

# WELDER

Ontario  
Practical Examination

2020.12

***Please read all the information provided before you start the examination.***

This examination tests four welding processes (FCAW, SMAW, GMAW, GTAW), five plate assemblies (measurement, visual and bend), and three oxy-acetylene cutting tests (measurement and visual). Unless otherwise advised by the examining officer, you may do the tests in any logical order. Review the enclosed marking sheet for specifications.

**Materials Provided:**

**NWPE #1 & #3**

- 4 pieces – 75 mm x 150 mm x 10 mm (3" x 6" x 3/8") P-1 Plates cut/bevel one end at 30°- 37.5°

**NWPE #2 & #5**

- 2 pieces – 75 mm x 150 mm x 10 mm (3" x 6" x 3/8") P-1 Plates cut/bevel one end at 30°
- 2 pieces – 75 mm x 150 mm x 10 mm (3" x 6" x 3/8") P-1 Plates cut at 90° both ends
- 2 pieces – 50 mm x 177 mm x 6 mm (2" x 7" x 1/4") P-1 Backing plates cut at 90° both ends

**NWPE #4**

- 2 pieces – 75 mm x 150 mm x 6 mm (3" x 6" x 1/4") P-1 Plates cut/bevel one end at 30° - 37.5°

**NWPE #6**

- 1 piece – 100 mm x 152 mm x 10 mm (4" x 6" x 3/8") for Oxy-Fuel Test (note: 6" is to allow material to be flame cut down to 5" as a final dimension)

**General Specifications:**

- +/- 25 mm x 50 mm (+/-1" x 2") P-1 tabs for bridge or run off tabs
- All required welding electrodes, welding wire and shielding gas as described in the following pages
- Smaller plate pieces for setting of welding machine

**Candidate to Provide:**

- Helmet, goggles, gloves, personal hand tools and appropriate safety equipment including CSA approved work boots and safety glasses. **Candidates not having this safety equipment will not be allowed to perform the practical examination.**
- Angle grinder, grinding discs and buffing wheel.

**General Instructions:**

1. You will be allowed six (6) hours to complete this examination of all "six projects" and (2) hours for bending of the coupons for the "five" weld tests. Do not engage in needless conversation with examining officers or other candidates. Pay close attention to the availability of welding and cutting stations in order to complete the examination in the time allotted. The test timer will start after the test assemblies are stamped with the tester's ID.
2. **You must follow these instructions precisely**, as well as any additional instructions by the examining officers. You may ask the examining officers for clarification of these instructions at any time.
3. You are required to wear and/or use all appropriate safety equipment.
4. **There is no extra test assembly issued during this assessment.** The original testing assemblies issued at the beginning of the examination are the only testing assemblies you will have to work with.
5. **Test assemblies must be stamped** with candidate number and position letter, testing assembly identification letter (F=Face and R=Root), as illustrated on the following pages, **before** beginning the exam.
6. Any **single** testing assembly (WPS 1 through 5) receiving a complete fracture rating (see last point of page 3) will result in a re-test of the failed position immediately following this testing. During the re-test, the testing assembly will be bent on the face or root as applicable. One (1) hour will be allowed for this re-test. Only 1 "re-test" is permitted out of the 5 testing assemblies (WPS1 through 5).

**If a candidate fails any of the "re-tests", this will result in failure of the Ontario Practical Examination.**

**Note: Failure to complete this "re-test" when instructed to do so by the examining officers will result in failure of the entire assessment. This "re-test" may not be done at any time other than**

**the day of the original assessment\*\*.** There is no partial “re-test” following the **failure** of this examination.

7. Any **two** test coupons receiving a complete fracture rating in one testing assembly will result in failure of the **entire examination**.
8. When you have completed the examination, clean up your workstation.
9. Tests will be marked in the absence of the candidates. Stay away from the bending station until called by the examining officers to review your examination results.
10. **If a candidate fails any of the retests this will result in failure of the Ontario Practical Examination.**
11. Official examination results will be emailed to the Ontario College of Trades at [practicals@collegeoftrades.ca](mailto:practicals@collegeoftrades.ca) and issued to the candidate within four weeks after the testing date.

**\*\*The costs associated with any re-testing will be set by the testing centre and the number of items that need to be retested.**

Welding Test Centres have set been up across the province for Trade Equivalency Assessment applicants to complete the testing. Once a centre has a minimum of three (3) to a maximum of six (6) registrations the practical assessment will be scheduled.

The following Testing Centres are available for the Welder Practical Examination:

**GTA Region**

UA Local 46  
936 Warden Avenue  
Scarborough, ON  
Contact: D. Hardy  
[dhardy@ualocal46.org](mailto:dhardy@ualocal46.org)

Institute of Technical Trades  
749 Warden Avenue  
Scarborough, ON  
Contact: T. Hall  
[markosh@sympatico.ca](mailto:markosh@sympatico.ca)

**Eastern Ontario**

UA Local 71  
1250 Ages Drive  
Ottawa, ON  
K1G 5T4  
Contact: E. Turpin  
[eric@ualocal71.com](mailto:eric@ualocal71.com)

Durham College  
2000 Simcoe Street North  
Oshawa, ON  
Contact: R. Milburn  
[rebecca.milburn@durhamcollege.ca](mailto:rebecca.milburn@durhamcollege.ca)

**Southwestern Ontario**

UA Local 527  
225 Frobisher Drive  
Waterloo, ON  
Contact: D. Twomey  
[dan.twomey@ua527.com](mailto:dan.twomey@ua527.com)

Technical Training Group  
428 Forman Avenue  
Stratford, ON  
Contact: S. Bontaine  
[sbontaine@technicaltraininggroup.org](mailto:sbontaine@technicaltraininggroup.org)

Mohawk College  
481 Barton Street  
Stoney Creek, ON  
Contact: C. Mastroianni  
[claudio.mastroianni@mohawkcollege.ca](mailto:claudio.mastroianni@mohawkcollege.ca)

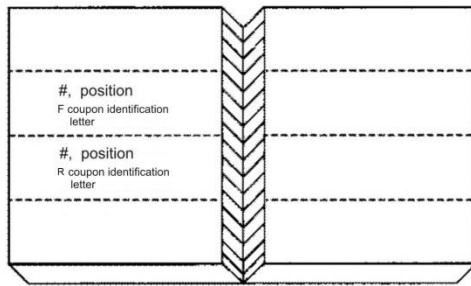
UA Local 67  
195 Dartnall Road  
Hamilton, ON  
Contact : D. McGavin  
[dmcgavin@ualocal67.com](mailto:dmcgavin@ualocal67.com)

**Northern Ontario**

UA Local 800  
1640 Bancroft Drive  
Sudbury, ON  
P3B 1R8  
Contact: A. Iannucci  
[anthony.iannucci@ualocal800.com](mailto:anthony.iannucci@ualocal800.com)

UA Local 628  
969 Alloy Drive  
Thunder Bay, ON  
Contact: D. Rojik  
[dan628@tbaytel.net](mailto:dan628@tbaytel.net)

## Welding Process Tests



- Before beginning to weld, stamp your coupons as illustrated above with your candidate number, **leave a space**, and then the position letter. For example, if your candidate number is 3 and the coupon is for the vertical position, mark the coupon **3 V** on both halves. For project 4, the double position, use the letter **D** as the position number. **Re-test assemblies** (if required) are to be stamped in the same way, except **double stamp** the position letter before beginning any welding.
- Test assembly pieces are to be tacked to each other on the bevel side unless otherwise described for each project. Maximum length of tacks is 13 mm (1/2") after feathering. All tacks and feathering of tacks may be done in the flat position. Any tool or grinder may be used for feathering of tacks. If the tack appears faulty, you may remove it. The original bevel must still be used following any tack repair. Run off tabs and/or bridge tacks are allowed on all tests.
- All welding is to be done from the bevel side **only**.
- **All roots must be completed as described in tests 1, 3 and 4. NOTE: For tests 1, 3 and 4 it is required to request a marker to inspect your root pass *IN POSITION* once it has been completed.** Stops are allowed to be feathered **while in position only**.
- Reasonable grinding reflecting industry practices is allowed for tests 2 and 5 at the discretion of the examining officers.
- When completed, **wire wheel or wire brush only** and present your completed testing assemblies to the examination officers for marking **before surface grinding begins**.
- Grind the welded surfaces to the thickness of the original parent metal. **Maximum** deviation is – 0.8 mm (1/32"). **Failure to maintain original testing assembly thickness to within this tolerance throughout the weld area will result in a COMPLETE FRACTURE rating for the test coupon.** See last point at the bottom of this page.
- The excess weld metal deposited at the edges of the 150 mm (6") testing assemblies may be ground flush with the parent metal. **Do not grind parent metal.**
- Cut the testing coupons lengthways once down the middle. The cutting method used is at the discretion of the test candidate. Cut one 37mm (1 1/2") coupon each side of the centre line of the test specimen. **Minimum width is 37 mm (1 1/2").** Test coupons outside an allowance of +/- 1/16" will receive a **COMPLETE FRACTURE RATING**. **Do not grind the cut edges of the testing coupons.** Lightly remove any burrs from the edges of the testing coupon (maximum of 1/8" radius). The removal method used is at the discretion of the test candidate.
- During bending, a **complete fracture** is a fracture exceeding 6.4 mm (1/4") starting from either edge or exceeding 3.2 mm (1/8") anywhere else. A **single** test coupon having a complete fracture will result in a "re-test" of the failed position at the end of this examination. **Two** test coupons having a complete fracture will represent a **failure of the entire examination**.

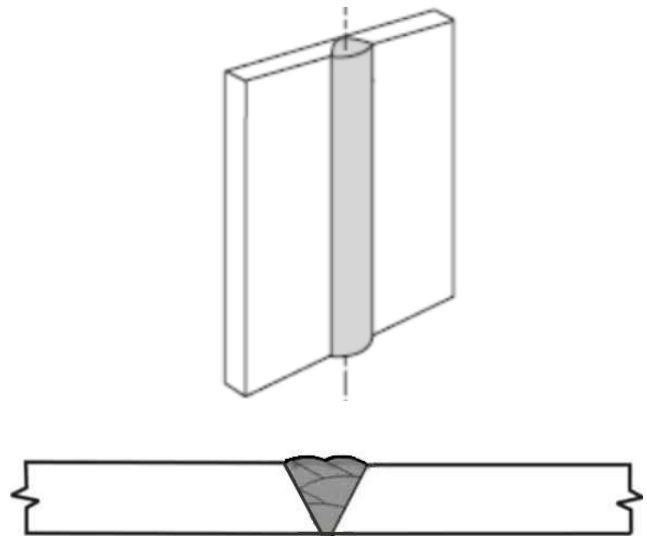
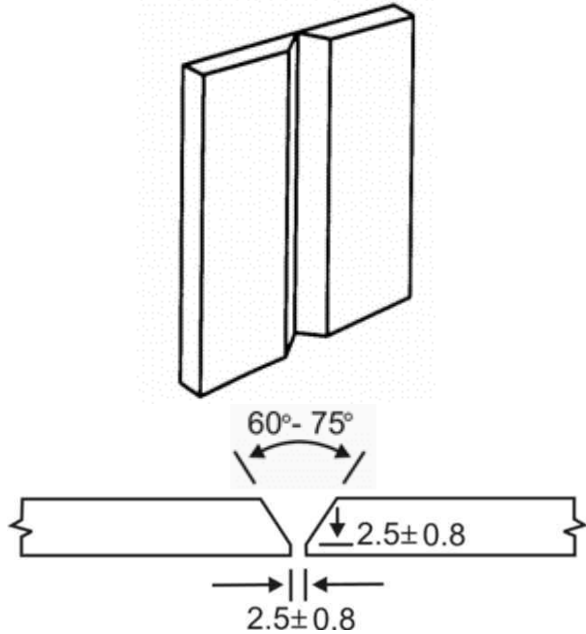
**Welding Procedure Specification (WPS): NWPE #1**

Position: 3G Uphill

Process: SMAW

Joint Design and Tolerance:

Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F3:E4310/E4311  
(E6010/E6011) root  
F4:E4918 (E7018)  
hotpass, fill and cap

Diameter of Electrode:

F3: 2.4mm (3/32")/3.2mm  
(1/8")  
F4: 2.4mm (3/32")/3.2mm  
(1/8")

Shielding:

NA

Welding Notes:

Testing assemblies must be tacked within the bevel only using F3 or F4 electrodes.

Root passes must be completed and ground in position only.

Hotpass, fill and cover passes may be ground during the welding process.

Stringer beads / weave passes may be used to fill and cap.

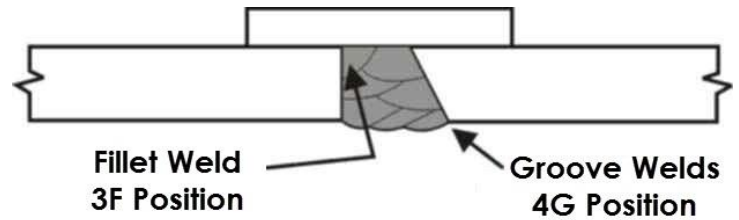
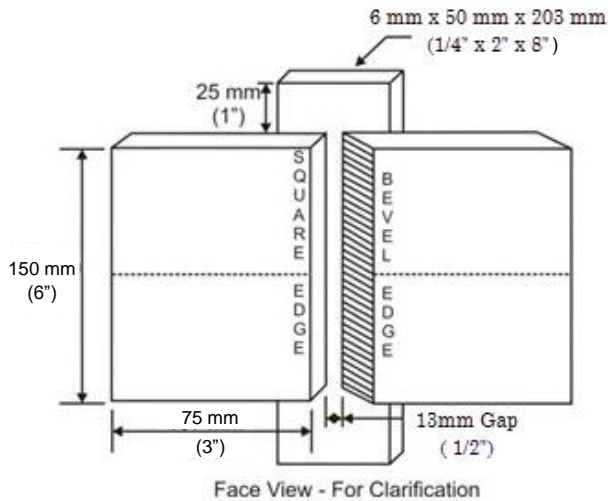
## Welding Procedure Specification (WPS): NWPE #2

Position: 3F (First Pass) Uphill  
4G (Fill and Cap)

Process: SMAW

Joint Design and Tolerance:

Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F4:E4918 (E7018)

Diameter of Electrode:

F4:3.2mm (1/8")

Shielding:

NA

Welding Notes:

Backing plate is to be tacked on the topside of the test assembly.

Test assembly must be presented to the markers for verification of fit-up prior to beginning root weld.

Stringer beads / weaves are allowed on this two-position test.

**Fillet weld for the square shoulder must be performed in the vertical position.**

Request examining officers to inspect the 3F uphill pass before proceeding to the 4G position.

Request examining officers to inspect the first pass in the 4G position before proceeding with the remaining passes.

All remaining welding to be performed in the overhead position.

Backing plate to be removed using any thermal process to **within 1.6 mm (1/16")** of the parent metal.

Reasonable grinding reflecting industry practices is allowed at the discretion of the examining officers.

Test assembly must be presented to the examining officers after backing plate removal, **prior to face and root grinding.**

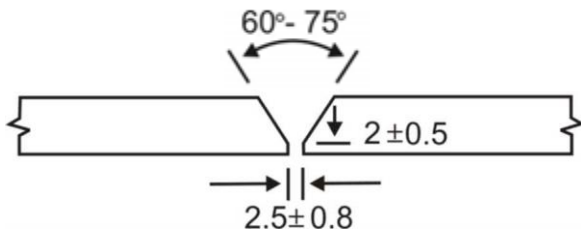
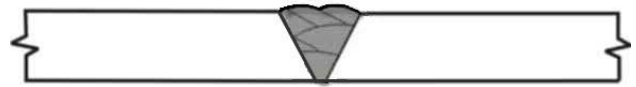
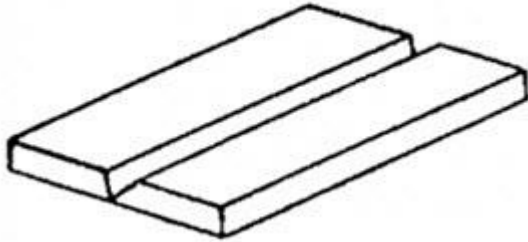
### Welding Procedure Specification (WPS): NWPE #3

Position: 1G

Process: GMAW

Joint Design and Tolerance:

Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F6: ER49S-6 (ER70S-6)

Diameter of Electrode:

0.9 mm (0.035")

Shielding:

Gas: 75% Ar 25% CO<sub>2</sub>  
and/or

Gas: 92% Ar 8% CO<sub>2</sub>

Flowrate: 12-17 L/min  
(25-35 cfh)

Welding Notes:

Root face and gap to be determined by candidate.

Bridge tacks will be allowed **within the bevel only** at the discretion of the candidate.

Run on/run off tabs or bridge tabs **tacked to the edges of the test assembly only** will be allowed at the discretion of the candidate.

Request examining officers to inspect the root pass before proceeding to fill and cap.

Stringer/weave passes can be used to fill and cap.

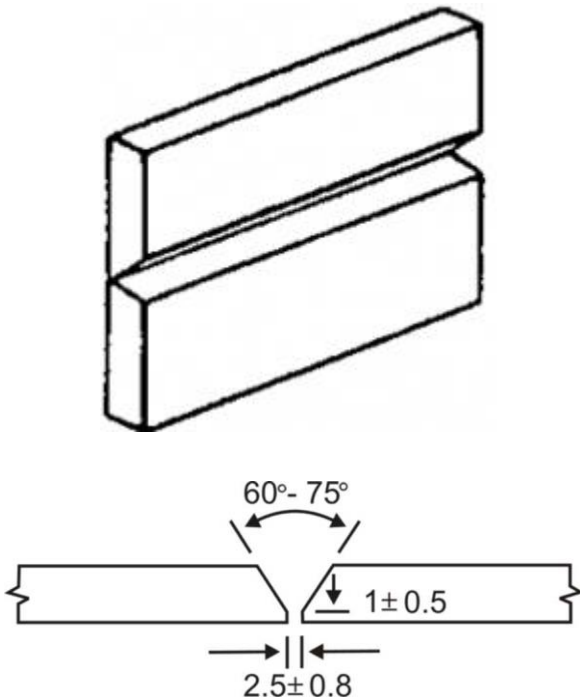
Candidate may select transfer mode.

## Welding Procedure Specification (WPS): NWPE #4

Position: 2G

Process: GTAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 1/4" Plate / 6mm Plate)

Filler Metal:

F6: ER49S-2 (ER70S-2)

Root, hotpass, fill and cap

Diameter of Filler Metal:

2.5 mm (3/32") – 3.2 mm (1/8")

Shielding:

Argon

Flowrate: 7-17 L/min  
(15-35 cfh)

Welding Notes:

Filler metal rod diameter at the discretion of the candidate.

Root face and gap to be determined by the candidate.

**NOTE:** testing assemblies must be tacked **within the bevel only** using GTAW.

**NOTE:** you must request a marker to inspect your GTAW root pass *IN POSITION* once it has been completed before proceeding with GTAW hotpass, fill and cap.

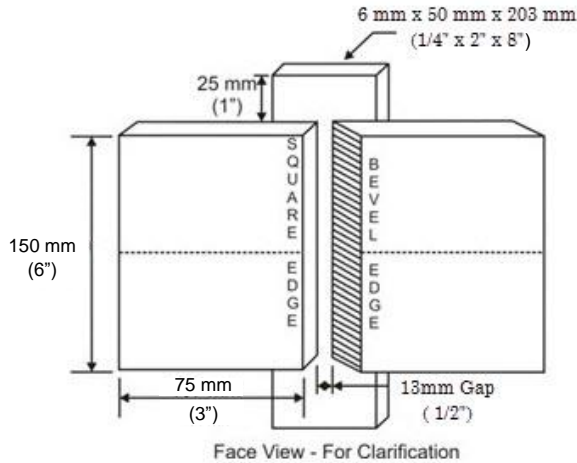


## Welding Procedure Specification (WPS): NWPE #5

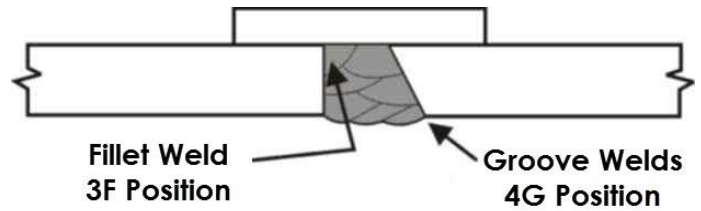
Position: 3F (First Pass) Uphill  
4G (Fill and Cap)

Process: FCAW

Joint Design and Tolerance:



Suggested Sequence:



Base Metal: Low Carbon Steel Plate CSA G40.21 GR 300W/A36 (Thickness: 3/8" Plate / 10mm Plate)

Filler Metal:

F6:E491T-9 (E71T-1)

Diameter of Electrode:

1.1 mm (0.045")

Shielding:

100% CO<sub>2</sub> or

75% Ar 25% CO<sub>2</sub>

Flow Rate: 17 - 20L/PM (35 - 45 cfh)

Welding Notes:

Backing plate is to be tacked on the topside of the testing assemblies.

Test assembly must be presented to the markers for verification of fit-up prior to beginning root weld.

Stringer beads / weaves are allowed on this two-position test.

**Fillet weld for the square shoulder must be performed in the vertical position.** Request examining officers to inspect the 3F uphill pass before proceeding to the 4G position. Request examining officers to inspect the first pass in the 4G position before proceeding with the remaining passes.

All remaining welding to be performed in the overhead position.

Backing plate to be removed using any thermal or mechanical process to **within 1.6 mm (1/16")** of the parent metal.

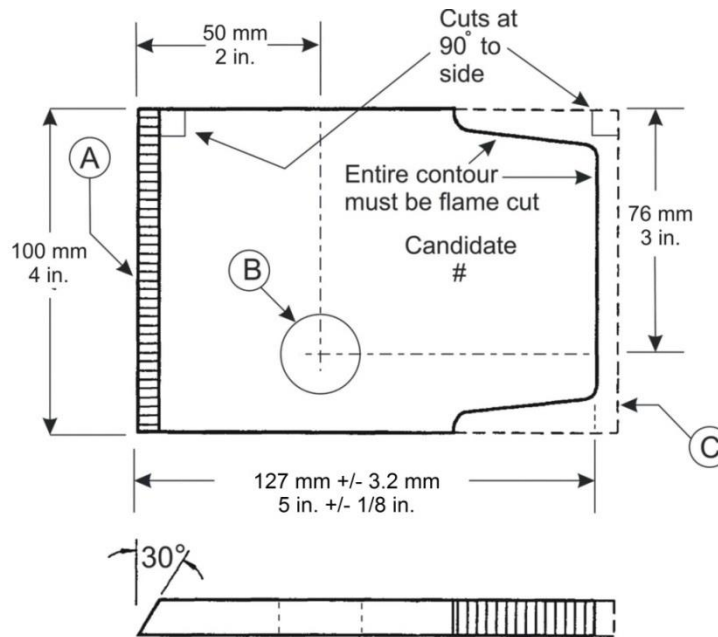
Reasonable grinding reflecting industry practices is allowed at the discretion of the examining officers.

Test assembly must be presented to the examining officers after backing plate removal, **prior to face and root grinding.**

## Welding Procedure Specification (WPS): NWPE #6

Position: N/A

Process: Oxy-Fuel Cutting



### Directions:

- Only one 100 mm x 150 mm x 10 mm (4" x 6" x 3/8") Low carbon/mild Steel flat bar cut at 90° both ends will be provided for this portion of the test. **No retesting assembly will be allowed for this portion of the examination.**
- Any measuring device may be used for marking layout lines. A 1" NPS pipe and a section of 100 mm (4") channel or template of same will be provided for marking the layout lines for the applicable projects of this test.
- **No grinding is permitted on any cut edges.** Knock off the slag and **lightly** file the edges to remove any burrs. Any cut edges will result in **failure** of this testing assembly.
- The 1" circle and the cope projects are to be cut freehand. The 30 degree bevel project can be completed freehand or with the use of a straight edge as a guide, the 30 degree angle must be maintained by the test candidate.
- **Overall length of the finished test plate must be within the tolerance stated in the above diagram.**

<b>Project A:</b>	Perform a 30° cut along the 100 mm (4") end as shown in the diagram. Cut must be at 90° to the sides. The cut angle is allowed a <b>maximum</b> tolerance of +/- 3°.
<b>Project B:</b>	Locate and perform a circular 90° cut to accept a 1" NPS pipe as shown in the diagram. The fit of the pipe is allowed a <b>maximum</b> 3/32" clearance at any point.
<b>Project C:</b>	Perform a coping cut to accept a 100 mm (4") channel or template as shown in the diagram. Cut must be at 90° to the sides. The fit of the channel is allowed a <b>maximum</b> 2.5 mm (3/32") clearance at any point.