

# STRATHCONA COUNTY UTILITY REDEVELOPMENT STANDARDS

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# 1. INTRODUCTION

Strathcona County's Utility Redevelopment Standards provide guidance for the completion of redevelopment applications within the County's Built-up Urban Area and the Hamlet of Ardrossan. As the County's Urban Service Area continues to age the demand for redevelopment is growing and the need for a document outlining a process specifically for redevelopment has been identified. By establishing the processes within this document, the County aspires to provide opportunities for redevelopment while ensuring that an acceptable level of risk to the County is maintained within our utility systems.

This document includes various elements that work together to define a transparent, step by step process for redevelopment applications. The intent of the document is to ensure clear and consistent expectations are provided to the development community and where possible, eliminate the need for redevelopment to pursue the County's variance process.

## 1.1 DOCUMENT FRAMEWORK

The utility redevelopment standards consist of six main elements that are interconnected including Redevelopment Criteria, Redevelopment Principles, Redevelopment Design Inputs, Triggers for Upgrades, Fundamentals for Utility Upgrades and Utility Assessments. The following provides a general overview of each element:

1. **REDEVELOPMENT CRITERIA** - Criteria outlining when a proposed development will be required to follow the County's Redevelopment Application Process.
2. **GUIDING PRINCIPLES** - The high level principles which have guided the creation of the standards and the redevelopment processes within them.
3. **REDEVELOPMENT DESIGN INPUTS** - The modelling inputs that will be used to determine the effect of a proposed development on the existing utility systems. Inputs are intended to portray the most realistic scenario of actual impact.
4. **TRIGGERS FOR UPGRADE** - The limit to be reflected in the modelling as unacceptable. If the model shows that a trigger has been reached or exceeded, upgrades will be required. Triggers are intended to define a minimum factor of safety at a maximum level of acceptable risk.
5. **FUNDAMENTALS FOR UTILITY UPGRADES** - Once an upgrade has been triggered, the fundamentals will be used alongside the County's Design and Construction Standards to assess infrastructure upgrade proposals and variance requests. The fundamentals are intended to define known areas of intolerable risk or unacceptable service levels as well as outline specific circumstances under which particular types of upgrades may be considered.
6. **UTILITY ASSESSMENTS** - There are two types of utility assessments outlined within these standards that use the various elements above to assess impacts and upgrade requirements related to the County's utility systems. These include the following:
  - **UTILITY IMPACT ASSESSMENT:** A modelling exercise which uses Redevelopment Design Inputs to assess the impact of the proposed redevelopment on existing utility systems.
  - **UTILITY UPGRADE ASSESSMENT:** An analysis to determine what upgrades are required if the Utility Impact Assessment shows that a trigger for upgrade has been met or exceeded.

## 1.2 REDEVELOPMENT APPLICATION PROCESS

The flowchart included as Appendix A is a generalization of the process applicants will be required to follow for redevelopment applications. The process uses the various elements within this document to address the three main steps outlined below:

STEP 1 - As part of a subdivision or development permit application, proposed developments which meet the **REDEVELOPMENT CRITERIA** will, at a minimum, be required to provide a **UTILITY IMPACT ASSESSMENT** which uses the **REDEVELOPMENT DESIGN INPUTS** to determine the impact of their proposal on the County's existing utility systems.

STEP 2 - If the **UTILITY IMPACT ASSESSMENT** shows that a **TRIGGER FOR UPGRADE** is met or exceeded the applicant will be required to complete a **UTILITY UPGRADE ASSESSMENT** and propose an upgrade based on the results or refer to the approved upgrade within an existing Area Redevelopment Plan.

STEP 3 - If a variance to the County's Design and Construction Standards is submitted for the required utility upgrade, the **FUNDAMENTALS FOR UTILITY UPGRADES** will be used to assist the variance committee in their review of the application.

Once proposed upgrades are approved, they will be addressed at the subdivision or development permit stage through a condition that the applicant enter into a Development Agreement for contributions or construction of upgrades.

## 2. REDEVELOPMENT CRITERIA

The following redevelopment criteria identifies which developments have the potential to impact to the County's existing utility systems and therefore are required to follow the County's Redevelopment Application Process as outlined within these standards.

### 2.1 REDEVELOPMENT CRITERIA

At the determination of the Director of Planning and Development Services, proposed developments which meet the following criteria are required to follow the Redevelopment Application Process, as outlined within the County's Utility Redevelopment Standards:

1. The proposed development:
  - a. is located within the Built-Up Urban Area or the Hamlet of Ardrossan as indicated with the County's Municipal Development Plan; and
  - b. has not been considered within an existing Area Structure Plan; and
  - c. contains any of the following:
    - i. a new high water consumption or wastewater generation commercial or industrial use such as a hotel, carwash, food processing facility, laundry mat or brewery;
    - ii. a 0.10 ha or more increase to the existing ground floor area, parking area or combination thereof; or
    - iii. an increased dwelling unit count of four or more.

## 3. GUIDING PRINCIPLES

The following principles have been established to guide the Redevelopment Design Inputs, Triggers for Upgrades, Fundamentals for Utility Upgrades and Utility Assessments. Each guiding principle and standard have been carefully considered and vetted through the municipality. Alignment with these Principles will be a key consideration when reviewing any proposed redevelopment applications.

### 3.1 PRINCIPLES

1. The County will allow for a first in approach for available capacity within utility systems;
2. The impacts to utility systems shall be analyzed through a Utility Impact Assessment for new redevelopment applications;
3. Modeling and utility assessments for new redevelopment applications shall be completed by the applicant, using the County's authenticated calibrated model;
4. Redevelopment Design Inputs shall provide for a realistic projection of actual impacts to the utility systems;
5. Conservative assumptions shall be maintained within redevelopment Triggers for Upgrades and proposed infrastructure upgrades;
6. Redevelopment will address utility upgrades when a Trigger for Upgrade has been met;
7. Planning for utility upgrades should consider the potential for economies of scale;
8. Infrastructure upgrades shall accommodate future development as outlined in any relevant statutory plans;
9. Applicants shall be responsible for their proportionate share of the costs of utility infrastructure utilized by their development;
10. Trunks shall be designed, constructed and maintained by the County; and
11. On-site infrastructure shall be maintained by landowners.

## 4. REDEVELOPMENT DESIGN INPUTS

The Redevelopment Design Inputs within Table 4.1 have been created with the intent of establishing the most accurate depiction possible of the actual impact a redevelopment may have on the County's utility systems. They are intended to be used when assessing whether a proposed development can be accommodated within the existing system. Where an item is not referenced below the applicant shall refer to the County's Design and Construction Standards. Variance requests that would result in a reduction of the below inputs will not be considered as the factor of safety has already been removed.

| TABLE 4.1: REDEVELOPMENT DESIGN INPUTS  |                              |  |  |
|---|------------------------------|--|--|
| Wastewater  |                              |  |  |
| Density   | Residential Generation Rate  | Residential Peaking Factor                                   | Inflow Infiltration  |
| As per Strathcona County’s Statutory Plan Terms of Reference  | 220L/person/day <sup>1</sup> | Sewage flow data shall be used for the downstream assessment | The authenticated calibrated model shall be used for downstream assessment |
| Water   |                              |  |  |
| Density   |                              | Residential Consumption                                      |  |
| As per Strathcona County’s Statutory Plan Terms of Reference  |                              | 220L/person/day  |  |
| <sup>1</sup> When assessing sewage generation rates for mixed-use buildings it should be assumed that 25% of the commercial space contributes to the peak flow. |                              |  |  |

## 5. TRIGGERS FOR UPGRADES

The Triggers for Upgrades within Table 5.1 have been established, recognizing that a factor of safety is required to ensure that the utility systems remain functional. The removal of this factor of safety with the Redevelopment Design Inputs means that the factors of safety built into the Triggers for Upgrades are essential to balance the risks associated with modeling and density projections. Where a proposed development is unable to maintain the below standards, it will cause the trigger to be met and upgrades will be required to the system as part of the redevelopment. Variances to the Triggers for Upgrades will not be considered.

| TABLE 5.1: TRIGGERS FOR UPGRADES  |  |
|---|--|
| Wastewater  |  |
| Hydraulic Grade Line  |  |
| Shall not come within 2.75 m below ground along the main, unless it remains within the pipe. Consideration for pressures caused by surcharging may further reduce the hydraulic grade line. <sup>2,3</sup>  |  |
| Water   |  |
| Pressure  | Fire Flow  |
| 140kPa (max day plus fire flow)<br><br>280 kPa (peak hour) with 25 mm service and vacuum break valves for new development<br><br>350kPa (average day) for existing development  | Single Family Residential: 100L/s<br><br>Mid Value Multi-Family: 180L/s<br><br>High Value: 250L/s  |
| Stormwater  |  |
| Overland Flooding – Onto Private Property   | Water Quality  |
| 1:100 year overland flow shall not enter more than 2.0m onto private property and must remain 3.0m from any existing buildings or proposed minimum setbacks, whichever is greater   | 85% of Total Suspended Solids<br>75µm or greater   |
| Overland Flooding - Local Roads   | Overland Flooding – Collector/Arterial Roads   |
| Overland flooding on local roads during a 1:100 year event shall:<br><br>1) drain free from the driving surface within 6 hours;<br>2) if the flow route is adjacent to pedestrian or recreational infrastructure, ensure the combination of velocity and flow depth within the table below is not exceeded in open-channel design; and<br>3) be no deeper than 300 mm in depth within the gutter and 180mm across private accesses. | Overland flooding on collector or arterials roads during a 1:100 year event shall:<br><br>1) drain free from the driving surface within 3 hours;<br>2) if the flow route is adjacent to pedestrian or recreational infrastructure, ensure the combination of velocity and flow depth within the table below is not exceeded in open-channel design; and<br>3) be no deeper than 300 mm in depth within the gutter and 180mm across private accesses. |

| PERMISSIBLE DEPTHS FOR SUBMERGED OBJECTS <sup>4</sup>  |                       |
|--|-----------------------|
| Water Velocity (m/s)   | Permissible Depth (m) |
| 0.5  | 0.80                  |
| 1.0  | 0.32                  |
| 2.0  | 0.21                  |
| 3.0  | 0.09                  |
| <sup>2</sup> Where it can be confirmed that basements are not present along the main, consideration may be given to an increased hydraulic grade line.<br><sup>3</sup> In a situation where deep walkouts exist along the downstream system or an adjacent lot slopes entirely away from the roadway, a reduced hydraulic grade line may be required.<br><sup>4</sup> Permissible depths for submerged objects are based on a 20 kg child and concrete-lined channels. Larger Persons may be able to withstand deeper flows. |                       |



## 6. FUNDAMENTALS FOR UTILITY UPGRADES

The following Fundamentals for Utility Upgrades will be used alongside the County's Design and Construction Standards to assess infrastructure upgrade proposals. The establishment of these fundamentals recognize that redevelopment deals with pre-existing utility systems and challenges may arise that require site specific solutions. The fundamentals are intended to define known areas of unacceptable risk or service levels as well as outline specific circumstances under which specific tactics may be considered. Compliance with the following Fundamentals for Utility Upgrades does not guarantee approval however, upgrade proposals that conflict with any of the below fundamentals will not be considered.

### 6.1 WASTEWATER

1. The ultimate wastewater system shall meet the County's Design and Construction Standards for system performance (HGL); and
2. On-site sanitary storage shall only be considered for industrial, commercial or mixed-use developments, as a last resort, after all potential off-site improvements have been explored.

### 6.2 WATER

1. Fire flow shall be provided for all redevelopment areas; and
2. Redevelopment water demands shall not reduce the pressure of existing development below the County's Design and Construction Standards.

### 6.3 STORMWATER

1. Overland flows shall not cause damage to private property, shall allow for passable access and necessary emergency access, and shall not remain on the surface for an elongated time period;
2. Outflow from stormwater storage shall not exceed the pre-redevelopment flow unless there is available storage in the downstream system. Otherwise 1:100 year (24hr) storage must be provided on-site, taking into account for any existing deficiencies with the on-site stormwater design; and
3. Low impact development for wet weather storage shall only be considered where there is no available storage capacity in the downstream system, on-site storage is not feasible, and failure of the LID is not anticipated to cause damage to private property.

## 7. UTILITY ASSESSMENTS

The following sections outline the County's expectations for supporting technical information that will be required by the County as part of a redevelopment permit application. The County may require that utility assessments be provided at the subdivision or rezoning stage for certain applications. This may include proposals for concurrent subdivision and development, subdivision proposals that would result in a parcel that does not have direct access to existing utility infrastructure or site-specific zoning district proposals.

### 7.1 UTILITY IMPACT ASSESSMENT

When applying for a development which aligns with the County's redevelopment criteria under Section 2.1, the applicant shall be responsible for providing a Utility Impact Assessment which generally follows the process outlined below:

1. Begin with the County's authenticated calibrated model. The County will have the ability to assess condition of the existing network and identify if potential relining of sewers may be required, which will affect the available capacity, prior to providing the authenticated calibrated model;
2. Add in the current redevelopment proposal as per Section 4: Redevelopment Design Inputs;
3. Assess the impacts of the redevelopment proposal on the existing system to the nearest trunk;
4. If the current redevelopment application does not trigger an upgrade as per Section 5: Triggers for Utility Upgrades it may proceed;
5. If a trigger for upgrade listed under Section 5: Triggers for Utility Upgrades is met or exceeded, the applicant shall complete the Utility Upgrade Assessment process outlined in Section 7.2 or refer to relevant Area Redevelopment Plan for information on required upgrades.

### 7.2 UTILITY UPGRADE ASSESSMENT

When determining upgrades required as part of a redevelopment application located outside of an established Area Redevelopment Plan, the applicant shall be responsible for preparing an Engineering Design Brief which generally follows the Utility Upgrade Assessment process outlined below:

1. Begin with the County's authenticated calibrated model. The County will have the ability to assess condition of the existing network and identify if potential relining of sewers may be required, which will affect the available capacity, prior to providing the authenticated calibrated model;
2. Add in the current redevelopment proposal using the County's Design and Construction Standards. If the development is proposed to be staged, all phases should be included in the assessment;
3. Assess the impacts of the redevelopment proposal on the existing system to the nearest trunk;
4. Determine necessary upgrades as per the County's Design and Construction Standards;

5. If a variance request is proposed, the Engineering Design Brief shall outline the effects of the proposed variances on the extent of the required upgrades in comparison to those required under the County's Design and Construction Standards. Variance proposals must align with Section 6: Fundamentals for Utility Upgrades. Variance requests shall follow the County's existing variance application process;
6. When the County has approved the proposed upgrades, the applicant may propose proportionate contributions towards the cost of approved upgrades for the County's consideration (where applicable).

# APPENDIX A: REDEVELOPMENT APPLICATION PROCESS

