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Organizational factors affecting the safety and safety culture at a medium sized construction site.

A case study at a Skanska construction site.

Master's Thesis in the Master's Programme Design and Construction Project Management

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Department of Architecture and Civil Engineering

Division of Building Design

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MASTER'S THESIS ACEX30

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Institutionen för arkitektur och samhällsbyggnadsteknik
Chalmers tekniska högskola, 2025

Department of Architecture and Civil Engineering
Division of Building Design
Chalmers University of Technology
SE-412 96 Göteborg
Sweden
Telephone: + 46 (0)31-772 1000

Cover:
An illustration of Skanska employees walking through a construction site. Source: Skanska media hub

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ABSTRACT

The construction industry is regarded as one of the most dangerous sectors in Sweden, with a significant number of work-related injuries reported each year. To create a safer industry, the organisations within the construction industry hold great responsibility in creating a better workplace for their employees. To understand what affects the safety on construction sites this report studies a midsized Skanska project in Sweden. Through interviews with actors active in the project organisation from Skanska and subcontractors, understanding of what creates a safe construction site and a strong safety culture is gathered. Different organisational and site-specific initiatives as well as general site visit observations are carried out to get an understanding of how things on site actually works. The result indicates there is a deviation through the organisation where a lack of understanding from either end means some measures are disqualified from the beginning. However, many things work as intended and the general opinion gathered from the interviews and observations is that the site is working actively with safety which is paying off. As the complexity of the project increases with more people on site, the on-site management face challenges in maintaining the same safety standard. Making others adapt to their safety culture and policies rather than following their own was found to be challenging, requiring more on-site presence over time. It was found that organisations have a role in making the decision to do the right thing easy. Through inclusion and education, organisations can create policies which the actors in the organisation understand and accept, creating a shared risk perception and a common goal. However, some issues were found more challenging than others as personal risk perception combined with an industry reluctant to change makes issues such as personal safety equipment difficult to solve.

Key words: Safety, safety culture, management, communication, organisation, construction…

Organisatoriska faktorer som påverkar säkerheten och säkerhetskulturen på en medelstor byggarbetsplats. En fallstudie på en Skanska-byggarbetsplats.

En case studie på en Skanska byggarbetsplats.

Examensarbete inom masterprogrammet Design and Construction project management

ALIZE RASHID

VALTER SAMUELSSON

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Avdelningen för Byggnadsdesign
Chalmers tekniska högskola

SAMMANFATTNING

Byggbranschen anses vara en av de farligaste branscherna att arbeta inom i Sverige med ett stort antal arbetsrelaterade olyckor rapporterade varje år. Som reaktion på statistiken har flera organisationer inom branschen engagerat sig för att skapa en säkrare byggindustri för sina anställda. För att förstå vilka faktorer som påverkar säkerheten på byggarbetsplatser genomför den här rapporten en fallstudie på en medelstor Skanska byggarbetsplats i Sverige. Genom att intervjua olika aktörer som är aktiva i projektorganisationen, från Skanska-anställda på kontoret till underentreprenörer, skapas en förståelse för vad som skapar en säker byggarbetsplats och en stark säkerhetskultur. Olika organisatoriska och platsspecifika initiativ samt generella platsbesök observerades för att få en förståelse för hur arbetsplatsen faktiskt fungerar. Resultaten indikerar att det finns en splittring inom organisationen vad gäller förståelse för olika initiativ, där de ibland resulterar i en negativ attityd från början. Samtidigt fungerar mycket i organisationen som det var tänkt och den samlade åsikten från intervjuer och observationer var att arbetsplatsen aktivt jobbar med säkerhet på ett sätt som gör att det märks. När projektet blir mer komplext, med fler personer, ökar utmaningen för platsledningen att bibehålla säkerhetsstandarden på projektet. Att få arbetare att anpassa sig till säkerhetskulturen som organisationen etablerat visade sig kräva mer närvaro från platsledningen över tid. Resultatet indikerade att organisationen har en tydlig roll i att göra beslutfattningsprocessen enkel. Genom inkludering och utbildning kan organisationer skapa riktlinjer som är förståeliga och acceptabla för aktörerna på arbetsplatsen, resulterande i en delad riskuppfattning och gemensamma mål inom organisationen. Samtidigt var vissa utmaningar större än andra med personlig riskuppfattning kombinerat med industrins motvillighet till förändring resulterande i att personlig skyddsutrustning återkommer som problem.

Nyckelord: Säkerhet, säkerhetskultur, byggbranschen, organisation, ledande yrkesroller, kommunikation

CONTENTS

PREFACE

The master's thesis was conducted in the Division of Construction Management at the Department of Architecture and Civil Engineering at Chalmers University of Technology. The thesis was the final part in the M.Sc. program Design and Construction Project Management and consisted of 120 ECTS. It was performed in cooperation with Skanska AB during the spring term of 2025. All the work done in the thesis was divided equally between the researchers.

There are several people that deserved acknowledgement from contributing to the thesis. First, we would like to thank our supervisor at Chalmers, Associate Professor Martine Buser for pushing us constantly and being committed to moving the project forward. It has been reassuring to have such an engaged supervisor. We would also like to thank Karin Moen at Skanska AB for being more than just a contact person. Your input and guidance have made the study fun and we are grateful for the freedom you have given us in regards to where we wanted to take this study. And a big thank you to all the people at the construction site that made us feel very welcome and safe during our visits, your contribution was crucial for our study. We would also like to thank all the interviewees for your willingness, knowledge and input. The study would not be able to exist without you and we are very grateful for the fact that so many engaged in the interviews. Finally, we would like to thank family and friends for pushing, supporting and celebrating this achievement together with us.

By conducting this project we have gained extensive knowledge regarding safety work, organisational factors, management and a construction site. This was the final step to conclude our education at Chalmers University of Technology and we would like to thank everyone involved.

Göteborg, May 2025

Alize Rashid

Valter Samuelsson

1. INTRODUCTION

The construction industry is regarded as one of the most dangerous sectors in Sweden, with a significant number of work-related injuries reported each year. In their 2023 report, Arbetsmiljöverket revealed statistics that show that the construction sector accounted for around 10% of all workplace injuries, highlighting the continuous safety challenges faced by workers. The industry has also seen a troubling pattern of fatal accidents, with nearly a quarter of all workplace fatalities in Sweden over the past decade occurring in construction. These figures have fueled public discourse on the effectiveness of existing safety measures and the need for stricter regulations (Arbetsmiljöverket, 2024). While the risks of construction work are well-documented, recent incidents have further underscored systemic weaknesses in the industry. One tragic event in December 2023, where a construction elevator plummeted from the ninth floor, killing five workers, brought attention to gaps in oversight and documentation (Statens Haverikommission, 2024). Initial confusion about the workers' identities raised concerns about subcontracting practices and the lack of transparency in worker registration. This incident has increased discussions on industry-wide accountability and the long-term sustainability of subcontracting models. The growing focus on construction safety is not limited to industry discussions; academia has also recognized its urgency. Research on occupational hazards in construction has expanded, with increasing attention to best practices, safety culture and regulatory frameworks aimed at reducing accidents and fatalities (Senthamizh Sankar & Anandh, 2024). Reacting to these statistics, organisations within the industry have, over time, increased their focus on safety with Skanska being one of them.

In this report, a medium sized Skanska project was studied in order to understand how their organisational wide initiatives affect the safety and safety culture on site. The report also investigates factors and methods used on site, in order to create a safe site and a sustainable safety culture, and see if they function as intended. The project includes workers from Skanska in different roles as well as subcontractors which makes it applicable to other projects in the industry, being close to the standard setup for a medium sized project. The site has some unique challenges that have influenced the project and plan which means there are insights as to what organisational structures continue to work and which guidelines are, when pressure is applied, not prioritized. Studying how the project organisation deals with these challenges and using established methods such as communication, policymaking and management leadership to create a safety culture on site which aligns with the safety culture of the Skanska organisation. It will also be investigated how the people within the project organisation perceive each other's commitment and initiatives to create a safer workplace. Although the study focuses on a specific Skanska project, the intention is also to gain a broader understanding of how safety practices and organisational structures function within the construction industry as a whole. When mentioning

safety in this report, it refers to every situation that could lead to someone getting injured. For example, a metal pipe falling down on someone, a worker not wearing gloves and getting a cut or someone falling over due to a messy workstation. It includes any workplace accidents that could lead to a person getting hurt. The report does not however include psychosocial workplace risks like bullying, feeling unsafe at work and similar risks. The report will also mention leadership in the context of professional leadership assigned to people in leading work positions and not informal leadership.

Based on these findings, the thesis aims to provide actionable recommendations for improving safety practices, reducing workplace accidents and fostering a more resilient safety culture, both within Skanska and from a broader industry perspective. The study also examines how subcontractors are integrated into Skanska's safety protocols and how their adherence to safety standards is monitored.

1.1 Purpose

The purpose of this report is to investigate the role of management in the context of safety in the construction industry. It aims to provide a deeper understanding of how safety protocols are implemented and maintained at the operational level on a medium size Skanska construction site in Sweden. By examining both the perspectives of on-site workers and office staff, the study seeks to uncover potential gaps or areas of improvement in current safety practices. The report also explores how safety culture is shaped within an organization which puts great effort into making their sites safer through different initiatives. It also explores how communication and collaboration between different levels of staff contribute to safety outcomes and how management decisions impact the day-to-day safety experience for workers within the organisation. This research aspires to offer practical insights for enhancing safety practices in construction, while also contributing to the broader body of academic literature by connecting the findings to general trends and challenges within the industry as a whole.

1.2 Research questions

- How do the actors on site and in the organisation influence the construction site safety and safety culture at a medium sized project?
- How do workers on site perceive safety measures and initiatives implemented by the organisation?
- How does the worker's views and experiences affect the real-world safety culture on site, beyond just written rules or official procedures?
- How does the safety climate among different actors on-site and within the company indicate the future development of safety practices in the construction industry?

1.3 Limitations

- The time frame for observation is limited which means only certain parts of the construction phase will be observed. Starting during groundworks and raising the framework and the last observation during the introduction of casting the floor and the finalization of the framework and roof.
- The issue is generally sensitive and therefore the results from the interviews could be somewhat misguided as the interviewee might not want to admit their wrongdoings.
- The study is limited to physical risks and does not focus on psycho-social risks.
- The study is limited to one specific site which makes generalisations about the industry or Skanska as a global organisation less relevant but rather the Skanska Sweden context will be relevant.

1.4 Overall aim and objectives

The aim of this thesis is to demonstrate the knowledge and abilities required for independent work as a Master of Science in Engineering, Architect or Master of Science. The study focuses on deepening the understanding of safety management within the construction industry, using Skanska's medium size construction site in Göteborg, as a case study. The objective is to analyze and assess the effectiveness of current safety measures on-site, identify key challenges and explore the role of management and communication in shaping a strong safety culture. Particular attention is given to the influence of organization-wide safety initiatives, the importance of clear communication between different levels of staff and the critical role of site managers and supervisors in ensuring safety.

1.5 Ethical considerations

When writing this report several ethical considerations have been made. Due to the context of doing a case study of a specific site as well as interviews with individuals connected to the specific project, issues such as data privacy and professional integrity are relevant to consider. Because of the size of the site and organization it is important to value the information gathered and work with a transparent process when it comes to how the information gathered through observations and interviews will be used and spread in order to not bring harm to any participants. To enforce this each interview was started with a description of the report purpose, information of how their contribution would be used and the participant was asked if they agreed to be recorded. Once the interviewee have given their consent the interview could be started (Chenail, 2019)

To assure confidentiality the recording was started after the person had answered personal questions such as name, experience in the business and age. This measure

was done to protect the interviewee in the case the transcript would be used in any information handling program. To make sure anonymity is accomplished both for skanska and the participants the Skanska name would be substituted for “the company” in the case of transcriptions being fed to any outside program. Through the writing process the transcriptions were stored by first name of the interviewee but without last name or title. During the process only the authors had access to the transcripts and recordings. When used in the report the first name of the interviewed participants were substituted to their professional role for example *Supervisor 1* (Hickson III, 1974). Any quotes which diverge from “public opinion” was controlled to ensure there are no misinterpretations during the transcription process. Once the data was used all recordings and raw transcriptions were deleted.

As an ethical consideration the exact date of observation and the actors involved is not displayed. This was due to the risk of observing rule defying behaviour which was not the purpose of the report but something to be handled within the Site organisation.

Because of the nature of the case study which involves one main contractor and their employees as well as a client and subcontractors there is a clear potential to bias. Most obvious when interviewing subcontractors which might not have the same employee security and at the same time being at the project part time and depending on being hired as subcontractors for future projects they might avoid criticising Skanska.

1.6 Sustainability

The report is primarily focused on social sustainability through safety and the well-being of workers in the construction industry. As mentioned in the introduction the construction industry faces multiple challenges due to the statistics and public opinion of it being unsafe. These aspects are somewhat connected to economic sustainability through the issues of lack of skilled labour and high unemployment which in some cases are connected to the reputation of the industry. Some people might choose other work due to the high accident rates within construction. The global sustainability goal 8, Decent work and economic growth , the subgoal 8.8 states “many workers face significant risks in their workplaces” (United Nations [UN], 2025). This report might indicate how an organization within the construction industry can act in order to create safer worksites.

2. METHOD

This chapter outlines the methodological approach applied in this study to examine safety practices at a medium size construction project in Gothenburg. The study adopts a qualitative method that aims at gaining a deeper understanding of how safety procedures are implemented, communicated and followed in practice. As part of this approach, a case study was conducted on the specific construction site, allowing for an in-depth exploration of safety routines in a real-world context.

2.1 Research design

To answer the research questions, we conducted a qualitative case study with two main data collection methods: interviews and observations. This design was particularly suitable because the research aimed to explore different behaviours and perceptions related to safety culture in a specific real-world context. A qualitative case study enables in-depth understanding of context-dependent practices and the meanings individuals attach to them, something that quantitative approaches would not have captured as effectively.

In order to analyse the results gathered from the data collection a theoretical framework was compiled. Semi-structured and unstructured interviews were conducted with key stakeholders in the construction project listed in table 1. Observations were carried out at the construction site to examine safety measures in practice and get an idea of how they work and identify any deviations from formal guidelines.

The interviews provided insights into perceived challenges and improvements, while observations allowed for an assessment of how the work occurred in real situations. By combining these methods, the study aimed to capture both the intended and actual practices within the construction site. The interviews also helped the report by giving first hand perspectives from workers and managers, highlighting not only communication issues but also broader experiences with safety policies and management behaviour. This qualitative input allowed the report to present a more nuanced understanding of the safety culture, revealing gaps between formal procedures and everyday practices and also suggesting targeted areas for future improvement.

The use of multiple methods and perspectives strengthens the credibility of the findings through triangulation, increasing trustworthiness by showing consistency across data sources and providing a well-rounded view of the studied context (Creswell & Poth, 2018).

The interviews with the collar workers and the On-site managers were, with concession, recorded and transcribed using Microsoft teams. The interviews with blue collar workers and subcontractors were not recorded as they were made on-site with

limited ability to record. Notes were however taken in all four instances and then used to control the transcriptions of the first two roles. The transcriptions and notes were then analysed by highlighting similarities between the interviewees within the same group, which formed the report results. The same approach was then used to find discrepancies between interview groups and observations.

Special focus was placed on the issues of the research questions and aspects that could be linked to them. To understand how safety is communicated within the construction project, this study examined both formal and informal communication channels. The focus was on how safety information is delivered, the effectiveness of communication between different actors and how workers perceive and respond to safety messages. Data on safety communication was collected through interviews with site managers, safety officers and workers, as well as observations and on-site interactions. The interview study and observations also strongly contribute to understand the roles of both on site managers and higher management. It gives an idea of both the day to day management on site as well as the organisational management affect everybody involved in the project.

During the literature review and more specifically the background active policies and guidelines both industry wide and company specific were studied. The literature review also examined the industry context which set the president of how a construction site operates and which roles are included to conduct a construction project. It also enables a deeper understanding as to how and what the literature has found affecting aspects such as safety culture and on-site safety.

2.2 Literature review

The literature review includes scientific articles, industry reports and relevant legislation to provide a theoretical background and contextualize the empirical findings. It has been done by collecting and reviewing information from different sources such as official websites, books, conference papers and scientific reports. In order to find relevant literature established databases, foremostly google scholar and Chalmers Library were used. Keywords were identified relating to the topic and used when searching such as safety, safety management, safety leadership, safety in the construction sector etc.

The literature review is divided into two parts, being background and theoretical framework. The information gathered forms a basis of understanding for the topic as well as an understanding of what has been considered in other reports and how this report can contribute to the field. In order to understand the industry in which the case is set in the background, include an overview of the industry context and how it affects a site such as the case. The background also contains organisational context which guide the work on site through policies and guidelines. This information was retrieved either from Skanskas internal website, Oneskanska, or from their public

website. Most of the information was available to users outside the organisation through their website but some was limited to Skanska personnel only.

2.3 Interview study

By reviewing the method outlined by (Kallio et al., 2016) in their review paper Systematic methodological review: developing a framework for a qualitative semi-structured interview guide it was decided to use a semi structured interview approach. After establishing the conditions are suitable for using semi-structured interviews, since the topic can be sensitive and the purpose is to investigate the interviewees opinions and perceptions. As a part of the suitability analysis of semi structured interviews they argue the importance of using previous knowledge in order to assist in creating the interview guide. In order to be able to direct the interview to align with the research focus Kallio et al. (2016) suggest creating an interview manuscript which is based on the gathered literature, but also using the interview to fill knowledge gaps remaining. The used interview guide in this report will have been using both Internal testing as suggested in the review paper but also Field tested in order to make sure the questions were relevant. The final phase recommended was publishing the interview guide which in this report can be found in appendix 1-4 for the different interview groups. All interviews were held in Swedish with people who spoke Swedish as their first language.

The interviews with management roles were held in a semi-structured way with the goal to get an understanding of their experiences in regards to safety and safety culture. The interviews with the construction workers and subcontractors were held out on the construction site in an more unstructured way, however still using a battery of prepared questions combined with followup questions. The difference of questions was due to the circumstances of their work and time availability.

The specific roles chosen for interviews were identified through conversation with individuals with relevant experience in the fields as well as employees involved with the project. Starting by interviewing white collar employees within the company to establish an understanding of what their objectives and strategies are when it comes to safety and creating a safety culture within the organisation. Figure 1 below shows how the organisation within the company and more specifically within this project is built and what their presence is on the construction site. In the Skanska organisation that works mainly at the office but also out on the projects in some capacity, we interviewed one health and safety manager, two health and safety leaders and the district manager in charge of the region that the project is under. At the work site, we talked to the production manager and BAS-U, the interim production manager now working as a supervisor in the project, three other supervisors on the project, 4 construction workers of which one was a safety representative and 3 subcontractors all represented below.

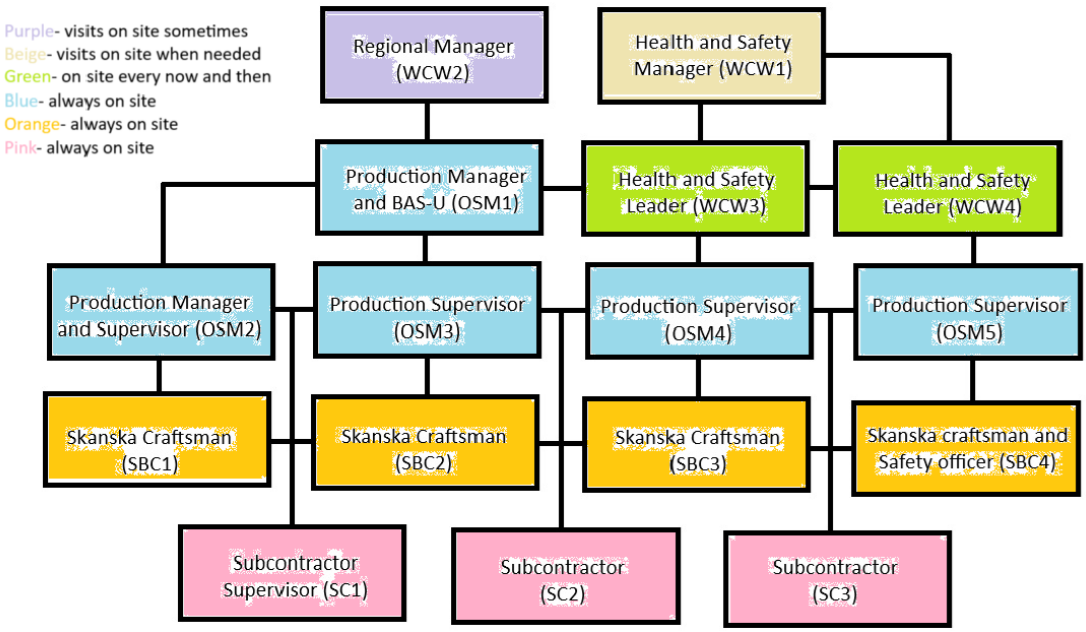

Figure 1: *Description of Skanskas organisation specific to this project.*

In the table below the different interviewees are listed with their reference which will be used in the report, an explanation and their experience in the construction industry. White collar workers (WCW) in table X below are the people who are mostly working from the office between 40 and 60 years old. On-site management (OSM) includes different levels of management based at the on-site office and their experience varied from 4-34 years. The Blue collar workers (SBC) are the craftsmen employed by Skanska and subcontractors (SC) are the ones hired to perform specific tasks on the project. Throughout the report, the respondents will be referred to as the column name in report states found in table 1. This is to enforce the ethical considerations and promises made in the interviews in terms of answers not being traceable to their person but rather representing their role.

Table 1: *The role, experience in the construction industry and name in report of all the interviewees in the study.*

Role	Experience	Name in report	What it stands for
Health and Safety Manager, Female	32 years	WCW1	White Collar Worker 1
Regional Manager, Female	26 years	WCW2	White Collar Worker 2
Health and Safety Leader, Male	10 years	WCW3	White Collar Worker 3
Health and Safety Leader, Female	18 years	WCW4	White Collar Worker 4
Production Manager and BAS-U, Male	14 years	OSM1	On-site Manager 1
Production Manager and Supervisor, Male	12 years	OSM2	On-site Manager 2
Production Supervisor, Male	34 years	OSM3	On-site Manager 3
Production Supervisor, Male	4 years	OSM4	On-site Manager 4
Production Supervisor, Male	8 years	OSM5	On-site Manager 5
Skanska craftsman, Male	9 years	SBC1	Skanska Blue Collar Worker 1
Skanska craftsman, Male	17 years	SBC2	Skanska Blue Collar Worker 2
Skanska craftsman, Male	30 years	SBC3	Skanska Blue Collar Worker 3
Skanska craftsman & safety officer, Male	44 years	SBC4	Skanska Blue Collar Worker 4
Subcontractor Supervisor, Male	4 years	SC1	Subcontractor 1
Subcontractor, Male	39 years	SC2	Subcontractor 2
Subcontractor, Male	7 years	SC3	Subcontractor 3

2.4 Observational study

To gain direct insights into the safety practices at the construction project, observations were conducted on-site. The purpose of these observations was to examine how safety measures were implemented in practice, identify potential deviations from safety protocols and assess the overall safety culture on the construction site. The observations are an important complement to the interviews to not only see how things work on site but also identify gaps between what is said in the interviews and what is seen in the observations.

The observations were non-participant, meaning that we did not interfere with the work but rather documented ongoing activities. A structured observation guide which can be found in appendix 5 was used, focusing on key safety aspects such as:

- Work Environment & Risk Management
- Use of Personal Protective Equipment
- Work Routines & Safety Culture
- Communication & Responsibility
- Equipment & Machinery Safety

Data was recorded through field notes and some photographic documentation, ensuring that no confidential or sensitive information was captured. Observations were conducted on four different occasions at different times of the day and on different occasions to capture variations in safety practices. Observations started during the groundworks and framework erection and the last observation was made during the casting of the floor and initial phases of electricians and roofers operations. When planning the observations multiple of the methods explained in Granström (2004) were considered. Due to the ethical considerations made in *1.5 Ethical considerations,* as well as organizational possibilities it was chosen to use an observation with an open schedule. This means the participants observed were informed of the study and the aim, method and how the information gathered would be used. Granström (2004) argues this method of observing interferes with the authenticity of the situations more than other methods but it is more ethical. Because of the role of the observations in this study, being a complement to the interviews, the factor of interference was not considered as valuable as other considerations.

2.5 The use of AI tools

Different AI tools have been used throughout the development of this report to help with organizing interview data by identifying recurring themes and suggesting possible patterns across different responses. It has also been used to support the writing process by providing language improvements and restructuring sentences for clarity. Additionally, it has been used to provide different sources that are relevant to the topics. All AI generated contributions were reviewed critically and adapted to make sure they aligned with the research objectives and maintained a high level of academic integrity.

3. BACKGROUND

As previously mentioned, construction remains one of the most high-risk industries, with workers regularly exposed to dangerous conditions such as working at heights, handling heavy machinery and dealing with hazardous materials. These risks make stringent safety protocols not only a regulatory requirement but also a necessity for protecting workers' well-being. Despite improvements in safety standards, construction continues to report some of the highest injury and fatality rates. According to the International Labour Organization (ILO, 2023) the sector accounts for around 20% of global workplace fatalities. Similarly, within the European Union, construction-related deaths represent a significant share of all work-related fatalities. In Sweden, the industry continues to rank among the most hazardous sectors, pushing ongoing efforts to enhance safety management and compliance with legal regulations (Arbetsmiljöverket, 2024). These persistent risks highlight the need for both industry-wide and governmental initiatives to strengthen workplace safety measures.

The Swedish Work Authority's website provides a load of information on health and safety regulations for all work environments, including the construction industry. Some of the key topics that are the most relevant to the construction sector include personal protective equipment, which should complement but not replace other safety measures and fall protection, as falls are among the most common workplace injuries. The website also covers risks related to collapses and landslides, highlighting the importance of preventive measures. It also addresses vibration hazards from work equipment and the need for ergonomic load management to prevent strain-related injuries. Practical guidelines are provided to help employers minimize risks and create safer workplaces (Arbetsmiljöverket, 2024).

3.1 Construction industry context

Given the high accident rates, strict legal requirements and the impact on worker well-being, safety has to be a top priority in the construction industry. This leads to some companies implementing extensive safety programs to mitigate risks, but continuous improvements are needed to ensure safer working conditions. However the construction industry is well known as a sector that struggles with cultural change, which is highlighted in several studies. Löwstedt (2017) says that even though there are ambitions to improve efficiency, deeply ingrained professional roles and traditional ways of working create resistance to standardization and innovation. Boverket (2025) also points out that a lack of motivation and engagement among workers contributes to recurring errors and inefficiencies, making cultural shifts difficult to implement. Some reasons people are unmotivated to change their habits could be that the work assignments are not seen as valuable or that people feel like they are not valued at the company. Their research underscores the importance of actively transforming project cultures to increase accountability and quality. Additionally, Löwstedt (2017) suggests that understanding the underlying

mechanisms of change resistance is key to fostering long-term renewal within the industry. These findings show that despite the recognized need for modernization, well established habits and occupational identities make cultural transformation in construction a complex and slow-moving process. The report points out that professional roles, personal attachment and well established work ways make the greatest obstacles in change, even though the need for change is known. Löwstedt shows how change often occurs reactively and person related rather than through a persuasive and long-term renewal. He mentions the role of site manager as an example on how deeply rooted professional identities and ideals of freedom counteracts standardisation and industrialisation, and with that hinders desired development.

In order to deal with the reluctance to change there are several initiatives within the Swedish construction sector trying to make the change of habits manageable. One example of such an industry-wide initiative is Håll Nollan, a Swedish membership organization founded in 2017 by 13 industry stakeholders, including major construction companies and public agencies. Its mission is to ensure that everyone working on construction and civil engineering sites returns home uninjured after each workday. The organization promotes collaboration across the entire construction process, uniting clients, contractors and designers to share knowledge and improve workplace safety. Key initiatives include the annual Safety Push, a coordinated event held week 38, where members pause work to highlight the importance of cooperation in achieving a zero-accident industry. Additionally, Håll Nollan awards an annual Occupational Health and Safety Prize to teams demonstrating exceptional commitment to safety, recognizing their efforts to create accident-free work environments. Through these initiatives and the development of safety standards and guides, Håll Nollan strives to foster a culture where safety is paramount and all industry participants work together to eliminate workplace accidents (Håll Nollan, n.d).

Small and medium-sized companies often face specific challenges when it comes to maintaining high standards of occupational health and safety, especially during times of economic pressure. Unlike larger organizations, research shows that these companies have limited resources to dedicate to systematic health and safety management. Safety in small firms is often not prioritized, as management tends to focus more on production targets than on preventing safety measures. This becomes even more clear during financially difficult periods, when cuts are often made in areas such as training, staffing and protective equipment (Walters & Wadsworth, 2014). Smaller construction companies face large challenges in implementing safety measures compared to large firms that have dedicated in-house safety and health initiatives. Unlike major corporations that can afford specialized safety departments and extensive training programs, smaller firms often rely on external resources like industry associations, subcontracted safety consultants and government-provided guidelines (Lingard & Holmes, 2001). Due to limited budgets, they might struggle to

invest in advanced safety technologies or regular safety training, making compliance with strict regulations more difficult (Al-Bayati et al., 2023). Instead, safety management in smaller companies often depends on hands-on management, peer accountability and simplified protocols adapted to their specific work environments. For example, they might implement basic but effective measures such as daily safety briefings, checklists and a strong focus on personal protective equipment enforcement (Wang et al., 2016). However, without the same level of structured oversight, these companies may experience higher risks of workplace accidents and rely more on personal responsibility and informal safety cultures (Al-Bayati et al., 2023). Collaboration with larger firms through subcontracting arrangements can sometimes provide access to better safety practices, but ensuring consistent safety standards across projects remains a challenge (Lingard & Holmes, 2001).

Even though there is a basis of both information and tools to create safe workplaces the construction industry seems to have trouble implementing them. However it is important to recognize there is a difference between the construction industry and the manufacturing industry. The main difference which makes comparisons somewhat unfair is the changing conditions at a construction site. Since the baseline and conditions are changing, solutions are by default temporary. Another challenge which is facing the industry is the shortage of skilled labor. Byggföretagen reports that 40% of approximately 500 surveyed companies have had to decline projects due to a lack of skilled workers, while 66% find it challenging to recruit qualified personnel (Byggföretagen, 2024). This shortage not only impacts project execution but also affects overall workplace safety, as a well-trained workforce is crucial for maintaining safe working conditions and adhering to industry regulations.

When both the construction sites and the personnel working there are changing there is a great challenge in creating a **standard procedure** for working. Larger construction companies have developed a standard of which their construction sites should be operating. This includes subcontractors who are expected to adapt to the demands placed by the main contractor. This is however challenging as each company has different standards and collaboration often is temporary. The shortage of skilled labour in the Swedish market adds another challenge with labour from other countries, where the standard procedure might differ even more. The communication and understanding of the standard way of working might also be affected by things such as language barriers, previous working experiences and habits (Kivrak et al., 2009). This is also connected to the human factors, which refer to the various elements that influence human performance and behavior in the workplace, including organizational culture, communication and individual competencies. Recognizing and addressing human factors is vital in reducing errors and accidents on construction sites. Additionally, technology in safety management plays a key role in improving workplace safety. The integration of technological solutions such as digital monitoring systems, wearable devices and Building Information Modeling (BIM)

enhances the ability to monitor, analyze and improve safety conditions in real-time (Evelyn, et.al, 2016).

Experience feedback is something which holds both challenges and potential for the industry (Gustavsson et al., 2019). While internal communication within individual teams is generally strong, the study says that there are barriers when it comes to sharing knowledge between different project phases and departments. A major issue is that a lot of the valuable knowledge remains implied, living with individuals and is often lost when employees leave or when it is not actively documented. Existing digital tools are perceived as difficult to use and poorly integrated, which discourages employees from utilizing them. The lack of time and high workload also limit opportunities for reflection and knowledge sharing. Despite these challenges, the study points out that there is a strong willingness among employees to both share and receive experiences. Experience feedback is seen as a key tool for improving quality, avoiding repetitive mistakes and increasing efficiency and competitiveness in construction projects. Similarly, the study by Serpella et al. (2014) also pushes the importance of knowledge and experience in improving risk management within construction projects. It highlights that the lack of structured experience feedback often leads to poor risk identification, insufficient preventive actions and ultimately reduced project performance. Much like Gustavsson et al. (2019), the authors point to the frequent loss of valuable knowledge due to insufficient documentation and the mobility of personnel. By integrating experience feedback into a detailed risk management system, construction companies can not only reduce uncertainty but also enhance decision-making and project outcomes. In this way, experience feedback is not only a tool for learning but also a strategic resource for improving risk management maturity and organizational resilience.

In a recent report from Ramirent, they highlight serious work environment issues in the Swedish construction industry. According to their 2024 survey, 54% of workers feel stressed weekly and 60% have experienced mental health issues due to work in the past year. Contributing factors include tight schedules, poor communication, unclear leadership and lack of guidelines, which are very common issues in the construction sector due to the nature of project based industries. Efforts to improve mental well-being through organizational changes have had limited success, partly due to structural issues and external factors like the pandemic (Cedstrand, 2023). High stress levels also increase the risk of workplace accidents (Mälardalens Universitet, 2023).

3.2 Regulations affecting safety in the construction industry

Specific to the construction sector, Arbetsmiljöverket has a tab on Building and civil engineering work, design and building work environment coordination. There you can find information on design and construction environment coordination, who is responsible for what in a construction project, work environment risks and other tools to help with the work.

Governments and industry regulators have established strict **laws and guidelines** to improve workplace safety and reduce accident rates. In Sweden, the Work Environment Act (Arbetsmiljölagen, 1977:1160) mandates that employers take proactive measures to ensure a safe working environment, conduct regular risk assessments and provide proper training to workers (Arbetsmiljöverket, 2025b). The European Framework Directive on Safety and Health at Work (89/391/EEC) also highlights employer responsibility in preventing occupational risks and promoting safety measures (Commission of the European Communities, 1995). Failure to comply with these regulations can result in legal penalties, project delays and reputational damage for construction companies. According to AFS 2023:3 there needs to be a work environment plan if a specifically dangerous work is going to be executed or if the project exceeds 30 days and 20 employees are simultaneously active at the site. It could also be that the total time worked equals more than 500 workdays.

The Swedish Work Environment Act (Arbetsmiljölag 1977:1160) serves as the foundation for workplace safety regulations in Sweden, including within the construction sector. The law outlines employers' responsibilities to prevent accidents, ensure a safe working environment, and systematically assess and mitigate risks (Arbetsmiljöverket, 2025b). For construction sites, this means implementing measures such as risk assessments, safety training and protective equipment to minimize hazards like falls, heavy machinery accidents and exposure to harmful substances. In large companies like Skanska, compliance with the Work Environment Act is reinforced through safety programs and dedicated safety officers.

Sweden has strict work environment laws aimed at reducing workplace accidents. The Swedish Work Environment Act and the regulations set by the Swedish Work Environment Authority define safety requirements, risk assessments and responsibilities of employers. Skanska, as one of Sweden’s largest construction firms, are obligated to stick to these regulations, but they are also implementing their own additional company-specific safety initiatives.

Safety within the construction sector is a principle attached to and enforced by construction safety managers. It is the result of equipment usage, worker protection from hazards, regular site inspections and risk assessments. A key component of construction safety is compliance with the safety and health regulations of the region, as well as in the country. There are more reasons and benefits to prioritizing construction safety other than to just comply with workplace safety and health regulations, such as reducing the number of safety hazards and incidents. Not only is it important to keep workers safe with these safety regulations, but a high number of safety hazards and incidents can weaken a company's reputation in the industry. Incidents also create a high cost for the companies, injuries or illnesses among the workers means that they can not work. This leads to indirect costs for training replacement or substitute workers, repairs of damaged equipment or property, lost

productivity and lower worker morale. The benefits of prioritizing construction safety is also that it helps strengthen the trust between workers, construction safety managers and company executives. A higher level of trust leads to better communication across the whole command chain within the company. This results in less misunderstandings and clashes between people both within the company and among subcontractors. Something that can also increase worker productivity and efficiency is construction safety programs. Workers are more fit to do their jobs effectively and safely when they are given the right training and protection by the company (SafetyCulture, 2024).

The Swedish Institute for Standards (SIS, 2024) has a model for Occupational health and safety management systems - Requirements with guidance for use (ISO 45001:2018, IDT). This model provides a structured framework for managing occupational health and safety risks, making it very relevant to safety practices within the construction sector. The standard highlights proactive risk management, worker involvement and continuous improvement. These are all critical aspects for maintaining safety in dynamic environments such as construction sites. This standard is relevant when looking at the Skanska's construction site that is observed in this study and the implementation of ISO 45001:2018 plays a key role in shaping safety practices (SIS, 2024). The principles are for example risk identification and prevention, evaluating how hazards are identified and reduced to prevent accidents. Worker participation, analyzing the extent of employee involvement in safety decision-making and reporting unsafe conditions. Compliance with Swedish regulations, assessing how Skanska ensures adherence to legal requirements set by the Swedish Work Environment Authority. And finally, safety culture and continuous improvement, investigating how incident reporting, audits and feedback loops contribute to ongoing safety enhancements.

While safety culture and proactive risk management are essential, Wamuziri (2006), in *Municipal Engineer*, published in the ICE Proceedings, examines the effectiveness of regulatory measures in improving construction site safety. His findings show that, even though legislation and enforcement play a significant role, gaps between policy requirements and on-site implementation keep going on due to factors such as project deadlines, financial constraints and worker compliance levels. In addition to regulations, leadership commitment plays a critical role in shaping safety outcomes. Zou (2011) highlights that management’s proactive engagement in safety initiatives, such as regular safety audits, open communication channels and worker involvement in safety planning, is directly correlated with reduced accident rates. This reinforces the notion that leadership involvement is a key factor in fostering a strong safety culture in the construction industry. In Sweden, the evolution of occupational safety and health (OSH) policies reflects a shift towards mandatory OSH management, highlighting the need for structured and theoretically informed strategies to enhance workplace safety (Thörnquist, 2008).

3.3 Guidelines and project documents

A project is created when a client has a project they need constructed. They look for a contractor which will be responsible for finalizing the project within time and budget decided in the contract. According to Boverket (2024) there are two main **contracts within construction**, turn key contracts and construction contracts. The difference is the involvement and responsibility of the client. In a construction contract the client is responsible for documentation and design, whereas the turn key contract puts the responsibility on the contractor to produce documentation and follow the demands established by the client (Boverket, 2024). The case studied in this report is a turnkey contract with a set price, which means that the contractor has provided a total price for the entire project. That includes all the aspects from design and planning to construction and completion and the price remains fixed throughout the whole project. In this case Skanska as the main contractor is responsible for delivering the project "ready to use" by a set date (CCCTraining, 2022).

When the client has found a contractor willing to take on the project the **design phase** starts. The time between the design and the construction can vary between projects and mostly depends on the urgency of the client. As part of designing and constructing a project there are multiple documents which support the process. By planning and recording what is agreed and how it is supposed to be done management creates possibilities to have a safe construction site. These documents come in different shapes, some general and others specific to tasks and high risk work. The construction industry in general produces the general documents in the design phase and the more specific documents related to tasks are produced during constructing.

One of the more general documents is the **work environment plan** which should contain the project's work environment organization including who's responsible for what and which routines are active. More specific information about what responsibilities each of the people responsible have, when and how their duties are executed. The plan should contain the general guidelines for work at the construction site as well as how coordination with other activities should be done. The measures taken when executing dangerous tasks should also be stated in the plan but only to the extent to tasks occuring in the project. Serving as a supportive document throughout the construction process, from start to completion, the work environment plan helps key roles such as the client, Bas-U and Bas-P ensure that no work environment-related aspects are overlooked.

Safety protocols are established procedures and guidelines designed to maintain a safe working environment on construction sites, surrounding practices such as proper equipment usage, hazard communication and emergency response plans. Obedience to these protocols is crucial in reducing risks associated with construction activities. Risk assessment is a systematic process that involves identifying potential hazards, evaluating the likelihood and severity of risks and implementing measures to control

or eliminate them. In Sweden, the Work Environment Act (Arbetsmiljölagen) mandates that employers conduct regular risk assessments to ensure workplace safety (Arbetsmarknadsdepartementet [ARM],1977).

3.4 Roles in construction project organisations

Building and civil engineering work is riskful and as an entrepreneur, developer, construction environment coordinator, designer etc you are the ones that make a difference to make sure no one gets injured, ill or dies on the job. Identifying who is responsible for what can be challenging in an environment such as the construction site. Different actors, with workplace environmental responsibility and varying missions, are active at the site. Due to this it is important to identify roles and their respective responsibilities at a site. Arbetsmiljöverket (2025c) presents some key roles at the construction site and what is expected of them on their website, *Vem är ansvarig för vad i ett byggprojekt*.

Starting with the **Client** who is the one initiating a project by hiring help to build, renovate or demolish an asset. The client can be one person or a larger organization. The role is responsible for striving for a good working environment both during the construction and when it is constructed. This is done by making informed choices which enables a good working environment. The choices could be of the nature of having a reasonable timeframe, construction area and materials. The responsibility could also be more organisational such as ensuring clear role responsibilities, follow up work place environment actions and plans. It is also the clients responsibility to name the construction work environment coordinator during the design phase (BAS-P) and construction work environment coordinator during the construction phase (BAS-U). The Client is responsible for establishing a work environment plan and that it is accessible and updated during the project. BAS-P is responsible for creating the plan during the design construction stage of the project. At the point of construction, every aspect of interest regarding the work environment should be mentioned in the plan which is to be transferred to BAS-U. BAS-U continually updates the plan and makes sure it is accessible to every worker active on site

According to Arbetsmiljöverket (2024), **BAS-P** is supposed to coordinate the work environment initiatives during the planning and design construction phase. The coordination entails working with the active specialists in the design construction process with focus on the work environment. It is also central to the role to work proactively to reduce risks and have action plans when risks occur during the construction phase. There is a collaborative element with the specialists where the BAS-P try to plan in order to create as few risks as possible while giving feedback and guidelines to what the specialists should do to follow for example safety guidelines.

The specialists and designers are responsible to work proactively to avoid workplace risks in the design parts you are active within. Everybody who is hired for the design

construction is accounted for as a specialist/designer as they are producing for example drawings, calculations or descriptions for the project. The role can be just one person or a company with many people producing documents for the design construction.

BAS-U is similar to BAS-P, a role responsible for work environment but the difference being BAS-U is active during the construction phase of the project. BAS-U is responsible for contractors cooperation in issues regarding work environment and the risks connected. The role is active from the start of the construction, during the planning, by making sure the work environment issues are processed. Another responsibility is the areas used by multiple actors such as walkways, elevators etc. It is important to coordinate the contractors so they don't put each other in harm's way, which Bas-U is responsible for together with making sure contractors follow their own work environment guidelines.

Contractors are a common occurrence at Swedish construction sites and often make up most of the blue collar workforce. A contractor is responsible for their employees as well as not creating risks for others on the construction site. A contractor could be a one-man company, family business or larger organisation. Arbetsmiljöverket states every contractor has a work environment responsibility. It is common for contractors to hire contractors which would be called sub-contractors. This phenomenon can create some confusion as to who is responsible for the work environment, and therefore is responsible to handle the risks. Each contractor is supposed to, before starting a work, identify what risks the work will inflict on others at the site, what high risk moments will be performed and if any of these need to be handled through coordination with others. BAS-U is also supposed to give contractors permission to start working at the site when initiating their work for the first time. During the contractors activity at the site they are supposed to actively contribute to the site work environment initiatives (Arbetsmiljöverket , 2025a). .

Another important role in construction projects are **subcontractors** who are specialized individuals or companies hired by the main contractor to perform specific tasks within a larger project. These tasks often require particular expertise, such as electrical work, plumbing or carpentry. By engaging subcontractors, main contractors can ensure that specialized aspects of the construction are handled by professionals with the right skills, thereby enhancing the overall quality and efficiency of the project. Subcontractors operate under a contractual agreement with the main contractor, rather than directly with the project owner, which outlines their responsibilities, deadlines and payment terms (Zeeshan, 2024). How many subcontractors there are on a project depends on who the client is, who the tenants are and the magnitude of the project is. In some cases, there could be one specific subcontractor for each working moment depending on what demands the tennant or client have on the contractor, which could increase the amount of subcontractors hugely.

The fact that the construction industry is project based also implies challenges. Since new **project teams** are assembled between each project, finding long term processes can be challenging. The PMBOK describes the project management team as a Project Based Organisation which creates a temporary organisation to finish and deliver a project (Project Management Institute[PMI], 2021). Further Backlund & Sundqvist (2018) argue PBOs have difficulty learning between and from other projects. They argue the approach is centered around the end of the project rather than lessons learned along the way when reporting and sharing experiences. There is a pattern of project managers doing things their own way rather than following models or procedures which is enabled through the organisational layout which is found in the construction industry (Backlund & Sundqvist, 2018).

4. THEORETICAL FRAMEWORK

The theoretical perspectives outlined below provide a structured approach to analyzing the data collected through on-site observations and interviews. Safety culture theories will be used to assess how workers and office personnel perceive and prioritize safety. HRO principles will guide the analysis of Skanska's ability to manage safety dynamically. Risk management frameworks will be applied to evaluate safety policies and their effectiveness in preventing accidents. By integrating these perspectives, the study aims to provide a comprehensive understanding of how safety is implemented and perceived at the Skanska site.

Ensuring workplace safety is essential for making the construction industry both sustainable and attractive to workers. Acknowledging the high number of accidents and fatalities, the sector has increasingly prioritized safety initiatives aimed at fostering a proactive safety culture. One such effort is the Håll Nollan initiative, which unites stakeholders across the Swedish construction industry to work towards eliminating workplace accidents. This initiative identifies four key pillars for improving safety: leadership and culture, knowledge and competencies, standardized work processes, and active client engagement (Håll Nollan, n.d). By promoting these core areas, the industry seeks to address underlying causes of workplace incidents rather than just reacting to them. The emphasis on management and culture is particularly critical, as strong safety management can drive meaningful change. Ensuring that workers possess the necessary competencies and that companies adopt common safety procedures can also significantly reduce risks. These industry-wide efforts reflect a growing recognition that improving safety is not just about compliance but also about fostering a culture where workplace accidents become preventable rather than inevitable.

The affects an injury has on a project can be monetary, damaging worker morale and lead to negative publicity. These are significant negative impacts for a company which serve as motivation to take safety seriously. Schaufelberger and Lin (2013) argue the three main motivational aspects to implement safety practices are "Humanitarian concern for workers and the public, Economic cost of accidents and Regulatory requirements for work site safety". They also argue that a health and safety policy is the most important part of a company's health and safety work. Working as a statement such a policy sends a message to any stakeholder working with the company as well as workers within the company that they take safety seriously and are invested in making their sites safe (Schaufelberger and Lin, 2013). Applying a theoretical lens allows the identification of key factors that influence safety management, such as organizational culture, communication patterns and the adoption of safety technologies. With that, facilitating the development of effective interventions tailored to the unique challenges of the construction sector (Zhu, et.al. 2020). The theories presented in this section provide a balanced perspective, combining organizational, behavioral and regulatory dimensions of safety. The safety

culture approach captures employee attitudes and behaviors, HRO theory examines safety resilience and risk management frameworks assess the technical aspects of safety implementation. This multidisciplinary approach is necessary to fully understand how safety works in practice at Skanska.

4.1 Management aspects affecting safety and safety culture

Effective management and communication are key to maintaining safety on construction sites. Recent studies show that site managers' behaviors, both direct and indirect, play an important role in shaping a safety culture, influencing safety outcomes and reducing workplace accidents. In the construction industry, effective safety management is an important factor and by understanding and implementing this you can foster a strong safety culture and reduce workplace accidents. To minimize risks and make sure the work environment is safe, construction companies implement different safety management tools and approaches.

Theoretical perspectives provide valuable tools for analyzing both on-site safety practices and broader organizational policies within the construction industry. It enables a structured examination of how individual behaviors, organizational structures and technological systems interact to influence safety outcomes. For example, research on the safety implications of Building Information Modeling (BIM) underscores the significance of integrating safety considerations into the design phase, allowing for proactive identification and management of risks rather than relying only on reactive measures during construction (Evelyn et al., 2016).

Research highlights that leadership and communication play a crucial role in dealing with safety at construction sites. A study from the University of Gothenburg shows that site managers influence safety both through direct leadership behaviors, such as active supervision and addressing safety risks, and indirect behaviors, such as establishing meeting structures and sticking to regulations and guidelines. A lack of active leadership and unclear communication were identified in the study as factors that reduce workplace safety (Grill & Nilsen, 2019). Additionally, the research project *Säker ledare* (Safe Leader) indicates that site managers act as role models for supervisors, whose safety leadership influences workers' safety behaviors. Individualized training in behavior-based safety leadership helps increase site managers' use of positive feedback and active listening, promoting a stronger safety culture (Ulfdotter Samuelsson et al., 2023). A study from Lund University examines how communication about work environment and safety issues functions at construction sites. The findings show that effective communication between workers and management leads to improved discussions about risks and safety, reducing workplace accidents and enhancing overall working conditions (Khorsheed Dhannoon & Ljajic, 2022).

In a study made by Larsman et al. (2024), they highlight factors like site managers acting as role models, setting the tone for supervisors, who in turn influence both

managers and workers through their own safety practices. A key tool in this process is contingent reward (CR) leadership, where leaders clarify expectations and reinforce compliance by rewarding safe behaviors. Both generic and safety-specific CR behaviors from site managers shape supervisors' approaches in a significant way, eventually impacting frontline workers. This stream effect marks the importance of leadership in reducing occupational accidents and injuries by promoting a proactive safety climate. Role modeling and imitation are central to this dynamic, as observed safety behaviors are more likely to be internalized and replicated. By reinforcing safety as a shared priority, site managers and supervisors contribute to a culture where safety is not just a regulation but an established organizational value.

There are theories about how construction site safety can be improved. The conference paper *Safety Culture in the Construction Industry: Changing behaviour through enforcement and education?* submitted by Dingsdag et al. (2006) mentions multiple key factors in changing the situation on construction sites. They mention the aspect of proper education in order to understand and follow guidelines and rules. In addition it is argued that it is very important to have someone responsible and that there is a clear decision making path when uncertainties are discovered. The authors conclude in establishing there is a need for both policies and guidelines as well as safety culture initiatives (Dingsdag et al., 2006). In a study by Bortey et.al. (2022) they conducted a systematic review of existing risk models and theories. They identified that human factors, risky behaviours and a lack of training are consistent contributors to safety risk in construction.

The study by Elosta & Alzubi (2024) shows that safety leadership plays a crucial role in shaping construction workers' safety behavior by fostering a strong safety culture, enhancing safety knowledge and reinforcing safe practices. In the text by Saleem & Malik (2022), it is suggested that effective safety management enhances employees' awareness and the overall safety atmosphere which leads to improved safety outcomes. Both Saleem & Malik (2022) and Elosta & Alzubi (2024) argue leaders who prioritize safety, set clear expectations and act as a role model encourage employees to adopt safer behaviors. Elosta & Alzubi (2024) argues further about the relationship being strengthened when workers perceive their employer as committed to safety, as it increases their willingness to follow safety protocols. Safety knowledge also acts as a bridge between leadership and behavior, meaning that when workers understand safety risks and procedures, they are more likely to act safely. However, if employees feel that their employer neglects safety obligations, the positive impact of safety leadership on behavior weakens. Therefore, effective safety leadership, supported by strong organizational commitment, is essential for improving safety outcomes in construction.

According to the PMBOK guide by PMI (2021), effective communication is a fundamental part of successful project management, influencing all aspects of project performance. The guide highlights that project managers must establish and maintain

clear, open and respectful communication channels among all stakeholders to foster collaboration and shared understanding. Communication is not limited to information exchange but also involves active listening, empathy and creating an environment where team members feel psychologically safe to express concerns, including those related to safety. By promoting transparency and regular feedback loops, project communication supports informed decision-making, manages stakeholder expectations and contributes to a strong safety culture. The PMBOK underscores that tailored communication strategies are essential, considering factors such as stakeholder needs, organizational culture and project complexity. It highlights the project manager's role in facilitating meaningful interactions that align with both project goals and stakeholder values that in the end leads to increasing project outcomes and fostering a culture of trust and accountability (PMI, 2021).

4.2 Safety Culture in construction

Safety culture theories highlight the collective values, beliefs and behaviors that shape an organization's approach to safety. These theories provide an understanding of how safety is inserted within organizational practices, especially in relation to management commitment, employee involvement and communication structures. For example, examining how safety protocols are developed and implemented, along with how they are perceived by different organizational actors, can offer insights into the strength and character of an organization's safety culture, as seen in contexts like Skanska's.

This approach aligns with findings from a study comparing Swedish and Danish construction industries, which highlighted the importance of participatory management and long-term planning in fostering a robust safety culture (Grill et. al., 2015). While comprehensive safety policies are important, inconsistencies often arise between prescribed protocols and their practical application on construction sites. Factors such as project timelines, resource constraints and varying levels of safety awareness among site workers can hinder the effective implementation of safety measures. In the Swedish construction sector, research has identified challenges in aligning social procurement policies with on-site practices, indicating a gap between policy intentions and actual execution (Troje, 2021). These conflicts underscore the need for adaptive strategies that consider on-the-ground realities, ensuring that safety policies are both practical and effective in reducing risks.

Although the industry has made significant efforts to better the work environment, construction sites are still overrepresented in the work injury statistics (Johansson, 2020). According to a survey, every fifth person in the construction sector rarely or never reports situations that can lead to accidents (Byggnyheter.se,2024). There are different factors on why a number of accidents are not reported. For example, a lot of workers feel like some injuries are just part of the job and that is mostly because of cultural factors that are a part of the construction industry. Another part of that is that some people do not want to seem weak in front of their superiors or coworkers and

there is a fear of having to abandon their team in a crucial part of the project due to an injury as there can be some unclarity as to what counts as an incident or accident (Skålander & Broberg, 2016). Additionally almost every tenth construction worker feels like their workplace is not fully safe (Byggnyheter.se, 2024). Common safety risks include fall from great heights, tripping on things on the ground, hit to the head, eye injuries, hearing and breathing risks and falling objects (3M, 2024). These challenges are amplified by factors like stress, tight schedules, low understanding of the purpose of reporting and a lacking safety culture, which underlines the need for continuous improvements within the work environment and safety (Byggnyheter.se, 2024; Skålander & Broberg, 2016).

The definitions of safety leadership are independent from any specific style of leadership, with the aim of promoting a strong safety culture through clear expectations, role modeling and active engagement. It fosters trust, communication and continuous improvement, reducing workplace accidents and integrating safety into daily operations (Adra et al. 2024). The theory of safety leadership has been widely studied in recent decades due to its critical role in increasing organizational safety performance. It plays a crucial role in shaping workplace safety culture and performance, especially in high-risk industries such as construction. Recent research highlights the importance of leadership styles in promoting a proactive safety climate. Senthamizh Sankar & Anandh (2024) highlight the increasing preference for safety-specific transformational leadership, which focus on shared values, motivation and empowerment to improve safety outcomes. Similarly, Elosta & Alzubi (2024) explores how safety leadership influences workers' safety behavior through safety knowledge and the employees perception of the employers safety standards. In that way, reinforcing the need for leaders to actively engage with employees in promoting a culture of safety. Lloyde (2020) further challenges traditional compliance-based safety approaches, recommending a shift toward trust-based leadership that prioritizes psychological safety and open communication. By understanding the variations of different leadership approaches, construction firms can move beyond just regulatory compliance to promoting a workplace where safety is an integral part of daily operations.

In order to create a culture which is working together to create a safe workplace Schaufelberger and Lin (2013) suggest stating clear and achievable goals. These could be regarding the amount of accidents or a percentage reduction to strive for but they also stress the importance of having a fatal accidents goal of zero as that is "the only acceptable standard" when talking about fatal accidents at work. It is also suggested in their book to communicate how the safety performance is on the site which helps to engage and motivate workers. They argue that it is important to engage the workforce and to give them the tools to work in a safe manner because then management can demand they do so. If the conditions are not right it is difficult to make demands and include workers in the process (Schaufelberger and Lin, 2013).

Misnan & Mohammed (2007) highlights the importance of cultivating a robust safety culture within the construction industry. They propose a conceptual framework highlighting that accidents often result from unsafe behaviors, non-compliance with procedures and insufficient safety awareness. Their research suggests that an effective safety management system should be rooted in an extensive safety culture involving all stakeholders. Building on this, (Cesarini & Kupiec, 2013) outline a 12-step approach to enhancing job site safety, advocating for the integration of safety considerations from the project's start. Their paper underscores that fostering a proactive safety culture requires commitment from all organizational levels, from executives to on-site workers. Additionally, they highlight the significance of collaborating with insurers to develop effective risk management strategies before and during construction projects. The role of human behavior in safety outcomes is further explored by Tehrania et al. (2019), who analyze behavioral safety in the construction sector in their study. The study identifies risk perception, safety attitudes and behavioral practices as crucial factors in accident prevention. They suggest that addressing these human elements through training and awareness programs can improve safety performance largely.

In Zohar's study (1980) about how employees perceive safety at a factory, he uses the term "safety climate", which at the time was a new concept. The term refers to employees' shared perceptions of the importance of safety within the organisation. The author defines safety climate as the collective perception of safety policies, procedures and practices within a workplace. It is shaped by management commitment and communication about safety. Studies have shown that unsafe working conditions can contribute to not only physical injuries but also to mental health issues such as stress and anxiety (Lingard & Turner, 2017). Workers who feel unsafe are less productive and more likely to get burnout, experience absence and reduced job satisfaction (Zhou et al., 2015). Creating a strong safety culture, where employees feel protected and empowered to report if they experience any dangers, is very important for maintaining workforce morale and efficiency.

4.3 Summary of theoretical aspects

When using the theoretical framework to evaluate the case studies efforts in creating a safe workplace and a strong safety culture the literature was organised relative to theoretical aspects which was found important. These aspects include multiple theories which were mentioned throughout the theoretical framework which form this summary making it easier to compare to the case study in the discussion and conclusion. The theories were as seen in table 2 divided into five theoretical aspects being, Knowledge availability, proactive work, acting as a role model, organisational structure and personal responsibilities.

Table 2: *A summary of theoretical framework displaying key aspects and their key concepts found in the literature displayed in the right hand column.*

Theoretical aspects	Key theories	Sources
Knowledge availability	Discussing and educating about safety measures and situations, raising awareness about safety risks, shared values, information sharing, and common risk perception.	(Hållnollan, n.d; Khorsheed Dhannoon & Ljajic, 2022; Larsman et al., 2024; Dingsdag et al., 2006; Saleem & Malik, 2022; Elosta & Alzubi, 2024; Senthamizh Sankar & Anandh, 2024; Schaufelberger and Lin, 2013; Tehrania et al., 2019)
Proactive work	Planning, meeting structures and regulations, clear expectations and achievable goals.	(Evelyn et al., 2016; Grill & Nilsen, 2019; Larsman et al., 2024; PMI, 2021; Grill et al., 2015; Schaufelberger and Lin, 2013)
Acting as a role model	Using positive feedback, following rules and policies, generating trust and commitment to safety, sustainable image and attitude.	(Ulfdotter Samuelsson et al., Larsman et al., 2024; Elosta & Alzubi, 2024 ; Saleem & Malik, 2022; PMI,2021; Adra et al., 2024; Senthamizh Sankar & Anandh, 2024; Lloyde, 2020; Cesarini & Kupiec, 2013; Skålander & Broberg, 2016)
Organisational structure	Clear guidelines that are followed, clear decision making path, clear expectations, clear priorities, not allowing personal interpretations of safe behaviour, worker empowerment and involving stakeholders, reporting incidents and accidents.	(Dingsdag et al., 2006; Elosta & Alzubi, 2024; Saleem & Malik, 2022; Bortey et al., 2022; Troje, 2021; Adra et al., 2024; Senthamizh Sankar & Anandh, 2024; Misnan & Mohammed, 2007;Cesarini & Kupiec, 2013; Byggnyheter.se, 2024)
Personal responsibilities	Safety attitude, commitment to working safe, reporting incidents and accidents, sustainable social climate	(Tehrania et al., 2019; Cesarini & Kupiec, 2013; Byggnyheter.se, 2024; Skålander & Broberg 2016)

5. RESULTS

To understand how both Skanska wanted their construction site to function and how it actually functions in terms of safety and safety culture interviews and observations were combined. The purpose was not to find abnormalities but rather to gain multiple perspectives as to how the site operates. To gain an understanding of how the organization relates to the issue of safety culture a wide spectrum of roles were interviewed.

5.1 Case study

Skanska is a Swedish construction company founded in 1887 as a concrete product manufacturer, with their current headquarters in Stockholm. The company divides their operations into four business lines: construction, residential development, commercial property development and infrastructure development, where the construction part is the largest one based on income and number of employees. Skanska operates in many different countries but since 2002 they only focus on a number of selected markets in countries like Norway, Finland, Denmark, Poland, Britain and the US. In 2024, the company had a turnover of approximately 50 billion SEK (Skanska Sverige, 2025a).

According to Skanska (2025), safety is highly prioritized in their organisation and their goal is to create the best conditions for a sustainable work-life. As stated on their website, they strive to create the best conditions so all employees can work without the risk of injury or illness. Their work environment strategy is based on three core principles:

- **We work safely or not at all**: By continuously assessing risks, implementing and following up on our processes, they prevent health issues and accidents.

- **Everyone counts**: They provide knowledge, support and close management to ensure that each individual has the conditions for a sustainable working life.

- **Better together**: Collaboration within the industry is crucial for success and they are all part of each other's work environment.

5.1.1 The Skanska way of working

At Skanskas workplaces, the protocol is to start every morning with a meeting that connects planning and execution. The meetings provide a visualisation of the project's progress and the weekly/daily production is communicated between on-site leaders, workers and subcontractors. The purpose is to give a common and clear picture of the goals, progress, people, assignments, risks etc. Everyone goes through what they are going to do during the day, what they need and what potential safety factors are included. This creates participation, a sense of responsibility, proactivity and an uninterrupted production. The meeting is usually held by the production manager

(PC) and the goal is to have as many people as possible that are working on site that day to attend the meetings (OneSkanska, 2023). These meetings are not only something that is expected by the company, it is something that is done on all construction sites throughout the organisation.

At Skanskas construction sites, several different methods are used to enhance safety, including personal protective equipment, safety training and on-site inspections. These approaches contribute to both compliance with regulations and the development of a strong safety culture. Special to the project that is observed in this study, is the monthly safety meeting held by the project manager at the project. The aim of that meeting, which differs from the daily morning meeting, is to get everyone on site a chance to see each other and get an appreciation of how many they are on the site at the moment. It is also to give information about what is going on on the site to everyone directly and not to have supervisors pass on information to their employees. Another goal is to try and get everyone on site speaking up if they have any concerns regarding safety, or just to get a conversation started.

Personal protective equipment is a fundamental safety measure which protects the workers from common dangers such as falls, flying debris, chemical exposure etc. At the site, equipment like helmets, high-visibility clothes, gloves, protective eyewear and steel-toed shoes are mandatory when being out on the site. Regular check-ups ensure that the equipment meets the Swedish safety standards. Effective safety management relies on continuous training to educate workers on potential dangers and best practices. To achieve this, Skanska contacts onboard safety training for all new workers, regular toolbox talks to address specific risks and reinforce safety protocols and simulation-based training where workers practice handling different emergencies (Skanska Sverige, 2024).

Routine on-site safety inspections is something that helps to identify and address hazards before they lead to accidents. Skanska's safety officers and site managers conduct daily safety briefings before work begins, scheduled audits to check compliance with regulators and internal policies and do behavior-based safety observations, where supervisors assess whether workers are following proper procedures. A strong safety culture ensures that safety is not just a rule but an important part of daily work. At their work sites, Skanska encourages open communication between workers and management about safety concerns, safety incentive programs to recognize and reward safe behaviour and worker participation in safety planning, giving employees a voice in hazard identification and mitigation strategies.

Skanska has established a management system called VSAA short in Swedish for our way of working (OneSkanska, 2024b). The management system introduces a common internal work method, including health and safety. The paragraph contains the procedure of reporting unsafe conditions, near misses, accidents and injuries. The system is structured as a process where an employee observes some of the situations

mentioned. The employee reports the incident to their manager who is responsible for any measures and reports it into the SAI-analysis tool.

The tool is used to get an overview of incidents observed and measures taken. The system is used to report accidents, work related illnesses, unsafe conditions as well as positive and negative observations. It is used to register security checks and other checks. The user can also register measures that have been carried out as a result of the security checks or measures connected to reported accidents, unsafe conditions or observations (OneSkanska, 2024a).

Before any work, which contains high risk tasks, is carried out the responsible employees should fill out a Work preparation form. This is one of the more specific documents related to safety which is produced by the organisation. The work preparation contains among other things a risk assessment, how the identified risks shall be handled to be able to do it in a safe way. The work preparation form is also a tool for planning where tools and gear can be identified early and thus avoiding delays later. At Skanska any worker who starts a new project on site should fill out and sign the form. As a site project can vary in size the work preparation form can be customised to fit the purpose. This means more in detail when the project is larger and time consuming, and shorter when it's a short-term small project which is not deemed to be as complex. Another thing which shall be specified is the personnel who are going to be doing the work and also their licenses and education. This is to be able to confirm that the workers have the competences required both by law and by the company if they have any demands beyond the legal requirements.

5.1.2 Initiatives for safer workplaces

Since the construction industry is one of Sweden’s most high-risk sectors, Skanska tries to constantly aim to manage their sites in a safe and responsible manner. They set ambitious goals for their occupational health and safety efforts and seek to be a leader in the industry. To promote employee well-being, they offer preventive health initiatives such as morning warm-ups, health check-ups and wellness allowances. If signs of ill health arise, they also provide rehabilitation support. Through initiatives like Safety Week and their membership in "Håll Nollan," they actively work to reduce accidents and create a safe working environment for everyone.

One of the company's biggest safety initiatives is Safety week, a yearly global initiative with focus on health and safety. The initiative is an annual global initiative dedicated to enhancing health and safety awareness across all its workplaces. Established in 2004, it has grown into the world's largest safety event organized by a private company, engaging over 40,000 employees and more than 200,000 suppliers and partners worldwide .

The primary goal of Safety Week is to ensure that all Skanska workplaces are safe and healthy environments. This is done through a week filled with activities designed

to boost awareness and commitment to safety and well-being. These activities include workshops, seminars, safety drills and health screenings which are all aimed at fostering a culture where every individual takes responsibility for their own safety and that of their colleagues.

Over the years, Safety Week has introduced several key milestones that have significantly shaped Skanska's safety culture:

2004: Inception of the first Safety Week, introducing a zero-accident vision.

2005: Implementation of mandatory personal protective equipment, including helmets, high-visibility clothing and safety shoes.

2009: Introduction of global safety stand-downs to enhance knowledge and engagement in workplace safety.

2014: Adoption of the slogan "We work safely or not at all," emphasizing the prevention of accidents and health issues.

2022: Launch of a new occupational health and safety strategy titled "The best conditions for a sustainable working life," focusing on creating a safe work environment that promotes well-being and work-life balance.

Safety Week is also a way for Skanska to show their commitment to safety but it also serves as a platform for collaboration with clients, subcontractors, suppliers and business partners. By engaging all stakeholders, Skanska aims to create a culture of care and responsibility, to make sure that everyone returns home safely each day. The theme for this year is “Risk awareness- see the risk, act and make a difference”. Through initiatives like Safety Week, Skanska tries to continue their journey toward an accident-free workplace, seeking to demonstrate that with collective effort and dedication, a safe and healthy work environment is achievable (Skanska Sverige, 2025).

5.1.3 Case description

The case studied in this report is a medium sized construction site in Sweden where they are constructing a commercial building. The case is a turn-key contract with a set price and the timeline for the project is relatively short. The study does not include most of the groundwork and site preparation which for this project was extensive due to challenging soil conditions. When observations and interviews were initiated the project was completing groundworks and starting to erect the framework including casting supports and an emergency shelter.

The site organisation can be followed in Figure 1 as seen below and previously in the method. The regional manager and the health and safety roles are not bound to this site specifically but does affect how the site operates. The blue and orange roles are

working full time on site and the pink roles being subcontractors are part of the organisation during their time performing tasks at the site.

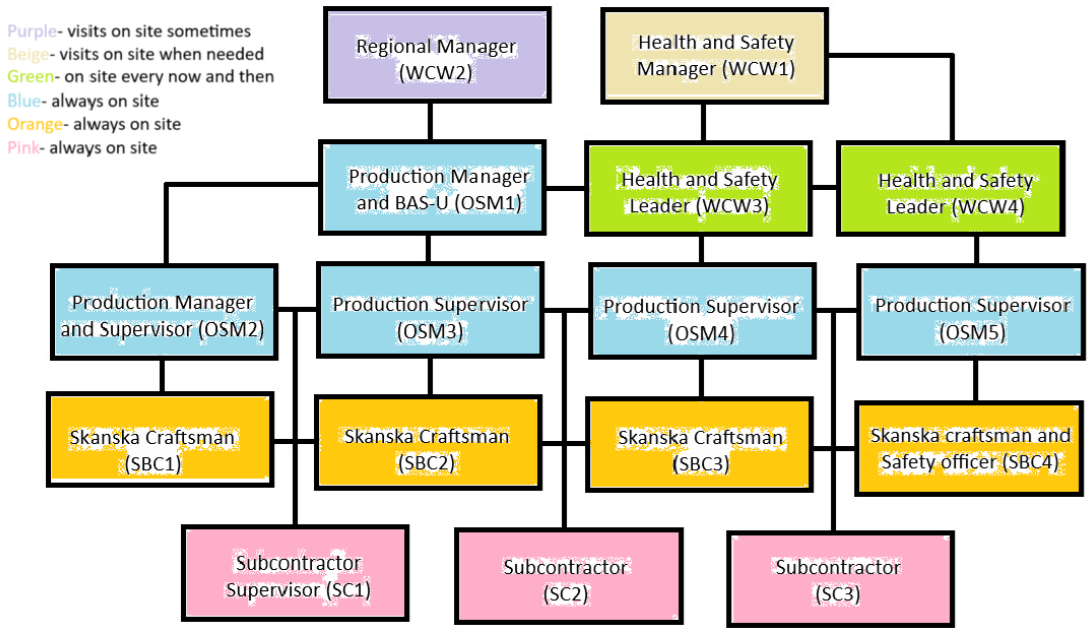

Figure 1: *Description of Skanskas organisation specific to this project.*

The regional manager is in charge of the whole project, along with other projects within their region. The role of regional manager is to first and foremost deliver money to the shareholders and does not visit the site very often. The health and safety manager is involved in all projects within their region, but has the health and safety leaders assigned to specific projects where they go out on site as often as possible. The health and safety leaders work with prevention of risks in projects, planning and similar activities. They work closely with the production managers on each project to make sure they know what to do and if they have any questions regarding safety. The production manager and BAS-U works with planning and coordinating all work steps that take place on the construction site, where safety plays a key role. They are also in charge of trying to eliminate risks in all steps and try to make sure everything happens according to the schedule. The production supervisors/on-site managers have different work areas, but they all work a lot with work preparation forms and closely with both Skanska craftsmen and subcontractors. They split their time between the site establishment and being on site, but they are usually on site at least once a day. The Skanska craftsmen are in charge of constructing some of the components that need to be done to be able to get a finished building. They have different knowledge areas and different work assignments depending on the needs of the project, in this case most of them were working with casting or reinforcements. There is always one appointed safety officer among the craftsmen on each project. The subcontractors are the only ones on this project that are not directly employed by Skanska. They all work for different companies that have their own areas of expertise, for example electricians,

plumbers or ground workers. They have their internal supervisors but also go under Skanskas supervisors.

During the time of the study it became clear things did not work as intended in the timeplan. This was mostly due to the site conditions when Skanska started and the time to get the conditions right meant delays. There was some extension of the project but not enough to make up for the lost time. The implications of this was more personnel and shorter distance between operations. Because of the nature of the project some changes were made as construction progressed and some decisions were still to be made by the client. Late changes mean more work and redoing work in some areas. The decreased distance between workers and delays at the start of the project results in an increased probability of feeling stressed. Foremostly at the office which has to deal with and make sure things work but also at the construction site with things being finished just in time rather than as planned.

During our time on the project, the change between how it looked when we first started and when we ended was large. In the beginning, they were doing work on the frame and there were not a lot of workers on site which made the overall vibe on site pretty calm. But as more things were being done on site, the more people arrived which made the vine on site feel a bit more crowded and stressful. More people on site means more machines, more riskful work moments and more people to fill the space. When visiting the site there were at least 15 people working at the same time and at the most there were closer to 40 people.

5.2 Interviews

Through the interviews the participants answered the questions found in Appendix 1-4 as well as spontaneous questions during the interviews. The organisation is divided into four groups; White collar workers whose time is mostly spent at the office. On-site management that includes different levels of management based at the on-site office. Also active on the specific site observed are the groups blue collar workers, which is specifically the ones employed by Skanska, and subcontractors hired for specific tasks. As referred in table 1, the interview subjects have been anonymized and will be referred to as WCW 1-4, OSM 1-5, SBC 1-4 and SC 1-3.

5.2.1 White collar workforce

The roles interviewed within the white collar workforce were health and safety-manager and leaders as well as a district manager. These roles all have different responsibilities and relations to workplace safety. The Health and safety manager is working on a strategic level of the organisation. That entails updating policies and guides which together with other documents make up what, in this report, is defined as safety documents. These documents describe and outline how to carry thought riskful construction tasks in a safe manner. The health and safety organisation also contains health and safety leaders which have a similar role as the manager but are assigned to different projects within the districts. Their role is of a supportive nature

with a focus on helping on-site managers in their health and safety responsibility by supporting them in actions such as health and safety rounds, incident-reports, and general discussions about health and safety. They also support the managers within the on-site organisation with documents such as guides and forms. Also part of the white collar roles interviewed is district manager which brings an alternative perspective to safety as it is only a part of their responsibilities. The district manager also has to prioritise production, efficiency and monetary issues as well as having personnel responsibility.

During the interviews the respondents White collar 1 through 4 described the organisation and the **systems and procedures** Skanska have established to achieve safe construction sites. Their descriptions were sometimes detailed and specific and sometimes more general descriptions. All respondents were asked what their personal safety procedure was when entering a construction site. The entirety of the White collar workers mentioned using ID-06 to identify themselves and to use the appropriate personal protective equipment. The personal protective equipment mentioned was steel toed shoes, helmet, high visibility clothing, safety glasses and gloves. White collar worker 1 (WCW1) also mentions the importance of doing the site specific introduction. This introduction summarises the important information you need to know when visiting and also gives contact information to key persons on-site. WCW4 on the other hand argues it is important to communicate with the on-site management when arriving to get an update about any risks on site and what areas to avoid walking in. Both WCW1 and WCW2 also mention the visiting log, where you sign in for a shorter visit. They argue this is important due to Skanskas work with seriousness and also to, in any situation, know who is on the construction site.

The organisation also has some **long term processes** for making Skanska and their employees safer. One of these is Safety week which is a recurring event where the focus is safety. Generally the week has a focus on a specific risk each year to discuss and raise awareness about. The event has been active for many years but WCW1 says it might have dulled down somewhat in recent years due to a shift of focus where the organisation has started to prioritize environmental issues more than before. The respondents are in agreement the company has come far which also affects the participants view on safety week. WCW4 says there is a risk it becomes too much of an event and creates frustration as it interrupts the construction on the sites. The perspective of safety week making a difference historically is also mentioned by WCW2 who argue the company has “gone from rules to culture” when it comes to safety.

There are also some industry wide initiatives which Skanska has been involved with. One of these which the participants were asked to talk about were Håll Nollan. WCW3 describes Håll Nollan as an industry wide initiative which helps smaller organisations to work with safety. By sharing their knowledge in the area WCW1 hopes Skanska and other bigger construction companies can help others. Through

sharing their ways of working to håll nollan the result is industry guidelines, however WCW1 dont see Skanska changing their processes to match the ones presented by Håll Nollan.

One way for the organisation to become more structured is to use **documents and guides** such as work preparation form, VSAA and internal safety documents which are described in the background. When asked about the role of the safety documents WCW3 describes them as being a support for sub-contractors to reach the safety demands on Skanska sites which is also supported by WCW1. WCW4 argues the safety documents play an important role when starting operations on site as well as refreshing the procedure once in a while by reading them. WCW1, 2 and 4 also describes the safety documents as crucial in the work preparation form which should be produced ahead of any riskful operation. WCW3 adds the perspective of work preparation from helping the planning process. They continue their argument saying it also can be used in the follow-up and evaluation of employees and sub-contractors. Another interesting perspective is the one mentioned by WCW1 who says it is very important to understand why they have these processes so that it does not end up being "just filling out a form".

The tools available to managers when leading the safety work on site are plenty according to the interviews. One interviewee, WCW3, formulated it as " at least there is no shortage of tools" which reveals their interpretation of the conditions. Tools which all four white collar workers mentioned were documents and guides provided on the internal website and meetings such as morning meetings and other recurring meetings. Some tools were mentioned by three respondents which included rounds of different character either as scheduled risk identification rounds or rounds executed by supervisors on a more daily basis, mentioned by WCW2, 3 and 4. The VSAA was also mentioned by interviewee WCW1, 2 and 3 with the reasoning being it contains a structured guide as to how things should be done at a Skanska site. In addition to these more organisational tools that are provided, WCW4 mentioned a handful of informal tools such as verbal feedback, Site visits from superior managers, Visual aids such as drone shots, signs and barriers as well as chatting to people on site. The perspective of WCW4 gives a perspective of tools which are provided by the manager as a leader rather than the organisational structure around them and brings light to why there might be differences between Skanskas sites depending on the manager.

The main tool mentioned for handling these safety violations during the construction was **communication**. Both acknowledging good behavior and violations. WCW4 also mentioned there is a difference between a Skanska employee breaking the rules and a subcontractor. Both get warnings but where the Skanska employee risks their employment the subcontractor gets a company fine and the personal consequences are decided by their employer. When looking from a more long term perspective the risk identification process at Skanska was described as something starting in the design phase of the project. Doing risk assessments in the early stages and through the entire

project to ensure a safe site. WCW3 and 1 mention it is important to involve all parties active at the site in this process which means engaging subcontractors as well. There was a general consensus about when you should talk about safety during the work day, being during the morning meetings. In addition to the morning meeting WCW4 also mentions continuing the conversation during the day and including all workers in the dialogue about safety. WCW2 argues the dialogue with and between on-site management is crucial to maintain a safe workplace. WCW1 includes the sub-contractors in the same argument and argue they are important as they also bring new risks to the site. Something mentioned during the interviews by both WCW1 and 2 is the importance of seeing and praising the good behaviours. Not only mentioning errors but also the things done right and using positive reinforcement when communicating about safety.

When asked about which type of communication they think works best at the construction site there was a preference towards verbal communication, both because it was expected to be the most appreciated by the blue collar workers but also because it is easy. WCW3 extended their argument saying there could be benefits in communicating with smaller groups at the time. WCW1 and WCW2 on the other hand focuses on visual support focusing on signs and boards to more clearly mediate the content. One example of visual support used at the observed site is Figure 2 where the on-site management uses a whiteboard to visually represent the site and where the activity is for each day.

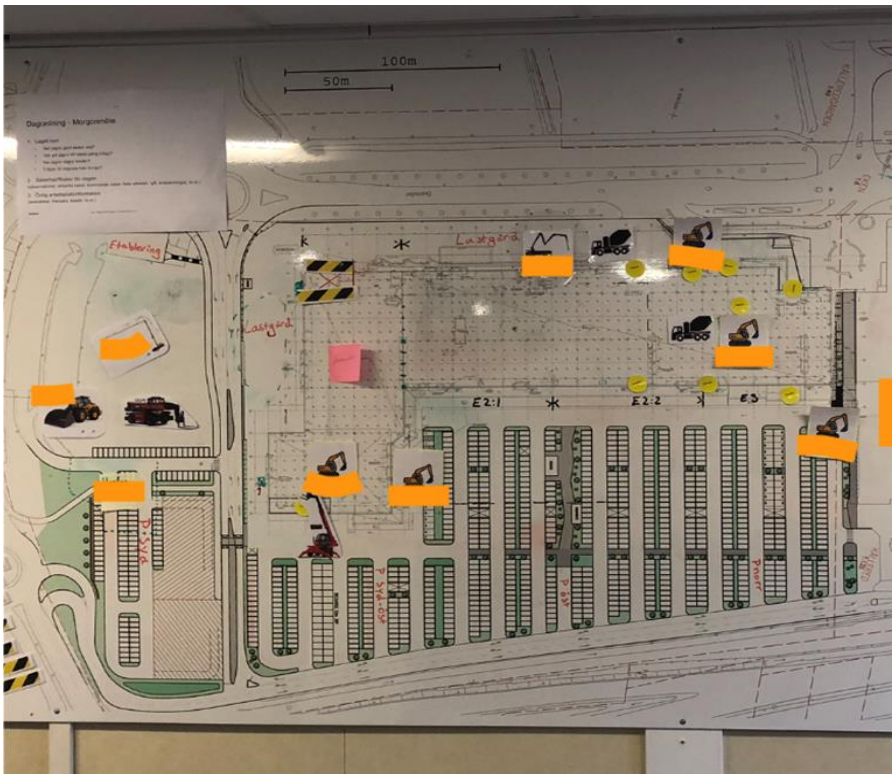

Figure 2: *An illustration of the case site which was used during morning meetings. Source personal picture.*

The interviewees were also asked what the most **common or recurring risks** at the site were in their opinion. Their answers included some risks which might be hard to avoid such as tripping and falling from short heights or getting cut by sharp material but also some risks with more life threatening consequences such as falling from great height and heavy lifting. However these big consequences risks, according to WCW2, are something they work with within the organization by creating "säkra arbetssätt". WCW1 also mentions these bigger risks are focus areas where they put a lot of effort in making it safe. Another common situation is the usage of bad equipment according to WCW3. They argue there are a lot of tools which do not meet the safety criterias being used such as ladders and hand held machines. WCW1 also mentions tools are a recurring risk but focus more on the use rather than the tool itself.

When it comes to handling these identified risks there are both short term and long term efforts that can be made. WCW3 mentions the role of the employer in being clear and aware of the risks as something affecting the process. A long term effort mentioned by WCW2 is risk identification on site with the goal of identifying risks before there is an accident. In terms of short term efforts WCW4 mentions barriers blocking an area around riskful operations and WCW3 mentions the usage of personal safety equipment. The white collar workers also gave some examples of specific efforts. The efforts were both organisational such as drafting guides and documents but also in some cases hands on implementing change or instructions and support to the on-site management in their implementation.

The interviewees were in agreement about the personal safety equipment rules being the most **difficult to obey** on the Skanska sites. The reason mentioned among the white collar workers interviewed did however vary somewhat. WCW1 mentioned the effect of an engaged project manager versus a disengaged one when it comes to safety which enables a more careless attitude on the site. WCW3 however argues it is more about comfort and feeling discomfort in a helmet or gloves when working which leads to removing them. WCW4 agrees with the argument of WCW3 but describes there are situations where a helmet for example can feel unjustified for example in the late stages of the construction. This is something which is mentioned by WCW2 as well who says the issues are occurring more in the later stages of the project but emphasise it could also be an effect of there being more people on site in general. Both WCW1 and 3 say it is easy to forget that you put others at risk when acting in a riskful manner on site. WCW1 uses the example of setting up a perimeter which they argue can feel unnecessary because "it is obvious you should not go there" and WCW3 uses the example of taking shortcuts either using the wrong equipment or walking where you are not supposed to since it is the shortest route.

The white collar workers were, during the interviews, clear about the **management's** ability to be leaders in safety issues being crucial. Taking charge and leading by doing were some of the abilities a good manager should possess. Another aspect of the managers leadership which was mentioned was the ability to be clear in their

communication and convince others safety is important. WCW2 argues it is an organisational matter where the entire organisation needs to be unanimous and distinct from top to bottom. WCW3 mentions feedback as an important aspect of managing these issues, to interact and acknowledge both safe and unsafe acts. The recurring interactions send the message that the manager actually cares enough to check which WCW3 thinks leads to a more safety aware organisation.

The white collar workers were asked what specific leadership behaviours they wanted to see from managers on site. Behaviours such as being positive and using positive reinforcement were mentioned as important. Similar behaviours which was mentioned from multiple interviews were being engaged and active on site meaning organizing meetings and attending safety rounds as well as just being present on site talking to the Blue collar workers and subcontractors. WCW1 and 4 also mentioned acting as a role model with WCW4 saying you should "act as you want others to act". WCW1 and 3 are more situations based in their opinion. Managers should act on safety violations and not stand back and allow violations if they are observed according to WCW1. Another aspect mentioned as crucial was communicating and being communicative with both Skanska staff and subcontractors. WCW3 specifically mentions the importance of communicating with the subcontractors and learning about their experience from the site, both positive and negative. WCW1 and 4 made the argument that communication needs to be clear in order to work and to create a climate where there can be clarity both ways. It was lastly mentioned that managers should be preventive in their leadership which entails doing the right things and thinking about and acting on unsafe situations before an accident happens.

All four respondents were positive towards workers **interrupting their work** if it is not deemed safe to execute. However, only one of the respondents, WCW1 mentioned they had interrupted others which in their example did not wear the correct safety equipment when working at high height. WCW4 expressed they collaborate with on-site management with the most common situation being someone informing them about a situation which they discuss with the management.

Lastly for the white collar workers they were asked if they think the sites act and function as intended when it comes to safety. The answers were quite similar between the respondents arguing the **overall quality** is alright. WCW1 says "I don't think everyone is doing exactly what it says in the VSAA because it's a lot" and WCW2 thinks similarly "everyone tries but the quality is varying". WCW3 argues the safety when performing high risk tasks is very good and WCW4 thinks the high goals set by Skanska means, even if not reaching them, a project that is trying to will imply a safe workplace. WCW3 and 4 had some suspicions as to what might affect the safety on site where WCW3 thought problems with communication affect understanding whereas WCW4 thought it might be tradition and younger managers being more open to doing things differently, which in this case means prioritizing safety higher.

5.2.2 On-site management

The interviewees on the construction site observed have a management structure containing, a production manager and Bas-U, interim production manager and Skanska employed-supervisors. The different roles entails different work areas and the role of production manager and BAS-U is to make sure the project runs smoothly and also having contact with the client. As BAS-U, the role is to make sure everyone is cooperating on things like the work environment. You are also responsible for making sure everyone on site is cooperating and that no conflicts occur. On this project, the production manager has not been out on site every day since there has been a lot of administrative work that is done in the on- site office, but OSM1 has a goal of being out at least once every other day. The supervisors on site have all the same role fundamentally, but often have different areas where they focus more. On this project, the three different supervisors have a different amount of experience in the role, with one working for just four years and another for over 30. As supervisor you support and lead the different workers and subcontractors in different moments and make sure they are doing what they should and in a safe way. They also work alongside the health and safety managers in making sure they are following all the right **procedures** that have been set in the work preparation form. The finished preparation forms as well as site specific documents and guides are placed in the entrance to the site establishment, as seen in Figure 3, and every blue collar worker is supposed to sign their preparation form before starting their operations on site.

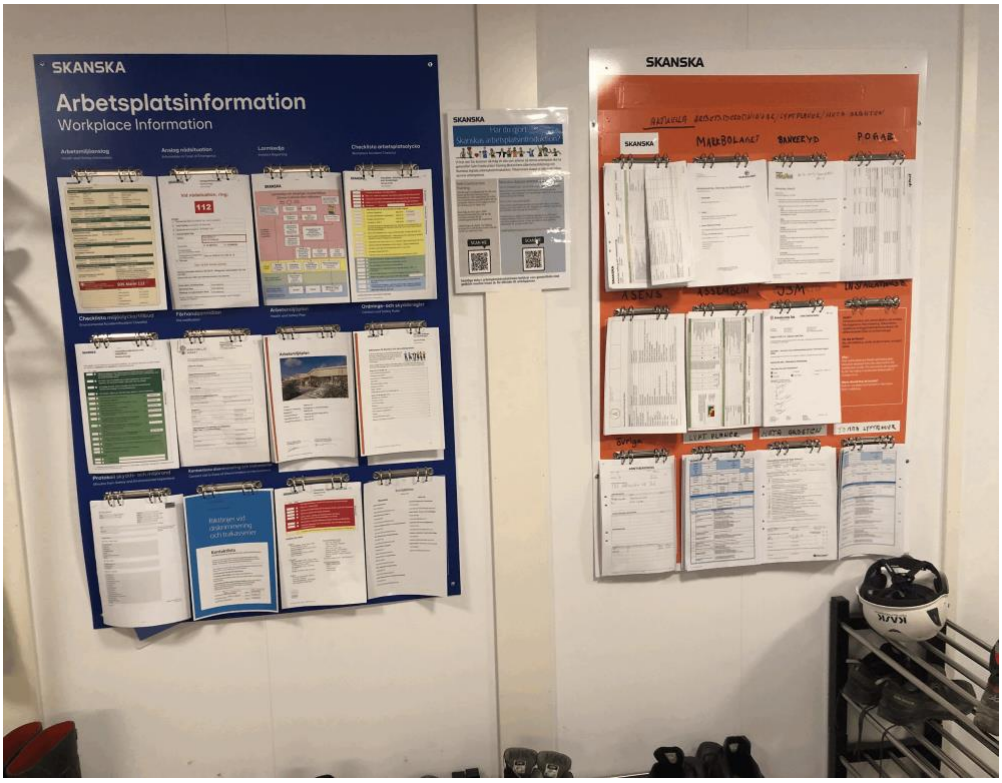

Figure 3: *The workplace information and preparation forms showcased in the entrance to the establishment together with a reminder to do the site specific introduction.*

During interviews with On-site manager (OSM) 1 through 5, questions about safety, communication, safety documents, safety initiatives and injuries were asked. All five of the supervisors were in agreement that the morning **meetings** are by far the most effective way to communicate about safety and to go through what will happen on site during the day. During the meetings, they both communicate verbally but also visually by showing the board that they have of the site and going through what is happening in different areas. One thing that could improve with the meetings on this specific project according to OSM1 is that it would be even better if they could have everyone working on site attending the morning meetings. At the moment, they do not have the space to hold every person on site in the same room.

The people attending the safety meetings are all of Skanskas own supervisors, project manager, BAS-U as well as leading installers on the current work moments. But separate morning meetings are held by OSM3 for Skanskas own workers that do not attend the "main meeting" to make sure they are aware of what is happening on site during the day.

When asked about **safety training** on site, training courses like Safe Construction Training (SCT), work place introductions and workplace adapted training has to be done by everyone visiting or working on site. This is done as a way to make sure everyone is aware of what is expected of them on site, Skanskas view on safety and that everyone has the right training. Talking about safety is done daily in the morning meetings which everyone thinks is a great way to communicate what will happen during the day and if there are any particularly dangerous moments happening that day. And even though everyone agrees that these meetings are the most efficient, not everyone agrees on what type of communication is the best. OSM3 and 5 prefers verbal communication when talking about safety since they believe that is the best way to make sure the message is received. OSM2 also believes that verbal communication works the best, but when it comes to specific information about for example safety, it should be communicated via mail so they can look back and read it again. OSM1 believes visual communication is the best, because it is both hard to misinterpret but also easy to see.

The Safety Week and håll nollan **initiatives** are well known to everyone in the on-site management. Safety Week specifically is something most of them are critical against. According to them, it is more for show rather than something that is actually effective. They believe it probably had more of an effect back in the earlier days when construction work was not safe at all. OSM2 says it takes too much time from production with all the meetings and preparing for visits which makes it inefficient. OSM3 feels that it is just a moment for Skanska to show everyone in the industry how good they are, not so much about actually working safer. They also feel like they are already working safely everyday and do not need a whole week once a year to focus more on safety. One thing that both OSM1 and 2 appreciate about the week is the visits to other Skanska construction sites.

The foundation pillars of **policies** within the company are VSAA, work preparations and security patrols, something all the on site managers work with. The work in establishing and following the safety routines are done by communicating them to everyone working on the project, often talked about on start meetings and on information boards available to everyone on site. There is a difference in who feels like they are aware of the updating of policies, OSM4 does not know how often they are updated and believes that happens more centrally. There is also a difference in how they use the policies and safety documents, some use them as a minimum, while some use them as their guiding tool.

When it comes to how the supervisors and project manager **works with safety** in their roles, everyone mentioned work preparation forms, safety patrols and morning meetings as the central tools. And the keys to manage and lead the safety work is communication and showing a presence at the work site, not just sitting up in the office to do their job. The difference in this work is that OSM3 works a lot with planning and thinks that safety relies a lot on experience and common sense. Others, like OSM1, believe that reactive work, like interfering in unsafe situations, is something that is important in their role. Relations and dialogue with the construction workers is something OSM4 does a lot in their daily work to make sure things are being done safely on site. All of the on-site managers mentioned logging in with ID06 first thing when arriving at site, as well as using personal protective equipment when visiting on site. Most of them also do their own safety analysis before starting a new work activity as a way to work with their own safety routine. Their personal safety routines are on the other hand done in different ways, some do things more formally documented and some do more informal and situational.

Reporting incidents and accidents are done in the internal program SAI, which is used by everyone at the company, but according to OSM3, it is not a program that works very well. When incidents or accidents occur it is important to both OSM1 and 3 to make sure they do not put blame on anyone. They talk through the incident with those involved and push that it is never something to be embarrassed about but it is an opportunity to learn. The interviewees were asked if they had ever stopped a work task that felt dangerous, both something they were doing themselves or seeing someone doing it, and they all said that they had. They all had the experience of it not feeling bad to do and that there is an openness and acceptance to doing such within the company. But OSM5 mentioned that in those situations it is important to explain why a task was interrupted to make sure there is no animosity or questions about it.

They all experience issues with making sure **safety measures and routines** are followed by everyone on site. One main issue that everyone feels is the hardest one to maintain is the wear of personal protective equipment, more specific glasses and helmets. OSM3 said that he sees people have the hardest time wearing glasses when it is raining because they easily fog up or that a lot of people do not wear gloves when it is warm. OSM5 says that on this specific project, there is an issue with maintaining

access roads because the ground conditions are not ideal for this type of project. OSM1 and 2 mentions the difficulties in how to manage people not working with the right safety equipment. As a manager on site, it is difficult to always be able to catch when people are not working fully safe and sometimes they could only be working safely because someone is out there looking at them. And sometimes the personal protective equipment is not ideal for every work step which leads to a "I'm just going to" mentality where you might skip some equipment for some steps. For example, it can be annoying to wear a helmet inside an almost completed building, and while installing something some might take their helmet off because they are just going to do that element.

When asked about their opinion on **Skanskas overall view on safety**, they all have a positive look on how it works and the focus that the company has on safety. A lot of them also mention the "Work safely or not at all" motto that Skanska has. But working safely is not without its difficulties and OSM3 says it is hard to get the subcontractors on board with their high standards on safety. But his experience is that they also respect it and feel like it is clear how they work and if it is not followed, you are not allowed on site. Another thing that affects the safety work is pressure from the client on budget and time, which both makes it harder to work safely because sometimes it takes a little bit longer, or it gives people an "out" to not have to work as safely. But according to OSM1, 2 and 5, safety is never a compromise, even if they have a responsibility to deliver to the client in time.

The on-site managers were asked about their view on **management** and motivation in relation to safety work, as well as their relationships to the blue-collar workers. While they agreed on a lot of things, there were also clear differences in some elements. When asked about how they view their role as a leader in creating a safe work environment, some of the on-site managers had a more structural view on leadership/management. For example, OSM4 and 5 said he prefers to plan the work to make sure it is as safe as possible and not just having to put out fires. While OSM2 and 3 pushes more on the importance of building good relationships to make sure people feel motivated to work safely and that they are being listened to. To achieve that, OSM2 focuses on setting a good example for the workers as a leader/manager. They all agree on the fact that great leadership/management is a result of relations, leading by example and communication. To achieve a good relation to their workers and to motivate them, they all see dialogue and trust as important tools. One even believes that knowing everyone's name is an important factor that also shows respect. OSM3 who was the most experienced on-site manager saw his relationship with the blue-collar workers as equal where they solve problems together and lift each other's positive qualities. He felt it is important to believe in the workers and give them the opportunity to evolve and work together. He also believes that his experience has something to do with them respecting him in his role as a leader. But at the same time, OSM5 talked about not having any experience in working as a craftsman but still feel he has a great relationship with the blue-collar workers and that they listen to him.

How the leader/manager's experience in the industry affects their relationships to the blue-collar workers differs, but the general opinion was that the more experience you have, the better they listen to you.

At the end of the interview, the interviewees were asked about the **future of safety work** in the industry, how they feel this work site works with safety and if there is anything that could improve. They were all cautiously optimistic about the future but feel that the safety work is on the right path and that it will only get better in the future. But there are still some issues with time and coordination that could become hard to overcome. OSM3 is critical to shorter construction time frames and how that affects the safety work. There are different views among the managers on what the best ways to solve the issues are. Some believe that technology will play a large part in the future work around safety. Others highlight a large resistance to change which makes it hard to implement more change factors. Another issue that OSM4 brought up was that different ways of working within the organisation creates insecurity among the workers which is another obstacle for future safety work. They all agreed that this site is one of the better ones that they have been on when it comes to working safely. OSM1 believes that Skanska is very far along on that journey already and that the other large companies like Skanska are also doing a good job to become more safe. He says that the next big step is to get the sub-contractors onboard on their safety standards and he thinks that "there will be less nagging in the future" regarding getting everyone on board. OSM4 says that work preparations plans are central in this project which makes working safely easier for everyone involved.

5.2.3 Blue collar workforce

The blue collar workforce employed by Skanska includes different craftsmen active on the project. These were employed by different districts within the Skanska organisation, and transferred to the project due to a lack of work in their district at the time. One of the craftsmen was a safety officer and therefore had a different insight into the safety measures used on site. The interviewees were, due to the stage of the project mainly working with reinforcements, casting and logistics. Since the study was conducted over a time period of a few months the roles active on site were limited to the works they were doing. The interviews were also interrupting their work and were therefore shorter than the scheduled interviews held with on-site management and white collar workers.

The respondents were aware of the **safety initiative** Safety week but did however not recognize industry wide initiatives such as Håll Nollan. Their feelings towards safety week were somewhat mixed, for example SBC1 says it does not affect them very much and SBC4 saying its a good thing to refresh the memory from time to time with the focus areas offered each year during safety week. SBC2 and 3 did not have much of an opinion saying it's good on one hand but can at times feel like a waste of production time.

The interviewees describe they all felt they were **thinking about safety** when working however from a functional standpoint. They generally also argued experience in certain operations, for example SBC 2 mentioned they notice if a machine is about to break rather than looking for an inspection date or similar. SBC 4, who is also working as a safety officer, had a different perspective, saying they try to keep track of what everyone at the site is doing and that they are doing it safely. The interviewees also described they wear safety equipment every day at work but the personal safety equipment sometimes varies due to different tasks. SBC1 mentions they sometimes perform hot jobs which means using specific safety equipment.

The blue collar workers employed by Skanska think the morning meeting is the prime occasion to **talk about safety**. Of course other occasions are mentioned as well such as SBC4 mentioning the safety round which is conducted every other week and SBC1 mentioning the organisation has a meeting any time a serious accident has happened at a Skanska site. Respondents SBC2 and 3 also mention the day to day conversations happening on site which, at this site, is a "nice jargon". SBC 3 says the communication about safety can sometimes be lacking from on-site management, foremostly in terms of late changes which is a recurring thing at the site. In terms of communicating all respondents were in agreement verbal communication is the preferred method with drawings and visual planning such as the board in the establishment being mentioned as well. When it comes to written communication such as documents and emails they rarely use them. SBC4 mentions they can be used as reminders if you are unsure about something. SBC2 also mentions they are part of the planning and preparation stages but once the construction has started they don't use them.

The type of **managerial behaviours** which was the most appreciated on site according to the interviews were clarity when communicating, acting in a "humane way" and involving and listening to the blue collar workers. Most interviewees stress the need for both on-site management and white collar workers to be more involved during construction. SBC4 describes it as "it is hard to understand what's going on if you don't see it". SBC2 continues in saying the office personnel should be more involved in the process. Thinking about the leadership on site SBC2 was quick in establishing it affects the work a lot. They argue the priorities of the manager influence the way the site and workers prioritise. SBC 1 and 3 have the same idea saying it influences a lot and SBC1 mentions the personality of the manager affects their way of leading, saying some managers are stricter than others. SBC3 says there are some differences within the Skanska organisation depending on which department you are working for, meaning the leadership of the senior managers also affect the sites.

When asked if there were any **safety routines** they thought were harder to follow than others the answers were somewhat varying. SBC1 argued personal safety equipment sometimes gets in the way and makes things more difficult, mentioning situations

such as wearing glasses in the rain, the helmet sometimes being in the way. SBC4 says they don't have any problems personally but they identify a lot of people having trouble using safety equipment. SBC3 however have a different understanding saying they don't have any issues but subcontractors often do. They argue they are many years behind when it comes to safety, especially with workers from abroad. SBC2 agrees about subcontractors but their argument is that pressure is the most common reason to not follow safety protocol. They argue delays or, in terms of workers from abroad, it can involve employment safety and monetary pressure making them take short cuts and prioritizing different things than safety.

The general understanding between the interviewees is that it is acceptable to **stop working if the situation feels unsafe**. Even if it was not experienced on the site studied in this report, they felt comfortable in sharing their previous experiences and letting the on-site management know when something isn't right. SBC1 thinks there is a good system of interrupting an operation and figuring out how to fix it together, especially when it is a matter of safety. SBC3 has the experience that any time they have informed management they have listened. SBC4 explains there has been an improvement regarding stopping unsafe situations and that the reaction varies between people. They have experienced trucks being sent away due to unsafe loading which has generated reactions from the driver, however their experience is that everybody on-site is aligned in the issue and therefore the reactions within the organisation is positive. SCB4 says conversations between workers can become uncomfortable as it is critical and it can become a discussion, however there is never this situation when management is involved in their experience.

Reflecting about the site observed in this study the interviews show the **site** is **functioning** in a good way when it comes to safety. However there are challenges when it comes to communication. SBC3 says there is a language barrier which can lead to errors. SBC1 also mentions communication and it is creating frustration when changes are not communicated. Another perspective was brought by SBC4 saying there have been challenges which have affected the site such as poor soil conditions. They also argue the site functions somewhat temporarily at the moment. A lot of things are still built and changed which means challenges when it comes to walking paths being marked, saying “they would need to be changed every other day”.

5.2.4 Subcontractors

Three different subcontractors from three different companies with different experience in the industry were interviewed in this study. The interviews were modified to not only ask about the safety culture and organisation on the observed site but also about comparisons between this site and others they have been on in the past. The interviews were conducted in an unstructured way out on site by just walking around and asking if we could ask some questions. Subcontractor 1 (SC1) worked as a ground worker on this project and had the role of supervisor for his team. Subcontractor 2 (SC2) worked as an electrician and senior assembler on this project

and subcontractor 3 (SC3) worked as a plumber. One observation that was made during the interviews with all three subcontractors was that they were all lacking the right safety equipment that Skanska demands they wear while being on the site. None of them were wearing safety glasses and one of them was not wearing gloves and did not have the chin strap fastened.

The subcontractors were asked questions about safety, communication, safety training/introductions, clarity in safety routines and how they feel about working at a Skanska work site. Regarding **communication** around safety they all say that Skanska is a company that is very strict about what they expect and they all agree that the communication about that works well. SC1 says that his communication with Skanskas on-site managers is good, but that he has had issues with other subcontractors, although he did not specify about what. SC2 highlights the morning meetings as a great place for messages to be communicated and that it is very good on this project compared to others. They have all had some kind of safety training or introduction before coming to this site to work. These include Safe construction training (SCT), an introduction to the work site and registration on site. SC2 has also been through some internal training within his company. All three subcontractors feel like the safety routines set up by Skanska are very clear. SC3 says they communicate well with signs, spreading information through the morning meeting and by talking one on one. According to SC2, Skanska are consistent with their safety measures, but stress affects the ability to follow all safety measures all the time. It can also lead to people taking more risks in an attempt to do their job faster.

There is a **culture on site** that makes them feel safe speaking up if there is something they want to bring up to the on-site management or just to ask questions. SC3 says that you will get a warning if you do not behave in the right way and follow safety procedures and he feels that is a good thing. SC2 thinks that the increase in safety routines and following up if there are any issues is good. But he says that it "could be a way for companies to save themselves from taking responsibility if anything happens." But when an unsafe situation occurs, he never feels forced to continue and that with Skanska and management they will help come up with a better way to do things together. SC3 agrees that there is never a bad reaction to stop an unsafe work task, it is rather positive. They all mention that the biggest risks are physical risks in the work environment like sharp objects, risk of tripping and traffic on the work site. But SC1 also mentioned stress as a large issue that affects the safety on site. SC3, who works as a plumber, is most worried about not being seen by trucks and other vehicles and risk getting runned over. For SC2, his biggest personal risk is electrical accidents since he is an electrician.
They were asked about what **safety routines** they believe are the hardest to follow and the pattern was that there were mostly issues with helmets, earmuffs and glasses. SC2 said that the helmet is heavy to wear with the earmuffs, but he accepts that he needs to wear it. SC3 said that he does not experience any difficulties with safety routines, but as mentioned previously, he was nog wearing glasses. That could be an

indicator that some people do not think about personal protective equipment as an important safety routine. Finally, when asked if they believe there are any areas of improvement for Skanska, two of them said no, but one said their way of implementing safety measures are almost "too safe." He believes that having this large safety mindset is a good thing, but it is not always possible to work as safely as Skanska wants them to in practice.

5.3 Observations

The observations done in this study were made on seven different occasions over a time period of 40 days. Day one hosting an observation of the monthly safety meeting as well as a site observation. In accordance with the open schedule method the study's aim and the observations themselves were introduced. One week later the daily morning meeting on site was observed and later the same day a second site observation took place. About three weeks later the third observation was conducted followed by the fourth a week after that. Lastly the observation of a safety visit to the site was conducted during safety week. The entirety of the observations and the order they were conducted is visualised in Figure 4 below.

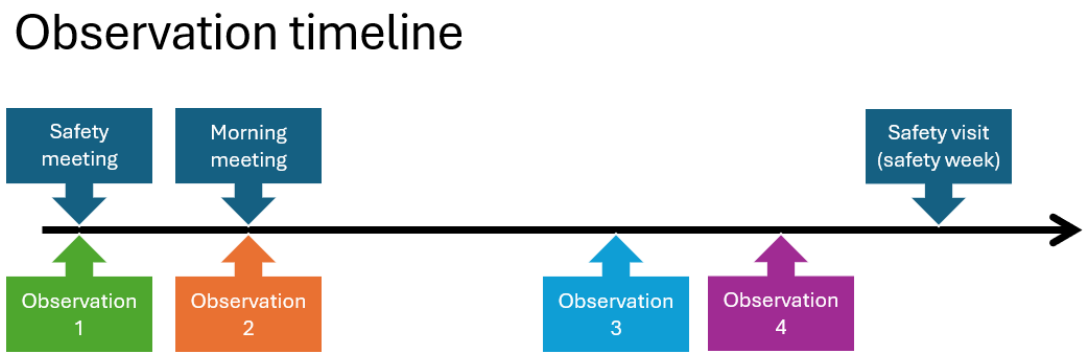

Figure 4: *Displaying a timeline of when the observations were conducted relative to each other but without specific dates due to anonymity of the actors observed.*

5.3.1 Site Observations

The site observations were made starting when the project was just beginning to assemble the framework, bombshelter and groundworks. When the last observation was conducted, about a month after the first one, the site had changed, posing new challenges as groundworks and framework mostly finished and new works such as concrete casting, electric works and piping as well as finishing the roof. The observations were conducted by walking through the site observing the ongoing construction and noting anything which relates to the observation guide, found in appendix 5. The themes found in the guide could be for example the work environment & risk management. When observing this included the use of safety equipment such as signs, barriers and guardrails. It also included any walking paths and if high risk tasks were signalised correctly. Another example of observation focus could be the use of personal safety equipment. In the observations this included the use of personal safety protection such as glasses, gloves and high disability, to

mention a few. It could also include task specific personal safety such as harness when working on heights and welding hood when welding.

During the fourth observation two workers were seen smoking outside the designated area for smoking and close to the ongoing construction, which is violating the parameter following established safety procedures. Other aspects included in work routines and safety culture are daily safety briefings, which has been the case for each of the observations made in this report, and if workers are encouraged to report incidents or risks without fear of consequences.

When the project has grown from the first observation through the weeks the site and personnel has increased in number and complexities with a lot of operations going on at once. However through this process the on-site management has not changed which entails there is an experience of less pressans from the site management on site. Their pressans on site was one of the aspects observed which affect the communication & responsibility. The other aspects were clear emergency and evacuation information, superiors enforcing safety measures, safety instructions in multiple languages on site, the general communication on site as well as how the vibe is on site.

When it comes to the aspects such as the emergency procedure and evacuation plan they were clearly showcased in the on site office. When entering the site there was information clearly stating what was expected by anyone visiting or working in the area in both Swedish and English as can be seen in Figure 5.

Figure 5: *An image of the sign presenting the rules to any visitor entering the studied site.*

Other aspects which were observed, but did not show any deviation between the different observations were equipment & machinery safety and handling of hazardous substances & materials. These aspects were however showing some things of interest. For example, during observation one, workers on site explained they use tools until they stop working and are not strictly following the inspection dates on the machines, but they did not feel forced to work with poor equipment and if they mentioned it being below standard or unsafe site management would do something about it. Another example was from observation 3 where an electrician explained they have good tools against quartz dust to protect the workers lungs. During observation 1 workers also shared they are offered regular health examinations generally and more frequently when working with dangerous substances.

5.3.2 Meeting Observations

Two meetings were observed during the study. One being a regular morning meeting containing the lead operators or supervisors for each occupational group. The meeting consisted of ten people and lasted about ten minutes. The meetings recur daily and the number of workers attending can vary depending on how many occupational groups are active at the site. The other event was safety week which is a company wide event once every year. The observation occurred during a safety visit where approximately twelve white collar workers from other sites visited.

During the morning meeting some observations were made. Firstly everyone attending was on time and familiar with how the meeting was functioning, however the on-site manager did a quick repetition anyway. The agenda was also visibly presented on the board, indication 1, shown in Figure 6. The board was used as visual support when going through what activities were planned for the day. Any activities which required a safety barrier were marked with striping tape and motivated as to why it was dangerous to be in that area as seen in indication 2. Since one of the major risks on site was the heavy machinery these were also marked, indication 3, and personalised with name and illustration of what type of machine.

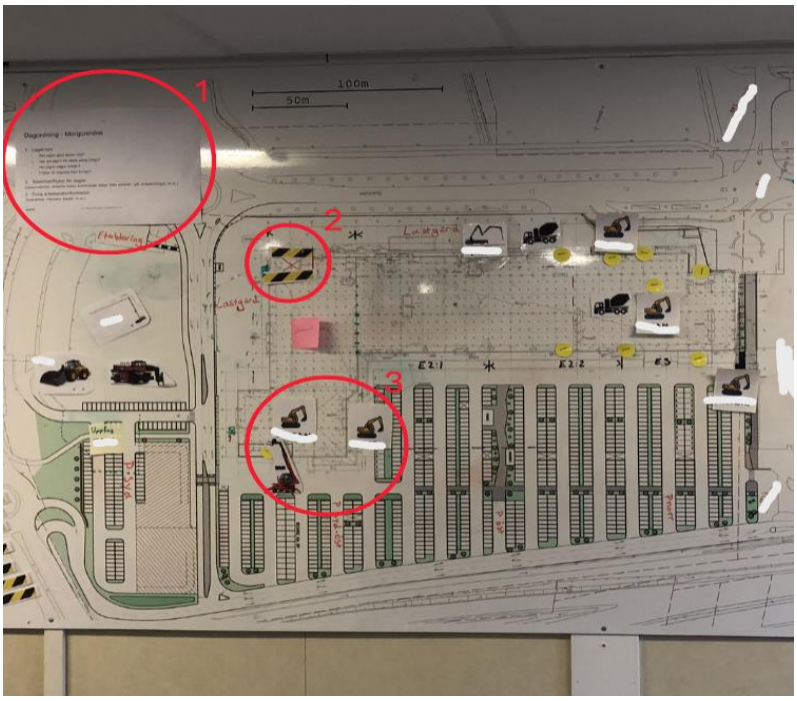

Figure 6: *representing the morning meeting board which works as a visual support for planning and understanding the site including where the major risks are located. (Personal image.)*

The conversations during the meeting were very focused on functionality and planning and did not directly focus on safety other than the notification and explanation of indication 2 shown in Figure 6. However, there was an understanding between the participants of the meeting that informing about where each group will be working for the day was in fact talking about safety. There was also a situation which proved the power of the visual support as a new subcontractor for the week was using and showing where they would be working by pointing on the map and by doing so used less time and got their point across. The same goes for the production manager which repeatedly referred to areas of the map and at the same time pointed at that spot on the map.

The second meeting observed was the monthly sitewide safety meeting which is an initiative taken by the site management in order to reach all active workers on site with information regarding the safety on site. The meeting was held outside and the PC for the project was the one talking for most of it. They mentioned emergency routines in the case of fire or medical emergencies. The information was detailed and it was also mentioned where to find it after the meeting. They also did a brief recall of the injuries which had happened on site and what to be extra mindful of. There were also invitations for the once attending to contribute with comments or thoughts but only a few workers took the chance. Since the meeting was outside there was no visual support and traffic sometimes disturbed the listeners. Afterwards some of the listeners expressed they didn't hear everything but whether it was because of disturbances or lack of focus is unclear.

5.3.3 Safety visit observation

On to the other organisational event, being the safety visit during safety week, the event differed a lot from the morning meeting since the duration was three hours and the meeting took place both in the office and on site. Because the meeting consisted of people from different parts of the organisation there was an initial presentation round where everyone introduced themselves. After that the site manager which hosted the meeting presented an organisation wide information package about the theme of safety week, being falling objects. Examples from construction sites within the organisation where objects were dropped or fell were presented and explained. During this the person with the most information took the word rather than the meeting leader and explained what had happened. The situation was explained with pictures and arrows illustrating what had happened. After each example there was a short discussion as to what went wrong and lessons learned.

The Production manager on the site then introduced their site and the challenges they faced in general, with extra focus on those presenting a risk though a presentation. During the presentation there were questions about the project and about the management aspects such as economy, timelines and subcontractors. Some questions were also about safety but a clear majority of the questions were about other aspects of the project.

After the presentation the meeting attendants went out to the site. Everyone wore full safety equipment when entering the construction site. During the visits there were spontaneous reflections about the site and the safety on site. There were also conversations about how things were done and some investigation in the unique parts of the project benign the bombshelter, soil conditions and the roof construction. After being out on site the participants got the opportunity to give both positive feedback and critique about the site's safety and they also got the opportunity to share what they learned.

5.4 Key findings from the results

In summary the interviews of white collar workers, on-site management, blue collar workers and subcontractors, as well as through site observations show a pattern regarding how safety culture functions in practice at a Skanska construction site. All groups acknowledged the importance of safety, though practical challenges persist, notably inconsistent use of personal protective equipment, especially in later construction phases. Communication is primarily verbal but is highly valued. Leadership presence and role modelling was shown as critical for fostering trust and compliance, while safety initiatives like Safety Week were viewed as symbolically important but of limited practical impact. Subcontractor integration remains a challenge due to differing expectations and enforcement issues. The safety culture was found to be strong but strained by project pressure during the later observations.

6. DISCUSSION

Based on the literature review, interviews, observations and further reflections from this study, a deeper understanding has occurred regarding the dynamics of safety on a Skanska construction site and in the broader construction industry. The analysis addresses patterns related to safety culture, communication, organizational structure, and individual behaviors, in relation to the study's research questions.

6.1 Safety culture and communication at construction sites

Figure 7 below shows how the work environment and risk management was during the four different observations. All the results shown in the figures are illustrated from a scale from very compliant to not compliant and represent the general compliance during the time of observation.

Figure 7: *Illustrating the observed compliance to work environment and risk management factors.*

As seen in Figure 7 the result of each observation varied somewhat. During the second observation, Observation 2 It was found that the site was organised well and signs of pedestrian crossing across the main driveway were clearly marked. The site did however not have any designated pedestrian path, something that was the case for all four observations. During the first observation, Observation 1, things were organised well and work with heavy machinery was marked with cones. However the reason it was lower is the fact that one cone was run over by the machine. Observations 3 and 4 were placed more towards the not complying but not all the way there. The better of the two Observation 3 was placed there due to the outside still being clearly marked but the inside of the building was being worked on and there was a lack of signs as well as poor lighting. It was also observed that a worker crossed some debris and was close to stumbeling. These same conditions existed for the final observation, Observation 4, as well and in addition to these it was observed that a worker passed beneath an operating crane jib. The crane working area was not clearly marked off and the person crossing beneath was not using a road or walking path but rather crossed though debris using the shortest route to their workstation.

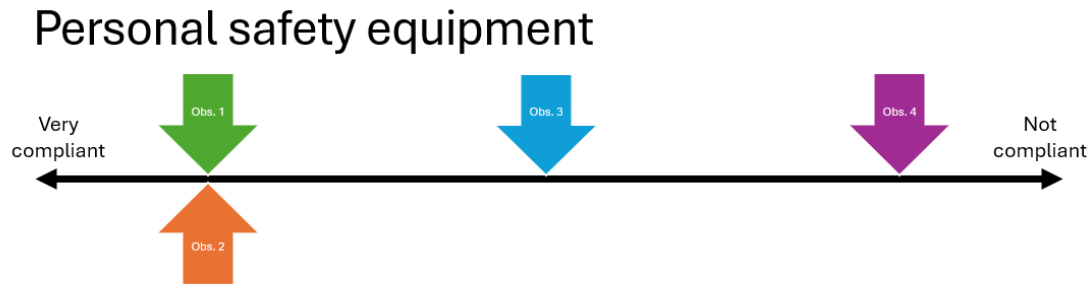

Figure 8: *illustrating the compliance regarding personal safety equipment as observed between the four occasions.*

As seen in Figure 8 there is a clear pattern of personal safety equipment being used to a larger extent earlier in the project. During Observations 1 and 2 the safety violations notified was not wearing glasses when walking between tasks at most. Everyone observed who were working on height wore a harness which was true for the entirety of the observations as well. The reasoning behind Observation 3 being placed somewhere in the middle between good and bad was an increased number of workers, foremostly not wearing glasses during work. It was observed that the violations were more frequent from subcontractors than from skanska employees however did occur for both. Observation 4 is as shown in Figure 8 placed close to very bad. This is due to several serious violations of the personal safety policies. Multiple workers from one subcontractor were missing helmets, glasses and high visibility clothing. Another worker was missing a helmet and glasses as well.

The result regarding work routines and safety culture during the different observations can be seen in Figure 9 where observations 1 through 3 is ranking close to very compliant and observation four is on the other half of the spectrum.

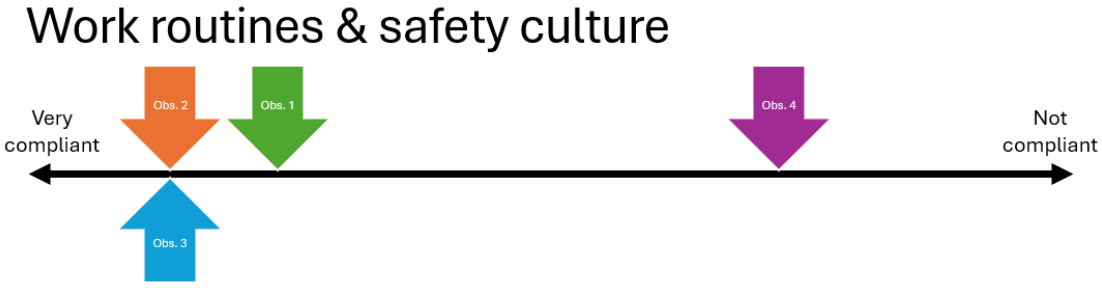

Figure 9: *showing the results of the four observations in terms of work routines and safety culture.*

As can be seen in Figure 9 observation 2 and 3 were ranked as very compliant, this was due to there being no observations of violations of safety routines and the site seemed organised, calm and conversations with employees were positive in terms of safety culture. Observation 1 is placed just beneath the first two and this is due to the site being somewhat less organised but as a whole ranked very close to the first two. The odd one out is observation 4 where multiple violations of safety routines such as the above mentioned smoking and less structure, which is natural due to the construction entering an more intensive phase, but still contains violations. During the

fourth observation conversations also indicated a more conflicted site where some disagreements had or could occur.

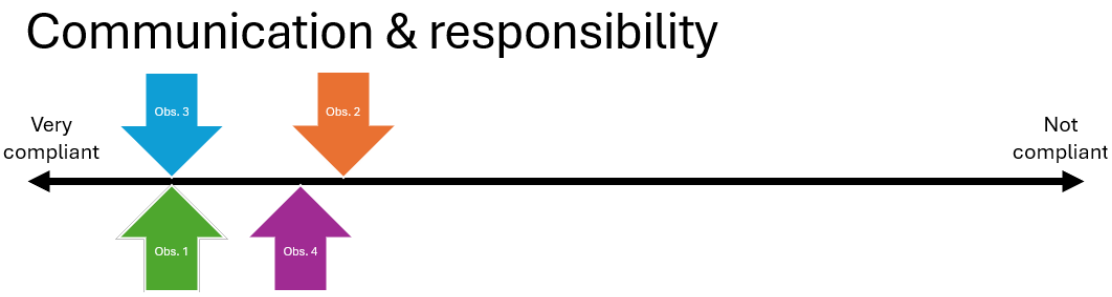

Figure 10: *Displaying the results of observations 1-4 in terms of compliance to skanska guidelines about communication and responsibility.*

As Figure 10 showcases, the site's compliance in regards to communication was generally good. The main reason for observation 2 being placed not as compliant as the other observations was the fact no supervisor was seen during the observation, however this could have many reasons and juste timing the other observations continued supervisors communicating with workers to some extent. Observation 4 is placed somewhat better than observation 2 due to the impression of site management being on site but lower than observation 3 and one due to there being safety violations which were observed but not dealt with during the observation. Again this could be an effect of the construction crew on site becoming larger, the work being divided between indoors and outdoors and the fact that deadlines are coming up and there being a larger need for meetings.

6.2 Leadership's Role in Shaping Safety Culture

Skanska are clear about their priorities of either working safely or not working at all (Skanska Sverige, 2025). This does in theory align with the importance of an open climate and a top down positioning prioritizing humanitarian aspects. Through the interviews with all SBC they argue it is possible for them, at any given time when it feels unsafe to stop working and management will be both understanding and taking them seriously. This relationship is according to the theoretical framework important as Schaufelberger & Lin (2013) argues health and safety policy is very important for an organisation to be successful in their health and safety. Supporting this argument is Elosta & Alzubi (2024) highlighting the potential consequences of employers neglecting safety obligations leading to the loss of trust among the workers. This indicates the trust of the employees is very important to foster and prioritize, something confirmed by SC1, 2 and 3 saying they trust Skanska as a contractor when it comes to safety. The importance of trust is also mentioned by the website SafetyCulture (2024), arguing a higher level of trust leads to better coordination within the project organisation. At the same time SBC 2 mentioned a lack of trust occurring when on-site management aren't seen on site regularly or when

subcontractors which are not properly educated or skilled are employed at the company. At the same time Skanska actively empower their workers through their policy, creating shared values as mentioned by Senthamizh Sankar & Anandh (2024) in respect to changing and creating a sustainable safety culture.

WCW4 gives a perspective of tools which are provided by the manager as a leader rather than the organisational structure around them and brings light to why there might be differences between Skanskas sites depending on the manager. Tools are, as argued by Schaufelberger and Lin (2013), a necessity of being able to conduct work in a safe way. This includes both physical tools and management tools which are relevant for different groups of the interviewees but impact them all. One of the management tools were meeting structures mentioned by Grill & Nilsen (2019) which is actively used in the case combined with the initiatives from on-site management in having a monthly safety meeting. Further the on-site management uses the organisational guides and documents such as work preparation forms which could be seen as sticking to regulations and guidelines, also part of the leadership behaviors presented in (Grill & Nilsen, 2019). The most recurring aspect of managers actions is role modeling seen through observations and mentioned by interviewees from WCW, OSM and SBC. Examples could include the basics like everybody in the safety visit having all personal safety equipment or supervisors being active on site. Role modeling was also found important in the literature with Larsman et al. (2024) arguing it is crucial to reinforce the shared priority of safety as you are always observed and affecting the safety culture whilst on site.

The result from the interviews clearly shows that all of the interviewees employed by Skanska believe that leadership is crucial to create a safe work environment, but their methods are different. OSM2 and 3 as well as WCW1 and 4 highlights relationships with the workers, communication and leading by example as important factors, something which is supported in the literature as crucial to create a functioning construction site (SafetyCulture, 2024; Khorsheed Dhannoon & Ljajic, 2022). Also appreciated was a more structural and planning-oriented approach mentioned by OSM4, 5 and SBC1. Planning and structuring was found to be important according to the literature with Adra, et. al (2024) mentioning the importance of clear expectations and Grill et al. (2015) mentioning long-term planning as central in fostering a strong safety culture. This shows that different leadership/management styles can be equally efficient, but they also require adaptation to different personalities, experiences and behaviour among the workers. This finding aligns with Grill & Nilsen's (2019) study from the University of Gothenburg, which highlights that site managers influence safety through both direct actions, such as supervision and addressing risks, and indirect actions, including establishing routines and sticking to regulations. The importance of active and engaged leadership is further supported by the Säker ledare (Safe Leader) project, which highlights how site managers serve as role models to the other workers, whose behavior directly impacts how people act in relation to safety (Ulfdotter Samuelsson et al., 2023). Several of the Skanska employees mentioned the

importance of communication and trust as central tools in motivating safety, which connects with the idea that behavior-based leadership, including active listening and positive feedback, helps build a stronger safety culture. WCW1, 2 and 3 specifically mentions positive reinforcement as a tool which they perceive is crucial in creating a healthy safety culture. Additionally, OSM2 and OSM3's priority on personal relationships and open dialogue connects well with Khorsheed Dhannoon & Ljajic's (2022) findings from Lund University, which focuses on that effective communication between management and workers improves safety discussions, reduces risks and contributes to safer working conditions overall. In this context, leadership on construction sites is not just about enforcing rules but about shaping the safety culture through presence, dialogue and example-setting.

6.3 Utilizing organisational structures

The use of safety documentation like work preparation plans, their management system VSAA and their internal incident report system SAI is done by all on-site managers, but to different extents. Some see the safety documents as a minimum level, like OSM1, and only use them when they feel it is necessary, others use them as a leading tool, like OSM5. This variation in usage reflects the flexibility built into Skanska's system, where both the VSAA framework and the work preparation forms are designed to be adaptable depending on project size and complexity (OneSkanska, 2024b). The use of these kinds of documents is an example of what Dingsdag, Sheahan & Biggs (2006) mention as proper education helping people on site understand and follow guidelines and rules. Within Skanska all who visit their sites are supposed to educate themselves through a site introduction (OneSkanska, 2024b). This is important as different companies have different rules and expectations and offering a site introduction means everybody has the ability to do the right thing and follow the rules. WCW1, 2 and 3 reinforce the VSAAs role as a structured guide for the organisation. However, it also reveals a potential implementation gap between the intended standardized use of safety procedures and how they are actually applied in practice. While the VSAA system and SAI provide a structured process for reporting and follow-up on incidents, near-misses and unsafe conditions, how the structure is used and is followed seems to depend on individual manager preferences and interpretations. This is significant because the theoretical aim of these systems is to promote a shared safety culture and proactive risk management through consistency and traceability. The work preparation forms are also designed not only to identify risks, but to ensure that the right tools, competence and planning are in place before work starts and in that way functioning both as a safety and productivity tool. When managers treat the documents as optional or secondary, the double functionality risks being reduced. On the other hand, the possibility to adapt the documentation can also be seen as a strength, allowing safety work to be integrated more smoothly into the fast-paced and varying context of construction. This raises an important question about how much freedom should be allowed in the use of standardized safety tools and whether more consistent use would further strengthen the safety culture across projects.

Experience plays a role in work management and the experience level among the on-site managers on this project varies between 4 to over 30 years of experience. OSM3, who has the most experience working in construction and being a manager feels like experience and common sense are fundamental in the safety work and that equal relationships build trust. However, as Gustavsson et al. (2019) point out, much of the experience within the construction industry remains implied and undocumented, which makes it vulnerable to being lost when individuals leave or transition between roles. This concern becomes particularly relevant in the context of a project-based industry, where teams are assembled temporarily and often disbanded at the end of the project. According to Backlund and Sundqvist (2018), project-based organizations (PBOs) such as construction firms struggle with systematic learning between projects. The organizational structure tends to focus on project delivery over learning, meaning that lessons learned often come too late or not at all to benefit ongoing work. This aligns with interview results showing that while experienced managers value and apply their knowledge, there is little evidence of formal mechanisms that support the transfer of that experience across teams or projects. In this study, even though managers use tools like work preparation forms and the SAI system, their engagement with these tools varies depending on their personal routines and perceptions of usefulness. From the observations it could be argued safety week works as a formal mechanism for exchanging experiences in practice but should in theory only do so in regard to safety issues. Serpella et al. (2014) highlight that the absence of structured experience feedback leads to poor risk identification and undermines project outcomes. When combined with the tendency in PBOs for project managers to "do things their own way" rather than follow standardized procedures (Backlund & Sundqvist, 2018), there is a risk that valuable knowledge and safety routines become fragmented and inconsistent. Despite these challenges, both the literature and interviewees suggest a willingness to share and learn. What is lacking are robust and integrated systems that facilitate this process across project boundaries. Bridging this gap would not only strengthen risk management and safety but also contribute to long-term organizational learning and resilience in the construction industry.

There are challenges with upholding certain safety procedures in practice and the on-site management and white collar workers all mention that personal protective equipment are the hardest to follow. More specifically, the on-site management has a hard time making people wear helmets, gloves and protective eyewear. Weather and work tasks affect compliance and sometimes as in the example mentioned by SBC1 who says it can sometimes be difficult to see when wearing safety glasses in the rain. The Skanska blue collar workers mention these issues as foremostly a subcontractor issue but the observations in this report shows both skanska employees and subcontractors fail to comply with personal safety equipment rules, even if it was found the branches were more severe among subcontractors. This reflects the broader issue of human factors in construction safety, which include behavior, perception of risk and work culture. As noted by Evelyn et al. (2016), human factors such as

organizational culture, communication and individual competencies greatly influence safety outcomes. These factors must be acknowledged not just in training or documentation but in the day-to-day leadership on site. Environmental aspects, like poor weather or discomfort, further challenge compliance, suggesting that safety systems must account for the real conditions in which they are applied. In parallel to that, regulatory measures such as mandatory personal protective equipment, regular safety training and compliance inspections are intended to reduce risks and support a safety culture. Still, the reality on site shows that regulations alone are not enough to ensure full compliance. The monthly site-wide safety meeting introduced on this project, which allows everyone to meet and discuss safety openly, represents a promising complement to more traditional top-down methods. The intentions with the meeting were as explained admirably however the actual output was not a flowing dialogue with discussion. The reasons were, according to our observation, not due to the chance not being given but due to no one from the participants taking the chance to speak up. By encouraging open dialogue and participation, this initiative directly targets cultural and behavioral barriers to safety and encourages workers to voice concerns or suggestions. According to Evelyn et al. (2016), technology can further support this process by introducing wearable sensors, monitoring systems or digital reporting tools that provide real-time feedback. However, for such innovations to be effective, they must be integrated into an organizational culture that recognizes and addresses human limitations rather than relying solely on control and enforcement. The challenges observed in this study with a short timeframe generating a cramped worksite where a lot is going on at the same time highlight the importance of combining regulations and technological tools with leadership, communication and behavioral understanding to truly improve safety practice on construction sites. The observations and interviews with the Skanska blue collar indicated a decreasing pressans from on-site management during the observations 3 and 4 which in combination with an increased amount of subcontractors and workers on site could be connected and result in an increased amount of safety violations.

6.4 Differing attitudes towards safety and safety culture

The attitude regarding safety among the interviewed subcontractors was different compared to the managers and blue-collar workers. All three subcontractors interviewed describe Skanska's safety communication as clear and consistent, but at the same time they themselves violate safety rules by lacking glasses, gloves and chin strap. So how can this difference between knowledge and action be? It could be a mix of a lack of commitment, practical obstacles and culture normalization of minor rule violations. This inconsistency highlights a known challenge within construction safety work: the gap between regulation and on-site practice, which is well documented in prior research (Wamuziri, 2006). While Sweden has a strong regulatory framework, including the Work Environment Act (Arbetsmiljölagen, 1977:1160) and project-specific requirements such as AFS 2023:3, the enforcement of rules still depends heavily on individual responsibility, leadership commitment and workplace culture.

All interviewed subcontractors had undergone some form of safety introduction and training, yet compliance in everyday routines remained partial. This could suggest that safety education alone is not enough, instead, a proactive and engaged safety culture is required. The ISO 45001:2018 standard, which Skanska claims to align with, focuses on risk identification, worker participation and continuous improvement. However, the informal and unstructured nature of the interviews, where workers were seen not using required equipment while still feeling that safety was "strict," may indicate that formal systems are not fully embedded in the day-to-day mindset on site. This supports Skålander & Broberg's (2016) findings that highlight a lack of clarity, low understanding of reporting systems and time pressure as reasons for underreporting and non compliance. Another important factor raised in the interviews is stress. SC1 and SC2 both described how time pressure affects their ability to follow safety routines, even if the intention is there. This reflects what Lingard & Turner (2017) argue about the psychological risks on construction sites, stress and tight schedules not only increase accident risks but also reduce workers' mental well-being and ability to prioritize safety. The subcontractors' differing risk perceptions based on their roles, like electrical risks for electricians, traffic visibility for plumbers, also highlights the need for risk management strategies tailored to specific job types.

Although the subcontractors and Skanska employed blue collars felt they could speak up about unsafe conditions, an indicator of a healthy safety culture, the culture of normalizing minor rule-breaking must be taken seriously. Zhou et al., (2015) stress that strong safety cultures are those where workers are not only heard but also supported in following routines consistently, without peer pressure or fear of slowing the job down. Furthermore, Thörnquist (2008) highlights that the evolution of safety policies in Sweden points toward a more structured and mandatory OSH management, but implementation still depends on leadership and team dynamics.While Skanska appears to follow regulatory and ISO standards on paper, the reality on site demonstrates how fragile safety implementation can be when culture, stress and informal norms come into play. Strengthening leadership involvement, clarifying reporting procedures and addressing practical barriers to compliance, such as uncomfortable equipment, could help close the gap between knowledge and practice. Ultimately, building a sustainable safety culture requires more than rules, it requires integration into daily habits, shared accountability and a genuine commitment across all levels of the workforce. The first step towards personal responsibility could arguably be awareness (Tehrania et al., 2019). Something the site studied does by educating all workers about the site when first entering and having them sign their work preparation form before starting their operations. This initiative avoids the risk presented by Misnan & Mohammed (2007) about non-compliance due to lack of awareness.The fixed-price contract puts pressure on the site team when delays occur, and therefore making it harder to uphold safety standards. Although Skanska promotes a 'work safely or not at all' policy, interviews show that time pressure, especially from the client, can lead to shortcuts being made. Some respondents

admitted that safety routines sometimes become formalities rather than meaningful practices. Others stressed that consistent management and more on-site presence are crucial for maintaining safety, but limited resources make this difficult. This reveals a clear gap between policy and practice and raises the question about if Skanska truly prioritizes safety or saving money. Although the experience of the work site was that the on-site management were enforcing safety procedures and letting people know if they are not following them correctly, there is still something that makes some people disregard some things. It could be an issue with culture in the construction industry, a resistance to change or that wearing all the personal protective equipment is “not cool”. Another factor could be that there is a culture within construction work that getting injured is just a part of the job and not getting injured could be seen as “weak” and therefore some people are not wearing the right equipment or following certain procedures. This behavior is also influenced by broader cultural norms and attitudes within the industry, where risk-taking and normalization of minor violations can undermine safety efforts. Building trust and open communication between workers and management is crucial to change these norms."

Transparency in decision-making and understanding of on-site realities are fundamental. Those executing the work best understand how procedures translate into daily practice. Managers must foster trust by appreciating this knowledge and involving workers in safety planning. This can lead to a more responsive and engaged safety culture, where safety measures are aligned with practical work conditions and workers feel their experiences and insights are valued.

6.5 Communication within the organisation

Among the on-site managers, there is an agreement that the morning meetings are the key to talk efficiently about safety, with the WCW agreeing the morning meeting is a good occasion to talk about it. The observation from a morning meeting exemplified in what way safety is communicated, where the on-site management does not have a list of everything that is dangerous but rather talk about the site and the upcoming work and which risks are connected to those operations. The conversation is held and directed towards practicality rather than theoretical speculations which, from the interview results can be understood as a choice adapting to what is most appreciated by the personnel on site. The type of communication that works the best differs between the interviewees, with some preferring visual communication, like signs and boards used for morning meetings as seen in Figure 2. The results showed the most preferred communication was verbal though meetings and conversations and OSM2 specifically prefers talking one-on-one with someone, but also thinks email is a good way to communicate more important information. Clear communication helps workers understand the reasons behind safety procedures, increasing both compliance and trust. Site workers have valuable insight into daily tasks, so management needs to listen to and involve them. Because while profit pressures exist, worker safety must remain a priority. One effective example of a safety procedure that works well in practice is how loading and unloading is handled; the procedures are clear, and staff

react well when issues occur. This indicates that the organisation has succeeded in creating clear guidelines.

These varying preferences reflect on the complexity of communication on construction sites, where information must reach diverse groups with different backgrounds and experiences. This is consistent with research from Lund University (Khorsheed Dhannoon & Ljajic, 2022), which emphasizes that effective communication between workers and management improves safety-related discussions, reduces workplace risks and strengthens the overall working environment. The broader literature on leadership and safety underlines that communication is not only a practical tool, but also a leadership behavior in itself. As Grill & Nilsen (2019) argue, both direct communication, like supervision and dialogue, and indirect communication, like structured routines and meetings, are crucial to maintaining safety on site. The Safe Leader project (Ulfdotter Samuelsson et al., 2023) adds to this by highlighting how communication, especially in the form of active listening and positive feedback, is central to behavior-based safety leadership. The diversity in communication styles among the interviewed on-site managers shows that there is no one-size-fits-all approach, but rather a need for flexible strategies that align with both the leader's style and the needs of the workers. It also suggests that communication is not only about transmitting information, but also about creating a safe culture through trust, clarity and engagement. And in evaluating safety culture and practices, it is crucial to recognize that observations serve as a vital complement to interviews. While interviews provide valuable insights into workers' perceptions, attitudes and beliefs about safety procedures, they may also be influenced by social appeal bias or limited recall. Direct observations allow people to see firsthand how safety routines are actually implemented in everyday work, revealing discrepancies between policy and practice, informal behaviors and contextual factors that influence compliance. By triangulating observational data with interview responses, organizations can develop a more nuanced and accurate understanding of the safety climate, which is essential for designing effective interventions and fostering genuine safety engagement.

6.6 Organisational events

The result of what the white collar workers think about Safety Week and what the people at the construction site think varies a lot. The white collar people celebrate the initiative, while the people on site think it is more of an unnecessary event that is just for show. The workers on site feel like they are already working safely and talk about safety everyday so they do not need a whole week to focus on it. They also said that sometimes the theme of Safety Week is not relevant to them, if it for example focuses on heavy lifting or likewise. But one thing they like about it is the chance to visit other projects to see how they work and learn from that. One suggested that this is something they should do more often and not just during Safety Week. The results indicate organisation and industry wide events importance decrease the further down in the organisation you look. For example few of the interviewees knew about Håll

Nollan but all of the white collar workers knew about it. However the event is one example of where Skanska prioritises the awareness of workers committing throughout the entire organisation. This organisational decision to prioritise this could lead to more collaboration, higher awareness and a stronger safety culture (Ulfdotter Samuelsson et al., 2023; Misnan & Mohammed, 2007; Cesarini & Kupiec, 2013)

Some of the on-site managers feel like Safety Week is more of a stunt than a real and effective tool to increase safety. They felt like preparing for safety week takes too much time and energy from the actual project and that it is just done for show. This contrasts with Skanska's official framing of Safety Week as a cornerstone of their safety culture. An initiative that, since its start in 2004, has grown into one of the largest private safety events that involves hundreds of thousands of workers, subcontractors and partners globally (Skanska, 2025). The company's goal with the week is to raise awareness, strengthen commitment and promote a shared responsibility for health and safety through activities like workshops, drills and health checks. In theory, this reflects a genuine investment in creating safe and sustainable work environments, aligned with Skanska's broader vision of zero accidents and "working safely or not at all." However, the gap between policy and practice becomes clear in the interviews. In evaluating safety culture and practices, it is crucial to recognize that observations serve as a vital complement to interviews. While interviews provide valuable insights into workers' perceptions, attitudes, and beliefs about safety procedures, they may also be influenced by social desirability bias or limited recall. Direct observations allow researchers and managers to see firsthand how safety routines are actually implemented in everyday work, revealing discrepancies between policy and practice, informal behaviors, and contextual factors that influence compliance. By triangulating observational data with interview responses, organizations can develop a more nuanced and accurate understanding of the safety climate, which is essential for designing effective interventions and fostering genuine safety engagement. While the intention behind Safety Week is well-meaning and strategically designed, its implementation can feel disconnected from the real life of day-to-day site work. This shows in broader research findings around organizational safety initiatives, saying that while they could serve to set a common standard, their perceived relevance and impact on ground level depend on how they are received and experienced by those expected to participate. With that said, the interviewed on-site managers still pointed out one valuable aspect of Safety Week: the opportunity to visit other construction sites and exchange experiences. This event supports the concept of cross-project learning and inter-site communication, which is especially important in a project-based industry where knowledge is often stored. This aspect is also supported by the observations which indicate a large part of safety week being sharing experiences about safety and other aspects of the project. During the observation of the safety visit the most prominent aspect was the willingness to share and to learn. Even if Safety Week is not praised among the on-site managers, it still provides potential for experience, feedback and peer learning, which could be strengthened if more time and effort were spent adapting the initiative to the practical

needs and constraints of each project site. But at the same time, since Safety week is an initiative that extends to all Skanska work-sites around the world, it might be challenging to do as many different focuses as there are Skanska projects.

6.7 Future of safety work

Regarding future safety work, the on-site managers were cautiously optimistic about how it could improve. They mentioned issues like timepressure around shorter construction times, coordination difficulties, differences in work ways within the organisation and resistance to change. These reflections align with findings in the literature, where researchers like Löwstedt (2017) describe the construction industry as inherently resistant to cultural and structural transformation. Deeply ingrained professional roles, a preference for autonomy and traditional working methods often hinder the implementation of standardized procedures and long-term innovation. While large companies like Skanska invest in advanced safety initiatives and technologies, such as Safety Week, work preparation routines and wearable safety tech (Evelyn et al., 2016), change is often slow-moving and reactive rather than strategic. In the meantime Troje (2021) argues adaptive strategies are needed to reduce risks efficiently. This could be done by having safety policies which are connected to reality on site. The case shows this flexibility though their work preparation form routine but the interviewees also mention these documents sometimes create a hindrance to getting things done.

The on-site managers' hopes for improved safety through new technologies reflect growing industry trends, but as noted in the literature, just using technology cannot overcome fundamental cultural barriers. Studies by Boverket (2025) further highlight how motivation and engagement are critical factors for safety outcomes. A lack of perceived value in one's work, or not feeling seen or appreciated, contributes to both reduced reporting of incidents and a lower sense of accountability. The increased focus on positive reinforcement mentioned by the white collar workers could be a reaction to the cultural reality. This cultural reality is reinforced by Skålander & Broberg's (2016) finding that many construction workers avoid reporting injuries due to fear of appearing weak or jeopardizing the workflow. The approach used by th white collar workers using positive reinforcement is reinforced in the theoretical framework by Ulfsdotter Samuelsson et al. (2023) who argues this could be an efficient strategy to promote a stronger safety culture. . In this context, the optimism expressed by the on-site managers, especially their pride in Skanska's safety culture, can be seen as a positive indicator, but it also highlights a divide between policy and practice. Initiatives like *Håll Nollan* represent steps toward an unified industry culture around safety, but smaller subcontractors often lack the resources to fully align with these standards (Walters & Wadsworth , 2014; Lingard & Holmes, 2001). The on-site managers in this study acknowledged that getting subcontractors to adopt Skanska's level of safety was one of the remaining challenges. Language barriers, varying national safety norms and different experience levels complicate efforts to create

shared practices across temporary project teams even more (Kivrak et al., 2009). Overall, while optimism around safety improvements is justified, especially with the help of digital tools, structured routines and inter-organizational collaboration, the complexity of the construction industry demands long-term systemic efforts. A sustainable shift in safety culture requires not only top-down regulation and technology, but also an inclusive work environment, better communication, support for mental well-being and mechanisms for continuous learning and feedback across project boundaries (Gustavsson et al., 2019; Serpella et al., 2014). Bridging this gap is essential to making construction a safer and healthier industry in the future. The relationship between management and workers also influences the safety culture. Observations suggest variability, from relationship-oriented leadership to more structured approaches, depending on the manager's experience and working environment. Trust and mutual understanding between site management and blue-collar workers are crucial for fostering safety. Frustrations between workers and subcontractors hints that there could possibly be some underlying communication and relational issues. On-site managers play a vital role in resolving these conflicts and nurturing a culture of shared responsibility and trust, which is essential for effective safety implementation.

One of the subcontractors describes Skanska's approach to safety as almost "too safe," suggesting that it can sometimes be difficult to meet all the requirements in practice. While Skanska clearly states that safety is non-negotiable, something that shines through in their motto "we work safely or not at all", this raises an important question: is it possible to balance high safety ambitions with the practical realities of construction work? This issue becomes especially relevant considering how deeply safety is integrated into Skanska's organisation. Their commitment is reflected not only in company values but also in the way safety is implemented on site: through structured morning meetings, mandatory use of personal protective equipment, ongoing inspections and systematic training, all aimed at building a strong and consistent safety culture throughout every project.

At the observed construction site in Gothenburg, this commitment was visible through a range of safety measures such as onboarding training, toolbox talks, simulation exercises and routine safety audits. The goal is to create a work environment where safety is fully integrated into the workflow and not as a box-ticking exercise, but as a proactive and collaborative process. The implementation of additional routines like monthly safety meetings that are designed to increase transparency and encourage open dialogue between different actors on site reflects on Skanska's broader ambition to build a culture of shared responsibility and continuous improvement. However, as the subcontractor's comment reveals, even the most well-intended systems can meet resistance when they collide with the reality of construction work. Tight deadlines, physical strain, unpredictable site conditions and equipment discomfort can all contribute to a perception that safety measures are sometimes impractical. For example, while wearing full personal protective equipment is required and supported

by inspections, several subcontractors were observed without proper gear, suggesting a gap between policy and practice. If you look at it in this way, what is experienced as “too safe” could actually signal a lack of flexibility in adapting safety procedures to the specific demands of different roles or tasks on site.

This tension becomes even more noticeable under the project’s contractual conditions. The turnkey contract, set with a fixed price, places a lot of pressure on site management to meet deadlines despite changing conditions. Skanska highlights that they operate under a 'safety or not at all' policy, however, tight schedules and financial constraints can challenge this stance. Without additional leadership resources on site to enforce safety and manage progress, there is a risk that the prioritization of safety may be compromised to avoid costly delays or penalties. The practical implementation of safety policies depends heavily on sufficient leadership presence and resource allocation, which appears limited in this project.

To address this tension, companies like Skanska must navigate the fine line between setting high safety standards and creating conditions that make it possible and reasonable for all workers to comply. This might involve adapting protective equipment for better comfort and usability, ensuring that safety routines are grounded in the specific context of each role and creating feedback loops where workers can express concerns or suggest improvements without fear of reprisal. It also involves acknowledging that overregulation, if not meaningfully explained or contextualised, can lead to reduced engagement or informal non-compliance. Ultimately, while ambition in safety should never be compromised, it must be coupled with realistic, user-informed implementation. Only then can a strong safety culture become more than a vision and actually become a real and sustainable practice on every level of the organisation.

SC2 expresses some skepticism about why safety procedures are followed up so closely and suggests in his interview that it might be more about the company protecting itself than genuinely caring about the workers’ safety. This perspective raises an important question about how employers can avoid being perceived as avoiding responsibility and instead promote genuine participation in safety work? While regulations like the Swedish Work Environment Act (Arbetsmiljölagen, 1977:1160) and frameworks such as ISO 45001:2018 place a clear legal and structural obligation on employers to prevent accidents and promote safe working environments, successful implementation does not only depend on compliance, but also on trust and engagement. If workers view safety routines primarily as tools for legal self-protection, rather than as shared efforts to keep everyone safe, it risks undermining the safety culture itself. As Thörnquist (2008) and Zou (2011) argue in their text, leadership commitment and open communication are key to bridging this gap. Workers need to feel that their experiences, observations and input are not only heard but valued in the shaping of safety practices. The example of this work site's monthly safety meetings. that is aimed at encouraging open dialogue and direct

communication rather than passing information top-down, is a step in the right direction. However, the skepticism expressed by SC2 suggests that more can be done to increase transparency and worker inclusion. To try to truly engage workers, safety needs to be seen not as a management control tool, but as a collaborative process. This means involving employees in risk assessments, encouraging open reporting without fear of blame and showing that their contributions lead to real changes. Building such trust-based systems can shift the perception from compliance for liability's sake to shared responsibility for everyone's well-being. These are all things that Skanska is doing, but it is still viewed by some to not be genuine or effective enough. Maybe there needs to be an even more engagement from the on-site management to get all the workers on site to work together on how they want and need the following up on safety procedures routines to work.

Furthermore, not everyone adapts equally to Skanska's safety culture and policies. While communication appears effective, the persistence of rule-breaking, especially among subcontractors, such as smoking on site or working without proper gear, raises questions about individual risk assessments and ingrained habits. Some workers may rely on their experience rather than strictly complying to formal rules, which can challenge supervisors' enforcement efforts. Repeated non-compliance, from both workers and subcontractors, creates a cycle that tests leadership persistence and impacts safety culture over time. The short-term consequences might be fines or a negative safetyculture on site, but long-term it risks undermining trust and future collaborations.

7. CONCLUSIONS

This chapter outlines the conclusions, recommendations and suggestions about future research drawn in this report based on the results and discussion.

7.1 General conclusions drawn from the discussion

Communication and Safety Culture

While communication about safety measures is generally effective within the organization, not all workers fully adhere to safety policies. Subcontractors, in particular, tend to violate safety rules more frequently, indicating a gap between policy enforcement and actual practice.

Influences on Worker Behavior

Individual risk assessments, personal habits and reliance on work experience significantly influence safety behavior. Many workers justify skipping protective equipment or safety procedures based on their own judgment or familiarity with tasks.

Safety Enforcement Challenges

Supervisors face difficulty in enforcing rules, especially when rule-breaking persists despite repeated warnings. This ongoing non-compliance can undermine safety culture and discipline on-site.

Impact of Contract Type and Project Pressure

The fixed-price, turnkey contract creates intense pressure to meet deadlines, which can conflict with safety priorities. When project timelines slip, on-site management may lack the resources or motivation to uphold all the safety standards.

Management and Leadership

Leadership plays a crucial role in fostering a safety culture. Managers vary in their approach, with some focusing on relationship-building and others on structured enforcement. Trust and transparency between management and workers are essential for effective safety practices.

Safety Initiatives and Perception

Workers perceive safety initiatives like Safety Week as potentially superficial if their purpose is not clearly communicated. When safety measures seem more like formalities than genuine efforts, engagement and compliance may decline.

Potential Improvements

Existing work preparation forms mainly serve as self-awareness tools rather than accident prevention measures. The organization should explore additional strategies to proactively prevent accidents.

Long-Term Implications

Repeated rule-breaking and perceived inconsistencies may lead to reputational damage and influence future subcontractor relationships, potentially affecting the safety culture in upcoming projects.

7.2 Answering the research questions

1. **How do the actors on site and in the organization influence the construction site safety and safety culture?**

Leadership quality and managerial approaches directly impact safety culture. Variations in management styles, trust levels and relationship-building influence workers' adherence to safety protocols. Effective communication helps, but enforcement remains challenging, especially with subcontractors where non-compliance is more frequent.

2. **How do workers on site perceive safety measures and initiatives implemented by the organization?**

While safety initiatives like Safety Week are recognized, workers often perceive them as superficial or not fully purposeful unless clearly communicated. Personal habits, risk assessments and reliance on experience lead some workers to overlook safety rules, affecting overall perceptions.

3. **How do individual perceptions and behaviors influence the safety culture on site?**

Individual risk judgments, ingrained habits and personal experience contribute to rule-breaking behaviors. These perceptions can weaken the safety culture, especially when workers believe they do not need full protective equipment for certain tasks.

4. **How does the safety climate among different actors on-site and within the company indicate the future development of safety practices in the construction industry?**

Persistent non-compliance, especially among subcontractors, signals challenges to building a strong, consistent safety climate. Superficial safety initiatives and lack of resource support during pressure points may hinder the evolution of a robust safety culture in future projects.

7.3 Recommendations for the case

Based on this study, we have concluded some recommendations for the company to help them work with safety in the future. The recommendations are the following:

- Since the client's pressure affects the on-site management and late changes and lack of time extensions reduce the time in production, it is important to review the workforce on site in order to be able to manage the workload and create more presence in production.
- It is also important to more clearly communicate how Safety Week strengthens the safety culture and promotes learning within the organization through, for example, safety visits as an exchange of experience.
- Since there are cases where certain subcontractors are lacking in their safety work and this negatively affects the safety culture of the workplace, there should be ways to give them more long-term consequences in addition to warnings and fines.
- By involving and training skilled workers at an earlier stage, the organization can achieve a more consistent risk assessment and a greater sense of belonging and trust.
- To learn more from clear and functioning routines, such as when loading and unloading, because a common risk perception is created there, which is good for the safety culture.
- Finally, more people should be able to participate in the morning meetings to avoid information loss and strengthen participation in the project.

7.4 Future research

For further research on the topic of safety culture and organisations' affect on the safety culture it would be both relevant and interesting to investigate psycho-social risks occurring in the industry and their effect on the safety culture. It would also be interesting to include stakeholders perspective and how they by decision making and involvement affect the specific sites safety culture. It could also be interesting to do a comparison between different construction sites within the Skanska organisation. These comparisons could be made between similar sizes or looking at different size projects to determine what differs when the project size changes.
Furthermore, future research could examine how safety culture is influenced by working with individuals from different cultural backgrounds, especially those who do not speak Swedish as their first language or at all. Differences in cultural background may also lead to varying perceptions of risk, which can affect how safety procedures are understood, communicated and implemented on site.

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9. Appendix

In the appendix the manuscripts used during interviews can be found together with the observation guide used during site visits.

9.1 Appendix 1

Interview questions to White collar workers

1. Tell us about how you work with safety in your role?

2. What safety routines do you have when you arrive at the workplaces on the construction site? For example: what safety clothing do you wear? Do you make sure to stamp ID06 the first thing you do?

3. Have you ever had to deal with an employee interrupting a task that felt unsafe?

4. What are the most common risks that you feel people encounter during work and how are they handled?

5. Are there any concrete safety measures that you have been involved in implementing?

6. When and how do you think we should talk about safety during the workday?

7. How do you want the safety documents that Skanska has to be used? In what situations should they be checked and for what purpose?

8. What type of communication about safety do you think is most effective in the workplace? Do you think it is the same communication that the workers appreciate the most?

9. Are there any safety routines that you feel people have more difficulty following than others? How do you work with these?

10. How do you go about identifying and assessing risks in the workplace? What is the process like if you identify a risk that requires action? Who are the people involved in this work? (is it the "right" constellation).

11. What do you think about the Safety Week and Håll Nollan initiatives? What impact has it had on you? What impact do you think these initiatives are having on construction sites?

12. In what way do you think leadership affects safety on the construction site?

13. What tools are available to successfully create a safe workplace?

14. What concrete behaviors would you like to see in a leader on the construction site?

15. What do you think safety work looks like in the workplaces? Do you think it is followed as well as it is intended?

9.2 Appendix 2

Interview questions to On-site management

1. How do you work with safety in your role?

2. What safety routines do you have when arriving at work and during the day?

3. How would you describe Skanska's overall view of safety and how do you work as a leader to implement it?

4. Do you have a grasp of what safety procedures and policies the company has implemented? And how often are they updated? Is it due to a specific incident?

5. How do you ensure that all employees and subcontractors follow safety regulations?

6. How much do you base your work on Skanska's safety documents?

7. Are you aware of the Safety Week and Håll Nollan initiatives? If so, how does it affect you?

8. What type of safety training do employees and subcontractors receive?

9. When and how do you talk about safety during the workday?

10. How do you communicate safety issues and changes in safety procedures to your staff?

11. What type of communication do you prefer?

12. How do you handle reporting of incidents and accidents?

13. How do you learn from previous incidents?

14. How do you ensure that everyone on the construction site follows the safety procedures established through the risk assessment?

15. Are there any safety procedures that you find more difficult to follow than others? Both for yourself and also what you can see in others?

16. Have you ever stopped work that you perceived as unsafe, both for others and yourself?

17. How do you see your role as a leader in creating a safe working environment?

18. How do you work to motivate employees to prioritize safety in their daily work? Do you encounter challenges in implementing this?

19. Do you experience that, for example, skilled workers listen to you? In what situations do they listen more/less?

20. How do you see the future of safety work in the construction industry?

21. How do you feel about this workplace working with safety, and is there anything that could be improved?

9.3 Appendix 3

Interview questions to Skanska Blue collar workers

1. Tell us how you work with safety in your role

2. What safety routines do you have when arriving at work and during the day?

3. Have you ever had to interrupt a job that felt unsafe to carry out? How did managers and supervisors react to it? What are the most common risks you have dealt with during your work? Are there any specific safety measures you have been a part of implementing?

4. When and how do you talk about safety during the day?

5. What type of communication do you prefer? And what about that one is it that you appreciate?

6. How much do you rely on Skanska's safety documents when you work? Do you know how to find them and where they are, etc.?

7. How often, if ever, do you check what the documents say about various safety measures before you do something?

8. Are there any safety procedures that you find more difficult to follow than others?

9. Are you aware of the Safety Week and Keep Zero initiatives? (If yes) Has it affected you in any way? (If yes) In what way?

10. In what way do you feel that leadership affects safety on the construction site?

11. How do you feel that this workplace works with safety, and is there anything that could be improved?

12. Do you feel comfortable speaking up in front of the group if there is something you consider unsafe or similar in the workplace?

9.4 Appendix 4

Interview questions to Subcontractors

1. Please tell us a little about yourself and your role on this project.

2. How do you experience Skanska's communication about safety on this construction site?

3. What type of safety training or introduction did you receive before you started working here?

4. How clear do you think Skanska's safety routines and requirements are for subcontractors?

5. How do you feel that Skanska follows up and handles safety issues in daily work? Do you receive feedback or support when you have questions?

6. Is there anything you think Skanska could improve when it comes to safety work for subcontractors?

7. What are the most common risks you encounter in the workplace?

8. Is there any safety routine that you experience as difficult/more difficult to follow?

9. Have you ever had to interrupt a job that felt unsafe to carry out? How did managers and supervisors react to it?

10. Do you feel that you can share your opinion in the workplace?

9.5 Appendix 5

Observation chart

Category	Key Observations	Observation comment
Work Environment & Risk Management	- Are there clear signs and markings for dangerous areas?	
	- Are guardrails, barriers, and other safety measures in place where needed?	
	- Are walkways and work areas free of obstacles and debris?	
	- Are safety procedures followed during high-risk tasks?	
	- Is the work organized?	
Use of Personal Protective Equipment	- Is everyone wearing helmets, safety glasses, hearing protection and safety shoes where required?	
	- Is fall protection equipment used correctly when working at heights?	
Work Routines & Safety Culture	- Are workers following established safety procedures?	
	- Are safety briefings (daily morning risk meetings) conducted?	
	- Are workers encouraged to report incidents and risks without fear of negative consequences?	
Communication & Responsibility	- Are safety officers and supervisors present and accessible?	
	- Are there clear emergency procedures and evacuation plans?	

	-Are superiors enforcing safety measures?	
	- Are safety instructions understandable and adapted to all languages on-site?	
	- How is the communication on site?	
	- How is the vibe on site?	
Equipment & Machinery Safety	- Are machines and tools in good condition and regularly inspected?	
	- Are proper safety devices used when working with dangerous machinery?	
	- Do workers have the proper training and certifications to operate machines?	
	- Are the machines used in a way that does not expose the worker to dangerous things for too long.	
Handling of Hazardous Substances & Materials	- Are chemicals and hazardous substances stored safely?	
	- Is appropriate handling and protective equipment used when working with dust, asbestos or other harmful substances?	