

## Excavation Inspection and Approval Process on Infill Projects

At the April 23, 2019 Urban Planning Committee meeting, Administration received the following motion:

*"Explore options to introduce an excavation inspection and approval process on infill projects."*

### Relevant Legislation

The 2019 National Building Code - Alberta Edition (NBC-AE) sets out technical provisions for the design and construction of new buildings. It also applies to the alteration, change of use and demolition of existing buildings. The NBC-AE complements the Alberta Fire Code with regards to site safety. Part 8 of the NBC-AE and Section 5.6 of the 2019 National Fire Code-Alberta Edition (NFC-AE) address safety measures at construction and demolition sites. Section 2.2.13.1. 'Safety During Construction', requires that the contractor is responsible for compliance with Part 8 of the NBC-AE and also assigns the contractor as responsible jointly and severally with the owner for safety during construction.

It is important to note that the NBC-AE does not regulate excavations. The Building Code also does not regulate where, or if, shoring is required for excavations. Rather, it requires shoring be designed by a professional engineer when considered applicable to the construction activities. The NBC-AE does require that excavations be kept clear of water and that the builder prevent damage to buildings on adjacent properties.

### Safety Codes Officers

Safety Codes Officers (SCO) are not professional engineers and would not be able to assess when protection may be required, and if so, the design/installation of said protection.

SCOs monitor compliance with the Safety Codes Act and other relevant regulations. The role of the SCO is to periodically audit construction to ensure that a minimum standard of building safety is achieved. This standard is set by the Safety Codes Act and the regulations made pursuant under this Act.

Through inspections, SCOs identify deficiencies and/or infractions and take appropriate action(s) for the correction of the plans, the construction of buildings, and the installation of services in buildings. Safety Codes Officers use technical knowledge to conduct field inspections for compliance monitoring and for enforcement of the Safety Codes Act, other code(s), and the Safety Codes Permit Bylaw No. 15894.

For issues that are not directly related to the Safety Codes Act, the SCO will liaise with the appropriate unit within Administration and/or external agencies, such as Alberta Health Services or Alberta Occupational Health and Safety, to manage issues under appropriate legislation.

### **Excavations**

Excavations are regulated by Part 32 of the Alberta Occupational Health and Safety Code. Based on soil conditions and desired depth, an appropriate excavation plan may be required. In addition to shoring, compliance with Alberta Occupational Health and Safety Code requirements may be achieved by 'cutting back' walls or utilizing a 'slope/step-down' method of excavation design.

Excavations must be a minimum of 24" wider than the perimeter of the house to be built to meet Alberta Occupational Health and Safety Code requirements for bank clearance after forms are raised and walls are cast. This space is to allow workers to safely handle formwork, place weeping tile, apply dampproofing, and place exterior insulation.

If the Alberta Occupational Health and Safety Code is complied with, excavation stability should be addressed and any potential issues mitigated. Administration is exploring an auto-notification to Alberta Occupational Health and SCOs when infill excavation depths are 1.5m or greater. Alberta Occupational Health and SCOs could further investigate these notifications. To confirm depth of excavation, additional details may be required on associated plans and specifications. Safety Codes, Permits and Inspections Section is further exploring timelines and costs associated with this potential change to Administration's requirements of building permit applications.

For infill construction sites, the City relies on the builder to determine the design of the excavation based on their observations during a preliminary excavation. The excavation is completed based on these observations and the owners responsibilities to adhere with relevant legislation. An SCO does not inspect the preliminary excavation unless requested, or, a complaint is received. This is permitted by the Safety Codes Act. Where knowledge of the subsurface conditions exists, the Safety Codes Act allows discretion to be exercised on whether further testing and exploration is required.

There are a number of items to take into consideration with undertaking an excavation, including soil conditions (native or modified), site servicing, finished grade, main floor height, surface drainage patterns, stable soil depths, water table depths, and existing improvements and vegetation.

The main purpose of the footings is to distribute the load on native soil, as such, a soil test should be performed at the footings level after excavation (exceptions include when boreholes are required in areas for sloping hazards like river valleys area). Top soil layers are generally fill-soil, so soil conditions under the footings may not be determined until after excavation has occurred.

It is important to note that the excavation itself does not affect the design of the footing and foundation of the structure to be built.

Administration does request soils reports for conditions including:

- Top-of-bank sites
- Potentially contaminated brownfield sites (ie. old gas stations, dry cleaners, etc.)
- Buildings greater than 600 squared metres in area, and/or greater than three storeys in height

The building permit process for single detached homes focuses review on the structure that is proposed to be built. This mainly includes structural integrity, fire protection, and energy efficiency. Administration's Plans Examination staff review items that include:

- Foundation lateral bracing requirements
- Foundation and stairwell openings
- Tall wall construction

- Roof and floor engineered components
- Required fire ratings
- Energy efficiency compliance
- Others

The typical excavation/foundation process for residential properties would include to:

- Apply for required permit(s) (owner/applicant)
- Stakeout of house location (surveyor)
- Water/sanitary services (trencher or utility)
- Excavate for foundation (mid-duty machine operators and trucking)
- Soils test for sulphates/bearing capacity (geotechnical services)
- Form and place concrete for footings (cribber)
- Form and place concrete for walls (cribber or alternate systems)
- Hoard/heat, strip forms as needed (general contractor)
- Install weeping tile and waterproofing membrane/sump pit (foundation drainage workers)
- Construct main floor frame diaphragm
- Complete foundation construction inspection(s) where required
- Place backfill soils up to rough grade

The Safety Codes, Permits and Inspections Section currently conducts a footing and foundation inspection for all single detached infill homes. This inspection includes observation of the state of the foundation (significant cracking, honeycombing), ensuring a moisture barrier is applied, verifying that weeping tile is installed with appropriate gravel coverage for drainage, and ensuring no excessive water accumulation is present.

### **Fencing**

The National Building Code-Alberta Edition requires SCOs to ensure site safety for the general public. Safety Codes, Permits and Inspections deems the public to be any persons not directly involved in the construction project, including neighbours, newspaper and letter carriers, passersby, and so on. To achieve this, site fencing to restrict public access with a strongly constructed fencing, boarding or barricade not less than 1.8 m high is required around the perimeter of the excavation to resist or discourage public access to the construction site.

Site fencing must be maintained for the duration of the excavation and until such time that the newly constructed building is at a lock up stage.

**Inspection Process**

If a complaint is received, an SCO is dispatched to the site to evaluate the situation. If it has been determined that the site is unsafe (for example, an open excavation where water may collect) the owner/builder is contacted and ordered to install fencing that is a minimum of six feet high and secured.

Safety Codes continues to work closely with 311 to ensure all complaints related to excavation practices are forwarded to the Safety Codes Compliance team. Once a complaint is received, an SCO will be dispatched to the site to further investigate, typically within 24-48 hours. This is a significant evolution from past practices where inquiries were triaged and reassigned to appropriate areas.

If an SCO determines that there may be damage to an adjacent property as a result of excavation practices, an SCO may write an order to correct the problem. The majority of infill projects are completed without negatively affecting adjacent properties. A small percentage have caused damages to adjacent properties. In these situations, an SCO evaluates the scenario, provides an opportunity for the builder to remedy the situation or issues an order for remedy actions where an unsafe or imminent danger situation exists.

Ongoing education of infill builders and neighbors of infill and timely inspections by SCOs are key to ensuring good excavation and overall construction practices are met.