



**Scottish Borders Woodland Partnership
Project 2: Construction and Sustainable Development using Local Timber**

Sub-project 9: Cladding Development

Final Report, November 2009

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North Woods Construction Ltd.**

Aim

It was recognised early during Project 2 that the Scottish Borders did not have any dedicated suppliers of timber cladding. To address this market opportunity this project sought to establish contact with a sawmill with the necessary equipment and supply chains and develop a standard range of cladding species and profiles for sale to the Borders construction markets.

Introduction

During the very early stages of Project 2 it was established that several sawmills in the Scottish Borders had produced 'off saw' cladding on an ad hoc basis to respond to occasional individual local orders.

Following the success of various timber cladding suppliers in England, such as Vincent Timber, Vastern Timber Cladding and Howarth Timber, and the large market presence of Russwood in the northern part of Scotland it was recognised that there was market potential within the Scottish Borders to establish a timber cladding supplier, who could offer a standard range of homegrown timber cladding profiles, at competitive rates.

In addition the increase in the use of timber in construction, both as a result of current architectural fashions as well as an increased perception of the material's 'green' credentials, had the potential to generate a substantial market for such a product range.

It is also anticipated that Project 2's various outputs, such as the Supplementary Planning Guidance (SPG) will have a positive effect on increasing the use of homegrown timber in construction within the Scottish Borders.

Project development

Following early discussions with the sawmillers in the Scottish Borders one definite expression of interest in developing cladding products was received, from Abbey Timber in Abbey St Bathans, run by Willie Dobie.

The consultants' visited Abbey Timber to discuss the potential for developing a standard range of cladding profiles and to explore what development would entail from his perspective. Abbey Timber confirmed that they would be very interested in developing a standard range of cladding profiles, but that the tight budgetary constraints of operating a small sawmill meant that investing the time required to do so was very difficult.

During this discussion with Abbey Timber, two main strands of work were identified as being necessary to develop a standard range of timber cladding:

1) Research and gather market intelligence including price information on what other cladding suppliers currently offer

2) Carry out product line development. This latter work involved running up samples in the workshop and actually timing all operations associated with each product as well as its material cost. This established the viability of each product variant as well as real cost.

It might appear that working with a single sawmill would only assist this particular business, but - as the mill identified is the only one currently equipped with kiln and planer/thicknesser – this is the only sawmilling business in the Scottish Borders that is actually capable of immediately developing cladding lines other than basic off-saw or feather edged un-kilned boards.

The case was argued that, as long as the results/product info were disseminated to all sawmills, the project was simply using this particular sawmill as a 'research facility' to benefit the potential wider development of cladding in Borders.

It is also the case that in the event that cladding demand accelerates to the levels predicted by trade organisations such as TRADA, Abbey Timber would need to collaborate to secure timber supplies and he might buy 'blanks' from other mills (as already happens in practice) which is then kiln dried and machined.

Project process

As noted above, the project was split into two separate and distinct stages.

Stage 1

The first stage involved Abbey Timber carrying out research on the various timber cladding supply companies operating throughout the UK. This established a number of key pieces of information including:

- The timber cladding market in the UK is very competitive, though cladding prices can vary.
- Cladding suppliers keep their price lists up to date to reflect varying global wholesale timber prices.
- The types of timber cladding products offered generally include some or all of the following:
 - o Modified timber, eg Accoya, Thermowood etc
 - o Siberian larch
 - o Homegrown larch
 - o Western Red Cedar, Canadian and homegrown
 - o Timber shingles
 - o Oak
 - o Other FSC-certified hardwood cladding, eg Red Louro
- The majority of cladding suppliers offer advice eg size/material for fixings, and best practice installation details.

The results of this market research were collated into a short report prepared by Abbey Timber, and this was used to inform the next stage of the project.

Stage 2

Abbey Timber deals exclusively with homegrown timber, generally sourced from within, and around, the Scottish Borders. For this reason all of the timber cladding profiles developed for this project use this material, and have to take account of the natural variance of the materials. In practice this means it can be difficult to mill certain species to thin profiles due to the prevalence of knots, eg Douglas fir may prove difficult to mill into feather-edge boards or small cladding battens. It is also recognized that individual stands of timber can, and do, have their own growth characteristics and that it is only when the timber is being milled that these characteristics become fully apparent.

Prior to agreeing the species of timber to be developed into cladding ranges, Abbey Timber prepared a short briefing on the relative merits of the various timber species available locally, and issues to be considered when milling. This is attached as Appendix 1.

Based on Abbey Timber's report, and extensive knowledge and experience of milling homegrown timber, a selection of timber types and profiles were agreed to be developed and finished costs obtained. The species trialled included:

- Hybrid larch (*Larix x eurolepsis*). It is generally acknowledged that both homegrown hybrid larch and Japanese larch (*L. kaempferi*) are of comparable quality to European larch (*L. decidua*). Classed as 'moderately durable' to 'slightly durable' under BS EN 350, the heartwood of this material can be used without treatment as a weathering surface, though regular inspection should be carried out and attention to detail is of the utmost importance. The use of an appropriate microporous surface coating can increase longevity.

- Sitka spruce (*Picea sitchensis*). Due to the fast growth of Sitka spruce it is classed as 'slightly durable' or 'not durable' under BS EN 350, so requires treatment and/or a surface coating to repel rot where it is to be used as a weathering surface.
- Douglas fir (*Pseudotsuga menziesii*). Classed as 'moderately durable' to 'slightly durable' under BS EN 350, the heartwood of this material can be used without treatment as a weathering surface, though regular inspection should be carried out and attention to detail is of the utmost importance. The use of an appropriate microporous surface coating can increase longevity.
- European oak (*Quercus robur*). Classed as 'durable' under BS EN 350, European oak requires no treatment to be used for external applications.

In terms of cladding profiles, Abbey Timber and the consultants agreed a range that would appeal to specifiers as well as being cost-effective to produce. The range also reflected the various, simple profiles available from other cladding suppliers around the UK. It was established that profiled cladding (eg tongued and grooved or trapezoidal) tended to be requested on a less frequent basis, and in specific sizes to suit the individual application. For this reason profiled cladding was expressly excluded from the trials.

Best practice installation and fixing details

Abbey Timber had previously received assistance from TRADA (Timber Research and Development Agency) with regard to installation and fixing details for a variety of timber products, including flooring and cladding.

This information is available from Abbey Timber upon request, and the outcomes from this cladding-specific project did not repeat the work undertaken by TRADA.



Figure 1. logs awaiting milling



Figure 2. sawn log passing through multi-blade saw



Figure 3. sawn boards passing through planer-thicknesser



Figure 4. 4-sided planer



Figure 5. 4-sided laner in operation



Figure 6. finished boards stacked and stored



Figure 7. typical cladding profiles and examples of surface coatings



Figure 8. untreated, board-on-board vertical cladding

Project outcomes

The timber species and profiles that were developed were as follows:

Species	Finish	Profile
Hybrid larch (<i>Larix x eurolepsis</i>) (heartwood only)	sawn/planed	150x25mm square edge
	sawn/planed	150x19mm feather edge
	sawn/planed	150x13mm feather edge
	sawn/planed	150x25mm board on board
Treated softwood (eg Sitka spruce) (heartwood and sapwood)	sawn/planed	150x25mm square edge
	sawn/planed	150x19mm square edge
	sawn/planed	150x19mm feather edge
	sawn/planed	150x13mm feather edge
	sawn/planed	150x25mm board on board
Untreated softwood (eg Douglas fir) (heartwood only)	sawn/planed	150x25mm square edge
	sawn/planed	150x19mm feather edge
	sawn/planed	150x13mm feather edge
	sawn/planed	150x25mm board on board
European oak (<i>Quercus robur</i>)	sawn/planed	150x25mm square edge
	sawn/planed	150x15mm feather edge
	sawn/planed	150x25mm board on board

Refer Appendix 2 for diagrams of the different cladding profiles.

With the assistance of this project, Abbey Timber have developed a range of standard cladding profiles to offer to the Scottish Borders market. As Abbey Timber are the only sawmill in the region who have the requisite profiling equipment it is likely that competition may be slow to develop. However, it is hoped that once the market benefits of having a standard range of cladding are appreciated by the other sawmillers, they may be willing to invest in the equipment required to offer similar products.

For best practice advice on timber selection, fixing and installation, the following documents are invaluable:

BS EN 350, parts 1 & 2, 1994, *Durability of wood and wood-based products - Natural durability of solid wood. Guide to the principles of testing and classification of the natural durability of wood*

Timber cladding in Scotland, Scottish Government, 2002

Scottish Borders Council support

Scottish Borders Council assisted with the project in the following ways:

- Funding for the project partner (Abbey Timber) to spend time carrying out market research
- Funding for the project partner to spend time running sample profiles (eg workshop machines running and machinists time)

Appendix 1

Abbey Timber report on timber species and profiles

SBC CLADDING PROJECT

ABBHEY TIMBER

2009

WHY CLADDING?

We are always looking for higher value markets provided they do not demand undue capital expenditure, technical skills or quality requirements.

We need products that make a good match with the timber grown at Abbey St Bathans or easily acquired in the eastern Borders. Our sawlog production is approximately 50% spruce, 25% hybrid larch, 20% pine, 2.5% douglas fir and 2.5% hardwood.

Also orders must balance the scale at which we operate. We should avoid the risk of depending on a few large orders but also the hassle of hundreds of very small orders.

The benefits of cladding for Abbey Timber are:

- It is a more valuable product than pallets or fencing, but uses the same raw material without that much extra restraints
- We already have drying and planing facilities and the skills to go with them
- Typical cladding orders are for 1 - 5m³ of sawn timber, or £200 – 2000 in value. Our weekly production is currently under 10m³ but we hope to increase it to about 20m³

SPECIES:

Larch:

- ✓ timber resistant to moisture penetration
- ✓ heartwood resistant to rot
- ✓ readily available
- ✓ known and trusted by architects and customers
- ✓ attractive appearance fresh sawn
- ✓ machines well

- × trees less straight than other conifers
- × large quantities of long lengths a problem
- × tensions in log can cause long lengths to twist
- × easily split when nailed

Spruce

- ✓ timber, especially sitka, resistant to moisture penetration
- ✓ all too available
- ✓ straight trees and long lengths no problem
- ✓ the standard cladding timber for the rest of Europe
- ✓ takes nails well without splitting

- × not rot resistant so needs coating
- × can be difficult to machine, especially sitka

Pine

- ✓ readily available
- ✓ takes preservative treatment well
- ✓ machines well

- × not rot resistant
- × readily absorbs moisture
- × rotten knots often prevalent

Other possibilities

Douglas Fir

- ✓ easy to machine
- ✓ resistant to moisture penetration
- ✓ attractive appearance
- ✓ available in long lengths
- ✓ very stable

- × log supply unreliable
- × higher value alternative markets
- × sapwood not rot resistant
- × wide sapwood band so impractical to grade out
- × very loose dead knots problem with older trees

Oak

- ✓ very resistant to rot and moisture penetration
- ✓ very trusted by customers
- ✓ big price premium

- × local log supply very unreliable and rather expensive
- × timber defects means impractical to work to standard lengths

Western Red Cedar

- ✓ very rot resistant
- ✓ straight grained and easy to saw and machine
- ✓ imported timber very expensive
- ✓ grows well in this area

- × log supply very unreliable

CONCLUSION

The durability of timber cladding depends less on choice of species than ensuring that the timber remains in as dry a state as possible through correct detailing and ongoing maintenance. Even a perishable timber will last indefinitely if permanently dry, and a durable timber will rot relatively quickly if permanently wet.

The choice of species depends on customer's perception of aesthetics, risk and value for money

Larch for those who want to end up with the silvery gray look of untreated timber and those who are prepared to pay more for a feeling of extra confidence re durability

Boards graded for minimal sapwood and loose dead knots

Spruce, preferably with a sawn rather than planed surface, for those who prefer a coloured finish.

The logs should be graded before sawing for straight grain and reasonable knot size.

Pine pressure treated as a low cost option where appearance is not important and maintenance may be erratic

Boards with big loose knots would need to be graded out

Oak as a prestige option or as the safest option in awkward situations where replacement or regular maintenance would be expensive.

Sapwood and rotten knots would need to be graded out. Short and variable lengths would have to be accepted

At the moment it would serve little purpose to introduce other species.

PRODUCTION

Logs are sawn into standard dimensions and put into stock. Grading for sapwood, loose knots, rot etc takes place at this stage.

The sawn timber is then dried to 20% or under. Air drying is preferable but kilning is available to speed the process up.

The final product is prepared (resawn, planed etc) to order from these standard sizes.

PROFILES

The optimum width particularly for larch is 150mm. Any wider and the yield of sapwood free boards will be too low. Wider boards up to 250mm would be possible for species where sapwood exclusion is not an issue.

The standard thicknesses to be held in stock are 25mm and 40mm. 25mm is the industry standard for most types of cladding before machining. 40mm has several possibilities such as extra heavy duty cladding, but the main use will be for rebated feather edge cladding

The profiles we have tried so far are:

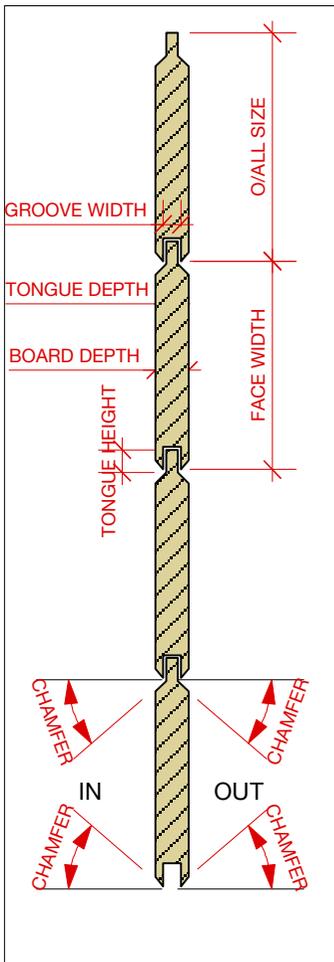
- Board on board
- Board and batten
- Rebated feather edge
- Waney edged

- Shiplap tongue and groove
- V tongue and groove standard 19mm
- V tongue and groove heavy duty 35mm
- Loglap
- Parallelogram

Application	Species	Profile	Location	Architect	Area
Garden Building	DF/L	Loglap	Grangemouth	Self build	
Garage/Office	Oak	B on B	Duns	Amos for himself	
Conservatory	Oak	tgV	Duns	Joiner for himself	
Newbuild - minor	Oak	tgV	Musselburgh	?	
Garden building	Larch	Shiplap	Duns	Self build	
Old folks home	Larch	Shiplap	Alnwick	Roberts	
Garden building	Larch	W/E	Durham	Roberts	
Garden building	Larch	F/E	Berwick	Self build	
Garden building	Larch	F/E	Coldstream	Self build	
Newbuild - minor	Oak	P'gram	Portobello	Gaffney for himself	
Extension	Larch	F/E	Kelso	?	
Newbuild	DF	35mm TGV	Alnwick	Scott Watson	
Garden building	Larch	F/E	Stirling	Sandels	
Extension	Larch	B on B	Coldstream	Self build	
Garage	Larch	tgV	Alnwick	Scott Watson	
Extension	Larch	F/E	Berwick	Roberts	

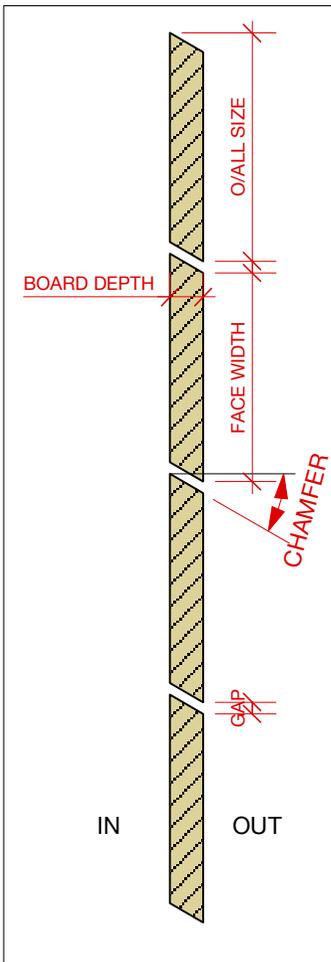
Appendix 2

Cladding profiles



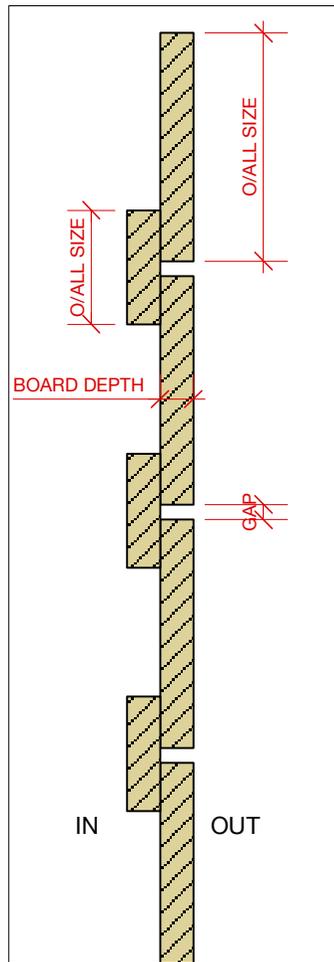
DESCRIPTION

Profile:
Tongue and grooved v-jointed
Mounting:
Horizontal or vertical
Material:
Oak
Timber finish:
Dressed
Treatment:
Untreated
Finish:
Unfinished



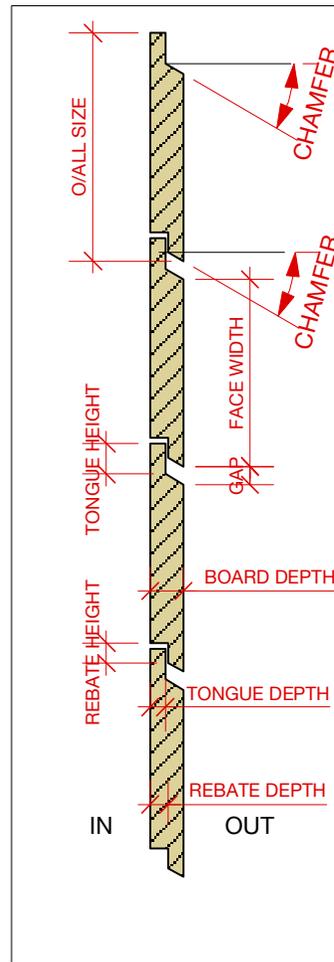
DESCRIPTION

Profile:
Trapezoidal profile
Mounting:
Horizontal or vertical
Material:
Oak
Timber finish:
Dressed
Treatment:
Untreated
Finish:
Unfinished



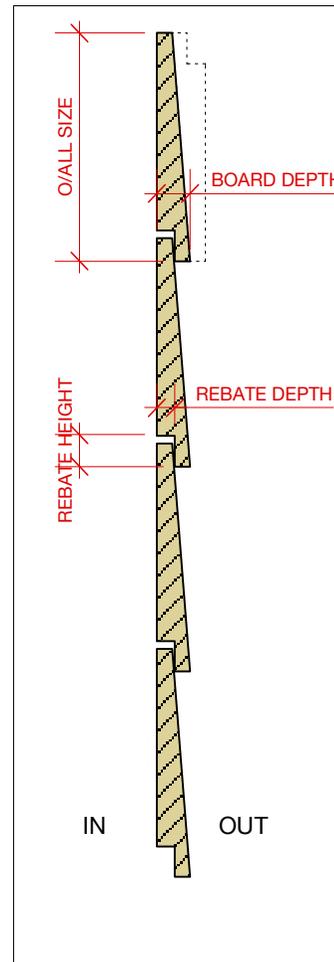
DESCRIPTION

Profile:
Square edge boards
Mounting:
Vertical
Material:
Heartwood of European larch
Timber finish:
Sawn (option A) or dressed (option B)
Treatment:
Untreated
Finish:
Unfinished



DESCRIPTION

Profile:
Fully profiled
Mounting:
Horizontal or vertical
Material:
Heartwood of European larch
Timber finish:
Sawn (option A) or dressed (option B)
Treatment:
Untreated
Finish:
Unfinished



DESCRIPTION

Profile:
Rebated feather-edge (cut from larger piece of solid timber to provide two boards)
Mounting:
Horizontal
Material:
Heartwood of sitka spruce
Timber finish:
Sawn
Treatment:
Untreated
Finish:
Must be painted on site OR pre-painted



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Project
**MP9 - CLADDING
DEVELOPMENT**

Drawing

TYPICAL CLADDING PROFILES

Scale: 1:5 @A4
Date: SEPT 2008
Drawn: SF

Drwg no.: 0810/01

Revision: