Morrison 2018-2019 Scholarship Application

Emma Harrington

DT175 Architectural Technology **5/27/19** **Student Number: C17750321**

LIST OF FILE SUBMISSIONS

Semester 1: (September – December 2018)

1. TDS Project 1: Introduction to Timber Buildings – Overview (Poster)
2. TDS Project 2: Steel Building – Extract of Revit Drawings & Esquisses
3. TDS Project3: Passive House - Extract of Revit Drawings
4. TDS Project 4: Repair / Renewal / Replace (Combined Reviews)
5. BIM3 Project 3: Development of Families (Curtain Walls, Gothic Windows)

Semester 2: (January – May 2019)

6. BIM4 Project 3: Renders & Graphical Representations
7. TDS Project 1: Group A – Review of Commercial Building in Dublin City Centre – Retail & Office Development on 34-39 Nassau Street and 60-65 Dawson Street

   Extracts (Emma Harrington only)

   - Project B – Structural Review of Building
   - Project C – Analysis of External Envelope
   - Project D - Analysis of Environmental Strategy
8. TDS Project 4: Broombridge Commercial Development (Concrete) – Planning Permission Drawings (Revit)
9. TDS Project 4: 2D Construction Details (Revit)
10. TDS Project 4 / BP4: Landscaping & Drainage Plan – with Drainage Calculations

Case Study 1 Parliamentary Ticket Office, Westminister, London (2003 -2006)

References: Trada Case Study and PRS Architects

Picture 1: Front View of Ticket Office (Photo: Morley Von Sternberg)

Project Information

Building Description: 48m² scallop shell shaped ticket office which can be dismantled and stored in a flat pack form during off season. Constructed with prefabricated SWP.

Architect: Pringle Richards Sharrett

Structural Engineer: Alan Baxter & Associates

Timber Elements: Floor, Walls, Roof Beams & External Deck

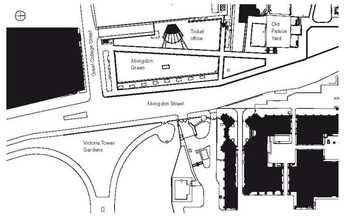
Timber Species: Spruce, Thermowood decking

Structural Elements & Connections

Foundations: Mass concrete blocks and strip footings (See Detail Cross Section), which are fully covered with turf in winter. The SWP walls are attached to the foundations by galvanised steel angled base plates – reducing resistance against wind load with the cantilevered roof.

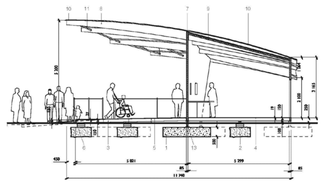
Picture 2: Walls anchored to foundations. Picture 3: Assembly of SWP on galvanised steel angled base plates (Photos: PRS Architects)

Site Plan



Detail cross section

1. Mass concrete foundations 2.5 x 2.5 x 1.5m
2. Strip footings of compacted granular material
3. Joists 60 x 150mm
4. Flooring to office area: plywood planks on joists
5. External timber floor, radial floor decking on joists made of Thermowood boards 27mm thick.
6. Edge beam 60 x 150mm to support floor boards and give clean appearance
7. External walls: Larro wall elements, 3 layers, 81mm thick
8. Curved cantilever beams in Kerto LVL 69, 300 – 520mm laminated timber cut to curved profile and stiffed into top of Lenoplan walls
9. Solid roof panels: Lenoplan 95mm securely fixed between beams
10. Roof membrane: PVC coated translucent fabric stretched over boards
11. Steel struts CHS d = 60.3 x 5.0mm
12. Cable bracings to perimeter of beams
13. Galvanised steel connections between wall elements and concrete foundations



Architectural Details: PRS Architects / TRADA

Floors: The internal floor is plywood planks laid across the joists. While the external decking is non-slip and rot resistant Thermowood (See Detail Cross Section).

Walls: SWP – 81mm thick, 3 x layers of spruce, which provide good insulation and structural support – no internal supports. All cut outs were made during fabrication using CAD/CAM technology. The panels were sized for transport.

Picture 4: Test Assembly in factor (Photos: PRS Architects)

Roof: Comprises of slender, curved & splayed LVL spruce beams which are slotted into the pre-cut slots on top of the SWP. (See Picture 4). Solid Roof Panels are secured between the beams and a roof canopy is tensioned over the beams (See Picture 6) supported by steel struts (See Picture 7).

Picture 5: Cantilevered Kerto LVL Spruce roof beams, Picture 6: Roof Panels (Photos: PRS Architects)

Picture 7 below: Roof membrane with steel supports (Photos: PRS Architects)

Case Study 3 The Fishing Hut, Hampshire

References: Niall McLaughlin Architects, Trada Case Study (2015), Dezeen Magazine (November 2015), Detail Magazine (May 2016)

Picture 1: Side view of fishing hut (All photos: Nick Kane)

Project Information

Building Description: Fishing Hut (Intermittent Use). Design was predicated by the requirement to be completely open when in use, but secure and weatherproof for the rest of the year.

Architect: Niall McLaughlin

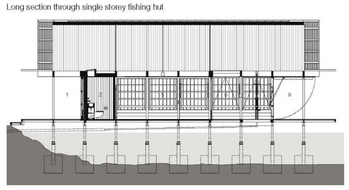
Structural Engineer: Price & Myers

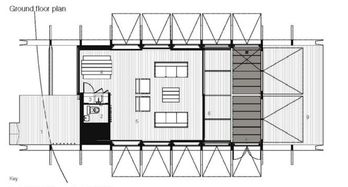
Timber Elements: Glulam Structure, Internal & External Cladding, Shutters, Floor Boards

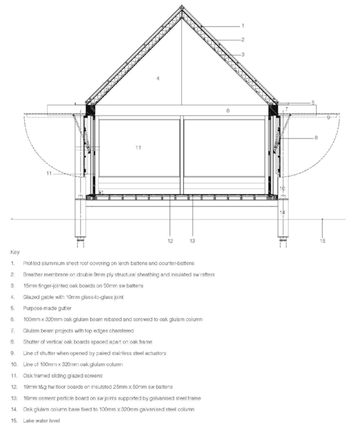
Timber Species: Oak, Douglas Fir

Structural Elements & Connections

Foundations: 18 concrete Pad Foundations comprising of precast concrete drainage rings filled with concrete were cast on the lakebed. A steel frame was built over the foundations to support the timber floor and a glue-laminated oak structure (10 x oak glulam beam and posts at 1.8m centres.)



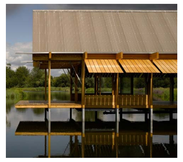




Technical Drawings: Niall McLaughlin Architects

Internal Walls: Oak sliding glazed screens with oak shutters on the outside are fixed between the glulam columns (100 x 320mm) & beams. The shutters are hydraulically operated to lift upwards acting like a large brise soleil. This feature creates an open platform with views over the man-made lake and when closed, a secure building. Picture 2 & 3 below: Interior of hut with shutters closed & open.

Roof: The pitched and overhanging roof is comprised of insulated softwood rafters which were internally clad with 15mm oak boards (finger jointed) and externally with profiled aluminium sheet on larch battens. Oak panels line the interior, while the pitched softwood roof is covered with a more durable layer of aluminium.



Pictures 4 & 5: Interior view and External View of raised shutters

Case Study 2 – Belarusian Memorial Chapel, Woodside Park, London

References: Arch Daily (January 2017), Detail Magazine (January 2017) Spheron Architects, Trada Case Study (2018)

Picture 1: Exterior Front View of Church (Photo: Joakim Boren)

Project Information

Building Description: C. 70sqm Timber Chapel commemorating the 30th Anniversary of the Chernobyl Nuclear Disaster. First timber church to be built in London since the Great Fire (1666).

Architect: Spheron Architects

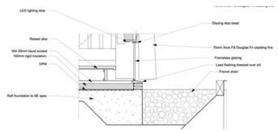
Structural / Environmental Engineer: Timberwright Ltd & ARUP

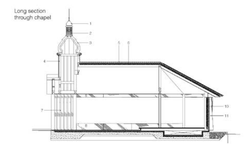
Timber Elements: Structure, external & internal cladding, roof covering, floors, doors, windows & bell tower

Timber Species: UK Douglas fir, Spanish radiata pine, Canadian western red cedar, Canadian Douglas fir floor boards

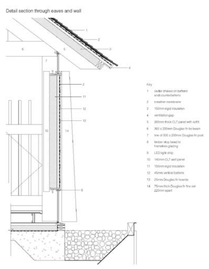
Structural Elements & Connections

Foundations and Floor: The church is constructed on a raft foundation surrounded by a French drain. Above this is a DPM, 100mm Rigid Insulation & 50mm screed overlaid with 35mm thick T&G Douglas Fir floorboards.

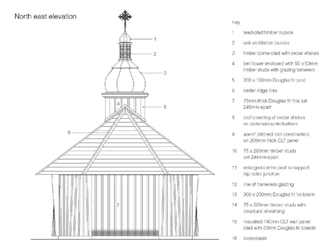




Roof: Warm roof and cupola are clad in Canadian cedar shakes.

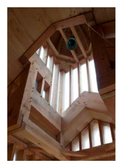


Picture 2: Exterior Walls clad with undulating Douglas Fir fins.



Architectural Drawings: Spheron Architects

Walls: The main structure is prefabricated Douglas Fir tie beams with exposed mortice & tenon joints (See Picture 2). The internal walls & roof are insulated (140mm & 200mm respectively) CLT panels, clad with 30mm Douglas fir boards (See Picture 4).



Picture 3 & Picture 4: (Photos: Ilona Marinescu & Helene Binet

Case Study 4 Maggie's Cancer Support Centre, Oxford

Reference: Arch Daily (October 2014), Trada Case Study 2016, Wilkinson Eyre Architects

Picture 1: Rear view of building (All photos Julian Abrams)

Project Information

Building Description: 225sqm Cancer Support Centre.

Architects: Wilkinson Eyre

Structural Engineer: Alan Baxter & Associates & Metsawood

Timber Elements: Structural frame, Floors and Walls, Internal wall and ceiling linings, External Cladding and External Screens.

Timber Species: Norway Spruce, White fir, Scots pine, European larch, Douglas fir, Swiss stone pine, European oak, birch plywood, Scandinavian kiln-dried softwood.

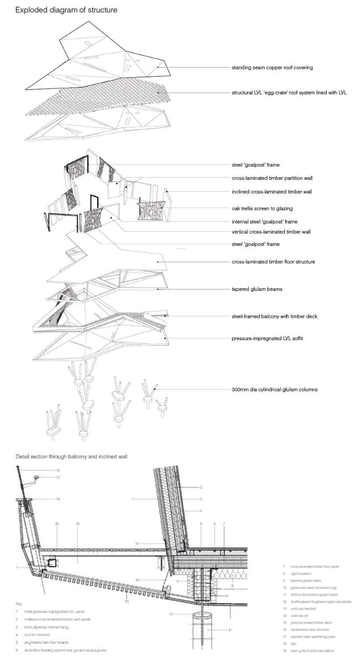
Structural Elements & Connections

Picture 2: Underneath of building

Foundations: Due to the protected site, prefabricated cross ply laminated timber panels were erected on top of 9 - three pronged sets of 300mm tapered glulam timber columns, which were fixed to concealed screw piles below the ground. The columns were connected to the floor panels via galvanised steel connection caps. (See Detail section through balcony drawing.)

Walls: External & Internal walls are insulated cross laminated timber panels, lined with Kerto LVL. Internally the walls are and ceilings are lined with birch plywood.

Roof: The design is a folding, 3 – dimensional Kerto LVL structure comprising of structural ribs and skin, with a standings seam copper roof. (See exploded diagram of building opposite.)



All architectural drawings from Architects.