# Report

MUNICIPALITY OF NORTH Cowichan

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| Date | June 18, 2025 | File: |
| Subject | Zero Carbon Step Code Implementation | |

## PURPOSE

To provide Council with an update on North Cowichan's implementation of the Zero Carbon Step Code, including outcomes, compliance, and industry uptake.

## BACKGROUND

This report responds to Council's Referral Motion dated June 4, 2025:

> *THAT Council, in accordance with section 4.4.4 of the Notice of Motion Policy, refers the 'Amendment to Building Bylaw [Zero Carbon Step Code]' notice of motion to staff to return with a report outlining the policy implications including the Climate Action and Energy Plan objectives; recent costing studies; as well as information on the energy level that is being achieved in recent building permits issued both prior to and after adoption of EL-4 step code, to assess the local building industry's readiness with the new standard.*

Council adopted the Provincial Zero Carbon Step Code requirements within Building Bylaw 3932 on October 18, 2023, introducing Emission Level 3 (EL-3) on January 1, 2024, and Emission Level 4 (EL-4) requirements on July 1, 2024.

The Zero Carbon Step Code was introduced in the May 1, 2023, update to the B.C. Building Code as a companion to the B.C. Energy Step Code[1]. While the Energy Step Code focuses on how efficiently a building uses energy (and refers to limits as "Steps"), the Zero Carbon Step Code targets the *carbon content* of that energy—setting performance limits on greenhouse gas emissions from heating, hot water, ventilation, and other mechanical systems in new construction (and refers to limits as "Emissions Levels"). These requirements only apply to new construction and do not affect existing buildings.

The Zero Carbon Step Code is a performance-based framework within the B.C. Building Code that enables local governments to limit operational greenhouse gas emissions from new buildings. It does not ban specific energy sources but instead sets emissions intensity limits that effectively prioritize low- or zero-carbon energy options.

- Part 9 buildings (e.g., single-family homes) can comply via one of three methods: total emissions limit, intensity-based emissions limit, or prescriptive energy source requirements.
- Part 3 buildings (e.g., apartments, commercial) use an intensity-based emissions limit.

[1] North Cowichan aligns to the B.C. Building Code requirements for Energy Step Code. This is currently at Step 3 for Part 9 buildings and Step 2 for Part 3 buildings.

## DISCUSSION

Provincial implementation

The B.C. Building Code permits municipalities to implement higher steps of the step codes ahead of provincial mandates. The B.C. Building Code mandates that new construction comply with EL-1 (measure only) effective March 10, 2025. The Province of BC has released a timeline for when higher levels of the Zero Carbon Step Code are expected to be implemented, with the highest level anticipated in 2030. The Province of BC is undertaking a review of CleanBC, with a final report to be issued late fall 2025. It is expected that further clarity on implementation timelines will be available after the review. As of July 1, 2024, North Cowichan requires EL-4 compliance for all new Part 9 and Part 3 buildings.

*Table 1 Comparison of implementation timelines for Zero Carbon Step Code*

| | **BC Building Code** | **North Cowichan** |
|---|---|---|
| EL-1 | **March 2025** | |
| EL-2 | Was anticipated 2024 | |
| EL-3 | Anticipated 2027 | January 2024 |
| EL-4 | Anticipated 2030 | **July 2024** |

North Cowichan is one of 33 local governments and First Nations across B.C., 15 of which are located on Vancouver Island, that have implemented Zero Carbon Step Code requirements in their new construction bylaws.

*Table 2 Vancouver Island Zero Carbon Step Code Adoption*

| **Vancouver Island Municipality** | **Zero Carbon Step Code Level Adoption** |
|---|---|
| Capital Regional District | EL-3 |
| Cowichan Valley Regional District | EL-4 |
| Central Saanich | EL-4 |
| Colwood | EL-4 |
| Courtenay | EL2 in 2024, EL3 in 2027, EL 4 in 2030 |
| Duncan | EL-4 |
| Esquimalt | EL-4 |
| Metchosin | EL-4 |
| Nanaimo | EL-4 |
| North Cowichan | EL-4 |
| Oak Bay | EL-4 |
| Qualicum Beach | EL-4 |
| Saanich | EL-4 |
| Victoria | EL-4 |
| View Royal | EL-4 |

Southern Vancouver Island is well-positioned for EL-4 due to the availability of heat pump technologies, a well-established network of suppliers and installers, and a climate zone that is well-suited to electric heating systems. In contrast, other regions in the Province are in earlier stages of addressing market readiness, building local industry capacity, and aligning with climate objectives.

Industry Uptake and Compliance

To determine local industry uptake, information was extracted from the B.C. Step Code Compliance Checklist that is submitted with the Building Permit application. These checklists are tools provided by the Province of BC to demonstrate compliance with the Energy Step Code and the Zero Carbon Step Code, and are required at both the pre-construction and project completion stages. The information processed reflects both the completed construction and pre-construction phases.

**Part 9 Buildings**

North Cowichan processed 146 permits for Part 9 buildings between 2023 and 2024, with 82 permits processed in 2024 (Figures 1 and 2). Ahead of North Cowichan adopting the Zero Carbon Step Code in 2023, 55% of permit applications were achieving EL-3 or EL-4 equivalent. The trend increased once the B.C. The Building Code introduced requirements for builders to achieve Energy Step Code Step 3, effective May 1, 2023. Ahead of Step 3, 36% of applications were achieving EL-3 or EL-4 equivalent, which increased to 58% after May 1, 2023. North Cowichan introduced EL-4 requirements on July 1, 2024, and 26 permits have been processed at EL-4 levels since this date. Builders have demonstrated the ability to comply with EL-4.

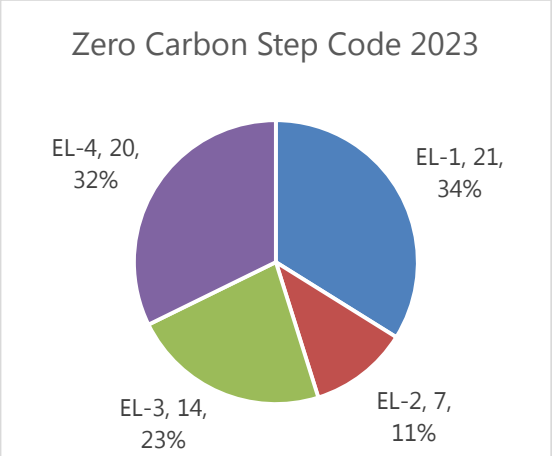


*Figure 1 Building Permit Zero Carbon Step Code alignment in 2023, ahead of North Cowichan requirements*

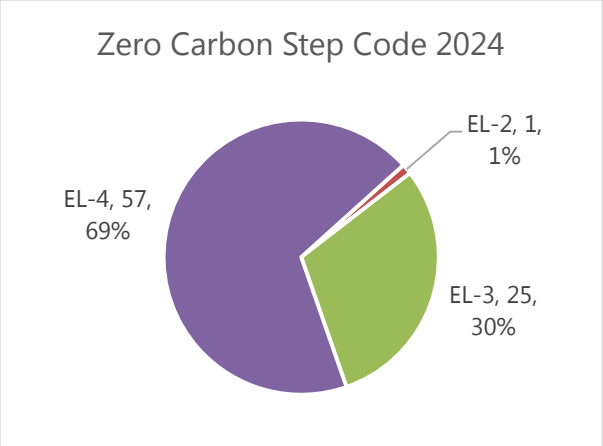


*Figure 2 Building Permit Zero Carbon Step Code compliance in 2024. EL-3 compliance as of January 1, 2024 and EL-4 as of July 1, 2024*

The Zero Carbon Step Code does not ban gas. In 2024, 49% of permits at EL-3 and EL-4 utilized gas in the house, primarily in supplemental furnaces, fireplaces, barbecues, or stoves (Table 3).

*Table 3 2024 Part 9 EL-3 and EL-4 building permits that are designed to use gas.*

| | 2023 | 2024 |
|---|---|---|
| # Part 9 building permit | 64 | 82 |
| # new Part 9 building with gas | 50 | 40 |
| % new Part 9 building with gas | 78% | 49% |

B.C. Building Code overheating provisions were introduced in 2024 in response to the 2021 heat dome, which resulted in the heat-related deaths of 619 people in B.C. These provisions require at least one living space to be capable of maintaining an indoor air temperature of not more than 26°C. This provision is accelerating the uptake of heat pumps, and most homes are now being designed with 100% cooling in response to market preferences.

Reviewing 52 permit applications reaching EL-4, the majority of houses are designed with an air-source heat pump as the primary space heating and cooling system, supplemented by either an electric or gas furnace (Figure 3). All domestic hot water is supplied with electricity: 51 units have an electric tank, and 1 unit has a heat pump.

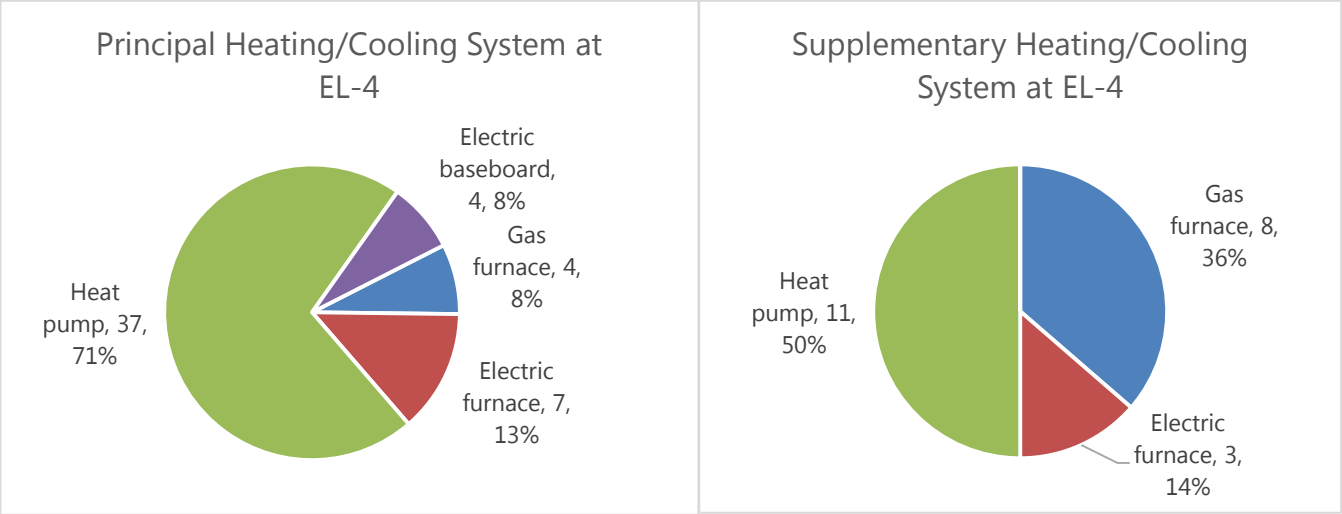


*Figure 3 Principal and supplementary heating/cooling systems at EL-4*

**Part 3 Buildings**

North Cowichan processed eight eligible permits for Part 3 buildings between 2023 and 2024, with one permit in 2023 and seven in 2024. The three permits processed since July 1, 2024, when EL-4 requirements were in place, demonstrated EL-4 compliance, and 75% of the eight permits achieved in both years demonstrated either EL-3 or EL-4 performance.

*Table 4 Summary of Part 3 Zero Carbon Step Code applicable building permits*

| | 2023 | 2024 |
|---|---|---|
| # Part 3 eligible building permits | 1 | 7 |
| EL-1 | 0 | 2 |
| EL-2 | 0 | 0 |
| EL-3 | 0 | 1 |
| EL-4 | 1 | 4 |

As the sample size is small, it is challenging to determine typical building archetypes for this building type in North Cowichan. The five buildings achieving EL-4 typically use in-unit heat pumps and electric baseboard units in common areas with electrical hot water (either central or in-unit).

Complying with EL-4 is harder to meet with gas, and this tends to push these building types toward full electrification. Locally, we only have a few examples, and there is likely still more to learn about Code implementation for these building types. There is a greater need for Part 3 building education due to increased uncertainty. Because of this uncertainty, when the City of Victoria and Saanich advanced Zero Carbon Step Code, they presented a gradual implementation timeline for buildings to comply:

- Residential buildings between four and six storeys will be required to achieve Step 3 and a low carbon standard by July 1, 2024, and Step 3 and a zero-carbon ready standard by July 1, 2025.
- Residential buildings over six storeys and commercial buildings will be required to achieve Step 2 and a low carbon standard by July 1, 2024, and Step 2 and a zero-carbon ready standard by July 1, 2025.
- Low-density residential buildings such as single-family dwellings, duplexes and townhouses will be required to achieve Step 3 and a low carbon standard by July 1, 2023, and Step 3 and a zero-carbon ready standard by January 1, 2025.

The Technical Review supporting Victoria and Saanich's recommendation also included an analysis of Part 3 buildings in the Capital Region[2]. This Technical Review also confirmed that Part 3 building archetypes would likely require full electrification to comply with EL-4, as gas buildings had not demonstrated the ability to achieve a zero carbon standard at the time of analysis in 2022.

**Readiness**

Zero Carbon Step Code requirements were implemented without accompanying education or outreach to the local building community. Council's previous direction on October 4, 2023, was to communicate the pending changes to the Bylaw. A larger outreach initiative was originally suggested as part of an alternate option for engagement on implementing higher levels of the code, but was not adopted or incorporated into the Council motion. Building officials have been attending industry events to build internal capacity on Zero Carbon Step Code requirements, and staff participate in municipal peer networks to learn of implementation challenges and best practices. There is likely still more to learn for builders and building officials, particularly given the local maturity of Part 3 building types.

An Energy Advisor is required by the B.C. Building Code to complete energy modelling and prepare a Compliance Checklist. This is a requirement under the existing Energy Step Code compliance levels, so this is not a new process for Zero Carbon Step Code implementation. Building Officials have found that they must conduct additional verification on these documents to ensure accuracy and compliance with the Code, which can be challenging at times without access to the energy models performed by Energy Advisors. This additional verification is necessary as Energy Advisors are not registered professionals, and building officials cannot treat these checklists as professionally assured. The Energy Models provided for Part 3 buildings are professionally assured; therefore, this concern is more relevant to Part 9 buildings.

[2] Attachment B - Technical Review https://pub-victoria.escribemeetings.com/Meeting.aspx?Id=a4f6863e-2b42-45ba-b8c3-e764a0e89971&lang=English&Agenda=PostAgenda&Item=12&Tab=attachments

Staff have received some feedback from the building community indicating that they do not agree with the Zero Carbon Step Code requirements, particularly for Part 3 construction. In the absence of local industry outreach guidance, staff have observed that some builders are installing two complete heating systems in new homes to ensure full redundancy. The motivations for this approach are unclear, but anecdotal feedback suggests it may stem from a desire for future fuel-switching (e.g., reintroducing gas heating post-permit) or perceived risks related to electrical grid reliability—despite gas systems still requiring electricity for controls to operate. This design choice incurs additional construction costs that exceed what is required under the code.

Emissions Reduction Outcomes

Since adopting the Zero Carbon Step Code, new building emissions in North Cowichan have declined. Table 5 indicates that while permit applications have increased by 28%, total emissions generated from new construction have decreased by 76%. In one year, 48,888 kg $CO_2e$ was not emitted (equivalent to removing 55 cars from the road or the electricity use of 120 homes for one year). This emissions reduction is due to the emissions limits imposed on new construction, which result in a preference for electric buildings or highly efficient uses of gas, given the carbon intensity of each fuel. In 2024, the emissions factor for electricity was 0.00275 kg $CO_2e$ and for gas 49.7 t $CO_2e$[3]. This data is supplied on the B.C. Step Code Compliance Checklist and is an output from the energy modelling requirements.

*Table 5 Avoided Emissions from Zero Carbon Step Code implementation*

| Avoided emissions | 2023 | 2024 | Difference |
|---|---|---|---|
| # houses | 64 | 82 | +18 |
| Total emissions (kg $CO_2e$/yr) | 64,268 | 15,380 | -48,888 |
| Average Emissions per house (kg $CO_2e$/yr) | 1,004 | 188 | -816 |

Council's approval of the Climate Action and Energy Plan established a goal to reduce the potential emissions of new buildings. Modelling demonstrated that to reduce North Cowichan's greenhouse gas emissions by 80% by 2050, all new construction must be zero-emission by 2030.

Cost and Affordability

The BC Energy Step Code Metrics Research Report (2022)[4] commissioned by the Province of B.C.'s Building & Safety Standards Branch, derives incremental cost of construction for new Part 3 and Part 9 buildings at all levels of the Energy Step Code and all climate zones in B.C. Cost percentages are incremental to a new house built to the minimum prescriptive requirements of the 2018 B.C. Building Code (Revision 4). Incremental construction costs for EL-4 are modest (average 0.5%, range from -0.1% to +2.2%). Operating costs from the Metrics Report showed variability, ranging from a 7% savings to a 2.2% increase.

[3] Province of B.C. Emissions Factors Catalogue: https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/guidance-documents/emission_factors_catalogue.xlsx

[4] Analysis by Evoke Buildings Engineering and E3 Eco Group https://energystepcode.ca/reports/#technical

*Table 6 Summary of incremental construction costs by building type*

| | Zero Carbon EL-4 |
|---|---|
| Small single-family dwelling | 0.6% |
| Medium single-family dwelling | 0.6% |
| Large single-family dwelling | 0.4% |
| Multi-family (6 storey or less) | -0.1%-2.2% |

The incremental building costs modelled in Part 3 varied. The model demonstrated that a low-rise multi-unit building would be less expensive (-0.1%) if constructed using electric baseboard heating and electric water heating, and is more expensive (2.2%) if constructed with air-source heat pump heating and electric water heating.

Most costing reports are based on the Metrics Research Report study, including the City of Nanaimo (2023)[5] and the City of Victoria, City of Saanich, City of Central Saanich and Capital Regional District (2022)[6].

The City of Richmond commissioned a report in 2024 to conduct a study on cost estimates for space heating and cooling systems[7]. While this report primarily focused on in-floor radiant systems, typical of the construction type preferred in Richmond, it also updated some of the incremental costs for affordability. It demonstrated that the cost to install an air-to-air heat pump with cooling, compared to a gas-fired boiler and cooling, was $45,000 less in capital cost (-50%) with a lower total operating cost.

The City of Vancouver also updated cost information in 2024. While the City of Vancouver Building Code is not directly comparable to the B.C. Building Code, Vancouver staff calculated that zero emission heating and hot water systems would have an incremental effect on the construction cost of roughly -4% to +0.9% for small buildings and +0.1% to +0.4% for large buildings, compared to a typical building not subject to Zero Carbon Step Code requirements[8].

A recent BC Housing Research Centre report (June 2024) found no correlation between construction cost and carbon emission performance[9].

An industry survey done by the Zero Emissions Innovation Centre found that energy and emissions requirements were not significant drivers of capital cost variance (the highest drivers of housing costs were borrowing costs, interest rates, land values, and development cost charges and levies)[10]. Furthermore, the building industry views energy and emission policies as a competitive advantage, and there will be considerable future demand for climate-friendly, energy-efficient new homes.

[5] Analysis by Introba https://www.nanaimo.ca/docs/social-culture-environment/sustainability/attachment-a--city-of-nanaimo-net-zero-code-adoption-report-_introba_-final.pdf
[6] Attachment B - Technical Review https://pub-victoria.escribemeetings.com/Meeting.aspx?Id=a4f6863e-2b42-45ba-b8c3-e764a0e89971&lang=English&Agenda=PostAgenda&Item=12&Tab=attachments
[7] Analysis by Ecolighten Energy Solutions https://citycouncil.richmond.ca/agendafiles/Open_GP_11-4-2024.pdf.
[8] https://council.vancouver.ca/20241126/documents/pspc8_revised.pdf
[9] https://research-library.bchousing.org/Home/ResearchItemDetails/8836
[10] https://zeic.ca/bc-building-industry-members-support-climate-policies-for-new-construction/

With respect to operating costs, the Metrics Report provides the basis for costing reports for new construction. A report commissioned by Saanich in 2003 looked at completed retrofits and compared the operational costs of gas furnaces vs electric heat pumps over a two-year period[11]. Overall, heat pumps were found to result in lower household utility costs, with 66% of participating homes resulting in the same or lower energy costs.

Electrical Supply and Capacity:
In a presentation to Council on February 21, 2024, BC Hydro indicated that they can meet the needs of Vancouver Island municipalities looking to adopt the Zero Carbon Step Code and have the capacity and infrastructure in place to support growth in the Cowichan Valley. BC Hydro prepares detailed electricity forecasts through an Integrated Resource Plan, and the B.C. Utilities Commission provides regulatory and engagement oversight to this process. These Integrated Resource Plans are updated on a rolling basis and look out a 20-year time frame. After a three-year process, the B.C. Utilities Commission concluded that BC Hydro fulfilled the requirements of the resource plan, including an estimate of demand and a plan for energy purchases to meet the demand[12]. The Call for Power is one of the tools BC Hydro has for supplying demand. BC Hydro's recent Call for Power for additional electricity was previously anticipated in the Integrated Resource Plan to avoid overbuilding underutilized infrastructure.

The City of Vancouver reviews electrical service capacity in their jurisdiction (Technical Services BC provides North Cowichan electrical jurisdiction)[13]. Vancouver found that the main driver for electrical capacity is increased density and that there is no difference in capacity needs for heating and cooling, whether a heat pump or gas system is used. This is because the system is sized using calculations of the larger of the heating or cooling loads. In new, efficient buildings where these loads are similar, there is no reduction in overall electrical load by using gas for heating.

**OPTIONS**

1. **(Recommended Option)** THAT Council receives the staff report titled "Zero Carbon Step Code Implementation" dated June 18, 2025, for information and to reaffirm its commitment to proceed with the implementation of EL-4 as currently planned.
    - The data provided shows a successful implementation and progress toward climate targets, affirming builder's capacity and compliance.
    - While actual cost data is limited and variable, studies have indicated that costs are relatively neutral.
    - Aligns with Council adopted Official Community Plan, Climate Action and Energy Plan, and Council's 2018-2022 Strategic Plan objectives.
    - Demonstrable emissions savings with near cost neutrality to North Cowichan and minimal cost impact to builders.

[11] Analysis by RDH Building Science Inc.
https://www.saanich.ca/assets/Community/Documents/MakeTheSwitch_SummaryReportFinal_MAY9.pdf
[12] https://www.bcuc.com/OurWork/ViewProceeding?applicationid=965
[13] https://council.vancouver.ca/20241126/documents/pspc8_revised.pdf

2. THAT Council:
   (a) receives the staff report titled "Zero Carbon Step Code Implementation" dated June 18, 2025, for information and reaffirm its commitment to proceed with the implementation of EL-4 as currently planned, and,
   (b) directs staff to develop an engagement and education plan for Council's consideration to support greater industry readiness.

   - Additional outreach presents an opportunity to further strengthen ongoing readiness and a greater understanding of the Zero Carbon Step Code.

3. THAT Council directs staff to amend the Building Bylaw to set the current Zero Carbon Emissions Level to match the Provincial B.C. Building Code level (currently at EL-1) and follow the Province's schedule for further changes to the Zero Carbon Step Code.

   - This option would provide additional time for the builders not yet acclimatized to learn Step Code requirements. With the introduction of the cooling requirement in the 2024 B.C. Building Code, it is likely that high levels of compliance may continue.
   - This option may require additional retrofits by homeowners to comply with future policy directed by the Province of B.C. and would slow the implementation of the Climate Action and Energy Plan.
   - Reverting to minimum code requirements may compromise the efforts of local builders to gain proficiency in low-carbon building and possibly slow the expansion of local expertise once the Province moves to higher levels in the future.

4. THAT Council refers conversations on housing costs to Council's Strategic Planning sessions.

   - Given that there is no significant cost driver to comply with the Zero Carbon Step Code, other factors and processes may result in greater cost reductions for builders. Council could provide direction to staff to explore ways to help reduce building costs through Strategic Plan updates.

**IMPLICATIONS**

- Policy Alignment: In alignment with the Climate Action and Energy Plan, the Official Community Plan, and Council's 2018-2022 Strategic Plan, the objective is to implement the Climate Action and Energy Plan. Aligns with future provincial policy direction.
- Financial: No financial implications from this report.
- Social/Environmental: Positive environmental benefits from reduced GHG emissions. The provision of cooling in new construction provides relief during heat events.
- Communication: Staff will continue to communicate building code updates and guidance to the local industry as part of ongoing implementation and to support additional direction regarding builder and construction industry education.

**RECOMMENDATION**

THAT Council receives the staff report titled "Zero Carbon Step Code Implementation" dated June 18, 2025, for information and reaffirm its commitment to proceed with the implementation of EL-4 as currently planned.

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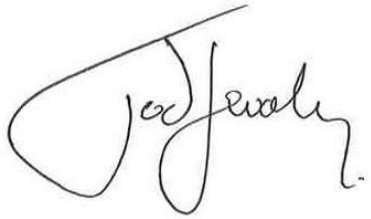
**Approved to be forwarded to Council:**



Ted Swabey
Chief Administrative Officer