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College of Engineering



Department of Civil Engineering

Assessment of Design Codes and Design of Bridge Using British Standard (BS5400) and American (AASHTO-LRFD) Code

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بسم الله الرحمن الرحيم

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تحية طيبة وبعد،

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تبين بعد الإطلاع بأن اللجنة مستوفية للشروط وذلك وفق اللوائح والنظم المعمول بها في جامعة البحرين. هذا بالإضافة إلى إفادة المشرف حول صلاحية الأطروحة للمناقشة، واستمارة تعيين لجنة مناقشة الأطروحة، ونسخة واحدة من التجليد المؤقت للأطروحة واستكمال الطالب لساعات التخرج اللازمة.

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Abstract

This study presents a comprehensive comparative analysis of two major bridge design codes: the American Association of State Highway and Transportation Officials Load and Resistance Factor Design (AASHTO-LRFD) and the British Standard (BS5400). It aims to critically examine the methodologies, technical specifications, and overall effectiveness of these codes in ensuring the structural integrity, durability, and efficiency of bridge designs. By comparing these standards, the research seeks to highlight their respective strengths and limitations, thereby offering valuable insights for potential advancements in bridge engineering practices.

After setting the stage with a thorough introduction and a review of relevant literature, the research delves into an in-depth examination of the design procedures advocated by the AASHTO-LRFD and BS5400 codes. It scrutinizes the foundational principles underpinning each code and their practical application in the design of bridge structures.

Chapter 4 stands out by presenting an empirical analysis conducted through advanced engineering software CSiBridge 24. This segment of the study unveils notable differences between the codes in terms of structural component forces and moments. Specifically, the axial load results show that for an abutment column, AASHTO-LRFD prescribes 2747.877 kN, while BS5400 suggests a more conservative value of 3499 kN. Similarly, for a pier column, AASHTO-LRFD's calculation of 4048.873 kN contrasts with BS5400's 4843 kN. Additionally, the moment calculations for girders reveal that the interior girder moment according to AASHTO-LRFD is 2898 kN.m, with the exterior at 2464 kN.m, where in BS5400 specifies 2759 kN.m for the interior and a significantly higher 3939.64 kN.m for the exterior girder.

These findings underscore a conservative trend in the BS5400 code, manifesting in higher force and moment values that suggest a design approach geared towards enhanced robustness and stiffness in bridge structures. The results also indicate potential areas for optimization in each code.

The concluding chapter synthesizes these insights, drawing comprehensive conclusions and formulating recommendations for further research and development in bridge design standards. This study contributes to the ongoing discourse on bridge engineering, aiming to influence future code improvements and foster the advancement of bridge design methodologies.

Dedication

I dedicate this project to God Almighty, my creator, strong pillar, and source of inspiration, wisdom, knowledge, and understanding. He has been the source of my strength throughout this program. I also dedicate this work to my supervisor, Dr MD Shah Alam, who has encouraged me. To my parents Aqeel (Father), Shaikh (Mother), and Sara (Wife), who have been affected in every way possible by this quest. Thank you. My love for you all can never be quantified. God bless you.

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List of Abbreviations

AASHO	American Association of State Highway Officials
AASHTO	American Association of State Highway and Transportation Officials
BS	British Standard
BOCA	Building Officials and Codes Administrators
BR	Vehicular Braking Force
CE	Vehicular Centrifugal Force
CT	Vehicular Collision Force
DC	Dead Load of Structural Components and Nonstructural Attachments
EV	Vertical Pressure from Dead Load of Earth Fill
EH	Horizontal Earth Pressure Load
FR	Friction Load
GCC	Gulf Cooperation Council
IC	Ice Load
LL	Vehicular Live Load
LN	Design Lane Load
LRFD	Load and Resistance Factor Design
LFD	Load Factor Design
LS	Live Load Surcharge
NCHRP	National Cooperative Highway Research Program
PS	Secondary Forces from Posttensioning
SH	Force Effects Due to Shrinkage
TG	Force Effect Due to Temperature Gradient
TL	Design Truck Load or Design Tandem Load
TU	Force Effect Due to Uniform Temperature
TRB	Transportation Research Board
WA	Water Load and Stream Pressure

WL Wind on Live Load

WSD Working Stress Design

WS Wind Load on Structure

List of Appendices

Appendix (1) Design of Bridge using AASHTO LRFD

Appendix (2) Design of Bridge using BS-5400

Chapter One

Introduction

Chapter One

Introduction

1.1 General

Understanding the differences between codes, standards, and specifications is crucial for engineers.

What is the Standard?

A standard is a collection of technical definitions and recommendations - or simply a "how-to" manual for designers and manufacturers. It specifies all of the product, service, and operation criteria (HardHatEngineer, 2022).

A designer will use the standard to design the product, and a manufacturer to produce the product.

Why is the standard required?

Consider the case of a mobile phone charger. If you are in the United States and traveling to the Gulf Cooperation Council, you will need an adaptor to use your charger. This is because both countries utilize different power socket standards. However, because they are made to an internationally acknowledged standard, your USB cables will function anywhere globally.

In the process sector, building components are supplied worldwide; we want all these materials, regardless of their place of origin, to fit precisely on the job site. The following are examples of legal assistance in achieving these goals:

- Standardization reduces manufacturing costs since engineers can create in mass for worldwide markets.
- Standard increases users' trust in the product's quality.

What is the Code?

The standard becomes a code when governmental authorities accept it and make it legally binding or when it is integrated into a commercial contract (HardHatEngineer, 2022).

Please keep in mind that the code's requirements will only be required if and only if the following conditions are met:

- The code is adopted as law by a regulatory body.
- It is a part of the business contract.

Otherwise, the code will serve as widely recognized design, manufacturing, construction, and installation instructions.

However, in addition to their national norm, almost all process facilities adhere to various rules and standards.

Why is Code required?

A Code is a set of regulations specifying the minimum acceptable level of safety and quality for things manufactured, created, or constructed.

Codes may also refer to standards or specifications for specific details on different needs not covered by the Code.

What is a Specification?

Specifications give specific/additional criteria for materials, components, or services that go beyond the requirements of the Code or Standard (HardHatEngineer, 2022).

Private firms create specifications to satisfy additional needs for a specific product or application.

Why is Specification required?

- It enables a purchaser to specify particular needs based on design and service conditions; and
- It enables customized products.
- Please remember that the requirements in the Specification must be met.

To summarize Table 1.1 shows the differences between code, standard, and specifications.

Table (1.1): Differences Between Code, Standard And Specification (HardHatEngineer, 2022).

CODE	STANDARD	SPECIFICATION
Enforceable by Law or by contract	Globally accepted "how to instruction"	Must meet requirements by contracts
Written by government or government approved body	Written by public organization or by government body	Written by private companies
Guidelines for design, fabrication, construction and installation	Set of technical definitions and guidelines for manufacturing	Additional requirements, beyond code & standard

1.2 Background of the Study

As mentioned before, code is a legally acceptable standard in design and manufacture. These codes are changing time to time to consider updated conditions of the requirements of the products. To this end, GCC countries are using different codes and standards. However, GCC countries are trying to reconcile all the codes and develop a unique code to use in all GCC countries. In this context, reviewing different codes and adopting more suitable ones is necessary. The body of knowledge related to the design of highway bridges has grown enormously since 1931 and continues

to do so. Theory and practice have significantly evolved, reflecting advances through research in understanding the properties of materials, in improved materials, in more rational and accurate analysis of structural behaviour, in the advent of computers and rapidly advancing computer technology, in the study of external events representing hazards to bridges such as seismic events and stream scour, and in many other areas. As a result, the pace of advances in these areas has, if anything, stepped up in recent years.

The following subsections discussed the evolution of the current AASHTO-LRFD and BS5400 codes and their development history.

1.2.1 Background to Development of Codes in the USA

To understand the somewhat chaotic way building regulations are formed in the United States, we must go back about 220 years to the passage of the Bill of Rights to the United States Constitution. There was a significant concern, bordering on fear, at the time about establishing too strong a national, centralized authority, so the US Constitution's 10th Amendment clarified that powers not explicitly granted to the Federal Government nor prohibited to the states by the Constitution are the dominion of the states or the people themselves (Rossberg and Leon, 2019). As a result, the authority to control building design and construction has been delegated to the governments of individual states, cities, and towns. Respective communities created and disseminated building regulations over time, generally in response to a big fire (1886 Chicago Fire) or natural calamity (1906 San Franciso Earthquake). At the same time, insurance as a business began to mature, and the recognized need to provide for more excellent public safety and lower insurance payouts led to the establishment in 1915 of the Building Officials and Codes Administrators, International (BOCA)

and their subsequent publication of the first "model" building code, which was based on a document used by insurance companies at the time.

In the United States, two more model code groups emerged throughout time: (a) the Southern Building Code Congress International and (b) the International Conference of Building Officials. Each covered a specific region of the United States based on its membership, which included the numerous jurisdictional building code departments (Figure 1.1). It should be noted that all three were for-profit businesses.

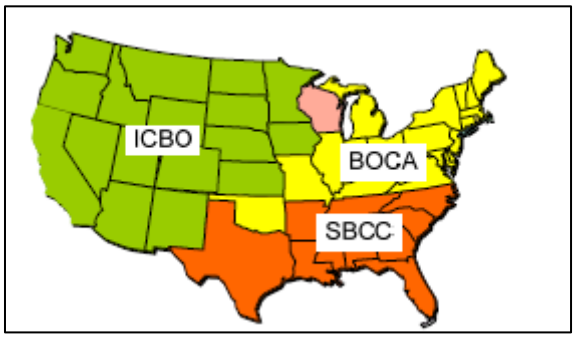


Figure (1.1): Applicability Of Building Codes By Region (Rossberg, 2019)

These three groups created distinct but comparable approaches for revising their model-building regulations over time. These rules encompass plumbing, electrical, residential, fire codes, other design considerations, and structural design. The explanation above applies equally to each of these, although only structural design aspects will be highlighted. Each group released a new version of its model codes every three years, and each state or jurisdiction would then have to decide whether to accept it and update its building code. A building code in the United States becomes legislation via this procedure at the state or municipal level. Most states in the United States have building rules enacted by their state legislatures; however, applying such regulations to the various jurisdictions within a state varies considerably. Large cities, such as Chicago, New Orleans, or New York, frequently have their building code, which may or may not be

per the state building code. Furthermore, it is typical for the ultimate adopting authority to be delegated to a single municipality. Figure (1.1) Building code applicability by area pre-IBC or county. As a result, it is very unusual for significant portions of the state, often rural, to have no building code at all.

1.2.2 AASHTO-LRFD Standard Background

The American Association of State Highway Officials (AASHO), the forerunner of AASHTO-LRFD, produced the first widely known national Standard for designing and constructing bridges in the United States in 1931. With the introduction of the automobile and the establishment of highway departments in all American states just before the turn of the century, most U.S. bridges' design, construction, and maintenance fell to these departments and, more specifically, the chief bridge engineer within each department. As a result, it was only inevitable that these engineers, working as the AASHTO Highway Subcommittee on Bridges and Structures (now the Committee on Bridges and Structures), would become the creator and keepers of the first bridge standard (AASHTO, 2020).

Standard Specifications for Highway Bridges and Incidental Structures was the title of the first publication. It swiftly became the de facto national Standard, and as such, it was accepted and utilized by state transportation departments and other bridge-owning authorities and agencies in the United States and worldwide. The last three words of the original title were eliminated very early on, and it has since been reprinted in consecutive editions at around four-year intervals as Standard Specifications for Highway Bridges, with the final 17th edition appearing in 2002 (AASHTO, 2020).

In 1986, the Subcommittee requested that the AASHTO Standing Committee on Research assess U.S. bridge design specifications, review foreign design specifications and codes, consider alternative design philosophies to those underlying the Standard Specifications, and make recommendations based on these investigations. This work was completed as part of the National Cooperative Highway Research Initiative (NCHRP), an applied research program supervised by the AASHTO Standing Committee on Research and managed by the Transportation Research Board (TRB). The work was finished in 1987, and the Standard Specifications were assessed to include noticeable gaps, inconsistencies, and even some conflicts, as may be anticipated with a standard progressively changed over time. Aside from that, the Standard did not reflect or embrace the most recently established design philosophy, load-and-resistance factor design (LRFD), which has gained traction in other fields of structural engineering and other regions of the world, such as Canada and Europe.

Working stress design (WSD) was the sole design concept inside the Standard Specifications from its origin until the early 1970s. Permitted stresses are defined as a fraction or percentage of a specific material's load-carrying capability, and estimated design stresses must not exceed those allowable stresses. WSD began to be altered in the early 1970s to represent the varying predictability of some load types, such as vehicular loads and wind forces, by changing design factors, a design philosophy known as load factor design (LFD).

Consideration of variability in structural element qualities, analogous to load variability, leads to a further philosophical expansion. While LFD considers the variability in structural element behaviour to a limited extent, the load and resistance factor design (LRFD) design philosophy explicitly

considers the variability in structural element behaviour. Moreover, LRFD heavily uses statistical approaches yet presents the results in a way that bridge designers and analysts can understand.

Starting with the Eighth Edition of the AASHTO LRFD Bridge Design Specifications, interim changes to the Specifications were discontinued, and new editions were published on a three-year cycle.

1.2.3 BS 5400 Standard Background

BS 5400 is a document that combines rules of practice for the design and construction of steel, concrete, and composite bridges and load, material, and quality criteria. It is based on the limit state design concepts defined in ISO 2394:1986 (first edition), General principles on structure reliability. Eurocodes would ultimately supersede BS 5400. In the interim, it is expected to remain BS 5400 to reflect the modifications contained in ISO 2394:1998. (Second edition). The following are included in BS 5400:

- Part 1: General statement.
- Part 2: Specification for loads.
- Part 3: Code of practice for the design of steel bridges.
- Part 4: Code of practice for the design of concrete bridges.
- Part 5: Code of practice for the design of composite bridges.
- Part 6: Specification for materials and workmanship, steel.
- Part 7: Specification for materials and workmanship, concrete, reinforcement, and prestressing tendons.
- Part 8: Recommendations for materials and workmanship, concrete, reinforcement, and prestressing tendons.
- Part 9: Bridge bearings.
    - Section 9.1: Code of practice for the design of bridge bearings.

    - Section 9.2: Specification for materials, manufacture, and installation of bridge bearings.
- Part 10: Code of practice for fatigue.

Some preceding sections are recommended practice guides, while others define criteria in specific terms. As a result, BS 5400 should not be integrated into construction contracts by reference. In addition, certain sections, namely Parts 2, 6, and 7, may be appropriate for individual inclusion by reference if care is taken to ensure that no provisions in such parts contradict other terms in the contract's content.

The modifications from the 1978 edition of this section of 5400 were meant to be implemented by issuing an amendment. However, for convenience of use, the adjustments were agreed to be incorporated into a new edition. As a result, BS 5400-1:1978 has been withdrawn.

The goal of BS 5400 is to attain an acceptable level of probability such that the structure being built is appropriate for the application for which it is required, i.e., it does not approach a limit state during its design life. Instead, it provides specific design standards and a coherent set of partial safety factors for bridges in the United Kingdom, which work together to give an acceptable low chance of reaching the limit states. Finally, the British Standard assumes that implementing its provisions will be entrusted to adequately trained and experienced persons.

1.3 Project Motivation and Aim

Design codes are periodically changing to incorporate shortcomings in the previous editions. These shortcomings may be due to changes in traffic loads, volume, natural disasters, drivers' behaviour, economy, and safety. In 2017, AASHTO-LRFD revised its code to incorporate many changes and update the code. A new code for the Gulf Cooperation Council (GCC)

countries is underway to develop based on American codes, and this topic is one of the problems that need immediate action as per the focus of the Bahrain government on transportation sector development shortly in Kingdom of Bahrain vision in year 2030.

Motivated by these changes and vision 2030, it was decided to assess the BS5400 standard and American AASHTO-LRFD code and design a typical concrete bridge using these two provisions. Therefore, this study will help to identify any loopholes in the existing codes (if any) that can be used in the new code/revision.

1.4 Objectives

The main objective of this study is to conduct a comprehensive assessment of the design codes and methodologies utilized in bridge design under the British Standard (BS 5400) and the American Association of State Highway and Transportation Officials Load and Resistance Factor Design (AASHTO-LRFD) code.

1.5 Outline of Thesis

The comparison between the British Standard (BS 5400-2005) and American (AASHTO-LRFD-2020) codes codes is rarely found. The current study will fill this gap; therefore, the research will be carried out based on the following Chapters:

-Chapter 1 Introduction to the Study: This chapter provides the background of the study, outlining the significance and necessity of comparing the British Standard (BS 5400-2005) and American (AASHTO-LRFD-2020) codes in bridge design. The objectives of the study are clearly stated.

Finally, the structure of the report is outlined to guide the reader through the subsequent chapters.

- Chapter 2 Literature Review: This chapter covers an extensive review of existing literature related to bridge design standards. The chapter also addresses recent advances in bridge design techniques and concludes with a summary of literature findings, identifying gaps and areas for further investigation.

- Chapter 3 Design Procedure: This chapter details the methodological approach to designing a bridge using both the British Standard (BS 5400-2005) and American (AASHTO-LRFD-2020) codes.

- Chapter 4 Analysis and Discussion: This chapter presents a comprehensive analysis and discussion of the results obtained from the bridge designs in CSiBridge 24 program using (BS 5400-2005) and (AASHTO-LRFD-2020) codes.

- Chapter 5 Conclusion and Recommendations: The final chapter summarizes the key findings of the study, drawing conclusions based on the comparative analysis of (BS 5400-2005) and (AASHTO-LRFD-2020) codes. Recommendations for practitioners are provided.

Chapter two

Literature Review

Chapter two

Literature Review

2.1 Introduction

Bridges were traditionally built with natural materials such as stone and wood, thus the most prevalent style. With the advent of steel and concrete manufacturing and the development of new structural design philosophies, new types of bridges have been emerged (Fu, 2013).

Bridges are critical components of every infrastructural system. They are essential to transportation networks since they carry traffic and manage traffic load and volume. Bridges are expensive constructions; consequently, the designer must carefully evaluate their initial planning and design to provide a safe bridge that can withstand current and future loads.

Bridges are often constructed when there is a requirement to span a road, railway, or water channel. Throughout history, many vast and tiny bridges have been created to pass over hurdles and impediments. The type of bridge constructed is determined by the unique physical and design scope requirements. As a result, a bridge can be as simple as a board used to cross a stream or as complex as a vast structural span designed to carry traffic across a wide river.

The foundation, substructure, and superstructure are the three primary components of a bridge (as shown in Figure 2.1). Each of these introductory sections contains additional components. The bridge's foundation is made up of piles and pile caps. Piers and abutments are part

of the substructure, whereas girders, bearings, and decks are part of the superstructure.

Laying the foundation is the first step in the construction of a bridge. The substructure supports the massive superstructure above it, which serves as the road or walkway.

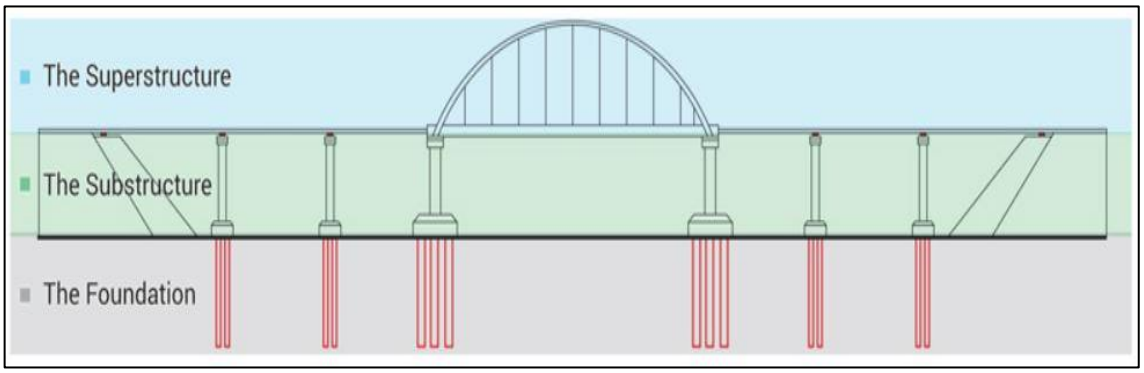


Figure (2.1): Bridge Part (Engineeringclicks, 2017)

Let us look at the main parts of a bridge in more detail and consider the components that make up the three core areas, as shown in Figure 2.2:

1- The Foundation

- Piles: Piles are typically used to support a bridge and form the foundation. The piles allow the bridge's weight and stress to be distributed equally through the earth, resulting in a stable and robust structure. A pile's material and design are determined by various criteria, including soil type, ground instability, and load-bearing capacity constraints. Scouring is also taken into account while designing river crossings.
- Caps: Caps add additional load-transfer capability to piles. Because they are put directly on top of the pile foundation, also known as pile caps, caps are frequently composed of heavy concrete to provide optimum support to the bridge's top section.

- Bents: Bents are formed when piles and caps are joined together. A series of bends support the substructure.

2- The Substructure

- Abutments: Bridges feature vertical supports at their approaching ends that act as ground retaining barriers. These are reinforced concrete and can sustain high amounts of horizontal stress.
- Piers: When a bridge has many spans, piers are erected at either end to provide sustenance from forces and vibrational effects, functioning as supporting points for the bridge.
- Pier Caps: Pier caps are sometimes referred to as headstocks. This is a place for girders to carry weights from the top superstructure components to bearings (which distribute the load across all the piers).

3- The Superstructure

- Girders: Girders connect all of the pile caps by stretching across them. Girders, commonly known as beams, provide support for the deck. Depending on the length of the bridge, this might be a single span or many spans connecting all the bends. Girders are often trussed to improve stress and load resistance. As a result, pressure is immediately transferred to the foundation. Girders are often built of metal or concrete.
- Bearings are structural components that transmit loads from the deck to the substructure. These transfer stresses and loads to the piers via the girders, allowing movement between bridge segments. The movement might be both linear and torsional. Bearings provide clearance between these components.

- Trusses are formed by linking triangular components to distribute weights and bending moments throughout the bridge. Simple trusses, suspension trusses, and cantilever trusses are some examples. The truss network, which can be created as a deck truss, pony truss, or through truss, offers a surface for transit. The way traffic moves on the bridge varies depending on the truss.
- Decks: Decks receive the most direct traffic. Some simple decks can be composed of both concrete and metal. Examples include travel or walking routes, drainage systems, curbs, expansion components, sidewalks, and approach slabs.
- Barriers: Mainly as a safety and protection feature, bridges have barriers on the sides of their decks. For better aesthetics, these can be specially designed fixtures, ropes, rails, fences, or concrete walls.
- Arches: A bridge with arches is solid. Arches can help control the bridge's safety and load-carrying capacity. The number of arches and materials utilized in a building is critical. The spandrel is the gap between the bridge pillars and the deck beam. Depending on the arch design, spandrels can be opened or closed.

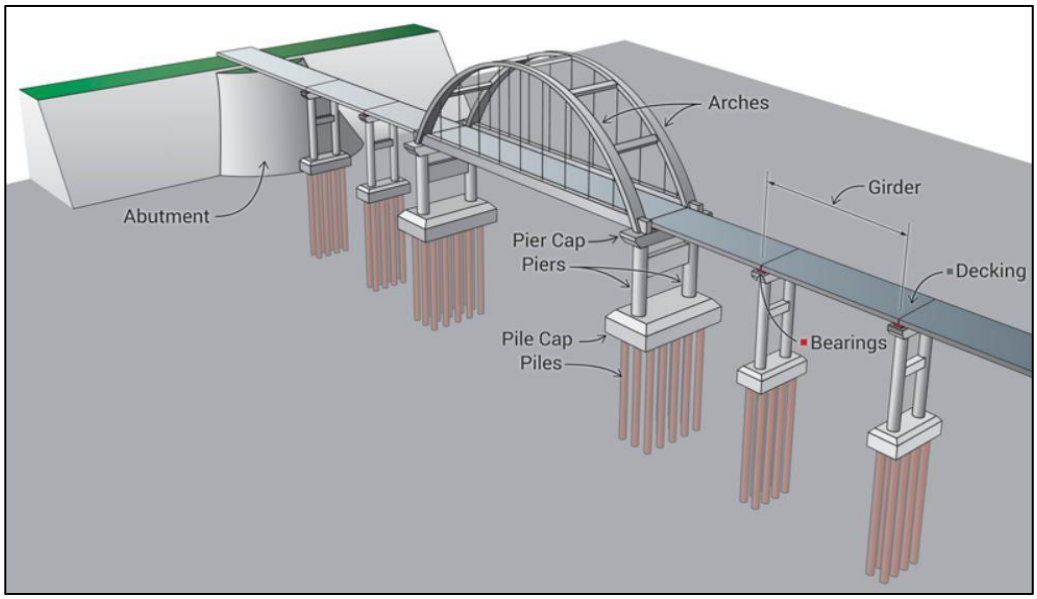


Figure (2.2): Detailed Bridge Parts (Engineeringclicks, 2017)

Bridges serve as an essential part of transportation. As a result, before a bridge design is finalized, complicated calculations and in-depth feasibility research are performed. In addition, factors such as the environment, load capacity, soil type and preservation, material, building approaches, and procedures must all be considered when designing a bridge.

2.2 Literature review for code comparison

This study is based on comparing the British BS5400 standard with the American AASHTO-LRFD code for bridge design. Ravikant and Chand (2019) Compared bridge girders were utilizing IRC 2014, Euro 2003, and AASHTO 2002 codes. Masrom and Goh (2018) Conducted a similar assessment for bridge traffic loading utilizing British Standard (BS 5400-2005) and European standard (Euro code 1) 2003. So, in this chapter, we will go through a few of them.

2.2.1 Comparative study of highway loads on bridges according to different codes by Kamal (2014)

A comparative study between different codes for highway loads on bridges is introduced. These codes are:

(a) Egyptian code (EC45:1993),

(b) Egyptian Code (EC201-2012),

(c) The British standard (BD 37/01),

(d) The American code AASHTO-Standard 17th edition 2002,

(e) The American code AASHTO- LRFD 4th edition 2007,

(f) The European standard (Euro code 1) 2003.

The comparison is based on carefully examining a standard slab-girder bridge deck, widely utilized worldwide with varying spans and spacing between the main girders. Comparison charts highlight the relationships between the various codes, Egyptian code 45 1993 and American code AASHTO LRFD. The main findings from each of these codes are discussed. Charts are created to show the links between the various codes about the American code, AASHTO-LRFD. These charts are essential for providing bridge designers with a vital design aid.

As previously stated, the author compared six principal international highway codes. These six codes are utilized in the design of bridges in Egypt and all Arab countries. One of the main goals of this comparative study is that many bridges in the Middle East have been developed and examined by various consultants from various nations. As a result, these consultants may be more familiar with their own country's codes than the other codes; thus, providing them with the tools they need to readily convert from the various design codes to the code they are familiar with is critical.

Another critical purpose of the author's research is to analyze the performance of bridges designed according to various codes. For example, it was discovered that bridges designed based on AASHTO highway traffic loads must be revised to resist serviceability circumstances, as demonstrated later in this research.

To compare the effect of the imposed load on the bridge deck, the highway traffic loads stated in these six codes are applied on a typical bridge deck, which has frequently been used with almost the same designs in many large highway projects. This investigation used several deck lengths (L=20, 25, 30,35,40,45, & 50 meters) and girder spacing (S=2.00, 2.50, 3.20, & 4.00 meters) used. To simulate the bridge, the grillage analysis approach is used.

The comparison results are reviewed, and simple charts are introduced as a design help for bridge designers.

The bridge deck under consideration is widely used in the bridge business worldwide. It has been employed in a variety of Egyptian projects. Al Marioteia, a new connection connecting the eastern and western sides of Cairo's ring road (see Figure 2.3), Saft Al Laban, the Al Meadia Bridge across Edko Lake (see Figure 2.4), and other bridges around Egypt are among these projects. The identical bridge configuration is used all around the world.



Figure (2.3): Al Marioteia Bridge (Kamal, 2014)

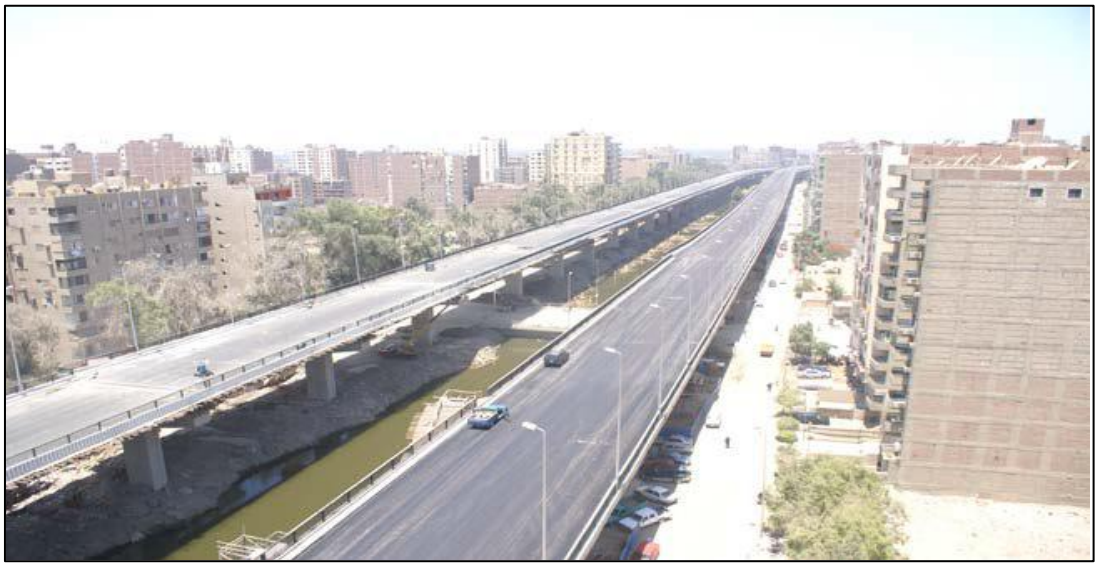


Figure (2.4): Al Media Bridge (Kamal, 2014)

The straining actions obtained by applying the different codes to the typical bridge deck are compared. The comparison is made for three different cases:

• UF= Unfactored values

• SLS= Service limit state= γ(SLS) x UF

• ULS= Ultimate limit state= γ(ULS) x UF

A comparative study between the traffic loads specified by six principal international codes is presented. The main conclusions of this study may be summarized as follows:

1- The highway traffic loads given by the new Egyptian Code EC-201 and the European Code EN-1991 are identical and provide higher values than the previous Egyptian code EC45, which is still employed in designing Egyptian bridges.

2- The British Standard, BD37/01, creates more multiple service straining actions than the EC45-1993 while yielding marginally higher results for ultimate straining actions.

3- The straining actions generated by AASHTO STANDARD and AASHTO LRFD highway traffic loads are significantly lower than those found by the other codes. This extraordinary divergence may be the primary source of deterioration to bridges designed in the 1980s in Gulf countries adopting these rules.

4- The maximum average ratio for the different codes relative to AASHTO-LRFD is presented for rapid correlation between the multiple codes.

5- AASHTO-LRFD calibration curves are created in the design stage to convert between different codes.

6- Most Arabic countries require a unified bridge design code that can be changed and fine-tuned based on the nature of traffic in each country.

2.2.2 Comparative study of bridge traffic loadings between British standards and Eurocodes by Masrom and Goh (2018)

This research focuses on the importance of bridge traffic loads from both the BS 5400 and EC 2003 perspectives. A grillage analysis also demonstrates comparative research on a supported bridge. Because of differences in design regulations among European countries, the European Commission resolved to remove technical barriers to enable a more open economy. The good intentions caused the British Standards (BS) implemented in many countries since 1990 to be replaced by Eurocodes (EC) in 2010. The withdrawal of the BS has presented Malaysian practitioners with a problem in handling the bridge design in compliance with the EC. As a result, this study includes a detailed discussion on the importance of traffic loads in both BS and EC design standards. The topic covers a new notion in EC in which variable actions are classified into four representative values, explained in this paper. This study also discusses the discrepancies in using the partial safety factor in both codes. In this study, a supported bridge is used as a demonstration for a comparison study to emphasize the differences in execution between the two systems. Using STAAD Pro, the grillage analysis is used to model the seven possible span lengths of the bridge. As a result, it is discovered that the nature of unfactored dead load (UDL) influences the maximum moment differently depending on the length of the loaded bridge. Therefore, the adjusted adjustment factor has a substantial impact on the analysis as well.

The majority of the bridges are built to withstand both normal and abnormal traffic loads. These loads were designated by BS as HA and HB loadings, while EC designated them as Load Model 1 (LM1) and Load Model 3 (LM3) as normal and abnormal traffic loadings, respectively. Both codes' LM1 and HA loadings are designed to cover flowing, congested, or traffic jam circumstances with a large percentage of heavy vehicles. These loads must be put in so that the worst effects are produced. In other words, it is a parameter that provides a similar UDL to mimic real-world traffic loads' bending and shearing effects. As done in the study, the lane factor must be multiplied by both the HA and LM1 loadings.

The authors intend to compare the bridge design results between the BS and EC codes. A model of a precast-supported bridge with seven various span lengths has been created. In this work, the grillage modeling technique is used. The bridge cross section is designed to be the same across all spans. STAAD Pro is used in two circumstances where highway traffic loads provided by both codes are used. The two scenarios are the normal traffic load alone and the combination of normal and abnormal traffic loads. The abnormal traffic load system has been configured to produce the worst effect for the maximum bending moment (BM) and maximum shear force (SF) to the design goal. The permanent loads are comprised of dead loads and superimposed dead loads.

The authors outline research comparing bridge traffic loadings using BS and EC techniques. The outcomes of this study contribute to the pool of knowledge in bridge design, particularly for Malaysian bridge designers who aim to replace the existing practice approach of employing BS5400 in considering traffic loadings with the EC approach. The following findings are highlighted in this study:

1) EC adds a new idea for bridge designers to include variable actions not covered by BD-37 that refers to a standard related to "Loads for Highway Bridges." It is part of the Design Manual for Roads and Bridges (DMRB), which provides guidelines and standards for the design, assessment, and maintenance of road infrastructure in certain jurisdictions. Specifically, BD-37/01 is a document that outlines the requirements for the loads that highway bridges must be designed to support. This includes various types of loads such as vehicular loads, environmental loads (like wind and snow), and special loads (such as those from maintenance vehicles). The standard ensures that bridges are designed to be safe, durable, and capable of handling the expected traffic loads over their service life. The new approach divides variable activities into four representative values (characteristic, combination, frequent, and quasi-permanent) used in various combination combinations. These four example values have varying chances of occurrence.

2) It was discovered that the TS system in EC, with the nature of UDL intensity (which remained constant with loaded length and has a significant influence at longer lengths), dictated the maximum moment at a critical position on bridges with spans of 30 m and above. This factor denotes a significant discrepancy between the two codes.

3) In all cases, the modified adjustment factor, *q*, of UDL (which was significantly greater than EN values) indicated in BS EN imparted higher RBM ratio values than EN (UF, SLS, and ULS). However, under all cases, the modified adjustment factor, *q*, specified in BS EN, is dominant in giving the ratio RBM pattern.

2.2.3 Comparative study of live loads for a bridge deck with IRC 2016 and AASHTO-LRFD codes by Choubry, Rai and Bajpai (2018)

The authors compare the fundamental structural properties of an I-section concrete girder bridge with slab thicknesses ranging from 365mm to 815mm under AASHTO HS 20 loadings and IRC Class A loadings. The deck girder bridge was analyzed using the FEA software Staad pro. In this work, the RC deck is represented by a supported beam and a bridge deck spanning only one direction. The Bridge deck is 10 meters long and 12 meters wide. Moving live loads have been assigned to the concrete deck bridge under AASHTO and IRC:6 requirements. Class A loadings were taken from the Indian Code IRC: 6 Section: II, while HS-20 loadings were taken from the AASHTO LRFD HS-20. According to the study, the values of the structure parameters of the I-section concrete girder bridge under AASHTO HS-20 loadings are greater than those under IRC Class A loading. As a result, more uniform and realistic load concepts and standards are required in the future.

IRC Class A loading comprises a train of wheel loads (8 axles) that contains two trailers with prescribed axle spacing and a driving vehicle. This loading was created and presented to cover the worst possible combination of axle loads and spacing. It is commonly used on roadways where permanent bridges are required to be built.

The American Association of State Highway and Transportation Officials introduced the AASHTO LRFD HS-20 LIVE LOADINGS-AASHTO HS-20-44, where H stands for highway, S for semi-trailer, and 20 Tons (325 kN) weight of the first two wheels in 1994. To generate the most positive moment in a span, the two rear axles have varied separations ranging from 4.3 to 9m.

This work created a virtual model using the finite element analysis software Staad-Pro. This virtual model can be updated and improved for different load classes and supports. The loads evaluated are primarily the self-weight of the entire building and moving living loads. The findings for both Class A and HS-20 loadings have been obtained. In the study, the parameters were compared. The findings of the four I-section girders supporting the deck under IRC class A and HS-20 loadings are compared. The bending moment, torsions, and shear force parameters are examined as the deck thickness varies from 365mm to 415mm.

It is discovered that AASHTO HS-20 loadings create higher bending moment values than IRC Class A loadings. The percentage difference between the two Figures is 3.4. The AASHTO loads also vary in a torsional moment, owing to the difference in wheel designs between the two loadings. In the case of AASHTO, the torsional value is more significant. It is shown that the size of loadings mainly determines the maximum shear force in beams, and as indicated, AASHTO wheel loads are greater than IRC Class A loadings. The AASHTO shear force Figure is 17% greater than the IRC value. Furthermore, when deck thickness increases, the cracking propensity decreases.

2.2.4 Design and analysis of bridge girders using different codes by Ravikant and Chand (2019)

The current work looks at the design of bridge girders, including longitudinal and cross girders. The span of the bridge is set at 25m, and girders are used to support it. The dimensions of longitudinal girders are 2000x500 mm, while cross girders are 1500x250 mm. There are three longitudinal girders with a spacing of 2600 mm c/c and cross girders with a spacing of 5000 mm c/c. The girders are designed using the software

STAAD Pro. In this bridge girder design research, three identical models are created in STAAD pro, and then their loadings are adjusted according to IRC 2010 codes, Euro 1992 codes, and AASHTO-LRFD 2010 criteria. Based on these various loadings, they calculated the shear force, bending moment, and steel area in the longitudinal and cross girders. The analysis is carried out in STAAD Pro, and the results are compared using tables and graphs.

Bridge girders have been designed for both dead and live loads. The slab's dead load is considered to be 7.5 kN/m^2, whereas the dead load of the members is taken into account in STAAD Pro. IRC 2010 codes, Euro 1992 codes, and AASHTO-LRFD 2010 specifications were chosen for live loads, and the model was developed in STAAD Pro.

Bridge girders are designed in STAAD Pro utilizing various vehicle loadings from IRC Codes, AASHTO Specifications, and Euro Codes. The maximum value of the steel area required is considered in both the longitudinal and cross girders. Figure 2.5 below shows the comparison of the steel longitudinal girder for each code.

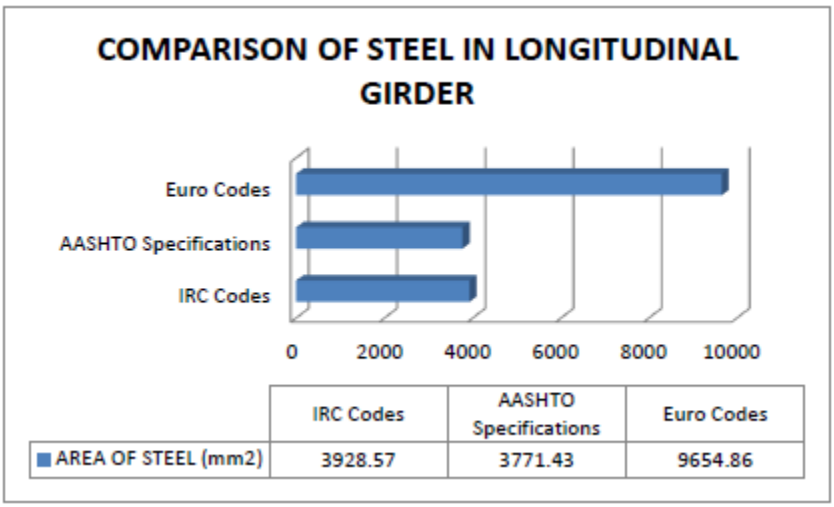


Figure (2.5): Comparison of Steel in Longitudinal Girder (Ravikant and Chand, 2019)

Different loadings are taken from IRC codes, AASHTO specifications, and Euro codes. The conclusion of the analysis is as follows:

1. Compared to the other two codes, IRC codes and AASHTO requirements, Euro code designs are over-strengthened, as shown in Figure 2.5.

2. When shearing forces, bending moments, and deflection are calculated using Euro codes, they are nearly double those calculated using IRC codes and AASHTO requirements.

3. Bridge girders (up to 25m) designed utilizing IRC standards are more cost-effective and safer than the other two, AASHTO requirements and Euro codes.

4. Compared to the other two, AASHTO requirements and Euro codes, IRC codes have the best loading and design methodologies combination.

5. Because bridge girders designed utilizing IRC standards have the least amount of deflection and bending moment, IRC Class A loading is the most affordable and optimum loading for bridge girder design in INDIA.

2.2.5 Implication of using the British standards on the design of precast, prestressed concrete AASHTO girders by Antoine and Miroslav (2011)

Internationally, AASHTO and British Standards are utilized to build bridge structures. Compared to AASHTO, the British Standards (BS 5400-2:2006, BD37/01, and BS 5400-4:1990) have bigger live loads and strict service load stress standards. In places where either code can be used, increasing the AASHTO design live loads by 50% is common practice to represent the British Standards' truck weights and axle configurations.

The authors examine the effects of utilizing British Standards for precast bridge girder design to AASHTO LRFD requirements. For this objective, a numerical application is explored based on a project case study of 3.64 km of bridge structures subdivided into 40 m long spans (a total of 90 spans) and supported by 905 girders. Based on British Standards and 2.3 m deep girders, the original design is exhibited for the first time. Then, a cost-effective solution is constructed employing a reduced girder depth and weight. Finally, results based on AASHTO LRFD design specifications are shown for comparison.

The data in the authors' analysis is helpful because it indicates new trends in determining bridge design live loads that more accurately mirror contemporary populations with complicated vehicle weights and axle distribution.

Using a project case study, the authors emphasize variations in live load and service load criteria between British Standards and AASHTO LRFD specifications and their impact on precast girder layout. In addition, he attempts to construct 3.64 km of bridge structures partitioned into 90 spans of equal length and supported by 905 precast, prestressed girders developed under British Standards and project specifications. All spans are 40 m long (measured between pier centerlines) and are supported solely by laminated reinforced bearing pads. The reinforced concrete deck slab includes expansion joints every 3 to 4 spans (e.g., the expansion length varies from 120 m to 160 m). Only the deck slab provides continuity across the piers.

The primary goal of the authors' research is to demonstrate the effects of higher live loads on the design of precast bridge girders. The British Standards design live loads (BS 5400-2:2006 and BD 37/01) are used for this purpose. The following is the paper's outline:

- Recognize the distinctions between British Standards and AASHTO LRFD design live loads.

- Recognize the changes in service load criteria and load combinations between British Standards and AASHTO.

- Present the original girder design for a project case study based on simple span units under British Standards.

- Explain the cost-effective alternative solution that was used.

- Create the girder design using AASHTO LRFD requirements and demonstrate the influence of applying British Standards on the design using code-to-code comparison of results.

- Show the effect of increased live loads on continuous precast girders for composite dead and live loads.

The author applied a case study project that included three bridge structures: a 28.9 m wide main highway bridge, a 27.5 m wide utility bridge, and a 12 m wide trestle bridge. The bridges were built per British Standards. The trestle bridge was constructed for HA live loads, while the main highway and utility bridges were intended for HA and HB loads, considering the HB truck's substantial axle load of 450 kN. Based on class 2 concrete and a 28-day cube strength (f'c) of 50 MPa (e.g., a cylindrical strength f'c = 41.7 MPa), the allowed tensile stress was established at 3.2 MPa.

Finally, the authors compare the effects of utilizing British Standards on the design of precast, prestressed girder bridges to AASHTO LRFD. The following results were reached based on comparisons of live load and service load tensile stress limits:

- AASHTO HL93 live loads are bigger than British Standards live loads (marked as HA for lane load and HB for truckload). If the HB truck axle load of 450 kN is utilized, the induced bending moments due to HA + HB live loads can be double the moments due to HL93 live loads and 40% bigger if the HB truck axle load of 300 kN is used.

- The load combination for the service load stress check in tension is more stringent in British Standards because the temperature gradient factor is 0.8 compared to 0.1 in AASHTO LRFD, and the live load factor is 1.0 compared to 0.8 in AASHTO.

- In British Standards, the allowed service load tensile stress is generally specified at 0.5 f 'c in MPa for class 2 concrete (tensile stress permitted without visible cracking). This is greater than the permitted value of 0.25 f 'c in MPa for aggressive conditions and zero for highly aggressive environments in AASHTO.

Based on these findings and a case study, it was determined that designs based on British Standards HA and HB live loads with the HB axle load set at 300 kN and a service load tensile stress limit of 0.5 f 'c in MPa outperform AASHTO LRFD designs if the AASHTO HL93 live load is increased by 50%. The service load tension stress limit is set at zero. This supports authorities' requirements in countries where both codes are used to mention these limits in project design criteria when AASHTO LRFD is employed. Furthermore, it was demonstrated that if the British Standards heavy HB axle load of 450 kN were utilized, the quantity of precast, prestressed girders required would be more significant.

The concept of making the girders continuous for composite and live loads was briefly given, and the problems of overstress in the precast girder end zones due to higher live loads were explored. It is important to note that

the information presented in this research paves the path for further rigorous investigations into the effects of new trends in bridge design live loads that may soon be implemented in design specifications.

2.3 Some literature review for code comparison to being summarized

Different journals, thesis, and design aspects were studied, considering IS, IRC, Euro, AASHTO specifications, and ACI codes.

Many studies have been undertaken on the resistance of highway bridges in bearing varied traffic loads as the principal source of stress on the structure, such as the study (Lenner and Sykora, 2016). These traffic loads are considered in bridge analysis and design per the specific design code used in the country of practice.

Djahani and Ibrahim (2005) presented another critical study a preliminary comparison of AASHTO- LFD, AASHTO- LRFD, and BS5400. They used actual truck bridges in the UAE to compare and advise using the AASHTO-LRFD with a multiplication factor of 2.

Bakhoum (1996) examined the traffic loading specified by various codes. One of the key conclusions is that when alternative codes are used to calculate section resistance, the differences in principal actions are more significant than the changes in section resistance. This research methodology differs from the one used here.

Kumar and Dattatreya (2015) released a vital study on "Analysis of Bridge Girder -2-way Beams" discovered that employing cross beams or girders reduces deflection, bending moment, and shear force compared to the design of girder bridge without cross beams or girders.

Saxena and Maru (2013) Publish a vital research paper titled "Comparative Study of the Analysis and Design of T-Beam Girder and Box Girder Super Structure," explaining that the T-beam girder is more economical than the box girder. However, the box girder is better suited for long-span bridges. They have a high torsional rigidity due to their compact box sections.

Chu and Pinjarkar (1971) used the finite element method to produce a "Simply Supported Curved Box Girder Bridge." The researchers Wang and Huang (1992) investigated the "Dynamic & Impact Characteristics of Continuous Steel Beam Bridge Decks and Slant-legged Rigid Frame Bridges". Also, Paul (2011) released the "Three-Dimensional Finite Element Model and Tested Them with Loading System of Two Points" to examine the structural behaviour of RCC T-beam bridge longitudinal girders.

2.4 Summary

The above literature review shows that during the past few years, the number of studies concerning the comparison of different codes has gradually developed. The studies encompassed codes such as IS, IRC, Euro, AASHTO specifications, ACI, and British standards. However, some studies compare local codes, such as Egyptian and Malaysian.

Several methods were used to analyze the bridges, from writing a computer program for analysis to using advanced bridge structures software.

It can also be observed from the above literature review that they used different techniques to find the differences between different codes. However, fewer papers are comparing Bs 5400 to AASHTO-LRFD. The BS 5400 standard is no longer used in Euro countries. However, with the recent evolution in the road sector in GCC and especially in Bahrain, the

development of the bridge design and the new code for the Gulf Cooperation Council countries is underway based on American code. In addition, this topic is one of the problems that need immediate action as per the focus of the Bahrain government on transportation sector development. Therefore, this study will help to identify any loopholes in the existing codes (if any) that can be used in the new code/revision.

Furthermore, Bs-5400 standard and AASHTO-LRFD were explored in this thesis, which – to the researcher's knowledge – had not been compared before.

The research has also benefited from the new CSI program and interfacing procedure applied in some research papers.

The following two chapters explain the design procedure and analysis of the bridge using the BS 5400 and AASHTO-LRFD.

Chapter Three

Design Procedure

Chapter three

Design Procedure

3.1 Introduction

As mentioned earlier, there are different methods for the design of bridges depending on different design codes. Different countries use different codes based on each country's requirements. However, some countries are trying to develop their codes based on others. Against this background, this thesis deals with the codes of AASHTO-LRFD and BS 5400 in the following sections.

The AASHTO LRFD Bridge Design Specifications, Ninth Edition, contains the following 15 sections and an index:

1. Introduction.

2. General Design and Location Features.

3. Loads and Load Factors.

4. Structural Analysis and Evaluation.

5. Concrete Structures.

6. Steel Structures.

7. Aluminium Structures.

8. Wood Structures.

9. Decks and Deck Systems.

10. Foundations.

11. Abutments & Piers and Walls.

12. Buried Structures and Tunnel Liners.

13. Railings.

14. Joints and Bearings.

15. Design of Sound Barriers.

BS 5400 is a document that combines rules of practice for the design and construction of steel, concrete, and composite bridges and load, material, and workmanship criteria.

Parts 2, 3, 4, and 5 are condensed in this chapter for easy comparison with AASHTO-LRFD. It is emphasized that a bridge built in accordance with this reduced design would only meet some of the BS 5400 standards; numerous essential clauses are not addressed due to their complexity, and the scope of loads and constructional features is limited.

3.2 AASHTO-LRFD Design Procedure

Bridges are constructed for particular limit states that consider a variety of loads and resistance in the load and resistance factor design (LRFD). This chapter's first section defines these limit states: strength, intense events, service, and exhaustion. The following factors of load and resistance are covered in more detail in this sections as listed below:

- Load combinations and load factors
- Strength limit states for superstructure design
- Resistance factors for strength limits
- Design live loads
- Number of design lanes
- Multiple presences of live loads
- Dynamic load allowances
- Live load distribution factors
- Load combinations for the Strength I Limit State

- Simple beam moments and shears carrying moving concentrated loads

3.2.1 Limit States

AASHTO-LRFD Article. 3.4.1 defines the following load combinations. The load and resistance considerations covered in later sections of this chapter are considered when designing bridges for these limit states.

- **Strength I**: Basic load combination related to the normal vehicular use of the bridge without wind.
- **Strength II**: Load combination relating to using the bridge by owner-specified special design vehicles and/or evaluation permit vehicles without wind.
- **Strength III**: Load combination relating to the bridge exposed to wind velocity exceeding 55 mph without live loads.
- **Strength IV**: Load combination relating to very high dead load to live load force effect ratios exceeding about 7.0 (e.g., for spans greater than 250 ft).
- **Strength V**: Load combination relating to normal vehicular use of the bridge with a wind velocity of 55 mph.
- **Extreme Event I**: Load combinations, including earthquakes.
- **Extreme Event II**: Load combinations relating to ice load or collisions by vessels and vehicles.
- **Service I**: Load combination relating to the normal operational use of the bridge with 55 mph wind. They are also used for live load deflection control.
- **Service II**: Load combination intended to control yielding of the steel structures and slip of slip-critical connections due to vehicular live load.

- **Service III**: Load combination relating only to tension in prestressed concrete structures with the objective of crack control.
- **Fatigue I**: Fatigue and fracture load combination related to infinite load-induced fatigue life.
- **Fatigue II**: Fatigue and fracture load combination related to finite load-induced fatigue life.

The following terms are defined for limit states:

γ_i = Load factor: a statistically based multiplier applied to force effects

ϕ = Resistance factor: a statistically based multiplier applied to nominal resistance, as specified in AASHTO Specification Sections 5 to 8, and 10 to 12

η_i = Load modifier: a factor relating to ductility, redundancy, and operational importance

η_D = A factor relating to ductility, as specified in AASHTO Article 1.3.3

η_R = A factor relating to redundancy as specified in AASHTO Article 1.3.4

η_I = A factor relating to operational importance as specified in AASHTO Article 1.3.5

Q_i = Force effect

R_n = Nominal resistance

R_r = Factored resistance: (ϕR_n)

As per **AASHTO-LRFD Article1.3.2**, the effects of loads must be less than or equal to the resistance of a member (or its components), or $\eta\gamma Q \leq \Phi R_n = R_r$

So **AASHTO-LRFD Eq. 1.3.2.1-1** defined this equation,

$$\Sigma\eta_i \gamma_i Q_i \leq \phi R_n \text{ -(Equation 1)}$$

According to **AASHTO-LRFD Eq. 1.3.2.1-2** for loads for which a maximum value of γ_i is appropriate,

$$\eta_i = \eta_D \eta_R \eta_I \geq 0.95 \text{ -(Equation 2)}$$

And **AASHTO-LRFD Eq. 1.3.2.1-3** for loads for which a minimum value of γ_i is appropriate,

$$\eta_i = \frac{1}{\eta_D \eta_R \eta_I} \leq 1.0 \quad \text{-(Equation 3)}$$

3.2.2 Load Combinations and Load Factors

Table 3.1 (**AASHTO-LRFD Tbl. 3.4.1-1**) and Table 3.2 (**AASHTO-LRFD Tbl. 3.4.1-2**), which show the load factors for various load combinations and permanent loads.

The following permanent and transient loads and forces shall be considered in bridge design:

a- Permanent Loads

CR = force effects due to creep

DD = downdrag force

DC = dead load of structural components and nonstructural attachments

DW = dead load of wearing surfaces and utilities

EH = horizontal earth pressure load

EL = miscellaneous locked-in force effects resulting from the construction process, including jacking apart of cantilevers in segmental construction.

ES = earth surcharge load.

EV = vertical pressure from dead load of earth fill.

PS = secondary forces from posttensioning.

SH = force effects due to shrinkage.

γ_p = load factor for permanent loading.

Table (3.1): (AASHTO Table3.4.1-1) Load Combinations And Load Factor

Load Combinations and Load Factors

Load Combination Limit State	*DC DD DW EH EV ES EL PS CR SH*	*LL IM CE BR PL LS*	*WA*	*WS*	*WL*	*FR*	*TU*	*TG*	*SE*	Use One of These at a Time *EQ*	*IC*	*CT*	*CV*
Strength I (unless noted)	γp	1.75	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Strength II	γp	1.35	1.00	—	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Strength III	γp	—	1.00	1.40	—	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Strength IV	γp	—	1.00	—	—	1.00	0.50/1.20	—	—	—	—	—	—
Strength V	γp	1.35	1.00	0.40	1.0	1.00	0.50/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Extreme Event I	γp	γEQ	1.00	—	—	1.00	—	—	—	1.00	—	—	—
Extreme Event II	γp	0.50	1.00	—	—	1.00	—	—	—	—	1.00	1.00	1.00
Service I	1.00	1.00	1.00	0 30	1.0	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Service II	1.00	1.30	1.00	—	—	1.00	1.00/1.20	—	—	—	—	—	—
Service III	1.00	0.80	1.00	—	—	1.00	1.00/1.20	γ_{TG}	γ_{SE}	—	—	—	—
Service IV	1.00	—	1.00	0.70	—	1.00	1.00/1.20	—	1.0	—	—	—	—
Fatigue I— *LL, IM, & CE* only	—	1.50	—	—	—	—	—	—	—	—	—	—	—
Fatigue II— *LL, IM, & CE* only	—	0.75	—	—	—	—	—	—	—	—	—	—	—

Table (3.2): (AASHTOTable3.4.1-2) Load Factors For Permanent Loads γ_p

Load Factors for Permanent Loads, γ_p

Type of Load. Foundation Type, and Method Used to Calculate Downdrag		Load Factor	
		Maximum	Minimum
DC: Component and Attachments		1.25	0.90
DC: Strength IV only		1.50	0.90
DD: Downdrag	Piles, α Tomlinson Method	1.4	0.25
	Piles. λ Method	1.05	0.30
	Drilled shafts. O'Neill and Reese (1999) Method	1.25	0.35
DW: Wearing Surfaces and Utilities		1.50	0.65
EH: Horizontal Earth Pressure			
• Active		1.50	0.90
• At-Rest		1.35	0.90
• *AEP* for Anchored Walls		1.35	N/A
EL: Locked-in Construction Stresses		1.00	1.00
EV: Vertical Earth Pressure			
• Overall Stability		1.00	N/A
• Retaining Walls and Abutments		1.35	1.00
• Rigid Buried Structure		1.30	0.90
• Rigid Frames		1.35	0.90
ES: Earth Surcharge		1.50	0.75

b- Transient Loads

BR = vehicular braking force

CE = vehicular centrifugal force

CT = vehicular collision force

CV = vessel collision force

EQ = earthquake load

FR = friction load

IC = ice load

IM = vehicular dynamic load allowance

LL = vehicular live load

LN = design lane load

LS = live load surcharge

PL = pedestrian live load

SE = force effect due to settlement

TG = force effect due to temperature gradient

TL = design truck load or design tandem load

TU = force effect due to uniform temperature

WA = water load and stream pressure

WL = wind on live load

WS = wind load on structure

3.2.3 Strength Limit States for Superstructure Design

The load effect, Q, is given in the following equations in relation to various limit states:

Strength I: Q = 1.25 DC + 1.5 DW + 1.75 LL; LL = TL + LN

Strength II: Q = 1.25 DC + 1.5 DW + 1.35 LL

Strength III: Q = 1.25 DC + 1.5 DW + 1.4 WS

Strength IV: Q = 1.5 DC + 1.5 DW

Service I: Q = 1.0DC + 1.0DW + 1.0LL + 1.0WA + 0.3WS + 1.0WL

Service II: Q = 1.0 DC + 1.0 DW + 1.3 LL

Service III: Q = 1.0 DC + 1.0 DW + 0.8 LL +1.0 WA

Fatigue I: Q = 1.5 (LL + IM)

Fatigue II: Q = 0.75 (LL + IM)

3.2.4 Resistance Factors, Φ, for Strength Limits

Resistance factors, Φ, for strength limit states are given for various structural categories in AASHTO-LRFD. Selected resistance factors that are most frequently encountered follow.

AASHTO-LRFD Article 1.3.2.1 stated that the resistance factors ϕ shall be taken as 1.0 for service and extreme event limit states except for bolts.

AASHTO-LRFD Article. 5.5.4.2 gives flexure and tension in reinforced concrete to be 0.90.

According to **AASHTO-LRFD Article. 6.5.4.2** gives all limits to be consider as stated below:

- ❖ Flexure and tension in prestressed concrete: 1.00
- ❖ Shear in concrete: 0.90
- ❖ Axial compression in concrete: 0.75
- ❖ Flexure in structural steel: 1.00
- ❖ Shear in structural steel: 1.00
- ❖ Axial compression in structural steel: 0.90
- ❖ Tension, yielding in gross section: 0.95

3.2.5 Design Live Load HL-93

HL-93 is a notional live load where H represents the HS truck, L is the lane load, and 93 is the year in which the design live load HL-93 was adopted.

The design live load designated as the HL-93 consists of as per **AASHTO-LRFD Article 3.6.1.2** a combination of:

- Design truck (HS-20) or design tandem (a pair of 25-kip axles 4 ft apart).
- Design lane load of 0.64 kip-ft uniformly distributed in the longitudinal direction. Transversely the design lane load is distributed over a 10 ft width within a 12 ft design lane. Note that the design lane load is not subject to dynamic allowance.

For both design truck and design tandem loads, the transverse spacing of wheels is taken as 6.0 ft. However, the uniform lane load may be continuous or discon-tinuous to produce the maximum force effect.

3.2.6 Fatigue Live Load

The fatigue load will be one truck or axles as specified in Figure 3.1 (**AASHTO-LRFD Article. 3.6.1.2.2**) with a constant spacing of 30 ft between the 32.0 kip axles. The frequency of the fatigue load shall be taken as the single-lane average daily truck traffic. When the bridge is analyzed by approximate load distribution (**AASHTO-LRFD Article. 4.6.3**), the distribution factor for one traffic lane shall be used. See Figure 3.2.

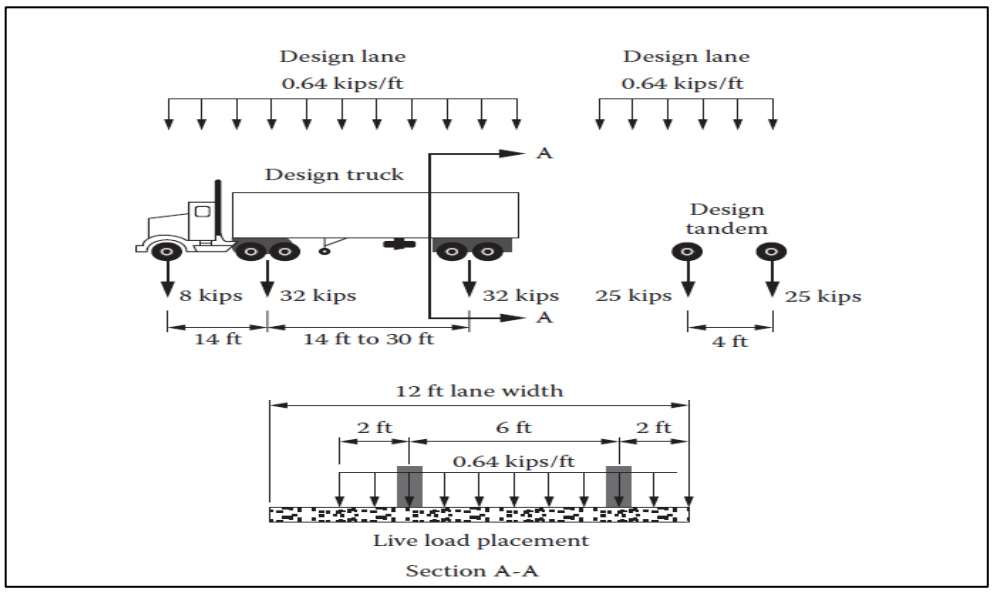


Figure (3.1): Design Truck (HS-20) (AASHTO-LRFD Article. 3.6.1.2.2.)

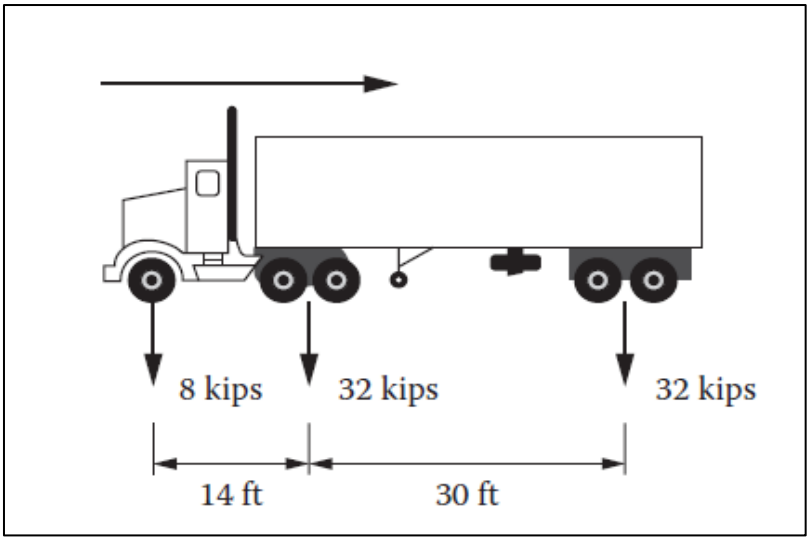


Figure (3.2): Fatigue Live Loading (AASHTO-LRFD Article. 3.6.1.4.)

3.2.7 Number of Design Lanes, N_L

The number of design lanes, NL, defined in **AASHTO-LRFD Article. 3.6.1.1.1** is the integer portion of the ratio of the clear roadway width (ft), w, and the width of the design traffic lane (12 ft). For example, if the clear roadway width is 50 ft.

$$N_L = \frac{w}{12.0\,\frac{ft}{lane}} = \frac{50\,ft}{12.0\,\frac{ft}{lane}} = 4.17 \text{ lanes (4 lanes)}$$

3.2.8 Multiple Presence Factor of Live Load, m

Design trucks will be present in adjacent lanes on roadways with multiple design lanes. Because it is unlikely that three or more adjacent lanes will be loaded simultaneously with trucks, adjustments in design loads are necessary. These factors have been implicitly included in the approximate equations for distribu-tion factors and should be removed for fatigue investigations. See (Table 3.3).

Therefore, according to **AASHTO-LRFD Article. 3.6.1.1.2**, for fatigue investigations in which the traffic truck is placed in a single lane, the factor

of 1.2, which has been included in the approximate equations, should be removed.

The multiple presence m is defined for sites with an ADTT of 5,000 trucks or greater in one direction. For sites with a lower ADTT, reduce force effects by:

$$100 < \text{ADTT} < 1{,}000 \rightarrow 95\%$$

$$\text{ADTT} < 100 \rightarrow 90\%$$

This adjustment is based on the reduced probability of attaining the design event during a 75-year design life with reduced truck volume.

Table (3.3): (AASHTO Table 3.6.1.1.2-1) Multiple Presence Factors, m

Multiple Presence Factors, m

A Art. 3.6.1.1.2

Number of Loaded Lanes	Multiple Presence Factors, m
1	1.20
2	1.00
3	0.85
>3	0.65

3.2.9 Dynamic Load Allowance, IM

The dynamic load allowance, IM, is applied only to the design truck load or tandem, not the design lane load as stated in **AASHTO-LRFD Article. 4.6.2.2**. The design truck's or tandem's static effects shall be increased for dynamic load allowance. Table 3.4 indicates the dynamic load allowance for different components under different limit states.

The distribution factors are included in several AASHTO-LRFD articles, and essential provisions are in AASHTO-LRFD Section 4.

The live load moment and shear for beams or girders are determined by applying the lane fraction (distribution factor) in **AASHTO-LRFD Article. 4.6.2.2.2** to the moment and shear due to the loads assumed to occupy ten ft. transversely within a design lane.

Table (3.4): (AASHTO Table 3.6.2.1-1) Dynamic Load Allowance, IM

Dynamic Load Allowance, IM	
Component	**IM (%)**
Deck joints, all limit states	75
All other components	
Fatigue and fracture limit state	15
All other limit states	33

As a summary of **AASHTO-LRFD Article 2.5.2.7.1**. Distribution factors are most sensitive to beam (girder) spacing, span length, and longitudinal stiffness have more minor influences.

The load-carrying capacity of exterior beams (girders) shall not exceed that of interior beams (girders).

3.2.10 Load Combinations for the Strength I Limit State

The total factored force effects, Q, shall be taken as per **AASHTO-LRFD Eq. 3.4.1-1** to be,

$$Q = \Sigma \eta_i \gamma_i Q_i \quad \text{-(Equation 4)}$$

Where:

η_i = load modifier = 1.0

γ_i = load factor

AASHTO-LRFD Article. 1.3 defined the load combination limit state Strength I to be,

Q = 1.25 DC + 1.50 DW + 1.75 (TL + LN)

Mu = 1.25 MDC +1.50 MDW + 1.75 (MTL + MLN)

Vu = 1.25 VDC +1.50 VDW + 1.75 (VTL + VLN)

TL = Truck load or tandem load

LN = Lane load

η_D = 1.0 for conventional designs

η_R = 1.0 for conventional levels of redundancy

η_I = 1.0 for typical bridges

Φ = 1.0 for service and fatigue limit states

ϕ for concrete structures and steel structures, refer to **AASHTO-LRFD Article. 5.5.4.2.1** and **AASHTO-LRFD Article. 6.5.4.2**, respectively.

Unfactored Dead Load Moments and Shears:

- MDC = Maximum unfactored moment due to DC
- MDW = Maximum unfactored moment due to DW
- VDC = Maximum unfactored shear due to DC
- VDW = Maximum unfactored shear due to DW

Unfactored Live Load Moments per beam with Distribution Factors DFM, and Dynamic Allowance IM:

- MTL = (maximum truck or tandem load moment per lane due to design truck load) (DFM) (1 + IM)
- MLN = (maximum lane load moment per lane) (DFM)

Unfactored Live Load Shear per Beam with Distribution Factors DFV, and Dynamic Allowance, IM:

- VTL = (maximum truck load per shear lane) (DFV) (1+IM)
- VLN = (maximum lane load shear per lane) (DFV)2

Live Load Distribution Factors for Moment for Beams:

- DFMsi = Single (one) lane loaded for moment in interior beams
- DFMmi = Multiple (two or more) lanes loaded for moment in interior beams
- DFMse = Single (one) lane loaded for moment in exterior beams
- DFMme = Multiple (two or more) lanes loaded for moment in exterior beams

Live Load Distribution Factors for Shear for Beams

- DFVsi = Single (one) lane loaded for shear in interior beams
- DFVmi = Multiple (two or more) lanes loaded for shear in interior beams
- DFVse = Single (one) lane loaded for shear in exterior beams
- DFVme = Multiple (two or more) lanes loaded for shear in exterior beams

3.2.11 Simple Beam Live Load Moments and Shears Carrying Moving Concentrated Loads per Lane

The maximum moment occurs under one of the loads when that load is as far from one support as the center of gravity of all the moving loads on the beam is from the other support. This condition occurs when the center of the span is midway between the center of gravity of the moving loads and the nearest concentrated load where the maximum moment occurs.

The maximum shear due to moving loads occurs at one support when one of the moving loads is at that support. With several moving loads, the location that will produce maximum shear must be determined by trial and error. Because the maximum moments for uniform loads, such as lane and dead loads, occur at midspan, the maximum design truck or tandem moment is generally used with the HL-93 center axle at midspan. See Figures 3.3 and 3.4.

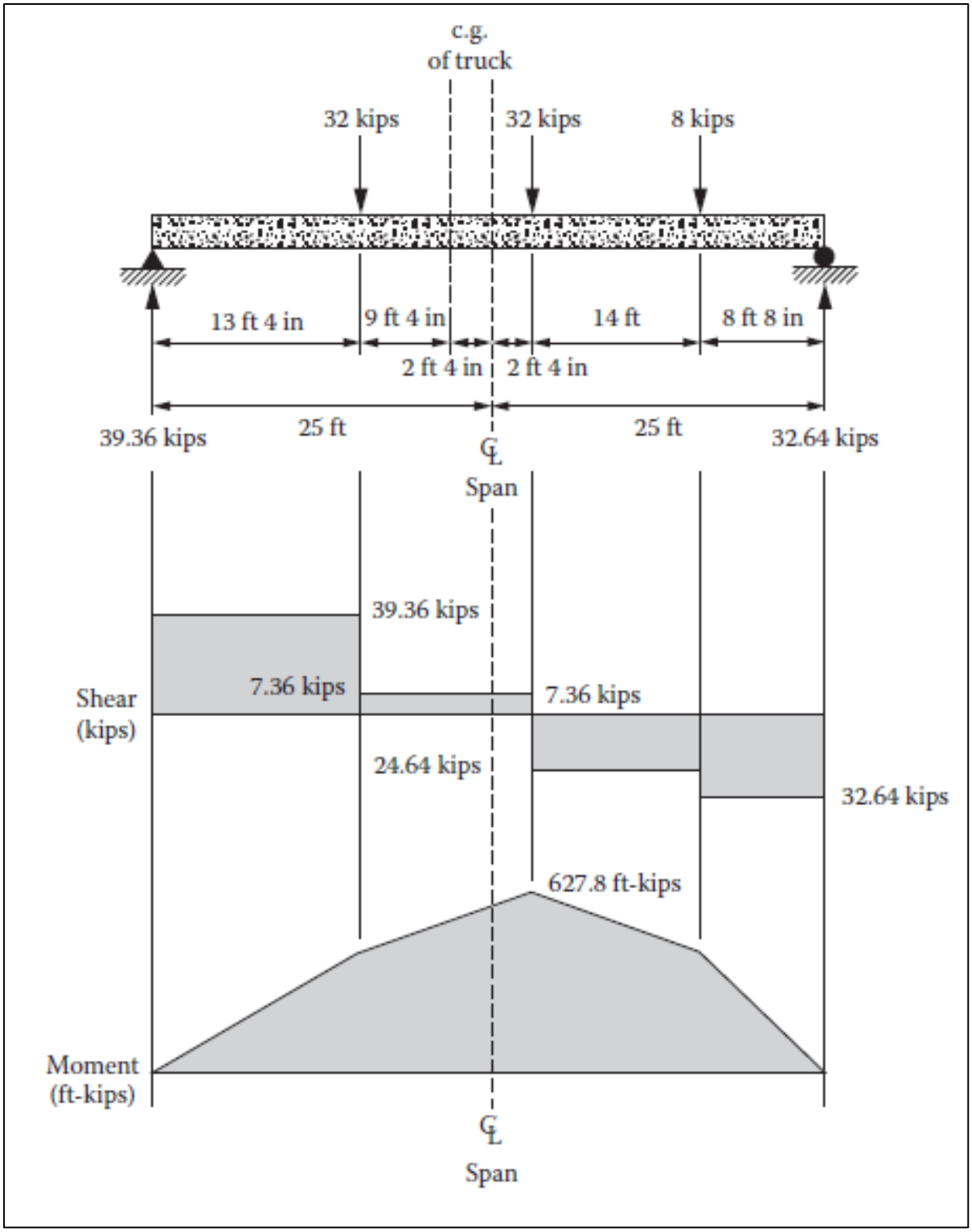


Figure (3.3): Shear and Moment Diagrams for Controlling Design Truck (HS-20)

Live Load Position

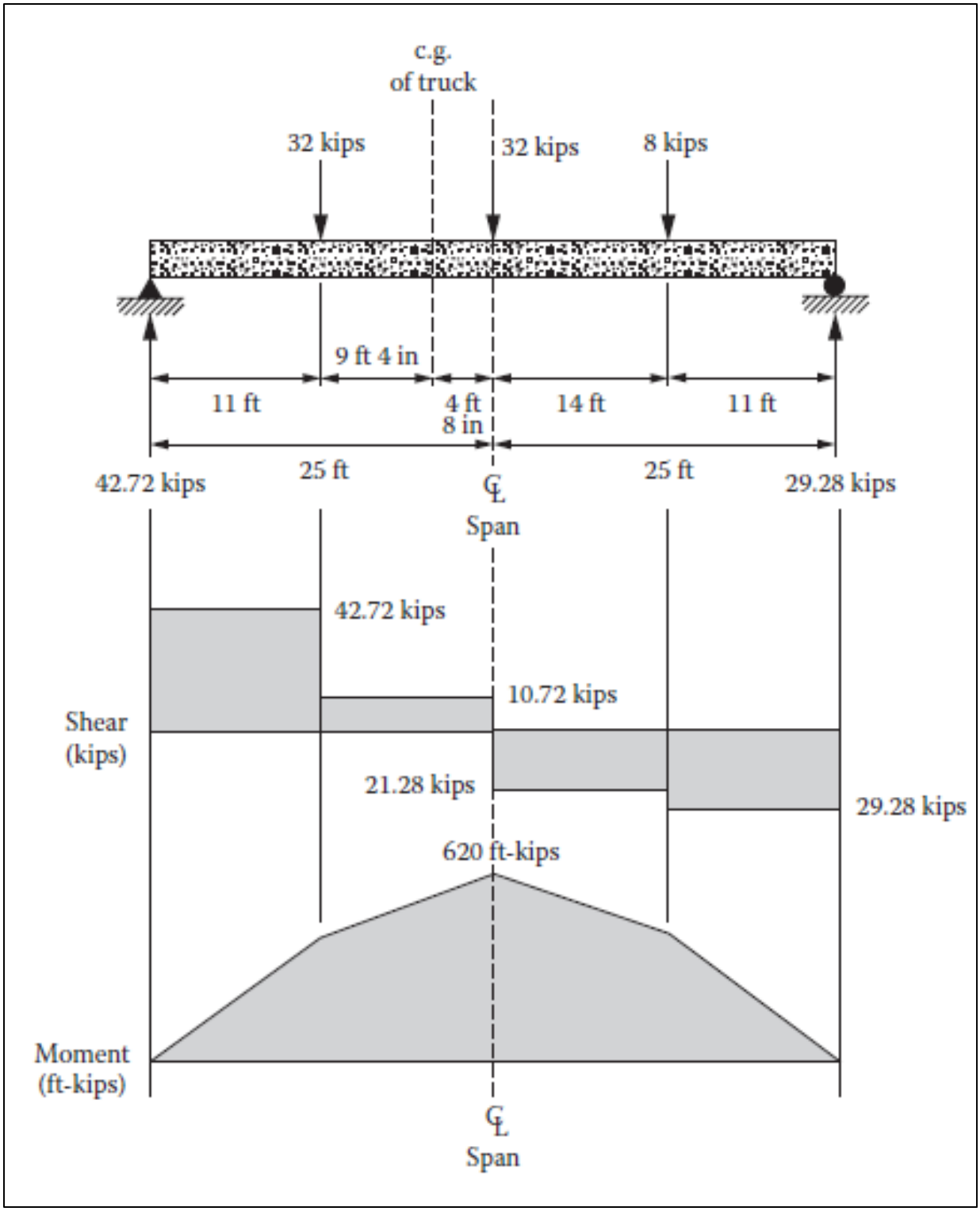


Figure (3.4): Shear and Moment Diagrams for Design Truck (HS-20) Center Axel At Midspan

3.2.12 Live Load Moments and Shears for Beams (Girders)

Live load moments and shears for beams (girders) are determined by apply-ing the distribution factors for live loads per lane in **AASHTO-LRFD tables in 4.4.2.2** to the moment and shears due to the live loads assumed to occupy ten ft. within a design lane (**AASHTO-LRFD Article. 3.6.1.2.1**).

3.2.13 Summary of ASSHTO-LRFD design procedure

From the above AASHTO-LRFD design procedure, to make an easy step, let us write a step-by-step how to design a reinforced concrete T-Beam bridge with three load combination limit states considered Strength I, Fatigue II, and Service I.

Before starting to design anything, we need to list all data we have, and in case of designing a bridge to comply with AASHTO-LRFD, we need to have this data:

- C&P = Curb and parapet cross section in (ft^2)
- E_c = Modulus of elasticity of concrete in ($kips/in^2$)
- f'_c = Specified compressive strength of concrete in ($kips/in^2$)
- f_y = Specified yield strength of epoxy-coated reinforcing bars in ($kips/in^2$)
- W_c = Self-weight of concrete in ($kips/ft^3$)
- W_{FWS} = Future wearing surface load in ($kips/ft^2$)
- L= Span length in (ft)
- overall width of the bridge in (ft)
- Clear (roadway) width in (ft)

Step 1: Design T-Beam Using Strength I Limit State

- Find the flange width and web thickness.
- Find the width of T-beam stem (web thickness), b.
- Find the beam depth including deck.
- Find the effective flange width.
- Find the interior T-beam section.
- Find the number of design lanes.
- Find the truck load moments and shears.
- Find the live load distribution factors for moments, DFM.
- Find the distributed live load moments.
- Find the distribution factors for shears, DFV.
- Find the distributed live load shears for Strength I.
- Find the dead load force effects.
- Find the factored moments and shears for Strength I.
- Find the design flexural reinforcements, neglecting compression reinforcement, and note the exterior girder moment and interior girder shear control.
- Check the reinforcement requirements.
- Design for shear.

Step 2: Check the Fatigue Limit State

- Find the unfactored fatigue load moment per beam.
- Find the factored fatigue moment per beam.
- Find the stress in the reinforcement.
- Find the fatigue stress range.

Step 3: Check the Service I Limit State

Step 4: Design the Deck Slab

This is the procedure of designing reinforced concrete T-Beam bridges with three load combination limit states: Strength I, Fatigue II, and Service I, to comply with AASHTO-LRFD.

3.3 BS-5400 Design Procedure

BS 5400 is a document that combines rules of practice for the design and construction of steel, concrete, and composite bridges and load, material, and workmanship criteria. It is divided into ten Parts; Part 2 (BS 5400-2:1978) is the loading standard; Part 4 (BS 5400-4:1990) is for concrete bridges; and Part 5 (BS 5400-5:1982) is for composite design.

This chapter includes 'simplified versions' of Parts 2, 3, 4, and 5 for easy comparison with AASHTO-LRFD. It is stressed that a bridge created under this simplified design would not necessarily meet all of the standards of BS 5400; several critical clauses still need to be addressed due to their complexity, and the scope of loads and constructional details has been limited.

3.3.1 Simplified version of the bridge loading specification, BS 5400 -2:1978

This simplified version of the bridge loading standard provides loadings for highway bridge design utilizing the design technique indicated in the simplified version of the steel bridge code. It is based on BS 5400 Part 2. This version only includes vertical loadings. Horizontal loads (wind, traction/braking, etc.) and other loads, such as temperature, are excluded.

3.3.1.1 LOADS

1- Partial load factors

For clarity, the factors that comprise the partial safety factor for loads are restated as follows: design loads, Q*, are the loads obtained by multiplying the nominal loads, Q_k, by γ_{fL}, the partial safety factor for loads. γ_{fL} is a function of two individual factors, γ_{f1} and γ_{f2}, which take account of the following:

γ_{f1} = possible unfavourable deviations of the loads from their nominal values.

γ_{f2} = reduced probability that various loadings acting together will all attain their nominal values simultaneously.

the design load effects, S^*, should be obtained from the design loads by the relation:

$S = \gamma_{f3}$ (effects of Q) where

γ_{f3} = is a factor that takes account of inaccurate assessment of the effects of loading, unforeseen stress distribution in the structure and variations in dimensional accuracy achieved in construction.

2- Design loads and load factors

The loads shown here are nominal loads. To calculate the design loads, multiply these by the relevant load factors γ_{fL}. Typically, a greater factor is used for weights that are less definite, like live loads, whereas a lower factor is used for loads that are precisely known, such as steel weight. In order to account for the potential for future inadvertent overlay of more material, the highest load factor is given to the weight of the surfacing (superimposed dead load). The variables to be used at the two limit states are listed in Tables 3.5 and 3.6, respectively.

The code recognizes that when loads are combined, mainly when wind or HB loads are involved, they are unlikely to exceed their prescribed values by substantial amounts simultaneously; thus, load factors for such combinations are decreased.

Table (3.5): Load Factors At Ultimate Limit State

Load	γ_{fL} **at ultimate limit state**	
	Combination	
	1	2
Dead load (steel)	1.05	1.05
Dead load (concrete)	1.15	1.15
Superimposed dead load (surfacing)	1.75	1.75
Wind		
with Dead + superimposed dead		1.4
with Dead + superimposed Dead + Live		1.1
Vertical live load	1.5	1.25
HA alone	1.3	1.1
HA with HB or HB alone		

Table (3.6): Load Factors at Serviceability Limit State

Load	γ_{fL} **at serviceability limit state**	
	Combination	
	1	2
Dead (steel)	1.0	1.0
Dead load (structural concrete)	1.0	1.0
Superimposed dead load (surfacing)	1.2	1.2
Wind load		1.0
with Dead + superimposed dead		1.0
with Dead + superimposed Dead + Live	1.2	1.0
Vertical live load	1.1	1.0
HA alone		
HA with HB or HB alone		

3- Dead loads

The weight of dead load materials to be based on the following specific weights:

Steel =77 kN/m^3

Concrete=24 kN/m^3

4- Superimposed dead loads

The weight of a 100 mm thick layer of surfacing may be taken as 2.2 kN/m^2. The weight of a parapet may be taken as 0.5 kN/m.

5- HA live loads

A uniformly distributed load (UDL) plus a knife edge load comprise HA loading (KEL). The UDL is defined as 30 kN/m per meter of a traffic lane, distributed evenly across the lane. The UDL should be applied to a loaded length corresponding to a positive or negative component of an influence

diagram relevant to the effects being studied. In a two-span beam, for example, just one span is loaded to determine the worst moment in a span, whereas two spans are loaded to determine the worst response at the center support. The KEL value is obtained by dividing 120 kN by the lane width. It should be used where it will create the most significant moment or shear at the place in the bridge being tested.

6- HB live loads

The HB vehicle is atypical, with sixteen identical wheel loads placed, as shown in Figure 3.5. A 'loading unit' corresponds to the load on four axles and is equivalent to 10 kN per axle; each axle has four equally loaded wheels. HB loading units of 30, 37.5, or 45 are typically specified, equivalent to total vehicle weights of 1200, 1500, or 1800 kN.

The HB vehicle replaces one lane of HA loading and should be positioned for the worst effect. For a simple design, it is suggested that HB loading may be ignored.

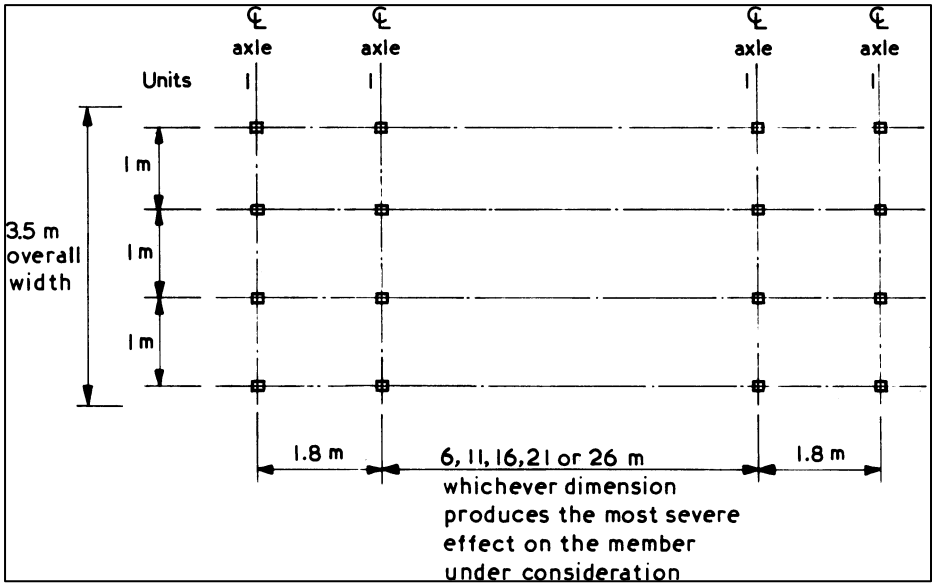


Figure (3.5): Dimensions of HB Vehicle

7- Multiple lanes

Full HA loading should be applied in up to two bridge lanes. When there are more than two lanes, the extra lanes should be loaded with 60% HA. The selection of which lanes are loaded with full HA and which are loaded with 60% HA should be made in such a way that the highest bending moment or shear force is created in the part of the structure being constructed.

3.3.2 Simplified version of the composite bridge code, BS 5400 -4:1990

3.3.2.1 Limit state philosophy

1- General.

To achieve an acceptable level of safety and serviceability, the limit states philosophy should be considered in the design. The typical strategy will be to design around the most crucial limit state and then ensure that the remaining limit states are not reached and that all other requirements are met. Other aspects like deflection, fatigue, and durability are considered.

2- Serviceability limit state.

The structure should be designed so local damage does not affect its intended life or entail excessive maintenance expenditures. Calculated crack widths, in particular, should not exceed the limits specified in the Cracking section below.

3- Ultimate limit state.

The structure's strength should be sufficient to bear the design loads while taking into account the danger of overturning or buckling. The assessment should ensure that collapse does not occur as a result of one or more key

portions rupturing, overturning, or buckling caused by elastic or plastic instability, taking into account the impacts of sway when appropriate.

3.3.2.2 Design

1- Limit state requirements

A- Serviceability limit states

Cracking: Concrete cracking should not have an unfavorable effect on the structure's appearance or durability. Given the requirements of the specific structure and the exposure conditions, the Engineer should be satisfied that any cracking will not be excessive. Without special investigations, the boundaries outlined below should be followed.

Reinforced concrete: Design crack widths should not exceed the values indicated in Table 3.7 under the loading given in BS5400 part 4 clause 4.2.2, as computed in accordance with BS5400 part 4 clause 5.8.8.2.

Prestressed concrete structures or elements: These are classified by flexural tensile limitations. The categories are as follows:

- Class 1: no tensile stress permitted.
- Class 2: tensile stresses permitted,
- class 3: tensile stress permitted, but with design crack widths limited to the values of Table 3.7.

Vibration: The dynamic impacts of ordinary highway or railway loads on commonly encountered bridge types are assumed to be addressed by the impact allowance in the nominal live load.

To avoid unwanted deformations, compressive stresses in concrete and stresses in steel should be evaluated using linear elastic analysis for load combinations 1 to 5 in any of the following applications:

- For all prestressed concrete construction.
- For all composite concrete construction.
- Where the effects of differential settlement, temperature difference,
- Furthermore, the creep and shrinkage of concrete are not considered at the ultimate limit state.
- A plastic method or redistribution of moments is used
- to analyze the structure at the ultimate limit state.
- Under global and local direct and bending effects, these are considered separately at the ultimate limit state.

For reinforced and prestressed concrete, the compressive and tensile stress limitations are summarized in Table 3.7.

Deflections: The structure or any component of its deflection should not have an unfavourable effect on its look or efficiency.

Table (3.7): Stress Limitations for the Serviceability Limit State

Material	**Type of stress under design loading**	**Type of construction**	
		Reinforced concrete	**Prestressed concrete**
Concrete	Triangular or near triangular compressive stress distribution(e.g. due to bending) Uniform or near uniform compressivestress distribution (e.g. due to axial loading)	$0.50f_{cu}$ $0.38f_{cu}$	$0.40f_{cu}$ $0.30f_{cu}$
Reinforcement	Compression Tension	$0.75f_{y}$	Not applicable
Prestressing tendons	Tension	Not applicable	Deemed to be satisfied byBS5400 part **6.7.1**
NOTE See BS5400 part 4 **7.3.3** for limiting flexural stresses in joints for post-tensioned segmental construction.			

Concrete superstructure's look and function are typically unaffected, though calculations may be required in the following situations:

- Where minimum specified clearances may be violated.
- Where drainage difficulties might ensue.

- Where the manner of construction may necessitate strict profile control, such as at discontinuities in serial construction, and where decks are made up of abutting prestressed concrete beams.

Durability: The guidelines in BS5400 Part 4 for concrete cover to reinforcement and allowable crack widths see Table 3.8 (see clause 4.1.1.1), in conjunction with the cement contents in Part 8, are intended to meet the durability requirements of practically all structures. However, further precautions may be required in more severe conditions, and specialized literature should be sought.

Table (3.8): Design Crack Widths

Environment	Examples	Design crack width
Extreme Concrete surfaces exposed to: abrasive action by sea water or water with a pH « 4.5	Marine structures Parts of structure in contact with moorland water	0.10 mm
Very severe Concrete surfaces directly affected by: de-icing salts or sea water spray	Walls and structure supports adjacent tothe carriageway Parapet edge beams Concrete adjacent to the sea	0.15
Severe Concrete surfaces exposed to: driving rain or alternate wetting and drying	Wall and structure supports remote fromthe carriageway Bridge deck soffits Buried parts of structures	0.25
Moderate Concrete surfaces above ground level *and* fully sheltered against all of the following: rain, de-icing salts, sea water spray Concrete surfaces permanently saturatedby water with a pH > 4.5	Surface protected by bridge deck water-proofing or by permanent formwork Interior surface of pedestrian subways, voided superstructures or cellular abutments Concrete permanently under water	0.25

2- Loads, load combinations and partial factors γ_{fL} and γ_{f3}

Loads: As previously indicated, the nominal values of loads are given in BS5400 Part 2.

Creep and shrinkage of concrete and prestress (including secondary effects in statically indeterminate structures) are load effects caused by the nature of the structural material; where they exist, they should be considered permanent loads.

For the limitations given for prestressed concrete, the load combinations considered for the appropriate category should be as follows:

a) class 1 under load combination 1, except that live loading may be ignored for lightly trafficked highway bridges and railway bridges where the live loading is controlled.

b) class 2 or class 3 for load combinations 2 to 5.

The partial safety factor values, γ_{fL}, BS5400 Part 2 specifies the individual loading containing combinations 1 to 5. The value of γ_{fL} for concrete creep and shrinkage, as well as prestress (including secondary effects in statically indeterminate constructions), should be assumed to be 1.0. Furthermore, the value of γ_{f3} should be taken as 1.0.

The values of γ_{fL} for the effects of shrinkage and, where creep is relevant, should be interpreted as 1. 2. When determining member resistance to vertical shear and torsion, γ_{fL} for the prestressing force should be taken as 1.15 when it negatively impacts resistance and 0.87 when it does not. Secondary effects are calculated in statically indeterminate structures. γ_{fL} for the prestressing force may be taken as 1.0.

The value of γ_{f3} should be taken as 1.10, except that where plastic methods are used for the analysis of the structure, γ_{f3} should be taken as 1.15.

Under the action of load combination 1, the minimum stipulated clearances for deflection shall be maintained. The structure's appearance and drainage properties should also be assessed alone under the action of permanent loads.

The values of γ_{fL} for the individual loads and the value of γ_{f3} should be those appropriate to the serviceability limit state.

3- Properties of materials

For the analysis of sections, the material properties to be used for the individual limit states are as follows:

- Serviceability limit state. The characteristic stresses should be taken as $0.75f_y$ for reinforcement, $0.5f_{cu}$ for concrete in compression and $0.56\sqrt{f_{cu}}$ for tension in concrete for prestressed concrete.

In the absence of particular investigations, the modulus of elasticity to be utilized for elastic analysis should be appropriate to the cube strength of the concrete at the age considered and obtained as follows.

a) Structure analysis: To determine the effects of long-term and short-term loading, use the appropriate value from Table 3.8.

b) Section analysis: To evaluate crack widths and stresses due to the impacts of permanent and short-term loading and induced deformations, an appropriate intermediate value between that given in Table 3.9 and half that value.

Table (3.9): Modulus of Elasticity of Concrete Under Short Term Loading

Characteristic strength (or cube strength of concrete at the age considered)	**Modulus of elasticity E_C of concrete,**
N/mm^2	kN/mm^2
20	25
25	26
30	28
40	31
50	34
60	36

To account for creep under long-term loading, use half the values in Table 3.8 for the modulus of elasticity.

For lightweight concrete having an air dry density between 1400 kg/m^3 and 2300 kg/m^3, the values given in Table 3 should be multiplied by $(D_c/2300)^2$ where D_c is the density of the lightweight aggregate concrete in kg/m^3. Tests can also be used to determine the elastic modulus for a certain strength.

For elastic analysis, Poisson's ratio may be taken as 0.2. The coefficient of thermal expansion may be taken as $12 \times 10^{-6}/°C$ for normal weight concrete. For lightweight concrete and limestone aggregate concrete, the values can be as low as $7 \times 10^{-6}/°C$ and $9 \times 10^{-6}/°C$ respectively.

Reinforcement and prestressing steel: The design stress-strain curves may be taken as follows:

- For reinforcement and prestressing steel: from Figure 3.6, using the value of γ_m
- For reinforcement: the modulus of elasticity may be taken as 200 kN/mm^2 for both short and long-term loading. For prestressing steel, the short and long-term modulus may be taken from Figure 3.7.

4- Values of γ_m

Table 3.10 shows the γ_m values that were applied to the characteristic stresses to determine the serviceability limit condition. The higher values for the prestressed concrete result from the fact that the entire concrete cross section is generally in compression, and hence creep is greater than in reinforced concrete. Similarly, creep will be greater in reinforced concrete where the compressive stress distribution is uniform across the entire cross section.

Ultimate limit state: The values of γ_m applied to the typical strengths of reinforced concrete and prestressed concrete are 1.50 for concrete and 1.15 for reinforcing and prestressing tendons.

Fatigue: The value of γ_m applied to the stress range limitations for reinforcement in reinforced concrete is 1.00.

5- Analysis of structure

BS 5400 Part 1 describes the standards for analysis techniques adequate for determining the distribution of forces and deformations to determine whether the limit state criteria are satisfied. Except for cable-stayed superstructures, the effects of shear lag on structural analysis can be ignored.

6- Analysis for serviceability limit state

Internal forces and deformations should be determined using elastic methods of analysis. Flexural stiffness constants (second moment of area) for discrete member sections or slab element unit widths can be based on any of the following:

- Concrete section: The complete cross-section of a member, ignoring the presence of reinforcement.
- Gross transformed section: The entire member cross-section,

including the reinforcement, is transformed based on a modular ratio.

Net transformed section: The modular ratio was used to alter the area of the cross-section in compression as well as the tensile reinforcement.

Table (3.10): Values of γ_m for fhe Serviceability Stress Limitations

Material	Type of stress	Type of construction	
		Reinforced concrete	Prestressed concrete
Concrete	Triangular or near-triangular compressive stress distribution (e.g. due to bending)	1.00	1.25
	Uniform or near-uniform compressive stress distribution (e.g. due to axial loading)	1.33	1.67
	Tension	Not applicable	1.25 pre-tensioned 1.55 post-tensioned
Reinforcement	Compression Tension	1.00	Not applicable
Prestressing tendons	Tension	Not applicable	Not required

Methods of analysis and their requirements: The method of analysis should ideally take account of all the significant aspects of the behavior of a structure governing its response to loads and imposed deformations.

7- Analysis for ultimate limit state

Elastic methods can be used to determine how forces and deformations are distributed throughout the structure. Stiffness constants should be based on the section properties utilized in the structure's serviceability limit state analysis. Plastic techniques of analysis (e.g., plastic hinge methods for beams or yield line methods for slabs) may, however, be utilized where such methods can be demonstrated to appropriately describe the combined

local and global impacts of all loads due to combinations 1 to 5. Such approaches should be agreed upon with the relevant bridge authority.

In general, using elastic analysis methods in conjunction with design loads for the ultimate limit state yields safe lower-bound answers; they can be modified and made less conservative by referring to test findings or expert literature. However, load effects owing to torsional and distortional warping constraints may be ignored for longitudinal members.

8- Analysis of section

Serviceability limit state: An elastic analysis should be performed at any segment to satisfy BS5400 standards. Allow for in-plane shear flexibility in concrete flanges (shear lag effects). This can be accomplished by determining the effective width of the flange.

Deflection: Deflection should be estimated for the most unfavorable loading distributions for the member (or slab strip) and can be determined from an elastic structure study.

Fatigue: The effect of repeated live loading on a bridge's fatigue strength should be addressed in the case of reinforcing bars that have been welded; specifics of compliance standards are provided in BS5400 Part 10.

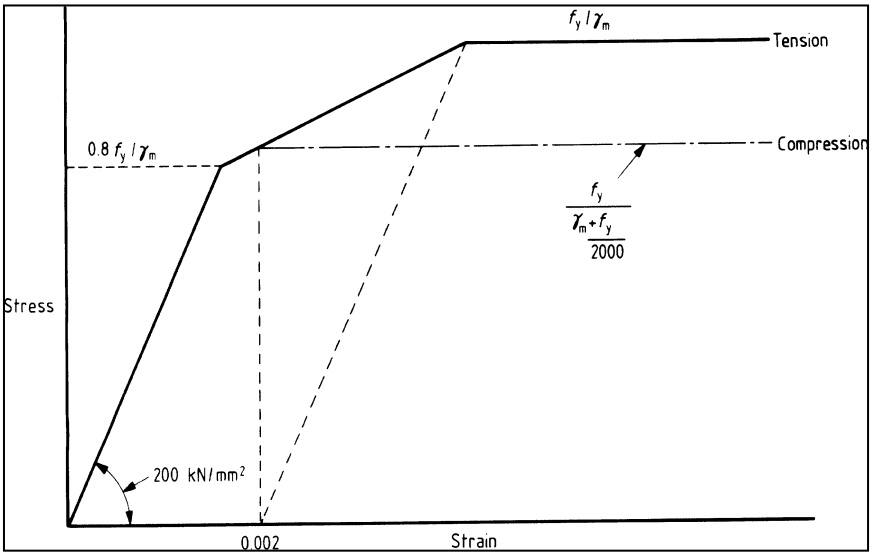


Figure (3.6): Short Term Design Stress-Strain Curve for Reinforcement

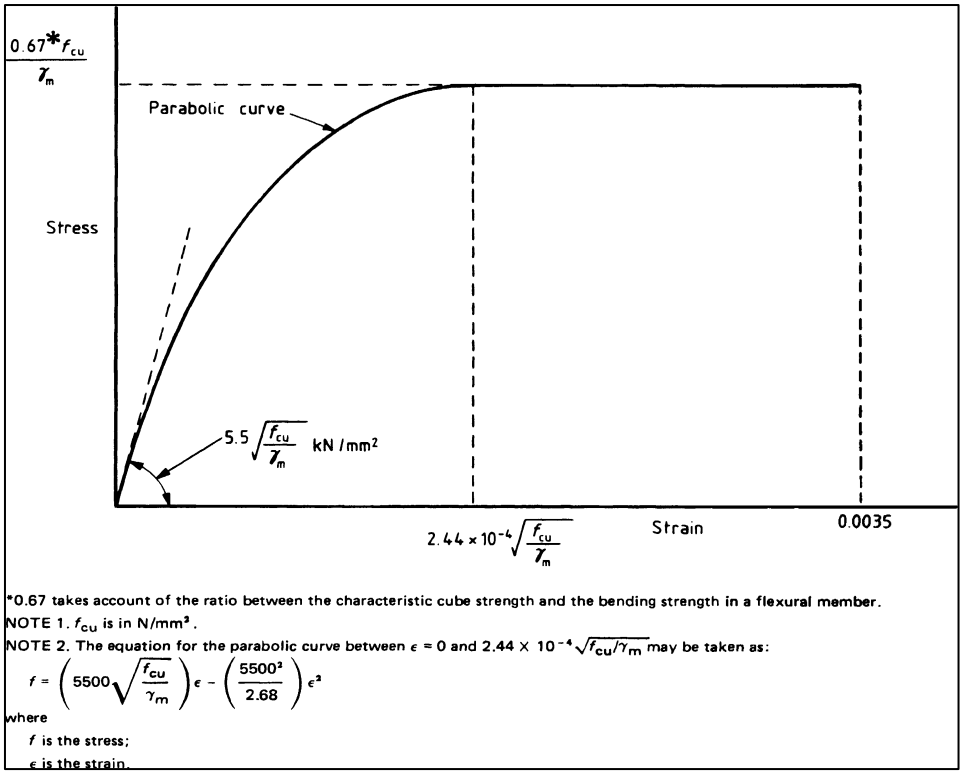


Figure (3.7): Short Term Design Stress-Strain Curve for Normal Weight Concrete

3.3.2.3 Design and detailing: reinforced concrete

This section presents analysis and design approaches that guarantee that the recommendations in BS5400 part 4 clauses 4.1.1 and 4.1.2 for reinforced concrete structures are met. Other procedures may be used if they can be shown to be satisfactory for the structure or portion in question. The assumptions in this clause may be wrong in some cases, and the Engineer should adopt a more appropriate technique based on the nature of the structure in question.

1- Structures and structural frames

Structures should be analysed in accordance with the requirements in BS5400 clause 4.4. If the following conditions are met, it is possible to redistribute moments obtained via rigorous elastic analysis in the ultimate limit state:

a) Using suitable test data, checks are done to ensure that adequate rotation capacity exists at parts when moments are reduced.

In the absence of a special investigation, the plastic rotation capacity may be taken as the lesser of:

$$\mathbf{0.008+0.035(0.5-\frac{d_c}{d_e})\ or\ \frac{0.6\,\emptyset}{d-d_c}}\quad \text{-(Equation 5)}$$

but not less than 0 or more than 0.015 where

d_c= is the calculated depth of concrete in compression at the ultimate limit state;

d_e = is the effective depth for a solid slab or rectangular beam, otherwise the overall depth of the compression flange;

ϕ=is the diameter of the smallest tensile reinforcing bar;

d=is the effective depth to tension reinforcement.

The values for strength of concrete and reinforcement for different grades are given in Table 3.11 and 3.12.

Table (3.11): Strength of Concrete

Grade	**Characteristic strength, f_{cu}**	**Cube strength at an age of**				
		7 days	**2 months[a]**	**3 months[a]**	**6 months[a]**	**1 Year[a]**
	N/mm^2	N/mm^2	N/mm^2	N/mm^2	N/mm^2	N/mm^2
25	25.0	16.5	27.5	29	30	31
30	30.0	20	33	35	36	37
40	40.0	28	44	45.5	47.5	50
50	50.0	36	54	55.5	57.5	60

[a] Increased strengths at these ages should be used only if the Engineer is satisfied that the materials used are capable of producing these higher strengths.

Table (3.12): Strength of Reinforcement

Designation	**Nominal sizes**	**Characteristic strength,** f_y
	m	N/mm^2
Grade 250 (BS 4449)	m 8, 10, 12, and 16	250
Grade 460 (BS 4449)	All sizes	460
Cold reduced steel wire (BS 4482)	Up to and including 12	485

b) A unique study based on a non-linear approach is used to properly account for changes in transverse moments, transverse deflections, and transverse shears caused by redistributing longitudinal moments.

c) Shears and reactions utilized in design are computed before or after redistribution, whichever is greater.

d) The depth of the members of elements considered is less than 1200 mm.

2- Beams

The effective span of a simply supported member should be taken as the smaller of:

a) The distance between the centres of bearings or other supports.

b) The clear distance between supports plus the effective depth.

The distance between the shear centers of the supporting members should be treated as the effective span of a member framing into supporting members.

Except in the case of beams on wide columns, where the influence of column width is incorporated in the analysis, the effective span of a continuous member should be taken as the distance between centers of supports.

The effective length of a cantilever is the length from the face of the support plus half the effective depth unless it is an extension of a continuous beam, in which case the length to the center of the support should be utilized as the effective width of flanged beams. In analysing structures, the full width of flanges may be taken as effective.

In the absence of a more precise determination, the effective flange width should be taken as the width of the web plus one-tenth of the distance between the points of zero moments (or the actual width of the outstanding if this is less) on each side of the web when analysing sections at the serviceability limit state. The points of zero moments in a continuous beam can be assumed to be 0.15 times the effective span from the support. When analysing sections in the ultimate limit state, the entire width of the flanges can be considered effective.

Slenderness limits for beams: To ensure lateral stability, a simply supported or continuous beam should be so proportioned that the clear distance between lateral restraints does not exceed 60bc or $250b_c^2/d$, whichever is the lesser, where:

d = is the effective depth to tension reinforcement;

b_c= is the breadth of the compression face of the beam midway

between restraints.

For cantilevers with lateral restraint provided only at the support, the clear distance from the end of the cantilever to the face of the support should not exceed $25b_c$ or $100b_c^2/d$, whichever is the lesser.

3- Resistance moment of beams

Analysis of sections. When analysing a cross section to determine its ultimate moment of resistance the following assumptions should be made:

a) The strain distribution in the concrete in compression and the strains in the reinforcement, whether in tension or compression, are derived from the assumption that plane sections remain plane.

b) The stresses in the concrete in compression are either derived from the stress-strain curve in Figure 3.7 with γ_m = 1.5 or, where the neutral axis is located in rectangular portions, flanged, ribbed, and voided sections

c) The flange, the compressive stress may be taken as equal to $0.4f_{cu}$ over the whole compression zone. In both circumstances, the strain is greatest near the very edge.

d) The failure compression fiber is taken to be 0.0035.

e) The concrete's tensile strength is ignored.

f) The stresses in the reinforcement are derived from the stress-strain curves in Figure 3.6 with γ_m = 1.15.

In addition, if the calculated ultimate moment of resistance is less than 1.15 times the required value, the section should be proportioned so that the strain at the tensile reinforcement centroid is not less than:

$$\mathbf{0.002}+\frac{f_y}{E_s y_m} \quad \text{-(Equation 6)}$$

where Es is the modulus of elasticity of the steel.

The predicted strain due to the application of ultimate loads at the outermost compression fibre of the concrete should not exceed 0.0035 when utilizing the alternative technique of analysis. And the strain at the centroid of the tensile reinforcement should be not less than $0.002 + f_y/\gamma_m$ except If the requirement for the estimated strain in the concrete can be met by applying 1.15 times the ultimate loads.

In analyzing a beam cross-section that has to resist a small axial thrust, the effect of the ultimate axial force may be ignored if it does not exceed $0.1f_{cu}$ times the cross-sectional area

Formulae for design the following formulae may be used to calculate the ultimate moment of resistance of a solid slab or rectangular beam or of a flanged beam, ribbed slab, or voided slab when the neutral axis lies within the flange, provided the amount of redistribution of the ultimate elastic moments is less than 10%.

The ultimate moment of resistance for sections without compression reinforcement can be calculated as the lesser of the values derived from equations 7 and 8. For sections with compression reinforcement, utilize Equations 9 and 10.

A rectangular stress block of maximum depth 0.5d and a uniform compression stress of $0.4f_{cu}$ has been assumed.

$$M_u = (0.87f_y)\, A_s z \qquad \text{-(Equation 7)}$$

$$M_u = 0.15 f_{cu} b d^2 \qquad \text{-(Equation 8)}$$

$$M_u = 0.15 f_{cu} b d^2 + 0.72 f_y A'_s (d - d') \qquad \text{-(Equation 9)}$$

$$(0.87\, f_y) A_s = 0.2 f_{cu} b d + 0.72 f_y A'_s \qquad \text{-(Equation 10)}$$

$$\mathbf{Z= (1 - \frac{1.1 f_y A_s}{f_{cu} b d}) d}$$ -(Equation 11)

$$\boldsymbol{Mu = (0.87\ fy)\ As\ (\ d - \frac{h_f}{2}\ )}$$ -(Equation 12)

$$\boldsymbol{Mu = (0.87\ fy)\ As\ (\ d - \frac{h_f}{2}\ )}$$ -(Equation 13)

The value z should be at most 0.95d. The ultimate resistance moment of a flanged beam is the lesser of the values obtained by equations 12 and 13, where hf is the flange thickness, where the resistance moment must be greater than the value indicated by equation 13.

4- Shear resistance of beams

The shear stress, v, at any cross section should be calculated from:

$$\boldsymbol{v = \frac{V}{bd}}$$ -(Equation 14)

where

V = is the shear force due to ultimate loads;

b = is the breadth of the section which, for a flanged beam, should be taken as the rib width;

d = is the effective depth to tension reinforcement.

In no case should v exceed $0.75\sqrt{f_{cu}}$ or 4.75 N/mm^2, whichever is the lesser, whatever shear reinforcement is provided. Shear reinforcement should be provided as given in Table 3.13.

Table (3.13): Form and Area of Shear Reinforcement in Beams

Value of v (N/mm^2)	**Area of vertical shear reinforcement provided** (mm^2)
$v \ll \varepsilon_s v_c$	$A_{sv} \gg 0.4\ b s_v / 0.87 f_{yv}$
$v > \varepsilon_s v_c$	$A_{sv} \gg b s_v (v + 0.4 - \varepsilon_s v_c) / 0.87 f_{yv}$

v is the shear stress;

ε_s is the depth factor (see Table 3.14);

v_c is the ultimate shear stress in concrete (see Table 3.13);

A_{sv} is the cross-sectional area of all the legs of the links at a particular cross section;

s_v is the spacing of the links along the member;

f_{yv} is the characteristic strength of link reinforcement but not greater than 460 N/mm^2.

Where links combined with bent-up bars are used for shear reinforcement, not more than 50 % of the shear force $(v + 0.4 - \varepsilon_s v_c)bd$ should be resisted by bent-up bars. These bars are thought to be tension members of one or more single lattice girder systems, with the concrete acting as compression members. The maximum stress in any bar should be taken as $0.87f_y$. Any vertical section's shear resistance should be calculated as the sum of the tension and compression forces cut by the section.

Table (3.14): Ultimate Shear Stress in Concrete, vc

$\frac{100A_s}{bd}$	**Concrete grade**			
	20	**25**	**30**	**40 or more**
	N/mm^2	N/mm^2	N/mm^2	N/mm^2
« 0.15	0.31	0.34	0.36	0.39
0.25	0.37	0.40	0.42	0.47
0.50	0.47	0.50	0.53	0.59
1.00	0.59	0.63	0.67	0.74
2.00	0.74	0.80	0.85	0.93
» 3.00	0.85	0.91	0.97	1.06
NOTE $b = b_s$ for punching shear cases (see Figure 5).				

Table 3.14 is derived from the following relationship:

$$v_c = \frac{0.27}{\gamma_m}\left(\frac{100A_s}{b_w d}\right)^{1/3}(f_{cu})^{1/3} \qquad \text{-(Equation 15)}$$

Table (3.15): Effective Depth Factor

Effective depth, *d*	ε_s
2000 or more	0.70
1500	0.75
1000	0.85
500	1.00
400	1.05
300	1.15
250	1.20
200	1.25
150	1.35
« 100	1.50

Table 3.15 is derived from the following relationship:

$\varepsilon_s = (500/d)^{1/4}$ or 0.70, whichever is the greater. The spacing of the legs of links, in the direction of the span and at right-angles to it, should not exceed 0.75d

5- Slabs

Shear forces and moments in slabs Moments and shear forces in slab bridges and top slabs of beam and slab, voided slab, and box beam bridges can be calculated using a general elastic analysis or specific elastic analyses such as those of Westergaard or Pucher; alternatively, Johansen's yield line method can be used to calculate required ultimate moments of resistance if the recommendations of BS5400 part 4 clause 4.4.3.1 are followed.

Slab resistance moments procedures described in BS5400 part 4 clause 5.3.2 can be used to calculate the ultimate resistance moment in a

reinforcing direction. Suppose reinforcement is applied to resist a combination of two bending moments and a twisting moment at a spot in a slab. In that case, the major moment and reinforcement directions do not always coincide. Allowance can be calculated by computing moments of resistance in the reinforcement directions, ensuring appropriate strength in all directions. An appropriate methodology should be used to calculate the stresses in the transverse flexural reinforcement due to transverse shear effects in voided slabs (e.g., an analysis based on the assumption that the transverse section acts as a Vierendeel frame).

If reinforcement is to be applied to withstand a combination of in-plane direct and shear pressures at a spot in a slab, the major stress and reinforcing directions should only sometimes coincide. Such a provision can be established by calculating the required forces in the reinforcement directions.

6- Shear resistance of slabs

The shear stress, v, at any cross section in a solid slab, should be calculated from:

$$\boldsymbol{v = \frac{V}{bd}} \qquad \text{-(Equation 14)}$$

where

V = is the shear force due to ultimate loads.

b = is the width of slab under consideration.

d = is the effective depth to tension reinforcement.

7- Columns

A reinforced concrete column is a compression member with a greater lateral dimension that is less than or equal to four times its smaller lateral dimension, and the reinforcement determines its strength.

A column should be considered as short if the ratio l_e/h in each plane of buckling is less than 12. Otherwise, be considered as slender, where:

l_e is the effective height in the plane of buckling under consideration.

h is the depth of the cross section in the plane of buckling under consideration.

It should Effective height of a column. The effective height, l_e, in a given plane may be obtained from Table 3.15 where l_o is the clear height between end restraints.

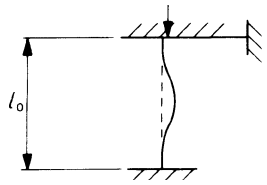
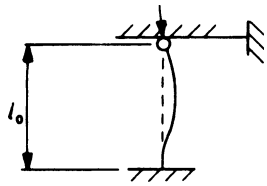
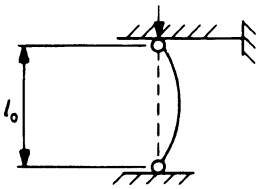
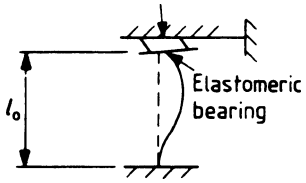
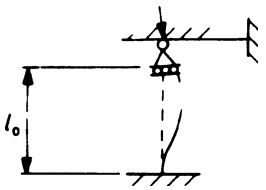
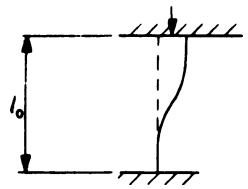
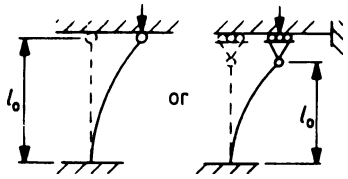
The values given in Table 3.16 are based on the following assumptions:

a) Rotational restraint is at least $4(EI)_c/l_o$ for cases 1, 2 and 4 to 6 and $8(EI)_c/l_o$ for case 7, $(EI)_c$ being the flexural rigidity of the column cross section.

b) Lateral and rotational rigidity of elastomeric bearings are zero.

The following design methodologies for rectangular and circular columns may be applied based on the previous assumptions. Design approaches for different column shapes should be derived from the first principles utilizing the above assumptions.

Table (3.16): Effective Hight l_e

Case	Idealized column and bucklingmode	Restraints			Effective height, l_e
		Location	Position	Rotation	
1		Top	Full	Full[a]	$0.70l_o$
		Bottom	Full	Full[a]	
2		Top	Full	None	$0.85l_o$
		Bottom	Full	Full[a]	
3		Top	Full	None	$1.0l_o$
		Bottom	Full	None	
4		Top	None[a]	None[a]	$1.3l_o$
		Bottom	Full	Full[a]	
5		Top	None	None	$1.4l_o$
		Bottom	Full	Full[a]	
6		Top	None	Full[a]	$1.5l_o$
		Bottom	Full	Full[a]	
7		Top	None	None	$2.3l_o$
		Bottom	Full	Full[a]	

[a] Assumed value (see BS 5400 part 4 clause **5.5.1.2**).

The following formulae (based on a concrete stress of $0.4f_{cu}$ over the whole compression zone and the assumptions in BS 5400 part 4 clause 5.5.3.2) may be utilized to design a rectangular column with longitudinal reinforcement in two faces parallel to the axis of bending, whether symmetrical or not. The ultimate axial load, N, and ultimate moment, M, shall not be more than the values Nu and Mu given by equations 16 and 17 for the appropriate value of d_c.

$$N_u = 0.4 f_{cu} b d_c + f_{yc} A'_{s1} + f_{s2} A_{s2} \qquad \text{-Equations 16}$$

$$M_u = 0.2 f_{cu} b d_c (h - d_c) + f_{yc} A'_{s1} \left(\frac{h}{2} - d' \right) - f_{s2} A_{s2} \left(\frac{h}{2} - d_2 \right) \qquad \text{-Equations 17}$$

Where,

N = is the ultimate axial load applied on the section considered.

M = is the moment applied about the axis considered due to ultimate loads including the nominal allowance for construction tolerances (see BS 5400-part 4 clause 5.5.3).

N_u and M_u = are the ultimate axial load and bending capacities of the section for the particular value of d_c assumed.

f_{cu} = is the characteristic cube strength of the concrete.

b = is the breadth of the section.

d_c = is the depth of concrete in compression assumed subject to a minimum value of $2d'$.

f_{yc} = is the design compressive strength of the reinforcement (in N/mm^2), taken as:

$$\frac{f_y}{y_m+\frac{fy}{2000}}$$ -Equations 18

A'_{s1} = is the area of compression reinforcement in the more highly compressed face.

f_{s2} = is the stress in the reinforcement in the other face, derived from Figure 3.6 and taken as negative if tensile.

A_{s2} = is the area of reinforcement in the other face which may be considered as being:

a) In compression.
b) Inactive.
c) In tension.

As the resultant eccentricity of load increases and d_c decreases from h to $2d'$:

h = is the overall depth of the section in the plane of bending.

d' = is the depth from the surface to the reinforcement in the more highly compressed face.

d_2 = is the depth from the surface to the reinforcement in the other face.

8- Slender columns

A slender column of constant cross section bent about the minor y-y axis should be designed for its ultimate axial load, N, together with the moment M_{ty} given by:

$$M_{ty} = M_{iy} + \frac{Nh_x}{1750}\left(\frac{l_e}{h_x}\right)^2\left(1 - \frac{0.0035l_e}{h_x}\right) \qquad \text{-Equations 19}$$

Where;

M_{iy} = is the initial moment due to ultimate loads, but not less than that corresponding to the nominal allowance for construction tolerances as given in BS 5400 part 4 clause 5.5.3.

h_x = is the overall depth of the cross section in the plane of bending M_{iy}.

l_e = is the effective height either in the plane of bending or in the plane at right-angles, whichever is greater.

For a column fixed in position at both ends where no transverse loads occur in its height the value of M_{iy} may be reduced to:

$$M_{iy} = 0.4M_1 + 0.6M_2$$

where

M_1 = is the smaller initial end moment due to ultimate loads (assumed negative if the column is bent in double curvature).

M_2 = is the larger initial end moment due to ultimate loads (assumed positive).

In no case, however, should M_{iy} be taken as less than $0.4M_2$ or such that M_{ty} is less than M_2.

A column subject to uniaxial shear due to ultimate loads should be designed in accordance with BS5400 part 4 clause 5.3.3 except that the ultimate shear stress, $\varepsilon_s v_c$, obtained from Table 3.13 and Table 3.14 may be multiplied by:

$$1 + \frac{0.05\,N}{A_c}$$ -Equations 20

Where:

N = is the ultimate axial load (in newtons).

A_c = is the area of the entire concrete section (in mm2).

A column subject to biaxial shear due to ultimate loads should be designed such that:

$$\frac{V_x}{V_{ux}} + \frac{V_y}{V_{uy}} \leqslant 1.0$$ -Equations 21

where

V_x and V_y are the applied shears due to ultimate loads for the x-x axis and y-y axis respectively.

V_{ux} and V_{uy} are the corresponding ultimate shear capacities of the concrete and link reinforcement for the x-x and y-y axis respectively derived in accordance with this clause.

9- Design of bases

Bases should be designed as “beam-and-slab” or “flat-slab” as appropriate. Therefore, beam-and-slab bases should be designed in accordance with BS5400 part 4 clause 5.3.

Flat-slab sections should be designed to resist the total moments and shears at the sections considered.

Where the width of the section considered is less than or equal to $1.5(b_{col} + 3d)$, where b_{col} is the width of the column and d is the effective depth, to the tension reinforcement, of the base,

reinforcement should be distributed evenly across the width of the section considered. For greater widths, two-thirds of the area of reinforcement should be concentrated on a width of $(b_{col} + 3d)$ centred on the column.

Pile caps may be designed either by bending theory or by truss analogy, taking the apex of the truss at the center of the loaded area and the corners of the base of the truss at the intersections of the center lines of the piles with the tensile reinforcement.

The reinforcement in pile caps designed as beams should be uniformly distributed across any given section. In pile caps designed by truss analogy, 80 % of the reinforcement should be concentrated in strips linking the pile heads, and the remainder uniformly distributed throughout the pile cap.

The design shear is the algebraic sum of all ultimate vertical loads acting on one side of or outside the periphery of the critical section. The shear strength of flat-slab bases in the vicinity of concentrated loads is governed by the more severe of the following two conditions.

Shear along a vertical section extending across the full width of the base, at a distance equal to the effective depth from the face of the loaded area. The recommendations of BS5400 part 4 clause 5.4.4.1 apply.

Punching shear around the loaded area, where the recommendations of BS5400 part 4 clause 5.4.4.2 apply.

The shear strength of pile caps is governed by the more severe of the following two conditions:

1) Shear along any vertical section extending across the full width of

the cap. The recommendations of BS5400 part 4 clause 5.4.4.1 apply except that over portions of the section where the flexural reinforcement is fully anchored by passing across the head of a pile. The allowable ultimate shear stress may be increased to $(2d/a_v)\,\varepsilon_s\,v_c$:

Where:

a_v is the distance between the face of the column or wall and the critical section.

d is the effective depth, to tension reinforcement, of the section.

Where a_v is taken to be the distance between the face of the column or wall and the nearer edge of the piles it should be increased by 20 % of the pile diameter. In applying the recommendations of BS5400 part 4 clause 5.4.4.1 the allowable ultimate shear stress should be taken as the average over the whole section.

2) Punching shear around loaded areas, where the recommendations of 5.4.4.2 apply.

Bond and anchorage: The recommendations of BS5400 part 4 clause 5.8.6 apply to reinforcement in bases. The critical sections for local bond are:

a) The critical sections described in BS5400 part 4 clause 5.8.6.2.

b) Sections at which the depth changes or any reinforcement stops.

c) In the vicinity of piles, where all the bending reinforcement required to resist the pile load should be continued to the pile centre line and provided with an anchorage beyond the centre line of 20 bar diameters.

Deflection of bases: The deflection of bases need not be considered.

Crack control in bases: The recommendations of BS5400 part 4 clause 5.8.8.2 apply as appropriate depending on the type of base and treatment of design (see BS5400 part 4 clause 5.7.3.1).

Maximum areas of reinforcement in members: In a beam or slab, neither the area of tension reinforcement nor the area of compression reinforcement should exceed 4 % of the gross cross-sectional area of the concrete.

In a column, the percentage of longitudinal reinforcement should not exceed 6 in vertically cast columns or 8 in horizontally cast columns, except that at laps in both column types, the percentage maybe 10.

In a wall, the area of vertical reinforcement should not exceed 4 % of the gross cross-sectional area of the concrete.

3.3.3 Simplified version of the composite bridge code, BS 5400 -5:2000

This simplified version of the composite bridge code provides supplementary guidance to the simplified version of the steel bridge code for the treatment of the concrete elements of composite bridges and the interconnection of the steel and concrete elements.

It is based on extracts from Part 5 of BS 5400, though it is considerably reduced in extent. Detailed design of the deck slab is excluded.

f_{cu} = Characteristic concrete cube strength

f_{ry} = Characteristic strength of reinforcement

P_u = Nominal static strength of shear connector

γ_m = Partial safety factor for strength

σ_y = Nominal yield stress of the steel beam

1. Martial Properties

It is suggested that a characteristic (cube) strength of concrete of 40N/mm^2 is assumed. The elastic modulus should then be taken as 31kN/mm^2, giving a modular ratio of 6.6. (Long-term effects should be ignored for the purposes of this simplified approach).

2. Analysis

In carrying out the global analysis for the composite structure, the cross-sectional properties should be determined using the transformed slab area (i.e., divided by the modular ratio) or, for cracked slabs, using the area of tensile reinforcement.

At the ULS, gross section properties should be determined. At SLS, allowance should usually be made for shear lag using an effective breadth of a slab, but for simplified design, this may be ignored.

Uncracked concrete should be used, except for regions adjacent to intermediate support. Cracked concrete should be assumed for approximately 15% of the span on either side of each intermediate support.

Gross elastic sectional properties should be used to calculate stresses and shear flows (between the steel beam and slab) except when the section is checked as a compact beam. For compact beams, the calculation of the plastic modulus with an uncracked slab should assume a transformed slab area equal to:

$$\boldsymbol{Gross\ area} \times \frac{\mathbf{0.4}\ \boldsymbol{fcu}}{\boldsymbol{\sigma_y/\gamma_m}} \qquad \text{-Equations 22}$$

Where $\boldsymbol{\gamma_m}$ is the material factor for steel = 1.0 5.

Calculation of the plastic modulus with a cracked slab should ignore the concrete and use a transformed area of reinforcement equal to:

$$\boldsymbol{Gross\ reinforcment\ area} \times \frac{\mathbf{0.87}\ \boldsymbol{fry}}{\boldsymbol{\sigma_y/\gamma_m}} \qquad \text{-Equations 23}$$

It is usual for composite bridges to be constructed in stages, such that the steel beams initially carry the weight of wet concrete and the composite beams subsequently carry superimposed dead loads and live loads. This form of construction may be evaluated by analysing separate loads on a model with bare steel beams and loads on a model with composite beams. The total effects in any section are the sum of the two separate results.

For simplified design, no distinction is made between long-term and short-term loading on composite beams.

For greater simplicity in the design of composite bridges, all the loads may be assumed to be applied to the composite beams.

3. Design Resistance

For a beam treated as non-compact, the stresses at any section are determined by summating the stress distributions for the two stages. The stresses at any fiber are thus the sum of the values for each stage.

Total stresses in the concrete due to longitudinal bending should not exceed $0.5f_{cu}/\gamma_{f3}$ at either ULS or SLS and total stresses in the reinforcement should not exceed $0.87f_{ry}/\gamma_{f3}$ at ULS or $0.75f_{ry}/\gamma_{f3}$ at SLS.

The interface must resist the longitudinal shear flow to ensure composite action between the steel beam and concrete (calculated on the elastic section using b theory). This is achieved by welding shear studs (see Figure 3.8) onto the top flange of the beam.

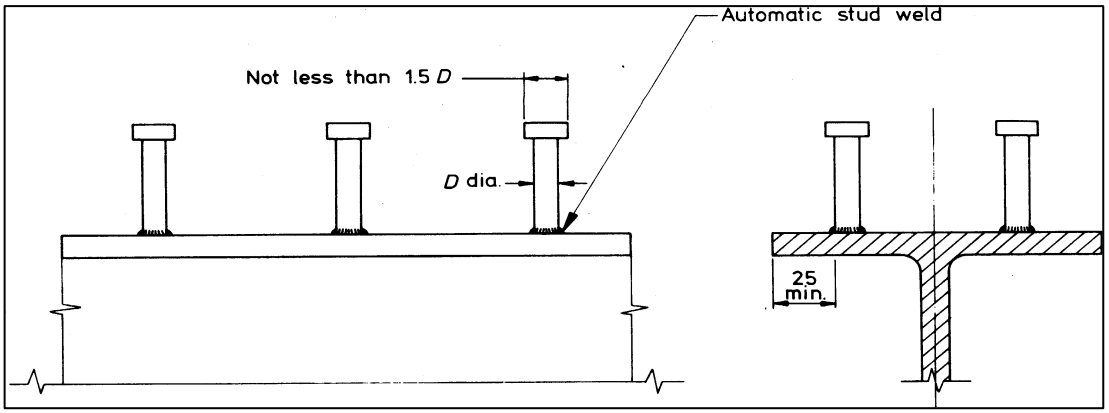


Figure (3.8): Stud Connector

Studs are provided two or three in a row across the flange at between 100 mm and 300 mm centres. The number and spacing should be sufficient to provide a resistance of at least the calculated shear flow.

The design resistance of each shear stud should be taken as P_u/γ_m. Values of P_u for a 19 mm shear stud of minimum height 100 mm are 100 kN for grade 30 concrete and 109 kN for grade 40 concrete.

As per BS 5400 Part 5 clause 5.3.2.5 values of γ_m are 1.85 at SLS and 1.40 at UI.S. (The higher value at SLS is to ensure that there is no local crushing in service).

4. Slab Design

The design of the slab itself is considered outside the scope of the simplified bridge design covered by this and the related publications.

For illustrative purposes, the slab reinforcement may be taken, as shown in Figure 3.9. Extra longitudinal top reinforcement would be required over intermediate supports. Slab thickness should be taken between 230 mm and 250 mm.

Note: In the Design Manual for Roads and Bridges, the covers shown below have been increased by 10 mm for improved durability.

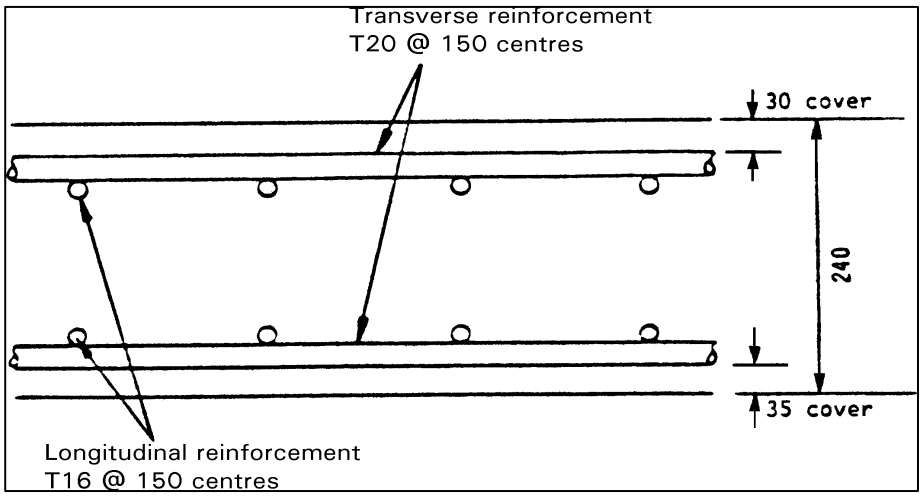


Figure (3.9): Slab Reinforcement

3.3.4 Summary of BS-5400 design procedure

From the above BS-5400 design procedure, to make an easy step, let us write a step-by-step on how to design a bridge using BS 5400 involves the following procedures:

1. Identify the design requirements: Determine the design requirements for the bridge, including the span, height, and width of the bridge, the materials to be used, the expected loads, and any other specific design considerations.
2. Choose the bridge type: Select the appropriate one based on the site conditions and design requirements. Common bridge types include beam, truss, arch, suspension, and cable-stayed bridges.
3. Determine the loading conditions: Determine the loading conditions for the bridge, including dead load, live load, and environmental loads such as wind and temperature changes.
4. Calculate the required strength and stability: Determine the required strength and stability of the bridge by analyzing the loads and

stresses on the bridge components. This may involve performing structural analysis using software such as STAAD or SAP2000, or CSiBridge 24 which will be used in this research.

5. Select appropriate materials: Select appropriate materials for the bridge components based on their strength, durability, and other properties. Common materials used for bridge construction include steel, concrete, and timber.
6. Design the bridge components: Design the bridge components, such as the deck, piers, abutments, and bearings, based on the loading conditions and the selected materials.
7. Conduct safety checks: To ensure the bridge can withstand the expected loads and remain stable under all conditions.
8. Prepare construction drawings and specifications: Prepare detailed drawings and specifications that include all the necessary information for the bridge's construction.
9. Obtain regulatory approvals: Obtain regulatory approvals from local and national authorities before proceeding with construction.
10. Construct the bridge: Construct the bridge according to the approved designs and specifications, ensuring that the work is carried out safely and complies with all relevant regulations and standards.

3.4 Summary

To conclude, the BS 5400 standard and the AASHTO LRFD standard are both widely used bridge design standards, but they have some significant differences.

The AASHTO LRFD standard is based on the limit states design philosophy, which considers both the strength and serviceability of limit

states. On the other hand, the BS 5400 standard is based on the permissible stress design philosophy, which considers only the strength limit state.

The AASHTO LRFD standard uses load and resistance factors to account for uncertainties in loads and material properties. These factors are calibrated based on a statistical analysis of the loads and material properties. The BS 5400 standard, on the other hand, uses a partial safety factor approach to account for uncertainties.

The AASHTO LRFD standard provides several load models for different types of vehicles and loads, while the BS 5400 standard provides fewer load models.

The AASHTO LRFD standard covers a wider range of materials and construction techniques than the BS 5400 standard. For example, it includes provisions for the design of concrete-filled steel tubes and composite steel-concrete bridges.

The AASHTO LRFD standard is widely used in the United States, while the BS 5400 standard is widely used in Europe and other parts of the world.

Ultimately, both standards have advantages and disadvantages, and the choice between them depends on the specific project requirements and local regulations. For the next chapter, analyzing a bridge by CSi bridge program using both BS5400 and AASHTO LRFD will be presented and highlighting all the significant differences between them.

Chapter Four

Analysis and Discussion

Chapter Four

Analysis and Discussion

4.1 Introduction

In this chapter simply support concrete bridge were design base on the two different design standards used in different countries in the word AASHTO-LRFD and BS-5400. In both cases the bridge was designed as simply supported having more than two lanes and spans.

CSiBridge is a software program developed by Computers and Structures, Inc. (CSI) that is used for the structural analysis and design of bridges. It is a powerful tool for engineers and designers, providing them with the ability to model, analyze, and design bridge structures of all types, including steel, concrete, and cable-stayed bridges.

The software uses a sophisticated modelling and analysis engine that can simulate the behaviour of bridge structures under a variety of loading conditions, such as vehicle loads, seismic events, and wind loads. CSiBridge also includes advanced design tools that enable users to optimize their designs for efficiency and safety.

CSiBridge has a user-friendly interface and supports a wide range of input and output formats, making it a versatile tool for engineers and designers working on bridge projects.

Any bridge should have this major parts bridge deck, concrete beams, bearings, pier cap, and column as shown in Figure 4.1. Furthermore, these parts and bridge details with the result for both AASHTO-LRFD and BS-5400 by using CSiBridge Program will be presented in next sections of this chapter.



Figure (4.1): Major Bridge Parts (providencejournal,2017)

4.2 Comparative and differences between AASHTO & BS-5400

This report consisted of the detailed comparison between AASHTO LRFD and British Standards for the bridge design, providing the changes in the parameters and design philosophies. The philosophy of the American Association of States Highway and Transportation Officials (AASHTO) LRFD and the British Standards BS 5400 are different with respect to the strength calculations, mainly the shear strength. AASHTO LRFD makes use of both the modified compression field theory (MCFT) and the strut and tie methods. The Strut and Tie method is typically used for the deep beam and pile caps. On the other hand, BS5400 is not considered. The MCFT, it is traditionally deal with the shear force based on the typical failure modes including the diagonal tension and shear-compression. AbuTahoun and Kara (2022) utilizing AASHTO LRFD approach provides much higher shear capacity than the traditional shear design approach.

4.2.1 Differences in Shear Design Philosophy

Apart from the shear design approach in both standards, the flexure stresses in the prestressing girders vary between AASHTO LRFD and BS 5400. The limits in the allowable compression stresses in AASHTO are higher than BS 5400 while the allowable tension stresses in BS 5400 are higher than AASHO LRFD. As referred earlier, BS 5400 design approach, which is similar to BS 8100, is based on two modes of failures in the traditional beams which are diagonal tension and shear-compression. The diagonal tension, as shown in Figure 4.2.

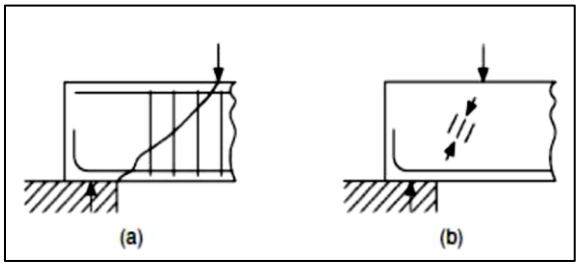


Figure (4.2): BS 5400 Failure Modes Due to Shear

Assumes that the crack is being formed and progressed as the load is increasing. This type of failure is prevented by reinforcement. The British Standard in general assumes an inclined failure plane with an angle of 45°. The former philosophy leads to limit the maximum shear strength to $0.8\sqrt{f}_{cu}$ as in BS 8110 without exceeding 5.0 N/mm^2 or to $0.75\sqrt{f}_{cu}$ as in BS 5400-4 limited to 4.75 N/mm^2. For the prestressed beam, the maximum shear strength is a little bit higher than the non-prestressed beams. Figure (4.3) below shows the maximum shear in BS 5400-4. Nevertheless, according to BS 5400-4, there is a requirement to decrease the beam width for post-tensioned beams by two-thirds of the duct diameter of the

prestressing cables.

	Concrete grade			
	30	40	50	60 and over
Maximum shear stress	N/mm^2 4.1	N/mm^2 4.7	N/mm^2 5.3	N/mm^2 5.8

Figure (4.3): As per BS 5400 Maximum Shear Stress

Based on the research, the idea of assuming the compressive stresses in shear is inclined with an angle of 45° has been proven that it is too conservative. The angle value is much lesser than this value which leads to higher shear strength. Accordingly, and as referred earlier, AASHTO LRFD utilizes the modified compression field theory (MCFT) in the shear design which models the cracked section considering it is subjected to in-plane shear and normal stresses with varying the angle of the diagonal compressive stresses as is calculated. The compression field theory or the modified compression field theory (MCFT) of treating the cracked section as a new material that has its own characteristics in terms of stress-strain while the modified compression field theory specifically utilized the average stress-average strain relationships considering the tensile stresses in the concrete between cracks. The consideration of these average stresses and strains have been developed based on verified experiments. The concept of average stress and strain suggests that stress and strain levels fluctuate along the crack location. For example, tensile stresses peak at the crack itself, while they diminish between cracks.
Building upon the preceding discussion and incorporating considerations for tensile strain calculations, AASHTO LRFD places significant emphasis on the design of shear capacity. This involves determining the angle of inclination of diagonal compressive strength, as well as evaluating the

factor indicating the capacity of diagonal cracked concrete to transmit tension and shear forces. The calculation of nominal shear strength in AASHTO LRFD is depicted in Figure (4.4), illustrating a comprehensive approach to assess shear resistance in concrete structures. By addressing these critical factors, AASHTO LRFD aims to ensure robust and reliable designs that withstand the demands of shear loading effectively.

5.8.3.3—Nominal Shear Resistance

The nominal shear resistance, V_n, shall be determined as the lesser of:

$$V_n = V_c + V_s + V_p \qquad (5.8.3.3\text{-}1)$$

$$V_n = 0.25 f'_c b_v d_v + V_p \qquad (5.8.3.3\text{-}2)$$

in which:

$V_c = 0.0316 \beta \sqrt{f'_c}\, b_v d_v$, if the procedures of Articles 5.8.3.4.1 or 5.8.3.4.2 are used (5.8.3.3-3)

V_c = the lesser of V_{ci} and V_{cw}, if the procedures of Article 5.8.3.4.3 are used

$$V_s = \frac{A_v f_y d_v (\cot\theta + \cot\alpha)\sin\alpha}{s} \qquad (5.8.3.3\text{-}4)$$

Figure (4.4): AASHTO LRFD given Nominal Shear Strength

If a beam with a traditional compressive strength of 40 N/mm^2, and without the effect of prestressing, the shear resistance could reach 10 N/mm^2 which is almost double the value of BS 5400-4. Moreover, and as per AASHTO LRFD, only one-fourth the diameter of prestressing cable duct is dedicated from the width of the beam.

4.2.2 Difference in Live loads

AASHTO LRFD specifications and BS 5400 loads both consist of lane loading and truck loading, but the magnitude and configuration of the loads differ as shown in the Figure (4.5).

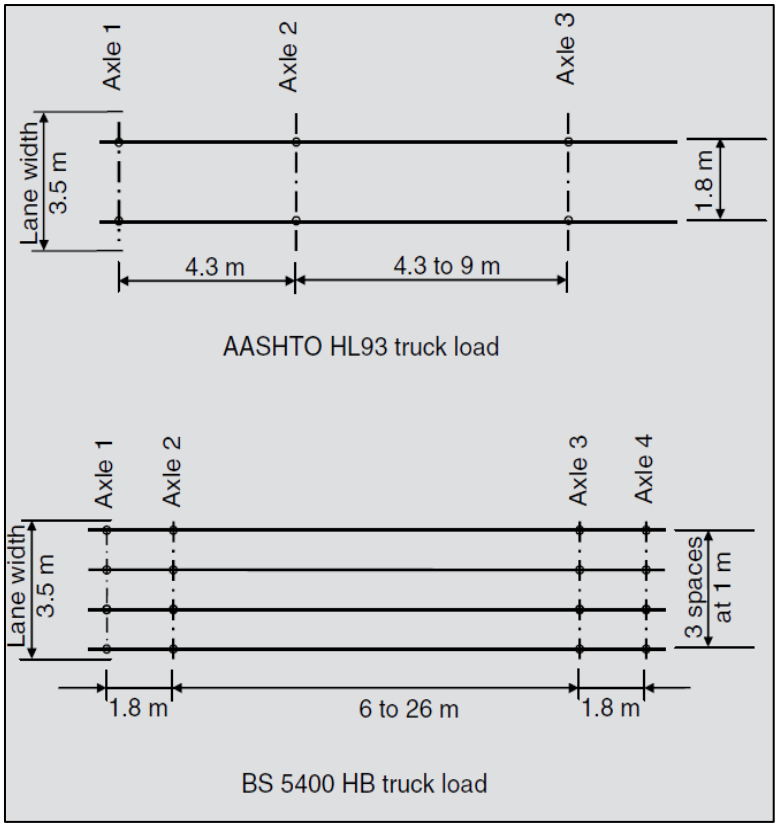


Figure (4.5): Axle Load Distribution

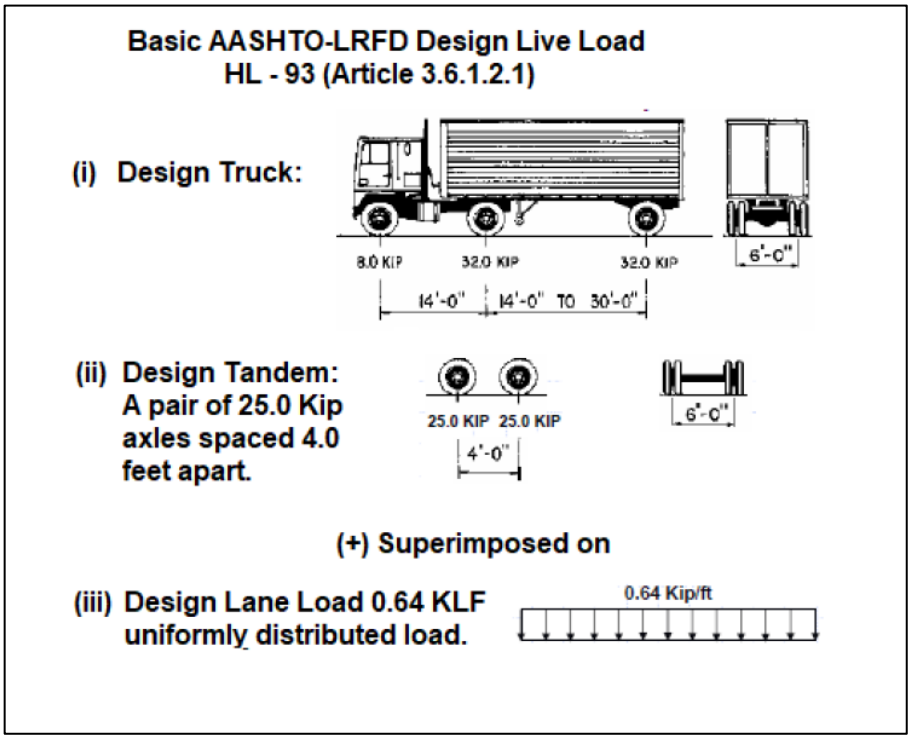


Figure (4.5a): AASHTO Live Load cases applied for Bridge Design

The live load designations in BS 5400, namely lane (HA) and truck (HB), carry greater weight compared to the AASHTO LRFD specifications HL93 live load, with different truck axle configurations. Additionally, BS 5400 incorporates dynamic load allowance (impact) for both lane and truck loads, whereas AASHTO LRFD specifies it only for truck and tandem loads. AASHTO Live loading given as follows.

Given the significantly higher HB truck loads compared to HL93, there are variations in how lane loading and truck loading are applied in design. Unlike AASHTO LRFD, BS 5400 mandates that HB loads be combined with HA loads. This means that for multiple lanes, an HB truck is assigned to one lane while the remaining lanes bear the lighter HA load. (Gergess and Tepavcevic, 2011) If the number of design lanes is four or more, the HA loads in the third and subsequent lanes are reduced by 40%.

4.3 STRUCTURAL DESIGN CRITERIA

4.3.1 Codes of Practices

For the modeling and design of both bridge model in the CSI Bridge Following is the summary of the codes used in designing:

- AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017) used for all analysis, design, and specifications of loads (including live loads, which ever governs), load combinations for one bridge model.
- BRITISH STANDARD (BS-5400) Part 4, used for all analysis, design, and specifications of loads (including live loads, which ever

governs), load combinations for other bridge model. Note that in CSiBridge 24 the BS-5400 is been addressed as Eurocode 2 2004.

4.3.2 Material Properties

a) 28 Days Compressive Strength of Concrete (Cylindrical)

- as per AASHTO LRFD

Pre-stressed Girders	41 MPa (*6000 Psi*)
Deck Slab and Diaphragm	28 MPa (*4000 Psi*)
Transom	28 MPa (*4000 Psi*)

- as per BS-5400

Pre-stressed Girders	41 MPa
Deck Slab and Diaphragm	28 MPa
Transom	28 MPa

b) Reinforcement

- AASHTO-LRFD

High yield deformed steel bars conforming to AASHTO M31 (ASTM A615) with seismic effect (ASTM 706) Grade 60 with minimum yield strength of 413 MPa shall be used.

- BS-5400

High yield deformed steel bars conforming ultimate strength of 460 MPa with modulus of elasticity of 200 (kN/mm^2)

c) Pre-Stressing Strands

- AASHTO-LRFD

Pre-stress strands will be 12, 12.7mm diameter, normal relaxation strands, conforming to ASTM A-416 (AASHTO M203) having ultimate Strength

of 1860 MPa (Grade 270) shall be used. The following parameters will be used for Pre-stressing losses calculations:

Wobble Coefficient	0.0033 per meter
Modulus of Elasticity	200000 MPa

- BS-5400

Pre-stress strands will be high strength steel strand confirming the requirement of T12.7-1860.

d) Unit Weights

Reinforced Concrete	24 kN/m^3 (150 Pcf)
Steel	78.5 kN/m^3 (140 Pcf)

e) Modulus of Elasticity

Concrete	$57000\sqrt{f'_c}$ psi
Rebar	200,000 MPa

4.3.3 Load Combinations and Load Factors

- AASHTO LRFD 2017 – TABLE 3.4.1-1 – Load Combinations and Load Factors see Table (4.1). AASHTO LRFD has provided the five strength cases, and two extreme events. For the service design and analysis four cases are provided.

Table (4.1): Load Combinations and Load Factors (AASHTO LRFD 2019 – TABLE 3.4.1-1)

Load Combination Limit State	DC DD DW EH EV ES EL PS CR CH	LL IM CE BR PL LS	WA	WS	WL	FR	TU	TG	SE	EQ	BL	IC	CT	CV
Strength I	γ_p	1.75	1.00	-	-	1.00	0.5/1.2	γ_{EG}	γ_{SE}	-	-	-	-	-
Strength II	γ_p	1.35	1.00	-	-	1.00	0.5/1.2	γ_{EG}	γ_{SE}	-	-	-	-	-
Strength II	γ_p	-	1.00	1.00	-	1.00	0.5/1.2	γ_{EG}	γ_{SE}	-	-	-	-	-
Strength IV	γ_p	-	1.00	-	-	1.00	0.5/1.2	-	-	-	-	-	-	-
Strength V	γ_p	1.35	1.00	1.00	1.00	1.00	0.5/1.2	γ_{EG}	γ_{SE}	-	-	-	-	-
Extreme Event I	1.00	γ_{EQ}	1.00	-	-	1.00	-	-	-	1.00	-	-	-	-
Extreme Event II	1.00	0.5	1.00	-	-	1.00	-	-	-	-	1.00	1.00	1.00	1.00
Service I	1.00	1	1.00	1.00	1.00	1.00	1.0/1.2		γ_{SE}	-	-	-	-	-
Service II	1.00	1.3	1.00	-	-	1.00	1.0/1.2	-	-	-	-	-	-	-
Service III	1.00		1.00	-	-	1.00	1.0/1.2	γ_{EG}	γ_{SE}	-	-	-	-	-
Service IV	1.00	-	1.00	1.00	-	1.00	1.0/1.2	-	1.00	-	-	-	-	-
Fatigue I- LL, IM & CE only	-	1.75	-	-	-	-	-	-	-	-	-	-	-	-
Fatigue II- LL, IM & CE only	-	0.8	-	-	-	-	-	-	-	-	-	-	-	-

- BS-5400-2 proposed the different cases based on the $v_{FL.}$ for both ULS: ultimate limit state SLS: serviceability limit state, see Figure (4.6).

ULS: ultimate limit state
SLS: serviceability limit state

Clause number	Load	Limit state	γ_{fL} to be considered in combination				
			1	2	3	4	5
5.1	**Dead:** steel	ULS[a]	1.05	1.05	1.05	1.05	1.05
		SLS	1.00	1.00	1.00	1.00	1.00
	concrete	ULS[a]	1.15	1.15	1.15	1.15	1.15
		SLS	1.00	1.00	1.00	1.00	1.00
5.2	**Superimposed dead**	ULS[b]	1.75	1.75	1.75	1.75	1.75
		SLS[b]	1.20	1.20	1.20	1.20	1.20
5.1.2.2 & 5.2.2.2	Reduced load factor for dead and superimposed dead load where this has a more severe total effect	ULS	1.00	1.00	1.00	1.00	1.00
5.3	**Wind:** during erection	ULS		1.10			
		SLS		1.00			
	with dead plus superimposed dead load only, and for members primarily resisting wind loads	ULS		1.40			
		SLS		1.00			
	with dead plus superimposed dead plus other appropriate combination 2 loads	ULS		1.10			
		SLS		1.00			
	relieving effect of wind	ULS		1.00			
		SLS		1.00			
5.4	**Temperature: restraint to movement, except frictional**	ULS			1.30		
		SLS			1.00		
	frictional restraint	ULS					1.50
		SLS					1.00
	effect of temperature difference	ULS			1.00		
		SLS			0.80		
5.6	**Differential settlement**	ULS	to be assessed and agreed between the engineer and the appropriate authority				
5.7	**Exceptional loads**	SLS					
5.8	**Earth pressure:** retained fill and/or live load surcharge	ULS	1.50	1.50	1.50	1.50	1.50
		SLS	1.00	1.00	1.00	1.00	1.00
	relieving effect	ULS	1.00	1.00	1.00	1.00	1.00
5.9	**Erection:** temporary loads	ULS		1.15	1.15		
6.2	**Highway bridges live loading:** HA alone	ULS	1.50	1.25	1.25		
		SLS	1.20	1.00	1.00		
6.3	HA with HB or HB alone	ULS	1.50	1.10	1.10		
		SLS	1.10	1.00	1.00		
6.5	**Centrifugal load and associated primary live load**	ULS	each secondary live shall be considered separately together with the other combination 4 loads as appropriate			1.50	
		SLS				1.00	
6.6	**Longitudinal load:** HA and associated primary live load	ULS				1.25	
		SLS				1.00	
	HB and associated primary live load	ULS				1.10	
		SLS				1.00	
6.7	**Accidental skidding load and associated primary live load**	ULS				1.25	
		SLS				1.00	
6.8	**Vehicle collision load with bridge parapets and associated primary live load**	ULS				1.25	
		SLS				1.00	
6.9	**Vehicle collision load with bridge supports**[c]	ULS				1.25	
		SLS				1.00	
7	**Foot/cycle track bridges:** live load and parapet load	ULS	1.50	1.25	1.25	1.25	
		SLS	1.00	1.00	1.00	1.00	
8	**Railway bridges:** type RU and RL primary and secondary live loading	ULS	1.40	1.20	1.20		
		SLS	1.10	1.00	1.00		

NOTE For loads arising from creep and shrinkage, or from welding and lack of fit, see Parts 3, 4 and 5 of this standard, as appropriate.
[a] γ_{fL} shall be increased to at least 1.10 and 1.20 for steel and concrete respectively to compensate for inaccuracies when dead loads are not accurately assessed.
[b] γ_{fL} may be reduced to 1.2 and 1.0 for the ULS and SLS respectively subject to approval of the appropriate authority (see 5.2.2.1)
[c] This is the only secondary live load to be considered for foot/cycle track bridges.

Figure (4.6): Load Combination (BS 5400-2)

4.4 Superstructure Design

The analysis of both bridges' super structure was obtained through a three-dimensional Finite Element model using CSI Bridge. The bridge FE model is shown below in Figure (4.7). The bridge is a three span (skew 0 degree) with Pier abutments.

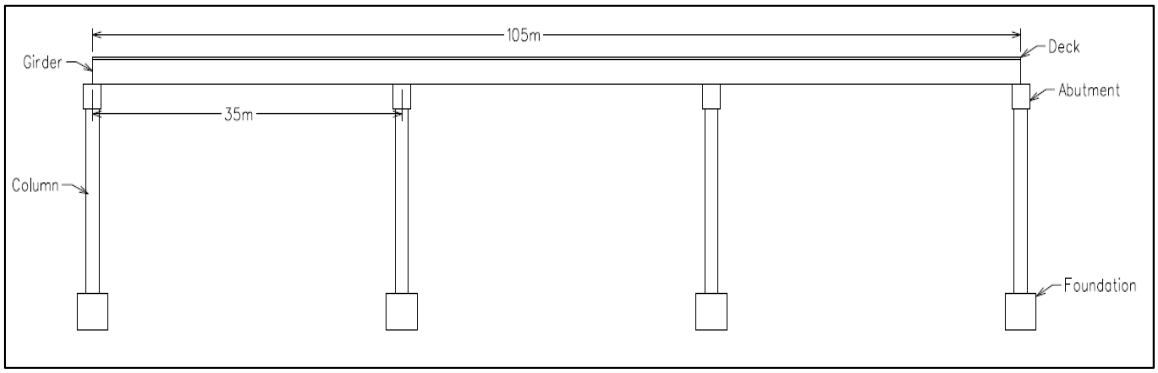
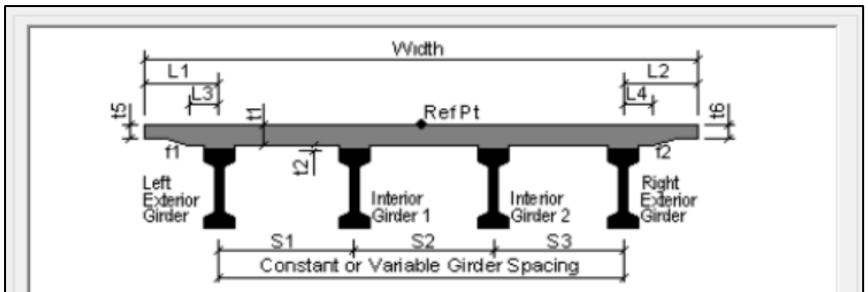


Figure (4.7a): Bridge Details



Section Data

Definition | Loads

Item	Value
Total Width	12900.
Girder Longitudinal Layout	Along Layout Line
Constant Girder Spacing	Yes
Constant Girder Haunch Thickness (t2)	Yes
Constant Girder Frame Section	Yes
Slab Thickness	
Top Slab Thickness (t1)	225.
Concrete Haunch Thickness (t2)	50.
Girder Section Properties	
Girder Section	Girder 35m
Fillet Horizontal Dimension Data	
f1 Horizontal Dimension	225.
f2 Horizontal Dimension	225.
Left Overhang Data	
Left Overhang Length (L1)	1050.
Left Overhang Distance to Fillet (L3)	650.
Left Overhang Outer Thickness (t5)	225.
Right Overhang Data	
Right Overhang Length (L2)	1050.

Figure (4.7b): Bridge Section Details

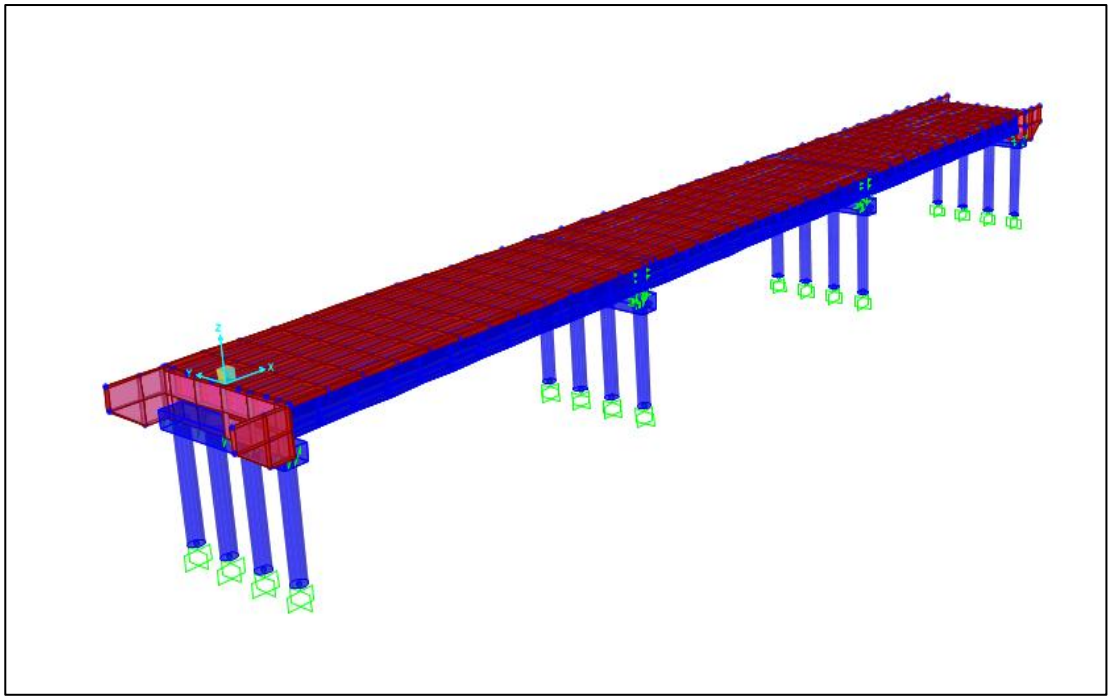


Figure (4.7c): Bridge 3D View

4.4.1 Applied Loads

Loads applied on super structure for the Bridge design as pe the AASHTO, following loads mentioned in the Table 4.2 have been applied for super structure:

Table (4.2): Load Applied For Super Structure

Type	Applied Loads
Dead Load	Dead weight is self-calculated by the software.
Barrier Load	5.9 kN/m is applied over deck slab on both sides. Barrier load of 7.5 kN/m is applied at the center of the bridge deck slab.
Wearing Course	1.15 kN/m^2 is applied on deck slab (AASHTO) 1.15 kN/m^2 is applied on deck slab (BS)
Moving Load	Class A, Class AA as per West Pakistan Highway code of practice 1967. HL 93 K and M as per AASHTO LRFD

a) Loads Application in CSI Model

- Barrier Loading see Figure (4.8).

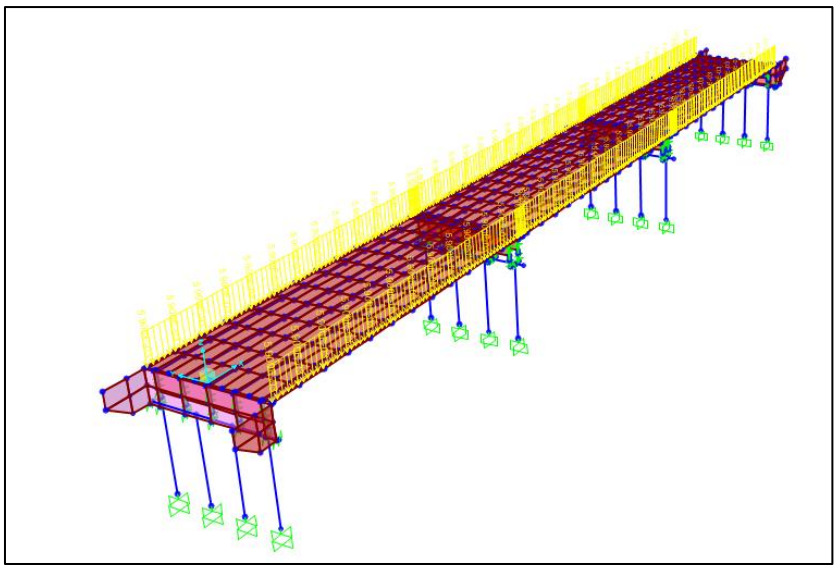


Figure (4.8): Application of Barrier Loading on Bridge

- Wearing course load see Figure (4.9)

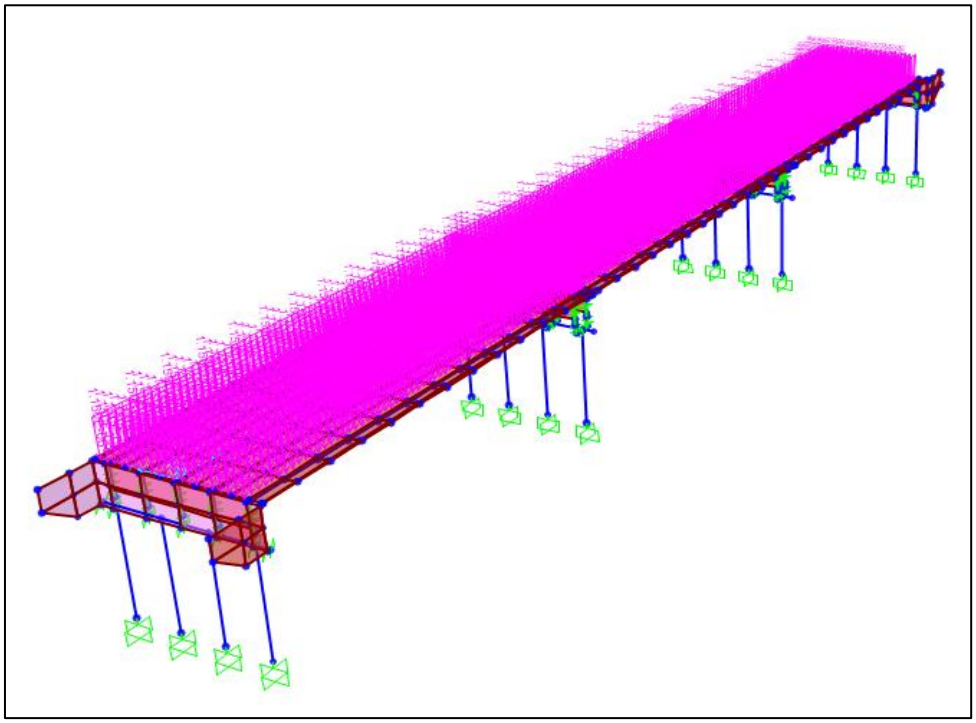


Figure (4.9): Wearing Course Load

- Moving Lane on Bridge and bridge specification data Figure (4.10).

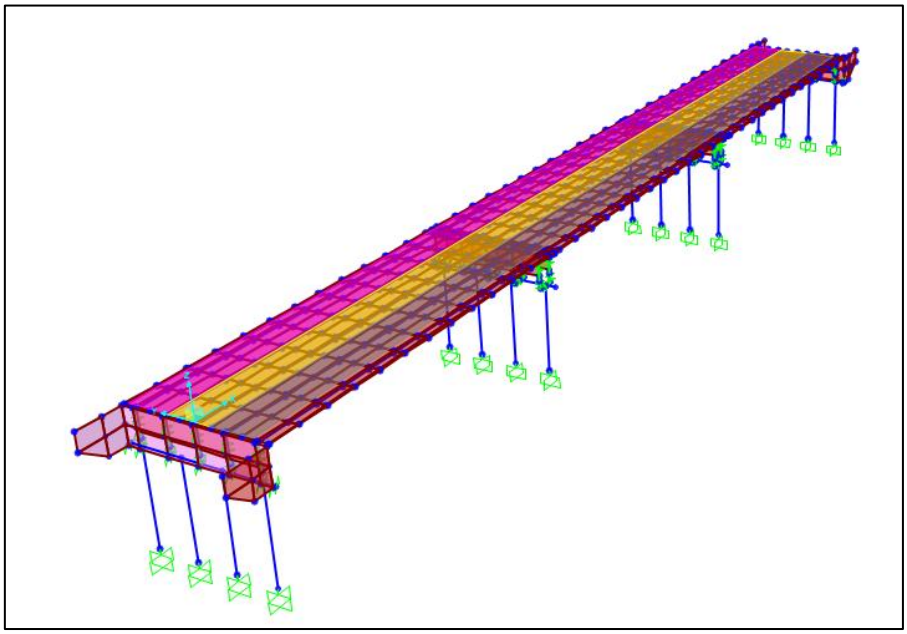


Figure (4.10): Defining the Moving Lanes on Bridge

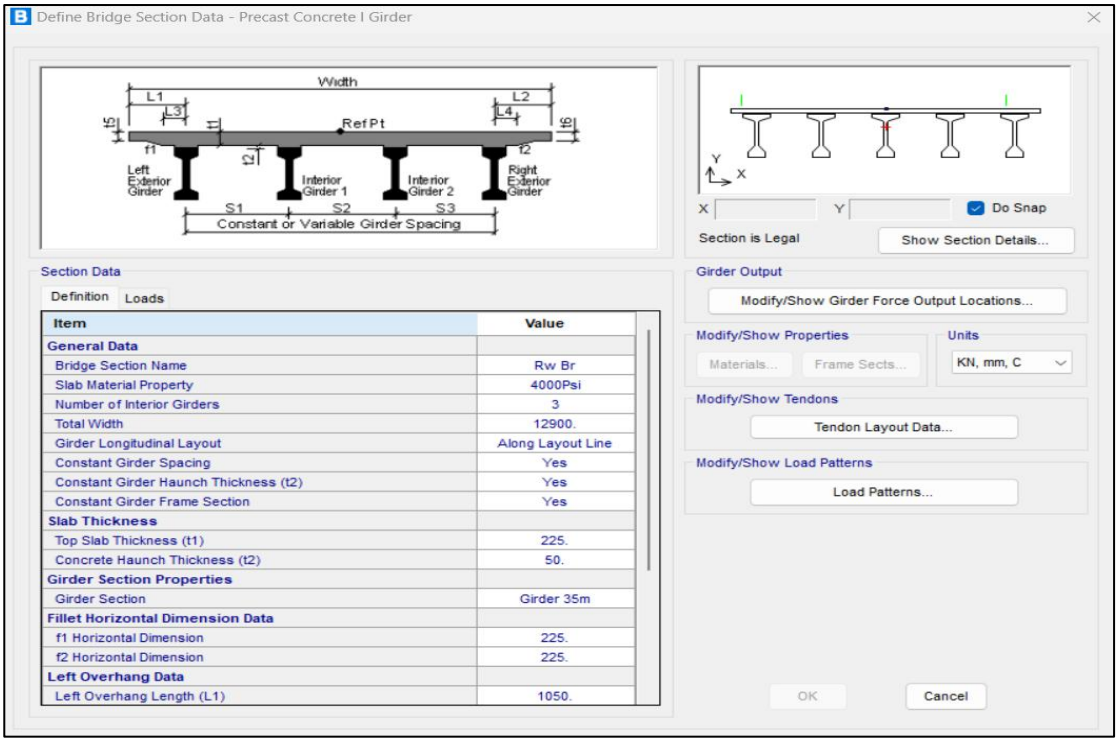


Figure (4.10a): Bridge Layout Data

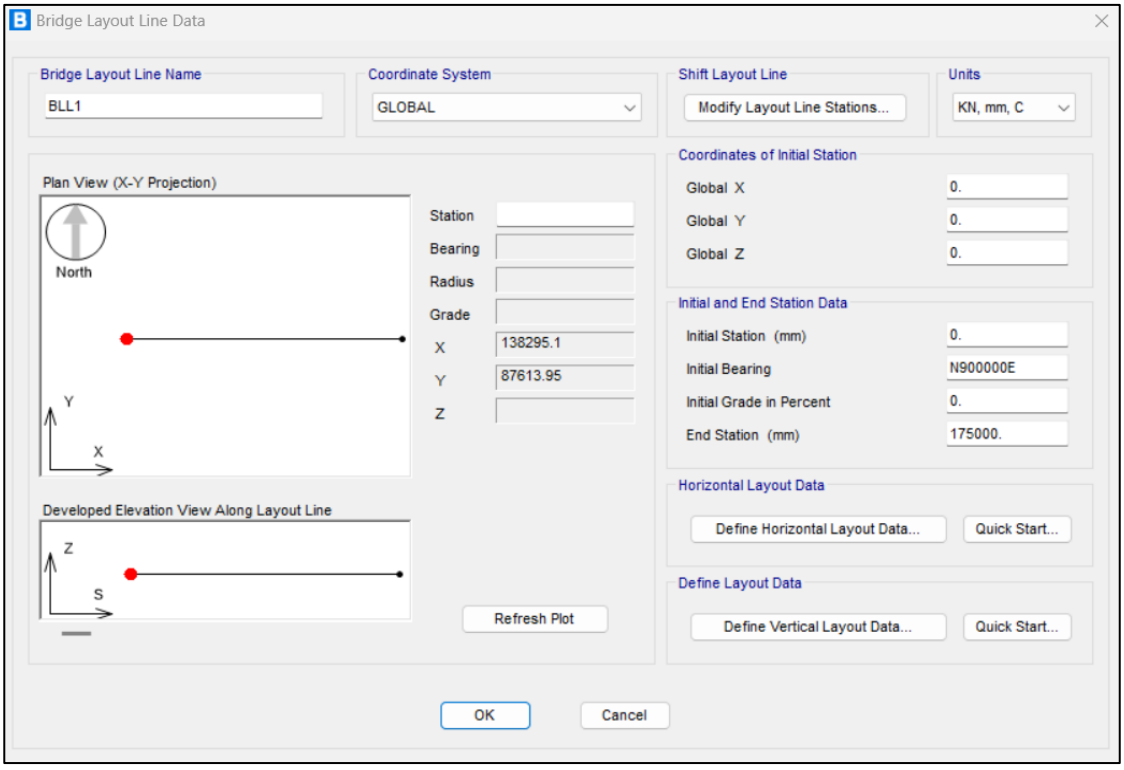


Figure (4.10b): Bridge Section Input Data

- HL-93 Moving Load see Figure (4.11) and Figure (4.12).

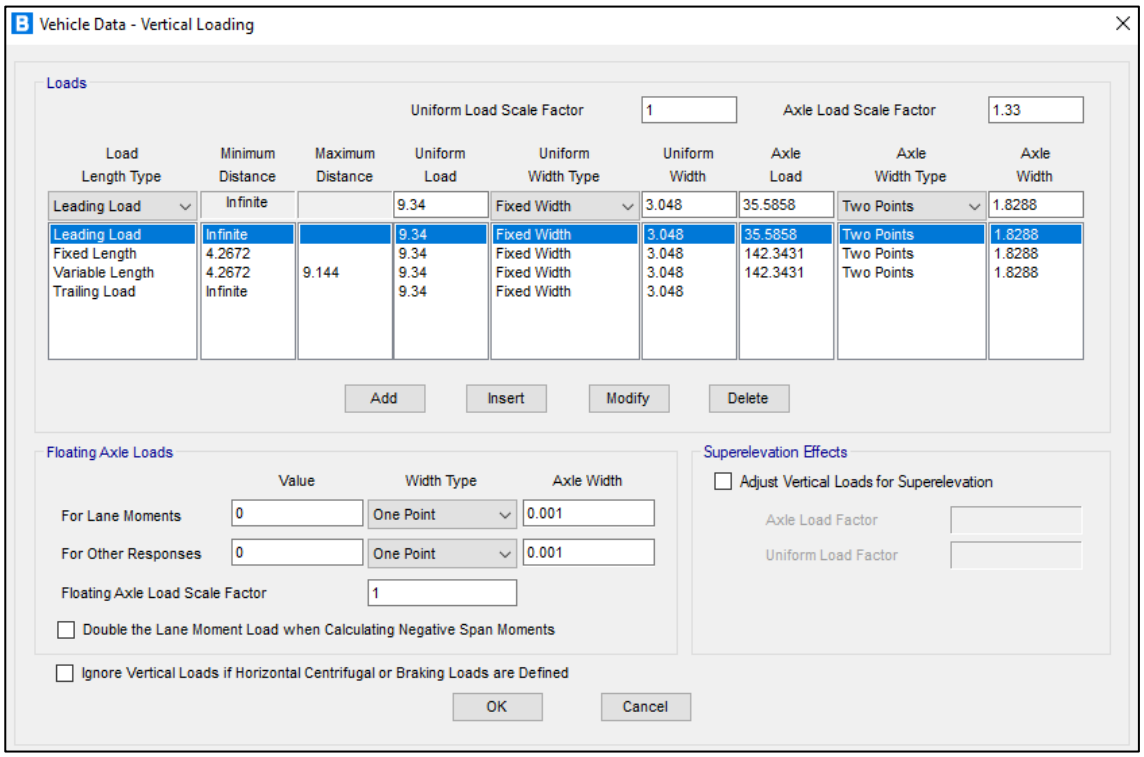


Figure (4.11): HL-93 Moving Load data-01

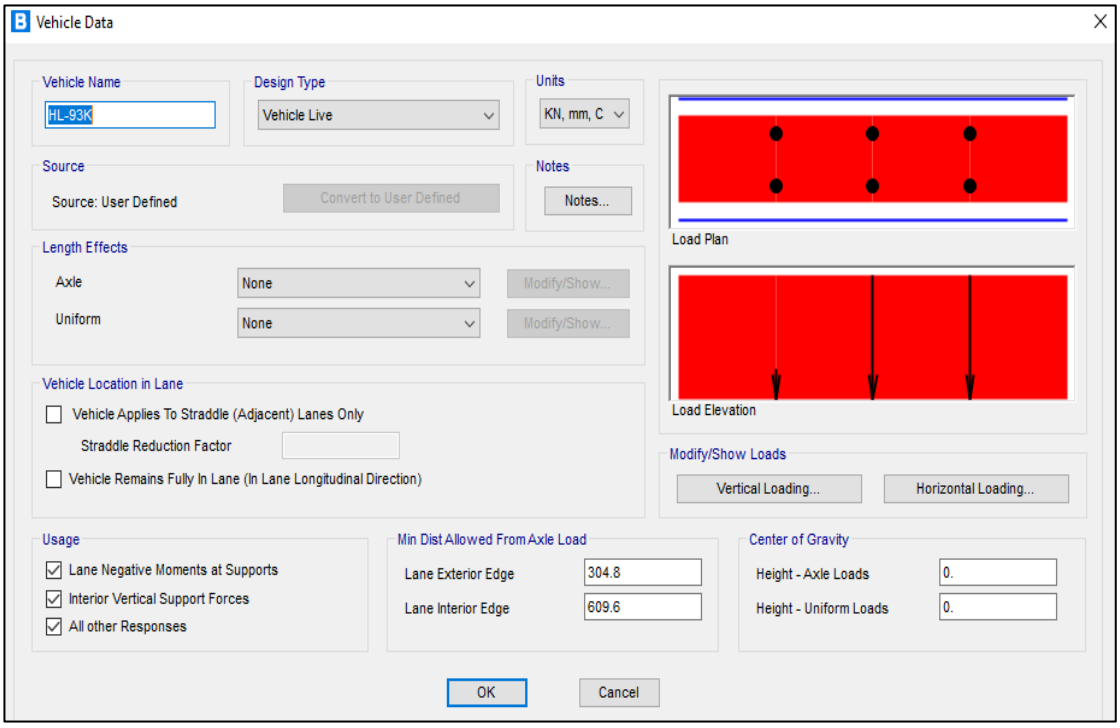


Figure (4.12): HL-93 Moving Load data-02

- HB vehicle per Cl.6.3.1 see Figure (4.13) and Figure (4.14).

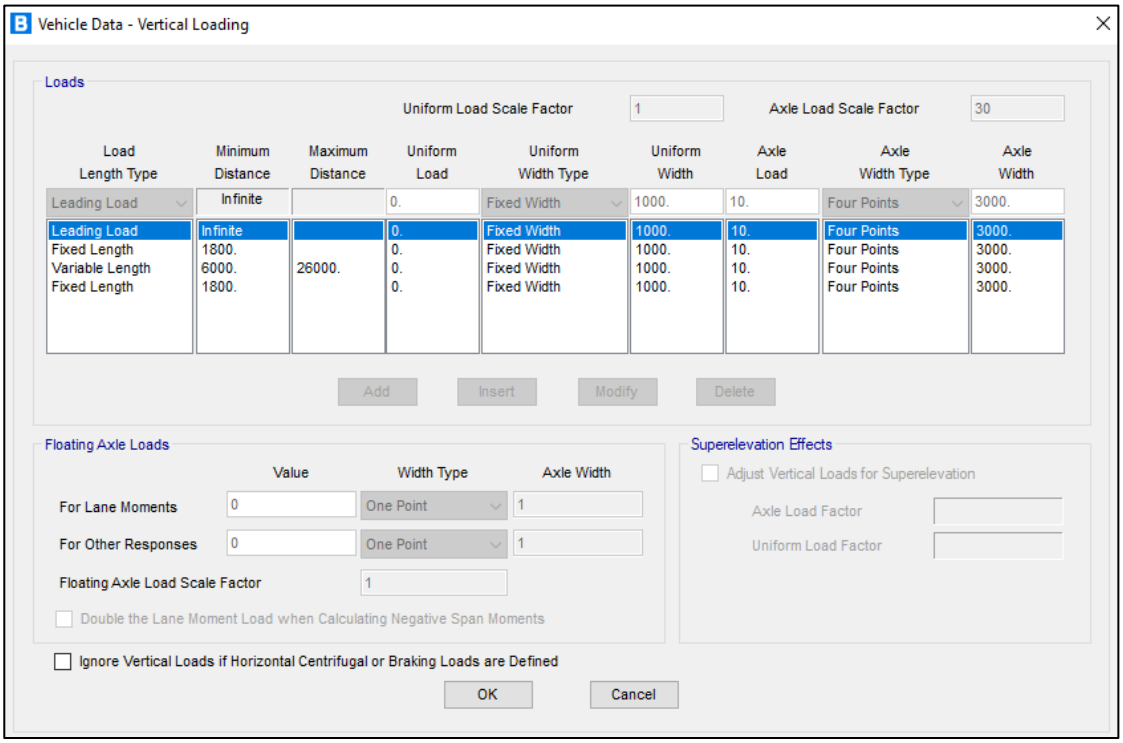


Figure (4.13): HB Moving Load Data-01

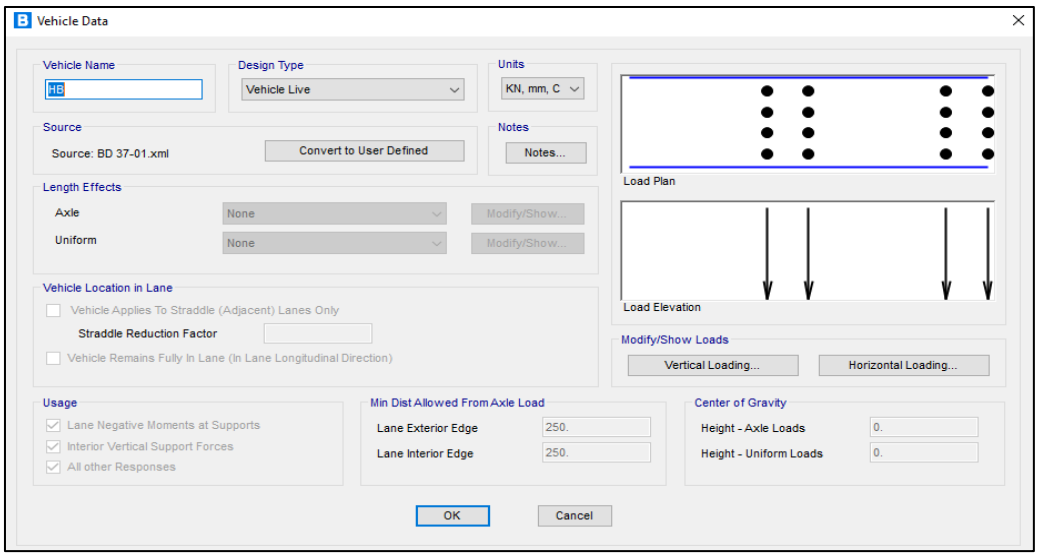


Figure (4.14): HB Moving Load Data-02

b) Wind load

Wind pressure on the structure was calculated through both design standards. Wind pressure as per the AASHTO is calculated as follows,

$$P_z = 2.56 \times 10^{-6} V^2 K_z G C_D \qquad (3.8.1.2.1\text{-}1)$$

British standard recommends the different parameter to calculate the wind pressure on the structure as per Figure (4.15).

Wind loads shall be calculated in accordance with Clause 5.3.3. as follows.

Pt = 0.613 Vc x A1 x C_D

Where :

- Vc = maximum wind gust speed (m/s).
- A1 = the solid area (m)
- C_D = the drag coefficient

In calculating maximum wind gust speed (Vc)

- Vc = v x K1 x S1 x S2
- v = mean hourly wind speed (m/s) = 40 m/s
- K1 = 1.0 (for 120 years return period)
- S1 = 1.0
- S2 = is to be taken from T.2 corresponding to height above ground level and span of the bridge.

The height of bridge above ground level is 10 m and length is 40 m

Vc = 40 x 1.0 x 1.0 x 1.545

= 61.80 m/s

Maximum wind gust speed on bridges with live load shouldn't exceed 35 m/s.

Figure (4.15): Wind load as per BS

Wind was applied at the substructure for the analysis in the CSI Bridge.

- Wind Forces on Abutment As per AASHTO.

Application of the lateral wind force on the abutment as per AASHTO see Figure (4.16).

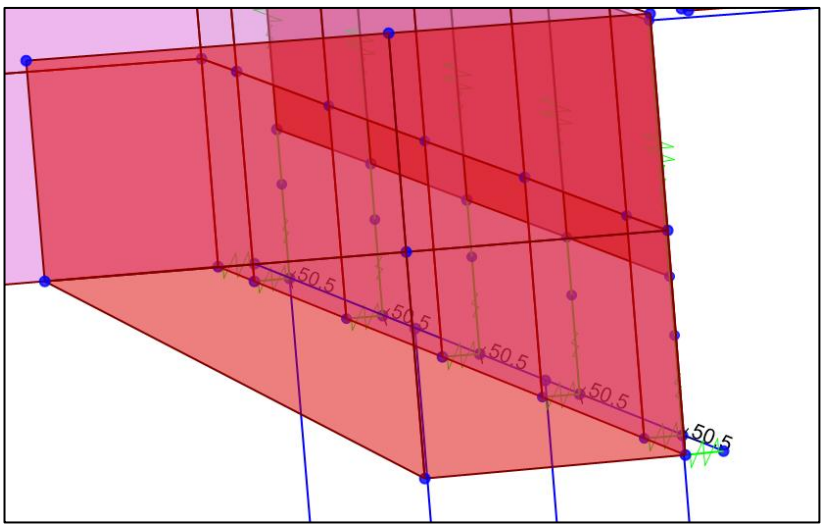


Figure (4.16): Wind Force on Abutment (AASHTO)

- Wind Forces on Abutment as per BS.

Application of the lateral wind force on the abutment as per British Standard see Figure (4.17).

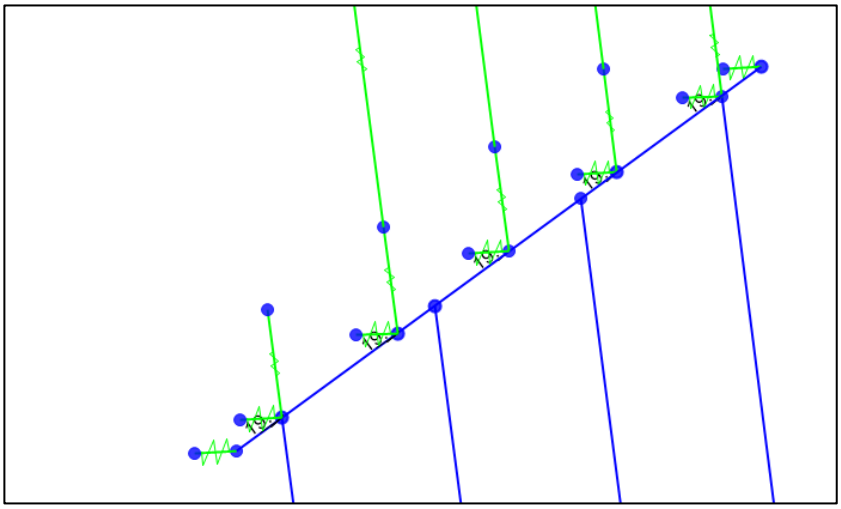


Figure (4.17): Wind Force at the Abutment Pier (BS)

4.4.2 Concrete Deck Slab

The bridge deck is the horizontal surface or roadway of a bridge that spans the gap between the supporting structures, such as piers, abutments, or other supporting elements see (Figure 4.18). It is the part of the bridge on which vehicles, pedestrians, or trains travel. The deck is a critical component of the bridge, as it directly bears the weight of the traffic loads and distributes them to the bridge's supporting elements. In the design of deck slabs according to AASHTO LRFD guidelines, a composite loading scenario is employed, which combines the effects of a design truck or design tandem along with a design lane load. This approach ensures a comprehensive assessment of the slab's structural capacity under realistic loading conditions. Moreover, both the truck and lane loads incorporate a dynamic allowance of 33%, accounting for the dynamic effects inherent in vehicular traffic loads. By considering these dynamic factors, the design

process aims to accurately capture the dynamic response of the deck slab and ensure its adequacy for serviceability and safety requirements. Whereas the BS 5400 specifies that HB loads should be applied in combination with HA loads. That is, for multiple lanes, an HB truck is placed in one lane only while the remaining lanes are loaded with the lighter HA load. If the number of design lanes is greater than or equal to four, the HA loads in the third and subsequent lanes are reduced 40%. In AASHTO LRFD, the design lane load consists of a uniformly distributed load of 9.3 N/mm along the longitudinal direction. Transversely, the design lane load is assumed to be distributed uniformly over a 3 m width, which is narrower than the full lane width (3.6 m in BS). This discrepancy in lane width represents a notable difference between the Eurocode and AASHTO standards.



Figure (4.18): Bridge Deck slab for Al Fateh Highway

Bridge slabs are typically treated as beams with a wide width, neglecting the effect of their larger dimension. When designing slabs, it's crucial to consider shear failure modes such as flexural shear and punching shear. Flexural shear failure manifests as an S-shaped shear crack near the support of the slab. Alternatively, in cases where the slab is exceptionally wide, the crack may develop within the interior of the slab itself as per Lantsoght et al (2016), as illustrated in Figure (4.19). This highlights the importance of thorough verification of shear failure modes in slab design to ensure structural integrity and safety.

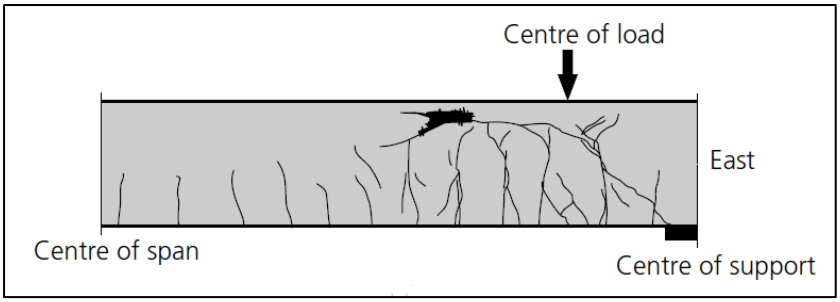


Figure (4.19): S-shaped Shear Crack (Lantsoght et al,2016)

In British Standard practice, horizontal load spreading is assumed under a 45° angle from the center of the load towards the support leadings to limit the maximum shear strength to $0.8\sqrt{f_{cu}}$ a in BS 8110 without exceeding 5.0 N/mm^2 or to $0.75\sqrt{f_{cu}}$ as in BS 5400-4 limited to 4.75 N/mm^2 which make this assumption too conservative. AASHTO design approach of modified compression field theory (MCFT) in the shear design with varying angle of the diagonal compressive stresses as is more realistic of the shear at less angles.

4.4.4 Bearings

In the context of bridge construction, a bearing (also known as a bridge bearing or expansion joint) refers to a structural device or element that allows controlled movements and rotations between different components of the bridge see Figure (4.20).



Figure (4.20): Bearing used in Al Fateh Highway

Bearings are designed to accommodate the thermal expansion, contraction, and other dynamic forces that bridges experience due to temperature changes, traffic loads, and other external factors. The primary purpose of bearings in a bridge is to:

1. Facilitate Movement: Bridges are subject to various forces and movements, including thermal expansion and contraction, traffic loads, wind-induced vibrations, and settlement of supports. Bearings allow the bridge deck or superstructure to move relative to the substructure (abutments and piers) while maintaining stability and preventing damage.

2. Distribute Loads: Bearings help in distributing the loads from the bridge deck or superstructure to the supporting substructure, such as abutments and piers. They ensure that the loads are transmitted in a controlled and

uniform manner, preventing localized stresses and potential damage.

There are different types of bearings used in bridge construction, including:

1. Elastomeric Bearings: These bearings consist of layers of elastomeric materials (usually rubber) sandwiched between steel plates. Elastomeric bearings provide flexibility and allow horizontal and rotational movement.

2. Pot Bearings: Pot bearings consist of a steel pot or cylinder filled with elastomeric material. They allow movement in multiple directions and can support both vertical and horizontal loads.

3. Roller Bearings: Roller bearings use cylindrical or spherical rollers to facilitate movement. They are suitable for bridges with large longitudinal movements, such as long-span bridges.

4. Sliding Bearings: Sliding bearings allow smooth sliding movements between bridge components. They are commonly used in expansion joints where larger movements are expected.

5. Rocker Bearings: Rocker bearings are designed to accommodate rotations. They allow a rocking motion to occur between bridge components.

In particular, the current AASHTO Specifications fail to distinguish between plain pads and reinforced bearings, lack a particularly sound foundation, and neglect to address a number of critical concerns. Link support to model the bearing was defined as follows:

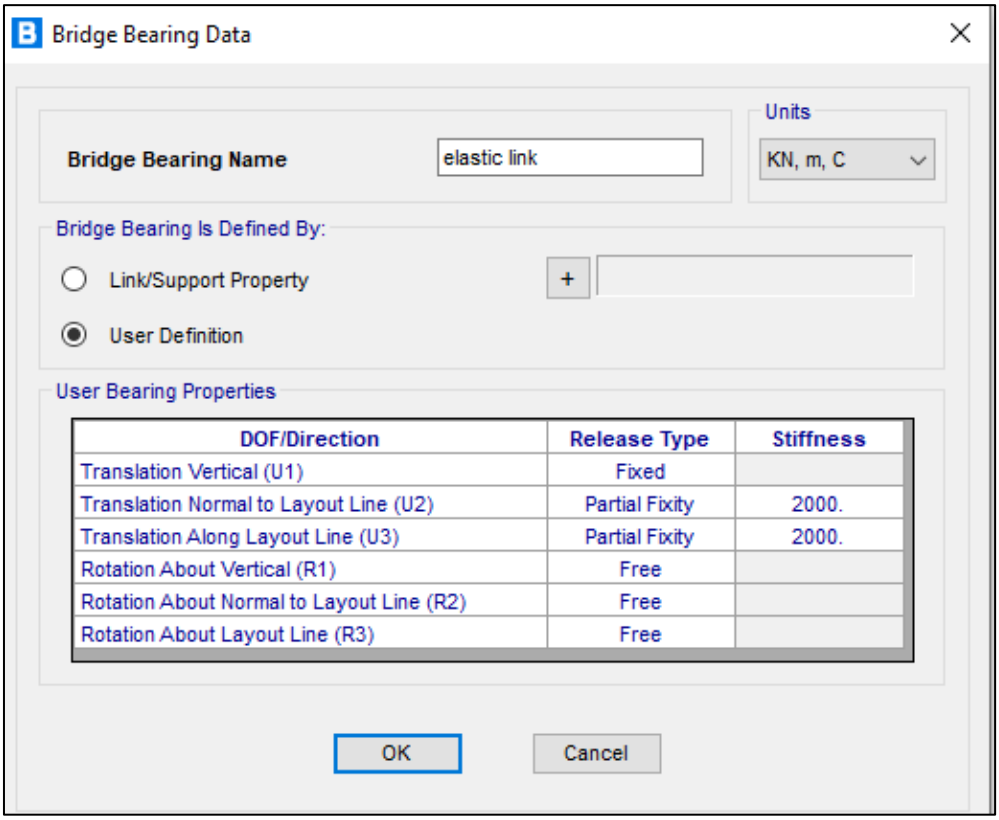


Figure (4.21): Bridge Bearing

The type of bearing used in a bridge depends on various factors, including the bridge's design, span length, expected movements, and load requirements. Proper selection, installation, and maintenance of bridge bearings are crucial to ensure the bridge's safety, longevity, and functionality. Regular inspections and maintenance are essential to identify any issues with bearings and address them promptly to avoid potential hazards.

4.4.5 Pre-stressed Girder

In a bridge, girders are the primary horizontal structural members that support the bridge deck and transfer the load from the deck to the bridge's vertical supports, such as columns or piers. Girders are critical components of a bridge's superstructure, providing strength and stability to carry the weight of vehicles, pedestrians, and other loads crossing the bridge. The specific type and configuration of girders used in a bridge depend on various factors, including the bridge's span length, the expected loads, site conditions, and design requirements. Larger and longer bridges may require more complex girder systems, such as box girders, to provide the necessary strength and stability.

Girders are typically positioned perpendicular to the length of the bridge and are spaced at regular intervals across the bridge's width. The bridge deck is then placed on top of the girders, creating a platform for vehicles and pedestrians to traverse the span.

Overall, girders play a crucial role in the overall structural integrity and load- carrying capacity of a bridge, making them a fundamental component in bridge construction and design. Effect of live load in the concrete girders is very clear, moment generated from the moving load higher as per the British design approach compared to the AASHTO LRFD. Gergess and Tepavcevic (2011) The increase in live load moments due to BS 5400 HA + HB loading compared with AASHTO LRFD specifications HL93 loading. Section properties of the Bridge Girder are defined in the CSI Bridge as followed.

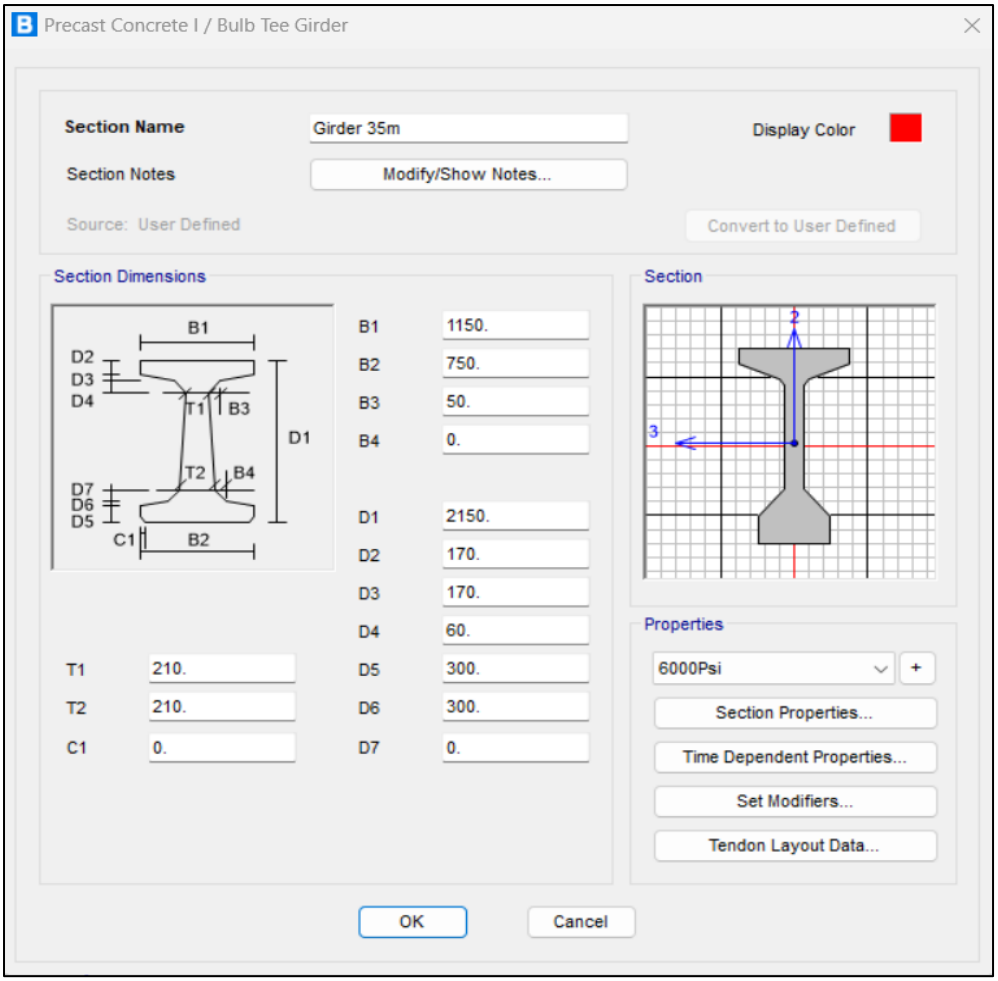


Figure (4.22): Girder Properties

The results extracted from the CSI Bridge for the Girders live load analysis are given in following Table 4.3.

Table (4.3): Results extracted from the CSI Bridge for the Girders live load

Girder Type	Live Load Vehicle	Moment (kN. m)	Comparison
British Standard			
Interior Girder	HB	2759.45	
Interior Girder	HA Lane	3811.49	
Exterior Girder	HB	3939.64	
Exterior Girder	HA Lane	2747.88	
AASHTOO LRFD			

Interior Girder	HL-93K	2898.12	>3% BS (HB Truck)
Exterior Girder	HL-93K	2464.68	<23% BS (HB Truck)

The moment comparison of both standards is as follows:

a) Interior Girder Moments

The positive moment in the interior girder of bridge due to Truck loading of HL93K about the M3 axis is M=2898.119 kN.m as per (Figure 4.23).

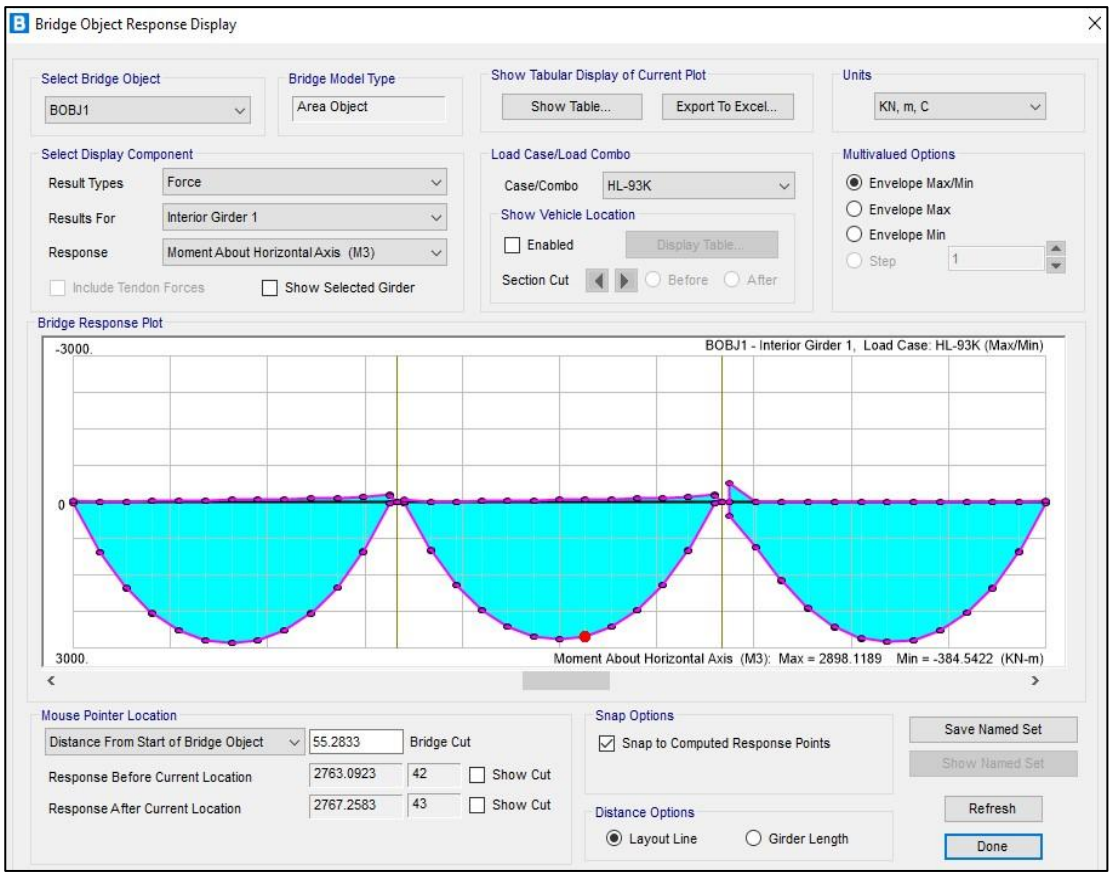


Figure (4.23): Positive Moment in Interior Girder due to HL93

The positive moment in the interior girder of bridge due to HB Truck loading as per the BS 5400 about the M3 axis is M =2759.45 kN.m as per Figure (4.24 (a)).

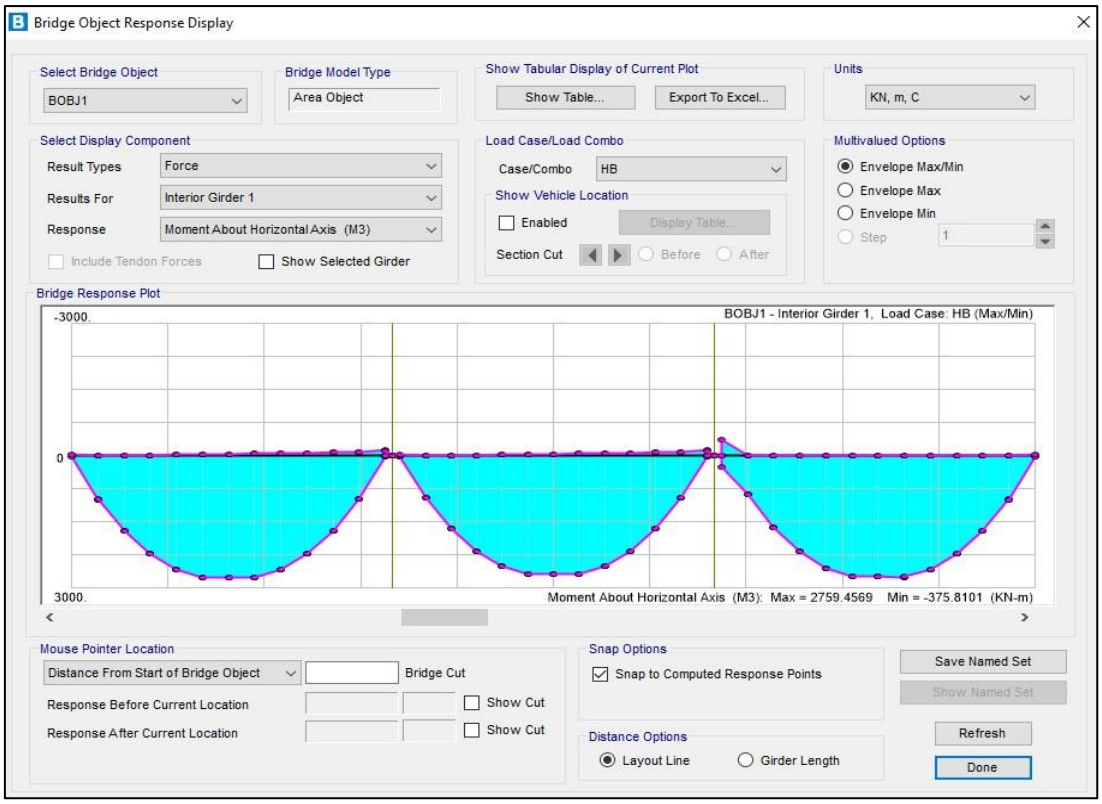


Figure (4.24a): Interior Girder Moment due to HB Truck

The positive moment in the interior girder of bridge due to HA Lane loading as per the BS 5400 about the M3 axis is M=3811.4924 kN.m as per Figure (4.24 (b)).

Figure (4.24b): Interior Girder Moment due to HA Lane Loading

b) Exterior Girder Moments

The positive moment in the interior girder of bridge due to Truck loading of HL93K about the M3 axis is M=2464.689 kN.m as per Figure (4.25).

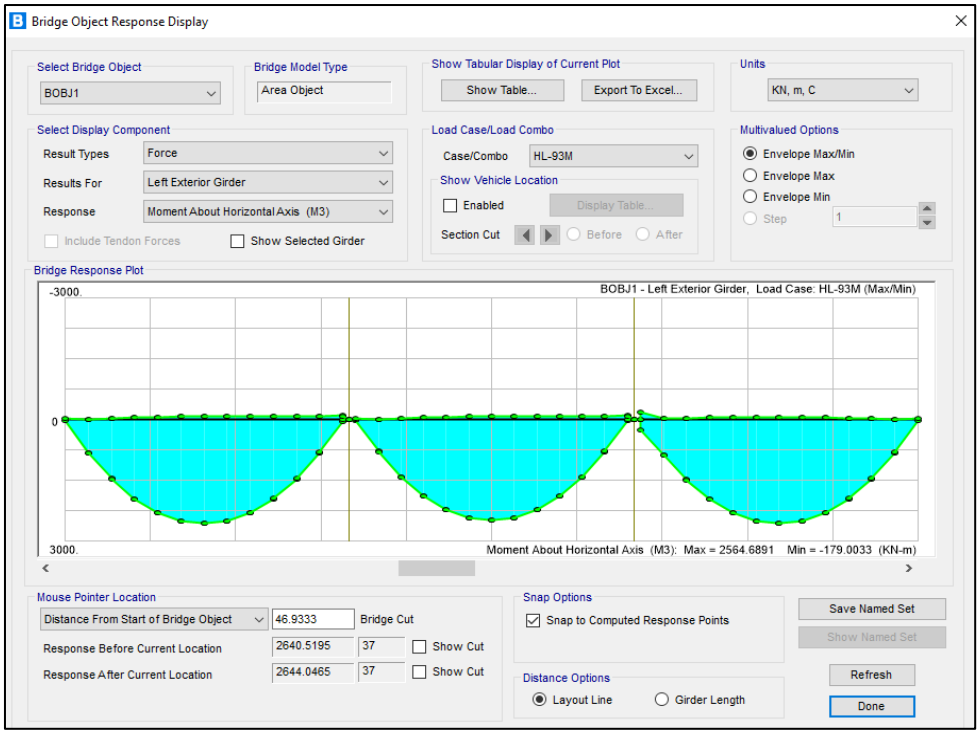


Figure (4.25): Positive Moment in Exterior Girder due to HL93

The positive moment in the interior girder of bridge due to HB Truck loading as per the BS 5400 about the M3 axis is M=3939.64 kN.m as per Figure (4.26).

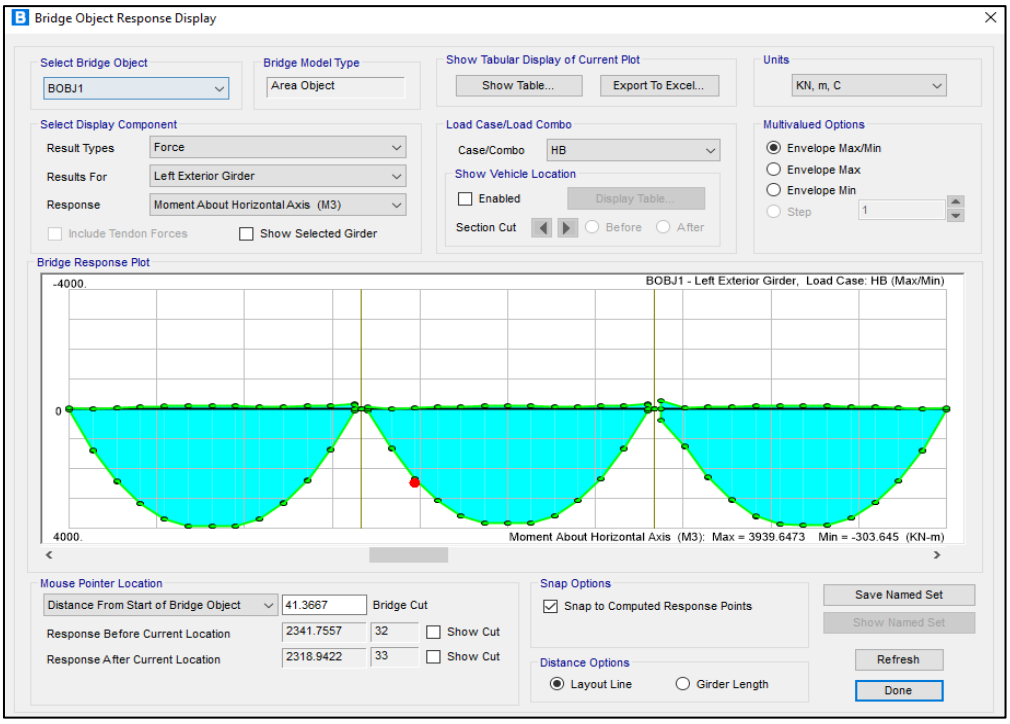


Figure (4.26): Interior Girder Moment due to HB Truck

4.4.6 Column/Piers

A bridge pier, also known simply as a pier, is a vertical support structure that is used to hold up a bridge deck and transfer the weight of the bridge and its traffic loads to the underlying foundation or the ground. Piers are essential components of various types of bridges, such as highway bridges, railway bridges, and pedestrian bridges.

The main function of a bridge pier is to provide stability and strength to the bridge structure by resisting the vertical loads, such as the weight of the bridge itself, the vehicles passing over it, and other live loads. Piers are typically constructed using reinforced concrete or steel, although some older bridges may have piers made from stone or masonry.

The design and shape of the bridge piers can vary depending on factors like the type of bridge, the span length, the location, and the environmental conditions Bridge Column/Pier are design in the CSI Bridge as per the BS and AASHTO LRFD design approach. Axial load under different cases of AASHTO and BS 5400 was studied. And the results are as follows see Table 4.5.

Table (4.5): Axial Load

Standard Name	**Load Case**	**Column Type**	**Axial Load (kN)**	**Comparison**
BS 5400	ULS-1	Abutment Column	-3499.797	
AASHTOO	Strength-1	Abutment Column	-2747.877	<12% of BS
BS 5400	ULS-1	Pier Column	-4843.113	
AASHTOO	Strength-1	Pier Column	-4048.873	<8% of BS

Axial load in the bridge columns for the abutment pier was 12% higher in case of BS (ULS-1) than the AASHTO (Strength-1). Similarly for the pier column it was 8% higher. CSI Bridge extracted results are as follows:

- Axial Load Abutment Column at ULS-1 (British Standard)

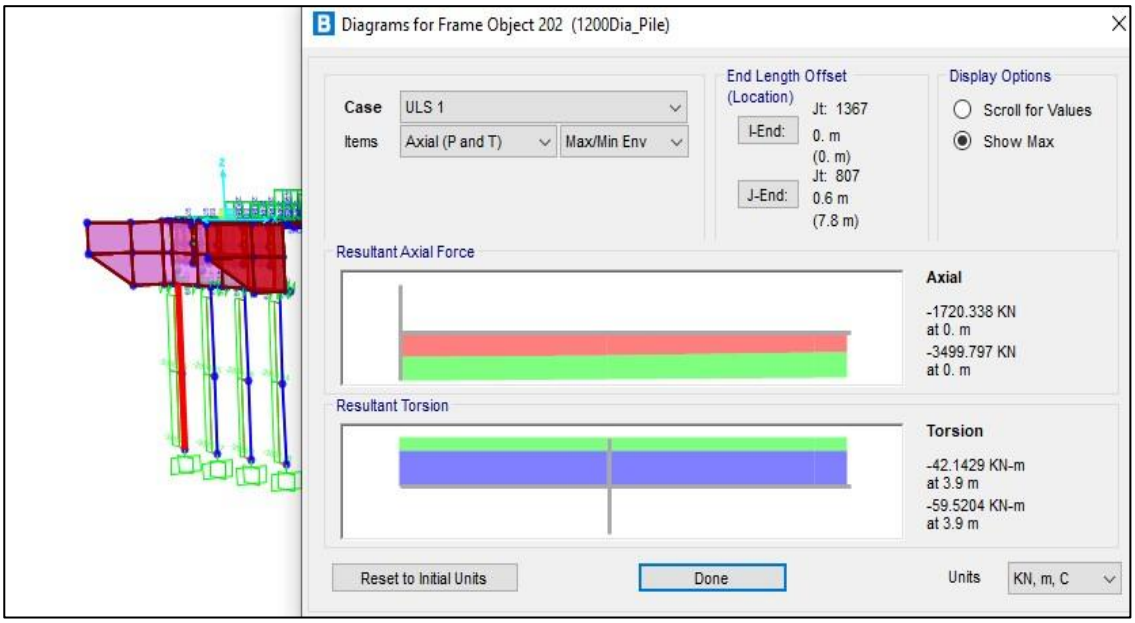


Figure (4.27): Axial Load at ULS-1 (BS_5400)

Axial Load Abutment Column at Strength (AASHTO LRFD)

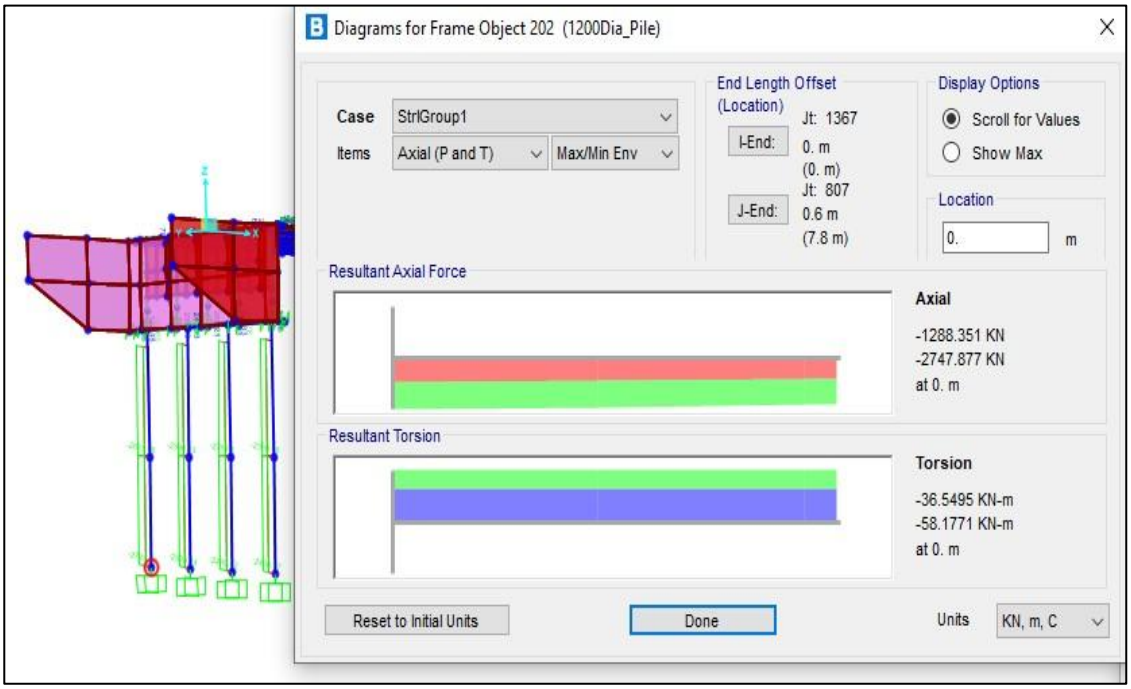


Figure (4.28): Axial Load at Strength-1 (AASHTO)

Axial Load Pier/Column at ULS-1 (BS-5400)

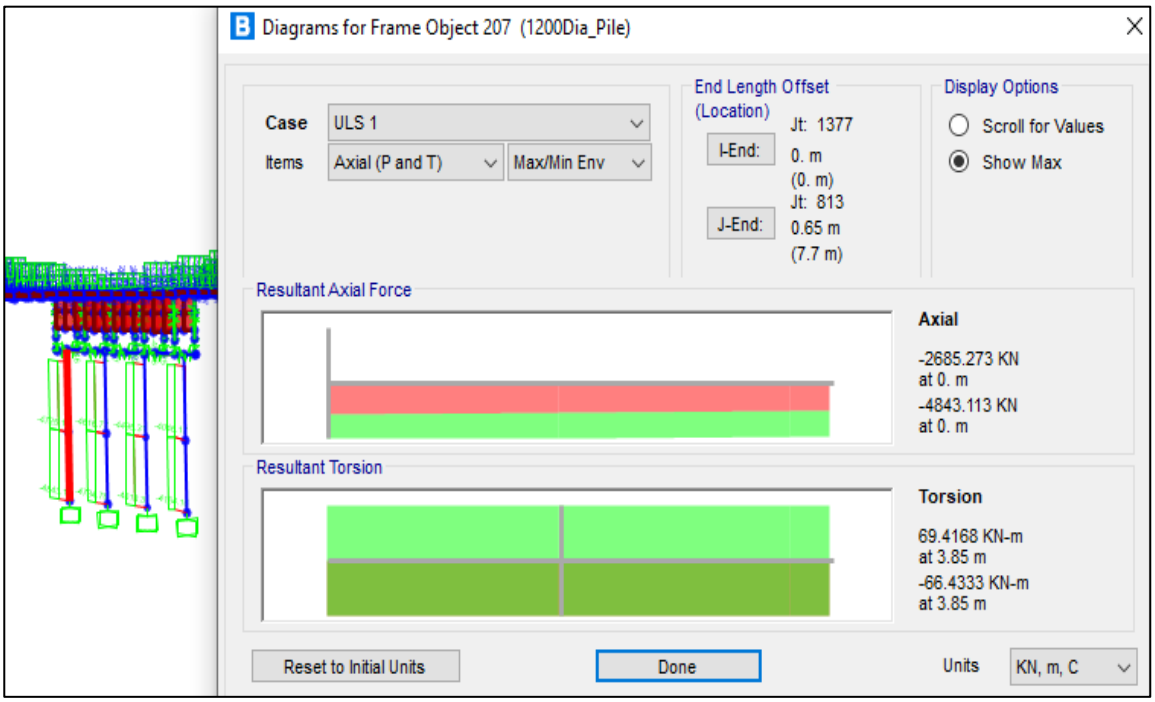


Figure (4.29): Axial Load at ULS-1 Pier Column (BS-5400)

- Axial Load Pier/Column at Strength-1 (AASHTO)

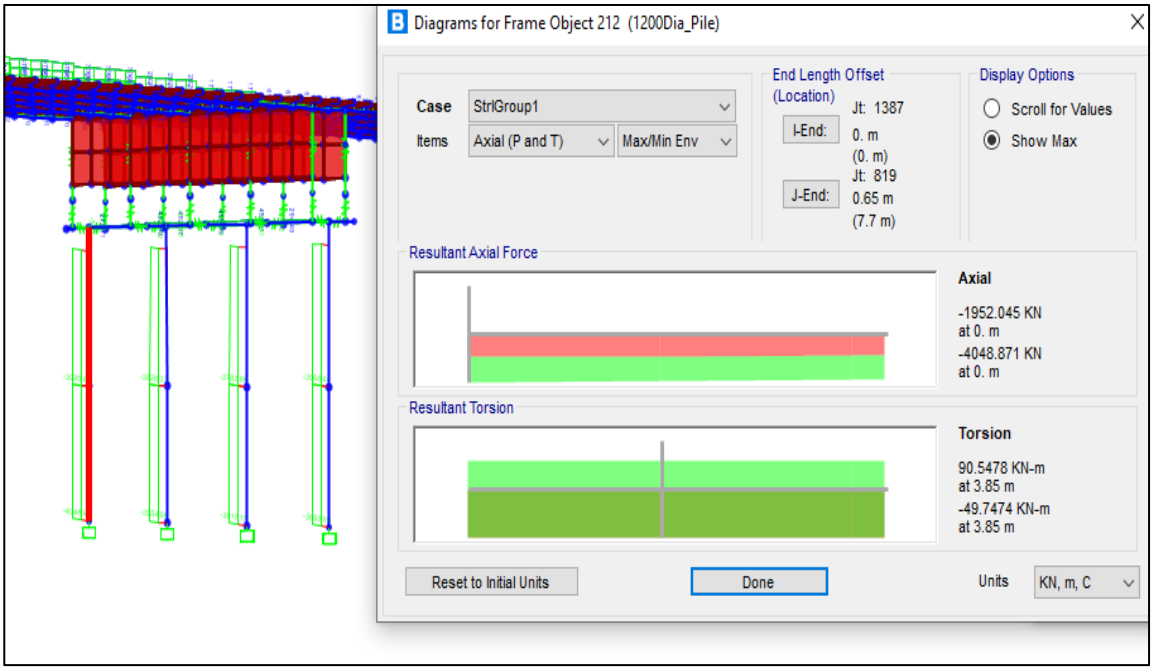


Figure (4.30): Axial Load at Strength-1 Pier Column (AASHTO)

4.4.7 Pier cap

In bridge construction, a pier cap (also known as a pier cap beam) is a horizontal structural element that sits on top of bridge piers or columns. Its primary function is to distribute the load from the bridge superstructure (such as girders or beams) to the supporting piers below see Figures 4.31.



Figure (4.31): Pier cap at Al Fateh Highway

Pier caps are essential for transferring the loads safely and uniformly to the bridge's substructure.

The pier cap acts as a bridge between the individual piers, providing continuity and stability to the entire bridge structure. It helps to ensure that the loads from the superstructure are evenly distributed to the supporting piers, preventing any localized stress concentrations that could lead to structural failure.

The design and size of pier caps vary depending on factors such as the type of bridge, the number of piers, the span length, the loads to be carried, and the material used for construction. Generally, pier caps are made of reinforced concrete, which offers the necessary strength and durability for supporting the bridge deck and transferring the loads to the piers.

Pier caps are typically designed to accommodate the placement of bridge girders or beams, providing a level and stable surface for these components

to rest on. Once the pier caps are in place, the bridge girders or beams are installed on top of them, completing the bridge's superstructure.

It's important to ensure that pier caps are designed and constructed to high engineering standards to ensure the overall safety and structural integrity of the bridge. Pier Cap was defined in the CSI Bridge as shown in Figures below.

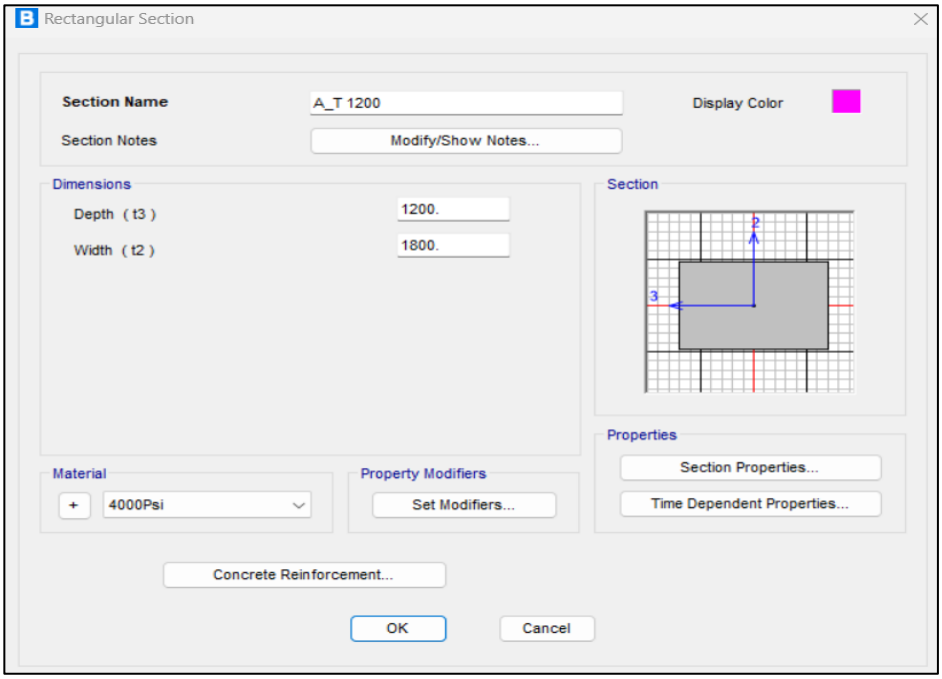


Figure (4.32): Section Properties Pier Cap (Abutment Pier)

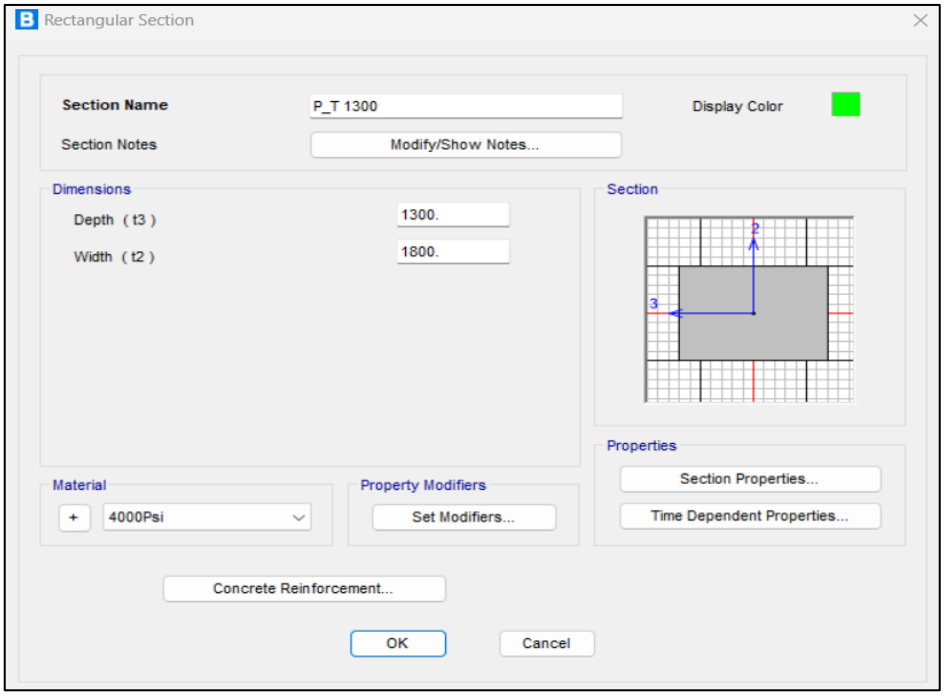


Figure (4.33): Section Properties Pier Cap (Pier Column)

1. BS 5400 Standard Design

- Analysis of Abutment Pier Cap

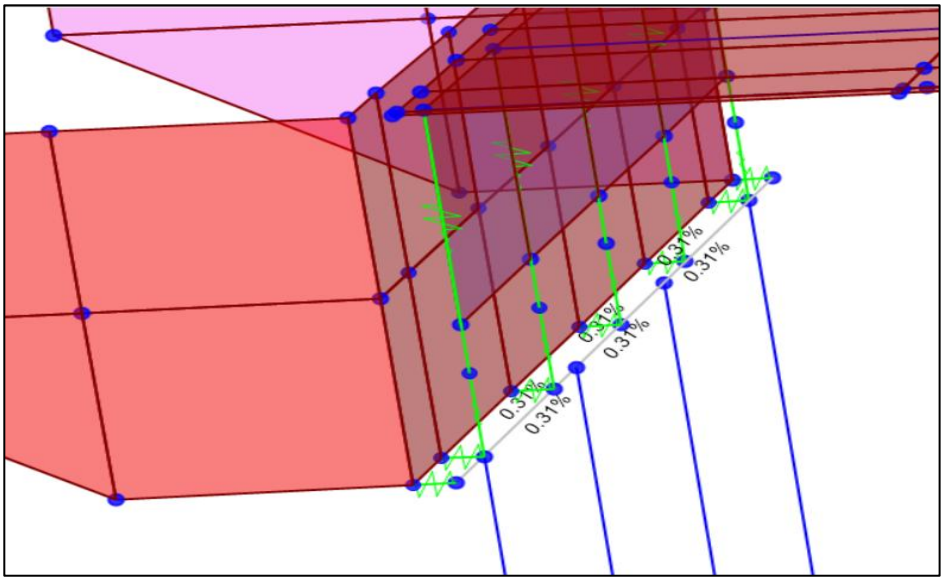
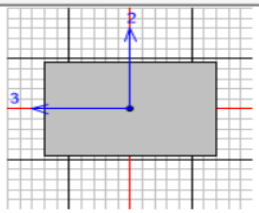


Figure (4.34): Percentage Reinforcement in Abutment Cap (BS)

Concrete Design Data Eurocode 2-2004

File



Eurocode 2-2004 BEAM SECTION DESIGN Type: DC HIGH MRF Units: KN, mm, C (Summary)

L=12900.
Element : 201 D=1200. B=1800. bf=1800.
Section ID : A_T 1200 ds=0. dct=60. dcb=60.
Combo ID : DCON9 E=24.856 fck=0.028 Lt.Wt. Fac.=1.
Station Loc : 12900. fyk=0.414 fywk=0.414

Gamma(Concrete): 1.5
Gamma(Steel) : 1.15

Design Moments, M3

	Positive Moment	Negative Moment
	1557.001	0.

Flexural Reinforcement for Moment, M3

	Required Rebar	+Moment Rebar	-Moment Rebar	Minimum Rebar
Top (+2 Axis)	0.	0.	0.	0.
Bottom (-2 Axis)	6791.792	3.797	0.	6791.792

Shear Reinforcement for Shear, V2

Rebar Asw/s	Shear VEd	Shear VRdc	Shear VRds	Tan(Theta) Ratio
1.828	38.969	730.172	674.686	1.

Torsion Reinforcement for Torsion, T

Rebar At/s	Rebar Asl	Torsion TEd	Critical T	Area Ak	Perimeter uk
0.	619.591	118245.533	1053583.667	1209600.	4560.

Figure (4.35): Concrete Design of Abutment (Pier Cap)

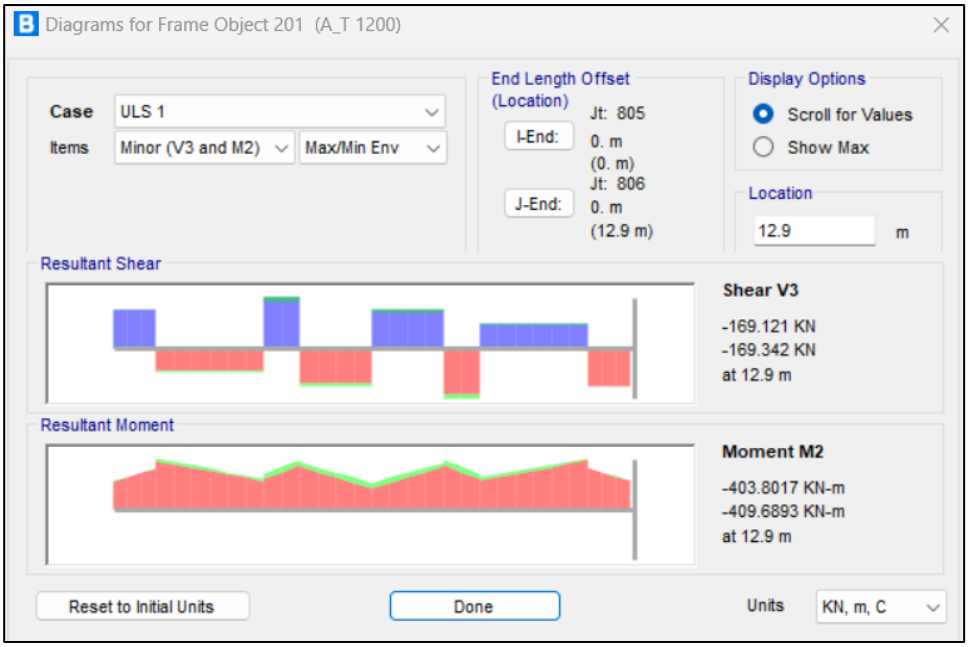


Figure (4.36): Moment and Shear at ULS-1 (Abutment Pier)

- Analysis of Pier Cap (Pier Column)

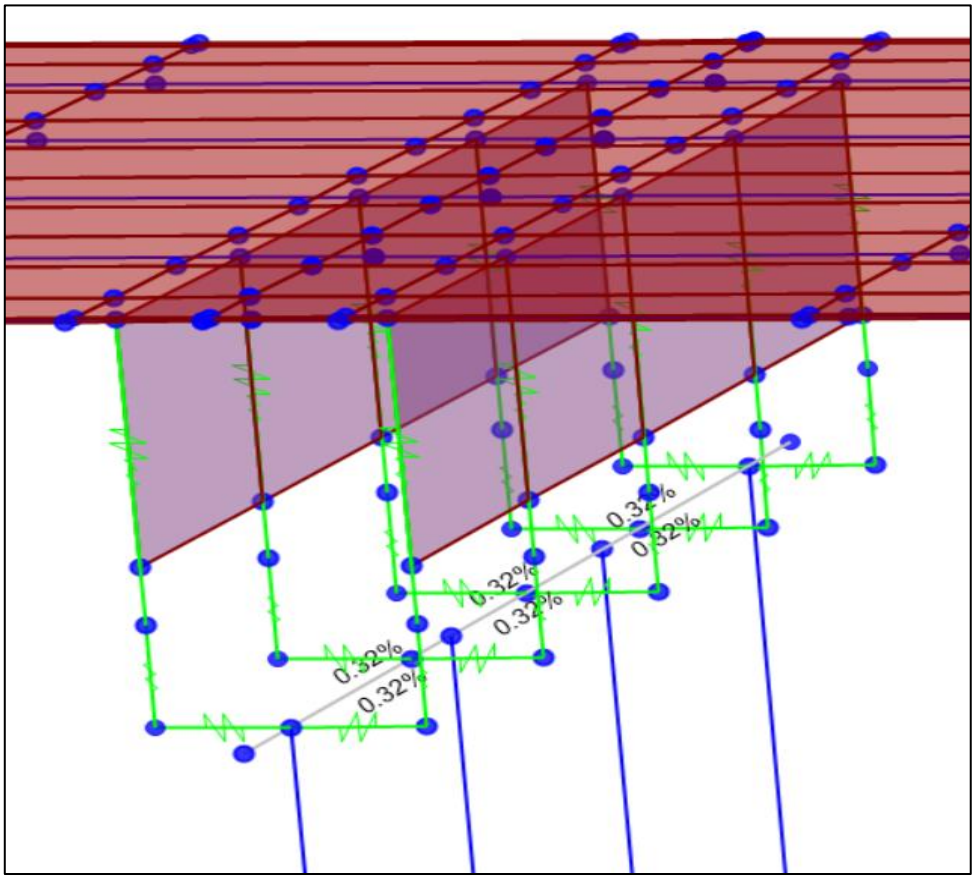


Figure (4.37): Percentage Reinforcement in Pier cap (BS).

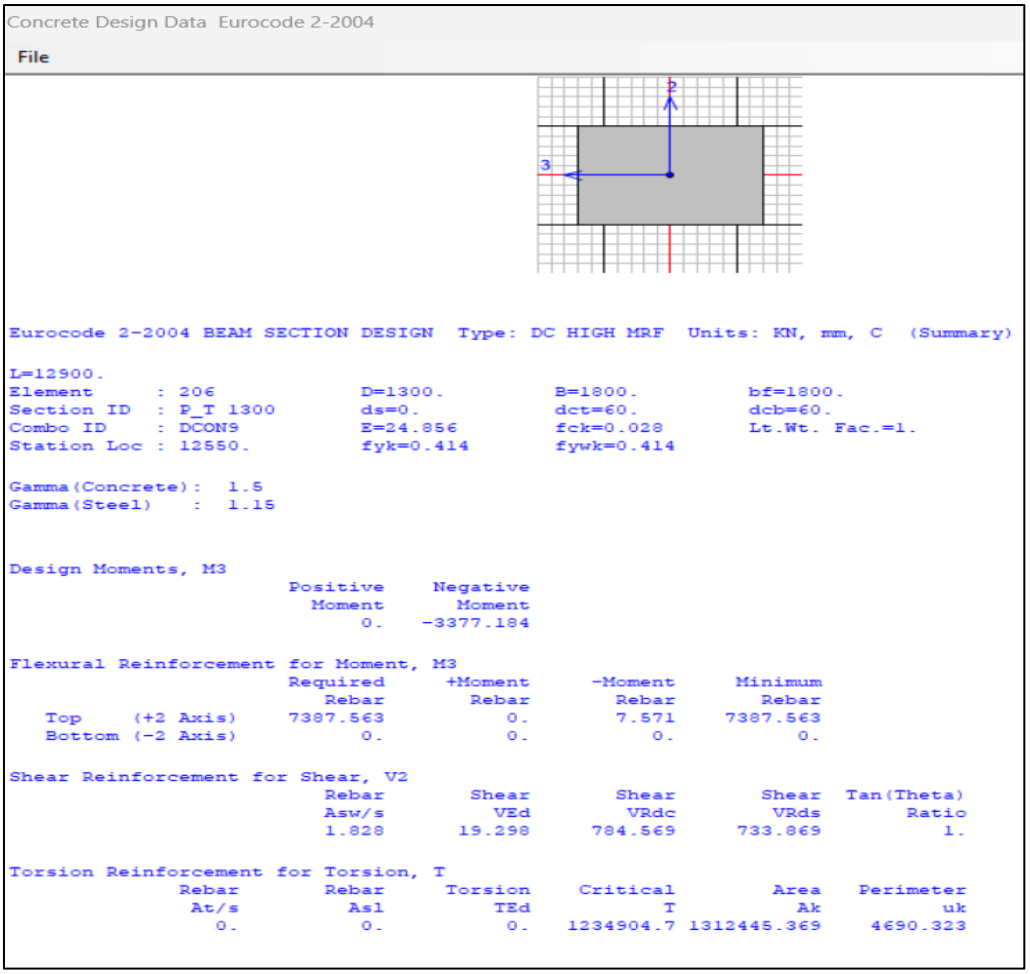


Figure (4.38): Concrete Design of Pier Columns (Pier Cap)



Figure (4.39): Moment and Shear at ULS-1 (Pier Column)

2. AASHTO LRFD DESGIN

- Analysis of Abutment Pier Cap

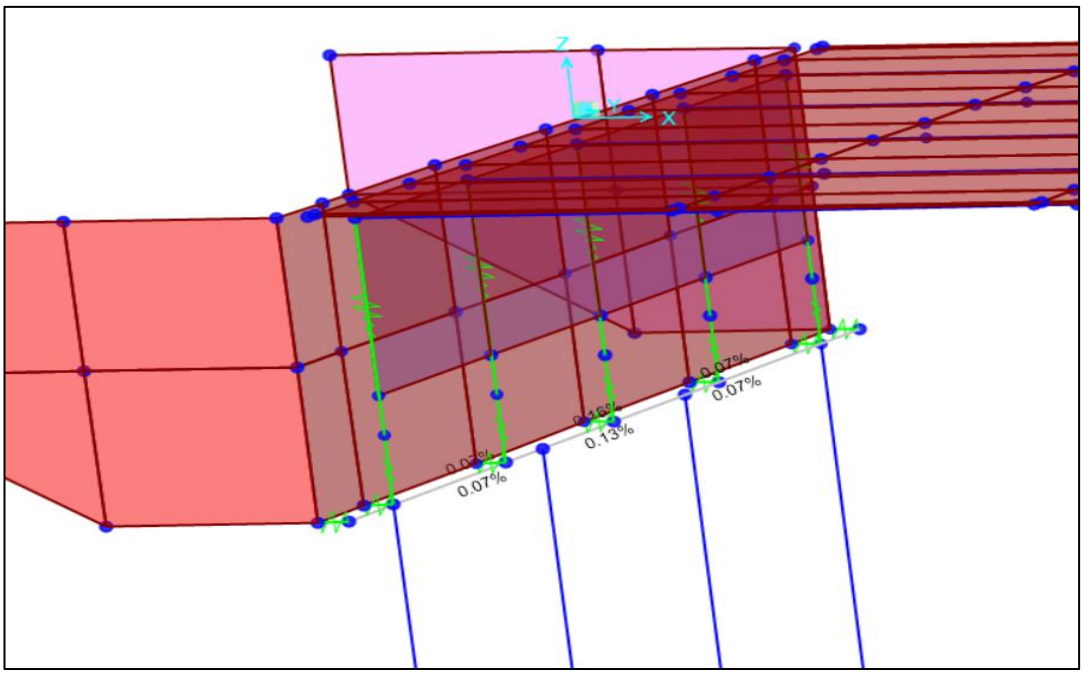


Figure (4.40): Percentage Reinforcement in Abutment Cap (AASHTO)

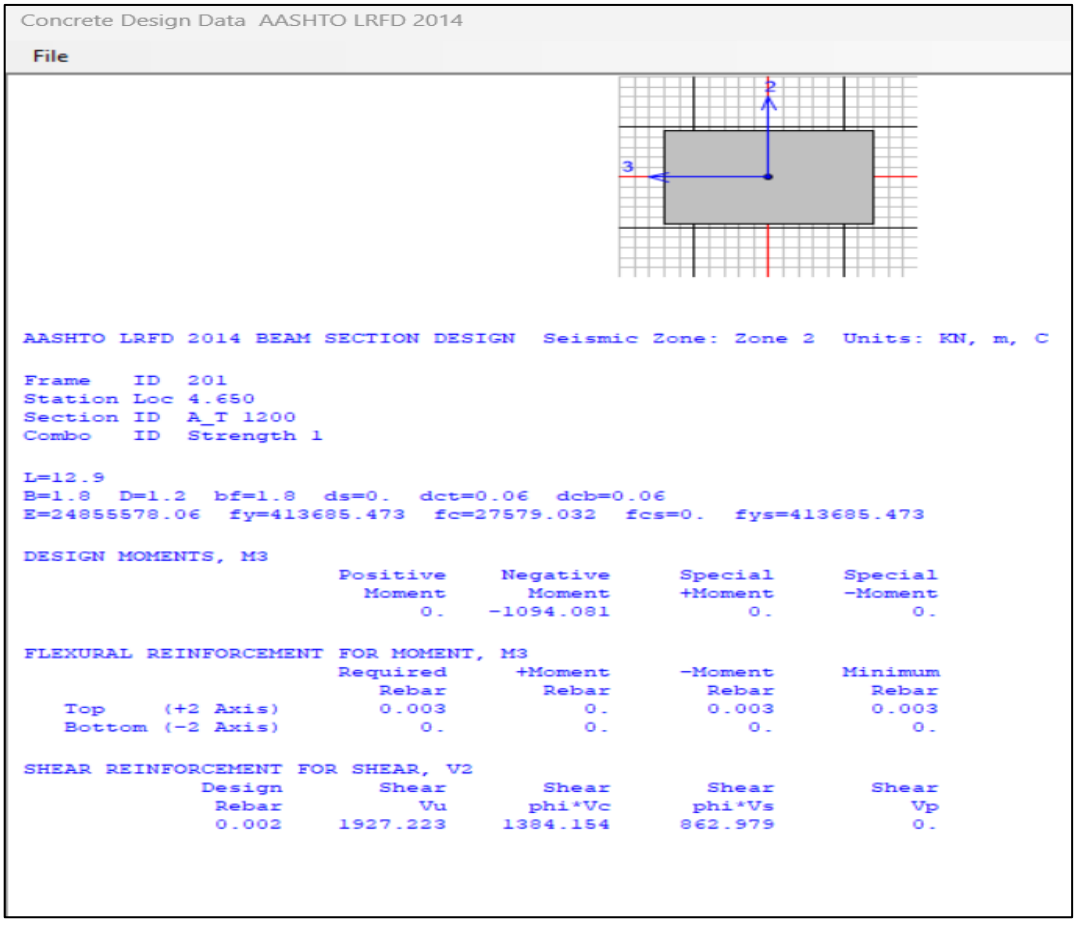


Figure (4.41): Concrete Design of Abutment (Pier Cap)

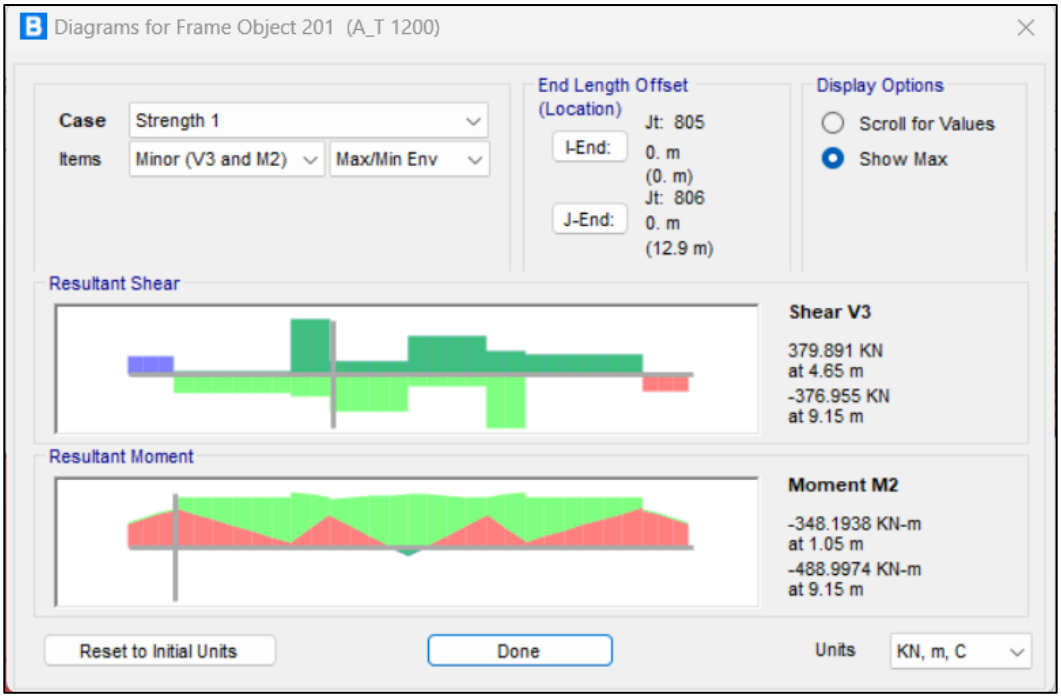


Figure (4.42): Moment and Shear at Strength-1 (Abutment Pier)

- Analysis of Pier Cap (Pier Column)

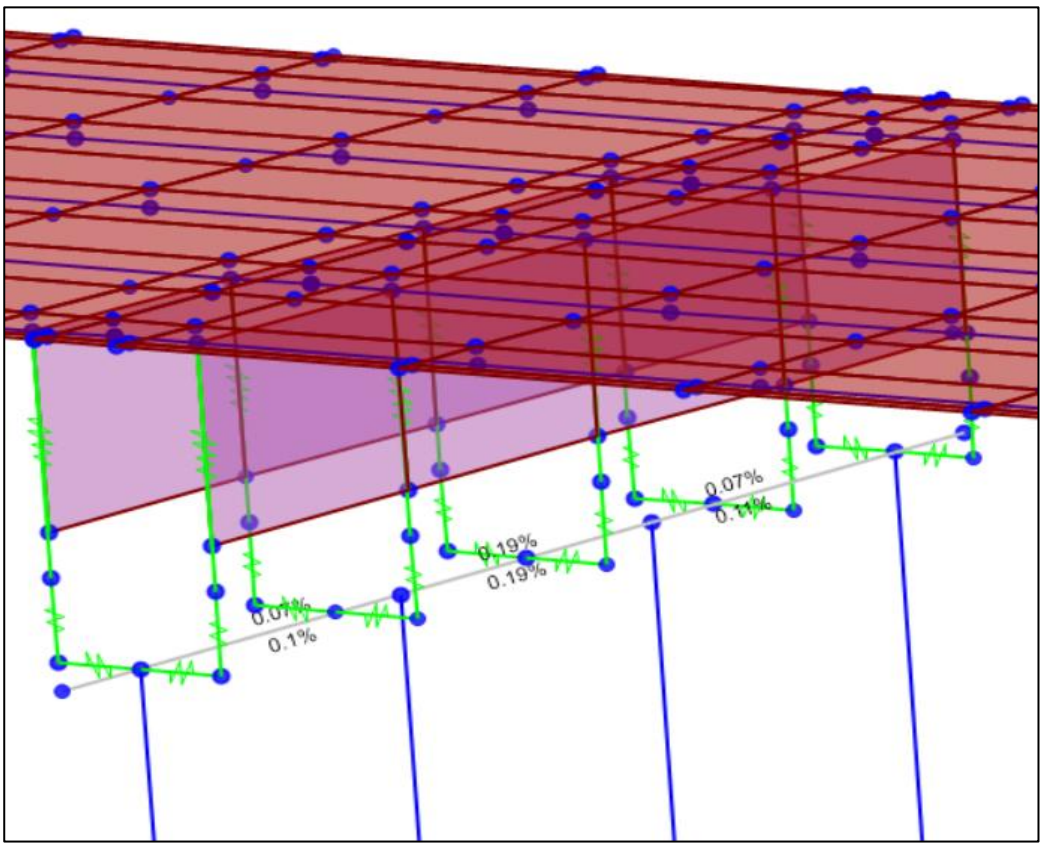


Figure (4.43): Percentage Reinforcement in Pier cap (AASHTO)

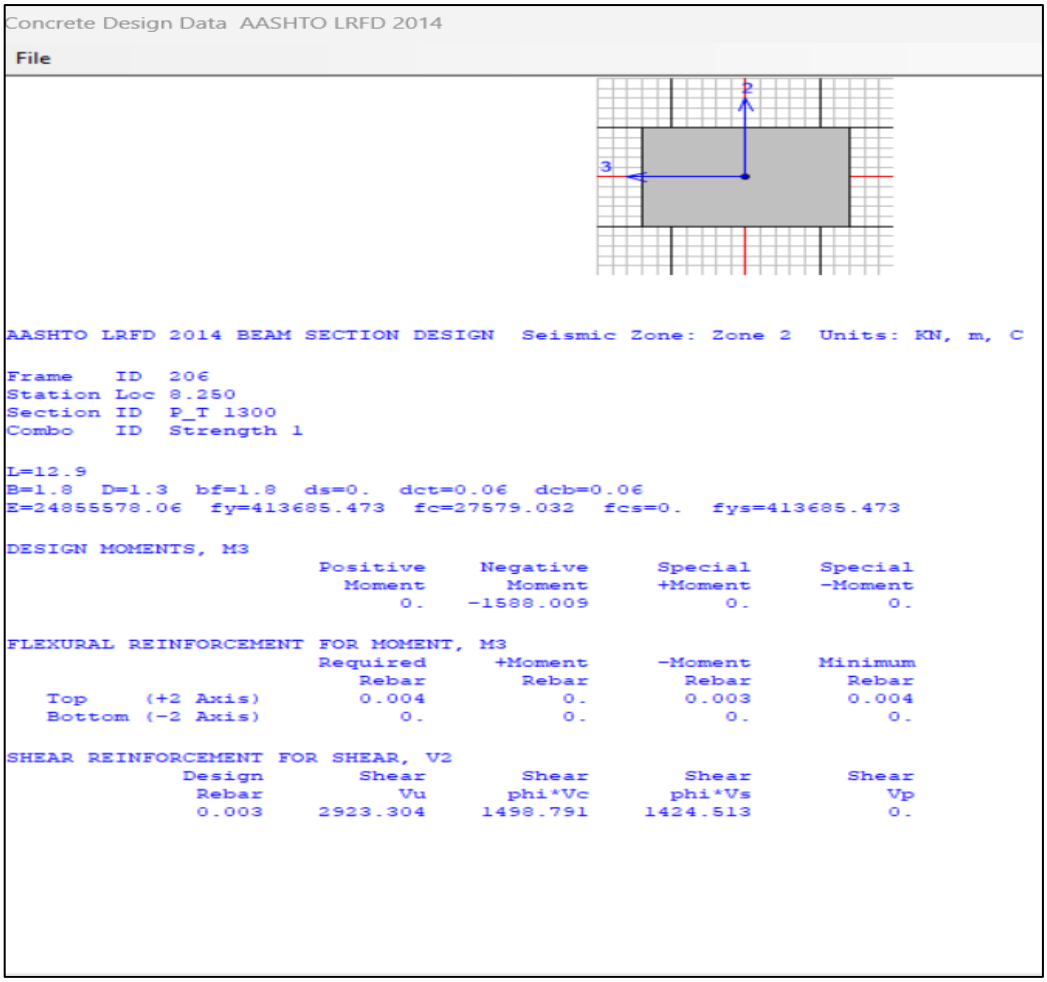


Figure (4.44): Concrete Design of Abutment (Pier Cap)



Figure (4.45): Moment and Shear at Strength-1 (Pier Columns)

4.3 Summary

The comparative done for BS 5400-4 and AASHTO LRFD shows clearly the main differences in the shear design of beam/slab. The shear design approach outlined in AASHTO LRFD offers significant convenience by providing equations for calculating the required reinforcement to withstand shear stresses, facilitating a thorough and efficient design process. Conversely, BS-5400 does not include specific provisions or guidelines for seismic design considerations in bridge structures, rendering it unsuitable for use in regions prone to earthquake activity. As a result, bridge designs based solely on BS-5400 may lack the necessary resilience and safety measures required in earthquake-prone areas.

As stated before that the AASHTO LRFD Bridge Design Specifications are intended for use in the design, evaluation, and rehabilitation of bridges. And the specifications employ the Load and Resistance Factor Design (LRFD) methodology, using factors developed from current statistical knowledge of loads and structural performance. Load and Resistance Factor Design (LRFD) takes into account both the statistical mean resistance and the statistical mean loads. The fundamental LRFD equation includes a load modifier (η), load factors (γ), force effects (Q), a resistance factor (Φ), a nominal resistance (R n), and a factored resistance (R r = ΦR n). and as stated for BS 5400 is a document combining codes of practice to cover the design and construction of steel, concrete and composite bridges and specifications for the loads1), materials and workmanship. BS 5400 is consists of several parts that included all the information to be followed when a bridge is designed. Specification of bridges, loads and other relevant information can be found in the code.

Chapter Five

Conclusion and Recommendations

Chapter Five

Conclusion and Recommendations

5.1 Conclusion and Recommendations

In conclusion, the comparative assessment of the British Standard (BS5400) and the American (AASHTO-LRFD) codes in bridge design has revealed significant insights into the strengths and weaknesses of each code. Both codes have proven effective in ensuring the safety, durability, and efficiency of bridge structures, albeit with different approaches and emphases.

The BS5400 code, with its emphasis on material limits and safety factors, provides a robust framework for bridge design. However, it may be less flexible in accommodating innovative design and materials. On the other hand, the AASHTO-LRFD code, with its load and resistance factor design approach, offers more flexibility and precision, but it may require more complex calculations and assumptions.

Despite the differences, both codes share a common goal: ensuring the safety and longevity of bridge structures. The choice between the two often depends on the specific requirements of the project, the available resources, and the expertise of the design team.

The empirical analysis presented in Chapter 4 compares bridge design results using AASHTO and BS5400 standards. This analysis highlights notable differences in structural component forces and moments. For instance, the comparison of axial load results for the abutment column reveals a significant difference between the two design codes. AASHTO-LRFD prescribes an axial load of -2747.877 kN, whereas BS5400 show a

more value of -3499 kN. Similarly, for a pier column, AASHTO-LRFD's calculation is -4048.873 kN compared to BS5400 -4843 kN. Moment calculations for girders reveal that the interior girder moment according to AASHTO-LRFD is 2898 kN.m, with the exterior at 2464 kN.m, whereas BS5400 specifies 2759 kN.m for the interior and a significantly higher 3939.64 kN.m for the exterior girder.

These findings underscore a conservative trend in the BS5400 code, resulting in higher force and moment values, suggesting a design approach geared towards enhanced robustness and stiffness in bridge structures. The results also indicate potential areas for optimization in each code.

The differences in moments in the interior girder for bridges designed according to the AASHTO LRFD and BS5400 standards can be attributed to several factors, including design philosophies, load factors, material properties, and analysis methods. AASHTO LRFD uses a load and resistance factor design methodology tailored for U.S. conditions, incorporating reliability theory and statistical data. In contrast, BS5400, designed for UK conditions, includes load factor design and allowable stress design, emphasizing different load types and material strengths.

AASHTO LRFD employs load factors based on extensive studies of U.S.-specific conditions, while BS5400 uses European or UK-specific studies. Differences in material properties and safety factors specified by each standard also affect design moments. Additionally, both standards offer different structural analysis methods, contributing to variations in the calculated moments.

Understanding these differences is crucial for engineers working in international contexts or on projects where multiple design codes might be applicable. The observed differences in the results between AASHTO and

BS5400 are due to the distinct methodologies, assumptions, and criteria each standard employs. These differences highlight the importance of selecting the appropriate design standard for the specific context of the bridge, considering geographical location, expected usage, and environmental exposure. Ultimately, it is the responsibility of the structural engineer to interpret these standards correctly and ensure that the bridge design is safe, serviceable, and economical while meeting all regulatory and functional requirements.

5.2 Further research

For further research, it would be beneficial to delve deeper into the following areas:

Case Studies: More in-depth case studies of bridges designed using both codes would provide practical insights into their application and effectiveness. This could include a post-occupancy evaluation to assess the long-term performance of the bridges.

Innovative Materials and Design: Research could explore how each code accommodates and encourages the use of innovative materials and design techniques. This could include a focus on sustainability and resilience in bridge design.

Comparative Studies: Further comparative studies could be conducted with other international design codes to broaden the understanding of global best practices in bridge design.

Technological Integration: Research could also focus on how emerging technologies, such as artificial intelligence and digital twins, can be integrated into the design process under each code.

Training and Education: Research could assess the training and educational

needs of engineers to effectively use each code, identifying gaps and proposing solutions.

In conclusion, while both the BS5400 and AASHTO-LRFD codes provide effective frameworks for bridge design, there is always room for improvement and adaptation to meet the evolving needs of the industry. Further research in the areas outlined above would contribute significantly to this ongoing development.

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APPENDICES

Appendix (1): Design of Bridge using AASHTO LRFD



License #3010*16VYVAXY7ALDJQT

CSiBridge Analysis and Design Report

Prepared by

Khalid Albastki

Model Name: Model AASHTO.bdb

8 March 2023

1. Model geometry

This section provides model geometry information, including items such as the layout line and lane definitions.

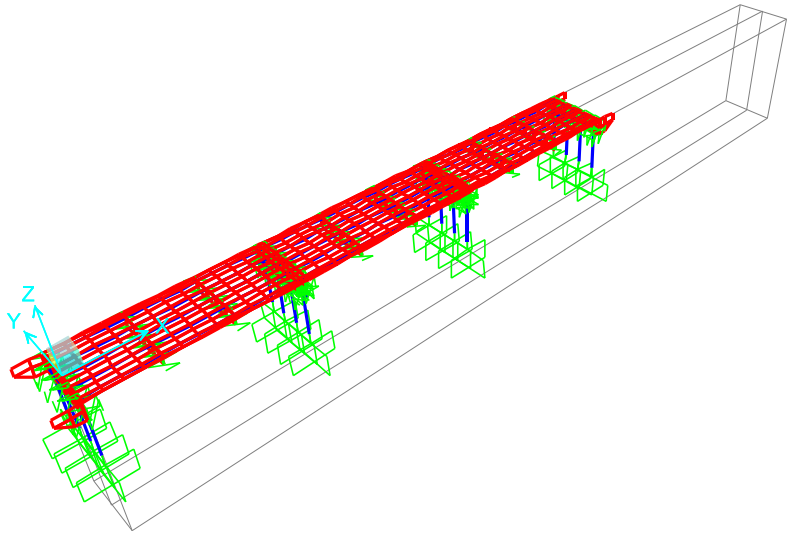


Figure 1: Finite element model

1.1. Layout Line

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 1 of 2

LayoutLine	SegType	Station	Radius	Bearing	X
		mm	mm		mm
BLL1	Initial Station and Bearing	0.		N900000E	0.
BLL1	Straight at Previous Bearing to End	175000.			175000.

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 2 of 2

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 2 of 2

LayoutLine	Y	GlobalX	GlobalY
	mm	mm	mm
BLL1	0.	0.	0.
BLL1	0.	175000.	0.

Table 2: Bridge Layout Line 3 - Vertical Layout Data

LayoutLine	SegType	Station	Grade	CoordSys	GlobalZ
		mm	Percent		mm
BLL1	Initial Station, Elevation Z and Grade	0.	0.	GLOBAL	0.
BLL1	Constant at Previous Grade to End	175000.	0.	GLOBAL	0.

1.2. Lanes

Table 3: Lane Definition Data, Part 1 of 3

Lane	LaneFrom	LayoutLine	Station	LaneType	Width	Offset	LoadGroup
			mm		mm	mm	
LANE1	Layout Line	BLL1	0.	Fixed Lane	3700.	-4200.	Default
LANE1	Layout Line	BLL1	105000.		3700.	-4200.	Default
LANE2	Layout Line	BLL1	0.	Fixed Lane	3700.	-500.	Default
LANE2	Layout Line	BLL1	105000.		3700.	-500.	Default
LANE3	Layout Line	BLL1	0.	Fixed Lane	3700.	3200.	Default
LANE3	Layout Line	BLL1	105000.		3700.	3200.	Default

Table 3: Lane Definition Data, Part 2 of 3

Lane	DiscAlong	DiscAcross	DiscSpan	DiscSpanFac	DiscLane	LeftType	RightType
	mm	mm					
LANE1	3000.	3000.	Yes	4.	Yes	Interior	Interior
LANE1							
LANE2	3000.	3000.	Yes	4.	Yes	Interior	Interior
LANE2							
LANE3	3000.	3000.	Yes	4.	Yes	Interior	Interior
LANE3							

Table 3: Lane Definition Data, Part 3 of 3

Table 3: Lane Definition Data, Part 3 of 3

Lane	Color	Notes
LANE1	Magenta	

Table 3: Lane Definition Data, Part 3 of 3

Lane	Color	Notes
LANE1		
LANE2	Yellow	
LANE2		
LANE3	Gray8Dark	
LANE3		

1.3. Spans

Table 4: Bridge Object Definitions 03 - Spans 1 - General

Table 4: Bridge Object Definitions 03 - Spans 1 - General

BridgeObj	SpanName	BridgeSect	Variation
BOBJ1	Span 1	Rw Br	No
BOBJ1	Span 2	Rw Br	No
BOBJ1	Span 3	Rw Br	No

1.4. Bridge Sections

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 1 of 4

Section	Material	NumIntGird	TotalWidth	GirdLayout	DiffSpacing	DiffHaunch
			mm			
Rw Br	4000Psi	3	12900.	Along Layout Line	No	No

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 2 of 4

Section	TopSlabThk	HaunchHSame	LOLength	LOFillDist	LOOuterThk	ROLength	ROFillDist
	mm	mm	mm	mm	mm	mm	mm
Rw Br	225.	50.	1050.	650.	225.	1050.	650.

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 3 of 4

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 3 of 4

Section	ROOuterThk	FHoriz1	FHoriz2	CurbLoc	CurbLeft	CurbRight	CurbMedian
	mm	mm	mm		mm	mm	mm
Rw Br	225.	225.	225.	Program Determined	400.	1400.	0.

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 4 of 4

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 4 of 4

Section	CurbMWidth	RefPtOffX	RefPtOffY
	mm	mm	mm
Rw Br	0.	0.	0.

1.5. Abutments

Table 6: Bridge Abutment Definitions

Table 6: Bridge Abutment Definitions

Abutment	GirderSup	SubType	FSProp
BABT	Bottom	Spring	Pinned

Table 7: Bridge Object Definitions 06 - Abutments, Part 1 of 2

BridgeObj	Location	SupportName	BearingDir	DiaphProp	SubType	BentProp	SubElev
							mm
BOBJ1	Start	Start Abutment	Default	END_DIAPHRAGM	Bent	Abut	-2675.
BOBJ1	End	Span 4	Default	END_DIAPHRAGM	Bent	Abut	-2675.

Table 7: Bridge Object Definitions 06 - Abutments, Part 2 of 2

Table 7: Bridge Object Definitions 06 - Abutments, Part 2 of 2

BridgeObj	Location	SupportName	BearProp	BearResProp	BearElev	BearAngle
					mm	Degrees
BOBJ1	Start	Start Abutment	elastic link	None	-2550.	0.
BOBJ1	End	Span 4	elastic link	None	-2550.	0.

1.6. Bents

Table 8: Bridge Bent Definitions 1 - General

Bent	BeamLength	BeamSect	Type	GirderSup1	BearDist1	BearDist2	NumCols
	mm				mm	mm	
Abut	12900.	A_T 1200	Single	Bottom			4
BENT1	12900.	P_T 1300	Double	Bottom	800.	800.	4

Table 9: Bridge Bent Definitions 2 - Column Data, Part 1 of 2

Bent	ColNum	Section	Distance	Height	ColSupport	RHLong	RHTrans
			mm	mm			
Abut	1	1200Dia_Pile	1050.	9000.	Free	1.	1.
Abut	2	1200Dia_Pile	4650.	9000.	Free	1.	1.
Abut	3	1200Dia_Pile	8250.	9000.	Free	1.	1.
Abut	4	1200Dia_Pile	11850.	9000.	Free	1.	1.
BENT1	1	1200Dia_Pile	1050.	9000.	Free	1.	1.
BENT1	2	1200Dia_Pile	4650.	9000.	Free	1.	1.
BENT1	3	1200Dia_Pile	8250.	9000.	Free	1.	1.
BENT1	4	1200Dia_Pile	11850.	9000.	Free	1.	1.

Table 9: Bridge Bent Definitions 2 - Column Data, Part 2 of 2

Bent	ColNum	Section	ColSupport	HingeTop	R1Release	R2Release	R3Release
Abut	1	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
Abut	2	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
Abut	3	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed

Bent	ColNum	Section	ColSupport	HingeTop	R1Release	R2Release	R3Release
Abut	4	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
BENT1	1	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
BENT1	2	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
BENT1	3	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed
BENT1	4	1200Dia_Pile	Free	Auto	Fixed	Fixed	Fixed

Table 10: Bridge Object Definitions 07 - Bents, Part 1 of 3

BridgeObj	SpanName	BentProp	Continuous	SupportName	BearingDir	BentElev mm	DiaphBefore
BOBJ1	Span 1	BENT1	No	Span 1	Default	-2675.	END_DIAPHRAGM
BOBJ1	Span 2	BENT1	No	Span 5	Default	-2675.	END_DIAPHRAGM

Table 10: Bridge Object Definitions 07 - Bents, Part 2 of 3

BridgeObj	SpanName	SupportName	DiaphAfter	ResPropSS	ResElevSS mm	MeshAtBent	BearProp1
BOBJ1	Span 1	Span 1	END_DIAPHRAGM	None	-609.6	Yes	elastic link
BOBJ1	Span 2	Span 5	END_DIAPHRAGM	None	-609.6	Yes	elastic link

Table 10: Bridge Object Definitions 07 - Bents, Part 3 of 3

BridgeObj	SpanName	SupportName	BearElev1 mm	BearAngle1 Degrees	BearProp2	BearElev2 mm
BOBJ1	Span 1	Span 1	-2550.	0.	elastic link	-2550.
BOBJ1	Span 2	Span 5	-2550.	0.	pin	-2550.

1.7. Diaphragms

Table 11: Bridge Diaphragm Definitions

Table 11: Bridge Diaphragm Definitions

Diaph	DiaphType	Thickness	Depth	UseGDepth	MatSolidDia	UseBSectMat
		mm	mm			
END_DIAPHRAGM	Solid	300.	1850.	No	4000Psi	No
INT_DIAPHRAGM	Solid	300.	1850.	No	4000Psi	No

1.8. Bearings

Table 12: Bridge Bearing Definitions, Part 1 of 2

Bearing	Type	U1Type	U2Type	U3Type	R1Type	R2Type	R3Type
BBRG1	User	Fixed	Fixed	Fixed	Free	Free	Free
elastic link	User	Fixed	Partial Fixed	Partial Fixed	Free	Free	Free
pin	User	Fixed	Fixed	Fixed	Free	Free	Free
roller	User	Fixed	Fixed	Free	Free	Free	Free

Table 12: Bridge Bearing Definitions, Part 2 of 2

Table 12: Bridge Bearing Definitions, Part 2 of 2

Bearing	U3Stiff
	kN/mm
BBRG1	
elastic link	2.
pin	
roller	

Table 13: Bridge Model Summary 01 - Bearing Supports

BridgeObj	SpanName	Station	Type	Bearing	BearProp	BearElev
		mm				mm
BOBJ1	Start Abutment	0.	Bent	1	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	2	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	3	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	4	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	5	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	1	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	2	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	3	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	4	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	5	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	1	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	2	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	3	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	4	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	5	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	1	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	2	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	3	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	4	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	5	elastic link	-2550.

2. Material properties

This section provides material property information for materials used in the model.

Table 14: Material Properties 02 - Basic Mechanical Properties

Table 14: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight	UnitMass	E1	G12	U12	A1
	kN/mm3	kN-s2/mm4	kN/mm2	kN/mm2		1/C
4000Psi	2.3563E-08	2.4028E-12	24.85558	10.35649	0.2	9.9000E-06
6000Psi	2.3563E-08	2.4028E-12	30.44174	12.68406	0.2	9.9000E-06
6500Psi	2.3563E-08	2.4028E-12	32.1994	13.41642	0.2	9.9000E-06

Table 14: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight	UnitMass	E1	G12	U12	A1
	kN/mm3	kN-s2/mm4	kN/mm2	kN/mm2		1/C
A615Gr60	7.6973E-08	7.8490E-12	199.94798			1.1700E-05
A709Gr50	7.6973E-08	7.8490E-12	199.94798	76.90307	0.3	1.1700E-05
A722Gr150TypII	7.6973E-08	7.8490E-12	206.84274			1.1700E-05

Table 15: Material Properties 03a - Steel Data

Table 15: Material Properties 03a - Steel Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A709Gr50	0.34474	0.44816	-0.1	Von Mises

Table 16: Material Properties 03b - Concrete Data

Table 16: Material Properties 03b - Concrete Data

Material	Fc	eFc	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
4000Psi	0.02758	0.02758	-0.1	Modified Darwin-Pecknold
6000Psi	0.04137	0.04137	-0.1	Modified Darwin-Pecknold
6500Psi	0.045	0.045	-0.1	Modified Darwin-Pecknold

Table 17: Material Properties 03e - Rebar Data

Table 17: Material Properties 03e - Rebar Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A615Gr60	0.41369	0.62053	-0.1	Von Mises

Table 18: Material Properties 03f - Tendon Data

Table 18: Material Properties 03f - Tendon Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A722Gr150TypII	0.82737	1.03421	-0.1	Von Mises

3. Section properties

This section provides section property information for objects used in the model.

3.1. Frames

Table 19: Frame Section Properties 01 - General, Part 1 of 4

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
1200Dia_Pile	4000Psi	Circle	1200.		1130973.36	2.036E+11	1.018E+11	1.018E+11
A_T 1200	4000Psi	Rectangular	1200.	1800.	2160000.	6.085E+11	2.592E+11	5.832E+11
BRD1	4000Psi	Bridge Section			5790515.17	1.944E+11	2.916E+12	4.916E+13
BRD10	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD11	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD12	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD13	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD14	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD15	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
BRD16	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD17	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD18	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD19	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD2	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD20	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD21	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD22	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD23	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD24	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD3	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD4	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD5	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD6	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD7	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD8	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD9	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
Girder 35m	6000Psi	PC Conc I Girder	2150.	1150.	945700.	3.419E+10	5.716E+11	4.405E+10
P_T 1300	4000Psi	Rectangular	1300.	1800.	2340000.	7.320E+11	3.296E+11	6.318E+11
VAR1		Nonprismatic						
VAR10		Nonprismatic						

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
VAR11		Nonprismatic						
VAR12		Nonprismatic						
VAR13		Nonprismatic						
VAR14		Nonprismatic						
VAR15		Nonprismatic						
VAR16		Nonprismatic						
VAR17		Nonprismatic						
VAR18		Nonprismatic						
VAR19		Nonprismatic						
VAR2		Nonprismatic						
VAR20		Nonprismatic						
VAR21		Nonprismatic						
VAR3		Nonprismatic						
VAR4		Nonprismatic						
VAR5		Nonprismatic						
VAR6		Nonprismatic						
VAR7		Nonprismatic						
VAR8		Nonprismatic						
VAR9		Nonprismatic						

Table 19: Frame Section Properties 01 - General, Part 2 of 4

Table 19: Frame Section Properties 01 - General, Part 2 of 4

SectionName	I23	AS2	AS3
	mm4	mm2	mm2
1200Dia_Pile	0.	1017876.02	1017876.02
A_T 1200	0.	1800000.	1800000.
BRD1	0.	2342083.85	2444907.5
BRD10	0.	4727035.72	4298902.35
BRD11	0.	4557530.76	4360003.76
BRD12	0.	4557530.76	4360003.76
BRD13	0.	4557530.76	4360003.76
BRD14	0.	4557530.76	4360003.76
BRD15	0.	4557530.76	4360003.76
BRD16	0.	4557530.76	4360003.76
BRD17	0.	4557530.76	4360003.76
BRD18	0.	4557530.76	4360003.76
BRD19	0.	4557530.76	4360003.76
BRD2	0.	4727035.72	4298902.35
BRD20	0.	4557530.76	4360003.76
BRD21	0.	4557530.76	4360003.76
BRD22	0.	3552081.54	3517303.57
BRD23	0.	3552081.54	3517303.57
BRD24	0.	3552081.54	3517303.57
BRD3	0.	4727035.72	4298902.35
BRD4	0.	4727035.72	4298902.35

Table 19: Frame Section Properties 01 - General, Part 2 of 4

SectionName	I23	AS2	AS3
	mm4	mm2	mm2
BRD5	0.	4727035.72	4298902.35
BRD6	0.	4727035.72	4298902.35
BRD7	0.	4727035.72	4298902.35
BRD8	0.	4727035.72	4298902.35
BRD9	0.	4727035.72	4298902.35
Girder 35m	0.	464668.64	842262.39
P_T 1300	0.	1950000.	1950000.
VAR1			
VAR10			
VAR11			
VAR12			
VAR13			
VAR14			
VAR15			
VAR16			
VAR17			
VAR18			
VAR19			
VAR2			
VAR20			
VAR21			
VAR3			
VAR4			
VAR5			
VAR6			
VAR7			
VAR8			
VAR9			

Table 19: Frame Section Properties 01 - General, Part 3 of 4

Table 19: Frame Section Properties 01 - General, Part 3 of 4

SectionName	S33	S22	Z33	Z22	R33	R22
	mm3	mm3	mm3	mm3	mm	mm
1200Dia_Pile	169646003.3	169646003.3	288000000.	288000000.	300.	300.
A_T 1200	432000000.	648000000.	648000000.	972000000.	346.41	519.615
BRD1	2260715413.	9733686622.	4103694219.	1.726E+10	709.598	2913.572
BRD10	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD11	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD12	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD13	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD14	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD15	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD16	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD17	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD18	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD19	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD2	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD20	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD21	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD22	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD23	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD24	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD3	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD4	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56

Table 19: Frame Section Properties 01 - General, Part 3 of 4

SectionName	S33	S22	Z33	Z22	R33	R22
	mm3	mm3	mm3	mm3	mm	mm
BRD5	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD6	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD7	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD8	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD9	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
Girder 35m	516311523.	76602071.01	681984202.	156348750.	777.441	215.813
P_T 1300	507000000.	702000000.	760500000.	1053000000.	375.278	519.615
VAR1						
VAR10						
VAR11						
VAR12						
VAR13						
VAR14						
VAR15						
VAR16						
VAR17						
VAR18						
VAR19						
VAR2						
VAR20						
VAR21						
VAR3						
VAR4						
VAR5						
VAR6						
VAR7						
VAR8						
VAR9						

Table 19: Frame Section Properties 01 - General, Part 4 of 4

SectionName	AMod	A2Mod	A3Mod	I2Mod	I3Mod	MMod	WMod
1200Dia_Pile	1.	1.	1.	1.	1.	1.	1.

SectionName	AMod	A2Mod	A3Mod	I2Mod	I3Mod	MMod	WMod
A_T 1200	1.	1.	1.	0.5	0.5	1.	1.
BRD1	1.	1.	1.	1.	1.	0.861435	0.861435
BRD10	1.	1.	1.	1.	1.	0.878736	0.878736
BRD11	1.	1.	1.	1.	1.	0.880553	0.880553
BRD12	1.	1.	1.	1.	1.	0.880553	0.880553
BRD13	1.	1.	1.	1.	1.	0.880553	0.880553
BRD14	1.	1.	1.	1.	1.	0.880553	0.880553
BRD15	1.	1.	1.	1.	1.	0.880553	0.880553
BRD16	1.	1.	1.	1.	1.	0.880553	0.880553
BRD17	1.	1.	1.	1.	1.	0.880553	0.880553
BRD18	1.	1.	1.	1.	1.	0.880553	0.880553
BRD19	1.	1.	1.	1.	1.	0.880553	0.880553
BRD2	1.	1.	1.	1.	1.	0.878736	0.878736
BRD20	1.	1.	1.	1.	1.	0.880553	0.880553
BRD21	1.	1.	1.	1.	1.	0.880553	0.880553
BRD22	1.	1.	1.	1.	1.	0.881674	0.881674
BRD23	1.	1.	1.	1.	1.	0.881674	0.881674
BRD24	1.	1.	1.	1.	1.	0.881674	0.881674
BRD3	1.	1.	1.	1.	1.	0.878736	0.878736
BRD4	1.	1.	1.	1.	1.	0.878736	0.878736
BRD5	1.	1.	1.	1.	1.	0.878736	0.878736
BRD6	1.	1.	1.	1.	1.	0.878736	0.878736
BRD7	1.	1.	1.	1.	1.	0.878736	0.878736
BRD8	1.	1.	1.	1.	1.	0.878736	0.878736
BRD9	1.	1.	1.	1.	1.	0.878736	0.878736
Girder 35m	1.	1.	1.	1.	1.	1.	1.
P_T 1300	1.	1.	1.	0.5	0.5	1.	1.
VAR1							
VAR10							
VAR11							
VAR12							
VAR13							
VAR14							
VAR15							
VAR16							
VAR17							
VAR18							
VAR19							
VAR2							
VAR20							
VAR21							
VAR3							

SectionName	AMod	A2Mod	A3Mod	I2Mod	I3Mod	MMod	WMod
VAR4							
VAR5							
VAR6							
VAR7							
VAR8							
VAR9							

Table 20: Frame Section Properties 02 - Concrete Column, Part 1 of 2

Table 20: Frame Section Properties 02 - Concrete Column, Part 1 of 2

SectionName	RebarMatL	RebarMatC	ReinfConfig	LatReinf	Cover	NumBarsCirc	BarSizeL
					mm		
1200Dia_Pile	A615Gr60	A615Gr60	Circular	Spiral	91.	8	#9

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR1	1	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	2	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	3	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	4	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	5	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	6	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	7	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	8	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	9	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	10	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	11	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	12	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	13	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	14	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	15	BRD1	BRD1	0.065	Parabolic	Linear
VAR10	1	BRD10	BRD10	0.0122	Parabolic	Linear
VAR10	2	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	3	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	4	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	5	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	6	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	7	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	8	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	9	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	10	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	11	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	12	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	13	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	14	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	15	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	16	BRD10	BRD10	0.0667	Parabolic	Linear
VAR11	1	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	2	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	3	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	4	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	5	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	6	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	7	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	8	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	9	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	10	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	11	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	12	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	13	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	14	BRD11	BRD11	0.0623	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR11	15	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	16	BRD11	BRD11	0.0138	Parabolic	Linear
VAR12	1	BRD12	BRD12	0.0138	Parabolic	Linear
VAR12	2	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	3	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	4	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	5	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	6	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	7	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	8	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	9	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	10	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	11	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	12	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	13	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	14	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	15	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	16	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	17	BRD12	BRD12	0.0138	Parabolic	Linear
VAR13	1	BRD13	BRD13	0.0138	Parabolic	Linear
VAR13	2	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	3	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	4	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	5	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	6	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	7	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	8	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	9	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	10	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	11	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	12	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	13	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	14	BRD13	BRD13	0.0622	Parabolic	Linear
VAR13	15	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	16	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	17	BRD13	BRD13	0.0138	Parabolic	Linear
VAR14	1	BRD14	BRD14	0.0138	Parabolic	Linear
VAR14	2	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	3	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	4	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	5	BRD14	BRD14	0.0623	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR14	6	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	7	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	8	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	9	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	10	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	11	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	12	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	13	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	14	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	15	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	16	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	17	BRD14	BRD14	0.0138	Parabolic	Linear
VAR15	1	BRD15	BRD15	0.0138	Parabolic	Linear
VAR15	2	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	3	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	4	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	5	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	6	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	7	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	8	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	9	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	10	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	11	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	12	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	13	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	14	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	15	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	16	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	17	BRD15	BRD15	0.0138	Parabolic	Linear
VAR16	1	BRD16	BRD16	0.0138	Parabolic	Linear
VAR16	2	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	3	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	4	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	5	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	6	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	7	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	8	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	9	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	10	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	11	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	12	BRD16	BRD16	0.0623	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR16	13	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	14	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	15	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	16	BRD16	BRD16	0.0622	Parabolic	Linear
VAR16	17	BRD16	BRD16	0.0138	Parabolic	Linear
VAR17	1	BRD17	BRD17	0.0138	Parabolic	Linear
VAR17	2	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	3	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	4	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	5	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	6	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	7	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	8	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	9	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	10	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	11	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	12	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	13	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	14	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	15	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	16	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	17	BRD17	BRD17	0.0138	Parabolic	Linear
VAR18	1	BRD18	BRD18	0.0138	Parabolic	Linear
VAR18	2	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	3	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	4	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	5	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	6	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	7	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	8	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	9	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	10	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	11	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	12	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	13	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	14	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	15	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	16	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	17	BRD18	BRD18	0.0138	Parabolic	Linear
VAR19	1	BRD19	BRD19	0.0138	Parabolic	Linear
VAR19	2	BRD19	BRD19	0.0623	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR19	3	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	4	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	5	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	6	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	7	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	8	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	9	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	10	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	11	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	12	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	13	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	14	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	15	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	16	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	17	BRD19	BRD19	0.0138	Parabolic	Linear
VAR2	1	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	2	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	3	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	4	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	5	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	6	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	7	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	8	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	9	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	10	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	11	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	12	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	13	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	14	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	15	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	16	BRD2	BRD2	0.0122	Parabolic	Linear
VAR20	1	BRD20	BRD20	0.0138	Parabolic	Linear
VAR20	2	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	3	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	4	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	5	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	6	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	7	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	8	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	9	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	10	BRD20	BRD20	0.07	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR20	11	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	12	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	13	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	14	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	15	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	16	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	17	BRD20	BRD20	0.0138	Parabolic	Linear
VAR21	1	BRD21	BRD21	0.0138	Parabolic	Linear
VAR21	2	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	3	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	4	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	5	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	6	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	7	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	8	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	9	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	10	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	11	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	12	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	13	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	14	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	15	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	16	BRD21	BRD21	0.065	Parabolic	Linear
VAR3	1	BRD3	BRD3	0.0122	Parabolic	Linear
VAR3	2	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	3	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	4	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	5	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	6	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	7	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	8	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	9	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	10	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	11	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	12	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	13	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	14	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	15	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	16	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	17	BRD3	BRD3	0.0122	Parabolic	Linear
VAR4	1	BRD4	BRD4	0.0122	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR4	2	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	3	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	4	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	5	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	6	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	7	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	8	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	9	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	10	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	11	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	12	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	13	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	14	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	15	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	16	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	17	BRD4	BRD4	0.0122	Parabolic	Linear
VAR5	1	BRD5	BRD5	0.0122	Parabolic	Linear
VAR5	2	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	3	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	4	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	5	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	6	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	7	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	8	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	9	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	10	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	11	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	12	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	13	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	14	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	15	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	16	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	17	BRD5	BRD5	0.0122	Parabolic	Linear
VAR6	1	BRD6	BRD6	0.0122	Parabolic	Linear
VAR6	2	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	3	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	4	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	5	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	6	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	7	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	8	BRD6	BRD6	0.0667	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR6	9	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	10	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	11	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	12	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	13	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	14	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	15	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	16	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	17	BRD6	BRD6	0.0122	Parabolic	Linear
VAR7	1	BRD7	BRD7	0.0122	Parabolic	Linear
VAR7	2	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	3	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	4	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	5	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	6	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	7	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	8	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	9	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	10	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	11	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	12	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	13	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	14	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	15	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	16	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	17	BRD7	BRD7	0.0122	Parabolic	Linear
VAR8	1	BRD8	BRD8	0.0122	Parabolic	Linear
VAR8	2	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	3	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	4	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	5	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	6	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	7	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	8	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	9	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	10	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	11	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	12	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	13	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	14	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	15	BRD8	BRD8	0.0642	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR8	16	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	17	BRD8	BRD8	0.0122	Parabolic	Linear
VAR9	1	BRD9	BRD9	0.0122	Parabolic	Linear
VAR9	2	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	3	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	4	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	5	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	6	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	7	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	8	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	9	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	10	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	11	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	12	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	13	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	14	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	15	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	16	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	17	BRD9	BRD9	0.0122	Parabolic	Linear

Table 20: Frame Section Properties 02 - Concrete Column, Part 2 of 2

Table 20: Frame Section Properties 02 - Concrete Column, Part 2 of 2

SectionName	BarSizeC	SpacingC
		mm
1200Dia_Pile	#4	150.

Table 21: Frame Section Properties 03 - Concrete Beam, Part 1 of 2

Table 21: Frame Section Properties 03 - Concrete Beam, Part 1 of 2

SectionName	RebarMatL	RebarMatC	TopCover	BotCover
			mm	mm
A_T 1200	A615Gr60	A615Gr60	60.	60.
P_T 1300	A615Gr60	A615Gr60	60.	60.
VAR19	A615Gr60	A615Gr60	60.	60.

Table 21: Frame Section Properties 03 - Concrete Beam, Part 2 of 2

Table 21: Frame Section Properties 03 - Concrete Beam, Part 2 of 2

SectionName	TopLeftArea	TopRghtArea	BotLeftArea	BotRghtArea
	mm2	mm2	mm2	mm2
A_T 1200	0.	0.	0.	0.
P_T 1300	0.	0.	0.	0.
VAR19	0.	0.	0.	0.

Table 22: Frame Section Properties 05 - Nonprismatic

3.2. Tendons

Table 23: Tendon Section Definitions, Part 1 of 2

TendonSect	Material	Diameter	Area	TorsConst	I	AS
		mm	mm2	mm4	mm4	mm2
TEN1	A722Gr150TypII	28.661	645.16	66245.29	33122.64	580.64

Table 23: Tendon Section Definitions, Part 2 of 2

TendonSect	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	WMod
TEN1	1.	1.	1.	1.	1.	1.	1.

3.3. Areas

Table 24: Area Section Properties, Part 1 of 3

Section	Material	AreaType	Type	DrillDOF	Thickness	BendThick
					mm	mm
ASEC2	4000Psi	Shell	Shell-Thin	Yes	250.	250.
ASEC3	6000Psi	Shell	Shell-Thin	Yes	250.	250.

Section	Material	AreaType	Type	DrillDOF	Thickness	BendThick
					mm	mm
Wing Wall	4000Psi	Shell	Shell-Thick	Yes	400.	400.

Table 24: Area Section Properties, Part 2 of 3

Section	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod
ASEC2	1.	1.	1.	1.	1.	1.
ASEC3	1.	1.	1.	1.	1.	1.
Wing Wall	1.	1.	1.	1.	1.	1.

Table 24: Area Section Properties, Part 3 of 3

Table 24: Area Section Properties, Part 3 of 3

Section	MMod	WMod
ASEC2	1.	1.
ASEC3	1.	1.
Wing Wall	1.	1.

3.4. Solids

Table 25: Solid Property Definitions

Table 25: Solid Property Definitions

SolidProp	Material	MatAngleA	MatAngleB	MatAngleC
		Degrees	Degrees	Degrees
Solid1	4000Psi	0.	0.	0.

4. Loading

This section provides loading information as applied to the model.

4.1. Load patterns

Table 26: Load Pattern Definitions

Table 26: Load Pattern Definitions

LoadPat	DesignType	SelfWtMult	AutoLoad
DC	Dead	1.	
WL	Wind	0.	AASHTO 2018
EH	Hor Earth Pr	0.	
LS	LL Surchr	0.	
Barrier	Dead	0.	
Sidewalk	Dead	0.	
Haunch	Dead	0.	
Temperature Pos	Temperature	0.	
Temperature Neg	Temperature	0.	
DW	Wearing Surface	0.	

4.2. Vehicles

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 1 of 5

VehName	FromLibrary	LibraryName	FltAxleFac	AxleFac	UnifFac	SupportMom
HL-93M	No	User Defined	1.	1.33	1.	Yes
HL-93K	No	User Defined	1.	1.33	1.	Yes

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 2 of 5

VehName	OtherResp	AxleMom kN	AxleMType	AxleMWidth mm	AxleMDbl	AxleOther kN
HL-93M	Yes	0.		1.	No	0.
HL-93K	Yes	0.		1.	No	0.

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 3 of 5

VehName	AxleOWidth	LEffAxle	LEffUnif	ForStraddle	NumInter	MinExtDist
	mm					mm
HL-93M	1.	None	None	No	3	304.8
HL-93K	1.	None	None	No	4	304.8

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 4 of 5

VehName	MinIntDist	StayInLane	CGHTAxle	CGHTUnif	AdjustSuper
	mm		mm	mm	
HL-93M	609.6	No	0.	0.	No
HL-93K	609.6	No	0.	0.	No

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 5 of 5

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 5 of 5

VehName	IgnoreVert	Centrifugal	Braking	NosingForce	DesignType
				kN	
HL-93M	No	No	No	0.	Vehicle Live
HL-93K	No	No	No	0.	Vehicle Live

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 1 of 2

VehName	LoadType	InterUnif	UnifType	UnifWidth	InterAxle	AxleType	AxleWidth
		kN/mm		mm	kN		mm
HL-93M	Leading Load	0.00934	Fixed Width	3048.	111.206	Two Points	1828.8
HL-93M	Fixed Length	0.00934	Fixed Width	3048.	111.206	Two Points	1828.8
HL-93M	Trailing Load	0.00934	Fixed Width	3048.			
HL-93K	Leading Load	0.00934	Fixed Width	3048.	35.586	Two Points	1828.8
HL-93K	Fixed Length	0.00934	Fixed Width	3048.	142.343	Two Points	1828.8
HL-93K	Variable Length	0.00934	Fixed Width	3048.	142.343	Two Points	1828.8
HL-93K	Trailing Load	0.00934	Fixed Width	3048.			

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 2 of 2

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 2 of 2

VehName	InterMaxD
	mm
HL-93M	
HL-93M	
HL-93M	
HL-93K	
HL-93K	
HL-93K	9144.
HL-93K	

Table 29: Vehicles 4 - Vehicle Classes

Table 29: Vehicles 4 - Vehicle Classes

VehClass	VehName	ScaleFactor
HL-93M	HL-93M	1.
HL-93K	HL-93K	1.

4.3. Bridge loading

Table 30: Bridge Load Definitions 02 - Line

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<40m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	-76000.	0.0091
<40m>BL2	Force	GLOBAL	Gravity		-76000.	0.0091
<45m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.00911
<45m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.00911
<45m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp5_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp5_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp5_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp5_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp5_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp5_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp6_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp6_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp6_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp6_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp6_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp6_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp7_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp7_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp7_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp7_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp7_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp7_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp8_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp8_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp8_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp8_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp8_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp8_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp9_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp9_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp9_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp9_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp9_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp9_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<BSEC1>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	650.	0.00047
<BSEC1>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3150.	0.00047
<BSEC1>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	5650.	0.00047
<BSEC1>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	8150.	0.00047
<BSEC1>Sp1_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	650.	0.00047
<New 40m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0091
<New 40m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0091
<New 40m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp10_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp10_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp10_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp10_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp10_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp10_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp11_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp11_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp11_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp11_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp11_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp11_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp5_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp5_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp5_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp5_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp5_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp5_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp6_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp6_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp6_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp6_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp6_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp6_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp7_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp7_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp7_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp7_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp7_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp7_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp8_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp8_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp8_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp8_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp8_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp8_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp9_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp9_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp9_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp9_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp9_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp9_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<Rw Br>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<Rw Br>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059
<Rw Br>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp1_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135
<Rw Br>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp2_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<Rw Br>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp3_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135
<SK 25m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<SK 25m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059
<SK 25m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108
<SK 25m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108
<SK 25m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 25m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108
<SK 25m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 25m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 25m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108
<SK 25m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108
<SK 25m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 40m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 40m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 40m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 40m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 40m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 40m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 40m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 40m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 40m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 40m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 40m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 40m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
<SK 45m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<SK 45m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059
<SK 45m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 45m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 45m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 45m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 45m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 45m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
<SK 45m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 45m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 45m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 45m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 45m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 45m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
LEFT_BARRIER_LOAD	Force	GLOBAL	Gravity	Left Edge of Deck	200.	0.00588
RIGHT_BARRIER_LOAD	Force	GLOBAL	Gravity	Right Edge of Deck	200.	0.00588
SIDE_WALK	Force	GLOBAL	Gravity	Right Edge of Deck	725.	0.00341

Table 31: Bridge Load Definitions 03 - Area, Part 1 of 2

Name	Type	CoordSys	Dir	RefLocLft	DistLft
					mm
<BSEC1>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	1600.
<Rw Br>SL1	Force	GLOBAL	Gravity		400.
<Rw Br>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<Rw Br>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<Rw Br>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 25m>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.

Name	Type	CoordSys	Dir	RefLocLft	DistLft
					mm
<SK 25m>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 25m>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 40m>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 40m>Sp4_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 45m>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 45m>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
DW	Force	GLOBAL	Gravity	Left Edge of Deck	400.
PLL	Force	GLOBAL	Gravity	Left Edge of Deck	400.

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Name	DistRgt	FOverL2Lft	FOverL2Rgt
	mm	kN/mm2	kN/mm2
<BSEC1>Sp1_DW1	400.	1.150E-06	1.150E-06
<Rw Br>SL1	1400.	6.000E-06	6.000E-06
<Rw Br>Sp1_DW1	1400.	1.150E-06	1.150E-06
<Rw Br>Sp2_DW1	1400.	1.150E-06	1.150E-06
<Rw Br>Sp3_DW1	1400.	1.150E-06	1.150E-06
<SK 25m>Sp1_DW1	400.	1.150E-06	1.150E-06
<SK 25m>Sp2_DW1	400.	1.150E-06	1.150E-06

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Name	DistRgt	FOverL2Lft	FOverL2Rgt
	mm	kN/mm2	kN/mm2
<SK 25m>Sp3_DW1	400.	1.150E-06	1.150E-06
<SK 40m>Sp1_DW1	400.	1.150E-06	1.150E-06
<SK 40m>Sp4_DW1	400.	1.150E-06	1.150E-06
<SK 45m>Sp2_DW1	400.	1.150E-06	1.150E-06
<SK 45m>Sp3_DW1	400.	1.150E-06	1.150E-06
DW	400.	1.150E-06	1.150E-06
PLL	1600.	3.590E-06	3.590E-06

5. Load cases

This section provides load case information.

5.1. Definitions

Table 32: Load Case Definitions, Part 1 of 2

Case	Type	MLFactVert	InitialCond	MLFactBrake	MLFactCentr
DEAD	LinStatic		Zero		
MODAL	LinModal		Zero		
DW	LinStatic		Zero		
WL	LinStatic		Zero		
EH	LinStatic		Zero		
LS	LinStatic		Zero		
HL-93K	LinMoving	1.	Zero	1.	0.
HL-93M	LinMoving	1.	Zero	1.	0.
barrier	LinStatic		Zero		

Table 32: Load Case Definitions, Part 2 of 2

Table 32: Load Case Definitions, Part 2 of 2

Case	BaseCase	DesActOpt	MassSource	DesignAct
DEAD		Prog Det		Non-Composite
MODAL		Prog Det		Other
DW		Prog Det		Long-Term Composite
WL		Prog Det		Short-Term Composite
EH		Prog Det		Long-Term Composite
LS		Prog Det		Short-Term Composite
HL-93K		Prog Det		Short-Term Composite
HL-93M		Prog Det		Short-Term Composite
barrier		Prog Det		Non-Composite

5.2. Static case load assignments

Table 33: Case - Static 1 - Load Assignments

Table 33: Case - Static 1 - Load Assignments

Case	LoadType	LoadName	LoadSF
DEAD	Load pattern	DC	1.
DW	Load pattern	DW	1.
WL	Load pattern	WL	1.
EH	Load pattern	EH	1.
LS	Load pattern	LS	1.
barrier	Load pattern	Barrier	1.

6. Load combinations

This section provides load combination information.

Table 34: Combination Definitions

Table 34: Combination Definitions

ComboName	ComboType	CaseName	ScaleFactor
Strength 1	Linear Add	DEAD	1.25
Strength 1		barrier	1.25
Strength 1		DW	1.5
Strength 1		EH	1.5
Strength 1		LS	1.75
Strength 1		HL-93K	1.75
Strength 1		HL-93M	1.75
Service 1	Linear Add	barrier	1.
Service 1		DEAD	1.
Service 1		DW	1.
Service 1		EH	1.
Service 1		HL-93K	1.
Service 1		HL-93M	1.
Service 1		LS	1.
Service 1		WL	1.

7. Structure results

This section provides structure results, including items such as structural periods and base reactions.

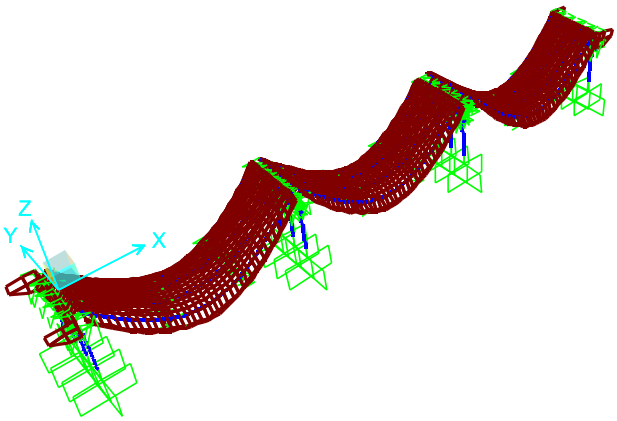


Figure 2: Deformed shape

7.1. Base reactions

Table 35: Base Reactions

Table 35: Base Reactions

OutputCase	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ
	kN	kN	kN	kN-mm	kN-mm	kN-mm
DEAD	1.395E-06	5.537E-09	28057.632	6.490E-03	-1473026116.	-1.909E-03
DW	9.749E-08	9.158E-10	1340.325	670162.5	-70367056.	-5.535E-05
WL	2.033E-08	-1515.	1.785E-09	-5012125.	8.641E-05	-79537500.
EH	2.075E-07	-1.712E-09	6.315E-08	-1.026E-04	-3.939E-03	1.360E-03
LS	1.155E-07	-9.408E-10	3.526E-08	-5.702E-05	-2.208E-03	7.584E-04
barrier	8.370E-08	7.964E-09	1239.	4.124E-04	-65047494.	2.822E-04

8. Joint results

This section provides joint results, including items such as displacements and reactions.

Table 36: Joint Reactions

Joint	F1	F2	F3	M1	M2	M3
	kN	kN	kN	kN-mm	kN-mm	kN-mm
1367	0.447	-4.059	1394.888	11427.48	163552.29	1501.91
1367	0.448	-0.443	61.646	1412.94	4518.96	130.23
1367	0.128	-61.797	94.454	263642.72	1557.45	-1314.12
1367	-99.157	-0.339	-3.007	970.74	-933542.24	19523.8
1367	-51.088	9.299E-03	0.583	-67.6	-508218.44	12364.18
1367	0.582	0.248	64.838	-722.33	4699.37	-197.12
1369	10.53	2.473	1350.919	-6618.	192055.79	343.13
1369	0.632	0.083	59.	-49.84	5095.23	4.89
1369	-0.066	-64.601	9.881	271445.64	89.22	-592.52
1369	-93.844	-0.055	3.007	164.79	-906481.97	5702.19
1369	-47.951	0.013	-0.583	-49.44	-491571.32	3729.39
1369	0.364	0.347	35.997	-969.54	3938.34	-97.33
1371	10.53	-2.473	1350.919	6618.	192055.79	-343.13
1371	0.603	-0.056	54.348	297.81	4934.58	-159.36
1371	0.066	-64.601	-9.881	271445.64	-89.22	-592.52
1371	-93.844	0.055	3.007	-164.79	-906481.97	-5702.19
1371	-47.951	-0.013	-0.583	49.44	-491571.32	-3729.39
1371	0.364	-0.347	35.997	969.54	3938.34	97.33
1373	0.447	4.059	1394.888	-11427.48	163552.29	-1501.91
1373	0.351	0.416	43.168	-1016.96	4013.47	-275.6
1373	-0.128	-61.797	-94.454	263642.72	-1557.45	-1314.12
1373	-99.157	0.339	-3.007	-970.74	-933542.24	-19523.8
1373	-51.088	-9.299E-03	0.583	67.6	-508218.44	-12364.18
1373	0.582	-0.248	64.838	722.33	4699.37	197.12
1377	1.576	-17.422	2039.901	47277.17	30027.86	60.61
1377	-7.580E-03	-1.305	120.928	3865.79	1061.17	-12.01
1377	0.286	-117.769	195.467	509826.54	1421.99	-394.29
1377	-8.566	-1.963E-03	-0.043	5.33	-78620.42	-341.11
1377	-4.768	-1.306E-03	-0.029	3.54	-43767.64	-189.83
1377	3.030E-03	1.046	143.621	-2835.88	977.17	0.97
1379	1.627	1.813	2228.697	-4963.51	30213.88	23.03
1379	1.055E-03	0.041	129.128	210.12	1071.67	-12.5
1379	0.087	-134.633	-8.067	555657.9	457.17	-415.4
1379	-8.75	-6.426E-04	0.043	1.74	-79385.64	-131.54
1379	-4.871	-4.878E-04	0.029	1.32	-44194.67	-73.19
1379	-1.993E-03	0.856	65.295	-2323.43	964.39	0.49
1381	1.627	-1.813	2228.697	4963.51	30213.88	-23.03
1381	7.034E-03	0.017	119.407	281.63	1074.86	-12.15
1381	-0.087	-134.633	8.067	555657.9	-457.17	-415.4
1381	-8.75	6.426E-04	0.043	-1.74	-79385.64	131.54

Joint	F1	F2	F3	M1	M2	M3
	kN	kN	kN	kN-mm	kN-mm	kN-mm
1381	-4.871	4.878E-04	0.029	-1.32	-44194.67	73.19
1381	-1.993E-03	-0.856	65.295	2323.43	964.39	-0.49
1383	1.576	17.422	2039.901	-47277.17	30027.86	-60.61
1383	0.01	1.266	82.537	-3110.54	1071.47	-11.38
1383	-0.286	-117.769	-195.467	509826.54	-1421.99	-394.29
1383	-8.566	1.963E-03	-0.043	-5.33	-78620.42	341.11
1383	-4.768	1.306E-03	-0.029	-3.54	-43767.64	189.83
1383	3.030E-03	-1.046	143.621	2835.88	977.17	-0.97
1387	5.016	-12.525	2081.024	34610.39	13702.74	-8360.78
1387	1.232	-0.994	125.578	3236.62	6068.32	-1172.98
1387	-4.609	-119.385	186.641	511196.38	-22931.58	9373.15
1387	16.406	0.016	0.063	-44.42	150110.71	151.34
1387	9.133	8.952E-03	0.031	-24.37	83566.3	84.44
1387	0.399	0.278	131.821	-920.65	3408.61	-2492.66
1389	-0.945	1.73	2187.575	-4529.27	-7562.48	-2119.25
1389	0.39	-0.031	125.017	583.75	2740.15	-984.17
1389	-0.223	-131.796	14.289	545168.31	-3507.23	5810.15
1389	16.541	-3.557E-03	-0.063	9.09	150531.94	4.25
1389	9.209	-2.078E-03	-0.031	5.33	83802.09	2.48
1389	0.236	0.625	77.094	-1773.53	447.88	-1284.76
1391	-0.945	-1.73	2187.575	4529.27	-7562.48	2119.25
1391	-0.065	-0.119	114.802	777.43	400.32	-1121.95
1391	0.223	-131.796	-14.289	545168.31	3507.23	5810.15
1391	16.541	3.557E-03	-0.063	-9.09	150531.94	-4.25
1391	9.209	2.078E-03	-0.031	-5.33	83802.09	-2.48
1391	0.236	-0.625	77.094	1773.53	447.88	1284.76
1393	5.016	12.525	2081.024	-34610.39	13702.74	8360.78
1393	-0.223	0.745	86.603	-1610.35	-1218.51	-911.88
1393	4.609	-119.385	-186.641	511196.38	22931.58	9373.15
1393	16.406	-0.016	0.063	44.42	150110.71	-151.34
1393	9.133	-8.952E-03	0.031	24.37	83566.3	-84.44
1393	0.399	-0.278	131.821	920.65	3408.61	2492.66
1397	-4.048	-4.066	1394.761	11447.77	-196589.42	-1642.36
1397	-0.791	-0.351	61.303	1016.58	-7620.19	-130.97
1397	-0.068	-62.341	96.334	265991.04	-1257.81	1236.56
1397	91.415	-0.349	-3.106	995.21	862539.65	-19821.76
1397	46.778	3.595E-03	0.528	-53.98	468691.16	-12530.06
1397	-0.898	0.25	64.886	-726.83	-7587.79	186.03
1399	-14.202	2.471	1351.05	-6612.53	-225393.96	-396.75
1399	-0.975	0.181	58.964	-462.93	-8193.04	4.55
1399	0.086	-65.178	10.169	273886.09	12.62	502.05
1399	85.955	-0.055	3.106	164.16	834847.97	-5815.61

Joint	F1	F2	F3	M1	M2	M3
	kN	kN	kN	kN-mm	kN-mm	kN-mm
1399	43.559	0.013	-0.528	-49.79	451692.53	-3792.53
1399	-0.684	0.348	35.949	-973.22	-6848.11	93.19
1401	-14.202	-2.471	1351.05	6612.53	-225393.96	396.75
1401	-0.939	0.042	54.418	-117.05	-7999.9	178.81
1401	-0.086	-65.178	-10.169	273886.09	-12.62	502.05
1401	85.955	0.055	3.106	-164.16	834847.97	5815.61
1401	43.559	-0.013	-0.528	49.79	451692.53	3792.53
1401	-0.684	-0.348	35.949	973.22	-6848.11	-93.19
1403	-4.048	4.066	1394.761	-11447.77	-196589.42	1642.36
1403	-0.674	0.509	43.477	-1418.19	-7018.86	301.02
1403	0.068	-62.341	-96.334	265991.04	1257.81	1236.56
1403	91.415	0.349	-3.106	-995.21	862539.65	19821.76
1403	46.778	-3.595E-03	0.528	53.98	468691.16	12530.06
1403	-0.898	-0.25	64.886	726.83	-7587.79	-186.03

9. Bridge object forces

This section provides bridge object forces at the program determined section cuts.

Table 37: Bridge Object Forces, Part 1 of 3

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	1	0.	After	DEAD	LinStatic	-21.953	-3210.382	2.412E-08
BOBJ1	2	2916.75	Before	DEAD	LinStatic	-21.953	-2685.92	2.412E-08
BOBJ1	3	2916.75	After	DEAD	LinStatic	-21.953	-2685.92	2.411E-08
BOBJ1	4	5833.5	Before	DEAD	LinStatic	-21.953	-2161.459	2.412E-08
BOBJ1	5	5833.5	After	DEAD	LinStatic	-21.953	-2161.459	2.412E-08
BOBJ1	6	8750.25	Before	DEAD	LinStatic	-21.953	-1636.998	2.411E-08
BOBJ1	7	8750.25	After	DEAD	LinStatic	-21.953	-1636.998	2.411E-08
BOBJ1	8	11667.	Before	DEAD	LinStatic	-21.953	-1112.536	2.411E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	9	11667.	After	DEAD	LinStatic	-21.953	-971.299	2.408E-08
BOBJ1	10	14583.75	Before	DEAD	LinStatic	-21.953	-446.838	2.403E-08
BOBJ1	11	14583.75	After	DEAD	LinStatic	-21.953	-446.838	2.401E-08
BOBJ1	12	17500.5	Before	DEAD	LinStatic	-21.953	77.624	2.402E-08
BOBJ1	13	17500.5	After	DEAD	LinStatic	-21.953	77.624	2.402E-08
BOBJ1	14	20417.25	Before	DEAD	LinStatic	-21.953	602.085	2.400E-08
BOBJ1	15	20417.25	After	DEAD	LinStatic	-21.953	602.085	2.400E-08
BOBJ1	16	23334.	Before	DEAD	LinStatic	-21.953	1126.546	2.426E-08
BOBJ1	17	23334.	After	DEAD	LinStatic	-21.953	1267.784	2.318E-08
BOBJ1	18	26050.5	Before	DEAD	LinStatic	-21.953	1756.238	2.329E-08
BOBJ1	19	26050.5	After	DEAD	LinStatic	-21.953	1756.238	2.412E-08
BOBJ1	20	28767.	Before	DEAD	LinStatic	-21.953	2244.693	2.410E-08
BOBJ1	21	28767.	After	DEAD	LinStatic	-21.953	2244.693	2.410E-08
BOBJ1	22	31483.5	Before	DEAD	LinStatic	-21.953	2733.147	2.404E-08
BOBJ1	23	31483.5	After	DEAD	LinStatic	-21.953	2733.147	2.402E-08
BOBJ1	24	34200.	Before	DEAD	LinStatic	-21.953	3221.601	2.394E-08
BOBJ1	25	34200.	After	DEAD	LinStatic	2.640E-11	-143.848	7.105E-12
BOBJ1	26	35000.	Before	DEAD	LinStatic	-8.754E-12	6.112E-12	9.426E-12
BOBJ1	27	35000.	After	DEAD	LinStatic	1.453E-10	2.738E-12	4.105E-12
BOBJ1	28	35800.	Before	DEAD	LinStatic	1.581E-10	143.848	1.454E-12
BOBJ1	29	35800.	After	DEAD	LinStatic	-28.358	-3144.063	-1.411E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	30	38516.75	Before	DEAD	LinStatic	-28.358	-2655.564	-1.399E-09
BOBJ1	31	38516.75	After	DEAD	LinStatic	-28.358	-2655.564	-1.398E-09
BOBJ1	32	41233.5	Before	DEAD	LinStatic	-28.358	-2167.065	-1.385E-09
BOBJ1	33	41233.5	After	DEAD	LinStatic	-28.358	-2167.065	-1.383E-09
BOBJ1	34	43950.25	Before	DEAD	LinStatic	-28.358	-1678.565	-1.379E-09
BOBJ1	35	43950.25	After	DEAD	LinStatic	-28.358	-1678.565	-1.378E-09
BOBJ1	36	46667.	Before	DEAD	LinStatic	-28.358	-1190.066	-1.364E-09
BOBJ1	37	46667.	After	DEAD	LinStatic	-28.358	-1048.829	-8.431E-10
BOBJ1	38	49583.75	Before	DEAD	LinStatic	-28.358	-524.367	-8.329E-10
BOBJ1	39	49583.75	After	DEAD	LinStatic	-28.358	-524.367	-8.303E-10
BOBJ1	40	52500.5	Before	DEAD	LinStatic	-28.358	4.229E-03	-8.259E-10
BOBJ1	41	52500.5	After	DEAD	LinStatic	-28.358	4.229E-03	-8.380E-10
BOBJ1	42	55417.25	Before	DEAD	LinStatic	-28.358	524.555	-8.393E-10
BOBJ1	43	55417.25	After	DEAD	LinStatic	-28.358	524.555	-8.378E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	44	58334.	Before	DEAD	LinStatic	-28.358	1049.017	-8.408E-10
BOBJ1	45	58334.	After	DEAD	LinStatic	-28.358	1190.254	-1.175E-09
BOBJ1	46	61050.5	Before	DEAD	LinStatic	-28.358	1678.709	-1.188E-09
BOBJ1	47	61050.5	After	DEAD	LinStatic	-28.358	1678.709	-1.186E-09
BOBJ1	48	63767.	Before	DEAD	LinStatic	-28.358	2167.163	-1.194E-09
BOBJ1	49	63767.	After	DEAD	LinStatic	-28.358	2167.163	-1.196E-09
BOBJ1	50	66483.5	Before	DEAD	LinStatic	-28.358	2655.617	-1.212E-09
BOBJ1	51	66483.5	After	DEAD	LinStatic	-28.358	2655.617	-1.210E-09
BOBJ1	52	69200.	Before	DEAD	LinStatic	-28.358	3144.072	-1.224E-09
BOBJ1	53	69200.	After	DEAD	LinStatic	3.838E-11	-143.848	-5.431E-12
BOBJ1	54	70000.	Before	DEAD	LinStatic	2.329E-11	-2.413E-12	-3.012E-12
BOBJ1	55	70000.	After	DEAD	LinStatic	4.555E-10	8.276E-12	4.315E-12
BOBJ1	56	70800.	Before	DEAD	LinStatic	5.126E-10	143.848	-4.336E-12
BOBJ1	57	70800.	After	DEAD	LinStatic	-36.501	-3221.593	3.096E-08
BOBJ1	58	73516.75	Before	DEAD	LinStatic	-36.501	-2733.094	3.099E-08
BOBJ1	59	73516.75	After	DEAD	LinStatic	-36.501	-2733.094	3.098E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	60	76233.5	Before	DEAD	LinStatic	-36.501	-2244.594	3.096E-08
BOBJ1	61	76233.5	After	DEAD	LinStatic	-36.501	-2244.594	3.095E-08
BOBJ1	62	78950.25	Before	DEAD	LinStatic	-36.501	-1756.095	3.098E-08
BOBJ1	63	78950.25	After	DEAD	LinStatic	-36.501	-1756.095	3.096E-08
BOBJ1	64	81667.	Before	DEAD	LinStatic	-36.501	-1267.596	3.098E-08
BOBJ1	65	81667.	After	DEAD	LinStatic	-36.501	-1126.358	3.092E-08
BOBJ1	66	84583.75	Before	DEAD	LinStatic	-36.501	-601.897	3.100E-08
BOBJ1	67	84583.75	After	DEAD	LinStatic	-36.501	-601.897	3.099E-08
BOBJ1	68	87500.5	Before	DEAD	LinStatic	-36.501	-77.436	3.103E-08
BOBJ1	69	87500.5	After	DEAD	LinStatic	-36.501	-77.436	3.103E-08
BOBJ1	70	90417.25	Before	DEAD	LinStatic	-36.501	447.026	3.106E-08
BOBJ1	71	90417.25	After	DEAD	LinStatic	-36.501	447.026	3.106E-08
BOBJ1	72	93334.	Before	DEAD	LinStatic	-36.501	971.487	3.111E-08
BOBJ1	73	93334.	After	DEAD	LinStatic	-36.501	1112.724	2.774E-08
BOBJ1	74	96250.5	Before	DEAD	LinStatic	-36.501	1637.141	2.777E-08
BOBJ1	75	96250.5	After	DEAD	LinStatic	-36.501	1637.141	2.777E-08
BOBJ1	76	99167.	Before	DEAD	LinStatic	-36.501	2161.557	2.778E-08
BOBJ1	77	99167.	After	DEAD	LinStatic	-36.501	2161.557	2.778E-08
BOBJ1	78	102083.5	Before	DEAD	LinStatic	-36.501	2685.973	2.779E-08
BOBJ1	79	102083.5	After	DEAD	LinStatic	-36.501	2685.973	2.780E-08
BOBJ1	80	105000.	Before	DEAD	LinStatic	-36.501	3210.39	2.781E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	1	0.	After	DW	LinStatic	-2.034	-211.957	4.660E-04
BOBJ1	2	2916.75	Before	DW	LinStatic	-2.034	-187.135	4.660E-04
BOBJ1	3	2916.75	After	DW	LinStatic	-2.034	-174.724	4.660E-04
BOBJ1	4	5833.5	Before	DW	LinStatic	-2.034	-149.903	4.660E-04
BOBJ1	5	5833.5	After	DW	LinStatic	-2.034	-137.492	4.660E-04
BOBJ1	6	8750.25	Before	DW	LinStatic	-2.034	-112.671	4.660E-04
BOBJ1	7	8750.25	After	DW	LinStatic	-2.034	-100.26	4.660E-04
BOBJ1	8	11667.	Before	DW	LinStatic	-2.034	-75.438	4.660E-04
BOBJ1	9	11667.	After	DW	LinStatic	-2.034	-63.027	4.660E-04
BOBJ1	10	14583.75	Before	DW	LinStatic	-2.034	-38.206	4.660E-04
BOBJ1	11	14583.75	After	DW	LinStatic	-2.034	-25.795	4.660E-04
BOBJ1	12	17500.5	Before	DW	LinStatic	-2.034	-0.974	4.660E-04
BOBJ1	13	17500.5	After	DW	LinStatic	-2.034	11.437	4.660E-04
BOBJ1	14	20417.25	Before	DW	LinStatic	-2.034	36.259	4.660E-04
BOBJ1	15	20417.25	After	DW	LinStatic	-2.034	48.67	4.660E-04
BOBJ1	16	23334.	Before	DW	LinStatic	-2.034	73.491	4.660E-04
BOBJ1	17	23334.	After	DW	LinStatic	-2.034	85.476	4.660E-04
BOBJ1	18	26050.5	Before	DW	LinStatic	-2.034	108.593	4.660E-04
BOBJ1	19	26050.5	After	DW	LinStatic	-2.034	120.152	4.660E-04
BOBJ1	20	28767.	Before	DW	LinStatic	-2.034	143.269	4.660E-04
BOBJ1	21	28767.	After	DW	LinStatic	-2.034	154.828	4.660E-04

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	22	31483.5	Before	DW	LinStatic	-2.034	177.945	4.660E-04
BOBJ1	23	31483.5	After	DW	LinStatic	-2.034	189.504	4.660E-04
BOBJ1	24	34200.	Before	DW	LinStatic	-2.034	212.622	4.660E-04
BOBJ1	25	34200.	After	DW	LinStatic	-1.377E-12	-5.106	-1.608E-13
BOBJ1	26	35000.	Before	DW	LinStatic	-3.041E-12	-5.106	3.557E-13
BOBJ1	27	35000.	After	DW	LinStatic	5.676E-12	5.106	-1.694E-13
BOBJ1	28	35800.	Before	DW	LinStatic	6.703E-12	5.106	-1.230E-13
BOBJ1	29	35800.	After	DW	LinStatic	-2.045	-207.396	0.019
BOBJ1	30	38516.75	Before	DW	LinStatic	-2.045	-184.276	0.019
BOBJ1	31	38516.75	After	DW	LinStatic	-2.045	-172.716	0.019
BOBJ1	32	41233.5	Before	DW	LinStatic	-2.045	-149.597	0.019
BOBJ1	33	41233.5	After	DW	LinStatic	-2.045	-138.037	0.019
BOBJ1	34	43950.25	Before	DW	LinStatic	-2.045	-114.918	0.019
BOBJ1	35	43950.25	After	DW	LinStatic	-2.045	-103.358	0.019
BOBJ1	36	46667.	Before	DW	LinStatic	-2.045	-80.238	0.019
BOBJ1	37	46667.	After	DW	LinStatic	-2.045	-68.253	0.019
BOBJ1	38	49583.75	Before	DW	LinStatic	-2.045	-43.432	0.019
BOBJ1	39	49583.75	After	DW	LinStatic	-2.045	-31.022	0.019
BOBJ1	40	52500.5	Before	DW	LinStatic	-2.045	-6.201	0.019
BOBJ1	41	52500.5	After	DW	LinStatic	-2.045	6.209	0.019
BOBJ1	42	55417.25	Before	DW	LinStatic	-2.045	31.032	0.019
BOBJ1	43	55417.25	After	DW	LinStatic	-2.045	43.444	0.019
BOBJ1	44	58334.	Before	DW	LinStatic	-2.045	68.265	0.019
BOBJ1	45	58334.	After	DW	LinStatic	-2.045	80.25	0.019
BOBJ1	46	61050.5	Before	DW	LinStatic	-2.045	103.368	0.019
BOBJ1	47	61050.5	After	DW	LinStatic	-2.045	114.926	0.019
BOBJ1	48	63767.	Before	DW	LinStatic	-2.045	138.044	0.019
BOBJ1	49	63767.	After	DW	LinStatic	-2.045	149.602	0.019
BOBJ1	50	66483.5	Before	DW	LinStatic	-2.045	172.72	0.019
BOBJ1	51	66483.5	After	DW	LinStatic	-2.045	184.279	0.019
BOBJ1	52	69200.	Before	DW	LinStatic	-2.045	207.396	0.019

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	53	69200.	After	DW	LinStatic	3.540E-13	-5.106	-6.225E-13
BOBJ1	54	70000.	Before	DW	LinStatic	-6.808E-13	-5.106	-2.221E-13
BOBJ1	55	70000.	After	DW	LinStatic	2.986E-11	5.106	-2.465E-13
BOBJ1	56	70800.	Before	DW	LinStatic	3.308E-11	5.106	-3.180E-13
BOBJ1	57	70800.	After	DW	LinStatic	-3.379	-212.621	-0.381
BOBJ1	58	73516.75	Before	DW	LinStatic	-3.379	-189.502	-0.381
BOBJ1	59	73516.75	After	DW	LinStatic	-3.379	-177.942	-0.381
BOBJ1	60	76233.5	Before	DW	LinStatic	-3.379	-154.822	-0.381
BOBJ1	61	76233.5	After	DW	LinStatic	-3.379	-143.262	-0.381
BOBJ1	62	78950.25	Before	DW	LinStatic	-3.379	-120.143	-0.381
BOBJ1	63	78950.25	After	DW	LinStatic	-3.379	-108.583	-0.381
BOBJ1	64	81667.	Before	DW	LinStatic	-3.379	-85.464	-0.381
BOBJ1	65	81667.	After	DW	LinStatic	-3.379	-73.478	-0.381
BOBJ1	66	84583.75	Before	DW	LinStatic	-3.379	-48.657	-0.381
BOBJ1	67	84583.75	After	DW	LinStatic	-3.379	-36.246	-0.381
BOBJ1	68	87500.5	Before	DW	LinStatic	-3.379	-11.424	-0.381
BOBJ1	69	87500.5	After	DW	LinStatic	-3.379	0.986	-0.381
BOBJ1	70	90417.25	Before	DW	LinStatic	-3.379	25.808	-0.381
BOBJ1	71	90417.25	After	DW	LinStatic	-3.379	38.219	-0.381
BOBJ1	72	93334.	Before	DW	LinStatic	-3.379	63.04	-0.381
BOBJ1	73	93334.	After	DW	LinStatic	-3.379	75.45	-0.381
BOBJ1	74	96250.5	Before	DW	LinStatic	-3.379	100.27	-0.381
BOBJ1	75	96250.5	After	DW	LinStatic	-3.379	112.68	-0.381
BOBJ1	76	99167.	Before	DW	LinStatic	-3.379	137.499	-0.381
BOBJ1	77	99167.	After	DW	LinStatic	-3.379	149.909	-0.381
BOBJ1	78	102083.5	Before	DW	LinStatic	-3.379	174.728	-0.381
BOBJ1	79	102083.5	After	DW	LinStatic	-3.379	187.138	-0.381
BOBJ1	80	105000.	Before	DW	LinStatic	-3.379	211.957	-0.381
BOBJ1	1	0.	After	WL	LinStatic	-7.870E-10	-2.187E-09	-0.296
BOBJ1	2	2916.75	Before	WL	LinStatic	-7.941E-10	-2.187E-09	-0.296

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	3	2916.75	After	WL	LinStatic	-7.929E-10	-2.187E-09	-0.296
BOBJ1	4	5833.5	Before	WL	LinStatic	-8.107E-10	-2.186E-09	-0.296
BOBJ1	5	5833.5	After	WL	LinStatic	-8.050E-10	-2.185E-09	-0.296
BOBJ1	6	8750.25	Before	WL	LinStatic	-8.230E-10	-2.185E-09	-0.296
BOBJ1	7	8750.25	After	WL	LinStatic	-8.187E-10	-2.184E-09	-0.296
BOBJ1	8	11667.	Before	WL	LinStatic	-8.460E-10	-2.184E-09	-0.296
BOBJ1	9	11667.	After	WL	LinStatic	-3.156E-09	-1.377E-09	-0.296
BOBJ1	10	14583.75	Before	WL	LinStatic	-3.212E-09	-1.376E-09	-0.296
BOBJ1	11	14583.75	After	WL	LinStatic	-3.306E-09	-1.410E-09	-0.296
BOBJ1	12	17500.5	Before	WL	LinStatic	-3.590E-09	-1.422E-09	-0.296
BOBJ1	13	17500.5	After	WL	LinStatic	-3.584E-09	-1.421E-09	-0.296
BOBJ1	14	20417.25	Before	WL	LinStatic	-3.614E-09	-1.421E-09	-0.296
BOBJ1	15	20417.25	After	WL	LinStatic	-3.609E-09	-1.421E-09	-0.296
BOBJ1	16	23334.	Before	WL	LinStatic	-4.696E-09	-1.420E-09	-0.296

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	17	23334.	After	WL	LinStatic	-9.580E-12	3.840E-10	-0.296
BOBJ1	18	26050.5	Before	WL	LinStatic	9.151E-10	3.237E-10	-0.296
BOBJ1	19	26050.5	After	WL	LinStatic	1.652E-09	-4.058E-10	-0.296
BOBJ1	20	28767.	Before	WL	LinStatic	1.821E-09	-3.881E-10	-0.296
BOBJ1	21	28767.	After	WL	LinStatic	1.883E-09	-3.803E-10	-0.296
BOBJ1	22	31483.5	Before	WL	LinStatic	1.933E-09	-3.711E-10	-0.296
BOBJ1	23	31483.5	After	WL	LinStatic	1.943E-09	-3.696E-10	-0.296
BOBJ1	24	34200.	Before	WL	LinStatic	1.946E-09	-3.702E-10	-0.296
BOBJ1	25	34200.	After	WL	LinStatic	-6.940E-12	1.755E-12	-2.890E-11
BOBJ1	26	35000.	Before	WL	LinStatic	-1.763E-12	1.985E-12	2.375E-11
BOBJ1	27	35000.	After	WL	LinStatic	-3.577E-12	-5.261E-14	-2.672E-11
BOBJ1	28	35800.	Before	WL	LinStatic	-1.716E-12	7.628E-15	3.915E-11
BOBJ1	29	35800.	After	WL	LinStatic	-1.320E-09	1.575E-10	-0.101
BOBJ1	30	38516.75	Before	WL	LinStatic	-1.376E-09	1.568E-10	-0.101
BOBJ1	31	38516.75	After	WL	LinStatic	-1.405E-09	1.562E-10	-0.101
BOBJ1	32	41233.5	Before	WL	LinStatic	-1.531E-09	1.561E-10	-0.101
BOBJ1	33	41233.5	After	WL	LinStatic	-1.940E-09	-5.110E-11	-0.101

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	34	43950.25	Before	WL	LinStatic	-2.014E-09	-7.174E-11	-0.101
BOBJ1	35	43950.25	After	WL	LinStatic	-2.011E-09	-7.115E-11	-0.101
BOBJ1	36	46667.	Before	WL	LinStatic	-2.037E-09	-1.321E-10	-0.101
BOBJ1	37	46667.	After	WL	LinStatic	-1.883E-09	-2.136E-10	-0.101
BOBJ1	38	49583.75	Before	WL	LinStatic	-1.653E-09	-2.121E-10	-0.101
BOBJ1	39	49583.75	After	WL	LinStatic	-1.502E-09	-1.151E-10	-0.101
BOBJ1	40	52500.5	Before	WL	LinStatic	-1.486E-09	-1.152E-10	-0.101
BOBJ1	41	52500.5	After	WL	LinStatic	-1.642E-09	6.775E-11	-0.101
BOBJ1	42	55417.25	Before	WL	LinStatic	-1.641E-09	6.924E-11	-0.101
BOBJ1	43	55417.25	After	WL	LinStatic	-1.641E-09	7.025E-11	-0.101
BOBJ1	44	58334.	Before	WL	LinStatic	-1.657E-09	7.050E-11	-0.101
BOBJ1	45	58334.	After	WL	LinStatic	-1.699E-09	-8.672E-12	-0.101
BOBJ1	46	61050.5	Before	WL	LinStatic	-1.723E-09	-9.736E-12	-0.101
BOBJ1	47	61050.5	After	WL	LinStatic	-1.722E-09	-9.721E-12	-0.101

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	48	63767.	Before	WL	LinStatic	-1.741E-09	-9.178E-12	-0.101
BOBJ1	49	63767.	After	WL	LinStatic	-1.738E-09	-1.110E-11	-0.101
BOBJ1	50	66483.5	Before	WL	LinStatic	-1.757E-09	-1.082E-11	-0.101
BOBJ1	51	66483.5	After	WL	LinStatic	-1.760E-09	-3.389E-11	-0.101
BOBJ1	52	69200.	Before	WL	LinStatic	-1.783E-09	-3.336E-11	-0.101
BOBJ1	53	69200.	After	WL	LinStatic	-5.757E-12	2.303E-13	-4.232E-11
BOBJ1	54	70000.	Before	WL	LinStatic	7.539E-13	-1.610E-15	2.018E-11
BOBJ1	55	70000.	After	WL	LinStatic	-3.493E-12	-4.896E-12	-8.191E-12
BOBJ1	56	70800.	Before	WL	LinStatic	2.645E-12	-4.788E-12	4.547E-11
BOBJ1	57	70800.	After	WL	LinStatic	-1.133E-08	-1.624E-09	2.537
BOBJ1	58	73516.75	Before	WL	LinStatic	-1.135E-08	-1.625E-09	2.537
BOBJ1	59	73516.75	After	WL	LinStatic	-1.135E-08	-1.625E-09	2.537
BOBJ1	60	76233.5	Before	WL	LinStatic	-1.133E-08	-1.624E-09	2.537
BOBJ1	61	76233.5	After	WL	LinStatic	-1.133E-08	-1.624E-09	2.537
BOBJ1	62	78950.25	Before	WL	LinStatic	-1.135E-08	-1.625E-09	2.537

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	63	78950.25	After	WL	LinStatic	-1.132E-08	-1.612E-09	2.537
BOBJ1	64	81667.	Before	WL	LinStatic	-1.133E-08	-1.613E-09	2.537
BOBJ1	65	81667.	After	WL	LinStatic	-1.133E-08	-1.621E-09	2.537
BOBJ1	66	84583.75	Before	WL	LinStatic	-1.137E-08	-1.619E-09	2.537
BOBJ1	67	84583.75	After	WL	LinStatic	-1.138E-08	-1.618E-09	2.537
BOBJ1	68	87500.5	Before	WL	LinStatic	-1.139E-08	-1.617E-09	2.537
BOBJ1	69	87500.5	After	WL	LinStatic	-1.140E-08	-1.618E-09	2.537
BOBJ1	70	90417.25	Before	WL	LinStatic	-1.141E-08	-1.618E-09	2.537
BOBJ1	71	90417.25	After	WL	LinStatic	-1.141E-08	-1.617E-09	2.537
BOBJ1	72	93334.	Before	WL	LinStatic	-1.145E-08	-1.617E-09	2.537
BOBJ1	73	93334.	After	WL	LinStatic	-8.445E-09	-4.922E-10	2.537
BOBJ1	74	96250.5	Before	WL	LinStatic	-8.466E-09	-4.934E-10	2.537
BOBJ1	75	96250.5	After	WL	LinStatic	-8.468E-09	-4.936E-10	2.537
BOBJ1	76	99167.	Before	WL	LinStatic	-8.476E-09	-4.960E-10	2.537

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	77	99167.	After	WL	LinStatic	-8.472E-09	-4.964E-10	2.537
BOBJ1	78	102083.5	Before	WL	LinStatic	-8.486E-09	-4.976E-10	2.537
BOBJ1	79	102083.5	After	WL	LinStatic	-8.484E-09	-4.983E-10	2.537
BOBJ1	80	105000.	Before	WL	LinStatic	-8.500E-09	-4.997E-10	2.537
BOBJ1	1	0.	After	EH	LinStatic	-47.246	-5.440E-09	-9.060E-09
BOBJ1	2	2916.75	Before	EH	LinStatic	-47.246	-5.438E-09	-9.009E-09
BOBJ1	3	2916.75	After	EH	LinStatic	-47.246	-5.436E-09	-9.016E-09
BOBJ1	4	5833.5	Before	EH	LinStatic	-47.246	-5.437E-09	-8.951E-09
BOBJ1	5	5833.5	After	EH	LinStatic	-47.246	-5.453E-09	-8.946E-09
BOBJ1	6	8750.25	Before	EH	LinStatic	-47.246	-5.459E-09	-8.877E-09
BOBJ1	7	8750.25	After	EH	LinStatic	-47.246	-5.458E-09	-8.886E-09
BOBJ1	8	11667.	Before	EH	LinStatic	-47.246	-5.462E-09	-8.805E-09
BOBJ1	9	11667.	After	EH	LinStatic	-47.246	-1.166E-08	-8.861E-09
BOBJ1	10	14583.75	Before	EH	LinStatic	-47.246	-1.166E-08	-8.784E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	11	14583.75	After	EH	LinStatic	-47.246	-1.167E-08	-8.818E-09
BOBJ1	12	17500.5	Before	EH	LinStatic	-47.246	-1.171E-08	-8.793E-09
BOBJ1	13	17500.5	After	EH	LinStatic	-47.246	-1.171E-08	-8.804E-09
BOBJ1	14	20417.25	Before	EH	LinStatic	-47.246	-1.171E-08	-8.724E-09
BOBJ1	15	20417.25	After	EH	LinStatic	-47.246	-1.173E-08	-8.724E-09
BOBJ1	16	23334.	Before	EH	LinStatic	-47.246	-1.173E-08	-8.963E-09
BOBJ1	17	23334.	After	EH	LinStatic	-47.246	-2.453E-09	-9.032E-09
BOBJ1	18	26050.5	Before	EH	LinStatic	-47.246	-2.445E-09	-7.621E-09
BOBJ1	19	26050.5	After	EH	LinStatic	-47.246	7.567E-10	-7.449E-09
BOBJ1	20	28767.	Before	EH	LinStatic	-47.246	7.598E-10	-7.535E-09
BOBJ1	21	28767.	After	EH	LinStatic	-47.246	7.539E-10	-7.533E-09
BOBJ1	22	31483.5	Before	EH	LinStatic	-47.246	7.499E-10	-7.409E-09
BOBJ1	23	31483.5	After	EH	LinStatic	-47.246	7.537E-10	-7.364E-09
BOBJ1	24	34200.	Before	EH	LinStatic	-47.246	7.501E-10	-7.236E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	25	34200.	After	EH	LinStatic	-3.974E-10	-9.057E-12	3.844E-12
BOBJ1	26	35000.	Before	EH	LinStatic	-3.436E-10	-8.912E-12	-1.129E-11
BOBJ1	27	35000.	After	EH	LinStatic	-4.134E-11	-6.735E-13	2.040E-13
BOBJ1	28	35800.	Before	EH	LinStatic	-4.619E-11	-5.815E-13	6.515E-13
BOBJ1	29	35800.	After	EH	LinStatic	-12.615	5.132E-09	-3.632E-10
BOBJ1	30	38516.75	Before	EH	LinStatic	-12.615	5.132E-09	-3.652E-10
BOBJ1	31	38516.75	After	EH	LinStatic	-12.615	5.129E-09	-3.658E-10
BOBJ1	32	41233.5	Before	EH	LinStatic	-12.615	5.132E-09	-3.705E-10
BOBJ1	33	41233.5	After	EH	LinStatic	-12.615	5.132E-09	-3.697E-10
BOBJ1	34	43950.25	Before	EH	LinStatic	-12.615	5.136E-09	-3.712E-10
BOBJ1	35	43950.25	After	EH	LinStatic	-12.615	5.132E-09	-3.713E-10
BOBJ1	36	46667.	Before	EH	LinStatic	-12.615	5.136E-09	-3.713E-10
BOBJ1	37	46667.	After	EH	LinStatic	-12.615	6.954E-09	-3.637E-10
BOBJ1	38	49583.75	Before	EH	LinStatic	-12.615	6.955E-09	-3.694E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	39	49583.75	After	EH	LinStatic	-12.615	6.923E-09	-3.679E-10
BOBJ1	40	52500.5	Before	EH	LinStatic	-12.615	6.922E-09	-3.711E-10
BOBJ1	41	52500.5	After	EH	LinStatic	-12.615	6.925E-09	-3.709E-10
BOBJ1	42	55417.25	Before	EH	LinStatic	-12.615	6.924E-09	-3.699E-10
BOBJ1	43	55417.25	After	EH	LinStatic	-12.615	6.929E-09	-3.702E-10
BOBJ1	44	58334.	Before	EH	LinStatic	-12.615	6.928E-09	-3.724E-10
BOBJ1	45	58334.	After	EH	LinStatic	-12.615	9.405E-11	-3.730E-10
BOBJ1	46	61050.5	Before	EH	LinStatic	-12.615	9.614E-11	-3.756E-10
BOBJ1	47	61050.5	After	EH	LinStatic	-12.615	1.009E-10	-3.747E-10
BOBJ1	48	63767.	Before	EH	LinStatic	-12.615	1.038E-10	-3.775E-10
BOBJ1	49	63767.	After	EH	LinStatic	-12.615	1.027E-10	-3.776E-10
BOBJ1	50	66483.5	Before	EH	LinStatic	-12.615	1.034E-10	-3.807E-10
BOBJ1	51	66483.5	After	EH	LinStatic	-12.615	9.320E-11	-3.804E-10
BOBJ1	52	69200.	Before	EH	LinStatic	-12.615	8.563E-11	-3.828E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	53	69200.	After	EH	LinStatic	2.256E-11	-1.636E-13	-1.374E-12
BOBJ1	54	70000.	Before	EH	LinStatic	1.896E-11	2.837E-13	-8.822E-13
BOBJ1	55	70000.	After	EH	LinStatic	-1.678E-10	-2.899E-12	-1.770E-13
BOBJ1	56	70800.	Before	EH	LinStatic	-1.866E-10	-3.763E-12	2.083E-12
BOBJ1	57	70800.	After	EH	LinStatic	-78.509	-1.270E-08	-2.460E-08
BOBJ1	58	73516.75	Before	EH	LinStatic	-78.509	-1.270E-08	-2.461E-08
BOBJ1	59	73516.75	After	EH	LinStatic	-78.509	-1.270E-08	-2.461E-08
BOBJ1	60	76233.5	Before	EH	LinStatic	-78.509	-1.269E-08	-2.460E-08
BOBJ1	61	76233.5	After	EH	LinStatic	-78.509	-1.269E-08	-2.460E-08
BOBJ1	62	78950.25	Before	EH	LinStatic	-78.509	-1.269E-08	-2.461E-08
BOBJ1	63	78950.25	After	EH	LinStatic	-78.509	-1.265E-08	-2.459E-08
BOBJ1	64	81667.	Before	EH	LinStatic	-78.509	-1.266E-08	-2.460E-08
BOBJ1	65	81667.	After	EH	LinStatic	-78.509	2.304E-08	-2.460E-08
BOBJ1	66	84583.75	Before	EH	LinStatic	-78.509	2.304E-08	-2.463E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	67	84583.75	After	EH	LinStatic	-78.509	2.304E-08	-2.463E-08
BOBJ1	68	87500.5	Before	EH	LinStatic	-78.509	2.304E-08	-2.464E-08
BOBJ1	69	87500.5	After	EH	LinStatic	-78.509	2.305E-08	-2.464E-08
BOBJ1	70	90417.25	Before	EH	LinStatic	-78.509	2.305E-08	-2.466E-08
BOBJ1	71	90417.25	After	EH	LinStatic	-78.509	2.305E-08	-2.466E-08
BOBJ1	72	93334.	Before	EH	LinStatic	-78.509	2.306E-08	-2.469E-08
BOBJ1	73	93334.	After	EH	LinStatic	-78.509	2.139E-08	-2.467E-08
BOBJ1	74	96250.5	Before	EH	LinStatic	-78.509	2.140E-08	-2.469E-08
BOBJ1	75	96250.5	After	EH	LinStatic	-78.509	2.139E-08	-2.469E-08
BOBJ1	76	99167.	Before	EH	LinStatic	-78.509	2.140E-08	-2.469E-08
BOBJ1	77	99167.	After	EH	LinStatic	-78.509	2.140E-08	-2.469E-08
BOBJ1	78	102083.5	Before	EH	LinStatic	-78.509	2.141E-08	-2.470E-08
BOBJ1	79	102083.5	After	EH	LinStatic	-78.509	2.140E-08	-2.470E-08
BOBJ1	80	105000.	Before	EH	LinStatic	-78.509	2.141E-08	-2.472E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	1	0.	After	LS	LinStatic	-26.302	-3.017E-09	-5.041E-09
BOBJ1	2	2916.75	Before	LS	LinStatic	-26.302	-3.017E-09	-5.015E-09
BOBJ1	3	2916.75	After	LS	LinStatic	-26.302	-3.024E-09	-5.019E-09
BOBJ1	4	5833.5	Before	LS	LinStatic	-26.302	-3.023E-09	-4.982E-09
BOBJ1	5	5833.5	After	LS	LinStatic	-26.302	-3.029E-09	-4.982E-09
BOBJ1	6	8750.25	Before	LS	LinStatic	-26.302	-3.031E-09	-4.942E-09
BOBJ1	7	8750.25	After	LS	LinStatic	-26.302	-3.036E-09	-4.947E-09
BOBJ1	8	11667.	Before	LS	LinStatic	-26.302	-3.038E-09	-4.899E-09
BOBJ1	9	11667.	After	LS	LinStatic	-26.302	-6.487E-09	-4.935E-09
BOBJ1	10	14583.75	Before	LS	LinStatic	-26.302	-6.485E-09	-4.887E-09
BOBJ1	11	14583.75	After	LS	LinStatic	-26.302	-6.492E-09	-4.904E-09
BOBJ1	12	17500.5	Before	LS	LinStatic	-26.302	-6.513E-09	-4.892E-09
BOBJ1	13	17500.5	After	LS	LinStatic	-26.302	-6.523E-09	-4.900E-09
BOBJ1	14	20417.25	Before	LS	LinStatic	-26.302	-6.522E-09	-4.856E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	15	20417.25	After	LS	LinStatic	-26.302	-6.534E-09	-4.857E-09
BOBJ1	16	23334.	Before	LS	LinStatic	-26.302	-6.537E-09	-4.989E-09
BOBJ1	17	23334.	After	LS	LinStatic	-26.302	-1.371E-09	-5.027E-09
BOBJ1	18	26050.5	Before	LS	LinStatic	-26.302	-1.366E-09	-4.243E-09
BOBJ1	19	26050.5	After	LS	LinStatic	-26.302	4.248E-10	-4.150E-09
BOBJ1	20	28767.	Before	LS	LinStatic	-26.302	4.244E-10	-4.196E-09
BOBJ1	21	28767.	After	LS	LinStatic	-26.302	4.219E-10	-4.200E-09
BOBJ1	22	31483.5	Before	LS	LinStatic	-26.302	4.204E-10	-4.124E-09
BOBJ1	23	31483.5	After	LS	LinStatic	-26.302	4.155E-10	-4.105E-09
BOBJ1	24	34200.	Before	LS	LinStatic	-26.302	4.148E-10	-4.034E-09
BOBJ1	25	34200.	After	LS	LinStatic	-1.989E-10	-6.077E-13	-3.932E-12
BOBJ1	26	35000.	Before	LS	LinStatic	-1.658E-10	-8.377E-13	-1.055E-11
BOBJ1	27	35000.	After	LS	LinStatic	-1.471E-11	-1.743E-13	3.093E-13
BOBJ1	28	35800.	Before	LS	LinStatic	-1.731E-11	-4.104E-15	3.861E-13

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	29	35800.	After	LS	LinStatic	-7.023	2.857E-09	-2.022E-10
BOBJ1	30	38516.75	Before	LS	LinStatic	-7.023	2.857E-09	-2.032E-10
BOBJ1	31	38516.75	After	LS	LinStatic	-7.023	2.855E-09	-2.034E-10
BOBJ1	32	41233.5	Before	LS	LinStatic	-7.023	2.856E-09	-2.063E-10
BOBJ1	33	41233.5	After	LS	LinStatic	-7.023	2.856E-09	-2.061E-10
BOBJ1	34	43950.25	Before	LS	LinStatic	-7.023	2.858E-09	-2.065E-10
BOBJ1	35	43950.25	After	LS	LinStatic	-7.023	2.856E-09	-2.066E-10
BOBJ1	36	46667.	Before	LS	LinStatic	-7.023	2.859E-09	-2.069E-10
BOBJ1	37	46667.	After	LS	LinStatic	-7.023	3.871E-09	-2.027E-10
BOBJ1	38	49583.75	Before	LS	LinStatic	-7.023	3.871E-09	-2.061E-10
BOBJ1	39	49583.75	After	LS	LinStatic	-7.023	3.853E-09	-2.050E-10
BOBJ1	40	52500.5	Before	LS	LinStatic	-7.023	3.854E-09	-2.070E-10
BOBJ1	41	52500.5	After	LS	LinStatic	-7.023	3.855E-09	-2.067E-10
BOBJ1	42	55417.25	Before	LS	LinStatic	-7.023	3.855E-09	-2.060E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	43	55417.25	After	LS	LinStatic	-7.023	3.857E-09	-2.061E-10
BOBJ1	44	58334.	Before	LS	LinStatic	-7.023	3.857E-09	-2.074E-10
BOBJ1	45	58334.	After	LS	LinStatic	-7.023	5.182E-11	-2.074E-10
BOBJ1	46	61050.5	Before	LS	LinStatic	-7.023	5.262E-11	-2.092E-10
BOBJ1	47	61050.5	After	LS	LinStatic	-7.023	5.543E-11	-2.087E-10
BOBJ1	48	63767.	Before	LS	LinStatic	-7.023	5.680E-11	-2.104E-10
BOBJ1	49	63767.	After	LS	LinStatic	-7.023	5.659E-11	-2.108E-10
BOBJ1	50	66483.5	Before	LS	LinStatic	-7.023	5.705E-11	-2.124E-10
BOBJ1	51	66483.5	After	LS	LinStatic	-7.023	5.166E-11	-2.119E-10
BOBJ1	52	69200.	Before	LS	LinStatic	-7.023	4.867E-11	-2.137E-10
BOBJ1	53	69200.	After	LS	LinStatic	-6.432E-12	3.127E-13	-6.511E-13
BOBJ1	54	70000.	Before	LS	LinStatic	-8.953E-12	2.889E-13	-3.673E-13
BOBJ1	55	70000.	After	LS	LinStatic	-9.403E-11	-2.980E-12	-4.961E-14
BOBJ1	56	70800.	Before	LS	LinStatic	-1.056E-10	-2.956E-12	1.535E-12

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	57	70800.	After	LS	LinStatic	-43.706	-7.071E-09	-1.369E-08
BOBJ1	58	73516.75	Before	LS	LinStatic	-43.706	-7.071E-09	-1.370E-08
BOBJ1	59	73516.75	After	LS	LinStatic	-43.706	-7.071E-09	-1.370E-08
BOBJ1	60	76233.5	Before	LS	LinStatic	-43.706	-7.065E-09	-1.369E-08
BOBJ1	61	76233.5	After	LS	LinStatic	-43.706	-7.068E-09	-1.369E-08
BOBJ1	62	78950.25	Before	LS	LinStatic	-43.706	-7.068E-09	-1.370E-08
BOBJ1	63	78950.25	After	LS	LinStatic	-43.706	-7.042E-09	-1.369E-08
BOBJ1	64	81667.	Before	LS	LinStatic	-43.706	-7.045E-09	-1.369E-08
BOBJ1	65	81667.	After	LS	LinStatic	-43.706	1.283E-08	-1.369E-08
BOBJ1	66	84583.75	Before	LS	LinStatic	-43.706	1.283E-08	-1.371E-08
BOBJ1	67	84583.75	After	LS	LinStatic	-43.706	1.283E-08	-1.371E-08
BOBJ1	68	87500.5	Before	LS	LinStatic	-43.706	1.283E-08	-1.372E-08
BOBJ1	69	87500.5	After	LS	LinStatic	-43.706	1.283E-08	-1.372E-08
BOBJ1	70	90417.25	Before	LS	LinStatic	-43.706	1.283E-08	-1.372E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	71	90417.25	After	LS	LinStatic	-43.706	1.283E-08	-1.372E-08
BOBJ1	72	93334.	Before	LS	LinStatic	-43.706	1.284E-08	-1.374E-08
BOBJ1	73	93334.	After	LS	LinStatic	-43.706	1.190E-08	-1.373E-08
BOBJ1	74	96250.5	Before	LS	LinStatic	-43.706	1.191E-08	-1.374E-08
BOBJ1	75	96250.5	After	LS	LinStatic	-43.706	1.190E-08	-1.374E-08
BOBJ1	76	99167.	Before	LS	LinStatic	-43.706	1.191E-08	-1.375E-08
BOBJ1	77	99167.	After	LS	LinStatic	-43.706	1.191E-08	-1.375E-08
BOBJ1	78	102083.5	Before	LS	LinStatic	-43.706	1.191E-08	-1.375E-08
BOBJ1	79	102083.5	After	LS	LinStatic	-43.706	1.191E-08	-1.375E-08
BOBJ1	80	105000.	Before	LS	LinStatic	-43.706	1.191E-08	-1.376E-08
BOBJ1	1	0.	After	barrier	LinStatic	-1.893	-195.933	2.865E-09
BOBJ1	2	2916.75	Before	barrier	LinStatic	-1.893	-172.988	2.866E-09
BOBJ1	3	2916.75	After	barrier	LinStatic	-1.893	-161.516	2.865E-09
BOBJ1	4	5833.5	Before	barrier	LinStatic	-1.893	-138.571	2.866E-09
BOBJ1	5	5833.5	After	barrier	LinStatic	-1.893	-127.098	2.866E-09
BOBJ1	6	8750.25	Before	barrier	LinStatic	-1.893	-104.153	2.867E-09
BOBJ1	7	8750.25	After	barrier	LinStatic	-1.893	-92.68	2.867E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	8	11667.	Before	barrier	LinStatic	-1.893	-69.735	2.868E-09
BOBJ1	9	11667.	After	barrier	LinStatic	-1.893	-58.263	1.790E-09
BOBJ1	10	14583.75	Before	barrier	LinStatic	-1.893	-35.318	1.785E-09
BOBJ1	11	14583.75	After	barrier	LinStatic	-1.893	-23.845	1.772E-09
BOBJ1	12	17500.5	Before	barrier	LinStatic	-1.893	-0.9	1.743E-09
BOBJ1	13	17500.5	After	barrier	LinStatic	-1.893	10.573	1.743E-09
BOBJ1	14	20417.25	Before	barrier	LinStatic	-1.893	33.518	1.742E-09
BOBJ1	15	20417.25	After	barrier	LinStatic	-1.893	44.99	1.742E-09
BOBJ1	16	23334.	Before	barrier	LinStatic	-1.893	67.935	1.608E-09
BOBJ1	17	23334.	After	barrier	LinStatic	-1.893	79.014	6.162E-12
BOBJ1	18	26050.5	Before	barrier	LinStatic	-1.893	100.384	-1.362E-10
BOBJ1	19	26050.5	After	barrier	LinStatic	-1.893	111.069	-2.084E-10
BOBJ1	20	28767.	Before	barrier	LinStatic	-1.893	132.439	-2.327E-10
BOBJ1	21	28767.	After	barrier	LinStatic	-1.893	143.123	-2.353E-10
BOBJ1	22	31483.5	Before	barrier	LinStatic	-1.893	164.493	-2.383E-10
BOBJ1	23	31483.5	After	barrier	LinStatic	-1.893	175.178	-2.390E-10
BOBJ1	24	34200.	Before	barrier	LinStatic	-1.893	196.548	-2.426E-10
BOBJ1	25	34200.	After	barrier	LinStatic	3.133E-12	-4.72	4.783E-13

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	26	35000.	Before	barrier	LinStatic	1.855E-12	-4.72	6.268E-13
BOBJ1	27	35000.	After	barrier	LinStatic	1.065E-11	4.72	-2.011E-13
BOBJ1	28	35800.	Before	barrier	LinStatic	1.159E-11	4.72	-4.170E-13
BOBJ1	29	35800.	After	barrier	LinStatic	-1.895	-191.717	1.584E-09
BOBJ1	30	38516.75	Before	barrier	LinStatic	-1.895	-170.345	1.584E-09
BOBJ1	31	38516.75	After	barrier	LinStatic	-1.895	-159.66	1.584E-09
BOBJ1	32	41233.5	Before	barrier	LinStatic	-1.895	-138.288	1.581E-09
BOBJ1	33	41233.5	After	barrier	LinStatic	-1.895	-127.602	1.568E-09
BOBJ1	34	43950.25	Before	barrier	LinStatic	-1.895	-106.23	1.544E-09
BOBJ1	35	43950.25	After	barrier	LinStatic	-1.895	-95.544	1.544E-09
BOBJ1	36	46667.	Before	barrier	LinStatic	-1.895	-74.173	1.487E-09
BOBJ1	37	46667.	After	barrier	LinStatic	-1.895	-63.093	-1.218E-09
BOBJ1	38	49583.75	Before	barrier	LinStatic	-1.895	-40.148	-1.261E-09
BOBJ1	39	49583.75	After	barrier	LinStatic	-1.895	-28.677	-1.286E-09
BOBJ1	40	52500.5	Before	barrier	LinStatic	-1.895	-5.733	-1.290E-09
BOBJ1	41	52500.5	After	barrier	LinStatic	-1.895	5.74	-1.308E-09
BOBJ1	42	55417.25	Before	barrier	LinStatic	-1.895	28.686	-1.308E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	43	55417.25	After	barrier	LinStatic	-1.895	40.16	-1.308E-09
BOBJ1	44	58334.	Before	barrier	LinStatic	-1.895	63.105	-1.308E-09
BOBJ1	45	58334.	After	barrier	LinStatic	-1.895	74.183	-1.320E-09
BOBJ1	46	61050.5	Before	barrier	LinStatic	-1.895	95.553	-1.322E-09
BOBJ1	47	61050.5	After	barrier	LinStatic	-1.895	106.238	-1.321E-09
BOBJ1	48	63767.	Before	barrier	LinStatic	-1.895	127.608	-1.322E-09
BOBJ1	49	63767.	After	barrier	LinStatic	-1.895	138.293	-1.322E-09
BOBJ1	50	66483.5	Before	barrier	LinStatic	-1.895	159.663	-1.323E-09
BOBJ1	51	66483.5	After	barrier	LinStatic	-1.895	170.348	-1.323E-09
BOBJ1	52	69200.	Before	barrier	LinStatic	-1.895	191.717	-1.324E-09
BOBJ1	53	69200.	After	barrier	LinStatic	-1.891E-12	-4.72	-2.285E-13
BOBJ1	54	70000.	Before	barrier	LinStatic	-2.618E-12	-4.72	-1.512E-14
BOBJ1	55	70000.	After	barrier	LinStatic	3.143E-11	4.72	-7.394E-14
BOBJ1	56	70800.	Before	barrier	LinStatic	3.415E-11	4.72	-7.641E-13
BOBJ1	57	70800.	After	barrier	LinStatic	-3.164	-196.547	3.007E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	58	73516.75	Before	barrier	LinStatic	-3.164	-175.176	3.009E-09
BOBJ1	59	73516.75	After	barrier	LinStatic	-3.164	-164.49	3.008E-09
BOBJ1	60	76233.5	Before	barrier	LinStatic	-3.164	-143.118	3.007E-09
BOBJ1	61	76233.5	After	barrier	LinStatic	-3.164	-132.432	3.007E-09
BOBJ1	62	78950.25	Before	barrier	LinStatic	-3.164	-111.06	3.008E-09
BOBJ1	63	78950.25	After	barrier	LinStatic	-3.164	-100.375	3.007E-09
BOBJ1	64	81667.	Before	barrier	LinStatic	-3.164	-79.003	3.009E-09
BOBJ1	65	81667.	After	barrier	LinStatic	-3.164	-67.924	3.006E-09
BOBJ1	66	84583.75	Before	barrier	LinStatic	-3.164	-44.978	3.010E-09
BOBJ1	67	84583.75	After	barrier	LinStatic	-3.164	-33.506	3.010E-09
BOBJ1	68	87500.5	Before	barrier	LinStatic	-3.164	-10.561	3.012E-09
BOBJ1	69	87500.5	After	barrier	LinStatic	-3.164	0.912	3.012E-09
BOBJ1	70	90417.25	Before	barrier	LinStatic	-3.164	23.857	3.014E-09
BOBJ1	71	90417.25	After	barrier	LinStatic	-3.164	35.329	3.014E-09
BOBJ1	72	93334.	Before	barrier	LinStatic	-3.164	58.275	3.017E-09
BOBJ1	73	93334.	After	barrier	LinStatic	-3.164	69.747	-1.150E-10
BOBJ1	74	96250.5	Before	barrier	LinStatic	-3.164	92.69	-1.138E-10
BOBJ1	75	96250.5	After	barrier	LinStatic	-3.164	104.161	-1.133E-10
BOBJ1	76	99167.	Before	barrier	LinStatic	-3.164	127.104	-1.126E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	77	99167.	After	barrier	LinStatic	-3.164	138.576	-1.127E-10
BOBJ1	78	102083.5	Before	barrier	LinStatic	-3.164	161.519	-1.119E-10
BOBJ1	79	102083.5	After	barrier	LinStatic	-3.164	172.991	-1.121E-10
BOBJ1	80	105000.	Before	barrier	LinStatic	-3.164	195.934	-1.111E-10

Table 37: Bridge Object Forces, Part 2 of 3

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	1	0.	After	DEAD	-1.986E-03	-4.376E-05	-15164.16	0.
BOBJ1	2	2916.75	Before	DEAD	-1.986E-03	-1.140E-04	8583855.13	2916.75
BOBJ1	3	2916.75	After	DEAD	-1.986E-03	-1.141E-04	8583855.13	2916.75
BOBJ1	4	5833.5	Before	DEAD	-1.984E-03	-1.844E-04	15653151.78	5833.5
BOBJ1	5	5833.5	After	DEAD	-1.983E-03	-1.845E-04	15653151.78	5833.5
BOBJ1	6	8750.25	Before	DEAD	-1.983E-03	-2.548E-04	21192725.81	8750.25
BOBJ1	7	8750.25	After	DEAD	-1.982E-03	-2.546E-04	21192725.81	8750.25
BOBJ1	8	11667.	Before	DEAD	-1.980E-03	-3.251E-04	25202577.2	11667.
BOBJ1	9	11667.	After	DEAD	-4.278E-04	-6.943E-04	25202577.2	11667.
BOBJ1	10	14583.75	Before	DEAD	-4.271E-04	-7.644E-04	27270751.92	14583.75
BOBJ1	11	14583.75	After	DEAD	-4.273E-04	-7.643E-04	27270751.92	14583.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	12	17500.5	Before	DEAD	-4.253E-04	-8.344E-04	27809204.01	17500.5
BOBJ1	13	17500.5	After	DEAD	-4.227E-04	-8.343E-04	27809204.01	17500.5
BOBJ1	14	20417.25	Before	DEAD	-4.234E-04	-9.043E-04	26817933.47	20417.25
BOBJ1	15	20417.25	After	DEAD	-4.196E-04	-9.043E-04	26817933.47	20417.25
BOBJ1	16	23334.	Before	DEAD	-4.173E-04	-9.742E-04	24296940.3	23334.
BOBJ1	17	23334.	After	DEAD	2.358E-03	-2.256E-04	24296940.3	23334.
BOBJ1	18	26050.5	Before	DEAD	2.361E-03	-2.885E-04	20189562.36	26050.5
BOBJ1	19	26050.5	After	DEAD	2.361E-03	-2.859E-04	20189562.36	26050.5
BOBJ1	20	28767.	Before	DEAD	2.360E-03	-3.520E-04	14755298.16	28767.
BOBJ1	21	28767.	After	DEAD	2.360E-03	-3.520E-04	14755298.16	28767.
BOBJ1	22	31483.5	Before	DEAD	2.358E-03	-4.174E-04	7994147.7	31483.5
BOBJ1	23	31483.5	After	DEAD	2.358E-03	-4.174E-04	7994147.7	31483.5
BOBJ1	24	34200.	Before	DEAD	2.357E-03	-4.826E-04	-93889.02	34200.
BOBJ1	25	34200.	After	DEAD	-6.175E-09	3.298E-07	-57539.26	34200.
BOBJ1	26	35000.	Before	DEAD	-3.969E-09	3.475E-07	4.169E-08	35000.
BOBJ1	27	35000.	After	DEAD	2.783E-08	1.954E-08	1.007E-07	35000.
BOBJ1	28	35800.	Before	DEAD	2.886E-08	2.566E-08	-57539.26	35800.
BOBJ1	29	35800.	After	DEAD	-3.592E-05	-1.689E-04	-104495.9	35800.
BOBJ1	30	38516.75	Before	DEAD	-3.581E-05	-1.652E-04	7773572.4	38516.75
BOBJ1	31	38516.75	After	DEAD	-3.614E-05	-1.653E-04	7773572.4	38516.75
BOBJ1	32	41233.5	Before	DEAD	-3.585E-05	-1.615E-04	14324510.21	41233.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	33	41233.5	After	DEAD	-3.585E-05	-1.616E-04	14324510.21	41233.5
BOBJ1	34	43950.25	Before	DEAD	-3.602E-05	-1.579E-04	19548317.51	43950.25
BOBJ1	35	43950.25	After	DEAD	-3.600E-05	-1.579E-04	19548317.51	43950.25
BOBJ1	36	46667.	Before	DEAD	-3.503E-05	-1.544E-04	23444994.32	46667.
BOBJ1	37	46667.	After	DEAD	1.457E-04	-1.313E-04	23444994.32	46667.
BOBJ1	38	49583.75	Before	DEAD	1.480E-04	-1.288E-04	25739303.7	49583.75
BOBJ1	39	49583.75	After	DEAD	1.490E-04	-1.293E-04	25739303.7	49583.75
BOBJ1	40	52500.5	Before	DEAD	1.494E-04	-1.269E-04	26503890.47	52500.5
BOBJ1	41	52500.5	After	DEAD	1.454E-04	-1.269E-04	26503890.47	52500.5
BOBJ1	42	55417.25	Before	DEAD	1.495E-04	-1.244E-04	25738754.56	55417.25
BOBJ1	43	55417.25	After	DEAD	1.513E-04	-1.242E-04	25738754.56	55417.25
BOBJ1	44	58334.	Before	DEAD	1.523E-04	-1.217E-04	23443896.05	58334.
BOBJ1	45	58334.	After	DEAD	-1.575E-05	1.881E-05	23443896.05	58334.
BOBJ1	46	61050.5	Before	DEAD	-1.801E-05	2.212E-05	19547127.46	61050.5
BOBJ1	47	61050.5	After	DEAD	-1.809E-05	2.175E-05	19547127.46	61050.5
BOBJ1	48	63767.	Before	DEAD	-1.725E-05	2.503E-05	14323472.6	63767.
BOBJ1	49	63767.	After	DEAD	-1.887E-05	2.517E-05	14323472.6	63767.
BOBJ1	50	66483.5	Before	DEAD	-1.836E-05	2.842E-05	7772931.48	66483.5
BOBJ1	51	66483.5	After	DEAD	-1.846E-05	2.820E-05	7772931.48	66483.5
BOBJ1	52	69200.	Before	DEAD	-1.784E-05	3.174E-05	-104495.9	69200.
BOBJ1	53	69200.	After	DEAD	-5.489E-08	-9.839E-08	-57539.26	69200.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	54	70000.	Before	DEAD	-5.818E-08	-8.976E-08	2.130E-07	70000.
BOBJ1	55	70000.	After	DEAD	-4.271E-09	-8.884E-07	-3.595E-08	70000.
BOBJ1	56	70800.	Before	DEAD	-2.273E-08	-8.615E-07	-57539.26	70800.
BOBJ1	57	70800.	After	DEAD	-8.513E-04	1.326E-04	-117977.96	70800.
BOBJ1	58	73516.75	Before	DEAD	-8.514E-04	4.856E-05	7970719.6	73516.75
BOBJ1	59	73516.75	After	DEAD	-8.513E-04	4.891E-05	7970719.6	73516.75
BOBJ1	60	76233.5	Before	DEAD	-8.504E-04	-3.479E-05	14732286.66	76233.5
BOBJ1	61	76233.5	After	DEAD	-8.511E-04	-3.545E-05	14732286.66	76233.5
BOBJ1	62	78950.25	Before	DEAD	-8.518E-04	-1.191E-04	20166723.22	78950.25
BOBJ1	63	78950.25	After	DEAD	-8.548E-04	-1.195E-04	20166723.22	78950.25
BOBJ1	64	81667.	Before	DEAD	-8.554E-04	-2.032E-04	24274029.29	81667.
BOBJ1	65	81667.	After	DEAD	-8.564E-04	-2.034E-04	24274029.29	81667.
BOBJ1	66	84583.75	Before	DEAD	-8.533E-04	-2.936E-04	26794473.91	84583.75
BOBJ1	67	84583.75	After	DEAD	-8.517E-04	-2.937E-04	26794473.91	84583.75
BOBJ1	68	87500.5	Before	DEAD	-8.493E-04	-3.843E-04	27785195.9	87500.5
BOBJ1	69	87500.5	After	DEAD	-8.514E-04	-3.846E-04	27785195.9	87500.5
BOBJ1	70	90417.25	Before	DEAD	-8.513E-04	-4.750E-04	27246195.25	90417.25
BOBJ1	71	90417.25	After	DEAD	-8.496E-04	-4.751E-04	27246195.25	90417.25
BOBJ1	72	93334.	Before	DEAD	-8.482E-04	-5.657E-04	25177471.98	93334.
BOBJ1	73	93334.	After	DEAD	1.460E-03	-1.490E-04	25177471.98	93334.
BOBJ1	74	96250.5	Before	DEAD	1.459E-03	-2.298E-04	21167481.33	96250.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	75	96250.5	After	DEAD	1.458E-03	-2.300E-04	21167481.33	96250.5
BOBJ1	76	99167.	Before	DEAD	1.454E-03	-3.109E-04	15628030.26	99167.
BOBJ1	77	99167.	After	DEAD	1.453E-03	-3.111E-04	15628030.26	99167.
BOBJ1	78	102083.5	Before	DEAD	1.450E-03	-3.924E-04	8559118.79	102083.5
BOBJ1	79	102083.5	After	DEAD	1.450E-03	-3.920E-04	8559118.79	102083.5
BOBJ1	80	105000.	Before	DEAD	1.449E-03	-4.732E-04	-39253.1	105000.
BOBJ1	1	0.	After	DW	-105701.17	-879.84	-3368.31	0.
BOBJ1	2	2916.75	Before	DW	-93290.4	-881.2	578657.21	2916.75
BOBJ1	3	2916.75	After	DW	-87085.02	-881.2	578657.21	2916.75
BOBJ1	4	5833.5	Before	DW	-74674.25	-882.55	1052085.38	5833.5
BOBJ1	5	5833.5	After	DW	-68468.86	-882.55	1052085.38	5833.5
BOBJ1	6	8750.25	Before	DW	-56058.09	-883.91	1416916.19	8750.25
BOBJ1	7	8750.25	After	DW	-49852.7	-883.91	1416916.19	8750.25
BOBJ1	8	11667.	Before	DW	-37441.93	-885.27	1673149.65	11667.
BOBJ1	9	11667.	After	DW	-31236.55	-885.27	1673149.65	11667.
BOBJ1	10	14583.75	Before	DW	-18825.78	-886.63	1820785.77	14583.75
BOBJ1	11	14583.75	After	DW	-12620.39	-886.63	1820785.77	14583.75
BOBJ1	12	17500.5	Before	DW	-209.62	-887.99	1859824.53	17500.5
BOBJ1	13	17500.5	After	DW	5995.77	-887.99	1859824.53	17500.5
BOBJ1	14	20417.25	Before	DW	18406.54	-889.35	1790265.94	20417.25
BOBJ1	15	20417.25	After	DW	24611.92	-889.35	1790265.94	20417.25
BOBJ1	16	23334.	Before	DW	37022.69	-890.71	1612110.	23334.
BOBJ1	17	23334.	After	DW	43015.06	-890.71	1612110.	23334.
BOBJ1	18	26050.5	Before	DW	54573.77	-891.98	1348515.75	26050.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	19	26050.5	After	DW	60353.13	-891.98	1348515.75	26050.5
BOBJ1	20	28767.	Before	DW	71911.83	-893.24	990723.82	28767.
BOBJ1	21	28767.	After	DW	77691.19	-893.24	990723.82	28767.
BOBJ1	22	31483.5	Before	DW	89249.89	-894.51	538734.2	31483.5
BOBJ1	23	31483.5	After	DW	95029.25	-894.51	538734.2	31483.5
BOBJ1	24	34200.	Before	DW	106587.96	-895.77	-7453.11	34200.
BOBJ1	25	34200.	After	DW	-2553.	1.154E-08	-4084.8	34200.
BOBJ1	26	35000.	Before	DW	-2553.	1.249E-08	8.045E-09	35000.
BOBJ1	27	35000.	After	DW	2553.	5.623E-09	2.028E-09	35000.
BOBJ1	28	35800.	Before	DW	2553.	6.916E-09	-4084.8	35800.
BOBJ1	29	35800.	After	DW	-103680.89	-851.92	-7471.07	35800.
BOBJ1	30	38516.75	Before	DW	-92121.11	-903.66	524566.47	38516.75
BOBJ1	31	38516.75	After	DW	-86341.23	-903.66	524566.47	38516.75
BOBJ1	32	41233.5	Before	DW	-74781.46	-955.4	962388.97	41233.5
BOBJ1	33	41233.5	After	DW	-69001.57	-955.4	962388.97	41233.5
BOBJ1	34	43950.25	Before	DW	-57441.8	-1007.13	1305996.45	43950.25
BOBJ1	35	43950.25	After	DW	-51661.91	-1007.13	1305996.45	43950.25
BOBJ1	36	46667.	Before	DW	-40102.14	-1058.87	1555388.91	46667.
BOBJ1	37	46667.	After	DW	-34109.51	-1058.87	1555388.91	46667.
BOBJ1	38	49583.75	Before	DW	-21698.74	-1114.42	1718266.86	49583.75
BOBJ1	39	49583.75	After	DW	-15493.88	-1114.42	1718266.86	49583.75
BOBJ1	40	52500.5	Before	DW	-3083.64	-1169.97	1772547.46	52500.5
BOBJ1	41	52500.5	After	DW	3121.74	-1169.97	1772541.26	52500.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	42	55417.25	Before	DW	15533.05	-1225.52	1718224.51	55417.25
BOBJ1	43	55417.25	After	DW	21738.96	-1225.52	1718224.51	55417.25
BOBJ1	44	58334.	Before	DW	34149.73	-1281.06	1555310.4	58334.
BOBJ1	45	58334.	After	DW	40142.1	-1281.06	1555310.4	58334.
BOBJ1	46	61050.5	Before	DW	51700.81	-1332.8	1305911.57	61050.5
BOBJ1	47	61050.5	After	DW	57480.17	-1332.8	1305911.57	61050.5
BOBJ1	48	63767.	Before	DW	69038.87	-1384.53	962315.04	63767.
BOBJ1	49	63767.	After	DW	74818.23	-1384.53	962315.04	63767.
BOBJ1	50	66483.5	Before	DW	86376.93	-1436.26	524520.83	66483.5
BOBJ1	51	66483.5	After	DW	92156.29	-1436.26	524520.83	66483.5
BOBJ1	52	69200.	Before	DW	103715.	-1488.	-7471.07	69200.
BOBJ1	53	69200.	After	DW	-2553.	-2.058E-08	-4084.8	69200.
BOBJ1	54	70000.	Before	DW	-2553.	-1.952E-08	1.121E-08	70000.
BOBJ1	55	70000.	After	DW	2553.	-1.467E-08	-2.294E-09	70000.
BOBJ1	56	70800.	Before	DW	2553.	-1.384E-08	-4084.8	70800.
BOBJ1	57	70800.	After	DW	-107821.97	-14064.71	-9679.58	70800.
BOBJ1	58	73516.75	Before	DW	-96262.2	-13030.69	536553.66	73516.75
BOBJ1	59	73516.75	After	DW	-90482.31	-13030.69	536553.66	73516.75
BOBJ1	60	76233.5	Before	DW	-78922.54	-11996.67	988571.87	76233.5
BOBJ1	61	76233.5	After	DW	-73142.65	-11996.67	988571.87	76233.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	62	78950.25	Before	DW	-61582.88	-10962.64	1346375.06	78950.25
BOBJ1	63	78950.25	After	DW	-55803.	-10962.64	1346375.06	78950.25
BOBJ1	64	81667.	Before	DW	-44243.23	-9928.62	1609963.22	81667.
BOBJ1	65	81667.	After	DW	-38250.59	-9928.62	1609963.22	81667.
BOBJ1	66	84583.75	Before	DW	-25839.82	-8818.48	1788081.93	84583.75
BOBJ1	67	84583.75	After	DW	-19634.43	-8818.48	1788081.93	84583.75
BOBJ1	68	87500.5	Before	DW	-7223.66	-7708.34	1857603.28	87500.5
BOBJ1	69	87500.5	After	DW	-1018.28	-7708.34	1857603.28	87500.5
BOBJ1	70	90417.25	Before	DW	11392.49	-6598.19	1818527.29	90417.25
BOBJ1	71	90417.25	After	DW	17597.88	-6598.19	1818527.29	90417.25
BOBJ1	72	93334.	Before	DW	30008.65	-5488.05	1670853.95	93334.
BOBJ1	73	93334.	After	DW	36213.77	-5488.05	1670853.95	93334.
BOBJ1	74	96250.5	Before	DW	48623.48	-4378.	1414609.87	96250.5
BOBJ1	75	96250.5	After	DW	54828.33	-4378.	1414609.87	96250.5
BOBJ1	76	99167.	Before	DW	67238.04	-3267.96	1049787.06	99167.
BOBJ1	77	99167.	After	DW	73442.89	-3267.96	1049787.06	99167.
BOBJ1	78	102083.5	Before	DW	85852.6	-2157.91	576385.51	102083.5
BOBJ1	79	102083.5	After	DW	92057.45	-2157.91	576385.51	102083.5
BOBJ1	80	105000.	Before	DW	104467.16	-1047.86	-5594.77	105000.
BOBJ1	1	0.	After	WL	-1662.7	-4952.56	-1.274E-06	0.
BOBJ1	2	2916.75	Before	WL	-1662.7	-4088.56	5.112E-06	2916.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	3	2916.75	After	WL	-1662.7	-4088.56	5.109E-06	2916.75
BOBJ1	4	5833.5	Before	WL	-1662.7	-3224.56	1.150E-05	5833.5
BOBJ1	5	5833.5	After	WL	-1662.7	-3224.56	1.149E-05	5833.5
BOBJ1	6	8750.25	Before	WL	-1662.7	-2360.57	1.788E-05	8750.25
BOBJ1	7	8750.25	After	WL	-1662.7	-2360.57	1.788E-05	8750.25
BOBJ1	8	11667.	Before	WL	-1662.7	-1496.57	2.427E-05	11667.
BOBJ1	9	11667.	After	WL	-1662.7	-1496.57	1.387E-05	11667.
BOBJ1	10	14583.75	Before	WL	-1662.7	-632.57	1.793E-05	14583.75
BOBJ1	11	14583.75	After	WL	-1662.7	-632.57	1.800E-05	14583.75
BOBJ1	12	17500.5	Before	WL	-1662.7	231.42	2.235E-05	17500.5
BOBJ1	13	17500.5	After	WL	-1662.7	231.42	2.234E-05	17500.5
BOBJ1	14	20417.25	Before	WL	-1662.7	1095.42	2.651E-05	20417.25
BOBJ1	15	20417.25	After	WL	-1662.7	1095.42	2.651E-05	20417.25
BOBJ1	16	23334.	Before	WL	-1662.7	1959.42	3.150E-05	23334.
BOBJ1	17	23334.	After	WL	-1662.7	1959.42	1.079E-05	23334.
BOBJ1	18	26050.5	Before	WL	-1662.7	2764.1	9.136E-06	26050.5
BOBJ1	19	26050.5	After	WL	-1662.7	2764.1	8.590E-06	26050.5
BOBJ1	20	28767.	Before	WL	-1662.7	3568.77	9.534E-06	28767.
BOBJ1	21	28767.	After	WL	-1662.7	3568.77	9.485E-06	28767.
BOBJ1	22	31483.5	Before	WL	-1662.7	4373.45	1.047E-05	31483.5
BOBJ1	23	31483.5	After	WL	-1662.7	4373.45	1.046E-05	31483.5
BOBJ1	24	34200.	Before	WL	-1662.7	5178.13	1.146E-05	34200.
BOBJ1	25	34200.	After	WL	-1.626E-08	5.764E-08	7.936E-09	34200.
BOBJ1	26	35000.	Before	WL	2.834E-08	6.827E-08	1.593E-09	35000.
BOBJ1	27	35000.	After	WL	1.820E-08	-3.287E-09	2.908E-09	35000.
BOBJ1	28	35800.	Before	WL	6.984E-08	1.216E-10	1.295E-09	35800.
BOBJ1	29	35800.	After	WL	6.35	473.59	-1.407E-06	35800.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	30	38516.75	Before	WL	6.35	748.26	-1.789E-06	38516.75
BOBJ1	31	38516.75	After	WL	6.35	748.26	-1.767E-06	38516.75
BOBJ1	32	41233.5	Before	WL	6.35	1022.94	-2.093E-06	41233.5
BOBJ1	33	41233.5	After	WL	6.35	1022.94	-2.441E-06	41233.5
BOBJ1	34	43950.25	Before	WL	6.35	1297.62	-2.220E-06	43950.25
BOBJ1	35	43950.25	After	WL	6.35	1297.62	-2.223E-06	43950.25
BOBJ1	36	46667.	Before	WL	6.35	1572.29	-1.959E-06	46667.
BOBJ1	37	46667.	After	WL	6.35	1572.29	-2.122E-06	46667.
BOBJ1	38	49583.75	Before	WL	6.35	1867.19	-1.681E-06	49583.75
BOBJ1	39	49583.75	After	WL	6.35	1867.19	-2.028E-06	49583.75
BOBJ1	40	52500.5	Before	WL	6.35	2162.09	-1.705E-06	52500.5
BOBJ1	41	52500.5	After	WL	6.35	2162.09	-2.289E-06	52500.5
BOBJ1	42	55417.25	Before	WL	6.35	2456.99	-2.489E-06	55417.25
BOBJ1	43	55417.25	After	WL	6.35	2456.99	-2.489E-06	55417.25
BOBJ1	44	58334.	Before	WL	6.35	2751.88	-2.682E-06	58334.
BOBJ1	45	58334.	After	WL	6.35	2751.88	-2.492E-06	58334.
BOBJ1	46	61050.5	Before	WL	6.35	3026.54	-2.448E-06	61050.5
BOBJ1	47	61050.5	After	WL	6.35	3026.54	-2.450E-06	61050.5
BOBJ1	48	63767.	Before	WL	6.35	3301.19	-2.409E-06	63767.
BOBJ1	49	63767.	After	WL	6.35	3301.19	-2.410E-06	63767.
BOBJ1	50	66483.5	Before	WL	6.35	3575.84	-2.366E-06	66483.5
BOBJ1	51	66483.5	After	WL	6.35	3575.84	-2.425E-06	66483.5
BOBJ1	52	69200.	Before	WL	6.35	3850.49	-2.317E-06	69200.
BOBJ1	53	69200.	After	WL	-5.832E-08	-4.366E-08	4.858E-09	69200.
BOBJ1	54	70000.	Before	WL	-9.045E-09	1.369E-09	-3.465E-10	70000.
BOBJ1	55	70000.	After	WL	1.065E-10	1.787E-08	4.973E-09	70000.
BOBJ1	56	70800.	Before	WL	4.311E-08	3.862E-08	3.226E-09	70800.
BOBJ1	57	70800.	After	WL	8425.5	82854.41	-2.871E-05	70800.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	58	73516.75	Before	WL	8425.5	75962.74	-2.428E-05	73516.75
BOBJ1	59	73516.75	After	WL	8425.5	75962.74	-2.428E-05	73516.75
BOBJ1	60	76233.5	Before	WL	8425.5	69071.07	-1.988E-05	76233.5
BOBJ1	61	76233.5	After	WL	8425.5	69071.07	-1.988E-05	76233.5
BOBJ1	62	78950.25	Before	WL	8425.5	62179.4	-1.546E-05	78950.25
BOBJ1	63	78950.25	After	WL	8425.5	62179.4	-1.547E-05	78950.25
BOBJ1	64	81667.	Before	WL	8425.5	55287.73	-1.109E-05	81667.
BOBJ1	65	81667.	After	WL	8425.5	55287.73	-1.108E-05	81667.
BOBJ1	66	84583.75	Before	WL	8425.5	47888.71	-6.329E-06	84583.75
BOBJ1	67	84583.75	After	WL	8425.5	47888.71	-6.327E-06	84583.75
BOBJ1	68	87500.5	Before	WL	8425.5	40489.69	-1.594E-06	87500.5
BOBJ1	69	87500.5	After	WL	8425.5	40489.69	-1.589E-06	87500.5
BOBJ1	70	90417.25	Before	WL	8425.5	33090.68	3.143E-06	90417.25
BOBJ1	71	90417.25	After	WL	8425.5	33090.68	3.143E-06	90417.25
BOBJ1	72	93334.	Before	WL	8425.5	25691.66	7.887E-06	93334.
BOBJ1	73	93334.	After	WL	8425.5	25691.66	1.025E-05	93334.
BOBJ1	74	96250.5	Before	WL	8425.5	18293.28	1.171E-05	96250.5
BOBJ1	75	96250.5	After	WL	8425.5	18293.28	1.170E-05	96250.5
BOBJ1	76	99167.	Before	WL	8425.5	10894.89	1.316E-05	99167.
BOBJ1	77	99167.	After	WL	8425.5	10894.89	1.315E-05	99167.
BOBJ1	78	102083.5	Before	WL	8425.5	3496.51	1.462E-05	102083.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	79	102083.5	After	WL	8425.5	3496.51	1.461E-05	102083.5
BOBJ1	80	105000.	Before	WL	8425.5	-3901.87	1.608E-05	105000.
BOBJ1	1	0.	After	EH	1.788E-04	8.467E-06	-78231.64	0.
BOBJ1	2	2916.75	Before	EH	1.788E-04	3.414E-05	-78231.64	2916.75
BOBJ1	3	2916.75	After	EH	1.788E-04	3.411E-05	-78231.64	2916.75
BOBJ1	4	5833.5	Before	EH	1.788E-04	6.028E-05	-78231.64	5833.5
BOBJ1	5	5833.5	After	EH	1.788E-04	5.954E-05	-78231.64	5833.5
BOBJ1	6	8750.25	Before	EH	1.789E-04	8.508E-05	-78231.64	8750.25
BOBJ1	7	8750.25	After	EH	1.789E-04	8.494E-05	-78231.64	8750.25
BOBJ1	8	11667.	Before	EH	1.789E-04	1.105E-04	-78231.64	11667.
BOBJ1	9	11667.	After	EH	1.741E-04	3.885E-04	-78231.64	11667.
BOBJ1	10	14583.75	Before	EH	1.742E-04	4.144E-04	-78231.64	14583.75
BOBJ1	11	14583.75	After	EH	1.742E-04	4.137E-04	-78231.64	14583.75
BOBJ1	12	17500.5	Before	EH	1.743E-04	4.399E-04	-78231.64	17500.5
BOBJ1	13	17500.5	After	EH	1.742E-04	4.399E-04	-78231.64	17500.5
BOBJ1	14	20417.25	Before	EH	1.743E-04	4.659E-04	-78231.64	20417.25
BOBJ1	15	20417.25	After	EH	1.742E-04	4.648E-04	-78231.64	20417.25
BOBJ1	16	23334.	Before	EH	1.741E-04	4.909E-04	-78231.64	23334.
BOBJ1	17	23334.	After	EH	1.599E-04	-2.235E-04	-78231.64	23334.
BOBJ1	18	26050.5	Before	EH	1.609E-04	-2.010E-04	-78231.64	26050.5
BOBJ1	19	26050.5	After	EH	1.525E-04	-1.710E-04	-78231.64	26050.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	20	28767.	Before	EH	1.525E-04	-1.483E-04	-78231.64	28767.
BOBJ1	21	28767.	After	EH	1.525E-04	-1.487E-04	-78231.64	28767.
BOBJ1	22	31483.5	Before	EH	1.526E-04	-1.277E-04	-78231.64	31483.5
BOBJ1	23	31483.5	After	EH	1.526E-04	-1.277E-04	-78231.64	31483.5
BOBJ1	24	34200.	Before	EH	1.527E-04	-1.083E-04	-78231.64	34200.
BOBJ1	25	34200.	After	EH	8.773E-10	2.004E-07	4.337E-07	34200.
BOBJ1	26	35000.	Before	EH	-8.843E-09	2.414E-07	3.246E-07	35000.
BOBJ1	27	35000.	After	EH	8.281E-10	-7.483E-08	1.324E-08	35000.
BOBJ1	28	35800.	Before	EH	5.784E-10	-7.622E-08	1.621E-08	35800.
BOBJ1	29	35800.	After	EH	-3.130E-06	-1.015E-05	-20888.04	35800.
BOBJ1	30	38516.75	Before	EH	-3.134E-06	-9.144E-06	-20888.04	38516.75
BOBJ1	31	38516.75	After	EH	-3.136E-06	-9.130E-06	-20888.04	38516.75
BOBJ1	32	41233.5	Before	EH	-3.134E-06	-8.088E-06	-20888.04	41233.5
BOBJ1	33	41233.5	After	EH	-3.132E-06	-8.083E-06	-20888.04	41233.5
BOBJ1	34	43950.25	Before	EH	-3.137E-06	-7.058E-06	-20888.04	43950.25
BOBJ1	35	43950.25	After	EH	-3.139E-06	-7.053E-06	-20888.04	43950.25
BOBJ1	36	46667.	Before	EH	-3.130E-06	-6.011E-06	-20888.04	46667.
BOBJ1	37	46667.	After	EH	-1.826E-06	3.413E-05	-20888.04	46667.
BOBJ1	38	49583.75	Before	EH	-1.816E-06	3.524E-05	-20888.04	49583.75
BOBJ1	39	49583.75	After	EH	-1.903E-06	3.525E-05	-20888.04	49583.75
BOBJ1	40	52500.5	Before	EH	-1.902E-06	3.636E-05	-20888.04	52500.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	41	52500.5	After	EH	-1.927E-06	3.641E-05	-20888.04	52500.5
BOBJ1	42	55417.25	Before	EH	-1.896E-06	3.753E-05	-20888.04	55417.25
BOBJ1	43	55417.25	After	EH	-1.882E-06	3.752E-05	-20888.04	55417.25
BOBJ1	44	58334.	Before	EH	-1.879E-06	3.866E-05	-20888.04	58334.
BOBJ1	45	58334.	After	EH	-3.381E-06	5.631E-05	-20888.04	58334.
BOBJ1	46	61050.5	Before	EH	-3.400E-06	5.731E-05	-20888.04	61050.5
BOBJ1	47	61050.5	After	EH	-3.412E-06	5.728E-05	-20888.04	61050.5
BOBJ1	48	63767.	Before	EH	-3.400E-06	5.829E-05	-20888.04	63767.
BOBJ1	49	63767.	After	EH	-3.425E-06	5.831E-05	-20888.04	63767.
BOBJ1	50	66483.5	Before	EH	-3.421E-06	5.934E-05	-20888.04	66483.5
BOBJ1	51	66483.5	After	EH	-3.382E-06	5.923E-05	-20888.04	66483.5
BOBJ1	52	69200.	Before	EH	-3.364E-06	6.031E-05	-20888.04	69200.
BOBJ1	53	69200.	After	EH	7.140E-09	-7.901E-09	1.018E-09	69200.
BOBJ1	54	70000.	Before	EH	7.151E-09	-5.916E-09	7.416E-09	70000.
BOBJ1	55	70000.	After	EH	5.693E-09	7.878E-08	4.953E-08	70000.
BOBJ1	56	70800.	Before	EH	4.544E-09	8.674E-08	6.052E-08	70800.
BOBJ1	57	70800.	After	EH	6.974E-07	-2.332E-05	-129997.34	70800.
BOBJ1	58	73516.75	Before	EH	7.165E-07	4.345E-05	-129997.34	73516.75
BOBJ1	59	73516.75	After	EH	6.990E-07	4.346E-05	-129997.34	73516.75
BOBJ1	60	76233.5	Before	EH	6.867E-07	1.102E-04	-129997.34	76233.5
BOBJ1	61	76233.5	After	EH	6.887E-07	1.103E-04	-129997.34	76233.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	62	78950.25	Before	EH	7.064E-07	1.770E-04	-129997.34	78950.25
BOBJ1	63	78950.25	After	EH	4.995E-07	1.786E-04	-129997.34	78950.25
BOBJ1	64	81667.	Before	EH	4.966E-07	2.452E-04	-129997.34	81667.
BOBJ1	65	81667.	After	EH	5.049E-07	2.454E-04	-129997.34	81667.
BOBJ1	66	84583.75	Before	EH	4.437E-07	3.170E-04	-129997.34	84583.75
BOBJ1	67	84583.75	After	EH	4.442E-07	3.172E-04	-129997.34	84583.75
BOBJ1	68	87500.5	Before	EH	4.105E-07	3.890E-04	-129997.34	87500.5
BOBJ1	69	87500.5	After	EH	4.253E-07	3.891E-04	-129997.34	87500.5
BOBJ1	70	90417.25	Before	EH	4.182E-07	4.610E-04	-129997.34	90417.25
BOBJ1	71	90417.25	After	EH	4.045E-07	4.608E-04	-129997.34	90417.25
BOBJ1	72	93334.	Before	EH	3.695E-07	5.329E-04	-129997.34	93334.
BOBJ1	73	93334.	After	EH	-1.990E-05	3.602E-04	-129997.34	93334.
BOBJ1	74	96250.5	Before	EH	-1.991E-05	4.321E-04	-129997.34	96250.5
BOBJ1	75	96250.5	After	EH	-1.991E-05	4.320E-04	-129997.34	96250.5
BOBJ1	76	99167.	Before	EH	-1.987E-05	5.040E-04	-129997.34	99167.
BOBJ1	77	99167.	After	EH	-1.986E-05	5.041E-04	-129997.34	99167.
BOBJ1	78	102083.5	Before	EH	-1.985E-05	5.762E-04	-129997.34	102083.5
BOBJ1	79	102083.5	After	EH	-1.985E-05	5.761E-04	-129997.34	102083.5
BOBJ1	80	105000.	Before	EH	-1.985E-05	6.483E-04	-129997.34	105000.
BOBJ1	1	0.	After	LS	9.952E-05	4.556E-06	-43551.72	0.
BOBJ1	2	2916.75	Before	LS	9.953E-05	1.927E-05	-43551.72	2916.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	3	2916.75	After	LS	9.955E-05	1.873E-05	-43551.72	2916.75
BOBJ1	4	5833.5	Before	LS	9.958E-05	3.344E-05	-43551.72	5833.5
BOBJ1	5	5833.5	After	LS	9.958E-05	3.335E-05	-43551.72	5833.5
BOBJ1	6	8750.25	Before	LS	9.961E-05	4.736E-05	-43551.72	8750.25
BOBJ1	7	8750.25	After	LS	9.959E-05	4.720E-05	-43551.72	8750.25
BOBJ1	8	11667.	Before	LS	9.962E-05	6.145E-05	-43551.72	11667.
BOBJ1	9	11667.	After	LS	9.693E-05	2.164E-04	-43551.72	11667.
BOBJ1	10	14583.75	Before	LS	9.697E-05	2.307E-04	-43551.72	14583.75
BOBJ1	11	14583.75	After	LS	9.697E-05	2.302E-04	-43551.72	14583.75
BOBJ1	12	17500.5	Before	LS	9.700E-05	2.448E-04	-43551.72	17500.5
BOBJ1	13	17500.5	After	LS	9.698E-05	2.449E-04	-43551.72	17500.5
BOBJ1	14	20417.25	Before	LS	9.701E-05	2.596E-04	-43551.72	20417.25
BOBJ1	15	20417.25	After	LS	9.699E-05	2.586E-04	-43551.72	20417.25
BOBJ1	16	23334.	Before	LS	9.689E-05	2.733E-04	-43551.72	23334.
BOBJ1	17	23334.	After	LS	8.901E-05	-1.246E-04	-43551.72	23334.
BOBJ1	18	26050.5	Before	LS	8.959E-05	-1.118E-04	-43551.72	26050.5
BOBJ1	19	26050.5	After	LS	8.488E-05	-9.537E-05	-43551.72	26050.5
BOBJ1	20	28767.	Before	LS	8.486E-05	-8.265E-05	-43551.72	28767.
BOBJ1	21	28767.	After	LS	8.486E-05	-8.269E-05	-43551.72	28767.
BOBJ1	22	31483.5	Before	LS	8.493E-05	-7.137E-05	-43551.72	31483.5
BOBJ1	23	31483.5	After	LS	8.496E-05	-7.114E-05	-43551.72	31483.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	24	34200.	Before	LS	8.502E-05	-6.009E-05	-43551.72	34200.
BOBJ1	25	34200.	After	LS	2.228E-08	-1.523E-07	1.507E-07	34200.
BOBJ1	26	35000.	Before	LS	1.783E-08	-1.220E-07	1.166E-07	35000.
BOBJ1	27	35000.	After	LS	-5.117E-10	-1.978E-08	1.853E-08	35000.
BOBJ1	28	35800.	Before	LS	-7.585E-10	-2.217E-08	2.152E-08	35800.
BOBJ1	29	35800.	After	LS	-1.744E-06	-5.640E-06	-11628.41	35800.
BOBJ1	30	38516.75	Before	LS	-1.745E-06	-5.098E-06	-11628.41	38516.75
BOBJ1	31	38516.75	After	LS	-1.745E-06	-5.066E-06	-11628.41	38516.75
BOBJ1	32	41233.5	Before	LS	-1.743E-06	-4.499E-06	-11628.41	41233.5
BOBJ1	33	41233.5	After	LS	-1.745E-06	-4.498E-06	-11628.41	41233.5
BOBJ1	34	43950.25	Before	LS	-1.746E-06	-3.917E-06	-11628.41	43950.25
BOBJ1	35	43950.25	After	LS	-1.748E-06	-3.917E-06	-11628.41	43950.25
BOBJ1	36	46667.	Before	LS	-1.746E-06	-3.360E-06	-11628.41	46667.
BOBJ1	37	46667.	After	LS	-1.017E-06	1.901E-05	-11628.41	46667.
BOBJ1	38	49583.75	Before	LS	-1.013E-06	1.964E-05	-11628.41	49583.75
BOBJ1	39	49583.75	After	LS	-1.056E-06	1.962E-05	-11628.41	49583.75
BOBJ1	40	52500.5	Before	LS	-1.055E-06	2.024E-05	-11628.41	52500.5
BOBJ1	41	52500.5	After	LS	-1.072E-06	2.029E-05	-11628.41	52500.5
BOBJ1	42	55417.25	Before	LS	-1.056E-06	2.090E-05	-11628.41	55417.25
BOBJ1	43	55417.25	After	LS	-1.049E-06	2.088E-05	-11628.41	55417.25
BOBJ1	44	58334.	Before	LS	-1.045E-06	2.153E-05	-11628.41	58334.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	45	58334.	After	LS	-1.887E-06	3.136E-05	-11628.41	58334.
BOBJ1	46	61050.5	Before	LS	-1.899E-06	3.192E-05	-11628.41	61050.5
BOBJ1	47	61050.5	After	LS	-1.899E-06	3.189E-05	-11628.41	61050.5
BOBJ1	48	63767.	Before	LS	-1.895E-06	3.244E-05	-11628.41	63767.
BOBJ1	49	63767.	After	LS	-1.906E-06	3.247E-05	-11628.41	63767.
BOBJ1	50	66483.5	Before	LS	-1.906E-06	3.305E-05	-11628.41	66483.5
BOBJ1	51	66483.5	After	LS	-1.883E-06	3.298E-05	-11628.41	66483.5
BOBJ1	52	69200.	Before	LS	-1.877E-06	3.357E-05	-11628.41	69200.
BOBJ1	53	69200.	After	LS	-1.241E-09	5.576E-08	-1.260E-08	69200.
BOBJ1	54	70000.	Before	LS	-1.097E-09	5.732E-08	-1.498E-08	70000.
BOBJ1	55	70000.	After	LS	-4.420E-09	9.981E-08	1.128E-08	70000.
BOBJ1	56	70800.	Before	LS	-3.203E-09	9.370E-08	2.058E-08	70800.
BOBJ1	57	70800.	After	LS	3.936E-07	-1.292E-05	-72369.79	70800.
BOBJ1	58	73516.75	Before	LS	4.000E-07	2.425E-05	-72369.79	73516.75
BOBJ1	59	73516.75	After	LS	3.950E-07	2.426E-05	-72369.79	73516.75
BOBJ1	60	76233.5	Before	LS	3.882E-07	6.146E-05	-72369.79	76233.5
BOBJ1	61	76233.5	After	LS	3.973E-07	6.144E-05	-72369.79	76233.5
BOBJ1	62	78950.25	Before	LS	4.007E-07	9.856E-05	-72369.79	78950.25
BOBJ1	63	78950.25	After	LS	2.907E-07	9.950E-05	-72369.79	78950.25
BOBJ1	64	81667.	Before	LS	2.898E-07	1.366E-04	-72369.79	81667.
BOBJ1	65	81667.	After	LS	2.983E-07	1.366E-04	-72369.79	81667.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	66	84583.75	Before	LS	2.647E-07	1.766E-04	-72369.79	84583.75
BOBJ1	67	84583.75	After	LS	2.426E-07	1.766E-04	-72369.79	84583.75
BOBJ1	68	87500.5	Before	LS	2.230E-07	2.166E-04	-72369.79	87500.5
BOBJ1	69	87500.5	After	LS	2.406E-07	2.166E-04	-72369.79	87500.5
BOBJ1	70	90417.25	Before	LS	2.405E-07	2.567E-04	-72369.79	90417.25
BOBJ1	71	90417.25	After	LS	2.246E-07	2.566E-04	-72369.79	90417.25
BOBJ1	72	93334.	Before	LS	2.079E-07	2.967E-04	-72369.79	93334.
BOBJ1	73	93334.	After	LS	-1.108E-05	2.006E-04	-72369.79	93334.
BOBJ1	74	96250.5	Before	LS	-1.108E-05	2.406E-04	-72369.79	96250.5
BOBJ1	75	96250.5	After	LS	-1.107E-05	2.406E-04	-72369.79	96250.5
BOBJ1	76	99167.	Before	LS	-1.106E-05	2.806E-04	-72369.79	99167.
BOBJ1	77	99167.	After	LS	-1.105E-05	2.807E-04	-72369.79	99167.
BOBJ1	78	102083.5	Before	LS	-1.104E-05	3.208E-04	-72369.79	102083.5
BOBJ1	79	102083.5	After	LS	-1.104E-05	3.207E-04	-72369.79	102083.5
BOBJ1	80	105000.	Before	LS	-1.104E-05	3.609E-04	-72369.79	105000.
BOBJ1	1	0.	After	barrier	-1.183E-04	-2.550E-06	-3134.8	0.
BOBJ1	2	2916.75	Before	barrier	-1.182E-04	-1.091E-05	534891.14	2916.75
BOBJ1	3	2916.75	After	barrier	-1.182E-04	-1.092E-05	534891.14	2916.75
BOBJ1	4	5833.5	Before	barrier	-1.181E-04	-1.928E-05	972529.39	5833.5
BOBJ1	5	5833.5	After	barrier	-1.180E-04	-1.931E-05	972529.39	5833.5
BOBJ1	6	8750.25	Before	barrier	-1.180E-04	-2.765E-05	1309779.97	8750.25

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	7	8750.25	After	barrier	-1.179E-04	-2.765E-05	1309779.97	8750.25
BOBJ1	8	11667.	Before	barrier	-1.178E-04	-3.601E-05	1546642.87	11667.
BOBJ1	9	11667.	After	barrier	-1.409E-05	-5.682E-05	1546642.87	11667.
BOBJ1	10	14583.75	Before	barrier	-1.398E-05	-6.204E-05	1683118.08	14583.75
BOBJ1	11	14583.75	After	barrier	-1.401E-05	-6.203E-05	1683118.08	14583.75
BOBJ1	12	17500.5	Before	barrier	-1.388E-05	-6.716E-05	1719205.62	17500.5
BOBJ1	13	17500.5	After	barrier	-1.375E-05	-6.716E-05	1719205.62	17500.5
BOBJ1	14	20417.25	Before	barrier	-1.376E-05	-7.224E-05	1654905.47	20417.25
BOBJ1	15	20417.25	After	barrier	-1.346E-05	-7.224E-05	1654905.47	20417.25
BOBJ1	16	23334.	Before	barrier	-1.342E-05	-7.714E-05	1490217.65	23334.
BOBJ1	17	23334.	After	barrier	1.329E-04	-3.943E-05	1490217.65	23334.
BOBJ1	18	26050.5	Before	barrier	1.331E-04	-3.924E-05	1246550.42	26050.5
BOBJ1	19	26050.5	After	barrier	1.329E-04	-3.873E-05	1246550.42	26050.5
BOBJ1	20	28767.	Before	barrier	1.328E-04	-3.814E-05	915806.61	28767.
BOBJ1	21	28767.	After	barrier	1.327E-04	-3.813E-05	915806.61	28767.
BOBJ1	22	31483.5	Before	barrier	1.326E-04	-3.751E-05	497986.2	31483.5
BOBJ1	23	31483.5	After	barrier	1.326E-04	-3.751E-05	497986.2	31483.5
BOBJ1	24	34200.	Before	barrier	1.325E-04	-3.687E-05	-6910.8	34200.
BOBJ1	25	34200.	After	barrier	7.458E-11	1.387E-08	-3776.	34200.
BOBJ1	26	35000.	Before	barrier	-5.584E-10	1.342E-08	7.317E-09	35000.
BOBJ1	27	35000.	After	barrier	1.435E-09	-1.312E-09	4.275E-09	35000.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	28	35800.	Before	barrier	5.046E-09	-1.236E-09	-3776.	35800.
BOBJ1	29	35800.	After	barrier	-2.136E-06	-1.324E-05	-6914.24	35800.
BOBJ1	30	38516.75	Before	barrier	-2.146E-06	-1.756E-05	484902.67	38516.75
BOBJ1	31	38516.75	After	barrier	-2.147E-06	-1.757E-05	484902.67	38516.75
BOBJ1	32	41233.5	Before	barrier	-2.126E-06	-2.188E-05	889626.97	41233.5
BOBJ1	33	41233.5	After	barrier	-2.120E-06	-2.190E-05	889626.97	41233.5
BOBJ1	34	43950.25	Before	barrier	-2.193E-06	-2.614E-05	1207258.64	43950.25
BOBJ1	35	43950.25	After	barrier	-2.162E-06	-2.615E-05	1207258.64	43950.25
BOBJ1	36	46667.	Before	barrier	-2.122E-06	-3.030E-05	1437797.68	46667.
BOBJ1	37	46667.	After	barrier	8.166E-06	-2.870E-05	1437797.68	46667.
BOBJ1	38	49583.75	Before	barrier	8.284E-06	-2.512E-05	1588362.5	49583.75
BOBJ1	39	49583.75	After	barrier	8.324E-06	-2.513E-05	1588362.5	49583.75
BOBJ1	40	52500.5	Before	barrier	8.383E-06	-2.138E-05	1638539.63	52500.5
BOBJ1	41	52500.5	After	barrier	7.987E-06	-2.128E-05	1638533.89	52500.5
BOBJ1	42	55417.25	Before	barrier	8.343E-06	-1.746E-05	1588323.35	55417.25
BOBJ1	43	55417.25	After	barrier	8.502E-06	-1.746E-05	1588323.35	55417.25
BOBJ1	44	58334.	Before	barrier	8.561E-06	-1.365E-05	1437725.12	58334.
BOBJ1	45	58334.	After	barrier	-1.332E-06	-4.925E-06	1437725.12	58334.
BOBJ1	46	61050.5	Before	barrier	-1.525E-06	-1.339E-06	1207180.17	61050.5
BOBJ1	47	61050.5	After	barrier	-1.507E-06	-1.334E-06	1207180.17	61050.5
BOBJ1	48	63767.	Before	barrier	-1.497E-06	2.243E-06	889558.63	63767.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	49	63767.	After	barrier	-1.603E-06	2.248E-06	889558.63	63767.
BOBJ1	50	66483.5	Before	barrier	-1.572E-06	5.840E-06	484860.49	66483.5
BOBJ1	51	66483.5	After	barrier	-1.582E-06	5.829E-06	484860.49	66483.5
BOBJ1	52	69200.	Before	barrier	-1.529E-06	9.428E-06	-6914.24	69200.
BOBJ1	53	69200.	After	barrier	2.163E-09	-2.231E-08	-3776.	69200.
BOBJ1	54	70000.	Before	barrier	1.719E-10	-2.218E-08	1.047E-08	70000.
BOBJ1	55	70000.	After	barrier	-1.446E-10	-4.394E-10	-1.118E-08	70000.
BOBJ1	56	70800.	Before	barrier	1.382E-10	1.210E-09	-3776.	70800.
BOBJ1	57	70800.	After	barrier	-5.889E-05	1.736E-05	-9015.08	70800.
BOBJ1	58	73516.75	Before	barrier	-5.892E-05	9.164E-06	495924.38	73516.75
BOBJ1	59	73516.75	After	barrier	-5.890E-05	9.213E-06	495924.38	73516.75
BOBJ1	60	76233.5	Before	barrier	-5.881E-05	1.025E-06	913771.22	76233.5
BOBJ1	61	76233.5	After	barrier	-5.886E-05	1.032E-06	913771.22	76233.5
BOBJ1	62	78950.25	Before	barrier	-5.893E-05	-7.117E-06	1244525.44	78950.25
BOBJ1	63	78950.25	After	barrier	-5.917E-05	-7.130E-06	1244525.44	78950.25
BOBJ1	64	81667.	Before	barrier	-5.924E-05	-1.528E-05	1488187.03	81667.
BOBJ1	65	81667.	After	barrier	-5.925E-05	-1.527E-05	1488187.03	81667.
BOBJ1	66	84583.75	Before	barrier	-5.908E-05	-2.403E-05	1652840.44	84583.75
BOBJ1	67	84583.75	After	barrier	-5.894E-05	-2.406E-05	1652840.44	84583.75
BOBJ1	68	87500.5	Before	barrier	-5.867E-05	-3.285E-05	1717106.17	87500.5
BOBJ1	69	87500.5	After	barrier	-5.888E-05	-3.284E-05	1717106.17	87500.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	70	90417.25	Before	barrier	-5.894E-05	-4.164E-05	1680984.22	90417.25
BOBJ1	71	90417.25	After	barrier	-5.878E-05	-4.163E-05	1680984.22	90417.25
BOBJ1	72	93334.	Before	barrier	-5.870E-05	-5.045E-05	1544474.58	93334.
BOBJ1	73	93334.	After	barrier	1.037E-04	-2.508E-05	1544474.58	93334.
BOBJ1	74	96250.5	Before	barrier	1.036E-04	-2.474E-05	1307601.88	96250.5
BOBJ1	75	96250.5	After	barrier	1.035E-04	-2.475E-05	1307601.88	96250.5
BOBJ1	76	99167.	Before	barrier	1.032E-04	-2.442E-05	970358.7	99167.
BOBJ1	77	99167.	After	barrier	1.031E-04	-2.442E-05	970358.7	99167.
BOBJ1	78	102083.5	Before	barrier	1.029E-04	-2.410E-05	532745.05	102083.5
BOBJ1	79	102083.5	After	barrier	1.029E-04	-2.410E-05	532745.05	102083.5
BOBJ1	80	105000.	Before	barrier	1.028E-04	-2.378E-05	-5239.08	105000.

Table 37: Bridge Object Forces, Part 3 of 3

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	1	0.	After	DEAD	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	3	2916.75	After	DEAD	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	5	5833.5	After	DEAD	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	7	8750.25	After	DEAD	9.095E-13	-894.18
BOBJ1	8	11667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	9	11667.	After	DEAD	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	11	14583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	DEAD	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	13	17500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	15	20417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	16	23334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	17	23334.	After	DEAD	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	19	26050.5	After	DEAD	9.095E-13	-894.18
BOBJ1	20	28767.	Before	DEAD	9.095E-13	-894.18
BOBJ1	21	28767.	After	DEAD	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	23	31483.5	After	DEAD	9.095E-13	-894.18
BOBJ1	24	34200.	Before	DEAD	9.095E-13	-894.18
BOBJ1	25	34200.	After	DEAD	9.095E-13	-894.18
BOBJ1	26	35000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	27	35000.	After	DEAD	9.095E-13	-894.18
BOBJ1	28	35800.	Before	DEAD	9.095E-13	-894.18
BOBJ1	29	35800.	After	DEAD	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	31	38516.75	After	DEAD	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	33	41233.5	After	DEAD	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	35	43950.25	After	DEAD	9.095E-13	-894.18
BOBJ1	36	46667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	37	46667.	After	DEAD	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	39	49583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	41	52500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	43	55417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	44	58334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	45	58334.	After	DEAD	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	47	61050.5	After	DEAD	9.095E-13	-894.18
BOBJ1	48	63767.	Before	DEAD	9.095E-13	-894.18
BOBJ1	49	63767.	After	DEAD	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	51	66483.5	After	DEAD	9.095E-13	-894.18
BOBJ1	52	69200.	Before	DEAD	9.095E-13	-894.18
BOBJ1	53	69200.	After	DEAD	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	54	70000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	55	70000.	After	DEAD	9.095E-13	-894.18
BOBJ1	56	70800.	Before	DEAD	9.095E-13	-894.18
BOBJ1	57	70800.	After	DEAD	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	59	73516.75	After	DEAD	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	61	76233.5	After	DEAD	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	63	78950.25	After	DEAD	9.095E-13	-894.18
BOBJ1	64	81667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	65	81667.	After	DEAD	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	67	84583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	69	87500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	71	90417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	72	93334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	73	93334.	After	DEAD	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	75	96250.5	After	DEAD	9.095E-13	-894.18
BOBJ1	76	99167.	Before	DEAD	9.095E-13	-894.18
BOBJ1	77	99167.	After	DEAD	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	79	102083.5	After	DEAD	9.095E-13	-894.18
BOBJ1	80	105000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	1	0.	After	DW	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	DW	9.095E-13	-894.18
BOBJ1	3	2916.75	After	DW	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	DW	9.095E-13	-894.18
BOBJ1	5	5833.5	After	DW	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	DW	9.095E-13	-894.18
BOBJ1	7	8750.25	After	DW	9.095E-13	-894.18
BOBJ1	8	11667.	Before	DW	9.095E-13	-894.18
BOBJ1	9	11667.	After	DW	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	DW	9.095E-13	-894.18
BOBJ1	11	14583.75	After	DW	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	DW	9.095E-13	-894.18
BOBJ1	13	17500.5	After	DW	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	DW	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	15	20417.25	After	DW	9.095E-13	-894.18
BOBJ1	16	23334.	Before	DW	9.095E-13	-894.18
BOBJ1	17	23334.	After	DW	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	DW	9.095E-13	-894.18
BOBJ1	19	26050.5	After	DW	9.095E-13	-894.18
BOBJ1	20	28767.	Before	DW	9.095E-13	-894.18
BOBJ1	21	28767.	After	DW	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	DW	9.095E-13	-894.18
BOBJ1	23	31483.5	After	DW	9.095E-13	-894.18
BOBJ1	24	34200.	Before	DW	9.095E-13	-894.18
BOBJ1	25	34200.	After	DW	9.095E-13	-894.18
BOBJ1	26	35000.	Before	DW	9.095E-13	-894.18
BOBJ1	27	35000.	After	DW	9.095E-13	-894.18
BOBJ1	28	35800.	Before	DW	9.095E-13	-894.18
BOBJ1	29	35800.	After	DW	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	DW	9.095E-13	-894.18
BOBJ1	31	38516.75	After	DW	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	DW	9.095E-13	-894.18
BOBJ1	33	41233.5	After	DW	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	DW	9.095E-13	-894.18
BOBJ1	35	43950.25	After	DW	9.095E-13	-894.18
BOBJ1	36	46667.	Before	DW	9.095E-13	-894.18
BOBJ1	37	46667.	After	DW	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	DW	9.095E-13	-894.18
BOBJ1	39	49583.75	After	DW	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	DW	9.095E-13	-894.18
BOBJ1	41	52500.5	After	DW	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	DW	9.095E-13	-894.18
BOBJ1	43	55417.25	After	DW	9.095E-13	-894.18
BOBJ1	44	58334.	Before	DW	9.095E-13	-894.18
BOBJ1	45	58334.	After	DW	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	DW	9.095E-13	-894.18
BOBJ1	47	61050.5	After	DW	9.095E-13	-894.18
BOBJ1	48	63767.	Before	DW	9.095E-13	-894.18
BOBJ1	49	63767.	After	DW	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	DW	9.095E-13	-894.18
BOBJ1	51	66483.5	After	DW	9.095E-13	-894.18
BOBJ1	52	69200.	Before	DW	9.095E-13	-894.18
BOBJ1	53	69200.	After	DW	9.095E-13	-894.18
BOBJ1	54	70000.	Before	DW	9.095E-13	-894.18
BOBJ1	55	70000.	After	DW	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	56	70800.	Before	DW	9.095E-13	-894.18
BOBJ1	57	70800.	After	DW	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	DW	9.095E-13	-894.18
BOBJ1	59	73516.75	After	DW	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	DW	9.095E-13	-894.18
BOBJ1	61	76233.5	After	DW	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	DW	9.095E-13	-894.18
BOBJ1	63	78950.25	After	DW	9.095E-13	-894.18
BOBJ1	64	81667.	Before	DW	9.095E-13	-894.18
BOBJ1	65	81667.	After	DW	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	DW	9.095E-13	-894.18
BOBJ1	67	84583.75	After	DW	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	DW	9.095E-13	-894.18
BOBJ1	69	87500.5	After	DW	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	DW	9.095E-13	-894.18
BOBJ1	71	90417.25	After	DW	9.095E-13	-894.18
BOBJ1	72	93334.	Before	DW	9.095E-13	-894.18
BOBJ1	73	93334.	After	DW	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	DW	9.095E-13	-894.18
BOBJ1	75	96250.5	After	DW	9.095E-13	-894.18
BOBJ1	76	99167.	Before	DW	9.095E-13	-894.18
BOBJ1	77	99167.	After	DW	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	DW	9.095E-13	-894.18
BOBJ1	79	102083.5	After	DW	9.095E-13	-894.18
BOBJ1	80	105000.	Before	DW	9.095E-13	-894.18
BOBJ1	1	0.	After	WL	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	WL	9.095E-13	-894.18
BOBJ1	3	2916.75	After	WL	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	WL	9.095E-13	-894.18
BOBJ1	5	5833.5	After	WL	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	WL	9.095E-13	-894.18
BOBJ1	7	8750.25	After	WL	9.095E-13	-894.18
BOBJ1	8	11667.	Before	WL	9.095E-13	-894.18
BOBJ1	9	11667.	After	WL	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	WL	9.095E-13	-894.18
BOBJ1	11	14583.75	After	WL	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	WL	9.095E-13	-894.18
BOBJ1	13	17500.5	After	WL	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	WL	9.095E-13	-894.18
BOBJ1	15	20417.25	After	WL	9.095E-13	-894.18
BOBJ1	16	23334.	Before	WL	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	17	23334.	After	WL	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	WL	9.095E-13	-894.18
BOBJ1	19	26050.5	After	WL	9.095E-13	-894.18
BOBJ1	20	28767.	Before	WL	9.095E-13	-894.18
BOBJ1	21	28767.	After	WL	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	WL	9.095E-13	-894.18
BOBJ1	23	31483.5	After	WL	9.095E-13	-894.18
BOBJ1	24	34200.	Before	WL	9.095E-13	-894.18
BOBJ1	25	34200.	After	WL	9.095E-13	-894.18
BOBJ1	26	35000.	Before	WL	9.095E-13	-894.18
BOBJ1	27	35000.	After	WL	9.095E-13	-894.18
BOBJ1	28	35800.	Before	WL	9.095E-13	-894.18
BOBJ1	29	35800.	After	WL	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	WL	9.095E-13	-894.18
BOBJ1	31	38516.75	After	WL	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	WL	9.095E-13	-894.18
BOBJ1	33	41233.5	After	WL	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	WL	9.095E-13	-894.18
BOBJ1	35	43950.25	After	WL	9.095E-13	-894.18
BOBJ1	36	46667.	Before	WL	9.095E-13	-894.18
BOBJ1	37	46667.	After	WL	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	WL	9.095E-13	-894.18
BOBJ1	39	49583.75	After	WL	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	WL	9.095E-13	-894.18
BOBJ1	41	52500.5	After	WL	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	WL	9.095E-13	-894.18
BOBJ1	43	55417.25	After	WL	9.095E-13	-894.18
BOBJ1	44	58334.	Before	WL	9.095E-13	-894.18
BOBJ1	45	58334.	After	WL	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	WL	9.095E-13	-894.18
BOBJ1	47	61050.5	After	WL	9.095E-13	-894.18
BOBJ1	48	63767.	Before	WL	9.095E-13	-894.18
BOBJ1	49	63767.	After	WL	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	WL	9.095E-13	-894.18
BOBJ1	51	66483.5	After	WL	9.095E-13	-894.18
BOBJ1	52	69200.	Before	WL	9.095E-13	-894.18
BOBJ1	53	69200.	After	WL	9.095E-13	-894.18
BOBJ1	54	70000.	Before	WL	9.095E-13	-894.18
BOBJ1	55	70000.	After	WL	9.095E-13	-894.18
BOBJ1	56	70800.	Before	WL	9.095E-13	-894.18
BOBJ1	57	70800.	After	WL	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	58	73516.75	Before	WL	9.095E-13	-894.18
BOBJ1	59	73516.75	After	WL	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	WL	9.095E-13	-894.18
BOBJ1	61	76233.5	After	WL	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	WL	9.095E-13	-894.18
BOBJ1	63	78950.25	After	WL	9.095E-13	-894.18
BOBJ1	64	81667.	Before	WL	9.095E-13	-894.18
BOBJ1	65	81667.	After	WL	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	WL	9.095E-13	-894.18
BOBJ1	67	84583.75	After	WL	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	WL	9.095E-13	-894.18
BOBJ1	69	87500.5	After	WL	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	WL	9.095E-13	-894.18
BOBJ1	71	90417.25	After	WL	9.095E-13	-894.18
BOBJ1	72	93334.	Before	WL	9.095E-13	-894.18
BOBJ1	73	93334.	After	WL	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	WL	9.095E-13	-894.18
BOBJ1	75	96250.5	After	WL	9.095E-13	-894.18
BOBJ1	76	99167.	Before	WL	9.095E-13	-894.18
BOBJ1	77	99167.	After	WL	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	WL	9.095E-13	-894.18
BOBJ1	79	102083.5	After	WL	9.095E-13	-894.18
BOBJ1	80	105000.	Before	WL	9.095E-13	-894.18
BOBJ1	1	0.	After	EH	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	EH	9.095E-13	-894.18
BOBJ1	3	2916.75	After	EH	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	EH	9.095E-13	-894.18
BOBJ1	5	5833.5	After	EH	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	EH	9.095E-13	-894.18
BOBJ1	7	8750.25	After	EH	9.095E-13	-894.18
BOBJ1	8	11667.	Before	EH	9.095E-13	-894.18
BOBJ1	9	11667.	After	EH	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	EH	9.095E-13	-894.18
BOBJ1	11	14583.75	After	EH	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	EH	9.095E-13	-894.18
BOBJ1	13	17500.5	After	EH	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	EH	9.095E-13	-894.18
BOBJ1	15	20417.25	After	EH	9.095E-13	-894.18
BOBJ1	16	23334.	Before	EH	9.095E-13	-894.18
BOBJ1	17	23334.	After	EH	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	EH	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	19	26050.5	After	EH	9.095E-13	-894.18
BOBJ1	20	28767.	Before	EH	9.095E-13	-894.18
BOBJ1	21	28767.	After	EH	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	EH	9.095E-13	-894.18
BOBJ1	23	31483.5	After	EH	9.095E-13	-894.18
BOBJ1	24	34200.	Before	EH	9.095E-13	-894.18
BOBJ1	25	34200.	After	EH	9.095E-13	-894.18
BOBJ1	26	35000.	Before	EH	9.095E-13	-894.18
BOBJ1	27	35000.	After	EH	9.095E-13	-894.18
BOBJ1	28	35800.	Before	EH	9.095E-13	-894.18
BOBJ1	29	35800.	After	EH	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	EH	9.095E-13	-894.18
BOBJ1	31	38516.75	After	EH	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	EH	9.095E-13	-894.18
BOBJ1	33	41233.5	After	EH	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	EH	9.095E-13	-894.18
BOBJ1	35	43950.25	After	EH	9.095E-13	-894.18
BOBJ1	36	46667.	Before	EH	9.095E-13	-894.18
BOBJ1	37	46667.	After	EH	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	EH	9.095E-13	-894.18
BOBJ1	39	49583.75	After	EH	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	EH	9.095E-13	-894.18
BOBJ1	41	52500.5	After	EH	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	EH	9.095E-13	-894.18
BOBJ1	43	55417.25	After	EH	9.095E-13	-894.18
BOBJ1	44	58334.	Before	EH	9.095E-13	-894.18
BOBJ1	45	58334.	After	EH	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	EH	9.095E-13	-894.18
BOBJ1	47	61050.5	After	EH	9.095E-13	-894.18
BOBJ1	48	63767.	Before	EH	9.095E-13	-894.18
BOBJ1	49	63767.	After	EH	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	EH	9.095E-13	-894.18
BOBJ1	51	66483.5	After	EH	9.095E-13	-894.18
BOBJ1	52	69200.	Before	EH	9.095E-13	-894.18
BOBJ1	53	69200.	After	EH	9.095E-13	-894.18
BOBJ1	54	70000.	Before	EH	9.095E-13	-894.18
BOBJ1	55	70000.	After	EH	9.095E-13	-894.18
BOBJ1	56	70800.	Before	EH	9.095E-13	-894.18
BOBJ1	57	70800.	After	EH	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	EH	9.095E-13	-894.18
BOBJ1	59	73516.75	After	EH	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	60	76233.5	Before	EH	9.095E-13	-894.18
BOBJ1	61	76233.5	After	EH	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	EH	9.095E-13	-894.18
BOBJ1	63	78950.25	After	EH	9.095E-13	-894.18
BOBJ1	64	81667.	Before	EH	9.095E-13	-894.18
BOBJ1	65	81667.	After	EH	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	EH	9.095E-13	-894.18
BOBJ1	67	84583.75	After	EH	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	EH	9.095E-13	-894.18
BOBJ1	69	87500.5	After	EH	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	EH	9.095E-13	-894.18
BOBJ1	71	90417.25	After	EH	9.095E-13	-894.18
BOBJ1	72	93334.	Before	EH	9.095E-13	-894.18
BOBJ1	73	93334.	After	EH	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	EH	9.095E-13	-894.18
BOBJ1	75	96250.5	After	EH	9.095E-13	-894.18
BOBJ1	76	99167.	Before	EH	9.095E-13	-894.18
BOBJ1	77	99167.	After	EH	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	EH	9.095E-13	-894.18
BOBJ1	79	102083.5	After	EH	9.095E-13	-894.18
BOBJ1	80	105000.	Before	EH	9.095E-13	-894.18
BOBJ1	1	0.	After	LS	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	LS	9.095E-13	-894.18
BOBJ1	3	2916.75	After	LS	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	LS	9.095E-13	-894.18
BOBJ1	5	5833.5	After	LS	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	LS	9.095E-13	-894.18
BOBJ1	7	8750.25	After	LS	9.095E-13	-894.18
BOBJ1	8	11667.	Before	LS	9.095E-13	-894.18
BOBJ1	9	11667.	After	LS	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	LS	9.095E-13	-894.18
BOBJ1	11	14583.75	After	LS	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	LS	9.095E-13	-894.18
BOBJ1	13	17500.5	After	LS	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	LS	9.095E-13	-894.18
BOBJ1	15	20417.25	After	LS	9.095E-13	-894.18
BOBJ1	16	23334.	Before	LS	9.095E-13	-894.18
BOBJ1	17	23334.	After	LS	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	LS	9.095E-13	-894.18
BOBJ1	19	26050.5	After	LS	9.095E-13	-894.18
BOBJ1	20	28767.	Before	LS	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	21	28767.	After	LS	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	LS	9.095E-13	-894.18
BOBJ1	23	31483.5	After	LS	9.095E-13	-894.18
BOBJ1	24	34200.	Before	LS	9.095E-13	-894.18
BOBJ1	25	34200.	After	LS	9.095E-13	-894.18
BOBJ1	26	35000.	Before	LS	9.095E-13	-894.18
BOBJ1	27	35000.	After	LS	9.095E-13	-894.18
BOBJ1	28	35800.	Before	LS	9.095E-13	-894.18
BOBJ1	29	35800.	After	LS	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	LS	9.095E-13	-894.18
BOBJ1	31	38516.75	After	LS	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	LS	9.095E-13	-894.18
BOBJ1	33	41233.5	After	LS	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	LS	9.095E-13	-894.18
BOBJ1	35	43950.25	After	LS	9.095E-13	-894.18
BOBJ1	36	46667.	Before	LS	9.095E-13	-894.18
BOBJ1	37	46667.	After	LS	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	LS	9.095E-13	-894.18
BOBJ1	39	49583.75	After	LS	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	LS	9.095E-13	-894.18
BOBJ1	41	52500.5	After	LS	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	LS	9.095E-13	-894.18
BOBJ1	43	55417.25	After	LS	9.095E-13	-894.18
BOBJ1	44	58334.	Before	LS	9.095E-13	-894.18
BOBJ1	45	58334.	After	LS	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	LS	9.095E-13	-894.18
BOBJ1	47	61050.5	After	LS	9.095E-13	-894.18
BOBJ1	48	63767.	Before	LS	9.095E-13	-894.18
BOBJ1	49	63767.	After	LS	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	LS	9.095E-13	-894.18
BOBJ1	51	66483.5	After	LS	9.095E-13	-894.18
BOBJ1	52	69200.	Before	LS	9.095E-13	-894.18
BOBJ1	53	69200.	After	LS	9.095E-13	-894.18
BOBJ1	54	70000.	Before	LS	9.095E-13	-894.18
BOBJ1	55	70000.	After	LS	9.095E-13	-894.18
BOBJ1	56	70800.	Before	LS	9.095E-13	-894.18
BOBJ1	57	70800.	After	LS	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	LS	9.095E-13	-894.18
BOBJ1	59	73516.75	After	LS	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	LS	9.095E-13	-894.18
BOBJ1	61	76233.5	After	LS	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	62	78950.25	Before	LS	9.095E-13	-894.18
BOBJ1	63	78950.25	After	LS	9.095E-13	-894.18
BOBJ1	64	81667.	Before	LS	9.095E-13	-894.18
BOBJ1	65	81667.	After	LS	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	LS	9.095E-13	-894.18
BOBJ1	67	84583.75	After	LS	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	LS	9.095E-13	-894.18
BOBJ1	69	87500.5	After	LS	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	LS	9.095E-13	-894.18
BOBJ1	71	90417.25	After	LS	9.095E-13	-894.18
BOBJ1	72	93334.	Before	LS	9.095E-13	-894.18
BOBJ1	73	93334.	After	LS	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	LS	9.095E-13	-894.18
BOBJ1	75	96250.5	After	LS	9.095E-13	-894.18
BOBJ1	76	99167.	Before	LS	9.095E-13	-894.18
BOBJ1	77	99167.	After	LS	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	LS	9.095E-13	-894.18
BOBJ1	79	102083.5	After	LS	9.095E-13	-894.18
BOBJ1	80	105000.	Before	LS	9.095E-13	-894.18
BOBJ1	1	0.	After	barrier	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	barrier	9.095E-13	-894.18
BOBJ1	3	2916.75	After	barrier	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	barrier	9.095E-13	-894.18
BOBJ1	5	5833.5	After	barrier	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	barrier	9.095E-13	-894.18
BOBJ1	7	8750.25	After	barrier	9.095E-13	-894.18
BOBJ1	8	11667.	Before	barrier	9.095E-13	-894.18
BOBJ1	9	11667.	After	barrier	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	11	14583.75	After	barrier	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	13	17500.5	After	barrier	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	15	20417.25	After	barrier	9.095E-13	-894.18
BOBJ1	16	23334.	Before	barrier	9.095E-13	-894.18
BOBJ1	17	23334.	After	barrier	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	barrier	9.095E-13	-894.18
BOBJ1	19	26050.5	After	barrier	9.095E-13	-894.18
BOBJ1	20	28767.	Before	barrier	9.095E-13	-894.18
BOBJ1	21	28767.	After	barrier	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	barrier	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	23	31483.5	After	barrier	9.095E-13	-894.18
BOBJ1	24	34200.	Before	barrier	9.095E-13	-894.18
BOBJ1	25	34200.	After	barrier	9.095E-13	-894.18
BOBJ1	26	35000.	Before	barrier	9.095E-13	-894.18
BOBJ1	27	35000.	After	barrier	9.095E-13	-894.18
BOBJ1	28	35800.	Before	barrier	9.095E-13	-894.18
BOBJ1	29	35800.	After	barrier	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	barrier	9.095E-13	-894.18
BOBJ1	31	38516.75	After	barrier	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	barrier	9.095E-13	-894.18
BOBJ1	33	41233.5	After	barrier	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	barrier	9.095E-13	-894.18
BOBJ1	35	43950.25	After	barrier	9.095E-13	-894.18
BOBJ1	36	46667.	Before	barrier	9.095E-13	-894.18
BOBJ1	37	46667.	After	barrier	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	39	49583.75	After	barrier	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	41	52500.5	After	barrier	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	43	55417.25	After	barrier	9.095E-13	-894.18
BOBJ1	44	58334.	Before	barrier	9.095E-13	-894.18
BOBJ1	45	58334.	After	barrier	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	barrier	9.095E-13	-894.18
BOBJ1	47	61050.5	After	barrier	9.095E-13	-894.18
BOBJ1	48	63767.	Before	barrier	9.095E-13	-894.18
BOBJ1	49	63767.	After	barrier	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	barrier	9.095E-13	-894.18
BOBJ1	51	66483.5	After	barrier	9.095E-13	-894.18
BOBJ1	52	69200.	Before	barrier	9.095E-13	-894.18
BOBJ1	53	69200.	After	barrier	9.095E-13	-894.18
BOBJ1	54	70000.	Before	barrier	9.095E-13	-894.18
BOBJ1	55	70000.	After	barrier	9.095E-13	-894.18
BOBJ1	56	70800.	Before	barrier	9.095E-13	-894.18
BOBJ1	57	70800.	After	barrier	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	barrier	9.095E-13	-894.18
BOBJ1	59	73516.75	After	barrier	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	barrier	9.095E-13	-894.18
BOBJ1	61	76233.5	After	barrier	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	barrier	9.095E-13	-894.18
BOBJ1	63	78950.25	After	barrier	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	64	81667.	Before	barrier	9.095E-13	-894.18
BOBJ1	65	81667.	After	barrier	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	67	84583.75	After	barrier	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	69	87500.5	After	barrier	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	71	90417.25	After	barrier	9.095E-13	-894.18
BOBJ1	72	93334.	Before	barrier	9.095E-13	-894.18
BOBJ1	73	93334.	After	barrier	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	barrier	9.095E-13	-894.18
BOBJ1	75	96250.5	After	barrier	9.095E-13	-894.18
BOBJ1	76	99167.	Before	barrier	9.095E-13	-894.18
BOBJ1	77	99167.	After	barrier	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	barrier	9.095E-13	-894.18
BOBJ1	79	102083.5	After	barrier	9.095E-13	-894.18
BOBJ1	80	105000.	Before	barrier	9.095E-13	-894.18

10. Material take-off

This section provides a material take-off.

Table 38: Material List 2 - By Section Property

Table 38: Material List 2 - By Section Property

Section	ObjectType	NumPieces	TotalLength	TotalWeight
			mm	kN
A_T 1200	Frame	2	25800.	1313.126
1200Dia_Pile	Frame	16	134000.	3571.001
P_T 1300	Frame	2	25800.	1422.553
Girder 35m	Frame	200	525000.	11698.913
ASEC2	Area			7181.156
ASEC3	Area			1694.848
Wing Wall	Area			1176.035
fixed link	Link	14		0.
BFIX-3	Link	20		0.
BFIXSS-4	Link	90		0.
elastic link-1	Link	25		0.
pin-1	Link	5		0.

Appendix (2): Design of Bridge using BS5400



License #3010*16VYVAXY7ALDJQT

CSiBridge Analysis and Design Report

Prepared by

Khalid Albastki

Model Name: Model BS-5400.bdb

8 March 2023

1. Model geometry

This section provides model geometry information, including items such as the layout line and lane definitions.

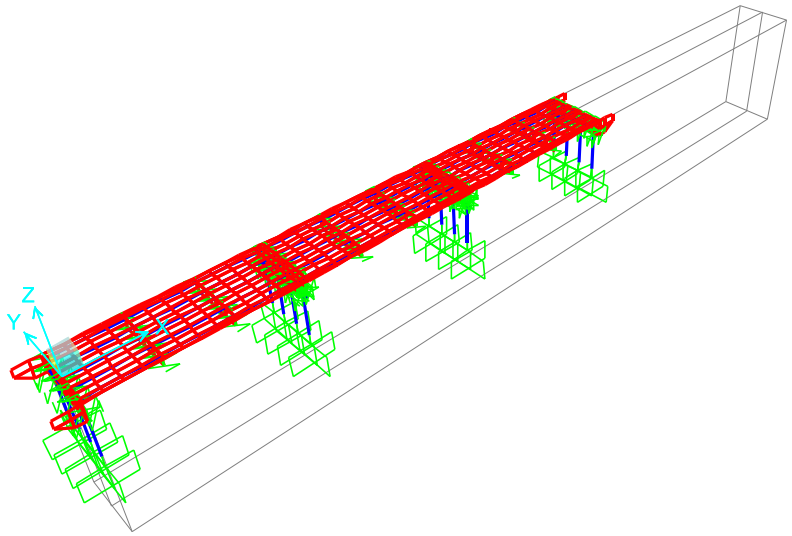


Figure 1: Finite element model

1.1. Layout Line

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 1 of 2

LayoutLine	SegType	Station	Bearing	CoordSys	X
		mm			mm
BLL1	Initial Station and Bearing	0.	N900000E	GLOBAL	0.
BLL1	Straight at Previous Bearing to End	175000.		GLOBAL	175000.

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 2 of 2

Table 1: Bridge Layout Line 2 - Horizontal Layout Data, Part 2 of 2

LayoutLine	Y	GlobalX	GlobalY
	mm	mm	mm
BLL1	0.	0.	0.
BLL1	0.	175000.	0.

Table 2: Bridge Layout Line 3 - Vertical Layout Data

LayoutLine	SegType	Station	Grade	CoordSys	Z
		mm	Percent		mm
BLL1	Initial Station, Elevation Z and Grade	0.	0.	GLOBAL	0.
BLL1	Constant at Previous Grade to End	175000.	0.	GLOBAL	0.

1.2. Lanes

Table 3: Lane Definition Data, Part 1 of 3

Lane	LaneFrom	LayoutLine	Station	LaneType	Width	Offset	LoadGroup
			mm		mm	mm	
LANE1	Layout Line	BLL1	0.	Fixed Lane	3700.	-4200.	Default
LANE1	Layout Line	BLL1	105000.		3700.	-4200.	Default
LANE2	Layout Line	BLL1	0.	Fixed Lane	3700.	-500.	Default
LANE2	Layout Line	BLL1	105000.		3700.	-500.	Default
LANE3	Layout Line	BLL1	0.	Fixed Lane	3700.	3200.	Default
LANE3	Layout Line	BLL1	105000.		3700.	3200.	Default

Table 3: Lane Definition Data, Part 2 of 3

Lane	DiscAlong	DiscAcross	DiscSpan	DiscSpanFac	DiscLane	DiscLaneFac	LeftType
	mm	mm					
LANE1	3000.	3000.	Yes	4.	Yes	10.	Interior
LANE1							
LANE2	3000.	3000.	Yes	4.	Yes	10.	Interior
LANE2							
LANE3	3000.	3000.	Yes	4.	Yes	10.	Interior
LANE3							

Table 3: Lane Definition Data, Part 3 of 3

Table 3: Lane Definition Data, Part 3 of 3

Lane	Color	Notes
LANE1	Magenta	
LANE1		
LANE2	Yellow	
LANE2		
LANE3	Gray8Dark	
LANE3		

1.3. Spans

Table 4: Bridge Object Definitions 03 - Spans 1 - General

Table 4: Bridge Object Definitions 03 - Spans 1 - General

BridgeObj	SpanName	BridgeSect	Variation
BOBJ1	Span 1	Rw Br	No
BOBJ1	Span 2	Rw Br	No
BOBJ1	Span 3	Rw Br	No

1.4. Bridge Sections

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 1 of 4

Section	Material	NumIntGird	TotalWidth	GirdLayout	DiffSpacing	DiffHaunch
			mm			
Rw Br	4000Psi	3	12900.	Along Layout Line	No	No

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 2 of 4

Section	TopSlabThk	HaunchHSame	LOLength	LOFillDist	LOOuterThk	ROLength	ROFillDist
	mm	mm	mm	mm	mm	mm	mm
Rw Br	225.	50.	1050.	650.	225.	1050.	650.

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 3 of 4

Section	ROOuterThk	FHoriz1	FHoriz2	CurbLoc	CurbLeft	CurbRight
	mm	mm	mm		mm	mm
Rw Br	225.	225.	225.	Program Determined	400.	1400.

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 4 of 4

Table 5: Bridge Section Definitions 09 - PCC I Girders 1 - General, Part 4 of 4

Section	CurbMWidth	RefPtOffX	RefPtOffY
	mm	mm	mm
Rw Br	0.	0.	0.

1.5. Abutments

Table 6: Bridge Abutment Definitions

Table 6: Bridge Abutment Definitions

Abutment	GirderSup	SubType	FSProp
BABT	Bottom	Spring	Pinned

Table 7: Bridge Object Definitions 06 - Abutments, Part 1 of 2

BridgeObj	Location	SupportName	BearingDir	DiaphProp	SubType	BentProp	SubElev
							mm
BOBJ1	Start	Start Abutment	Default	END_DIAPHRAGM	Bent	Abut	-2675.
BOBJ1	End	Span 4	Default	END_DIAPHRAGM	Bent	Abut	-2675.

Table 7: Bridge Object Definitions 06 - Abutments, Part 2 of 2

Table 7: Bridge Object Definitions 06 - Abutments, Part 2 of 2

BridgeObj	Location	SupportName	BearProp	BearResProp	BearElev	BearAngle
					mm	Degrees
BOBJ1	Start	Start Abutment	elastic link	None	-2550.	0.
BOBJ1	End	Span 4	elastic link	None	-2550.	0.

1.6. Bents

Table 8: Bridge Bent Definitions 1 - General

Bent	BeamLength	BeamSect	Type	BearDist1	BearDist2	NumCols
	mm			mm	mm	
Abut	12900.	A_T 1200	Single			4
BENT1	12900.	P_T 1300	Double	800.	800.	4

Table 9: Bridge Bent Definitions 2 - Column Data, Part 1 of 2

Bent	ColNum	Section	Distance	Height	ColSupport	RHLong
			mm	mm		
Abut	1	1200Dia_Pile	1050.	9000.	Free	1.
Abut	2	1200Dia_Pile	4650.	9000.	Free	1.
Abut	3	1200Dia_Pile	8250.	9000.	Free	1.
Abut	4	1200Dia_Pile	11850.	9000.	Free	1.
BENT1	1	1200Dia_Pile	1050.	9000.	Free	1.
BENT1	2	1200Dia_Pile	4650.	9000.	Free	1.
BENT1	3	1200Dia_Pile	8250.	9000.	Free	1.
BENT1	4	1200Dia_Pile	11850.	9000.	Free	1.

Table 9: Bridge Bent Definitions 2 - Column Data, Part 2 of 2

Table 9: Bridge Bent Definitions 2 - Column Data, Part 2 of 2

Bent	ColNum	Section	ColSupport	HingeTop	HingeBot	R1Release	R2Release	R3Release
Abut	1	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
Abut	2	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
Abut	3	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
Abut	4	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed

Table 9: Bridge Bent Definitions 2 - Column Data, Part 2 of 2

Bent	ColNum	Section	ColSupport	HingeTop	HingeBot	R1Release	R2Release	R3Release
BENT1	1	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
BENT1	2	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
BENT1	3	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed
BENT1	4	1200Dia_Pile	Free	Auto	Auto	Fixed	Fixed	Fixed

Table 10: Bridge Object Definitions 07 - Bents, Part 1 of 3

BridgeObj	SpanName	BentProp	Continuous	SupportName	BearingDir	BentElev
						mm
BOBJ1	Span 1	BENT1	No	Span 1	Default	-2675.
BOBJ1	Span 2	BENT1	No	Span 5	Default	-2675.

Table 10: Bridge Object Definitions 07 - Bents, Part 2 of 3

BridgeObj	SpanName	SupportName	DiaphAfter	ResPropSS	ResElevSS	MeshAtBent	BearProp1
					mm		
BOBJ1	Span 1	Span 1	END_DIAPHRAGM	None	-609.6	Yes	elastic link
BOBJ1	Span 2	Span 5	END_DIAPHRAGM	None	-609.6	Yes	elastic link

Table 10: Bridge Object Definitions 07 - Bents, Part 3 of 3

BridgeObj	SpanName	SupportName	BearElev1	BearAngle1	BearProp2	BearElev2
			mm	Degrees		mm
BOBJ1	Span 1	Span 1	-2550.	0.	elastic link	-2550.
BOBJ1	Span 2	Span 5	-2550.	0.	pin	-2550.

1.7. Diaphragms

Table 11: Bridge Diaphragm Definitions

Table 11: Bridge Diaphragm Definitions

Diaph	DiaphType	Thickness	Depth	UseGDepth	MatSolidDia	UseBSectMat
		mm	mm			
END_DIAPHRAGM	Solid	300.	1850.	No	4000Psi	No
INT_DIAPHRAGM	Solid	300.	1850.	No	4000Psi	No

1.8. Bearings

Table 12: Bridge Bearing Definitions, Part 1 of 2

Bearing	U1Type	U2Type	U3Type	R1Type	R2Type	R3Type	U2Stiff
							kN/mm
BBRG1	Fixed	Fixed	Fixed	Free	Free	Free	
elastic link	Fixed	Partial Fixed	Partial Fixed	Free	Free	Free	2.
pin	Fixed	Fixed	Fixed	Free	Free	Free	
roller	Fixed	Fixed	Free	Free	Free	Free	

Table 12: Bridge Bearing Definitions, Part 2 of 2

Table 12: Bridge Bearing Definitions, Part 2 of 2

Bearing	U3Stiff
	kN/mm
BBRG1	
elastic link	2.
pin	
roller	

Table 13: Bridge Model Summary 01 - Bearing Supports

BridgeObj	SpanName	Station	Type	Bearing	BearProp	BearElev
		mm				mm
BOBJ1	Start Abutment	0.	Bent	1	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	2	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	3	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	4	elastic link	-2550.
BOBJ1	Start Abutment	0.	Bent	5	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	1	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	2	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	3	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	4	elastic link	-2550.
BOBJ1	Span 1	35000.	Bent-Before	5	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	1	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	2	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	3	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	4	elastic link	-2550.
BOBJ1	Span 2	70000.	Bent-Before	5	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	1	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	2	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	3	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	4	elastic link	-2550.
BOBJ1	Span 3	105000.	Bent	5	elastic link	-2550.

2. Material properties

This section provides material property information for materials used in the model.

Table 14: Material Properties 02 - Basic Mechanical Properties

Table 14: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight	UnitMass	E1	G12	U12	A1
	kN/mm3	kN-s2/mm4	kN/mm2	kN/mm2		1/C
4000Psi	2.3563E-08	2.4028E-12	24.85558	10.35649	0.2	9.9000E-06
6000Psi	2.3563E-08	2.4028E-12	30.44174	12.68406	0.2	9.9000E-06
6500Psi	2.3563E-08	2.4028E-12	32.1994	13.41642	0.2	9.9000E-06

Table 14: Material Properties 02 - Basic Mechanical Properties

Material	UnitWeight	UnitMass	E1	G12	U12	A1
	kN/mm3	kN-s2/mm4	kN/mm2	kN/mm2		1/C
A615Gr60	7.6973E-08	7.8490E-12	199.94798			1.1700E-05
A709Gr50	7.6973E-08	7.8490E-12	199.94798	76.90307	0.3	1.1700E-05
A722Gr150TypII	7.6973E-08	7.8490E-12	206.84274			1.1700E-05

Table 15: Material Properties 03a - Steel Data

Table 15: Material Properties 03a - Steel Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A709Gr50	0.34474	0.44816	-0.1	Von Mises

Table 16: Material Properties 03b - Concrete Data

Table 16: Material Properties 03b - Concrete Data

Material	Fc	eFc	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
4000Psi	0.02758	0.02758	-0.1	Modified Darwin-Pecknold
6000Psi	0.04137	0.04137	-0.1	Modified Darwin-Pecknold
6500Psi	0.045	0.045	-0.1	Modified Darwin-Pecknold

Table 17: Material Properties 03e - Rebar Data

Table 17: Material Properties 03e - Rebar Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A615Gr60	0.41369	0.62053	-0.1	Von Mises

Table 18: Material Properties 03f - Tendon Data

Table 18: Material Properties 03f - Tendon Data

Material	Fy	Fu	FinalSlope	CoupModType
	kN/mm2	kN/mm2		
A722Gr150TypII	0.82737	1.03421	-0.1	Von Mises

3. Section properties

This section provides section property information for objects used in the model.

3.1. Frames

Table 19: Frame Section Properties 01 - General, Part 1 of 4

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
1200Dia_Pile	4000Psi	Circle	1200.		1130973.36	2.036E+11	1.018E+11	1.018E+11
A_T 1200	4000Psi	Rectangular	1200.	1800.	2160000.	6.085E+11	2.592E+11	5.832E+11
BRD1	4000Psi	Bridge Section			5790515.17	1.944E+11	2.916E+12	4.916E+13
BRD10	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD11	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD12	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD13	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD14	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD15	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
BRD16	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD17	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD18	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD19	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD2	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD20	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD21	4000Psi	Bridge Section			11268992.03	5.914E+11	1.004E+13	2.521E+14
BRD22	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD23	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD24	4000Psi	Bridge Section			8981206.16	4.858E+11	6.445E+12	1.292E+14
BRD3	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD4	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD5	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD6	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD7	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD8	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
BRD9	4000Psi	Bridge Section			11553809.57	5.493E+11	1.377E+13	2.586E+14
Girder 35m	6000Psi	PC Conc I Girder	2150.	1150.	945700.	3.419E+10	5.716E+11	4.405E+10
P_T 1300	4000Psi	Rectangular	1300.	1800.	2340000.	7.320E+11	3.296E+11	6.318E+11
VAR1		Nonprismatic						
VAR10		Nonprismatic						

Table 19: Frame Section Properties 01 - General, Part 1 of 4

SectionName	Material	Shape	t3	t2	Area	TorsConst	I33	I22
			mm	mm	mm2	mm4	mm4	mm4
VAR11		Nonprismatic						
VAR12		Nonprismatic						
VAR13		Nonprismatic						
VAR14		Nonprismatic						
VAR15		Nonprismatic						
VAR16		Nonprismatic						
VAR17		Nonprismatic						
VAR18		Nonprismatic						
VAR19		Nonprismatic						
VAR2		Nonprismatic						
VAR20		Nonprismatic						
VAR21		Nonprismatic						
VAR3		Nonprismatic						
VAR4		Nonprismatic						
VAR5		Nonprismatic						
VAR6		Nonprismatic						
VAR7		Nonprismatic						
VAR8		Nonprismatic						
VAR9		Nonprismatic						

Table 19: Frame Section Properties 01 - General, Part 2 of 4

Table 19: Frame Section Properties 01 - General, Part 2 of 4

SectionName	I23	AS2	AS3
	mm4	mm2	mm2
1200Dia_Pile	0.	1017876.02	1017876.02
A_T 1200	0.	1800000.	1800000.
BRD1	0.	2342083.85	2444907.5
BRD10	0.	4727035.72	4298902.35
BRD11	0.	4557530.76	4360003.76
BRD12	0.	4557530.76	4360003.76
BRD13	0.	4557530.76	4360003.76
BRD14	0.	4557530.76	4360003.76
BRD15	0.	4557530.76	4360003.76
BRD16	0.	4557530.76	4360003.76
BRD17	0.	4557530.76	4360003.76
BRD18	0.	4557530.76	4360003.76
BRD19	0.	4557530.76	4360003.76
BRD2	0.	4727035.72	4298902.35
BRD20	0.	4557530.76	4360003.76
BRD21	0.	4557530.76	4360003.76
BRD22	0.	3552081.54	3517303.57
BRD23	0.	3552081.54	3517303.57
BRD24	0.	3552081.54	3517303.57
BRD3	0.	4727035.72	4298902.35
BRD4	0.	4727035.72	4298902.35

Table 19: Frame Section Properties 01 - General, Part 2 of 4

SectionName	I23	AS2	AS3
	mm4	mm2	mm2
BRD5	0.	4727035.72	4298902.35
BRD6	0.	4727035.72	4298902.35
BRD7	0.	4727035.72	4298902.35
BRD8	0.	4727035.72	4298902.35
BRD9	0.	4727035.72	4298902.35
Girder 35m	0.	464668.64	842262.39
P_T 1300	0.	1950000.	1950000.
VAR1			
VAR10			
VAR11			
VAR12			
VAR13			
VAR14			
VAR15			
VAR16			
VAR17			
VAR18			
VAR19			
VAR2			
VAR20			
VAR21			
VAR3			
VAR4			
VAR5			
VAR6			
VAR7			
VAR8			
VAR9			

Table 19: Frame Section Properties 01 - General, Part 3 of 4

Table 19: Frame Section Properties 01 - General, Part 3 of 4

SectionName	S33	S22	Z33	Z22	R33	R22
	mm3	mm3	mm3	mm3	mm	mm
1200Dia_Pile	169646003.3	169646003.3	288000000.	288000000.	300.	300.
A_T 1200	432000000.	648000000.	648000000.	972000000.	346.41	519.615
BRD1	2260715413.	9733686622.	4103694219.	1.726E+10	709.598	2913.572
BRD10	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD11	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD12	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD13	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD14	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD15	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD16	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD17	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD18	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD19	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD2	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD20	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD21	5934310366.	3.161E+10	1.047E+10	5.349E+10	943.897	4729.502
BRD22	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD23	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD24	4210326384.	2.003E+10	7431828198.	3.352E+10	847.136	3792.532
BRD3	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD4	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56

Table 19: Frame Section Properties 01 - General, Part 3 of 4

SectionName	S33	S22	Z33	Z22	R33	R22
	mm3	mm3	mm3	mm3	mm	mm
BRD5	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD6	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD7	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD8	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
BRD9	7301033328.	3.242E+10	1.277E+10	5.497E+10	1091.607	4730.56
Girder 35m	516311523.	76602071.01	681984202.	156348750.	777.441	215.813
P_T 1300	507000000.	702000000.	760500000.	1053000000.	375.278	519.615
VAR1						
VAR10						
VAR11						
VAR12						
VAR13						
VAR14						
VAR15						
VAR16						
VAR17						
VAR18						
VAR19						
VAR2						
VAR20						
VAR21						
VAR3						
VAR4						
VAR5						
VAR6						
VAR7						
VAR8						
VAR9						

Table 19: Frame Section Properties 01 - General, Part 4 of 4

SectionName	AMod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
1200Dia_Pile	1.	1.	1.	1.	1.	1.	1.

SectionName	AMod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
A_T 1200	1.	1.	1.	0.5	0.5	1.	1.
BRD1	1.	1.	1.	1.	1.	0.861435	0.861435
BRD10	1.	1.	1.	1.	1.	0.878736	0.878736
BRD11	1.	1.	1.	1.	1.	0.880553	0.880553
BRD12	1.	1.	1.	1.	1.	0.880553	0.880553
BRD13	1.	1.	1.	1.	1.	0.880553	0.880553
BRD14	1.	1.	1.	1.	1.	0.880553	0.880553
BRD15	1.	1.	1.	1.	1.	0.880553	0.880553
BRD16	1.	1.	1.	1.	1.	0.880553	0.880553
BRD17	1.	1.	1.	1.	1.	0.880553	0.880553
BRD18	1.	1.	1.	1.	1.	0.880553	0.880553
BRD19	1.	1.	1.	1.	1.	0.880553	0.880553
BRD2	1.	1.	1.	1.	1.	0.878736	0.878736
BRD20	1.	1.	1.	1.	1.	0.880553	0.880553
BRD21	1.	1.	1.	1.	1.	0.880553	0.880553
BRD22	1.	1.	1.	1.	1.	0.881674	0.881674
BRD23	1.	1.	1.	1.	1.	0.881674	0.881674
BRD24	1.	1.	1.	1.	1.	0.881674	0.881674
BRD3	1.	1.	1.	1.	1.	0.878736	0.878736
BRD4	1.	1.	1.	1.	1.	0.878736	0.878736
BRD5	1.	1.	1.	1.	1.	0.878736	0.878736
BRD6	1.	1.	1.	1.	1.	0.878736	0.878736
BRD7	1.	1.	1.	1.	1.	0.878736	0.878736
BRD8	1.	1.	1.	1.	1.	0.878736	0.878736
BRD9	1.	1.	1.	1.	1.	0.878736	0.878736
Girder 35m	1.	1.	1.	1.	1.	1.	1.
P_T 1300	1.	1.	1.	0.5	0.5	1.	1.
VAR1							
VAR10							
VAR11							
VAR12							
VAR13							
VAR14							
VAR15							
VAR16							
VAR17							
VAR18							
VAR19							
VAR2							
VAR20							
VAR21							
VAR3							

SectionName	AMod	A3Mod	JMod	I2Mod	I3Mod	MMod	WMod
VAR4							
VAR5							
VAR6							
VAR7							
VAR8							
VAR9							

Table 20: Frame Section Properties 02 - Concrete Column, Part 1 of 2

SectionName	RebarMatL	RebarMatC	ReinfConfig	LatReinf	Cover	NumBarsCirc
					mm	
1200Dia_Pile	A615Gr60	A615Gr60	Circular	Spiral	91.	8

Table 20: Frame Section Properties 02 - Concrete Column, Part 2 of 2

Table 20: Frame Section Properties 02 - Concrete Column, Part 2 of 2

SectionName	BarSizeC	SpacingC
		mm
1200Dia_Pile	#4	150.

Table 21: Frame Section Properties 03 - Concrete Beam, Part 1 of 2

Table 21: Frame Section Properties 03 - Concrete Beam, Part 1 of 2

SectionName	RebarMatL	RebarMatC	TopCover	BotCover
			mm	mm
A_T 1200	A615Gr60	A615Gr60	60.	60.
P_T 1300	A615Gr60	A615Gr60	60.	60.
VAR19	A615Gr60	A615Gr60	60.	60.

Table 21: Frame Section Properties 03 - Concrete Beam, Part 2 of 2

Table 21: Frame Section Properties 03 - Concrete Beam, Part 2 of 2

SectionName	TopLeftArea	TopRghtArea	BotLeftArea	BotRghtArea
	mm2	mm2	mm2	mm2
A_T 1200	0.	0.	0.	0.
P_T 1300	0.	0.	0.	0.
VAR19	0.	0.	0.	0.

Table 22: Frame Section Properties 05 - Nonprismatic

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR1	1	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	2	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	3	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	4	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	5	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	6	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	7	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	8	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	9	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	10	BRD1	BRD1	0.07	Parabolic	Linear
VAR1	11	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	12	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	13	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	14	BRD1	BRD1	0.065	Parabolic	Linear
VAR1	15	BRD1	BRD1	0.065	Parabolic	Linear
VAR10	1	BRD10	BRD10	0.0122	Parabolic	Linear
VAR10	2	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	3	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	4	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	5	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	6	BRD10	BRD10	0.0642	Parabolic	Linear
VAR10	7	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	8	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	9	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	10	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	11	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	12	BRD10	BRD10	0.0667	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR10	13	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	14	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	15	BRD10	BRD10	0.0667	Parabolic	Linear
VAR10	16	BRD10	BRD10	0.0667	Parabolic	Linear
VAR11	1	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	2	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	3	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	4	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	5	BRD11	BRD11	0.065	Parabolic	Linear
VAR11	6	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	7	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	8	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	9	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	10	BRD11	BRD11	0.07	Parabolic	Linear
VAR11	11	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	12	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	13	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	14	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	15	BRD11	BRD11	0.0623	Parabolic	Linear
VAR11	16	BRD11	BRD11	0.0138	Parabolic	Linear
VAR12	1	BRD12	BRD12	0.0138	Parabolic	Linear
VAR12	2	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	3	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	4	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	5	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	6	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	7	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	8	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	9	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	10	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	11	BRD12	BRD12	0.07	Parabolic	Linear
VAR12	12	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	13	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	14	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	15	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	16	BRD12	BRD12	0.0623	Parabolic	Linear
VAR12	17	BRD12	BRD12	0.0138	Parabolic	Linear
VAR13	1	BRD13	BRD13	0.0138	Parabolic	Linear
VAR13	2	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	3	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	4	BRD13	BRD13	0.0623	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR13	5	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	6	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	7	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	8	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	9	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	10	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	11	BRD13	BRD13	0.07	Parabolic	Linear
VAR13	12	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	13	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	14	BRD13	BRD13	0.0622	Parabolic	Linear
VAR13	15	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	16	BRD13	BRD13	0.0623	Parabolic	Linear
VAR13	17	BRD13	BRD13	0.0138	Parabolic	Linear
VAR14	1	BRD14	BRD14	0.0138	Parabolic	Linear
VAR14	2	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	3	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	4	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	5	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	6	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	7	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	8	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	9	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	10	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	11	BRD14	BRD14	0.07	Parabolic	Linear
VAR14	12	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	13	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	14	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	15	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	16	BRD14	BRD14	0.0623	Parabolic	Linear
VAR14	17	BRD14	BRD14	0.0138	Parabolic	Linear
VAR15	1	BRD15	BRD15	0.0138	Parabolic	Linear
VAR15	2	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	3	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	4	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	5	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	6	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	7	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	8	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	9	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	10	BRD15	BRD15	0.07	Parabolic	Linear
VAR15	11	BRD15	BRD15	0.07	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR15	12	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	13	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	14	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	15	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	16	BRD15	BRD15	0.0623	Parabolic	Linear
VAR15	17	BRD15	BRD15	0.0138	Parabolic	Linear
VAR16	1	BRD16	BRD16	0.0138	Parabolic	Linear
VAR16	2	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	3	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	4	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	5	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	6	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	7	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	8	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	9	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	10	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	11	BRD16	BRD16	0.07	Parabolic	Linear
VAR16	12	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	13	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	14	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	15	BRD16	BRD16	0.0623	Parabolic	Linear
VAR16	16	BRD16	BRD16	0.0622	Parabolic	Linear
VAR16	17	BRD16	BRD16	0.0138	Parabolic	Linear
VAR17	1	BRD17	BRD17	0.0138	Parabolic	Linear
VAR17	2	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	3	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	4	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	5	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	6	BRD17	BRD17	0.0622	Parabolic	Linear
VAR17	7	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	8	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	9	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	10	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	11	BRD17	BRD17	0.07	Parabolic	Linear
VAR17	12	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	13	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	14	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	15	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	16	BRD17	BRD17	0.0623	Parabolic	Linear
VAR17	17	BRD17	BRD17	0.0138	Parabolic	Linear
VAR18	1	BRD18	BRD18	0.0138	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR18	2	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	3	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	4	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	5	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	6	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	7	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	8	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	9	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	10	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	11	BRD18	BRD18	0.07	Parabolic	Linear
VAR18	12	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	13	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	14	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	15	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	16	BRD18	BRD18	0.0623	Parabolic	Linear
VAR18	17	BRD18	BRD18	0.0138	Parabolic	Linear
VAR19	1	BRD19	BRD19	0.0138	Parabolic	Linear
VAR19	2	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	3	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	4	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	5	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	6	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	7	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	8	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	9	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	10	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	11	BRD19	BRD19	0.07	Parabolic	Linear
VAR19	12	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	13	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	14	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	15	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	16	BRD19	BRD19	0.0623	Parabolic	Linear
VAR19	17	BRD19	BRD19	0.0138	Parabolic	Linear
VAR2	1	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	2	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	3	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	4	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	5	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	6	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	7	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	8	BRD2	BRD2	0.0667	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR2	9	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	10	BRD2	BRD2	0.0667	Parabolic	Linear
VAR2	11	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	12	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	13	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	14	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	15	BRD2	BRD2	0.0642	Parabolic	Linear
VAR2	16	BRD2	BRD2	0.0122	Parabolic	Linear
VAR20	1	BRD20	BRD20	0.0138	Parabolic	Linear
VAR20	2	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	3	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	4	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	5	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	6	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	7	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	8	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	9	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	10	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	11	BRD20	BRD20	0.07	Parabolic	Linear
VAR20	12	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	13	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	14	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	15	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	16	BRD20	BRD20	0.0623	Parabolic	Linear
VAR20	17	BRD20	BRD20	0.0138	Parabolic	Linear
VAR21	1	BRD21	BRD21	0.0138	Parabolic	Linear
VAR21	2	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	3	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	4	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	5	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	6	BRD21	BRD21	0.0623	Parabolic	Linear
VAR21	7	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	8	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	9	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	10	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	11	BRD21	BRD21	0.07	Parabolic	Linear
VAR21	12	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	13	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	14	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	15	BRD21	BRD21	0.065	Parabolic	Linear
VAR21	16	BRD21	BRD21	0.065	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR3	1	BRD3	BRD3	0.0122	Parabolic	Linear
VAR3	2	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	3	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	4	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	5	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	6	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	7	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	8	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	9	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	10	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	11	BRD3	BRD3	0.0667	Parabolic	Linear
VAR3	12	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	13	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	14	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	15	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	16	BRD3	BRD3	0.0642	Parabolic	Linear
VAR3	17	BRD3	BRD3	0.0122	Parabolic	Linear
VAR4	1	BRD4	BRD4	0.0122	Parabolic	Linear
VAR4	2	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	3	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	4	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	5	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	6	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	7	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	8	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	9	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	10	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	11	BRD4	BRD4	0.0667	Parabolic	Linear
VAR4	12	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	13	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	14	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	15	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	16	BRD4	BRD4	0.0642	Parabolic	Linear
VAR4	17	BRD4	BRD4	0.0122	Parabolic	Linear
VAR5	1	BRD5	BRD5	0.0122	Parabolic	Linear
VAR5	2	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	3	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	4	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	5	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	6	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	7	BRD5	BRD5	0.0667	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR5	8	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	9	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	10	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	11	BRD5	BRD5	0.0667	Parabolic	Linear
VAR5	12	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	13	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	14	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	15	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	16	BRD5	BRD5	0.0642	Parabolic	Linear
VAR5	17	BRD5	BRD5	0.0122	Parabolic	Linear
VAR6	1	BRD6	BRD6	0.0122	Parabolic	Linear
VAR6	2	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	3	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	4	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	5	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	6	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	7	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	8	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	9	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	10	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	11	BRD6	BRD6	0.0667	Parabolic	Linear
VAR6	12	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	13	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	14	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	15	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	16	BRD6	BRD6	0.0642	Parabolic	Linear
VAR6	17	BRD6	BRD6	0.0122	Parabolic	Linear
VAR7	1	BRD7	BRD7	0.0122	Parabolic	Linear
VAR7	2	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	3	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	4	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	5	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	6	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	7	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	8	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	9	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	10	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	11	BRD7	BRD7	0.0667	Parabolic	Linear
VAR7	12	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	13	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	14	BRD7	BRD7	0.0642	Parabolic	Linear

SectionName	SegmentNum	StartSect	EndSect	VarLength	EI33Var	EI22Var
VAR7	15	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	16	BRD7	BRD7	0.0642	Parabolic	Linear
VAR7	17	BRD7	BRD7	0.0122	Parabolic	Linear
VAR8	1	BRD8	BRD8	0.0122	Parabolic	Linear
VAR8	2	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	3	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	4	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	5	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	6	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	7	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	8	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	9	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	10	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	11	BRD8	BRD8	0.0667	Parabolic	Linear
VAR8	12	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	13	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	14	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	15	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	16	BRD8	BRD8	0.0642	Parabolic	Linear
VAR8	17	BRD8	BRD8	0.0122	Parabolic	Linear
VAR9	1	BRD9	BRD9	0.0122	Parabolic	Linear
VAR9	2	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	3	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	4	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	5	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	6	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	7	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	8	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	9	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	10	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	11	BRD9	BRD9	0.0667	Parabolic	Linear
VAR9	12	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	13	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	14	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	15	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	16	BRD9	BRD9	0.0642	Parabolic	Linear
VAR9	17	BRD9	BRD9	0.0122	Parabolic	Linear

3.2. Tendons

Table 23: Tendon Section Definitions, Part 1 of 2

TendonSect	ModelOpt	Diameter	Area	TorsConst	I	AS
		mm	mm2	mm4	mm4	mm2
TEN1	Elements	28.661	645.16	66245.29	33122.64	580.64

Table 23: Tendon Section Definitions, Part 2 of 2

TendonSect	AMod	A2Mod	A3Mod	JMod	I2Mod	I3Mod	MMod
TEN1	1.	1.	1.	1.	1.	1.	1.

3.3. Areas

Table 24: Area Section Properties, Part 1 of 3

Section	Material	AreaType	Type	DrillDOF	Thickness	BendThick
					mm	mm
ASEC2	4000Psi	Shell	Shell-Thin	Yes	250.	250.
ASEC3	6000Psi	Shell	Shell-Thin	Yes	250.	250.
Wing Wall	4000Psi	Shell	Shell-Thick	Yes	400.	400.

Table 24: Area Section Properties, Part 2 of 3

Section	F22Mod	F12Mod	M11Mod	M22Mod	M12Mod	V13Mod
ASEC2	1.	1.	1.	1.	1.	1.
ASEC3	1.	1.	1.	1.	1.	1.
Wing Wall	1.	1.	1.	1.	1.	1.

Table 24: Area Section Properties, Part 3 of 3

Table 24: Area Section Properties, Part 3 of 3

Section	MMod	WMod
ASEC2	1.	1.
ASEC3	1.	1.
Wing Wall	1.	1.

3.4. Solids

Table 25: Solid Property Definitions

Table 25: Solid Property Definitions

SolidProp	Material	MatAngleA	MatAngleB	MatAngleC
		Degrees	Degrees	Degrees
Solid1	4000Psi	0.	0.	0.

4. Loading

This section provides loading information as applied to the model.

4.1. Load patterns

Table 26: Load Pattern Definitions

Table 26: Load Pattern Definitions

LoadPat	DesignType	SelfWtMult	AutoLoad
DC	Dead	1.	
WL	Wind	0.	AASHTO 2018
EH	Hor Earth Pr	0.	
LS	LL Surchr	0.	
Barrier	Dead	0.	
Sidewalk	Dead	0.	
Haunch	Dead	0.	

Table 26: Load Pattern Definitions

LoadPat	DesignType	SelfWtMult	AutoLoad
Temperature Pos	Temperature	0.	
Temperature Neg	Temperature	0.	
DW	Wearing Surface	0.	

4.2. Vehicles

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 1 of 5

VehName	FromLibrary	LibraryName	FltAxleFac	AxleFac	UnifFac	SupportMom
HB	Yes	BD 37-01.xml	1.	30.	1.	Yes
HA	Yes	BD 37-01.xml	120.	1.	1.	Yes

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 2 of 5

VehName	OtherResp	AxleMom kN	AxleMType	AxleMDbl	AxleOther kN	AxleOType
HB	Yes	0.	One Point	No	0.	One Point
HA	Yes	1.	Lane Width Line	No	1.	Lane Width Line

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 3 of 5

VehName	AxleOWidth mm	LEffAxle	LEffUnif	ForStraddle	NumInter	MinExtDist mm
HB		None	None	No	4	250.
HA		None	BD-37/01	No	1	0.

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 4 of 5

VehName	MinIntDist	StayInLane	CGHTAxle	CGHTUnif	AdjustSuper
	mm		mm	mm	
HB	250.	No	0.	0.	No
HA	0.	No	0.	0.	No

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 5 of 5

Table 27: Vehicles 2 - General Vehicles 1 - General, Part 5 of 5

VehName	IgnoreVert	Centrifugal	Braking	NosingForce	DesignType
				kN	
HB	No	No	No	0.	Vehicle Live
HA	No	No	No	0.	Vehicle Live

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 1 of 2

VehName	LoadType	InterUnif	UnifType	InterAxle	AxleType	AxleWidth	InterMinD
		kN/mm		kN		mm	mm
HB	Leading Load	0.	Fixed Width	10.	Four Points	3000.	
HB	Fixed Length	0.	Fixed Width	10.	Four Points	3000.	1800.
HB	Variable Length	0.	Fixed Width	10.	Four Points	3000.	6000.
HB	Fixed Length	0.	Fixed Width	10.	Four Points	3000.	1800.
HA	Trailing Load	0.0244	Lane Width				

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 2 of 2

Table 28: Vehicles 3 - General Vehicles 2 - Loads, Part 2 of 2

VehName	InterMaxD
	mm
HB	
HB	
HB	26000.
HB	
HA	

Table 29: Vehicles 4 - Vehicle Classes

Table 29: Vehicles 4 - Vehicle Classes

VehClass	VehName	ScaleFactor
HB	HB	1.
HA	HA	1.

4.3. Bridge loading

Table 30: Bridge Load Definitions 02 - Line

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<40m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	-76000.	0.0091
<40m>BL2	Force	GLOBAL	Gravity		-76000.	0.0091
<45m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.00911
<45m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.00911
<45m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp5_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp5_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp5_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp5_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp5_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp5_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp6_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp6_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp6_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp6_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp6_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp6_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp7_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp7_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp7_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp7_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp7_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp7_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp8_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp8_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp8_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp8_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013
<45m>Sp8_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp8_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<45m>Sp9_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.0013
<45m>Sp9_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.0013
<45m>Sp9_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.0013
<45m>Sp9_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.0013

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<45m>Sp9_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.0013
<45m>Sp9_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.0013
<BSEC1>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	650.	0.00047
<BSEC1>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3150.	0.00047
<BSEC1>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	5650.	0.00047
<BSEC1>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	8150.	0.00047
<BSEC1>Sp1_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	650.	0.00047
<New 40m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0091
<New 40m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0091
<New 40m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp10_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp10_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp10_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp10_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp10_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp10_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp11_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp11_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp11_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp11_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp11_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp11_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp5_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp5_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp5_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp5_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp5_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp5_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp6_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp6_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp6_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp6_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp6_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp6_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp7_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp7_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp7_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp7_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp7_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp7_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp8_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp8_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp8_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp8_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135
<New 40m>Sp8_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp8_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<New 40m>Sp9_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	975.	0.00135
<New 40m>Sp9_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3775.	0.00135
<New 40m>Sp9_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6575.	0.00135
<New 40m>Sp9_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9375.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<New 40m>Sp9_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	12175.	0.00135
<New 40m>Sp9_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	975.	0.00135
<Rw Br>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<Rw Br>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059
<Rw Br>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp1_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135
<Rw Br>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp2_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135
<Rw Br>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1050.	0.00135
<Rw Br>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3750.	0.00135
<Rw Br>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6450.	0.00135
<Rw Br>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9150.	0.00135
<Rw Br>Sp3_HL5	Force	GLOBAL	Gravity	Right Edge of Deck	1050.	0.00135
<SK 25m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<SK 25m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 25m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108
<SK 25m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108
<SK 25m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 25m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108
<SK 25m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108
<SK 25m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 25m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1250.	0.00108
<SK 25m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3900.	0.00108

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 25m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6550.	0.00108
<SK 25m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9200.	0.00108
<SK 25m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11850.	0.00108
<SK 25m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1250.	0.00108
<SK 40m>Sp1_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 40m>Sp1_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 40m>Sp1_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 40m>Sp1_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 40m>Sp1_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 40m>Sp1_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
<SK 40m>Sp4_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 40m>Sp4_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 40m>Sp4_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 40m>Sp4_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 40m>Sp4_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 40m>Sp4_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
<SK 45m>BL1	Force	GLOBAL	Gravity	Left Edge of Deck	123.8	0.0059
<SK 45m>BL2	Force	GLOBAL	Gravity	Right Edge of Deck	123.8	0.0059
<SK 45m>Sp2_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 45m>Sp2_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 45m>Sp2_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 45m>Sp2_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 45m>Sp2_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135
<SK 45m>Sp2_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
<SK 45m>Sp3_HL1	Force	GLOBAL	Gravity	Left Edge of Deck	1260.	0.00135
<SK 45m>Sp3_HL2	Force	GLOBAL	Gravity	Left Edge of Deck	3906.	0.00135
<SK 45m>Sp3_HL3	Force	GLOBAL	Gravity	Left Edge of Deck	6552.	0.00135
<SK 45m>Sp3_HL4	Force	GLOBAL	Gravity	Left Edge of Deck	9198.	0.00135
<SK 45m>Sp3_HL5	Force	GLOBAL	Gravity	Left Edge of Deck	11844.	0.00135

Table 30: Bridge Load Definitions 02 - Line

Name	Type	CoordSys	Dir	RefLoc	Dist	FOverL
					mm	kN/mm
<SK 45m>Sp3_HL6	Force	GLOBAL	Gravity	Right Edge of Deck	1260.	0.00135
LEFT_BARRIER_LOAD	Force	GLOBAL	Gravity	Left Edge of Deck	200.	0.00588
RIGHT_BARRIER_LOAD	Force	GLOBAL	Gravity	Right Edge of Deck	200.	0.00588
SIDE_WALK	Force	GLOBAL	Gravity	Right Edge of Deck	725.	0.00341

Table 31: Bridge Load Definitions 03 - Area, Part 1 of 2

Name	Type	CoordSys	Dir	RefLocLft	DistLft
					mm
<BSEC1>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	1600.
<Rw Br>SL1	Force	GLOBAL	Gravity		400.
<Rw Br>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<Rw Br>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<Rw Br>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 25m>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 25m>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 25m>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 40m>Sp1_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 40m>Sp4_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.

Name	Type	CoordSys	Dir	RefLocLft	DistLft
					mm
<SK 45m>Sp2_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
<SK 45m>Sp3_DW1	Force	GLOBAL	Gravity	Left Edge of Deck	400.
DW	Force	GLOBAL	Gravity	Left Edge of Deck	400.
PLL	Force	GLOBAL	Gravity	Left Edge of Deck	400.

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Name	DistRgt	FOverL2Lft	FOverL2Rgt
	mm	kN/mm2	kN/mm2
<BSEC1>Sp1_DW1	400.	1.150E-06	1.150E-06
<Rw Br>SL1	1400.	6.000E-06	6.000E-06
<Rw Br>Sp1_DW1	1400.	1.150E-06	1.150E-06
<Rw Br>Sp2_DW1	1400.	1.150E-06	1.150E-06
<Rw Br>Sp3_DW1	1400.	1.150E-06	1.150E-06
<SK 25m>Sp1_DW1	400.	1.150E-06	1.150E-06
<SK 25m>Sp2_DW1	400.	1.150E-06	1.150E-06
<SK 25m>Sp3_DW1	400.	1.150E-06	1.150E-06
<SK 40m>Sp1_DW1	400.	1.150E-06	1.150E-06
<SK 40m>Sp4_DW1	400.	1.150E-06	1.150E-06
<SK 45m>Sp2_DW1	400.	1.150E-06	1.150E-06

Table 31: Bridge Load Definitions 03 - Area, Part 2 of 2

Name	DistRgt	FOverL2Lft	FOverL2Rgt
	mm	kN/mm2	kN/mm2
<SK 45m>Sp3_DW1	400.	1.150E-06	1.150E-06
DW	400.	1.150E-06	1.150E-06
PLL	1600.	3.590E-06	3.590E-06

5. Load cases

This section provides load case information.

5.1. Definitions

Table 32: Load Case Definitions, Part 1 of 2

Case	Type	MLFactVert	InitialCond	MLFactBrake	MLFactCentr
DEAD	LinStatic		Zero		
MODAL	LinModal		Zero		
DW	LinStatic		Zero		
WL	LinStatic		Zero		
EH	LinStatic		Zero		
LS	LinStatic		Zero		
barrier	LinStatic		Zero		
HB	LinMoving	1.	Zero	1.	0.
HA	LinMoving	1.	Zero	1.	0.

Table 32: Load Case Definitions, Part 2 of 2

Table 32: Load Case Definitions, Part 2 of 2

Case	BaseCase	DesActOpt	MassSource	DesignAct
DEAD		Prog Det		Non-Composite
MODAL		Prog Det		Other

Table 32: Load Case Definitions, Part 2 of 2

Case	BaseCase	DesActOpt	MassSource	DesignAct
DW		Prog Det		Long-Term Composite
WL		Prog Det		Short-Term Composite
EH		Prog Det		Long-Term Composite
LS		Prog Det		Short-Term Composite
barrier		Prog Det		Non-Composite
HB		Prog Det		Short-Term Composite
HA		Prog Det		Short-Term Composite

5.2. Static case load assignments

Table 33: Case - Static 1 - Load Assignments

Table 33: Case - Static 1 - Load Assignments

Case	LoadType	LoadName	LoadSF
DEAD	Load pattern	DC	1.
DW	Load pattern	DW	1.
WL	Load pattern	WL	1.
EH	Load pattern	EH	1.
LS	Load pattern	LS	1.
barrier	Load pattern	Barrier	1.

6. Load combinations

This section provides load combination information.

Table 34: Combination Definitions

Table 34: Combination Definitions

ComboName	ComboType	CaseName	ScaleFactor
ULS 1	Linear Add	barrier	1.75
ULS 1		DEAD	1.15
ULS 1		DW	1.75
ULS 1		EH	1.5
ULS 1		HA	1.5
ULS 1		HB	1.3
ULS 1		LS	1.5
ULS 1		WL	1.4
SLS 1	Linear Add	barrier	1.2
SLS 1		DEAD	1.
SLS 1		DW	1.2
SLS 1		EH	1.
SLS 1		HA	1.2
SLS 1		HB	1.1
SLS 1		LS	1.
SLS 1		WL	1.

7. Structure results

This section provides structure results, including items such as structural periods and base reactions.

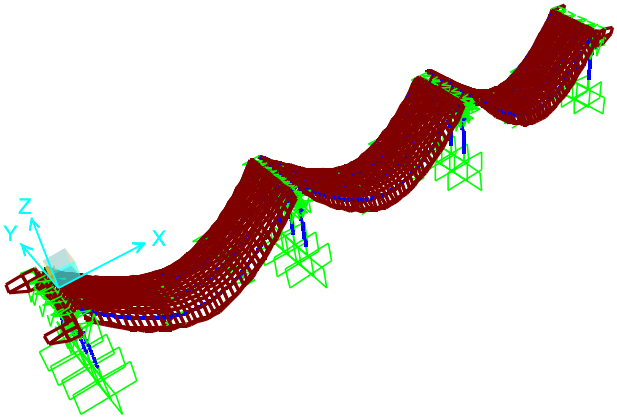


Figure 2: Deformed shape

7.1. Base reactions

Table 35: Base Reactions

Table 35: Base Reactions

OutputCase	GlobalFX	GlobalFY	GlobalFZ	GlobalMX	GlobalMY	GlobalMZ
	kN	kN	kN	kN-mm	kN-mm	kN-mm
DEAD	1.395E-06	5.546E-09	28057.632	6.491E-03	-1473026116.	-1.908E-03
DW	9.749E-08	9.166E-10	1340.325	670162.5	-70367056.	-5.527E-05
WL	1.523E-08	-750.	7.699E-10	-2484250.	5.941E-05	-39375000.
EH	2.074E-07	-1.702E-09	6.301E-08	-1.023E-04	-3.925E-03	1.360E-03
LS	4.199E-07	-3.400E-09	1.280E-07	-2.068E-04	-8.000E-03	2.759E-03
barrier	8.370E-08	7.964E-09	1239.	4.125E-04	-65047494.	2.822E-04

8. Joint results

This section provides joint results, including items such as displacements and reactions.

Table 36: Joint Reactions

Joint	OutputCase	F1	F2	F3	M1	M2	M3
		kN	kN	kN	kN-mm	kN-mm	kN-mm
1367	DEAD	0.447	-4.059	1394.888	11427.48	163552.29	1501.91
1367	DW	0.448	-0.443	61.646	1412.94	4518.96	130.23
1367	WL	0.15	-23.276	35.65	99304.78	1116.16	-648.4
1367	EH	-99.157	-0.339	-3.007	970.74	-933542.24	19523.8
1367	LS	-185.774	0.034	2.121	-245.83	-1848067.06	44960.66
1367	barrier	0.582	0.248	64.838	-722.33	4699.37	-197.12
1369	DEAD	10.53	2.473	1350.919	-6618.	192055.79	343.13
1369	DW	0.632	0.083	59.	-49.84	5095.23	4.89
1369	WL	5.373E-03	-24.334	3.734	102249.02	201.78	-385.09
1369	EH	-93.844	-0.055	3.007	164.79	-906481.97	5702.19
1369	LS	-174.366	0.047	-2.121	-179.77	-1787532.07	13561.41
1369	barrier	0.364	0.347	35.997	-969.54	3938.34	-97.33
1371	DEAD	10.53	-2.473	1350.919	6618.	192055.79	-343.13
1371	DW	0.603	-0.056	54.348	297.81	4934.58	-159.36
1371	WL	-5.373E-03	-24.334	-3.734	102249.02	-201.78	-385.09
1371	EH	-93.844	0.055	3.007	-164.79	-906481.97	-5702.19
1371	LS	-174.366	-0.047	-2.121	179.77	-1787532.07	-13561.41
1371	barrier	0.364	-0.347	35.997	969.54	3938.34	97.33
1373	DEAD	0.447	4.059	1394.888	-11427.48	163552.29	-1501.91
1373	DW	0.351	0.416	43.168	-1016.96	4013.47	-275.6
1373	WL	-0.15	-23.276	-35.65	99304.78	-1116.16	-648.4
1373	EH	-99.157	0.339	-3.007	-970.74	-933542.24	-19523.8
1373	LS	-185.774	-0.034	2.121	245.83	-1848067.06	-44960.66
1373	barrier	0.582	-0.248	64.838	722.33	4699.37	197.12
1377	DEAD	1.576	-17.422	2039.901	47277.17	30027.86	60.61
1377	DW	-7.580E-03	-1.305	120.928	3865.79	1061.17	-12.01
1377	WL	0.211	-65.29	108.334	282640.41	1049.45	-291.
1377	EH	-8.566	-1.963E-03	-0.043	5.33	-78620.42	-341.11
1377	LS	-17.339	-4.747E-03	-0.105	12.88	-159155.07	-690.3
1377	barrier	3.030E-03	1.046	143.621	-2835.88	977.17	0.97
1379	DEAD	1.627	1.813	2228.697	-4963.51	30213.88	23.03
1379	DW	1.055E-03	0.041	129.128	210.12	1071.67	-12.5
1379	WL	0.064	-74.639	-4.477	308047.73	337.21	-306.55
1379	EH	-8.75	-6.426E-04	0.043	1.74	-79385.64	-131.54
1379	LS	-17.714	-1.774E-03	0.105	4.81	-160707.89	-266.16
1379	barrier	-1.993E-03	0.856	65.295	-2323.43	964.39	0.49
1381	DEAD	1.627	-1.813	2228.697	4963.51	30213.88	-23.03
1381	DW	7.034E-03	0.017	119.407	281.63	1074.86	-12.15
1381	WL	-0.064	-74.639	4.477	308047.73	-337.21	-306.55
1381	EH	-8.75	6.426E-04	0.043	-1.74	-79385.64	131.54
1381	LS	-17.714	1.774E-03	0.105	-4.81	-160707.89	266.16
1381	barrier	-1.993E-03	-0.856	65.295	2323.43	964.39	-0.49
1383	DEAD	1.576	17.422	2039.901	-47277.17	30027.86	-60.61
1383	DW	0.01	1.266	82.537	-3110.54	1071.47	-11.38
1383	WL	-0.211	-65.29	-108.334	282640.41	-1049.45	-291.

Table 36: Joint Reactions

Joint	OutputCase	F1	F2	F3	M1	M2	M3
		kN	kN	kN	kN-mm	kN-mm	kN-mm
1383	EH	-8.566	1.963E-03	-0.043	-5.33	-78620.42	341.11
1383	LS	-17.339	4.747E-03	-0.105	-12.88	-159155.07	690.3
1383	barrier	3.030E-03	-1.046	143.621	2835.88	977.17	-0.97
1387	DEAD	5.016	-12.525	2081.024	34610.39	13702.74	-8360.78
1387	DW	1.232	-0.994	125.578	3236.62	6068.32	-1172.98
1387	WL	-3.37	-66.084	103.059	282952.05	-16831.01	6370.
1387	EH	16.406	0.016	0.063	-44.42	150110.71	151.34
1387	LS	33.212	0.033	0.114	-88.6	303877.47	307.06
1387	barrier	0.399	0.278	131.821	-920.65	3408.61	-2492.66
1389	DEAD	-0.945	1.73	2187.575	-4529.27	-7562.48	-2119.25
1389	DW	0.39	-0.031	125.017	583.75	2740.15	-984.17
1389	WL	-0.371	-72.945	7.888	301733.72	-3258.93	4439.89
1389	EH	16.541	-3.557E-03	-0.063	9.09	150531.94	4.25
1389	LS	33.486	-7.557E-03	-0.114	19.4	304734.86	9.
1389	barrier	0.236	0.625	77.094	-1773.53	447.88	-1284.76
1391	DEAD	-0.945	-1.73	2187.575	4529.27	-7562.48	2119.25
1391	DW	-0.065	-0.119	114.802	777.43	400.32	-1121.95
1391	WL	0.371	-72.945	-7.888	301733.72	3258.93	4439.89
1391	EH	16.541	3.557E-03	-0.063	-9.09	150531.94	-4.25
1391	LS	33.486	7.557E-03	-0.114	-19.4	304734.86	-9.
1391	barrier	0.236	-0.625	77.094	1773.53	447.88	1284.76
1393	DEAD	5.016	12.525	2081.024	-34610.39	13702.74	8360.78
1393	DW	-0.223	0.745	86.603	-1610.35	-1218.51	-911.88
1393	WL	3.37	-66.084	-103.059	282952.05	16831.01	6370.
1393	EH	16.406	-0.016	0.063	44.42	150110.71	-151.34
1393	LS	33.212	-0.033	0.114	88.6	303877.47	-307.06
1393	barrier	0.399	-0.278	131.821	920.65	3408.61	2492.66
1397	DEAD	-4.048	-4.066	1394.761	11447.77	-196589.42	-1642.36
1397	DW	-0.791	-0.351	61.303	1016.58	-7620.19	-130.97
1397	WL	-0.108	-23.675	37.037	101029.35	-905.29	594.08
1397	EH	91.415	-0.349	-3.106	995.21	862539.65	-19821.76
1397	LS	170.102	0.013	1.92	-196.29	1704331.48	-45563.84
1397	barrier	-0.898	0.25	64.886	-726.83	-7587.79	186.03
1399	DEAD	-14.202	2.471	1351.05	-6612.53	-225393.96	-396.75
1399	DW	-0.975	0.181	58.964	-462.93	-8193.04	4.55
1399	WL	8.485E-03	-24.757	3.949	104040.85	-130.02	321.46
1399	EH	85.955	-0.055	3.106	164.16	834847.97	-5815.61
1399	LS	158.395	0.047	-1.92	-181.05	1642518.29	-13791.01
1399	barrier	-0.684	0.348	35.949	-973.22	-6848.11	93.19
1401	DEAD	-14.202	-2.471	1351.05	6612.53	-225393.96	396.75
1401	DW	-0.939	0.042	54.418	-117.05	-7999.9	178.81

Table 36: Joint Reactions

Joint	OutputCase	F1	F2	F3	M1	M2	M3
		kN	kN	kN	kN-mm	kN-mm	kN-mm
1401	WL	-8.485E-03	-24.757	-3.949	104040.85	130.02	321.46
1401	EH	85.955	0.055	3.106	-164.16	834847.97	5815.61
1401	LS	158.395	-0.047	-1.92	181.05	1642518.29	13791.01
1401	barrier	-0.684	-0.348	35.949	973.22	-6848.11	-93.19
1403	DEAD	-4.048	4.066	1394.761	-11447.77	-196589.42	1642.36
1403	DW	-0.674	0.509	43.477	-1418.19	-7018.86	301.02
1403	WL	0.108	-23.675	-37.037	101029.35	905.29	594.08
1403	EH	91.415	0.349	-3.106	-995.21	862539.65	19821.76
1403	LS	170.102	-0.013	1.92	196.29	1704331.48	45563.84
1403	barrier	-0.898	-0.25	64.886	726.83	-7587.79	-186.03

Table 36: Joint Reactions

9. Bridge object forces

This section provides bridge object forces at the program determined section cuts.

Table 37: Bridge Object Forces, Part 1 of 3

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	1	0.	After	DEAD	LinStatic	-21.953	-3210.382	2.412E-08
BOBJ1	2	2916.75	Before	DEAD	LinStatic	-21.953	-2685.92	2.412E-08
BOBJ1	3	2916.75	After	DEAD	LinStatic	-21.953	-2685.92	2.412E-08
BOBJ1	4	5833.5	Before	DEAD	LinStatic	-21.953	-2161.459	2.412E-08
BOBJ1	5	5833.5	After	DEAD	LinStatic	-21.953	-2161.459	2.412E-08
BOBJ1	6	8750.25	Before	DEAD	LinStatic	-21.953	-1636.998	2.412E-08
BOBJ1	7	8750.25	After	DEAD	LinStatic	-21.953	-1636.998	2.412E-08
BOBJ1	8	11667.	Before	DEAD	LinStatic	-21.953	-1112.536	2.411E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	9	11667.	After	DEAD	LinStatic	-21.953	-971.299	2.408E-08
BOBJ1	10	14583.75	Before	DEAD	LinStatic	-21.953	-446.838	2.403E-08
BOBJ1	11	14583.75	After	DEAD	LinStatic	-21.953	-446.838	2.401E-08
BOBJ1	12	17500.5	Before	DEAD	LinStatic	-21.953	77.624	2.402E-08
BOBJ1	13	17500.5	After	DEAD	LinStatic	-21.953	77.624	2.402E-08
BOBJ1	14	20417.25	Before	DEAD	LinStatic	-21.953	602.085	2.400E-08
BOBJ1	15	20417.25	After	DEAD	LinStatic	-21.953	602.085	2.400E-08
BOBJ1	16	23334.	Before	DEAD	LinStatic	-21.953	1126.546	2.426E-08
BOBJ1	17	23334.	After	DEAD	LinStatic	-21.953	1267.784	2.317E-08
BOBJ1	18	26050.5	Before	DEAD	LinStatic	-21.953	1756.238	2.329E-08
BOBJ1	19	26050.5	After	DEAD	LinStatic	-21.953	1756.238	2.411E-08
BOBJ1	20	28767.	Before	DEAD	LinStatic	-21.953	2244.693	2.411E-08
BOBJ1	21	28767.	After	DEAD	LinStatic	-21.953	2244.693	2.411E-08
BOBJ1	22	31483.5	Before	DEAD	LinStatic	-21.953	2733.147	2.404E-08
BOBJ1	23	31483.5	After	DEAD	LinStatic	-21.953	2733.147	2.403E-08
BOBJ1	24	34200.	Before	DEAD	LinStatic	-21.953	3221.601	2.395E-08
BOBJ1	25	34200.	After	DEAD	LinStatic	3.228E-11	-143.848	6.762E-12
BOBJ1	26	35000.	Before	DEAD	LinStatic	-1.059E-11	6.490E-12	1.017E-11
BOBJ1	27	35000.	After	DEAD	LinStatic	1.609E-10	3.393E-12	2.967E-12
BOBJ1	28	35800.	Before	DEAD	LinStatic	1.755E-10	143.848	8.729E-13
BOBJ1	29	35800.	After	DEAD	LinStatic	-28.358	-3144.063	-1.417E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	30	38516.75	Before	DEAD	LinStatic	-28.358	-2655.564	-1.404E-09
BOBJ1	31	38516.75	After	DEAD	LinStatic	-28.358	-2655.564	-1.401E-09
BOBJ1	32	41233.5	Before	DEAD	LinStatic	-28.358	-2167.065	-1.388E-09
BOBJ1	33	41233.5	After	DEAD	LinStatic	-28.358	-2167.065	-1.389E-09
BOBJ1	34	43950.25	Before	DEAD	LinStatic	-28.358	-1678.565	-1.385E-09
BOBJ1	35	43950.25	After	DEAD	LinStatic	-28.358	-1678.565	-1.383E-09
BOBJ1	36	46667.	Before	DEAD	LinStatic	-28.358	-1190.066	-1.367E-09
BOBJ1	37	46667.	After	DEAD	LinStatic	-28.358	-1048.829	-8.528E-10
BOBJ1	38	49583.75	Before	DEAD	LinStatic	-28.358	-524.367	-8.398E-10
BOBJ1	39	49583.75	After	DEAD	LinStatic	-28.358	-524.367	-8.369E-10
BOBJ1	40	52500.5	Before	DEAD	LinStatic	-28.358	4.229E-03	-8.324E-10
BOBJ1	41	52500.5	After	DEAD	LinStatic	-28.358	4.229E-03	-8.400E-10
BOBJ1	42	55417.25	Before	DEAD	LinStatic	-28.358	524.555	-8.398E-10
BOBJ1	43	55417.25	After	DEAD	LinStatic	-28.358	524.555	-8.404E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	44	58334.	Before	DEAD	LinStatic	-28.358	1049.017	-8.423E-10
BOBJ1	45	58334.	After	DEAD	LinStatic	-28.358	1190.254	-1.168E-09
BOBJ1	46	61050.5	Before	DEAD	LinStatic	-28.358	1678.709	-1.178E-09
BOBJ1	47	61050.5	After	DEAD	LinStatic	-28.358	1678.709	-1.177E-09
BOBJ1	48	63767.	Before	DEAD	LinStatic	-28.358	2167.163	-1.187E-09
BOBJ1	49	63767.	After	DEAD	LinStatic	-28.358	2167.163	-1.189E-09
BOBJ1	50	66483.5	Before	DEAD	LinStatic	-28.358	2655.617	-1.203E-09
BOBJ1	51	66483.5	After	DEAD	LinStatic	-28.358	2655.617	-1.200E-09
BOBJ1	52	69200.	Before	DEAD	LinStatic	-28.358	3144.072	-1.213E-09
BOBJ1	53	69200.	After	DEAD	LinStatic	-1.765E-11	-143.848	-6.455E-12
BOBJ1	54	70000.	Before	DEAD	LinStatic	-3.670E-11	-2.874E-12	-3.150E-12
BOBJ1	55	70000.	After	DEAD	LinStatic	4.587E-10	7.709E-12	9.223E-12
BOBJ1	56	70800.	Before	DEAD	LinStatic	5.107E-10	143.848	-1.264E-12
BOBJ1	57	70800.	After	DEAD	LinStatic	-36.501	-3221.593	3.098E-08
BOBJ1	58	73516.75	Before	DEAD	LinStatic	-36.501	-2733.094	3.100E-08
BOBJ1	59	73516.75	After	DEAD	LinStatic	-36.501	-2733.094	3.100E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	60	76233.5	Before	DEAD	LinStatic	-36.501	-2244.594	3.097E-08
BOBJ1	61	76233.5	After	DEAD	LinStatic	-36.501	-2244.594	3.097E-08
BOBJ1	62	78950.25	Before	DEAD	LinStatic	-36.501	-1756.095	3.100E-08
BOBJ1	63	78950.25	After	DEAD	LinStatic	-36.501	-1756.095	3.097E-08
BOBJ1	64	81667.	Before	DEAD	LinStatic	-36.501	-1267.596	3.100E-08
BOBJ1	65	81667.	After	DEAD	LinStatic	-36.501	-1126.358	3.094E-08
BOBJ1	66	84583.75	Before	DEAD	LinStatic	-36.501	-601.897	3.100E-08
BOBJ1	67	84583.75	After	DEAD	LinStatic	-36.501	-601.897	3.100E-08
BOBJ1	68	87500.5	Before	DEAD	LinStatic	-36.501	-77.436	3.104E-08
BOBJ1	69	87500.5	After	DEAD	LinStatic	-36.501	-77.436	3.104E-08
BOBJ1	70	90417.25	Before	DEAD	LinStatic	-36.501	447.026	3.108E-08
BOBJ1	71	90417.25	After	DEAD	LinStatic	-36.501	447.026	3.108E-08
BOBJ1	72	93334.	Before	DEAD	LinStatic	-36.501	971.487	3.113E-08
BOBJ1	73	93334.	After	DEAD	LinStatic	-36.501	1112.724	2.774E-08
BOBJ1	74	96250.5	Before	DEAD	LinStatic	-36.501	1637.141	2.776E-08
BOBJ1	75	96250.5	After	DEAD	LinStatic	-36.501	1637.141	2.777E-08
BOBJ1	76	99167.	Before	DEAD	LinStatic	-36.501	2161.557	2.778E-08
BOBJ1	77	99167.	After	DEAD	LinStatic	-36.501	2161.557	2.778E-08
BOBJ1	78	102083.5	Before	DEAD	LinStatic	-36.501	2685.973	2.780E-08
BOBJ1	79	102083.5	After	DEAD	LinStatic	-36.501	2685.973	2.780E-08
BOBJ1	80	105000.	Before	DEAD	LinStatic	-36.501	3210.39	2.781E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	1	0.	After	DW	LinStatic	-2.034	-211.957	4.660E-04
BOBJ1	2	2916.75	Before	DW	LinStatic	-2.034	-187.135	4.660E-04
BOBJ1	3	2916.75	After	DW	LinStatic	-2.034	-174.724	4.660E-04
BOBJ1	4	5833.5	Before	DW	LinStatic	-2.034	-149.903	4.660E-04
BOBJ1	5	5833.5	After	DW	LinStatic	-2.034	-137.492	4.660E-04
BOBJ1	6	8750.25	Before	DW	LinStatic	-2.034	-112.671	4.660E-04
BOBJ1	7	8750.25	After	DW	LinStatic	-2.034	-100.26	4.660E-04
BOBJ1	8	11667.	Before	DW	LinStatic	-2.034	-75.438	4.660E-04
BOBJ1	9	11667.	After	DW	LinStatic	-2.034	-63.027	4.660E-04
BOBJ1	10	14583.75	Before	DW	LinStatic	-2.034	-38.206	4.660E-04
BOBJ1	11	14583.75	After	DW	LinStatic	-2.034	-25.795	4.660E-04
BOBJ1	12	17500.5	Before	DW	LinStatic	-2.034	-0.974	4.660E-04
BOBJ1	13	17500.5	After	DW	LinStatic	-2.034	11.437	4.660E-04
BOBJ1	14	20417.25	Before	DW	LinStatic	-2.034	36.259	4.660E-04
BOBJ1	15	20417.25	After	DW	LinStatic	-2.034	48.67	4.660E-04
BOBJ1	16	23334.	Before	DW	LinStatic	-2.034	73.491	4.660E-04
BOBJ1	17	23334.	After	DW	LinStatic	-2.034	85.476	4.660E-04
BOBJ1	18	26050.5	Before	DW	LinStatic	-2.034	108.593	4.660E-04
BOBJ1	19	26050.5	After	DW	LinStatic	-2.034	120.152	4.660E-04
BOBJ1	20	28767.	Before	DW	LinStatic	-2.034	143.269	4.660E-04
BOBJ1	21	28767.	After	DW	LinStatic	-2.034	154.828	4.660E-04

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	22	31483.5	Before	DW	LinStatic	-2.034	177.945	4.660E-04
BOBJ1	23	31483.5	After	DW	LinStatic	-2.034	189.504	4.660E-04
BOBJ1	24	34200.	Before	DW	LinStatic	-2.034	212.622	4.660E-04
BOBJ1	25	34200.	After	DW	LinStatic	7.387E-12	-5.106	-1.351E-13
BOBJ1	26	35000.	Before	DW	LinStatic	5.830E-12	-5.106	3.345E-13
BOBJ1	27	35000.	After	DW	LinStatic	6.225E-12	5.106	-1.361E-13
BOBJ1	28	35800.	Before	DW	LinStatic	7.156E-12	5.106	-1.935E-13
BOBJ1	29	35800.	After	DW	LinStatic	-2.045	-207.396	0.019
BOBJ1	30	38516.75	Before	DW	LinStatic	-2.045	-184.276	0.019
BOBJ1	31	38516.75	After	DW	LinStatic	-2.045	-172.716	0.019
BOBJ1	32	41233.5	Before	DW	LinStatic	-2.045	-149.597	0.019
BOBJ1	33	41233.5	After	DW	LinStatic	-2.045	-138.037	0.019
BOBJ1	34	43950.25	Before	DW	LinStatic	-2.045	-114.918	0.019
BOBJ1	35	43950.25	After	DW	LinStatic	-2.045	-103.358	0.019
BOBJ1	36	46667.	Before	DW	LinStatic	-2.045	-80.238	0.019
BOBJ1	37	46667.	After	DW	LinStatic	-2.045	-68.253	0.019
BOBJ1	38	49583.75	Before	DW	LinStatic	-2.045	-43.432	0.019
BOBJ1	39	49583.75	After	DW	LinStatic	-2.045	-31.022	0.019
BOBJ1	40	52500.5	Before	DW	LinStatic	-2.045	-6.201	0.019
BOBJ1	41	52500.5	After	DW	LinStatic	-2.045	6.209	0.019
BOBJ1	42	55417.25	Before	DW	LinStatic	-2.045	31.032	0.019
BOBJ1	43	55417.25	After	DW	LinStatic	-2.045	43.444	0.019
BOBJ1	44	58334.	Before	DW	LinStatic	-2.045	68.265	0.019
BOBJ1	45	58334.	After	DW	LinStatic	-2.045	80.25	0.019
BOBJ1	46	61050.5	Before	DW	LinStatic	-2.045	103.368	0.019
BOBJ1	47	61050.5	After	DW	LinStatic	-2.045	114.926	0.019
BOBJ1	48	63767.	Before	DW	LinStatic	-2.045	138.044	0.019
BOBJ1	49	63767.	After	DW	LinStatic	-2.045	149.602	0.019
BOBJ1	50	66483.5	Before	DW	LinStatic	-2.045	172.72	0.019
BOBJ1	51	66483.5	After	DW	LinStatic	-2.045	184.279	0.019
BOBJ1	52	69200.	Before	DW	LinStatic	-2.045	207.396	0.019

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	53	69200.	After	DW	LinStatic	2.099E-12	-5.106	-5.811E-13
BOBJ1	54	70000.	Before	DW	LinStatic	1.148E-12	-5.106	-8.011E-14
BOBJ1	55	70000.	After	DW	LinStatic	2.521E-11	5.106	1.934E-13
BOBJ1	56	70800.	Before	DW	LinStatic	2.861E-11	5.106	-1.761E-13
BOBJ1	57	70800.	After	DW	LinStatic	-3.379	-212.621	-0.381
BOBJ1	58	73516.75	Before	DW	LinStatic	-3.379	-189.502	-0.381
BOBJ1	59	73516.75	After	DW	LinStatic	-3.379	-177.942	-0.381
BOBJ1	60	76233.5	Before	DW	LinStatic	-3.379	-154.822	-0.381
BOBJ1	61	76233.5	After	DW	LinStatic	-3.379	-143.262	-0.381
BOBJ1	62	78950.25	Before	DW	LinStatic	-3.379	-120.143	-0.381
BOBJ1	63	78950.25	After	DW	LinStatic	-3.379	-108.583	-0.381
BOBJ1	64	81667.	Before	DW	LinStatic	-3.379	-85.464	-0.381
BOBJ1	65	81667.	After	DW	LinStatic	-3.379	-73.478	-0.381
BOBJ1	66	84583.75	Before	DW	LinStatic	-3.379	-48.657	-0.381
BOBJ1	67	84583.75	After	DW	LinStatic	-3.379	-36.246	-0.381
BOBJ1	68	87500.5	Before	DW	LinStatic	-3.379	-11.424	-0.381
BOBJ1	69	87500.5	After	DW	LinStatic	-3.379	0.986	-0.381
BOBJ1	70	90417.25	Before	DW	LinStatic	-3.379	25.808	-0.381
BOBJ1	71	90417.25	After	DW	LinStatic	-3.379	38.219	-0.381
BOBJ1	72	93334.	Before	DW	LinStatic	-3.379	63.04	-0.381
BOBJ1	73	93334.	After	DW	LinStatic	-3.379	75.45	-0.381
BOBJ1	74	96250.5	Before	DW	LinStatic	-3.379	100.27	-0.381
BOBJ1	75	96250.5	After	DW	LinStatic	-3.379	112.68	-0.381
BOBJ1	76	99167.	Before	DW	LinStatic	-3.379	137.499	-0.381
BOBJ1	77	99167.	After	DW	LinStatic	-3.379	149.909	-0.381
BOBJ1	78	102083.5	Before	DW	LinStatic	-3.379	174.728	-0.381
BOBJ1	79	102083.5	After	DW	LinStatic	-3.379	187.138	-0.381
BOBJ1	80	105000.	Before	DW	LinStatic	-3.379	211.957	-0.381
BOBJ1	1	0.	After	WL	LinStatic	-6.422E-10	-1.395E-09	-0.22
BOBJ1	2	2916.75	Before	WL	LinStatic	-6.432E-10	-1.395E-09	-0.22

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	3	2916.75	After	WL	LinStatic	-6.450E-10	-1.395E-09	-0.22
BOBJ1	4	5833.5	Before	WL	LinStatic	-6.469E-10	-1.394E-09	-0.22
BOBJ1	5	5833.5	After	WL	LinStatic	-6.464E-10	-1.394E-09	-0.22
BOBJ1	6	8750.25	Before	WL	LinStatic	-6.537E-10	-1.394E-09	-0.22
BOBJ1	7	8750.25	After	WL	LinStatic	-6.504E-10	-1.394E-09	-0.22
BOBJ1	8	11667.	Before	WL	LinStatic	-6.623E-10	-1.394E-09	-0.22
BOBJ1	9	11667.	After	WL	LinStatic	-2.261E-09	-1.005E-09	-0.22
BOBJ1	10	14583.75	Before	WL	LinStatic	-2.292E-09	-1.004E-09	-0.22
BOBJ1	11	14583.75	After	WL	LinStatic	-2.339E-09	-1.022E-09	-0.22
BOBJ1	12	17500.5	Before	WL	LinStatic	-2.487E-09	-1.028E-09	-0.22
BOBJ1	13	17500.5	After	WL	LinStatic	-2.483E-09	-1.028E-09	-0.22
BOBJ1	14	20417.25	Before	WL	LinStatic	-2.498E-09	-1.028E-09	-0.22
BOBJ1	15	20417.25	After	WL	LinStatic	-2.496E-09	-1.028E-09	-0.22
BOBJ1	16	23334.	Before	WL	LinStatic	-3.061E-09	-1.027E-09	-0.22
BOBJ1	17	23334.	After	WL	LinStatic	3.740E-10	-9.516E-11	-0.22

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	18	26050.5	Before	WL	LinStatic	8.524E-10	-1.264E-10	-0.22
BOBJ1	19	26050.5	After	WL	LinStatic	1.186E-09	-4.934E-10	-0.22
BOBJ1	20	28767.	Before	WL	LinStatic	1.271E-09	-4.844E-10	-0.22
BOBJ1	21	28767.	After	WL	LinStatic	1.301E-09	-4.804E-10	-0.22
BOBJ1	22	31483.5	Before	WL	LinStatic	1.324E-09	-4.756E-10	-0.22
BOBJ1	23	31483.5	After	WL	LinStatic	1.331E-09	-4.745E-10	-0.22
BOBJ1	24	34200.	Before	WL	LinStatic	1.334E-09	-4.750E-10	-0.22
BOBJ1	25	34200.	After	WL	LinStatic	-3.605E-12	7.993E-13	-2.213E-11
BOBJ1	26	35000.	Before	WL	LinStatic	-1.955E-12	6.831E-13	9.881E-12
BOBJ1	27	35000.	After	WL	LinStatic	-2.900E-12	1.829E-13	-2.031E-11
BOBJ1	28	35800.	Before	WL	LinStatic	1.634E-13	6.785E-14	5.243E-12
BOBJ1	29	35800.	After	WL	LinStatic	-1.017E-09	8.671E-11	-0.076
BOBJ1	30	38516.75	Before	WL	LinStatic	-1.046E-09	8.644E-11	-0.076
BOBJ1	31	38516.75	After	WL	LinStatic	-1.064E-09	8.603E-11	-0.076
BOBJ1	32	41233.5	Before	WL	LinStatic	-1.133E-09	8.603E-11	-0.076
BOBJ1	33	41233.5	After	WL	LinStatic	-1.359E-09	-2.860E-11	-0.076
BOBJ1	34	43950.25	Before	WL	LinStatic	-1.399E-09	-4.017E-11	-0.076

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	35	43950.25	After	WL	LinStatic	-1.399E-09	-4.001E-11	-0.076
BOBJ1	36	46667.	Before	WL	LinStatic	-1.413E-09	-7.395E-11	-0.076
BOBJ1	37	46667.	After	WL	LinStatic	-1.339E-09	-1.201E-10	-0.076
BOBJ1	38	49583.75	Before	WL	LinStatic	-1.207E-09	-1.196E-10	-0.076
BOBJ1	39	49583.75	After	WL	LinStatic	-1.127E-09	-6.560E-11	-0.076
BOBJ1	40	52500.5	Before	WL	LinStatic	-1.118E-09	-6.545E-11	-0.076
BOBJ1	41	52500.5	After	WL	LinStatic	-1.207E-09	3.617E-11	-0.076
BOBJ1	42	55417.25	Before	WL	LinStatic	-1.204E-09	3.709E-11	-0.076
BOBJ1	43	55417.25	After	WL	LinStatic	-1.207E-09	3.737E-11	-0.076
BOBJ1	44	58334.	Before	WL	LinStatic	-1.214E-09	3.735E-11	-0.076
BOBJ1	45	58334.	After	WL	LinStatic	-1.242E-09	-3.250E-12	-0.076
BOBJ1	46	61050.5	Before	WL	LinStatic	-1.254E-09	-3.850E-12	-0.076
BOBJ1	47	61050.5	After	WL	LinStatic	-1.252E-09	-3.926E-12	-0.076
BOBJ1	48	63767.	Before	WL	LinStatic	-1.262E-09	-3.670E-12	-0.076

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	49	63767.	After	WL	LinStatic	-1.262E-09	-4.439E-12	-0.076
BOBJ1	50	66483.5	Before	WL	LinStatic	-1.274E-09	-4.407E-12	-0.076
BOBJ1	51	66483.5	After	WL	LinStatic	-1.275E-09	-1.681E-11	-0.076
BOBJ1	52	69200.	Before	WL	LinStatic	-1.290E-09	-1.644E-11	-0.076
BOBJ1	53	69200.	After	WL	LinStatic	-3.652E-12	2.330E-13	-3.091E-11
BOBJ1	54	70000.	Before	WL	LinStatic	6.133E-13	2.359E-13	1.211E-12
BOBJ1	55	70000.	After	WL	LinStatic	-2.171E-12	-2.549E-12	-2.128E-11
BOBJ1	56	70800.	Before	WL	LinStatic	8.396E-13	-2.603E-12	1.314E-11
BOBJ1	57	70800.	After	WL	LinStatic	-8.424E-09	-1.133E-09	1.865
BOBJ1	58	73516.75	Before	WL	LinStatic	-8.431E-09	-1.134E-09	1.865
BOBJ1	59	73516.75	After	WL	LinStatic	-8.431E-09	-1.134E-09	1.865
BOBJ1	60	76233.5	Before	WL	LinStatic	-8.423E-09	-1.133E-09	1.865
BOBJ1	61	76233.5	After	WL	LinStatic	-8.425E-09	-1.134E-09	1.865
BOBJ1	62	78950.25	Before	WL	LinStatic	-8.430E-09	-1.134E-09	1.865
BOBJ1	63	78950.25	After	WL	LinStatic	-8.423E-09	-1.126E-09	1.865

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	64	81667.	Before	WL	LinStatic	-8.428E-09	-1.127E-09	1.865
BOBJ1	65	81667.	After	WL	LinStatic	-8.430E-09	-1.130E-09	1.865
BOBJ1	66	84583.75	Before	WL	LinStatic	-8.451E-09	-1.130E-09	1.865
BOBJ1	67	84583.75	After	WL	LinStatic	-8.452E-09	-1.129E-09	1.865
BOBJ1	68	87500.5	Before	WL	LinStatic	-8.460E-09	-1.128E-09	1.865
BOBJ1	69	87500.5	After	WL	LinStatic	-8.463E-09	-1.129E-09	1.865
BOBJ1	70	90417.25	Before	WL	LinStatic	-8.475E-09	-1.129E-09	1.865
BOBJ1	71	90417.25	After	WL	LinStatic	-8.473E-09	-1.129E-09	1.865
BOBJ1	72	93334.	Before	WL	LinStatic	-8.488E-09	-1.128E-09	1.865
BOBJ1	73	93334.	After	WL	LinStatic	-6.266E-09	-5.047E-10	1.865
BOBJ1	74	96250.5	Before	WL	LinStatic	-6.274E-09	-5.051E-10	1.865
BOBJ1	75	96250.5	After	WL	LinStatic	-6.274E-09	-5.053E-10	1.865
BOBJ1	76	99167.	Before	WL	LinStatic	-6.278E-09	-5.065E-10	1.865
BOBJ1	77	99167.	After	WL	LinStatic	-6.279E-09	-5.067E-10	1.865

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	78	102083.5	Before	WL	LinStatic	-6.283E-09	-5.074E-10	1.865
BOBJ1	79	102083.5	After	WL	LinStatic	-6.285E-09	-5.077E-10	1.865
BOBJ1	80	105000.	Before	WL	LinStatic	-6.292E-09	-5.082E-10	1.865
BOBJ1	1	0.	After	EH	LinStatic	-47.246	-5.427E-09	-9.053E-09
BOBJ1	2	2916.75	Before	EH	LinStatic	-47.246	-5.426E-09	-9.007E-09
BOBJ1	3	2916.75	After	EH	LinStatic	-47.246	-5.430E-09	-9.017E-09
BOBJ1	4	5833.5	Before	EH	LinStatic	-47.246	-5.435E-09	-8.952E-09
BOBJ1	5	5833.5	After	EH	LinStatic	-47.246	-5.443E-09	-8.949E-09
BOBJ1	6	8750.25	Before	EH	LinStatic	-47.246	-5.444E-09	-8.881E-09
BOBJ1	7	8750.25	After	EH	LinStatic	-47.246	-5.452E-09	-8.881E-09
BOBJ1	8	11667.	Before	EH	LinStatic	-47.246	-5.453E-09	-8.805E-09
BOBJ1	9	11667.	After	EH	LinStatic	-47.246	-1.165E-08	-8.867E-09
BOBJ1	10	14583.75	Before	EH	LinStatic	-47.246	-1.165E-08	-8.780E-09
BOBJ1	11	14583.75	After	EH	LinStatic	-47.246	-1.167E-08	-8.818E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	12	17500.5	Before	EH	LinStatic	-47.246	-1.172E-08	-8.787E-09
BOBJ1	13	17500.5	After	EH	LinStatic	-47.246	-1.172E-08	-8.788E-09
BOBJ1	14	20417.25	Before	EH	LinStatic	-47.246	-1.172E-08	-8.714E-09
BOBJ1	15	20417.25	After	EH	LinStatic	-47.246	-1.174E-08	-8.719E-09
BOBJ1	16	23334.	Before	EH	LinStatic	-47.246	-1.174E-08	-8.961E-09
BOBJ1	17	23334.	After	EH	LinStatic	-47.246	-2.458E-09	-9.038E-09
BOBJ1	18	26050.5	Before	EH	LinStatic	-47.246	-2.452E-09	-7.629E-09
BOBJ1	19	26050.5	After	EH	LinStatic	-47.246	7.504E-10	-7.457E-09
BOBJ1	20	28767.	Before	EH	LinStatic	-47.246	7.497E-10	-7.555E-09
BOBJ1	21	28767.	After	EH	LinStatic	-47.246	7.571E-10	-7.556E-09
BOBJ1	22	31483.5	Before	EH	LinStatic	-47.246	7.546E-10	-7.430E-09
BOBJ1	23	31483.5	After	EH	LinStatic	-47.246	7.479E-10	-7.380E-09
BOBJ1	24	34200.	Before	EH	LinStatic	-47.246	7.432E-10	-7.256E-09
BOBJ1	25	34200.	After	EH	LinStatic	-3.244E-10	-6.128E-12	-5.929E-12

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	26	35000.	Before	EH	LinStatic	-2.597E-10	-6.550E-12	-1.492E-11
BOBJ1	27	35000.	After	EH	LinStatic	-4.752E-11	-9.476E-13	-3.833E-13
BOBJ1	28	35800.	Before	EH	LinStatic	-5.291E-11	-4.968E-13	2.206E-13
BOBJ1	29	35800.	After	EH	LinStatic	-12.615	5.132E-09	-3.629E-10
BOBJ1	30	38516.75	Before	EH	LinStatic	-12.615	5.132E-09	-3.648E-10
BOBJ1	31	38516.75	After	EH	LinStatic	-12.615	5.129E-09	-3.652E-10
BOBJ1	32	41233.5	Before	EH	LinStatic	-12.615	5.132E-09	-3.695E-10
BOBJ1	33	41233.5	After	EH	LinStatic	-12.615	5.132E-09	-3.693E-10
BOBJ1	34	43950.25	Before	EH	LinStatic	-12.615	5.135E-09	-3.708E-10
BOBJ1	35	43950.25	After	EH	LinStatic	-12.615	5.131E-09	-3.708E-10
BOBJ1	36	46667.	Before	EH	LinStatic	-12.615	5.136E-09	-3.708E-10
BOBJ1	37	46667.	After	EH	LinStatic	-12.615	6.955E-09	-3.631E-10
BOBJ1	38	49583.75	Before	EH	LinStatic	-12.615	6.954E-09	-3.695E-10
BOBJ1	39	49583.75	After	EH	LinStatic	-12.615	6.923E-09	-3.673E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	40	52500.5	Before	EH	LinStatic	-12.615	6.923E-09	-3.708E-10
BOBJ1	41	52500.5	After	EH	LinStatic	-12.615	6.923E-09	-3.706E-10
BOBJ1	42	55417.25	Before	EH	LinStatic	-12.615	6.922E-09	-3.696E-10
BOBJ1	43	55417.25	After	EH	LinStatic	-12.615	6.928E-09	-3.689E-10
BOBJ1	44	58334.	Before	EH	LinStatic	-12.615	6.928E-09	-3.717E-10
BOBJ1	45	58334.	After	EH	LinStatic	-12.615	9.388E-11	-3.717E-10
BOBJ1	46	61050.5	Before	EH	LinStatic	-12.615	9.523E-11	-3.749E-10
BOBJ1	47	61050.5	After	EH	LinStatic	-12.615	1.003E-10	-3.746E-10
BOBJ1	48	63767.	Before	EH	LinStatic	-12.615	1.028E-10	-3.774E-10
BOBJ1	49	63767.	After	EH	LinStatic	-12.615	1.021E-10	-3.777E-10
BOBJ1	50	66483.5	Before	EH	LinStatic	-12.615	1.032E-10	-3.805E-10
BOBJ1	51	66483.5	After	EH	LinStatic	-12.615	9.368E-11	-3.799E-10
BOBJ1	52	69200.	Before	EH	LinStatic	-12.615	8.634E-11	-3.825E-10
BOBJ1	53	69200.	After	EH	LinStatic	2.612E-11	-2.342E-12	-1.099E-12

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	54	70000.	Before	EH	LinStatic	2.207E-11	-2.154E-12	-6.776E-13
BOBJ1	55	70000.	After	EH	LinStatic	-1.508E-10	-1.563E-12	-1.657E-12
BOBJ1	56	70800.	Before	EH	LinStatic	-1.673E-10	-1.540E-12	3.361E-14
BOBJ1	57	70800.	After	EH	LinStatic	-78.509	-1.270E-08	-2.460E-08
BOBJ1	58	73516.75	Before	EH	LinStatic	-78.509	-1.270E-08	-2.461E-08
BOBJ1	59	73516.75	After	EH	LinStatic	-78.509	-1.270E-08	-2.461E-08
BOBJ1	60	76233.5	Before	EH	LinStatic	-78.509	-1.269E-08	-2.460E-08
BOBJ1	61	76233.5	After	EH	LinStatic	-78.509	-1.269E-08	-2.460E-08
BOBJ1	62	78950.25	Before	EH	LinStatic	-78.509	-1.269E-08	-2.461E-08
BOBJ1	63	78950.25	After	EH	LinStatic	-78.509	-1.265E-08	-2.459E-08
BOBJ1	64	81667.	Before	EH	LinStatic	-78.509	-1.265E-08	-2.460E-08
BOBJ1	65	81667.	After	EH	LinStatic	-78.509	2.304E-08	-2.460E-08
BOBJ1	66	84583.75	Before	EH	LinStatic	-78.509	2.304E-08	-2.463E-08
BOBJ1	67	84583.75	After	EH	LinStatic	-78.509	2.304E-08	-2.463E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	68	87500.5	Before	EH	LinStatic	-78.509	2.304E-08	-2.465E-08
BOBJ1	69	87500.5	After	EH	LinStatic	-78.509	2.305E-08	-2.464E-08
BOBJ1	70	90417.25	Before	EH	LinStatic	-78.509	2.305E-08	-2.466E-08
BOBJ1	71	90417.25	After	EH	LinStatic	-78.509	2.305E-08	-2.466E-08
BOBJ1	72	93334.	Before	EH	LinStatic	-78.509	2.306E-08	-2.469E-08
BOBJ1	73	93334.	After	EH	LinStatic	-78.509	2.139E-08	-2.467E-08
BOBJ1	74	96250.5	Before	EH	LinStatic	-78.509	2.140E-08	-2.468E-08
BOBJ1	75	96250.5	After	EH	LinStatic	-78.509	2.139E-08	-2.469E-08
BOBJ1	76	99167.	Before	EH	LinStatic	-78.509	2.140E-08	-2.470E-08
BOBJ1	77	99167.	After	EH	LinStatic	-78.509	2.140E-08	-2.470E-08
BOBJ1	78	102083.5	Before	EH	LinStatic	-78.509	2.140E-08	-2.470E-08
BOBJ1	79	102083.5	After	EH	LinStatic	-78.509	2.140E-08	-2.471E-08
BOBJ1	80	105000.	Before	EH	LinStatic	-78.509	2.141E-08	-2.472E-08
BOBJ1	1	0.	After	LS	LinStatic	-95.644	-1.099E-08	-1.834E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	2	2916.75	Before	LS	LinStatic	-95.644	-1.099E-08	-1.824E-08
BOBJ1	3	2916.75	After	LS	LinStatic	-95.644	-1.099E-08	-1.824E-08
BOBJ1	4	5833.5	Before	LS	LinStatic	-95.644	-1.099E-08	-1.813E-08
BOBJ1	5	5833.5	After	LS	LinStatic	-95.644	-1.104E-08	-1.812E-08
BOBJ1	6	8750.25	Before	LS	LinStatic	-95.644	-1.104E-08	-1.798E-08
BOBJ1	7	8750.25	After	LS	LinStatic	-95.644	-1.106E-08	-1.800E-08
BOBJ1	8	11667.	Before	LS	LinStatic	-95.644	-1.106E-08	-1.784E-08
BOBJ1	9	11667.	After	LS	LinStatic	-95.644	-2.359E-08	-1.794E-08
BOBJ1	10	14583.75	Before	LS	LinStatic	-95.644	-2.359E-08	-1.778E-08
BOBJ1	11	14583.75	After	LS	LinStatic	-95.644	-2.361E-08	-1.785E-08
BOBJ1	12	17500.5	Before	LS	LinStatic	-95.644	-2.370E-08	-1.779E-08
BOBJ1	13	17500.5	After	LS	LinStatic	-95.644	-2.373E-08	-1.780E-08
BOBJ1	14	20417.25	Before	LS	LinStatic	-95.644	-2.373E-08	-1.765E-08
BOBJ1	15	20417.25	After	LS	LinStatic	-95.644	-2.374E-08	-1.766E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	16	23334.	Before	LS	LinStatic	-95.644	-2.375E-08	-1.815E-08
BOBJ1	17	23334.	After	LS	LinStatic	-95.644	-4.972E-09	-1.832E-08
BOBJ1	18	26050.5	Before	LS	LinStatic	-95.644	-4.950E-09	-1.543E-08
BOBJ1	19	26050.5	After	LS	LinStatic	-95.644	1.538E-09	-1.510E-08
BOBJ1	20	28767.	Before	LS	LinStatic	-95.644	1.537E-09	-1.530E-08
BOBJ1	21	28767.	After	LS	LinStatic	-95.644	1.547E-09	-1.530E-08
BOBJ1	22	31483.5	Before	LS	LinStatic	-95.644	1.536E-09	-1.503E-08
BOBJ1	23	31483.5	After	LS	LinStatic	-95.644	1.541E-09	-1.493E-08
BOBJ1	24	34200.	Before	LS	LinStatic	-95.644	1.523E-09	-1.470E-08
BOBJ1	25	34200.	After	LS	LinStatic	-6.716E-10	2.869E-11	1.571E-12
BOBJ1	26	35000.	Before	LS	LinStatic	-5.230E-10	2.875E-11	-2.853E-11
BOBJ1	27	35000.	After	LS	LinStatic	-1.008E-10	1.389E-12	6.981E-13
BOBJ1	28	35800.	Before	LS	LinStatic	-1.094E-10	1.402E-12	1.895E-12
BOBJ1	29	35800.	After	LS	LinStatic	-25.537	1.039E-08	-7.346E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	30	38516.75	Before	LS	LinStatic	-25.537	1.039E-08	-7.375E-10
BOBJ1	31	38516.75	After	LS	LinStatic	-25.537	1.038E-08	-7.388E-10
BOBJ1	32	41233.5	Before	LS	LinStatic	-25.537	1.039E-08	-7.482E-10
BOBJ1	33	41233.5	After	LS	LinStatic	-25.537	1.039E-08	-7.477E-10
BOBJ1	34	43950.25	Before	LS	LinStatic	-25.537	1.039E-08	-7.504E-10
BOBJ1	35	43950.25	After	LS	LinStatic	-25.537	1.039E-08	-7.512E-10
BOBJ1	36	46667.	Before	LS	LinStatic	-25.537	1.040E-08	-7.511E-10
BOBJ1	37	46667.	After	LS	LinStatic	-25.537	1.408E-08	-7.371E-10
BOBJ1	38	49583.75	Before	LS	LinStatic	-25.537	1.408E-08	-7.477E-10
BOBJ1	39	49583.75	After	LS	LinStatic	-25.537	1.401E-08	-7.438E-10
BOBJ1	40	52500.5	Before	LS	LinStatic	-25.537	1.402E-08	-7.518E-10
BOBJ1	41	52500.5	After	LS	LinStatic	-25.537	1.401E-08	-7.515E-10
BOBJ1	42	55417.25	Before	LS	LinStatic	-25.537	1.401E-08	-7.476E-10
BOBJ1	43	55417.25	After	LS	LinStatic	-25.537	1.402E-08	-7.477E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	44	58334.	Before	LS	LinStatic	-25.537	1.402E-08	-7.548E-10
BOBJ1	45	58334.	After	LS	LinStatic	-25.537	1.893E-10	-7.557E-10
BOBJ1	46	61050.5	Before	LS	LinStatic	-25.537	1.936E-10	-7.594E-10
BOBJ1	47	61050.5	After	LS	LinStatic	-25.537	2.019E-10	-7.584E-10
BOBJ1	48	63767.	Before	LS	LinStatic	-25.537	2.077E-10	-7.652E-10
BOBJ1	49	63767.	After	LS	LinStatic	-25.537	2.035E-10	-7.633E-10
BOBJ1	50	66483.5	Before	LS	LinStatic	-25.537	2.066E-10	-7.702E-10
BOBJ1	51	66483.5	After	LS	LinStatic	-25.537	1.878E-10	-7.691E-10
BOBJ1	52	69200.	Before	LS	LinStatic	-25.537	1.738E-10	-7.745E-10
BOBJ1	53	69200.	After	LS	LinStatic	4.751E-11	-1.110E-12	-2.443E-12
BOBJ1	54	70000.	Before	LS	LinStatic	3.912E-11	-1.169E-12	-6.459E-13
BOBJ1	55	70000.	After	LS	LinStatic	-3.702E-10	-6.843E-12	7.547E-13
BOBJ1	56	70800.	Before	LS	LinStatic	-4.133E-10	-7.371E-12	5.907E-12
BOBJ1	57	70800.	After	LS	LinStatic	-158.932	-2.571E-08	-4.980E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	58	73516.75	Before	LS	LinStatic	-158.932	-2.571E-08	-4.981E-08
BOBJ1	59	73516.75	After	LS	LinStatic	-158.932	-2.572E-08	-4.981E-08
BOBJ1	60	76233.5	Before	LS	LinStatic	-158.932	-2.569E-08	-4.979E-08
BOBJ1	61	76233.5	After	LS	LinStatic	-158.932	-2.570E-08	-4.979E-08
BOBJ1	62	78950.25	Before	LS	LinStatic	-158.932	-2.570E-08	-4.981E-08
BOBJ1	63	78950.25	After	LS	LinStatic	-158.932	-2.562E-08	-4.978E-08
BOBJ1	64	81667.	Before	LS	LinStatic	-158.932	-2.563E-08	-4.980E-08
BOBJ1	65	81667.	After	LS	LinStatic	-158.932	4.664E-08	-4.980E-08
BOBJ1	66	84583.75	Before	LS	LinStatic	-158.932	4.664E-08	-4.986E-08
BOBJ1	67	84583.75	After	LS	LinStatic	-158.932	4.664E-08	-4.985E-08
BOBJ1	68	87500.5	Before	LS	LinStatic	-158.932	4.664E-08	-4.988E-08
BOBJ1	69	87500.5	After	LS	LinStatic	-158.932	4.666E-08	-4.989E-08
BOBJ1	70	90417.25	Before	LS	LinStatic	-158.932	4.666E-08	-4.992E-08
BOBJ1	71	90417.25	After	LS	LinStatic	-158.932	4.666E-08	-4.992E-08

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	72	93334.	Before	LS	LinStatic	-158.932	4.668E-08	-4.998E-08
BOBJ1	73	93334.	After	LS	LinStatic	-158.932	4.328E-08	-4.995E-08
BOBJ1	74	96250.5	Before	LS	LinStatic	-158.932	4.330E-08	-4.997E-08
BOBJ1	75	96250.5	After	LS	LinStatic	-158.932	4.329E-08	-4.997E-08
BOBJ1	76	99167.	Before	LS	LinStatic	-158.932	4.330E-08	-4.999E-08
BOBJ1	77	99167.	After	LS	LinStatic	-158.932	4.331E-08	-5.000E-08
BOBJ1	78	102083.5	Before	LS	LinStatic	-158.932	4.331E-08	-5.001E-08
BOBJ1	79	102083.5	After	LS	LinStatic	-158.932	4.331E-08	-5.002E-08
BOBJ1	80	105000.	Before	LS	LinStatic	-158.932	4.331E-08	-5.005E-08
BOBJ1	1	0.	After	barrier	LinStatic	-1.893	-195.933	2.865E-09
BOBJ1	2	2916.75	Before	barrier	LinStatic	-1.893	-172.988	2.866E-09
BOBJ1	3	2916.75	After	barrier	LinStatic	-1.893	-161.516	2.866E-09
BOBJ1	4	5833.5	Before	barrier	LinStatic	-1.893	-138.571	2.867E-09
BOBJ1	5	5833.5	After	barrier	LinStatic	-1.893	-127.098	2.866E-09
BOBJ1	6	8750.25	Before	barrier	LinStatic	-1.893	-104.153	2.867E-09
BOBJ1	7	8750.25	After	barrier	LinStatic	-1.893	-92.68	2.868E-09
BOBJ1	8	11667.	Before	barrier	LinStatic	-1.893	-69.735	2.868E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	9	11667.	After	barrier	LinStatic	-1.893	-58.263	1.789E-09
BOBJ1	10	14583.75	Before	barrier	LinStatic	-1.893	-35.318	1.784E-09
BOBJ1	11	14583.75	After	barrier	LinStatic	-1.893	-23.845	1.772E-09
BOBJ1	12	17500.5	Before	barrier	LinStatic	-1.893	-0.9	1.742E-09
BOBJ1	13	17500.5	After	barrier	LinStatic	-1.893	10.573	1.742E-09
BOBJ1	14	20417.25	Before	barrier	LinStatic	-1.893	33.518	1.742E-09
BOBJ1	15	20417.25	After	barrier	LinStatic	-1.893	44.99	1.742E-09
BOBJ1	16	23334.	Before	barrier	LinStatic	-1.893	67.935	1.607E-09
BOBJ1	17	23334.	After	barrier	LinStatic	-1.893	79.014	6.111E-12
BOBJ1	18	26050.5	Before	barrier	LinStatic	-1.893	100.384	-1.363E-10
BOBJ1	19	26050.5	After	barrier	LinStatic	-1.893	111.069	-2.086E-10
BOBJ1	20	28767.	Before	barrier	LinStatic	-1.893	132.439	-2.324E-10
BOBJ1	21	28767.	After	barrier	LinStatic	-1.893	143.123	-2.350E-10
BOBJ1	22	31483.5	Before	barrier	LinStatic	-1.893	164.493	-2.382E-10
BOBJ1	23	31483.5	After	barrier	LinStatic	-1.893	175.178	-2.388E-10
BOBJ1	24	34200.	Before	barrier	LinStatic	-1.893	196.548	-2.424E-10
BOBJ1	25	34200.	After	barrier	LinStatic	2.597E-12	-4.72	3.627E-13
BOBJ1	26	35000.	Before	barrier	LinStatic	1.387E-12	-4.72	5.287E-13

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	27	35000.	After	barrier	LinStatic	8.627E-12	4.72	-1.824E-13
BOBJ1	28	35800.	Before	barrier	LinStatic	9.680E-12	4.72	-3.168E-13
BOBJ1	29	35800.	After	barrier	LinStatic	-1.895	-191.717	1.584E-09
BOBJ1	30	38516.75	Before	barrier	LinStatic	-1.895	-170.345	1.584E-09
BOBJ1	31	38516.75	After	barrier	LinStatic	-1.895	-159.66	1.583E-09
BOBJ1	32	41233.5	Before	barrier	LinStatic	-1.895	-138.288	1.581E-09
BOBJ1	33	41233.5	After	barrier	LinStatic	-1.895	-127.602	1.567E-09
BOBJ1	34	43950.25	Before	barrier	LinStatic	-1.895	-106.23	1.544E-09
BOBJ1	35	43950.25	After	barrier	LinStatic	-1.895	-95.544	1.544E-09
BOBJ1	36	46667.	Before	barrier	LinStatic	-1.895	-74.173	1.487E-09
BOBJ1	37	46667.	After	barrier	LinStatic	-1.895	-63.093	-1.218E-09
BOBJ1	38	49583.75	Before	barrier	LinStatic	-1.895	-40.148	-1.262E-09
BOBJ1	39	49583.75	After	barrier	LinStatic	-1.895	-28.677	-1.286E-09
BOBJ1	40	52500.5	Before	barrier	LinStatic	-1.895	-5.733	-1.290E-09
BOBJ1	41	52500.5	After	barrier	LinStatic	-1.895	5.74	-1.308E-09
BOBJ1	42	55417.25	Before	barrier	LinStatic	-1.895	28.686	-1.308E-09
BOBJ1	43	55417.25	After	barrier	LinStatic	-1.895	40.16	-1.307E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	44	58334.	Before	barrier	LinStatic	-1.895	63.105	-1.308E-09
BOBJ1	45	58334.	After	barrier	LinStatic	-1.895	74.183	-1.320E-09
BOBJ1	46	61050.5	Before	barrier	LinStatic	-1.895	95.553	-1.321E-09
BOBJ1	47	61050.5	After	barrier	LinStatic	-1.895	106.238	-1.320E-09
BOBJ1	48	63767.	Before	barrier	LinStatic	-1.895	127.608	-1.321E-09
BOBJ1	49	63767.	After	barrier	LinStatic	-1.895	138.293	-1.321E-09
BOBJ1	50	66483.5	Before	barrier	LinStatic	-1.895	159.663	-1.322E-09
BOBJ1	51	66483.5	After	barrier	LinStatic	-1.895	170.348	-1.322E-09
BOBJ1	52	69200.	Before	barrier	LinStatic	-1.895	191.717	-1.323E-09
BOBJ1	53	69200.	After	barrier	LinStatic	-1.093E-12	-4.72	-2.811E-13
BOBJ1	54	70000.	Before	barrier	LinStatic	-2.171E-12	-4.72	-2.146E-13
BOBJ1	55	70000.	After	barrier	LinStatic	3.815E-11	4.72	1.460E-13
BOBJ1	56	70800.	Before	barrier	LinStatic	4.132E-11	4.72	-2.533E-13
BOBJ1	57	70800.	After	barrier	LinStatic	-3.164	-196.547	3.008E-09
BOBJ1	58	73516.75	Before	barrier	LinStatic	-3.164	-175.176	3.009E-09
BOBJ1	59	73516.75	After	barrier	LinStatic	-3.164	-164.49	3.010E-09

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	60	76233.5	Before	barrier	LinStatic	-3.164	-143.118	3.009E-09
BOBJ1	61	76233.5	After	barrier	LinStatic	-3.164	-132.432	3.009E-09
BOBJ1	62	78950.25	Before	barrier	LinStatic	-3.164	-111.06	3.010E-09
BOBJ1	63	78950.25	After	barrier	LinStatic	-3.164	-100.375	3.009E-09
BOBJ1	64	81667.	Before	barrier	LinStatic	-3.164	-79.003	3.011E-09
BOBJ1	65	81667.	After	barrier	LinStatic	-3.164	-67.924	3.007E-09
BOBJ1	66	84583.75	Before	barrier	LinStatic	-3.164	-44.978	3.010E-09
BOBJ1	67	84583.75	After	barrier	LinStatic	-3.164	-33.506	3.010E-09
BOBJ1	68	87500.5	Before	barrier	LinStatic	-3.164	-10.561	3.012E-09
BOBJ1	69	87500.5	After	barrier	LinStatic	-3.164	0.912	3.013E-09
BOBJ1	70	90417.25	Before	barrier	LinStatic	-3.164	23.857	3.015E-09
BOBJ1	71	90417.25	After	barrier	LinStatic	-3.164	35.329	3.015E-09
BOBJ1	72	93334.	Before	barrier	LinStatic	-3.164	58.275	3.018E-09
BOBJ1	73	93334.	After	barrier	LinStatic	-3.164	69.747	-1.154E-10
BOBJ1	74	96250.5	Before	barrier	LinStatic	-3.164	92.69	-1.136E-10
BOBJ1	75	96250.5	After	barrier	LinStatic	-3.164	104.161	-1.137E-10
BOBJ1	76	99167.	Before	barrier	LinStatic	-3.164	127.104	-1.125E-10
BOBJ1	77	99167.	After	barrier	LinStatic	-3.164	138.576	-1.126E-10
BOBJ1	78	102083.5	Before	barrier	LinStatic	-3.164	161.519	-1.123E-10

Table 37: Bridge Object Forces, Part 1 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	CaseType	P	V2	V3
		mm				kN	kN	kN
BOBJ1	79	102083.5	After	barrier	LinStatic	-3.164	172.991	-1.122E-10
BOBJ1	80	105000.	Before	barrier	LinStatic	-3.164	195.934	-1.114E-10

Table 37: Bridge Object Forces, Part 2 of 3

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	1	0.	After	DEAD	-1.986E-03	-4.362E-05	-15164.16	0.
BOBJ1	2	2916.75	Before	DEAD	-1.986E-03	-1.138E-04	8583855.13	2916.75
BOBJ1	3	2916.75	After	DEAD	-1.986E-03	-1.142E-04	8583855.13	2916.75
BOBJ1	4	5833.5	Before	DEAD	-1.984E-03	-1.843E-04	15653151.78	5833.5
BOBJ1	5	5833.5	After	DEAD	-1.983E-03	-1.845E-04	15653151.78	5833.5
BOBJ1	6	8750.25	Before	DEAD	-1.983E-03	-2.548E-04	21192725.81	8750.25
BOBJ1	7	8750.25	After	DEAD	-1.981E-03	-2.548E-04	21192725.81	8750.25
BOBJ1	8	11667.	Before	DEAD	-1.980E-03	-3.251E-04	25202577.2	11667.
BOBJ1	9	11667.	After	DEAD	-4.279E-04	-6.942E-04	25202577.2	11667.
BOBJ1	10	14583.75	Before	DEAD	-4.263E-04	-7.645E-04	27270751.92	14583.75
BOBJ1	11	14583.75	After	DEAD	-4.274E-04	-7.644E-04	27270751.92	14583.75
BOBJ1	12	17500.5	Before	DEAD	-4.245E-04	-8.343E-04	27809204.01	17500.5
BOBJ1	13	17500.5	After	DEAD	-4.226E-04	-8.342E-04	27809204.01	17500.5
BOBJ1	14	20417.25	Before	DEAD	-4.229E-04	-9.043E-04	26817933.47	20417.25

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	15	20417.25	After	DEAD	-4.199E-04	-9.042E-04	26817933.47	20417.25
BOBJ1	16	23334.	Before	DEAD	-4.170E-04	-9.741E-04	24296940.3	23334.
BOBJ1	17	23334.	After	DEAD	2.357E-03	-2.253E-04	24296940.3	23334.
BOBJ1	18	26050.5	Before	DEAD	2.361E-03	-2.884E-04	20189562.36	26050.5
BOBJ1	19	26050.5	After	DEAD	2.361E-03	-2.858E-04	20189562.36	26050.5
BOBJ1	20	28767.	Before	DEAD	2.360E-03	-3.520E-04	14755298.16	28767.
BOBJ1	21	28767.	After	DEAD	2.360E-03	-3.519E-04	14755298.16	28767.
BOBJ1	22	31483.5	Before	DEAD	2.358E-03	-4.172E-04	7994147.7	31483.5
BOBJ1	23	31483.5	After	DEAD	2.358E-03	-4.175E-04	7994147.7	31483.5
BOBJ1	24	34200.	Before	DEAD	2.357E-03	-4.824E-04	-93889.02	34200.
BOBJ1	25	34200.	After	DEAD	-1.185E-08	4.768E-07	-57539.26	34200.
BOBJ1	26	35000.	Before	DEAD	-8.017E-09	4.557E-07	-3.148E-08	35000.
BOBJ1	27	35000.	After	DEAD	-1.013E-11	1.548E-07	4.622E-08	35000.
BOBJ1	28	35800.	Before	DEAD	-1.952E-09	1.639E-07	-57539.26	35800.
BOBJ1	29	35800.	After	DEAD	-3.630E-05	-1.690E-04	-104495.9	35800.
BOBJ1	30	38516.75	Before	DEAD	-3.610E-05	-1.652E-04	7773572.4	38516.75
BOBJ1	31	38516.75	After	DEAD	-3.644E-05	-1.653E-04	7773572.4	38516.75
BOBJ1	32	41233.5	Before	DEAD	-3.594E-05	-1.616E-04	14324510.21	41233.5
BOBJ1	33	41233.5	After	DEAD	-3.600E-05	-1.618E-04	14324510.21	41233.5
BOBJ1	34	43950.25	Before	DEAD	-3.628E-05	-1.578E-04	19548317.51	43950.25
BOBJ1	35	43950.25	After	DEAD	-3.609E-05	-1.579E-04	19548317.51	43950.25

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	36	46667.	Before	DEAD	-3.525E-05	-1.543E-04	23444994.32	46667.
BOBJ1	37	46667.	After	DEAD	1.451E-04	-1.312E-04	23444994.32	46667.
BOBJ1	38	49583.75	Before	DEAD	1.478E-04	-1.287E-04	25739303.7	49583.75
BOBJ1	39	49583.75	After	DEAD	1.485E-04	-1.293E-04	25739303.7	49583.75
BOBJ1	40	52500.5	Before	DEAD	1.494E-04	-1.269E-04	26503890.47	52500.5
BOBJ1	41	52500.5	After	DEAD	1.473E-04	-1.267E-04	26503890.47	52500.5
BOBJ1	42	55417.25	Before	DEAD	1.511E-04	-1.243E-04	25738754.56	55417.25
BOBJ1	43	55417.25	After	DEAD	1.526E-04	-1.243E-04	25738754.56	55417.25
BOBJ1	44	58334.	Before	DEAD	1.522E-04	-1.218E-04	23443896.05	58334.
BOBJ1	45	58334.	After	DEAD	-1.626E-05	1.894E-05	23443896.05	58334.
BOBJ1	46	61050.5	Before	DEAD	-1.783E-05	2.194E-05	19547127.46	61050.5
BOBJ1	47	61050.5	After	DEAD	-1.827E-05	2.190E-05	19547127.46	61050.5
BOBJ1	48	63767.	Before	DEAD	-1.711E-05	2.500E-05	14323472.6	63767.
BOBJ1	49	63767.	After	DEAD	-1.881E-05	2.503E-05	14323472.6	63767.
BOBJ1	50	66483.5	Before	DEAD	-1.839E-05	2.838E-05	7772931.48	66483.5
BOBJ1	51	66483.5	After	DEAD	-1.856E-05	2.827E-05	7772931.48	66483.5
BOBJ1	52	69200.	Before	DEAD	-1.798E-05	3.155E-05	-104495.9	69200.
BOBJ1	53	69200.	After	DEAD	-6.340E-08	-2.311E-07	-57539.26	69200.
BOBJ1	54	70000.	Before	DEAD	-5.858E-08	-2.346E-07	1.763E-07	70000.
BOBJ1	55	70000.	After	DEAD	4.695E-09	-7.080E-07	9.554E-08	70000.
BOBJ1	56	70800.	Before	DEAD	6.894E-09	-7.447E-07	-57539.26	70800.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	57	70800.	After	DEAD	-8.514E-04	1.328E-04	-117977.96	70800.
BOBJ1	58	73516.75	Before	DEAD	-8.517E-04	4.892E-05	7970719.6	73516.75
BOBJ1	59	73516.75	After	DEAD	-8.515E-04	4.914E-05	7970719.6	73516.75
BOBJ1	60	76233.5	Before	DEAD	-8.507E-04	-3.517E-05	14732286.66	76233.5
BOBJ1	61	76233.5	After	DEAD	-8.511E-04	-3.520E-05	14732286.66	76233.5
BOBJ1	62	78950.25	Before	DEAD	-8.521E-04	-1.192E-04	20166723.22	78950.25
BOBJ1	63	78950.25	After	DEAD	-8.549E-04	-1.194E-04	20166723.22	78950.25
BOBJ1	64	81667.	Before	DEAD	-8.556E-04	-2.035E-04	24274029.29	81667.
BOBJ1	65	81667.	After	DEAD	-8.563E-04	-2.034E-04	24274029.29	81667.
BOBJ1	66	84583.75	Before	DEAD	-8.536E-04	-2.936E-04	26794473.91	84583.75
BOBJ1	67	84583.75	After	DEAD	-8.522E-04	-2.936E-04	26794473.91	84583.75
BOBJ1	68	87500.5	Before	DEAD	-8.484E-04	-3.844E-04	27785195.9	87500.5
BOBJ1	69	87500.5	After	DEAD	-8.508E-04	-3.843E-04	27785195.9	87500.5
BOBJ1	70	90417.25	Before	DEAD	-8.513E-04	-4.752E-04	27246195.25	90417.25
BOBJ1	71	90417.25	After	DEAD	-8.504E-04	-4.750E-04	27246195.25	90417.25
BOBJ1	72	93334.	Before	DEAD	-8.485E-04	-5.658E-04	25177471.98	93334.
BOBJ1	73	93334.	After	DEAD	1.460E-03	-1.491E-04	25177471.98	93334.
BOBJ1	74	96250.5	Before	DEAD	1.459E-03	-2.301E-04	21167481.33	96250.5
BOBJ1	75	96250.5	After	DEAD	1.458E-03	-2.300E-04	21167481.33	96250.5
BOBJ1	76	99167.	Before	DEAD	1.453E-03	-3.110E-04	15628030.26	99167.
BOBJ1	77	99167.	After	DEAD	1.453E-03	-3.107E-04	15628030.26	99167.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	78	102083.5	Before	DEAD	1.451E-03	-3.922E-04	8559118.79	102083.5
BOBJ1	79	102083.5	After	DEAD	1.450E-03	-3.923E-04	8559118.79	102083.5
BOBJ1	80	105000.	Before	DEAD	1.449E-03	-4.735E-04	-39253.1	105000.
BOBJ1	1	0.	After	DW	-105701.17	-879.84	-3368.31	0.
BOBJ1	2	2916.75	Before	DW	-93290.4	-881.2	578657.21	2916.75
BOBJ1	3	2916.75	After	DW	-87085.02	-881.2	578657.21	2916.75
BOBJ1	4	5833.5	Before	DW	-74674.25	-882.55	1052085.38	5833.5
BOBJ1	5	5833.5	After	DW	-68468.86	-882.55	1052085.38	5833.5
BOBJ1	6	8750.25	Before	DW	-56058.09	-883.91	1416916.19	8750.25
BOBJ1	7	8750.25	After	DW	-49852.7	-883.91	1416916.19	8750.25
BOBJ1	8	11667.	Before	DW	-37441.93	-885.27	1673149.65	11667.
BOBJ1	9	11667.	After	DW	-31236.55	-885.27	1673149.65	11667.
BOBJ1	10	14583.75	Before	DW	-18825.78	-886.63	1820785.77	14583.75
BOBJ1	11	14583.75	After	DW	-12620.39	-886.63	1820785.77	14583.75
BOBJ1	12	17500.5	Before	DW	-209.62	-887.99	1859824.53	17500.5
BOBJ1	13	17500.5	After	DW	5995.77	-887.99	1859824.53	17500.5
BOBJ1	14	20417.25	Before	DW	18406.54	-889.35	1790265.94	20417.25
BOBJ1	15	20417.25	After	DW	24611.92	-889.35	1790265.94	20417.25
BOBJ1	16	23334.	Before	DW	37022.69	-890.71	1612110.	23334.
BOBJ1	17	23334.	After	DW	43015.06	-890.71	1612110.	23334.
BOBJ1	18	26050.5	Before	DW	54573.77	-891.98	1348515.75	26050.5
BOBJ1	19	26050.5	After	DW	60353.13	-891.98	1348515.75	26050.5
BOBJ1	20	28767.	Before	DW	71911.83	-893.24	990723.82	28767.
BOBJ1	21	28767.	After	DW	77691.19	-893.24	990723.82	28767.
BOBJ1	22	31483.5	Before	DW	89249.89	-894.51	538734.2	31483.5
BOBJ1	23	31483.5	After	DW	95029.25	-894.51	538734.2	31483.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	24	34200.	Before	DW	106587.96	-895.77	-7453.11	34200.
BOBJ1	25	34200.	After	DW	-2553.	1.552E-08	-4084.8	34200.
BOBJ1	26	35000.	Before	DW	-2553.	1.586E-08	7.273E-09	35000.
BOBJ1	27	35000.	After	DW	2553.	1.231E-08	2.615E-09	35000.
BOBJ1	28	35800.	Before	DW	2553.	1.263E-08	-4084.8	35800.
BOBJ1	29	35800.	After	DW	-103680.89	-851.92	-7471.07	35800.
BOBJ1	30	38516.75	Before	DW	-92121.11	-903.66	524566.47	38516.75
BOBJ1	31	38516.75	After	DW	-86341.23	-903.66	524566.47	38516.75
BOBJ1	32	41233.5	Before	DW	-74781.46	-955.4	962388.97	41233.5
BOBJ1	33	41233.5	After	DW	-69001.57	-955.4	962388.97	41233.5
BOBJ1	34	43950.25	Before	DW	-57441.8	-1007.13	1305996.45	43950.25
BOBJ1	35	43950.25	After	DW	-51661.91	-1007.13	1305996.45	43950.25
BOBJ1	36	46667.	Before	DW	-40102.14	-1058.87	1555388.91	46667.
BOBJ1	37	46667.	After	DW	-34109.51	-1058.87	1555388.91	46667.
BOBJ1	38	49583.75	Before	DW	-21698.74	-1114.42	1718266.86	49583.75
BOBJ1	39	49583.75	After	DW	-15493.88	-1114.42	1718266.86	49583.75
BOBJ1	40	52500.5	Before	DW	-3083.64	-1169.97	1772547.46	52500.5
BOBJ1	41	52500.5	After	DW	3121.74	-1169.97	1772541.26	52500.5
BOBJ1	42	55417.25	Before	DW	15533.05	-1225.52	1718224.51	55417.25
BOBJ1	43	55417.25	After	DW	21738.96	-1225.52	1718224.51	55417.25
BOBJ1	44	58334.	Before	DW	34149.73	-1281.06	1555310.4	58334.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	45	58334.	After	DW	40142.1	-1281.06	1555310.4	58334.
BOBJ1	46	61050.5	Before	DW	51700.81	-1332.8	1305911.57	61050.5
BOBJ1	47	61050.5	After	DW	57480.17	-1332.8	1305911.57	61050.5
BOBJ1	48	63767.	Before	DW	69038.87	-1384.53	962315.04	63767.
BOBJ1	49	63767.	After	DW	74818.23	-1384.53	962315.04	63767.
BOBJ1	50	66483.5	Before	DW	86376.93	-1436.26	524520.83	66483.5
BOBJ1	51	66483.5	After	DW	92156.29	-1436.26	524520.83	66483.5
BOBJ1	52	69200.	Before	DW	103715.	-1488.	-7471.07	69200.
BOBJ1	53	69200.	After	DW	-2553.	-2.479E-08	-4084.8	69200.
BOBJ1	54	70000.	Before	DW	-2553.	-2.486E-08	1.094E-08	70000.
BOBJ1	55	70000.	After	DW	2553.	9.195E-09	-1.270E-09	70000.
BOBJ1	56	70800.	Before	DW	2553.	1.056E-08	-4084.8	70800.
BOBJ1	57	70800.	After	DW	-107821.97	-14064.71	-9679.58	70800.
BOBJ1	58	73516.75	Before	DW	-96262.2	-13030.69	536553.66	73516.75
BOBJ1	59	73516.75	After	DW	-90482.31	-13030.69	536553.66	73516.75
BOBJ1	60	76233.5	Before	DW	-78922.54	-11996.67	988571.87	76233.5
BOBJ1	61	76233.5	After	DW	-73142.65	-11996.67	988571.87	76233.5
BOBJ1	62	78950.25	Before	DW	-61582.88	-10962.64	1346375.06	78950.25
BOBJ1	63	78950.25	After	DW	-55803.	-10962.64	1346375.06	78950.25

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	64	81667.	Before	DW	-44243.23	-9928.62	1609963.22	81667.
BOBJ1	65	81667.	After	DW	-38250.59	-9928.62	1609963.22	81667.
BOBJ1	66	84583.75	Before	DW	-25839.82	-8818.48	1788081.93	84583.75
BOBJ1	67	84583.75	After	DW	-19634.43	-8818.48	1788081.93	84583.75
BOBJ1	68	87500.5	Before	DW	-7223.66	-7708.34	1857603.28	87500.5
BOBJ1	69	87500.5	After	DW	-1018.28	-7708.34	1857603.28	87500.5
BOBJ1	70	90417.25	Before	DW	11392.49	-6598.19	1818527.29	90417.25
BOBJ1	71	90417.25	After	DW	17597.88	-6598.19	1818527.29	90417.25
BOBJ1	72	93334.	Before	DW	30008.65	-5488.05	1670853.95	93334.
BOBJ1	73	93334.	After	DW	36213.77	-5488.05	1670853.95	93334.
BOBJ1	74	96250.5	Before	DW	48623.48	-4378.	1414609.87	96250.5
BOBJ1	75	96250.5	After	DW	54828.33	-4378.	1414609.87	96250.5
BOBJ1	76	99167.	Before	DW	67238.04	-3267.96	1049787.06	99167.
BOBJ1	77	99167.	After	DW	73442.89	-3267.96	1049787.06	99167.
BOBJ1	78	102083.5	Before	DW	85852.6	-2157.91	576385.51	102083.5
BOBJ1	79	102083.5	After	DW	92057.45	-2157.91	576385.51	102083.5
BOBJ1	80	105000.	Before	DW	104467.16	-1047.86	-5594.77	105000.
BOBJ1	1	0.	After	WL	-1203.17	-3708.76	-1.043E-06	0.
BOBJ1	2	2916.75	Before	WL	-1203.17	-3068.37	3.025E-06	2916.75
BOBJ1	3	2916.75	After	WL	-1203.17	-3068.37	3.025E-06	2916.75
BOBJ1	4	5833.5	Before	WL	-1203.17	-2427.99	7.097E-06	5833.5
BOBJ1	5	5833.5	After	WL	-1203.17	-2427.99	7.090E-06	5833.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	6	8750.25	Before	WL	-1203.17	-1787.6	1.116E-05	8750.25
BOBJ1	7	8750.25	After	WL	-1203.17	-1787.6	1.116E-05	8750.25
BOBJ1	8	11667.	Before	WL	-1203.17	-1147.22	1.524E-05	11667.
BOBJ1	9	11667.	After	WL	-1203.17	-1147.22	7.289E-06	11667.
BOBJ1	10	14583.75	Before	WL	-1203.17	-506.83	1.024E-05	14583.75
BOBJ1	11	14583.75	After	WL	-1203.17	-506.83	1.028E-05	14583.75
BOBJ1	12	17500.5	Before	WL	-1203.17	133.55	1.338E-05	17500.5
BOBJ1	13	17500.5	After	WL	-1203.17	133.55	1.338E-05	17500.5
BOBJ1	14	20417.25	Before	WL	-1203.17	773.94	1.639E-05	20417.25
BOBJ1	15	20417.25	After	WL	-1203.17	773.94	1.639E-05	20417.25
BOBJ1	16	23334.	Before	WL	-1203.17	1414.32	1.983E-05	23334.
BOBJ1	17	23334.	After	WL	-1203.17	1414.32	4.662E-06	23334.
BOBJ1	18	26050.5	Before	WL	-1203.17	2010.74	4.604E-06	26050.5
BOBJ1	19	26050.5	After	WL	-1203.17	2010.74	4.336E-06	26050.5
BOBJ1	20	28767.	Before	WL	-1203.17	2607.16	5.598E-06	28767.
BOBJ1	21	28767.	After	WL	-1203.17	2607.16	5.574E-06	28767.
BOBJ1	22	31483.5	Before	WL	-1203.17	3203.58	6.854E-06	31483.5
BOBJ1	23	31483.5	After	WL	-1203.17	3203.58	6.849E-06	31483.5
BOBJ1	24	34200.	Before	WL	-1203.17	3800.	8.139E-06	34200.
BOBJ1	25	34200.	After	WL	-2.209E-08	3.294E-08	3.412E-09	34200.
BOBJ1	26	35000.	Before	WL	4.653E-09	3.805E-08	7.889E-10	35000.
BOBJ1	27	35000.	After	WL	1.587E-08	-1.513E-09	2.494E-09	35000.
BOBJ1	28	35800.	Before	WL	3.613E-08	8.875E-09	-7.162E-11	35800.
BOBJ1	29	35800.	After	WL	-14.12	330.19	-1.254E-06	35800.
BOBJ1	30	38516.75	Before	WL	-14.12	537.34	-1.466E-06	38516.75
BOBJ1	31	38516.75	After	WL	-14.12	537.34	-1.452E-06	38516.75
BOBJ1	32	41233.5	Before	WL	-14.12	744.49	-1.633E-06	41233.5
BOBJ1	33	41233.5	After	WL	-14.12	744.49	-1.827E-06	41233.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	34	43950.25	Before	WL	-14.12	951.64	-1.703E-06	43950.25
BOBJ1	35	43950.25	After	WL	-14.12	951.64	-1.704E-06	43950.25
BOBJ1	36	46667.	Before	WL	-14.12	1158.79	-1.556E-06	46667.
BOBJ1	37	46667.	After	WL	-14.12	1158.79	-1.652E-06	46667.
BOBJ1	38	49583.75	Before	WL	-14.12	1381.19	-1.407E-06	49583.75
BOBJ1	39	49583.75	After	WL	-14.12	1381.19	-1.596E-06	49583.75
BOBJ1	40	52500.5	Before	WL	-14.12	1603.58	-1.412E-06	52500.5
BOBJ1	41	52500.5	After	WL	-14.12	1603.58	-1.733E-06	52500.5
BOBJ1	42	55417.25	Before	WL	-14.12	1825.98	-1.842E-06	55417.25
BOBJ1	43	55417.25	After	WL	-14.12	1825.98	-1.839E-06	55417.25
BOBJ1	44	58334.	Before	WL	-14.12	2048.38	-1.943E-06	58334.
BOBJ1	45	58334.	After	WL	-14.12	2048.38	-1.822E-06	58334.
BOBJ1	46	61050.5	Before	WL	-14.12	2255.51	-1.802E-06	61050.5
BOBJ1	47	61050.5	After	WL	-14.12	2255.51	-1.804E-06	61050.5
BOBJ1	48	63767.	Before	WL	-14.12	2462.64	-1.786E-06	63767.
BOBJ1	49	63767.	After	WL	-14.12	2462.64	-1.785E-06	63767.
BOBJ1	50	66483.5	Before	WL	-14.12	2669.77	-1.765E-06	66483.5
BOBJ1	51	66483.5	After	WL	-14.12	2669.77	-1.796E-06	66483.5
BOBJ1	52	69200.	Before	WL	-14.12	2876.9	-1.740E-06	69200.
BOBJ1	53	69200.	After	WL	-3.596E-08	-2.382E-08	3.084E-09	69200.
BOBJ1	54	70000.	Before	WL	-1.031E-08	8.959E-09	-4.948E-10	70000.
BOBJ1	55	70000.	After	WL	-3.844E-10	2.174E-08	2.097E-09	70000.
BOBJ1	56	70800.	Before	WL	2.701E-08	4.040E-08	2.516E-09	70800.
BOBJ1	57	70800.	After	WL	6259.18	60800.87	-2.127E-05	70800.
BOBJ1	58	73516.75	Before	WL	6259.18	55735.16	-1.818E-05	73516.75
BOBJ1	59	73516.75	After	WL	6259.18	55735.16	-1.818E-05	73516.75
BOBJ1	60	76233.5	Before	WL	6259.18	50669.45	-1.510E-05	76233.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	61	76233.5	After	WL	6259.18	50669.45	-1.510E-05	76233.5
BOBJ1	62	78950.25	Before	WL	6259.18	45603.74	-1.202E-05	78950.25
BOBJ1	63	78950.25	After	WL	6259.18	45603.74	-1.204E-05	78950.25
BOBJ1	64	81667.	Before	WL	6259.18	40538.03	-8.972E-06	81667.
BOBJ1	65	81667.	After	WL	6259.18	40538.03	-8.972E-06	81667.
BOBJ1	66	84583.75	Before	WL	6259.18	35099.4	-5.656E-06	84583.75
BOBJ1	67	84583.75	After	WL	6259.18	35099.4	-5.659E-06	84583.75
BOBJ1	68	87500.5	Before	WL	6259.18	29660.76	-2.355E-06	87500.5
BOBJ1	69	87500.5	After	WL	6259.18	29660.76	-2.355E-06	87500.5
BOBJ1	70	90417.25	Before	WL	6259.18	24222.13	9.480E-07	90417.25
BOBJ1	71	90417.25	After	WL	6259.18	24222.13	9.459E-07	90417.25
BOBJ1	72	93334.	Before	WL	6259.18	18783.49	4.252E-06	93334.
BOBJ1	73	93334.	After	WL	6259.18	18783.49	6.007E-06	93334.
BOBJ1	74	96250.5	Before	WL	6259.18	13345.32	7.488E-06	96250.5
BOBJ1	75	96250.5	After	WL	6259.18	13345.32	7.488E-06	96250.5
BOBJ1	76	99167.	Before	WL	6259.18	7907.16	8.965E-06	99167.
BOBJ1	77	99167.	After	WL	6259.18	7907.16	8.966E-06	99167.
BOBJ1	78	102083.5	Before	WL	6259.18	2468.99	1.045E-05	102083.5
BOBJ1	79	102083.5	After	WL	6259.18	2468.99	1.045E-05	102083.5
BOBJ1	80	105000.	Before	WL	6259.18	-2969.18	1.194E-05	105000.
BOBJ1	1	0.	After	EH	1.787E-04	8.275E-06	-78231.64	0.
BOBJ1	2	2916.75	Before	EH	1.788E-04	3.441E-05	-78231.64	2916.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	3	2916.75	After	EH	1.788E-04	3.411E-05	-78231.64	2916.75
BOBJ1	4	5833.5	Before	EH	1.788E-04	6.010E-05	-78231.64	5833.5
BOBJ1	5	5833.5	After	EH	1.788E-04	5.906E-05	-78231.64	5833.5
BOBJ1	6	8750.25	Before	EH	1.788E-04	8.492E-05	-78231.64	8750.25
BOBJ1	7	8750.25	After	EH	1.788E-04	8.486E-05	-78231.64	8750.25
BOBJ1	8	11667.	Before	EH	1.789E-04	1.107E-04	-78231.64	11667.
BOBJ1	9	11667.	After	EH	1.741E-04	3.884E-04	-78231.64	11667.
BOBJ1	10	14583.75	Before	EH	1.741E-04	4.141E-04	-78231.64	14583.75
BOBJ1	11	14583.75	After	EH	1.741E-04	4.133E-04	-78231.64	14583.75
BOBJ1	12	17500.5	Before	EH	1.742E-04	4.402E-04	-78231.64	17500.5
BOBJ1	13	17500.5	After	EH	1.742E-04	4.398E-04	-78231.64	17500.5
BOBJ1	14	20417.25	Before	EH	1.742E-04	4.655E-04	-78231.64	20417.25
BOBJ1	15	20417.25	After	EH	1.742E-04	4.646E-04	-78231.64	20417.25
BOBJ1	16	23334.	Before	EH	1.740E-04	4.908E-04	-78231.64	23334.
BOBJ1	17	23334.	After	EH	1.598E-04	-2.234E-04	-78231.64	23334.
BOBJ1	18	26050.5	Before	EH	1.609E-04	-2.011E-04	-78231.64	26050.5
BOBJ1	19	26050.5	After	EH	1.525E-04	-1.711E-04	-78231.64	26050.5
BOBJ1	20	28767.	Before	EH	1.524E-04	-1.482E-04	-78231.64	28767.
BOBJ1	21	28767.	After	EH	1.524E-04	-1.483E-04	-78231.64	28767.
BOBJ1	22	31483.5	Before	EH	1.525E-04	-1.281E-04	-78231.64	31483.5
BOBJ1	23	31483.5	After	EH	1.526E-04	-1.279E-04	-78231.64	31483.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	24	34200.	Before	EH	1.527E-04	-1.080E-04	-78231.64	34200.
BOBJ1	25	34200.	After	EH	-1.476E-09	1.077E-07	3.608E-09	34200.
BOBJ1	26	35000.	Before	EH	-7.195E-09	1.176E-07	4.682E-08	35000.
BOBJ1	27	35000.	After	EH	-7.390E-10	-5.443E-08	1.567E-08	35000.
BOBJ1	28	35800.	Before	EH	1.136E-09	-5.511E-08	1.749E-08	35800.
BOBJ1	29	35800.	After	EH	-3.132E-06	-1.015E-05	-20888.04	35800.
BOBJ1	30	38516.75	Before	EH	-3.136E-06	-9.121E-06	-20888.04	38516.75
BOBJ1	31	38516.75	After	EH	-3.140E-06	-9.149E-06	-20888.04	38516.75
BOBJ1	32	41233.5	Before	EH	-3.135E-06	-8.073E-06	-20888.04	41233.5
BOBJ1	33	41233.5	After	EH	-3.135E-06	-8.052E-06	-20888.04	41233.5
BOBJ1	34	43950.25	Before	EH	-3.139E-06	-7.036E-06	-20888.04	43950.25
BOBJ1	35	43950.25	After	EH	-3.133E-06	-7.080E-06	-20888.04	43950.25
BOBJ1	36	46667.	Before	EH	-3.134E-06	-6.004E-06	-20888.04	46667.
BOBJ1	37	46667.	After	EH	-1.835E-06	3.414E-05	-20888.04	46667.
BOBJ1	38	49583.75	Before	EH	-1.821E-06	3.526E-05	-20888.04	49583.75
BOBJ1	39	49583.75	After	EH	-1.902E-06	3.526E-05	-20888.04	49583.75
BOBJ1	40	52500.5	Before	EH	-1.900E-06	3.635E-05	-20888.04	52500.5
BOBJ1	41	52500.5	After	EH	-1.915E-06	3.644E-05	-20888.04	52500.5
BOBJ1	42	55417.25	Before	EH	-1.890E-06	3.754E-05	-20888.04	55417.25
BOBJ1	43	55417.25	After	EH	-1.875E-06	3.754E-05	-20888.04	55417.25
BOBJ1	44	58334.	Before	EH	-1.883E-06	3.867E-05	-20888.04	58334.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	45	58334.	After	EH	-3.387E-06	5.630E-05	-20888.04	58334.
BOBJ1	46	61050.5	Before	EH	-3.415E-06	5.729E-05	-20888.04	61050.5
BOBJ1	47	61050.5	After	EH	-3.415E-06	5.729E-05	-20888.04	61050.5
BOBJ1	48	63767.	Before	EH	-3.403E-06	5.830E-05	-20888.04	63767.
BOBJ1	49	63767.	After	EH	-3.429E-06	5.830E-05	-20888.04	63767.
BOBJ1	50	66483.5	Before	EH	-3.424E-06	5.933E-05	-20888.04	66483.5
BOBJ1	51	66483.5	After	EH	-3.385E-06	5.926E-05	-20888.04	66483.5
BOBJ1	52	69200.	Before	EH	-3.369E-06	6.032E-05	-20888.04	69200.
BOBJ1	53	69200.	After	EH	3.784E-09	1.264E-08	-4.896E-09	69200.
BOBJ1	54	70000.	Before	EH	2.708E-09	1.829E-08	3.445E-10	70000.
BOBJ1	55	70000.	After	EH	6.809E-09	9.135E-09	5.257E-08	70000.
BOBJ1	56	70800.	Before	EH	8.302E-09	2.742E-08	8.008E-08	70800.
BOBJ1	57	70800.	After	EH	6.959E-07	-2.336E-05	-129997.34	70800.
BOBJ1	58	73516.75	Before	EH	7.187E-07	4.348E-05	-129997.34	73516.75
BOBJ1	59	73516.75	After	EH	7.010E-07	4.339E-05	-129997.34	73516.75
BOBJ1	60	76233.5	Before	EH	6.770E-07	1.102E-04	-129997.34	76233.5
BOBJ1	61	76233.5	After	EH	7.031E-07	1.101E-04	-129997.34	76233.5
BOBJ1	62	78950.25	Before	EH	7.148E-07	1.769E-04	-129997.34	78950.25
BOBJ1	63	78950.25	After	EH	5.133E-07	1.785E-04	-129997.34	78950.25
BOBJ1	64	81667.	Before	EH	5.174E-07	2.452E-04	-129997.34	81667.
BOBJ1	65	81667.	After	EH	5.210E-07	2.452E-04	-129997.34	81667.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	66	84583.75	Before	EH	4.729E-07	3.171E-04	-129997.34	84583.75
BOBJ1	67	84583.75	After	EH	4.463E-07	3.171E-04	-129997.34	84583.75
BOBJ1	68	87500.5	Before	EH	3.955E-07	3.889E-04	-129997.34	87500.5
BOBJ1	69	87500.5	After	EH	4.152E-07	3.890E-04	-129997.34	87500.5
BOBJ1	70	90417.25	Before	EH	4.093E-07	4.610E-04	-129997.34	90417.25
BOBJ1	71	90417.25	After	EH	3.947E-07	4.608E-04	-129997.34	90417.25
BOBJ1	72	93334.	Before	EH	3.666E-07	5.328E-04	-129997.34	93334.
BOBJ1	73	93334.	After	EH	-1.990E-05	3.601E-04	-129997.34	93334.
BOBJ1	74	96250.5	Before	EH	-1.991E-05	4.319E-04	-129997.34	96250.5
BOBJ1	75	96250.5	After	EH	-1.992E-05	4.320E-04	-129997.34	96250.5
BOBJ1	76	99167.	Before	EH	-1.988E-05	5.040E-04	-129997.34	99167.
BOBJ1	77	99167.	After	EH	-1.987E-05	5.039E-04	-129997.34	99167.
BOBJ1	78	102083.5	Before	EH	-1.985E-05	5.762E-04	-129997.34	102083.5
BOBJ1	79	102083.5	After	EH	-1.986E-05	5.760E-04	-129997.34	102083.5
BOBJ1	80	105000.	Before	EH	-1.987E-05	6.482E-04	-129997.34	105000.
BOBJ1	1	0.	After	LS	3.618E-04	1.694E-05	-158369.88	0.
BOBJ1	2	2916.75	Before	LS	3.619E-04	6.919E-05	-158369.88	2916.75
BOBJ1	3	2916.75	After	LS	3.619E-04	6.929E-05	-158369.88	2916.75
BOBJ1	4	5833.5	Before	LS	3.620E-04	1.209E-04	-158369.88	5833.5
BOBJ1	5	5833.5	After	LS	3.620E-04	1.197E-04	-158369.88	5833.5
BOBJ1	6	8750.25	Before	LS	3.621E-04	1.717E-04	-158369.88	8750.25

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	7	8750.25	After	LS	3.620E-04	1.720E-04	-158369.88	8750.25
BOBJ1	8	11667.	Before	LS	3.622E-04	2.235E-04	-158369.88	11667.
BOBJ1	9	11667.	After	LS	3.524E-04	7.871E-04	-158369.88	11667.
BOBJ1	10	14583.75	Before	LS	3.526E-04	8.390E-04	-158369.88	14583.75
BOBJ1	11	14583.75	After	LS	3.526E-04	8.372E-04	-158369.88	14583.75
BOBJ1	12	17500.5	Before	LS	3.527E-04	8.911E-04	-158369.88	17500.5
BOBJ1	13	17500.5	After	LS	3.526E-04	8.912E-04	-158369.88	17500.5
BOBJ1	14	20417.25	Before	LS	3.527E-04	9.423E-04	-158369.88	20417.25
BOBJ1	15	20417.25	After	LS	3.527E-04	9.409E-04	-158369.88	20417.25
BOBJ1	16	23334.	Before	LS	3.523E-04	9.939E-04	-158369.88	23334.
BOBJ1	17	23334.	After	LS	3.237E-04	-4.534E-04	-158369.88	23334.
BOBJ1	18	26050.5	Before	LS	3.258E-04	-4.060E-04	-158369.88	26050.5
BOBJ1	19	26050.5	After	LS	3.088E-04	-3.467E-04	-158369.88	26050.5
BOBJ1	20	28767.	Before	LS	3.086E-04	-2.996E-04	-158369.88	28767.
BOBJ1	21	28767.	After	LS	3.086E-04	-3.005E-04	-158369.88	28767.
BOBJ1	22	31483.5	Before	LS	3.089E-04	-2.602E-04	-158369.88	31483.5
BOBJ1	23	31483.5	After	LS	3.088E-04	-2.590E-04	-158369.88	31483.5
BOBJ1	24	34200.	Before	LS	3.091E-04	-2.182E-04	-158369.88	34200.
BOBJ1	25	34200.	After	LS	-6.138E-08	1.225E-06	4.292E-07	34200.
BOBJ1	26	35000.	Before	LS	-8.505E-08	1.251E-06	1.724E-07	35000.
BOBJ1	27	35000.	After	LS	8.685E-09	-1.688E-07	1.364E-08	35000.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	28	35800.	Before	LS	9.601E-09	-1.746E-07	1.605E-08	35800.
BOBJ1	29	35800.	After	LS	-6.349E-06	-2.055E-05	-42285.14	35800.
BOBJ1	30	38516.75	Before	LS	-6.354E-06	-1.853E-05	-42285.14	38516.75
BOBJ1	31	38516.75	After	LS	-6.358E-06	-1.848E-05	-42285.14	38516.75
BOBJ1	32	41233.5	Before	LS	-6.350E-06	-1.637E-05	-42285.14	41233.5
BOBJ1	33	41233.5	After	LS	-6.347E-06	-1.632E-05	-42285.14	41233.5
BOBJ1	34	43950.25	Before	LS	-6.359E-06	-1.430E-05	-42285.14	43950.25
BOBJ1	35	43950.25	After	LS	-6.352E-06	-1.433E-05	-42285.14	43950.25
BOBJ1	36	46667.	Before	LS	-6.344E-06	-1.220E-05	-42285.14	46667.
BOBJ1	37	46667.	After	LS	-3.716E-06	6.912E-05	-42285.14	46667.
BOBJ1	38	49583.75	Before	LS	-3.677E-06	7.137E-05	-42285.14	49583.75
BOBJ1	39	49583.75	After	LS	-3.855E-06	7.139E-05	-42285.14	49583.75
BOBJ1	40	52500.5	Before	LS	-3.849E-06	7.365E-05	-42285.14	52500.5
BOBJ1	41	52500.5	After	LS	-3.882E-06	7.387E-05	-42285.14	52500.5
BOBJ1	42	55417.25	Before	LS	-3.826E-06	7.602E-05	-42285.14	55417.25
BOBJ1	43	55417.25	After	LS	-3.798E-06	7.600E-05	-42285.14	55417.25
BOBJ1	44	58334.	Before	LS	-3.809E-06	7.831E-05	-42285.14	58334.
BOBJ1	45	58334.	After	LS	-6.852E-06	1.141E-04	-42285.14	58334.
BOBJ1	46	61050.5	Before	LS	-6.907E-06	1.160E-04	-42285.14	61050.5
BOBJ1	47	61050.5	After	LS	-6.896E-06	1.160E-04	-42285.14	61050.5
BOBJ1	48	63767.	Before	LS	-6.883E-06	1.180E-04	-42285.14	63767.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	49	63767.	After	LS	-6.932E-06	1.180E-04	-42285.14	63767.
BOBJ1	50	66483.5	Before	LS	-6.930E-06	1.202E-04	-42285.14	66483.5
BOBJ1	51	66483.5	After	LS	-6.857E-06	1.199E-04	-42285.14	66483.5
BOBJ1	52	69200.	Before	LS	-6.825E-06	1.220E-04	-42285.14	69200.
BOBJ1	53	69200.	After	LS	6.093E-09	3.284E-08	-2.884E-08	69200.
BOBJ1	54	70000.	Before	LS	1.372E-08	3.186E-08	-1.236E-08	70000.
BOBJ1	55	70000.	After	LS	-1.524E-09	1.009E-07	5.094E-08	70000.
BOBJ1	56	70800.	Before	LS	1.058E-08	1.110E-07	1.226E-07	70800.
BOBJ1	57	70800.	After	LS	1.434E-06	-4.709E-05	-263162.86	70800.
BOBJ1	58	73516.75	Before	LS	1.479E-06	8.845E-05	-263162.86	73516.75
BOBJ1	59	73516.75	After	LS	1.449E-06	8.813E-05	-263162.86	73516.75
BOBJ1	60	76233.5	Before	LS	1.423E-06	2.233E-04	-263162.86	76233.5
BOBJ1	61	76233.5	After	LS	1.434E-06	2.231E-04	-263162.86	76233.5
BOBJ1	62	78950.25	Before	LS	1.457E-06	3.583E-04	-263162.86	78950.25
BOBJ1	63	78950.25	After	LS	1.037E-06	3.617E-04	-263162.86	78950.25
BOBJ1	64	81667.	Before	LS	1.035E-06	4.969E-04	-263162.86	81667.
BOBJ1	65	81667.	After	LS	1.061E-06	4.966E-04	-263162.86	81667.
BOBJ1	66	84583.75	Before	LS	9.433E-07	6.417E-04	-263162.86	84583.75
BOBJ1	67	84583.75	After	LS	9.034E-07	6.421E-04	-263162.86	84583.75
BOBJ1	68	87500.5	Before	LS	8.175E-07	7.874E-04	-263162.86	87500.5
BOBJ1	69	87500.5	After	LS	8.769E-07	7.878E-04	-263162.86	87500.5

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	70	90417.25	Before	LS	8.715E-07	9.334E-04	-263162.86	90417.25
BOBJ1	71	90417.25	After	LS	8.161E-07	9.332E-04	-263162.86	90417.25
BOBJ1	72	93334.	Before	LS	7.664E-07	1.079E-03	-263162.86	93334.
BOBJ1	73	93334.	After	LS	-4.029E-05	7.291E-04	-263162.86	93334.
BOBJ1	74	96250.5	Before	LS	-4.027E-05	8.747E-04	-263162.86	96250.5
BOBJ1	75	96250.5	After	LS	-4.027E-05	8.748E-04	-263162.86	96250.5
BOBJ1	76	99167.	Before	LS	-4.021E-05	1.020E-03	-263162.86	99167.
BOBJ1	77	99167.	After	LS	-4.017E-05	1.020E-03	-263162.86	99167.
BOBJ1	78	102083.5	Before	LS	-4.015E-05	1.166E-03	-263162.86	102083.5
BOBJ1	79	102083.5	After	LS	-4.015E-05	1.166E-03	-263162.86	102083.5
BOBJ1	80	105000.	Before	LS	-4.016E-05	1.312E-03	-263162.86	105000.
BOBJ1	1	0.	After	barrier	-1.183E-04	-2.553E-06	-3134.8	0.
BOBJ1	2	2916.75	Before	barrier	-1.183E-04	-1.093E-05	534891.14	2916.75
BOBJ1	3	2916.75	After	barrier	-1.182E-04	-1.092E-05	534891.14	2916.75
BOBJ1	4	5833.5	Before	barrier	-1.181E-04	-1.929E-05	972529.39	5833.5
BOBJ1	5	5833.5	After	barrier	-1.180E-04	-1.929E-05	972529.39	5833.5
BOBJ1	6	8750.25	Before	barrier	-1.180E-04	-2.766E-05	1309779.97	8750.25
BOBJ1	7	8750.25	After	barrier	-1.179E-04	-2.766E-05	1309779.97	8750.25
BOBJ1	8	11667.	Before	barrier	-1.178E-04	-3.602E-05	1546642.87	11667.
BOBJ1	9	11667.	After	barrier	-1.412E-05	-5.682E-05	1546642.87	11667.
BOBJ1	10	14583.75	Before	barrier	-1.397E-05	-6.204E-05	1683118.08	14583.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	11	14583.75	After	barrier	-1.405E-05	-6.202E-05	1683118.08	14583.75
BOBJ1	12	17500.5	Before	barrier	-1.391E-05	-6.715E-05	1719205.62	17500.5
BOBJ1	13	17500.5	After	barrier	-1.375E-05	-6.716E-05	1719205.62	17500.5
BOBJ1	14	20417.25	Before	barrier	-1.374E-05	-7.224E-05	1654905.47	20417.25
BOBJ1	15	20417.25	After	barrier	-1.353E-05	-7.224E-05	1654905.47	20417.25
BOBJ1	16	23334.	Before	barrier	-1.343E-05	-7.715E-05	1490217.65	23334.
BOBJ1	17	23334.	After	barrier	1.329E-04	-3.942E-05	1490217.65	23334.
BOBJ1	18	26050.5	Before	barrier	1.332E-04	-3.922E-05	1246550.42	26050.5
BOBJ1	19	26050.5	After	barrier	1.329E-04	-3.873E-05	1246550.42	26050.5
BOBJ1	20	28767.	Before	barrier	1.328E-04	-3.815E-05	915806.61	28767.
BOBJ1	21	28767.	After	barrier	1.328E-04	-3.814E-05	915806.61	28767.
BOBJ1	22	31483.5	Before	barrier	1.327E-04	-3.750E-05	497986.2	31483.5
BOBJ1	23	31483.5	After	barrier	1.326E-04	-3.750E-05	497986.2	31483.5
BOBJ1	24	34200.	Before	barrier	1.325E-04	-3.685E-05	-6910.8	34200.
BOBJ1	25	34200.	After	barrier	-1.406E-09	1.094E-08	-3776.	34200.
BOBJ1	26	35000.	Before	barrier	-6.248E-10	1.063E-08	2.101E-09	35000.
BOBJ1	27	35000.	After	barrier	-4.366E-11	1.733E-09	5.486E-09	35000.
BOBJ1	28	35800.	Before	barrier	-3.092E-11	1.733E-09	-3776.	35800.
BOBJ1	29	35800.	After	barrier	-2.168E-06	-1.325E-05	-6914.24	35800.
BOBJ1	30	38516.75	Before	barrier	-2.165E-06	-1.757E-05	484902.67	38516.75
BOBJ1	31	38516.75	After	barrier	-2.184E-06	-1.758E-05	484902.67	38516.75

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	32	41233.5	Before	barrier	-2.180E-06	-2.187E-05	889626.97	41233.5
BOBJ1	33	41233.5	After	barrier	-2.114E-06	-2.190E-05	889626.97	41233.5
BOBJ1	34	43950.25	Before	barrier	-2.208E-06	-2.614E-05	1207258.64	43950.25
BOBJ1	35	43950.25	After	barrier	-2.170E-06	-2.614E-05	1207258.64	43950.25
BOBJ1	36	46667.	Before	barrier	-2.139E-06	-3.030E-05	1437797.68	46667.
BOBJ1	37	46667.	After	barrier	8.069E-06	-2.869E-05	1437797.68	46667.
BOBJ1	38	49583.75	Before	barrier	8.267E-06	-2.511E-05	1588362.5	49583.75
BOBJ1	39	49583.75	After	barrier	8.359E-06	-2.513E-05	1588362.5	49583.75
BOBJ1	40	52500.5	Before	barrier	8.371E-06	-2.138E-05	1638539.63	52500.5
BOBJ1	41	52500.5	After	barrier	8.141E-06	-2.127E-05	1638533.89	52500.5
BOBJ1	42	55417.25	Before	barrier	8.459E-06	-1.746E-05	1588323.35	55417.25
BOBJ1	43	55417.25	After	barrier	8.536E-06	-1.745E-05	1588323.35	55417.25
BOBJ1	44	58334.	Before	barrier	8.540E-06	-1.364E-05	1437725.12	58334.
BOBJ1	45	58334.	After	barrier	-1.354E-06	-4.921E-06	1437725.12	58334.
BOBJ1	46	61050.5	Before	barrier	-1.519E-06	-1.330E-06	1207180.17	61050.5
BOBJ1	47	61050.5	After	barrier	-1.561E-06	-1.347E-06	1207180.17	61050.5
BOBJ1	48	63767.	Before	barrier	-1.516E-06	2.238E-06	889558.63	63767.
BOBJ1	49	63767.	After	barrier	-1.586E-06	2.248E-06	889558.63	63767.
BOBJ1	50	66483.5	Before	barrier	-1.577E-06	5.839E-06	484860.49	66483.5
BOBJ1	51	66483.5	After	barrier	-1.591E-06	5.843E-06	484860.49	66483.5
BOBJ1	52	69200.	Before	barrier	-1.536E-06	9.429E-06	-6914.24	69200.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	53	69200.	After	barrier	3.240E-09	-2.327E-08	-3776.	69200.
BOBJ1	54	70000.	Before	barrier	1.544E-09	-2.183E-08	6.487E-09	70000.
BOBJ1	55	70000.	After	barrier	3.092E-10	-4.087E-09	-1.101E-08	70000.
BOBJ1	56	70800.	Before	barrier	3.061E-09	-2.244E-09	-3776.	70800.
BOBJ1	57	70800.	After	barrier	-5.890E-05	1.735E-05	-9015.08	70800.
BOBJ1	58	73516.75	Before	barrier	-5.893E-05	9.158E-06	495924.38	73516.75
BOBJ1	59	73516.75	After	barrier	-5.891E-05	9.199E-06	495924.38	73516.75
BOBJ1	60	76233.5	Before	barrier	-5.882E-05	1.028E-06	913771.22	76233.5
BOBJ1	61	76233.5	After	barrier	-5.887E-05	1.046E-06	913771.22	76233.5
BOBJ1	62	78950.25	Before	barrier	-5.892E-05	-7.129E-06	1244525.44	78950.25
BOBJ1	63	78950.25	After	barrier	-5.921E-05	-7.126E-06	1244525.44	78950.25
BOBJ1	64	81667.	Before	barrier	-5.923E-05	-1.528E-05	1488187.03	81667.
BOBJ1	65	81667.	After	barrier	-5.927E-05	-1.528E-05	1488187.03	81667.
BOBJ1	66	84583.75	Before	barrier	-5.907E-05	-2.404E-05	1652840.44	84583.75
BOBJ1	67	84583.75	After	barrier	-5.892E-05	-2.405E-05	1652840.44	84583.75
BOBJ1	68	87500.5	Before	barrier	-5.876E-05	-3.285E-05	1717106.17	87500.5
BOBJ1	69	87500.5	After	barrier	-5.889E-05	-3.285E-05	1717106.17	87500.5
BOBJ1	70	90417.25	Before	barrier	-5.895E-05	-4.166E-05	1680984.22	90417.25
BOBJ1	71	90417.25	After	barrier	-5.879E-05	-4.164E-05	1680984.22	90417.25
BOBJ1	72	93334.	Before	barrier	-5.871E-05	-5.044E-05	1544474.58	93334.
BOBJ1	73	93334.	After	barrier	1.037E-04	-2.509E-05	1544474.58	93334.

Table 37: Bridge Object Forces, Part 2 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	T	M2	M3	GlobalX
		mm			kN-mm	kN-mm	kN-mm	mm
BOBJ1	74	96250.5	Before	barrier	1.036E-04	-2.473E-05	1307601.88	96250.5
BOBJ1	75	96250.5	After	barrier	1.036E-04	-2.475E-05	1307601.88	96250.5
BOBJ1	76	99167.	Before	barrier	1.032E-04	-2.441E-05	970358.7	99167.
BOBJ1	77	99167.	After	barrier	1.032E-04	-2.443E-05	970358.7	99167.
BOBJ1	78	102083.5	Before	barrier	1.029E-04	-2.411E-05	532745.05	102083.5
BOBJ1	79	102083.5	After	barrier	1.029E-04	-2.411E-05	532745.05	102083.5
BOBJ1	80	105000.	Before	barrier	1.028E-04	-2.378E-05	-5239.08	105000.

Table 37: Bridge Object Forces, Part 3 of 3

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	1	0.	After	DEAD	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	3	2916.75	After	DEAD	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	5	5833.5	After	DEAD	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	7	8750.25	After	DEAD	9.095E-13	-894.18
BOBJ1	8	11667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	9	11667.	After	DEAD	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	11	14583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	13	17500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	15	20417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	16	23334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	17	23334.	After	DEAD	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	19	26050.5	After	DEAD	9.095E-13	-894.18
BOBJ1	20	28767.	Before	DEAD	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	21	28767.	After	DEAD	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	23	31483.5	After	DEAD	9.095E-13	-894.18
BOBJ1	24	34200.	Before	DEAD	9.095E-13	-894.18
BOBJ1	25	34200.	After	DEAD	9.095E-13	-894.18
BOBJ1	26	35000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	27	35000.	After	DEAD	9.095E-13	-894.18
BOBJ1	28	35800.	Before	DEAD	9.095E-13	-894.18
BOBJ1	29	35800.	After	DEAD	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	31	38516.75	After	DEAD	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	33	41233.5	After	DEAD	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	35	43950.25	After	DEAD	9.095E-13	-894.18
BOBJ1	36	46667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	37	46667.	After	DEAD	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	39	49583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	41	52500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	43	55417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	44	58334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	45	58334.	After	DEAD	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	47	61050.5	After	DEAD	9.095E-13	-894.18
BOBJ1	48	63767.	Before	DEAD	9.095E-13	-894.18
BOBJ1	49	63767.	After	DEAD	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	51	66483.5	After	DEAD	9.095E-13	-894.18
BOBJ1	52	69200.	Before	DEAD	9.095E-13	-894.18
BOBJ1	53	69200.	After	DEAD	9.095E-13	-894.18
BOBJ1	54	70000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	55	70000.	After	DEAD	9.095E-13	-894.18
BOBJ1	56	70800.	Before	DEAD	9.095E-13	-894.18
BOBJ1	57	70800.	After	DEAD	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	59	73516.75	After	DEAD	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	61	76233.5	After	DEAD	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	62	78950.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	63	78950.25	After	DEAD	9.095E-13	-894.18
BOBJ1	64	81667.	Before	DEAD	9.095E-13	-894.18
BOBJ1	65	81667.	After	DEAD	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	DEAD	9.095E-13	-894.18
BOBJ1	67	84583.75	After	DEAD	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	69	87500.5	After	DEAD	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	DEAD	9.095E-13	-894.18
BOBJ1	71	90417.25	After	DEAD	9.095E-13	-894.18
BOBJ1	72	93334.	Before	DEAD	9.095E-13	-894.18
BOBJ1	73	93334.	After	DEAD	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	75	96250.5	After	DEAD	9.095E-13	-894.18
BOBJ1	76	99167.	Before	DEAD	9.095E-13	-894.18
BOBJ1	77	99167.	After	DEAD	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	DEAD	9.095E-13	-894.18
BOBJ1	79	102083.5	After	DEAD	9.095E-13	-894.18
BOBJ1	80	105000.	Before	DEAD	9.095E-13	-894.18
BOBJ1	1	0.	After	DW	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	DW	9.095E-13	-894.18
BOBJ1	3	2916.75	After	DW	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	DW	9.095E-13	-894.18
BOBJ1	5	5833.5	After	DW	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	DW	9.095E-13	-894.18
BOBJ1	7	8750.25	After	DW	9.095E-13	-894.18
BOBJ1	8	11667.	Before	DW	9.095E-13	-894.18
BOBJ1	9	11667.	After	DW	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	DW	9.095E-13	-894.18
BOBJ1	11	14583.75	After	DW	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	DW	9.095E-13	-894.18
BOBJ1	13	17500.5	After	DW	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	DW	9.095E-13	-894.18
BOBJ1	15	20417.25	After	DW	9.095E-13	-894.18
BOBJ1	16	23334.	Before	DW	9.095E-13	-894.18
BOBJ1	17	23334.	After	DW	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	DW	9.095E-13	-894.18
BOBJ1	19	26050.5	After	DW	9.095E-13	-894.18
BOBJ1	20	28767.	Before	DW	9.095E-13	-894.18
BOBJ1	21	28767.	After	DW	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	DW	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	23	31483.5	After	DW	9.095E-13	-894.18
BOBJ1	24	34200.	Before	DW	9.095E-13	-894.18
BOBJ1	25	34200.	After	DW	9.095E-13	-894.18
BOBJ1	26	35000.	Before	DW	9.095E-13	-894.18
BOBJ1	27	35000.	After	DW	9.095E-13	-894.18
BOBJ1	28	35800.	Before	DW	9.095E-13	-894.18
BOBJ1	29	35800.	After	DW	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	DW	9.095E-13	-894.18
BOBJ1	31	38516.75	After	DW	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	DW	9.095E-13	-894.18
BOBJ1	33	41233.5	After	DW	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	DW	9.095E-13	-894.18
BOBJ1	35	43950.25	After	DW	9.095E-13	-894.18
BOBJ1	36	46667.	Before	DW	9.095E-13	-894.18
BOBJ1	37	46667.	After	DW	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	DW	9.095E-13	-894.18
BOBJ1	39	49583.75	After	DW	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	DW	9.095E-13	-894.18
BOBJ1	41	52500.5	After	DW	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	DW	9.095E-13	-894.18
BOBJ1	43	55417.25	After	DW	9.095E-13	-894.18
BOBJ1	44	58334.	Before	DW	9.095E-13	-894.18
BOBJ1	45	58334.	After	DW	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	DW	9.095E-13	-894.18
BOBJ1	47	61050.5	After	DW	9.095E-13	-894.18
BOBJ1	48	63767.	Before	DW	9.095E-13	-894.18
BOBJ1	49	63767.	After	DW	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	DW	9.095E-13	-894.18
BOBJ1	51	66483.5	After	DW	9.095E-13	-894.18
BOBJ1	52	69200.	Before	DW	9.095E-13	-894.18
BOBJ1	53	69200.	After	DW	9.095E-13	-894.18
BOBJ1	54	70000.	Before	DW	9.095E-13	-894.18
BOBJ1	55	70000.	After	DW	9.095E-13	-894.18
BOBJ1	56	70800.	Before	DW	9.095E-13	-894.18
BOBJ1	57	70800.	After	DW	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	DW	9.095E-13	-894.18
BOBJ1	59	73516.75	After	DW	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	DW	9.095E-13	-894.18
BOBJ1	61	76233.5	After	DW	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	DW	9.095E-13	-894.18
BOBJ1	63	78950.25	After	DW	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	64	81667.	Before	DW	9.095E-13	-894.18
BOBJ1	65	81667.	After	DW	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	DW	9.095E-13	-894.18
BOBJ1	67	84583.75	After	DW	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	DW	9.095E-13	-894.18
BOBJ1	69	87500.5	After	DW	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	DW	9.095E-13	-894.18
BOBJ1	71	90417.25	After	DW	9.095E-13	-894.18
BOBJ1	72	93334.	Before	DW	9.095E-13	-894.18
BOBJ1	73	93334.	After	DW	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	DW	9.095E-13	-894.18
BOBJ1	75	96250.5	After	DW	9.095E-13	-894.18
BOBJ1	76	99167.	Before	DW	9.095E-13	-894.18
BOBJ1	77	99167.	After	DW	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	DW	9.095E-13	-894.18
BOBJ1	79	102083.5	After	DW	9.095E-13	-894.18
BOBJ1	80	105000.	Before	DW	9.095E-13	-894.18
BOBJ1	1	0.	After	WL	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	WL	9.095E-13	-894.18
BOBJ1	3	2916.75	After	WL	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	WL	9.095E-13	-894.18
BOBJ1	5	5833.5	After	WL	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	WL	9.095E-13	-894.18
BOBJ1	7	8750.25	After	WL	9.095E-13	-894.18
BOBJ1	8	11667.	Before	WL	9.095E-13	-894.18
BOBJ1	9	11667.	After	WL	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	WL	9.095E-13	-894.18
BOBJ1	11	14583.75	After	WL	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	WL	9.095E-13	-894.18
BOBJ1	13	17500.5	After	WL	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	WL	9.095E-13	-894.18
BOBJ1	15	20417.25	After	WL	9.095E-13	-894.18
BOBJ1	16	23334.	Before	WL	9.095E-13	-894.18
BOBJ1	17	23334.	After	WL	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	WL	9.095E-13	-894.18
BOBJ1	19	26050.5	After	WL	9.095E-13	-894.18
BOBJ1	20	28767.	Before	WL	9.095E-13	-894.18
BOBJ1	21	28767.	After	WL	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	WL	9.095E-13	-894.18
BOBJ1	23	31483.5	After	WL	9.095E-13	-894.18
BOBJ1	24	34200.	Before	WL	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	25	34200.	After	WL	9.095E-13	-894.18
BOBJ1	26	35000.	Before	WL	9.095E-13	-894.18
BOBJ1	27	35000.	After	WL	9.095E-13	-894.18
BOBJ1	28	35800.	Before	WL	9.095E-13	-894.18
BOBJ1	29	35800.	After	WL	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	WL	9.095E-13	-894.18
BOBJ1	31	38516.75	After	WL	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	WL	9.095E-13	-894.18
BOBJ1	33	41233.5	After	WL	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	WL	9.095E-13	-894.18
BOBJ1	35	43950.25	After	WL	9.095E-13	-894.18
BOBJ1	36	46667.	Before	WL	9.095E-13	-894.18
BOBJ1	37	46667.	After	WL	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	WL	9.095E-13	-894.18
BOBJ1	39	49583.75	After	WL	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	WL	9.095E-13	-894.18
BOBJ1	41	52500.5	After	WL	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	WL	9.095E-13	-894.18
BOBJ1	43	55417.25	After	WL	9.095E-13	-894.18
BOBJ1	44	58334.	Before	WL	9.095E-13	-894.18
BOBJ1	45	58334.	After	WL	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	WL	9.095E-13	-894.18
BOBJ1	47	61050.5	After	WL	9.095E-13	-894.18
BOBJ1	48	63767.	Before	WL	9.095E-13	-894.18
BOBJ1	49	63767.	After	WL	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	WL	9.095E-13	-894.18
BOBJ1	51	66483.5	After	WL	9.095E-13	-894.18
BOBJ1	52	69200.	Before	WL	9.095E-13	-894.18
BOBJ1	53	69200.	After	WL	9.095E-13	-894.18
BOBJ1	54	70000.	Before	WL	9.095E-13	-894.18
BOBJ1	55	70000.	After	WL	9.095E-13	-894.18
BOBJ1	56	70800.	Before	WL	9.095E-13	-894.18
BOBJ1	57	70800.	After	WL	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	WL	9.095E-13	-894.18
BOBJ1	59	73516.75	After	WL	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	WL	9.095E-13	-894.18
BOBJ1	61	76233.5	After	WL	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	WL	9.095E-13	-894.18
BOBJ1	63	78950.25	After	WL	9.095E-13	-894.18
BOBJ1	64	81667.	Before	WL	9.095E-13	-894.18
BOBJ1	65	81667.	After	WL	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	66	84583.75	Before	WL	9.095E-13	-894.18
BOBJ1	67	84583.75	After	WL	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	WL	9.095E-13	-894.18
BOBJ1	69	87500.5	After	WL	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	WL	9.095E-13	-894.18
BOBJ1	71	90417.25	After	WL	9.095E-13	-894.18
BOBJ1	72	93334.	Before	WL	9.095E-13	-894.18
BOBJ1	73	93334.	After	WL	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	WL	9.095E-13	-894.18
BOBJ1	75	96250.5	After	WL	9.095E-13	-894.18
BOBJ1	76	99167.	Before	WL	9.095E-13	-894.18
BOBJ1	77	99167.	After	WL	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	WL	9.095E-13	-894.18
BOBJ1	79	102083.5	After	WL	9.095E-13	-894.18
BOBJ1	80	105000.	Before	WL	9.095E-13	-894.18
BOBJ1	1	0.	After	EH	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	EH	9.095E-13	-894.18
BOBJ1	3	2916.75	After	EH	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	EH	9.095E-13	-894.18
BOBJ1	5	5833.5	After	EH	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	EH	9.095E-13	-894.18
BOBJ1	7	8750.25	After	EH	9.095E-13	-894.18
BOBJ1	8	11667.	Before	EH	9.095E-13	-894.18
BOBJ1	9	11667.	After	EH	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	EH	9.095E-13	-894.18
BOBJ1	11	14583.75	After	EH	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	EH	9.095E-13	-894.18
BOBJ1	13	17500.5	After	EH	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	EH	9.095E-13	-894.18
BOBJ1	15	20417.25	After	EH	9.095E-13	-894.18
BOBJ1	16	23334.	Before	EH	9.095E-13	-894.18
BOBJ1	17	23334.	After	EH	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	EH	9.095E-13	-894.18
BOBJ1	19	26050.5	After	EH	9.095E-13	-894.18
BOBJ1	20	28767.	Before	EH	9.095E-13	-894.18
BOBJ1	21	28767.	After	EH	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	EH	9.095E-13	-894.18
BOBJ1	23	31483.5	After	EH	9.095E-13	-894.18
BOBJ1	24	34200.	Before	EH	9.095E-13	-894.18
BOBJ1	25	34200.	After	EH	9.095E-13	-894.18
BOBJ1	26	35000.	Before	EH	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	27	35000.	After	EH	9.095E-13	-894.18
BOBJ1	28	35800.	Before	EH	9.095E-13	-894.18
BOBJ1	29	35800.	After	EH	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	EH	9.095E-13	-894.18
BOBJ1	31	38516.75	After	EH	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	EH	9.095E-13	-894.18
BOBJ1	33	41233.5	After	EH	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	EH	9.095E-13	-894.18
BOBJ1	35	43950.25	After	EH	9.095E-13	-894.18
BOBJ1	36	46667.	Before	EH	9.095E-13	-894.18
BOBJ1	37	46667.	After	EH	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	EH	9.095E-13	-894.18
BOBJ1	39	49583.75	After	EH	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	EH	9.095E-13	-894.18
BOBJ1	41	52500.5	After	EH	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	EH	9.095E-13	-894.18
BOBJ1	43	55417.25	After	EH	9.095E-13	-894.18
BOBJ1	44	58334.	Before	EH	9.095E-13	-894.18
BOBJ1	45	58334.	After	EH	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	EH	9.095E-13	-894.18
BOBJ1	47	61050.5	After	EH	9.095E-13	-894.18
BOBJ1	48	63767.	Before	EH	9.095E-13	-894.18
BOBJ1	49	63767.	After	EH	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	EH	9.095E-13	-894.18
BOBJ1	51	66483.5	After	EH	9.095E-13	-894.18
BOBJ1	52	69200.	Before	EH	9.095E-13	-894.18
BOBJ1	53	69200.	After	EH	9.095E-13	-894.18
BOBJ1	54	70000.	Before	EH	9.095E-13	-894.18
BOBJ1	55	70000.	After	EH	9.095E-13	-894.18
BOBJ1	56	70800.	Before	EH	9.095E-13	-894.18
BOBJ1	57	70800.	After	EH	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	EH	9.095E-13	-894.18
BOBJ1	59	73516.75	After	EH	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	EH	9.095E-13	-894.18
BOBJ1	61	76233.5	After	EH	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	EH	9.095E-13	-894.18
BOBJ1	63	78950.25	After	EH	9.095E-13	-894.18
BOBJ1	64	81667.	Before	EH	9.095E-13	-894.18
BOBJ1	65	81667.	After	EH	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	EH	9.095E-13	-894.18
BOBJ1	67	84583.75	After	EH	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	68	87500.5	Before	EH	9.095E-13	-894.18
BOBJ1	69	87500.5	After	EH	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	EH	9.095E-13	-894.18
BOBJ1	71	90417.25	After	EH	9.095E-13	-894.18
BOBJ1	72	93334.	Before	EH	9.095E-13	-894.18
BOBJ1	73	93334.	After	EH	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	EH	9.095E-13	-894.18
BOBJ1	75	96250.5	After	EH	9.095E-13	-894.18
BOBJ1	76	99167.	Before	EH	9.095E-13	-894.18
BOBJ1	77	99167.	After	EH	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	EH	9.095E-13	-894.18
BOBJ1	79	102083.5	After	EH	9.095E-13	-894.18
BOBJ1	80	105000.	Before	EH	9.095E-13	-894.18
BOBJ1	1	0.	After	LS	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	LS	9.095E-13	-894.18
BOBJ1	3	2916.75	After	LS	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	LS	9.095E-13	-894.18
BOBJ1	5	5833.5	After	LS	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	LS	9.095E-13	-894.18
BOBJ1	7	8750.25	After	LS	9.095E-13	-894.18
BOBJ1	8	11667.	Before	LS	9.095E-13	-894.18
BOBJ1	9	11667.	After	LS	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	LS	9.095E-13	-894.18
BOBJ1	11	14583.75	After	LS	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	LS	9.095E-13	-894.18
BOBJ1	13	17500.5	After	LS	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	LS	9.095E-13	-894.18
BOBJ1	15	20417.25	After	LS	9.095E-13	-894.18
BOBJ1	16	23334.	Before	LS	9.095E-13	-894.18
BOBJ1	17	23334.	After	LS	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	LS	9.095E-13	-894.18
BOBJ1	19	26050.5	After	LS	9.095E-13	-894.18
BOBJ1	20	28767.	Before	LS	9.095E-13	-894.18
BOBJ1	21	28767.	After	LS	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	LS	9.095E-13	-894.18
BOBJ1	23	31483.5	After	LS	9.095E-13	-894.18
BOBJ1	24	34200.	Before	LS	9.095E-13	-894.18
BOBJ1	25	34200.	After	LS	9.095E-13	-894.18
BOBJ1	26	35000.	Before	LS	9.095E-13	-894.18
BOBJ1	27	35000.	After	LS	9.095E-13	-894.18
BOBJ1	28	35800.	Before	LS	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	29	35800.	After	LS	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	LS	9.095E-13	-894.18
BOBJ1	31	38516.75	After	LS	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	LS	9.095E-13	-894.18
BOBJ1	33	41233.5	After	LS	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	LS	9.095E-13	-894.18
BOBJ1	35	43950.25	After	LS	9.095E-13	-894.18
BOBJ1	36	46667.	Before	LS	9.095E-13	-894.18
BOBJ1	37	46667.	After	LS	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	LS	9.095E-13	-894.18
BOBJ1	39	49583.75	After	LS	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	LS	9.095E-13	-894.18
BOBJ1	41	52500.5	After	LS	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	LS	9.095E-13	-894.18
BOBJ1	43	55417.25	After	LS	9.095E-13	-894.18
BOBJ1	44	58334.	Before	LS	9.095E-13	-894.18
BOBJ1	45	58334.	After	LS	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	LS	9.095E-13	-894.18
BOBJ1	47	61050.5	After	LS	9.095E-13	-894.18
BOBJ1	48	63767.	Before	LS	9.095E-13	-894.18
BOBJ1	49	63767.	After	LS	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	LS	9.095E-13	-894.18
BOBJ1	51	66483.5	After	LS	9.095E-13	-894.18
BOBJ1	52	69200.	Before	LS	9.095E-13	-894.18
BOBJ1	53	69200.	After	LS	9.095E-13	-894.18
BOBJ1	54	70000.	Before	LS	9.095E-13	-894.18
BOBJ1	55	70000.	After	LS	9.095E-13	-894.18
BOBJ1	56	70800.	Before	LS	9.095E-13	-894.18
BOBJ1	57	70800.	After	LS	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	LS	9.095E-13	-894.18
BOBJ1	59	73516.75	After	LS	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	LS	9.095E-13	-894.18
BOBJ1	61	76233.5	After	LS	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	LS	9.095E-13	-894.18
BOBJ1	63	78950.25	After	LS	9.095E-13	-894.18
BOBJ1	64	81667.	Before	LS	9.095E-13	-894.18
BOBJ1	65	81667.	After	LS	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	LS	9.095E-13	-894.18
BOBJ1	67	84583.75	After	LS	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	LS	9.095E-13	-894.18
BOBJ1	69	87500.5	After	LS	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	70	90417.25	Before	LS	9.095E-13	-894.18
BOBJ1	71	90417.25	After	LS	9.095E-13	-894.18
BOBJ1	72	93334.	Before	LS	9.095E-13	-894.18
BOBJ1	73	93334.	After	LS	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	LS	9.095E-13	-894.18
BOBJ1	75	96250.5	After	LS	9.095E-13	-894.18
BOBJ1	76	99167.	Before	LS	9.095E-13	-894.18
BOBJ1	77	99167.	After	LS	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	LS	9.095E-13	-894.18
BOBJ1	79	102083.5	After	LS	9.095E-13	-894.18
BOBJ1	80	105000.	Before	LS	9.095E-13	-894.18
BOBJ1	1	0.	After	barrier	9.095E-13	-894.18
BOBJ1	2	2916.75	Before	barrier	9.095E-13	-894.18
BOBJ1	3	2916.75	After	barrier	9.095E-13	-894.18
BOBJ1	4	5833.5	Before	barrier	9.095E-13	-894.18
BOBJ1	5	5833.5	After	barrier	9.095E-13	-894.18
BOBJ1	6	8750.25	Before	barrier	9.095E-13	-894.18
BOBJ1	7	8750.25	After	barrier	9.095E-13	-894.18
BOBJ1	8	11667.	Before	barrier	9.095E-13	-894.18
BOBJ1	9	11667.	After	barrier	9.095E-13	-894.18
BOBJ1	10	14583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	11	14583.75	After	barrier	9.095E-13	-894.18
BOBJ1	12	17500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	13	17500.5	After	barrier	9.095E-13	-894.18
BOBJ1	14	20417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	15	20417.25	After	barrier	9.095E-13	-894.18
BOBJ1	16	23334.	Before	barrier	9.095E-13	-894.18
BOBJ1	17	23334.	After	barrier	9.095E-13	-894.18
BOBJ1	18	26050.5	Before	barrier	9.095E-13	-894.18
BOBJ1	19	26050.5	After	barrier	9.095E-13	-894.18
BOBJ1	20	28767.	Before	barrier	9.095E-13	-894.18
BOBJ1	21	28767.	After	barrier	9.095E-13	-894.18
BOBJ1	22	31483.5	Before	barrier	9.095E-13	-894.18
BOBJ1	23	31483.5	After	barrier	9.095E-13	-894.18
BOBJ1	24	34200.	Before	barrier	9.095E-13	-894.18
BOBJ1	25	34200.	After	barrier	9.095E-13	-894.18
BOBJ1	26	35000.	Before	barrier	9.095E-13	-894.18
BOBJ1	27	35000.	After	barrier	9.095E-13	-894.18
BOBJ1	28	35800.	Before	barrier	9.095E-13	-894.18
BOBJ1	29	35800.	After	barrier	9.095E-13	-894.18
BOBJ1	30	38516.75	Before	barrier	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	31	38516.75	After	barrier	9.095E-13	-894.18
BOBJ1	32	41233.5	Before	barrier	9.095E-13	-894.18
BOBJ1	33	41233.5	After	barrier	9.095E-13	-894.18
BOBJ1	34	43950.25	Before	barrier	9.095E-13	-894.18
BOBJ1	35	43950.25	After	barrier	9.095E-13	-894.18
BOBJ1	36	46667.	Before	barrier	9.095E-13	-894.18
BOBJ1	37	46667.	After	barrier	9.095E-13	-894.18
BOBJ1	38	49583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	39	49583.75	After	barrier	9.095E-13	-894.18
BOBJ1	40	52500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	41	52500.5	After	barrier	9.095E-13	-894.18
BOBJ1	42	55417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	43	55417.25	After	barrier	9.095E-13	-894.18
BOBJ1	44	58334.	Before	barrier	9.095E-13	-894.18
BOBJ1	45	58334.	After	barrier	9.095E-13	-894.18
BOBJ1	46	61050.5	Before	barrier	9.095E-13	-894.18
BOBJ1	47	61050.5	After	barrier	9.095E-13	-894.18
BOBJ1	48	63767.	Before	barrier	9.095E-13	-894.18
BOBJ1	49	63767.	After	barrier	9.095E-13	-894.18
BOBJ1	50	66483.5	Before	barrier	9.095E-13	-894.18
BOBJ1	51	66483.5	After	barrier	9.095E-13	-894.18
BOBJ1	52	69200.	Before	barrier	9.095E-13	-894.18
BOBJ1	53	69200.	After	barrier	9.095E-13	-894.18
BOBJ1	54	70000.	Before	barrier	9.095E-13	-894.18
BOBJ1	55	70000.	After	barrier	9.095E-13	-894.18
BOBJ1	56	70800.	Before	barrier	9.095E-13	-894.18
BOBJ1	57	70800.	After	barrier	9.095E-13	-894.18
BOBJ1	58	73516.75	Before	barrier	9.095E-13	-894.18
BOBJ1	59	73516.75	After	barrier	9.095E-13	-894.18
BOBJ1	60	76233.5	Before	barrier	9.095E-13	-894.18
BOBJ1	61	76233.5	After	barrier	9.095E-13	-894.18
BOBJ1	62	78950.25	Before	barrier	9.095E-13	-894.18
BOBJ1	63	78950.25	After	barrier	9.095E-13	-894.18
BOBJ1	64	81667.	Before	barrier	9.095E-13	-894.18
BOBJ1	65	81667.	After	barrier	9.095E-13	-894.18
BOBJ1	66	84583.75	Before	barrier	9.095E-13	-894.18
BOBJ1	67	84583.75	After	barrier	9.095E-13	-894.18
BOBJ1	68	87500.5	Before	barrier	9.095E-13	-894.18
BOBJ1	69	87500.5	After	barrier	9.095E-13	-894.18
BOBJ1	70	90417.25	Before	barrier	9.095E-13	-894.18
BOBJ1	71	90417.25	After	barrier	9.095E-13	-894.18

Table 37: Bridge Object Forces, Part 3 of 3

BridgeObj	BridgeCut	Distance	LocType	OutputCase	GlobalY	GlobalZ
		mm			mm	mm
BOBJ1	72	93334.	Before	barrier	9.095E-13	-894.18
BOBJ1	73	93334.	After	barrier	9.095E-13	-894.18
BOBJ1	74	96250.5	Before	barrier	9.095E-13	-894.18
BOBJ1	75	96250.5	After	barrier	9.095E-13	-894.18
BOBJ1	76	99167.	Before	barrier	9.095E-13	-894.18
BOBJ1	77	99167.	After	barrier	9.095E-13	-894.18
BOBJ1	78	102083.5	Before	barrier	9.095E-13	-894.18
BOBJ1	79	102083.5	After	barrier	9.095E-13	-894.18
BOBJ1	80	105000.	Before	barrier	9.095E-13	-894.18

10. Material take-off

This section provides a material take-off.

Table 38: Material List 2 - By Section Property

Table 38: Material List 2 - By Section Property

Section	ObjectType	NumPieces	TotalLength	TotalWeight
			mm	kN
A_T 1200	Frame	2	25800.	1313.126
1200Dia_Pile	Frame	16	134000.	3571.001
P_T 1300	Frame	2	25800.	1422.553
Girder 35m	Frame	200	525000.	11698.913
ASEC2	Area			7181.156
ASEC3	Area			1694.848
Wing Wall	Area			1176.035
fixed link	Link	14		0.
BFIX-3	Link	20		0.
BFIXSS-4	Link	90		0.
elastic link-1	Link	25		0.
pin-1	Link	5		0.

الملخص

تقدم هذه الدراسة تحليلًا مقارنًا شاملًا لمعيارين رئيسيين في تصميم الجسور: معيار الجمعية الأمريكية لمسؤولي الطرق السريعة والنقل وتصميم عوامل الحمولة والمقاومة (AASHTO–LRFD) والمعيار البريطاني (BS5400). تهدف الدراسة إلى فحص منهجيات والمواصفات الفنية والفعالية العامة لهذه المعايير في ضمان سلامة البنية التحتية، ومتانتها، وكفاءة تصاميم الجسور. من خلال مقارنة هذه المعايير، تسعى البحوث إلى تسليط الضوء على نقاط القوة والقيود لكل منهما، مقدمةً بذلك رؤى قيمة للتقدم المحتمل في ممارسات هندسة الجسور.

بعد تمهيد الطريق بمقدمة مفصلة ومراجعة للأدبيات ذات الصلة، تغوص الدراسة في فحص معمق لإجراءات التصميم التي يدعو إليها معيارا AASHTO–LRFD و BS5400. تدقق الدراسة في المبادئ الأساسية التي تقوم عليها كل معيار وتطبيقها العملي في تصميم بنيات الجسور.

يبرز الفصل الرابع بتقديمه لتحليل تجريبي منفذ من خلال برمجيات هندسية متقدمة. يكشف هذا الجزء من الدراسة عن اختلافات ملحوظة بين المعايير من حيث قوى ولحظات المكونات الهيكلية. تحديدًا، تظهر نتائج الحمل المحوري أن لعمود الركيزة، يقترح AASHTO–LRFD قيمة −2747.877 كيلونيوتن، بينما يقترح BS5400 قيمة أكثر تحفظًا تبلغ −3499 كيلونيوتن. وبالمثل، لعمود الأساس، تباين حساب AASHTO–LRFD البالغ −4048.873 كيلونيوتن مع −4843 كيلونيوتن لـ BS5400. بالإضافة إلى ذلك، تكشف حسابات اللحظة للجسور أن لحظة الجسر الداخلي وفقًا لـ AASHTO–LRFD هي 2898 كيلونيوتن.متر، مع الخارجية عند كيلونيوتن.متر، بينما يحدد BS5400 2759 كيلونيوتن.متر للجسر الداخلي وقيمة أعلى بكثير تبلغ 3939.64 كيلونيوتن.متر للجسر الخارجي.

تبرز هذه النتائج اتجاهًا تحفظيًا في معيار BS5400 ، يتجلى في قيم القوة واللحظة الأعلى التي تشير إلى منهج تصميم يهدف إلى تعزيز الصلابة والمتانة في بنى الجسور. تشير النتائج أيضًا إلى مناطق محتملة للتحسين في كل معيار لتوازن السلامة والتكلفة والكفاءة بشكل أكثر فعالية.

يخلص الفصل الختامي هذه الرؤى، مستخلصًا استنتاجات شاملة وصياغة توصيات لمزيد من البحث والتطوير في معايير تصميم الجسور. تسهم هذه الدراسة في الحوار المستمر حول هندسة الجسور، بهدف التأثير على تحسينات المعايير المستقبلية وتعزيز تقدم منهجيات تصميم الجسور.

جامعة البحرين

كلية الهندسة **قسم الهندسة المدنية**

تقييم مواصفات التصميم وتصميم الجسور باستخدام المواصفات البريطانية (BS5400) والأمريكية (AASHTO-LRFD)

أطروحة مقدمة كجزء من متطلبات الحصول على درجة

الماجستير الانشاءات في الهندسة المدنية

إعداد

خالد عقيل البستكي

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أستاذ

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مملكة البحرين

سيبتمبر، 2024