer Chrome.
- Trap: Tubular.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
  - Size: To fit waste.
  - Depth of seal (minimum): 75 mm.
- Waste:
  - Bedding: Waterproof jointing compound.
  - Fixing: With resilient washer between appliance and backnut.
- Accessories: Standing tube overflow and support brackets.

35A SINKS, TAPS, TRAPS AND WASTES

- Sink: [Catering Hand Wash Basin]
  - Manufacturer: Franke Water Systems.
  - Product reference: D20140N Round Insert Sink Bowl or equal approved.
  - Configuration: Single bowl.
  - Material: Stainless steel.
  - Colour and finish: Satin.
- Tap / chainstay / overflow holes: No chainstay or overflow hole.
- Tap: Swan neck tap.
  - Manufacturer: Bristan.
  - Product reference: MZ SNK EF C Monza Easyfit Mono Sink Mixer Chrome.
- Trap: Tubular.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
  - Size: To fit waste.
  - Depth of seal (minimum): 75 mm.
- Waste:
  - Bedding: Waterproof jointing compound.
  - Fixing: With resilient washer between appliance and backnut.
- Accessories: Standing tube overflow and support brackets.

45 APPLIANCES

- Item: Directly sourced by client.
  - Manufacturer: Various.
  - Product reference: As chosen by client.
- Colour and finish: As chosen by client.

55 SEALANT

- Standard: To BS EN ISO 11600 Class F 20 HM.
- Type: Kitchen sealant.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Colour: To be agreed.

N 13 Sanitary Appliances and Fittings

Suitability of all products to be checked and confirmed prior to ordering.

16 ACCESSIBLE W.C. EQUIPMENT PACKAGE TO AREA A

- Type: Doc M Contour 21 Wall-Mounted Left-Hand Corner Pack.
- Manufacturer: Armitage Shanks.
  - Product reference: S6972(AA) Doc M Contour 21 Wall-Mounted Left-Hand Corner Pack – rimless W.C. pan and support brackets, water saving dual flush Conceala cistern, grab rails, luxury back support, hinged support rail with toilet roll holder, seat no cover with retaining buffers and copper tails on TMV3 mixer tap.
  - Finish: White Vitreous China.
  - Handed: Left.

17 W.C. ON IPS SYSTEM TO AREA C

- Type: Wall-mounted W.C. on IPS system (pre-plumbed wall duct access).
- Cubicle Systems Ltd or similar approved.
- Module 2 Half-Height Wall-Hung W.C.
- Load tested to in excess of 200 Kg.
- Standard IPS steel frame and panel set.
- Pan:
  - Manufacturer: Olympus.
  - Product reference: Rema Wall-Hung Pan.
  - Finish: White.
- Cistern: Pneumatic dual-flush cistern.
- Seat and cover:
  - Manufacturer: Olympus.
  - Product reference: Rema Seat and Lid.
  - Finish: White.
- Flushing arrangement: Pneumatic dual-flush push button set.
- Pan to soil connector.
- Flexi cold water connector with shut off valve.
- All necessary pipes, fittings and fixtures.

32 HANDWASH BASINS

- Manufacturer: Armitage Shanks.
  - Product reference: S2474 Contour 21 37 cm Handrinse Washbasin Right-Hand Taphole – no overflow or chainstay hole, bottom outlet.
  - Finish: White Vitreous China.
  - Handed: Right.
- Water supply fittings: A4169 Contour 21 Washbasin Mixer – thermostatic 1 hole, single sequential long lever, copper tube inlet, chrome-plated metal with alternative anti-splash or aerator outlets.
- Wastes: Pop-up waste.
- Traps: S8920 Trap 1 ¼ " Resealling Bottle – 75 mm seal, plastic.
- Accessories: S9006 Isolating Valve ½ " – with screwdriver control, inlet for 15 mm copper, outlet with ½ " BSP female swivel capnut.

33 BABY CHANGING UNIT TO AREA A AND AREA C

- Manufacturer: Magrini Ltd.
  - Telephone: 01543 375311.
  - Type: Horizontal Wall-Mounted Baby Changing Unit.
  - Product reference: MH 42 or equal approved.
  - Size: 585 mm (height) x 760 mm (width) x 145 mm (closed depth) / 540 mm (open depth).
  - Material: MDPE with enclosed stainless steel reinforced hinge and gas strut closing mechanism.
  - Finish: Oatmeal or White Fleck. To be agreed.
- Installation kit as supplied by manufacturer.
- Fully compliant with BS EN 12221:2008 + A1:2013 and Decree 91-1292 for use in the public domain.
- The baby changing unit must be fixed to the wall for safe use of the product.
- The unit does not require a changing pad and therefore no changing pad is supplied.

34 AUTOMATIC HAND DRYER TO AREA A

- Manufacturer: Stream Hygiene.
  - Product reference: 4604 Windsor Hand Dryer or equal approved.
  - Size: 320 mm (height) x 295 mm (width) x 165 mm (depth).
  - Material: Stainless steel.
  - Finish: Satin.

35 ACCESSORIES PACK TO AREA A AND AREA C

- Manufacturer: Trade Washrooms.
  - Product reference: TWDOCMAC Doc M Accessories Pack.
  - Contents: Soap dispenser, paper towel dispenser and toilet paper dispenser.
  - Size: Soap dispenser 196 mm (height) x 96 mm (width) x 97 mm (depth); paper towel dispenser 215 mm (height) x 262 mm (width) x 128 mm (depth); and toilet paper dispenser 277 mm (height) x 133 mm (width) x 110 mm (depth).
  - Material: Stainless steel.
  - Finish: Brushed finish.

68 SEALANT FOR POINTING

- Standard: To BS EN ISO 11600.
  - Class: F20 HM.
- Type: Silicone.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
- Colour: White.

70 INSTALLATION GENERALLY

- Assembly and fixing: Fix appliances securely to structure, without taking support from pipelines, level and plumb so that surfaces designed to fall drain as intended.
- Jointing and bedding compounds: Recommended by manufacturers of appliances, accessories and pipes, to form watertight joints between appliances and backgrounds (except cisterns) and between appliances and discharge pipes.

75 CISTERNS

- Cistern operating components: Obtain from cistern manufacturer.
- Inlet and flushing valves. Match to pressure of water supply.
- Internal overflows: Into pan to give visible warning of discharge.
- External overflows: Fix pipes to falls and locate to give visible warning of discharge. Agree position.

P 20 Unframed Isolated Trims / Skirtings / Sundry Items

120 HARDWOOD SKIRTINGS, TRIMS, ETC.

- Quality of wood and fixing: To BS 1186-3.
  - Species: European oak.
  - Class: J10.
- Moisture content at time of fixing: 9 – 13 %.
- Preservative treatment: Not required.
- Fire rating: Not applicable.
- Profile: See drawings.
  - Finished size: See drawings.
- Finish as delivered: Sanded.
- Fixing: Plugged, screwed and pelleted.

510 INSTALLATION GENERALLY

- Joinery workmanship: As per Section Z 10.
- Methods of fixing and fasteners: As per Section Z 20 where not specified.
- Straight runs: To be in one piece or in long lengths with as few joints as possible.
- Running joints: Location and method of forming to be agreed where not detailed.
- Joints at angles: Mitre, unless shown otherwise.
- Position and level: To be agreed where not detailed.

P 21 Door / Window Ironmongery

PRE-TENDER

10 QUANTITIES AND LOCATIONS

- Quantities and locations of ironmongery are yet to be agreed.
- Fixing: As per Section L 10 and Section L 20.

GENERAL

170 IRONMONGERY FOR FIRE DOORS

- Relevant products: Ironmongery fixed to, or morticed into, the component parts of a fire-resisting door assembly.
- Compliance: Ironmongery included in successful tests to BS 476-22 or BS EN 1634-1 on door assemblies similar to those proposed.
    - Certification: Submit Certifire certificates.
- Melting point of components (except decorative non-functional parts): 800°C minimum.

R 10 Rainwater Pipework / Gutters

Fabric Repair Works

TYPES OF PIPEWORK / GUTTER

130 CAST IRON PIPEWORK FOR EXTERNAL USE

- Pipes, fittings and accessories: To BS 460.
  - Manufacturer and reference: J & J W Longbottom Ltd, Bridge Foundry, Holmfirth, Huddersfield, HD9 7AW or equal approved.
  - Type: Cast iron circular rainwater pipe.
  - Size: Size and profile to match existing.
  - Finish / colour: Delivered dipped and primed for painting. Apply one coat of undercoat and two coats of gloss paint prior to installation. Touch up any damage or scratches when fixed.
  - Method of fixing: Stainless steel bolts, stainless steel bobbins and hardwood plugs.

INSTALLATION

400 BEFORE COMMENCING WORK SPECIFIED IN THIS SECTION

- Ensure that:
  - below ground drainage is ready to receive rainwater or that the discharge can be dispersed by approved means to prevent damage or disfigurement of the building fabric,
  - any specified painting of surfaces which will be concealed or inaccessible is completed.

410 INSTALLATION GENERALLY

- Install pipework / gutters to ensure the complete discharge of rainwater from the building without leaking.
- Obtain all components for each type of pipework / guttering from the same manufacturer unless specified otherwise.
- Provide access fittings and rodding eyes as necessary in convenient locations to permit adequate cleaning and testing of pipework.
- Avoid contact between dissimilar metals and other materials which would result in electrolytic corrosion.
- Do not bend plastics or galvanized steel pipes.
- Adequately protect pipework / gutters from damage and distortion during construction. Fit purpose made temporary caps to prevent ingress of debris. Fit all access covers, cleaning eyes and blanking plates as the work proceeds.
- Where not specified otherwise use plated, sherardized, galvanized or non-ferrous fastenings suitable for the purpose and background and compatible with the material being fixed.

450 RAINWATER OUTLETS

- Ensure that:
  - outlets are securely fixed before connecting pipework,
  - junctions between outlets and pipework can accommodate all movement in the structure and pipework.

460 FIXING PIPEWORK

- Fix securely at specified centers plumb and / or true to line.
- Make changes in direction of pipe runs only where shown on drawings unless otherwise approved.
- Fix branches and low gradient sections with uniform and adequate falls to drain efficiently.
- Fix externally socketed pipes / fittings with sockets facing upstream.
- Provide additional supports as necessary to support junctions and changes in direction.
- Fix every length of pipe at or close below the socket collar or coupling.
- Provide a load bearing support for vertical pipes at not less than every story level. Tighten fixings as the work proceeds so that every story is self-supporting and undue weight is not imposed on fixings at the base of the pipe.
- Provide for thermal and building movement when fixing and jointing and ensure that clearances are not reduced as fixing proceeds.
- Fix expansion joint pipe sockets rigidly to the building and elsewhere use fixings that allow the pipe to slide.

465 JOINTING PIPEWORK / GUTTERS

- Joint using materials, fittings and techniques which will make effective and durable connections.
- Joint differing pipework / gutter systems with adaptors recommended by manufacturer(s).
- Cut ends of pipes to be clean and square with burrs and swarf removed. Chamfer pipe ends before inserting into ring seal sockets.
- Ensure that jointing or mating surfaces are clean, and where necessary lubricated, immediately before assembly.
- Form junctions using fittings intended for the purpose ensuring that jointing material does not project into bore of pipes, fittings and appliances.
- Remove surplus flux / solvent / cement / sealant from joints.

Z 12 Preservative / Fire Retardant Treatment

10 TREATMENT APPLICATION

- Timing: After cutting and machining timber, and before assembling components.
- Processor: Licensed by manufacturer of specified treatment solution.
- Certification: For each batch of timber provide a certificate of assurance that treatment has been carried out as specified.

21 COMMODITY SPECIFICATIONS

- Standard: Current edition of the British Wood Preserving and Damp-proofing Association (BWPDA) Manual.

25 PRESERVATIVE TREATMENT SOLUTION STRENGTHS / TREATMENT CYCLES

- General: Select to achieve specified service life and to suit treatability of specified wood species.

41 ORGANIC SOLVENT PRESERVATIVE TREATMENT TO NEW TIMBER GENERALLY

- Solution:
  - Manufacturer: Lonza Wood Protection or equal approved.
  - Product reference: Tanalith or equal approved.
  - Application: Double vacuum and low pressure impregnation, or immersion.
- Moisture content of wood:
  - At time of treatment: As specified for the timber / component at time of fixing.
  - After treatment: Timber to be surface dry before use.

50 FIRE RETARDANT TREATMENT

- Solution type: Internal.
  - Manufacturer: Contractor's choice.
  - Product reference: Contractor's choice.
  - Application: Vacuum and pressure impregnation.
- Moisture content of wood:
  - At time of treatment: As specified for the timber / component at time of fixing.
  - After treatment: Timber to be redried slowly at temperatures not exceeding 60° to minimize distortion and degradation.

Z 20 Fixings and Adhesives

PRODUCTS

12 FASTENERS GENERALLY

- Materials to have:
  - bimetallic corrosion resistance appropriate to items being fixed,
  - atmospheric corrosion resistance appropriate to fixing location.

13 MASONRY FIXINGS

- Light duty: Plugs and screws.
- Heavy duty: Expansion anchors or chemical anchors.

14 PLUGS

- Type: Proprietary types to suit substrate, loads to be supported and conditions expected in use.

15 ADHESIVES GENERALLY

- Standards:
  - Hot-setting phenolic and aminoplastic: To BS 1203.
  - Thermosetting wood adhesives: To BS EN 12765.
  - Thermoplastic adhesives: To BS EN 204.

EXECUTION

29 FIXING GENERALLY

- Integrity of supported components: Select types, sizes, quantities and spacings of fixings, fasteners and packings to retain supported components without distortion or loss of support.
- Components, substrates, fixings and fasteners of dissimilar metals: Isolate with washers / sleeves to avoid bimetallic corrosion.
- Appearance: Fixings to be in straight lines at regular centers.

31 FIXING THROUGH FINISHES

- Penetration of fasteners and plugs into substrates: To achieve a secure fixing.

41 FIXING PACKINGS

- Function: To take up tolerances and prevent distortion of materials and components.
- Limits: Do not use packings beyond thicknesses recommended by fixings and fasteners manufacturer.
- Locations: Not within zones to be filled with sealant.

42 FIXING CRAMPS

- Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centers.
- Fasteners: Fix cramps to frames with screws of same material as cramps.
- Fixings in masonry work: Fully bed in mortar.

51 PELLETED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Pellets: Cut from matching timber, match grain and glue in to full depth of hole.
- Finished level of pellets: Flush with surface.

56 PLUGGED COUNTERSUNK SCREW FIXING

- Finished level of countersunk screw heads: Minimum 6 mm below timber surface.
- Plugs: Glue in to full depth of hole.
- Finished level of plugs: Projecting above surface.

61 APPLYING ADHESIVES

- Surfaces: Clean. Adjust regularity and texture to suit bonding and gap filling characteristics of adhesive.
- Support and clamping during setting: Provide as necessary. Do not mark surfaces or distort components being fixed.
- Finished adhesive joints: Fully bonded. Free of surplus adhesive.

Z 21 Mortar and Repointing

HYDRAULIC LIME MORTAR

110 PRODUCT

- Hydraulic lime mortar 1 : 2 ½ - 3 using a moderately hydraulic lime (St. Astier NHL 3.5 or similar approved) and well-graded sand aggregates from 2.5 mm down to 75 microns.
- Suppliers to be consulted for variations in aggregates to achieve required distribution and colour. Mixing and usage to be strictly in accordance with supplier's recommendations.

120 MATERIALS

- Hydraulic lime or pre-mixed hydraulic lime mortar may be obtained from or equal approved:

  - Wormersley Associates
    Walkley Lane
    Heckmondwike
    WF16 0PG
    Telephone: 01924 400651
    Fax: 01924 403489

  - Wenlock Lime Ltd
    The Coats Kiln
    Stretton Road
    Much Wenlock
    TF13 6DG
    Telephone: 01952 728611
    Fax: 01952 728361

  - Telling Lime Products Ltd
    Primrose Avenue
    Fordhouses
    Wolverhampton
    WV10 8AW
    Telephone: 01902 709777
    Fax: 01902 398777

130 FINE AGGREGATES

- All sand shall be to BS 1200, well-graded, non-staining, clean sharp coarse sand, uncontaminated by clay / silt. Sand shall be selected so that when the mortar has dried out the colour will match the colour and texture of the original mortar, unless instructed otherwise in writing by the architect.
- For work requiring very fine joints in the masonry, sand grain size may impede filling the joints. In these instances, fine stone dust or brick dust should replace the sand as the fine aggregate.
- Suppliers of lime to be consulted on suitability of sands proposed. Ideally sand to be obtained from the supplier of the lime.

140 PREPARATION OF COARSE STUFF

- Mortar is to be a lime sand mortar and is to be prepared from 'coarse stuff' in the following manner:
  - Lime and sand 'coarse stuff' is to be prepared by mixing fine aggregate with hydraulic lime in the preparation of three parts aggregate to one part lime by volume with only sufficient water added to make the mixture workable. The mix is to match the existing mortar in colour and texture. Submit samples for architect approval.

145 PROVISIONAL MIX OF AGGREGATE

- Prepare sample pointing area using the following mix of aggregates:
  - 1 part Waddington Fell Fine Washed River Sand
  - ½ part Waddington Fell Course Washed River Sand
  - 1 ½ part Nosterfield Washed River Sand

150 COLD WEATHER PROTECTION

- No work involving the preparation of mortar or the laying of stonework shall be undertaken when at or below 5°C and falling or below 3°C and rising.

160 PROTECTION

- All work is to be protected from the frost and rain with hessian sheets for a minimum of seven days or until the mortar has cured if longer.
- In warm weather the work is to be protected with hessian sheets which should be kept moist at all times to avoid curing occurring too quickly.

170 DAMAGE DUE TO WEATHER

- Any work affected by the weather is to be cut out and replaced at the contractor's expense.

Z 22 Sealants

31 JOINTS TO NEW DOORS AND WINDOW SURROUNDS

- Primer, backing strip, bond breaker: As recommended by sealant manufacturer.

EXECUTION

61 SUITABILITY OF JOINTS

- Pre-sealing checks:
  - Joint dimensions: Within limits specified for the sealant.
  - Substrate quality: Surfaces regular, undamaged and stable.
- Joints not fit to receive sealant: Submit proposals for rectification.

62 PREPARING JOINTS

- Surfaces to which sealant must adhere:
  - remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond,
  - clean using materials and methods recommended by sealant manufacturer.
- Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.
- Backing strip and / or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.
- Protection: Keep joints clean and protect from damage until sealant is applied.

63 APPLYING SEALANTS

- Substrate: Dry (unless recommended otherwise) and unaffected by frost, ice or snow.
- Environmental conditions: Do not dry or raise temperature of joints by heating.
- Sealant application: Fill joints completely and neatly, ensuring firm adhesion to substrates.
- Sealant profiles:
  - Butt and lap joints: Slightly concave.
  - Fillet Joints: Flat or slightly convex.
- Protection: Protect finished joints from contamination or damage until sealant has cured.

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SYMBOL DESCRIPTION

POWER & ANCILLARY

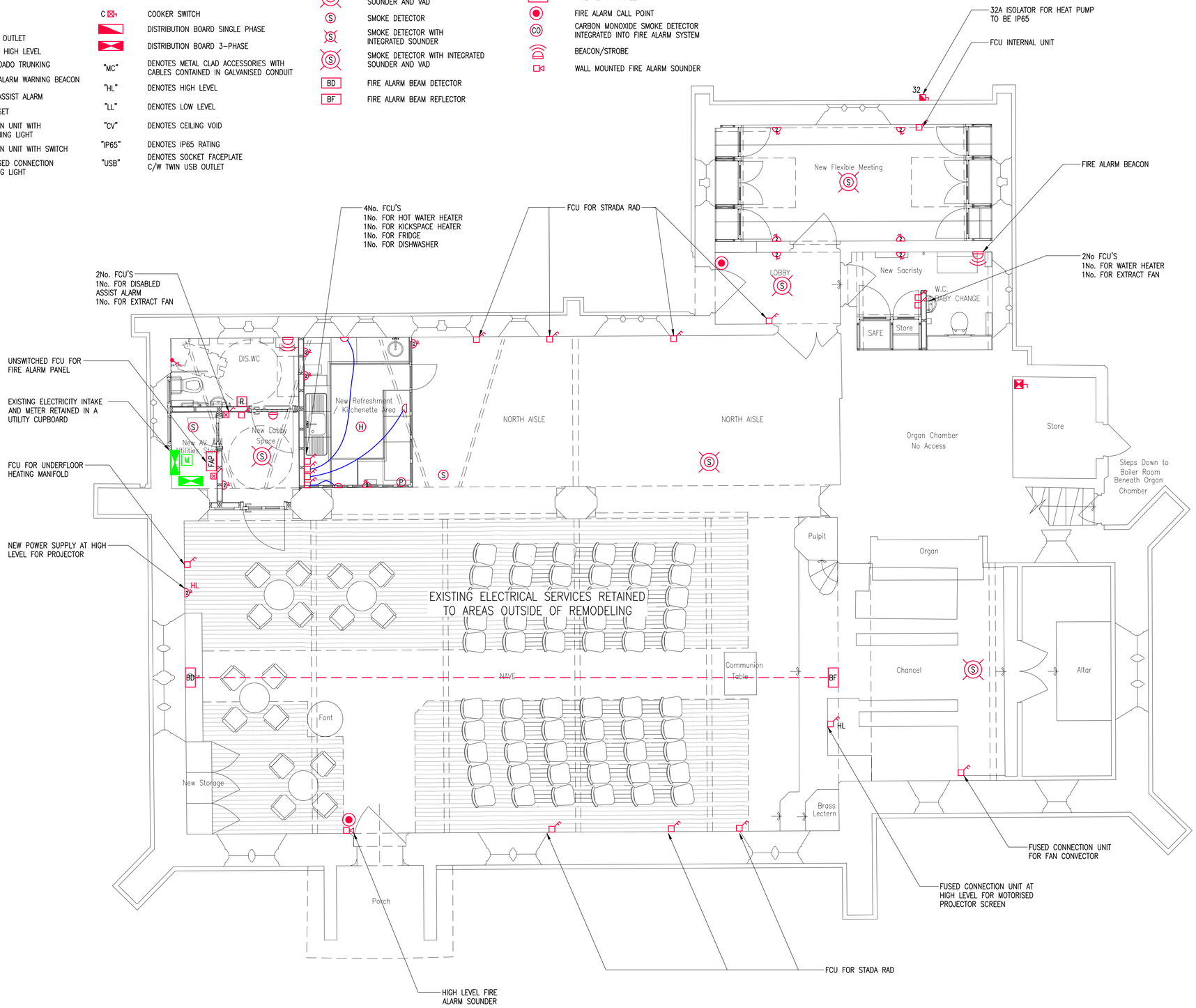
- SINGLE 13A UN-SWITCHED SOCKET OUTLET
- SINGLE 13A SWITCHED SOCKET OUTLET
- DOUBLE 13A SWITCHED SOCKET OUTLET
- FLEX OUTLET
- S — SHAVER SOCKET
- DUAL CAT 6 DATA OUTLET
- DADO DROP FROM HIGH LEVEL
- 3 COMPARTMENT DADO TRUNKING
- DISABLED ASSIST ALARM WARNING BEACON
- PULL CORD FOR ASSIST ALARM
- R — ASSIST ALARM RESET
- FUSED CONNECTION UNIT WITH SWITCH AND WARNING LIGHT
- FUSED CONNECTION UNIT WITH SWITCH
- UN-SWITCHED FUSED CONNECTION UNIT WITH WARNING LIGHT

- TV/R — TELEVISION AND RADIO AERIAL SOCKET
- SINGLE PHASE ISOLATOR
- THREE PHASE ISOLATOR
- C — COOKER SWITCH
- DISTRIBUTION BOARD SINGLE PHASE
- DISTRIBUTION BOARD 3-PHASE
- "MC" — DENOTES METAL CLAD ACCESSORIES WITH CABLES CONTAINED IN GALVANISED CONDUIT
- "HL" — DENOTES HIGH LEVEL
- "LL" — DENOTES LOW LEVEL
- "CV" — DENOTES CEILING VOID
- "IP65" — DENOTES IP65 RATING
- "USB" — DENOTES SOCKET FACEPLATE C/W TWIN USB OUTLET

FIRE SERVICES

- H — HEAT DETECTOR
- H — HEAT DETECTOR WITH INTEGRATED SOUNDER
- H — HEAT DETECTOR WITH INTEGRATED SOUNDER AND VAD
- S — SMOKE DETECTOR
- S — SMOKE DETECTOR WITH INTEGRATED SOUNDER
- S — SMOKE DETECTOR WITH INTEGRATED SOUNDER AND VAD
- BD — FIRE ALARM BEAM DETECTOR
- BF — FIRE ALARM BEAM REFLECTOR

- M — MAINS INTERLINKED MULTI SMOKE/HEAT DETECTOR
- FAI — FIRE ALARM INTERFACE
- FAP — FIRE ALARM PANEL
- FIRE ALARM CALL POINT
- CO — CARBON MONOXIDE SMOKE DETECTOR INTEGRATED INTO FIRE ALARM SYSTEM
- BEACON/STROBE
- WALL MOUNTED FIRE ALARM SOUNDER



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2. DO NOT SCALE. ALL DIMENSIONS IN MM TAKE ALL MEASUREMENTS ON SITE

AMENDMENTS

NO.	DATE	DESCRIPTION	DRAWN	APP
P	10.10.22	PRELIMINARY ISSUE	JT	BC

BCA
BOB COSTELLO ASSOCIATES LTD
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PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

ELECTRICAL SERVICES
GROUND FLOOR PLAN
POWER, ANCILLARY &
FIRE SERVICES

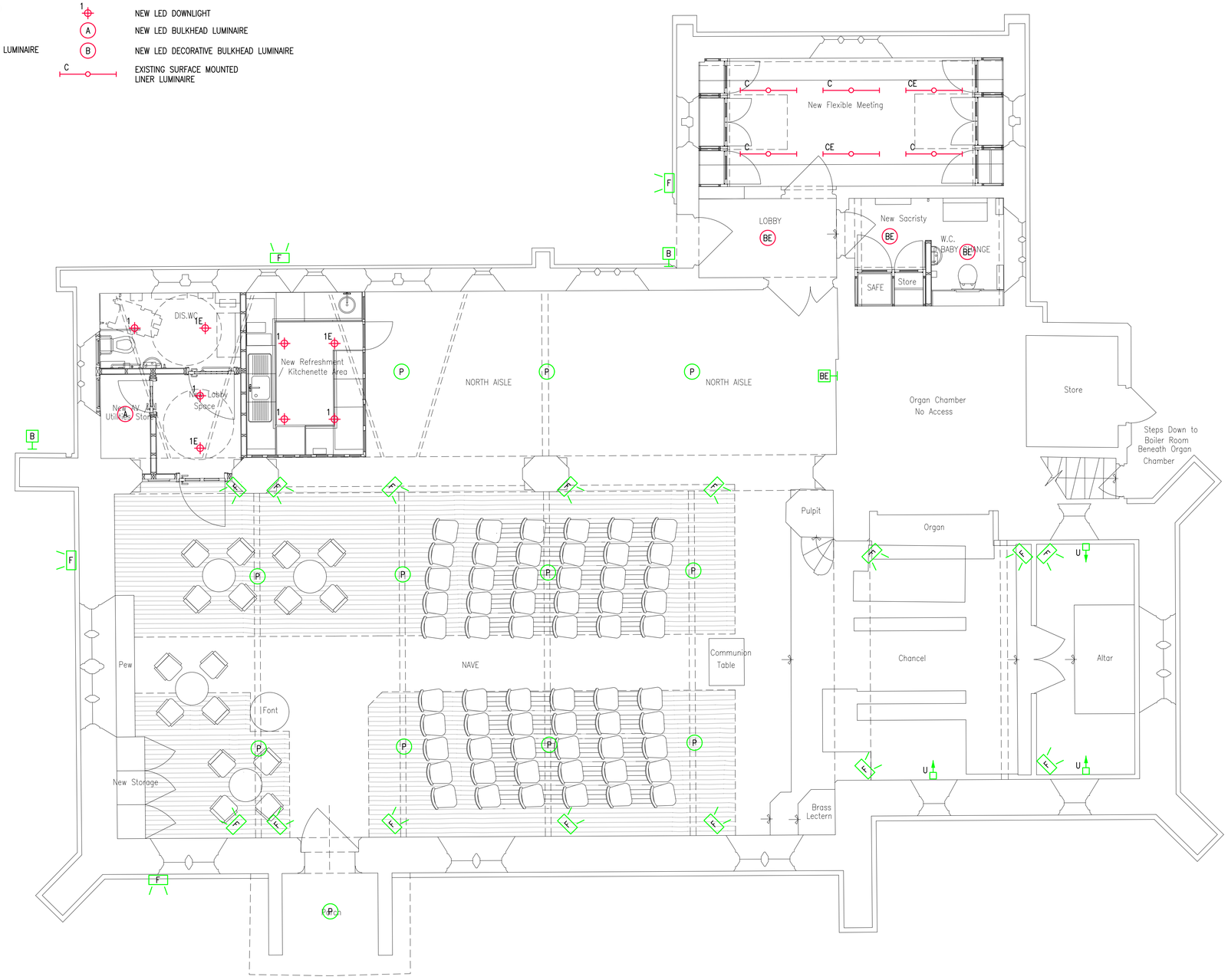
DRAWN	JT	APP	DM
DATE	AUGUST 2022		
SCALE	1:50 at A1		
DRG.No.:	754-E-501	REV	P

SYMBOL DESCRIPTION

- LIGHTING SWITCH
- 2 WAY LIGHTING SWITCH
- D — DIMMABLE LIGHTING SWITCH
- K — EMERGENCY LIGHTING TEST SWITCH
- CEILING MOUNTED PULL-CORD LIGHTING SWITCH
- INTERMEDIATE SWITCH
- MS — MICRO-SWITCH
- 5 — 5A SOCKET OUTLET
- EXIT — EMERGENCY EXIT SIGN-WALL MOUNTED
- 3 — TRIPLE POLE ISOLATOR SWITCH
- "E" — DENOTES 3Hr EMERGENCY VARIANT OF LUMINAIRE
- DISTRIBUTION BOARD SINGLE PHASE
- DISTRIBUTION BOARD 3-PHASE
- PINK HIDDEN SPLINE DENOTES CIRCUIT GROUPS
- DBX/XLX
- BLUE SPLINE DENOTES LUMINAIRE SWITCHING CONTROL GROUPS

- P — EXISTING PENDANT LUMINAIRE
- F — EXISTING FLOOD LIGHT
- U — EXISTING UPLIGHT LUMINAIRE
- A — EXISTING SURFACE MOUNTED LINER LUMINAIRE
- B — EXISTING WALL MOUNTED LUMINAIRE
- 1 — NEW LED DOWNLIGHT
- A — NEW LED BULKHEAD LUMINAIRE
- B — NEW LED DECORATIVE BULKHEAD LUMINAIRE
- C — EXISTING SURFACE MOUNTED LINER LUMINAIRE

NOTE:
SERVICES SHOWN IN GREEN INDICATE EXISTING LUMINAIRES RETAINED AND RE-LAMPED DURING WORKS



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PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

ELECTRICAL SERVICES
GROUND FLOOR PLAN
LIGHTING

DRAWN JT	APP DM
DATE AUGUST 2022	
SCALE 1:50 at A1	
DRG.No.: 754-E-511	REV P

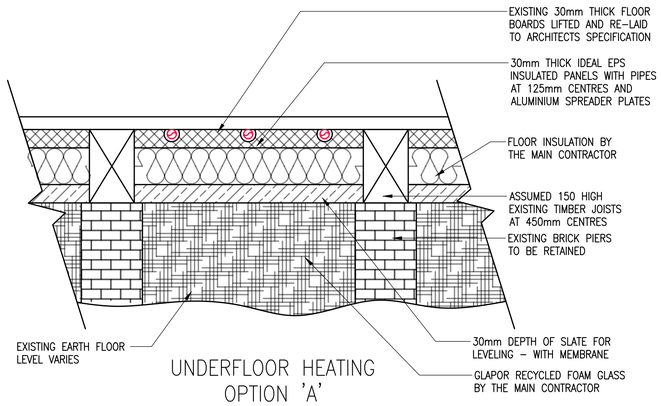
RADIATOR SCHEDULE

REF	ROOM	LENGTH (mm)	HEIGHT (mm)	DEPTH (mm)	MAKE	MODEL	TYPE	OUTPUT @ ΔT=50°C	OUTPUT @ ΔT=25°C
R/GF/01	DIS. WC	760	650	132	STELRAD	K2	LST	717	369
R/GF/02	NORTH AISLE	1000	650	165	JAGA	STRADA	DBE 16	3135	1347
R/GF/03	NORTH AISLE	1000	650	165	JAGA	STRADA	DBE 16	3135	1347
R/GF/04	NORTH AISLE	1200	650	165	JAGA	STRADA	DBE 16	3568	1534
R/GF/05	LOBBY	800	650	165	JAGA	STRADA	DBE 16	2218	954
R/GF/06	WC	760	650	132	STELRAD	K2	LST	717	369
R/GF/07	NAVE	1200	650	165	JAGA	STRADA	DBE 16	3568	1534
R/GF/08	NAVE	1200	650	165	JAGA	STRADA	DBE 16	3568	1534
R/GF/09	NAVE	1200	650	165	JAGA	STRADA	DBE 16	3135	1347

COLOUR OF RADIATORS TO BE SELECTED BY THE ARCHITECT

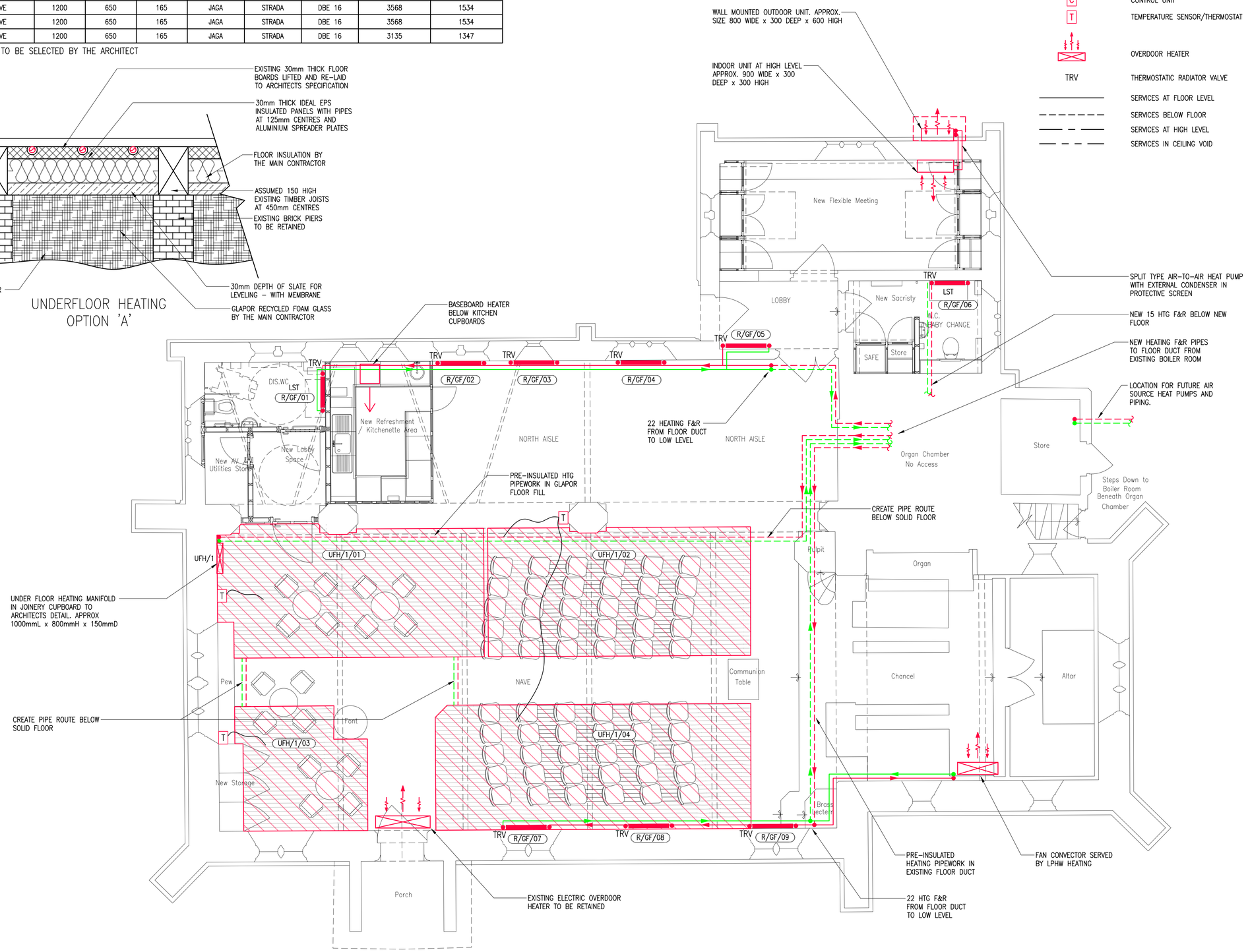
UNDERFLOOR HEATING SCHEDULE

REF	ROOM	AREA(m²)	OUTPUT(@55W/m²)	MANIFOLD
UFH/1/01	WEST END	20	1100W	UFH/1
UFH/1/02	NAVE	20	1100W	UFH/1
UFH/1/03	NAVE	9	495W	UFH/1
UFH/1/04	WEST END	24	1320W	UFH/1



UNDERFLOOR HEATING
OPTION 'A'

SYMBOL	DESCRIPTION
	RADIATOR
UFH	UNDERFLOOR HEATING MANIFOLD
	UNDERFLOOR HEATING
C	CONTROL UNIT
T	TEMPERATURE SENSOR/THERMOSTAT
	OVERDOOR HEATER
TRV	THERMOSTATIC RADIATOR VALVE
	SERVICES AT FLOOR LEVEL
	SERVICES BELOW FLOOR
	SERVICES AT HIGH LEVEL
	SERVICES IN CEILING VOID



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PROJECT

REORDERING OF CHRIST CHURCH WILLASTON IN WIRRAL

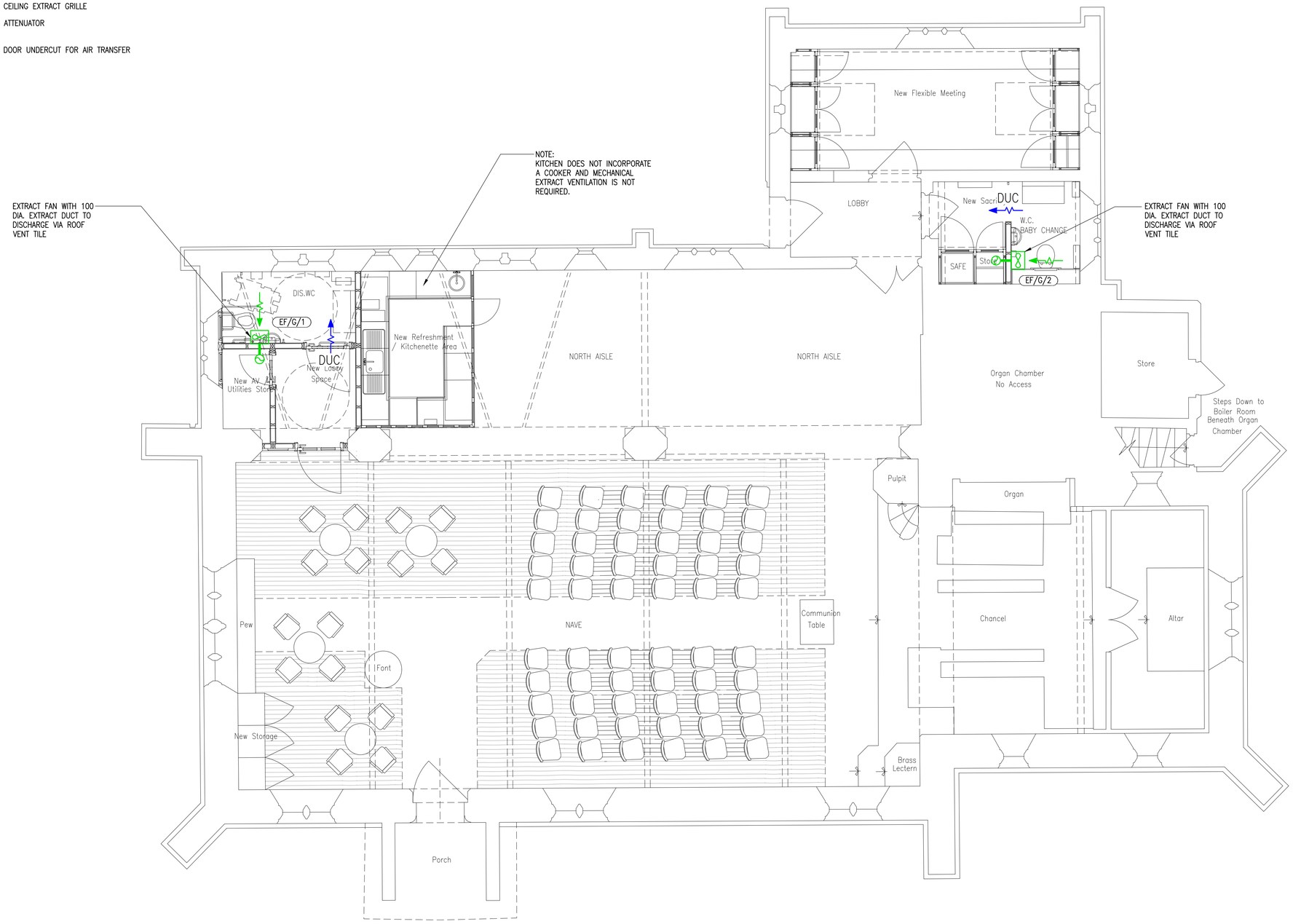
DRAWING TITLE

MECHANICAL SERVICES GROUND FLOOR PLAN HEATING

DRAWN	JT	APP	BC
DATE	AUGUST 2022		
SCALE	1:50 at A1		
DRG.No.:	754-M-301	REV	P

SYMBOL	DESCRIPTION
VCD	VOLUME CONTROL DAMPER
FD	FIRE DAMPER
	FAN
C	CONTROL UNIT
	AIR TRANSFER GRILLE
	AIR FLOW DIRECTION
	CEILING EXTRACT GRILLE
	ATTENUATOR
DUC	DOOR UNDERCUT FOR AIR TRANSFER

FAN SCHEDULE					
FAN REF	ROOM NAME	MAKE	MODEL	FLOW (l/s)	CONTROLS
EF/G/1	DIS. WC	VENT AXIA	ACM100	10	PIR SENSOR & TIMED RUN-ON
EF/G/2	BABY CHANGE WC	VENT AXIA	ACM100	10	PIR SENSOR & TIMED RUN-ON



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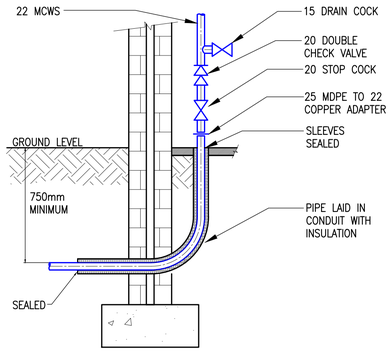
PROJECT

REORDERING OF CHRIST CHURCH WILLASTON IN WIRRAL

DRAWING TITLE

MECHANICAL SERVICES GROUND FLOOR PLAN VENTILATION

DRAWN	JT	APP	BC
DATE	AUGUST 2022		
SCALE	1:50 at A1		
DRG.No.:	754-M-311	REV	P



DETAIL A
TYPICAL WATER PIPE ENTRY INTO BUILDING
(NTS)

SYMBOL	DESCRIPTION
	HOT WATER OUTLET
	COLD WATER OUTLET
"MCWS"	MAINS COLD WATER SERVICE
"HWSF"	HOT WATER SERVICE FLOW

NOTE: ALL PIPES ARE 15mm
EXCEPT WHERE NOTED OTHERWISE

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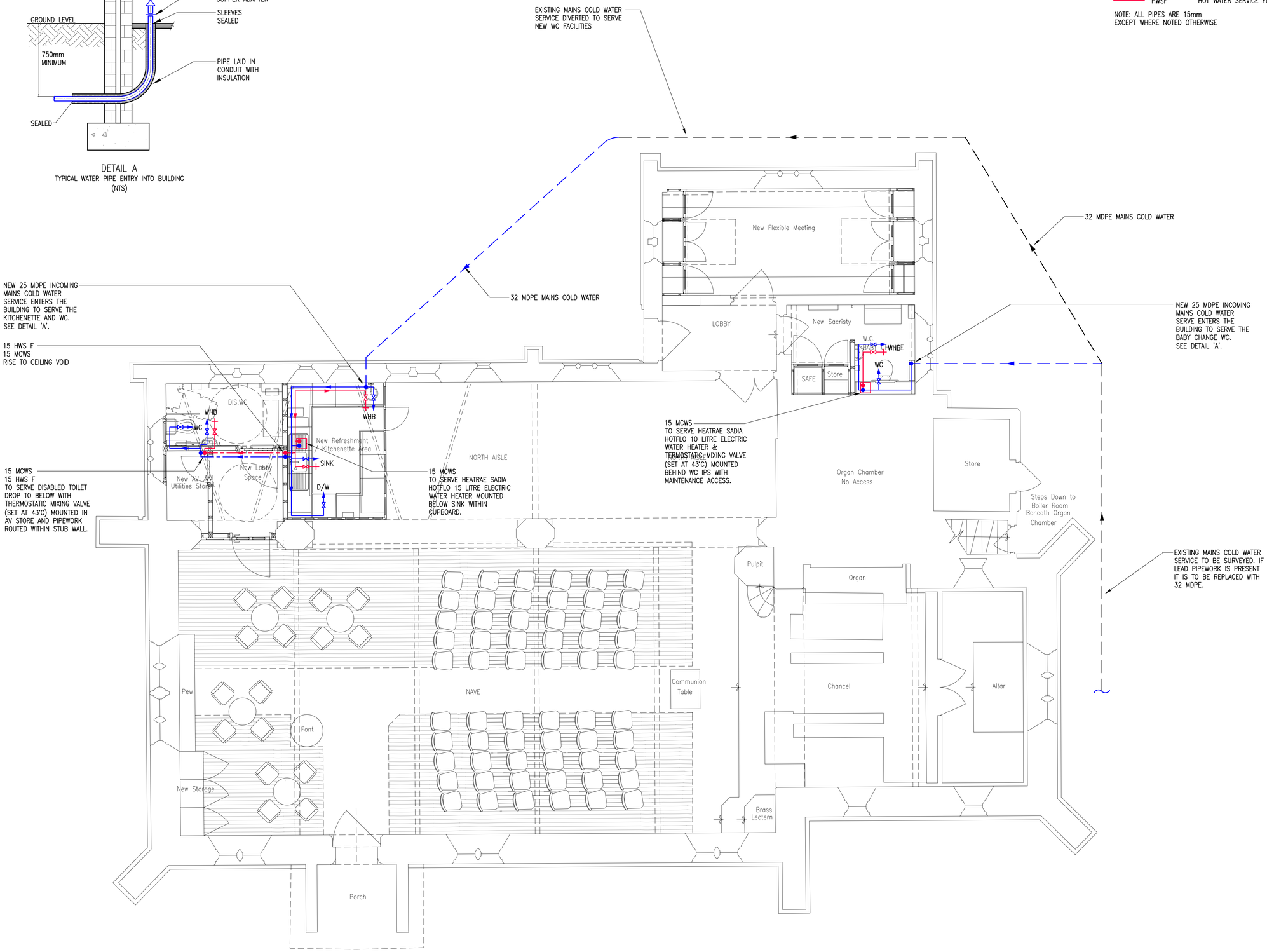

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PROJECT
REORDERING OF CHRIST CHURCH WILLASTON IN WIRRAL

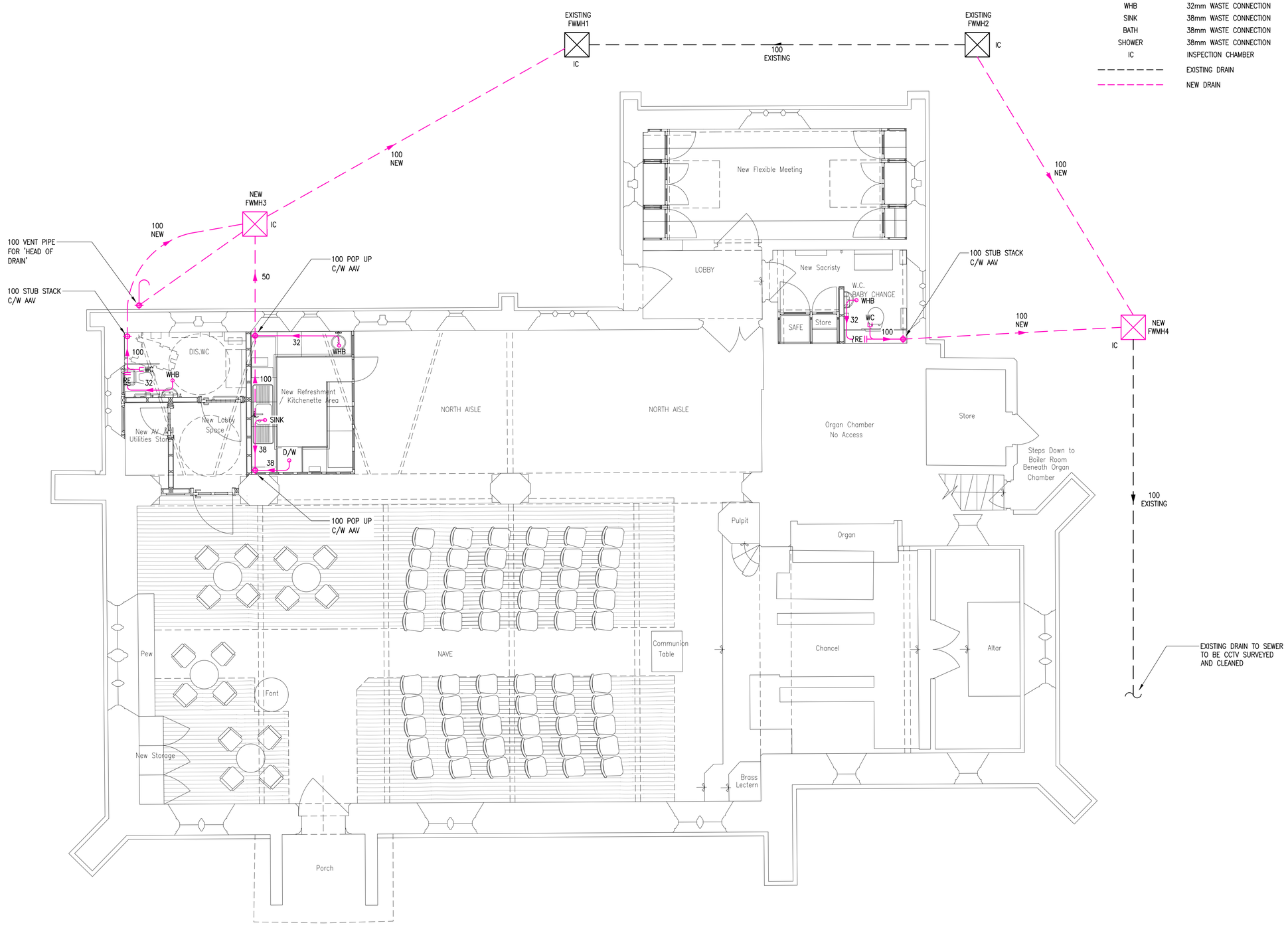
DRAWING TITLE
MECHANICAL SERVICES GROUND FLOOR PLAN WATER SERVICES

DRAWN SB	APP BC	
DATE AUGUST 2022		
SCALE 1:50 at A1		
DRG.No.: 754-P-401	REV P	

SCHEDULE OF INSPECTION CHAMBERS

REF	EXISTING COVER LEVEL (m)	NEW COVER LEVEL (m)	EXISTING INVERT LEVEL (m)	NEW INVERT LEVEL (m)	EXISTING DEPTH (m)	NEW DEPTH (m)	INTERIOR SIZE (mm)	COVER SIZE (mm)	COVER TYPE	COMMENTS
FWMH1	TBS	TBS	TBS	–	0.65	0.65	TBS	TBS	C1	TBS
FWMH2	TBS	TBS	TBS	–	0.95	0.95	TBS	TBS	C1	TBS
FWMH3	–		–			0.45	600 DIA.	600 x 600	C1	
FWMH4	–		–				600 DIA.	600 x 600	C1	

'TBS' = TO BE SURVEYED AND DETAILS ESTABLISHED UNDER THE CONTRACT.
FURTHER DETAILS FOR FWMH3 AND FWMH4 WILL BE PROVIDED BY THE ENGINEER FOLLOWING CCTV SURVEY.



SYMBOL	DESCRIPTION
'FWMH'	FOUL WATER MAN HOLE
WC	WC DRAINAGE TRAP
RE	RODDING EYE
AAV	AIR ADMITTANCE VALVE
	SERVICES AT FLOOR LEVEL
	SERVICES BELOW FLOOR
	SERVICES AT HIGH LEVEL
	SERVICES IN CEILING VOID
WC	110mm SOIL CONNECTION
WHB	32mm WASTE CONNECTION
SINK	38mm WASTE CONNECTION
BATH	38mm WASTE CONNECTION
SHOWER	38mm WASTE CONNECTION
IC	INSPECTION CHAMBER
	EXISTING DRAIN
	NEW DRAIN

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PROJECT

REORDERING OF CHRIST CHURCH WILLASTON IN WIRRAL

DRAWING TITLE

MECHANICAL SERVICES GROUND FLOOR PLAN WASTES & DRAINS

	DRAWN JT	APP BC
	DATE AUGUST 2022	
	SCALE 1:50 at A1	
DRG.No.: 754-P-411		REV P

BOB COSTELLO ASSOCIATES LTD

CHRIST CHURCH WILLASTON

MECHANICAL AND ELECTRICAL SERVICES STRATEGY FOR REFURBISHMENT REPORT

JULY 2021

CONTENTS

APPENDICIES

1. INTRODUCTION

Christ Church is located in the village of Willaston in the Wirral. It was originally consecrated in 1855 and was extended in the 1920's. It is constructed in local red sandstone and was listed Grade II in 1999.

Bob Costello Associates Ltd (BCA) were appointed in June 2021 following a competitive tender process at the invitation of Mark Pearce of Kepczyk Pearce Sanderson Architects.

Bob Costello undertook a survey of the existing mechanical and electrical services on 24 June 2021 and would like to record his thanks and appreciation of the generous assistance provided by PCC Members, Mr Tim Boulton, the Project Manager for the re-ordering, Mr Chris Brown-Bolton of the Fabric Committee and Mrs Viv Ley, Church Warden.

The PCC has undertaken a comprehensive review of their requirements and expectations for the re-ordering and have provided an outline brief for the new services and options they wish to have investigated. This report outlines the key facts obtained during the survey and information regarding future aspirations for the church provided by the PCC Members.

The survey was non-invasive in that no 'opening-up' of concealed services was undertaken. The existing services, particularly heating, are routed through floor voids and are inaccessible for inspection. We have consequently assessed what cannot be seen on the basis of what is visible. The key services information is presented on drawing no. 754-ME-101 contained in Appendix A.

A brief description and appraisal of the existing incoming utilities and mechanical and electrical services is provided in Sections 3, 4 and 5. A number of options for alternative heating solutions are reviewed in Section 6 and proposals for other services are discussed in Section 7. The PCC has expressed an interest in the possibility of adopting photovoltaic systems and these are discussed in Section 8.

The brief requires that the following three options for heating be investigated:

Option A. A 'high eco', low carbon solution with complete replacement of existing heating distribution and emitters.

Option B. A new dual-fuel gas/electric heating system with complete replacement of existing heating distribution and emitters.

Option C. Retaining existing gas-fired boiler and replacing the existing heating distribution and emitters.

Supplementary information is presented in the Appendices.

Appendix A contains drawings of the key existing services and illustrates the principles of the heating options under review.

Appendix B contains record information on gas and electricity consumption at the church during recent years. This was kindly provided by Mr Tim Boulton and we understand that it was collated by Mr Tim Ley, the PCC Treasurer. This is valuable information and we are indebted to him for diligently recording it.

Appendix C provides generic information on low carbon technologies to help explain the key features of them.

Appendix D contains comparative cost-in-use and carbon emission data for commonly used fuels. Costs and carbon emissions predictions are based on gas consumption figures provided in Appendix B.

Appendix E provides background information on the parameters that define human comfort. There is a possibility of adopting underfloor heating which is ideal for evenly distributing low intensity warmth in what is referred to as the 'occupied area', i.e. the lower 2 metres of a room. The various underfloor heating systems are illustrated in Appendix F.

Radiators are the most common form of heat emitters and Appendix G explains the various types available and explains the consequences of utilising radiators with low temperature water resulting from the use of heat pumps.

Appendix H contains selected information on photovoltaic electricity generation provided by Exclusive Solutions Ltd. The subject matter is quite complex and our present purpose is to make the salient points as understandable as possible. The full submission from Exclusive Solutions and other PV companies we have contacted will be forwarded when available.
Appendix I presents solar energy calculations using the Energy Saving Trust 2021 on-line program and Appendix J tabulates the rates paid by various electricity supply companies for electricity exported from photovoltaic installations.

Appendix K shows examples of modern lighting schemes and some projects we have recently undertaken

P1.1 North façade of church

P1.2 Rear entrance. Note chimney serving gas-fired boiler in Cellar

P1.3 Store Room and entrance to Cellar

P1.4 South facing roofs are the most suitable for photovoltaic panels

2. SUMMARY

This initial report is intended to collate all relevant information, explain and quantify options as best as possible, and provide a basis for further discussion to enable the PCC to make informed decisions.

The key issue of course is what form should the future heating system take? Low carbon solutions attract a considerable cost premium and are really only viable in energy efficient buildings where they can operate almost continually. Their adoption in a church which has little scope for thermal improvement and is used very intermittently is seldom viable.

The aim of achieving carbon zero by 2030 is laudable but obviously present difficulties. The carbon-intensity of mains supplied electricity has reduced from 0.528kg CO_2 kWh in 2006 to a current figure of 0.233kg CO_2/kWh by large scale renewable generation schemes, wind turbines, photovoltaic arrays, and the contribution from nuclear power stations. The future of nuclear power is far from certain and achieving carbon-free mains supplied electricity is a far distant prospect. Purchasing electricity from 'so-called' renewable suppliers may be deemed zero-carbon but it shares a common distribution system with electricity from other sources. It is not available at all times and labelling it zero carbon is debateable.

Similarly the much publicised addition of hydrogen into the natural gas network to replace methane needs to be 'taken with a pinch of salt'. So called 'green' hydrogen generated by hydrolysis of water is enormously expensive and commercially sourced hydrogen is produced from methane gas. The carbon content of this has not yet been successfully captured. Zero or even low-carbon network gas is a long way ahead in the future.

Given this global situation there is no simple answer to how best to provide low carbon heating in a traditionally-constructed church effectively and economically. The existing 60kW rated gas-fired boiler is probably under-sized to provide rapid heat-up of the church from cold. A sizing factor of 2:1 for heat-up in a few hours would require a boiler size of some 100kW or so. Any use of gas in the future will involve carbon emissions but it is difficult to see how heating the church to comfortable temperatures quickly can be achieved without the use of gas.

An all-electric solution, particularly if it includes the use of heat pumps would have a lower carbon footprint. Heat from this source would have similar running costs to that of gas but cannot provide the capacity required for rapid heat-up.

Partial off-setting of carbon emissions by generating electricity on-site using photovoltaic panels is possible but capital costs are high. If the electricity generated can be usefully used on site then it is effectively reducing the import of expensive electricity from the mains supply. If it has to be exported back into the mains supply the price paid by the electricity company would be comparatively small. The use of batteries is possible for short duration storage, perhaps overnight, but is not practical for seasonal energy storage.

Abandoning gas as a heating fuel would limit options to electric heat only. The carbon reduction consequence is debateable but the increase in running costs is not. Never-the-less some churches are adopting all-electric solutions as part of a long-term decarbonisation programme.

The options available need to be studied in more detail and all factors weighed before any decision is made. Further investigation of the construction of the wooden floors in the Nave needs to be undertaken to ascertain the practicality of installing underfloor heating. This is a key issue.

There is considerable technical information in this report and the PCC will need time to digest it. A further meeting with ourselves and the Architects, hopefully coinciding with access into the area of wooden flooring in the Nave is recommended.

3. UTILITIY SERVICES

ELECTRICITY

The existing electricity supply cable is routed below ground and terminates in a service head with fuses and meter located at the west end of the North Aisle as indicated on drawings no. 754-ME-101 in Appendix A.

Photo 3.1 Incoming electricity service head and meter

The electricity supply is three-phase and neutral (TP&N) and the fuses are rated 100 Amp per phase. The intake equipment appears to be in good condition. It is considered adequate for the future development of the church without further reinforcement.

GAS

The incoming gas supply pipe is routed below ground and surfaces externally outside the Store Room at the east end of the church as indicated on drawing no. 754-ME-101.

Photo 3.2 Gas meter

The gas meter is located within the Store Room and is size G10. It has a maximum capacity of 16m^3/hr which is equivalent of 173kW. The installation is in good order and is considered adequate for any future uses it may be called on to provide.

WATER

The existing mains cold water supply is routed below ground and surfaces in the north west corner of the existing Accessible WC as indicated on drawing no. 754-ME-101.

The existing supply is 20mm nominal bore which is considered adequate size for normal water uses in a church. Its location however is not suitable for the proposed re-ordering of the church and it should be removed and re-routed.

DRAINS

Existing below ground drains are routed to an inspection chamber with cast iron manhole cover to the north of the church as indicated on drawing no. 754-ME-101. There is no further information available on the drainage at this time.

The drains will require modifying to serve the reordered church. They should be jet-cleaned, surveyed and recorded prior to any work commencing.

UTILITY RECORDS

There is presently no information available regarding below ground utility services. It is reasonable to assume that all emanate from main services located in Neston Road but there are minor roads to the north and east of the church. Utility companies routinely charge for providing information about their installations but it is essential from a health and safety perspective to provide contractors with all available records of concealed services. Since this information will need to be made available at some stage it is logical to obtain it as early as possible.

4. EXISTING MECHANICAL SERVICES

HEATING

Heating is currently provided by a gas-fired boiler located in a cellar plantroom serving a mixture of pipe coils, radiators and a fan convector in the church.

Photo 4.1 Existing Ideal Concord gas-fired boiler in cellar

The boiler is an Ideal Concord model CXA 60/H and generates low pressure hot water (LPHW) at a flow water temperature of 82°C and a return water temperature of 71°C.

The heating system is served by a feed and expansion tank located in the roof void above the Choir Vestry. This was not accessible for examination.

It is understood that the boiler was originally installed around 2003 which would make it 18 years old. It is a cast iron sectional boiler and these typically have a working life in the order of 25 years or so. The boiler was repaired in October 2020 by Kimpton Energy Solutions. We are indebted to Mr Colin Swanick, their Service Director (tel. 07976 846743) who advised that new ionisation and ignition probes, ignition PCB and thermostat were fitted to the boiler and the flue boost fan was fitted with a new electric motor and control PCB. These are routine component replacements and do not reflect on the condition of the boiler.

The boiler appears to be in reasonable order and the recent repairs have returned it to working order. It is approaching the end of its working life but this is a robust design of boiler if a little inefficient by modern standards. Never the less it should have a further working life in the order of 10 years or so. Spare parts are available and should remain so for a number of years yet.

Photo 4.2 Ventilation to the cellar is via a grille in the door outside

Photo 4.3 The boiler flue discharges via a masonry chimney

Ventilation of the boiler room is via a grille in the door accessing the steps down into the cellar and does not meet the requirements of BS 6644 for both high and low level ventilation. This could be corrected. The flue gases are extracted from the boiler by the flue gas fan and the flue duct connects to a masonry chimney to discharge above roof level. This will have been fitted with an approved chimney liner when the boiler was installed.

The arrangement of the heating in the church is indicated on drawing no. 754-ME-101 in Appendix A.

Photo 4.4 Cast iron heating pipework

Photo 4.5 Caulked joints on cast iron pipework

Cast iron pipework is routed at low level around the perimeter of the church and provides most of the heat emitted. There is a mixture of pipe joints including some original 'caulked' joints. These often had asbestos rope in them and this would need to be removed by a specialist contractor if and when the heating is replaced.

Photo 4.6 Cast iron radiator in North Aisle

Photo 4.7 Fan convector in the Chancel

There are also some cast iron radiators and more recently added steel panel radiators, some of which have thermostatic radiator valves. There is a room thermostat adjacent to the organ which controls the boiler and circulating pump.

Photo 4.8 Electric over door heater

There is a three-phase electric over door heater above the main entrance into the church. This has no identification labels but typically they are 9 to 12 kW rating. It is there to counter cold air entering from outside.

The heating system is old and ineffective and is clearly in need of replacement.

WATER SERVICES

Water is only distributed to the Assisted WC and the kitchen's sink in the Choir Vestry.

Photo 4.9 Electric water heater in WC

Photo 4.10 Electric water heater over sink

Local electric water heaters serve the wash hand basin and sink.

The proposed re-ordering of the church will necessitate a new water distribution system.

DRAINAGE

The existing drains were not examined but clearly they will need to be extensively modified to serve the proposed re-ordering of the church.

Photo 4.11 Sump and pump in cellar

The cellar is below the level of the drains and is provided with a sump and sump pump. This discharges into a drainage gully outside of the Store room at the east end of the church. The pump is functional but clearly old and may need replacing as part of the intended works.

VENTILATION

There is no mechanical extract ventilation in the church but it does have a reasonable provision of openable windows.

Photo 4.12 Openable window in the North Aisle

Adequate ventilation is an important provision if the church is to accommodate multi-function events in future and it is recommended that all existing windows be refurbished and made controllable

5. EXISTING ELECTRICAL SERVICES

ELECTRICAL POWER

The existing three-phase and neutral electricity service head and meter was installed in 1998 and the switchboards appear to have been installed about that time.

Photo 5.1 Distribution boards at west end of North Aisle

Photo 5.2 Internal view of DB1

Periodic inspection and test labels appear to indicate that the electrical installation was last tested in December 2006 with a recommendation that a retest take place in December 2011. It would appear that the electrical installation has not been tested for some 15 years. The PCC should check their records regarding this since it may impose on the building insurance.

There were no obvious visible defects with the electrical installation but the absence of periodic inspection and testing certificates is a cause for concern.

Photo 5.3 Electrical supply to organ air compressor

The existing three-phase and neutral electricity supply would have been installed to serve the air compressor for the organ which is located in the Store Room at the east end of the church.

The proposed re-ordering will necessitate extensive modifications and replacement to parts of the electrical installation and depending on the final extent of this it may be preferable and more economic to provide for replacement of the existing electrical distribution system. Subject to testing some difficult-to-replace circuits may be retained.

LIGHTING

Existing lighting consists of pendants dating back to the 1920s, various fluorescent lights, flood lights and uplighters as indicated on drawing no. 754-ME-101 in Appendix A.

Photo 5.4 Lighting in North Aisle

Photo 5.5 Lighting in Nave

The existing lighting does little to enhance the appearance of the church and the brief includes replacement. The existing pendants are to be retained but are to be refitted with LED lamps. There are stand-alone emergency lighting units.

Photo 5.6 Light switches

Existing light switches are located adjacent to the distribution boards at the west end of the North Aisle. Access and egress from the church is via the rear door but there are no light switches in this location.

Photo 5.7 External floodlight

There are a number of external lanterns and floodlights to provide safe access around the church and a single post-mounted floodlight in the graveyard to illuminate the south façade.

OTHER SERVICES

There is a radio microphone system installed in the church and an existing sound system which was not examined since the brief requires new systems.

There is currently no fire detection and alarm system nor intruder detection or similar security system.

6. OPTIONS FOR HEATING

The proposed re-ordering of the church is intended to make it more flexible in use and add facilities which will make it more adaptable. Potentially the church has the biggest venue space in the village. There is no church hall and the local Memorial Hall is used extensively for pre-school sessions precluding it being available for other uses. The business case for greater usage for meetings and other events is strong. The pandemic has naturally reduced the number of weddings, only 3 are currently booked for this current year, but this will change as things return to normal.

Services are currently only held on Sunday mornings but in the past there were services on a Wednesday and the church was used by a youth group. The current attendance at services is around 45 people but this has been as high as 75 in the recent past. Experience from other churches which have undertaken re-ordering is that attendance at services will increase. The provision of modern facilities, toilets, lighting and heating all go towards making the venue more popular.

As reported in Section 4 the existing heating distribution system is ineffective and the gas-fired boiler, although recently repaired, is approaching the end of its working life. We are instructed to consider three alternative approaches to replacing the heating. The following is extracted from the brief:

OPTION A – High eco solution; replacement of boiler and all pipework and emitters. Appropriate water heating to toilets and kitchenette.

OPTION B – Duel gas boiler system with gas or electric water heating (as appropriate) to toilets and kitchenette, replacement of all pipes and emitters.

OPTION C – Use existing boiler (and pump if appropriate to do so) and replace existing pipes and emitters. Appropriate water heating to toilets and kitchenette.

The brief requires independent evidence of efficiency of the new heating system. Annex 1 – Heating Requirements describes further requirements for the heating which are summarised below.

- Proposals to take cognisance of the Grade II listing and physical constraints.
- Note the requirement for net carbon emissions by 2030.
- The replacement heating system to achieve an internal air temperature (dry air temperature) of 18°C at any time of the year measured 1 metre above floor level at all locations in excess of 3 metres from external door or window. Reasonable flexibility can be applied to this requirement.
- An internal temperature of 12°C to be achieved within 6 hours of switching on the heating and increasing this to 18°C in a further 6 hours.
- Remote access to heating controls via mobile phones.
- Two control zones – church main space and meeting room/toilet space.
- Maintainable system with quotations for servicing and call outs with 4 hour response time.
- Resilience can be provided by ‘split generator’ solutions.
- 5 years warranty required on all components. (Note that the standard component guarantees are generally 12 months. Extended warranties may need to be provided by a separate insurance scheme arranged by the church.
- Hot water to be provided in the toilets, cleaners sink and kitchenette.
- A boiling water/chilled water dispenser is required at the sink in the kitchenette. (Note that this needs to be part of the kitchen equipment supply contract).

Performance requirements are not unreasonable but will be partly dictated by the thermal performance of the building fabric. Acceptable locations for heat emitters will also be a constraint. Matters such as maintenance, call outs and warranty need to be negotiated with prospective contractors.

A number of building fabric issues need to be addressed.

1. Providing 'weather doors' to reduce the infiltration of cold outside air can significantly reduce energy consumption and improve internal conditions. Modern designs using toughened glass can be visually acceptable.

2. Existing windows could be secondary glazed to reduce heat loss.

3. Openable windows are vital if multi-function events are to be held and windows should be repaired, made controllable and fitted with effective seals.

4. The church should be insulated to improve its thermal performance but there are obvious limitations to what can be done in a Grade II listed building.

5. There are areas of wood block flooring in the Nave which appear to be suspended. These could potentially accommodate underfloor heating without invasion into the solid floor structure and this needs to be investigated.

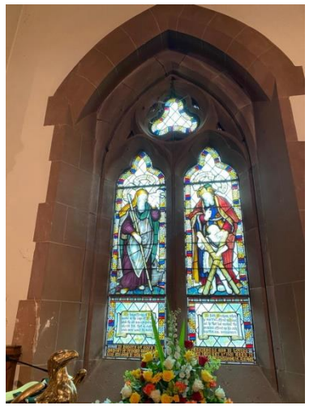


Photo 6.1 Existing windows could be secondary glazed

Photo 6.2 Areas of floor in the Nave could possibly accommodate underfloor heating

Installing underfloor heating would be advantageous for many reasons and should be investigated at the earliest stage possible. It cannot be assessed without intervention and possible damage to areas of flooring but this need not be extensive and repairs can be undertaken. BCA could investigate the existing suspended wooden floor construction using an endoscope if access can be provided.

Records of gas and electricity consumption during recent years are provided in Appendix B. These indicate a typical heating energy consumption (gas) of around 50000 kWh/annum. This of course may change as and when the church experiences greater usage. We have used this consumption as the basis for comparing fuel cost-in-use and carbon dioxide emissions and this data is presented in Appendix D, Comparative Energy Data. It is hoped that this information is self-explanatory. It should be remembered that it is only for guidance but it should be adequate to allow informed decisions to be made.

Information on so-called 'low carbon technologies' is presented in Appendix C. This of course is background information and is intended to better inform readers of this report. All low carbon technologies come with a premium over conventional forms of heating in terms of capital cost. The mantra to be adopted is 'be lean, be mean, be green' by which is meant reduce requirements to a minimum, do not oversize heating equipment, and adopt low carbon technology. It is one thing adopting this principle for a newly built, thermally efficient building but it is quite another doing so in a traditionally built church.

Comfort is a subjective matter and acceptable conditions for one person may not be acceptable to another. There are many factors affecting the achievement of comfort and these are described in Appendix E.

Mention has already been made of the potential for installing underfloor heating in areas, generally below existing pews, in the Nave. Underfloor heating provides gentle. Low temperature warmth in what is referred to as the occupied zone i.e. the lower 2 metres of a space. The advantage of course is that it heats the occupants rather than the space and this is particularly beneficial in high spaces such as a church. Forms of underfloor heating are explained in Appendix F. Ideally insulation should be installed below the system to reduce heat transfer to the ground but in some circumstances this can be omitted. This would almost certainly be the case here. Heat emission from a wooden floor is generally limited to around 55 Watts/m^2 due to the need to reduce surface temperatures to 27°C to prevent damage to the wood floor.

Radiators are the most commonly used heat emitters and come in many forms as is explained in Appendix G. Most people are familiar with radiators and the 'high intensity' heat they emit. Utilising radiators with low temperature hot water as is typically generated by a heat pump system results in a marked reduction in heat output and this is explained in Appendix G3. A traditional radiator needs to be increased in the order of 3 times to achieve the same heat output. New radiators have been developed to better work with low water temperatures and these may have a series of small fans underneath to increase the airflow across the heat emitter and increase heat output. They are consequently physically smaller. The Jaga Strada DBE is a typical 'enhanced performance' radiator and this is explained in Appendix G. The fans only operate when required thermostatically and sound levels are extremely low. We have recently had these radiators installed in The Fratry at Carlisle Cathedral to good effect.

We have assessed the heat loss for Christ Church to be in the order of 50kW based on -3°C outside, 18°C inside and 0.5 air changes per hour infiltration. The existing gas-fired boiler is rated 60kW output and there is a large electric over-door heater at the south entrance door. The church is intermittently heated and this requires a substantial over-sizing of boiler capacity over heat loss to provide for a reasonable warming up period in cold weather. A factor of 2 to 1 is quite normal requiring a boiler in the order of 100kW output. There are obvious problems with distribution of heat given that the only locations for radiators are the perimeter walls which can be up to 6 metres away from occupants. The assessed heat output of existing radiators and pipework is 36kW. It is quite apparent that the existing heating installation capacity would need to uprated if any replacement heating system is to provide better performance.

The following proposals for heating all assume that the marked floor areas of the Nave can accommodate underfloor heating so it is imperative to confirm the feasibility of this as soon as possible by examination of the floor supporting structure.

Heating Option A

This is indicated on the drawing no. 754-ME-102 in Appendix A which illustrates the key components and features.

A low carbon, high eco solution would involve heat pumps. There is no possibility of providing a biomass boiler scheme. The proximity of graves makes ground source heat pumps impractical and consequently an air source heat pump system would need to be adopted.

A preliminary scheme is indicated on the drawing with external condensers accommodated in a steel mesh enclosure to protect them from vandalism and a robust 'garden shed' size of a building provided to accommodate the necessary buffer vessels, pumps and control equipment. The heat output of an air source heat pump decreases as the air temperature reduces. The Coefficient of Performance (COP) is a measure of efficiency and typically reduces from 3.5 to 1.0 at 30°C external temperature to around 2.0 at 0°C depending on the machine selected. This reduced efficiency is still worth having of course.

There are many variables to take into consideration not least of which is the extent of thermal improvement works to the church which can realistically be undertaken. Based on data contained in Appendix D it is reasonable to assume that an air source heat pump scheme would emit only 37% of the CO_2 of a similar gas-fired heating system. Based on an annual energy consumption of 50000kWh for space heating this would reduce CO_2 emissions from 10500kg/annum to 3900kg/annum, i.e. a saving of 6600kg/annum. If this were to be adopted in conjunction with a 10kWe solar PV system this would further reduce the carbon footprint of the combined system by 2200kg/annum.

It is extremely difficult to assess the capital cost of such a heating system but it is reasonable to anticipate costs in the order of £150000 to £180000 plus associated builderswork. A more accurate estimate of cost would be achievable when more information is to hand.

Running costs would be similar to those for gas-fired heating using a condensing boiler as stated in Appendix D. There would be little or no running cost saving at the current cost of electricity and gas.

There are no government grants or subsidies available for adopting low carbon technologies beyond March 2021.

The existing electricity supply should be adequate to serve the proposed heat pump installation but this would need to be verified when design work is completed.

Heating Option B

This option comprises a mix of low carbon technology for background heating coupled with conventional gas-fired heating to provide comfort heating. The salient features of this option are illustrated on drawing no. 754-ME-103 in Appendix A.

Heat pumps operate most effectively and efficiently with lower water temperatures and are consequently suitable for use with underfloor heating. This proposal is to provide an air source heat pump system to heat the proposed areas of underfloor heating only. The maximum area of underfloor heating is assessed as 68m^2 which at an emission rate of 55W/m^2 equates to 3.74kW. A small air source heat pump system could serve this. It may make a numerically small contribution to the heat requirements of the church but critically it provides the even distribution of heat which is so vital to making the space comfortable.

The New Flexible Meeting Room could have its own separate split air source heat pump system with a fan coil unit at high level in the room and an external condenser (heat pump) located outside, again with some form of physical protection. Given the anticipated pattern of usage of the space this is a logical solution. The heating in the Chancel could be similarly provided but the infrequent usage probably means that a direct electric fan convector would be more cost effective and of course pipework would not be viable.

Comparative budget costs for the 'all electric' Option B would be as follows:

Wet underfloor heating	£15000
Wet ASHP system	£10000
Split ASHP for Meeting Room	£ 5000
Electric heating	£45000
	£75000

Costs quoted exclude VAT and associated builderswork.

Running costs based on Appendix D would be in the order of £7750 per annum as against some £9000 per annum for all-direct electric heating. CO_2 emissions would be in the order of 9600kg/annum which equates to 90% of a new condensing gas-fired boiler plant.

Comparative budget costs for a mixture of air-source heat pumps serving the underfloor heating and the Meeting Room and a new condensing gas-fired heating system serving all other areas would be as follows:

Wet underfloor heating	£15000
Wet ASHP system	£10000
Split ASHP for Meeting Room	£ 5000
Boiler system, pipework, radiators	£75000
	£105000

Costs quoted exclude VAT and associated builderswork.

Running costs for this option based on Appendix D would be approximately £2750 per annum and CO_2 emissions would be around 8750kg/annum.

The difference in capital cost for the two 'mixed fuel' options is £30000 plus VAT. The all electric heating option would cost £5000 per year in additional fuel costs over an electric/gas option. Conceived wisdom is that gas, as a fossil fuel, will be taxed at higher rates than electricity from renewable sources in future. Market prices for fuels are likely to be tipped increasingly in favour of low carbon solutions by penalising taxation on fossil fuels.

It is quite obvious that considerable supplementary heating is going to need to be provided to achieve comfortable temperatures and this could be done either using electric radiators or alternatively by modern water radiators served by a new condensing gas-fired boiler. Both options are viable.

Heating Option C

This option basically involves retaining the existing boiler plant but replacing the heating distribution system and heat emitters with new. The key characteristics of this are illustrated on drawing no. 754-ME-104 in Appendix A.

Wet underfloor heating is still a key component of the scheme as per Options A and B in order to provide improved heat distribution by radiator heating in all other spaces and a new fan convector in the Chancel.

The existing heating boiler will in time need to be replaced and it is mandatory that new gas-fired boilers below 400kW output be condensing type. These operate typically at 80°C flow and 60°C return water temperatures resulting in a mean water temperature of 70°C. This is approximately 6°C lower than the mean operating temperature of the existing boiler resulting in a 13% reduction in heat output. New radiators would need to be sized to work adequately with a condensing gas-fired boiler but the full range of modern radiators is available to choose from and they do not need to be oversized as would be necessary if they were operating at the low water temperatures inherent with heat pump systems.

Comparative budget costs for a new heating distribution system operating with the existing boiler plant are as follows:

Wet underfloor heating	£15000
Radiators, pipework etc.	£50000
Pumps and controls	£ 5000
	£70000

Costs quoted exclude VAT and associated builderswork.

Running costs based on Appendix D would be around £2565 per annum and CO_2 emissions would be 10500kg/annum.

The gas industry is experimenting with mixing hydrogen into the gas supply which is currently methane and trials are taking place in a number of locations in the UK including some 200 or so properties at Keele University. Practical problems arise from the small size of the hydrogen molecule which is capable of passing through most pipeline materials currently in use causing leaks. To actually reduce carbon intensity of gas the hydrogen needs to be produced without emission of carbon dioxide which current commercial production techniques are not capable of. Boilers are being sold with the label ‘hydrogen ready’ but the reality of zero-carbon hydrogen being transmitted along existing pipelines to gas consuming properties is a long way off in the future. We see no immediate prospect of the carbon intensity of network supplied gas reducing to any meaningful extent in the foreseeable future.

7. PROPOSALS FOR REFURBISHMENT

This report has focused on the options for replacing the heating and this is discussed at length in Section 6 and the Appendices. The heating is however only one aspect of the refurbishment of the mechanical and electrical services. Others need to be considered as follows.

Water

The existing mains cold water supply is poorly sited to serve the new toilets and kitchenette and our recommendation is to re-route pipework externally below-ground rather than extend this through the church. Although it will necessitate new and invasive service entry locations the cold water will be as cool as possible at the points of entry and unsightly insulated pipework routed through the church will be avoided. Water consumption in a church is low and hot water demand is minimal. Point-of-use electric water heaters as at present are the logical choice. Water at wash hand basins should be blended to ensure the temperature does not exceed 43°C for safety reasons.

Drainage

The proposed re-ordering of spaces makes modifications to the below-ground drainage system inevitable. The drains need to be adequately vented to atmosphere and locations for vent pipes need to be carefully considered and coordinated.

Ventilation

Natural ventilation needs to be provided by means of openable windows. This will necessitate refurbishment of the windows as part of the building works including new seals and if possible, mechanisms to control the openings to regulate the ventilation. The cooker and hob in the kitchenette will require an extract hood and ductwork to outside.

Electrical Distribution

The existing installation needs to be tested but the re-ordering works are extensive and will result in substantial deterioration of the existing system. It would probably be sensible to assume that virtually complete replacement, including new distribution boards, will be necessary.

Lighting

New modern and flexible lighting is required to enhance the appearance of the church and provide better functionality and control. Existing pendant lights are to be retained and refurbished. Information on modern lighting and some recent schemes we have undertaken are contained in Appendix K.

Fire Detection and Alarm

The legal requirement of the PCC is to undertake a fire risk assessment and implement the necessary measures. This can be done in-house if you consider you have the relevant expertise available or you can appoint a specialist fire consultant to undertake an assessment on your behalf. Our experience with similar churches indicates that the fire risk assessment will determine that an L2 standard automated fire detection system will be required as a minimum. This can be remotely monitored during unoccupied hours to alert the fire brigade of an emergency. Such early action is usually adequate to prevent serious damage and insurance companies actively encourage and sometimes insist on such measures. Beam detectors, which are relatively unobtrusive, are generally installed in high spaces with smoke detectors at ceiling level in smaller rooms.

Emergency Lighting

It is mandatory that a public building such as a church has emergency lighting to provide for safe egress in an emergency during hours of darkness. This must operate automatically in the event of an electrical supply outage and needs to be certified and tested periodically. New lighting can be adapted to incorporate the emergency lighting facility and illuminated exit signs can be provided above doors to outside. Amenity lighting external to the building to allow safe egress also needs to be provided.

Security Systems

Unless the insurance company insists on intruder detection and CCTV systems provision is not compulsory. The church does not suffer from vandalism and there are no reports of attempted break-ins. That may change in time of course. Forced entry would probably be attempted from a side door or small window and can often be deterred by PIR activated external lighting. This is probably all that is necessary but the matter should be discussed and the need for additional measures considered by the PCC.

8. PHOTOVOLTAICS

The PCC has expressed an interest in the option of installing photovoltaic panels (PV) on the church and believes that planning permission could be obtained.

Photo 8.1 South facing roofs of the church

The church has two sections of south facing roof which could potentially accommodate PV panels. The obvious questions in regards to PV are:

- How much electricity can be generated?
- How much would it cost to install?
- What can we do with the electricity generated?
- If exported to the electricity grid how much would be earned?
- Can the electricity be stored?
- What would the installation look like?

As part of this initial study BCA contacted three specialist PV companies. We provided drawings, photographs and information on electricity consumption and invited proposals. The companies are Exclusive Solutions Ltd, with whom we have recently worked with on a project in Myddle, Shropshire, The Solar Electricity Power Company Ltd (TSPEC Ltd) and Griff Services Ltd of Manchester. Exclusive Solutions have provided useful solar data and are preparing quotations for 3kW and 10kW arrays. Griff Services responded to say that a 3kW array would cost approximately $4700 plus VAT and a 10kW array would cost around £8600 plus VAT. We will forward all responses received when available.

Photo 8.2 59m^2 array on log store in Shropshire

Photo 8.3 PV panels are recessed into a tray in the roof

The photographs 8.2 and 8.3 show a large PV array installed by Exclusive Solutions on a project we are undertaking with them in Myddle in Shropshire. The installation consists of 30 PV panels totalling 59m^2 with a nominal peak electricity production of 20kW. The panels are located on a log store building in the gardens. We have designed a 45kW ground-source open-loop heat pump system for this project which uses borehole water abstracted and returned to an aquifer. This particular PV system utilises Panasonic panels which are approximately 1.0 metre wide x 1.5 metre high. Each panel is nominally rated 330 Watts which is comparatively high. Most similar size panels are rated around 250-280 Watts.

Appendix H contains PV data provided by Exclusive Solutions Ltd. It is impossible to predict the performance of a PV system with accuracy due to the variables of weather, shading and the seasonal variation in solar radiation. Assessment procedures are established by various authorities including MCS (Microgeneration Certification Scheme). The data is based on a 20kWe nominal sized PV array and shows anticipated projections for electricity generation and consumption. As is to be expected the majority of electricity generated would be in the period April through to September. An 18kWe PV array is the maximum size that could be accommodated on the roof but some 90% of generated electricity is projected as having to be exported to the grid. The provision of batteries would allow some storage of generated electricity but they are expensive as will be discussed later. They can only be economically sized for short-term, perhaps overnight, storage of electricity.

On the basis of this preliminary information we have concluded that a maximum size PV system should be discounted. It should also be noted that any generation system in excess of 10kW requires permission from the energy provider and this would be dependent on local network characteristics.

The Energy Saving Trust provides a simple to use online calculation program to assess the possible benefits of installing PV systems. This is based on domestic properties and establishes the key parameters for four alternative sized PV installations. We have inputted the information related to Christ Church into the program and the results are presented in Appendix I. The projections are summarised below.

	2kWp Array	4kWp Array	6kWp Array	8kWp Array
Potential energy generation kWh/annum	1580	3160	4740	6320
Potential CO_2 saving kg/year	438	876	1314	1752
Income from expected electricity £/annum	£46	£103	£163	£224
Installation cost	£2895	£5419	£7944	£10469
Potential annual cost benefit	£117	£197	£270	£340

It should be noted that these are only guidance figures and are based on the consumption likely for domestic properties. A church would have a different consumption pattern.

PV panels are a common sight on domestic properties in the UK now and very large, ground-mounted arrays can be seen in rural locations. Most of these were installed and attracted financial benefits from the Feed-in-Tariff scheme (FIT) set up by the government to provide an incentive to encourage adoption of PV installations.

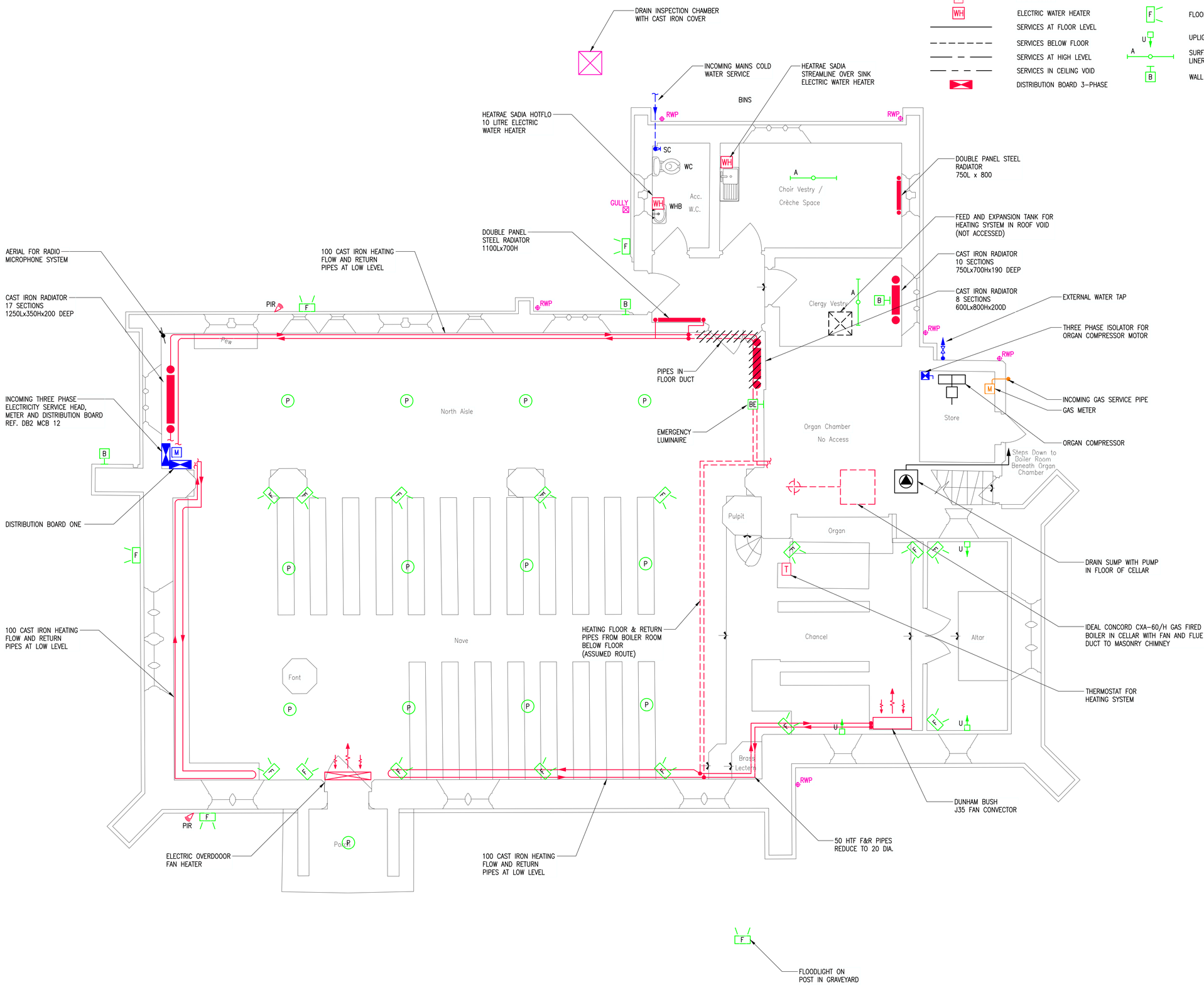
This scheme originally paid some 35p/kWh for exported electricity but this was scaled back to around 15p/kWh before the scheme closed in 2019. Contracts established under the scheme last for 20 years providing a good financial return. Those halcyon days are over however and electricity companies currently pay much lower rates for exported surplus electricity. See Appendix J which shows the rates currently available from a range of electricity suppliers.

Whilst the income from electricity exported from PV installations has reduced dramatically the cost of providing them has also reduced substantially over the same period. It is reported that PV installations are now around 60% less expensive than they were 12 years ago. It is also fair to say that the importance of the carbon reduction aspect of solar generated electricity is becoming a bigger factor in the provision of PV installations. Whilst the income from exported electricity has reduced the carbon dioxide emission ‘credit’ has not.

We have asked the specialist PV companies we contacted to provide two alternative proposals, a domestic size system of around 3kWe and a larger system of 10kWe. These will be forwarded when available. A 3kWe array would comprise some 10 PV panels and could be accommodated on the roof over the Chancel and Altar. A 10kWe array would comprise some 30 PV panels and would probably be accommodated on the roof over the Nave.

The option of installing batteries will also be investigated but these are expensive and generally only suitable for short-term storage of electricity. A TESLA Powerwall unit has a storage capacity of 13.5kWh and a continuous charge and discharge rate of 5kW. The peak ‘real’ power is 7kW. The unit is 755mm wide x 1150mm high x 155mm deep and can be located externally but should be under cover. The purchase price of the unit is around £2500 plus VAT and the total installed cost is typically £3500 plus VAT.

The historic electricity consumption of the church is around 5000kWh/annum but this may increase in future if heat pumps or direct electric heaters are installed. There are obviously many variables involved and it is not possible at this early stage in the design process to recommend a particular size of photovoltaic system.



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AMENDMENTS

NO.	DATE	DESCRIPTION	DRAWN	APP
P	30.07.21	REPORT ISSUE	JT	BC

BCA
BOB COSTELLO ASSOCIATES LTD
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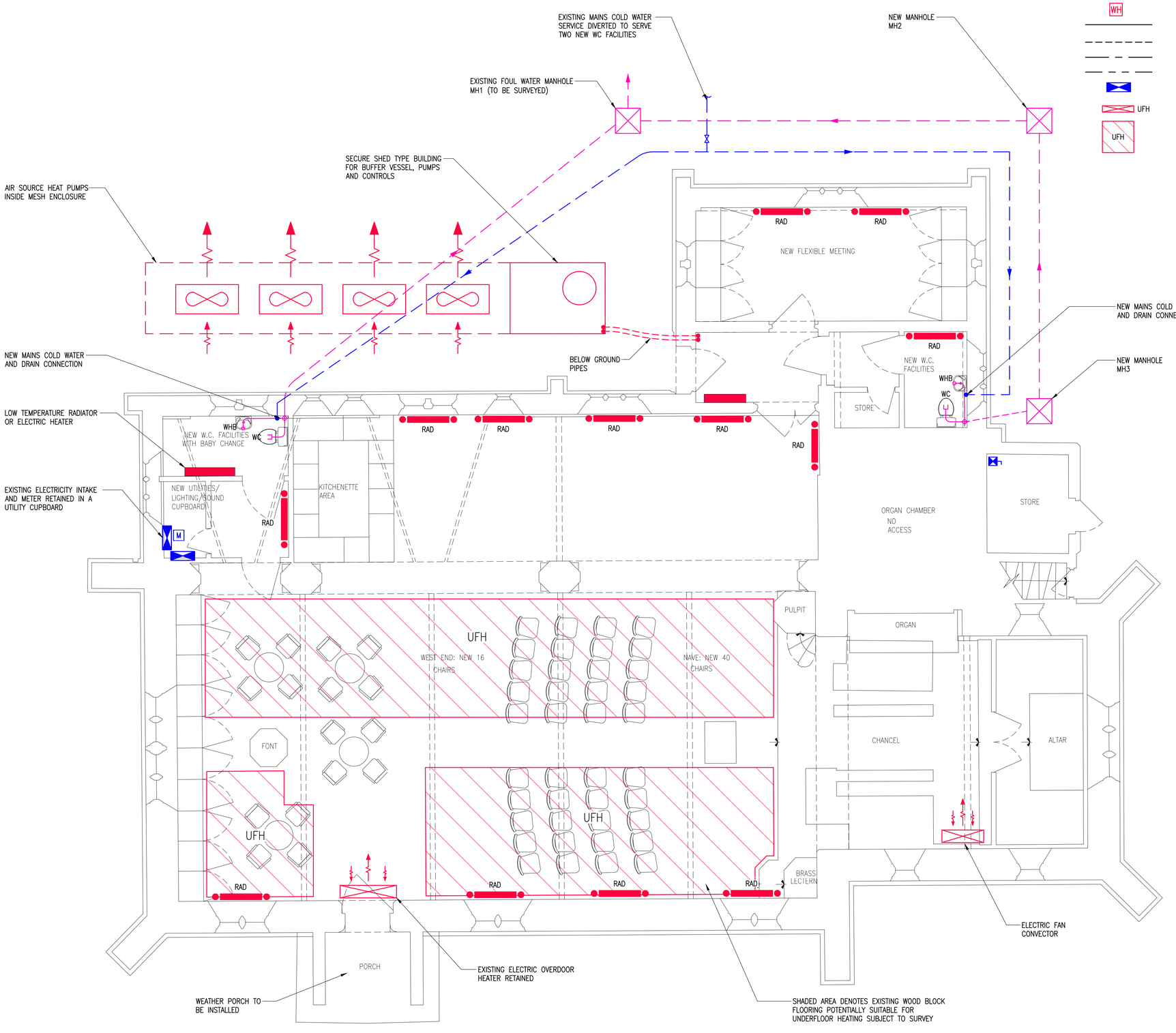
PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

M&E SERVICES
GROUND FLOOR PLAN
KEY SURVEY INFORMATION

DRAWN	JT
APP	BC
DATE	JUNE 2021
SCALE	1:50 at A1
DRG.No.:	754-ME-101
REV	P



SYMBOL	DESCRIPTION
	LOW TEMPERATURE RADIATOR
	ELECTRIC HEATER
T	THERMOSTAT
WH	ELECTRIC WATER HEATER
	SERVICES AT FLOOR LEVEL
	SERVICES BELOW FLOOR
	SERVICES AT HIGH LEVEL
	SERVICES IN CEILING VOID
	DISTRIBUTION BOARD 3-PHASE
UFH	UNDERFLOOR HEATING MANIFOLD
UFH	UNDERFLOOR HEATING

WC	WC DRAINAGE TRAP
RE	RODDING EYE
AAV	AIR ADMITTANCE VALVE
	SINGLE PHASE ISOLATOR
	THREE PHASE ISOLATOR

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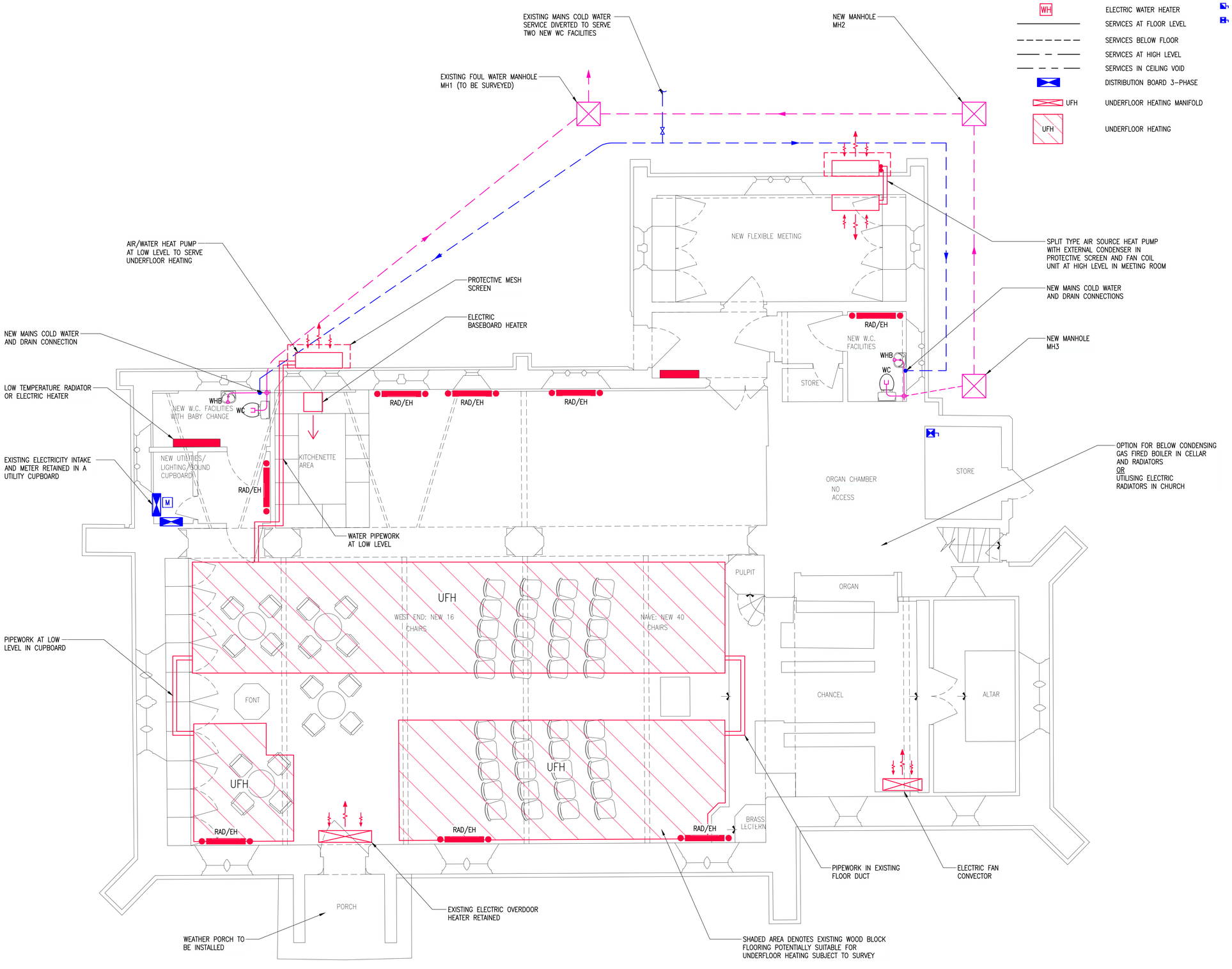
PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

M&E SERVICES
GROUND FLOOR PLAN
HEATING OPTION A

	DRAWN JT	APP BC	
	DATE JUNE 2021		
	SCALE 1:50 at A1		
DRG.No.: 754-ME-102			REV P



SYMBOL	DESCRIPTION
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WH	ELECTRIC WATER HEATER
	SERVICES AT FLOOR LEVEL
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AMENDMENTS

NO.	DATE	DESCRIPTION	DRAWN	APP
P	30.07.21	REPORT ISSUE	JT	BC

BCA
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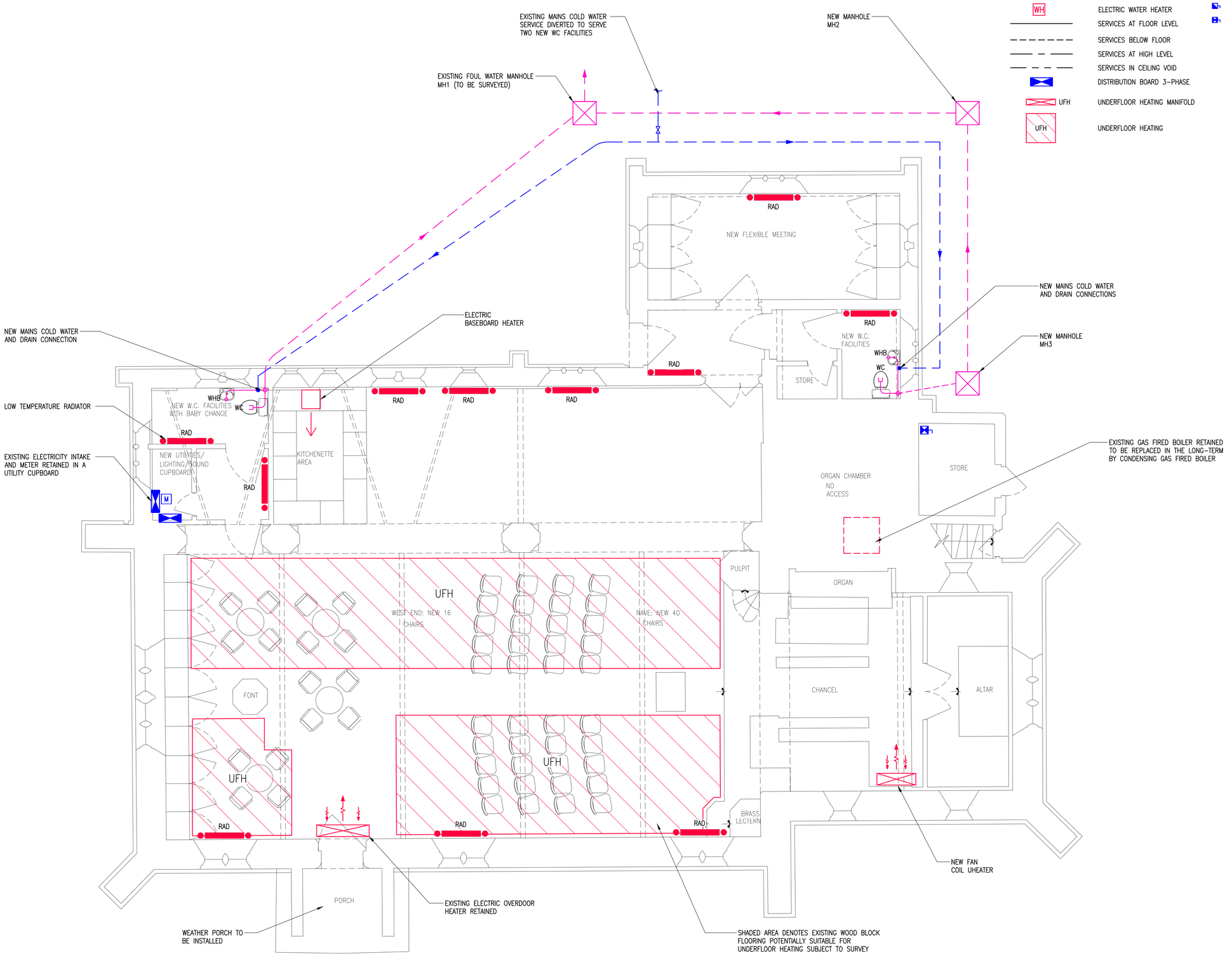
PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

M&E SERVICES
GROUND FLOOR PLAN
HEATING OPTION B

DRAWN	JT	APP	BC
DATE	JUNE 2021		
SCALE	1:50 at A1		
DRG.No.:	754-ME-103	REV	P



SYMBOL	DESCRIPTION
	LOW TEMPERATURE RADIATOR
	ELECTRIC HEATER
T	THERMOSTAT
WH	ELECTRIC WATER HEATER
	SERVICES AT FLOOR LEVEL
	SERVICES BELOW FLOOR
	SERVICES AT HIGH LEVEL
	SERVICES IN CEILING VOID
	DISTRIBUTION BOARD 3-PHASE
UFH	UNDERFLOOR HEATING MANIFOLD
UFH	UNDERFLOOR HEATING
WC	WC DRAINAGE TRAP
RE	RODDING EYE
AAV	AIR ADMITTANCE VALVE
	SINGLE PHASE ISOLATOR
	THREE PHASE ISOLATOR

NOTES:

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PROJECT

CHRIST CHURCH
WILLASTON IN WIRRAL

DRAWING TITLE

M&E SERVICES
GROUND FLOOR PLAN
HEATING OPTION C

DRAWN JT	APP BC	
DATE JUNE 2021		
SCALE 1:50 at A1		
DRG.No.: 754-ME-104	REV P	

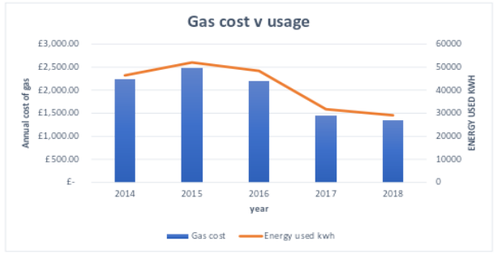
CHRIST CHURCH WILLASTON
REVIEW OF GAS AND ELECTRICITY COSTS AND CONSUMPTION 2014-18

2014		Gas Cost	Gas kwh		Elec Cost	Elec kwh
January	£	164.08	3712	£	73.40	459
February	£	308.05	6402	£	78.44	457
March	£	512.55	10756	£	71.69	418
April	£	298.87	6207	£	102.61	607
May	£	151.90	3092	£	71.84	417
June	£	118.42	2377	£	67.64	390
July	£	356.50	7435	£	78.76	460
August	£	54.68	1024	£	68.45	395
September	£	69.23	1333	£	67.00	386
October	-£	98.71	-2227	£	81.02	474
November	£	174.44	3566	£	76.99	448
December	£	133.75	2707	£	76.50	446
	£	2,243.76	46384	£	914.34	5357
Cost/kwh	£	0.05		£	0.17	
2015						
January	£	354.60	7390	£	89.23	524
February	£	486.98	10200	£	149.15	896
March	£	240.10	4967	£	74.58	436
April	£	326.13	7058	£	93.26	549
May	£	219.20	4702	£	83.60	490
June	£	167.24	3550	£	78.60	458
July	£	93.37	1924	£	40.91	225
August	£	15.67	204	£	71.83	416
September	£	68.95	1380	£	40.26	220
October	£	134.95	2842	£	69.26	401
November	£	161.48	3423	£	74.09	430
December	£	203.95	4365	£	33.99	182
	£	2,472.62	52005	£	898.76	5227
Cost/kwh	£	0.05		£	0.17	
2016						
January	£	214.30	4598	£	79.57	464
February	£	285.96	6171	£	79.09	461
March	£	391.03	8500	£	121.13	724
April	£	273.35	6252	£	76.02	442
May	£	211.71	4813	£	68.13	394
June	£	67.27	1425	£	82.14	480
July	£	76.58	1648	£	68.29	395
August	£	72.69	1552	£	68.45	395
September	£	69.31	1473	£	67.48	389
October	£	78.92	1703	£	69.91	405
November	£	170.63	3846	£	74.32	434
December	£	278.31	6373	£	30.11	158
	£	2,190.06	48354	£	884.64	5141
Cost/kwh	£	0.05		£	0.17	
2017						
January	£	263.48	6021	£	86.97	510
February	£	27.08	484	£	141.27	847
March	£	200.31	4556	£	82.32	484
April	£	218.18	4960	£	68.94	398
May	£	178.66	4039	£	86.74	449
June	£	114.06	2521	£	77.94	400
July	£	79.27	1711	£	79.24	408
August	-£	105.38	-2619	£	79.59	409
September	£	65.18	1376	-£	4.32	-50
October	£	86.21	1800	£	82.65	419
November	£	119.47	2502	£	89.03	449
December	£	203.44	4365	£	101.63	517
	£	1,449.96	31716	£	972.00	5240
Cost/kwh	£	0.05		£	0.19	
2018						
January	£	392.14	8537	£	141.74	730
February	£	279.69	6048	£	107.04	541
March	£	346.14	7543	£	103.75	530
April	£	321.89	6982	£	96.15	487
	£	1,339.86	29110	£	448.68	2288
Cost/kwh	£	0.05		£	0.20	

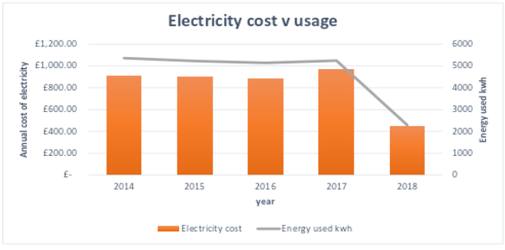
Summary of gas and electricity costs and consumption 2014-2018

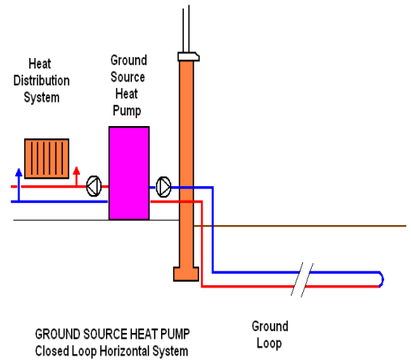
Costs shown include VAT Rates include standing charge.
Club charges are not included but are effectively cancelled out by commission payments.

	2014	2015	2016	2017	2018
Gas cost	£ 2,243.76	£ 2,472.62	£ 2,190.06	£ 1,449.96	£ 1,339.86
Energy used kwh	46384	52005	48354	31716	29110



	2014	2015	2016	2017	2018
Electricity cost	£ 914.34	£ 898.76	£ 884.64	£ 972.00	£ 448.68
Energy used kwh	5357	5227	5141	5240	2288





Ground Source Heat Pumps (GSHP)

GSHP transfer heat from the ground into a building to provide space heating and in some cases, to pre-heat domestic hot water.

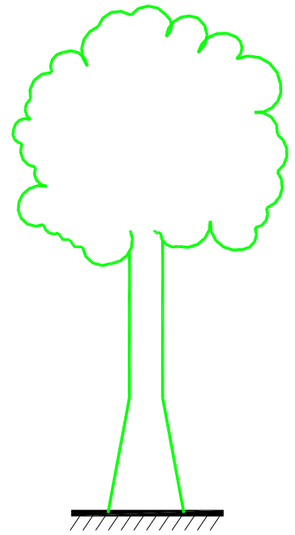
For every unit of electricity used to pump the heat, 3-4 units of heat are produced.

A single 100m borehole can provide around 4 to 5kW of heat load dependant on ground conditions at an approximate cost of £6,000. A slinky coil laid in a horizontal trench of 10m length will provide approximately 1kW of heat load at an approximate cost of £1,000. Installed cost of a GSHP ranges from about £800-£1800 per kW.

Solar Water Heating

Solar water heating systems gather energy radiated by the sun and convert into useful heat in the form of hot water. The system works in parallel with a conventional water heating system to ensure year round hot water.

Solar water heating can provide almost all of your hot water during the summer months and around 55% all year round. System consists of solar panels, storage vessel and pipework. Solar panels are most efficient when installed south facing. A typical installation to store around 200 litres of hot water would require 2-4m^2 of south facing roof with minimal shading. A system of this size would cost approximately £2,500 - £4,000 installed.



Biomass Heating

Biomass heating using boiler plant system is designed to provide heating and hot water and works in the same way as any other boiler system. However the fuel used does not contain fossil fuels and is produced from organic matter. It is carbon neutral in that the carbon dioxide emitted during combustion is the same and is cancelled out by the carbon dioxide absorbed during growth.

'Biomass' fuels generally take the form of wood pellets, wood chips or wood logs.

Storage is required for the fuel being used.

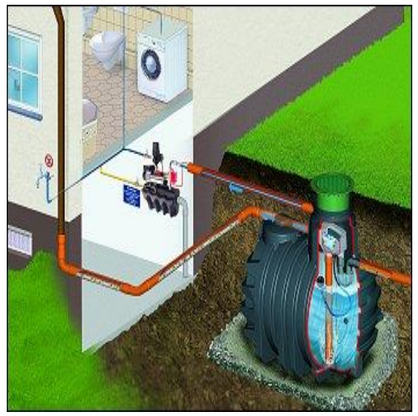
Biomass heating is most cost-effective when a local fuel source is used.

Biomass fuels are very competitively priced compared to conventional fossil fuels, in excess of 50% cheaper. However, moisture content is a major variable and effects the heat output.

Capital cost of the boiler installation is greater than a conventional system due to the requirement for a feeding mechanism and storage silo.

With larger schemes, storage of fuel can present problems and frequent deliveries may be necessary.

The ash content of the fuel is only around 1% and is usually used as a soil improver in local gardens.



Rainwater Recovery

The recovery of rainwater involves the collection of filtered water mainly from roofs and storage underground for re-use as required.

Up to 50% of main supply water can be substituted, thereby significantly reducing consumption and costs.

Reduces the dependance on mains water.

Sustained water savings add value to the property.

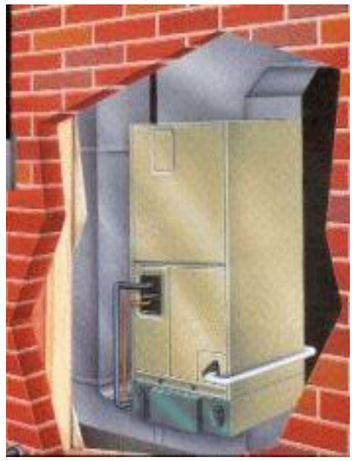
Horticultural and other day to day needs not effected during hose pipe bans.

Combined Heat and Power (CHP)

Combined heat and power is the production of electricity and useful heat in a single process and can be designed to run on any fuel from biomass to natural gas to serve a buildings needs.

Heat recovered from the electricity generation process may be re-used for space heating and water heating with up to 50% reduction in carbon emission.

Can be utilised to provide cooling with additional plant.



Air Source Heat Pump

An air-source heat pump draws freely available heat from the ambient air and is utilised to provide heating and domestic hot water. Can also be utilised for cooling in summer months.

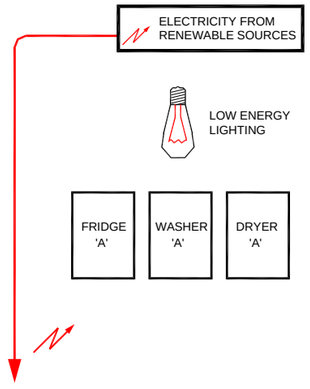
For every unit of electricity used, up to 3.4 units of heat can be produced.

A typical 14kW installation would cost between £10,000 - £13,000 installed.

Less expensive than comparable ground source heat pump installations.

Limited output up to 14kW available at present and therefore restricted to small residential developments or partial schemes.

Noise is the main draw-back. Internal mounting units are available and these are quieter but noise is still evident and can be a nuisance particularly during the night-time.



Low Energy Electrics

Selecting appliances such as washing machines and dishwashers, and energy saving lighting will dramatically reduce electricity consumption and not only reduce costs but also carbon emissions.

Replacing a single domestic light bulb with an energy efficient type can save £100 over the life of the fitting.

Purchasing domestic appliances with the energy logo rated 'A' exceeds specified energy requirements and is a guarantee the product will save energy, cost less to run and reduce carbon emissions.

Switching off appliances and not leaving them on standby is a useful tip both financially and environmentally.

Photovoltaic Panels

Photovoltaic panels (PV) use energy from the sun to create electricity. PV only requires daylight, not direct sunlight to generate electricity.

PV systems generate no greenhouse gases with up to 450kg reduction in carbon emission per year for each kW of power.

Typically 9m^2 panel area is required for 1.0 kWe of power. Cost between £2,500 to £4000 per kW of power installed but grants up to 60% are available at times.

Planning consent may be required by local authority for PV system.

Wind Turbines

Utilising wind as a renewable energy source involves converting the wind power from rotating blades to turn the shaft. The shaft rotates inside a generator which generates electricity.

Siting of wind turbines is crucial to their effectiveness. Best sited at the highest possible point with clear exposure away from obstructions such as trees and other buildings.

Meteorological office data, site monitoring and local knowledge should be sought during feasibility stage.

Systems can cost between £1500 - £25,000 depending on size and type of installation.

A large 6kW system can provide 12,000 - 15,000 units of electricity (kWh) per year depending on site and location with a reduction of 5-6 tonnes of carbon dioxide emissions per year.

	FUEL COSTS				RHI SUBSIDY			CARBON FOOTPRINT		
SPACE HEATING	A Nett Cost Of Fuel	B Efficiency % or C.O.P	C Cost-in-use Pence/kWh	D Annual Cost For Heating £/year	E RHI P/kWh	F Anticipated Payment £/year	G Maximum Payment £/year	H Carbon Emission Kg/kWh CO_2	I Annual Carbon Emission kg CO_2/annum	J % CO_2 Emission Compared to gas (1)
1. Gas fired boiler (Condensing	4.36p/kWh	85%	5.13	£2565.00	N/A	-	-	0.210	10500	100%
2. Oil fired boiler (Condensing)	52.0p/Litre	85%	5.86	£2930.00	N/A	-	-	0.298	14900	142%
3. LPG Fired Boiler (Condensing)	47.4p/kWh	85%	7.85	£3925.00	N/A	-	-	0.241	12050	115%
4. Solid fuel boiler Anthracite grains	£22.82 50kg bag	70%	7.21	£3605.00	N/A	-	-	0.331	16550	158
5. Electric-heaters on peak	18.61p/kWh	100%	18.610	£9305.00	N/A	-	-	0.233	11650	111%
6. Electric storage Heaters off peak	Day 24.31/9/kWh Night 4.99p/kWh	100%	Variable	£7500.00	N/A	-	-	0.233	11650	111
7. Ground-Source Heat Pump with Radiators	Electricity 18.61p/kWh	Max COP = 4.2 to 1 Seasonal = 3.7 to 1	5.00	£2500.00	Nil	Nil	Nil	0.063	3150	30%
8. Ground-Source Heat Pump with Underfloor Heating	Electricity 18.61p/kWh	Max COP = 4.5 to 1 Seasonal = 4.0 to 1	4.64	£2320.00	Nil	Nil	Nil	0.058	2900	28%
9. Air-source Heat Pump with Radiators	Electricity 18.61p/kWh	Max COP = 3.5 to 1 Seasonal = 3.0 to 1	5.33	£3090.00	Nil	Nil	Nil	0.078	3900	37%
10. Air-Source Heat Pump with Underfloor Heating	Electricity 18.61p/kWh	Max COP = 4.8 to 1 Seasonal = 3.3 to 1	6.18	£2665.00	Nil	Nil	Nil	0.071	3550	34%
11. Biomass boiler Pellet fuel	£302.89/tonne delivered	80%	7.85	£3925.00	Nil	Nil	Nil	0.0154	770	7%
12. Biomass Boiler Wood Chips	£100.00/tonne delivered	80%	4.00	£2000.00	Nil	Nil	Nil	0.0154	770	7%

Notes

1. Input data and costs for fuels have generally been based on Sutherland Comparative Heating Tables April 2021 North West England except for heat pumps. Fuel costs exclude VAT.
2. Data for heat pumps is based on current models. Sutherland Tables data includes older less efficient heat pumps and can be misleading for new installations.
3. Data is based on an assessed annual energy for heating of 50000kWh based on information in Appendix B.
4. Carbon emissions based on data published in HM Government 'Conversion Factors for Company Reporting 2020'
5. Renewable Heat Incentive (RHI) non-domestic scheme ended 31 March 2021. A replacement scheme is anticipated but has yet to be promulgated.
6. Columns C and D reflect fuel costs only excluding servicing costs.

Comfort conditions in occupied spaces are achieved by the proper combination of the following parameters: -

Clothing
Activity Levels
Air Temperature
Relative Humidity
Air Movement
Mean Radiant Temperature

These factors are all interdependent and no one set of values can define comfort especially when individual differences in clothing levels, environmental preferences and expectations of the built environment are considered. It is not possible to establish one set of parameters which will please all the occupants all the time. Dissatisfaction from parameters affecting any one sense should not exceed 20% of people, or when considering all the factors above the predicted percentage of dissatisfied occupants should not exceed 10%.

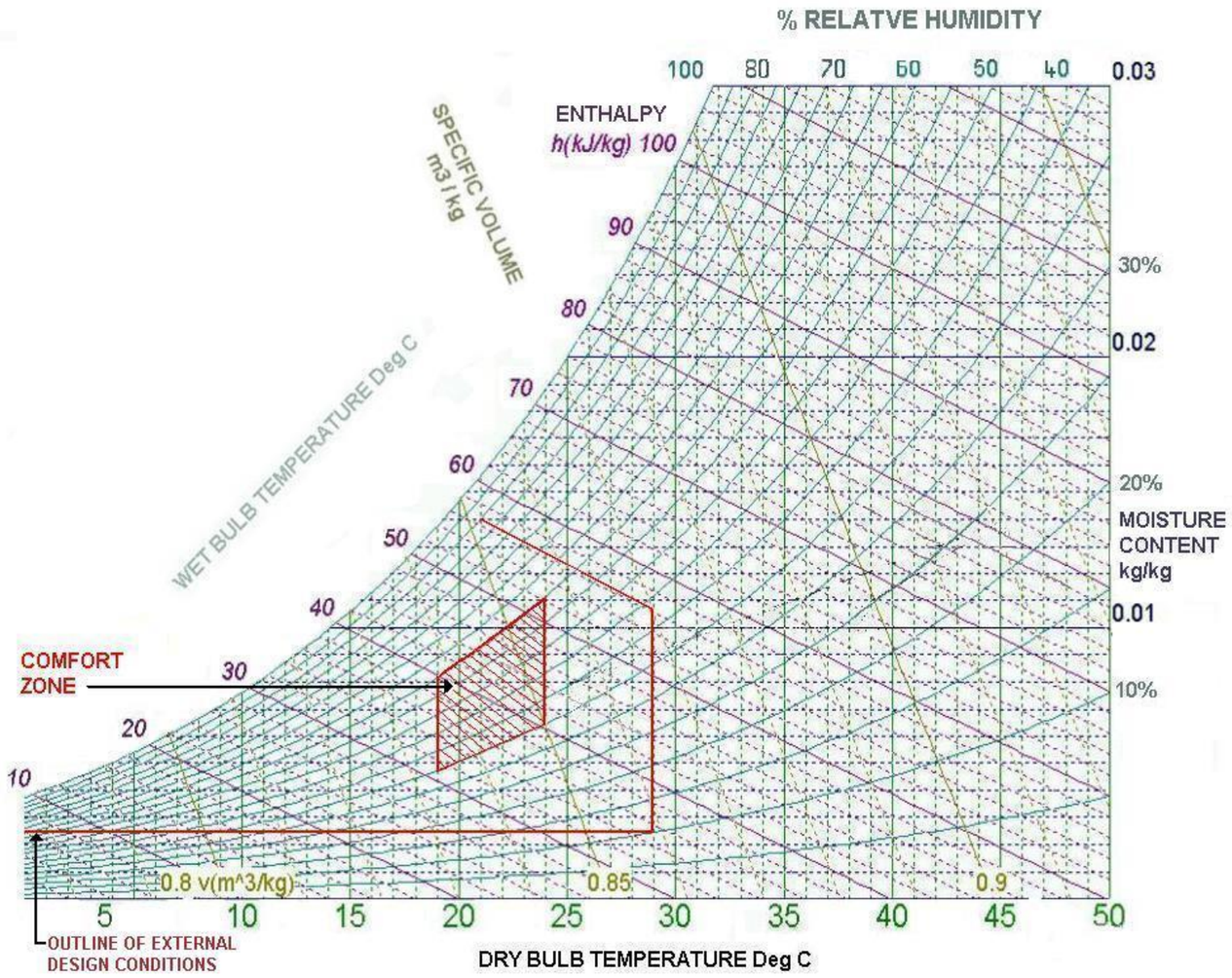
In UK homes, comfort can be maintained with a variety of room air temperatures depending on activity levels, clothing levels and room air velocity. A change of clothing such as removing a jacket, would produce an increase in 2^0C or 3^0C of an occupants preferred temperature. Thus clothing levels give an occupant the ability to regulate their preferred temperature in keeping with room temperature.

Preferred room temperatures are also influenced by the cooling effect of moving air. Comfort conditions can be maintained with air velocities ranging from 0.1m/s to 0.8m/s but higher air temperatures are required at higher velocities.

Research has shown that humidity is not a significant factor in human comfort and its value can range from 30% up to 70% without undue discomfort although 60% RH is recommended as the upper value.

Radiation exchange between an occupant and their surroundings effects comfort conditions and is governed by the temperature of these surroundings. Preferences have been noted for the mean radiant temperature to be lower than the air temperatures in summer and higher in winter.

The psychrometric chart shows the range of air temperatures and relative humidities which give comfort conditions when associated with recommended values of the other parameters listed. The outer boundary indicates the range of external design conditions which have a 1% chance of being exceeded.



UNDERFLOOR HEATING

Underfloor heating operates with a range of water temperatures between 30 and 55°C and this is ideal for heat pumps. The lower the water temperature the higher the performance efficiency of the heat pumps and this makes underfloor heating particularly attractive for new properties. Heat is emitted in the occupied zone of a room and temperature stratification typical of convection heating, is very much reduced.

Underfloor heating is also seen as an effective solution in period buildings, where alternatives can often detract, or even ruin, efforts to maintain the original interior.

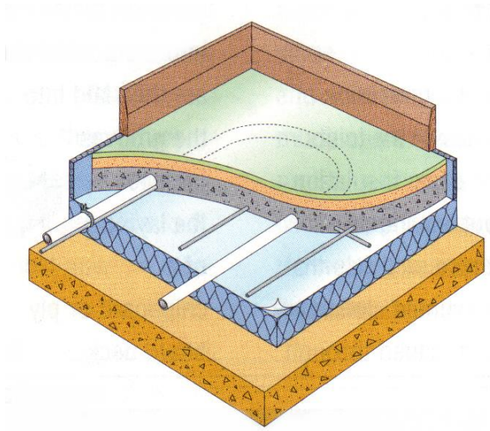
Underfloor heating has relatively low heat output and slow response time. However, the low-intensity radiant component of the heat emitted results in comfort at lower air temperatures and this reduces the feeling of drowsiness often associated with other forms of heating. Increasing the output of underfloor heating is not advisable since high floor temperatures and hot feet are not conducive to comfort.

SOLID FLOOR INSTALLATION

In this application, a screed is laid on top of the structural slab with underfloor heating loops integrated in the screed layer. First, a layer of insulation is laid on top of the concrete slab to provide a good degree of insulation and limit the downward heat losses

Best practice also requires that perimeter insulation is located around the walls to prevent the formation of thermal bridging.

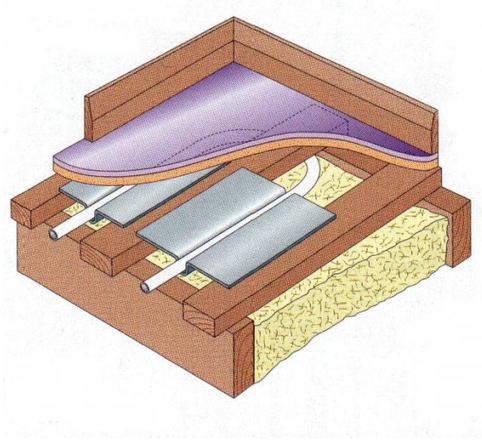
Underfloor heating pipework is then laid using a variety of fixing methods to suit local site conditions, the size of the job and installers preferences.



TIMBER SUSPENDED FLOOR INSTALLATION

Most intermediate floors are built with suspended wooden joists.
There are various methods for putting the plastic pipe into the void to heat the upper rooms. It is important that the void is insulated to prevent downward losses. It is also important to ensure that there is no air flow through the void.

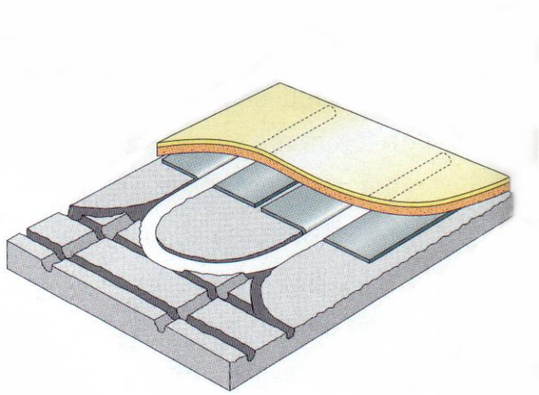
Heat diffusion plates are fixed to pipework to ensure good heat transfer between the pipework and floor above. A number of fixing systems are available to secure the pipework and its heat transfer plates to suit the floor construction.



FLOATING FLOOR INSTALLATION

An existing floor surface can be covered with high performance pre-grooved insulation board which sometimes have interlocking edges. These are either already covered with reflective foil, or heat diffusion plates can be laid into the board.

Pipes are then laid into the grooves prior to the laying of a chipboard or ply board deck.



RADIATORS

Radiators are the obvious first choice when selecting a heat emitter for a low temperature hot water heating system, offering an efficient, quiet and cost effective solution.

Radiators are manufactured in a wide variety of designs and sizes and it is impossible for us to report on all. We have consequently selected typical examples to represent the type of radiator i.e. sectional, panel or fan-assisted.

Although called radiators, typically only 30% of the heat is emitted by radiation, the rest is by convection. This naturally rises to ceiling level and air is induced from floor level over the radiator. This sets up a cycle of rising warm air at the heater and a corresponding down flow of air at the opposite side of the room. Unless the radiator is located under the window, cold draughts can be induced along the floor.

If radiators are enclosed they become natural convectors and the radiant component of the heat becomes negligible. A corresponding reduction in output occurs. It is imperative to provide adequate openings in the enclosure or casing to enable air to flow over the convector.

The heat output from a radiator is dependent on the temperature differential Δt between the mean temperature of the radiator and that of the surrounding space. Manufacturer's data is standardised at a Δt of 50°C in accordance with BS EN 442. This typically represents the water generated in a condensing boiler with a flow water temperature of 80°C and a return water temperature of 60°C. The mean water temperature is consequently 70°C and if the surrounding room temperature is 20°C then the differential Δt = 50°C.

The change in heat emission from a radiator at other temperatures is exponential, i.e. it is not a linear relationship. It is a function of the power of 1.3 as in:

$$\text{Heat emission at mean water temperature X°C} = \frac{(\Delta t \text{ X } °C)}{(\Delta t \text{ } 50°C)} \qquad (1.3)$$

The power of 1.3 is typical and varies slightly depending on type and make of radiator. It is a function of the radiant and convective components of the total heat emission for a particular design of radiator.

Heat pumps generate low temperature hot water (LTHW) at much lower temperatures than boilers, typically 45°C flow and 35 to 37°C return water temperatures resulting in a mean water temperature of 40°C and a differential temperature Δt of only 20°C. Because of the exponential nature of heat emission a radiator operating with a Δt = 20°C only emits 30.4% of the heat emitted at Δt = 50°C.

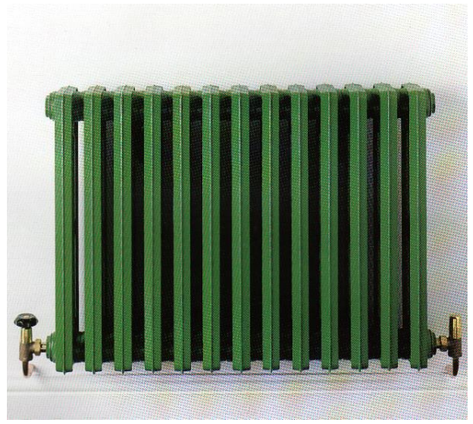
High temperature heat pumps, which have a reduced Coefficient of Performance typically generate LTHW at temperatures 55/45 giving a mean water temperature of 50°C and a differential temperature Δt = 30%. Heat emissions are reduced to 51.5% at these temperatures.

The following pages illustrate the types of radiators available and compare the heat outputs.

CAST IRON SECTIONAL RADIATORS

Originally designed for use on gravity heating systems, cast iron column radiators were used extensively throughout the first half of the twentieth century.

Today cast iron column radiators are available in a wide range of styles and are chosen for period applications or as a feature to complement interior decoration. In such instances it is important that valves are selected appropriate to the style of the room.



They are extremely heavy and usually require feet at each end to support them.

Existing cast iron radiators can be refurbished but it is expensive. They need to be removed from site and sent to a specialist company for refurbishment which usually involves immersing them in a caustic soda bath to remove old paint layers. Radiators larger than 15 to 20 sections are prone to damage during transit.

Cast iron radiators have a relatively large water content and are slow to respond to thermostatic control.

They may represent a 'blacksmith age' of engineering but will always be popular and have a role to play in historic buildings and period settings. They do have an ambience which is charming and difficult to replicate.

STEEL SECTIONAL RADIATORS

Steel sectional radiators emulate the classic appearance of traditional cast iron radiators but have a smoother finish and are extremely flexible. They are available in a wide range of heights, styles and sizes. They are considerably lighter size for size than cast iron radiators and consequently respond faster to thermostatic control. They can be provided with feet but can also be wall-mounted.

CAST ALUMINIUM SECTIONAL RADIATORS

Aluminium is lighter than either cast iron or steel and is a better thermal transmitter so radiators are relatively smaller for same heat output and it is better suited for use with lower temperature water.

FAN ASSISTED RADIATORS

The increasing use of heat pumps has led to the development of radiators designed to operate and be effective with heating water at much lower temperatures. Radiators with low water content and larger heating surfaces provide higher heat output and are more responsive to thermostatic control. The fan assisted radiator is a development of these low water content radiators.

IT IS NOT A FAN CONVECTOR! There is no noticeable air velocity or movement into the room and almost no sound at all.

The fan assisted radiator has an array of small, virtually silent, low power fans which, when activated, increase the air flow over the heating element within the radiator and dramatically increases the heat output.

At present the only commercially available fan-assisted radiator is the Jaga Strada DBE which is an acronym for ‘dynamic boost effect’. The fans require an electricity supply but have 12 volt motors so need a transformer. The radiator has in-built air and water temperature sensors and the fans are only operated when the thermostatic controls demand additional heating. The electricity consumption is virtually negligible and the fans have an operational life in the order of 50000 hours.

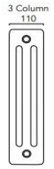
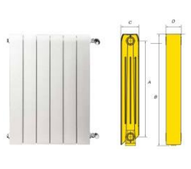
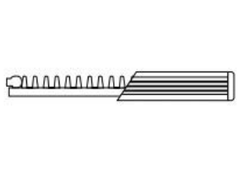
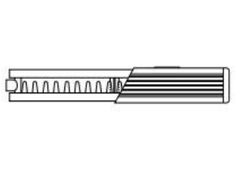
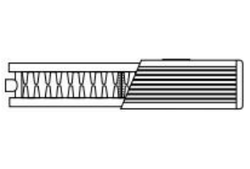
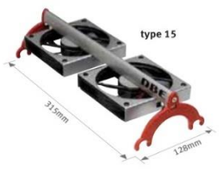
They are relatively high-tech devices and a far cry from traditional iron sectional radiators!

STEEL PANEL RADIATORS

Pressed steel radiators have been for many years the most popular choice in commercial and residential wet heating systems. They are available in extensive ranges from many different manufacturers.

Manufacturers have sought to enhance the appearance of pressed steel panel radiators by the addition of integrated side panels, and top grilles.

The steel panel radiators utilised in the attached comparison studies are the Myson Premier range which are referred to in MCS 021 ‘Heat Emitter Guide for Domestic Heat Pumps’ published by the DECC but there is a vast range of manufacturers and styles.

RADIATORS 1000 NOMINAL LENGTH		SECTIONAL RADIATORS			STEEL PANEL RADIATORS			FAN ASSISTED RADIATORS		
		CAST IRON TRADITIONAL 3 COLUMN	STEEL 3 COLUMN ANCONA	CAST ALUMINIUM FARAL ALLIANCE	MYSON 11	MYSON 21	MYSON 22	STRADA DBE TYPE 06	STRADA DBE TYPE 10	STRADA DBE TYPE 15
										
300 NOMINAL HEIGHT	ACTUAL L x H	N/A	N/A	N/A	800 x 300	800 x 300	1000 x 300	1000 x 300	1000 x 350	1000 x 350
	$\Delta T = 50^{O}C$	-	-	-	392W	584W	910W	790/1060W	1196/1796W	1593/2553W
	$\Delta T = 30^{O}C$	-	-	-	204W	313W	480W	388/636W	573/1078W	756/1532W
	$\Delta T = 20^{O}C$	-	-	-	119W	177W	276W	240/456W	363/772W	484/1098W
450 NOMINAL HEIGHT	ACTUAL L x HT	986 x 385 D = 117+	966 x 500 D = 107	960 x 430	1000 x 450	1000 x 450	1000 x 450	1000 x 500	1000 x 500	1000 x 500
	$\Delta T = 50^{O}C$	768W	1155W	1040W	700W	999W	1334W	947/1217W	1386/1986W	1898/2858W
	$\Delta T = 30^{O}C$	396W	-	576W	363W	524W	688W	470/730W	665/1192W	898/1715W
	$\Delta T = 20^{O}C$	233W	-	316W	213W	304W	405W	288/523W	421/854W	577/1229W
600 NOMINAL HEIGHT	ACTUAL L x H	994 x 572 D = 120+	966 x 600 D = 107	960 x 580	1000 x 600	1000 x 600	1000 x 600	1000 x 600	1000 x 600	1000 x 600
	$\Delta T = 50^{O}C$	1168W	1365W	1488W	913W	1264W	1705W	1066/1336W	1543/2143W	2173/3133W
	$\Delta T = 30^{O}C$	602W	-	732W	469W	653W	864W	535/802W	741/1286W	1026/1880W
	$\Delta T = 20^{O}C$	355W	-	452W	278W	384W	518W	324/574W	469/921W	660/1347W
700 NOMINAL HEIGHT	ACTUAL L x H	994 x 675 D = 115+	966 x 750 D =107	960 x 680	1000 x 700	1000 x 700	1000 x 700	N/A	N/A	N/A
	$\Delta T = 50^{O}C$	1344W	1680W	1704W	1060W	1446W	1922W	-	-	-
	$\Delta T = 30^{O}C$	692W	-	864W	539W	742W	965W	-	-	-
	$\Delta T = 20^{O}$	408W	-	518W	322W	440W	584W	-	-	-

Notes
1. Heat outputs in BLACK are manufacturer's published data
2. Heat outputs in RED are extrapolated at exponent 1.3
3. Heat outputs for STRADA are WITHOUT DBE / WITH DBE (i.e. fan OFF/fan ON)

Annual Output Performance Estimate

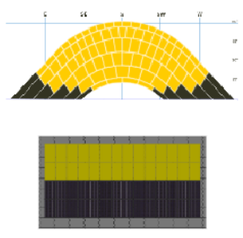
Site Details	
Client	BCA
Address	Christ Church, Neston Road, Willaston on the Wirral, Cheshire, post code CH64 2TL CH64 2TL.
Postcode zone	Zone 7E

The sunpath diagram shows the arcs of the sky that the sun passes through at different times of the day and year as yellow blocks. The shaded area indicates the horizon as seen from the location of the solar array. Where objects on the horizon are within 10m of the array, an added semi-circle is drawn to represent the increased shading. Blocks of the sky that are shaded by objects on the horizon are coloured red, and a shading factor is calculated from the number of red blocks.

The performance of the solar array is calculated by multiplying the size of the array (kWp) by the shading factor (sf) and a site correction factor (kk), taken from tables which take account of the geographical location, orientation and inclination of the array.

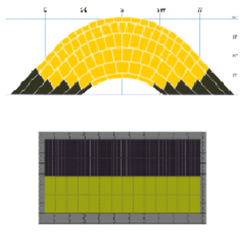
Inverter 1: Huawei SUN2000 M2 20kW 3ph Inverter

Input 1



A: Installation data	
Installed capacity	9.240 kWp
Orientation	25°
Inclination	55°
B: Calculations	
kWh/kWp (kk)	821
Shade factor (sf)	1.00
Estimated output	7586 kWh

Input 2



A: Installation data	
Installed capacity	9.240 kWp
Orientation	25°
Inclination	55°
B: Calculations	
kWh/kWp (kk)	821
Shade factor (sf)	1.00
Estimated output	7586 kWh

Total output over all inverter inputs: 15172 kWh

Disclaimer

The performance of solar PV systems is impossible to predict with certainty due to the variability in the amount of solar radiation (sunlight) from location to location and from year to year. This estimate is based upon the standard MCS procedure and is given as guidance only. It should not be considered a guarantee of performance.

The shade assessment has been undertaken using the standard MCS procedure. It is estimated that this method will yield results within 10% of the actual annual energy yield for most systems.

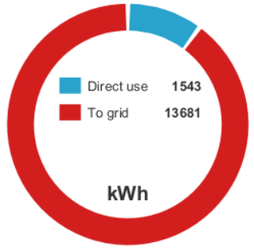
The system performance calculation has been undertaken using estimated values for array orientation, inclination or shading. Actual performance may be significantly lower or higher if the characteristics of the installed system vary from the estimated values.

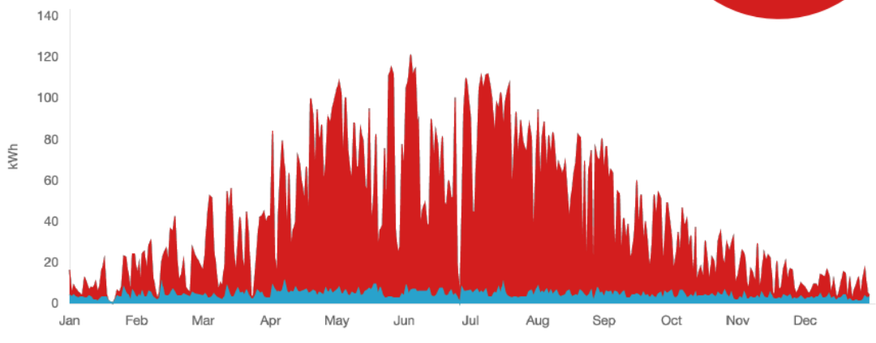
Generation projections

Yearly

The solar PV array is expected to generate 15225 kWh over a typical year. The graph shows whether the generated energy is used directly in the house or exported to the grid.

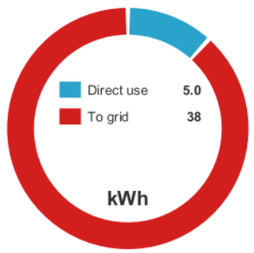
10% (1543 kWh) of the electricity generated is expected to be used directly in the property. The remaining generation (13681 kWh, or 90% of the total) is exported to the grid.

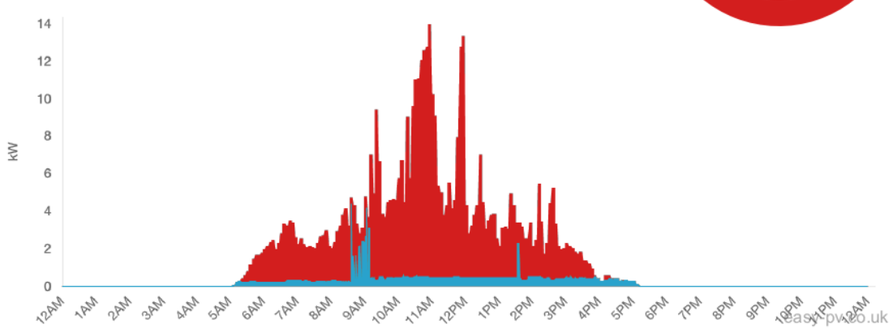




On a typical spring day

This graph shows the modelled profile of electricity generated by the PV array on a selected day (March 27th). On this day the PV system is expected to generate 43 kWh. Of this, 5 kWh (12%) is used directly in the property, and 37.9 kWh (88%) is exported to the grid.

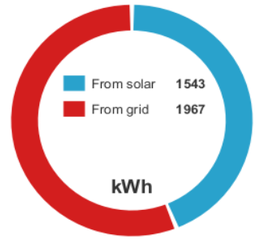


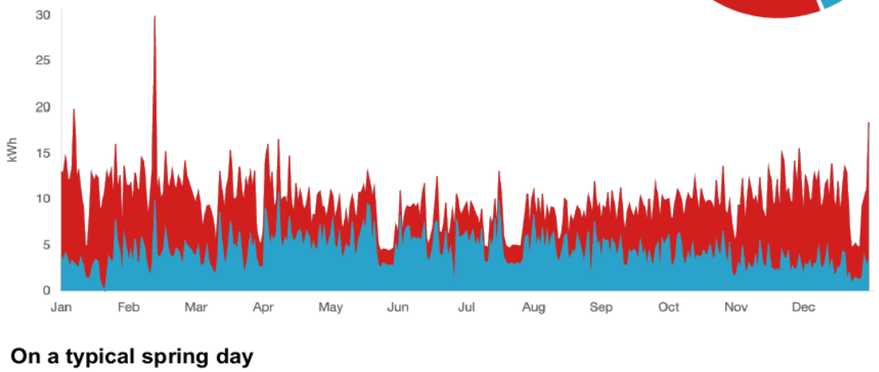


Consumption projections

Yearly

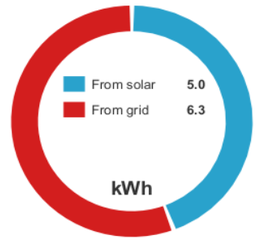
The property is expected to consume 3500kWh of electricity each year. Around 44% of this (1543 kWh) is expected to be supplied directly by the solar array. The remaining 56% (1967 kWh) is supplied from the grid.

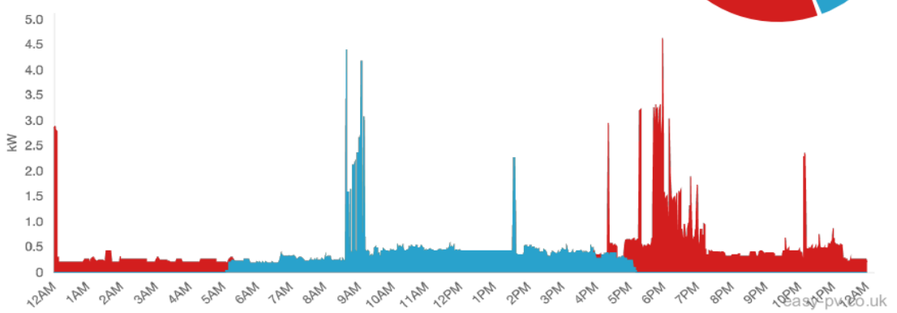




On a typical spring day

This graph shows modelled consumption data over the course of the selected day (March 27th). Total electricity consumption on this day was 11.4 kWh, of which 5 kWh (44%) is expected to be supplied directly by the solar array. The remaining 6.3 kWh (55%) is imported from the grid.



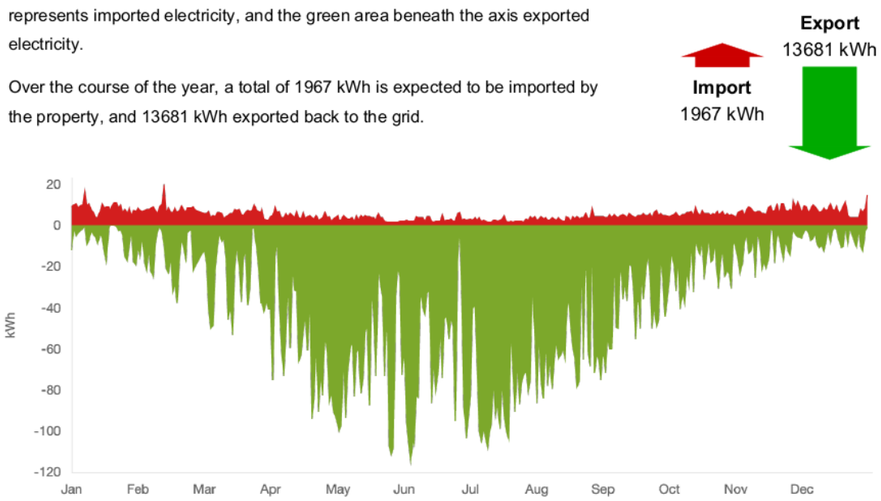


Import / export

Yearly

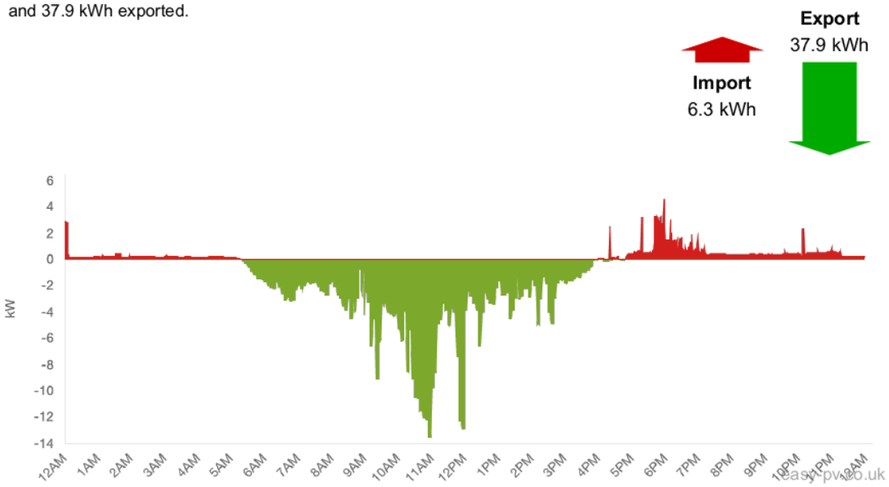
This graph shows modelled profiles of electricity imported and exported to and from the grid over the course of a year. The red area above the horizontal axis represents imported electricity, and the green area beneath the axis exported electricity.

Over the course of the year, a total of 1967 kWh is expected to be imported by the property, and 13681 kWh exported back to the grid.



On a typical spring day

This graph shows the modelled import and export of electricity over a selected day (March 27th). On this day 6.30 kWh is expected to be imported from the grid, and 37.9 kWh exported.



Self-consumption modelling

Consumption Electricity consumed in the property each year	3500 kWh
Generation Electricity generated by the PV array each year	15172 kWh
Self consumption Proportion of PV generation used in the property	10 %
Independence Proportion of electricity consumption provided by PV	44 %
Import / Export Electricity import / export each year from the property	1967 / 13681 kWh

We model here the performance of a solar PV system over the course of a year, using high resolution minute-by-minute generation data for a typical PV system and consumption data for a typical house, and calculating the flow of energy from the solar panels to the house during the day, and from the grid back to the house at night.

We provide yearly profiles of generation, consumption and import / export, along with detailed profiles for a typical spring day.

* A negative value here means that your PV system is estimated to cost this amount over its lifetime. For the non-financial benefits of a solar PV system please see the Energy Saving Trust's Solar PV web page.

Solar Energy Calculator

Your results

Assumptions

For more information, please read the calculator assumptions.

Potential annual benefit
£117

Potential CO_2 saving	Potential fuel bill saving	Potential payments from SEG (at 3.99 p/kWh)
438 kg / year	**£71 / year**	**£46 year**

Potential lifetime benefit
£2,793

Potential lifetime CO_2 saving	Potential lifetime fuel bill saving	Potential lifetime payments from SEG (at 3.99 p/kWh)
10,296 kg	**£1,734**	**£1,058**

Estimated installation costs
£2,895

Estimated lifetime maintenance costs
£1,450

Potential lifetime net benefit
-£1,552 *

Size of the system
2 kWp

Energy generated by the panels
1,580 kWh / year

Next steps

- We recommend you get three quotes to compare costs and services and be sure to consider planning permission.
- Explore the Smart Export Guarantee tariffs available to you on the Solar Trade Association website.
- Sign up to Energywire, our monthly e-newsletter, for energy saving tips, news and more.

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Solar Energy Calculator

Your results

Assumptions

For more information, please read the calculator assumptions.

Potential annual benefit
£197

Potential CO_2 saving	Potential fuel bill saving	Potential payments from SEG (at 3.99 p/kWh)
876 kg / year	**£94 / year**	**£103 year**

Potential lifetime benefit
£4,703

Potential lifetime CO_2 saving	Potential lifetime fuel bill saving	Potential lifetime payments from SEG (at 3.99 p/kWh)
20,591 kg	**£2,301**	**£2,402**

Estimated installation costs
£5,419

Estimated lifetime maintenance costs
£1,450

Potential lifetime net benefit
-£2,167 *

* A negative value here means that your PV system is estimated to cost this amount over its lifetime. For the non-financial benefits of a solar PV system please see the Energy Saving Trust's Solar PV web page.

Size of the system	Energy generated by the panels
4 kWp	**3,160 kWh / year**

Next steps

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Solar Energy Calculator

Your results

Assumptions

For more information, please read the calculator assumptions.

Potential annual benefit
£270

Potential CO_2 saving	Potential fuel bill saving	Potential payments from SEG (at 3.99 p/kWh)
1,314 kg / year	**£107 / year**	**£163 year**

Potential lifetime benefit
£6,435

Potential lifetime CO_2 saving	Potential lifetime fuel bill saving	Potential lifetime payments from SEG (at 3.99 p/kWh)
30,887 kg	**£2,632**	**£3,802**

Estimated installation costs
£7,944

Estimated lifetime maintenance costs
£1,450

Potential lifetime net benefit
-£2,960 *

* A negative value here means that your PV system is estimated to cost this amount over its lifetime. For the non-financial benefits of a solar PV system please see the Energy Saving Trust's Solar PV web page.

Size of the system	Energy generated by the panels
6 kWp	**4,740 kWh / year**

Next steps

- We recommend you get three quotes to compare costs and services and be sure to consider planning permission.
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Solar Energy Calculator

Your results

Assumptions

For more information, please read the calculator assumptions.

Potential annual benefit
£340

Potential CO_2 saving	Potential fuel bill saving	Potential payments from SEG (at 3.99 p/kWh)
1,752 kg / year	**£117 / year**	**£224 year**

Potential lifetime benefit
£8,094

Potential lifetime CO_2 saving	Potential lifetime fuel bill saving	Potential lifetime payments from SEG (at 3.99 p/kWh)
41,183 kg	**£2,867**	**£5,226**

Estimated installation costs
£10,469

Estimated lifetime maintenance costs
£1,450

Potential lifetime net benefit
-£3,825 *

* A negative value here means that your PV system is estimated to cost this amount over its lifetime. For the non-financial benefits of a solar PV system please see the Energy Saving Trust's Solar PV web page.

Size of the system	Energy generated by the panels
8 kWp	**6,320 kWh / year**

Next steps

- We recommend you get three quotes to compare costs and services and be sure to consider planning permission.
- Explore the Smart Export Guarantee tariffs available to you on the Solar Trade Association website.
- Sign up to Energywire, our monthly e-newsletter, for energy saving tips, news and more.

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Npower is not included as it directs customers to Eon's SEG tariff.

Prices correct in January 2020.

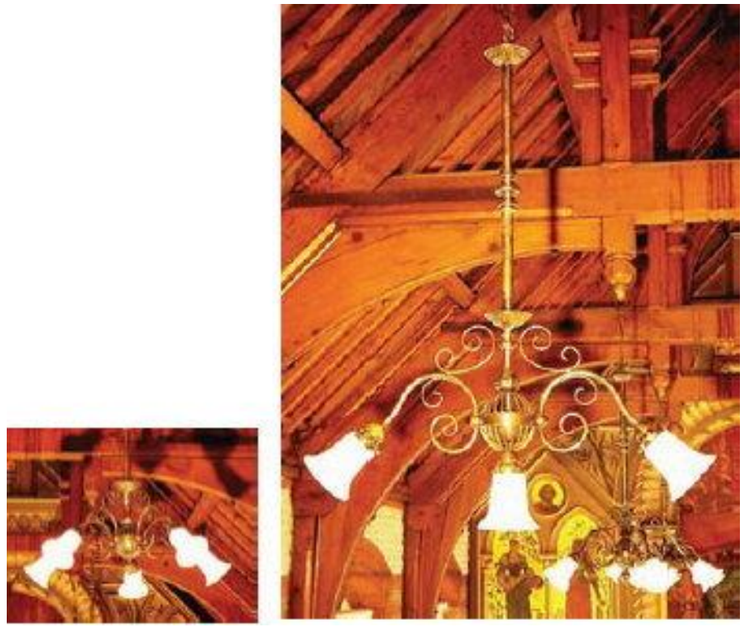
*You must have solar panels installed by Eon to qualify for this tariff.

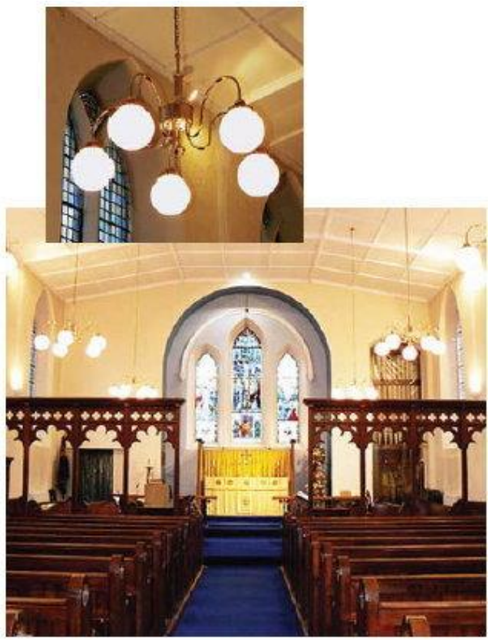
**You must be a customer of this supplier to get its SEG tariff.

***Customers can request payment up to four times a year.

****Utility Warehouse has since increased its SEG payments to 2p/kWh

Company	Tariff	Export rate (p/kWh)	Fixed or variable	Payment frequency	Payment method
Eon	Fix & Export Exclusive v1*	5.5	Fixed (12 months)	Annually***	Cheque
Octopus Energy	Outgoing Fixed	5.5	Fixed (12 months)	Monthly	Into Octopus account
Octopus Energy	Outgoing Agile	Based on day-ahead wholesale prices	Variable	Monthly	Into Octopus account
Bulb	Export Payments	5.38	Variable	Quarterly	Bank transfer or into Bulb account
Ovo	Ovo SEG Tariff	4	Fixed (12 months)	Quarterly	Bank transfer
Scottish Power	Smart Export Variable	4	Variable	Biannually	Bank transfer
EDF Energy	Export+Earn	3.5	Variable (12 months)	Quarterly	Bank transfer
Shell	Smart Export Guarantee (SEG) v1**	3.5	Variable	Annually	Bank transfer
SSE	Smart Export**	3.5	Variable	Annually	Cheque
Eon	Fix & Export v1	3	Fixed (12 months)	Annually***	Cheque
Utilita	Smart Export Guarantee Tariff	3	Variable	Quarterly	Bank transfer
British Gas	Export and Earn Flex	1.5	Variable	Biannually	Cheque
Utility Warehouse	UW Smart Export Guarantee	0.5****	Variable	Monthly	Bank transfer or into Utility Warehouse account





Although there is a requirement to retain and refurbish the existing pendants other options are available.

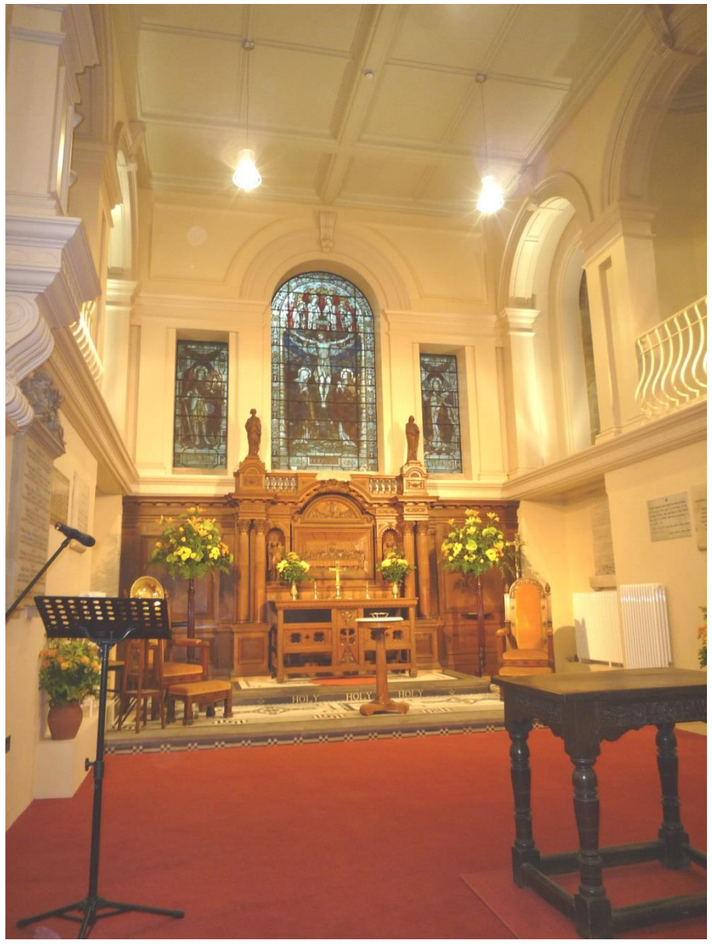
Traditional multi-arm pendant fittings are available in a range of sizes, styles, and prices.

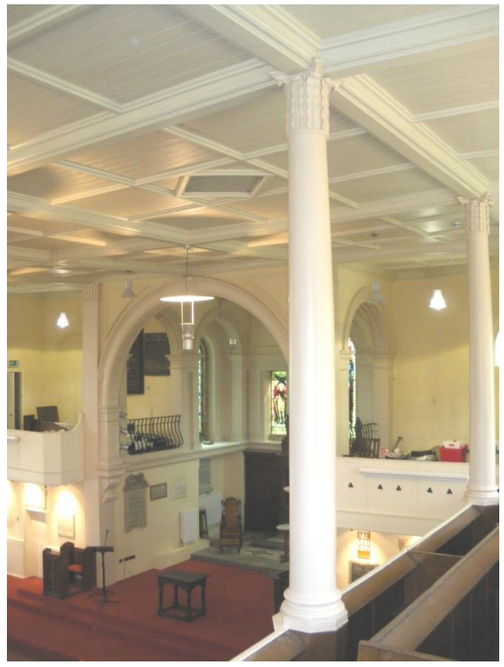
These add character to a space in addition to producing improved light.

Although most pendants traditionally use tungsten lamps, many are now available capable of accepting LED or compact fluorescent lamps.

Lanterns are generally considered to be decorative rather than providing high light levels. They can be used for general background lighting, but cannot normally be adapted for use of high-efficiency lamps, other than compact-fluorescent candle lamps.

More contemporary lighting can often blend into traditional buildings either as updated versions of chandeliers, or using obviously modern fittings to provide flexible, adjustable functionality.





Modern lighting can blend successfully into traditional heritage building to produce vastly improved lighting, using modern high-efficiency LED light sources, which although a stark contrast to traditional lighting, can stand in its own right as a quality installation with its own contemporary style.

This installation shown is St Michael's church, Madeley, Shropshire, and has recently been completed to the delight of the clergy, PCC, and congregation, as part of an overall facelift for this 19th Century Grade I-listed church designed by Thomas Telford.

Ceiling lighting is a combination of reflector uplights and glazed pendants, both using metal-halide discharge lamps, floor-recessed LED uplights to highlight the columns, concealed metal-halide spotlights for featuring the altar screen and memorial tablet, and LED fan lights to pick out the main window arches. These affects can now be achieved utilising all LED technology.

A scene-setting lighting control system was installed to allow quick and easy selection of lighting scenes for particular uses and moods.

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Consulting Engineers

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Edition: 1

Date: 13 October 2022

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CHRIST CHURCH
WILLASTON IN WIRRAL

MECHANICAL AND ELECTRICAL SERVICES

CLIENT REQUIREMENTS AND DESIGN STRATEGY

CONTENTS

1.0 INTRODUCTION

This document relates to the mechanical and electrical services aspects of the proposed re-ordering of Christ Church, Willaston. It identifies the anticipated Client requirements for the services, and explains the design strategy being proposed.

This report should be read in conjunction with BCA drawings for mechanical and electrical services. The engineering services have been designed sensitively to co-ordinate with the architecture and produce minimal visual intrusion.

BCA produced a Strategy for Refurbishment document for the mechanical and electrical services in July 2021 for review by the PCC. Mr Tim Boulton, Programme Manager provided a response in an email dated 23 November 2021 in which we were asked amongst other things to report on the possibility of installing underfloor heating. Further investigations were undertaken and BCA provided a report in March 2022 to explain options.

Mr Tim Boulton provided the following brief for the M&E works in an email dated 17 May 2022.

Item 7 *Lighting alterations/replacement;*
Item 8 *Upgrade of electrics;*
Item 9 *Replacement of all central heating pipes and radiators (to use existing boiler), configured in two zones (main church and North Extension) and upgrade of controls with zone temperature sensors and remote control facility ('Hive' or similar);*
Item 12 *Renewal of Tech (PA, projection & Streaming);*

We were subsequently issued with the minutes of a meeting dated 1st July 2022 by Mark Pearce of KPS Architects and the Re-ordering Procurement Group (RPG) which included the following items.

> *BCA's M&E proposals were discussed and are under further review. Paul's lighting proposal will be included in BCA's work.*
> *We need to aim for the highest possible level of sustainability within our budget.*

Electrical Scope of Phase 1 Works – Nave

> *Electrical installation including lighting.*
> *BCA's report, plans and specification are to include emergency lighting, intruder alarm and external lighting. The lighting design/specification will be given by Paul Janvier verbally to BCA, who will be asked to meet Paul at his home. At least two of the existing nave pendants are to be retained as part of the new lighting design as an historical link.*

Heating installation.
We will discuss with BCA the possibility of omitting the heat pump (but making provision for its future installation) This saves £20k. If budget permits use this to provide a new energy efficient boiler in this Phase. Asbestos report needed.

Scope of Phase 2 – The North East Wing

Internal alterations in the north east wing.
These will provide a new meeting room, sacristy and ambulant disabled toilet with baby change facility. The sacristy floor will remain at its existing level. A sketch plan and Viv's list were handed to Mark.
•Electrical installation.
•Heating installation.
•Renewal of AV, projection and streaming.
We need a consultant/specialist/installer such as Wigwam.

BCA have subsequently been advised that underfloor heating is to be provided during the Phase 1 works. There is clearly a need to define the extent of the mechanical and electrical works with more clarity at each proposed phase of works.

Generally, the criteria to be utilised for the design of the mechanical and electrical services will represent good practice as recommended in the guides published by the Chartered Institution of Building Services Engineering and all current Building Regulations and relevant British Standards. One purpose of this document is to bring these requirements to the attention of the Client and to request any specific requirements they may have over and above these.

2.0 WORKING LIFE

Requirements:

- The Client anticipates that the mechanical and electrical services in the church will provide reliable, trouble-free operation with low maintenance costs.

Strategy:

- The main items of mechanical and electrical plant are to be supplied from market leading companies and components are to be fully serviceable and wherever possible, capable of expansion. Components are also to be selected with regard to reliability and technical reputation for excellence and where possible future-proofed for longevity.
- Mechanical and electrical services systems should have a working life in the order of 20 to 25 years or longer, subject to receiving proper and regular maintenance.
- Heat pumps should last at least 15 years and have up to 20 years life.
- Electronic and control equipment has a minimum working life in the order of 15 years but this can be dramatically reduced should overheating occur.
- Consumables such as filters, lamps etc. will be required periodically dependent on frequency and duration of usage.

3.0 FUTURE PROOFING

Requirements:

- The Client requires that the Designers use their knowledge and expertise to ensure that any systems installed are fit-for-purpose and do not become redundant in the immediate and foreseeable future.

Strategy:

- Technology develops and moves on rapidly in this day and age, making it difficult to predict how long it will be before systems become redundant.
- As a principle, data and communications systems adopted should not be just state-of-the-art but use system architectures which are generally agreed to represent the way forward.

4.0 HEATING

Requirements:

- A comfortable environment with efficient, reliable heating which is convenient to operate. Limitations posed by the locations of heaters are acknowledged.
- The Client requires underfloor heating in the Nave.
- Supplementary heating is to be provided.

Strategy:

- The maximum permissible floor surface temperature with timber floors is 27^{o}C and this limits the amount of heat that can be emitted from underfloor heating.
- The output of underfloor heating is affected by the choice of floor coverings such as carpets and rugs.
- Criteria used for design of heating
  External temperature -3°C
  All spaces 18°C
  Natural infiltration rate all spaces – 0.5 air change per hour
- Higher room temperatures may be selected at times subject to available heat emission.
- Operational control of the heating is to be agreed with Client but a digital control system is intended which will include remote access facilities for the Client.
- The existing conventional gas-fired boiler is to be retained initially and this operates at 82/71°C maximum water flow temperatures. Mean water temperature is 76.5°C. The existing gravity feed and expansion tank is to be replaced by a pressurised system comprising of an expansion vessel and fill unit located in the Boiler Room in the Cellar.
- At some future stage the existing boiler is to be replaced by a 'hydrogen ready' condensing gas-fired boiler which will operate at 80/60°C maximum water flow temperatures. Mean water temperature will be 70°C.
- The long term aim is to replace gas-fired boiler plant with heat pumps. These typically operate with a maximum of 50/40°C water flow temperatures and a mean water temperature of 45°C. Heat pump equipment would be located externally at the east end of the church.
- The existing heating pipework and heat emitters are to be removed and replaced with new designed to function under all operating temperatures identified above. It is acknowledged that heat emissions will reduce as heating water temperatures are lowered.
- The heating will be arranged to provide 3 separately controlled circuits as follows.
  North Aisle, Lobby, Kitchen, Toilets
  Nave and Chancel
  Underfloor heating (water flow temperature modulated to maximum 45°C)

- The Kitchen is to be provided with a plinth heater to operate via the heating system with an option to operate on electric only.
- The Chancel is to be provided with a new fan convector to replace the existing. The heat output and effectiveness is limited and it cannot provide comfortable air temperatures under all conditions to all areas.
- The Meeting Room is to be provided with a split air-to-air heat pump which can be operated independently of the church heating system.
- The existing electric over-door heater over the external door to the south façade into the Nave is to be retained.
- To future proof the radiators for use with low temperature hot water heat pumps they shall incorporate small fans to enhance the air flow over the heating surface. They are not however fan convectors.

5.0 COMFORT COOLING

Requirements:

- Comfort cooling is not required.

Strategy:

- The proposed air-to-air heat pump in the Meeting Room incorporates the facility to provide cooling. This is relatively expensive to operate and it is recommended that the church not make use of this facility.

6.0 VENTILATION

Requirements:

- The existing church is of traditional construction and is to be naturally ventilated via openable windows.
- Mechanical extract ventilation is required to meet requirements of Building Regulations.

7.0 WATER

Requirements:

- The Client requires ample hot and cold water at water outlets.

Strategy:

- The existing mains cold water service is to be extended below-ground to new points of entry to the church.
- Local electric water heaters are to be provided to provide hot water in Kitchen and Toilets.
- Hot water temperature at wash hand basins is to be controlled so as not to exceed 43°C which is considered a safe temperature.

8.0 DRAINAGE

Requirements:

- The Client requires that the existing below-ground drainage be extended to serve new facilities.

Strategy:

- The above-ground drainage system is to be entirely new to serve new facilities.
- The existing below-ground drainage has been examined by BCA and is considered suitable for adapting for the proposed re-ordering project. Cleaning and CCTV survey to establish invert levels and any necessary repairs is to be included in the Phase 1 works.
- On completion of all works the completed drainage system is to be cleaned and CCTV surveyed under the contract to confirm acceptability.

9.0 GAS

Requirements:

- Natural Gas is presently available at the church but no future uses have been established.

Strategy:

- The existing gas supply and meter and supply pipework to the existing gas-fired boiler in the Cellar is to be retained without modifications.

10.0 ELECTRICAL SERVICES

Requirements:

- Existing electrical services will remain to areas of the church outside of the re-ordering proposals.
- Remodelled areas shall have an adequate supply and flexible distribution system to cater for current requirements with reasonable provision for future additions and amendments.

Strategy:

- All electrical installations to be in accordance with BS7671:2018, the IEE Wiring Regulations to current amendment's.
- The existing three-phase electrical utility supply is to be retained.
- All cabling is to be low-smoke zero-halogen sheathed so that in the event of a fire, toxic fumes are not emitted into the house.
- The finish of all electrical outlets and accessories is to be agreed with the Architect in order to complement architectural features and styles of the church.
- A generous provision of twin 13 amp socket outlets will be provided throughout the re-ordering.
- Dedicated power supplies will be provided from the primary distribution board for fire systems, and new AV systems.

11.0 LIGHTING

Requirements:

- The aim will be to provide a comfortable pleasant atmosphere with flexible switching to meet general requirements and to integrate with and enhance the architectural features of the church.

Strategy:

- Existing lighting to unaltered areas shall remain with luminaires re-lamped.
- New energy effective light sources are to be adopted, aesthetically compatible with the architectural and decorative features of the rooms to re-ordering areas.
- All lighting is to be selected in conjunction with the architect, primarily on the basis of effect and style rather than technical lighting standards and requirements.

12.0 FIRE ALARMS

Requirements:

- The church is to commission a fire risk assessment.
- The fire alarm system shall be designed to provide extensive coverage of the church with detectors and automatic alarms to provide early detection of any fire, to reduce risk to the occupants and the church.
- The installation is to be in accordance with the appropriate standard BS5839:

Strategy:

- All alarm sounders are to be integrated into the detectors.
- The automatic alarm system is to be remotely monitored, using a designated telephone line, at a specialist 24 hr-manned security centre to provide cover when the property is not occupied, or to provide call-out to the fire service at all times.
- All rooms and circulation routes are to be covered by individual detectors.
- Routine maintenance and checks for the first 12 months of operation is to be provided. Maintenance contracts will be needed for future years.

13.0 COMMUNICATIONS, AUDIO, VIDEO

Requirements:

- The AV and communication systems are to be upgraded in conjunction with a specialist AV contractor.
- A cabling network and infrastructure, to allow connection of telephone, data, audio and television equipment is required.

Strategy:

- A brief for the design of AV systems is to be developed in conjunction with the AV specialist.
- The cabling infrastructure to support the AV system shall form part of the electrical contract works, including required power supplies.

14.0 FIRE PROTECTION

Requirements:

- The Client does not require a sprinkler fire protection system.

15.0 LIGHTNING PROTECTION

Requirements:

- Lightning protection does not form part of the proposed works.


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Appendix A - Table of Existing & Proposed Uses

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Church Services Note: our scheme developed 5 different seating layouts: Eucharist Family services Morning Prayer Family Worship Informal services Evening Prayer/ Compline Evensong Remembrance See Footnote 1	Plan 3 CDE	 Weekly Weekly Monthly Weekly Weekly Monthly Monthly Annual	Various – from 20 – 170 Capacity	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes Yes
Funerals	Plan 3 CDE	5 (2022)	Average 70 To capacity	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated	No No	Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Funerals (Cntd) See Footnote 2				• Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No Poor quality, temporary. No Internet	Yes Yes Yes
Weddings See Footnote 3	Plan 3 CDE	4 (2022)	55 -100 Various numbers	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Baptisms See Footnote 4	Plan 3 CDE	6 (2022)	70 average	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Carol Concerts See Footnote 5	Plan 3 CDEFG	X3 annually	170	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Village School Services See Footnote 5	Plan 3 CDE	4 per year	170 (inc staff)	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Concerts See Footnote 5	Plan 3 ABCDE	3 (last 12 months)	170	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Christmas Tree Exhibition & Competition See Footnote 5	Plan 3 BCDE	5-10 days per year	TBE	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Christingle Service See Footnote 5	Plan 3 E	1 per year	170 seated + standing	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Community Fish'n Chip Supper/Similar catered events with entertainment See Footnote 6	Plan 2 with added tables/ chairs	1 -4 per year	60-80	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Men's Group Women's Group PCC meetings See Footnote 7	Plan 3 ABCFG	22 per year	10-30	• Small meeting space • Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 20-30 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No No Poor quality, temporary. No Internet	Yes Yes Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
APCM (Other parish meetings involving the wider community are also held) See Footnote 8	Plan 3 ABCE	1 per year (minimum)	50-100	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Interne	Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Exhibitions See Footnotes 5	Plan 2 Plan 3 Various	Subject to bookings	TBE	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No Interne	Yes Yes Yes Yes Yes

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Non-traditional worship (To be developed) See Footnote 9	Plan 3 CDEFG	TBE	TBE	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 190 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No internet	Yes Yes Yes Yes

The uses following on pages 14 and 15 are those formerly housed in the Church Hall

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Exercise Class See Footnote 10	Plan 3 CD	X2 weekly	20	• Inclusive access to all public areas including worshippers with pushchairs and wheelchair users. • A space to accommodate up to 170 seated • Compliant refreshment area • Fully compliant Toilet facilities • Lighting, audio/visual. internet streaming/video	No No No No Poor quality, temporary. No internet	Yes Yes Yes Yes Yes
Informal Concerts See Footnote 10	Plan 3 CD	2/3 Annually	60-80	Ditto above	Ditto Above	Ditto Above
Coffee Mornings See Footnote 10	Plan 3 BCDE	Weekly	20-30	Ditto above	Ditto Above	Ditto Above
Community Hub See Footnote 10	Plan 3 CD	TBE	20-30	Ditto Above	Ditto Above	Ditto Above
Day Care (Mother & Toddler) See Footnote 10	Plan 2 Plan 3 CD	TBE	20-40	Ditto Above	Ditto Above	Ditto Above
Youth clubs See Footnote 10	Plan 3 CD	X2 weekly	15-20	Ditto Above	Ditto Above	Ditto Above
Scouts (all ages) See Footnote 10	Plan 2	Weekly	20	Ditto Above	Ditto Above	Ditto Above
Guides (All ages) See Footnote 10	Plan 2	Weekly	20	Ditto Above.	Ditto Above	Ditto Above

Use	Layout **	Frequency	Numbers	Requirements	Current	Completed Re-ordered space
Banquets See Footnote 10	Plan 2	Subject to availability	50-80	Ditto Above	Ditto Above	Ditto Above
Wedding Receptions See Footnote 10	Plan 2	To match number of wedding ceremonies	TBE	Ditto Above	Ditto Above	Ditto Above
Dances See Footnote 10	Plan 3 ABC	X2 annually	TBE	Ditto Above	Ditto Above	Ditto Above
Receptions See Footnote 10	Plan 2	STA	Up to 80	Ditto Above	Ditto Above	Ditto Above
Suppers See Footnote 10	Plan 2	STA	Up to 80	Ditto Above	Ditto Above	Ditto Above
Public Meetings See Footnote 10	Plan 3 E	As needed	150	Ditto Above	Ditto Above	Ditto Above
Film Nights See Footnote 10	Plan 3 ABC	2/3 annually	70/80	Ditto Above	Ditto Above	Ditto Above
Amateur Dramatics See Footnote 10	Plan 3 ABE	2/3 annually	60/80	Ditto Above	Ditto Above	Ditto Above
Choirs & Musical Groups See Footnote 10	Plan 3 ABCDE	2/3 Annually	100+	Ditto Above	Ditto Above	Ditto Above
Public Emergency Accommodation See Footnote 10	Plan 2	As needed	TBE	Ditto Above	Ditto Above	Ditto Above
Pet Services See Footnote 10	Plan 3 CD	annually	40-60	Ditto Above	Ditto Above	Ditto Above
Continuing Education See Footnote 10	Plan 3 ABCDE FG	As needed	TBE	Ditto Above	Ditto Above	Ditto Above

STA – Subject to availability
TBE – To be estimated
** see Layout Options in Footnotes to Table

Footnotes to Table

These notes are to supplement the main body of text within the Faculty application by focussing on the issues raised by consultees.

Layout Options:

Plan 1: Current layout of pews. Seating capacity is around 150 persons (100 in fixed pews plus up to 50 in folding chairs in the North Aisle)
No view of the Altar from North Aisle.

Plan 2: Shows the existing Church with no seating.

Plan 3: Total pew removal: Shows Seven possible layouts for seating to demonstrate with a range of uses as set out in the Matrix.

Plan 4: Partial pew removal: Shows both the severe limitation to the range of uses, and overall reduction in seating capacity. The mixture is a visually unsympathetic and untidy mix of seating types in a Grade 2 Listed building.

All the uses set out in the table comprise either:

- Those currently housed within the building/intended capabilities;

or

- Uses that until 2011 were housed in the dilapidated Church Hall (a timber-framed system-built wooden building from the 1920s) prior to its demolition.

Background

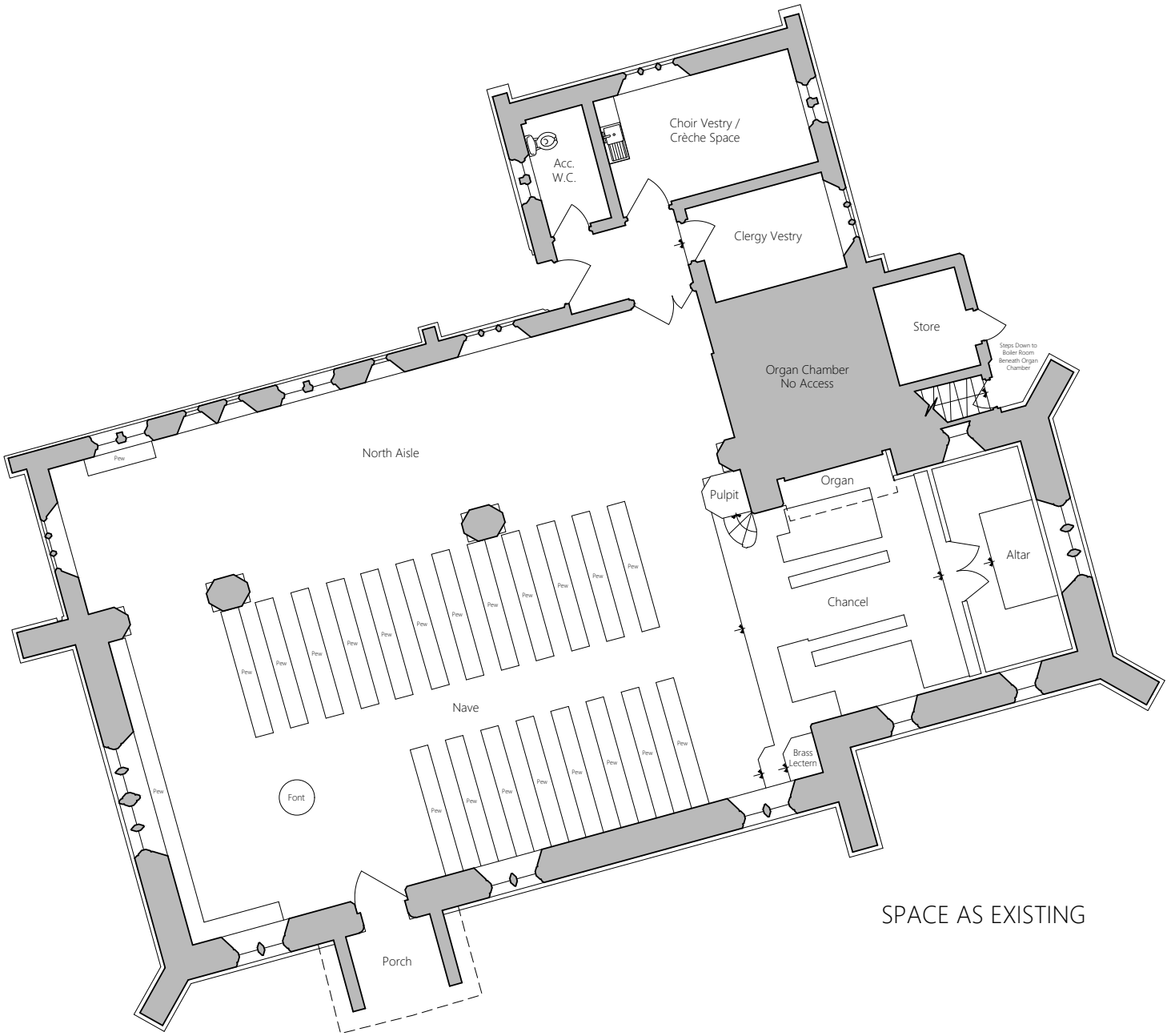
With full professional advice and scrutiny, after extensive consultation and a full **Options Appraisal** of the Parish owned **Church Hall** premises (including its repair, refurbishment, and rebuilding) the PCC decided that demolition of the unsustainable building and sale of the site was the correct action.

During the process of seeking Planning Consent for demolition of the Church Hall, it was demonstrated that the Nave and North Aisle area within the Church offered an equivalent floor area to that within the unsustainable Church Hall structure. This fact offered the comfort of a potential future home to some of the Church Hall uses. Additionally, we were able to establish the means to assist the expansion and furtherance of our Mission in the wider community based on the sustainable permanent Church building. It should also be noted that Cheshire West and Chester Council's Conservation Officer consulted the Victorian Society (part of that application incorporated an elemental outline of

the re-ordered space). The retention of a single pew and two light fittings were elements agreed and are currently part of the Faculty Application.

1. Christ Church, Willaston is a compact building, currently housing a maximum seated capacity of around 170 persons. The current position of toilet facilities towards the front of the Church makes access less discreet, a discouragement to frail and vulnerable worshippers.
2. **Based on a survey done in 2022**, the Churchyard surrounding the building has an assessed capacity for new burials of around 30years**.** Part of the area surveyed is the site of the Scout Centre. This structure is life expired and is to be demolished. The cleared site is part of the area included in establishing the current burial capacity. Expanding the church building to the north is therefore impractical, financially unviable, and unsustainable. It would also be over existing graves.
3. Due to its setting in a Conservation Area, Christ Church attracts several weddings. However, some of the physical restrictions of the current fixed seating layout and below par facilities is a discouragement to potential wedding couples.
4. It has been noted that at a number of baptisms the inflexibility of the seating has caused distress to families with young children. In particular families with pushchairs have severely restricted choice in the location of their seats. People with impaired mobility also find the seat pitch (distance between the rear of the row in front and the back of their seat) to be too small. Wheelchairs and mobility aids condemn these groups to the North Aisle and rear of the Nave.
5. Carol Concerts are popular, the acoustics of the Nave area are excellent and allow us to celebrate voice and music both sacred and secular. The North Aisle has much lower ceiling and consequently poorer acoustics.
   The Church groups, our local Church school and Veterinary College are some of those who use the Nave of the Church.
   Organ, Guitar, and Choral concerts will benefit from improved Audio-visual equipment which will further intensify the use of the building. Flexible seating and the ability to create a completely clear floorspace that would offer a broad range of size of events.
   Christingle numbers could be bolstered if the barriers to inclusivity evident in the fixed seating were removed.
   Exhibitions find the central location of the church building attractive as choice is currently restricted by the absence of suitably sized space within the village. We find these activities (Floral displays, Christmas-Tree exhibitions) offer opportunities to meet members of the community not normally sharing our church.
6. While we have been actively pursuing the Re-ordering process, we have undertaken to try several Fish and Chip Suppers with live music support as a fundraiser. These have been popular, but the current seating in the Church building and its poor facilities have necessitated the hire of space which has drastically reduced the viability of this format.

7. The absence of small group meeting space makes attendance by small groups uncomfortable, hard to heat. Consequently, a wider range of potential uses unlikely. The creation of small meeting space usable even when the main Nave space is in use will make the overall use of the building more sustainable.
8. As part of Mission we attempt to increase involvement in our active and caring Christian group and bolster the numbers of attendees to the APCM. The current layout does not speak to a forward looking and active Church, proclaiming neither welcome nor speaking to our wider mission. We have invested heavily to secure quality professional advice to enhance the elements that physically demonstrate our desire to share our values and include more of our wider community as part of our Church family.
9. The current fixed seating, poor Audio-Visual equipment, refreshment, and toilet facilities are barriers to bringing non-traditional types of worship forward. It is challenging to create the appropriate atmosphere of informality and warmth when so much shouts “tradition!”
10. The uses in this part of the Matrix are those which were located in the old Church Hall and which could fit into the Nave after re-ordering. We have publicised our progress in making the Faculty and re-opened dialogue with former users as opportunities arise.



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1

Contract: Internal Reordering Project

Client: P.C.C. of Christ Church, Willaston in Wirral

Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Existing: Options Appraisal

Drawing No.: OA 01

Scale: 1:100 @ A3

Contract No: 2069

Drawn: LMC

Date: Feb 2023

Revision: -

KEPCZYK PEARCE SANDERSON
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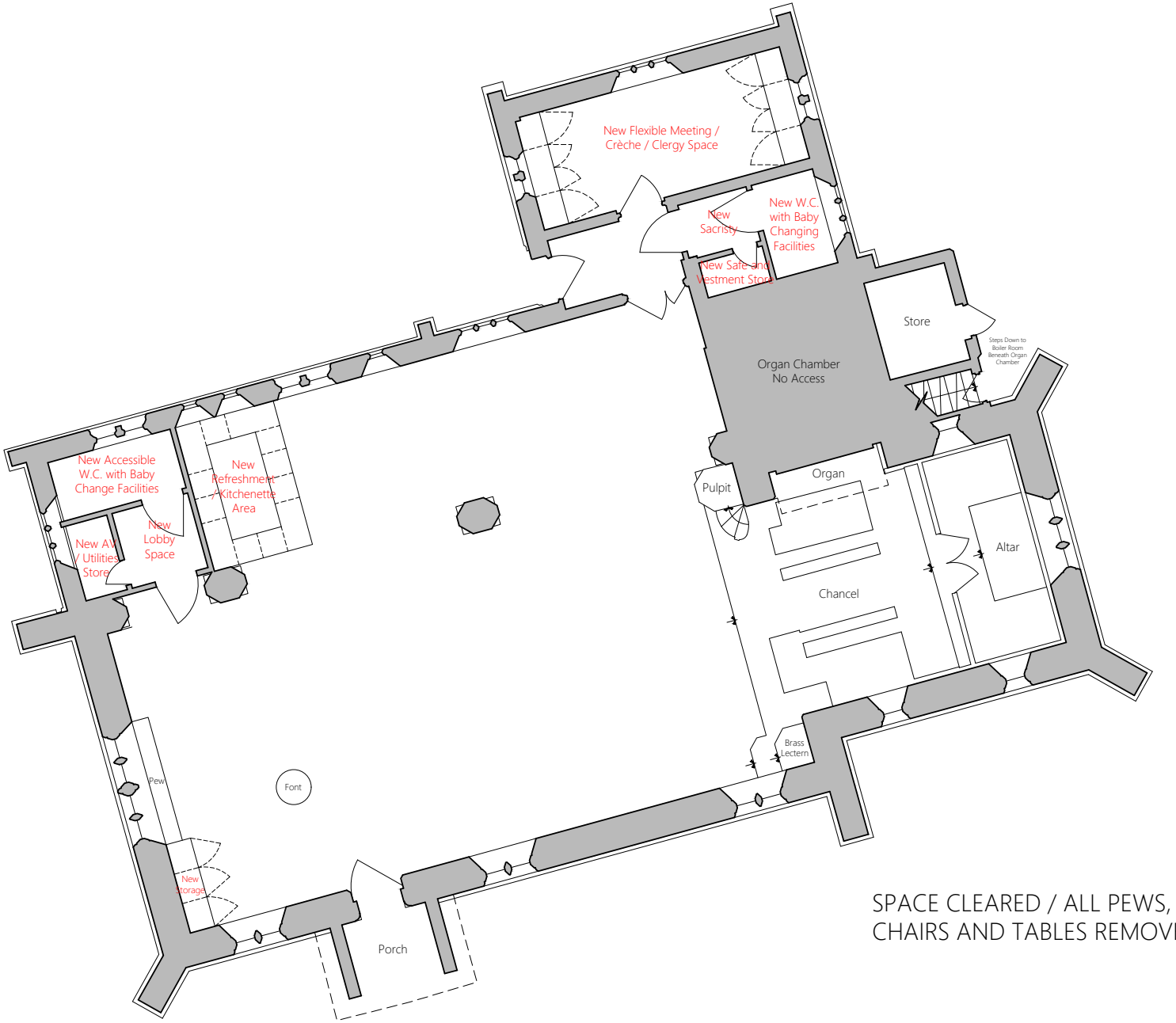

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2

Contract: Internal Reordering Project
Client: P.C.C. of Christ Church, Willaston in Wirral
Building / Structure: Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed: Options Appraisal

Drawing No.: OA 02
Scale: 1:100 @ A3
Contract No: 2069
Drawn: LMC
Date: Feb 2023
Revision: -

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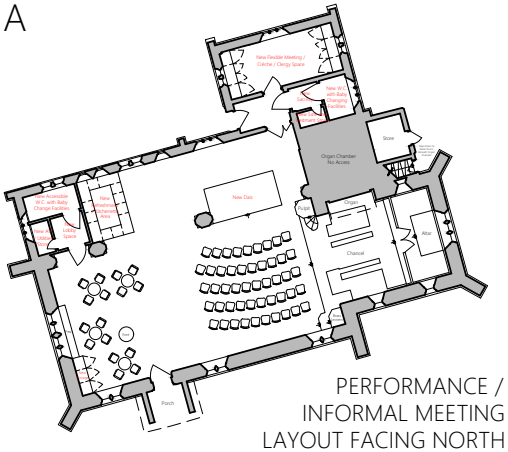

PERFORMANCE /
INFORMAL MEETING
LAYOUT FACING NORTH

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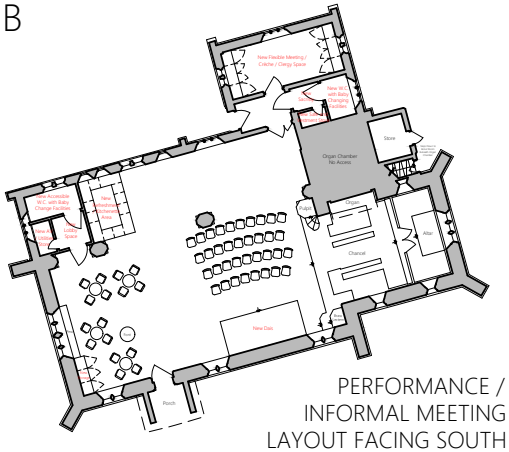

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LAYOUT FACING SOUTH

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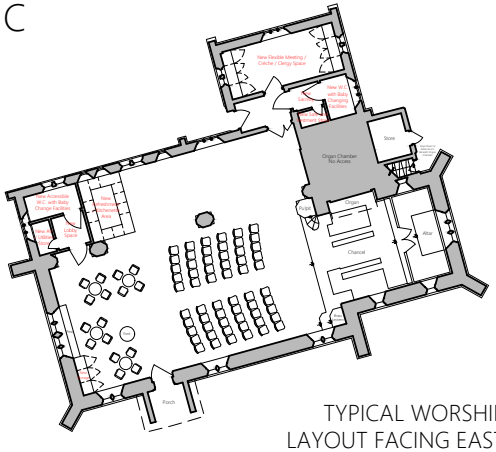
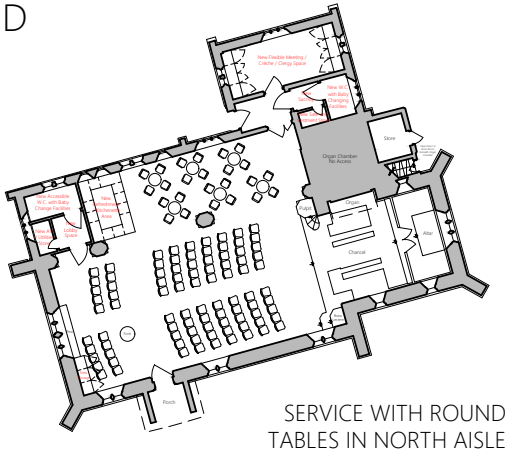


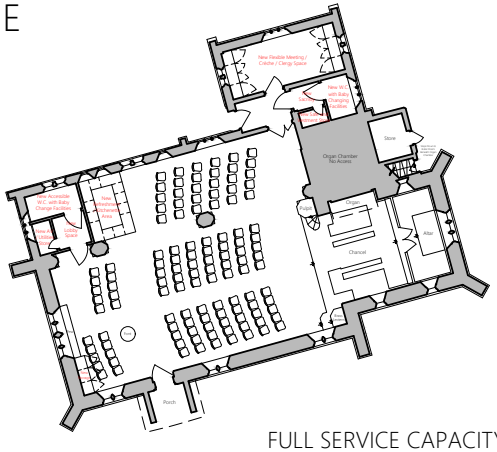
TYPICAL WORSHIP
LAYOUT FACING EAST

D



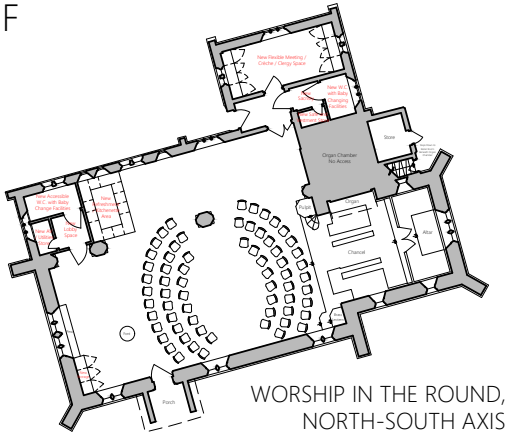
SERVICE WITH ROUND
TABLES IN NORTH AISLE

E



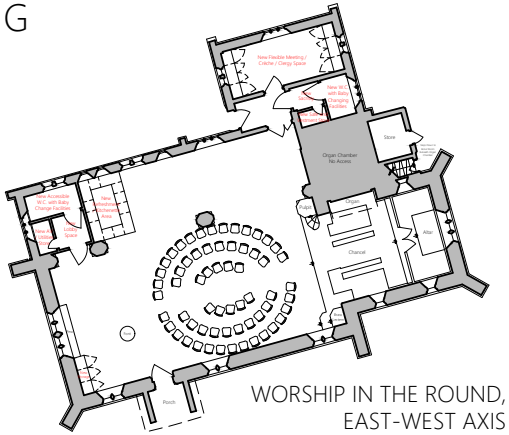
FULL SERVICE CAPACITY

F



WORSHIP IN THE ROUND,
NORTH-SOUTH AXIS

G



WORSHIP IN THE ROUND,
EAST-WEST AXIS

3

Contract	Internal Reordering Project
Client	P.C.C. of Christ Church, Willaston in Wirral
Building / Structure	Christ Church, Willaston in Wirral

Ground Floor Plan as Proposed:
Options Appraisal

Drawing No.	Scale
OA 03	1:100 @ A3

Contract No	2069	Drawn	LMC
Date	Feb 2023	Revision	-

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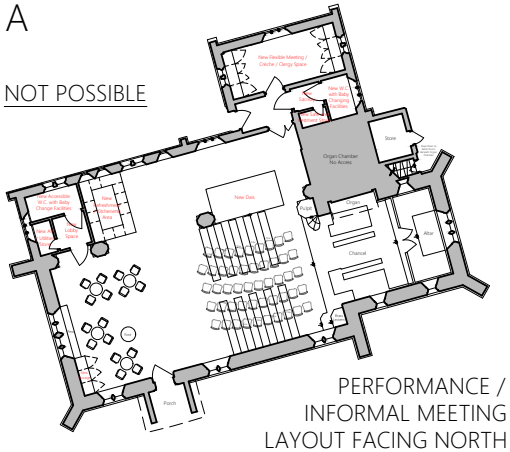
A

NOT POSSIBLE



PERFORMANCE /
INFORMAL MEETING
LAYOUT FACING NORTH

B

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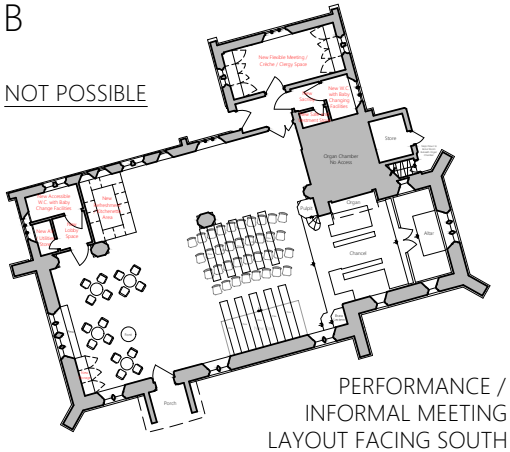

PERFORMANCE /
INFORMAL MEETING
LAYOUT FACING SOUTH

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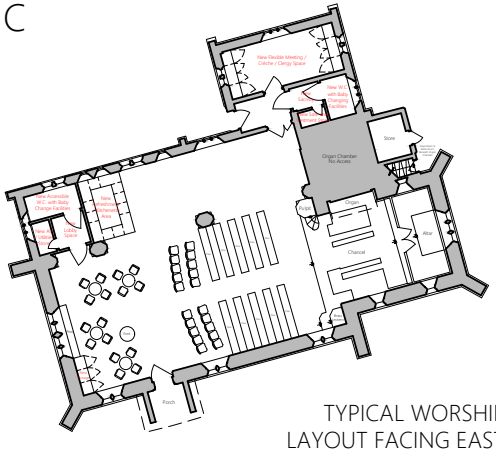
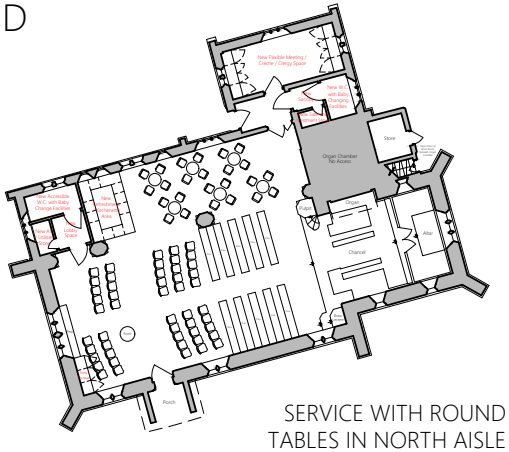


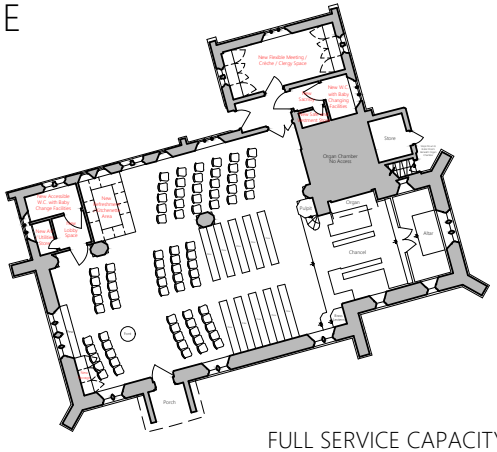
TYPICAL WORSHIP
LAYOUT FACING EAST

D



SERVICE WITH ROUND
TABLES IN NORTH AISLE

E



FULL SERVICE CAPACITY

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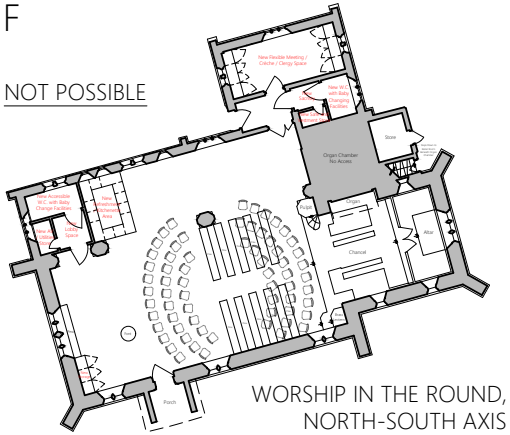
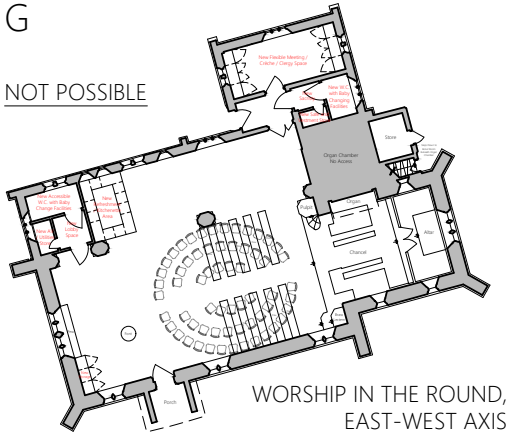


WORSHIP IN THE ROUND,
NORTH-SOUTH AXIS

G

NOT POSSIBLE



WORSHIP IN THE ROUND,
EAST-WEST AXIS

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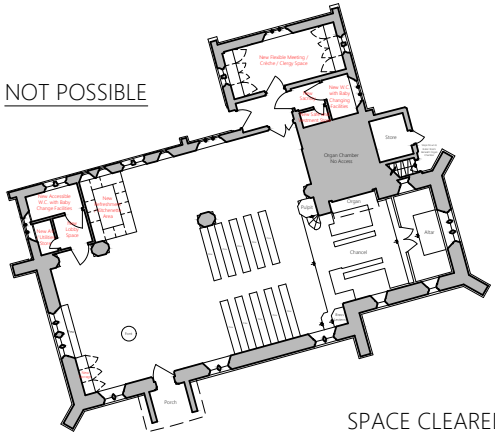

SPACE CLEARED

4

Contract	Internal Reordering Project
Client	P.C.C. of Christ Church, Willaston in Wirral
Building / Structure	Christ Church, Willaston in Wirral

Options Appraisal: Feasibility of Retaining Five Rows of Pews

Drawing No.	Scale
OA 04	1:100 @ A3

Contract No	2069	Drawn	LMC
Date	Feb 2023	Revision	

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Response to DAC advice following review on 13 January 2023

Preamble

The DAC review of 13 January considered feedback from consultees, with the remaining reservation being over the necessity of the removal of all pews from the Nave. The scheme had already incorporated a proposed change to retain a single pew for historical reasons, placing it centrally below the west window.

The DAC request was for the parish to "*provide an options appraisal setting out the options for partial pew removal to clearly demonstrate why this was not considered suitable for the scheme*".

This paper seeks to do this.

Background Summary

This is a re-ordering proposal to update an existing parish church building in order to make it a sustainable, viable, heritage and community asset for worshippers and multi-purpose use at the heart of a village community.

Whilst built as a place of worship in the nineteenth Century, an ageing church membership together with rising running & maintenance costs mean that innovative re-ordering is needed if closure is to be avoided within the first half of the 21st Century. The process was started about 2010 with an application for the demolition of the dilapidated church hall which was approved on the basis that the church hall uses could be more sustainably accommodated in a re-ordered church building. At the same time, an application for Consent to develop five houses on the church hall site was made. After receipt of Consents in 2011, proceeds from the sale of the site were set aside for the future re-ordering within the church building.

The church's worshipping needs are themselves diverse – from the full range of traditional and family services, both small, medium and occasionally large, and the beginning of more flexible forms like café church and 'messy church'. No doubt there will be further formats in the future to strengthen mission and outreach, particularly to young people needing differing layouts of seating and sometimes no seating at all.

The parish has a thriving Church of England primary school within 250m of the church and has developed a close working relationship over recent years through the work of the previous incumbent and provides foundation governors from church members. This church/school linkage provides a great opportunity for church growth and there are special services at various times in the year, however the space and facilities are very restricted and well below the standard of modern public buildings. The rising cost of heating fuel together with the large volume to heat only makes this more challenging going forward.

One of the social events in the church building pre-Covid has been a 'fish and chip supper' – this was well supported, but the parish was unable to accommodate all who wished to come because of the small amount of space available for the tables - very difficult with fixed pews to negotiate. This year alternative village facilities were hired – it is unsustainable to pay

twice for such community space, rather than being able to use the church building more flexibly and share it with others.

The parish concludes that a re-ordering scheme must be able to both meet the needs of the worshipping congregation AND be able to provide community space for a wide range of non-conflicting purposes. The local need for such facilities has risen in recent years since the closure of the church hall and the British Legion. **It is this combination of 'church' and 'community' use that will ensure the parish can continue to run and maintain Christ Church**. This combination requires a very high degree of flexibility in order that the use can flex between fully seating the occupants and, not seating any of them at all – with any number of variations requiring different seating layouts and densities.

Use Testing

In order to fulfil the DAC's request, the parish has produced a table of existing and proposed uses at a detailed level – with the layout reference depicted in column 2. This table can be found in Appendix A.

A set of 4 plans illustrates the layouts as follows:

Plan	DWG No.	Title	Description
1	OA01	Ground Floor Plan – as existing	
2	OA02	Ground Floor Plan – as proposed	Space cleared – all pews, chairs and tables removed
3	OA03	Ground Floor plan – as proposed	Layout options A – G
4	OA04	Ground Floor Plan – Feasibility of retaining 5 rows of pews	Demonstration of retention of 5 rows of pews on layout options A – G

Conclusion

Of the eight layouts illustrated in Plan 3, layouts A-G plus 'Space Cleared', five of them are not possible to achieve whilst retaining 5 rows of the existing pews.

Apart from the arguments already deployed in the Pew Removal Document v6, it is pertinent to capture the impression of one our visitors:

"My nephew aged 36 who is 6'4" (not unusual these days), found the pews very uncomfortable and ended just standing up at the back of the church at our daughter's wedding in July 2021 – preferring to get a better view of the proceedings from there rather than moving to the chairs at the side."

Recommendation

The parish recommends endorsement of this scheme as proposed, without any pew retention except the single pew retained for historical reasons to be placed centrally below the West Window.

Willaston Christ Church – Reordering - Correspondence with parish

Attachments are listed according to the numbering on the supporting documents list

- Attachments in brown are included within the overview section
- Attachments in blue are included within the proposals section
- *Attachments in black italics are superseded and not included within the application*

Date	Message
28/02/2018 To: Caroline Hilton From: Stephen Bazely	I am the Vicar of Christ Church Willaston and I am writing as we would like to have the DAC's pre-application advice on re-ordering the church building. We have completed a Community Audit, which is waiting for the PCC to accept, which included a community survey. We were hoping to complete our Statement of Significance and Needs as soon as possible, although we wanted the DAC to give us their advice before we get too far into the process.
14/03/2018 To: Stephen Bazely From: Caroline Hilton	Thank you for your message, and my apologies for the delayed response. This can be put before the DAC for 'informal' advice if you can provide some details regarding the proposals, as follows: 1) Please can you provide a description/summary of the proposals you are considering. 2) We will definitely need to see a Statement of Need and Statement of Significance (with thought given question regarding the effect of the proposals on the significance of the building) 3) Have you engaged an architect and if so, have they produced any preliminary 'sketch' drawings? (I appreciate that you may not have engaged your architect at this stage) 4) It would also be very helpful if you could provide photographs showing the areas affected by the proposals If you have any queries please do not hesitate to contact me.
22/03/2023 To: Caroline Hilton From: Stephen Bazely	1) Summary of our proposals - we are hoping to make our church a modern, fully-compliant, sustainable and flexible building for worship and community building. 2) We are currently working on our Statement of Need and Statement of Significance and will let you see it when it is complete 3) As we are yet to complete item 2 we have not engaged an architect 4) When we have an idea of what work will be done, we will provide photographs showing the areas affected by the proposals.

	I hope this clarifies our current position and I will try and keep you updated as we proceed, we were hoping the DAC would want to be involved earlier but it seems as though you want us to be further along first.
18/04/2018 To: Stephen Bazely From: Caroline Hilton	My apologies for not responding to your e-mail sooner. As you are at this very early stage of thinking about how to develop the church building, I would recommend you speak to the Church Buildings Development Officer, Emily Allen if you have not done so already. Emily will be able to help you think about your vision and needs for the development of the building (and also if you need to explore possible funding sources at all.) I have copied Emily in on this e-mail, and Emily can also be contacted on 01928 718834 Ext: 268 The Churchcare website provides a guidance note for parishes considering re-ordering/altering their church building which you may find useful. You can see this guidance note here - Re-ordering - Alterations and extensions The DAC will be definitely be interested in being involved from an early stage, but it would need to have an idea of your vision and needs for the building in order to offer its initial informal advice.
16/05/2018 To: Stephen Bazely From: Caroline Hilton	Further to our recent telephone conversation, I am writing to provide examples of Statements of Need for major projects. Please see attached the Statement of Need produced by Rostherne St Mary for a re-ordering project. As a further example I have also attached the Statement of Need produced by Waverton St Peter for a toilet extension.(What is of interest in this Statement of Need is that in the section at the end for Further Supporting Information they have included details of an Options Appraisal where alternative solutions are described and reasons given why they had been discounted.) I'd also recommend you take a look at the detailed guidance note provided by the ChurchCare website for producing Statements of Significance and Statements of Need – you can see it via this link Guidance Note-Statements of Significance and Need . It is important when developing a major project to produce a robust Statement of Need (along with details of an Options Appraisal) as this will be really helpful when you reach the point where any consultation takes place with Statutory Consultees (eg Historic England, The Victorian Society) so they have a clear understanding of the thought that has gone into the project and the justification for works affecting historic fabric.

	I have copied in Emily Allen (Church Buildings Development Officer) to this message. Once you have produced your draft Statement of Need, if you wish, Emily can take a look at it and provide comments/guidance as to how you may possibly strengthen your Statement of Need. Please do let Emily know if you wish for her to do this, once you have produced your draft. I hope this is of help. If you have any queries please do let me know. *Examples of Statements of Need*
29/08/2018 To: Caroline Hilton From: Tim Ley	Ted Dew spoke to you today to explain that we would like to submit our Statement of Significance and Statement of Needs in connection with our urgent desire to update and improve the facilities at Christ Church Willaston. Ted explained that that you had very kindly offered to review the document and provide some initial feedback, in order to help make sure it is appropriate for the DAC to consider. We are delighted that you will be able to support us in this way. We are keen that if possible, the DAC committee may be able to consider the reordering proposal during September if at all possible. I wonder if you would be good enough to confirm receipt of this email? Thank you. *Statement of Need - superseded*
12/09/2018 To: Caroline Hilton From: Tim Ley	Many thanks for getting back to us to request clarification on the three points raised in your email below. Please find our response in the attachment. We trust that the DAC will find these answers help them to conclude that we are setting out on a path to a successful transformation of our church building to better suit our future role as church and as a community asset. *Clarifications*
13/09/2018 To: Tim Ley From: Caroline Hilton	Many thanks for that further helpful information. This will be included with the Statement of Significance and Need that you provided when the proposals are put before the DAC at tomorrow's meeting. We will be in touch after the meeting to let you know the feedback of the DAC.
10/09/2018 To: Tim Ley From: Caroline Hilton	Thank you for your message and my apologies for the delay in responding - we've become very busy since the beginning of September. I have looked through the Statement of Significance and Needs document and confirm this is on the agenda for the DAC meeting on 14 September. I can see from the document that the parish is developing a wide ranging scheme of works including improvements to accessibility, hospitality and facilities, flexibility, energy/heating, audio-visual equipment and lighting for the building.

	I just have a few queries regarding the proposals and would be very grateful if you could provide answers/clarification of the following: • Can I just check, am I correct in understanding the new accessible toilet be in the same location as the existing toilet – ie in the choir vestry area? • Aside from Sunday services, please can you list the other uses of the building by groups and give an idea of the numbers attending the activities • Has there been any local consultation - within church and/or local community regarding the proposals – particularly thinking about the solar panels? If you are able to provide any response to those questions, that will be helpful for when this matter is put before the DAC on 14 September.
19/09/2018 To: Stephen Bazely, Ted Dew, Tim Ley From: Katy Purvis	**DAC Advice** I am writing to let you know that request for informal advice on reordering was considered at the DAC Meeting of 14 September 2018 and the Committee wishes to offer the following informal advice a) The Committee advises that the parish should interview potential architects in order to find the one they would consider most suitable to engage for the project and work together with them to develop the initial proposals, rather than hold a competition. (If architects produce designs for a competition, there may be the problem that they are producing work and presenting designs for free). b) Once the parish have engaged their architect and an initial proposal plan has been put together, it will be arranged for a DAC Sub-Committee to visit the church for a meeting with the parish and their architect c) In the meantime, the DAC Secretary would like to arrange an informal visit to the church to discuss the scheme and take photographs I've also attached a list of architects working in your area, one of whom you may consider suitable to work with. We suggest that you view the practice websites to get a feel for the nature of each practice. It's also well worth you speaking with other churches who have engaged any architects you're considering, to see how they've found the experience of working with them. You might then wish to pick 2 or 3 architects to meet and then decide who you might best work with. They're all technically competent but you also need to consider how well you would work with them. The list I have put together is not an exhaustive list, it just names architects approved for Grade 2 and above church buildings and known to work in Wirral South, Frodsham, Chester, and Wirral North

	deaneries. If you require any further suggested architect names, by all means let me know. If you have any queries please do not hesitate to contact me.
26/10/2018 To: Ted Dew and others From: Caroline Hilton	Thank you for your warm welcome on Wednesday, it was great to meet with you. To recap, we discussed the various works you are considering to the church building in order to make to provide greater comfort and hospitality to visitors and flexibility for use of the space in the building. The main works you described included the provision of a kitchenette pod/space, improvement/reconfiguring of the toilet facilities to make them fully accessible, the possible partitioning off of the north aisle to provide separate useful rooms, removal of the pews, relocation of the font, improvement of the heating and lighting and an improved audio visual system. As I mentioned at the meeting, I have since spoken to Mike Gilbertson and updated him regarding what we discussed at the meeting. I understand and am sympathetic to your sense of urgency to improve the building with the aim of making it a well valued and used space at the heart of the community. However, as mentioned, it is vital that the PCC are all of one voice and agreed as to the vision and goal for the church before moving further forward with developing any proposals. Also, very importantly, the vision for the future mission of the parish must be a factor in the conception and development of the proposals, to develop the church to facilitate mission and ministry (I am aware that our conversation was concentrated on the practicalities of the faculty process.) I understand there will need to be a conversation between yourselves and the Diocesan Missioner (Lyn Weston) regarding the parish vision for the future of the church in terms of mission, and this will feed into how major changes to the church are planned, and also therefore into the Statement of Need. I also understand that the conversation regarding mission will need to include Revd Stephen Bazely when he is available. In the meantime, I can send you examples of works carried out at other churches in the Diocese, which you may find useful when thinking about the sort of solutions you would wish for your church building. The following link takes you to the page on the diocesan website which lists and provides photos of a number of toilets, kitchenettes and tea stations that have been created at churches in the diocese: Toilets and kitchenettes . I am struggling to find examples of creche rooms being created – an example of a separate room bring created for a specific purpose is the Prayer Room as part of the alterations that were carried out at

	Ashton Upon Mersey St Mary. (Unfortunately I don't have a photo but I seem to remember from our meeting that you, or one of the other attendees had visited the redeveloped St Mary's and may have seen the this room.) The specific children's areas we have on file tend to be play areas within the main body of the church. I am aware of a substantial children's creche room at Hoole All Saints (having previously used it!). You had mentioned at the meeting the wish to be able to hire out the church/parts of the church for community use – the following link to the page on the diocesan website gives useful information on how to approach this: Community use of churches I thought it would also be useful to you to see the detailed guidance from Churchcare regarding lighting in churches, for when you consider your proposed new lighting scheme: http://www.churchcare.co.uk/images/Lighting_August_2016.pdf As discussed at the meeting, please see the attached following lists of contractors known to the diocese (we do not hold a list of 'recommended' contractors, but can let you know of names of contractors known to have carried out work in the diocese): • Heating • Electrical • Audio-visual I may be repeating myself in sending the following Statement of Need information to you, but I just want to be sure you have it - when thinking about further developing your Statement of Need please see attached examples – one for re-ordering at Rostherne St Mary and one from Waverton St Peter for a toilet extension, which includes an Options Appraisal. The useful, detailed Churchcare guidance on producing Statements of Significance and Need for major works can be seen here: Guidance Note-Statements of Significance and Need . I hope this is of some help, in terms of providing practical guidance and examples for you to look at and think about when considering possible alterations to the church building. Initially however, it is important that the PCC develops and agrees a vision of the way forward, and vital that the vision for future mission is considered and discussed as stated above as this will inform the understanding of the needs for the building and the development of the proposals. If you have any queries please do let me know.
11/01/2019 To: Caroline Hilton From: Tim Boulton	Many thanks for your time today. As discussed, I will be the single point of contact for this programme – I enclose my ToR as agreed by the PCC on 26 November 2018.

	Having met with Lyn Weston, I understand that the conversation on Vision/Mission will now be taken up by Stephen Bazely directly with Lyn and will 'inform' this programme at a later stage. This way we can continue to make progress whilst still ensuring that any significant changes to our requirements that result are fully accommodated in the overall design before it is finalised. I note your suggestion that we should develop our requirements further before selecting an architect and use this as an opportunity to record our thoughts as we go along to help with the construction of a future 'options appraisal' for the eventual faculty & other submissions. I also note: - The need to develop a list of what activities would take place in the main building space and gather 'letters of support' from any external organisations that might make use of it; - Internal works will be subject to the CoE faculty process and that external ones would be subject to CW&C Planning rules; - Plans of churchyard burial grounds are held at parish level. You mentioned at the conclusion of our meeting that the temporary faculty for removal of pews in the North Aisle had lapsed some time ago, but that it is expected that this will be regularised by inclusion in this programme.
11/01/2019 To: Tim Boulton From: Caroline Hilton	Thank you for your message regarding our meeting earlier today. (Just to clarify regarding permissions for any external works – this would require both faculty permission and planning permission.)
13/06/2020 To: Caroline Hilton From: Tim Boulton **With attachment**	As you may recall, Christ Church, Willaston has been planning a re-ordering scheme for some time. In February 2020, the PCC appointed Mark Pearce as our architect and he has been working with us to explore the feasibility of various configuration options. I am pleased to say that after a series of PCC Re-ordering Team meetings, we have settled on one as being preferred and would like to ask the DAC to give its informal feedback on it before we go any further. I am aware that the next DAC meeting is Friday 19th June and that the cut-off for submitting documents was 5 June. However, I wondered if it might be possible to squeeze a little airing of our scheme onto the agenda if it is not already overloaded? I enclose a brief document that would be quite quick to read, including measured plans. 4) Re-ordering Programme overview

17/06/2020 To: Tim Boulton From: Caroline Hilton	Thank you for your message and the attached document showing the parishes preferred configuration with seating options. This looks positive to me and I look forward to seeing how this scheme develops. I'm afraid we won't be able to fit it into this Friday's DAC meeting but I fully expect there will be a Standing Committee taking place at some point during July and this matter will be considered at that meeting. It would helpful if you could let us see the options drawn up by Mark Pearce that you decided against in favour of the one you have sent, along with some explanation as to why you rejected each of those other options, and the reason you preferred the one put forward. This would help the DAC (and eventually the statutory consultees) understand the thinking that lead to your preferred option and this will serve as an options appraisal. In the meantime, I think a major point to consider is the robust justification you will need to put forward for the removal of the pews which I understand are original to the church, ie how the benefit of their removal would far outweigh the impact to the significance of the interior. I mention this because as the scheme develops there will be need for consultation with The Victorian Society (and possibly Historic England) and it will be important to provide them with a strong argument/justification. If you can provide those further details so that we can include them with the details to be viewed by the Standing Committee I think it will be helpful for their understanding of the parish's thought process and will help to get the most value out of that meeting in terms of the informal advice the Committee provides. On a separate note, in your attached document you advise that the gas central heating has failed and is unusable in cold weather. It is therefore going to be important to find a suitable solution for heating the church, preferably before the cold weather returns. Please see the DAC 'Heating' page on the diocesan website which has recently been revised to be in line with the CofE 'net zero carbon' target which now needs to be taken into consideration when deciding on a new heating system - you can see it via this link Heating . The page includes a number of links to documents and guidance to help in your thinking and decision making, including Assessment of Heat in Church Buildings written by our diocesan Heating Adviser. I hope this is of some help.
17/06/2020 To: Caroline Hilton From: Tim Boulton	Many thanks for your response together with very helpful advice. I will revise the information provided in the light of your comments – **does the timing work if I get a revised report to you by Fri 3rd July?**

	My process involved leading a sub-committee of the PCC. As we were working during the lockdown, I gathered comments & preferences via an on-line voting tool and combined the views to report back – examining the options was one such study. As for the pews, I will put my mind to this – do you have any good examples of 'pew arguments' that have been successfully deployed? Finally, thanks for the comments on heating – Mark Pearce has put us in contact with a guy who can give some immediate advice on the current gas boiler (frankly I think it needs a new pump and maybe a power flush – but that's an amateur view) as well as possible professional consultancy on future heating – mindful of 'zero-by-30'…
24/06/2020 To: Tim Boulton From: Caroline Hilton	Thank you for your message. Yes, if you can get the details to us by 3 July that will be fine to be included in the Standing Committee in July. We don't have a date yet, but I'm expecting it will take place later on in the month. With regards to putting together an argument/justification for the removal of pews, here are some thoughts on the sort of points to consider: The key point is to set out how the benefit of their removal will greatly outweigh the impact on the significance of the interior. For example how the space will be used once the pews have been removed and how it will benefit and be positive for space being used for activities, and other types and configurations of worship – and to set out what those activities are that the space will be used for. If there is limited space in the village for these activities to take place so freeing up this space could be beneficial to the village and the church. Inclusion of results of any congregational or local consultation on this can also help to illustrate the argument if there is a strong response in favour of pew removal. A major consideration is the sustainability of the church going into the future and how the pew removals and opening up of space would serve this. Another point is accessibility within the building, could it be argued that the removal of pews would result improved accessibility and inclusivity within the building? Other points to set out are any existing negative points/problems regarding the pews themselves – eg if they are considered uncomfortable by the congregation, difficulties with sightlines, or if they are not of particularly good quality. Would you propose to re-use any pew material at all in the wider works to the building? These are the types of things to consider in setting out your reasoning for removing the pews and that have been used by other parishes where they have been proposing to remove their pews. I hope this is of some help.

26/06/2020 To: Katy Purvis From: Tim Boulton	A quick question – I think the 'Specification of works' would be produced as part of the architect's 'detailed design' phase – so not available at this time. Should I enclose a document entitled 'Specification of works' and just enclose a line saying "the 'Specification of works' would be produced as part of the architect's 'detailed design' phase – so not available at this time."??
29/06/2020 To: Tim Boulton From: Katy Purvis	It will be needed eventually, but you can't upload something you haven't got yet, so don't worry for now. I've had a very very quick look at the application, but not in any detail yet. I'm going to reupload the architects brief files as zip files don't really work well with the OFS. I'll let you know if anything else is required when I've been through the documents properly
29/06/2020 To: Katy Purvis From: Tim Boulton	Thanks very much for your early very very quick look! These are not my final submission yet as I've given my PCC Re-ordering Team until Wed 1 July @ 18:00hrs to provide me with any comments they might have… I take your point about the zip files – I've already had a request from a PCC colleague trying to read the documents on his phone and had to separate them for him! Perhaps a point for the system development team to either not allow use of zip files or provide a 'switch' at diocesan level for this to be a devolved choice?
02/07/2020 To: Katy Purvis From: Tim Boulton **With attachment**	I guessed you reviewed what I submitted late last night very swiftly this morning – thanks! It would probably be easiest if we could speak on this to ensure I'm putting the right level of detail in the right place… However, would it help if I added the following somewhere: The church was granted an archdeacon's licence for temporary removal of 10 pews in the north aisle on 26/9/16, expiring on 26/12/17 (see enclosed). Following a period of successful experimentation (see document **Pew Removal**, point 3), this was requested to be made permanent – Faculty Application 2017-010908 submitted on 21/10/17 refers. (It is understood that this request has remained pending as the DAC has been aware that a full re-ordering was being considered.) 3) Temporary minor reordering licence dated 26 September 2016
02/07/2020 To: Tim Boulton From: Katy Purvis	Thanks for talking to me this morning. Having reviewed the previous application to formalise the TMRO for the north aisle pews, there really isn't anything that is particularly useful to send you to help with describing the success of the experiment, which I suppose is to be expected, as that is the reason the application didn't progress. I've

	attached the photos and an extract of the petition as the best thing I can find. Essentially, for the new application , it would be helpful if the pew removal document section3, gave examples that support the success of removing the north aisle pews, ie the parish have used this space for x,y and z, which were impossible previously, and this has benefitted the church and/or community by … You should also upload the temporary licence, which you have already.
02/07/2020 To: Katy Purvis From: Tim Boulton	Thanks for your help today – I've updated the Pew Removal document and uploaded the temporary licence. If you think of anything else, please get in touch
03/07/2020 To: Tim Boulton From: Katy Purvis	I've sent this for architect review this morning. This will go to the 22 July standing committee meeting, but it will be considered for informal advice, as the DAC will need to see the specification for all the works, heating, av and seating details before making a decision about recommendation. I wasn't sure that was clear, so just thought I'd better say so now. It is completely appropriate to ask for informal advice at this stage, but I will need to send the application back to you on the OFS so that you are able to add and amend it as you wish over the next few weeks/months, it won't be at the stage for formal submission until the other details are ready.
03/07/2020 To: Katy Purvis From: Tim Boulton	Thanks – and understood. Can you remind me at which stage I am prompted for consultation with various groups?
03/07/2020 To: Tim Boulton From: Katy Purvis	Thank you, you can't do the statutory consultation until you have the same level of detail that the DAC will need for recommendation really, but we normally do that for you. If you do it too early, it will have to go back to them again. Basically if the DAC advise you are on the right track at the next meeting, Mark will need to proceed to the design stage, and once we have those documents and you have decided on the chair etc, then we will send the application to HE, JCAS and CBC if necessary. Let me know if we can help at all
03/07/2020 To: Katy Purvis From: Tim Boulton	thanks: understood. Now the detail work is about to begin…
08/07/2020 To: Tim Boulton From: Katy Purvis	We've now heard back from the initial DAC architect review, ahead of the standing committee meeting arranged for 22 July. The reviewer has commented as follows • Thank you for asking me to review the proposals for this fine GII listed church.

	• The principal consideration is the proposed removal of all of the Nave pews. Although they are of low quality, from what can be seen from the photographs, they were installed at the time of church construction and this space was always to include pews. There is probably insufficient quality or amenity in the pews to warrant sustained objection to their replacement, but their replacement would have to be a high quality new chair. We need to know and approve the chair design before accepting the pew removal. • Where would the tables and chairs be stored when not in church for flexible worship? There would not seem to be enough height in the new west wall cupboards? • The treatment of the church floor after pew removal would be a critical point, transforming a special space to a mundane community hall is an easy trap if not handled with sensitivity. • Moving the font appears a sensible move • The new facilities in the north aisle should be easily achieved but with the usual warnings about ventilation and the possible impact of service runs both inside and outside of the building. The proposals for the stained glass windows in the north aisle west end would have to be explained. • As usual it is the detail that matters but the principle seems achievable. If you have any response to these points, please let me know, and we will put them to the committee on the 22nd.
13/07/2020 To: Katy Purvis From: Tim Boulton	Many thanks for a quick review prior to the Standing Committee of the 22nd. My responses are inserted in the text below and shown in green: We are currently selecting a quantity surveyor and preparing to commence a detailed design upon receiving the response from the Standing Committee meeting of the 22 July. • Thank you for asking me to review the proposals for this fine GII listed church. • The principal consideration is the proposed removal of all of the Nave pews. Although they are of low quality, from what can be seen from the photographs, they were installed at the time of church construction and this space was always to include pews. There is probably insufficient quality or amenity in the pews to warrant sustained objection to their replacement, but their replacement would have to be a high quality new chair. We need to know and approve the chair design before accepting the pew removal. **Noted: this will be submitted as part of the detailed design phase.** • Where would the tables and chairs be stored when not in church for flexible worship? There would not seem to be enough height in the new west wall cupboards? **The new west wall cupboards are expected to be designed to be**

	able to contain all chairs and tables normally used in the Nave and North Aisle. • The treatment of the church floor after pew removal would be a critical point, transforming a special space to a mundane community hall is an easy trap if not handled with sensitivity. **Noted.** • Moving the font appears a sensible move • The new facilities in the north aisle should be easily achieved but with the usual warnings about ventilation and the possible impact of service runs both inside and outside of the building. **Noted.** The proposals for the stained glass windows in the north aisle west end would have to be explained. **Noted.** • As usual it is the detail that matters but the principle seems achievable.
14/07/2020 To: Tim Boulton From: Katy Purvis	Thanks Tim, I will add this to the papers for the meeting next week.
30/07/2020 To: Tim Boulton From: Katy Purvis	**DAC Advice** I am writing to let you know that at its meeting of 22 July 2020, the DAC Standing Committee considered the initial plans drawn up by the Scheme Architect in response to previous advice, along with the other supporting documentation including the justification for the replacement of the pews with chairs and wishes to offer the following informal advice a. The standing committee commended the parish on the progress made so far and encouraged them to continue in the development of the scheme
31/07/2020 To: Katy Purvis From: Tim Boulton	Many thanks for supporting me so well in preparing this submission - I am delighted to receive this feedback. We have run a brief competition to select a QS and expect the PCC to make an appointment next week - this will support our architect in his detailed design, etc.
19/03/2021 To: Katy Purvis From: Mark Pearce of Kepczyk Pearce Sanderson **With attachment**	Following our telephone conversation this afternoon please see the attached PDF file that contains eleven drawings that illustrates how the reordering scheme at Christ Church, Willaston is developing. The church would welcome any informal comments the DAC may have regarding these proposals. *Drawings of Kepczyk Pearce Sanderson numbered DD01 to DD11 dated February 2021 - superseded*
19/03/2021 To: Katy Purvis From: Mark Pearce of Kepczyk Pearce Sanderson	Please see the attached Statements. They are on the online system I believe also. *Statement of needs and significance v2 as uploaded to OFS - superseded*

With attachments	
26/04/2021 To: Tim Boulton From: Caroline Hilton	**DAC Advice** I am writing to let you know that at its meeting of 22 April 2021 the DAC Standing Committee considered the latest proposal details you provided and it wished to offer the following informal advice and query points: a. The Sub-Committee considered that the proposals were moving in a positive direction b. It understood that the vicar will be leaving in the Summer and this may cause some unavoidable delay to definitive progressing of the scheme. The Committee wished therefore to support the parish to continue developing the plans ready to present to the new vicar in due course. An informal visit would therefore be arranged for the DAC Secretary and a DAC Architect member to meet with the parish and discuss the scheme c. With regards to the proposed conversion of the clergy vestry to toilet facilities, the Sub-Committee queried where the clergy would robe up. d. It also queried whether the church has a safe for Communion elements etc. and if so, where would that be relocated to. With regards to point (b) I will contact you with suggested dates for the DAC Architect and myself to meet with you at the church. We look forward to having the opportunity to experience the church building 'face to face', and having an informal conversation with you about the various elements of proposals. The DAC Architect will offer his thoughts and suggestions that arise during the discussion as we walk around the building, and we can also answer any queries you may have during the meeting. Hopefully you will find this visit helpful as you look to further develop the scheme.
28/04/2021 To: Caroline Hilton From: Tim Boulton	Thank you for providing prompt feedback and informal advice from the DAC meeting of 22 April. I will respond to the individual points raised: a. I am pleased that the Sub-Committee thinks that the proposals are moving in a positive direction; b. Yes, very sadly our vicar will be leaving in the Summer – he's on sabbatical now until his official departure. However, under your guidance, the parish has developed this scheme from an initial assessment of local need, through the development of church vision & mission, so is not dependent upon any one person – even a vicar! Consequently, this is not a reason for delay; c. The interior of the building is relatively small, so we considered flexibility of use to be a key consideration. We planned to include two options for clergy robing – either using the new meeting room (with garment storage included

	in the cupboard/drawer design) or by 'locking off' the entire toilet facilities room for robing before/after a service. This would allow robing to take place without dedicated space – the meeting room and toilets in the north extension being able to be used independently of the main building – an advantage supporting community use. d. Yes, there is a safe for Communion elements, etc – we plan to relocate/re-provide within the storage of the new meeting room in the north extension. We are keen to continue to make progress without delay - if you think it would be helpful to visit, that's fine, but I'd request that it would be soonest.
05/05/2021 To: Tim Boulton From: Caroline Hilton	Thank you for your response. I will get back to you shortly with a suggested date for the visit, once I have confirmed availability of the DAC Architect to attend.
14/06/2021 To: Tim Boulton From: Katy Purvis	I've just re-read my comment from sending this back previously, you will still need to provide details of chair choice, AV, heating, lighting etc and full specification when ready, so we may have to consult twice in the end. It will still be good to get an initial view.
05/07/2021 To: Tim Boulton From: Katy Purvis	**DAC Advice** I am writing to let you know that at its meeting of 25 June 2021, the DAC considered the proposals for the reordering, after the site visit, and resolved to offer the following informal advice: a. The Committee commended the parish on its efforts so far. It encouraged the parish in their continuing development of the scheme b. The Committee noted that consultation with statutory consultees had been initiated
25/08/2021 To: Tim Boulton From: Katy Purvis	**DAC Advice** I am writing to let you know that at its meeting of 24 August 2021 the DAC Standing Committee considered the responses of the Church Buildings Council and Victorian Society and it wished to offer the following feedback: a. In accordance with the feedback of the Church Buildings Council and The Victorian Society, the parish will need to further develop their appraisal of the options for pew removals and also set out further details of the justification for the proposals in their Statement of Need b. Bearing in mind the Church of England's target for net zero carbon by 2030, in developing the energy use and heating proposals the parish will need to demonstrate its consideration of how it may reduce its carbon footprint. It should therefore carry out the three part exercise as set out in the diocesan guidance provided on the webpage for heating, via the link: Diocese of Chester | Heating (anglican.org)

	Further to point b, the Church of England have published new guidance, which you may find useful, which was brought to our attention this morning. The options appraisal guidance is quite good. https://www.churchofengland.org/resources/churchcare/advice-and-guidance-church-buildings/heating#na
07/10/2022 To: Katy Purvis From: Lucy Crowther of Kepczyk Pearce Sanderson **With attachments via link**	Please find attached our drawings for the Internal Reordering Project at Christ Church, Willaston in Wirral, for submission to the DAC: 2022 10 07 - DAC Faculty Application These are also being submitted to the Online Faculty System by the Client. Our Specification shall follow on Monday. 9) Drawings of Kepczyk Pearce Sanderson numbered FA1 Revision A (dated 4 October 2022), FA2 Revision A (dated 4 October 2022), FA3 (dated 4 October 2022), FA4 (dated 4 October 2022), FA5 (dated September 2022), FA06 (dated September 2022), FA7 (dated September 2022), FA8 (dated September 2022), FA9 (dated September 2022), FA10 (dated September 2022), FA11 (dated September 2022), FA12 Revision A (dated 4 October 2022), FA13 Area A (dated September 2022), FA14 (dated September 2022), FA15 (dated September 2022), FA16 (dated September 2022), FA17 (dated September 2022), FA18 Revision A (dated 4 October 2022), FA19 Revision A (dated 4 October 2022), FA20 Revision A (dated 4 October 2022), FA21 Revision A (4 October 2022), FA22 Revision A (4 October 2022), FA23 (dated September 2022), FA24 (dated September 2022), FA25 (dated September 2022), FA26 (dated September 2022), FA27 (dated September 2022), FA28 (dated September 2022), FA29 (dated September 2022), FA30 (dated September 2022), FA31 (dated September 2022), FA32 (dated September 2022), FR01 (dated February 2021), FR02 (dated February 2021), FR03 (dated February 2021) FR04 (dated 22 February 2021) and drawing issue sheet 10) Proposal and Quotation for Sound, AV & Live Streaming of Noiseboys dated 11 February 2021
07/10/2022 To: Katy Purvis From: Tim Boulton	I have just submitted this petition to meet today's deadline. A slight problem - I am awaiting a Specification document from the architect and a Specification document from our M&E consultants – **both have now been promised for Monday 10th.**
10/10/2022 To: Katy Purvis From: Lucy Crowther of Kepczyk Pearce Sanderson	Following my below email, please find attached new link which includes our Specification: 2022 10 10 - DAC Faculty Application Apologies for the delayed issue. 11) Specification for Internal Reordering Project of Kepczyk Pearce Sanderson dated October 2022
11/10/2022 To: Katy Purvis From: Tim Boulton	Many thanks for your call yesterday afternoon. I enclose the further documents to add to this application as discussed on the phone just now

With attachments	12) Drawings of Bob Costello Associates Ltd dated 10 October 2022 numbered 754-E-501 Revision P, 754-E-511 Revision P, 754-M-301 Revision P, 754-M-311 Revision P, 754-P-401 Revision P and 754-P-411 Revision P 13) Mechanical and Electrical Services Strategy for Refurbishment Report of Bob Costello Associates Ltd dated July 2021 *Specification for Internal Reordering Project of Kepczyk Pearce Sanderson dated October 2022*
13/10/2022 To: Katy Purvis From: Tim Boulton **With attachment**	I see this afternoon you've uploaded 1 of the 8 additional documents, included with the email, below. I guess you're still reviewing the others – thank you for this. I have an additional one from the M&E consultant this afternoon, which I hope you could upload too – please… 14) Mechanical and Electrical Services Client Requirements and Design Strategy of Bob Costello Associates Ltd dated October 2022
17/10/2022 To: Tim Boulton From: Katy Purvis	We have heard back from the AV and lighting advisers, who are both content with these elements of the proposals The lighting adviser said *"I have reviewed the lighting element of the proposal and everything looks fine. My only comment would be that where lighting fittings are to be re-lamped, consideration should be given to ensuring replacement lamps are of the same colour appearance as the new, for example 'warm white' to provide continuity throughout the Church. I know of BCA and they have a good reputation as consultants."* The AV adviser said *"This AV system will be very good, well presented quotation with good quality equipment. I have no concerns. Prices are reasonable."*
17/10/2022 To: Katy Purvis From: Tim Boulton	Thank you for this early feedback – encouraging. Thanks also for loading the further documents I sent over.
19/10/2022 To: Tim Boulton From: Katy Purvis	Further architect review details thank you for asking me about this GII Listed church. Using the points in your email : (These are the points in my email) 1. Removal of existing pews from the Nave and making permanent of removal from North Aisle; 2. Re-positioning of the Font; 3. Provision of kitchenette and accessible toilet with baby changing in NW corner; 4. Re-arrangement of space in North Extension to provide large flexible meeting space/vestry area plus separate accessible toilet and baby changing;

	5. Provision of new M&E, heating, audio-visual services and consideration of new fire safety systems; 6. Provision of storage, new seating etc 7. Redecoration & cleaning 1. They have made a strong case; the pews are not particularly special and they are keeping one. I wonder if the church can reuse the timber within their proposal. 2. Looks good to me. 3. It would be good to see a 3D visual or at least a marked-up photograph of how the kitchen insertion appears within the church space. 4. This all seems to work. 5. I think we should use a 3D visual or at least a marked-up photograph of what the new kit all looks like in situ and any visible service routes. Maybe there is too much information from BCA and I can't see it for looking? 6. The chosen seats are ok but what finish is proposed and how will they look within the church? 7. My key point is to ask the architects that this remains as a sacred space for worship and gathering and it doesn't end up as an "anywhere" church hall. Again, good photographs would help inform the proposal. In principle, we should support this proposal but after receiving some more information and reassurance. I don't have time to check the technical details of architect and M&E consultant but see nothing of concern.
19/10/2022 To: Katy Purvis From: Tim Boulton	Thanks for this – photo of the area to be used for the kitchen & new toilet sent over separately. I note that the DAC will be able to question Mark (although he will be out of the meeting for discussion/decision)
19/10/2022 To: Katy Purvis From: Tim Boulton **With attachments**	I hope this helps… 15) Photographs
19/10/2022 To: Katy Purvis From: Tim Boulton	Comments inserted below: Thank you for the information that you have sent through. I have reviewed the information and have the following comments: 1. There is mention of asbestos based materials in the building, has an appropriate survey been carried out and what are the proposals forward?

	The architect has already been instructed to have an asbestos survey carried out. 2. I suggest the parish if they have no already do so obtain refences for the company proposed for the audio installation. We understand that the DAC has received satisfactory references. 3. The MEP strategy report mentions appropriate control of the lighting installation but there appear to be no details of the control arrangements? There are no changes proposed to the existing lighting controls. 4. There appears to be no specific details of the new light fittings. I would recommend that samples of the specific light fittings are obtained and viewed by the parish / architect to ensure the visual appearance / effect is acceptable. No change in nave or chancel. The new light fittings for the new toilet in the NW corner and the NE wing were selected by the architect yesterday. 5. I would be grateful if the proposed wiring system for the general electrical installation could be confirmed. I assume that any wiring that is visible will be painted out to suitably blend with the background. See Section 10 of BCA specification – *" The finish of all electrical outlets and accessories is to be agreed with the Architect in order to complement architectural features and styles of the church."* 6. Drawing M-311 indicates that no ventilation is provided to the kitchen. Considering the kitchen has a water boiler, coffee maker and six slice toaster and the parish intends to run a regular café church is this approach appropriate? See FA04 – the kitchen is open to the full internal volume of the main church space and not enclosed. Also the project includes the refurbishment of the existing high level hopper vent windows on both sides of the nave at clerestory level. 7. The approach to heating the meeting room and WC areas separately is consider the appropriate approach. I am concerned that considering the extent of the overall proposals the parish appears to be retaining the existing gas boiler installed in 2004. This is an opportunity lost. In addition to this the parish propose the use of the building will increase together with the level of heating provided. This

	will increase energy consumption and carbon emissions. Therefore I do not support retaining the existing gas boiler and the energy source solution needs further consideration. For current affordability & technology status reasons, this proposal installs piping infrastructure to accommodate future change whilst retaining the current boiler for the time being. 8. The MEP strategy report refers to potential fabric thermal performance solutions but the remainder of the documents give no further details. Due to the proposed increased use / heating operation this needs further consideration. The strategy report considered wide options. The option of including thermal insulation in the ceiling space of the new toilet in the NW corner and the meeting room and toilet in the NE wing have been included. 9. The construction of the floor to incorporate the underfloor heating is different between drawing M-301 and FA02? In addition the Ty-Mawr guidance suggests an air gap under the timber floor covering but this is not shown on dwg FA02? This is as error – M-301 is correct: the architect will amend. 10. The heat pump to the meeting room has an external condenser associated with it. An number of external photographs with the condenser superimposed on it would be useful to understand the visual impact. The heat pump is not in scope at present. 11. The radiators shown on dwg M-301 if supplied via a heat pump in future only appear to have an output of circa 10kW plus u/f heating 4 kW, total 14kW. This compare with the heat loss of 50kW in winter. This does not seem to be suitable to accommodate a lower temperature system in future? Thank you for your comment – we would hope that by the time we are ready to implement a heat pump solution, there is ready availability of higher temperature units. 12. Details of a PV installation is included in the MEP strategy document but I assume this in not part of the current approval request. Correct – its feasibility was investigated and discounted.
27/10/2022 To: Tim Boulton	**DAC Advice**

From: Katy Purvis	I am writing to let you that at its meeting of 21 October 2022, the DAC considered the latest details of the reordering proposals and wished to offer the following informal advice a. It noted that the parish still needed to address points made by The Victorian Society and Church Buildings Council for example regarding options appraisal involving retention of pews. Once this information had been provided the DAC office would need to reconsult. b. The Committee looked forward to being able recommend the scheme but it first needed to carry out and conclude this further round of consultation
02/11/2022 To: Katy Purvis From: Tim Boulton	Thank you for your email of 27 October 2022 containing the relevant minute from the DAC meeting of 21 October 2022 and for advising us of the issues raised by The Victorian Society and the Church Building Council. **Our response to the issues raised by Connor McNeil of the Victorian Society in their email dated 15th July 2021 is respectfully given as follows:** In summary, this is a re-ordering proposal to update an existing parish church building in order to make it a sustainable, viable, heritage and community asset for worshippers and multi-purpose use at the heart of a village community. Whilst built as a place of worship in the nineteenth Century, an ageing church membership together with rising running & maintenance costs mean that an innovative re-ordering is needed if we are to avoid closure within the first half of the 21st Century. The process was started about 2010 with an application for the demolition of the dilapidated church hall which was approved on the basis that the church hall uses could be more sustainably accommodated in the re-ordered church. At the same time, we made an application for Consent to develop five houses on the site. After receipt of Consents in 2011, proceeds from the sale of the site were set aside for the future re-ordering within the church building. The church's worshipping needs are themselves diverse – from the full range of traditional and family services, both small, medium and occasionally large, and our beginning of more flexible forms like café church and 'messy church' and further formats in the future will strengthen our mission and outreach, particularly to young people, and need differing layouts of seating and sometimes no seating at all. The parish has a thriving Church of England primary school within 250m of the church and has developed a close working relationship over recent years through the work of the previous incumbent and providing foundation governors from members. This church/school

	linkage provides a great opportunity for church growth and there are special services at various times in the year, however the space and facilities are very restricted and well below the standard of modern public buildings. The rising cost of heating fuel together with the large volume to heat only makes this more challenging going forward. One of our social events in the church building pre-Covid has been a 'fish and chip supper' – this was well-supported, but we were unable to accommodate all who wished to come because of the small amount of space available for the tables…..very difficult with fixed pews to negotiate. This year we hired alternative village facilities – it is unsustainable to pay twice for such community space, rather than being able to use our own and share it with others. We conclude that a re-ordering scheme must be able to both meet the needs of the worshipping congregation AND be able to provide community space for a wide range of non-conflicting purposes. The local need for such facilities has risen in recent years since the closure of the church hall and the British Legion. It is this combination of 'church' and 'community' use that will ensure the parish can continue to run and maintain Christ Church. This combination requires a very high degree of flexibility in order that the use can flex between fully seating the occupants and, not seating any of them at all – with any number of variations requiring different seating layouts and densities. In our development conversations we have tried several layout options, and with the selected one have tested it against 5 use cases (see Options Appraisal). We are proposing to retain a pew from the nave for historic purposes – prominently displayed underneath the West window (perhaps the addition of a Victorian Society plaque might explain its significance?), however we are not able to proceed with the scheme without full pew replacement. The Victorian Society proposal to consider incorporation of cushions is not considered conducive to current hygiene standards. We have decided to leave the font where it is, one of a number of changes to achieve affordability, in a rapidly changing economic climate. The quality of replacement seating has been considered carefully and the Howe 40/4 high quality chair, like those used in Chester and many other cathedrals and churches has been selected. One advantage of this choice is that it is light to handle and can be stacked on safe dollies when not in use. This will reduce the need for storage along the west wall and enable the retained congregational pew to be featured directly under the west window. We have considered new forms of heating as well as the feasibility of generating electricity from solar panels – we have concluded that we

	need to 'heat the people' as a strategy, so have accepted the advice of leading M&E consultants BCA to use an underfloor heating system where the pews now stand. All this will produce a comfortable and highly useable space giving maximum flexibility to Christ Church as it moves ahead to strengthen its mission and outreach in the village community. All of this is now specified within the "Supporting Documents & Images" section of this faculty application. **Church Buildings Council** **Our response to the issues raised by Keri Dearmer of the Church Buildings Council in their email of 22 July 2021 is respectfully given as follows:** We have decided to leave the font where it is, one of several changes to achieve affordability, in a rapidly changing economic climate. We understand that the pews are original to the church building but have expressed the view in our Pew Removal document that they are in poor condition, unsuitable for present day use, and are unable to allow the flexibility that is needed to enable the church to fulfil its vision. However, in recognition of the historical contribution of the pews to the whole building, we have adjusted the plan to retain one of the pews centrally beneath the west window. In consideration of the need for high quality replacement seating, we have selected the high-quality Howe 40/4, as used in many cathedrals and churches. Although expensive, we believe these chairs meet the need for comfort, flexibility of uses and layout, low maintenance, ease of storage and good aesthetics. We need the main nave area to be able to be used separately from the north east wing so as to facilitate them being used for different purposes at the same time – e.g. so that a meeting room could be hired out for community use, whilst a church service was in progress in the nave and vice versa. This flexibility of uses will enable a more efficient use of the building and will assist in its financial management. All of this, together with proposals for Heating, Lighting & Audio Visual equipment are now specified within the "Supporting Documents & Images" section of this faculty application. I trust that this adequately answers the concerns of the consultees – please do not hesitate to contact me if either has additional questions
03/11/2022 To: Tim Boulton	This is good, well done. Do you want me to respond to each consultee separately, or would it be OK to include both comments to

From: Katy Purvis	each? I think it would be helpful for them to see both, but I won't do that unless you agree?
03/11/2022 To: Katy Purvis From: Tim Boulton	I'm happy with your suggestion – thanks for your help and guidance in this
03/11/2022 To: Katy Purvis From: Tim Boulton **With attachment**	This system-generated message states a 42 day period…..didn't you think it was c21days the consultees are given this time? *Automated mail from OFS*
04/11/2022 To: Tim Boulton From: Katy Purvis	Its looks like the developers didn't account for the need for two different message texts for initial and subsequent rounds of consultation. It is 21 days, and you can check that on the OFS, you should be able to see how many days are left. There is a bug that means the CBC were not included yesterday, so I've sent a separate request to them today, so they will be one day later. Unfortunately we were not aware of the requirement to consult the local authority when we did the initial consultation last year, so I have had to consult them under the 42 day rule, by email as they are not able to access the OFS. I think it is fairly unlikely that they will respond.
04/11/2022 To: Katy Purvis From: Tim Boulton	Understood – thanks for letting me know.
23/11/2022 To: Tim Boulton From: Katy Purvis **With attachment**	The CBC have responded to the second consultation request as attached. They are fine with Av and lighting, have cautioned about UFH, and can't support full pew removal, they think the pews are of higher significance than low, but admit you have provided good justification for removal of some pews. I think they are still wanting an options appraisal for partial pew removal. They won't support the gas boiler, but I think that is just standard rather than specific to the scheme CBC response - see 20) Consultation pages
23/11/2022 To: Katy Purvis From: Tim Boulton	Noted about UFH comments. We have made the historical compromise on the pews by retaining an example and placing it under the West window: anything further would restrict the building use. Let's see what comes back from VicSoc – tomorrow is 21 days…
02/12/2022	Following our conversation this morning re additional evidence that would be helpful for the DAC decision-making, I have managed to

To: Katy Purvis From: Tim Boulton **With attachments**	locate the CW&C planning permission documents under reference **11/01661/FUL** which provide the background to the demolition of the church hall and the consequent undertakings made to the local authority. This planning application was approved on 23/6/2011 and contain supporting documents evidencing a clear intent by the parish to provide replacement facilities to those lost through demolition of the old church hall. I enclose extracts below: **PCC REPORT – "Securing a more certain future" – reference EC19 – file -3111610.tif** Document enclosed in this email **JUSTIFICATION SUMMARY – reference EC20 – file -2314064.tif** Document enclosed in this email **CASE OFFICER REPORT (Miss Lynsey Hurl) Section 5.6: (file - - 2440795.tif)** *"…Whilst the Willaston Residents Society has raised concerns over the loss of the community facility, the Church is proposing to make alterations to the Church itself and utilise the space in the nave for the community activities previously held within the Hall. The nave would provide a similar floor space compared to that of the Church Hall….."* Document enclosed in this email. I hope this will provide useful additional input for the DAC meeting of 16 December 2022. Planning consent for demolition of hall evidence
22/12/2022 To: Tim Boulton From: Katy Purvis	**DAC Advice** I am writing to let you that at its meeting of 16 December 2022, the DAC considered the latest feedback of the CBC and the response of CWAC and subject to the parish providing further detailed justification of full pew removal as opposed to partial pew removal, resolved to recommend the scheme with the following provisos: a. The works to be under the direction and subject to the inspection of the Scheme Architect c. Any electrical works should be carried out by an electrical contractor accredited with the NICEIC or ECA, to the standards recommended in the Churchcare "Guidance Note: Electrical Wiring Installations in Churches" available via https://www.churchofengland.org/sites/default/files/2018-11/CCB_Electrical-wiring-installations-in-churches_Apr-2013.pdf This means that once we have received further explanation regarding partial versus full pew removal, Caroline will be in a position to raise the notification of advice. We are finishing for Christmas today, so I will contact you and Mark as soon as we are

	back in the office to discuss what will be required to fulfil this request. If you have any queries please do let me know.
19/01/2023 To: Tim Boulton From: Katy Purvis	**DAC Advice** I am writing to let you that at its meeting of 13 January 2023 the DAC resolved to clarify its previous feedback to the parish, advising that they should provide an options appraisal setting out the options for partial pew removal to clearly demonstrate why this was not considered suitable for the scheme. It noted that this should be a simple exercise for the scheme architect to produce, and that to do this now would help to avoid potential problems for the parish later in the faculty process. If you have any queries please do let me know
20/02/2023 To: Caroline Hilton From: Tim Boulton	Many thanks for the call-back. I understand things are very difficult this week due to a really exceptional issue you are managing as well as no one being in the office. Thanks for agreeing to try to review the documents we believe are ready for submission to the DAC for the 17th March meeting (deadline 3 March). The enclosed documents are: Overview (CCW Re-ordering Options Appraisal v3) Appendix A - Table of Existing & Proposed Uses Architect Drawings (2069 OA Options Appraisal, Feasibility of Retaining 5 rows of pews) As you know, we are really keen to have a brief face-to-face meeting with you before finally submitting the documents to the "system" – we really want to be successful this time! *Superseded versions of options documents resent on 24/02*
23/02/2023 To: Tim Boulton From: Caroline Hilton	Thank you for sending these details. My initial impression is that the options drawings do look helpful. Further to our conversation, the soonest I could possibly manage a face to face meeting would be Thursday 2nd or Friday 3rd March. I'll have to get back to you on that once there has been a chance for a fuller review of these details. Please be assured that this definitely has a place on the agenda for the 17 March, even if further information or changes are needed to what you have provided. I'm now out of the office for most of today and all of tomorrow but will get back to you as soon as possible next week.

24/02/2023 To: Caroline Hilton From: Tim Boulton **With attachments**	Many thanks for this. We've made one or two further improvements to the 3 documents (including making the plans open in 'landscape' for easier reading) – please use these documents for your informal review. We are available as follows next Thursday/Friday for a face-to-face meeting: 16) Table of Existing and Proposed Uses 17) Options drawings of Kepczyk Pearce Sanderson dated February 2023 numbered OA01, OA02, OA03 and OA04 18) Options Appraisal: Response to DAC Advice Following Review on 13 January 2023
28/03/2023 To: Tim Boulton From: Caroline Hilton	I am writing to let you know that at its DAC meeting of 17 March 2023 the DAC considered the options appraisal details that you had provided and it resolved to recommend the scheme [for the purpose of the Measure, the works are unlikely to result in a material effect] with the following provisos: a. The works to be under the direction and subject to the inspection of the Scheme Architect b. Any electrical works should be carried out by an electrical contractor accredited with the NICEIC or ECA, to the standards recommended in the Churchcare "Guidance Note: Electrical Wiring Installations in Churches" available via https://www.churchofengland.org/sites/default/files/2018-11/CCB_Electrical-wiring-installations-in-churches_Apr-2013.pdf This means I now need to raise the Notification of Advice so that the public notices can be displayed. I will let you know when I have carried this out (as discussed when we spoke last week, I am extremely snowed under currently while Katy is away so I'm afraid it will take a bit longer for me to be able to get the Notification of Advice processed than usual.)

Willaston Christ Church - Reordering – Consultation

Date	Message
22/06/2021 To: Katy Purvis From: Historic England	**Notification under the Ecclesiastical Exemption (Listed Buildings and** **Conservation Areas) (England) Orders 2010** **LOCATION: WILLASTON CHRIST CHURCH** **PROPOSED WORK:** Proposed work: Reordering We were notified on 14 June 2021 of the proposed works at the above site. Our specialist staff have considered the information received and we do not wish to offer any comments on the proposals. Any unamended application for faculty for this work can be determined without further reference to Historic England, but please consult us again if there are any material changes to the proposals. We would be grateful for a copy of the Diocesan Advisory Committee's advice in due course.
15/07/2021 To: Tim Boulton From: The Victorian Society	**Cheshire, Willaston, Christ Church (Grade II, 1854 by *Thomas Fulljames*, altered 1925 by *Bernard Miller*); internal re-ordering** **Our ref: 167142** Thank you for consulting the Victorian Society on the proposed works to Christ Church. The application was reviewed at the last meeting of the Society's Northern Buildings Committee. Its advice informed the following response. Christ Church is a significant building, as evidenced by its Grade II listing, which was designed by the interesting nineteenth-century architect *Thomas Fulljames*. Although not well known, he designed several characterful buildings, most notably the Gloucester Probate Court. From the years 1832-1870 he held the post of Diocesan Surveyor for Gloucestershire. While Christ Church has undergone alteration, especially in the 1920s by *Bernard Miller*, these alterations were largely sympathetic and much of *Fulljames'* characterful work remains. Among these remaining features is the nave seating, which, although not fine items individually, are those original to the church, which survive little altered. They make a positive contribution to the church interior, providing order and interest while also strongly communicating the church's history and *Fulljames'* vision for the building. The church remains a reasonably intact and is a notable example of *Fulljames'* work outside of Gloucestershire. The Society supports the parish's desire to welcome new users and worshippers to the church. However, it is difficult to ascertain from the Statement of Needs exactly what forms of worship or activities are driving the proposals and how the proposals would help achieve these aims. The Statement of Need is very brief, particularly given the wide-ranging nature of the proposals, and although additional documents are referenced, these do not satisfy the questions that should be addressed in any Statement of Need. Far more detail is required about the proposed use of the building for worship and other activities: what types of spaces are required, how many

	attendees are expected, etc. These details should then inform and justify each of the individual proposals. This robust justification is required for the proposed removal of the nave seating, which would harm the church's significance. While the removal of the benches in the north aisle may have been successful, more detail must be given of what that flexible space was used for and why it is no longer suitable. Given that the presumption in faculty applications is always to retain historic fabric and fittings, there should be exploration of options that would retain varying amounts of the nave seating. This is a particular weakness of the options appraisal, which only considers options that envisage the removal of all the nave seating. Likewise, the pew removal document, while valuable in outlining the theological basis for the proposals, is not convincing in its justification for such harmful proposals. The benefits wrought by the cleared north aisle do not necessarily infer the removal of all the remaining pews, nor that those benefits could not be extended by more modest proposals. The other issues of access, flexibility and comfort all could be solved by less intrusive means, such as making some of the benches moveable, or providing them with cushions. Furthermore, the acceptability of any proposed removal of seating relies to a large degree on the quality of their replacement, details of which are not included (nor any detail of how the floor would be treated). More information should be provided on both accounts. Any acceptable chair would be entirely timber and unupholstered, in accordance with Church of England guidance. We would appreciate more information on the existing floor finish and we would remind the parish that carpet is not suitable in historic churches (in line with Church guidance) and that historic floors should be preserved where they exist. The Society can accept in principle the provision of a kitchen and additional WCs but is concerned by the details of both proposals. There are no detailed drawings of the kitchen and it is imperative that these are provided before the application progresses. The Society's Committee also questioned the proposed location of the new WC, which would require additional sewerage through the church yard. The provision of storage across the west end of the nave also raised concerns, both in terms of design and of need. Spanning the west end of the interior it will have a significant effect on the character of the space and would need to be very carefully considered and detailed. Justification should be provided for such a large volume of storage. The proposals to alter the existing 1920s vestry and the relocation of the font are not contentious, although of course details of these should also be provided. Until greater justification and explanation is supplied for each of the proposals, as well as greater design detail, the Society cannot accept the proposals. I hope these comments are of assistance and will aid the application in progressing.

22/07/2021 To: Katy Purvis From: Church Buildings Council	**Willaston, Christ Church (Diocese of Chester)** **Proposed reordering** Thank you for seeking the Church Buildings Council's advice over the proposed reordering at Willaston, Christ Church. This has been considered under the Council's delegated advice policy and its advice is set out below. Christ Church was built in 1854 as a Chapel of Ease, to designs by Fulljames and Walker. The north aisle and vestries were added in 1926 by B Miller. The church is constructed of red sandstone with green Westmoreland slate roofs. The church has fine timber work including the original panelling in the chancel, the arch braced roof, font cover, oak altar, choir stalls and pews as well as the later pulpit. The stained glass is by Wailes and Kempe. The PCC proposes to remove all of the pews to be replaced with chairs. It further proposes to relocate the font, to install new storage, an accessible WC and a kitchenette as well as a new heating system, lighting and AV services. It is further proposed to re-arrange the provisions in the north extension of 1925. The Council does not necessarily object to the relocation of the font. However, it is not at all clear what benefit will be gained by moving it. According to Canon F1, the font should be placed as near as practicable to the principal entrance. There is no information about the font or its significance. If its significance warrants, its relocation should be supervised by a suitably qualified conservator. An Archdeacon's Licence was granted for the temporary removal of pews in the north aisle. This Licence expired at the end of 2017. The history of pews generally was well laid out, but there is no attempt to assess the significance of the pews in Willaston. An item's inclusion or exclusion from the list description has no bearing on its significance. The pews are original to the church's construction which makes them of high significance. The Council considers that the PCC has made a reasonable case for the removal of some pews and was grateful for the options appraisal which showed a number of different options regarding the quantity of toilets and the idea for a meeting room within the nave. The options appraisal made no attempt to consider partial pew removal or making the pews movable. No replacement chairs have yet been chosen. The proposed new chairs are a vital part of determining whether the removal of the pews is acceptable. The PCC should consult the Council's guidance on Seating before deciding on new seats. Based on the current information provided, the Council objects to the removal of all of the pews. The current proposed plans lend themselves to allowing the vestry area and the church to be used separately. While the community audit was a helpful, well-researched, and interesting document, it did not make clear whether having two separate spaces was necessary or even desired, as the vision focused mainly on bringing people together. If it can be shown that the two separate spaces are necessary, then the Council has no objection to the location of the facilities in the north aisle. However, the documentation which has been submitted indicates that the WC and possibly servery area could be provided in the vestry space with no need for additional facilities in the main body of the church.

	No proposals regarding the Heating, Lighting, or Audio Visual Equipment have been submitted and the Council is therefore unable to comment on these elements of the proposals. The PCC will find the Council's guidance on these topics helpful when drawing up their proposals. I hope that this advice is helpful, and the Council looks forward to seeing the case again once the parish has had time to consider its advice and develop the proposals.
03/11/2022 To: Victorian Society From: Katy Purvis	**Request for Formal Consultation on Material Changes under Part 4.8 of the Faculty Jurisdiction Rules 2019 - Willaston: Christ Church (609192) ref 2020-052669** The following consultees have been invited to view the following Application on the Online Faculty System by Katy Purvis: Reference 2020-052669 concerning Willaston: Christ Church (Church Code 609192). • casework@jcnas.org.uk FOA The Victorian Society and Church Buildings Council Willaston Christ Church (Grade 2 / 1854) Reordering You have been invited under part 4.5 and 4.6 of The Faculty Jurisdiction (Amendment) Rules 2019 to further consult on the above Faculty Application. A response to the consultation will be taken into account if it is received within 21 days of the date of this email. The deadline for your response is 24/11/2022 The reordering comprises 1. removal of all nave pews 2. formalising the TMRO for removal of north aisle pews 3. conversion of the choir vestry and existing toilet to a meeting room/creche 4. conversion of the clergy vestry to toilet 5. introduction of a kitchenette and toilet at the west end Further detail has now been provided regarding chair choice, AV, heating, lighting etc and full specification of works. We would welcome your feedback on the proposals as revised prior to your initial comments. Thanks for your help
04/11/2022 To: Church Buildings Council From: Katy Purvis	*Same message as sent to The Victorian Society 03/11/2022 above*
22/11/2022 To: Uploaded to OFS From: Church Buildings Council	Thank you for consulting the Church Buildings Council regarding the proposals at Willaston, Christ Church. The Council has no in principal objections to the AV or lighting systems. Underfloor heating works best in buildings which are in use at least 5 days a week. It takes a long time to heat up and can be epensive to leave running if the building is not in use. The Council understands

	that it is the church's intention ot use the building more often but it is not clear that the proposed level of usage would make underfloor heating the most viable option. The Council has no objection to the installation of UFH as proposed but asks that the PCC is fully convinced that this is the most financially sustainable option for them. The Church of England's commitment to Net Zero by 2030 means that the Council is not able to support the installation of a new gas boiler and would encourage the church to look at one of the more environmentally sustainable options considered in the heating appraisal. The Council maintains that the PCC has made a good case for the removal of a number of pews but does not agree with the PCC's assessment of the significance of the pews as low. The Council remains unable to support full pew removal as alternative options have not been considered, some of which were suggested in our letter of 2021. However, the proposed replacement chairs are considered acceptable.
15/12/2022 To: Katy Purvis From: Cheshire West & Chester	Thank you for sending over the documents. I have reviewed them and would not raise any objection to the principle of the works. The detailing of the largest intervention such as the flooring works appear to be well considered and propose appropriate materials. The introduction of the cosmetic detailing to create W.C and kitchen facilities will result in minimal intrusion in to historic fabric for services. The new uses in the various parts of the building will not result in an loss in legibility or reduce our understanding of the building. It is a shame that more of the original pews cannot be retained and re-purposed within the new spaces. Being original or historic I would consider them to be of high aesthetic, historic, and evidential value. I note that some of the 1920s light fittings are to be retained. I hope these comments are of some use.