

FIRE FLOW AND HYDRANT REQUIREMENTS IN INFILL DEVELOPMENT

Recommendation

That the May 6, 2024, Office of the City Manager report EFRS02341, be received for information.

Requested Action	Information only		
ConnectEdmonton's Guiding Principle	ConnectEdmonton Strategic Goals		
CONNECTED This unifies our work to achieve our strategic goals.	Urban Places		
City Plan Values	LIVE.		
City Plan Big City Move(s)	Rebuildable City	Relationship to Council's Strategic Priorities	District planning
Corporate Business Plan	Serving Edmontonians		
Council Policy, Program or Project Relationships	<ul style="list-style-type: none"> Edmonton Zoning Bylaw 20001 		
Related Council Discussions	<ul style="list-style-type: none"> UPE01232, Potential Work Plan for Rezoning Priority Growth Areas, Urban Planning Committee, February 27, 2024 		

Previous Council/Committee Action

At the January 22, 2024, Utility Committee Meeting, the following motion was passed:

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That Administration provide a report outlining the efforts being undertaken by Edmonton Fire Rescue Services (EFRS) to streamline fire flow and hydrant requirements in infill development.

Executive Summary

- Established in 2019, the Infill Fire Protection Assessment process takes a performance-based approach to fire flow requirements for infill developments. Fire flow is defined as the flow rate of a water supply that is available to the fire service through a hydrant.
- This approach deviated from the infrastructure requirements of City of Edmonton's Design and Construction Standard - Water (Volume 4) and focuses only on whether the required fire flow can be met with existing infrastructure.
- Between July 2019 until the end of 2023, EFRS completed 1,228 assessments where hydrant and/or water main infrastructure would have been needed to meet Volume 4 to support land development applications. Of those applications, 1,108 (90 per cent) met the performance requirements of Volume 4 without upgrades, removing the need for approximately \$200 million of infrastructure construction.
- In 2021, the assessment process had an average completion time of 95 calendar days. Process and technology improvements by Administration significantly reduced this timeline: in 2023, 67 per cent of assessments were completed within 14 calendar days.
- In January 2024, the data from the Infill Fire Protection Assessment program helped update Volume 4 with the introduction of the Zoning Bylaw 20001, making sure fire flow standards reflect the needs of modern development.
- Through the Housing Accelerator Fund-approved initiatives, Administration is bringing more transparency to fire flow water requirements with public-facing tools to show how building design can influence and potentially reduce the need for infrastructure upgrades. This reduces risks on new projects, saves time in review, and lowers development costs for infill.

REPORT

History of the Infill Fire Protection Assessment Program

The Infill Fire Protection Assessment program was developed to assess how Design and Construction Standard - Water (Volume 4) is applied to infill development. It was triggered by concerns that the water infrastructure standards to serve green field development, which is the primary focus of Volume 4, is different from the requirements for existing infrastructure for infill development.

The Infill Fire Protection Assessment process has relied on several internal steps:

1. Development application circulation/review by EPCOR Water determines any deficiencies to Volume 4, and if upgrades are identified, an Infill Fire Protection Assessment review may be started either by EPCOR Water or a Development Planner.

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2. After receiving the request for an Infill Fire Protection Assessment, EFRS analyzes the available fire flow at the site and the required fire flow of the proposed development based on information in the Development Permit Application.
 - a. If the available fire flow is at least as large as the required fire flow, EFRS issues a letter waiving the conditions applied from Volume 4.
 - b. If the available fire flow is lower than the required fire flow, EFRS either coordinates with applicants on possible changes to the development application or supports the infrastructure upgrades, depending on which solution is more beneficial to the applicant.

Program Update

EFRS evaluated whether the fire flow performance standard in the City's Design and Construction Standard - Water (Volume 4) could be met despite non-adherence to requirements within that standard, specifically for hydrant spacing and available fire flow. Between July 2019 and the end of 2023, EFRS completed 1,228 assessments where, in the absence of the program, hydrant and/or water main infrastructure upgrades would be needed to meet Volume 4 to support land development applications. Of those applications, 1,108 (90 per cent) were found to meet the performance requirements of Volume 4 without modifying infrastructure, removing approximately \$200 million of infrastructure construction to support those developments.

Review timelines for this process peaked in 2021, with an average completion time of 95 calendar days. Process and technology improvements by Administration have significantly reduced this timeline: 67 per cent of assessments are now completed within 14 calendar days.¹

Roadmap: Goals for the Infill Fire Protection Assessment Program

Through the Housing Accelerator Fund-approved initiatives, Administration is committed to greater transparency and providing tools to lower development costs related to fire flow requirements on infill projects. These improvements work to eliminate analysis by EFRS and only require review by EPCOR Water, with respect to firefighting water, if the proposed required fire flow exceeds the available fire flow for an application.

While the improvements made since 2021 have lowered development costs by helping to avoid costly infrastructure upgrades, there is still a lack of transparency with infrastructure capacity and a lack of ability to easily assess the required fire flow of potential developments.

1. Automating the Available Fire Flow Calculation and Open Data

Available fire flow is currently calculated by EFRS by considering the capacity of the water main network at a specific parcel, as well as limitations introduced by hydrants, firefighting hose, fire truck staging/proximity to hydrants, the number of pumping apparatus available and the capacity of fire pumps. While currently done manually, this analysis can be completed using geospatial/GIS technology.

Available fire flow data will be published for the entire city to provide transparency of the fire flow available at every parcel. This allows developers, builders and landowners to

¹ Corresponding to the Development Permit circulation/review timeframes for EFRS.

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independently compare the available fire flow to the required fire flow (see item 2 below) of potential developments before submitting land development applications.

Specifications for this system were developed and are currently in the procurement process.

2. *'Required Fire Flow Calculator' in the eServices Development Permit Self-serve Portal*

After completing the automation and open data processes, a calculator can be created to determine if the required fire flow can be implemented. Required fire flow is currently calculated by taking information provided in development applications and applying the Fire Underwriters Survey, Guide for Public Fire Protection in Canada. EFRS has created tools to simplify these calculations for most building types, allowing most applicants to verify and investigate how changes in design may affect required fire flow for a proposed building. Changes to the Development Permit application process within the self-service portal are part of the planned work to give applicants access to these calculators and easily state the required fire flow of a development application.

3. *Education Campaign and Training Materials*

After completing the e-Services processes, the creation of training materials, guidelines and an associated education campaign will be needed to prepare applicants for the fire flow aspects of the application process. While mostly focused on external/applicant training, this will also include process maps and job aids for Administration and EPCOR Water.

After completing the above, the performance-based Infill Fire Protection Assessment process will be integrated into the land development application process, eliminating the involvement and potential delays of fire flow assessment by EFRS and EPCOR Water. The only aspect that will still involve Administration is the detailed review of technical submissions, which is already completed by EFRS staff at the Development Permit stage.

There are three key additional benefits associated with the automation of the Infill Fire Protection Assessment process, aside from supporting infill development. Having available flow data for all areas of the city provides a useful estimation of where future development may or may not need changes to existing infrastructure. This also aligns with the objectives of The City Plan for a rebuildable city: supporting 600,000 additional residents in the redeveloping areas and where 50 per cent of net-new units are added through infill. For example, this information can be used to identify key areas within Priority Growth Areas that may or may not need upgrades to meet their target densities. Fire flow data can also be used to update the Volume 4 standard and build the sustainability and efficiency of firefighting resources.. The third benefit is the data collected through the automated process will support the ongoing review of the City's fire flow standards to ensure infrastructure performance expectations do not exceed the actual needs of current development. Updates to Volume 4 - Water standard were already completed by EPCOR Water and EFRS based on the new zoning bylaw in 2024 to align actual demand for firefighting water based on historical IFPA data. Future adjustments to the standard will be supported by the data collected through development applications, therefore ensuring the standard does not overprescribe resources for firefighting water, even as development practices change.

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Budget/Financial Implications

Through the Canada Mortgage and Housing Corporation, the Government of Canada created the Housing Accelerator Fund in the spring of 2023 to help local governments create transformational change that will increase the housing supply. The funding will help create complete, low-carbon, climate-resilient communities that are affordable, inclusive, equitable and diverse. The City was recently awarded \$175 million to implement its Housing Accelerator Fund (HAF) Action Plan as one of eleven actions of Edmonton's plan. The cost of the tools and resources needed for the work on infill fire flow requirements will be covered by the Housing Accelerator Fund. Administration is currently working to confirm plans and budgets for each HAF Action Plan initiative and will provide Council with an update in the coming months.

Community Insight

The Infill Fire Protection Assessment process was originally developed in 2019 in response to recurring questions from EPCOR Water and applicants about hydrant spacing and fire flow deficiency in land development application circulations. This process is continuously improved through consultation and engagement with EPCOR, the development industry and internally with Administration.

Administration regularly interacts with prospective and current infill developers who often lack understanding or knowledge about infill fire flow capacities and strategies to address situations where available fire flow is less than required fire flow. These interactions and City engagement activities over the last several years (on topics including the Zoning Bylaw Renewal, developer contributions to affordable housing and the updated Affordable Housing Strategy) led to the development of this action in the City's Housing Accelerator Fund application.

GBA+

Reducing cost and development barriers to create infill-supported development impacts future density, specifically in affordable housing. This work was a key initiative to help increase the volume of housing in Edmonton through the Housing Accelerator Fund. It helps to keep the total cost of development lower, which impacts overall housing affordability. As the information is available online, access will be evaluated and revised as needed using a GBA+ process.