NOVA SCOTIA APPRENTICESHIP AGENCY

Architectural Sheet Metal Worker Designation: Discussion Paper

Introduction

In early 2020, the Nova Scotia Apprenticeship Board accepted an application to designate Architectural Sheet Metal Worker (ASMW) as a trade under the Apprenticeship and Trades Qualifications Act. The Board established a Trade Advisory Committee with a mandate to review the application; review and verify trade-specific labour market information for the trade; review the program developed in British Columbia (BC) by provincial industry stakeholders in cooperation with the British Columbia Industry Training Authority (BCITA); and make a recommendation to the Board. The work of the TAC includes a recommendation on the trade definition, ratio, term of apprenticeship and potential apprenticeship training pathway.

The TAC convened in late 2020, holding seven meetings to discuss trade designation and the creation of an apprenticeship training program. The TAC has completed a review of the application and is recommending trade designation and apprenticeship training. The Apprenticeship Board is now seeking broader industry input on the TAC's proposed approach and way forward for Nova Scotia.

Background

The ASMW occupation has grown and evolved, increasing in volume, significance, and complexity of work, including expansion in materials and technologies in common use. The impact on new construction and renovation is a reshaping of the occupation's required skills, core competencies, and knowledge. This is driving demand from industry for formal apprenticeship training. The labour market is experiencing an increase in the demand for the skills, experience and competencies related to the occupation; however, the current supply is limited. Industry wants standards, accountability, and formal training for workers interested in a career to help sustain growth and quality in building construction. Currently there is no formal training available; as a result, in Nova Scotia, workers can only learn informally on the job. This can be a source of frustration to the contractors and coworkers, adding stress to the workplace. Employers have voiced a preference for a training pathway so workers can participate in training and gain an understanding of the occupation before and after they enter the jobsite. With the financial investment on a typical project being significant, training and skills competency are needed to enhance quality, productivity, and safety.

The occupation of ASMW is a designated trade in British Columbia. Other jurisdictions, Alberta and the Yukon, are in the trade certification process. New Brunswick and Newfoundland intend to follow Nova Scotia's lead according to the Atlantic Apprenticeship Harmonization Program guidelines. Provincial trade status and the development of an apprenticeship training pathway are interim steps to a longer-term industry goal to seek interprovincial Red Seal status for the trade.

The BCITA defines the occupation as: *The installation of Architectural Sheet Metal (ASM) materials associated with the construction of buildings. Qualified workers possess the ability to: read plans and specifications, operate specialized tools and metalwork machines, fabricate products of desired dimensions and properties, use specialized joining techniques for metal and other industry products, perform specialized welding techniques using a variety of metal alloys, inspect work for quality, layout and fabricate components and complete repairs.* The TAC supports and accepts this definition of the occupation.

In Nova Scotia, contractors, employers, and workers using Architectural Sheet Metal materials in new construction, renovation and/or repurposing of buildings are challenged to access formal structured training to acquire the core competencies and skills required to produce quality, healthy buildings. “Architectural Cladder” is a well-established occupation, in existence for eighty years, and is often referred to as "sheeter and/or decker". More recently the name "Architectural Sheet Metal Worker (ASMW)” has gained acceptance. The TAC is considering the definition of ASMW “*as a person who does the installation, welding, burning, cutting, layout, caulking, fastening, repair, hoisting and rigging of metal and translucent sheets, insulation, ventilators, all flashings, gutters, louvers, soffits, skylight and metal doors, when associated with the construction of buildings.”*

Demand for qualified installers is spread across five business lines, all utilizing similar techniques and a broad and growing range of materials:

1. Industrial (petrochemical plants, mines, pulp, paper, and lumber plants)
2. Commercial (hotels, apartments, office buildings, warehouses)
3. Institutional (hospitals, schools, airports, jails/prisons/remand centres, etc.)
4. Residential (condominiums, health and community care homes/facilities, single and multi-family units)
5. Recreational (arenas, sport/leisure centres, rinks)

Labour Market Demand

The TAC members gathered information on projects on the horizon between 2020 and 2025, based on market intelligence, compiling a list of 15 companies operating in the space and the associated number of workers. Based on the list, the TAC estimates there are 200+ workers performing the work of an ASMW or will be required on 32+ projects, active or on the horizon in a variety of business lines. Typically, workers are over 19 with a high school diploma (or equivalent). The hourly wage scale ranges from $15.00 to $33.00 (based on 2020 bargaining unit rates).

Opportunities, challenges, and barriers 2020-2025

Opportunities	Challenges
Supplying the labour market with trained, experienced and certified workers with a common set of core competencies and a body of knowledge for sustainable quality construction. Development and implementation of a training and certification pathway with the supporting exam bank and refresher modules to certify apprentices and experienced tradespersons. Building capacity to balance growth, supply, and demand for: ○ Recruitment, training, and employment of new workers interested in a certified trade designation ○ Replacement of older/experienced workers who are interested/eligible for retirement ○ Career advancement for ASMW's with hands-on tools experience interested in supervisory roles and Business Seal endorsement through NSAA.	Meeting the demand for qualified workers to supply current and future projects in new construction and renovation. Lack of industry-specific standards and guidelines to support consistent use and application of materials in an evolving complex environment. Absence of promotional programs in Atlantic Canada to support awareness of the occupation and careers.
	Barriers
	Lack of formal training and certification pathway with an occupational standard to train potential apprentices, generate career interest or demonstrate competency for experienced workers. No standard of equivalency to value experience. No formal connection to apprenticeship resources.

Trade Designation and Training in Nova Scotia

TAC members fully support trade designation, apprenticeship training and certification. The key priorities are establishing industry standards, skill competency, and sustainable recruitment to the occupation/trade. Based on the committee's review of the BC program, the TAC is proposing that apprentices in Nova Scotia set a term of apprenticeship of 5400 hours (approximately 3 years) of practical training with 3 levels of technical training to cover the required theory. Trade qualifiers would need a minimum of 8100 hours to challenge the exam. The TAC members also recommend a minimum ratio of 1 Journeyperson to 2 Apprentices (Ratio: 1:2).

Considerations

The TAC members considered the following as they prepared the draft recommendations for the Apprenticeship Board.

Advantages of trade certification and apprenticeship training for ASMWs:

- Address existing skilled technician shortages and the need to build capacity

    - Improvements in quality, productivity, and cost effectiveness
    - Increase in employee and employer satisfaction, engagement, and commitment
    - Potential to increase the quantity of workers/tradespersons in the occupation and quality of their training
    - Certified workers to do complex product installation and warranty work
    - Certification, recognition for new entrants, refresher training for experienced tradespersons
    - Equal footing with existing trades when competing for high operational workers
- Enhanced workplace safety
    - Trade specific safety and best work practices
    - Access to formal training on equipment and rigging for all building types and applications
    - Proper setting up of overhead staging to ensure proper erection able to withstand strong winds
- Ability to offer training in general building and building envelope science
    - Better understand the concepts of proper installation of exterior cladding, insulation, vapor barriers, membranes, tiebacks, air and heat loss, tolerances and watershed/rainscreen principles
- Trade-specific technical training expands the apprentice's exposure to the full scope of the trade in a somewhat specialist-focussed environment where an employer's business may not.

Scope of work:

- Fabrication/installation of sheet metal including:
    - Use of aluminum, steel, copper, and zinc wall cladding/other envelope products
    - Use of aluminum, cement, ceramic, wood & phenolic based composite panels
- Installation of membranes and waterproofing, steel floor & roof deck
    - Flashings, gutters, downspouts, soffits, metal doors
    - Metal roofs, architectural louvers, ventilators, curbs, skylights
    - Daylighting walls and roof systems
    - Snow stop and retention systems
    - Caulking and insulation
    - Permanent fall protection/arrest and lift systems
    - Insulated metal panels
- Repair and maintenance

Work environment:

- At heights, in buckets, zoom boom, scissor lifts and swing staging in all types of weather, exposed to the elements
- Interfaced with coworkers and other trades on-site
- A variety of metals and other materials, adhesives, primer, large and small precision tools are in use
- Worksites of all sizes

Knowledge areas and abilities:

- Read drawings, plans and specifications
- Layout, fabricate and repair materials and components according to specific dimensions and properties
- Use specialized joining and welding techniques for metal, metal alloys and other industry products
- Develop general knowledge of tools (power, hand, and precision), safety practices and equipment
- Operate specialized tools including precision measurement, laser, and metal working machines
- Understand and recognize potential for galvanic corrosion when working with dissimilar metals
- Understand the importance of good trade practices and relationships with other trades
- Inspect for quality

Profile and success factors:

- Able to perform physically demanding and complex tasks outdoors (estimate 75% of the time) in a variety of weather conditions
- Confident on high slope surfaces at extreme heights
    - Considerable time and effort spent lifting, climbing, bending, kneeling
- Superior verbal and written communication and math skills including mental math and fractions
    - Ability to communicate with other trades on the integrated work on the project site
- Attention to detail and be able to visualize 3-D dimensions from drawings.
    - mechanical aptitude
    - manual dexterity
    - work well as part of a team
- Good physical fitness and agility
- Safety awareness and understanding of risks
    - Awareness of surroundings and others
- Value lifelong learning, continuous improvement, and commitment to quality
    - Keep abreast of new developments in technology impacting the complexity of the ASM systems available in the marketplace
    - Understand and utilize current technologies

Education, knowledge areas, skills, and technical knowledge requirements:

As the industry expands and grows to meet the demands of the future, this occupation will play an ever-increasing role in all sizes and type of construction projects, new and renovation/repurposing. The tools, equipment, materials, and processes will continue to grow in complexity as technology advances. It is important for workers active in the trade to have proper training, for jobsite safety. The trade includes operating a range of tools, equipment and machines, hand and/or power, depending on the required level of production. This can include shears, roof seamers and a variety of forming tools, brakes, and machines available in a manual or automated design depending on the size and level of production required. Training in the proper use and handling of dangerous substances is recommended. Some products are toxic, highly

flammable, and volatile. Understanding proper use of substances is important to manage risk of harm through misuse such as improper application of chemicals for wall preparation which can produce harmful vapours and odors. The work needs to be conducted in the proper environment including proper ventilation and surrounding temperature to avoid risk of explosion. Knowledge and understanding of building envelope systems and local building codes are essential.

Impact on Trades, Occupation and Stakeholders

A significant driver for trade designation comes from industry participants and their interest in establishing standards within this occupation to enhance construction quality and unwanted moisture that may result in structural damage. A sometimes-harsh coastal climate in Nova Scotia in combination with climate change and the increase in extreme weather events provide a challenging environment. Other impacts of designation are:

- Improved handling of environmentally sensitive products
- Formalized training for setting up swing staging
- Proper safety precautions working at heights, both workers and the public
- Prevention of 'Sick Building Syndrome' resulting from undetected moisture that can penetrate the exterior and lead to mold.

Based on review and analysis of course outlines and competency profiles for Architectural Sheet Metal Worker, there is some overlap with the following trades:

- Sheet Metal Worker
- Ironworker
- Welder
- Carpenter/Sheeter

Designation, public interest, health, and safety

- Both Federal and Provincial governments have set aggressive environmental emission targets to meet by 2030; building efficiency standards will be impacted for new and existing stock
- Leadership in Energy and Environmental Design (LEED) is playing a role in government construction projects. LEED aims to improve occupant well-being, environmental performance, and economic returns from buildings, using both established and innovative practices, standards, and technologies. It is important to provide workers with an understanding of the building process and for the future and support sustainable building.