



## FORM No 06B

### THE ITC CERTIFICATE OF COMPETENCE for *TRUSS FABRICATORS*

#### 1. INTRODUCTION

- 1.1 The purpose of the **ITC** Certificate of Competence is to instil a consistent, professional approach into the prefabricated timber roof truss industry through a set of standards governing:
- 1.1.1 The design procedures employed;
  - 1.1.2 The presentation of quotations;
  - 1.1.3 The competence of key personnel;
  - 1.1.4 The quality of manufacture;
  - 1.1.5 The erection instructions provided to the site.
- 1.2 Fabricators who fulfil the requirements mentioned in this document shall appear on a list of **ITC** approved fabricators and shall be provided with an **ITC** Certificate of Competence for display on their premises. Such fabricators will be entitled to the use of a special ITC logo on their stationery and other documentation as well as their trusses.
- 1.3 The Institute will establish compliance with the requirements for an **ITC** Certificate through an audit conducted by the System Representative and an Approved Independent Auditor.

#### 2. DEFINITIONS

- 2.1 "**Institute**" means the Institute for Timber Construction Limited, hereinafter referred to as the "Institute" or the "**ITC**".
- 2.2 "**Approved**" shall mean approved by the Institute.
- 2.3 "**Certificate**" shall mean an **ITC** Certificate.
- 2.4 "**Certificated Fabricator**" shall mean a Truss Fabricator who has qualified in terms of 1.2 above and to whom a Certificate of Competence has been issued by the Institute.
- 2.5 "**SABS**" shall mean the South African Bureau of Standards.
- 2.6 "**CSIR**" shall mean the Timber Processing Programme of the Division of Forest Science and Technology of the Council for Scientific and Industrial Research.
- 2.7 The use of the singular shall include the plural and the use of the masculine shall include the feminine gender and vice versa.

### 3. STAFFING REQUIREMENTS

3.1 The Truss Fabricator's management must identify its key personnel and their main activities/responsibilities. Examination of the competence and effectiveness of key supervisory personnel will form a major part of any audit.

3.2 The key activities required to be identified are:

- 3.2.1 Management;
- 3.2.2 Designing and Estimating;
- 3.2.3 Production Control;

3.3 The specific roles or activities of the key supervisory personnel may overlap and more than one activity may be allocated to a single person. The key personnel will be required to be proficient or experienced in each of the following:-

3.3.1 Management of a prefabricated timber truss manufacturing facility:

**3.3.2 Designing and Estimating:**

- 3.3.2.1 Awareness of responsibility;
- 3.3.2.2 Knowledge of basic structural behaviour of simple elements;
- 3.3.2.3 Ability to read plans and take off pertinent quantities;
- 3.3.2.4 Ability to use computers where necessary;
- 3.3.2.5 Provision of roof plans and truss details  
Provision of special erection or bracing details
- 3.3.2.6 Knowledge of erection and bracing of roof trusses and an ability to undertake a site inspection when required;
- 3.3.2.7 Knowledge of applied loads and additional loads in roofs;
- 3.3.2.8 Basic knowledge of timber grading and treatment.

**3.3.3 Production Control:**

- 3.3.3.1 Quality Control;
- 3.3.3.2 Basic production scheduling;
- 3.3.3.3 Timber grading, moisture content, recognition of the requirements for treated timber.

### 4. DESIGN

The design function is to encompass all structural elements supplied by the Fabricator and includes not only trusses but any beams, all necessary bracing, rafters or joists and their connections. The Fabricator must ensure that the following items are complied with:

4.1 Design must be carried out in accordance with the National Building Regulations, SANS 10160 and 10163, SANS 10243 and the ITC recommendations for Truss Analysis and Design.

4.2 Designs which are not of a conventional domestic nature shall be checked by the System's Registered Person before manufacture. Such designs shall include roof or floor systems in the following categories:

**ITC ROOF COMPLEXITY CATEGORIES**

<p><b><u>CATEGORY A - (High Risk):</u></b>  <b>Very Complex roofs, including</b></p> <p>1.1 Scissors Trusses &gt; 5 metres          1.2 Site Splicing          1.3 Attics and Dormers          1.4 Very large spans greater than 10 metres          1.5 Piggy Back Trusses          1.6 Cantilevers &gt; 2 metres          1.7 Complex Industrial          1.8 Complex Commercial          1.9 Laminated Timber Roof Structures          1.10 Public Buildings &amp; Schools</p>	
<p><b><u>CATEGORY B - (Medium Risk):</u></b>  <b>Complex Domestic and Simple Industrial and Commercial Roofs, including up to 10 metre span:</b></p> <p>2.1 Hips and Valleys up to 10 metre span          2.2 Non standard Loads          2.3 Scissor Trusses up to 5 metres</p>	
<p><b><u>CATEGORY C - (Low Risk):</u></b>  <b>Simple Roofs up to and including 8.5 metre span with standard loadings, including:</b></p> <p>3.1 Valleys          3.2 Girders and special support Cleats          3.3 Stub-ends          3.4 Cantilevers up to 2 metres          3.5 Simple Hips (maximum span 8.5 metres)          3.6 Minimum pitch 15degrees</p>	
<p><b><u>CATEGORY D</u></b></p> <p>4.1 Gable to Gable roofs (no hips or valleys) up to 6.5 metre span.          4.2 No hips or Valleys greater than 2.0 metres.</p>	

- 4.4 The Client or his Engineer must be informed of any unusual loads or forces (vertical or horizontal) which may affect the supporting structure. Examples of loads in this category may include point loads applied to walls which may not have been designed as load bearing in addition to girder bearings which may affect lintels and foundations.
- 4.5 The designs of trusses which contains 38 x 50mm must be checked by the System's Registered Person. In addition, the use of such sizes must be clearly stated on the quotation. Where 38 x 50mm material is specified in the design, this material must be mechanically stress-graded or proof graded and assigned working stresses in bending, tension and compression, to the satisfaction of the SABS or CSIR and the supplying mill must provide proof of its SABS permit to so structurally grade such size.

- 4.6** The Designer must make every reasonable effort to ensure that the design is in accordance with the most recent revision to the Architect's drawings. Any significant variation or discrepancy between the latest drawings and those used to prepare the quotation must be reported to the client as soon as possible after it is noticed. The Client should be made aware, in writing, that cost variations may arise.

## **5. QUOTATIONS**

Quotations shall be in writing and shall state:

- 5.1** The number(s) and/or titles of the Architect's drawings used to prepare the quotation;
- 5.2** Loading, maximum truss centres, maximum batten/purlin centres, span, pitch, overhangs and any information required to define any unusual truss profiles. In the event of there being a range of spans and/or pitches, the minimum and maximum spans and pitches shall be stated;
- 5.3** Quantities of all the bracing and runners required to provide stability to the trusses. Bracing shall be in accordance with either the **ITC** requirements or any special requirements specified by the Design Engineers; or as laid down in SANS 10163 & 10243.
- 5.4** Details and quantities of all cleats, hurricane clips and hangers necessary to ensure compliance with the design requirements. Where specially fabricated cleats are required and their design or cost is not known, these may be excluded but this exclusion must be clearly stated on the quotation;
- 5.5** Where sundry timbers are quoted, the total quantities, sizes and purpose must be clearly stated;
- 5.6** The Designer must check that any member sizes and grades specified by the Client or his Architect for any trusses, beams or joists are adequate. If any sizes are found to be inadequate, this must be clearly noted on the quotation.
- 5.7** A statement as to whether or not delivery is included;
- 5.8** VAT must be clearly included on the quotation;
- 5.9** A statement with regards to engineering costs and Regulation A19 to be clearly noted;
- 5.10** The roof complexity and the recommended use of an ITC certified erector in accordance with the schedule in 4.2 must be noted on the quotation;
- 5.11** A member or his employee must not knowingly mislead the customer with respect to quotations or any item shown on the quotation.

## **6. DOCUMENTATION FOR ERECTION**

The minimum documentation to be provided shall consist of:

### **6.1 Roof Layout Plans:**

A roof layout drawing on minimum A3 paper size shall be provided for each project. This must show:

- 6.1.1** Loading, maximum truss centres and batten centres;
- 6.1.2** The positions of the trusses (truss centres and setback dimensions) with their marks clearly indicated;
- 6.1.3** The position of the braced bays with all necessary runners. These must be clearly shown.

- 6.1.4 The type of bracing employed and cross referenced on plan and truss elevation to the **ITC** bracing details or other provided. See **6.2**;
- 6.1.5 Any special erection details for hips and/or valleys where appropriate;
- 6.1.6 The position of ALL hangers and cleats/brackets.
- 6.1.7 Multiple ply girder details to be clearly indicated on the drawing.
- 6.1.8 The fabricators name and address with his System and ITC logo to appear on all drawings.

## 6.2 **Bracing Details:**

- 6.2.1 ***ITC Standard Details:***  
The relevant **ITC** bracing details must be included with the roof layout drawing or such details in SANS 10243.
- 6.2.2 ***Special Bracing Details:***  
These must be provided where non-standard bracing is required.  
(Reference to the System's Registered Person may be necessary).

## 6.3 **Standard Notes:**

Standard notes regarding material specifications, sundry timber and bracing connections, nailing and bolting should be sent to the site whenever detailed engineering drawings are not provided.

These notes are described hereunder:

### **NOTES**

**THESE NOTES ARE TO BE READ IN CONJUNCTION WITH THE ROOF LAYOUT ISSUED TO SITE.**

### **GENERAL**

1. The structural timber design and fabrication details shown on the attached drawings are in accordance with SABS 0163, "THE CODE OF PRACTICE FOR THE DESIGN OF TIMBER STRUCTURES" and the latest recommendations of the CSIR and the **ITC**.
2. Storage, handling, erection and bracing shall be in accordance with SANS 10243.

Bracing is to be installed in the position shown on the attached drawings. Fixing of the bracing to the roof trusses must be carried out in accordance with SANS 10243.

**N.B.:** Bracing of the roof structure is integral to the design of the timber roof trusses.

3. The drawings provided are to be read in conjunction with all relevant Architects/Consulting Engineers details.  
Roof trusses must be erected in the positions shown on the roof layout supplied.

### **MATERIALS**

4. The specified grades of timber shall be strictly adhered to, and shall have been graded in accordance with the relevant SABS Specification. The timber may only be sized within the SABS tolerances. The timber cross-section sizes shown are the minimum acceptable dimensions, as used in the design. The moisture content of timber at time of installation in the structure shall not exceed 17%.

5. Connector plates shall be galvanised steel 1mm thick U.O.S. as tested and approved by the CSIR. Connector plates (and other hardware as detailed in Paragraph 6 below).
6. Hurricane clips, cleats, U-type hangers and tooth connectors shall be manufactured by a reputable supplier and have been tested by an approved authority for load bearing capacities.
7. Nails shall be in accordance with SABS 820:1974, and positioned in accordance with SANS 10163, U.O.S.
8. Grade 43 mild steel square or round washers of the following minimum dimensions shall be used with all bolts, U.O.S. bolts shall be to BS 4190 or SABS 135, and positioned in accordance with SANS 10163, U.O.S.  
For bolt dia up to 12mm use washers 38 x 4mm, U.O.S. for bolt dia over 12mm, up to 20mm, use washers 60 x 5mm, U.O.S.

**LOADING**

9. Any deviation from the loads specified below must be approved by the Designer.

DESCRIPTION			KN/m2
TOP	LL		
CHORD	DL		
BOTTOM	LL		
CHORD	DL		
OTHER			

These loads are in accordance with SANS 10160.

If details on site differ from above please refer to Designer.

10. PURLINS ..... ON EDGE @ ..... mm  
 BATTENS ..... (spacing to be in accordance with the Tile Manufacture's Specification - max. 540mm c/c)  
 TRUSS SPACING ..... mm c/c Max U.O.S.

**STORAGE**

11. Trusses are to be stored flat and level or vertical. Where trusses are stored outside for periods greater than one month, tarpaulins or similar adequate cover must be provided.
12. Adequate storage and protection facilities shall be provided so that any form of damage to the trusses before erection can be prevented. This should be in accordance with the latest recommendations of the ITC.

**ERECTION AND BRACING**

13. It is the responsibility of the Erector to ensure that temporary erection bracing is installed to hold the trusses true and plumb and in safe condition until permanent truss bracing is firmly nailed or bolted in place. All permanent bracing shall be in accordance SANS 10243, or as may be required by the Registered person

responsible for the overall structure. All components must be permanently fastened before the application of any loads.

**N.B.:** Bracing of the roof structure is integral to the design of the timber roof trusses.

14. Trusses are to be supported only at bearing points indicated on the drawings. The Truss Designer is only responsible for design of the timber roof structure and on no account responsible for the design of the supporting superstructure, U.O.S. However, where unusual point loads occur, e.g. at girder supports or over windows/lintels, etc. These loads should be advised to the Building Designer (Architect/Engineer) by the Truss Designer.
15. The standard method of construction is that at all supports use 25 x 1,0mm galvanised hoop iron straps, embedded seven courses into BWK, or cast min. 200mm into concrete beam, wrapped over the trusses and fixed with 4 x 40mm clout nails for heavy roofs or 8 nails for light roof U.O.S., or as provided by the Registered Person responsible for the overall structure.
16. Connection of purlins and batters to rafters to be in accordance with SANS 10243. Purlins are to be nailed at each intersection and tied with 2,5mm double strand wire or alternatively a pair of hurricane clips at each inter-section.
17. Where there will be no directly fixed ceiling material, irrespective of roof covering, provide 38 x 76 (4) longitudinal runners on the tie beams at max. 2600mm c/c U.O.S. Similar, such runners at 1800mm c/c are required at all cantilever ends, U.O.S.  
These runners are to be fixed and braced before fixing the roof covering. Where the ceiling brandering is fixed directly to the tie beams, the required runners may be omitted, provided that SABS graded brandering is used.
18. No trusses are to be cut or modified without the prior consent of the Truss Designer.
19. The following accessories are required on site and should be fixed in position as described on the attached roof layout.

\_\_\_\_\_ Hurricane Clips have/have not been issued.

\_\_\_\_\_ Joist Hangers have/have not been issued.

\_\_\_\_\_ Hip Girder Brackets have/have not been issued.

\_\_\_\_\_ Connections for the shelf bracing have/have not been issued.

The non-issue of these items must comply with the quotation. The cleats or brackets will still be required to be in place for the roof to be structurally acceptable.

20. The roof structure indicated on the attached drawing has been supplied by:

.....

in the case of a problem, please contact:

**NAME:** .....

**TELEPHONE NUMBER:** ( ) .....

21. Copies of all documentation issued to the site must be kept in the Truss Fabricator's files. (It is recommended that details of the documentation issued are entered on the Delivery Note and proof of acceptance retained).

## 7. TRUSS MANUFACTURE

7.1 The Truss Fabricator shall institute quality control systems to ensure that:

- 7.1.1 The trusses conform to specification;
- 7.1.2 The trusses are of satisfactory quality.

### 7.2 TIMBER:

Manufacturing Members of the **ITC** must only supply SABS marked structurally graded timber for truss manufacture.

#### **Grade**

Timber should always be of the specified grade or better, but pieces with obviously severe defects (which might, as in the case of splits, have occurred after grading) should not be used.

#### **Size**

To ensure uniform thickness of members, timber should be "regularised" to the size given in the designs or drawings.

#### **Cutting**

Timber should be cut to the correct angles with double or single cuts strictly in accordance with the designs to ensure an acceptable fit.

### 7.3 ASSEMBLY:

#### **Method**

Trusses are to be assembled on a flat surface in such a way as to avoid damage to any of the members. The assembled truss must conform to the detailed drawings and specification supplied. Tolerances shall be in accordance with SANS 10243.

### 7.4 JOINTS:

7.4.1 All primary trusses, girders and truncated trusses shall have wood members accurately cut, assembled according to the configuration shown in the design, and fabricated in rigid fixtures or jigs, properly positioned with positive clamps so that all members have good bearing and all completed truss units are uniform. Joint positions (except for splices) should not vary between trusses in the same production run and tolerances shall be in accordance with SANS 10243.

7.4.2 Excessive Defects In Joint Area: Timber having defects (such as excessive wane and dead knots) in the connector plate contact area shall not be permitted unless the connector plate size is increased for the ineffective area.

7.4.3 Gaps Between Members: Joints should generally be tight with close fitting members. Peak joints, splice joints in main chord compression members, and similar joints requiring wood to wood compression for stability of design, shall have good bearing. Tolerances shall be in accordance with SANS 10243.



- 7.4.4** Nail Plates: Plates must be of the type specified and should be positioned within 5mm of the position shown in the drawings or design. Their sizes should be as shown but larger sizes may be used.
- 7.4.5** Pressing Of Plates: Plates must have their teeth embedded to their full length into the timber in accordance with the plate manufacturer's specification and the teeth should remain fully embedded after assembly of the joint. Any plate showing evidence of flattening of the teeth shall cause rejection of that joint. Alternatively, repairs may be made under the guidance of the System's Registered Person. A larger plate may be used to ensure an adequate number of securely embedded teeth.
- 7.5** A quality control system must be instituted in order to provide a control on the manufacturing procedure.

## **8. STORAGE ON FACTORY PREMISES**

Trusses on factory premises should either be stored on truss trolleys or similar in a vertical position or in the horizontal position on a true and level surface, raised approximately 100mm from the ground upon bearers supporting them at each node point of the truss. Storage should allow free circulation of air, but cover must be provided against prolonged exposure (4 weeks) to inclement weather conditions.

Trusses should be neatly stacked so that any variations in profile can be easily seen.

## **9. HANDLING**

Timber Trusses bend easily "out of plane" and care should be taken during handling both in the factory and on site.

Where possible, all trusses should be handled and lifted in an upright position. If trusses are to be carried horizontally adequate intermediate supports must be provided.

## **10. DELIVERY**

All trusses and sundry timber are to be securely fastened on to the truck or trailer taking care not to distort or bend any structural members.

Trusses must be carefully off-loaded in such a way that no damage is done to the timber or connector plates. Any trusses with broken members must be reported to the factory and repaired or replaced as determined by the supplier or his System's Registered Person.

- 11.** The Truss Fabricator must be responsible for the quality of the manufactured product and a product liability insurance must be able to be proved OR the company must declare, in writing, that it will support any claim based on proof that their product was sub-standard for its intended use.

## **12. APPLICATION PROCEDURES**

### **12.1 Approval:**

- 12.1.1** A Fabricator applying for a certificate shall request, in writing, an "**audit**" from the Institute. The audit will be conducted by the System Representative and an ITC Approved Independent Auditor.
- 12.1.2** The Fabricator shall, on applying for the Certificate, nominate his key personnel and their job descriptions. He must ensure that these personnel are available to be interviewed on the date agreed for the audit and that there is sufficient manufacturing work being performed for the Auditor to make a fair appraisal of all aspects of the Truss Plant. Any additional expenses incurred due to the absence of key personnel shall be borne by the applicant.

- 12.1.3** The "**Auditor**" will check whether all requirements are complied with in the operation of the Fabricator's plant. If satisfied, the Auditor will recommend the Applicant to the Institute for the issue of the Certificate.
- 12.1.4** A Certificate of Competence can only be issued after successful completion of the audit.
- 12.1.5** The audit team will assess the whole operation of truss estimating, design, manufacture, and in particular, the site documentation procedures and the ability of the nominated key personnel to undertake their responsibilities.
- 12.1.6** The Manager of the plant will be advised by the audit team as to their success or failure upon completion of the audit.
- 12.1.7** The Manager is entitled to discuss the findings of the audit team with the Auditor, and the Auditor will assist the Manager in addressing the problems they encountered together with the suggested solution for rectification.
- 12.1.8** The Auditor will submit this report to the **ITC** recommending or refusing the issue of a Certificate of Competence. The issue of a Certificate may require that a Director of the Fabricator company sign certain undertakings as required by the Auditor.
- 12.1.9** The **ITC** requires that the full cost of the audit is paid and that all necessary paperwork is completed and signed by the Applicant prior to the issue of the Certificate of Competence.
- 12.1.10** The successful Applicant is responsible for advising the **ITC** immediately of any changes in their operation after the audit has taken place.  
**i.e.** changes in key personnel  
changes in connector plate system  
changes in scope of operation  
change of premises
- 12.1.11** In addition, the **ITC** will prompt the notification of changes by mailing response forms (using email ) to all certificated Fabricators at six (6) monthly intervals. This, however, does not absolve the Fabricator from his responsibilities in **12.1.10** above.
- 12.1.12** These response forms must be returned to the **ITC** within twenty one (21) days with any changes required to the **ITC** records duly noted.

## **12.2 Re-examination and Suspension:**

- 12.2.1** A Fabricator shall be examined for compliance with **ITC** requirements at intervals not exceeding one (1) year.  
A duly convened meeting of the Executive Committee of the Board of Directors of the Institute may, by a two thirds majority decision, order that a certificated Fabricator's truss plant be re-examined under any of the following circumstances:
- In the event of :**
- 12.2.1.1** Changes in key personnel employed by such Fabricator;
- 12.2.1.2** A change in the connector plate system used by the Fabricator;
- 12.2.1.3** A written complaint being lodged with the Institute against a Fabricator, provided that the certificated Fabricator shall

have received one (1) weeks notice of such meeting and shall be entitled to be present at such meeting.

**12.2.1.4** A Fabricator not complying with minimum standards at the Certificate of Competence audits will be required to be re-audited within 14 days after the date of the unsuccessful audit. Cost of the re-audit will be borne by the Fabricator.

**12.2.2** The Fabricator must advise the Institute immediately of any change in connector plate system or key personnel. The Institute will then determine whether a re-examination is required. However, the Fabricator will retain all his rights under the scheme until any re-examination can be carried out or for a maximum period of thirty (30) days.

**12.2.3** A Fabricator may only be disqualified from certification after a re-examination has occurred.

**12.2.4** The cost of any inspections required to investigate a complaint will be borne by the Complainant except that, where the complaint is found to be justified, the costs of any such examination will be borne by the Fabricator.

**12.2.5** If disqualified, a Fabricator will no longer be entitled to use the **ITC** logo and will be struck off the **ITC** list of certificated Fabricators. A disqualified Fabricator may apply to be re-instated after thirty (30) days. The cost of any inspection or re-audit required will be borne by the Fabricator.

**12.2.6** Notwithstanding the above, any Fabricator who is shown using timber which has not been face marked with the relevant SABS Stress Mark or is using Black Cross (sub-grade) timber, or timber that has not been re-graded after having been ripped from graded timber, or any non-structural timber will summarily forfeit his Certificate of Competence and his Membership of the **ITC** will be terminated.

His name will be removed from the **ITC** list of Certificated Fabricators, and no monies will be refunded.

**12.3 Promotion:**

The list of approved Fabricators/Manufacturing Members and Certificate of Competence holders will be promoted through:  
The ITC Web Site

**12.4 Administration:**

The scheme will be administered through the **ITC** Secretariat.

**12.5 General:**

All audit and licence/membership fees will be subject to a review from time to time.

**FULL NAME:**.....

**SIGNED:**.....

**DESIGNATION:**.....

**DATE:**.....

**WITNESS:**.....

**WITNESS:**.....