

Report of the External Review Group on the Award Standards for the SOLAS

METAL FABRICATION Apprenticeship Programme

July 2014

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1. Introduction

Purpose

The purpose of the investigation carried out by the External Review Group (ERG) was to examine the metal fabrication apprenticeship training programme as proposed by SOLAS and to determine whether, in its view, the minimum programme learning outcomes outlined in the document were fit for purpose. To this end the ERG was required to answer four questions relating to the position on the programme on the National and European Frameworks of Qualifications (NFQ and EQF) and on the comparability of the programme to similar programmes in Europe and elsewhere (See Appendix B items a) to d)).

In addition the ERG was required to provide observations on the entry requirements for the programme, its general effectiveness in enabling learners to reach the minimum intended programme learning outcomes and the arrangements for progression. (See the second group of items a) to c) in Appendix B)

In essence the ERG was required to position the programme on the NFQ and the EQF and to establish linkages to other elements of the NFQ.

Membership, process, boundaries and limitations

The panel membership included experts on qualifications frameworks and on international comparators. It also included stakeholders from the social partnership and from providers of apprentice training. (See Appendix C)

As part of its deliberations, it had discussions with representatives of SOLAS and employers. It also met personnel from Education and Training Board Centres, (which provide phase 2 training), and spoke with personnel from Cork Institute of Technology, (which provides Phase 4 and Phase 6 training.) (See Appendix D)

The review took place over two days. It consisted of sessions with providers, learners and SOLAS. (See schedule in Appendix E).

The panel was conscious that the review was not a validation process but one that sought to position the programme learning outcomes within the specified frameworks. However the panel also felt that it was appropriate to comment on other aspects of the programme and to make suggestions as to issues that may arise if the recommendations are accepted. This was done in the context of the Review of Apprenticeship Training in Ireland¹ and of developments in the further and higher education fields.

The report addresses each of the seven questions separately, These are set out in the Apprenticeship Standards External Review Group Terms of Reference (Appendix B)

¹ DOES(2013)

2. Level of the Metal Fabrication Apprenticeship programme learning outcomes on the National Framework of Qualifications

Recommendation

1. What is the level on the Irish Framework of the minimum apprenticeship programme learning outcomes for the Craft?

Recommendation

- a) The panel recommends that the Metal Fabrication Apprenticeship programme learning outcomes be placed at Level 6 on the National Framework of Qualifications. The programme learning outcomes should be amended as described below and any necessary changes to lower level programme learning outcomes made.

Supporting Rationale

SOLAS has organised programme material at three levels of complexity:

- Compound Level where overall programme learning outcomes are defined
- Component Level where learning outcomes for the curriculum's components (which extend across the entire apprenticeship programme) are defined
- Modular Level where component modules are described to include learning outcomes and learning points

At Compound level, the overall programme learning outcomes are specified. At this level it was possible to match programme learning outcomes (PLO) to the NFQ level indicators, allowing the group to complete the initial NFQ positioning exercise.

Appendix F sets out the statement of minimum programme learning outcomes as described in the programme under review. Each of these statements was examined in light of the NFQ indicators and discussed in terms of the programme learning outcomes and the expected knowledge, skills and competence of craft persons. This allowed the group to make a broad initial assessment of the level of the programme on the NFQ. The best fit for the programme at this level of abstraction was NFQ level 6. Some elements of knowledge and competence reflected aspects of NFQ level 5. Overall, the initial positioning of the programme was at NFQ level 6 on the basis of a 'best fit' approach.

However the programme learning outcomes (PLO) as stated by SOLAS were nearly identical to the PLOs specified for other trades, plumbing and electrical and carpentry & joinery. SOLAS personnel explained at a previous review meeting that they had attempted to write a series of PLOs that would match the requirements of NFQ level 6 indicators. They felt that broadly the knowledge, skills and competencies of the trades involved were sufficiently similar to allow this approach. In effect the PLOs were level indicators for the craft area in the same way that standards have been defined for Business Studies, Engineering and the Humanities.

The group felt that the PLOs as stated were in fact an interpretation of the level indicators and not high level outcomes emanating from the programme. This approach results in an overuse of similar verbs, phraseology and conditions across the PLOs for all the apprenticeship programmes being reviewed. The implications suggest a difficulty for the ERG in differentiating the levels of the PLOs and their positioning on the NFQ. While these PLOs were determined by the ERG to be at NFQ level 6, the group did not feel that they could be relied upon exclusively to make a judgement on the programme. Consequently the Component learning outcomes or component standards, (see below) were analysed to ascertain their level on the NFQ.

With reference to the learning outcomes at programme level, the ERG makes the following observations and comments:

- The Knowledge programme learning outcomes K2 refers to the “design manufacture, maintenance and repair of steel components”. This limitation to steel components does not reflect the range of materials the metal fabricator has to deal with. The review group suggests that “steel “ be replaced with a more general term such as metallic.
- The Competence programme learning outcome C2 (Appendix F) suggests that the craftsperson would be in a supervisory position. The experts from the stakeholders on the review group did not confirm this. Accordingly the phrase “ under their direction” should be removed from that competence statement.

The ERG suggests that the learning outcomes be revisited with a view to formulating learning outcomes that capture the knowledge, skills and competences more comprehensively.

At a second level the various major strands or themes of the programme were described. These were referred to as *component standards*. Learning outcomes for each of these components were specified. These components were expressed over the full length of the programme and did not correspond to a particular phase. There were six components; SOLAS did not make any claim as to the NFQ level of the component or to the quantum of learning in FET² credits. This structure is not unexpected as components stretching over all four years of the programme are delivered at different levels. However, it is expected that the learning outcomes for components be expressed as the highest level of learning expected to successfully complete the component. In other words, the learning outcomes should represent the minimum performance achieved rather than the range of learning achieved during the process of completing the component.

The actual delivery of the learning experience was organised into modules. Module descriptors specified learning outcomes that were linked to the parent component learning outcomes. These were not specified as to NFQ level or quantity of credit. As these modules occurred at a particular time in the programme and had specific

² Further Education and Training

learning prerequisites and learning outcomes, ultimately it should be possible to specify the learning involved in terms of NFQ levels and credit earned.

The modules were further subdivided into learning units. These learning units have learning outcomes and learning points associated with them. At this level of granularity the learning outcomes are very narrow and the learning points are very small.

SOLAS provided a useful mapping document that linked the modules to the components. Thus the actual activity undertaken by the learners was traced back to the component standard. The panel examined the component learning outcomes and made an adjudication on the level of these outcomes against the NFQ indicators. This was done by looking at the module outcomes that contributed to the component outcomes.

Table 1: Programme Component Mapping to NFQ

Component	NFQ level
Fabrication	6
Thermal Processes	6
Structural Steel Fabrication	6
Fabrication Drawing	6
Communications	6
Team Leadership	6

The result of this analysis is presented in the Table 1 above.

This analysis confirmed the placing of the programme at NFQ level 6 as a best fit.

The final two components Communications and Team Leadership are common to all apprentice programmes. The group felt that the outcomes as specified in the component descriptor did not match a Level 6 programme. I. The group suggests that the component outcomes for these modules be revised. The group suggests that the learning outcomes for these components be revised to more relevantly reflect the learning needs of apprentices.

3. Level of the Metal Fabrication Apprentice Programme Learning Outcomes on the European Qualifications Framework

Recommendation

2. What is the level on the European Qualifications Framework (EQF) of the minimum apprenticeship programme learning outcomes for the Craft?

Recommendation

- a) The group recommends that the SOLAS Metal Fabrication Apprenticeship training programme be placed at Level 5 on the European Qualifications Framework.

Supporting Rationale

In assessing the appropriate level on the EQF of the Metal Fabrication Apprenticeship programme the group examined the NQAI referencing report³. However, the external, international experts advised that it was inappropriate for programmes to be placed on the EQF. They felt that as a meta-framework the EQF could be aligned with national frameworks but not to individual programmes, which were more properly linked to their national frameworks. Moreover, the EQF is characterised by three strands of descriptors (knowledge, skill, competence) that are defined by short and very general descriptor statements.

The referencing exercise placed the Irish NFQ level 6 at EQF level 5. While the exercise did distinguish between further and higher education awards, it placed both at level 5 EQF. It also made the distinction between the Bologna verification process, which positioned qualifications within the Bologna cycles, and the EQF referencing exercise, which was concerned with levels. This effectively leaves the Advanced Certificate outside of the Bologna process (and thus not a HE programme) but at EQF level 5.

In comparing the programme outcomes with the EQF descriptors the group looked at both EQF level 4 and level 5 descriptors. The “best fit” is at EQF level 5. However this does not imply that the entire programme is at EQF level 5. Clearly a four-year programme with a modest entry requirement encompasses a range of levels. However, the ERG concluded that the programme learning outcomes are at EQF level 5. See Table 2.

The exercise required the group to make a judgement of the programme against the EQF without regard to the previous decision in relation to the Irish NFQ referencing process. The three broad indicators of the knowledge, skill and competence at EQF levels 4 and 5 used by the Irish referencing process are listed below and the decisions of the group is indicated. Overall the group felt that the programme corresponded to level 5 on the EQF

³ NQAI, 2009

Table 2: Mapping Programme Learning Outcomes to EQF

	EQF Level 4 Indicators	EQF level 5 indicators	Metal Fabrication Apprenticeship Programme Learning Outcomes	Metal Fabrication Apprenticeship Programme best fit
Knowledge	<ul style="list-style-type: none"> • Factual and theoretical knowledge in broad contexts within a field of work or study 	<ul style="list-style-type: none"> • Comprehensive, specialised factual and theoretical knowledge within a field of work or study and awareness of the boundaries of that knowledge 	<ul style="list-style-type: none"> • Demonstrate a specialized knowledge of a broad range of the theoretical, conceptual and factual components and characteristics of the Metal Fabrication craft • Exhibit a specialized knowledge and understanding of the principles, practices, tools and equipment necessary for the design, manufacture, installation, maintenance and repair of steel components to conform with industrial standards and specifications within required workplace health and safety legislation 	EQF Level 5
Skill	<ul style="list-style-type: none"> • A range of cognitive and practical skills required to generate solutions to specific problems in a field of work 	<ul style="list-style-type: none"> • A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems 	<ul style="list-style-type: none"> • Demonstrate a comprehensive range of specialised Metal Fabrication skills using all commonly used Metal Fabrication hand and power tools in compliance with all relevant health and safety legislation. • Exercise proficiency in the planning, designing, manufacturing and installation of all fabricated steel components. 	EQF level 5
Competence	<ul style="list-style-type: none"> • Exercise self – management within the guidelines of work or study contexts that are usually predictable but are subject to change. Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities 	<ul style="list-style-type: none"> • Exercise management and supervision in contexts of work or study activities where there is unpredictable change. Review and develop the performance of others 	<ul style="list-style-type: none"> • Apply theoretical and technical know-how to install, manufacture, inspect, test, fault find, maintain and repair steel components in manufacturing and construction environments. • Exercise substantial independence in the workplace, taking responsibility for Metal Fabrication duties performed by themselves and others under their direction, ensuring safe working practices and interacting with a variety of individuals and groups to include customers, colleagues and suppliers • Have the capability and be able to take initiative to identify and address self-development and training needs in both an employment and structured training environments • Evaluate the function and role of the metal fabricator in society to include an awareness of energy conservation and other relevant ecological concerns 	EQF level 4

4. Comparability of Award Standards with other countries

Recommendation

3. How does the proposed Craft Award standard compare with the standards of qualifications from a selection of other countries (e.g. from Europe, America, Asia), which fully or partially overlap with it?

Recommendation

- a) Only a broad judgement can be made in this area. The expert opinion available to the group indicated that metal fabricators matched or were more skilled than their peers in other countries. Given the length of the programme and the typical entry level of learners a match with the 'advanced craftsman' level available in some countries might be the most appropriate comparison.

Supporting Rationale

This question is a very open question and it is difficult to make direct comparisons. The opinions expressed by the foreign expert group members and those consulted was that the skill level of Metal fabricators was high.

A critical difference between Ireland and many other countries is the fact that Metal Fabrication is a single trade in Ireland whereas in many other countries metal fabrication is carried out by a number of distinct trades. This is particularly true of those countries with a strong and extensive manufacturing industry. This can result in a larger range of narrower crafts. The training period of these apprenticeships can also be shorter. The range of skills that Irish Craftsmen acquire can in some cases be broader and more comprehensive than their continental European peers

The evidence from Alberta in Canada was that the Irish Metal Fabrication craft persons were well respected and easily matched their Albertan peers. The Advanced Certificate NFQ Level 6 is recognised in the workplace as providing a high level of competence.

In some countries in mainland Europe there is a system of two or three cycle vocational training with a master crafts person qualification being additional to the standard qualification. These include Austria, Luxembourg, Germany, France, Poland and Denmark. These master craft persons can have reserved to them certain regulatory, training and employment functions; this is not the case in Ireland. However, the review suggests that the Irish craftsperson's skills do match the standard craftsperson in these countries. As mentioned above, the intermediate level or advanced craftsperson level may be a better comparator for the Irish craftsperson.

The terms of reference for this review suggest that the review group base its decisions on objective evidence. A comparison of the award standards of a number of countries would require a far more detailed exercise than is possible for this group.

5. Comparable framework levels of similar Craft Awards in other countries

Recommendation

4. At what EQF levels are similar Craft Awards in a selection of other countries (e.g. from Europe, America, Asia)

Recommendation

Although it is difficult to directly compare programmes, typically European countries have placed craft vocational education at EFQ levels 3 and 4 with advanced (Master and Technician) craft qualifications placed at levels 4 and 5 with some at 6. Thus the Irish allocation could be seen as an outlier. The extent of this depends on whether the Irish craftsman is compared against the basic craftsman or against the technician level.

Supporting Rationale

Within the scope of the review, the most reliable evidence that was to hand was the results of the various referencing exercises across Europe and relevant information from a background document from the DOES (2013).

These referencing exercises typically compare national frameworks against the EQF. It is a separate exercise to place particular programmes on national frameworks and thus on the EFQ. In some cases this has been done for classes of qualifications. In a small number of cases, particular programmes have been definitively placed on the EQF.

Comparisons between programmes are difficult. A rigorous process would be either a deductive one where programme outcomes and labour market functions were compared as well as career expectations or an inductive one where specific skills and competencies were compared. Either of these approaches is outside the scope of this current review.

Another difficulty is the structure of vocational awards in other countries. Typically vocational training starts immediately after compulsory education. It can involve an introductory or pre-vocational phase that allows learners to enter the labour market with some basic skills. A more specialized phase follows that produces autonomous specialised workers. This phase is closest to the craftsman in Ireland. Some countries offer a Master crafts qualification which indicates a higher level of competency and skill than is available in the Irish system. Comments in the preceding section with regard to the comparative range of skills also applies.

Finally the range of vocational programmes elsewhere overlaps with the short cycle technician programmes in Irish Institutes of Technology. This is particularly true in the new technologies and in administrative areas. Thus what is classed as a vocational programme elsewhere might be placed in Higher Education in Ireland.

The list below gives an indication of the levels where comparable vocational programmes are placed on a best-fit basis. Caution should be exercised in making definitive judgments on the basis of this list.

United Kingdom – England, Wales and Northern Ireland

- One year programme post GCSE⁴ leading to QCF L2 EFQ level 3
- Two year additional training to QCF L3 EQF level 4

United Kingdom – Scotland

- Four year programme to SCQF 7 EQF level 5

Netherlands

There are four levels of VET⁵ with duration lasting from 6 months to 4 years. VET level 3 is the closest to Irish craft person and gives access to an advanced VET qualification at VET 4

- VET Level 3 –Independent practitioner EQF level 3
- VET Level 4 – Middle management EQF level 4

Luxembourg

There are four different certificates and Diplomas available to learners. The CCP⁶ is designed for those who might struggle in the more advanced DAP programme and is three years in duration. DAP⁷ programmes are typically 3 years in duration but can vary depending on specialty. Progression can be to technician DT⁸ or master craftsman qualification.

- Certificate de *Capacite Professionnelle* EQF level 2
- Diplome d’Aptitude professionnelle EQF level 3
- Diplome de *Technicien* EQF level 4
- Brevet de Technicien Supérieur EFQ level 5
- Master Craftsman Diploma EQF level 5

Italy

Professional operator certificate (Attestato di qualifica di operatore professionale) is a three-year VET programme. The more advanced professional technician’s diploma (Diploma professionale di tecnico) is a four-year programme.

- Professional Operators Certificate EQF level 3
- Professional Technician Diploma EQF level 4

⁴ General Certificate of Secondary Education

⁵ Vocational Education and Training

⁶ Certificate de *capacite professionnelle*

⁷ Diplôme d’Aptitude Professionnelle

⁸ Diplome de *technicien*

Denmark

Vocational training stretches over EQF levels 2 to 5 depending on the length of programme and the specialty. The referencing documentation gives examples of functions of vocational trainees. In this case there is a clear distinction between two types of technician.

Certificate for vocational educational and training

- Industrial assistant EQF level 3
- Industrial technician EQF level 4
- Film and TV production technician EQF level 5

Germany

The German system of dual vocational training and education produces a very large number of apprentice programmes. (See appendix G)

- Skilled Worker, journeyman (2 years post-compulsory) EFQ level 3/4
- (Facharbeiter, geselle) Technician (additional one/two years) EFQ level 4
- Master Craftsman in Industry (*Industriemeister*) EFQ level 6
- Master Craftsman (*Handwerksmeister*) EFQ level 6

Austria

- Apprenticeship Diploma EFQ level 4
- VET College Diploma EFQ level 5
- Master Craftsman's Diploma EFQ level 6

France

- Certificate d'aptitude professionnelle EFQ level 3
- Brevet Technique des Métiers EFQ level 3
- BAC PRO Bachelareate Professionel EFQ level 3
- Brevet de Technicien Superieur EFQ level 5
- Maitre Artisan EFQ level 5

Poland

- Journeyman craftsperson EFQ level 3
- Master Craftsperson EFQ level 5

6. Prerequisite Learning

Recommendation

5. Is the prerequisite learning for participation in the programme and any other assumptions relating to the programme's target learners specified?

Recommendation

- a) The group agrees that the generic entry requirements for apprenticeship are not suitable for the Metal Fabrication Trade. It recommends that the prerequisite learning for the programme should be raised to reflect the achievements of the majority of the entrants to the programme and to allow for the necessary strengthening of the programme.
- b) It recommends that the standard entry requirement be a Leaving Certificate or an equivalent NFQ level 4 or 5 major award.
- c) However, so that this will not restrict entry from others, such as more mature trainees, it recommends that access from Junior Certificate be open to those with substantial work experience and who have completed either a suitable access programme agreed by SOLAS at levels 4 or 5, or an RPL⁹ process.

Supporting Rationale

There are two symmetrical issues with regard to prerequisite learning of programmes within a framework. The first is that the specified prerequisite learning should be adequate to allow learners to be successful on the programme. The second is that the introductory elements of a programme make full use of the prior learning of its actual entrants.

Currently, the entry requirements for all apprenticeship programmes specify an age requirement and a minimum academic achievement. There is no discrimination between different trades that may require differing levels of academic or vocational preparation. The requirements are

- a) Minimum age for the employment of an apprentice is 16 years.
- b) The minimum educational requirements are: Grade D in five subjects in the Junior Certificate Examination (NFQ level 3 EQF level 2) or the successful completion of a pre-apprenticeship programme of four modules including Math's, Science and Technical Drawing at Junior Certificate level.

Evidence indicates that applicants for apprenticeships normally exceed these requirements. Data supplied by SOLAS indicates that 71% of new entrants in 2013 had Leaving Certificates (NFQ levels 4 and 5- EQF levels 3 and 4) and 28% had Junior Certificates. Only 1% fell into the 'Other' category. These figures were not disaggregated by trade.

⁹ Recognition of Prior Learning

An age analysis of the same cohort shows that only 7% were under 18 years of age, and 40% were over 20 years of age. This suggests that most of those with Junior Certificates did not take up apprenticeships from school but may have had considerable work experience.

The success rate for entrants in the years 2003 to 2007 with **Leaving Certificates was 73%**. The success rate for entrants in the years 2003 to 2007 with **Junior Certificates was 55%**.

Figures for the Metal Fabrication trade were not separately available. A more detailed analysis would be required to ascertain the reasons for unsuccessful entrants leaving the programmes but broadly it would appear that few entrants arrive with the minimum age and academic requirements. .

The review group is of the opinion that 1) the minimum entry requirements and 2) portions of the curriculum are out of line with the capabilities of the actual entrant groups. The entry requirements should be closer to the achievements of the large majority of the second level school population. Furthermore, ensuring that the standard of the learning points of the initial phases of the programme are aligned with the intellectual capability of the entrants will serve to provide engaging learning experiences.

There are three leaving certificates, the standard, the applied and the vocational. The standard leaving certificate is further divided into ordinary and higher levels. It is unclear which of these or which elements of these are at level 5 NFQ and which at level 4 NFQ. Given recent trends in the School leaving age and government policy in this regard the group suggests that a level 4 or 5 (NFQ) qualification be the basic requirement. This will allow all those with a Leaving Certificate or any type or level to be eligible for a Metal Fabrication apprenticeship. In addition the achievement of a level 4 or level 5 major award through other means such as a PLC programme or through an RPL process will confer eligibility.

The group recognises that the early school leavers with work experience see apprenticeships as a pathway for advancement. This route should remain open but an RPL process should be put in place for such learners; the RPL process should be managed centrally by SOLAS.

7. Achievement of programme learning outcomes

Recommendation

6. Will the programme enable its target learners to attain the minimum intended programme learning outcomes reliably and efficiently (in terms of learner effort)?

Recommendation

- a) This is a critical question that, more properly, should be put following a full validation process. It is particularly important as the claims made for the programme can only be ultimately justified by establishing the effectiveness of the programme in delivering the overall programme learning outcomes
- b) In the light of the recommendation at 8 above and 11 below, there is scope to look at the duration and content of the programme.
- c) In addition, the panel recommends robust evaluation of the 'on-the-job' phase of the apprenticeship programme in terms of monitoring and supervision.

Supporting Rationale

The group is of the opinion that the programme will enable its learners to reach the outcomes specified with one caveat. It suggests that a normal interpretation of the content and outcomes of the modules on communications and team leadership may be beyond a typical apprentice. It is also the case that both of these modules could be modified to reflect less challenging outcomes which are still appropriate to level 6 and to crafts persons.

Learners with good grades in leaving certificate maths, technical drawing and construction studies usually make excellent apprentices.

The group also feels that with the changes in entry requirements indicated above that the material in the introductory parts of the programme could be strengthened. The group heard that many apprentices were bored by Phase 2 especially those who had technical drawing as a subject to Leaving Certificate.

The Programme learning outcomes specify a comprehensive range of skills and competencies. Experience using some techniques and processes are not available in some enterprises. Although, these are covered in the 'off the job' phases, it is inevitable that some crafts persons will not have the full range of experience specified. Those delivering the Phase 4 and Phase 6 elements of the programme have confirmed this.

Those teaching Phases 4 and 6 also commented strongly on the poor mathematical skills of many of the apprentices coming to them. Many apprentices also have weak literacy skills. This is an area which could be strengthened in a reform of Phase 2.

The programme specification indicates the minimum periods that apprentices should spend on each phase of their training. They are as in table 2 below

On the Job		Off the Job	
	Minimum Duration in weeks		Minimum Duration in weeks
Phase 1	12	Phase 2	20
Phase 3	26	Phase 4	11
Phase 5	26	Phase 6	11
Phase 7	12		
Total Minimum on the Job	76	Total minimum off the job	42
Aggregate Minimum for all phases			118
Minimum duration of apprenticeship programme			208

The difference between the aggregate minimum for the phases and the minimum for the programme is 90 weeks. This 'time served' element can only be justified if genuine learning is continuing. This can only be assured if there is oversight from SOLAS. A validation panel should look at the issue of the level of supervision during these periods to assess whether the apprentices are marking time or consolidation previous learning.

The programme could be strengthened by including exercises in critical thinking and reflection. Deficiencies in IT skills might also be addressed in these periods.

8. Transfer and progression

Recommendation

7. Are the arrangements for transfer between the apprenticeship programme and other programmes, including other apprenticeship programmes, fair on learners (not unduly restrictive)?

Recommendation

- a) That SOLAS allocates either credits to elements of the programme or specifies exit awards at levels 4 or 5 for partial completion of the programme. .
- b) That SOLAS investigate the career needs of craftspeople and facilitate the design of level 7 programmes to address those needs.
- c) That SOLAS monitors the progression of crafts persons following successful completion of their apprenticeship training.

Supporting Rationale

There are at present relatively few higher education programmes that give Metal Fabrication craftspeople exemptions from modules. In the 2010 survey of HEIs FETAC found that there was progression to only three programmes in the IOT sector. All of these were in DIT. None offered any exemptions. Other Institutes reported lack of demand from Metal Fabrication craftsmen for further education.

Metal fabricators traditionally access short courses to improve specific skills. These include welding, AUTOCAD, and business start-up programmes..

However, SOLAS does not, as a matter of course, track craftspeople throughout their careers. Much attention had been paid in the HE sector to the need for HE institutions to be aware of the career needs of their graduate as a guide to providing skills that persist throughout a lifetime. There is a similar need in the craft area. These areas are affected by rapidly changing technologies, techniques and equipment. They are also affected by structural changes in industries and in crafts.

Traditionally apprenticeship programmes have been relatively disconnected from other elements of the educational system. Craft qualifications are seen as terminal qualifications and little attention has been given to linkages to other elements of the system. For example, in the Irish system at present there is no advanced craft qualification as in other countries and no subsidiary or exit awards are available.

It would seem to the group that the purpose of the NFQ is to provide pathways for learners to achieve skills that are useful to them in their careers and also in daily life. It is evident that currently craft training, while of a high quality in terms of its own functions is deficient in the linkages with other parts of the education and training system.

SOLAS personnel indicated that in their view apprenticeship programmes are of a piece and should not be disaggregated. For this reason credits have not been

allocated to phases of the programme and exit awards have not been designed. Those who exit early can access transcripts indicating their achievements.

The group is of the view that the purpose of the NFQ and the EQF is to facilitate free movement of labour within the EU. A large numbers of Irish workers seek work abroad and a very large percentage of apprentices do not complete their programmes. It seems strange then that considerable amounts of learning are not quantified and accredited and intermediate exit points not specified which might allow for the making of an award.

The group notes the lack of advanced programmes for craft persons and the recommendation by the Review of Apprenticeship report (DOES 2013) that such programmes should be developed. These programmes could develop those middle management craft skills that are common on master's craftsmen's programmes elsewhere.

To facilitate progression and advancement it would be desirable that the apprentice programmes more adequately prepared learners for level 7 study. This can be achieved by strengthening the theoretical aspects of the programme, by emphasising the aspect of reflection and by fostering learning to learn competence.

9. Additional comments

There were a number of issues which came to the attention of the review group which do not directly impinge on the questions asked but should be considered by SOLAS or by a validation panel.

In the overall aims of the programme the word mastery is used to indicate a level of skill and knowledge to be attained by learners. The use of this term could be confusing as mastery in the original craft sense of '*Meister*' is not an aim of the programme and mastery in the academic sense of '*Magister*' is more properly an outcome of level 9 programmes.

The title of the craft in Ireland is 'Metal Fabricator'. However these craftpersons deal with non-metal and with composite materials. A validation panel or SOLAS might consider whether 'Engineering Fabricator' would be an appropriate title.

The length of Phase 2 has been criticised as been too long. The changes suggested in entry standards might allow this to be reformed by either shortening this phase or by putting more varied or challenging material into it.

Ends

Appendix A: Documents consulted by the panel.

DOES (2013a) Review of Apprenticeship Training in Ireland, December 2013

DOES (2013b) Apprenticeship review – Background briefing issues Paper

European Communities (2008), The European Qualifications Framework for Lifelong Learning (EFQ)

FETAC (2010) Progression from FETAC Advanced Certificate- Craft to Higher Education Courses.

NARC (2009) Assessment in the FÁS Apprenticeship Programme. Dublin: National Apprenticeship Advisory Committee.

National Qualifications Authority of Ireland (2009) Referencing of the Irish National Framework of Qualification (NFQ) to the European Qualifications Framework for Lifelong Learning (EQF). Dublin: NQAI.

NQAI (2008) National Qualifications Authority of Ireland (2008) Background paper on the development, implementation and impact of the National Framework of Qualifications and related policies on access, transfer and progression. Dublin

QQI (2014a) Common Award System, Restatement of Policy and Guidelines 2014 version 4.0

SOLAS (2014a) Awards Standards for Apprenticeship Programmes, Terms of Reference for External Review groups

SOLAS (2014b) Metal Fabrication Certificate

SOLAS (2014c) Metal Fabrication Curriculum, Activity to Standards Mapping Document

Reports referencing National and Community Frameworks of Qualifications with the European Qualifications Framework from the countries and communities (**Ireland, United Kingdom, France, Germany, Belgium (Flemish community), Netherlands**), available at: http://ec.europa.eu/eqf/documentation_en.htm

Published by the various national Authorities and submitted to the European Community.

Appendix B Apprenticeship Standards External Review Group Terms of Reference

SOLAS has prepared in agreement with QQI the following set of documents reporting on the revision of the curriculum for apprentice programmes in [name of the craft].

- Standards
- Curriculum
- Sample Assessment
- NARC Report
- Background to Apprenticeship – to include introductory note on apprenticeship review

The information provided by these documents addresses the following topics (among others):

1. The minimum intended apprenticeship programme learning outcomes in the Craft.
2. Evidence that the minimum intended craft apprenticeship programme learning outcomes (i.e. overall outcomes) are to be assessed validly reliably, fairly and consistently for the purpose of ensuring that award candidates meet the required standard.
3. A detailed specification of the craft apprenticeship programme of education and training that explains how it enables the standard in (1) to be achieved by all who successfully complete the programme.
4. The NAAC Review Group's report for the craft, including conclusions and recommendations.
5. The External Review Group may request additional information it considers necessary for the performance of its functions.
6. The NARC Report

The review panel is required to meet with participating training providers, participating employers, learners who are involved in the current Craft apprenticeship programme, SOLAS and QQI (on qualifications and quality assurance matters).

Considering the documents provided including the NFQ award-type descriptors and other information gathered, the External Review Panel is required to report on the following:

From the Craft perspective, are the minimum intended Craft apprenticeship programme learning outcomes outlined in the documents fit for purpose?

- a) What is the level on the Irish Framework of the minimum apprenticeship programme learning outcomes for the Craft
- b) What is the level on the European Qualifications Framework (EQF) of the minimum apprenticeship programme learning outcomes for the Craft
- c) How does the proposed Craft award standard compare with the standards of qualifications from a selection of other countries (e.g. from Europe, America, Asia), which fully or partially overlap with it?

- d) At what EQF levels are similar Craft Awards in a selection of other countries (e.g. from Europe, America, Asia)

Considering the programme the External Review Panel is requested to provide observations on the following:

- a) Is the prerequisite learning for participation in the programme and any other assumptions relating to the programme's target learners specified?
- b) Will the programme enable its target learners to attain the minimum intended programme learning outcomes reliably and efficiently (in terms of learner effort)?
- c) Are the arrangements for transfer between the apprenticeship programme and other programmes including other apprenticeship programmes fair on learners (not unduly restrictive)?

The members of the External Review Group should base their responses on objective evidence. Members should declare any relevant interests and ensure that their membership of and involvement in the standards Review Group does not give rise to any conflict of interest—if a member is in any doubt about this he or she should consult QQI.

Appendix C Membership of the Metal Fabrication External Review Group

Chairman – Qualifications Framework Expert	Dr Anne Walsh, Academic Co-ordinator, Adult Training and Education Studies, Centre for Adult Learning and Professional Development, NUI, Galway
International Qualifications Framework Expert:	Jos Noesen - Pédagogue, Ministère de l'Éducation nationale, de l'Enfance et de la Jeunesse
International Education Specialist	Trevor Clark, Former Head NQF Wales, International Qualifications Framework expert
Secretary- Qualification Framework Expert	Stephen McManus, Former Registrar Dundalk Institute of Technology
Technical Experts Ireland	Duncan Beveridge, Former lecturer, Dublin Institute of Technology
Technical Experts Ireland	Patrick Guilfoyle, Regional Secretary , TEEU
Employer Representative	Adrian Geary, Quality Manager, BMD, Cork
Learner Representative	Adrian O Neill, apprentice Metal Fabricator

Appendix D Persons met by the Metal Fabrication External Review Group in the course of the review

SOLAS

Martin McMahon Assistant Manager, Apprenticeship Programme

Phase 4 and Phase 6 providers

Tim O Halloran Cork Institute of Technology

Canadian Industry

Allen Better Presiding Officer, Alberta Provincial Apprenticeship
Committee-Metal Fabrication

Wexford Waterford Educational Training Board

Michael Cash Trainer and 'on the job' supervisor.

Appendix E Schedule Metal Fabrication External Review Group

Day 1

9:00am:	Panel Group discussion gathering feedback on material sent
10:30am:	SOLAS APPRENTICESHIP Q&A
12:30pm:	Lunch Break
1:30pm:	Panel Resumes
2:30pm:	ETB Phase 2 Instructor/Management/STB Advisors
4:30pm:	Panel Re-group
5:30pm	Day 1 ends

Day 2

9:15am:	Panel meeting
10:30am:	Employer Representative
11.30am:	Phase 4 & 6 Instructor
12:30pm:	Lunch
1:30pm:	Panel Re-group
3:30pm:	Input from Canadian Expert
4.30pm:	Verbal feedback to SOLAS representatives
5:30pm	Day 2 ends

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Appendix F Programme learning outcomes- Metal Fabrication Programme

Programme Learning Outcome	Strand	
Demonstrate a specialized knowledge of a broad range of the theoretical, conceptual and factual components and characteristics of the Metal Fabrication craft	Knowledge <i>Breadth</i>	K1
Exhibit a specialized knowledge and understanding of the principles, practices, tools and equipment necessary for the design, manufacture, installation, maintenance and repair of steel components to conform with industrial standards and specifications within required workplace health and safety legislation	Knowledge <i>Kind</i>	K2
Demonstrate a comprehensive range of specialised Metal Fabrication skills using all commonly used Metal Fabrication hand and power tools in compliance with all relevant health and safety legislation.	Know How and Skill <i>Range</i>	KS1
Exercise proficiency in the planning, designing, manufacturing and installation of all fabricated steel components.	Know How and Skill <i>Selectivity</i>	KS2
Apply theoretical and technical know-how to install, manufacture, inspect, test, fault find, maintain and repair steel components in manufacturing and construction environments.	Competence <i>Context</i>	C1
Exercise substantial independence in the workplace, taking responsibility for Metal Fabrication duties performed by themselves and others under their direction ensuring safe working practices and interacting with a variety of individuals and groups to include customers, colleagues and suppliers.	Competence <i>Role</i>	C2
Have the capability and be able to take initiative to identify and address self-development and training needs in both an employment and structured training environments	Competence <i>Learning to learn</i>	C3
Evaluate the function and role of the metal fabricator in society to include an awareness of energy conservation and other relevant ecological concerns.	Competence <i>Insight</i>	C4

Appendix G Extract from DOES Apprenticeship Review – Background briefing issues Paper May 2013

8.2 International: Brief outline of the structure of apprenticeship systems in three sample EU countries and Switzerland

This section sets out briefly a number of alternative structures of apprenticeship in Germany, Finland, Norway and Switzerland for comparative purposes. The table below compares the systems in each country (as well as Ireland) across 5 key headings. This information is expanded upon in sections 8.2.1, 8.2.2, 8.2.3 and 8.2.4.

	Germany	Finland	Norway	Switzerland	Ireland
Level of Training	Vocational School	Upper Secondary Level	Upper Secondary Level	Upper Secondary Level	NFQ level 6 (Further Ed./Higher Ed)
Duration of Training	3 years on average	3 years (plus options for further and specialised training.)	4 years	Between 2 and 4 years	4 years
Format of Training	Min. 1/2 day per week education in Vocational School; balance with employer.	70%-80% of time training in workplace; balance in education in vocational institutions	2 + 2 Model: 2 years in school followed by 2 years in enterprise.	Typically takes place at 3 locations: Vocational School; Enterprise; and Industry Training Centre. Attendance pattern changes.	Phases 1, 3, 5 & 7 are on-the-job training with employer. Phase 2 with FAS. Phases 4 & 6 in Education sector (IOTs or CFEs)
Funding Provision	Govt. funding of schools; Enterprise funding of apprentice ship pay/ cost of trainers/ materials etc.	All training costs funded by Govt.; Enterprise pays apprentice wage.	All training costs funded by Govt.; Enterprise pays apprentice wage.	VET funding is shared between public and private sources. Enterprise pays apprentice wage.	Funding from Exchequer and NTF (Employer levies). Enterprise pays apprentice wage. State pays off-the-job allowance
Apprentice Payment Rates	Salary which increases each year. On average a third of skilled worker's starting wage.	Salary is approx. 80% of skilled worker's wages in relevant sector.	Salary increases from 30% to 80% of skilled worker's salary during 2 year apprenticeship	Apprentice wages are set through collective bargaining at company level.	Wages are set through negotiation between unions and employers in industry phases.

8.2.1 Germany

- Apprenticeship in Germany lasts approximately 3 years on average
 - An apprentice must spend at least 1/2 day a week training in a vocational school
 - German firms recruiting apprentices do not receive direct funding from public funds. Enterprises cover their own training costs (apprenticeship pay, cost of trainers, material etc.)
 - Government funding of schools
 - The apprentice earns a salary which increases every year and is on average one third of the starting wage for a skilled worker
 - Public funds are also available to assist groups of small firms to set up and run joint training facilities (Group Training Associations)
 - Some government financial support is available for training firms. Companies employing a trainee (beginning between July 2008 and December 2010) who has been searching for a training company for at least one year without success can receive a bonus of up to €6,000 (Hirschner, 2008)
- 8.2.2 Finland

- Training provided by Upper Secondary Level vocational institutions
 - Initial Vocational Qualification: Average duration of Studies 3 years
 - Further Vocational Qualification: Average duration of studies 4-12 months
 - Specialist Vocational Qualification: Average duration of studies 4-12 months.
 - Approximately 70-80% of the time is spent in the training workplace under the responsibility of on-the-job instructors
 - Training is financed by the state. The annual subsidy paid for one apprentice is calculated from the average costs of vocational training in Finland, and it is 80% of this average cost. The costs of upper secondary VET in 2007 were on average €8,400 per student
 - The state is responsible for fully covering funding - 100% of the unit cost confirmed by the Ministry of Education & Culture
 - Apprentices on off-the-job training receive a daily allowance, family allowance and transportation and accommodation allowances from the state
 - Employer pays apprentice a wage, approx 80% of skilled workers wages in that particular field. Employer is not obliged to pay wages for time spent in theoretical training
 - Vocational Education providers receive statutory government transfer to cover the operating costs on the basis of unit prices determined by the Ministry of Education & Culture. The transfer is calculated to cover 42% of the operating costs on average. The unit prices are scaled per provider
 - Some providers also receive performance-based funding based on Effectiveness (transfer to labour market), Processes (Drop Out rate) and Staff Qualifications. The performance based funding does not exceed 3% of the total amount of government transfer
- The state grants training compensation for the employers, which is

compensation for the training given at the workplace. The amount of training compensation paid to the employer is agreed upon separately for each apprenticeship contract before the contract is approved

8.2.3 Norway

- 2+2 Model - 2 Years education and training in school followed by 2 years apprenticeship in an enterprise
- The apprenticeship training is funded over public budgets and the training enterprises receive a state grant for each apprentice (in 2009: € 11,347 over two years)
- Apprentices in upper secondary IVET are entitled to grants and subsidised loans through the State Education Loan Fund if they come from low income families. They also receive a subsistence grant if they live away from home
- In addition to the basic subsidy, the training company also receives approx €5,000 per apprentice in traditional crafts for example a trade which may die out due to lack of recruitment or the trade has cultural value
- In 2009, Enterprises who employed apprentices were granted €600 per apprentice. This is in addition to the ordinary grant designed to advance an apprentice with training rights to his or her qualifying examination.

This measure may have contributed to the intake of apprentices only falling marginally. Apprentices are entitled to a salary agreed upon through a centralised system of collective bargaining. The salary corresponds to the productive work conducted. Since the productive work increases throughout the 2 year apprenticeship, the salary increases accordingly. Salary increases from 30% to 80% of a skilled worker's salary during the two years of apprenticeship

8.2.4 Switzerland

- Training is at upper-secondary level
- Programmes can take between two and four years
- Typically takes place at three different learning/training locations: vocational school; host company; and industry training centre
- Common patterns are one day per week at the vocational school and four days at the host company; or two days at the vocational school and three days at the company; or alternating between some weeks attending classes at the vocational school and some weeks attending an industry training centre
- To overcome an issue with some companies becoming increasingly specialised, training associations have been established whereby several companies share the task of training various apprentices so that they receive a broad enough education
- System is market driven. Students need first to find a place in a company and sign a contract. A place in a vocational school is then automatic.

- Match between apprenticeship demand and supply is monitored through the “apprenticeship barometer” based on surveys of businesses and young people
- All vocational teachers (at schools), trainers (at host companies) and instructors (at industry training centres) must meet certain standards
- Funding of VET programmes is shared between public and private sources. In 20-6, about 45% of VET costs were privately funded.
- Apprentice wages are set through collective bargaining at company level following recommendations from the industry associations.