

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONRY**  
**(BCSM#7)**

**Table of Content**

<b>1. NAME AND DESCRIPTION OF TRADE .....</b>	<b>2</b>
1.1.1. Stonemasonry.....	2
<b>2. SCOPE OF WORK AT COMPETITIONS .....</b>	<b>2</b>
<b>3. PRACTICAL WORK.....</b>	<b>2</b>
<b>4. THEORETICAL KNOWLEDGE.....</b>	<b>4</b>
<b>5. MATERIALS .....</b>	<b>5</b>
<b>6. WORKSHOP INSTALLATIONS.....</b>	<b>6</b>
<b>7. TEST PROJECT MARKING .....</b>	<b>9</b>
7.2 MARKING .....	9
7.2 RATING .....	10
<b>8. COMPETITION PROCEDURE.....</b>	<b>10</b>
<b>9. JUDGING PROCEDURAL REQUIREMENTS.....</b>	<b>11</b>
<b>10. GENERAL SAFETY REQUIREMENTS .....</b>	<b>12</b>

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONARY**  
**(BCSM#7)**

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONARY**  
**(BCSM#7)**

**INTRODUCTION**

WorldSkills Jamaica , by a resolution of the National Organizing Committee and in accordance with the Constitution, the Standing Orders and the Competition Rules, has adopted the following minimum requirements for this skill for the National Skills Competition.

The Technical Description consists of the following:

- Section 1 – Technical/Competition Description (TD)
- Section 2 – Project Design Criteria (PD)
- Section 3 – Skill Management Procedures (SM)
- Section 4 – Workshop Setup (WS)
- Section 5 – Infrastructure List (IL)
- Section 6 – Appendices

Effective 01.04.07

Grace Mclean (GM)  
Chairman, Competition Committee  
01.04.07

Daphne Simmonds  
Co-chair

The National Skills Competitions Sub-Committee has adopted the following minimum requirements for applicants' entry in the Skills Jamaica Competition.

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONRY**  
**(BCSM#7)**

The effective date will be that date on which this document is issued, and is subject to change by the Skills Jamaica Competition Steering Committee.

## **1. NAME AND DESCRIPTION OF TRADE**

1.1 The name of the trade is:

### **1.1.1. Stonemasonry**

1.2 Stonemasonry covers the cutting to shape of natural stone with different tools and machines; its preparation and use in making monuments and facades externally and internally. It also includes the restoration of historical monuments and of secular and religious buildings made of stone and ornamental design and carving.

1.3 **This technical description must be known to every candidate.**

1.4 Words implying masculine gender only shall include the feminine gender

## **2. SCOPE OF WORK AT COMPETITIONS**

2.1 The test project consists only of practical work, including the necessary templates and counter-templates.

2.2 The theoretical knowledge is limited to the adequate work process, including development of templates, reading and interpretation of drawings and ornamental design and lettering.

## **3. PRACTICAL WORK**

3.1 The competitor has to carry out, independently, the following tasks:

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

- Checking for defects and the measurements of the natural stone.
- Designing and carving letters and an ornament from a small example
- Manufacturing the templates in zinc or aluminum sheet in accordance with the process chosen
- Manufacturing the moulded piece with the necessary precision and surface finish

#### 3.2 Module identification

<b>Module</b>	<b>Name</b>	<b>Hours</b>
1	Ornamental design and carving	3-4
2	Templates	2-3
3	Moulded piece	15-17

#### 3.3 Module 1: Ornamental design and carving

The appropriate technical skills are:

- Designing an ornament from a small example
- Drawing and cutting letters on the stone

A drawing will be provided with the size and location of the ornament and text. Also a small example of the ornament is provided, from which the competitor may interpret his own design. The marking will be subjective on the sub-sections design/layout/ interpretation and craftsmanship.

#### 3.4 Module 2: Templates

The appropriate technical skills are:

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

- Drawing the templates on sheets of aluminum or zinc
- Cutting the templates from the sheets

A drawing should be provided (not scale 1:1) from which templates should be made. On the drawing are the minimum sizes of the templates. Further measurements are available on the drawing of module 3.

#### 3.5 Module 3: Moulded piece (main project)

The appropriate technical skills are:

- Measuring and tracing on the stone
- Depending on the type of stone, the following technical processes can be chosen to obtain the required surface finish:
  - cutting out the edges with a hammer and chisel, down to the line of reference
  - roughing down the surface
  - working the drafts
  - levelling the surfaces
  - finishing the surfaces

Rubbing stones are only allowed on arises.

All the above-mentioned processes can be carried out with hand tools, or with pneumatic hammers, fitted with the appropriate chisels.

## 4. THEORETICAL KNOWLEDGE

4.1 Interpretation and execution of drawings to industry standards.

4.2 Tracing and cutting the profiles and contours on template material to a scale of 1:1.

4.3 Knowledge of the particular type of stone and its reaction during the work process.

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

4.4 Knowledge of the design of letters and ornaments.

## 5. MATERIALS

### **Materials (local stones and by-products of stones, marbles, sands etc)**

5.1 Natural stone, preferably limestone or marble. It is allowed to use two different types of stones for module 1 and 3.

5.2 Depending on the type and characteristics of the natural stone, the test projects can be planned on the following objects:

- Pedestal, cornice, column, coping, plinth, capital, springer, keystone, tracery, or pediment
- Ornament (module 1)

The modules are to be worked on within the two days of the competition.

5.3 The test projects are to be determined by the size of the provided material.

Materials that have to be provided:

- A sample piece of stone of approximately 400 x 300 x 100 mm for testing the machines and tools. If two types of stone are used, for each type a sample piece must be provided.
- Module 1: a piece of stone of approximately 400 x 300 x 100 mm
- Module 2: 1 m<sup>2</sup> zinc or aluminum sheet, thickness between 0.2 and 0.4 mm
- Module 3: a piece of stone has to be cut with a circular diamond saw to a base size of 505 x 305 x 305 mm. The working size must be 500 x 300 x 300 mm.

# **NATIONAL SKILLS COMPETITION**

## **Competitions Sub-Committee**

### **STONE MASONRY**

#### **(BCSM#7)**

5.4 The competitor must present a sample of the stones. The size of the sample must be 10 x 10 x 5 cm and must be known together with the name and address of the producer. If two types of stones are used, for each type a sample piece must be provided.

A sample 10 x 10 cm zinc or aluminum for the producing of templates has to be available as well.

## **6. WORKSHOP INSTALLATIONS**

6.1 Each competitor will have a working area not smaller than 3 x 3 m, including an adjustable workbench and two tables (min. 1,4 x 0,8 m) for templates and tools.

Where the workshop is outside (under a roof) with enough natural ventilation, additional dust extraction is not necessary. When the workshop is inside an adequate system for dust extraction must remove the stone dust produced during the work process.

A sound insulated Porta cabin with roof, door and windows will be made available to the experts due to the noise, with the following

- A large table for the templates
- A chair and a locker for each expert.
- Every expert will be provided with a pair of ear defenders.

Visitors must be protected from stone splinters by a fine wire screen or a similar arrangement.

It is preferable that measures are taken to assure that neighboring workshops are not bothered with the noise of the stonemasonry workshop.

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

6.3 The following equipment and facilities will be made available to each competitor:

- Each work piece has to be able to be mounted ergonomically, depending on the height of the competitor. Felt or rubber strips will be available for soft stones.
- A tool grinder with two grinding discs, one carborundum, one green grit silica suitable for tungsten carbide, diameter approximately 300 mm, width at least 30 mm. (Any competitor bringing his own machine will have to place it centrally where all competitors can use it).
- 200 liters of compressed air per minute at a constant pressure of 7 bars. The inside diameter of the compressed-air hose must be 8 mm. The fittings for connecting the hoses to the compressed-air network will be made available to the competitor. Air-drying capacity will be built into the system.
- Each competitor's air connection should also include a water trap (approx. 30mm) below his connection with a bleeder valve.
- Lighting of 400 Lux should be provided at the work surface.
- 1m<sup>2</sup> zinc or aluminum sheet, thickness between 0.2 and 0.4mm, will be made available to each competitor.

6.5 The competitor must bring safety footwear, safety glasses and ear defenders.

Depending on the type of stone chosen, the following list of tools and auxiliary materials is suggested to make the selection easier:

- Pneumatic tools
  - pneumatic chiselling hammers with hoses and fittings
  - compressed-air reducing valve (regulator)

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

- chisels, boaster punch, point, claw tools
- manifold
  
- Hand tools
  - mallet
  - boosters, drafting chisels, punch, point, claw tool
  - hammers, squares
  
- Setting out equipment
  - set squares
  - compass
  - scissors
  - tin snips
  - scribe
  - flat & round files
  - knife for cutting plastic sheet
  - pencils
  - scale rule
  
- Supplementary
  - dusting brush
  - timber wedge
  - protective glasses
  - rubbing stones (only allowed on arises)
  - plastic sheet for supplementary templates
  - paper for drawing

# NATIONAL SKILLS COMPETITION

## Competitions Sub-Committee

### STONE MASONRY

#### (BCSM#7)

6.6 The use of the following machines, fixtures and materials is NOT allowed for the exercise:

- Grinding and cutting machines
- Handsaws
- Rasps and file

It is not allowed to glue anything onto the piece.

## 7. TEST PROJECT MARKING

7.1 The experts will decide together on the test projects, the marking criteria and the dimensional tolerances on forms provided. The drawings will be marked on which positions the test project will be checked.

### 7.2 MARKING

Marking will be both objective and subjective

- Marks for subjective sections:

Perfect	=	10 points
Very good	=	9 points
Good	=	8 points
Rather good	=	7points
Sufficient	=	6 points
Medium	=	5 points
Weak	=	4 points
Insufficient	=	3 points
Very bad	=	2 points
Zero	=	1 point
  
- Marks for objective sections:

Within tolerance  $\pm 1$  mm = 10 points

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONRY**  
**(BCSM#7)**

Within tolerance  $\pm 3$  mm = 5 points

Out of tolerance = 0 points

**Subjective sections have to be marked first.**

**7.2 RATING**

<b>Module</b>	<b>Section</b>	<b>Item</b>	<b>Max Points</b>	<b>Subjective Objective</b>
1	A	Ornamental design and carving	4	S
2	B	Templates	18	O
3	C	General impression	10	S
3	D	Corners, arrises, internal mitres	18	O
3	E	Measurements & external mitres	18	O
3	F	Flat surfaces	8	O
3	G	Profiles, curved surfaces	24	O
	H			

7.3 Conversion to the 400 - 600 scale will be done by computer.

**8. COMPETITION PROCEDURE**

8.1 The working areas (including the stones in it) are divided among the competitors by lottery. Stones will only be replaced when hidden faults occur during the working process.

8.2 Prior to the start of the competition a timetable with working hours will be made public after the experts have agreed on it.

## **NATIONAL SKILLS COMPETITION**

### **Competitions Sub-Committee**

#### **STONE MASONRY**

##### **(BCSM#7)**

- 8.3 At least two hours are available to set up the working stations, especially to make the air connection. Enough support of the shop master will be made available.
- 8.4 Competitors will have two hours at their disposal to familiarize themselves with the material, working on the provided sample piece.
- 8.5 Competitors will sign a form with safety rules, developed and provided by the experts.
- 8.6 When the competition starts the chief expert will give the competitors verbal instructions
- 8.7 Prior to module 1 the competitors will have half an hour at their disposal to study test project 1 and prior to module 2 another half hour to study test project 2 and 3.

## **9. JUDGING PROCEDURAL REQUIREMENTS**

- 9.1 The chief expert will divide the experts into groups of 3-4 persons each to mark part of the objective items. All experts will mark subjective items.
- 9.2 Every completed module will be marked on the same day in which it was completed.

**NATIONAL SKILLS COMPETITION**  
**Competitions Sub-Committee**  
**STONE MASONRY**  
**(BCSM#7)**

**10. GENERAL SAFETY REQUIREMENTS**

- 10.1 Wear safety glasses during all chiselling operations, including sharpening the chisels.
- 10.2 All competitors must wear appropriate clothing and safety footwear at all times.
- 10.3 All competitors must wear hearing protection at all times.
- 10.4 All machinery, equipment and safety clothing must comply with the safety rules of the organising country.
- 10.5 Use the dust extraction, if provided, in a correct manner at all times.
- 10.6 Competitors must keep their workspace clear of obstacles and the floor space clean of material and equipment - any items likely to cause the competitor to trip, slip or fall.
- 10.7 The competitor has to agree to and sign these regulations, before starting the competition. Failure by the competitor to comply with safety directions or instructions will incur loss of marks for safety.
- 10.8 Judges will wear the appropriate personal safety equipment when inspecting, checking or otherwise working with a competitor's project.