



# Regional Scope Document -

## *MECHANICAL CAD (Secondary)2010*

### **Purpose of the Challenge:**

To evaluate students knowledge and skill in interpreting and/or completing an accurate, precise and detailed Mechanical drawing.

### **Skills & Knowledge to be Tested:**

#### **Problem Solving:**

- Students may be required to solve open ended problems and interpret misleading or erroneous data. Such decision making will obviously affect the completion of the project.

#### **CAD Techniques:**

- Use of fundamental CAD techniques and commands to produce a drawing to International Drafting Standards.
- Ability to produce a CAD drawing to a defined scale using Templates and/or Borders.
- Knowledge of CAD standards for setting limits, linetypes and scales, layers, dimension variables and units.
- Ability to import files and blocks.

#### **Knowledge of file management and maintenance. Mechanical Drafting Procedures:**

- Knowledge and understanding of Mechanical Drafting Standards and Symbols (ISO/ANSI)
- Ability to create and appropriately layout the necessary views and/or sections, given a mechanical component or drawing.
- Accuracy and completeness of chosen views, linetypes, hatching and mechanical drafting conventions.
- Correct use of, and accuracy of, dimensioning on appropriate views.
- Presence of, and positioning of, required notations, symbols, annotations and text.
- The ability to use CAD to generate information such as areas, volumes, angles etc.
- Ability to generate Auxiliary and Orthographic views.

## **Specific Requirements:**

*All software packages will be original versions  
No add-on applications will be allowed*

## **Equipment / Tools / Materials**

### **Hardware:**

- Pentium type microcomputers fitted with SUPER VGA monitors and a three button mouse.

### **Software:**

Any drafting software will be allowed for mechanical design.

*Software and hardware are regional specific and based on what is available at our host location, so some variation may occur, students may be requested to bring software or a laptop containing the software at the discretion of the host committee.*

Should other software packages or platforms be required, the contestant and their mentors are responsible to provide systems support in order to complete the project as specified. The alternate software will require prior approval of the local committee to allow adequate preparation time.

AutoCAD or equivalent will be provided at the BC Skills Competition. We will attempt to acquire other packages if required however students should bring software with them to be loaded on site. If a student is successful at the regional level they must notify the skills Canada BC and indicate which software they intend to use upon registration for the BC Skills Competition.

No software reference manuals, textbooks or electronic data (eg. CD or diskette) will be permitted for the duration of the competition. However, the National Building Code and the CMHC Wood-Frame Construction handbook will be permitted.

Only diskettes provided to the contestant during the contest will be authorized for use. The installation use of user profiles will be permitted with prior approval of the committee.

### **Supplied by Contestant:**

- Metric and Imperial Scale
- Vernier Calipers
- Thread Pitch Gauges (metric and imperial)
- Calculator
- Notepad
- Pen / Pencil
- Machinery Handbook (or suitable reference text)

Judging / Distribution of Marks

<b>Skills Canada BC</b>						
<b>Mechanical CAD Drafting Competition</b>						
Competitor Number						
<b>PRESENTATION (100 pts)</b>						
Neatness of drawing	0	4	8	12	16	20
Proportional adherence text to object	0	8	16	24	32	40
Balance presentation	0	4	8	12	16	20
Choice of views	0	3	6	9	12	15
Title block	0	1	2	3	4	5
<b>MECHANICAL PROOF (200 PTS)</b>						
Layer Organization	0	8	16	24	32	40
Alignment and precision of views	0	8	16	24	32	40
Linetype conventions & weighting	0	4	8	12	16	20
Legibility of numbers and letters	0	20	40	60	80	100
<b>DRAFTING CONVENTIONS (200PTS)</b>						
Completeness of Notations	0	15	30	45	60	75
Material Symbols and Identification	0	10	20	30	40	50
Interpretation of surface condition	0	5	10	15	20	25
Identification of Component(s)/Part(s)	0	10	20	30	40	50
<b>PRODUCTION DRAWING (150 PTS)</b>						
Drawing accuracy	0	4	8	12	16	20
Alignment and accuracy of views	0	6	12	18	24	30
Conventional line type choices	0	6	12	18	24	30
Presence of axis lines and hidden contours	0	6	12	18	24	30
Line thickness	0	4	8	12	16	20
No apparent superimposition of lines	0	2	4	6	8	10
Hatching selection	0	2	4	6	8	10
<b>DIMENSIONING (150 PTS)</b>						
All production measurements present	0	10	20	30	40	50
Positioning of measurements	0	8	16	24	32	40
Presence of surface finish symbols	0	4	8	12	16	20
Dimensioning conventions	0	4	8	12	16	20
Presence of required annotations	0	4	8	12	16	20
<b>TIMELINE FOR COMPLETION</b>						
<1.5H=60, <2H=40, <2.5H=20, <3H=0						
<b>PLOTTING</b>						
Plotted Drawing	0					
to scale				40		

**Technical Committee:**

Jim Christiansen

Technical Chair

jim.c.christiansen@gmail.com

**If your contest is run as a Virtual (at your own school), please note the following:**

**All Virtual CAD Mechanical Contests have a registration deadline of February 15, 2010. The finished product must be received by Skills Canada BC by March 12, 2010.** Any submissions received after **March 12, 2010** will not be judged. All submissions will be judged by a panel of experts arranged by Skills Canada BC. All project submissions must be on paper (not CD or other computer format). The successful competitors will be notified prior to April 7, 2010 who qualify for Provincials.

In order to receive your contest package, **the teacher sponsor must register his/her student(s) prior to February 15, 2010.**

Your contest package will be forwarded to you on the morning of March 1, 2010, by email. The package is in .pdf format. **The finished project must be received by Adam Thorvaldson, Skills Canada BC 3777 Kingsway Burnaby, BC V5H 3Z7, 604-432-4229, on or before March 12, 2010. Any submissions received after this date will not be eligible for judging.**