AC2022-0876
Attachment 1

City Auditor's Office

Public Protection Site Safety Plan Process Audit

July 8, 2022

ISC: Unrestricted

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The City Auditor's Office conducted this audit in conformance with the *International Standards for the Professional Practice of Internal Auditing.*

Executive Summary

Construction activity in Calgary must comply with Part 8 of the Alberta Building Code and Section 5.6 of the Alberta Fire Code to ensure public safety. In response to unsafe construction practices, Calgary Building Services (Building Services) worked closely with the construction industry to develop technically feasible requirements for protecting the public during demolition and/or construction. Building Services' objective was to help builders minimize construction impact and ensure public safety. Although not required by the Alberta Building Code, the Public Protection Site Safety Plan (PPSSP), a requirement since 2012, is part of the building permit and plans review process. The PPSSP process design includes two phases:

- Building Permit Application Intake:
    - Building permit application review including PPSSP, where criteria are met; and
    - Public Safety Meeting at the construction site prior to beginning construction above grade.
- Public Protection Safety Inspection.

If construction activities are not properly managed, they can become unsafe for the public, disruptive to those that live nearby, or damage adjacent property. The objective of this audit was to assess the design and operating effectiveness of the PPSSP process to mitigate construction site safety risk. The objective was achieved by assessing key steps/controls in the PPSSP process, and monitoring of key risk indicators between January 1, 2019, and December 31, 2021.

The PPSSP process has evolved significantly since 2012 and is no longer operating as originally designed. Based on sample testing and data analysis, staff did not consistently complete PPSSP POSSE[1] application review workflow procedures, and Public Safety Meetings and Public Protection Safety Inspections did not routinely take place. While key steps in the process were not consistently completed, construction site safety considerations were incorporated informally into current practices. Safety Codes Officers inspected construction sites during building progress inspections rather than dedicated Public Protection Safety Inspections and might cover the Public Safety Meeting agenda at the same time. Although current staff are highly experienced and aware of safety requirements on construction sites, there is a risk, where there is staff turnover, new staff may not be aware of the requirement to address construction site safety during progress inspections. In addition, where current practice is not formalized, there is a risk construction site safety requirements may not be understood and consistently completed by applicants and staff.

Building Services did not monitor key construction site safety risk indicators. To gain further insight on key indicators, the effectiveness of current PPSSP processes, and construction site safety risk exposure, we conducted preliminary analysis of available data and did not identify significant concerns related to PPSSP process effectiveness or construction site safety risk exposure.

Since it's been almost a decade since the PPSSP process was implemented, it is a good time for Building Services to review the intention of the process and current practice and determine a future state that includes formalized critical steps to mitigate construction site safety risk. We also recommended that Building Services select relevant key risk indicators and implement monitoring and reporting to identify construction site safety trends and increasing risk exposure, and assess whether the future state of the PPSSP process is effectively mitigating risk.

[1] POSSE is a business process management tool used by Building Services to manage workflows such as building permit review and approval.

Building Services agreed with our recommendations and has indicated in their responses a commitment to implement these actions between March 31 and December 29, 2023. The City Auditor's Office will monitor the status of commitments as part of its ongoing recommendation follow-up process.

1.0 Background

Calgary Building Services (Building Services), a business unit in the Planning & Development department, is the primary point of contact for customers who require services, including building permit applications and approvals, and inspections. Building Services ensures compliance with regulations governing construction activities, which must comply with Part 8 of the Alberta Building Code and Section 5.6 of the Alberta Fire Code to ensure public safety. If construction activities are not properly managed, they can become unsafe for the public, disruptive to those that live nearby or damage adjacent property.

Building Services helps builders minimize construction impact and ensure public safety through the Public Protection Site Safety Plan (PPSSP). In response to unsafe construction practices, Building Services worked closely with the construction industry to develop technically feasible requirements for protecting the public during demolition and/or construction. Although not required by the Alberta Building Code, the PPSSP has been part of the building permit and plans review process since 2012. The PPSSP process design includes two phases:

- Building Permit Application Intake
- Public Protection Safety Inspection

Building Permit Application Intake

The Building Safety Approvals division reviews drawings for building code compliance and issues building permits. If building plans submitted with a building permit application meet the criteria for the PPSSP, the applicant must submit a separate site safety plan. The City will not issue the permit and construction may not begin until review of the plan[2] is completed and accepted. The PPSSP applies to new construction, demolition, and exterior remodeling, repairs or maintenance and is required if a project meets one of the following criteria:

- The scope of work is on a building 5-storeys or greater;
- The project is designated as a high building as per article 3.2.6 of the current Alberta Building Code; or
- Is required by the City of Calgary (The City) for unique situations such as demolitions or construction adjacent to a public space.

The Building Permit Application Intake process includes a Public Safety Meeting with the applicant and other City business units, where applicable, to review the PPSSP and discuss any concerns identified. After PPSSP intake and approval by the Plan Examiner, the building permit applicant is required to request a Public Safety Meeting prior to commencing construction above grade. The Public Safety Meeting's purpose is to discuss current and ongoing site safety requirements just prior to construction commencing. According to the PPSSP guidelines[3]: "*This is intended to both ensure public and property safety through the entire course of the project as well as to provide the owner/builder with a point of contact with City of Calgary staff.*".

Public Protection Safety Inspection

The Building Safety Services division is responsible for inspections to monitor compliance with building codes and standards. The PPSSP process design includes a Public Protection Safety

[2] For new construction, partial building permits for work below grade may be issued prior to a complete review of the PPSSP by The City.

[3] Staff provided the "Components of a "Public Protection Site Safety Plan" (PPSSP)", which included procedural guidelines.

Inspection of the construction site to ensure a minimum standard of safety is met on the site. Safety Codes Officers (SCO) conduct the inspections and identify deficiencies, which must be addressed by the building owner or construction company carrying out the construction before construction can continue.

SCO may also perform inspections in response to complaints received from citizens and other agencies related to construction site safety. Enforcement action will occur when necessary and can include stop-work orders, and safety violation related charges and fines.

An audit of Building Services was included in our 2022 Annual Audit Plan. During the planning phase of the audit, we reviewed Building Services' Service Risk Register, which identified Construction Site Safety risk and included the PPSSP process as an existing control to mitigate the risk, along with monitoring controls. Since the PPSSP initiative has been in place for approximately ten years, we determined there was value in conducting an audit to review the design and operating effectiveness of the PPSSP process to mitigate the risk of damages or injuries to the public due to unsafe construction sites. Protecting the public from construction site hazards aligns with The City's Principal Corporate Risk: Health and Safety.

2.0 Audit Objective, Scope and Approach

2.1 Audit Objective

The objective of this audit was to assess the design and operating effectiveness of the PPSSP process to mitigate construction site safety risk. The objective was achieved by assessing:

- Key steps/controls in the PPSSP process, from building permit application intake through to approval and inspections; and
- Monitoring of key risk indicators such as number of complaints and safety related charges to assess the risk exposure where Public Protection Safety Inspections are not conducted.

2.2 Audit Scope

The audit included building permit applications with PPSSP, and associated complaints and safety related charges created in the Public One Stop Service (POSSE[4]) system between January 1, 2019, and December 31, 2021. Our review did not include reviewing or confirming compliance with Alberta Building Codes, or technical aspects of reviewing building plan applications.

2.3 Audit Approach

Our audit approach included:

- Interviewing staff and reviewing documentation related to the PPSSP process;
- Reviewing building permit data for compliance with the PPSSP intake and inspection processes; and
- Reviewing key indicator monitoring documentation and data related to number of public safety complaints, and safety related charges and fines associated to building permits with PPSSP.

[4] POSSE is a business process management tool used by Building Services to manage workflows such as building permit review and approval.

3.0 Results

Overall, the PPSSP process, has changed significantly since its inception and is not operating as originally designed. Although key steps in the process were not consistently completed, other current practices in operation, such as building progress inspections, incorporated construction site safety considerations. We recommended Building Services review the design of the PPSSP process and current practice to determine a future state that effectively mitigates construction site safety risk. Key steps and controls in the future state should be formalized to ensure roles and responsibilities are understood by applicants and staff and can be executed consistently (Recommendation 1).

Building Services is not currently monitoring construction site safety key indicators. While our preliminary analysis of available risk indicator information did not indicate construction site safety risk concerns, we recommended Building Services establish relevant key indicators and implement monitoring and reporting to identify construction site safety trends and increasing risk exposure (Recommendation 2). Results will also help Building Services assess whether the future state of the PPSSP process is effectively mitigating risk to the public and minimizing the impact of construction.

3.1 Public Protection Site Safety Plan Process

Based on building permit application data for all building permits entered in POSSE between January 1, 2019, and December 31, 2021, there were 58,099 building permit applications. To identify all building permits that likely met the criteria for a PPSSP, we reviewed all building permits that had a PPSSP procedure assigned in POSSE and identified 76 building permits with one or more procedures.

We selected a judgmental sample of 12 building permits for further review. The sample included unique building permits (demolition and heritage building), building permits for buildings under 5-storeys, and building permits for buildings with 5-storeys or more initiated throughout the audit period (2019-6, 2020-2, and 2021-4). We also analyzed data for the 76 building permits in the audit period.

Our audit analysis (Section 4.1) indicated that, while some key steps in the process as designed were taking place, completion was inconsistent during the audit period:

- Plan Examiners assessed whether a PPSSP was required as part of building permit application review. However, we identified inconsistencies in the completion of POSSE review procedures.
- Public Safety Meetings were not taking place consistently. SCO advised:
    - The meetings are not viewed as a requirement before starting construction above grade, which was the original intention;
    - They may not be able to prioritize meeting requests due to other priorities such as responding to safety incidents or complaints; and.
    - The meeting agenda may be covered during building progress inspections.
- Public Protection Safety Inspections were not taking place as designed. Current practice incorporated construction site safety in building progress inspections rather than as a separate dedicated inspection. Although SCO advised current staff are experienced and aware of safety requirements on construction sites, there is a risk, where there is staff

turnover, new staff may not be aware of the requirement to address construction site safety during progress inspections.

3.2 Construction Site Safety Key Risk Indicators

We confirmed Building Services is not currently monitoring key construction site safety risk indicators (Section 4.2). We analyzed available safety orders and complaint data to gain further insight on key indicators, the effectiveness of current PPSSP processes, and construction site safety risk exposure. Based on our preliminary analysis of complaints and safety orders we did not identify significant concerns related to PPSSP process effectiveness or construction site safety risk exposure.

Complaints Analysis:
When 311 receives a complaint related to construction site issues, SCO create a Non-permitted (NP) application in POSSE. We obtained NP data from Building Services and reviewed NP related to the 12 building permits in our sample to assess whether there was any indication PPSSP practices were not effective. We identified five NP related to public safety issues and reviewed the results, which are included in the Appendix.

We determined one complaint was not preventable since it related to unsafe behaviour and a citizen driving through a block wall. The remainder of the complaints occurred after a Public Safety Meeting, Public Protection Safety Inspection or a building progress inspection. SCO advised scheduled inspections may not identify safety concerns since conditions on construction sites can change. For our sample, key PPSSP steps did not prevent the condition related to the complaint, which should be considered when Building Services determines the future state of the PPSSP process.

Safety Orders Analysis:
SCO issue safety orders to remediate a deficiency on a construction site. We analyzed 356 safety orders in the audit time frame and identified 11 categorized with a type “Creating an Unsafe Condition” and 5 with a description of “Stop all work immediately”. We did not find evidence of increased construction site safety risk exposure related to PPSSP since none of the 16 safety orders were for buildings with 5-storeys or more, and where there was an associated building permit, there was no PPSSP.

Monitoring and analyzing construction site safety risk indicators (Recommendation 2) will assist Building Services in early identification of construction site safety trends and increasing risk exposure to the public and implementation of appropriate mitigating actions. In turn, this process will also support assessment of whether the future state PPSSP process is effectively mitigating safety risk.

We would like to thank staff from Building Services for their assistance and support throughout this audit.

4.0 Observations and Recommendations

4.1 Public Protection Site Safety Plan Process Design and Operating Effectiveness

The PPSSP process has evolved significantly from the process originally designed in 2012. During the audit period between January 1, 2019, and December 31, 2021, staff inconsistently completed key steps in the process as it was originally designed. Since the PPSSP process was developed to specifically address construction site safety, Building Services should review the PPSSP process and evaluate current practice to determine a future state that effectively mitigates construction site safety risk. Once the review is complete, Building Services should update the PPSSP process and formalize key steps and controls, including POSSE procedures, to ensure roles and responsibilities are understood and can be executed effectively.

The PPSSP process includes assigning POSSE procedures to all building permit applications that meet PPSSP criteria. Where a PPSSP is applicable, Plan Examiners check the Site Safety Plans Review box, which generates the "Do Site Safety Plans Review", the "Do Public Protection Safety Meeting" and "Do Public Protection Safety Inspection" procedures[5].

We selected a sample of 12 building permits with a PPSSP in the audit period and walked through the completion of each POSSE procedure to assess key steps/controls in the PPSSP process. In addition, we analyzed building permit data with one or more POSSE PPSSP procedure to gain further insight into current practice[6]. Detailed results are outlined in the table below:

Expected PPSSP Process Step	Sample Testing Results	Data Analysis Results	Audit Analysis
Building Permit Application Intake			
Site Safety Plans Review *Plan Examiners review and approve the PPSSP.*	3 of 12- No completed "Do Site Safety Plans Review" procedure: • 1-No POSSE procedure added; evidence of Plan Examiner review; and • 2- Incomplete POSSE procedure, 1 of which had no PPSSP. Both had subsequent process steps completed.	43% (25/58)- No completed "Do Site Safety Plans Review" procedure, including the 3 in our sample.	While it is possible that some building permits had not advanced to the stage were the PPSSP review could be completed, the high percentage of non-completion indicates inconsistencies in completion of this procedure.

[5] During the audit period, there was a POSSE update to POSSE Web that resulted in POSSE procedures being automatically generated once the Plan Examiner checked the Site Safety Plans Review box. Prior to the update, Plan Examiners manually entered POSSE procedures.

[6] The total for each PPSSP procedure varies since the 76 building permits in the population did not have all PPSSP procedures assigned to each permit.

Expected PPSSP Process Step	Sample Testing Results	Data Analysis Results	Audit Analysis
Public Safety Meeting *Applicant requests a Public Safety Meeting prior to commencing construction above grade. SCO are expected to schedule the meeting once they are notified of the applicant's request, usually within 24 hours.*	3 of 11[7]- No Public Safety Meeting completion date in POSSE.	82% (41/50)- No completed "Do Public Safety Meeting", including 3 in our sample. Analyzed 311 Service Requests in the audit period and identified 14 related to PPSSP: • 9-Requesting a Public Safety Meeting • 3-Applicant made more than one request for a Public Safety Meeting and complained about delay/non-response from SCO (one in each of 2019, 2020 and 2021).	While it is possible that some building permits may not have progressed to a stage where a meeting was required, the high percentage of non-completion suggests meetings are not taking place consistently as designed. SCO interviewed indicated: • They receive a notice in their 'task list' a PPSSP meeting procedure was added to a building permit in POSSE. However, no action is taken upon notification, as the applicant is required to request the meeting. • Applicants may not be aware of their responsibility to request a meeting[8]; • If an applicant requests a meeting, SCO will schedule one.

[7] Sample size for this test and the next is 11, since one building permit applicant submitted a PPSSP with their application, which was not required and there was no "Do Public Safety Meeting", or "Do Public Protection Safety Inspection" POSSE procedure assigned.
[8] We noted guidance on The City website indicates applicants should call to schedule a Public Safety Meeting.

Expected PPSSP Process Step	Sample Testing Results	Data Analysis Results	Audit Analysis
Public Protection Safety Inspection			
Public Protection Safety Inspection *Designed to monitor compliance with the PPSSP and activities on construction sites that impact public safety. Scheduled and performed by the SCO.*	5 of 11-No completed "Do Public Protection Safety Inspection" procedure: • 1- Completed PPSSP meeting and multiple building progress Inspections; • 1- Completed multiple building progress inspections; and • 3- Building permits related to 2021 where there were no progress inspections, and it was unclear whether construction progressed sufficiently to require a PPSSP or progress inspection within the audit time frame.	62% (33/53)- No completed "Do Public Protection Safety Inspection" procedure. Further analysis indicated 16 building permits where a POSSE progress inspection procedure had been added, 12 of which had one or more progress inspections.	Sample results supported by interviews and data analysis, indicated current practice is to inspect construction site safety during progress inspections rather than as a separate construction site safety inspection.

<u>Recommendation 1</u>
The Director of Building Services review and update the PPSSP process to effectively mitigate construction site safety risk.

Management Response:

Agreed.

Action Plan	Responsibility
a)Building Services will conduct a comprehensive review of the PPSSP process including: • Confirming the criteria when a PPSSP is required; • Determining if Public Safety Meeting is applicable; and • Determining if the Public Protection Safety Inspections' outcomes should be separately recorded. b) Building Services will review and refine operational process including key steps and controls, and POSSE procedures.	Lead: Manager, Building Safety Services Support: Coordinator, Building Inspections Commitment Date: a)March 31, 2023 b)April 30, 2023

4.2 Monitoring Construction Site Safety Key Risk Indicators

Building Services is not regularly monitoring and reporting on key risk indicators that would provide insight into risk to public safety due to construction activity. Monitoring key risk indicators supports identification of trends and measurement of changes in risk exposure related to construction site safety, and assessment of the on-going effectiveness of PPSSP processes.

City Services prepare Service Risk Registers to support The City's Integrated Risk Management Program by identifying risks and risk treatments and ranking the current level of risk based on key indicators that are measurable and reviewed regularly. Risk levels are determined by assessing the effectiveness of the risk treatment and trending information provided by key indicators.

Building Services' Service Risk Register categorizes construction site safety under the Principal Corporate Risk: Health & Safety. The existing control and/or risk treatment includes the PPSSP process, and a risk rating supported by monitoring of the following key risk indicators:

- Number of complaints;
- Number of inspections that meet minimum safety standards; and
- Number of safety related charges.

Building Services staff confirmed the key indicators in the Service Risk Register related to construction site safety were not monitored or reported. Staff also indicated existing key indicators may not yield information useful to assessing construction site safety risk trends and exposure as follows:

- Number of complaints- Data is available. However, the data is not being analyzed to identify trends in construction site safety.
- Number of inspections that meet minimum safety standards- Data is not currently collected.
- Number of safety related charges- Law determines whether or not a safety order results in a safety related charge, which can take time. As a result, this information may not be immediately available to Building Services.

Staff indicated potential indicators that would be meaningful to support monitoring construction site safety trends and the effectiveness of the PPSSP program in mitigating risk included the number of safety orders issued by SCO, number of complaints against active construction sites with a PPSSP, number of PPSSP inspections, and ratios of number of complaints to number of construction sites.

Building Services should identify the most relevant key risk indicators and implement monitoring and reporting of trends to identify increasing risk exposure related to construction site safety. They should also consider the availability of data, including consistent use of processes that support data collection (i.e. ensure staff use a consistent POSSE procedure to record activity). Key risk indicators should be relevant and monitored regularly to determine if the PPSSP, as a control technique or risk treatment, is supporting risk ratings and can be relied on as a mitigation.

Recommendation 2

The Director of Building Services review and update key risk indicator monitoring processes including:

- Selecting indicators that are relevant to construction site safety risk;
- Determining monitoring frequency to support risk trending information;
- Ensuring processes support data availability and collection; and
- Setting appropriate thresholds to identify when additional mitigation is required.

Management Response:
Agreed.

Action Plan	Responsibility
• Develop construction site safety risk metrics; • Establish base line, through review of citizen complaints or concerns; • Determine proper risk thresholds; and • Develop a process to monitor key indicators on a defined frequency and take action when risk thresholds are exceeded.	Lead: Manager, Building Safety Services Support: Reporting and Analytics Lead Commitment Date: December 29, 2023

APPENDIX

Complaint Type	#	Complaint Date	Public Site Safety Meeting Date	Public Protection Safety Inspection Date	1st Building Progress Inspection Date	Analysis
Hoisting not included in PPSSP	1	06/11/21	05/28/20	05/28/20	11/25/20	• Complaint is after meeting and inspections • Scheduled inspections may not identify safety concerns due to changing construction site conditions
Improper fencing creating unsafe conditions for drivers	2	05/12/20 09/17/21	03/26/20 06/30/21	N/A 06/30/21	03/18/20 N/A	• Complaints are after meeting and inspections • Scheduled inspections may not identify safety concerns due to changing construction site conditions
Citizen drove through block wall	1	06/09/21	10/05/20	N/A	N/A	• Complaint was due to unsafe driving and not preventable
Scaffolding blocking access to adjacent facility	1	10/08/21	10/05/20	N/A	N/A	• Complaint is after meeting • Scheduled inspections may not identify safety concerns due to changing construction site conditions