

Ontario Straw Bale Building Coalition

**Straw Bale Wall Installer
and Plasterer**
*Apprenticeship Training
Manual*

Introduction

The Ontario Straw Bale Building Coalition is pleased to sanction this Straw Bale Wall Installer apprenticeship. It reflects the growth of straw bale building from a technique largely used by owner-builders to a trade that supports a growing number of dedicated professionals.

Straw bale building is a relatively young and developing construction technique and most builders have learned the trade via hands-on experience, learning on the job from those who have had more experience. The apprenticeship model for developing professional straw bale builders is a natural growth from this type of informal training. An apprenticeship, where learners are matched with experienced builders, seems the ideal way to grow the number of skilled straw bale builders and make this type of construction accessible to more homeowners.

The training units included in this apprenticeship are meant to recognize the skill sets that are important to a journeyman straw bale builder and to help guide the training experience of each apprentice. Should an apprentice complete all the modules in this booklet to the satisfaction of an approved trainer and pass the written examination, the OSBBC has confidence that this person will be able to offer quality straw bale wall construction to clients.

These training standards are intended for use by apprentices and trainers as a blueprint for a well-rounded training program. At this time, there are no Ontario Ministry of Skills Development criteria for the accreditation or certification of straw bale wall installer and plasterer. The successful completion of the training outlined by this guide will be accepted by the OSBBC as representing qualification as a straw bale wall installer and plasterer for the Coalition's purposes of providing professional memberships and listings on Coalition documents and web sites.

Notes on the Use of This Document

The care and maintenance of this book is the joint responsibility of the apprentice/trainee and the employer. The Training Standards were developed specifically for documenting the apprentice's acquisition of skills.

The units in this document need not be completed in the order in which they appear. The chronology is the choice of the apprentice and/or trainer. There is no time limit for completion of the apprenticeship.

All hours attributable to a skill set outlined in this manual should be recorded accurately in this book. All skill areas must be completed to the satisfaction of a qualified trainer and that trainer must sign off on each skill set.

The book becomes the only record of an apprentice's/trainee's training and should be treated with care.

Qualifications for OSBBC Apprenticeship Trainer

The OSBBC Apprenticeship Committee must approve any trainer prior to that person signing for the appropriate completion of apprenticeship hours. To qualify as an OSBBC sanctioned trainer a builder must have:

- Assumed the role of contractor in the completion of the straw bale walls of at least three code-approved structures. “Contractor role” assumes a direct relationship with the client and/or general contractor, the central responsibility for material take-offs and ordering, and the supervision of paid employees on all three projects.
- Applied to the OSBBC to become a trainer, and provided proof of the above qualifications. Application to become a trainer can be made by submission of the trainer’s name, company name, contact information and qualifying projects to:

OSBBC Apprenticeship Committee
c/o Jen Feigin
517 Sherbrooke St.
Peterborough, ON K9H 1A1
Phone: 1-877-872-9225
Email: info@osbbc.ca

The OSBBC will reserve the right to inspect the work of trainers, request reference letters from clients or otherwise verify the qualifications of a trainer.

The OSBBC will reserve the right to extend trainer designation to a person not meeting the above criteria in special cases.

At the discretion of the OSBBC Apprenticeship Committee, certain apprenticeship hours may be approved by trainers not meeting the above requirements, including:

- Professional plasterers
- Professional carpenters
- Other specialized trainers with qualifications in appropriate skill sets

Important Directions to Trainers

The Training Standards identify skills required for this occupation and its related training program.

These Training Standards have been written in concise statements that describe how well an apprentice/trainee must perform each skill in order to become competent. A trainer must pay particular attention to the skill statements. There are important distinctions between a directive to “understand” a skill and to “apply” the skill. Be sure the level of training and the level of proficiency demonstrated by the apprentice are appropriate to the requirements of each statement.

Trainers are required to date and sign in the appropriate area for each the skill statements following each successful acquisition by the apprentice. There are suggested guidelines

for the number of hours the Apprenticeship Committee believe to be appropriate for a particular skill set, but the trainer is given the responsibility to ensure that the apprentice can competently meet the intended skill level. If this requires less or more hours than suggested, the Apprenticeship Committee will accept the judgment of the trainer as demonstrated by the trainer's signature.

If a trainer is unsure about the requirements or expectations of a particular skill area, the trainer can contact the Apprenticeship Committee for clarification.

It is the hope of the Apprenticeship Committee that trainers will take their responsibilities seriously and do their utmost to ensure a quality education and experience for the apprentice, in keeping with the trainer's own high standards for straw bale building work. The apprentice should be able to perform each task such that he/she could replicate the task without direct supervision.

The OSBBC takes no responsibility for the arrangements made between a trainer and an apprentice. It is expected that all apprentices will be covered by the trainer's employee insurance and will be extended all legal guarantees for workers required in the jurisdiction of the work.

Important Directions to the Apprentice/Trainee

The OSBBC wishes to ensure that each apprentice reaches the high level of competency that will allow you to undertake a successful career in straw bale building. Nothing in this apprenticeship program is intended to hinder your progress to successful completion. The Apprenticeship Committee is willing to consider equivalencies in any area of the training, even where such equivalencies are not expressly stated. You may bring forward any requests for equivalencies to the Committee for consideration.

An apprentice may work with any number of trainers in the completion of the apprenticeship. Each employer should be recorded in the Employer Information section. It is the apprentice's responsibility to track and record all relevant hours for each skill area, and to ensure that the trainer signs off on each completed skill area. No skill area will be considered complete without the trainer's signature.

The "Summary of Hours" should be completed, signed and dated by both the apprentice and employer when either all terms of the contract have been completed or the apprentice/trainee leaves the employ of the employer.

All information provided by apprentice/trainee and employer(s) is subject to confirmation by the OSBBC prior to completed status being granted.

The OSBBC takes no responsibility for the arrangements made between a trainer and an apprentice. It is expected that all apprentices will be covered by the trainer's employee insurance and will be extended all legal guarantees for workers required in the jurisdiction of the work.

This training manual was developed by Chris Magwood on behalf of the Ontario Straw Bale Building Coalition. © 2012 Chris Magwood and the OSBBC.

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Employer 1 Information

Company: _____

Address: _____

Telephone: _____

Dates of Employment: _____

Trainer Signature/Date: _____

Apprentice Signature/Date: _____

Employer 2 Information

Company: _____

Address: _____

Telephone: _____

Dates of Employment: _____

Trainer Signature/Date: _____

Apprentice Signature/Date: _____

Employer 3 Information

Company: _____

Address: _____

Telephone: _____

Dates of Employment: _____

Trainer Signature/Date: _____

Apprentice Signature/Date: _____

If additional trainers were involved in the completion of the apprenticeship, please list on a separate sheet.

Unit 1) Protect Self and Others

General Performance Objective

Protect self and others by understanding safety legislation, understanding safety measures on-site, understanding the first steps in an accident, following fire safety practices, wearing personal protective devices, constructing, setting up and working on ladders, performing basic equipment maintenance, and setting up and using a variety of work platforms.

Terminal Performance Objectives

1.01 Understand relevant safety legislation such as Workers' Compensation Act, the Occupational Health and Safety Act (O.H.S.A.) and the Environmental Protection Act and be able to apply the prescribed procedure when reporting an accident or hazard. This objective may be met via appropriate certification delivered by a sanctioned safety trainer. A copy of certification must be provided in lieu of a supervisor's signature.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.02 Select, wear and maintain personal protective devices such as various types of respirators, hard hat, goggles, glasses and face shields, safety shoes and gloves, hearing protectors, special protective clothing to safeguard eyes, ears, feet, head, lungs and body from injury, making sure of proper fit and optimum protection in accordance with manufacturers' instructions and the O.H.S.A.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.03 Select, wear and maintain appropriate fall arrest devices, making sure of proper fit and optimum protection in accordance with manufacturer's instructions and the O.H.S.A. This objective may be met via appropriate certification delivered by a sanctioned safety trainer. A copy of certification must be provided in lieu of a supervisor's signature.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.04 Apply safety measures on the job site by using appropriate methods for lifting and handling material and equipment, using electrical protection and safety devices on tools and equipment, following good housekeeping practices, removing and guarding hazards and communicating them to co-workers, and building and installing site protection (fences, etc.) to protect the public and fellow workers.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.05 Understand appropriate procedures for construction site first aid, including CPR, removing immobile co-workers from danger with due precaution, obtaining medical help, and reporting hazards and accidents to immediate supervisor in accordance with the O.H.S.A. This objective may be met via appropriate certification delivered by a sanctioned safety trainer. A copy of certification must be provided in lieu of a supervisor's signature.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.06 Understand fire safety practices by inspecting the workplace for hazards and taking appropriate action, locating fires, activating alarms, communicating the danger to others, selecting fire extinguishers and applying fire fighting techniques for class A, B, C and D fires, and reporting problems in procedures and equipment (extinguishers in effective condition, tag signed every month, etc.) and required by the O.H.S.A.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.07 Construct and set up ladders by using the required type and size of materials, leaving them unpainted, inspecting for defects and repairing immediately, selecting the appropriate length, positioning for required height and correct angle, and tying off as required, all according to the O.H.S.A. Work on ladders by ascending and descending safely, assuring three-point contact at all times, carrying appropriate loads, assuring proper position, tying off with required fall-arrest harness, ensuring legal projection at step-off point of upper level, and avoiding obstructions (heat sources, electrical power source, piping and venting, physical obstructions, rotating equipment, etc.) in accordance with the O.H.S.A.

Date Completed

Supervisor's Signature

Apprentice's Signature

1.08 Build and erect scaffolds by placing proper footings, installing ends and braces and installing platform appropriate to load, placing proper attachments to building, installing handrails and kickboards, flagging off area below scaffold, ensuring stability and dismantling in reverse order, in accordance with manufacturers' specifications and the O.H.S.A.

Date Completed

Supervisor's Signature

Apprentice's Signature

2) Operate Tools and Equipment

General Performance Objective

Operate tools and equipment by using various hand tools and operating portable and stationary power tools and equipment with appropriate preparation, technique and maintenance.

Terminal Performance Objectives

2.01 Select and use hand tools for:

- Drawing and layout
- Pounding and impelling
- Shaving and paring
- Holding and supporting
- Scraping and abrading
- Drilling, boring and tapping
- Cutting and trimming
- Cinching, twisting, tying

selecting the correct tool for specific applications, maintaining and using all tools in a safe manner and in accordance with manufacturers' instructions, and working within the tools' limitations and in accordance with the Occupational Health and Safety Act (WHMIS).

Date Completed

Supervisor's Signature

Apprentice's Signature

2.02 Operate and maintain portable power tools and equipment, including:

- Saws (circular, reciprocating)
- Drills
- Routers, planes, sanders
- Pneumatic tools (including nailers and staplers)
- Screw guns
- Combustion-powered tools (including generators and propane heaters)

selecting the correct tools for specific applications, working within tool limitations and in accordance with the Occupational Health and Safety Act (WHMIS), and inspecting, maintaining and storing power tools and equipment.

Date Completed

Supervisor's Signature

Apprentice's Signature

2.03 Operate stationary power tools and equipment, including:

___ Saws (table, band, radial arm, mitre)

___ Planers

___ Grinders and sanders

applying and using all accessories according to manufacturers' instructions, and working within tool limitations and in accordance with the O.H.S.A.

Date Completed

Supervisor's Signature

Apprentice's Signature

3) Assess and Select Bales

General Performance Objective

Find a source of building-quality straw bales and inspect and assess the bales prior to purchasing and transporting them to the building site. Assess the method of transportation and on-site storage for the straw bales.

Terminal Performance Objectives

3.01) View straw bales at their original place of storage and assist in assessing the quality of the storage facility and any impacts on the quality of the straw bales. Choose a random sampling of bales and inspect them closely, including assessing the weight, density and dryness of the bales using a variety of methods.

Recommended hours: 1 visit to assess bales

Date Completed

Supervisor's Signature

Apprentice's Signature

3.02) Assist in the delivery of straw bales from the storage facility to the construction site. Ensure that the method of transportation provides the straw bales with adequate protection from the elements and the bales are loaded and unloaded with appropriate care to avoid damage via deformation or loosening of the strings.

Recommended hours: 1 bale delivery

Date Completed

Supervisor's Signature

Apprentice's Signature

3.03) Create appropriate storage conditions on the construction site for the straw bales, including protection from precipitation, ground moisture, wind, damage from other construction activities and fire.

Recommended hours: 1 storage setup

Date Completed

Supervisor's Signature

Apprentice's Signature

4) Prepare Site for Wall Construction

General Performance Objective

Prepare site for wall building by performing basic site practices, inspecting wall-framing systems, laying out walls, storing bales on site, creating a weather protection strategy and waste management system.

Terminal Performance Objectives

4.01) Assess the cleanliness and functionality of the construction site as it will affect the construction of the wall system, including guards and rails, electrical wiring, scaffolding, entrances and exits and general mobility issues.

Recommended hours: 1 construction site assessment

Date Completed

Supervisor's Signature

Apprentice's Signature

4.02) Inspect all existing wall framing to ensure that it performs according to the specifications of the building plans, including temporary bracing. Check for proper dimensions to suit the straw bales and ensure that all wall and plaster stops are properly in place. Check for appropriate overhangs, drip edges and flashings. Address any framing deficiencies with the constructor before beginning wall construction.

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

4.03) Ensure that all bales placed in walls or stored on site are provided with adequate weather protection. Ensure the creation of a weather-readiness plan to provide protection of the bales in the event of a sudden change in weather. Deploy weather protection.

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

4.04) Create a plan for effectively collecting, managing and removing all straw-related site waste as it accumulates. Provide a strategy for removing all non-organic material from the straw waste (including twine and plastic and metal mesh) and a composting plan for the straw.

Recommended hours: 8

Date Completed

Supervisor's Signature

Apprentice's Signature

5) Framing for Bale Walls

General Performance Objective

Create and install any framing components that are specific to the straw bale wall component of the building, including sill plates, temporary and/or permanent guides and braces, window and door bucks, top plates and roof bearing assemblies.

Terminal Performance Objectives

5.01) Measure, cut and install inner and outer sill plates according to the plans and corresponding to exact bale dimensions. Fasten sills to the foundation with appropriate fasteners, making sure that openings are appropriately detailed, sills are straight and level, sills have appropriate gaskets, seals at intersections, flashing and mesh attachment points. For load-bearing walls, ensure that pre-compression straps have an appropriate pathway through and/or under sill plates.

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

5.02) Install all temporary and/or permanent guides and braces in the wall system, including corner guides to ensure the construction of plumb and square bale corners, temporary plumb guides on long, straight sections of wall, any internal or external bracing or pinning as required by the building plans or site conditions. Ensure that any permanent bracing is placed in/on the wall in such a manner as to interface properly with the plaster.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

5.03) Measure, cut and install window or door bucks. Build and erect the frames by laying out wall position on the sills, positioning and fastening the frame to the sill and making any required connections at the top of the wall, plumbing and bracing frames to prevent movement during bale installation, and ensuring the placement of appropriate drip sills, flashing and weather-proofing.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

5.04) For load-bearing bale wall systems, layout, design and install the top plates or roof bearing assembly by cutting and assembling components with appropriate fasteners, checking dimensions according to the foundation/sill layout, lining up pre-compression tie-down straps with appropriate locations on the foundation, creating passages for the easy attachment of tie-downs, creating sufficiently strong attachments between various sections of top plates (including corner attachments and overlaps between straight sections).

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

Date	Skill #	Hours	Task	Supervisor	Signature

6) Install Bales

General Performance Objective

Install bale walls for a building with a structural framing system and for a building with load-bearing straw bale walls.

Terminal Performance Objectives

6.01) For framed wall systems, install all bales required to complete a continuous wall system so that all intersections with the frame are properly detailed according to the plans, including all notching of bales around framing members, and so that the walls are tightly and evenly packed to a consistent density.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

6.02) For load-bearing wall systems, install all bales required to complete a continuous, tightly packed wall system and place the top plate on the completed walls, attach the tie-down straps and apply pre-compression force such that the top plate is leveled and the wall is plumb and of a sufficient stiffness to complete the preparation of the straw bale wall for plastering.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

6.03) For all wall systems, install bales to minimize gaps between bales and stuff tightly where gaps occur, so the wall is of a consistent density at all points.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

6.04) Provide all surfaces adjacent to a straw bale wall or intersecting a straw bale wall with appropriate tie-ins for air barriers and/or other means of providing adequate sealing against air infiltration into the wall cavity.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

7) Services Within Bale Walls

General Performance Objective

Prepare and install mechanical services within a straw bale wall system to ensure best performance of the service and the finished wall.

Terminal Performance Objectives

7.01) Create chases for drains and vents in bale walls by notching bales around existing pipes, or by creating channels into which drains and vents can be installed.

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

7.02) Preparation electrical wiring within a bale wall by providing a suitable surface prior to placement of bales (within sills), within the bale walls (between courses of bales) or along framing members in the wall, so the project electrician can run wires and fasten them according to the provisions of the electrical code.

Recommended hours: 16

Date Completed

Supervisor's Signature

Apprentice's Signature

7.03) Placement of electrical boxes (and boxes for other wall mounted services such as thermostats, alarms, etc.) within bale walls by providing an attachment point on the frame or in the bale wall that allows for secure attachment of an appropriate electrical box, and proper detailing of the electrical box to prevent air leakage into the wall cavity, including vapour barriers and mesh to secure the box to the plaster skin, ensuring that the box is located to finish on an appropriate plane with the final coat of plaster.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

7.04) Placement of electrical service panel on a bale wall, including the provision of a secure mounting point on the wall, appropriate conduit through the wall and proper sealing of the service panel, mount and conduit from air leakage.

Recommended hours: 8

Date Completed

Supervisor's Signature

Apprentice's Signature

7.05) Placement of mounting points for cabinetry, intersecting frame walls, sinks, counters and other wall-mounted objects that will be attached to the straw bale wall using appropriate connections into or through the bale wall and providing proper sealing of the mounting apparatus.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

8) Prepare Bale Walls for Plastering

General Performance Objectives

Create a straw bale wall substrate that is fully prepared for the application of an appropriate plaster coating, including straw surfaces, wooden surfaces, meshed areas and all other parts of the wall intended to be plastered.

Terminal Performance Objectives

8.01) Prepare the straw bale wall surface for the application of plaster by providing a well trimmed and/or slip coated, reasonably plumb, completely stuffed and coherent straw surface on which plaster will readily adhere, including corners and all wall intersections where plaster is intended to be placed.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

8.02) Apply any required mesh, including plastic and/or metal meshes as specified by the plans, to the wall and to any adjoining, non-straw surfaces that are intended to be plastered in such a manner that the mesh is well-secured and provides complete coverage of the intended area with the mesh held close to the surface of the straw or other substrate so the mesh will be fully embedded in the plaster.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

8.03) Install plaster stops and/or flashings as required by the building plans so that all intersections between the wall and soffit, foundation, windows and doors, floor, ceiling and other adjacent surfaces are served by an appropriate plaster stop and/or flashing to define the edge of the plaster and provide a suitable striking surface for the trowelling of each intended coat of plaster, and provide protection and sealing for the edge of the plaster.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

8.05) Mask and protect windows and adjacent surfaces to protect them from overspray, dropped plaster and other unintentional application of plaster.

Recommended hours: 32

Date Completed

Supervisor's Signature

Apprentice's Signature

8.06) Inspect the straw bale wall prior to plastering and address any details or concerns that would compromise the sealing of the wall and/or the integrity of the plaster and address all concerns prior to the commencement of plastering.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

8.04) Apply a slip coat of clay plaster to any wall intended to be covered with a clay or earthen-based plaster using a dipping or spraying method to achieve a reasonable penetration of the straw surface.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

9) Assessing and Selecting Plasters

General Performance Objective

Select a type of plaster that is appropriate for the building's needs, source all the required ingredients for the plaster and define a suitable mix for the plaster.

Terminal Performance Objectives

9.01) Assist in selecting the binder, aggregate and fibers for a cement-lime plaster (stucco).

Date Completed

Supervisor's Signature

Apprentice's Signature

9.02) Assist in selecting the binder, aggregate and fibers for a lime plaster.

Date Completed

Supervisor's Signature

Apprentice's Signature

9.03) Assist in selecting the binder, aggregate, fibers and additives (if required) for a clay or earthen plaster. Create test samples of these ingredients to determine proper mix ratios.

Date Completed

Supervisor's Signature

Apprentice's Signature

9.04) Calculate the materials quantities required for all ingredients for a complete interior and exterior plaster coating of a building.

Date Completed

Supervisor's Signature

Apprentice's Signature

10) Mixing, Applying and Curing of Plasters

General Performance Objective

Mix, apply and assist in the proper curing of cement-lime, lime and clay plasters.

Terminal Performance Objectives

10.01) Prepare the site for the mixing of plaster by assisting in choosing and siting the mixing equipment, the binder, aggregate and water supply, creating appropriate ramps and delivery systems for mixed plaster.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

10.02) Prepare the site for the application of plaster by providing adequate work platforms around the interior and exterior of the building.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

10.03) Mix a cement-lime plaster for application to a straw bale wall.

Recommended hours: 24

Date Completed

Supervisor's Signature

Apprentice's Signature

10.04) Assist in the hand-application of a cement-lime plaster coating.

Recommended hours: 40

Date Completed

Supervisor's Signature

Apprentice's Signature

Date	Skill #	Hours	Task	Supervisor	Signature

10.05) Assist in the spray application of a cement-lime plaster coating.
Recommended hours: 40

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.06) Mix a lime plaster for application to a straw bale wall.
Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.07) Assist in the hand or spray application of a lime plaster coating.
Recommended hours: 40

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.08) Mix a clay/earthen plaster for application to a straw bale wall.
Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.09) Assist in the hand or spray application of a clay plaster coating.
Recommended hours: 40

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.10) Assist in the scratching and moistening of a plaster coating prior to applying a subsequent coat.
Recommended hours: 8

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.11) Assist in the application of a finish coat of plaster.
Recommended hours: 40

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.12) Assist in the protection and curing process of a plaster coating until full cure or dryness has been achieved.
Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

10.10) Assist in the unmasking and cleaning process after a coat of plaster has been applied.
Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

11) Apply Sidings and Finishes

General Performance Objectives

Install painted finishes and non-plaster sidings to bale walls.

Terminal Performance Objectives

11.01) Assist in the preparation and application of a paint or coating to a plastered bale wall surface, including silicate dispersion paint, milk paint, siloxane and other suitable, permeable surface coatings.

Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

11.02) Apply a strapping system to a bale wall to support a vertical or horizontal siding.

Recommended hours: 16

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

11.03) Apply a vertical or horizontal siding to an appropriately strapped bale wall.

Recommended hours: 24

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

11.04) Assist in the application of a brick or stone veneer to a bale wall.

Recommended hours: 8

Date Completed	Supervisor's Signature	Apprentice's Signature
_____	_____	_____

12) Use Plans and Sketches and Estimate Costs

General Performance Objectives

Use plans and sketches and estimate costs by interpreting plans and sketches, preparing sketches and drawings, performing trade-related calculations, estimating costs, and applying trade-related written and spoken information.

Terminal Performance Objectives

12.01) Locate, read and interpret plans and sketches such as survey or plot plan, architectural, structural, mechanical, electrical, sections, cuts, specifications and schedules in accordance with architectural standards, and take off dimensions in both SI and imperial measurements, paying particular attention to as-built drawings, contemplated change notices and addenda, and change orders.

Date Completed

Supervisor's Signature

Apprentice's Signature

12.02) Prepare sketches from oral/written instructions, formal drawings, and inspecting job location, and complete with necessary views, dimensions and other relative information, in order to clarify details and communicate information to others.

Date Completed

Supervisor's Signature

Apprentice's Signature

12.03) Perform trade-related calculations using fractions, decimals, ratios, percentages, involving measurements of lines, areas and volumes and including angles, triangles, and the Pythagorean theorem, and apply principles of basic geometry (lines, angles, triangles, polygons, circles, ellipses) to trade-related problems.

Date Completed

Supervisor's Signature

Apprentice's Signature

12.04) Estimate costs from plans, drawings and specifications, considering items such as materials, labour, hardware, and ancillary costs in accordance with standard estimating practices and based on current material and labour unit costs.

Date Completed

Supervisor's Signature

Apprentice's Signature

12.05) Apply trade-related written and spoken information by using established problem-solving procedures, explaining decisions and actions to co-workers and supervisors, and producing clear and accurate oral and written reports.

Date Completed

Supervisor's Signature

Apprentice's Signature

13) Workshops

General Performance Objective

Participate in the instruction of a workshop intended to teach beginners about the process of building a straw bale wall system.

Terminal Performance Objective

13.01) Participate in the creation of written support material to be distributed to participants of a workshop.

Recommended hours: 8

Date Completed

Supervisor's Signature

Apprentice's Signature

13.02) Participate in the curriculum planning and material take-off for a workshop.

Recommended hours: 8

Date Completed

Supervisor's Signature

Apprentice's Signature

13.03) Participate in the delivery of workshop curriculum for a minimum of one full day.

Recommended hours: 8

Date Completed

Supervisor's Signature

Apprentice's Signature

14) In Class Training

General Performance Objective

Participate in classroom training and examination to acquire and demonstrate appropriate theoretical knowledge of straw bale construction.

Curriculum Outline for OSBBC Sanctioned Straw Bale Building Course

Core Text for Program:

Design of Straw Bale Buildings, by Bruce King et al. Green Building Press, ISBN 0-9764911-1-8.

1) History of Bale Building – 1 hour suggested

An introduction to the use of straw bales as a building material from earliest known examples to the current day.

2) Bale Basics – 2 hours suggested

An introduction to straw bales, covering:

- Types of straw
- How bales are made
- Assessing bales for building
- Storage
- Transportation
- Cost

3) Structural Behaviour of Straw Bale Walls – 4 hours suggested

A thorough examination of the structural properties of straw bale wall systems, including:

- General loading considerations
- Structural model of a plastered straw bale wall
- Bale orientation and plaster types and effects on structural behaviour
- Summary of test results
- Design recommendations based on structural issues

4) Framing Systems for Straw Bale Walls – 2 hours suggested

A thorough examination of a wide variety of framing systems for straw bale walls, including:

- Load-bearing wall systems
- Light framing wall systems
- Heavy framing wall systems
- Prefabricated wall systems
- Hybrid wall systems
- Design recommendations for framing systems

5) Moisture and Straw Bale Walls – 4 hours suggested

A thorough examination of moisture in all its forms and its interaction with straw bale wall systems:

- Moisture and building envelopes (basic building science)
- Moisture problems
- Moisture storage and material response
- Drying regimes
- Moisture control practices
- Air tightness and straw bale walls
- Summary of test results
- Design recommendations based on moisture issues

6) Fire and Straw Bale Walls – 1 hour suggested

An introduction to fire issues in straw bale wall systems:

- Summary of test results
- Summary of field reports (fires in bale walls)
- Design recommendations based on fire issues

7) Plasters for Straw Bale Walls – 6 hours suggested

A thorough examination of the role of plasters in straw bale wall systems, including:

- The functions of plaster skins
- Structural properties of plasters
- Components of plasters
- Types of plasters
- Plaster bonding
- Compressive strength
- Curing of plasters
- Reinforcing for plasters
- Plasters and moisture control
- Mixing of plasters
- Application of plasters
- Finishes for plasters
- Cracking of plasters and crack remediation
- Design recommendations based on plaster issues

8) Codes and Straw Bale Walls – 3 hours suggested

An introduction to relevant provisions of the Ontario Building Code and to straw bale code regimes in other jurisdictions, including:

- OBC provisions affecting straw bale construction
- Objective based codes and straw bale construction
- Existing straw bale codes
- Working with building officials

9) Detailing of Straw Bale Wall Systems – 4 hours suggested

A thorough examination of key straw bale wall details, including:

- Proper installation of straw bales
- Stuffing gaps between bales

- Flashings in bale walls
- Meshing details
- Wood elements in wall systems
- Trimming of bales
- Dipping of bales
- Masking for plastering
- Finishing opportunities (sills, trims, etc.)
- Design recommendations based on detailing issues

10) Special Considerations in Straw Bale Walls – 2 hours suggested

A thorough examination of interactions with the straw bale wall system, including:

- Wiring in straw bale walls
- Plumbing in straw bale walls
- Mounting points in straw bale walls
- Intersections with other wall materials

11) Construction Methodology – 2 hours suggested

A thorough examination of practical considerations for on site construction of straw bale walls, including:

- Tarpenry and weather consideration
- Site set up for baling and plastering
- Specialty tools
- Health and safety considerations
- Interactions with other trades

12) Specifications, Material Take-Offs and Cost Estimating – 2 hours suggested

A thorough examination of the planning and costing issues associated with straw bale walls, including:

- OSBBC specifications
- Material sourcing and lead times
- Specifying products
- Bale take-offs
- Plastering take-offs
- Labour estimates for bale work and plastering

13) Finishes – 4 hours suggested

A thorough examination of plaster and non-plaster finishes for straw bale walls, including:

- Plaster textures and surface treatments
- Finish coat plasters
- Paints, stains and oils
- Siding, brick, stone and other non-plaster finishes

14) Maintenance – 2 hours suggested

An introduction to maintenance regimes and expectations for maintaining straw bale walls systems, including:

- Weathering
- Moisture monitoring
- Plaster modification and repair
- Bale replacement
- Additions to bale walls

15) Business Issues – 3 hours suggested

An introduction to business issues for builders and designers of straw bale walls systems, including:

- Legal issues
- Contracts
- Insurance
- Financing
- Customer relations
- Design teams

16) Examination – 4 hours suggested

A final written examination to determine candidate's suitability for designation of "Straw Bale Professional" by the OSBBC.

In-class training requires 40 hours and is delivered by The Endeavour Centre in Peterborough, Ontario. Contact the OSBBC or Endeavour for information on training dates.