

Titel	Beskrivning	Mål	Avd.	Kontor	Handledare	År
Structural Behavior of Connections between Tunnel Roof and Diaphragm Wall	Due to densification of cities and harder demands regarding material use, permanent D-walls has become a more common option to use as supporting structures of underground tunnels. D-walls require less construction space than more traditional foundation methods of tunnels, and is currently being used in the West Link Project in Gothenburg. The tunnel is only connected to the D-walls through the tunnel roof and thus, the connections become a critical part of the structure.	The aim of the project was to investigate a certain connection used in the West Link Project, the load effects on the connection and its behavior regarding cracks.	Anl	Gbg	Christoffer S	2022
Modelling and Design of Curved Composite I- and Box Girder Bridges	Design and modelling of curved composite bridges is a complex art, with few existing guidelines in European standards. By introducing a curvature to the bridge, behaviours such as torsion will highly influence its performance and the design demands will therefore include the torsional stiffness. Naturally, a box girder section would be an appropriate design choice, however, a twin I-girder section could be economically motivated if equipped with a lower plan bracing. This thesis aims to investigate the design and modelling of curved composite bridges.	The aim is to formulate a design procedure for curved composite I- and box girder bridges.	Anl	Gbg	Christoffer S Erik O Erik F	2022
Dynamic analysis of a pedestrian timber truss bridge	The interest in increasing the use of timber in structural engineering has risen significantly in recent years due to the urgency of reducing the environmental impact of the building industry. Timber bridges is one of the many possible use-cases for timber in structural engineering. When designing timber bridges the serviceability criteria regulate the design with deck accelerations often being the most limiting factor. It is therefore essential to accurately model the dynamic characteristics of timber bridges during the design stage. In the past this has proven difficult and more research on this area is needed and this thesis aims to shed some light on this issue.	The first aim of this master thesis is to conduct a literature review and gather relevant information regarding timber bridges and FE-modeling in relation to the main aim. The main goal is to account for how the connections and the asphalt layer on a timber truss bridge affect its dynamic behavior and how these components should be modelled to ensure an accurate analysis.	Anl	Sthlm	Costin P	2022
Spectral density approach for dynamic analysis of high-speed railway bridges	The focus of this thesis is to introduce the concept of train signature in the spectral density approach used in the dynamic analysis of simply-supported railway bridges. Due to the increased transportation demands, longer trains with higher axle loads and top speeds are being developed. To account for these innovations, a series of new train load models will be introduced in the upcoming Eurocode. The motivation behind the concept was to develop a time-efficient, simple method which can become quite useful after the inclusion of the new train load models.	The aim of the research is to create an alternative method for the evaluation of the dynamic response of railway bridges subjected to high-speed train loads.	Anl	Sthlm	Costin P	2022
Wind Dynamic Assessment Methods for Medium-span Bridges	Generally, bridge engineers are unfamiliar with wind dynamics as it falls in-between the fields of structural engineering and fluid dynamics. Therefore, there is a need to summarize the field in a digestible manner. Procedures for wind dynamic assessments of medium-span bridges (e.g. bridges with longest spans of 50 to 200 metres) are investigated by studying both the current norm in Sweden, and an international alternative.	The aim of this thesis is to investigate and summarize procedures for wind dynamic assessment of medium-span bridges. The goal is to present procedures of varying complexity, that bridge engineers unfamiliar to the field can easily apply in practice.	Anl	Sthlm	Christoffer S Per S	2021

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Modelling Time-Dependent Effects for Segmentally Constructed Prestressed Concrete Bridges	Long-term effects, such as creep, shrinkage, and steel relaxation, are often difficult to predict for prestressed concrete structures. Creep as a phenomenon is complicated to describe and is therefore simplified in the current building standards, to better accommodate the designer. When dealing with segmentally constructed prestressed concrete bridges, these simplifications have shown to provide inaccurate predictions of the long-term effects.	The aim of this Master's Thesis is to model these effects in a commercial Finite Element Analysis (FEA) program and to establish a reliable routine for future work in the area.	Anl	Malmö	Christoffer S	2021
Performance of reinforced concrete bridges strengthened with Carbon Fiber Reinforced Polymers: Case study: Essinge Bridge over Pampaslänken	This master thesis deals with the performance of existing reinforced concrete bridges strengthened with externally bonded carbon fibre reinforced polymers (CFRP). In the case of Essinge bridge, the structure is strengthened with externally bonded CFRP sheets after the extension of the bridge which led to changes in the statical mode of action of the structure. An additional reason which makes this case interesting to study is the "concave" surface on which the CFRP sheets are applied to.	The main aim of this master thesis is to both improve and gain more knowledge about the function of the external strengthening method of CFRP sheets applied on concave RC bridges. In addition, emphasis is placed on the bond created between the soffit of the concrete and CFRP. Thus, it is of high importance to improve the understanding and investigate the bond behavior of the chosen strengthening technique.	Anl	Sthlm	Costin Pacoste	2021
Refined model for calculating the dynamic amplification factor for road bridges	When classifying bridges in Sweden, a bearing capacity calculation shall be carried out according to Trafikverket (2019b). 14 different types of vehicle scenarios with axle loads A and B shall be used in the calculation and the values of these axle loads shall be determined in order to classify the bridge. A vehicle moving on a bridge provides a dynamic load in addition to the static load. This is due to irregularities in the roadway, curvature of the bridge and the dynamic response of both the bridge and vehicle. The calculation according to Trafikverket (2019b) therefore includes a dynamic amplification factor (DAF) which depends on the length of the bridge and the vehicle velocity, which is set to a constant value of 80 km/h.	The aim is to compare the results with the current formula for the DAF according to Trafikverket (2019b) and provide appropriate recommendations. The difference between two suspension types, i.e. air and leaf suspension, will be evaluated as well. Suggestions of measures taken for platoons if they prove to be a problem concerning resonance in bridges will also be presented. The aim is also to evaluate the influence of SSI and other parameters that affect the DAF.	Anl	Malmö	Christoffer S	2020
Soil-Structure Interaction Analysis of Portal Frame Railway Bridges: Numerical Analysis of Two Case Study Bridges	This thesis concerns dynamic Soil-Structure Interaction (SSI) analysis of portal framerailway bridges. Dynamic problems are common for bridges used for high speedrailway traffic. The passing trains induce harmonic loads on the bridges causing vibration amplitudes that may cause damage to the bridge structures and user discomfort. Previous studies have shown that the effects of SSI are substantial for short spanportal frame bridges. The damping ratio of the system is greatly increased due to theenergy dissipation properties of the surrounding soil causing significant changes in thedynamic response of the structure.	The aim of this report is to study the effects of Soil-Structure Interaction on the dynamic response of medium range portal frame bridges. The main focus is on how SSI affects the modal properties of the system.	Anl	Sthlm	Abbas Z K	2020
Cost optimization of composite bridges	Today in most design offices the practice when designing infrastructure is to adopt a trial-and-error based approach. This means that one solution to the problem is evaluated and based on the results the design is altered. This process is then repeated until satisfactory results have been achieved. This is an iterative process and in this project, a software has been developed as a tool for the practicing engineer to use for preliminary design.	The aim of this study is to develop an automated design process for composite bridges with the goal to optimize the investment cost regarding material.	Anl	Sthlm	Erik A, Costin P	2020

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Loop connections in heavily reinforced concrete frame corners	Loop connections are formed by U-shaped reinforcement bars and are often preferred by contractors, over a more conventional detailing in frame corners, requested mainly from a working environment safety aspect. Varying design equations, to estimate themoment capacity using loop connections, have been developed from performed testson slabs by a few researchers. However, there are no clear guidelines or restrictions of how to utilize this reinforcement configuration in large and heavily reinforced frame corners, which can be expected to differ from frame corners with smaller dimensionsand less reinforcement amount due to higher radial stresses	The aim of the thesis was to investigate to which extent it was possible to implementloop connections in large concrete frame corners, heavily reinforced with multiple layersof reinforcement. Structures that have long dimensions out of the plane of the cornerwere of main interest, such as tunnels, bridges and retaining walls.	Anl	Gbg	Christoffer S	2019
Fibre-reinforced polymer bridges. Guidance for engineers	The use of fibre reinforced polymers (FRP) in bridge applications have been rising over the last couple of years. The material is strong relative to its weight and is highly customisable in both form and performance. There is however no standardised design code available and the experience within the industry is limited. Henderson and Mottram (2018) recently published a guideline for the design of FRP bridges using the available design provisions given by Ascione et al. (2016). With the use of these two publications, this thesis evaluates the possibility to design an FRP bridge and the feasibility of such a bridge relative to conventional alternatives.	The main objective of this thesis is to investigate the feasibility of using FRP as a material in bridge design.	Anl	Malmö	Erik O	2019
Numerical and experimental dynamic analyses of the Vega Pedestrian bridge including seasonal effects	As timber structures become increasingly relevant and sought after – since they enable improvements in building time while reducing a structure’s life cycle impacts – streamlining their design can have meaningful economic and environmental implications. For timber footbridges, its design is frequently governed by serviceability criteria linked to excessive vibrations. To address this in design, it is necessary to correctly characterize the structure’s dynamic properties and understand what the leading parameters in its behaviour are. This thesis studied an existing timber arch footbridge, aiming to evaluate its dynamic behaviour both with experimental measurements and with theoretical models.	Of all the possible features to be studied in the field, this research will focus specifically on the influence that the asphalt layer of the deck plays in the dynamic behaviour of the bridge.	Anl	Sthlm	Costin P	2019
Utmattning vid svetsad anslutning mellan tvärvastvynning och fläns i samverkansbro	Vid samverkansbroar fästes tvärförband mellan huvudbalkar med funktion att leda laster ut mot huvudbalkarna. Dessa kan fästas via s.k. livavstyvningsplåtar mot huvudbalkens liv samt flänsar. Denna infästning kan ske med svetsförband. Vid ett antal fall har utmattningssprickor uppkommit i svetsanslutningen mellan livavstyvningsplåten samt överfläns på huvudbalk. Tydliga riktlinjer finns ej i dagsläget för vilken typ av svetsförband som bör nyttjas vid uppförande av benämnd konstruktionsanslutning. Här genomförs en jämförande studie av kälsvetsförband mot stumsvetsförband, med samt utan svetsutbredning.	Rapporten väntades ge svar på huruvida parameterstyrning av ett begränsat antal geometriska förutsättningar direkt påverkade spänningar i en specifik detalj i ett brotvärsnitt. Därmed förväntades modellering i finita element (finita element-metoden, [FEM]) av ett bro-tvärsnitt ge adekvat data för beaktande av utmattningsspänningar i granskad brodetalj.	Anl	Sthlm	Erik A, Frank A	2019

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Long-term behaviour of Timber Concrete Composite elements	Timber Concrete Composite (TCC) is a hybrid structure for effective material utilization, combining the compression performance of concrete with the tension capacity of timber. There are multiple design possibilities in terms of cross-sectional design, production method and type of connection. Especially the latter has a significant impact on the behaviour. Additionally, the interaction of timber and concrete causes a complex long-term behaviour, with deflections often being a critical aspect.	The broad aim of this thesis is to increase the knowledge of TCC elements and serve as a basis for possible future applications within the industry. More specifically, this includes an investigation of the long-term deformation behaviour caused by the different long-term effects of timber and concrete as well as the connection.	Bygg	Gbg	Linda J Johannes L	2022
Semi-Automatic calculation of the stability of shear walls in multi-storey buildings	Performing horizontal stability analysis in the conceptual design phase is time consuming and adjustments in the geometry of the building require new time consuming calculations. Often buildings are modelled in 3D modelling software such as Revit and Tekla but the calculations are often performed in a separate software. A script in Dynamo (add-in to Revit) has been designed that manages to gather geometric data and material data from the Revit model and automatically performs horizontal stability calculations for the stabilising system of a concrete building.	The purpose of this master thesis is to construct a script in Dynamo (add-in to Revit) that can perform design verifications for multi-storey buildings that are stabilised with shear walls. The user can easily optimize the stabilising element's positioning, geometry in the 3D model and then run the Dynamo script to quickly see how the changes affect the stabilising capacity of the structure.	Bygg	Sthlm	Nils D Elliott S	2022
Modeling of Cross Laminated Timber in FE Analysis	The use of cross laminated timber (CLT) is steadily increasing due to its beneficial structural properties, but also due to the increased popularity of timber buildings in general. Timber elements, such as CLT, have a highly orthotropic behaviour that can be challenging to implement in finite element analysis, and the consequences of the orthotropic modeling could be more substantial for taller timber buildings. This thesis investigates different methods and assumptions regarding how CLT is modeled in FE-analysis, and which advantages or disadvantages certain modeling assumptions have in regards to results on both element level and system level.	The objectives are to: (1) To perform a sensitivity study of which modeling assumptions for CLT elements affects the outcome of an FE-analysis for a high-rise timber building, and draw conclusions of how each parameter affects the result, (2) to compose recommendations of how to model CLT elements with respect to the orthotropy of the material, and (3) to highlight aspects of moment rigidity in connections for CLT slab elements which will have to be considered when modeling a timber structure in FE-software.	Bygg	Gbg	Linda J Johanna R	2021
Shrinkage Cracks in Concrete Structures - Comparison of Design Methods for Slab-on-Grade Foundations	Shrinkage cracks in reinforced concrete slabs-on-grade foundations are in most projects difficult to limit, despite that the design is carried out according to codes and recommendations. The current Eurocode can be interpreted in several ways regarding shrinkage cracks which results in that calculations made by two different designers could end up with different reinforcement amounts.	This master's thesis examines what affects shrinkage cracks in concrete slabs by analysis according to the finite element method. The analysis is compared with hand calculations.	Bygg	Gbg	Johanna R Christoffer S	2020
Dynamic analyses of hollow core slabs – Experimental and numerical analyses of an existing floor	For intermediate floors in residential and office buildings, as well as in parking garages and malls, there is a wide use of hollow core concrete slabs in Sweden today. Hollow core slabs are precast and prestressed concrete elements with cylindrical-shaped voids extending along the length of the slab. These structural elements have the advantage compared to cast-in-situ concrete slabs that they have a high strength, due to the prestressing, and that the voids allow for a lower self-weight. Additionally, the voids allow for a reduction in the use of concrete material.	The aim of this thesis is to contribute to an increased knowledge of the dynamic behavior of hollow core slabs. More specifically, this is done by a case study of a floor in an existing building, rather than an experimental structure. The work is focused towards frequency domain analyses of the response of the floor, as well as towards the investigation of the obtained complex modes.	Bygg	Sthlm	Lisa S	2020

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Stability design of steel structures – Comparison of approaches to consider imperfections and second-order effects according to Eurocode	The design procedure to consider imperfections and second-order effects is more complex for frame structures than individual members. The design procedures for individual members are relatively well described in EN1993-1-1 (2005). However, questions arise when studying a frame where the design should consider both system and member effects.	The purpose of this thesis project was to compare and establish guidelines for the different approaches presented in EN1993-1-1 (2005), regarding consideration of imperfections and second-order effects for steel structure	Bygg	Gbg	Svante S Christoffer S	2019
Korslimmat trä som bjälklag i hybridkonstruktioner	Ökande koldioxidhalt i atmosfären är ett problem som uppmärksammas alltmer i byggbranschen, som står för en stor andel av utsläppen. För att minska det ökande utsläppet av koldioxid har användningen av trämaterial blivit en del av lösningen. KL-trä, korslimmade skivor av trä, har under de senaste åren fått en mer framträdande roll i svenska byggbranschen där användningsområdet innefattar allt från bjälklag och väggar till yttertak i olika typer av byggnader. Den vanligaste stommen för lokaler som kontorshus består i dag av stålpelare, stålbalkar och bjälklag av håldäck.	En fråga som uppstår för bärande stommar är ifall KL-trä skulle kunna vara ett tillfredställande alternativ till håldäck. Arbetet utgick från förbestämda frågeställningar där möjliga hinder för ett utbyte av håldäck till KLträ föreligger.	Bygg	Sthlm	Johan K	2019
Stabiliserade/solidifierade muddermassor bakom spont i en marin miljö	Vid utvidgning av befintliga hamnar kan den relativt nya metoden stabiliserade/solidifierade (S/S) förorenade muddermassor användas i anslutning till spont. S/S metoden används för att binda föroreningarna fysikaliskt eller stänga in dem samt för att förbättra massornas hållfasthets- och deformationsegenskaper. Istället för att deponera dessa, ofta förorenade, muddermassor till ett högt pris kan det återanvändas i hamnkonstruktionen som ett byggmaterial. Det finns få rapporter som behandlar stabiliserade massor i anslutning till spont och hur de samverkar, vilket gör att det inte finns tydliga riktlinjer för hur metoden ska användas.	Syftet med studien är att kunna prognostisera hur jordtrycket mot en spont beror på de S/S -behandlade muddermassornas egenskaper. Vidare har en projekteringsmetodik till S/S massor i anslutning till spont föreslagits. För att svara på detta har en litteraturstudie gjorts för att samla bakgrundsinformation och skapa en djupare förståelse för ämnet. Därefter gjordes en parameterstudie i FEM-programmet PLAXIS.	Geo	Sthlm	Anders B-L	2021
Fault Tree Analysis of Quick Clay Slides	Quick clay slides are quite rare but often leads to major consequences for the society. These type of slides are complex and the true causes leading to a slide is difficult to map since the evidence is destroyed during the slide. Because of this, different theories develop of the causes of the slide based on the same information.	The objectives of this thesis were to construct a fault tree that facilitate risk identification and risk analysis of quick clay slides and to evaluate the applicability of the constructed fault tree, especially in the feasibility study and design phase.	Geo	Sthlm	Anders B-L	2021
Probabilistic Assessment of Pile Drivability in Swedish Soils	Site investigations are often performed prior to the design of pile foundations with the aim to collect data regarding soil properties including boulder content. The obtained data is typically limited due to non homogeneous characteristic of the soil. The geological conditions of the Mälardalen region are characterized by glacial and post glacial clay overlaying on the layer of moraine containing boulders on a bedrock.	This thesis aims to develop a numerical model to quantify the boulder content in a soil strata with a confidence interval based on the site investigation results. Furthermore, this study estimates the probability and the consequences of hitting boulders while installing piles	Geo	Sthlm	Anders B-L	2020
Buckling of slender composite piles in soft soils - A comparative study between the Swedish analytical method and 3D Finite Element	When designing piles in Sweden today an analytic method is used exclusively to calculate the piles structural bearing capacity with regards to buckling (buckling of the 2nd order). A geometrical instability arises when composite piles, made from steel and concrete, are designed according to Eurocode 4 "Design of composite structures".	The study was made as a comparison between the traditional Swedish analytical method and a 3D numerical model using the program Tochnog Professional.	Geo	Gbg	Simon H	2019



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Titel	Beskrivning	Mål	Avd.	Kontor	Handledare	År
Systemberäkning för långa pålar: En analys av samspelet mellan jordens och pålars styvhet genom friktion i axiell led	Sveriges geologi består mestadels av lös lera vid markytan följt av hård morän och hård berggrund på botten. Lös lera är inte gynnsamt vid grundläggning av konstruktioner pga. sättningar, dessa förhindras genom att påla ned till den hårda grunden. Pålning är en vanligt förekommande grundläggningsmetod i Sverige där pålsystem med varierande påltyper, längder och material används. Spetsburna pålar står för en stor andel av de olika påltyperna som används med anledning av landets hårda berggrund. Denna studie centreras kring tre olika varianter av spetsburna pålar: ihåliga stålplålar, betongplålar och betongfyllda stålplålar.	Denna studie utfördes på uppdrag av vår industrihandledare med målet att utifrån parametrar såsom pållängd, last och axiella deformationer, simulera, beräkna och utvärdera skillnaden i styvhet för enskilda pålar, både med och utan inverkan från fjädringen i jorden.	Geo	Sthlm	Anders B-L	2019
Jet grouting as a method for sealing sheet pile excavations in Swedish conditions	Jet grouting is a groundimprovement method that creates cemented columns in the soil. The soil is injected with different pressurized fluids, through the monitor, to replace and cement the soil, often with water cement grout. There are three different common systems for ejecting the fluids, the single, double and triple fluid system. The process is performed from the ground surface by drilling to desired depth and then withdrawing the monitor while rotating and ejecting and thus creating a column. There are many applications for this technique. However, this thesis focuses on using jet grouted columns in formation to seal sheet pile excavations from water.	The aim of this master thesis is to increase the knowledge about a not to commonly used ground improvement method in Sweden, Jet grouting. In particular in the area as a sealing component for sheet pile excavations.	Geo	Sthlm	Anders B-L	2019
Assessment of ice loads on piled structures based on local conditions	This master report studies structural design methods for ice loads and the impact of local conditions. Ice loads occur due to ice movements or expansion of the ice sheet. Specifically, this study analyses ice loads on piled structures and ten different design methods and handbooks to calculate the ice load. There are five Swedish methods among these, and the remaining are developed in Denmark, Finland, Norway, and Germany. The methods are developed for different types of structures.	The purpose of this master report is to facilitate and clarify the design process of ice loads on piled structures, as there is a lack of this information today. Further, facilitating how local conditions can be accounted for is also of interest to better adapt the design loads to each situation.	Marin	Sthlm	Henrik P M Gustav N	2022