STATICAL EVALUATION OF THE EUROPE BRIDGE BETWEEN KEHL AND STRASBOURG ACCORDING
TO THE “GUIDELINE FOR THE RECALCULATION OF EXISTING ROAD BRIDGES” WITH SPECIFIC
MATHEMATICAL AND STRUCTURAL EXAMINATION OF THE CRACKS IN THE SUPERSTRUCTURE

by

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ABSTRACT

Statical Evaluation of the Europe Bridge between Kehl and Strasbourg according to the “Guideline for the Recalculation of Existing Road Bridges” with Specific Mathematical and Structural Examination of the Cracks in the Superstructure

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This master’s project re-evaluates the Europe Bridge after 60 years of service. The framework for the calculations is provided by the “Guideline for the Recalculation of Existing Road Bridges”. With the help of a computer model, generated by the program SOFiSTiK, and the prescribed loads of the guideline, the required checks in the ULS were performed at the main load bearing system. As the results indicate a high exceedance of the capacity, different alternatives were evaluated to restore the structural safety.

A specific focus was laid on the assessment of the cracks in a connection of the lateral load bearing system. Initially, a literature research on the crack formation in the superstructure of steel bridges was conducted. The gathered information points towards category three fatigue cracks that were caused by poor fatigue design and a discrepancy between static modelling and execution on site. These conclusions were confirmed by the fatigue checks of the affected connections. However, an analysis of the crack detail with a FE-model of the lateral system shows that the crack has no significant impact on the load bearing behaviour of other components.

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1. INTRODUCTION

1.1 SCOPE OF THE THESIS

The subject of this research project is the Europe Bridge over the Rhine between Kehl and Strasbourg and its re-evaluation after a lifespan of almost 60 years. During an inspection, recurring cracks at a certain location inside the box-girders were found. To investigate the current condition of the structure, understand the formation of the cracks, and estimate their impact on the structural safety of the bridge, the following approaches were carried out.

The first one was a theoretical approach. A literature research was conducted on the crack formation in the superstructure of steel bridges. This research presents different examples of cracks that have occurred in steel structures all around the world. Their mechanical background, the impact on the structural safety, and renovation methods were described to draw initial conclusions with reference to the Europe Bridge.

The second part examined the load bearing system in longitudinal direction. This included the development of a computer model, the application of loads according to the existing guideline, a structural analysis as well as the development of possible steps to ensure the structural safety and an appropriate residual lifespan of the bridge. Even though the origin of the cracks might not be in the main load carrying system, this approach determined the general condition of the structure and is a mandatory step in the re-evaluation of old road bridges. Furthermore, it provided the necessary background to choose the most suitable renovation method for the cracks.

Finally, the transverse load bearing system was simulated as the cracks appeared in a connection of the cross girder. With the help of this model it was expected to ultimately identify the reason for the formation of the cracks and to assess their effect on the structural safety. Usually, the re-evaluation also includes the complete examination of the lateral load bearing system and not just of one detail. To remain within the scope of the thesis, this step was not performed and only the crack was investigated.

1.2 BACKGROUND

In recent years, the examination and recalculation of old road and highway bridges became an important issue in Germany. As many of them were built more than 50 years ago in the time after the 2nd world war, they no longer satisfy the engineering standards of today and need to be re-evaluated.

On the one hand, the weight of trucks, the axle loads, and the volume of the heavy vehicle traffic increased rapidly since the 1960s. In response to these changes, the design standards have constantly been enhanced while the traffic assumptions were adapted to the growing traffic. On the other hand, signs of wear and damages occurred at the aging structures that can compromise the load bearing capacity. These two trends demand counteractive steps to ensure the structural safety. Moreover, the usual restoration is no longer sufficient to maintain the condition of the inventory constructions and strengthening measures need to be considered.

The initial step in this process is the re-evaluation of the bridge to determine its condition and to reveal possible load bearing reserves or deficits that require reinforcements. However, the first attempts failed since they were based on the regulations for new structures. Therefore, a modified and more careful approach was required for the existing road bridges that allows to depict their special characteristics more realistically.

A general framework for these calculations, that sets uniform standards and generates comparable results, should be developed. Another goal was to find a compromise between the strict application of current standards and the inclusion of new approaches. As a result, the “Guideline for the Recalculation of Existing Road Bridges” was created, that is based on today's legislation and was designed to give assistance throughout a re-evaluation. It offers the equivalent use of generally accepted and established rules together with more sophisticated and alternative methods that do not request a building approval by the responsible authorities in each individual case. [L1] [L2]

The described guideline is also the foundation of this project and will be applied throughout the static evaluation of the Europe Bridge.

2. DESCRIPTION OF THE STRUCTURE

2.1 GENERAL INFORMATION

All information about the structure, that is presented in this chapter, is derived from the building file and the inventory documents which are listed in the references. The Europe Bridge which is depicted in Figure 2 is a road bridge over the Rhine of the state road 28. It is situated between Strasbourg on the French side and Kehl on the German side, as illustrated in Figure 1. It was built in 1960 and still has great significance for the car traffic in the area as it connects the city regions of Kehl and Strasbourg. Moreover, it is one of few river crossings in the area with the next road bridges being 10 kilometers away to the south and 15 kilometers to the north.

Figure 1: Location of the Europe Bridge (Google Maps, 18.7.19)

The structure is a two-span steel bridge with a total length of 251.6 meters. Each span has a length of 122.8 meters. The construction rests on a pillar in the middle of the river and on the abutments at each bank of the river. The width of the cross-section is 18 meters. This includes a road width of 12 meters with two lanes for each direction of traffic and a sidewalk for pedestrians and cyclists on each side. The alignment is straight in the top view whereas in longitudinal direction, the bridge has a gradient with a maximum of 2.5%.

Figure 2: The Europe Bridge [11]

2.2 STRUCTURAL SYSTEM

The cross-section consists of two closed box girders running parallel from one end to the other as continuous beams. They have a width of 3.0 meters and are 2 x 3.075 meters apart. The height of the girders varies between 2.5 meters at the abutments and 4.8 meters over the pillar in the middle of the river which is illustrated in Figure 3. They transfer the loads in longitudinal direction to the three supports.

Figure 3: Longitudinal View [115]

The deck plate is an orthotropic deck and supported by longitudinal ribs with a spacing of 290 millimeters as well as T-shaped cross girders every 2.56 meters. The span of the cross girder is 2 x 3.075 meters in between the box girders and a three-meter cantilever on the outside of the box-girders. This cross girder passes the loads from the deck to its support points on the box girders.

In addition, vertical and horizontal stiffeners can be observed in Figure 4. Like the cross girders, they are part of the transverse system which forms a rigid frame every 2.56 meters. The bottom plate and the web of the box girder just as the cover sheet are stiffened by longitudinal ribs to prevent buckling. The bracings in the longitudinal girders appear in combination with the cross girders and contribute additional stiffness. However, not every axle contains braces and there is only one diagonal brace per box girder in the field.

Figure 4: Cross-Section over the Pillar [I15]

As Figure 5 shows, the supports consist of two bearings for each box girder which means four bearings in each of the three axles. Over the pillar there are four fixed bearings. At the abutments, the inner bearings are mobile in longitudinal direction whereas the outer bearings are also movable in transverse direction. The eight supports at the abutments are pot bearings and the other four are linear bearings.

Figure 5: Supporting of the Construction [P4]

2.3 HISTORY OF THE BRIDGE

2.3.1 History of Structural Inspections

Since the bridge has been built in 1960 it has been object of studies and regular inspections. In this section the results of these investigations are presented, however, the documentation exhibits some gaps and some of it is entirely in French. Therefore, the following information might also be incomplete as well, since only the German records have been reviewed.

The first recorded general inspection dates back to the year 1979 and discovered cracks in the superstructure between the flange of the cross girder and the vertical stiffener of the box girder web. The exact location can be seen in Figure 6 on the right. These cracks are mostly limited to the welding line but triggered intensive examination.

Two studies were conducted in 1983 and 1985 to determine the cause of the cracks. Following these studies, several repair-methods were tested and evaluated to be prepared for a sudden

acceleration of the phenomenon. At the same time the cracks were monitored and documented in regular time intervals. These inspections took place in 1988, 1989, 1990, 1994, 1998, 2001, 2007, 2011 and 2015 but no further investigations or studies were conducted. It can be seen, that the time between the surveillances increased. This was because many cracks ceased to grow significantly after a certain time. For the same reason the affected details were still not repaired or strengthened to this day.

Apart from the cracks the bridge also showed other deficits that occurred throughout the inspections. In 1989 the deficits included cracks at the western abutment, congestions and leaks

Figure 6: Location of the Cracks [18]

in the drainage that caused intensive local corrosion, small areas with exfoliation of the anticorrosive painting, as well as problems with the road joints and the electrical power supply in the western field. Due to the general inspection from 1995, which is not documented, the condition of the corrosive protection was examined in 1998 to determine the date for a complete renewal. However, the coating was found to be in a good state considering its age of nearly 20 years since the renewal in 1980.

The last documented general inspection was conducted in 2007. In addition to the deficits found in 1989 local areas of buckling and bending were discovered. Other issues were advanced wearing of the supports, continuing deterioration of the anticorrosive painting, corrosion and damages in the handrail as well as dissolving of the asphalt on the pavement.

In 2015, the number of deficits and damages led to the decision to recalculate the bridge to evaluate its remaining load-bearing capacity.

2.3.2 Maintenance and Renovation Measures

In comparison to the amount of defects the bridge displays, relatively few actions have been taken to repair those. After it was built in 1960, the first measure was the replacement of all the supports at the abutments in the year 1972. Small restorations of the road marking and surface took place in 1973, followed by a renovation of the sidewalk surface and the handrail painting two years later. In 1980, a complete renewal of the anticorrosive painting was carried out. Further measures were the maintenance and strengthening of the road joints in 1997 and 2012.

Considering its age of almost 40 years, a new anticorrosive painting is necessary soon. A personal inspection of the bridge in June 2019 showed a poor condition of the sidewalk surface, which Figure 7 illustrates. In the picture the road surface seems to be in a good state but exhibits huge lane grooves and ground waves that can not be recognized in this perspective. In addition, some loose connections in the handrail make a lot of noise as soon as the bridge is under traffic and starts to vibrate. These features give the impression of a poor and unsafe construction and represent just a few of various deficits that draw attention while walking over the bridge. However, they hardly influence the structural safety.

Figure 7: Sidewalk Condition of the Europe Bridge (28.06.2019)

The examination of the condition of the load bearing system is the main focus of this work. It is of much greater importance because it governs the structural safety and is not covered by the mere listing of defects and deficits.

3. CRACKS IN THE SUPERSTRUCTURE OF STEEL BRIDGES

3.1 INTRODUCTION

In recent years the bridge building community in Germany experienced a noticeable change regarding its area of responsibility. After the Second World War most of Germany's infrastructure was destroyed. The subsequent economic growth demanded comprehensive and efficient transport routes. As a result, the time was characterized by intensive construction activity not only in the infrastructure sector. That is why today's bridges in the old western states of Germany mostly date back to the years 1960 – 1985 [L9]. In the course of the reunification Germany became not only a north-south transfer country, but also an east-west transfer and transit country [L8]. This triggered the realization of many new constructions and the extension of old ones so that a large part of the building stock in the new eastern states is from the years 1990-2000 [L9].

Figure 8: Bridge Stock in Germany Since the Year 1970 [L13]

Since the beginning of the 21st century the focus is shifting away from the construction of new bridges. As many existing bridges show significant signs of deterioration and damages, the maintenance and reinforcement of old constructions gains more and more importance [L11]. As one can see in Figure 8, the growth in the total number of bridges slowed down after the year 2000.

This new focus on renovating and strengthening old constructions was initiated by the development of a “Strategy for Strengthening the Road Bridge Stock on the Federal Trunk Roads” by the ministry of transportation in 2013. This led to a “Bridge Modernization Programme” that provided substantial financial resources to address the continuing aging process of bridges along federal roads. Since the introduction of this program around 500 bridges have already been strengthened to match future

traffic loads and over 1000 are currently in the process of examination or modernization (as of 2017). In Figure 9, it can be observed that after 2004 the number of bridges rated as insufficient or deficient slowly decreased [L9].

3.2 THE ROLE OF STEEL BRIDGES

The 40000 structures being in the public easement of the government (compare Figure 8) provide 30.5 million m² of road surface and combine to a fixed capital of more than 60 billion euros [9]. Due to the topography most of them are small to medium bridges whereas large bridges are an exception. This is also reflected in the distribution of

Figure 9: Condition of Road Bridge Stock [L11]

Figure 10: Bridge Surface in Germany by Construction Type [L13]

construction types, illustrated in Figure 10. Even though steel bridges represent a small amount in comparison to the total number of constructions, they are met more frequently among large-scale constructions due to their low self-weight [L10]. Around 80% of them were build between 1960 and 1980 when the traffic situation was entirely different and construction standards were

not nearly as strict as they are today. The result is that, although they were designed to last a hundred years, recently some of these constructions exhibited more and more damages. In some cases, these problems were so severe that they could only be faced with demolition and reconstruction [L8].

3.3 REASONS FOR ACCELERATING DETERIORATION

The deficits discovered in the superstructure of those steel bridges are neither due to bad engineering nor are they summarized by the two points above. They are the result of multiple circumstances that could not have possibly been foreseen.

At first the transformation of the traffic conditions is one of the major problems. Today many bridges endure several times the loads they were designed for. Not only the increase in traffic volume in general is responsible for that. The disproportionately high growth of heavy vehicle traffic combined with the continuous permission of higher axle loads leads to immense fatigue loads. To show the degree of this change, the two graphs on the right illustrate the development of the traffic since 1950. While the axle loads nearly doubled since the fifties, the traffic performance grew by a factor of around 40 in the same period. An increase that was not predictable and uneconomic to plan for [L11].

Figure 11: Traffic Performance in Billion tkm. [L11]

Figure 12: Permitted Axle Loads [L11]

The next reason is strongly connected to the previous one and originates from the calculation standards for the fatigue evaluation. Compared to today there were fewer and lighter trucks on the roads. Therefore, a mathematical fatigue check was not required, as it was covered simply by meeting the criteria for the load bearing capacity. As a result, a fatigue proof construction was neither considered during the design phase nor the construction phase

Furthermore, the increase in vehicles on the road made it necessary to open additional lanes. As the capacity of the bridges was reached and they could no longer enable a smooth traffic flow, the emergency lanes were opened, resulting in higher general loads and load positions not accounted for [L11].

Another cause might be the assembly of noise protection walls or other parts of the bridge equipment years after the construction when it suddenly became necessary by changes in the regulations. This not only imposed additional dead load but, in case of a noise protection wall, also live load as it increased the contact surface with the wind [L11].

Finally, other circumstances like poor welding execution, sparing material usage or the usage of road bridges for rail traffic can play a role in particular cases.

3.4 TYPES OF CRACKS

As it was stated before, the design of fatigue proof details and systems was no issue during the days of construction 50 years ago. Paired with the immense growth in fatigue loads caused by rising traffic volume and increasing axle loads and numbers, a massive fatigue problem of road bridges is the inevitable result. Therefore, most of the cracks found in steel superstructures can be traced back to this problem. Nonetheless, fatigue cracks do not necessarily mean that the load-bearing capacity is exceeded, or the structure is in danger of collapsing. In many cases redundancy is available, and loads can relocate themselves. The problem of overloading however threatens the structural safety at least just as much as fatigue damage. As the recalculation concentrated more on the latter part, the theoretical part focused on the evaluation of the cracks and tried to draw conclusions regarding the Europe Bridge.

According to Ungermann damages in the superstructure of steel bridges are categorized in four different types depending on their location in the superstructure and their influence on the component or the entire construction.

Category-1 damages appear in the orthotropic plate and the welded joint between longitudinal stiffener and cover plate. They can impact the serviceability as the asphalt above deteriorates faster. Still, redundancy is available, and a relocation of the loads is possible [L8].

Category-2 damages emerge in the longitudinal stiffeners and their connection to the cross girder. In this case a limited amount of redundancy exists as well [L8].

Cracks of the third category mostly appear between cross girder and vertical stiffener of the main girder web but can form in the whole transverse system. These types of cracks are more severe as very little redundancy remains and the cracks can lead to a failure of the component and a local loss of load bearing capacity [L8].

Category-4 cracks are the most concerning ones. They surface in parts of the main load carrying system like the main girder or the anchors of ropes of cable-stayed bridges. No relocation of loads is possible, and failure leads to global loss of load carrying ability or collapse [L8].

Figure 13 shows an exemplary section of a bridges bearing structure and illustrates the location of the damages for each category.

Figure 13: Categorization of Cracks in the Superstructure of Steel Bridges [L10]

Subsequent to the discovery of the cracks and their categorization, the Federal Road Research Institute initiated research projects to investigate category 1, 2 and 3 damages. Existing damages were collected, recorded and analysed to find the causes. In addition, renovation techniques were evaluated and recommended procedures to face these damages were developed. The results for each category are presented in the next chapter.

However, this fatigue problem is not restricted to Germany alone as the previous paragraphs indicate. All around the world, steel superstructures exhibit similar deficits. In China for example the Junshan Bridge in Wuhan showed extensive cracking in the connections of the longitudinal stiffeners to the deck plate and to the cross girder. These category 1 and 2 damages, as they would be categorized in Germany, were found to be caused by immense heavy vehicle traffic resulting in high fatigue loads and by inadequate welding quality [L7].

Another example are the Netherlands, where fatigue damages were discovered at the end of the 1990s and have been the object of many studies since. The circumstances are nearly identical to the ones in Germany. Most of the bridges were build from 1960 – 1980 and traffic increase was also assumed to be a major issue. The cracks are classified in four types as well. Cracks in the deck plate (1), in the weld under the deck plate (2), in the splicing of the longitudinal stiffeners (3) and in the connection of stiffeners to the crossbeam (4). It can be observed that these four categories only cover the first two of the German system which suggests that they do not have problems with cracks in the crossbeam or the main load-bearing system. As only the weight of trucks induces the fatigue phenomena, the heavy traffic flow was analysed with the result that the number of heavy vehicles was significantly higher than the one proposed in the Eurocode and that it increased by four to five percent every year [L12].

3.4.1 Category 1 Cracks

3.4.1.1 Mechanical Background

Cracks that form in the weld seam between orthotropic deck and longitudinal stiffener are called category-1 cracks. Compared to the weight that is imposed, the steel deck with around 10mm is a relatively thin element. In the heavy vehicle lane, the wheels of trucks impose high local loads and cause deformations of the deck. As the welded connection to the stiffeners is rigid, the deflections cause a clamping moment with high local stresses every time a truck is passing. These

stress-cycles occur thousands of times a day, eventually causing a fatigue crack to develop [L12]. Lacking knowledge about these constructions in the past and rising traffic loads favored the formation of these cracks, as more and more bridges exhibited this type of damage in the past years. The possible switch from twin tires to super single tires and the connected rise in local stresses could cause an additional problem for existing structures in the future [L5].

3.4.1.2 Visual Observation and Influence on the Structural Safety

Figure 14: Location and Types of Category-1 Cracks [L5]

The described cracks initiate at the root of the weld seam below the heavy vehicle lane and can either grow through the weld seam or upwards through the deck plate as Figure 14 illustrates. The problem is that the cracks 1a and 1c are not visible until they have reached the top of the deck or have grown through the fillet weld. Even when they have expanded through the deck, they are often covered by asphalt. Only when the road surface starts to break and potholes begin to form, the damage in the steel deck becomes visible. Cracks in the asphalt alone are no general indication for fractures in the orthotropic plate. Therefore, damages in the asphalt layer are difficult to interpret as the deterioration is governed by many factors like the thickness, age and stiffness of the road surface, the thickness of the steel plate or the existence of the described cracks [L12]. This however is no deficit that threatens the structural safety of the bridge as the orthotropic plate just passes the loads on to the stiffeners and cross girders. That means, enough redundancy for load transfer is available. The limitations on the serviceability are more severe. Once the asphalt breaks, the deterioration of the road surface accelerates, facilitating the development of holes. This imposes additional vibration and stress on the already damaged

components. The results can be damages on the vehicles and additional noise what might be problematic in populated areas.

3.4.1.3 Renovation Techniques

Apart from the necessity to understand the phenomenon to build fatigue proof details in the future, measures were needed to repair the existing components. In the last years many renovation techniques have been developed and tested. The fatigue life of a connection is mainly determined by two factors. On the one hand the construction of the detail and the execution of the fillet weld. On the other hand, the stress range it is subjected to. As the detail is already designed, the remaining option is to reduce the stress range. Therefore, a renovation method is not only supposed to repair the crack but also strengthen the construction to reduce the stresses and improve the fatigue behaviour. In the following, the focus is laid on the strengthening measures from which the most promising ones will be described.

A fatigue evaluation from Australia in 2007 examined the influence of different factors on the stresses in rib-to-deck joints. Considered factors were the thickness of the wearing surface (1), thickness of the rib wall (2), thickness of the deck plate (3), type of truck wheel (4) and the size of the stiffener (5) as illustrated in Table 1. Whereas (2) had little influence on the stress range, (1), (3) and (4) offered promising results. In this example the introduction of a 70mm wearing surface reduced the stresses to 67% just by distributing the load on a bigger area. Single wheels on the same wearing surface increased the original value by 10 - 20% having the opposite effect with the same weight on a smaller area. Raising the thickness of the deck plate also significantly lowered the stresses as it reduced the deflection of the plate and therefore the bending moments in the

Location of stress investigation		Stress range (MPa)					
		Basic model	Without surfacing	6 mm Rib	14 mm Deck	Single wheel	Large rib
Section A (Bottom face)	$X = 0$	91.0	134.0(1.47)	85.6(0.94)	63.2(0.69)	108.8(1.20)	59.9(0.66)
	$X = L/8$	104.8	158.7(1.51)	106.4(1.02)	76.6(0.73)	122.2(1.17)	78.1(0.74)
	$X = L/4$	103.6	156.3(1.51)	104.9(1.01)	75.2(0.73)	118.1(1.14)	76.6(0.74)
	$X = 3L/8$	101.6	153.5(1.51)	102.0(1.00)	73.2(0.72)	114.3(1.13)	73.8(0.73)
	$X = L/2$	99.8	151.5(1.52)	99.4(1.00)	71.4(0.72)	111.4(1.12)	72.7(0.73)
Section B (Bottom face)	$X = L/8$	118.3	181.4(1.53)	119.3(1.01)	87.0(0.74)	141.1(1.19)	85.8(0.73)
	$X = L/4$	117.5	180.1(1.53)	118.0(1.00)	85.9(0.73)	138.9(1.18)	84.9(0.72)
	$X = 3L/8$	115.2	177.3(1.54)	115.4(1.00)	83.9(0.73)	135.4(1.18)	82.1(0.71)
	$X = L/2$	113.0	174.5(1.54)	112.8(1.00)	81.8(0.72)	131.8(1.17)	81.2(0.72)

Note: Numbers in parentheses are ratios of stress range to the basic model.

Table 1: Stress Range of Rib-to-Deck Joint for Different Parameters [L15]

fillet weld. The promising results of large-sized ribs (5) should be handled with care. Whereas all other factors were examined individually, in this experiment the deck thickness and rib size were increased compared to the basic model. This makes it difficult to determine the influence of the ribs [L15].

An investigation on renovation techniques in the Netherlands from 2006 considered 13 possible methods from which three were assessed in further research. These three were high performance concrete instead of asphalt, bonding a second steel deck plate and filling the longitudinal stiffeners. As the cracks need to be repaired before applying one of those methods, submerged arc welding was suggested as it has a high speed of execution, can be done only from top of the deck plate and has little welding shrinkage. With a penetration depth of 65 - 75%, the repaired cracks had a just slightly lower detail classification compared to the uncracked situation as tests showed. Considering the three proposed methods, reinforced high performance concrete (RHPC) showed the best results. It reduced the stresses by 15 - 30% and thus extends the lifetime. Combined with an epoxy interface layer between steel and the RHPC the composite action was ensured. Additional filling of the stiffeners did not provide extra stress reduction. In general, this method proved unreliable and was therefore not recommended. Bonding additional steel plates with an adhesive layer is basically the same approach as increasing the thickness of the steel deck. Like in the previous paragraph it greatly reduced the stresses. However, delamination occurred in the adhesive layer during the fatigue test. To solve this problem the vacuum infusion technique who promised better fatigue behaviour was introduced. This method still needs to be tested further before it is possible to recommend it unrestrictedly. If these tests prove the efficiency of the introduced technique, it presents an equivalent alternative to RHCP [L14].

One of the more recent reports on strengthening methods for deck plates is from the Federal Road Research Institute in Germany. This paper primarily focused on the examination of the application of hollow spaced asphalt which was filled with epoxy- or bio-resin subsequently to reach a better stress distribution. Before that, the state of the art on renovation techniques for category-1 cracks was presented. As this document is from 2017, some of the methods described in the paragraphs before were also mentioned and it might be interesting to see their development in the last 10 years.

The first method used prefabricated sandwich-plate-systems as shown in Figure 15. Two steel plates surround an airtight void into which a polyurethane-elastomer-core is injected to connect the plates in a force fitting manner, forming a composite construction. Originally, this method was

Figure 15: Sandwich-Plate-System [L5]

developed for ships and served successfully on truck decks of ferries. In a pilot project from 2007 it was used as strengthening method for an orthotropic deck reducing the local stresses by up to 50%. After 10 years of service no damages have been detected, proving the durability and effectiveness of this technique. Yet, during the implementation several disadvantages showed. The installation is susceptible to humidity and requires constructional measures at the curbs and the roadway transition making it a costly technique. In addition, the panels impose an additional dead load of 100kg/m². Since then this alternative has been applied three other times while further research has been carried out to enhance the fatigue strength. In course of the research, the application has been optimised also with focus on the use in new bridges [L5].

Another technique was the use of RHCP instead of asphalt. This concept has been developed in the Netherlands and has already been described before, so there is no need to further evaluate its effectiveness. Nevertheless, issues occurred during the application that should be mentioned. Initial problems with the evenness of the road surface have already been solved and consistent grip could be provided by roughening the concrete surface and introducing the deck pavement subsequently. Like the SPS, humidity during the assembly is problematic, and the whole working area needs to be encased. All in all, this method is very effective in reducing the stresses in the deck plate but also requires high workmanship and considerable financial resources [L5].

An innovative idea that was suggested recently is, to use precast elements with ultra-high-performance concrete (UHCP) instead of cast-in-place concrete, to provide ideal quality and avoid problems with the workability on site. The elements are delivered to the site, where they are simply glued to the steel deck. To prevent an increase in the thickness of the road surface, the precast plates are fabricated with a minimal thickness of 30mm. This enables the application of a

mastic asphalt layer on top of the plates as they were not designed to be drivable. Being a new approach, the research is still in its beginnings. Stress tests have been carried out on a small and stiff system and provided a reduction of the stress variation range by 50% for a thickness of the UHCP of 30mm, compared to a design with only a steel plate. 60mm plates even offered a reduction of 64%. Even though the results seem promising, the method still needs to prove itself in a large scaled test with actual deflections to make a final statement about its suitability for application. Moreover, fatigue tests are necessary, and it needs to be checked if unevenness of the steel plate can be compensated by the adhesive layer. If that is the case this alternative to RHCP seems like the best solution so far [L5].

Also, the bonding of additional steel plates has been described before, so the reduction of the stresses was already proven 10 years ago. Suitable materials and a practical method for introducing the adhesive layer were developed in the meantime. Fatigue test are being carried out currently. Unfortunately, the gluing process is sensitive to moisture, so the construction site needs to be encased [L5].

An interesting concept described the use of epoxy asphalt, where the bitumen in the asphalt mixture is partly replaced by epoxide resin. It was already applied in the United States and China. Compared to normal asphalt, the properties are superior regarding deflection-resistance, fatigue-resistance and adhesion. The behaviour under low temperatures is also sufficient whereas adequate roughness is not assured and needs to be provided retrospectively. The criterion for exclusion however was that its processing posed major health risks and was therefore only possible under difficult conditions [L5].

Finally, the subsequent filling of asphalt with resin was proposed as strengthening method. Many of the alternatives named before, go along with an increased self weight of the bridge and high costs. This approach tried to modify the existing surface itself so that it is able to reduce the stresses in the steel deck. Before, it was already applied on concrete bridges as confining or protection layer. In general, this mixture is insensitive to deformations and exhibits a significantly higher stability. Nevertheless, the verification of the advantages proved to be difficult. The test to determine the Young's modulus was not suitable, so an increased stiffness could not be confirmed. Samples for static tests were very limited, manufactured in different dimensions and

the results scattered widely so no quantification was possible and only tendencies were detected. Still, the potential of this method could be seen in principal. In numerical calculations, it was found that with increasing stiffness of the surfacing, the stresses could be reduced by approximately 40%. A renouncement of the buffer layer also led to a stress reduction of 25%. To quantify the results, tests need to be performed in a large scale and further research is necessary [L5].

3.4.2 Category 2 Cracks

3.4.2.1 Mechanical Background

The second category summarizes all damages that occur in the longitudinal stiffeners under the steel deck and their connection to the crossbeam web. These stiffeners are mainly executed in trapezoidal, U- or Y-shape and can be continuous or fitted between the crossbeam webs. From Figure 16 it can be derived that the cracks are further divided into three categories depending on their location. Category 2a damages occur at the splicing of the stiffeners in the field between the crossbeams. Cracks of the category 2b are the ones most frequently observed, which appear at the weld between the crossbeam and the stiffener if it is not continuous. Finally, category 2c contains all damages at the cope holes of continuous troughs [L4].

Figure 16: Location of Possible Category-2 Cracks [L4]

The Y-profiles require increased welding effort and therefore are vulnerable to fatigue damages. Another problem results from the splicing of the stiffeners at the crossbeam webs. Tolerances and inaccuracies lead to an offset, inducing additional stresses. As the geometry of these connections between deck plate, cross beam and stiffeners is complicated, the path of the forces and corresponding stresses is difficult to determine. In general, cracks can be traced back to the rising fatigue loads by the traffic and to poor welding quality. The geometry, causing multiaxial

stress conditions also promotes the formation of cracks. Troughs fitted between, and welded to the crossbeam webs, proved to be more prone to fatigue damages than continuous stiffeners, as welded connections in general were identified to be problematic due to the inferior execution during construction. In many bridges that exhibited category 2 damages, impressed stresses due to welding shrinkage superposed with the stresses from daily traffic were found to be the reasons for crack formation and propagation [L4].

3.4.2.2 Visual Observation and Influence on the Structural Safety

On the right side a crack between the stiffener and the crossbeam web is depicted which has grown relatively large already. In Figure 18 a category 2a crack is clearly visible. Both have reached a state in which they can be easily detected. To recognize cracks in an early state, it helps to paint the surface of the connections and welding lines white. This way even fine cracks can be seen and monitored [L12].

These types of damages have not the same amount of redundancy as category 1 cracks, but still do not compromise the overall load bearing capacity of the bridge. The presence of a small crack does not have severe impacts and even if one stiffener fails, the loads are transferred to the adjacent ones and the steel deck has to carry more load. However, this results in higher stresses in the surrounding elements increasing their likeliness to crack eventually. Therefore, the propagation process should be monitored to prevent the failure of one element and excessive expansion of cracks into adjacent parts like the crossbeam web or the deck plate [L4] [L16].

Figure 17: Category 2 Crack [L16]

Figure 18: Crack at Splicing of the Stiffeners [L12]

3.4.2.3 Renovation Techniques

At a bridge over the Rhein-Herne-Kanal cracks were rehabilitated by grouting out and rewelding the connection. Unfortunately, this method was not very effective, as cracks appeared at the repaired details just three years later. The next measure consisted of the removal of the strap and the stiffener near the crossbeam web with the subsequent introduction of new profiles illustrated in Figure 19. Along with the enlargement of the cope hole this technique showed better outcome as no further cracks have been observed. Yet this approach required elaborated measurements and experiments prior to the execution under traffic [L4].

A further example is the Hasentalbrücke where a combination of welding and screwing was used. This solution however did not provide the desired outcome as it showed new cracks shortly after the renovation [L4].

For the Rhine Bridge in Leverkusen, a new approach was tried that is depicted in Figure 20. This time no welding was used. Instead, just fitted bolts and blind rivets were deployed. Equal sided angels were connected with the crossbeam web and the stiffener using bolts at the first leg and rivets for the stiffener. In this case, the rivets allowed a connection despite the closed stiffener. No crack growth was detected after the implementation of this method [L4].

*Figure 19: Removed Cross-Section (top)
Final Condition (bottom) [L4]*

Figure 20: Renovation Measure at the Rhine Bridge in Leverkusen [L4]

In general, screwed solutions enable a better quality-control than welded ones. Furthermore, welding requires a closure of traffic lanes in some cases and often has to be performed under

difficult circumstances, like overhead. Therefore, the investigation of the Federal Road Research Institute only focused on methods that avoided welding entirely [L4].

In course of this research project 20 fatigue tests were executed on realistic test setups for different renovation techniques. Four different measures from A to D were examined, although D was nearly equal to A and is not presented here. At first, the specimens in original condition were stressed in a fatigue test until cracks appeared. Then they were repaired and tested again under similar conditions to estimate the effectiveness of the renovation method. The original setup and the repair techniques are visualized in Figure 21. Fitting bolts were used in all test series and only for fixing the angles to the closed stiffeners in test series A, blind rivets were employed. In addition, all specimens received artificial cracks to simulate consistent conditions [L4].

Figure 21: Original Test-Setups (top) Renovation Methods (bottom) [L4]

During the fatigue test on the repaired samples, cracks started to form at the artificial cracks. To evaluate the fatigue resistance, the results were recalculated to fit the fatigue strength curves in the code. Renovation method A-rep showed much better fatigue behavior than the original detail. In theory, B and B-rep were expected to exhibit cracks at around the same amount of load cycles. Nevertheless, only sample B failed whereas B-rep could have been stressed further. Method C-rep proved to be inefficient as it showed lower fatigue strength. An optimization method was proposed to improve the fatigue strength but was not tested. Finally, D-rep showed the same

results as A-rep. It should also be noted, that even though few investigations on the fatigue strength of blind rivets are available, they did not show any signs of failure [L4].

Apart from the fatigue tests, the techniques were also evaluated regarding other criteria. In contrast to welded measures, the corrosion protection can remain on the bridge and elements can be delivered to the site already protected. The installation does not require any unusual equipment. Furthermore, the working stages are unaffected by environmental conditions. Simple working steps and easy feasibility also lead to cost savings in quality management, making screwed renovation methods highly economic [L4].

3.4.3 Category 3 Cracks

3.4.3.1 Mechanical Background

The third category covers all damages that occur at the transverse system. The transverse system serves many purposes but is mainly supposed to stiffen the bridge against horizontal loads and is responsible to transfer the loads in lateral direction to the main girders. It consists of several components, depending on the system of the bridge. Like the orthotropic plate, which transfers the loads between the longitudinal stiffeners and the crossbeam while also serving as flange for the stiffeners, the crossbeam and the main girder, elements of the cross system can have multiple functions as well. The crossbeam is part of the orthotropic plate and the transverse system simultaneously and therefore is loaded directly and indirectly. For very broad bridges diagonal braces are required to support the far overhanging crossbeam and to handle horizontal live loads. Other parts are the vertical and the horizontal stiffeners in the cross-girder axes to reinforce the main girder web or the bottom plate of box girders. They are designed due to constructive considerations as their prior duty is the stiffening against buckling. However, they also introduce vertical loads into the main girder, stabilize the lower flange of the main girder and act as a frame together with the crossbeam. Finally, cross-bracings are assembled inside a box girder or between two girders. They lead to an interaction between the main girders, ensure the introduction of horizontal and eccentric loads with small deflections and prevent lateral evasion of the lower main girder flange and the vertical stiffeners in negative moment regions. This means, all components handle several tasks and participate in the load transfer in different directions simultaneously. This causes a complicated and multiaxial condition of stresses that promotes the

crack formation. In addition, redirection of forces, internal stresses, points of discontinuity and other notch effects lead to stress concentrations in connection details and cause fatigue damages [L3]. Due to the number of components, cracks can occur at many locations and are subdivided into three classes that can be seen in Table 2.

type Ia	solid web girder, frame corner, (CB to TS), no bracings
type Ib	box girder, frame corner (CB to TS or vert. to hor. TS) no bracings
type IIa	solid web girder, connection between CB and TS, including bracings
type IIb	box girder, connection between CB and TS, including bracings
type III	box girder, joints of the outer diagonal strut

Table 2: General Types of Damages in Transverse Systems [L3]

In the report of the Federal Road Research Institute, essentially four reasons were identified to be responsible for the damages.

Overloading of the bridges is the first one. Rising traffic not only increased the loads, but also made it necessary to assemble additional lanes on bridges, causing load cases that were not calculated. Moreover, the bridges built in the sixties and seventies do not provide much load reserves as lean design and high utilization of the material were the main considerations [L3].

The second reason is the discrepancy between calculation and actual construction. As fatigue design was no issue during the time of construction and the transverse system was only supposed to carry horizontal loads, members of it did not need to be verified and were designed for constructive reasons. The structural analysis also assumed a joint for the connection between main girder and crossbeam which does not represent the actual construction in most cases [L3].

Another reason is the fatigue prone design of connections. The constructions contained discontinuities which caused structural notches whereas poor execution quality led to metallurgic notches. Both notch types generate weak spots which are the source of fatigue cracks. Internal stresses are also associated to the insufficient execution [L3].

At last, great demand for steel in the sixties might have led to the assembly of material with inferior qualities [L3]. The reasons named before are linked to the appearing cracks in Table 3.

type	principal drawings	main reasons
type Ia and type Ib		<ul style="list-style-type: none"> • simplified modelling • missing member check • missing post • filled weld instead of butt-weld • structural discontinuity
type Ib		
type IIa and type IIb		<ul style="list-style-type: none"> • wrong modelling assumptions • missing member check • structural discontinuity
type III		<ul style="list-style-type: none"> • missing member check (fatigue) • structural discontinuity • internal stresses because of inappropriate order of assembling

Table 3: Critical Details and Corresponding Reasons [L3]

3.4.3.2 Visual Observation and Influence on the Structural Safety

Damages of the category 3 are visible at an early stage and can be detected easily. In contrast to the cracks of category 1 they do not initiate in closed profiles but at connections inside the box-girder, that is usually accessible. Painting vulnerable details white helps to spot and monitor them. Nevertheless, additional equipment is required to examine the bridge for damages between and outside of the girders. In most cases a bridge inspection vehicle is installed that allows to check the construction from underneath and in between the main girders. The space below the cantilevers of the crossbeams is more difficult to assess as special vehicles are necessary.

Damages in the transverse system tend to be more serious because very limited redundancy is available. Compared to the longitudinal stiffeners which represent the origin of category 2 damages and are spaced very closely, the crossbeams are arranged with an interval of 2 meters or more. In case of local failure, the loads need to be transferred to the next cross-girder, which significantly raises the stresses for other elements and increases the possibility of global failure. Furthermore, many components are attached to the main girder and cracks can progress into them.

The following pictures illustrate typical crack patterns of category 3.

Figure 22: Cracks between Main-Girder Web and Crossbeam Web [L16]

Figure 23: Crack at Outer Connection of Diagonal Braces [L16]

3.4.3.3 Renovation Techniques

The Rhine Bridges Leverkusen and Duisburg-Neuenkamp both exhibited extensive damages in the transverse system. Several renovation measures were conducted and some of them are presented in the following.

At the load input points from the diagonal braces in the box girder, cracks appeared at the inside of the box girder and were monitored. After the number of damages increased, the cracks also started to grow into the bottom plate in 2011. Immediate repair measures showed problems with the welding of new stiffeners due to the quality of the base material. An improved shape, shown on the right, and better welding material were applied successfully during a restoration in 2012 and no more cracks were found since [L16].

Figure 24: Improved Design of the Stiffeners at the Rhine Bridge Leverkusen [L16]

Another critical detail was the connection of the diagonal braces to the flange of the crossbeam illustrated in Figure 23. Both bridges showed cracks at this location that could be traced back to a sudden change in stiffness, which is a textbook example for a fatigue prone design. This inferior detail was the result of a great difference between the static concept and the final execution. Performed measures included the welded reparation of the cracks, smoothing out the plate and reducing the lane width from 3.75m to 3.25m. These steps proved to be effective, as no growth of the cracks was detected afterwards. See Figure 25 for the improved design of the detail [L16].

Figure 25: Final Design of Steel Plate [L16]

Discontinuities in the material and a geometric offset between the crossbeam webs at their connection with the main girder web, illustrated in Figure 26, caused damages at the square knot. They were identified as fatigue cracks but also showed signs of material separation and lamellar tearing. It was decided to remove the fillet welds one by one and replace them with weld metal, creating a fully welded cross joint. Previous experience with this approach was associated with subsequent damages. Therefore, fatigue tests were carried out, observing a good fatigue strength. Two years after the renovation method no anomalies were detected at the details [L16].

Figure 26: Offset between the Crossbeam Web outside and inside of the Main Girder [L16]

One thing the three methods had in common is, that they were developed for these special circumstances and are not applicable in general. To work out universal techniques and give assistance with category 3 cracks was the goal of another research project of the Federal Road Research Institute. Various examples of repair concepts were gathered, investigated and analyzed in FE-simulations. Then, advantages and disadvantages were identified to evaluate the techniques and to recommend appropriate actions to face the diverse types of damages. Six alternatives were suggested and evaluated [L3].

The first one was a lane shift of the heavy vehicle lane. Internal stresses and deflections are mainly governed by the location of the trucks. By investigating the Sinntalbrücke and the Donau Brücke in Sinzig, the best location in lateral direction was determined. Placing the center line of the first traffic lane directly above the main girder reduced the stresses substantially for the critical detail between the crossbeam flange and the vertical stiffener of the main girder web. The introduction of a no passing zone for trucks amplified this effect further. Additional weight restrictions have the same outcome but should only be considered if instant action is required and no other options are available. This method in general is to be preferred in any case as it does not require any costly

constructional effort and can be performed immediately. Unfortunately, for box girders no ideal location could be determined which is why the application is limited to individual cases that demand previous examination. [L3].

Multiple systems with open cross sections and box girders were investigated in the second alternative to quantify the influence of the spacing of transverse bracings. Measuring the stress ranges at the critical detail for the transit of a truck, it was found that they are independent from the distance between the bracings. Stiff cross sections even obstructed deflections and led to constraining forces. Therefore, additional bracings are no option to prevent category 3 damages [L3].

Option number 3 was stiffening by frames and is illustrated in Figure 27. Contrary to the previous method, transverse bracings were not used at all besides in the support axis. Vertical stiffeners and crossbeams were supposed to take over the task of stiffening the construction instead. For box girders, also horizontal stiffeners on the bottom plate are required to form a frame. This approach avoided large stiffness jumps, allowed deformations thus

Figure 27: Original Cross Section with Bracing (top) Stiffening by Frames (bottom) [L3]

reduced constraining forces and also removed critical details. The new details could be redesigned according to the current state of the art. Stress range calculations showed first positive effects only by removing the transverse stiffeners. Strengthening the frame delivered additional reduction even though it was found that each bridge has a certain point at which stronger frames do not provide any further reduction of the stresses. Combined with an improved design of the critical details, the fatigue resistance reached a desirable value that even ranged around the cut-off limit. Another advantage was the light construction. Removing the bracings provided just as much weight savings as the installation of the frames consumed. All in all, the maximum growth in dead load remained below 3%. It should still be noted that the removal of bracings always results in higher stresses and deformations. The additional stress values, however, could be limited to less than 10 % while the extra horizontal deformation proved to be

insignificant. A bigger challenge posed the aspect of lateral buckling of the bottom flange. Reduced lateral stiffness by removed lateral support points led to higher stresses as the global buckling analysis proved. Even though the increased values could be limited to 5 – 10% by strengthening the stiffeners, new corresponding member checks were necessary which can result in an overstraining of the steel structure in specific unfavorable cases. The welding distortion that occurred could be handled by using bolted connections. As a conclusion, it can be stated that option number 3 brings significant benefits that outweigh some minor issues. The assembly can be performed under traffic and the costs are low compared to a new construction [L3].

The attempt to minimize additional dead load and avoid large interferences with the original structure led to a pure strengthening approach. Alternative number 4, which can be seen on the right, had

Figure 28: Reinforcing the Critical Detail according to Option 4 [L3]

the simple goal of enhancing the damaged components so that they can withstand the actual loads. The local reinforcement, which was only tested on open cross sections, reduced the stresses by 30 – 90% according to FE-simulations. Furthermore, the dead load increased by just 1 % and additional stresses by the redistribution of internal forces stayed below 4%. However, especially in the bracing axles of slender main girders the improved fatigue behavior was not always sufficient, making further measures necessary. Still, moderate traffic restrictions during construction and low material costs led to a recommendation of this option [L3].

Renovation method 5 was based on measures that were executed at the 'Haseltalbrücke'. In this example an additional longitudinal trussed beam was used for load distribution. It decreased the stresses in the transverse system and provided the opportunity to increase the load bearing capacity of the whole bridge. This alternative was assumed to be most efficient in combination with a large main girder spacing. With this framework conditions an FE-analysis was executed for open cross sections that proved a reduction of the stress ranges by 30 – 50%. The improvement of the load bearing capacity turned out to be unsatisfactory because the introduced self-weight of the girder consumed most of the additional reserves. As the required work and time for this

alternative is massive compared to the other options, an increase in load bearing capacity is essential for an economic application. For this reason, additional longitudinal trussed beams should only be used in individual cases, where a reasonable increase in bearing capacity can be guaranteed [L3].

The final option aimed at correcting the discrepancy between static modelling and actual construction which was identified as one of the main causes of the damages. It was suggested to form a joint at the critical connection so that the construction matches the design. This was achieved by removing specific material to reduce rotational stiffness. Due to the requirement of sufficient lateral stiffness, this application is especially suited for box girders and also possible for open cross sections with close spaced bracings. Experiments on the bottom corner of the frame showed no significant changes in the stress ranges which remained harmless. For the top corner it should be noted that no perfect joint can be accomplished as a reduced cross section still transfers a bending moment that might cause fatigue cracks. A numeric analysis came to the result that future fatigue cracks were to be expected within a short time. However, experiences with this technique on the 'Ruhrtalbrücke Mintard' were positive as no damages have been detected yet. Even though the technical efficiency could not be verified numerically, the method proved itself in practice. Furthermore, no additional material is required and little restrictions to the running traffic are necessary for an application [L3].

Independent of what alternative is chosen for renovation some general aspects should be considered. These recommendations include reducing of the notch effect with a minimum fatigue class of FAT 71, examination of the existing material, test assembly of the reinforcing elements under traffic and reducing of internal stresses and welding distortion. During all these steps, only qualified companies should be involved to ensure flawless quality [L3].

3.4.4 Category 4 Cracks

These types of damages appear at the main load bearing system and can cause the whole bridge to collapse in case of local failure. Fortunately, they have only been detected in experiments and hardly on actual bridges. This also means that there are very few experiences with them. Whereas the Federal Road Research Institute conducted intensive research projects on damages of the category 1 to 3, no such project was initiated for the last category. This means that, in case of

damages at the main load bearing system, no techniques can be recommended in general and measures must be developed depending on the individual circumstances.

Exceptions are the Rhine bridges Leverkusen and Duisburg-Neuenkamp where these types of damages were discovered. To provide a little insight in this topic the performed and documented measures are described in the following. Both are cable-stayed bridges where damages occurred in the anchorage areas of the cables. The middle main girder web splits into two webs in the area indicated in Figure 29 and the cables are anchored in a cable chamber in between the webs. Cable forces are introduced into the webs by traverses and thrust plates [L17].

Figure 29: Location of the Cracks at the Rhine Bridge Leverkusen [L17]

During a special inspection a crack was detected at an outlet plate between the deck plate and the main girder web on the outside of the cable chamber (see Figure 30). The fissure in the 13mm fillet weld was circumferential, completely separating the plate from the main girder web. Moreover, the crack between the web and the deck plate was discovered to continue below the top layer revealing a length of 400mm

Figure 30: Weld Crack at the Rhine Bridge Leverkusen [L17]

instead of 90mm. An initial repair measure led to crack progress inside the cable chamber. An examination of the welds by magnetic powder showed several cracks that turned out to be a 4-meter-long hidden weld crack after grinding. Another welding measure seemed too risky, so a bolted connection was executed. Nevertheless, further cracks were found at stiffeners and the direct anchorage of the cables. They could be explained by material discontinuities and weld

shrinkage. Some of the more massive cracks were renovated during a full closure of the bridge in 2016, but as components with extreme loads and without any redundancy were affected, the engineers ultimately decided to close to bridge permanently for vehicles with more than 3,5 tons [L17].

3.5 ADAPTIVITY OF BRIDGE CONSTRUCTIONS

An interesting approach that does not deal with the renovation of old bridges but rather with the construction of new ones, suggested designing new structures as adaptable as possible. This means to already plan for strengthening measures that might become necessary in the lifespan of the structure and create ideal circumstances for a future application [L11].

The reasons, already named at the beginning of this chapter, led to a progressing deterioration of the condition of the bridge stock in Germany. An analysis of 146 concrete bridges showed that 41% of them were in need of a renovation and 29% required a replacement. As a renovation is to be preferred in most cases due to the lower costs, the idea was to provide the conditions for an economic implementation of these measures later in the lifetime of the bridge. Ideal conditions are minimal interference with the existing structure and no disruption of the traffic [L11].

Bridges are usually planned for a lifetime of 100 years. In this period of time it is very likely that the need for a strengthening action will arise. This can be due to the usual reasons, like growing traffic, heavier trucks, installation of an additional traffic lane or the increase of dead load, as it was in the past. In the future, further changes can emerge that will cause an overloading of a bridge. For example, the introduction of autonomous driving can reduce the distance between the vehicles and increase the loads. The planned use of 'Gigaliner' trucks with 8 axles and a weight of 60 tons, will also lead to higher stresses and a change in the building codes can lead to deficits as well [L11].

To determine suitable measures many relevant techniques that currently exist, were evaluated regarding their practicability for future application. The considered measures for steel bridges mainly were the ones already described before. External prestressing was the only one that was not mentioned previously. Unfortunately, only the alternatives for concrete and composite bridges were evaluated and rated based on 11 criteria. Then a procedure was described to decide

on the best technique regarding the specific conditions. Finally, a feasibility study was carried out on three different structures with four new load scenarios that simulated the conditions described before. Even though the results relate to concrete and composite bridges, an important conclusion can still be derived for steel bridges. When designing a new structure, slender design and high utilization rates should be avoided because they reduce the general capacity of the bridge and the effectiveness of subsequent strengthening measures [L11].

3.6 RELEVANCE FOR THE EUROPE BRIDGE

Reviewing the information provided above, the existing cracks at the Europe Bridge can be classified explicitly. The typical location at the connection between vertical stiffener and crossbeam flange in the upper corner of the box girder, indicate a typical fatigue crack of category 3 type 1b.

In search for the causes, the first thing one comes across is the discrepancy between the modelling and execution of the detail shown in Figure 31. In the static calculations a joint was presumed for this connection which obviously contradicts the final design. The rigid connection does transfer significant bending moments and is therefore susceptible for fatigue damages. Overloading due to traffic increase and poor welding execution might have also promoted the formation of the cracks.

Even though there are several renovation methods proposed by the report from the Federal Road Research Institute, it is too early to decide on one of them as the bridge is likely to exhibit other deficits that require strengthening measures. At first, the effect of the cracks on the load bearing capacity needs to be evaluated to justify further action. In addition, all necessary renovation techniques should be determined previously. The redistribution of loads caused by one measure can conflict with another, so the best course of action should be chosen including all deficits. Moreover, the result of the recalculation can also be a complete reconstruction which makes any maintenance action pointless

4. DEVELOPMENT OF A COMPUTER MODEL FOR THE LONGITUDINAL SYSTEM

4.1 INTRODUCTION

In the second part of this thesis the main load bearing system of the Europe Bridge was analyzed in longitudinal direction. The primary aspect that needs to be evaluated is the general condition of the bridge regarding its structural safety. As it was built in 1960, it is a prime example for the type of bridge, that is likely to exhibit significant deficits due to rising axle loads, increasing traffic, poor fatigue construction or other reasons already described in Chapter 3.3. The components that were modelled and evaluated are the ones that are responsible for the load distribution in longitudinal direction. The cross girder was only modelled partly but was neglected during the structural analysis.

Finally, the results were analyzed and interpreted to get an overview over the current condition of the bridge. Subsequently, possible steps to improve the structural safety of the main load bearing system were described and evaluated with reference to an application at the Europe Bridge.

According to the literature research, the cracks in the connection between the vertical stiffeners of the box girder web and the crossbeam flanges, that were described previously, are not expected to have their origin in the longitudinal system. They were identified to be category three cracks and will consequently be examined later in the lateral system as their impact on the structural safety is still uncertain.

4.2 PRELIMINARY REMARKS

4.2.1 General Information

Modelling and calculation were conducted with the program SOFiSTiK 2018 with a student license. This license provides the full functional range of applications. In this thesis only the text editor “Teddy” was used. All plans and drawings that were available to recreate the Europe Bridge were inventory documents from 1959 used for the construction. They were digitalized and provided by the engineering company “Ingenieurgruppe Bauen”.

4.2.2 System

The objective of this step is to evaluate the structural safety and load bearing capacity of the bridge's superstructure. This means only components of the main load bearing systems were reproduced in the model. They include the box girder, the orthotropic plate, the sidewalk, and the longitudinal stiffeners. The cross-girder is the only part of the lateral system that was reproduced. It provides lateral stabilization for the model, distributes the loads in transverse direction and therefore ensures an interaction between the two box girders. The abutments, pillars and foundations were neither part of the model nor were they considered during the structural analysis.

The longitudinal system was modelled as beam model with one beam for each box girder and the corresponding cross section for each beam.

4.2.3 Materials

As the abutments, pillars and foundations were not part of the model, the only material in use was steel. According to the inventory documents two different steel grades were assembled. One was steel with the quality St37 and the other is St52. The "Guideline for the Recalculation of Existing Road Bridges" proposes values for the material properties of construction steel used in the past that were applied here. Table 4 defines the properties of St37 and St52. For a thickness lower than 30mm these values accord with the properties of today's steel S235 and S355.

1	2	3	4	5	6
Stahlgüte	Materialdicke max. t	Streckgrenze f_{yk}	Zugfestigkeit f_{uk}	Elastizitätsmodul E	Schubmodul G
	mm	N/mm ²	N/mm ²	N/mm ²	N/mm ²
Schweißeisen und Flusseisen vor 1900		220	320	200.000	77.000
Flusseisen nach 1900 und Flusstahl		235	335	210.000	81.000
Baustahl St 37	$t \leq 30$	235	340	210.000	81.000
Flusstahl St 37	$30 < t \leq 60$	215			
Baustahl St 48	$t \leq 30$	312	480		
Baustahl St 52	$t \leq 30$	355	490		
	$30 < t \leq 60$	335			
Baustahl St 37 ab DIN 17100 (1980)	$t \leq 40$	240	360		
	$40 < t \leq 80$	215			
Baustahl St 52 ab DIN 17100 (1980)	$t \leq 40$	355	510		
	$40 < t \leq 80$	335	470		

Table 4: Mechanical Strength Properties of Former Steel Products [S3]

4.2.4 Construction Process

The superstructure consists of two box girders that are connected through an orthotropic plate. Each girder is composed of 19 prefabricated sections that were put together on site. As the number of sections is uneven and the bridge is symmetrical in longitudinal direction, the first span includes the sections 1 – 9 and the half of section 10. The second span includes the other half of section 10 plus section 11 – 19. The same applies to the second girder.

In the first construction phases, section 1 to 11 were assembled on the access ramp at the abutment Kehl and shipped to the pillar in the middle of the Rhine as Figure 32 shows. After both girders were located on the pillar, the rest of the sections were installed by a derrick crane in cantilevered construction with temporal supports at section 13 and 16. Subsequent to the completion of section 19, the superstructure rested on all permanent supports, allowing the temporal supports to be removed. The welding of the orthotropic plate was carried out in two steps. At first the box girders were lifted by 1.63 meters and the plate was connected in the sections 7 – 13. Then the girders were lowered by 2.03 meters and the remaining parts of the orthotropic deck were welded to the superstructure. Finally, the box girders were lifted by 0.4 meters into their final location and the sidewalks were assembled with the aid of a truck mounted crane. Some of these steps are illustrated in the following images.

Figure 32: Shipping of the Box Girder to the Pillar [19]

Figure 33: Shipping of the Second Box Girder [19]

Figure 34: Installation of Section 12-19 with a Derrick Crane [19]

Figure 35: Welding of the Orthotropic Plate [I9]

Figure 36: Installation of the Sidewalk [I9]

4.3 MODELLING IN SOFISTIK

4.3.1 Explanation of the System

The longitudinal system was assembled as beam model. Each box girder was depicted by a beam with a cross-section that includes the orthotropic plate and the sidewalk. The beams run in longitudinal direction from the abutment Kehl to the abutment Strasbourg and are composed of many small members. These members are 2.56 meters long and lay in between the cross-girder axles. Two 2D cross sections were assigned to each small member describing its geometry at the beginning and end. By connecting the cross sections, a 3D model of the member was generated. This procedure was executed for every member of both superior beams to form the whole bridge.

Short vertical beams under the bridge with movement restrictions in certain directions represent the supports at the pillar and at the abutments.

Finally, a cross girder was inserted between the two beams to connect them in each axle. As stated before, it was only included to provide lateral safety and stability of the cross section. No actual structural analysis was conducted for the components of the cross girders.

To understand the construction of the model with SOFiSTiK, the complete input is provided in Appendix F.

4.3.2 Cross Section

Before any beam can be modelled, the cross-sections need to be defined. The cross section for one girder is composed of 71 steel sheets with the material S355. For each steel sheet a number, geometry and material were defined. Figure 37 shows an extract from the SOFiSTiK input that defines the orthotropic plate between the box girders with its longitudinal stiffeners. The starting and end points were defined with a Y-coordinate for the transverse direction and a Z-coordinate for the vertical direction. The X-coordinate in longitudinal direction was not necessary in the definition of the cross sections. Number 50-60 are the sheets of the orthotropic plate between the stiffeners and 70-79 are the stiffeners in longitudinal direction below the deck. The orthotropic plate cannot be modelled in one piece as SOFiSTiK can only connect the plates at their initial point or endpoint. Therefore, the orthotropic plate was divided into 11 pieces to connect the vertical stiffeners. The same approach was selected to model the box girder and the sidewalk.


```

$Cross section of orthotropic plate between the box girders
BA 23

$Orthotropic plate
BLEC 50 YA -3000+#y [mm] ZA -45.00 [mm] YE -3310+#y [mm] ZE -49.65 [mm] D 12 [mm] mnr 7
BLEC 51 YA -3310+#y [mm] ZA -49.65 [mm] YE -3600+#y [mm] ZE -54.00 [mm] D 12 [mm] mnr 7
BLEC 52 YA -3600+#y [mm] ZA -54.00 [mm] YE -3890+#y [mm] ZE -58.35 [mm] D 12 [mm] mnr 7
BLEC 53 YA -3890+#y [mm] ZA -58.35 [mm] YE -4180+#y [mm] ZE -62.70 [mm] D 12 [mm] mnr 7
BLEC 54 YA -4180+#y [mm] ZA -62.70 [mm] YE -4470+#y [mm] ZE -67.05 [mm] D 12 [mm] mnr 7
BLEC 55 YA -4470+#y [mm] ZA -67.05 [mm] YE -4760+#y [mm] ZE -71.40 [mm] D 12 [mm] mnr 7
BLEC 56 YA -4760+#y [mm] ZA -71.40 [mm] YE -5050+#y [mm] ZE -75.75 [mm] D 12 [mm] mnr 7
BLEC 57 YA -5050+#y [mm] ZA -75.75 [mm] YE -5340+#y [mm] ZE -80.10 [mm] D 12 [mm] mnr 7
BLEC 58 YA -5340+#y [mm] ZA -80.10 [mm] YE -5630+#y [mm] ZE -84.45 [mm] D 12 [mm] mnr 7
BLEC 59 YA -5630+#y [mm] ZA -84.45 [mm] YE -5920+#y [mm] ZE -88.80 [mm] D 12 [mm] mnr 7
BLEC 60 YA -5920+#y [mm] ZA -88.80 [mm] YE -6075+#y [mm] ZE -91.125 [mm] D 12 [mm] mnr 7

$Longitudinal stiffeners of the orthotropic plate
BLEC 70 YA -3310+#y [mm] ZA -49.65 [mm] YE -3310+#y [mm] ZE -49.65+#hmst [mm] D 12 [mm] mnr 8
BLEC 71 YA -3600+#y [mm] ZA -54.00 [mm] YE -3600+#y [mm] ZE -54.00+#hmst [mm] D 12 [mm] mnr 8
BLEC 72 YA -3890+#y [mm] ZA -58.35 [mm] YE -3890+#y [mm] ZE -58.35+#hmst [mm] D 12 [mm] mnr 8
BLEC 73 YA -4180+#y [mm] ZA -62.70 [mm] YE -4180+#y [mm] ZE -62.70+#hmst [mm] D 12 [mm] mnr 8
BLEC 74 YA -4470+#y [mm] ZA -67.05 [mm] YE -4470+#y [mm] ZE -67.05+#hmst [mm] D 12 [mm] mnr 8
BLEC 75 YA -4760+#y [mm] ZA -71.40 [mm] YE -4760+#y [mm] ZE -71.40+#hmst [mm] D 12 [mm] mnr 8
BLEC 76 YA -5050+#y [mm] ZA -75.75 [mm] YE -5050+#y [mm] ZE -75.75+#hmst [mm] D 12 [mm] mnr 8
BLEC 77 YA -5340+#y [mm] ZA -80.10 [mm] YE -5340+#y [mm] ZE -80.10+#hmst [mm] D 12 [mm] mnr 8
BLEC 78 YA -5630+#y [mm] ZA -84.45 [mm] YE -5630+#y [mm] ZE -84.45+#hmst [mm] D 12 [mm] mnr 8
BLEC 79 YA -5920+#y [mm] ZA -88.80 [mm] YE -5920+#y [mm] ZE -88.80+#hmst [mm] D 12 [mm] mnr 8

```

Figure 37: SOFiSTiK Input to Model Orthotropic Plate [P1]

As it was already stated in the description of the construction process, the box girder, the orthotropic plate and the sidewalk were assembled in different steps. For this reason, these three parts were assigned different phases in the construction process. The box girder was already present in the first phase (BA10). Then the plate between the box girders was installed in section 7-13 which relates to BA21. Figure 37 shows the definition of the same part but in section 1-6 or 14-19. At the top it can be seen that BA23 was assigned to that part. Finally, the sidewalks were added in BA 30. Figure 38 illustrates the different construction phases for the girder downstream. The same applied for the upstream girder only mirror inverted. Therefore, the second girder is not pictured here as well.

Figure 38: Assembly of the Cross Section in Different Construction Phases [P1]

The roadway also has a transverse gradient of 1.5 %. That is why the Z-coordinates in Figure 37 are odd-numbered. Normally, this gradient can be neglected, but as the bottom plate of the box girder is horizontal, the gradient leads to different heights of the box girder webs which can be important in the structural analysis. The longitudinal slope in contrast was not considered as it has no impact on any dimensions of the cross-section.

4.3.3 Variables and Effective Width

Even though the bridge has a straight alignment and the width does not change, the cross section still varies significantly over the length of the bridge. This made it necessary to define variables that described the changing cross section. In Figure 36 for example it can be seen that the superstructures height increases towards the middle of the bridge. Other variables, that were required to model the bridge, are illustrated in the excerpt in Figure 39 below.

```

!!Label Definition of variables

$Variables Cross-section
let#h      2517[mm] $ Height of the cross-section
let#hlst   250[mm] $ Height longitudinal stiffeners in box girder
let#hmst   250[mm] $ Height longitudinal stiffeners below orthotropic plate
let#tbst   0[mm]  $ horizontal part of the stiffeners on the bottom plate of the girder

$Variables effective width
let#m1     0.00 $ Effective width sidewalk
let#m2     0.00 $ Effective width in the middle of the deckplate in box girder
let#m3     0.00 $ Effective width in the middle of orthotropic plate
let#m4     0.00 $ Effective width bottom plate of box girder

$Variables bottom plate_
let#bo1    10[mm] $ Thickness bottom plate between outside box girder web and stiffener 1
let#bo2    10[mm] $ Thickness bottom plate between stiffener 1 and 2
let#bo3    10[mm] $ Thickness bottom plate between stiffener 2 and 3
let#bo4    10[mm] $ Thickness bottom plate between stiffener 3 and 4
let#bo5    10[mm] $ Thickness bottom plate between stiffener 4 and 5
let#bo6    10[mm] $ Thickness bottom plate between stiffener 5 and inside box girder web

```

Figure 39: Existing Variables for the Cross-Section Definition [P1]

Unfortunately, the longitudinal stiffeners inside and between the box girders differ slightly so two variables were necessary to define them. The stiffeners on the bottom plate have a constant height and thickness but they obtain an additional horizontal part in the sections 8 to 12 which was taken into account with the variable #tbst. The bottom plate itself changes its thickness many times and furthermore has various reinforcing plates welded to it between two longitudinal stiffeners. For this reason, the thickness was defined individually for each plate with the variables #bo1 - #bo6. Figure 40 pictures the reinforcing plates and the change of the general thickness of

the bottom plate between section 8 and 9. The other plates that are not outlined in red, are just fill-in plates to provide a plane connection between the sections.

Figure 40: Top View on Bottom Plate with Reinforcing Plates and Thickness Change [I23]

To generate a realistic model of the bridge, the value for each variable named above had to be determined for every cross section of both girders. This was done with the help of the inventory documents [I17] – [I26]. All the collected values were documented in an excel-sheet. To allow an overview over how the cross-section changes in the course of the bridge, the following images are provided to illustrate the behaviour of some variables. From the variables of the bottom plate only two of six are selected representatively because all six have a similar course. The excel-sheet with all variables can be viewed in Appendix A.

Figure 41: Height of the Box Girder Web [P2]

Figure 42: Height of Longitudinal Stiffeners in Box Girder [P2]

Figure 43: Height of Longitudinal Stiffeners below Orthotropic Plate [P2]

Figure 44: Thickness of Bottom Plate at the Outside [P2]

Figure 45: Thickness of Bottom Plate between Stiffener 1 & 2 [P2]

For broad flanges the fibers furthest away from the webs evade full participation in the load transfer. This was simulated by reducing the available geometric width to an effective width. However, it was easier subtracting the parts outside of the effective width as shown in Figure 46. As each half of the bottom and deck plate was viewed separately, the variables #m2 and #m3 were subtracted in both directions from the middle. Because the areas outside of the effective width include stiffeners their z range was chosen so that they were excluded as well.

Figure 46: Parts outside of the Effective Width [P1]

The formulas provided by the code are shown in Table 5 and Figure 47 which are extracts from [S2]. The β value from the table was required to calculate the effective width as $b_{\text{eff}} = \beta * b_0$. b_0 is the existing width, or half the width between the box-girder webs in case of #m2 and #m3.

κ	Nachweisort	β -Wert
$\kappa \leq 0,02$		$\beta = 1,0$
$0,02 < \kappa \leq 0,70$	Feldmoment	$\beta = \beta_1 = \frac{1}{1 + 6,4 \kappa^2}$
	Stützmoment	$\beta = \beta_2 = \frac{1}{1 + 6,0 \left(\kappa - \frac{1}{2 \cdot 500 \kappa} \right) + 1,6 \kappa^2}$
$> 0,70$	Feldmoment	$\beta = \beta_1 = \frac{1}{5,9 \kappa}$
	Stützmoment	$\beta = \beta_2 = \frac{1}{8,6 \kappa}$
alle κ	Endauflager	$\beta_0 = (0,55 + 0,025/\kappa) \beta_1$, jedoch $\beta_0 < \beta_1$
alle κ	Kragarm	$\beta = \beta_2$ am Auflager und am Kragarmende
$\kappa = \alpha_0 b_0 / L_e$ mit $\alpha_0 = \sqrt{1 + \frac{A_{sL}}{b_0 t}}$ Dabei ist A_{sL} die Querschnittsfläche aller Längssteifen innerhalb der Breite b_0 . Weitere Formelzeichen sind in Bild 3.1 und Bild 3.2 angegeben.		

Table 5: Calculation of the Beta Value to Determine the Effective Width [S2]

As Table 5 states, A_{SL} is the cross-section area of all longitudinal stiffeners within b_0 . Unfortunately, as mentioned before, these values are not constant. α_0 also depends on the thickness of the plate which varies as well in the area of the bottom plate. Another value that changes over the length of the bridge is the additional horizontal part of the stiffeners on the bottom plate and the value L_e . This meant α_0 , κ , β and b_{eff} had to be calculated for each cross-section individually. Therefore, another excel-sheet was created. Table 6 is an excerpt from the excel sheet only showing the values for the SOFiSTiK input, so the values $b_0 - b_{eff}$, that defined the parts indicated in Figure 46. In addition, only one cross-section from each of the 19 sections was selected. The full excel sheet can be found in Appendix B.

Figure 47: Calculation of L_e and b_0 [S2]

Cross-section in Sofistik	#m1 (Sidewalk)	#m2 (Deck Plate of Box Girder)	#m3 (Orthotropic Plate between Box Girders)	#m4 (Bottom Plate of Box Girder)
QNR	1 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	10 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	15 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	23 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	28 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	34 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	40 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	45 ; let#m1	148 ; let#m2	29 ; let#m3	165 ; let#m4
QNR	53 ; let#m1	570 ; let#m2	130 ; let#m3	634 ; let#m4
QNR	58 ; let#m1	811 ; let#m2	188 ; let#m3	903 ; let#m4
QNR	64 ; let#m1	510 ; let#m2	116 ; let#m3	569 ; let#m4
QNR	71 ; let#m1	148 ; let#m2	29 ; let#m3	166 ; let#m4
QNR	76 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	81 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	88 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	94 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	100 ; let#m1	27 ; let#m2	1 ; let#m3	33 ; let#m4
QNR	106 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4
QNR	115 ; let#m1	27 ; let#m2	1 ; let#m3	31 ; let#m4

Table 6: Values $b_0 - b_{eff}$ for the SOFiSTiK Input in [mm] [P2]

Cross section number 58 is the cross section in the middle over the pillar and marked red. Looking at the table it can be observed that every value has its maximum there. The graphs with the variables from Figure 41-45 exhibit their highest values at this location too. This axis in the middle of section 10 is directly above the pillar and forms the symmetry axis in longitudinal direction. For this reason, section 1 is symmetrical to 19, 2 to 18, 3 to 17 and so on. Another symmetry axis lies in the middle between the box girders. That is why the variables only had to be defined for one girder and for the cross sections 1 to 58 which is just one quarter of the bridge. The rest of the values could be derived from the existing ones. What stands out is that the values for #m2 and #m4 are exactly one in the field. The calculation resulted in a beff of 1,0 x b0 but SOFiSTiK did not accept a value of zero for #m2 and #m4. Therefore, a value of 1 [mm], which should not influence the results of the structural analysis, was chosen to avoid this problem.

After all variables were defined, they were included in SOFiSTiK and the cross sections were generated. Figure 46 already shows the cross-section number 1 of the downstream girder. In contrast, Figure 48 shows the cross-section number 58 over the pillar, where all variables reach its maximum, to point out how the cross-section changes throughout the bridge. In addition, both girders are depicted to enable a view of the whole cross-section.

Figure 48: Cross Section Number 58 [P1]

The effective width has its minimum at this location and the reduction of the cross section can be observed clearly, as the grey areas do not contribute to the load transfer. Also, the horizontal part of the stiffeners on the bottom plate is visible. In general, this cross-section is taller because the height of the box girders is 4.8m in contrast to 2.5 at the abutments and in Figure 46.

- Girder downstream ($y = 0\text{m}$):
Initial cross sections: 1-114
End cross sections: 401-514
- Girder upstream ($y = -9.15\text{m}$):
Initial cross sections: 201-314
End cross sections: 601-714

4.3.4 Construction of the System

Subsequent to the creation of the 2D cross-sections, the actual 3D model could be generated by connecting the cross sections through beams. Both halves of the superstructure were depicted

```
$ Box Girder 1:
KNOT Nr      x          y          z
1      0.00      0          0
2      2.46      0          0
3      5.02      0          0
4      7.58      0          0
5     10.14      0          0
6     12.70      0          0
7     13.98      0          0
8     15.26      0          0
9     17.82      0          0
```

```
$ Box Girder 2:
KNOT Nr      x      y      z
201      0.00    -9.15    0
202      2.46    -9.15    0
203      5.02    -9.15    0
204      7.58    -9.15    0
205     10.14    -9.15    0
206     12.70    -9.15    0
207     13.98    -9.15    0
208     15.26    -9.15    0
209     17.82    -9.15    0
210     20.38    -9.15    0
```

49

connection. Figure 49 shows and extract from SOFiSTiK to produce the knots. Knot 7 (and 207) is the knot between section one and two. The knot is not located in a crossbeam axle, therefore the distance between the knots 6,7 and 8 is not 2.56 meters but 1.28 meters. See below and in Figure 50 for an overview over the knots and their numeration.

- Girder downstream ($y = 0\text{m}$): Knot numbers: 1-115
- Girder upstream ($y = -9.15\text{m}$): Knot numbers: 201-315

Figure 50: Knots of the Two Main Girders [P1]

The next step after generating the knots was to connect them with members. In Figure 51 it can be seen that these members were assigned numbers, knots where they start (KA) and end (KE), and two cross-sections for the beginning and end (QNR). Here the members for section 1 (grup 11) and 2 (grup 12) of the downstream girder are described. The subdivision of the members, crossbeams and supports in groups, depending on their section, was necessary for the modeling of the construction process

```

!!Label Stäbe Hauptträger 1

grup 11
Stab  Nr      KA      KE      QNR      NP=-1
      1       1       2       1.401
      2       2       3       2.402
      3       3       4       3.403
      4       4       5       4.404
      5       5       6       5.405
      6       6       7       6.406

grup 12
Stab  Nr      KA      KE      QNR      NP=-1
      7       7       8       7.407
      8       8       9       8.408
      9       9      10       9.409
     10      10      11      10.410
     11      11      12      11.411
     12      12      13      12.412
  
```

Figure 51: SOFiSTiK Input to Generate the Members [P1]

described in 4.2.4. When reproducing the construction process later, the groups could be activated one after another. This approach also facilitated the application of loads in further steps. As both box girders consist of 19 sections, the distribution of groups and members is as follows:

- Group 1: Abutment Kehl
- Group 2: Pillar in the middle of the Rhine
- Group 3: Abutment Strasbourg
- Group 4: Flying shore in section 9
- Group 5: Flying shore in section 13
- Group 6: Flying shore in section 16
- Group 8: Crossbeams in section 1-6 and 14-19 of both girders
- Group 9: Crossbeams in section 7-13 of both girders
- Group 11-29: Sections 1-19 of downstream girder with members 1-114
- Group 31-49: Sections 1-19 of upstream girder with members 201-314

Figure 52: Subdivision of the Two Girders in Groups [P1]

4.3.4.2 Cross Girders

The cross girders were not modelled entirely in this step as the lateral system was examined later. In the longitudinal system they were only included to provide stability of the cross section and resistance against lateral forces. Therefore, only the part, outlined in Figure 53, was included as it is the part between the two main girder axes.

Figure 53: Crossbeam between the Main Girders [I15]

As one can see the height of the crossbeam changes linearly with its maximum in the middle of the bridge. To simulate this change, two cross-sections (801 and 802) were described. One in the axes of the main girders (801) and one in the middle between the girders (802). Then, additional knots were defined in the middle between the two axes at $y = -4.575\text{m}$. Finally, members were inserted to connect the knots in transvers direction. As pictured in Figure 55, the members run from the knots of the downstream girder (1-115), over the knots in the middle (401-515) to the knots of the upstream girder (201-315). Figure 54 shows the input to model the beams in section one. Because the crossbeams belong to the orthotropic plate, which is welded to the girder in two different steps, they were divided in the groups 8 and 9 to simulate the construction process later.

grup	8				
Stab	Nr	KA	KE	QNR	NP=-1
	401	1	401	801.802	
	402	2	402	801.802	
	403	3	403	801.802	
	404	4	404	801.802	
	405	5	405	801.802	
	406	6	406	801.802	
	407	401	201	802.801	
	408	402	202	802.801	
	409	403	203	802.801	
	410	404	204	802.801	
	411	405	205	802.801	
	412	406	206	802.801	

Figure 54: SOFiSTiK Input to Model Crossbeams [P1]

Figure 55: Schematic View of Knots in Section 1 [P1]

Unfortunately, the crossbeams were not depicted in the SOFiSTiK model because their cross-section lies partly within the orthotropic plate and the program cannot picture them properly. Regardless, the section properties that the program showed have been calculated and verified manually, so the results of the structural analysis should also be correct.

4.3.4.3 Supports

The last part of the bridge that remained were the supports. In the description of the groups, it can be seen that the superstructure has six supports axles. Three are permanent and located at the abutments and the pillar and the other three supports are temporary in the sections 9,13 and 16. During the construction process, these supports became active (or inactive when the temporary support was removed) in different steps. That is why each support axle has a different group so it can be activated and deactivated separately. The modelling is described exemplary for the abutment Kehl because all other supports were constructed similarly

Each support axle has four bearings which is shown in Figure 53 above. From the excel sheet it is known that the height of the box girder in cross-section one is 2.517 meters. Therefore, the knots 601, 611, 621 and 631 were positioned directly at the bottom of the girder as the z coordinate indicates. The knots 602, 612, 622 and 632 are immovable and lie exactly 450 mm below the other knots. This is the distance from the surface of the abutment to the bottom side of the box girder. Now, the knots that belong together (601 to 602 etc.) were connected by short members. These members were assigned storage conditions (MY, VZ...) according to the illustration in Figure 5. The problem that remained was that the program did not know that the knots 1, 601 and 611 belong to the same cross-section (also 201, 621

```

!!Label Knots Supports
$Abutment Kehl
KNOT Nr      X      Y      Z      fix
601  0.00[m]  1220[mm]  2517[mm]
602  0.00[m]  1220[mm]  2967[mm]  f
611  0.00[m] -1220[mm]  2517[mm]
612  0.00[m] -1220[mm]  2967[mm]  f
621  0.00[m] -7930[mm]  2517[mm]
622  0.00[m] -7930[mm]  2967[mm]  f
631  0.00[m] -10370[mm]  2517[mm]
632  0.00[m] -10370[mm]  2967[mm]  f

!!Label Members Supports
$ Support at Abutment Kehl
grup 1
Stab  Nr      KA      KE      QNR      ANFA      $ VZ = quer
601    601    602    1000    MTMYMZVYZ
602    611    612    1000    MTMYMZVY
603    621    622    1000    MTMYMZVY
604    631    632    1000    MTMYMZVYZ
        $ VZ = quer

$Linkages
KNOT  NR      FIX      NR1
601    KF      611      $ Abutment Kehl downstream
601    KF      1
611    KF      1

621    KF      631      $ Abutment Kehl upstream
621    KF      201
631    KF      201

```

Figure 56: SOFiSTiK Input to Generate Knots and Beams at the Abutment Kehl [P1]

and 631). By linking the knots to each other, which was done for both girders, this problem was solved. Figure 56 is the corresponding SOFiSTiK input while Figure 57 shows a schematic and graphic illustration of the abutment Kehl. The values that differed for the other supports were the lateral distance between the supports and the height of the supports. The linkages and members were generated the same way only with other numeration that is as follows:

- Abutment Kehl: Knots 601-632 Members 601-604
- Supports on the pillar: Knots 701-732 Members 701-704
- Abutment Strasbourg: Knots 801-832 Members 801-804
- Flying shore in section 9: Knots 901-908 Members 901-904
- Flying shore in section 13: Knots 921-928 Members 921-924
- Flying shore in section 16: Knots 941-948 Members 941-944

Figure 57: Illustration of the Abutment Kehl [P1]

4.3.5 Construction Process

The construction process has already been described in detail in Chapter 4.2.4. In SOFiSTiK, the superstructure was divided in groups that can be activated to imitate the installation of the bridge realistically and to reproduce impressed stresses. In the following, it is pictured how the process of construction is modelled in SOFiSTiK.

On the right it can be seen that in SOFiSTiK, at first the phases were defined. When the cross-section was assembled in 4.3.2 the phases 10, 21, 23 and 30 were already mentioned. Here the other construction stages that resulted from the description in 4.2.4 are determined and described. Phase 40 was just created for the application of the loads from the handrails and other parts of the bridge equipment that introduce additional dead load.

The second part defines which group becomes active in which construction phase. For the flying shores, also a deactivation was required which was managed by the fourth column (wbis). For example, section 1 - 11 of the superstructure were already active in phase 10 (group 11-

BA 10	TYP	G_1	bez	'Assembly until Section 11'
BA 11	TYP	G_1	bez	'Disposal on the Pillar'
BA 12	TYP	G_1	bez	'Assembly until Section 12'
BA 13	TYP	G_1	bez	'Assembly until Section 15'
BA 14	TYP	G_1	bez	'Assembly until Section 18'
BA 15	TYP	G_1	bez	'Assembly until Section 19'
BA 16	TYP	G_1	bez	'Removal of Shores and Derrick'
BA 20	TYP	G_1	bez	'Lifting at Supports by 1630mm'
BA 21	TYP	G_1	bez	'Orthotropic Plate Sections 7-13'
BA 22	TYP	G_1	bez	'Lowering at supports by 2030mm'
BA 23	TYP	G_1	bez	'Orthotropic Plate Rest'
BA 24	TYP	G_1	bez	'Lifting Superstructure by 400mm'
BA 30	TYP	G_1	bez	'Assembly Sidewalks'
BA 40	TYP	G_1	bez	'Additional Dead Load'

GRUP	NR	IBA1	IBAG	wbis	PHIF=1.0
1	10	10	-	-	\$Abutment Kehl
2	11	11	-	-	\$Pillar
3	15	15	-	-	\$Abutment Strasbourg
4	10	10	10	-	\$Flying Shore Section 9
5	13	13	15	-	\$Flying Shore Section 13
6	14	14	15	-	\$Flying Shore Section 16
8	23	23	-	-	\$Crossbeam Sections 1-6&14-19
9	21	21	-	-	\$Crossbeam Sections 7-13
11	10	10	-	-	
12	10	10	-	-	
13	10	10	-	-	
14	10	10	-	-	
15	10	10	-	-	
16	10	10	-	-	
17	10	10	-	-	
18	10	10	-	-	
19	10	10	-	-	
20	10	10	-	-	
21	10	10	-	-	
22	12	12	-	-	
23	13	13	-	-	
24	13	13	-	-	
25	13	13	-	-	
26	14	14	-	-	

Figure 58: SOFiSTiK Input to Model Construction Process [P1]

21) which corresponds with the description "Assembly until section 11". In addition, the supports at the abutment Kehl and the flying shore on the ship in section 9 were active as well. The flying shore in section 9 was deactivated directly after phase 10 because the structure then rested on the pillar which was activated in phase 11. In the following, these phases are illustrated with help of the SOFiSTiK visualization tool. Phase 11, 16, 20, 22, 24 and 40 are not pictured as only minor changes happen.

- Phase 10: Assembly of the superstructure until section 11 and shipping to the pillar.

Figure 59: Phase 10 of the Construction Process [P1]

- Phase 11: Disposing the construction on the pillar.
- Phase 12: Assembly until section 12.

Figure 60: Phase 12 of the Construction Process [P1]

- Phase 13: Assembly until section 15.

Figure 61: Phase 13 of the Construction Process [P1]

- Phase 14: Assembly until section 18.

Figure 62: Phase 14 of the Construction Process [P1]

- Phase 15: Assembly until section 19.

Figure 63: Phase 15 of the Construction Process [P1]

- Phase 16: Removal of the derrick crane and the flying shores in section 13 and 16.
- Phase 20: Lifting the superstructure at the supports by 1630mm.
- Phase 21: Welding of the orthotropic deck to the box girders in the sections 7-13.

Figure 64: Phase 21 of the Construction Process [P1]

- Phase 22: Lowering the superstructure at the supports by 2030mm.
- Phase 23: Welding of orthotropic deck to the box girders in the sections 1-6 and 14-19

Figure 65: Phase 23 of the Construction Process [P1]

- Phase 24: Lifting the superstructure at the supports by 400mm into the final location.
- Phase 30: Assembly of the sidewalks

Figure 66: Phase 30 of the Construction Process [P1]

- Phase 40: Additional dead loads from bridge equipment and effective width.

After the construction process the model was complete and the required loads could be applied.
The final model looks as follows:

Figure 67: View on the Europe Bridge [P1]

Figure 68: Model of the Europe Bridge [P1]

Figure 69: Schematic Model of the Europe Bridge [P1]

5. APPLICATION OF LOADS

5.1 DEFINITION OF THE REQUIRED LOAD MODEL

To determine the traffic loads a load model must be selected that defines all necessary traffic load cases. The different models and their application are regulated in the "Guideline for the Recalculation of Existing Road Bridges". The traffic volume, sort of traffic, vehicle type and type of bridge govern the selection of an appropriate load model.

Table 7 shows the Daily Traffic Volume in the years 1967 – 1997 and the percentage of heavy vehicle traffic. Unfortunately, no recent numbers were available to determine the load model more precisely. Therefore, the two most unfavorable values were combined to obtain conservative values. This resulted in a daily heavy vehicle traffic volume of $31000 \times 0.083 = 2573$.

Jahr	1967	1970	1975	1980	1985	1990	1995	1997
DTV	12300	13000	18000	23900	24100	31000	29000	27500

Jahr	1993	1994	1995	1996	1997
%	7,4	7,7	8,2	8,3	5,1*

Table 7: DTV and Heavy Vehicle Traffic Ratio of the Europe Bridge [I6]

		1	2	3
		Verkehrsart		
		Große Entfernung	Mittlere Entfernung	Ortsverkehr
1	DTV-SV < 2.000	LM1 ¹⁾	BK60/30	BK60 ^{2) 3)}
2	2.000 ≤ DTV-SV < 20.000		LM1 ¹⁾	BK60/30
3	DTV-SV ≥ 20.000			LM1 ¹⁾

1) Alternativ zu LM1 kann LMM angesetzt werden.

2) Bei Einfeld- und Durchlaufsystemen darf für Einzelstützweiten bis zu 25 m als Ziellastniveau BK30/30 angesetzt werden.

3) Wenn durch eine genauere Verkehrsuntersuchung eine wesentlich günstigere Verkehrszusammensetzung festgestellt wird, darf als Ziellastniveau BK30/30 angesetzt werden.

Table 8: Determination of the Required Load Model [S3]

For bridges with two or more lanes per direction, Table 8 of [S3] can be applied. With a DTV-SV of 2573 and traffic with great distances, LM1 was selected. For federal roads in general, a great distance of the traffic can be assumed. For this reason, the number of the DTV-SV is not important for the definition of the load model since the result is LM1 in any case and the absence of current traffic data has no impact. The load model LMM was not considered necessary. In general, it only has to be selected in consultation with the responsible road authority.

5.2 APPLIED LOADS

5.2.1 Self-Weight

The self-weight of the construction and all modelled components was already computed by SOFiSTiK. Nevertheless, the results shown by the program were not accurate. This was because not every detail of the bridge was included in the model. At first, bolts, rivets and other connection means were not reproduced. Furthermore, the crossbeam was modelled weightless and braces inside the box girder were neglected. Finally, vertical and horizontal stiffeners of the box girder web were assumed as insignificant for the load transfer and left out to simplify the model. This produced a big discrepancy between the actual self-weight and the one calculated by SOFiSTiK

To obtain more precise results for the self-weight, the structural analysis from 1960 was consulted where the self-weight of the construction had been calculated. Figure 70 below shows an extract in which the weight of the box girder is illustrated. See Appendix C for the entire calculation of the self-weight.

Figure 70: Self-Weight of the Box Girder according to the Structural Analysis [129]

This calculation differentiated between the three components box girder, orthotropic plate and sidewalk. With the help of these values the weight of each section was determined and then compared to the value from SOFiSTiK.

For the box girder the average weight per meter was assumed to be the mean value between the beginning and end of each section in Figure 70. The sidewalk has a constant weight of 550kg/m according to Appendix C. The orthotropic plate has an average weight of 665kg/m but the changes in the height of the longitudinal stiffeners were not considered. Including them led to a weight of 630kg/m for the parts with a stiffener height of 250mm. A height of 300mm resulted in a weight of 677kg/m and a height of 350mm in a weight of 724kg/m.

Adding up the values of the components and multiplying them with the length of the section the total weight per section was generated. Table 9 compares the values with the ones from SOFiSTiK. As the bridge is symmetrical the values for section 11 to 19 can be derived accordingly.

	Actual Self Weight	Self Weight according to SOFiSTiK	Increase
Section 1	34.71 t	31.09 t	11.6%
Section 2	36.22 t	32.37 t	11.9%
Section 3	40.33 t	34.6 t	16.6%
Section 4	41.64 t	35.67 t	16.7%
Section 5	41.44 t	35.19 t	17.8%
Section 6	39.28 t	32.31 t	21.6%
Section 7	37.57 t	30.03 t	25.1%
Section 8	39.36 t	33.95 t	16.0%
Section 9	45.27 t	42.04 t	7.7%
Section 10	50.49 t	46.34 t	8.9%

Table 9: Computed Self-Weight from SOFiSTiK in Comparison to Actual Self-Weight [P2]

Unfortunately, the construction process where the three components (box-girder, orthotropic plate, sidewalk) were assembled in different phases, made it necessary to split up the weight difference from Table 9 again. This means for every component an additional weight was determined that acted as soon as the corresponding component and section was assembled in SOFiSTiK. For example, in the first stage, only the box girders of the sections 1-11 were assembled which means that only the additional weight for this component and for these sections was activated. In contrast, the sidewalk was assembled last so the additional weight for this component was only activated in the last stage of the construction process.

Comparing the parts of the SOFiSTiK model with the parts of each component listed in Appendix C, the additional weight could be determined easily. For the sidewalk the value was 156 kg/m and for the orthotropic deck it was 95 kg/m. Consequently, the remaining surplus weight belonged to the box girder. However, this led to an additional weight of 9kg for the box girder in section 9. This value is highly unrealistic considering all parts that were left out. The conclusion was that the values from the structural analysis were incorrect or calculated by leaving out some components.

After looking through the structural analysis again, values for the self-weight of the box girder for each section were found in a description of the construction process. They were described as loads for the derrick crane who had to lift all the sections for the assembly. Table 10 includes the new numbers for the box girder and is an update of Table 9.

	Actual Self Weight	Self Weight according to SOFiSTiK	Increase
Section 1	41.49 t	31.09 t	33.5%
Section 2	39.10 t	32.37 t	20.8%
Section 3	41.71 t	34.6 t	20.6%
Section 4	42.72 t	35.67 t	19.8%
Section 5	42.72 t	35.19 t	21.4%
Section 6	41.10 t	32.31 t	27.2%
Section 7	39.10 t	30.03 t	30.2%
Section 8	42.71 t	33.95 t	25.8%
Section 9	48.32 t	42.04 t	14.9%
Section 10	55.32 t	46.34 t	19.4%

Table 10: Corrected Self-Weight Factors [P2]

5.2.2 Additional Dead Loads

Additional dead loads are all loads introduced by elements that are not part of the load-bearing system and therefore not part of the SOFiSTiK model.

The first component is the paving of the road. According to [S1] an additional and uniformly distributed load of 0,5 kN/m² had to be considered to account for the use of surplus material on the road surface. Combined with the values of the structural analysis the following loads act:

- Paving over orthotropic deck: $5.0 \text{ cm} \times 0.24 \text{ kN/cm} + 0.5 \text{ kN/m}^2 = \mathbf{1.7 \text{ kN/m}^2}$
- Paving over box-girder: $6.2 \text{ cm} \times 0.24 \text{ kN/cm} + 0.5 \text{ kN/m}^2 = \mathbf{2.0 \text{ kN/m}^2}$
- Paving of the sidewalk: $1.5 \text{ cm} \times 0.22 \text{ kN/cm} = \mathbf{0.33 \text{ kN/m}^2}$

The next element is the handrail which was included with a weight of 0.6 kN/m along the bridge and an eccentricity of 4.5 m.

Figure 71: Interior of the Europe Bridge [130]

For the runway, the cable-trough and the drainpipe from Figure 71, the following values were assumed:

- Runway: **1.2 kN/m**
- Cable-trough: **1.0 kN/m**
- Drainpipe: **0.6 kN/m**

Other parts of the bridge are the inspection trolley and the street lighting. These two however were not considered. The inspection trolley cannot be used anymore as it does not have a valid license. At its current location near the abutments its effect on the bridge is neglectable. The street lighting consists of six lanterns on each side which is a weight that could be left out as well.

5.2.3 Construction Process

In Chapter 4, the construction process was modelled by the subsequent assembly of the components and sections. The correction of the self-weight, that was described in Chapter 5.2.1, was activated simultaneously with the corresponding section. However, some loading cases were not yet included. During the assembly of the orthotropic plate, the superstructure was lifted or lowered to provide suitable stress conditions for the installation. By lifting the supports at the abutments these conditions were reproduced.

Further loads were introduced by the derrick crane that was installed on the bridge to lift the sections into position for their assembly. After the installation of one section the crane moved forward to lift the next section into place. This procedure was depicted by four loading cases with different locations. The loads itself only varied slightly. The derrick crane weighed 32 tons and the sections weighed between 24 and 27 tons.

Figure 72: Position in Section 15 [P1]

Figure 72 illustrates one of the four locations of the crane. The forces and moments in the first field belong to the anchoring of the derrick. Appendix D shows all the derrick locations to better understand Figure 72. The four locations used in the model are highlighted.

5.2.4 Settlement

The settlement is divided into possible ground movement which appears in the ultimate limit state (ULS) and probable ground movement in the serviceability limit state (SLS). Normally, the values are determined according to the geological survey. Unfortunately, no such document was available, so the ground movements had to be estimated.

The Europe Bridge already exists for 60 years so it was assumed that all possible settlements have already occurred. However, a minimum settlement of 10 mm is mandatory in the ULS and SLS.

Thus, the lifting of the superstructure for bearing replacement, which should also be considered with a value of 10mm according to [S1], was already covered.

5.2.5 Temperature

The temperature was considered according to [S1] and consists of a constant and linear part. Steel bridges can be classified in category 1 of Figure 73. Estimating a temperature of 10 degrees during the construction, the positive and negative values $\Delta T_{N,pos}$ and $\Delta T_{N,neg}$ are +41K and -36K and represent the constant part of the temperature

In Deutschland können $T_{e,min}$ und $T_{e,max}$ wie folgt angenommen werden:

Gruppe 1	(Stählerne Brücken)	$T_{e,min}$: -26 K	$T_{e,max}$: +51 K
Gruppe 2	(Verbundbrücken)	$T_{e,min}$: -20 K	$T_{e,max}$: +41 K
Gruppe 3	(Betonbrücken)	$T_{e,min}$: -17 K	$T_{e,max}$: +37 K

Figure 73: Category of Bridges and their Temperature Properties [S1]

The linear temperature gradient is the difference in temperature within the superstructure (top side to bottom side) and had to be determined next. Table 11 shows the values $\Delta T_{M,pos}$ and $\Delta T_{M,neg}$ of 18K and -13K.

Gruppen der Brückenüberbauten	Straßenbrücken		Eisenbahnbrücken	
	Positiver Temperaturunterschied	Negativer Temperaturunterschied	Positiver Temperaturunterschied	Negativer Temperaturunterschied
	$\Delta T_{M,pos}$ in K	$\Delta T_{M,neg}$ in K	$\Delta T_{M,pos}$ in K	$\Delta T_{M,neg}$ in K
Gruppe 1 Stahlüberbau aus Hohlkasten, Fachwerk oder Plattenbalken	18	- 13	18	- 13
Gruppe 2 Verbundüberbau: Betonplatte auf einem Hohlkasten, Fachwerk oder Plattenbalken aus Stahl	15	- 18	15	- 18
Gruppe 3 Betonüberbauten aus:				
- Betonhohlkasten	10	- 5	10	-5
- Betonplattenbalken	15	- 8	15	- 8
- Betonplatte	15	- 8	15	- 8

Table 11: Linear Temperature Difference within the Superstructure [S1]

The value K_{sur} that depends on the thickness of the paving can reduce the temperature difference. In 5.2.2 a thickness of 5.0 cm and 6.2 cm for the paving can be seen. According to Table 12, these values do not allow a reduction of the values $\Delta T_{M,pos}$ and $\Delta T_{M,neg}$.

Straßen- und Eisenbahnbrücken						
Belagsdicken in mm	Beton		Stahl		Verbundkonstruktion	
	Oberseite wärmer	Unterseite wärmer	Oberseite wärmer	Unterseite wärmer	Oberseite wärmer	Unterseite wärmer
	K_{sur}	K_{sur}	K_{sur}	K_{sur}	K_{sur}	K_{sur}
0	1,5 ¹⁾	1,0	1,6 ¹⁾	0,6	1,1	0,9
50	1,0	1,0	1,0	1,0	1,0	1,0
80	0,82	1,0	0,82	1,1	1,0	1,0
100	0,7	1,0	0,7	1,2	1,0	1,0
150	0,5	1,0	0,7	1,2	1,0	1,0
300	0,3	1,0	0,7	1,2	1,0	1,0
Schotterbett (60 cm)	0,6	1,0	0,6	1,4	0,8	1,2

Table 12: Adjustment Values for Paving Thickness [S1]

Assuming a simultaneous appearance of the constant part ΔT_N and the linear part ΔT_M , the equations on the right describe how to combine the two parts. Applying the formulas led to the following load cases:

$$\Delta T_M + \omega_N \cdot \Delta T_N$$

or

$$\omega_M \cdot \Delta T_M + \Delta T_N$$

with

$$\omega_M = 0,75$$

$$\omega_N = 0,35.$$

Figure 74: Equations to Combine Constant and Linear Part of the Temperature [S1]

- Loadcase 1: $T_N = +41 \text{ K}$ $\Delta T_M = 0.75 \times 18 = 13.5 \text{ K}$
- Loadcase 2: $T_N = +41 \text{ K}$ $\Delta T_M = 0.75 \times (-13) = -9.75 \text{ K}$
- Loadcase 3: $T_N = -36 \text{ K}$ $\Delta T_M = 0.75 \times 18 = 13.5 \text{ K}$
- Loadcase 4: $T_N = -36 \text{ K}$ $\Delta T_M = 0.75 \times (-13) = -9.75 \text{ K}$
- Loadcase 5: $T_N = 0.35 \times 41 = 14.35 \text{ K}$ $\Delta T_M = 18 \text{ K}$
- Loadcase 6: $T_N = 0.35 \times 41 = 14.35 \text{ K}$ $\Delta T_M = -13 \text{ K}$
- Loadcase 7: $T_N = 0.35 \times (-36) = -12.6 \text{ K}$ $\Delta T_M = 18 \text{ K}$
- Loadcase 8: $T_N = 0.35 \times (-36) = -12.6 \text{ K}$ $\Delta T_M = -13 \text{ K}$

5.2.6 Snow

The weight of snow needs to be included only for roofed bridges. For other bridges these loads must be considered in the construction process exclusively. As wind and snow do not act simultaneously and wind has a bigger effect on the bridge, the loads from snow were neglected

5.2.7 Wind

Wind acts on the superstructure in transverse direction. The red circle in Figure 75 circle marks the location of the bridge and indicates wind-zone 1. It is usually differentiated between “wind without traffic” and “wind with traffic”. Table 13 shows how the values were calculated, and Figure 76 illustrates how the wind acts on the superstructure in transverse direction without traffic and with a traffic height of 2.0m.

Figure 75: Wind Zones in Germany [S1]

1	2	3	4	5	6	7
	ohne Verkehr und ohne Lärmschutzwand			Mit Verkehr ¹⁾ oder mit Lärmschutzwand		
	auf Überbauten					
$b/d^{2)}$	$z_e \leq 20\text{ m}$	$20\text{ m} < z_e \leq 50\text{ m}$	$50\text{ m} < z_e \leq 100\text{ m}$	$z_e \leq 20\text{ m}$	$20\text{ m} < z_e \leq 50\text{ m}$	$50\text{ m} < z_e \leq 100\text{ m}$
$\leq 0,5$	1,75	2,45	2,90	1,45	2,05	2,40
$= 4$	0,95	1,35	1,60	0,80	1,10	1,30
≥ 5	0,95	1,35	1,60	0,60	0,85	1,00

Table 13: Transverse Wind-Load w on Bridges [S1]

In the inventory documents an average water-level of +134.76 meters above sea-level is recorded. As the height of the superstructure ranges between +146.75m and +148.30m, the value for z_e is lower than 20 meters. The value d changes as the height of the box-girder increases from the abutments towards the pillar in the middle. To represent this, the loads from wind were calculated at the locations with the minimum and maximum height. For the values in between a linear change was assumed. This led to the following results:

Wind at the Pillar:

- **Wind without Traffic:** $b = 18.5\text{m}$ $d = 4.81 + 0.30 = 5.11\text{m}$ $b/d = 3.62$
 - $w = 1.04\text{kN/m}^2 \times 5.11\text{m} = \mathbf{5.31\text{ kN/m}}$ ($ez = 2.255\text{m}$)
- **Wind with Traffic:** $b = 18.5\text{m}$ $d = 4.81 + 0.09 + 2.0 = 6.90\text{m}$ $b/d = 2.68$
 - $w = 1.05\text{kN/m}^2 \times 6.90\text{m} = \mathbf{7.25\text{ kN/m}}$ ($ez = 1.36\text{m}$)

Wind at the Abutments:

- **Wind without Traffic:** $b = 18.5\text{m}$ $d = 2.52 + 0.3 = 2.82\text{m}$ $b/d = 6.56$
 - $w = 0.95\text{kN/m}^2 \times 2.82\text{m} = \mathbf{2.68\text{ kN/m}}$ ($ez = 1.11\text{m}$)
- **Wind with Traffic:** $b = 18.5\text{m}$ $d = 2.52 + 0.09 + 2.0 = 4.61\text{m}$ $b/d = 4.01$
 - $w = 0.8\text{kN/m}^2 \times 4.61\text{m} = \mathbf{3.69\text{ kN/m}}$ ($ez = 0.215\text{m}$)

Figure 76: Load Cases for Wind in Transverse Direction [S5]

5.2.8 Exceptional Loads

Exceptional loads include several load cases. As no protection device was installed, the first case is the presence of a vehicle on the sidewalk, represented by an axle load of 160kN distributed on two wheels on the edge of the superstructure. The next case is a vehicle impact on the curb with a vertical load of 180kN and a horizontal load of 100kN. The location of the loads is illustrated in Figure 77. Vehicle impact on pillars and other load carrying components was not included as the pillars were not modelled. Impact on the handrail was neglected as well because it was not designed to withstand a vehicle impact.

These loads do not act simultaneously with the regular traffic loads making them insignificant for the calculation of the longitudinal system.

However, they can be important for the lateral

Figure 77: Location of an Exceptional Load at the Curbs [S1]

system as they cause high local stresses. Nonetheless, the exceptional loads act on the sidewalk. As the cracks that should be evaluated are located on the other side of the box-girder, these loads have no impact on the local stresses at the location of the crack. For this reason, the exceptional loads were not included in any model.

5.2.9 Traffic Loads

The biggest share of the loads derives from the traffic. Chapter 5.1 determined that the load-model 1 (LM1) is necessary which defines the axle loads for the trucks on the bridge. Furthermore, the superstructure was loaded with a uniformly distributed load (UDL) and a fatigue load model.

Figure 78: Geometric Properties of the Superstructure

5.2.9.1 UDL Loads

At first the UDL loads were distributed on the superstructure. For this, the road surface was divided into lanes according to Table 14. According to Figure 78 the roadway has a width of exactly 12m which is why four lanes, with a width of 3 meters each, were defined. A UDL of 2.5 kN/m² acts on the entire bridge. This value represents the normal car traffic or pedestrians on the sidewalk. In addition, one lane was loaded with a UDL of 6.5 kN/m², representing the heavy traffic lane. For bridges with just one superstructure, only one lane at a time must be loaded with UDL 6.5.

Fahrbahnbreite w	Anzahl der rechnerischen Fahrstreifen	Breite eines rechnerischen Fahrstreifens	Breite der Restfläche
$w < 5,4 \text{ m}$	$n_l = 1$	3 m	$w - 3 \text{ m}$
$5,4 \text{ m} \leq w < 6 \text{ m}$	$n_l = 2$	$w/2$	0
$6 \text{ m} \leq w$	$n_l = \text{Int}(w/3)$	3 m	$w - 3,0 \cdot n_l$

Table 14: Subdivision of the Roadway in Traffic Lanes [S1]

Four different combinations for each field were created. Figure 79 illustrates the four loading cases for the first field. Each half of the superstructure can be loaded individually, or both can be loaded simultaneously with the UDL 6.5 downstream or upstream. The four loading cases for the second field were equivalent. SOFiSTiK combined the most unfavorable case from each field to obtain the highest possible stresses at each location.

Figure 79: Loading Cases for UDL in Field 1

5.2.9.2 Truck Axle Loads according to LM1

The axle loads according to load-model 1 are shown in Table 15. The UDL values for each lane and the sidewalk are also described in the last column. For lane 1, two axles with an axle load of 240 kN had to be applied in addition to the 9.0 kN/m².

Stellung	Doppelachse			Gleichmäßig verteilte Last
	Grundwert	α_{Qi}	Angepasster Grundwert	
	Achslast Q_{ik} in kN		Achslast $\alpha_{Qi} \cdot Q_{ik}$ in kN	q_{ik} (oder q_{rk}) in kN/m ²
Fahrstreifen 1	300	0,8	240	9,0
Fahrstreifen 2	200	0,8	160	2,5
Fahrstreifen 3	0	-	0	2,5
Andere Fahrstreifen	0	-	0	2,5
Restfläche (q_{rk})	0	-	0	2,5

Table 15: UDL Loads and Truck Axle Loads [S1]

The geometry of the axles and wheels is shown in Figure 80. The 160kN axles in lane 2 must be located directly next to the ones in lane 1. As the lane width is 3 meters and the distance from the edge of the lane is 50 cm, all axles were placed in the middle of their lane. With two wheels per axle, each wheel represented a load of 120kN in lane 1 and 80kN in lane 2. This load model must be located in lane 1 (UDL 6.5 lane) and can only appear once on the entire superstructure.

Figure 80: Geometry of the Axles of LM 1 [S1]

5.2.9.4 Acceleration and Breaking

The simultaneous acceleration or breaking of vehicles due to accidents or traffic jams on the bridge can cause horizontal loads. These were calculated with the formula on the right. The minimum value was $Q_{lk} = 360 \times 0.8 = \mathbf{288kN}$. The maximum value was **900kN**. Inserting the corresponding values in the formula the result was:

$$Q_{lk} = 0,6 \cdot \alpha_{Q1} \cdot (2Q_{1k}) + 0,10 \cdot \alpha_{q1} \cdot q_{1k} \cdot w_l \cdot L$$

$$360 \cdot \alpha_{Q1} \leq Q_{lk} \leq 900 \text{ in kN}$$

Figure 83: Equation to Determine Horizontal Loads from Acceleration and Breaking [S1]

$$Q_{lk} = 0.6 \times 0.8 \times (2 \times 300\text{kN}) + 0.1 \times 1.0 \times 9.0\text{kN/m}^2 \times 3\text{m} \times 245.59 = \mathbf{951kN}$$

As this value was above the limit, a horizontal force of 900kN along the bridge was assumed. It was entered as line load along the centerline of the box girders on the surface of the road. The line load equals $q_{lk} = 900/245.59 = \mathbf{3.66kN/m}$. This line load acts on both girders in positive and negative direction. SOFiSTiK chose the load case that produced the most conservative results.

5.2.9.5 Centrifugal loads

As the horizontal alignment of the bridge does not include any curves, no centrifugal loads were considered.

5.2.10 Bearing Friction

No bearing can transfer loads and move without a small amount of friction. So, if vertical loads rest on the bearings that are forced to move horizontally due to bending of the superstructure, the displacement in x-direction is restrained by the friction in the bearings. The supports at the abutments can move in x-direction so the ones on the pillar need to absorb the forces arising from this phenomenon.

The horizontal forces acting upon the support-axis on the pillar were determined according to the formula showed in Figure 84.

$$F_{Hd} = \boxed{\gamma_Q Q_{lk}} + \left| \begin{array}{l} \mu_{\text{sup}} \left[\boxed{\sum \gamma_{G,j,\text{sup}} G_{kj} + \gamma_P P_k} \right] + \boxed{\gamma_Q \psi_1 Q_{k1}} + \sum \boxed{\gamma_{Qi} \psi_{oi} Q_{ki}} \\ - \mu_{\text{inf}} \left[\sum \gamma_{G,j,\text{inf}} G_{kj} + \gamma_P P_k \right] \end{array} \right|$$

Acceleration
and Breaking

Dead Load and
Prestressing

Traffic
Loads

Other
variable
Loads

Figure 84: Formula to Calculate the Forces from Bearing Friction [S1]

Loads from acceleration and breaking are transferred to the immobile support and were assumed to be absorbed by bending of the pillar. The dead load acts equally favorable and unfavorable on both abutments and does not lead to horizontal reactions at the pillar as well. Among the variable loads, only the traffic generates loads in vertical direction. The remaining part of the formula was $F_{Hd} = \mu_{sup} \left[\sum \gamma_Q \cdot \psi_1 \cdot Q_{k1} \right]$. The friction value μ_{sup} was calculated according to Figure 85.

$$\mu_a = 0,5 \cdot \mu_{max} (1 + \alpha)$$

$$\mu_r = 0,5 \cdot \mu_{max} (1 - \alpha)$$

n	α_n
≤ 4	1
$4 < n < 10$	$\frac{16 - n}{12}$
≥ 10	0,5

Figure 85: Determination of the Friction Value [S6]

There are four bearings in the abutment axis. So, n was 4 and α_n was 1. With $\mu_{max} = 0.03$ according to [S1] μ_a was 0.03 (unfavorable) and μ_r was 0 (favorable). The horizontal forces were as follows.

Superstructure half in field 1 loaded completely:

$$F_{1V,UDL} = 112.7 \times 0.5 \times (9m \times 2.5kN/m^2 + 3m \times 6.5kN/m^2) = \mathbf{2366.7kN}$$

$$F_{1V,TS} = 2 \times 240kN + 2 \times 160kN = \mathbf{800kN}$$

- $F_{H,k} = 0.03 \times (2366.7 + 800) = \mathbf{95.0kN}$
- $F_{H,k} = 95/2 = \mathbf{47.5kN}$

As the support axis on the pillar has two bearings for each superstructure half, the 95kN were distributed equally. The same applies for the other half. This means every bearing on the pillar is subjected to a horizontal force of 47.5kN.

5.3 GENERAL REMARKS TO THE INPUT OF THE LOADS

As the bridge was modelled with beams, no area loads could be defined. Therefore, all loads were entered as concentrated loads or line distributed loads. The loads from the construction process (lifting and lowering of the abutments, derrick loads), settlement, bearing friction and all axle loads are point loads and were defined in relation to knots. Their exact location was depicted by eccentricities in x- and y-direction. The self-weight, additional dead loads, temperature, wind, UDL and acceleration/breaking are line distributed loads and were described in relation to the center axis of the box girders with an eccentricity only in y-direction or z-direction for the wind.

An overview of the load cases is given in Table 16. Listed are all cases that were defined manually. Loading cases that were created by SOFiSTiK for superposition purposes are described later.

Overview Loadcases		
Loadcase Nr.	Description Loadcase	Remarks
1	Selfweight of the modelled Superstructure	
2	Self-Weight Correction for Box Girders in Sections 1 to 11	Acts as of BA 10
3	Self-Weight Correction for Box Girders in Section 12	Acts as of BA 12
4	Self-Weight Correction for Box Girders in Sections 13 to 15	Acts as of BA 13
5	Self-Weight Correction for Box Girders in Sections 16 to 18	Acts as of BA 14
6	Self-Weight Correction for Box Girders in Section 19	Acts as of BA 15
7	Self-Weight Correction for orthotropic Plate in Sections 7 to 13	Acts as of BA 21
8	Self-Weight Correction for orthotropic Plate in Sections 1 to 6 and 14 to 19	Acts as of BA 23
9	Self-Weight Correction for Sidewalk	Acts as of BA 30
10	Derrick Loads for Position in Section 11	Acts only in BA 11
11	Derrick Loads for Position in Section 12	Acts only in BA 12
12	Derrick Loads for Position in Section 15	Acts only in BA 13
13	Derrick Loads for Position in Section 18	Acts from BA 14 to 15
17	Lifting the Superstructure by 1630mm	Acts in BA 20
18	Lowering the Superstructure by 2030mm	Acts in BA 22
19	Lifting the Superstructure by 400mm	Acts in BA 24
21	Additional Dead Loads	Acts as of BA 40
31-32	Acceleration and Breaking	In positive and negative direction on one of the two girders
41-42	Wind with and without Traffic	In positive and negative direction
51-53	Probable Ground movement	SOFiSTiK chooses the most unfavorable of the 3 cases

61-63	Possible Ground Movement	SOFiSTiK chooses the most unfavorable of the 3 cases
81	Bearing Friction	Only acts if unfavorable
91-98	Temperature	SOFiSTiK chooses the most unfavorable of the 8 cases
101-108	UDL Combinations	SOFiSTiK combines the most unfavorable case from field 1 (101-104) and 2 (105-108)
151-265	LM1 Downstream	Only one LM1 acts on entire Bridge (Either Upstream or Downstream)
301-414	LM1 Upstream	Only one LM1 acts on entire Bridge (Either Upstream or Downstream)
501-630	LM3 Downstream	Only one LM3 acts on entire Bridge (Either Upstream or Downstream)
701-830	LM3 Upstream	Only one LM3 acts on entire Bridge (Either Upstream or Downstream)

Table 16: Overview Load Cases and Numbers [P2]

5.4 COMBINATION AND SUPERPOSITION OF LOAD CASES

After all load cases were described in SOFiSTiK, they had to be combined to obtain the maximum moments and internal forces in the ULS.

The first step was to identify the most unfavorable load case for the different load groups like UDL, LM1 and LM3 that only act once on bridge. Settlement and temperature also include several load cases, but only one of them acts at a time. A SOFiSTiK module called MAXIMA examined all load cases for one load group and generated an envelope of the stress resultants. This envelope showed the maximum/minimum value at each location by determining the most unfavorable case for each location. Table 17 shows the load cases/envelopes that were created by MAXIMA.

Overview Envelopes		
Loadcase Nr.	Description Envelopes	Remarks
901-912	Envelopes UDL	12 Envelopes that show Min/Max value of My, Mt, Mz, Vz, Vy, N
921-932	Envelopes LM1	12 Envelopes that show Min/Max value of My, Mt, Mz, Vz, Vy, N
941-952	Envelopes LM3	12 Envelopes that show Min/Max value of My, Mt, Mz, Vz, Vy, N
961-970	Envelopes probable Ground Movement	10 Envelopes that show Min/Max value of My, Mz, Vz, Vy, N
971-980	Envelopes possible Ground Movement	10 Envelopes that show Min/Max value of My, Mz, Vz, Vy, N
981-990	Envelopes Temperature	10 Envelopes that show Min/Max value of My, Mz, Vz, Vy, N

Table 17: Overview over Envelopes Created by MAXIMA [P2]

Subsequently, all load groups were superposed with combination values and safety factors to obtain the stress resultants in the ULS. The values and factors prescribed by the code are shown in Table 18 and 19.

Einwirkung	Bezeichnung	Bemessungssituation	
		S/V	A
Ständige Einwirkungen Eigenlasten der tragenden und nichttragenden Bauteile, ständige Einwirkungen des Baugrundes, Grundwasser und Wasser			
ungünstig	γ_{Gsup}	1,35 ^{2), 3), 4)}	1,00
günstig	γ_{Ginf}	1,00 ^{2), 3), 4)}	1,00
Horizontaler Erddruck aus Auflast ⁷⁾			
ungünstig	γ_{Gsup}	1,50	--
günstig	γ_{Ginf}	1,00	--
Vorspannung	γ_P	1,00 ⁵⁾	1,00
Setzungen ⁸⁾	γ_{Gset}	1,00 ⁶⁾	--
Verkehr ⁹⁾			
ungünstig	γ_Q	1,50	1,00
günstig		0	0
Temperatur			
ungünstig	γ_Q	1,35	1,00
günstig		0	0
Andere variable Einwirkungen			
ungünstig	γ_Q	1,50	1,00
günstig		0	0
Außergewöhnliche Einwirkungen	γ_A	--	1,00

Table 18: Safety Factors for Superposition in ULS Prescribed by [S1]

Einwirkung	Bezeichnung	ψ_0	ψ_1	ψ_2	ψ'_1 ¹⁾
Verkehrslasten (siehe 4.4.1)	TS	0,75	0,75	0,2	0,80
	gr 1 (LM1) ⁴⁾				
	UDL ³⁾	0,40	0,40	0,2	0,80
	Einzelachse (LM 2)	0	0,75	0	0,80
	gr 2 (Horiz. Lasten)	0	0	0	0
	gr 3 (Fußg. Lasten)	0	0	0	0,80
Horizontallasten		0	0	0	0
Windlasten	F_{wk}	0,50	0,50	0	0,60
Temperatur (siehe 1.5.1)	T_k	0 ⁵⁾	0,6	0,5	0,80

Table 19: Combination Factors according to [S1]

5.5 STRESS RESULTANTS IN THE ULTIMATE LIMIT STATE

The stress resultants in the ULS for the torsional moment, the moments around the y and z axis, the shear forces in y and z direction and the normal force are pictured in Appendix E. As the beams are symmetrical and the loads are symmetrical too, the stress resultants of beam one and two only differ slightly. For this reason, the results are only displayed for one beam. The results for the other beam can be assumed as similar.

To check the results, the maximum negative moment M_y above the pillar and the maximum positive moment M_y in the field were reviewed manually. The different load types with their respective combination values and safety factors are listed below in Table 20.

Load Type	M_y above the Pillar [kNm]	M_y in the Field [kNm]	Combination Values Ψ_0	Safety Factors γ
Self-Weight	-113860	42018	1.00	1.35
Breaking/Acceleration	-818	503	0.00	1.50
Wind	-307	111	0.50	1.50
Settlement	-177	177	1.00	1.00
Temperature	-10542	7299	0.80	1.35
Bearing Friction	-24	12	1.00	1.50
UDL	-82337	45078	0.40	1.50
LM1	-8301	12656	0.75	1.50

Table 20: M_y Values at 2 Locations to Check the SOFiSTiK Results [P2]

Having applied the values from the table with the traffic loads as dominant loads, the maximum positive and negative moments M_y were:

$$\begin{aligned}
 M_{y,neg} &= 1.35 \times (-113860) + 1.5 \times (-82337 - 8301) + 1.5 \times 0.0 \times (-818) + 1.5 \times 0.5 \times (-307) + 1.0 \times 1.0 \\
 &\quad \times (-177) + 1.35 \times 0.8 \times (-10542) + 1.5 \times 1.0 \times (-24) \\
 &= \mathbf{-301497 \text{ kNm}}
 \end{aligned}$$

$$\begin{aligned}
 M_{y,pos} &= 1.35 \times 42018 + 1.5 \times (45078 + 12656) + 1.5 \times 0.0 \times 503 + 1.5 \times 0.5 \times 111 + 1.0 \times 1.0 \times 177 + \\
 &\quad 1.35 \times 0.8 \times 7299 + 1.5 \times 1.0 \times 12 \\
 &= \mathbf{151486 \text{ kNm}}
 \end{aligned}$$

The moments M_y from SOFiSTiK were **-302330 kNm** and **148740 kNm**. The negative moment only had a deviation of 0.28% which is a very good compliance. The other value was 1.8% higher than

the value calculated by SOFiSTiK. This can be explained by the location of the moment. SOFiSTiK determined the maximum value of 148740 kNm at around 40% of field 1. The values for the individual load cases in the table are the overall maximum values in field 1 and not at 40% of the field. Therefore, in some cases they can be slightly higher compared to the location where SOFiSTiK determined the maximum moment. Nevertheless, both values show good correspondence.

SOFiSTiK also computed the section forces for the Serviceability Limit State (SLS) for four different load-combinations. These combinations were rare/characteristic, non-frequent, frequent and permanent. As the recalculation only considered the structural safety of a bridge, no structural analysis in the SLS was required.

6. STRUCTURAL ANALYSIS OF THE LONGITUDINAL SYSTEM

6.1 GENERAL REMARKS

All calculations and procedures to evaluate the condition and loadbearing capacity of the superstructure were conducted according to the “DIN Fachbericht 103” [S2], the “Guideline for the Recalculation of Existing Road Bridges” [S3] and the Eurocode 3 part 1-5 [S7] and part 1-9 [S9]

Initially the decisive elements of the superstructure (orthotropic plate, box-girder web, bottom plate of the box-girder) and their gross section were evaluated. At the connections between the sections the area of the cross-section is reduced by the rivets. Therefore, an additional check at the net section was carried out. In further calculations, the rivet connections itself and the buckling of the orthotropic plate, the box-girder webs and the bottom plate were evaluated. Finally, the fatigue check was conducted to complete the examination of the longitudinal system.

Performing all these calculations for every component of the cross-section and for every beam along the bridge would require a lot of work and go beyond the scope of this thesis. Furthermore, as the title indicates, the focus is also on the evaluation of the cracks in the lateral system. For those reasons, simplifications were made to reduce the effort and complexity of the calculation without affecting the quality of the results. If a simplification was not possible without compromising the accuracy of the evaluation, the calculations were only conducted at representative locations to describe the procedure. In addition, the two beams that were modelled, are symmetrical. As the stress resultants and stresses were nearly the same, all checks were conducted at the beam downstream. The results for the other beam were assumed to be similar.

To obtain the stresses for the verification calculations, during the modelling every component was provided with a different material number. SOFiSTiK allows to read out the stresses for every material separately. This way the maximum stress along the bridge for each component could be identified easily by selecting the corresponding material. The numeration of the material and the associated component are as follows:

- Material 1: S355 Component: Box girder deck plate
- Material 2: S355 Component: Longitudinal stiffeners of box girder deck plate
- Material 3: S355 Component: Outer box girder web
- Material 4: S355 Component: Inner box girder web
- Material 5: S355 Component: Bottom plate of box girder
- Material 6: S355 Component: Longitudinal stiffeners of bottom plate
- Material 7: S355 Component: Orthotropic plate between the box girders
- Material 8: S355 Component: Longitudinal stiffeners of orthotropic plate
- Material 9: S355 Component: Connection plate between deck plate and sidewalk
- Material 10: S355 Component: Sidewalk
- Material 11: S355 Component: Longitudinal stiffeners of sidewalk
- Material 12: S355 Component: Outer plate of sidewalk

Furthermore, stress points were defined in the web as it exhibited a linear stress distribution over the height. The buckling verification and the check of the rivet connections were not possible with the maximum stress alone. The stresses at the top and bottom of the web are required to determine the dimensions of the compression/tension zone. In addition, further stress points were defined to obtain the stress variation range which is important for the fatigue check. See Figure 86 for the location of all the stress points. The locations in the other box girder are similar.

Figure 86: Stress Points in the Cross Section [P4]

In Appendix L the output of SOFiSTiK for the longitudinal system is provided partially. It shows among other things the cross-section properties, load combinations, stress resultants and stresses. All necessary information for the re-evaluation that follows was derived from it.

6.2 GROSS SECTION

6.2.1 Procedure and Simplifications

This check was performed with the stresses computed by SOFiSTiK. With the stress resultants N , V_y , V_z , M_y , M_z and M_t in the ultimate limit state, tensile stresses, compressive stresses and shear stresses were created. As the material for all components is S355, the stress limits were 355 N/mm² for compression and tension. The limit for the shear stresses was $355/\sqrt{3} = 205$ N/mm². This means, the present stresses only needed to be compared to the permitted stresses to obtain a load factor and check if the component satisfies the stress limits.

To facilitate the procedure, the check was conducted with the equivalent stress that combines tension or compression with shear. This measure allowed to perform the verification for each beam only once rather than three times for each stress. In addition, by calculating the equivalent stress, SOFiSTiK already compared the values from tension and compression to decide which one to use in the superposition with shear. Usually, the interaction with shear is only necessary if the shear stress exceeds $0,5 \cdot f_y / \sqrt{3} = 102.5$ N/mm² but in this case the equivalent stress was used anyway as it saved multiple steps.

To estimate the influence of the interaction on the results, the difference between maximum tension/compression and the equivalent stress was reviewed. In the parts where the interaction would not have been necessary as the shear stress was below 102.5 N/mm², the interaction only increased the stresses by a maximum of 1.6%. This means the results are on the safe side and the deviation is very small. Even in the box-girder web, where the calculation of the equivalent stress was required due to high shear stresses, the interaction only led to a stress increase of 4.6%.

Furthermore, only the steel deck, the sidewalk, the box-girder webs and the bottom plate were reviewed. The stiffeners below these components and the other parts of the sidewalk were not considered as they all had lower stresses. The stiffeners are located closer to the centroid of the box-girder which reduces the stresses induced by the moments M_y and M_z .

The load combination that provided the maximum stresses for the verification calculations, was reviewed manually to ensure the plausibility of the values. For the cross-section 58 the present stress resultants M_y , M_z and N were converted into tensile and compressive stresses to compare

them with the values from SOFiSTiK. With the effective section properties, the calculated stresses exceeded the values from SOFiSTiK by 7% and 9%. This deviation is acceptable considering the manual calculation normally produces higher results than programs as it does not consider redistribution of loads and other influences that can not be captured in a manual evaluation.

6.2.2 Load Factor for Decisive Components

The following graphs illustrate the present stresses in relation to the permitted stresses for each component along the bridge. The whole excel sheets can be found in Appendix G. The graphs indicate that the box-girder web and the bottom plate exceed their load bearing capacity, whereas the other components appear to be fine. The inspection of the net section will offer more information about the workload of the components.

Figure 87: Load Factor for Plate over Box-Girder [P2]

Figure 88: Load Factor for the Box-Girder Web [P2]

Figure 89: Load Factor for Orthotropic Plate [P2]

Figure 90: Load Factor for Bottom Plate [P2]

Figure 91: Load Factor for Sidewalk [P2]

6.3 NET SECTION

6.3.1 Assumptions, Simplifications and Procedure

This check assessed the connection between the sections as the cross-section is weakened through rivets at this location. Within the sections, few fasteners are used, and the net section was assumed to be similar like the gross section. Therefore, the calculations were limited to the 18 locations where one section is connected to the next.

Like the gross section, the net section was examined with the equivalent stress and the stiffeners were neglected.

SOFiSTiK computed the stress at the end of the beam in one section and at the start of the beam in the next section. These values differed significantly at some connections. To cover the most unfavorable case, the check was performed with the higher stress of the two, if the cross section of both beams is equal. In some cases, the cross-section changes in between the two beams. When this was the case, the check was conducted for both locations with their respective stress.

The possibility that the connection plate fails also needed to be considered. That is why the cross-section area of the component was always compared to the one of the connection plates. As anticipated, the plates were always designed so that the component fails first.

As stated before, both beams are similar. Therefore, only the beam downstream was examined as it was already the case in the gross section. For the webs of the box-girder, the simplification goes further as only the inside web was considered. Although the outside web had higher stresses in some locations, the inside web had the same stresses on average and exhibited the highest overall value. As both webs have the same connections, the highest load factor was expected at the location of the highest stress, making the inner web decisive.

The check was performed by adding up the area of voids in the cross-section caused by rivets. With this area a net section was calculated and compared to the gross section. However, not all voids needed to be considered. In areas of compression, the weakening of the cross-section can be neglected completely. For shear the holes can be neglected as well, if the requirement from [S2] $A_{V,net} > \left(\frac{f_y}{0.9 f_u} \right) A_V$ is satisfied. Only in the tension area, the voids always must be taken into account.

To determine which rivets were used and to which degree the cross-section is weakened, [S8] was consulted. It provides an overview of historic symbols used in steel construction. On the right side the three different kinds of rivets used at the connections are pictured and outlined with blue, green and red. According to Table 21 the rivets in the lower picture have a hole diameter of 21 mm. They were only used to connect the sidewalks. The rivets in blue were only assembled in the connection of the bottom plate from section 9 to 10 and 10 to 11. They have a hole diameter of 25 mm. Finally, the rivets in green weaken the cross section by 23 mm and were used for the remaining connections.

Figure 92: Rivet Symbols from Inventory Documents [I23], [I21]

The stiffeners were connected by screws, but their net section was not considered as stated above.

Rohniet- $\varnothing$ (mm) d		8	10	12	14	16	18	20	22	24	27	30	33	36
$\varnothing$ des fertig geschlagenen Nietes = Loch- $\varnothing$ (mm) d ₁		8,4	11	13	15	17	19	21	23	25	28	31	34	37
Sinnbilder für	beiderseits Halbrundköpfe 2)													
	oberer Kopf versenkt													
	unterer Kopf versenkt													
	beide Köpfe versenkt													
	auf Baustelle zu schlagende Niete													
	auf Baustelle zu bohrende Nietlöcher													

Table 21: Historic Symbols for Rivet Connections [S8]

6.3.2 Check for Deck Plate, Orthotropic Plate and Sidewalk

These components on the upper side of the box-girder were mainly subjected to longitudinal stresses whereas shear only played a minor role. Therefore, the net-section was only calculated for the longitudinal stresses and in the tension area. Subsequently, a factor was generated by comparing the gross section to the net-section. Finally, the present stresses were increased by this factor to generate a new load factor. The following tables illustrate this procedure for the

connections of the 3 components. As one can see, for the areas of compression, highlighted in grey, no factor was generated, as the gross section was not reduced. Being in the upper part of the cross-section, this was the case for most connections. Moreover, it can be seen that the area of the connection plate was also calculated and was way bigger than the gross- or net-section.

Net Cross-Section Deck Plate							
Beam Number	Longitudinal Stress for Equivalent Stress	Cross-Section Area from SOFiSTiK[cm ²]	Area Connection Plate [cm ²]	Net Cross-Section Area	Factor	Old Load Factor	New Load Factor
7	Compression	360	446.12	277.2	-	0.65	0.65
13	Compression	360	446.12	277.2	-	0.895	0.895
19	Compression	360	446.12	277.2	-	0.946	0.946
25	Compression	360	446.12	277.2	-	0.889	0.889
31	Compression	360	446.12	277.2	-	0.766	0.766
37	Compression	360	446.12	277.2	-	0.699	0.699
43	Compression	360	446.12	277.2	-	0.341	0.341
49	Tension	360	446.12	277.2	1.299	0.618	0.803
55	Tension	360	446.12	277.2	1.299	0.904	1.174
61	Tension	360	446.12	277.2	1.299	0.899	1.168
67	Tension	360	446.12	277.2	1.299	0.597	0.775
73	Compression	360	446.12	277.2	-	0.342	0.342
79	Compression	360	446.12	277.2	-	0.698	0.698
85	Compression	360	446.12	277.2	-	0.769	0.769
91	Compression	360	446.12	277.2	-	0.889	0.889
97	Compression	360	446.12	277.2	-	0.946	0.946
103	Compression	360	446.12	277.2	-	0.873	0.873
109	Compression	360	446.12	277.2	-	0.638	0.638

Table 22: Load Factor for Net Section - Deck Plate [P2]

Net Cross-Section Orthotropic Plate							
Beam Number	Longitudinal Stress for Equivalent Stress	Cross-Section Area from SOFiSTiK[cm ²]	Area Connection Plate [cm ²]	Net Cross-Section Area	Factor	Old Load Factor	New Load Factor
7	Compression	369	465.2	280.68	-	0.434	0.434
13	Compression	369	465.2	280.68	-	0.544	0.544
19	Compression	369	465.2	280.68	-	0.593	0.593
25	Compression	369	465.2	280.68	-	0.605	0.605
31	Compression	369	465.2	280.68	-	0.563	0.563
37	Compression	369	465.2	280.68	-	0.479	0.479
43	Tension	369	465.2	280.68	1.315	0.624	0.820
49	Tension	369	465.2	280.68	1.315	0.746	0.981
55	Tension	369	465.2	280.68	1.315	0.942	1.238
61	Tension	369	465.2	280.68	1.315	0.928	1.220
67	Tension	369	465.2	280.68	1.315	0.746	0.981
73	Tension	369	465.2	280.68	1.315	0.625	0.822
79	Compression	369	465.2	280.68	-	0.484	0.484
85	Compression	369	465.2	280.68	-	0.576	0.576
91	Compression	369	465.2	280.68	-	0.601	0.601
97	Compression	369	465.2	280.68	-	0.596	0.596
103	Compression	369	465.2	280.68	-	0.548	0.548
109	Compression	369	465.2	280.68	-	0.422	0.422

Table 23: Load Factor for Net Section - Orthotropic Plate [P2]

Net Cross-Section Sidewalk							
Beam Number	Longitudinal Stress for Equivalent Stress	Cross-Section Area from SOFiSTiK[cm ²]	Area Connection Plate [cm ²]	Net Cross-Section Area	Factor	Old Load Factor	New Load Factor
7	Compression	315	586.6	252	-	0.543	0.543
13	Compression	315	586.6	252	-	0.725	0.725
19	Compression	315	586.6	252	-	0.798	0.798
25	Compression	315	586.6	252	-	0.775	0.775
31	Compression	315	586.6	252	-	0.695	0.695
37	Compression	315	586.6	252	-	0.591	0.591
43	Tension	315	586.6	252	1.250	0.420	0.525
49	Tension	315	586.6	252	1.250	0.527	0.659
55	Tension	315	586.6	252	1.250	0.756	0.945
61	Tension	315	586.6	252	1.250	0.758	0.948
67	Tension	315	586.6	252	1.250	0.526	0.658
73	Tension	315	586.6	252	1.250	0.421	0.526
79	Compression	315	586.6	252	-	0.592	0.592
85	Compression	315	586.6	252	-	0.719	0.719
91	Compression	315	586.6	252	-	0.776	0.776
97	Compression	315	586.6	252	-	0.798	0.798
103	Compression	315	586.6	252	-	0.724	0.724
109	Compression	315	586.6	252	-	0.519	0.519

Table 24: Load Factor for Net Section - Sidewalk [P2]

6.3.3 Check for Bottom Plate

As the components before, the bottom plate was mainly subjected to longitudinal stresses. Being on the bottom side of the cross-section, this time tension occurred in the field and not above the pillar. The procedure remained the same and the stresses were increased by the factor obtained from comparing A_{gross} to A_{net} . Whereas the plate thickness was constant for the three components before, the thickness of the bottom plate changes. This means, the area from the connection plates and components had to be determined for each connection. In addition, filler plates were welded on top of the bottom plate to provide a flat surface for the connection plates and to increase the cross-section area of the component. These plates were included in the determination of the net section but were no part of the SOFiSTiK model. As a consequence, the stresses calculated by SOFiSTiK are higher than the actual stresses and the factor obtained from comparing A_{gross} to A_{net} can be less than one.

In Table 25 it can also be seen that for some connections the check was performed twice. The reason is that, at these locations, the bottom plate was modelled with a different plate thickness before and after the connection resulting in different stresses. In this case the check was also performed before and after the connection.

Net Cross-Section Bottom Plate							
Beam Number	Longitudinal Stress for Equivalent Stress	Cross-Section Area from SOFiSTiK[cm ²]	Area Connection Plate [cm ²]	Net Cross-Section Area	Factor	Old Load Factor	New Load Factor
6	Tension	400	624	426	0.939	1.333	1.252
7	Tension	600	624	426	1.408	1.021	1.438
13	Tension	740	1128	735	1.007	1.296	1.305
19	Tension	860	1128	866.4	0.993	1.312	1.302
25	Tension	790	1128	839	0.942	1.329	1.251
31	Tension	720	789.6	605	1.190	1.189	1.415
36	Tension	420	624	309	1.359	1.114	1.514
37	Tension	300	624	309	0.971	1.406	1.365
43	Compression	-	-	-	1.000	1.001	1.001
49	Compression	-	-	-	1.000	1.042	1.042
55	Compression	-	-	-	1.000	1.075	1.075
61	Compression	-	-	-	1.000	1.082	1.082
67	Compression	-	-	-	1.000	1.041	1.041
73	Compression	-	-	-	1.000	1.003	1.003
79	Tension	300	624	309	0.971	1.399	1.358
84	Tension	520	789.6	605	0.860	1.457	1.252
85	Tension	720	789.6	605	1.190	1.184	1.409
91	Tension	790	1128	839	0.942	1.327	1.249
97	Tension	860	1128	866.4	0.993	1.311	1.301
102	Tension	790	1128	735	1.075	1.217	1.308
103	Tension	740	1128	735	1.007	1.299	1.308
109	Tension	600	624	426	1.408	1.027	1.446

Table 25: Load Factor for Net Section - Bottom Plate [P2]

6.3.4 Check for Box-Girder Web

This component was calculated different than the others. As it has a linear stress distribution with tension at the bottom side and compression at the top or inverted. Therefore, the number of rivets in the tension area changes depending on the stresses and needed to be determined for each connection. Furthermore, the component extends in vertical direction which means, subtracting the holes of the rivets on the tension side will change the centroid of the cross-section and the distribution of stresses. Normally, an iterative approach would be necessary but here only one step was conducted.

The stresses at the top and bottom were copied from SOFiSTiK and the number of rivets in the tension area was determined subsequently by assuming a linear distribution. The new section properties were calculated, and a new section modulus W_y was defined at the top and bottom side as the net section was not symmetrical anymore. Finally, by comparing the $W_{y, gross}$ to $W_{y, net}$ a factor was generated for the top and bottom side to obtain the new stresses at the two

locations. This procedure was performed for the load combinations max M_y , min M_y , max M_z , min M_z , max V_z and min V_z as shear also had to be considered.

The condition $A_{V,net} > \left(\frac{f_y}{0.9f_u} \right) A_V$ for shear was not satisfied which required an increase of the shear stress as well. The factor for shear is depicted in Table 26 along with the factors for the longitudinal stresses.

The excel sheet in which the stress factors were determined, and the load combinations were compared is presented in Appendix H. Table 26 only shows a brief summary of the results. As stated before, only the inside web was evaluated.

Net Cross-Section Inside Web						
Beam Number	Factor Shear	Factor Longitudinal Stress	Max Net Equivalent Stress	Equivalent Stress Gross Section	Factor Compared to Gross Section	Load Factor
7	1.108	1.132	526.70	471.80	1.116	1.484
13	1.108	1.164	527.80	459.60	1.148	1.487
19	1.096	1.164	530.20	463.00	1.145	1.494
25	1.097	1.158	537.10	471.20	1.140	1.513
31	1.086	1.141	478.90	425.70	1.125	1.349
37	1.077	1.145	474.60	419.20	1.132	1.337
43	1.078	1.055	371.10	354.70	1.046	1.045
49	1.078	1.059	391.60	373.00	1.050	1.103
55	1.072	1.036	404.70	393.70	1.028	1.140
61	1.072	1.037	408.00	396.30	1.030	1.149
67	1.078	1.059	392.70	373.90	1.050	1.106
73	1.078	1.054	372.00	355.60	1.046	1.048
79	1.077	1.134	529.20	468.30	1.130	1.491
85	1.086	1.125	575.50	518.20	1.111	1.621
91	1.097	1.158	536.90	468.80	1.145	1.512
97	1.096	1.164	530.10	463.00	1.145	1.493
103	1.108	1.165	528.80	462.00	1.145	1.490
109	1.108	1.154	425.90	375.60	1.134	1.200

Table 26: Load Factor for Net Section - Inside Web of Box Girder [P2]

6.4 RIVET CONNECTIONS

6.4.1 Procedure

After reviewing the net section at the rivet connections for the connection plates and components, the rivets itself were the subject of interest. The check is comparatively simple. Each rivet has a resistance against shearing and hole bearing and is not allowed to be under tension.

The number of rivets multiplied with their individual strength produced the strength of the whole connection which was compared with the acting force on the connection.

The load bearing capacity of the rivet was determined according to the formulas provided in Figure 93 on the right. The smaller value was decisive as it belongs to the failure that appears first. With the values $\alpha_r = 0.6$; $f_{ur,k} = 440 \text{ N/mm}^2$ and $\gamma_{M,2} = 1.25$ the resistance against shear was as follows:

$$F_{V,Rd} = \alpha_r \cdot \frac{f_{ur,k} \cdot A_o}{\gamma_{M,2}}$$

$$F_{b,Rd} = k_1 \cdot \alpha_b \cdot \frac{f_{u,k} \cdot d \cdot t}{\gamma_{M,2}}$$

Figure 93: Resistance of a Rivet against Shear (top) and Hole Bearing (bottom) [S3]

- $F_{V,Rd} (d=20\text{mm}) = 73.1 \text{ kN}$
- $F_{V,Rd} (d=22\text{mm}) = 87.6 \text{ kN}$
- $F_{V,Rd} (d=24\text{mm}) = 103.7 \text{ kN}$

The factors k_1 and α_b for hole bearing are dependent on the geometry and had to be defined individually for each connection and component. They are explained in detail in [S2] but are not discussed here as $F_{b,Rd}$ was always higher than $F_{V,Rd}$ and for this reason not decisive for the check of the rivet connections. Nevertheless, $F_{b,Rd}$ was calculated for each connection to ensure that there is no exception.

The force acting upon the connection was simply determined by multiplying the maximum longitudinal stress computed by SOFiSTiK with the cross-section area from the model. Shear was insignificant in these components and was not included in the check.

6.4.2 Rivet Connections of the Deck, Sidewalk and Bottom Plate

The tables below illustrate the check for the four components. It can be seen that the calculated values for $F_{b,Rd}$ are significantly higher than $F_{V,Rd}$. The rivets in the bottom plate appear to exceed their capacity clearly whereas in the other components, the stress in the rivets is only slightly above the limit.

As it was already the case in the net section, the variable cross-section area of the bottom plate required a more detailed examination of several connections. In addition, two different types of rivets were assembled in the connections of section 9 - 10 and 10 – 11 (Beam 55 and 61).

Rivet Connection Deck Plate Box-Girder															
Beam Number	Rivets/Conne ction	Shear Strength/ Rivet [kN]	Shear joints	e1 [mm]	p1 [mm]	e2 [mm]	p2 [mm]	F _{b,Rd} / Rivet Edge [kN]	F _{b,Rd} /Rivet Inside [kN]	Max Tension [N/mm ²]	Max Compression [N/mm ²]	Area Deck Plate [mm ²]	F _{v,Ed} Rivet Connection [kN]	F _{v,Rd} Rivet Connection [kN]	Load Factor
7	60	87.6	2	50	80	40	80	196.1	242.9	1.00	-219.80	36000	7913	10512	0.753
13	60	87.6	2	50	80	40	80	196.1	242.9	1.70	-306.20	36000	11023	10512	1.049
19	60	87.6	2	50	80	40	80	196.1	242.9	2.10	-335.80	36000	12089	10512	1.150
25	60	87.6	2	50	80	40	80	196.1	242.9	2.90	-313.90	36000	11300	10512	1.075
31	60	87.6	2	50	80	40	80	196.1	242.9	4.00	-261.20	36000	9403	10512	0.895
37	60	87.6	2	50	80	40	80	196.1	242.9	74.60	-245.20	36000	8827	10512	0.840
43	60	87.6	2	50	80	40	80	196.1	242.9	84.40	-108.10	36000	3892	10512	0.370
49	60	87.6	2	50	80	40	80	196.1	242.9	181.30	-7.50	36000	6527	10512	0.621
55	60	87.6	2	50	80	40	80	196.1	242.9	315.50	-10.00	36000	11358	10512	1.080
61	60	87.6	2	50	80	40	80	196.1	242.9	313.80	-10.00	36000	11297	10512	1.075
67	60	87.6	2	50	80	40	80	196.1	242.9	181.60	-7.50	36000	6538	10512	0.622
73	60	87.6	2	50	80	40	80	196.1	242.9	85.40	-109.50	36000	3942	10512	0.375
79	60	87.6	2	50	80	40	80	196.1	242.9	74.70	-245.00	36000	8820	10512	0.839
85	60	87.6	2	50	80	40	80	196.1	242.9	4.20	-266.20	36000	9583	10512	0.912
91	60	87.6	2	50	80	40	80	196.1	242.9	2.90	-315.10	36000	11344	10512	1.079
97	60	87.6	2	50	80	40	80	196.1	242.9	2.10	-335.80	36000	12089	10512	1.150
103	60	87.6	2	50	80	40	80	196.1	242.9	1.70	-306.50	36000	11034	10512	1.050
109	60	87.6	2	50	80	40	80	196.1	242.9	0.80	-215.90	36000	7772	10512	0.739

Table 27: Load Factor for Rivet Connections - Deck Plate [P2]

Rivet Connection Orthotropic Deck															
Beam Number	Rivets/Conne- ction	Shear Strength/ Rivet [kN]	Shear joints	e1 [mm]	p1 [mm]	e2 [mm]	p2 [mm]	F _{b,Rd} /Rivet Edge [kN]	F _{b,Rd} /Rivet Inside [kN]	Max Tension [N/mm ²]	Max Compresso n [N/mm ²]	Area Orthotropic Deck [mm ²]	F _{v,Ed} Rivet Connectio n [kN]	F _{v,Rd} Rivet Connectio n [kN]	Load Factor
7	63	87.6	2	50	80	75	90	196.1	242.9	20.40	-132.60	36900	4893	11038	0.443
13	63	87.6	2	50	80	75	90	196.1	242.9	26.50	-188.80	36900	6967	11038	0.631
19	63	87.6	2	50	80	75	90	196.1	242.9	32.00	-210.60	36900	7771	11038	0.704
25	63	87.6	2	50	80	75	90	196.1	242.9	26.30	-213.50	36900	7878	11038	0.714
31	63	87.6	2	50	80	75	90	196.1	242.9	28.10	-196.10	36900	7236	11038	0.656
37	63	87.6	2	50	80	75	90	196.1	242.9	134.70	-162.20	36900	5985	11038	0.542
43	63	87.6	2	50	80	75	90	196.1	242.9	213.60	-27.60	36900	7882	11038	0.714
49	63	87.6	2	50	80	75	90	196.1	242.9	253.80	-21.20	36900	9365	11038	0.848
55	63	87.6	2	50	80	75	90	196.1	242.9	329.90	-33.40	36900	12173	11038	1.103
61	63	87.6	2	50	80	75	90	196.1	242.9	325.30	-37.70	36900	12004	11038	1.088
67	63	87.6	2	50	80	75	90	196.1	242.9	254.20	-21.60	36900	9380	11038	0.850
73	63	87.6	2	50	80	75	90	196.1	242.9	213.80	-28.80	36900	7889	11038	0.715
79	63	87.6	2	50	80	75	90	196.1	242.9	134.90	-168.40	36900	6214	11038	0.563
85	63	87.6	2	50	80	75	90	196.1	242.9	29.00	-200.70	36900	7406	11038	0.671
91	63	87.6	2	50	80	75	90	196.1	242.9	26.50	-213.50	36900	7878	11038	0.714
97	63	87.6	2	50	80	75	90	196.1	242.9	31.80	-210.50	36900	7767	11038	0.704
103	63	87.6	2	50	80	75	90	196.1	242.9	25.80	-189.20	36900	6981	11038	0.633
109	63	87.6	2	50	80	75	90	196.1	242.9	19.80	-129.30	36900	4771	11038	0.432

Table 28: Load Factor for Rivet Connections - Orthotropic Deck [P2]

Rivet Connection Sidewalk															
Beam Number	Rivets/Conne- ction	Shear Strength/ Rivet [kN]	Shear joints	e1 [mm]	p1 [mm]	e2 [mm]	p2 [mm]	F _{b,Rd} /Rivet Edge [kN]	F _{b,Rd} /Rivet Inside [kN]	Max Tension [N/mm²]	Max Compression [N/mm²]	Area Sidewalk [mm²]	F _{v,Ed} Rivet Connection [kN]	F _{v,Rd} Rivet Connection [kN]	Load Factor
7	60	73.1	2	44	90	52	100	143.6	184.8	0.80	-192.90	31500	6076	8772	0.693
13	60	73.1	2	44	90	52	100	143.6	184.8	2.60	-257.50	31500	8111	8772	0.925
19	60	73.1	2	44	90	52	100	143.6	184.8	16.20	-283.40	31500	8927	8772	1.018
25	60	73.1	2	44	90	52	100	143.6	184.8	35.80	-275.30	31500	8672	8772	0.989
31	60	73.1	2	44	90	52	100	143.6	184.8	62.40	-246.70	31500	7771	8772	0.886
37	60	73.1	2	44	90	52	100	143.6	184.8	105.20	-209.80	31500	6609	8772	0.753
43	60	73.1	2	44	90	52	100	143.6	184.8	149.20	-116.10	31500	4700	8772	0.536
49	60	73.1	2	44	90	52	100	143.6	184.8	187.00	-18.10	31500	5891	8772	0.672
55	60	73.1	2	44	90	52	100	143.6	184.8	268.30	-3.70	31500	8451	8772	0.963
61	60	73.1	2	44	90	52	100	143.6	184.8	269.00	-3.80	31500	8474	8772	0.966
67	60	73.1	2	44	90	52	100	143.6	184.8	186.80	-18.70	31500	5884	8772	0.671
73	60	73.1	2	44	90	52	100	143.6	184.8	149.40	-116.60	31500	4706	8772	0.536
79	60	73.1	2	44	90	52	100	143.6	184.8	105.60	-210.30	31500	6624	8772	0.755
85	60	73.1	2	44	90	52	100	143.6	184.8	65.30	-255.10	31500	8036	8772	0.916
91	60	73.1	2	44	90	52	100	143.6	184.8	36.00	-275.60	31500	8681	8772	0.990
97	60	73.1	2	44	90	52	100	143.6	184.8	16.30	-283.20	31500	8921	8772	1.017
103	60	73.1	2	44	90	52	100	143.6	184.8	2.60	-257.00	31500	8096	8772	0.923
109	60	73.1	2	44	90	52	100	143.6	184.8	-0.10	-184.30	31500	5805	8772	0.662

Table 29: Load Factor for Rivet Connections - Sidewalk [P2]

Rivet Connection Bottom Plate Box-Girder																
Beam Number	Rivets/Connection	Shear Strength/Rivet [kN]	Shear Joints	e1 [mm]	p1 [mm]	e2 [mm]	p2 [mm]	t _{av} [mm]	F _{b,Rd} /Rivet Edge [kN]	F _{b,Rd} /Rivet Inside [kN]	Max Tension [N/mm ²]	Max Compression [N/mm ²]	Area Bottom Plate [mm ²]	F _{v,Ed} Rivet Connection [kN]	F _{v,Rd} Rivet Connection [kN]	Load Factor
7	60	87.6	2	50	80	70	90	13.33	217.53	269.81	461.50	-1.70	40000	18460	10512	1.756
7	60	87.6	2	50	80	70	90	20.00	326.38	404.82	361.10	-1.70	60000	21666	10512	2.061
13	120	87.6	2	50	80	70	90	24.67	402.59	499.35	459.70	-2.20	74000	34018	21024	1.618
19	120	87.6	2	50	80	70	90	28.67	467.87	580.31	465.50	-2.90	86000	40033	21024	1.904
25	120	87.6	2	50	80	70	90	26.33	429.68	532.95	471.30	-3.90	79000	37233	21024	1.771
31	90	87.6	2	50	80	70	90	24.00	391.66	485.78	421.00	-41.80	72000	30312	15768	1.922
37	60	87.6	2	50	80	70	90	14.00	228.47	283.37	390.90	-161.80	42000	16418	10512	1.562
37	60	87.6	2	50	80	70	90	10.00	163.19	202.41	493.20	-217.90	30000	14796	10512	1.408
43	60	87.6	2	50	80	70	90	10.00	163.19	202.41	189.90	-349.30	30000	10479	10512	0.997
49	90	87.6	2	50	80	70	90	22.00	359.02	445.30	9.40	-362.80	66000	23945	15768	1.519
55	30+120	87.6 & 103.7	2	50	80	70	90	40.00	652.76	809.64	8.90	-378.50	120000	45420	30144	1.507
61	30+120	87.6 & 103.7	2	50	80	70	90	40.00	652.76	809.64	9.20	-381.10	120000	45732	30144	1.517
67	90	87.6	2	50	80	70	90	22.00	359.02	445.30	9.10	-363.70	66000	24004	15768	1.522
73	60	87.6	2	50	80	70	90	10.00	163.19	202.41	191.30	-350.20	30000	10506	10512	0.999
79	60	87.6	2	50	80	70	90	10.00	163.19	202.41	490.90	-218.50	30000	14727	10512	1.401
85	90	87.6	2	50	80	70	90	17.33	282.81	350.78	514.90	-51.10	52000	26775	15768	1.698
85	90	87.6	2	50	80	70	90	24.00	391.66	485.78	420.30	-41.60	72000	30262	15768	1.919
91	120	87.6	2	50	80	70	90	26.33	429.68	532.95	471.10	-3.90	79000	37217	21024	1.770
97	120	87.6	2	50	80	70	90	28.67	467.87	580.31	465.30	-2.80	86000	40016	21024	1.903
103	120	87.6	2	50	80	70	90	26.33	429.68	532.95	432.00	-2.00	79000	34128	21024	1.623
103	120	87.6	2	50	80	70	90	24.67	402.59	499.35	460.10	-2.10	74000	34047	21024	1.619
109	60	87.6	2	50	80	70	90	20.00	326.38	404.82	360.20	-1.50	60000	21612	10512	2.056

Table 30: Load Factor for Rivet Connections - Bottom Plate [P2]

6.4.3 Rivet Connections of the Box Girder Web

Once again, the web had to be calculated in a different way than the other components. The linear distribution of stresses resulted in different forces acting on each rivet. To cover the most unfavorable case the force on the outer rivet was calculated as it is subjected to the highest stress. The corresponding area for that rivet was the distance to the end of the web and half the distance to the next rivet. By multiplying it with the maximum stress, the force on the rivet was computed.

For the web, shear also had to be included. The shear stress was obtained from the same loading case as the maximum stress and distributed evenly on all rivets. With the Pythagorean Theorem the resulting force on the rivet was determined

Rivet Connection Box Girder Web																		
Beam Number	Rivets/Conne ction	Shear Strength/ Rivet [kN]	Shear Joints	e1 [mm]	p1 [mm]	e2 [mm]	p2 [mm]	F _{b,Rd} /Rivet Edge [kN]	F _{b,Rd} /Rivet Inside [kN]	Max Stress Top/Bot [N/mm ²]	Corresp. Shear Stress [N/mm ²]	#h [mm]	Area for Outer Rivet [mm ²]	F _{v,Ed} from Max Stress [kN]	F _{v,Ed} from Shear [kN]	Total F _{v,Ed} for Outer 2 Rivets [kN]	F _{v,Rd} Rivet Connection [kN]	Load Factor
7	64	87.6	2	50	80	55	80	163.2	202.4	453.00	61.10	2692	1050	475.65	25.70	476.34	350.40	1.359
13	68	87.6	2	50	80	55	80	163.2	202.4	449.50	36.70	2860	985	442.76	15.44	443.03	350.40	1.264
19	70	87.6	2	50	80	55	80	163.2	202.4	455.00	14.10	3029	995	452.73	6.10	452.77	350.40	1.292
25	74	87.6	2	50	80	55	80	163.2	202.4	461.50	-29.40	3200	975	449.96	-12.71	450.14	350.40	1.285
31	76	87.6	2	50	80	55	80	163.2	202.4	413.10	-44.50	3375	975	402.77	-19.76	403.26	350.40	1.151
37	78	87.6	2	50	80	55	80	163.2	202.4	407.00	-48.50	3553	975	396.83	-22.09	397.44	350.40	1.134
43	82	87.6	2	50	80	55	80	163.2	202.4	-345.40	-38.00	3722	1000	345.40	-17.25	345.83	350.40	0.987
49	86	87.6	2	50	80	55	80	163.2	202.4	-357.80	-53.10	3910	1000	357.80	-24.14	358.61	350.40	1.023
55	96	87.6	2	50	80	55	80	163.2	202.4	-372.00	-66.70	4433	1065	396.18	-30.80	397.38	350.40	1.134
61	96	87.6	2	50	80	55	80	163.2	202.4	-374.70	67.00	4433	1065	399.06	30.94	400.25	350.40	1.142
67	86	87.6	2	50	80	55	80	163.2	202.4	-358.70	53.20	3910	1000	358.70	24.19	359.51	350.40	1.026
73	82	87.6	2	50	80	55	80	163.2	202.4	-346.40	38.00	3722	1000	346.40	17.25	346.83	350.40	0.990
79	78	87.6	2	50	80	55	80	163.2	202.4	461.20	43.60	3553	975	449.67	19.86	450.11	350.40	1.285
85	76	87.6	2	50	80	55	80	163.2	202.4	506.80	41.40	3375	975	494.13	18.38	494.47	350.40	1.411
91	74	87.6	2	50	80	55	80	163.2	202.4	461.30	29.00	3200	975	449.77	12.54	449.94	350.40	1.284
97	70	87.6	2	50	80	55	80	163.2	202.4	454.80	-14.40	3029	995	452.53	-6.23	452.57	350.40	1.292
103	68	87.6	2	50	80	55	80	163.2	202.4	449.90	-37.10	2860	985	443.15	-15.60	443.43	350.40	1.265
109	64	87.6	2	50	80	55	80	163.2	202.4	352.00	-66.50	2692	1050	369.60	-27.97	370.66	350.40	1.058

Table 31: Load Factor for Rivet Connections - Box Girder Web [P2]

6.5 BUCKLING

6.5.1 General Remarks

All buckling verifications were conducted according to stage 1 of the “Guideline for the Recalculation of existing road bridges” [S3]. Paragraph 13.7.2 refers to [S2] where all verification calculations are explained in detail. For steel bridges, normally the reduced stresses method in III-10 of [S2] is applied. This method is necessary whenever the buckling field does not meet the conditions for cross-section class 3 for components under compression.

$$\sqrt{\left(\frac{\sigma_{x,Ed}}{\rho_x f_y / \gamma_{M1}}\right)^2 + \left(\frac{\sigma_{z,Ed}}{\rho_z f_y / \gamma_{M1}}\right)^2 - \left(\frac{\sigma_{x,Ed}}{\rho_x f_y / \gamma_{M1}}\right)\left(\frac{\sigma_{z,Ed}}{\rho_z f_y / \gamma_{M1}}\right) + 3\left(\frac{\tau_{Ed}}{\chi_v f_y / \gamma_{M1}}\right)^2} \leq 1$$

Figure 94: Verification Formula for Reduced Stresses Method according to III-10 of [S2]

As the verification formula in Figure 94 demonstrates, the material strength f_y is reduced by the factors ρ_x , ρ_z and χ_v . The reduction factors ρ_x and ρ_z are obtained by an interaction that considers column-like behaviour and plate buckling whereas χ_v considers shear buckling. The whole process to obtain these three values is not described further as it was very complex and displaying all the applied formulas would occupy too much space. The buckling verification is explained in detail in the DIN FB-103 Chapter III [S2] and the DIN EN 1993-1-5 [S7]. For further examination of the reduced stresses method [L18] can be consulted where example calculations are conducted and explained. The following buckling verifications were also conducted with assistance of [L18].

In general buckling only occurs under compression. Therefore, only the components under compression were examined. In Addition, all signs in the excel sheets are inverted, as the employed formulas required tensile stresses to be negative and compressive stresses to have positive signs.

As there was no σ_z the three brackets in the middle fell away. A further simplification was made for all components except the box-girder web, because they all had a low shear stress. In this case only the first bracket remained.

The connection between the 19 sections is always in between two cross beams and therefore in the middle of a buckling field. With the connection plates stiffening these fields against lateral evasion, they were not considered in the calculations.

6.5.2 Box-Girder Web

As it was the case in the other chapters, the box-girder web required special considerations. To reduce the effort, only the inside web of the box-girder was assessed as it had higher stresses. In addition, only the field with the highest stress per section was chosen for evaluation.

6.5.2.1 Local Buckling for the Subpanels

In the box girder web, stiffeners restrain buckling partly. Therefore, the buckling fields between two vertical stiffeners had to be examined in two steps. The first one was local buckling of the subpanels between the longitudinal stiffeners. On the right the buckling field of beam 11 between two vertical stiffeners (Pos. 74 & 75) is shown. The field is divided into subpanels by the longitudinal stiffeners. For the local buckling, these subpanels were treated as individual buckling fields. The global buckling of the whole field was examined subsequently.

Figure 95: Buckling Field with its Respective Subpanels [118]

With the geometry of the subpanels obtained from the inventory documents and the stresses at the top and bottom of the web obtained from SOFiSTiK, the stresses at the top and bottom of each subpanel could be defined by linear interpolation. Since the height of the web changes linearly, the higher value of the right and left side was assumed, as it was the unfavorable case. The same strategy was applied for the stresses between the beginning and end of a beam.

With the border stresses of the subpanels Ψ_x was determined, the check for cross-section class 3 (QKL 3) could be performed and the verification for local buckling was possible. Subpanels that were completely in the tension area were not considered. This was also the case for all subpanels that met the requirements of QKL 3.

Figure 96 shows the load factor of the decisive subpanel for each buckling field. The whole excel sheet can be found in Appendix I where all subpanels were examined. The excel sheets for the other buckling verifications are also provided there.

Figure 96: Load Factor for Decisive Subpanel in Each Buckling Field [P2]

6.5.2.2 Global Buckling

The global buckling includes the influence of the longitudinal stiffeners. They have a certain stiffness that hinders the evasion of the web. To produce a global buckling form beyond the buckling of a single subpanel, the stiffeners must escape laterally. Therefore, the global buckling analysis examines the resistance of the stiffener in the compression zone. If more than one stiffener is under compression, the one closest to the edge is examined. It experiences the highest compressive force and will fail before the other stiffeners.

The stiffener itself and the corresponding effective part of the web form a beam whose cross section values were calculated and critical buckling stress $\sigma_{cr,st}$ was determined. By linear extrapolation, the corresponding compressive stress $\sigma_{cr,c}$ at the edge of the web was defined (compare Figure 97).

Figure 97: Determination of $\sigma_{cr,c}$ for a Stiffener under Compression [S2]

Together with the buckling values α_{cr} and $\sigma_{cr,p}$ that were determined with the help of EBPlate, the reduction factors could be calculated and the verification formula from Figure 93 was applied. This procedure was performed for the same buckling fields whose subpanels were evaluated in the previous step. Figure 98 compares the load factors from the global buckling analysis (dark blue) with the ones obtained from local buckling (grey). A significant increase can be observed. See Appendix I for the excel sheet with the detailed calculation.

Figure 98: Comparison of Local and Global Buckling [P2]

6.5.3 Bottom Plate and Deck Plate

These components had in common that, unlike the web, they had constant stresses in lateral direction. The bottom plate experiences compression above the pillar and was only evaluated at this location. The deck plate is at the top side of the superstructure and experiences compression in the field. Furthermore, all components had small shear stresses that were neglected in the buckling analysis. That facilitated the procedure as no reduction factor for shear was necessary and the verification formula from Figure 94 was reduced to the first bracket.

Due to the constant compressive stress, all stiffeners received the same compression which is why all stiffeners had the same values for $\sigma_{cr,st}$. In addition, no extrapolation for $\sigma_{cr,c}$ was necessary and it equaled $\sigma_{cr,st}$.

As described before, the bottom plate changes its thickness various times and has reinforcing plates welded to it. These reinforcing plates strengthen the cross-section locally and only occur between two stiffeners. For this reason, the plate thickness for the verification calculations was included as average thickness from the bottom plate and the reinforcing plates.

Finally, α_{cr} and $\sigma_{cr,p}$ were determined with EBPlate and the reduction factors were calculated considering column like behaviour and plate buckling. The following graphs show the results whereas Appendix I contains the corresponding excel sheets. In Appendix J the output of EBPlate is illustrated exemplary for beam 58 of the bottom plate.

Figure 99: Load Factor for Global Buckling of the Bottom Plate [P2]

Figure 100: Load Factor for Global Buckling of the Deck Plate [P2]

Evaluating the results of the deck plate, it should be noted that they are too conservative, as the impact of the road surface was not considered. Usually, a composite action between the paving and the deck plate obstructs the buckling of the plate. Including this effect, the load factors of the sidewalk, deck plate and orthotropic plate could be reduced. Since the results of the deck plate were already far below the results of the web and the bottom plate, the other components of the upper chord are not evaluated. They have lower stresses than the deck plate and are not decisive.

6.5.4 Suggestion for Further Buckling Analysis

In the previous calculations it was assumed that the vertical stiffeners provide a sufficient support for the longitudinal stiffeners and serve as clamping for the buckling field. This assumption usually needs to be verified. [S2] Chapter II-9 addresses the requirements for stiffeners in longitudinal and vertical direction. If the requirements are not met, the vertical stiffeners need to be neglected or considered as springs with reduced stiffness. In this case, several buckling field might act together on the length of two or three crossbeam axes. In addition, the edges of the buckling field could not be considered as clamped anymore.

For the longitudinal stiffeners the procedure is similar. If they do not meet the requirements in their stiffness, they should be neglected as well. That means, there is no local buckling of the subpanels as they are not divided by stiffeners anymore.

To remain within the scope of the thesis, all checks neglected some components of the superstructure that were assumed not to be decisive. For the buckling analysis one of those components was the sidewalk. Even though the stresses in the sidewalk are lower than in the evaluated components, the dimensions (stiffener height, plate thickness and width) are unfavorable and might lead to higher load factors.

6.6 FATIGUE CHECK

6.6.1 Procedure

The fatigue check examines the resistance of a connection against alternating stresses that are caused by the crossings of heavy vehicles. Throughout their lifespan, the components of a bridge are subjected to numerous of those stress cycles and can fail below their yield strength by the accumulation of fatigue damages caused from each crossing.

In contrast to all the checks performed previously, the fatigue check was only conducted with the loads from heavy vehicle traffic. All other loads either have a small number of repetitions (temperature, wind etc.) or do not cause stress cycles at all (self-weight, settlement etc.). To obtain the right stresses for this calculation, an own load model was designed. The LM3 described in section 5.2.9 realistically simulates the crossing of a 480kN truck and provides the decisive stress ranges. The values that this fatigue check was based on are shown in Figure 101.

Figure 101: Stress Ranges for Top and Bottom Part of the Superstructure [P1]

The two components pictured above exhibit the highest stress ranges and are the only ones that were evaluated. As compression does not promote the crack formation as much as tension, the compressive part of the stress range only needs to be considered with 60%. Furthermore, only the connections between the sections were calculated.

The fatigue check was performed according to [S2] II-9 and the verification formula in Figure 102.

γ_{Mf} and γ_{Ff} are safety factors and equalled 1.15 and 1.0. $\Delta\sigma_c$ was obtained by assigning a notch type to the connection that determines its fatigue strength. The last value $\Delta\sigma_{E,2}$ was calculated by multiplying the stress range with a λ value. λ consists of the 4 values λ_1 , λ_2 , λ_3 and λ_4 that were multiplied to get the final λ value. Finally, it was compared with λ_{max} and the smaller one was decisive.

$$\gamma_{Ff} \Delta\sigma_{E,2} \leq \Delta\sigma_c / \gamma_{Mf}$$

and

$$\gamma_{Ff} \Delta\tau_{E,2} \leq \Delta\tau_c / \gamma_{Mf}$$

Figure 102: Fatigue Check [S2]

The second term for shear was calculated similarly. However, the shear stress range only needs to be considered if it exceeds 15% of the longitudinal stress range. This check was conducted to evaluate the necessity for an interaction.

Once the shear value exceeded the limit, the interaction was performed with the formula on the right. The connections that did not require an interaction were colored grey in the Tables 32 and 33. In this case, no interaction was performed and the load factor from longitudinal stress was decisive.

$$\left[\frac{\gamma_{Ff} \cdot \Delta\sigma_{E2}}{\Delta\sigma_c / \gamma_{Mf}} \right]^3 + \left[\frac{\gamma_{Ff} \cdot \Delta\tau_{E2}}{\Delta\tau_c / \gamma_{Mf}} \right]^5 \leq 1$$

Figure 103: Formula for Fatigue Interaction of Shear and Longitudinal Stress [S2]

6.6.2 Fatigue Check for Bottom Plate

Rivet connections under shear and longitudinal stresses are classified in notch type 71 resulting in a $\Delta\sigma_c$ of 71 N/mm² for both shear and longitudinal stress. The stress ranges were already depicted in Figure 99. The λ factors were calculated for the areas of negative moments above the pillar and positive moments in the field. Table 32 shows the results of the fatigue analysis. The shear stress exceeds the 15% limit at few locations and only where the longitudinal stress range is small. Nevertheless, the interaction at these locations was performed as described above.

Fatigue Check Bottom Plate											
Beam Number	Max σ	Min σ	$\Delta\sigma_p$	$\Delta\tau_{E2}$	% of $\Delta\sigma_p$	λ	$\gamma_{Mf} \cdot \Delta\sigma_{E,2}$	$\Delta\sigma_c / \gamma_{Mf}$	Load Factor for $\Delta\tau$	Load Factor for $\Delta\sigma$	Load Factor from Interaction
7	33.8	-5.0	36.8	16.5	44.84	2.00	73.60	61.74	0.534	1.192	1.738
13	42.9	-5.9	46.4	7.5	16.15	2.00	92.88	61.74	0.243	1.504	3.405
19	59.4	-7.2	63.7	4.8	7.53	2.00	127.44	61.74	0.155	2.064	2.064
25	65.9	-9.6	71.7	4.8	6.70	2.00	143.32	61.74	0.155	2.321	2.321
31	65.7	-12.0	72.9	4.5	6.17	2.00	145.80	61.74	0.146	2.362	2.362
37	92.3	-22.9	106.0	10.6	10.00	2.00	212.08	61.74	0.343	3.435	3.435
43	75.5	-24.7	90.3	12.1	13.40	2.00	180.64	61.74	0.392	2.926	2.926
49	33.1	-16.7	43.1	9.5	22.03	2.00	86.24	61.74	0.308	1.397	2.728
55	12.5	-15.5	21.8	4.7	21.56	1.92	41.92	61.74	0.146	0.679	0.313
61	15.5	-12.2	22.8	5.5	24.10	1.92	43.88	61.74	0.171	0.711	0.359
67	35.1	-17.5	45.6	9.1	19.96	2.00	91.20	61.74	0.295	1.477	3.225
73	72.1	-25.7	87.5	11.4	13.03	2.00	175.04	61.74	0.369	2.835	2.835
79	90.5	-23.9	104.8	11.0	10.49	2.00	209.68	61.74	0.356	3.396	3.396
85	78.3	-15.7	87.7	8.4	9.58	2.00	175.44	61.74	0.272	2.842	2.842
91	66.7	-10.1	72.8	5.4	7.42	2.00	145.52	61.74	0.175	2.357	2.357
97	67.2	-7.6	71.8	5.9	8.22	2.00	143.52	61.74	0.191	2.325	2.325
103	73.9	-6.1	77.6	7.4	9.54	2.00	155.12	61.74	0.240	2.512	2.512
109	86.3	-3.9	88.6	8.4	9.48	2.00	177.28	61.74	0.272	2.871	2.871

Table 32: Fatigue Check for Bottom Plate [P2]

6.6.3 Fatigue Check for Deck Plate

The procedure remained the same as for the bottom plate, only that the interaction was necessary for most of the connections. Even though the shear stress ranges are comparable to those in the bottom plate they exceed the 15% limit more often because the longitudinal stress ranges are considerably lower.

Fatigue Check Deck Plate of Box Girder											
Beam Number	Min σ	Max σ	$\Delta\sigma_p$	$\Delta\tau_{E2}$	% of $\Delta\sigma_p$	λ	$\gamma_{Mf} * \Delta\sigma_{E,2}$	$\Delta\sigma_c / \gamma_{Mf}$	Load Factor for $\Delta\tau$	Load Factor for $\Delta\sigma$	Load Factor from Interaction
7	-13.0	1.8	9.6	12.6	131.25	2.50	24.00	61.74	0.510	0.389	0.093
13	-24.6	3.1	17.9	10.3	57.67	2.50	44.65	61.74	0.417	0.723	0.391
19	-38.3	4.2	27.2	6.0	22.08	2.50	67.95	61.74	0.243	1.101	1.334
25	-39.7	5.3	29.1	5.4	18.54	2.50	72.80	61.74	0.219	1.179	1.640
31	-38.4	6.4	29.4	7.3	24.80	2.50	73.60	61.74	0.296	1.192	1.696
37	-35.8	8.4	29.9	8.5	28.45	2.50	74.70	61.74	0.344	1.210	1.776
43	-30.1	9.6	27.7	9.6	34.71	2.50	69.15	61.74	0.389	1.120	1.414
49	-22.8	10.5	24.2	10.0	41.36	2.50	60.45	61.74	0.405	0.979	0.950
55	-13.2	12.3	20.2	8.6	42.53	1.80	36.40	61.74	0.251	0.590	0.206
61	-15.4	11.3	20.5	8.4	40.90	1.80	36.97	61.74	0.245	0.599	0.216
67	-22.9	10.8	24.5	9.5	38.71	2.50	61.35	61.74	0.385	0.994	0.990
73	-29.1	9.9	27.4	9.1	33.26	2.50	68.40	61.74	0.368	1.108	1.367
79	-34.8	8.1	29.0	8.5	29.33	2.50	72.45	61.74	0.344	1.173	1.621
85	-37.9	6.8	29.5	8.8	29.79	2.50	73.85	61.74	0.356	1.196	1.717
91	-40.6	5.5	29.9	6.2	20.76	2.50	74.65	61.74	0.251	1.209	1.769
97	-43.3	4.4	30.4	6.4	21.07	2.50	75.95	61.74	0.259	1.230	1.863
103	-43.6	3.2	29.4	9.5	32.36	2.50	73.40	61.74	0.385	1.189	1.689
109	-43.1	1.8	27.7	13.2	47.72	2.50	69.15	61.74	0.534	1.120	1.449

Table 33: Fatigue Check for Deck Plate of Box Girder [P2]

Comparing the load factors from the interaction of the two components in Table 32 and 33 it stands out that the bottom plate has significantly higher values. Moreover, some components have very high load factors of more than 3 after the interaction even though their capacity is just exceeded by 40 to 50%.

Reviewing the interaction formula, the reason for such high load factors can be identified clearly. The high exponents lead to an excessive growth of the load factor as soon as one of the components reaches a value higher than one. For example, in beam 13 the bottom plate has the load factors 0.243 and 1.504 for shear and longitudinal stress. Performing the interaction, the same beam has a load factor of 3.4. Even if the two results are simply added up, the load factor is only 1.75. Therefore, one should be careful in interpreting the results. The factor 3.4 does not mean that the capacity is exceeded by 340%. For small utilizations a similar behaviour can be

observed as the interaction produces very low load factors. The formula is designed to evaluate the load factor for a component if the stress ranges of both shear and longitudinal stress are close to their limits. If they are too low or one of them is higher than one, the results quickly get out of hand and do not display the utilization realistically anymore.

6.7 EVALUATION OF THE RESULTS

So far, only the load bearing system in longitudinal direction was examined. Usually a re-evaluation also demands the assessment of the transverse load bearing system where local stresses of the components are checked. Due to lack of time this step was not conducted and just the fatigue cracks were investigated in the lateral system. Therefore, the results presented in this chapter only lean on the examination of the longitudinal system.

The main load bearing system shows great deficits in the conducted calculations. Still, it can be differentiated between constructional elements of the upper chord like the deck plate, the orthotropic deck and the sidewalk, and components of the box girder which include the web and the bottom plate.

The results for the elements of the upper chord are comparatively good and usually remain within their capacity. Violations of the limit are below 20%. However, the stresses in the upper chord are to be superposed with the transverse stresses from the lateral system. This step cannot be performed as the lateral system was not assessed yet so no statement on the utilization of these parts can be made. The picture changes completely for the web and the bottom plate. There are very few locations where these components provide sufficient capacity. Especially for the rivet connections, buckling and the fatigue check high exceedances of 50% to 100% are no exception.

Furthermore, the question arises why the bottom plate and the web do not exhibit any severe visible damages even though their capacity is exceeded by 50 to 100% at several locations. First of all, due to the safety factors on the impact and on the resistance side it is no surprise that constructions withstand more loads than they were designed for. In addition, the full traffic load probably never occurred. It assumes a traffic jam with the heavy vehicle lane loaded exclusively by trucks and the sidewalk crowded with people. The available traffic data indicates that this

scenario is very conservative in case of the Europe Bridge as the heavy traffic numbers are low compared to other bridges with the same load model.

Nevertheless, the results are in an area where the securities and reserves of the bridge provided by the safety factors during the calculation are depleted entirely. This means the possibility of failure of vital components of the load bearing system can not be excluded with enough certainty. For this reason, immediate actions are required to ensure the reliable future utilization of the construction for its residual lifespan.

6.8 SUGGESTED MEASURES

6.8.1 Recalculation in Stage Two

According to the “Guideline for the Recalculation of Existing Road Bridges” [S3] the very first step would be the recalculation in stage two. The verification concept of [S3] is divided into four stages. The first one is based on the common verifications and formulas of [S2]. While these formulas are conservative, the second stage already allows special approaches that provide more possibilities in the evaluation by allowing a more precise calculation and higher utilization. Stage three involves measurements at the construction to capture the actual load bearing behaviour. This serves to validate the structural model but is seldom performed due to the high effort. The final stage four maxes out the capacity even further by using special scientific methods like geometrical or physical nonlinear approaches to prove sufficient load bearing capacity. Like the previous stage it is only used in special cases.

For the Europe Bridge, a stage two evaluation can provide better results in the calculations, especially for buckling and the fatigue check. Moreover, it is possible to reduce loads on the impact side in agreement with the road authority if the associated measures on site are performed.

An option according to [S3] could also be decreasing the traffic loads by the reduction of the load model with the simultaneous realization of traffic restrictions. Table 34 shows the permitted reductions with the corresponding traffic limitations. Unfortunately, this alternative only has a small effect on the stresses. In Table 20 the influence of the LM1 and the UDL was displayed. Considering the changes of BK 60 for the load model and the UDL loads, the impact on the stresses

would only range between 4% for the negative bending moment above the pillar and 7% for the positive moment in the field.

		1	2
		≥ 3 Fahrstreifen, gemeinsamer Überbau für beide Richtungsfahrbahnen	
1	DTV-SV < 2.000	BK60 + ÜV + SV	BK60/30 + ÜV
2	DTV-SV $\geq$ 2.000	BK60 + A25 + ÜV + SV	BK60/30 + ÜV + SV

Table 34: Reduction of the Load Model with the Corresponding Traffic Restrictions [S3]

6.8.2 Strengthening Measures

Apart from the possibilities on the calculation side, strengthening measures can be performed to improve the resistance of the components. From the various options that are available, only a few are presented here. The advantage is, that the critical components (bottom plate and box girder web) do not belong to the roadway and can be accessed without disturbing the traffic. Nonetheless, activities that require high precision might make it necessary to close the bridge anyway. Apart from that, these actions require further calculation to determine their extent.

At first, buckling can be handled by welding additional stiffeners to the buckling fields which is a common procedure and can be performed from inside the girder. The increase of the self-weight is small but should be assessed regardless considering the high utilization of the superstructure.

The rivet connections are more difficult to strengthen. As the rivets itself exceed their capacity they need to be replaced. This can be done by drilling open the rivet holes and replacing them by fitted bolts with a bigger diameter. Yet, bigger holes for the rivets also result in a reduction of the net section which already has a high load factor. Aside from that, the necessary extent of work is tremendous considering a number of 120 to 300 rivets per connection in the bottom plate.

Finally, the problems with the net and gross section could be solved by welding additional plates to the components. This step is also very costly and goes along with a considerable increase of the dead load.

6.8.3 Traffic Restrictions

These measures are easier to implement but affect the traffic and do not have the same impact as the steps described before. Recommended measures by [S3] are the following:

- No passing rule for trucks
- Reduced speed limit
- Weight limitation
- Shifting of lanes
- Narrowing of lanes
- Complete prohibition of trucks on the bridge
- Restrictions of axle loads

As stated above, the results are based on the position of the loads in longitudinal direction while the impact of the lateral location is not assessed. Lane shifting, lane narrowing, and a no passing rule primarily influence the lateral location of the loads and the local stresses which is why no statement can be made regarding these measures. The same applies to the restrictions of axle loads as they are only important for the local stresses. Reducing the total weight of the vehicles on the bridge is the measure that influences the results most of all. Consequently, a weight limitation or a prohibition of trucks on the bridge are the traffic restrictions that should be evaluated. If no trucks are allowed on the bridge engineering judgement would suggest that the LM1 is not necessary anymore and the extra 6.5 kN/m^2 UDL load for the heavy vehicle lane can be reduced. These load reductions have the impact of reducing the results by up to 30% and are worth considering. Still, this course of action is not regulated and the neglect of the LM1 and the reduction of the UDL 6,5 load requires the approval of the road authority.

6.9 CONCLUSION

Even though the Europe Bridge does not exhibit any noticeable damages in the load bearing system except the cracks in the cross girder, the conducted re-evaluation showed that the structure is in a severe condition and demands immediate action. The mandatory structural safety that must not be compromised can not be guaranteed anymore. After the examination of the lateral system, which was not conducted here, the first step is the evaluation on stage 2 as [S3]

proposes. This step can improve the values from stage one but cannot generate an essential reduction of the load factor in this case. What it can do is provide a basis for the justification of further actions towards the road authority.

As they are easier to implement traffic restrictions should be considered first. The proposed measures with noticeable effects on the longitudinal system are the weight limitation and the prohibition of trucks on the bridge. A popular example where a prohibition of heavy vehicle traffic was realized, is the Rhine Bridge in Leverkusen. Besides damages of the category 1 and 2 it showed severe cracks in the lateral system that grew into the main load bearing system and damages of the category 4 at the anchorage of the suspension cables. Against this background, the damages at the Europe Bridge appear minor which is why it is not expected that this measure is implemented. A closure of the bridge for heavy traffic would mean massive detours for trucks and a substantial economic damage that can not be justified. A weight limitation can be a compromise. However, the effect of this step depends on the extent of the limitation that most likely will only be permitted insufficiently. Moreover, it is difficult to ensure the compliance of this restriction. The reduction of the load model like described in 6.8.1 does not provide the desired results either. It should still be evaluated in stage two as the traffic restrictions are minor and easy to introduce.

In contrast, the strengthening methods that were proposed can be implemented without heavy traffic disturbances. For this reason, they are more likely to be realized although they cause higher expenses. In addition to determining their dimension, it is necessary to assess the measures regarding their additional weight. The re-evaluation showed that the bridges capacity is exceeded clearly, so any introduction of new weight should be avoided. Additional stiffeners against buckling increase the self weight but in a small range whereas the replacement of the rivets through fitted bolts with a bigger diameter can be performed without any noticeable change in the dead load. This is why these two steps are recommended for further analysis. Only the assembly of reinforcing plates to strengthen the gross- and net-section goes along with a considerable introduction of new weight. Therefore, this method does not seem suited under the given circumstances and a global reinforcement should be taken into consideration. Possible

alternatives could be an external prestressing, an additional longitudinal girder or a suspension of the superstructure through ropes and a pylon in the middle of the river.

The conclusion is that none of the measures presented above is sufficient to resolve the problems of the Europe Bridge alone. Only a combination of various methods that were described before could restore the structural safety to an adequate level. The immense resources that are required for this course of action, especially for a global reinforcement, suggest that a complete reconstruction might be the most economic way in the long term.

7. EXAMINATION OF THE CRACK DETAIL IN THE LATERAL SYSTEM

7.1 INTRODUCTION

After investigating the cracks theoretically in the literature research, it was found that the connection between the vertical stiffener of the box girder web and the flange of the crossbeam is a susceptible detail. Many other constructions show these types of damages as well which is why they have been subject of intensive studies. The conclusion was that they are category 3 fatigue cracks with their origin in the lateral load bearing system. Consequently, they were not analyzed in the previous step that focused on the longitudinal system. The evaluation of the cracks is described in the following chapter at the lateral system. A goal of this part was to be able to make a statement regarding their impact on the structural safety and to propose and assess renovation methods for the damaged connection.

Therefore, the lateral system was modelled, the necessary loads were applied, and suitable support conditions were selected. As they are supposed to be fatigue cracks, the required fatigue checks were performed in stage one and two to prove this assumption. To estimate their impact on the load bearing system, the cracks were included in the model and the change in the stresses was analyzed. Finally, possible renovation methods were discussed against the background of the available results from the lateral and longitudinal system. The checks of other components of the lateral system that would be required in a normal recalculation were not performed as already stated before.

7.2 DIFFERENCES TO THE LONGITUDINAL SYSTEM

The longitudinal system is a beam model with one beam for each box girder. It was modelled to check components of the box girder and elements in longitudinal direction. For the design of the elements of the transverse system, usually another model of the bridge is generated. In this case only the cracks in the upper corner of the box girder between the vertical stiffener and the bottom flange of the crossbeam were evaluated. To investigate these cracks, it was necessary to obtain the alternating local stresses that cause fatigue cracks. Therefore, the model was assembled with finite elements.

Another difference is that modelling with finite elements requires a higher effort for generation and computation of the elements. That is why only 2 of the 19 sections were reproduced. These two sections were assumed to be the decisive ones as they lie in the middle of the field and are subjected to the maximum positive bending moment.

In contrast to the longitudinal system, this model includes all components of the transverse system. This means the crossbeam, the diagonal braces, the vertical stiffeners, the horizontal stiffeners on the bottom plate, and the longitudinal stiffeners on the box-girder web were pictured entirely. Many of them consist of the steel type St 37 that was only used for the bearings in the previous system so far.

Finally, the construction process was not included in this model, as the impressed stresses were already considered in the calculation of the longitudinal system. Furthermore, these stresses are constant and do not induce any fatigue loads.

7.3 MODELLING IN SOFISTIK

7.3.1 Construction of the System

The lateral system was modeled with a different module that allows the generation of FE elements. Contrary to the previous model, the system is composed of points, lines and surface elements instead of knots and beams. At first, all points for the superstructure half upstream were defined in axis one. They can be seen in Figure 104 – 106. To create the points of the downstream half, the y-values were mirrored at the middle axis. Subsequently the other axes were produced simply by increasing the x-value by 2.56 for every new axis. The y values remained the same in longitudinal direction and the z values only changed for the points in the bottom plate according to the values of #h in Appendix A.

The next step was to connect the points with lines. Initially, this was done in transverse direction as indicated in Figure 104 – 106. Again, lines from the part upstream were mirrored at the center axis. Then the lines for the other axes were generated by copying the ones from axis one. All axes have the same points, hence the same lines to connect them. Moreover, additional lines were necessary to connect points from one axis with their corresponding points of the next. For instance, line 501 connects point 101 from axis 1 (Figure 104) and point 1101 from axis 2.

Finally, surface elements were created. One element was defined by the adjacent lines. In addition, a material and thickness were assigned to the element to produce a steel sheet. For example, surface element number 118 from Figure 104 is confined by the lines 102 – 113, 115, 117, 119 and 120. An element in longitudinal direction like 102 is confined by the lines 103, 502, 503 and 1103. In the creation of the longitudinal system a cross section was produced by defining all steel sheets of it, whereas the plates in longitudinal direction were created automatically by connecting two consecutive cross sections. In this module every metal sheet, also the ones in longitudinal direction, were defined manually. The finite element mesh was generated automatically by determining the mesh size.

Figure 104: Numeration of the Sidewalk [I26]

Figure 105: Numeration of the Orthotropic Plate [I25]

Figure 106: Numeration of the Box Girder [I19]

7.3.2 Geometry

The transverse system represents section 4 and 5 of the bridge. That corresponds to the cross sections 20 to 30 of the longitudinal system and 16 to 25 in the inventory documents. The model is 23.04 meters long and ranges from the x value 40.86 to 63.90 of the longitudinal system. The width of the superstructure is 18.45 meters. Picture 107 shows a schematic drawing of the transverse system with the numeration of the axles. The axles in green show where a crossbeam on the bottom plate was assembled. The axles with braces are also indicated.

Figure 107: Axle-Numeration of the Lateral System

The lateral model looks very similar to the longitudinal system. In contrast to the previous system, where only a small part of the transverse system was modelled to provide lateral stabilization, all parts that contribute stiffness in transverse direction were depicted. This means, that the geometry of the longitudinal system remains the same with the only difference that additional parts of the transverse system were included in the model. These parts are the crossbeams below the sidewalk, in the box girder and under the orthotropic plate as well as the vertical and horizontal stiffeners of the box girder web, the crossbeam on the bottom plate and the braces inside the box girder. All components that were not included in the longitudinal system are made of St 37 which corresponds to S235. Figure 108 – 109 illustrates the geometry of the lateral system. If these two pictures are compared to the cross section in Figure 68, the additional elements of the transverse system can be seen clearly.

The lateral system was modelled similarly as the longitudinal system with the only difference that the geometry was generated with another modul that required different commands. As the procedure itself remained the same, no SOFiSTiK input is provided.

Figure 108: Lateral System [P1]

Figure 109: Lateral System [P1]

7.3.3 Numeration

Every axis has the same amount of points, lines and surface elements. Therefore, the numeration for each axis is similar, and counts up in increments of 1000. The counting method is described for the first two axes and can be continued logically for the other eight axes. In between the axes, the lines have numbers of 500 or 600 to separate them from the lines within one axis. They count up in steps of 1000 as well. This way all elements can be assigned to an axis and to a superstructure half immediately only by its number. The numeration system is according to Figure 104 – 106 and also described below:

- **Points:**

Superstructure Half Upstream	Axis 1	101 – 195
	Axis 2	1101 – 1195
	Axis 3 – 10	2101 – 9195
Superstructure Half Downstream	Axis 1	201 – 295
	Axis 2	1201 – 1295
	Axis 3 – 10	2201 – 9295

- **Lines:**

Superstructure Half Upstream	Axis 1	100 – 200
	Axis 1 to 2	501 – 592
	Axis 2	1100 – 1200
	Axis 2 to 3	1501 – 1592
	Axis 3 – 10	2100 – 9200
	Axis 3-4, 4-5 etc.	2501 - 8592
Superstructure Half Downstream	Axis 1	201 – 301
	Axis 1 to 2	601 – 692
	Axis 2	1201 – 1295
	Axis 2 to 3	1601 – 1692
	Axis 3 – 10	2201 – 9295
	Axis 3-4, 4-5 etc.	2601 – 8692

- **Surface Elements**

Superstructure Half Upstream	Axis 1	101 – 194
	Axis 2	1101 – 1194
	Axis 3 – 10	2101 – 9194
Superstructure Half Downstream	Axis 1	201 – 294
	Axis 2	1201 – 1294
	Axis 3 – 10	2201 – 9294

7.4 LOADS FOR THE LATERAL SYSTEM

7.4.1 Applied Loads

Serving only to examine the local stress ranges for the fatigue evaluation of the cracks, not all the loads that were described for the longitudinal system were selected to act on the lateral system. Self-weight, additional dead loads and all other loads except the traffic loads are either constant or have a small number of repetitions. This means they do not induce fatigue loads on the crack detail and were not considered. From the traffic loads, only the fatigue load model LM3 was selected because the cracks were assumed to be fatigue cracks.

As the bridge is symmetrical, the stress ranges only needed to be examined for one box girder. Therefore, the LM3 only acted on the downstream half of the lateral system. The stress ranges arising from the corresponding location of the load on the other half of the superstructure were assumed to be equal.

For load model 3 no fixed position on the superstructure was prescribed. The axles were moved in transverse and longitudinal direction to generate the maximum stress ranges at the crack location. In 5.2.9.3 it was described that the complete LM3 consists of two trucks that are 40 meters apart. As the simulated section is only 23 meters long, the second truck was not necessary.

7.4.2 Remarks on the Input

The lateral system was modelled with FE-Elements, making it possible to define area loads unlike the longitudinal system, where only line loads or point loads could be defined in reference to the knots or beams.

Contrary to the longitudinal system, the exact location of the wheels and the distribution of the loads is important to obtain the local stresses. For this reason, the wheels of the LM3 were also defined as area loads with a dimension of 40cm x 40cm.

Considering a load distribution in the road surface with an angle of 45° depicted in Figure 110, the area for the wheels became bigger. The paving above the box-girder has a thickness of 6.2cm whereas the paving over

Figure 110: Load Distribution in a Steel Deck [S1]

the orthotropic plate has a thickness of 5cm. Assuming a distribution in each direction until the center line of the steel plate, the wheel areas were 0.536cm x 0.536cm over the box-girder and 0.512cm x 0.512cm above the orthotropic plate. Subsequently, the wheel loads had to be adjusted to the new areas as well. The value of the area loads is as follows:

- LM3 (t=6.2cm) $p = 208.8 \text{ kN/m}^2 \triangleq 60\text{kN/Wheel}$
- LM3 (t=5.0cm) $p = 228.9 \text{ kN/m}^2 \triangleq 60\text{kN/Wheel}$

7.5 DETERMINATION OF SUPPORT CONDITIONS

Like the longitudinal system, the lateral system needs to be supported. As only a small part of the bridge was modelled that did not contain any of the support axles, the support conditions had to reproduce the stiffness of the part that was not included and should depict the deflections realistically. Therefore, the cross-section of the outer axles was bedded with springs along the web, the deck plate and the bottom plate of the box girder. Vertical loads were assumed to have a constant distribution on the springs at the webs. Torsional moments were absorbed by the deck plate and bottom plate through force couples and with constant shear flow.

The stiffness of the springs was determined by the deflections at the longitudinal model under a unit load.

A vertical load of 1000 kN on knot 25 of the longitudinal system (midpoint of the lateral system) led to the deflections pictured in Figure 111.

Figure 111: Deflections in [mm] due to a 1000 kN Point Load on Knot 25 [P1]

Distributing the load uniformly on the length of the springs resulted in a line force in the webs of

$$p = 1000\text{kN} / (4 \times 3.046\text{m} + 4 \times 3.353\text{m}) = 39.07 \text{ kN/m}$$

Hence, the stiffness of the springs in the webs was

$$C = 39.07\text{kN/m} / 0.1113\text{m} = 351.09 \text{ kN/m}^2$$

For the torsional moment the approach was similar. This time a moment around the x axis of 1000 kNm acted on the same knot causing a rotation of 0.786 mrad. The shear flow was determined to

$$t = 1000\text{kNm} / (2 \times 3.0\text{m} \times 3.2\text{m}) = \mathbf{52.8 \text{ kN/m}}$$

The equivalent radius $r = ((3.0\text{m} + 3.2\text{m}) / 2) / 2 = 1.55 \text{ m}$ led to a deformation of

$$w = 1.55\text{m} * 0.786\text{mrad} = \mathbf{0.00122\text{m}}$$

The resulting stiffness of the spring in the bottom plate and the deck plate was

$$C = 52.8\text{kN/m} / 0.00122\text{m} = \mathbf{43278.69 \text{ kN/m}^2}$$

To estimate the accuracy of the results, the deflections of the longitudinal system and the lateral system were compared by applying the same loads to the lateral system. Figure 112 shows the deflections of the deck plate of the lateral system for the load of 1000kN. It should be noted that the value of 141 mm at the location of the point load included the local deformation of the deck plate and should not be considered. Nevertheless, the other values that represented the global deformations better, were still significantly higher than the values of the longitudinal system indicating that the stiffness of the springs in the web was too low.

Figure 112: Deformation of the Lateral System under a Point Load of 1000kN [P1]

Assessing the rotation of the cross section for the torsional moment it was found that the spring stiffness was slightly too high as the rotation was lower than in the longitudinal system.

Through an iterative approach the stiffness of the springs was adjusted until the deflections and rotations of the lateral system matched the ones of the longitudinal system. The final values were $C = 440 \text{ kN/m}^2$ for the webs and $C = 38000 \text{ kN/m}^2$ for the bottom and deck plate.

Figure 113: Schematic Model of the Lateral System [P1]

7.6 FATIGUE CHECKS

7.6.1 Stage 1

The fatigue check in stage one was already used in Chapter 6.6 to examine the rivet connections between the sections. For the crack detail in the lateral system, the procedure remained the same. On the right the connection where the cracks appeared is pictured. On the one hand, the fatigue check was performed for the steel plate. On the other hand, the fillet weld was evaluated.

Figure 114: Crack Detail in the Lateral System [I6]

All stresses were obtained only with the load model 3 like described in 7.4.1. Comparing several locations in lateral direction it was found that the one with the highest eccentricity on the edge of the roadway delivers the most unfavorable results. This location was then used to simulate the crossing of a truck by moving the load model over the bridge in longitudinal direction in steps of 35cm. However, the stresses that occurred at the crack detail varied significantly for the crossbeam axles of the lateral system. Whereas the stresses computed for the axles 2 to 9 (compare Figure 107) came close to values measured in a dynamic test in 1987, the values in the outer axles 1 and 10 increased considerably. It is assumed that these peak values for the stresses in the outer axles originate from the modelling of the

lateral system and do not depict the actual load-bearing behavior correctly. The other stress values trended down slightly towards the axles in the center where the results were more realistic. Furthermore, the axles with stiffeners on the bottom plate exhibited values that were around 20% higher than in the other axles. For this reason, the stress ranges were calculated on axis five in the middle, where a stiffener on the bottom plate is present.

As the crack in Figure 114 grew in horizontal direction it is likely that stresses in vertical direction, transverse to the crack, were responsible for its formation. Nevertheless, the examination of the stresses in SOFiSTiK revealed that the detail is subjected to stresses in horizontal direction as well. Both stresses were checked to identify the critical stress.

The maximum compressive stress transverse to the crack was -123.8 N/mm^2 and appeared when the truck axles were directly above the crossbeam in axle 5. The maximum tensile stress arised from the crossing of a truck on the other superstructure half and was 39.0 N/mm^2 . The respective stresses parallel to the crack were -39.4 N/mm^2 and 39.4 N/mm^2 and were assessed as well.

7.6.1.1 Fatigue Check of Steel Plate

Due to missing information on the base material, the steel plate was categorized in notch type 125 according to Table 35.

Tabelle II-L.1: Nicht geschweißte Konstruktionsdetails - Blatt 1 von 3				
Kerbgruppe	Konstruktionsdetail	Beschreibung	Anforderung	Bemerkung
160		<u>Walzerzeugnisse:</u> 1) Bleche und Flachstähle 2) Walzprofile 3) Nahtlose Rohre	<u>1) bis 3):</u> Scharfe Kanten, Oberflächen- und Walzfehler sind durch Schleifen zu beseitigen. Ausbessern durch Schweißen ist nicht zulässig.	
140		<u>Gescherte oder brenngeschnittene Bleche:</u> 4) Brenngeschnittener oder gescherter Werkstoff mit nachträglicher mechanischer Bearbeitung	4) Der durch den Schneid- bzw. Schervorgang beeinflusste Werkstoff ist mechanisch vollständig abzubearbeiten. 4) und 5): - Die Kanten sind zu brechen. Ausbessern durch Schweißen ist nicht zulässig. - Einspringende Ecken (Neigung $\leq 1:4$) sind durch Schleifen zu bearbeiten. - Die Spannungen sind bei Öffnungen am Nettoquerschnitt zu bestimmen.	5) Im Eisenbahnbrückenbau ist die Schnittgüte I nach ISO 9013 einzuhalten.
125		5) Maschneil brenngeschnittener Werkstoff mit Schnittgüte II nach ISO 9013		

Table 35: Notch Type for Steel Plate [S2]

As the crack propagation stopped and a failure of the stiffener does not lead to partial or complete failure of the bridge, the component could be classified as secondary. This allowed to reduce the safety factor on the resistance side γ_{Mf} from 1.15 to 1.0.

According to [S2] the decisive length for the determination of λ_1 and λ_{max} is two times the distance between the crossbeam axes which is 5.12m. In addition, the crack detail is in the local support area. With this information and the help of Figure 115 and 116, all λ values were determined.

Figure 115: λ_1 for the Support Area and $L = 5.12m$ [S2]

Figure 116: λ_{max} for Support Area and $L = 5.12m$ [S2]

- $\lambda_1 = 2.00$
- $\lambda_2 = 1.10$
- $\lambda_3 = 1.00$ (lifespan of 100 years)
- $\lambda_4 = (1+(2+1)*0.1)^{0.2} = 1.054$

$$\lambda_{ges} = 2.0 * 1.1 * 1.0 * 1.054 = \mathbf{2.319}$$

$$\lambda_{max} = \mathbf{1.80}$$

As for the rivet connections, the compressive stress only had to be included to 60 %. This led to the following results:

- Stresses transverse to the crack

$$\Delta\sigma = (39 + 0.6 * 123.8) * 1.8 = \mathbf{203.9 \text{ N/mm}^2} > \Delta\sigma_c = 125 \text{ N/mm}^2 \text{ (Check not fulfilled)}$$

- Stresses parallel to the crack

$$\Delta\sigma = (39.4 + 0.6 * 39.4) * 1.8 = \mathbf{113.5 \text{ N/mm}^2} < \Delta\sigma_c = 125 \text{ N/mm}^2 \text{ (Check fulfilled)}$$

7.6.1.2 Fatigue Check of Weld Line

According to [S2] τ and σ can be calculated independently and no interaction is required for a fillet weld. However, the fatigue check for weld lines does not allow the reduction of the compressive stress which is why the stress ranges are higher. In addition, the stresses that SOFiSTiK calculated were in the vertical stiffener that has a thickness of 10mm. The fillet weld has a diameter of 3.5mm on each side which is only 7mm in total. Therefore, the stress range had to be increased by this ratio. The following stress ranges were calculated

$$\Delta\sigma = (39 + 123.8) * (10/7) = \mathbf{232.6 \text{ N/mm}^2}$$

$$\Delta\tau = (39.4 + 39.4) * (10/7) = \mathbf{112.6 \text{ N/mm}^2}$$

According to Table 36 the fillet weld itself was categorized in notch type 36 for the stress transverse to the weld and notch type 80 for shear stress parallel to the fillet weld.

Tabelle II- L.5: Tragende Schweißnähte - Blatt 1 von 4)**

Kerbgruppe	Konstruktionsdetail	Beschreibung	Anforderung	Bemerkung
Wie Tab. II-L.4 Kerb-details 3, 4, 5		<u>Verbindungen von sich kreuzenden Tragelementen:</u> 1) Potentielles Versagen im Grundmaterial in voll durchgeschweißten und allen nicht durchgeschweißten Nähten	1) Nach Prüfung frei von erkennbaren Fehlern, Kategorie B - DIN EN ISO 5817 2) Es sind 2 Ermüdungsnachweise erforderlich: zum einen der Nachweis für die Schweißnahtwurzel gegen Abriss, Kerbgruppe 36* für σ_w und Kerbgruppe 80 für τ_w , zum anderen der Nachweis gegen Abriss am Nahtübergang mit Bestimmung der Spannungsschwingbreite in den belasteten Blechen.	
36*		2) Potentielles Versagen im Schweißgut bei nicht voll durchgeschweißten Verbindungen von sich kreuzenden Tragelementen und Verbindungen.	1) und 2): Die Ausmittigkeit der belasteten Bleche muss $\leq 15\%$ der Dicke des Zwischenblechs sein.	

*: Siehe II-L.3 (2) **): Blatt 2 von 4 der Eurocodes im Brückenbau nicht zugelassen.

Table 36: Notch Type for the Fillet Weld [S2]

With the same λ values like for the steel plate, the fatigue check for the fillet weld was as follows:

$$\Delta\sigma = 232.6 \text{ N/mm}^2 * 1.8 = \mathbf{418.63 \text{ N/mm}^2} \gg 36 \text{ N/mm}^2 \text{ (Check not fulfilled)}$$

$$\Delta\tau = 112.6 \text{ N/mm}^2 * 1.8 = \mathbf{202.68 \text{ N/mm}^2} \gg 80 \text{ N/mm}^2 \text{ (Check not fulfilled)}$$

7.6.2 Stage 2

7.6.2.1 Procedure

In this step the deterioration of the connection was calculated by the cumulative damage of every truck passage according to the Palmgren-Miner Rule. Contrary to the previous fatigue check, only the fillet weld was considered as the steel plate had a higher notch type and was not decisive. Furthermore, stage two does not require the λ values anymore. The check was also performed at the crack detail in axle 5.

At first, a new load model ELM4 was introduced that represents the actual heavy vehicle traffic more precise than the LM3. In reality, not only one but several types of trucks exist with a different height, weight or geometry. The new ELM4 consists of five different types of trucks that make up the heavy traffic. The geometry and axle loads are illustrated in Table 37.

1	2	3	4
	Fahrzeugtyp		Rad- bzw. Achstyp
LKW	Achsabstand	Achslast	
	m	kN
4,50	70 130	A B
4,20 1,30	70 120 120	A B B
3,20 5,20 1,30 1,30	70 150 90 90 90	A B C C C
3,40 6,00 1,80	70 140 90 90	A B B B
4,80 3,60 4,40 1,30	70 130 90 80 80	A B C C C
Rad- und Achstyp
	Typ A	Typ B	Typ C

Table 37: Truck Types of the ELM4 [S3]

After all five trucks of the ELM4 were defined, their share in the heavy vehicle traffic and the traffic volume needed to be determined. Table 38 shows the composition of the traffic for different time periods together with the annual number of truck crossings.

1	2	3	4	5	6
Zeitraum	bis 1950	1950 bis 1970	1970 bis 1990	1990 bis 2010	ab 2010
N_{obs} je Jahr für Fahrstreifen 1	$0,25 \cdot 10^6$	$0,5 \cdot 10^6$	$1,0 \cdot 10^6$	$2,0 \cdot 10^6$	$2,5 \cdot 10^6$
	Verkehrszusammensetzung in %
45	30	20	20	10
45	20	10	5	5
-	-	20	50	60
5	25	30	15	15
5	25	20	10	10

Table 38: Composition of the Traffic from 1950 until Today [S3]

The values in Table 38 show the traffic volume on a highway and are significantly higher than the actual traffic on the bridge. In Section 5.1, Table 7 shows the traffic data of the Europe Bridge for the years until 1997. In addition, the Federal Road Research Institute installed an automatic counting station at the Europe Bridge which documented the traffic since the year 2003. This allowed to retrace and determine the traffic volumes from the year of the construction until the present day. As these numbers were closer to the reality and provided much better results, they were used in the calculations instead of the value N_{obs} in Table 38. Nevertheless, the table still determines the composition of the traffic and the value N_{obs} for remaining 40 years in the lifespan of the bridge. This led to the following annual values for N_{obs}

- 1960 – 1969: 10 years $N_{obs} = 0.25 \cdot 10^6$
- 1970 – 1989: 20 years $N_{obs} = 0.5 \cdot 10^6$
- 1990 – 2009: 20 years $N_{obs} = 0.75 \cdot 10^6$
- 2010 – 2019: 10 years $N_{obs} = 0.6 \cdot 10^6$
- 2020 – 2059: 40 years $N_{obs} = 2.5 \cdot 10^6$

Subsequently the five trucks with their wheel geometry, their axle loads, and their distance of the axles were modelled in SOFiSTiK. The distribution of the load in a 45-degree angle was like described in 7.4 and the unfavorable location in lateral direction remained as determined in 7.6.1. By moving all trucks over the bridge in steps of 0.35m, the passage of each truck was simulated. The resulting stresses at the crack detail in axle five were recorded during the crossing of the trucks to determine the stress range according to the reservoir method that is illustrated below.

Table 39: Reservoir Method to Determine the Stress Ranges [S9]

This means due to the passage of one truck, several stress ranges $\Delta\sigma_1$ to $\Delta\sigma_4$ can occur. With the help of the Wöhler Curves which are illustrated on the right, it was calculated how many stress cycles of a certain stress range $\Delta\sigma_i$ the detail can endure before a fatigue crack forms. If the stress range is below the threshold value of the fatigue strength $\Delta\sigma_L$ at 10^8 stress cycles, no damage occurs.

Figure 117: Wöhler Curves for $\Delta\sigma$ [S9]

By dividing the number of occurring stress cycles n_{Ei} through the number of stress cycles N_{Ri} that the detail can endure, a deterioration value D was obtained. This was done for the crossings of all five truck types according to the Palmgren-Miner Rule while the value D was added up. If the final value D is above one a crack is supposed to emerge.

7.6.2.2 Fatigue Check for $\Delta\sigma$

The corresponding notch type for $\Delta\sigma_C$ was 36 as in stage one. Applying the formulas from the Wöhler Curve, the fatigue strength $\Delta\sigma_D$ at $5 \cdot 10^6$ stress cycles was 26.53 N/mm^2 whereas the threshold value at 10^8 stress cycles $\Delta\sigma_L$ was 14.57 N/mm^2 . With these boundary conditions the values N_{Ri} could be calculated using the following formulas (compare Figure 117):

$$N_{Ri} = (\Delta\sigma_C^m / \Delta\sigma_i^m) * 2 * 10^6 \quad (\text{With } m = 3 \text{ for } \Delta\sigma_i > \Delta\sigma_D)$$

$$N_{Ri} = (\Delta\sigma_D^m / \Delta\sigma_i^m) * 5 * 10^6 \quad (\text{With } m = 5 \text{ for } \Delta\sigma_D < \Delta\sigma_i < \Delta\sigma_L)$$

In stage one the stress range was computed using the maximum compressive stress from a truck crossing on the downstream half and the maximum tensile stress arising from the crossing of a truck on the upstream half. In stage two, only one location in lateral direction was used to determine the stress range. The stresses during the crossing of each truck were documented in an excel sheet. Figure 118 shows the stresses σ transverse to the crack at the connection between vertical stiffener of the box girder web and the crossbeam flange.

Figure 118: Stresses Transverse to Crack for the Five Different Truck Types [P2]

These curves made it possible to determine the values $\Delta\sigma_i$ for each truck type. They were documented in the second table of Figure 119. While the first table shows the heavy vehicle traffic volume n_{Ei} , the last table shows the N_{Ri} values that were calculated for the stresses $\Delta\sigma_i$. The final deterioration value D was calculated with the Palmgren-Miner Rule from Table 39 and resulted

in 2271.1. However, a value of 2000 does not mean that the capacity is exceeded by the factor 2000. As stated before, this value defines the deterioration of a connection and only implies that a crack occurs as soon as it is above one. To what extent D is higher than one does not provide any further information about the condition of the crack detail.

Still, D can be used to specify the time of the crack formation. With the annual traffic values N_{obs} from Page 124, D was already 1.45 after the first year. This means the crack occurred just shortly after the construction of the bridge.

ni	1960 - 1969	1970 - 1989	1990 - 2009	2010 - 2019	2020 - 2059	Total	
Truck 1	0.75	2	3	0.6	10	16.35	[10 ⁶]
Truck 2	0.5	1	0.75	0.3	5	7.55	[10 ⁶]
Truck 3	0	2	7.5	3.6	60	73.1	[10 ⁶]
Truck 4	0.625	3	2.25	0.9	15	21.775	[10 ⁶]
Truck 5	0.625	2	1.5	0.6	10	14.725	[10 ⁶]
Total Nobs	2.5	10	15	6	100	133.5	[10 ⁶]

Stress Range Transverse to the Crack

Notch Type 36

$\Delta\sigma_D$ 26.53

$\Delta\sigma_L$ 14.57

Truck Type	$\Delta\sigma_1$ [N/mm ²]	$\Delta\sigma_2$ [N/mm ²]	$\Delta\sigma_3$ [N/mm ²]	$\Delta\sigma_4$ [N/mm ²]
Truck 1	49.50	18.30	4.60	3.70
Truck 2	96.00	27.70	3.50	3.30
Truck 3	134.30	37.60	17.20	7.40
Truck 4	68.90	38.80	3.30	0.00
Truck 5	96.90	23.50	7.70	1.60

Deterioration D: 2271.1

Truck Type	N_{Ri} [10 ⁶]	N_{Ri} [10 ⁶]	N_{Ri} [10 ⁶]	N_{Ri} [10 ⁶]
Truck 1	0.77	32.02	no damage	no damage
Truck 2	0.11	4.39	no damage	no damage
Truck 3	0.04	1.76	43.65	no damage
Truck 4	0.29	1.60	no damage	no damage
Truck 5	0.10	9.17	no damage	no damage

Figure 119: Fatigue Check Stage Two for $\Delta\sigma$ [P2]

7.6.2.3 Fatigue Check for $\Delta\tau$

For $\Delta\tau$ the notch type was 80. Contrary to $\Delta\sigma$, the shear stresses have a different Wöhler Curve. Only the threshold value exists which was calculated to be 36.58 N/mm². The formula to determine N_{Ri} is as follows:

$$N_{Ri} = (\Delta\tau_c^m / \Delta\tau_i^m) * 2 * 10^6 \quad (m = 5 \text{ for } \Delta\tau_i > \Delta\tau_L)$$

Like for $\Delta\sigma$ the shear stresses were documented in an excel sheet during the crossing of the trucks. Figure 120 shows the values for τ in the fillet weld.

Figure 120: Shear Stresses in the Fillet Weld for the Five Different Truck Types [P2]

The procedure remained the same as for $\Delta\sigma$. The results for the fatigue check of the shear stresses are depicted in Figure 121. As the stresses were lower and the notch type was higher, the value D was significantly lower but still exceeded one. Nevertheless, the deterioration was calculated for the full lifespan of the bridge until the year 2059 with very high numbers for the heavy traffic in the future. If the value D is determined for the year 2019 the result is only 0.68.

ni	1960 - 1969	1970 - 1989	1990 - 2009	2010 - 2019	2020 - 2059	Total	
Truck 1	0.75	2	3	0.6	10	16.35	[10 ⁶]
Truck 2	0.5	1	0.75	0.3	5	7.55	[10 ⁶]
Truck 3	0	2	7.5	3.6	60	73.1	[10 ⁶]
Truck 4	0.625	3	2.25	0.9	15	21.775	[10 ⁶]
Truck 5	0.625	2	1.5	0.6	10	14.725	[10 ⁶]
Total Nobs	2.5	10	15	6	100	133.5	[10 ⁶]

Shear Stress Range in the Crack

Notch Type 80

$\Delta\tau_L$ 36.58

Truck Type	$\Delta\tau_1$ [N/mm ²]	$\Delta\tau_2$ [N/mm ²]	$\Delta\tau_3$ [N/mm ²]	$\Delta\tau_4$ [N/mm ²]
Truck 1	20.80	5.70	4.60	3.50
Truck 2	29.10	7.40	5.00	3.00
Truck 3	49.30	7.10	6.10	3.70
Truck 4	31.40	4.60	3.40	3.20
Truck 5	42.70	3.70	2.90	2.80

Deterioration D: 3.567

Truck Type	NRi [10 ⁶]	NRi [10 ⁶]	NRi [10 ⁶]	NRi [10 ⁶]
Truck 1	no damage	no damage	no damage	no damage
Truck 2	no damage	no damage	no damage	no damage
Truck 3	22.50	no damage	no damage	no damage
Truck 4	no damage	no damage	no damage	no damage
Truck 5	46.17	no damage	no damage	no damage

Figure 121: Stage Two Fatigue Check for the Shear Stress Range [P2]

7.6.3 Assessment of the Results

The crack in the fillet weld between the vertical stiffener of the web and the flange of the crossbeam is subjected to stresses in two different directions. One of them is in vertical direction transverse to the weld line and the other is horizontal in direction of the fillet weld. It was already stated that the vertical stresses σ are assumed to be responsible for the cracks. The conducted fatigue evaluation supports this statement as the results for the stresses transverse to the crack showed great exceedances of the fatigue strength. Furthermore, a crack caused by horizontal stresses τ would grow in vertical direction through the weld which is not the case. The stage two fatigue check also indicated that such a crack has not appeared to the present day. For this reason, the results for the horizontal stresses are not discussed further.

All checks for the vertical stresses produced very high load factors, confirming the conclusion of the literature research that the damages are fatigue cracks. Especially the stage one evaluation led to high exceedances as it was performed with the highest possible stress range that can occur during the simultaneous crossing of two trucks in the most unfavorable location. Even though the scenario is possible, it does not happen very often, and it is conservative. The fatigue check in stage two obtained the stress ranges from the crossing of only one truck which is more realistic. Still, the calculations resulted in a high exceedance which suggests that the crack formed just shortly after construction of the Europe Bridge. As the cracks were already found during the first building inspection, the outcome of the fatigue check is verified.

At that time the traffic loads were significantly smaller than today. The fact that the cracks occurred anyway implies that the design of the connection is not fatigue proof. This assumption is confirmed by the low notch type of 36 and the discrepancy between modelling and execution as stated in section 3.6. The structural analysis assumed a joint for this connection, but the detail was designed to transfer high bending moments. Consequently, the formation of a fatigue crack was inevitable. However, the crack progression stopped after a certain length between 10 to 20 mm. This circumstance allows the conclusion that the joint which was assumed in the calculations developed eventually by cracking of the connection. Usually, a crack leads to stress reductions in the affected detail as the stresses relocate to other components. The next section examines if this behavior results in different stresses in other parts of the lateral system.

7.7 IMPACT OF THE CRACK ON THE OTHER COMPONENTS

The crack has been identified as fatigue crack by the literature research and the corresponding fatigue checks in the previous paragraphs. Nevertheless, its impact on the load bearing system in transverse direction is still uncertain. As a crack reduces the stresses in the connection, a relocation of the loads is expected to cause higher stresses in other components. To assess the impact of these changes, the crack was included in the SOFiSTiK model and the stresses with and without the crack were compared.

The supervision of the fatigue cracks from 1998 [I6] documented a crack length of up to 22mm which was also the length of the modelled crack. As it is illustrated in Figure 122, the crack was reproduced by inserting two additional points and lines (compare Figure 106). Point 1 and 140 have the same coordinates which means line 1 and 2 actually run parallel. By using line 2 for the definition of the crossbeam flange and line 1 for the definition of the vertical stiffener, these two components are not connected in this area and no loads can be transferred.

Figure 122: Schematic Drawing of How the Crack is Reproduced in SOFiSTIK [P4]

Subsequently a load was applied and the changes in the stresses were examined. As all fatigue checks were conducted at axle five of the lateral system this location was also chosen to evaluate the impact of the crack. Furthermore, the load case with truck type 3 directly above axle 5, which provided the highest stresses in the fatigue evaluation, was selected. Figure 123 shows the stresses of the model with and without the crack. For a more detailed view on the corners of the frame see Appendix K.

Figure 123: Stress Comparison of the Lateral System with and without the Crack [P1]

Even though the stresses at the crack location decreased as described before the value is not representative. Where line one and two meet, a singularity arises that produces high stress peaks. Compared to the crack length of 22mm the mesh size of the FE net is still very wide with 30mm which is why the peak value remained within the range of the other values. If the mesh size would be reduced, the stress at the singularity would increase rapidly. Nevertheless, the stresses at the crack location were of no interest as the influence on the other components was evaluated. The latter showed nearly identical stresses in both simulations. Therefore, it can be assumed that the cracks do not have any influence on the load bearing system in lateral and longitudinal direction.

7.8 EVALUATION OF RENOVATION METHODS

The previous sections came to the result that the damages at the connection between vertical stiffener and crossbeam flange are fatigue cracks that do not compromise the structural safety of any other component. Moreover, the cracks ceased to grow which suggests that no action is necessary to repair the detail. Yet, it cannot be excluded that the crack might start to grow again under the load of heavier trucks or an increasing traffic volume in the future. The heavy traffic on the Europe Bridge has trended down by more than 25% since the year 2005 which contradicts the general development of the traffic. Therefore, it is not unlikely that the traffic numbers on the construction eventually catch up to the overall trend. To be prepared for this scenario and to allow immediate action in case of unexpected acceleration of the crack progression, possible reparation or strengthening measures should still be evaluated. The Federal Road Research Institute (BASt) proposed six different approaches to face category three cracks that were already described in Chapter 3.4.3.3. These measures were evaluated regarding their implementation at the Europe Bridge.

At first, a relocation of the heavy vehicle lane on the bridge was suggested. During the determination of the most unfavorable location of the truck axles it was found that the lateral location of the loads does have an impact on the stresses at the detail. Just by moving the center line of the truck transversely 50 centimeters towards the middle of the bridge the stresses could be reduced by more than 15%. This would mean narrowing the roadway by half a meter on each side of the bridge. As a result, the width for the traffic is only 11 instead of 12 meters and the lane width is 2.75 instead of 3 meters. The impact on the traffic is minor which is why the option is

worth considering. Nevertheless, it is necessary to ensure that the outer 50 centimeters are not used by the traffic which is why constructional elements would be required to separate this part from the roadway.

The next option was assembling additional transverse bracings between the box girders. In the report from the BAST this approach was already classified as ineffective and is not suited for an application at the Europe Bridge. In addition, the bracings introduce new weight to the construction which should be avoided at any cost considering the high utilization of the main load bearing system.

Another approach suggested to remove the bracings and ensure the lateral stability with vertical stiffeners. Even though the results were promising, and the method was recommended, the advantages cannot be exploited in this case. On the one hand, the construction already has rigid frames that provide sufficient lateral stiffness. On the other hand, load bearing capacities are required as the method increases the dead load. In this case the relation between the weight loss by removing bracings and the weight gain by bigger vertical stiffeners is particularly unfavorable as the bracings are very slender and the loss in dead load is negligible.

Redesigning and strengthening the critical details locally with the objective to minimize the additional dead load was the fourth alternative that was investigated. As the detail has the lowest notch type of 36, redesigning the connection and improving the fatigue behavior is highly effective. This would allow to classify the connection in a higher category with a better fatigue strength. Furthermore, the evaluation conducted by the BAST estimated the impact of this measure on other components as minor. Together with an increase of the dead load of less than 1% this option is suited for an implementation at the Europe Bridge. It should still be mentioned that the evaluation in [L3] focused on open cross sections and further analysis is necessary before the measure can be employed.

An additional longitudinal girder as option 5 proposed is not practicable in this case. It goes along with an immense increase of the self-weight of the bridge. As stated before, the results from Chapter 6 prohibit any introduction of new weight to the structure. Moreover, this large scaled measure represents an extensive interference with the load bearing system and is very expensive.

Therefore, an application with the sole aim of reducing the stresses at the crack detail is not reasonable. Still, an implementation in combination with a global reinforcement of the main load bearing system as suggested in 6.9 could make sense and should be assessed.

The final measure aimed at correcting the discrepancy between modelling and execution by realizing the presumed joint in the connection. This is what is assumed to already have happened automatically through the formation of the crack. For now, it is only recommended to drill out the ends of the crack. By that, further crack progression is obstructed as a rounded design in general has an improved fatigue behavior.

However, a crack with a length of 22mm in the 300mm fillet weld does not represent a full joint as significant bending moments are still transferred. Realizing this measure would mean producing a real joint in the connection that does not transfer any bending moments. This could change the stresses in the other components much more than it was the case in Figure 123 for the 22mm crack. Therefore, further analysis is required before an implementation of this measure is possible.

8. SUMMARY AND CONCLUSION

8.1 SUMMARY

To evaluate the current condition of the Europe Bridge, three different approaches were executed. As the construction exhibits frequent cracks at a connection in the lateral load bearing system, the first step was a literature research on cracks in the superstructure of steel bridges. The goal was to find examples with similar damages that obtain information on the reasons for the cracks and to draw first conclusions with reference to the Europe Bridge. It was found that many old highway bridges are in a bad condition as they were not designed to withstand the traffic volume and axle loads of today. While this leads to a general exceedance of the load bearing capacity, most of the cracks in steel bridges can be traced back to a different problem. The majority of the damages in steel constructions are fatigue cracks as a fatigue proof design was neither required nor necessary during the times of their creation. Consequently, these cracks have already been the object of many studies. In Germany, four categories were introduced to classify the cracks depending on their impact on the load bearing system. This information allowed to identify the existing cracks at the Europe Bridge as category 3 fatigue cracks since this category includes all damages that occur at the transverse system. Furthermore, the discrepancy between modelling and execution was presumed to be responsible for the crack formation.

Subsequently the longitudinal load bearing system was modelled and recalculated according to the “Guideline for the Recalculation of Existing Road Bridges” to assess the general condition of the structure. Due to their classification in category 3, the cracks were assumed to have their origin in the lateral system which is why no new findings regarding the cracks were expected from this step. Nevertheless, the assessment of the longitudinal system is a vital step in the course of the re-evaluation of a bridge. The literature research already indicated that constructions with the age of the Europe Bridge are likely to exhibit a range of deficits which was confirmed by the results of the structural analysis presented in Chapter 6. Nearly all checks of the components emphasized that their capacity is exceeded and that the structure is in desperate need of renovation and strengthening measures. With this background, possible steps to restore the structural safety were evaluated and recommended.

The final part examined the crack detail at the lateral load bearing system. Therefore, a new computer model was created that reproduced the load transfer in transverse direction. The presumption of the literature research of fatigue cracks was confirmed by the poor results of the performed fatigue checks in stage 1 and 2. Stage 2 of the fatigue evaluation even suggested that the crack occurred less than one year after the construction. The reasons for the crack formation complied with the ones from the literature research as well. In the structural analysis the connection between vertical stiffener and crossbeam flange was calculated as joint whereas the executed design transfers high bending moments. Moreover, the notch type of 36 for the detail indicates an insufficient fatigue behavior. However, the crack does not compromise the overall structural safety of the bridge since the stresses do not change significantly in the other components. In addition, the crack ceased to grow which is why it is assumed that the joint in the connection developed by itself. Even though their impact on the bridge is minor, possible renovation methods were still evaluated to be prepared in case of recurring crack growth. Two of them could be recommended. A third option suggested to create a joint as assumed in the structural analysis. This state already set in on its own and reflects the present situation. All that remains to do for now is to bore out the crack end to generate a better fatigue behavior.

8.2 CONCLUSION

All in all, the Europe Bridge is in a severe condition. Contrary to the first impression the problem of the bridge is overloading of the main load bearing system rather than the crack in the lateral system. The cracks have been evaluated theoretically and numerically and were identified to be category three cracks with no impact on the structural safety. The crack formation led to the development of a joint at the connection producing the conditions that were assumed during the calculation in 1960. Eventually, the crack growth stopped as the joint reduced the stresses at the critical detail.

The results from the longitudinal load bearing system point out that the structural safety cannot be guaranteed anymore. However, a closure of the bridge is very unlikely because the structure exhibits few damages compared to other bridges and has a high importance for the traffic as one of few Rhine crossings in the area. A range of possibilities to restore the structural safety were assessed and recommended. Still, only a combination of various measures has the potential to

restore the structural safety to an adequate level considering the high utilization of some components. To what extent these steps are implemented, and which methods are combined should be the object of further investigations as just their individual suitability was evaluated so far. Yet, the results from the recalculation of the main load bearing system suggest that in the long term a reconstruction might be the safest and most economical solution. As the responsible road authority has the financial resources at its disposal, it also determines the further course of action and ultimately the future of the Europe Bridge

APPENDICES

Appendix A Excel Sheet with Cross-Section Values

	Schuss		Cross-Section	Height Web	Stiffeners in Box Girder	Stiffeners between Box Girders	Horizontal Part Stiffener Bottom Plate	Not effective Part (NeP) Sidewalk	NeP Inside	NeP orthotropic Plate	NeP Bottom Plate	t Bottom Plate Outside	Between Stiffener 1 & 2	Between Stiffener 2 & 3	Between Stiffener 3 & 4	Between Stiffener 4 & 5	Bottom Plate Inside		
0		QNR	1	let#h 2517	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
1		QNR	2	let#h 2549	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
2	Section 1	QNR	3	let#h 2583	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
3		QNR	4	let#h 2617	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
4		QNR	5	let#h 2651	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 20	let#bo3 10	let#bo4 10	let#bo5 20	let#bo6 10	#include quer01
5		QNR	6	let#h 2685	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 20	let#bo3 10	let#bo4 10	let#bo5 20	let#bo6 10	#include quer01
		QNR	7	let#h 2692	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 20	let#bo3 20	let#bo4 20	let#bo5 20	let#bo6 20	#include quer01
6	Sections 2	QNR	8	let#h 2709	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 20	let#bo3 20	let#bo4 20	let#bo5 20	let#bo6 20	#include quer01
7		QNR	9	let#h 2743	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 20	let#bo3 20	let#bo4 20	let#bo5 20	let#bo6 20	#include quer01
8		QNR	10	let#h 2777	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 20	let#bo3 20	let#bo4 20	let#bo5 34	let#bo6 20	#include quer01
9		QNR	11	let#h 2811	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 34	let#bo3 20	let#bo4 20	let#bo5 34	let#bo6 20	#include quer01
10		QNR	12	let#h 2845	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 34	let#bo3 20	let#bo4 20	let#bo5 34	let#bo6 20	#include quer01
	QNR	13	let#h 2860	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 20	let#bo2 34	let#bo3 20	let#bo4 20	let#bo5 34	let#bo6 20	#include quer01	
11	Section 3	QNR	14	let#h 2875	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
12		QNR	15	let#h 2909	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
13		QNR	16	let#h 2944	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
14		QNR	17	let#h 2978	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
15		QNR	18	let#h 3012	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
	QNR	19	let#h 3029	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01	
16	Section 4	QNR	20	let#h 3046	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
17		QNR	21	let#h 3080	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
18		QNR	22	let#h 3114	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
19		QNR	23	let#h 3149	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 38	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
20		QNR	24	let#h 3183	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
	QNR	25	let#h 3200	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01	
21	Sections 5	QNR	26	let#h 3217	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
22		QNR	27	let#h 3251	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 38	let#bo6 24	#include quer01
23		QNR	28	let#h 3285	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 24	let#bo6 24	#include quer01
24		QNR	29	let#h 3319	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 24	let#bo6 24	#include quer01
25		QNR	30	let#h 3353	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 27	let#m2 1	let#m3 33	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 24	let#bo6 24	#include quer01
	QNR	31	let#h 3375	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 24	let#bo2 24	let#bo3 24	let#bo4 24	let#bo5 24	let#bo6 24	#include quer01	
26	Section 6	QNR	32	let#h 3398	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 14	let#bo2 24	let#bo3 14	let#bo4 14	let#bo5 24	let#bo6 14	#include quer01
27		QNR	33	let#h 3432	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 14	let#bo2 24	let#bo3 14	let#bo4 14	let#bo5 24	let#bo6 14	#include quer01
28		QNR	34	let#h 3466	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 14	let#bo6 14	#include quer01
29		QNR	35	let#h 3500	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 14	let#bo6 14	#include quer01
30		QNR	36	let#h 3534	let#hlst 300	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 14	let#bo6 14	#include quer01
	QNR	37	let#h 3553	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01	
31	Section 7	QNR	38	let#h 3572	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
32		QNR	39	let#h 3606	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
33		QNR	40	let#h 3640	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
34		QNR	41	let#h 3674	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
35		QNR	42	let#h 3709	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01
	QNR	43	let#h 3722	let#hlst 250	let#hmst 250	let#tbst 250	0	let#m1 27	let#m2 1	let#m3 31	let#m4 1	let#bo1 10	let#bo2 10	let#bo3 10	let#bo4 10	let#bo5 10	let#bo6 10	#include quer01	
36	Sections 8	QNR	44	let#h 3739	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 88	let#m2 14	let#m3 98	let#m4 7	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 14	let#bo6 14	#include quer01
37		QNR	45	let#h 3773	let#hlst 300	let#hmst 300	let#tbst 300	0	let#m1 148	let#m2 29	let#m3 165	let#m4 13	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 14	let#bo6 14	#include quer01
38		QNR	46	let#h 3807	let#hlst 300	let#hmst 300	let#tbst 300	10	let#m1 208	let#m2 43	let#m3 232	let#m4 20	let#bo1 14	let#bo2 14	let#bo3 14	let#bo4 14	let#bo5 38	let#bo6 14	#include quer01
39		QNR	47	let#h 3843	let#hlst 300	let#hmst 300	let#tbst 300	10	let#m1 268	let#m2 58	let#m3 299	let#m4 27	let#bo1 14	let#bo2 38	let#bo3 14	let#bo4 14	let#bo5 38	let#bo6 14	#include quer01
40		QNR	48	let#h 3891	let#hlst 300	let#hmst 300	let#tbst 300	10	let#m1 329	let#m2 72	let#m3 366	let#m4 34	let#bo1 14	let#bo2 38	let#bo3 14	let#bo4 14	let#bo5 38	let#bo6 14	#include quer01
	QNR	49	let#h 3910	let#hlst 300	let#hmst 300	let#tbst 300	10	let#m1 359	let#m2 79	let#m3 400	let#m4 37	let#bo1 14	let#bo2 38	let#bo3 14	let#bo4 14	let#bo5 38	let#bo6 14	#include quer01	
41	Sections 9	QNR	50	let#h 3945	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 389	let#m2 87	let#m3 433	let#m4 40	let#bo1 24	let#bo2 48	let#bo3 24	let#bo4 24	let#bo5 48	let#bo6 24	#include quer01
42		QNR	51	let#h 4025	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 449	let#m2 101	let#m3 500	let#m4 47	let#bo1 24	let#bo2 48	let#bo3 24	let#bo4 24	let#bo5 48	let#bo6 24	#include quer01
43		QNR	52	let#h 4121	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 510	let#m2 116	let#m3 567	let#m4 54	let#bo1 24	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 24	#include quer01
44		QNR	53	let#h 4234	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 570	let#m2 130	let#m3 634	let#m4 60	let#bo1 24	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 24	#include quer01
45		QNR	54	let#h 4363	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 630	let#m2 145	let#m3 702	let#m4 67	let#bo1 24	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 24	#include quer01
	QNR	55	let#h 4433	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 660	let#m2 152	let#m3 735	let#m4 70	let#bo1 24	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 24	#include quer01	
46	Section 10	QNR	56	let#h 4508	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 690	let#m2 159	let#m3 769	let#m4 74	let#bo1 48	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 48	#include quer01
47		QNR	57	let#h 4669	let#hlst 350	let#hmst 350	let#tbst 350	10	let#m1 751	let#m2 174	let#m3 836	let#m4 81	let#bo1 48	let#bo2 48	let#bo3 48	let#bo4 48	let#bo5 48	let#bo6 48	#include quer01
48		QNR	58	let#h 4811	let#hlst 350	let#hmst 350	let#tbst 3												

Appendix B Excel Sheet Effective Width

Cross-Section	bo1	bo2	bo3	bo4	bo5	bo6	hlst	hmst	lbst	b01	b02	b03	b04	α1	α2	α3	α4	α1 x b01	α2 x b02	α3 x b03	α4 x b04	Le	K ₁	K ₂	K ₃	K ₄	β ₁	β ₂	β ₃	β ₄	b _{eff,1}	b _{eff,2}	b _{eff,3}	b _{eff,4}
1	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
2	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
3	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
4	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
5	10	20	10	10	20	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.118	3868	1984	4140	1677	104.3	0.037	0.019	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
6	10	20	10	10	20	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.118	3868	1984	4140	1677	104.3	0.037	0.019	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
8	20	20	20	20	20	20	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.080	3868	2068	4140	1620	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
9	20	20	20	20	20	20	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.080	3868	2068	4140	1620	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
10	20	20	20	20	34	20	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.080	3868	2068	4140	1620	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
11	20	34	20	20	34	20	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.065	3868	2068	4140	1598	104.3	0.037	0.020	0.040	0.015	0.991	1.00	0.990	1.00	3123	1500	3044	1500
12	20	34	20	20	34	20	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.065	3868	2068	4140	1598	104.3	0.037	0.020	0.040	0.015	0.991	1.00	0.990	1.00	3123	1500	3044	1500
14	24	24	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
15	24	24	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
16	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
17	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
18	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
20	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
21	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
22	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
23	24	38	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.057	3868	2068	4322	1585	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
24	24	24	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
26	24	24	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
27	24	24	24	24	38	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
28	24	24	24	24	24	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
29	24	24	24	24	24	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
30	24	24	24	24	24	24	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.067	3868	2068	4322	1601	104.3	0.037	0.020	0.041	0.015	0.991	1.00	0.989	1.00	3123	1500	3042	1500
32	14	24	14	14	24	14	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.092	3868	2068	4140	1638	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
33	14	24	14	14	24	14	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.092	3868	2068	4140	1638	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
34	14	14	14	14	14	14	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.113	3868	2068	4140	1669	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
35	14	14	14	14	14	14	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.113	3868	2068	4140	1669	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
36	14	14	14	14	14	14	300	250	200	3150	1500	3075	1500	1.228	1.378	1.346	1.113	3868	2068	4140	1669	104.3	0.037	0.020	0.040	0.016	0.991	1.00	0.990	1.00	3123	1500	3044	1500
38	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
39	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
40	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
41	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
42	10	10	10	10	10	10	250	250	200	3150	1500	3075	1500	1.228	1.323	1.346	1.155	3868	1984	4140	1732	104.3	0.037	0.019	0.040	0.017	0.991	1.00	0.990	1.00	3123	1500	3044	1500
44	14	14	14	14	14	14	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.113	3868	2068	4322	1669	61.35	0.063	0.034	0.070	0.027	0.972	0.990	0.968	0.996	3062	1486	2977	1493
45	14	14	14	14	14	14	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.113	3868	2068	4322	1669	61.35	0.063	0.034	0.070	0.027	0.953	0.981	0.946	0.991	3002	1471	2910	1487
46	14	14	14	14	38	14	300	300	200	3150	1500	3075	1500	1.228	1.378	1.406	1.113	3868																

145

Appendix C Inventory Documents for Self-Weight

c) Fußweg (einschließlich Konsole, Schrammbord) g_3

Deckblech $2110 \times 10 = 242 \text{ kg/m}$

Blende: $\begin{aligned} &+ 500 \times 20 = 78,5 \text{ kg/m} \\ &+ 100 \times 100 \times 10 = 15,1 \text{ kg/m} \end{aligned} \quad \left. \vphantom{\begin{aligned} &+ 500 \times 20 \\ &+ 100 \times 100 \times 10 \end{aligned}} \right\} = 95 \text{ kg/m}$

5 Rippen $+ 120 \times 10 = 48 \text{ kg/m}$

Konsole: $\text{höchst. } 500 \times 10 \dots 2250 = 130 \text{ kg}$

Gurt $150 \times 10 \dots 2250 = 38 \text{ kg}$
 $168 \text{ kg} : 2,56 = 65 \text{ kg/m}$

Schrammbord: $\begin{aligned} &+ 25 \times 60 = 12 \text{ kg} \\ &200 \times 10 = 16 \text{ kg} \\ &230 \times 10 = 18 \text{ kg} \\ &240 \times 15 = 29 \text{ kg} \\ &\text{Schotken} = 5 \text{ kg} \end{aligned} \quad \left. \vphantom{\begin{aligned} &+ 25 \times 60 \\ &200 \times 10 \\ &230 \times 10 \\ &240 \times 15 \\ &\text{Schotken} \end{aligned}} \right\} = 80 \text{ kg/m}$

530 kg/m
 $+ 4\% \text{ Verputzmateriel} = 20 \text{ kg/m}$

$g_3 = 550 \text{ kg/m}$

Zusammenstellung

(lasten auf halben Querschnitt)

$g_I = g_1 + g_2 = 1835 + 0,665 = 2,50 \text{ t/m (auf Bohlkasten)}$

$g_{II} = g_3 = 0,55 \text{ t/m (auf Bohlk. + Mittelstück)}$

$g_{III} = g_4 = 1,20 \text{ t/m (auf Bohlk. + Mittelstück)}$
 $+ \text{Fußweg})$

(siehe Seite 108, 109, 110 ...)

Appendix D Locations of Derrick-Crane

Appendix E Stress Resultants for Ultimate Limit State

Appendix F SOFiSTiK Input to Model Longitudinal System

SOFiSTiK CADINP Eingabe
C:\...\Europabrücke Längssystem\Modell Europabrücke.dat

!#Kapitel 1. Materialien und Querschnitte

+prog template urs:41

KOPF Nachrechnung Europabrücke zwischen Kehl und Straßbourg

KOPF Masterarbeit an der Hochschule Karlsruhe und der Ryerson University Toronto

KOPF in Zusammenarbeit mit der Ingenieurgruppe Bauen

SEIT NRST 1 SPRA 0 PRIL -2 FORM 2 BEZ "S. 3/"

<TEXT>

<u>Appendix L EDV-Anhänge Sofistik </u>

Inhalt

1. Materialiel und Querschnitte

1.1 Materialien

1.2 Querschnitte

2. Modellierung Längssystem

3. Belastung

3.1 Überlagerungsvorschriften

3.2 Grundlasten

3.3 Verkehrslasten

3.4 Lasten für Auflagerbedingungen Quersystem

4. Einzelschnittgrößen und Lastgruppen

4.1 Zwischenüberlagerung Verkehr, Setzung und Temperatur

4.2 Berücksichtigung Bauablauf

5. Nachweiskonzept, Design Kombinationen und Spannungen

5.1 Nachweiskonzept

5.2 Schnittgrößen Design Kombinationen

5.3 Spannungen für Querschnittsnachweise

5.4 Lastkombination LM3 zur Ermittlung der Schwingbreiten

5.5 Schwingbreiten

5.6 Ausgangswerte für Berechnung der Lagerbedingungen des Quersystems

</TEXT>

ende

+prog aqua urs:47 \$ 1.1 Materialien

TXA <u>1. Materialien und Querschnitte</u>

TXA <u>1.1 Materialien</u>

<TEXT>

Nachfolgend werden nur die Eigenschaften der Materialien 1 (S 355),
5 (S 355T) und 30 (S235) dargestellt. Die anderen haben die gleichen
Eigenschaften.

</TEXT>

STEU warn 12413

ECHO MAT Voll

NORM DIN FB103-2009 WIND 1 \$ DIN FACHBERICHT 103

SOFISTIK CADINP Eingabe
C:\...\Europabrücke Längssystem\Modell Europabrücke.dat

```
STAH 1 S 355 gam 78.5 BEZ 'ST 52 Hohlkastendeckblech'
STAH 2 S 355 gam 78.5 BEZ 'ST 52 Hohlkastensteifen'
STAH 3 S 355 gam 78.5 BEZ 'ST 52 Aussensteg Hohlkasten'
STAH 4 S 355 gam 78.5 BEZ 'ST 52 Innensteg Hohlkasten'
STAH 5 S 355T gam 78.5 BEZ 'ST 52 Bodenblech'
STAH 6 S 355 gam 78.5 BEZ 'ST 52 Bodenblechsteifen'
STAH 7 S 355 gam 78.5 BEZ 'ST 52 Fahrbahnblech'
STAH 8 S 355 gam 78.5 BEZ 'ST 52 Fahrbahnblechsteifen'
STAH 9 S 355 gam 78.5 BEZ 'ST 52 Vertikales Blech Fußgängerweg'
STAH 10 S 355 gam 78.5 BEZ 'ST 52 Fußgängerweg'
STAH 11 S 355 gam 78.5 BEZ 'ST 52 Fußgängerwegsteifen'
STAH 12 S 355 gam 78.5 BEZ 'ST 52 Endsteife Fußgängerweg'
STAH 13 S 355 gam 0.00 BEZ 'ST 52 Querträger'
STAH 14 S 355 gam 0.00 BEZ 'ST 52 Fahrbahnblech für Querträger'
```

```
STAH 30 S 235 gam 78.5 BEZ 'St 37'
STAH 40 S 235 gam 0.00 BEZ 'Lagerstab'
ENDE
```

+prog aqua urs:42 \$ 1.2 Querschnitte

TXA <u>1.2 Querschnitte</u>

<text>

Nachfolgend werden die Querschnitte und ihre Bruttoquerschnittswerte dargestellt. Auf die Darstellung weiterer Querschnittseigenschaften wird verzichtet. Des weiteren wird von der Darstellung der Querschnitte in ihren jeweiligen Bauphasen abgesehen um den Programmausdruck übersichtlich zu halten.

Die Nummerierung der Querschnitte ist wie folgt.

```
Querschnitt 1-114 Stabanfangsquerschnitte Unterstrom
Querschnitt 201-314 Stabanfangsquerschnitte Oberstrom
Querschnitt 401-514 Stabanfangsquerschnitte Unterstrom
Querschnitt 601-714 Stabanfangsquerschnitte Oberstrom
Querschnitt 801 Äußerer Querschnitt Querträger
Querschnitt 802 Mittlerer Querschnitt Querträger
Querschnitt 1000 Lagerersatzquerschnitt
```

</text>

```
SEIT SPRA 0 PRIL -2 FORM 2 BEZ "S. 3/"
STEU REST 0
steu face neg
ECHO QUER VOLL
ECHO PICT VOLL
```

! *Label Variablendefinition

\$Variablendefinition Querschnitt

```
let#h 2500[mm] $ Querschnittshöhe
let#hlst 250[mm] $ Höhe Längssteifen Hohlkastendeckblech
let#hmst 250[mm] $ Höhe Längssteifen Fahrbahnplatte
let#tbst 0[mm] $ Blechdicke horizontaler Teil der Bodenblechsteife
```

\$Variablendefinition mitwirkende Breite

```
let#m1 0.00 $ NMW Teil Kragarm
```

let#m2 0.00 \$ NMW Teil innen (FbPL)
let#m3 0.00 \$ NMW Teil zwischen HK (FbPL)
let#m4 0.00 \$ NMW Teil unten (BoPLa)

\$Variablendefinition Bodenplatte

let#bo1 10[mm] \$ Dicke Bodenplatte zwischen HK-Steg aussen und Steife 1
let#bo2 10[mm] \$ Dicke Bodenplatte zwischen Steife 1 und Steife 2
let#bo3 10[mm] \$ Dicke Bodenplatte zwischen Steife 2 und Steife 3
let#bo4 10[mm] \$ Dicke Bodenplatte zwischen Steife 3 und Steife 4
let#bo5 10[mm] \$ Dicke Bodenplatte zwischen Steife 4 und Steife 5
let#bo6 10[mm] \$ Dicke Bodenplatte zwischen Steife 5 und HK-Steg innen

!*/Label Querschnitt Längsträger 1 Schuss 1-6 und 14-19

#define quer01

BA 10

let#y 1500[mm] \$Verschiebung Querschnitt in Kastenmittelpunkt

\$Hohlkastendeckblech

BLEC 1	YA	0+#y[mm]	ZA	0[mm]	YE	-363+#y[mm]	ZE	-5.445[mm]	D	12[mm]	mnr 1
BLEC 2	YA	-363+#y[mm]	ZA	-5.445[mm]	YE	-656+#y[mm]	ZE	-9.840[mm]	D	12[mm]	mnr 1
BLEC 3	YA	-656+#y[mm]	ZA	-9.840[mm]	YE	-949+#y[mm]	ZE	-14.235[mm]	D	12[mm]	mnr 1
BLEC 4	YA	-949+#y[mm]	ZA	-14.235[mm]	YE	-1242+#y[mm]	ZE	-18.630[mm]	D	12[mm]	mnr 1
BLEC 5	YA	-1242+#y[mm]	ZA	-18.630[mm]	YE	-1535+#y[mm]	ZE	-23.025[mm]	D	12[mm]	mnr 1
BLEC 6	YA	-1535+#y[mm]	ZA	-23.025[mm]	YE	-1828+#y[mm]	ZE	-27.420[mm]	D	12[mm]	mnr 1
BLEC 7	YA	-1828+#y[mm]	ZA	-27.420[mm]	YE	-2121+#y[mm]	ZE	-31.815[mm]	D	12[mm]	mnr 1
BLEC 8	YA	-2121+#y[mm]	ZA	-31.815[mm]	YE	-2414+#y[mm]	ZE	-36.210[mm]	D	12[mm]	mnr 1
BLEC 9	YA	-2414+#y[mm]	ZA	-36.210[mm]	YE	-2707+#y[mm]	ZE	-40.605[mm]	D	12[mm]	mnr 1
BLEC 10	YA	-2707+#y[mm]	ZA	-40.605[mm]	YE	-3000+#y[mm]	ZE	-45.000[mm]	D	12[mm]	mnr 1

\$ Spannungspunkte

QSP NR 31	Y	-10+#y[mm]	Z	-0.15[mm]	MNR	1
QSP NR 32	Y	-2990+#y[mm]	Z	-44.85[mm]	MNR	1

\$Längssteifen unter Hohlkastendeckblech

BLEC 11	YA	-363+#y[mm]	ZA	-5.445[mm]	YE	-363+#y[mm]	ZE	-5.445+#h1st[mm]	D	12[mm]	mnr 2
BLEC 12	YA	-656+#y[mm]	ZA	-9.840[mm]	YE	-656+#y[mm]	ZE	-9.840+#h1st[mm]	D	12[mm]	mnr 2
BLEC 13	YA	-949+#y[mm]	ZA	-14.235[mm]	YE	-949+#y[mm]	ZE	-14.235+#h1st[mm]	D	12[mm]	mnr 2
BLEC 14	YA	-1242+#y[mm]	ZA	-18.630[mm]	YE	-1242+#y[mm]	ZE	-18.630+#h1st[mm]	D	12[mm]	mnr 2
BLEC 15	YA	-1535+#y[mm]	ZA	-23.025[mm]	YE	-1535+#y[mm]	ZE	-23.025+#h1st[mm]	D	12[mm]	mnr 2
BLEC 16	YA	-1828+#y[mm]	ZA	-27.420[mm]	YE	-1828+#y[mm]	ZE	-27.420+#h1st[mm]	D	12[mm]	mnr 2
BLEC 17	YA	-2121+#y[mm]	ZA	-31.815[mm]	YE	-2121+#y[mm]	ZE	-31.815+#h1st[mm]	D	12[mm]	mnr 2
BLEC 18	YA	-2414+#y[mm]	ZA	-36.210[mm]	YE	-2414+#y[mm]	ZE	-36.210+#h1st[mm]	D	12[mm]	mnr 2
BLEC 19	YA	-2707+#y[mm]	ZA	-40.605[mm]	YE	-2707+#y[mm]	ZE	-40.605+#h1st[mm]	D	12[mm]	mnr 2

\$Steg des Hohlkastens unterstrom Aussen

BLEC 20	YA	0+#y[mm]	ZA	0[mm]	YE	0+#y[mm]	ZE	#h[mm]	D	10[mm]	mnr 3
---------	----	----------	----	-------	----	----------	----	--------	---	--------	-------

\$Steg des Hohlkastens unterstrom Innen

BLEC 21	YA	-3000+#y[mm]	ZA	-45.000[mm]	YE	-3000+#y[mm]	ZE	#h[mm]	D	10[mm]	mnr 4
---------	----	--------------	----	-------------	----	--------------	----	--------	---	--------	-------

\$Bodenblech des Hohlkastens

BLEC 30	YA	0+#y[mm]	ZA	#h[mm]	YE	-500+#y[mm]	ZE	#h[mm]	D	#bo1[mm]	mnr 5
BLEC 31	YA	-500+#y[mm]	ZA	#h[mm]	YE	-1000+#y[mm]	ZE	#h[mm]	D	#bo2[mm]	mnr 5
BLEC 32	YA	-1000+#y[mm]	ZA	#h[mm]	YE	-1500+#y[mm]	ZE	#h[mm]	D	#bo3[mm]	mnr 5
BLEC 33	YA	-1500+#y[mm]	ZA	#h[mm]	YE	-2000+#y[mm]	ZE	#h[mm]	D	#bo4[mm]	mnr 5
BLEC 34	YA	-2000+#y[mm]	ZA	#h[mm]	YE	-2500+#y[mm]	ZE	#h[mm]	D	#bo5[mm]	mnr 5

BLEC 35 YA -2500+#y[mm] ZA #h[mm] YE -3000+#y[mm] ZE #h[mm] D #bo6[mm] mnr 5

\$ Spannungspunkte

QSP NR 21 Y -10+#y[mm] Z #h[mm] MNR 5
QSP NR 22 Y -2990+#y[mm] Z #h[mm] MNR 5

\$Längssteifen auf Bodenblech

BLEC 40 YA -500+#y[mm] ZA #h[mm] YE -500+#y[mm] ZE #h-200[mm] D 10[mm] mnr 6
BLEC 41 YA -1000+#y[mm] ZA #h[mm] YE -1000+#y[mm] ZE #h-200[mm] D 10[mm] mnr 6
BLEC 42 YA -1500+#y[mm] ZA #h[mm] YE -1500+#y[mm] ZE #h-200[mm] D 10[mm] mnr 6
BLEC 43 YA -2000+#y[mm] ZA #h[mm] YE -2000+#y[mm] ZE #h-200[mm] D 10[mm] mnr 6
BLEC 44 YA -2500+#y[mm] ZA #h[mm] YE -2500+#y[mm] ZE #h-200[mm] D 10[mm] mnr 6

If #tbst

BLEC 45 YA -500+#y[mm] ZA #h-200[mm] YE -600+#y[mm] ZE #h-200[mm] D #tbst[mm] mnr 6
BLEC 46 YA -1000+#y[mm] ZA #h-200[mm] YE -1100+#y[mm] ZE #h-200[mm] D #tbst[mm] mnr 6
BLEC 47 YA -1500+#y[mm] ZA #h-200[mm] YE -1400+#y[mm] ZE #h-200[mm] D #tbst[mm] mnr 6
BLEC 48 YA -2000+#y[mm] ZA #h-200[mm] YE -1900+#y[mm] ZE #h-200[mm] D #tbst[mm] mnr 6
BLEC 49 YA -2500+#y[mm] ZA #h-200[mm] YE -2400+#y[mm] ZE #h-200[mm] D #tbst[mm] mnr 6
endif

\$ Spannungspunkte

QSP NR 1 Y 0+#y[mm] Z 30[mm] MNR 3
QSP NR 2 Y 0+#y[mm] Z #h/2[mm] MNR 3
QSP NR 3 Y 0+#y[mm] Z #h-30[mm] MNR 3
QSP NR 4 Y -3000+#y[mm] Z -15[mm] MNR 4
QSP NR 5 Y -3000+#y[mm] Z #h/2-22.5[mm] MNR 4
QSP NR 6 Y -3000+#y[mm] Z #h-30[mm] MNR 4

\$Querschnitt Fahrbahnblech zwischen Hohlkästen
BA 23

\$Fahrbahnblech zwischen Hohlkästen

BLEC 50 YA -3000+#y[mm] ZA -45.00[mm] YE -3310+#y[mm] ZE -49.65[mm] D 12[mm] mnr 7
BLEC 51 YA -3310+#y[mm] ZA -49.65[mm] YE -3600+#y[mm] ZE -54.00[mm] D 12[mm] mnr 7
BLEC 52 YA -3600+#y[mm] ZA -54.00[mm] YE -3890+#y[mm] ZE -58.35[mm] D 12[mm] mnr 7
BLEC 53 YA -3890+#y[mm] ZA -58.35[mm] YE -4180+#y[mm] ZE -62.70[mm] D 12[mm] mnr 7
BLEC 54 YA -4180+#y[mm] ZA -62.70[mm] YE -4470+#y[mm] ZE -67.05[mm] D 12[mm] mnr 7
BLEC 55 YA -4470+#y[mm] ZA -67.05[mm] YE -4760+#y[mm] ZE -71.40[mm] D 12[mm] mnr 7
BLEC 56 YA -4760+#y[mm] ZA -71.40[mm] YE -5050+#y[mm] ZE -75.75[mm] D 12[mm] mnr 7
BLEC 57 YA -5050+#y[mm] ZA -75.75[mm] YE -5340+#y[mm] ZE -80.10[mm] D 12[mm] mnr 7
BLEC 58 YA -5340+#y[mm] ZA -80.10[mm] YE -5630+#y[mm] ZE -84.45[mm] D 12[mm] mnr 7
BLEC 59 YA -5630+#y[mm] ZA -84.45[mm] YE -5920+#y[mm] ZE -88.80[mm] D 12[mm] mnr 7
BLEC 60 YA -5920+#y[mm] ZA -88.80[mm] YE -6075+#y[mm] ZE -91.125[mm] D 12[mm] mnr 7

\$ Spannungspunkte

QSP NR 41 Y -3010+#y[mm] Z -45.15[mm] MNR 7
QSP NR 42 Y -6065+#y[mm] Z -90.975[mm] MNR 7

\$Längssteifen des Fahrbahnblechs

BLEC 70 YA -3310+#y[mm] ZA -49.65[mm] YE -3310+#y[mm] ZE -49.65+#hmst[mm] D 12[mm] mnr 8
BLEC 71 YA -3600+#y[mm] ZA -54.00[mm] YE -3600+#y[mm] ZE -54.00+#hmst[mm] D 12[mm] mnr 8
BLEC 72 YA -3890+#y[mm] ZA -58.35[mm] YE -3890+#y[mm] ZE -58.35+#hmst[mm] D 12[mm] mnr 8
BLEC 73 YA -4180+#y[mm] ZA -62.70[mm] YE -4180+#y[mm] ZE -62.70+#hmst[mm] D 12[mm] mnr 8
BLEC 74 YA -4470+#y[mm] ZA -67.05[mm] YE -4470+#y[mm] ZE -67.05+#hmst[mm] D 12[mm] mnr 8
BLEC 75 YA -4760+#y[mm] ZA -71.40[mm] YE -4760+#y[mm] ZE -71.40+#hmst[mm] D 12[mm] mnr 8

BLEC 76 YA -5050+#y[mm] ZA -75.75[mm] YE -5050+#y[mm] ZE -75.75+#hmst[mm] D 12[mm] mnr 8
BLEC 77 YA -5340+#y[mm] ZA -80.10[mm] YE -5340+#y[mm] ZE -80.10+#hmst[mm] D 12[mm] mnr 8
BLEC 78 YA -5630+#y[mm] ZA -84.45[mm] YE -5630+#y[mm] ZE -84.45+#hmst[mm] D 12[mm] mnr 8
BLEC 79 YA -5920+#y[mm] ZA -88.80[mm] YE -5920+#y[mm] ZE -88.80+#hmst[mm] D 12[mm] mnr 8

\$Querschnitt Fußgängerweg und Konsole
BA 30

\$Vertikales Blech

BLEC 80 YA 0+#y[mm] ZA 0[mm] YE 0+#y[mm] ZE -253.00[mm] D 10[mm] mnr 9

\$Fußgängerweg

BLEC 81 YA 0+#y[mm] ZA -253.00[mm] YE 585+#y[mm] ZE -261.78[mm] D 10[mm] mnr 10
BLEC 82 YA 585+#y[mm] ZA -261.78[mm] YE 1099+#y[mm] ZE -269.49[mm] D 10[mm] mnr 10
BLEC 83 YA 1099+#y[mm] ZA -269.49[mm] YE 1613+#y[mm] ZE -277.20[mm] D 10[mm] mnr 10
BLEC 84 YA 1613+#y[mm] ZA -277.20[mm] YE 2127+#y[mm] ZE -284.91[mm] D 10[mm] mnr 10
BLEC 85 YA 2127+#y[mm] ZA -284.91[mm] YE 2641+#y[mm] ZE -292.62[mm] D 10[mm] mnr 10
BLEC 86 YA 2641+#y[mm] ZA -292.62[mm] YE 3150+#y[mm] ZE -300.25[mm] D 10[mm] mnr 10

\$Längssteifen

BLEC 90 YA 585+#y[mm] ZA -261.78[mm] YE 585+#y[mm] ZE -141.78[mm] D 10[mm] mnr 11
BLEC 91 YA 1099+#y[mm] ZA -269.49[mm] YE 1099+#y[mm] ZE -149.49[mm] D 10[mm] mnr 11
BLEC 92 YA 1613+#y[mm] ZA -277.20[mm] YE 1613+#y[mm] ZE -157.20[mm] D 10[mm] mnr 11
BLEC 93 YA 2127+#y[mm] ZA -284.91[mm] YE 2127+#y[mm] ZE -164.91[mm] D 10[mm] mnr 11
BLEC 94 YA 2641+#y[mm] ZA -292.62[mm] YE 2641+#y[mm] ZE -172.62[mm] D 10[mm] mnr 11

\$Endsteife

BLEC 95 YA 3150+#y[mm] ZA -300.25[mm] YE 3150+#y[mm] ZE 199.75[mm] D 20[mm] mnr 12

\$ nichtmitwirkende Flächen:

BA 40

neff type nr ymin zmin ymax zmax
z '#m1' 3150+#y-#m1 -310 3160+#y 199.75

neff type nr ymin zmin ymax zmax
z '#m2' -#m2 -35 #m2 350

neff type nr ymin zmin ymax zmax
z '#m3' -6075+#y -100 -6075+#m3+#y 300

neff type nr ymin zmin ymax zmax
z '#m4' -#m4 #h-250 #m4 #h+25

#enddef

!!Label Querschnitt Längsträger 1 Schuss 7-13*

#define quer1.1

BA 10

let#y 1500[mm] *\$Verschiebung Querschnitt in Kastenmittelpunkt*

\$Hohlkastendeckblech

BLEC 1 YA 0+#y[mm] ZA 0[mm] YE -363+#y[mm] ZE -5.445[mm] D 12[mm] mnr 1
BLEC 2 YA -363+#y[mm] ZA -5.445[mm] YE -656+#y[mm] ZE -9.840[mm] D 12[mm] mnr 1
BLEC 3 YA -656+#y[mm] ZA -9.840[mm] YE -949+#y[mm] ZE -14.235[mm] D 12[mm] mnr 1
BLEC 4 YA -949+#y[mm] ZA -14.235[mm] YE -1242+#y[mm] ZE -18.630[mm] D 12[mm] mnr 1
BLEC 5 YA -1242+#y[mm] ZA -18.630[mm] YE -1535+#y[mm] ZE -23.025[mm] D 12[mm] mnr 1

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```
BLEC 6  YA  -1535+#y[mm]  ZA  -23.025[mm]  YE  -1828+#y[mm]  ZE  -27.420[mm]  D  12[mm]  mnr 1
BLEC 7  YA  -1828+#y[mm]  ZA  -27.420[mm]  YE  -2121+#y[mm]  ZE  -31.815[mm]  D  12[mm]  mnr 1
BLEC 8  YA  -2121+#y[mm]  ZA  -31.815[mm]  YE  -2414+#y[mm]  ZE  -36.210[mm]  D  12[mm]  mnr 1
BLEC 9  YA  -2414+#y[mm]  ZA  -36.210[mm]  YE  -2707+#y[mm]  ZE  -40.605[mm]  D  12[mm]  mnr 1
BLEC 10 YA  -2707+#y[mm]  ZA  -40.605[mm]  YE  -3000+#y[mm]  ZE  -45.000[mm]  D  12[mm]  mnr 1
```

\$ Spannungspunkte

```
QSP NR 31  Y  -10+#y[mm]  Z  -0.15[mm]  MNR 1
QSP NR 32  Y  -2990+#y[mm]  Z  -44.85[mm]  MNR 1
```

\$Längssteifen unter Hohlkastendeckblech

```
BLEC 11 YA  -363+#y[mm]  ZA  -5.445[mm]  YE  -363+#y[mm]  ZE  -5.445+#hlst[mm]  D  12[mm]  mnr 2
BLEC 12 YA  -656+#y[mm]  ZA  -9.840[mm]  YE  -656+#y[mm]  ZE  -9.840+#hlst[mm]  D  12[mm]  mnr 2
BLEC 13 YA  -949+#y[mm]  ZA  -14.235[mm]  YE  -949+#y[mm]  ZE  -14.235+#hlst[mm]  D  12[mm]  mnr 2
BLEC 14 YA  -1242+#y[mm]  ZA  -18.630[mm]  YE  -1242+#y[mm]  ZE  -18.630+#hlst[mm]  D  12[mm]  mnr 2
BLEC 15 YA  -1535+#y[mm]  ZA  -23.025[mm]  YE  -1535+#y[mm]  ZE  -23.025+#hlst[mm]  D  12[mm]  mnr 2
BLEC 16 YA  -1828+#y[mm]  ZA  -27.420[mm]  YE  -1828+#y[mm]  ZE  -27.420+#hlst[mm]  D  12[mm]  mnr 2
BLEC 17 YA  -2121+#y[mm]  ZA  -31.815[mm]  YE  -2121+#y[mm]  ZE  -31.815+#hlst[mm]  D  12[mm]  mnr 2
BLEC 18 YA  -2414+#y[mm]  ZA  -36.210[mm]  YE  -2414+#y[mm]  ZE  -36.210+#hlst[mm]  D  12[mm]  mnr 2
BLEC 19 YA  -2707+#y[mm]  ZA  -40.605[mm]  YE  -2707+#y[mm]  ZE  -40.605+#hlst[mm]  D  12[mm]  mnr 2
```

\$Steg des Hohlkastens unterstrom Aussen

```
BLEC 20 YA  0+#y[mm]  ZA  0[mm]  YE  0+#y[mm]  ZE #h[mm]  D  10[mm]  mnr 3
```

\$Steg des Hohlkastens unterstrom Innen

```
BLEC 21 YA  -3000+#y[mm]  ZA  -45.000[mm]  YE  -3000+#y[mm]  ZE #h[mm]  D  10[mm]  mnr 4
```

\$Bodenblech des Hohlkastens

```
BLEC 30 YA  0+#y[mm]  ZA  #h[mm]  YE  -500+#y[mm]  ZE #h[mm]  D  #bo1[mm]  mnr 5
BLEC 31 YA  -500+#y[mm]  ZA  #h[mm]  YE  -1000+#y[mm]  ZE #h[mm]  D  #bo2[mm]  mnr 5
BLEC 32 YA  -1000+#y[mm]  ZA  #h[mm]  YE  -1500+#y[mm]  ZE #h[mm]  D  #bo3[mm]  mnr 5
BLEC 33 YA  -1500+#y[mm]  ZA  #h[mm]  YE  -2000+#y[mm]  ZE #h[mm]  D  #bo4[mm]  mnr 5
BLEC 34 YA  -2000+#y[mm]  ZA  #h[mm]  YE  -2500+#y[mm]  ZE #h[mm]  D  #bo5[mm]  mnr 5
BLEC 35 YA  -2500+#y[mm]  ZA  #h[mm]  YE  -3000+#y[mm]  ZE #h[mm]  D  #bo6[mm]  mnr 5
```

\$ Spannungspunkte

```
QSP NR 21  Y  -10+#y[mm]  Z  #h[mm]  MNR 5
QSP NR 22  Y  -2990+#y[mm]  Z  #h[mm]  MNR 5
```

\$Längssteifen auf Bodenblech

```
BLEC 40 YA  -500+#y[mm]  ZA  #h[mm]  YE  -500+#y[mm]  ZE #h-200[mm]  D  10[mm]  mnr 6
BLEC 41 YA  -1000+#y[mm]  ZA  #h[mm]  YE  -1000+#y[mm]  ZE #h-200[mm]  D  10[mm]  mnr 6
BLEC 42 YA  -1500+#y[mm]  ZA  #h[mm]  YE  -1500+#y[mm]  ZE #h-200[mm]  D  10[mm]  mnr 6
BLEC 43 YA  -2000+#y[mm]  ZA  #h[mm]  YE  -2000+#y[mm]  ZE #h-200[mm]  D  10[mm]  mnr 6
BLEC 44 YA  -2500+#y[mm]  ZA  #h[mm]  YE  -2500+#y[mm]  ZE #h-200[mm]  D  10[mm]  mnr 6
```

If #tbst

```
BLEC 45 YA  -500+#y[mm]  ZA  #h-200[mm]  YE  -600+#y[mm]  ZE #h-200[mm]  D  #tbst[mm]  mnr 6
BLEC 46 YA  -1000+#y[mm]  ZA  #h-200[mm]  YE  -1100+#y[mm]  ZE #h-200[mm]  D  #tbst[mm]  mnr 6
BLEC 47 YA  -1500+#y[mm]  ZA  #h-200[mm]  YE  -1400+#y[mm]  ZE #h-200[mm]  D  #tbst[mm]  mnr 6
BLEC 48 YA  -2000+#y[mm]  ZA  #h-200[mm]  YE  -1900+#y[mm]  ZE #h-200[mm]  D  #tbst[mm]  mnr 6
BLEC 49 YA  -2500+#y[mm]  ZA  #h-200[mm]  YE  -2400+#y[mm]  ZE #h-200[mm]  D  #tbst[mm]  mnr 6
```

endif

\$ Spannungspunkte

```
QSP NR 1  Y  0+#y[mm]  Z  30[mm]  MNR 3
```

QSP NR 2 Y 0+#y[mm] Z #h/2[mm] MNR 3
QSP NR 3 Y 0+#y[mm] Z #h-30[mm] MNR 3
QSP NR 4 Y -3000+#y[mm] Z -15[mm] MNR 4
QSP NR 5 Y -3000+#y[mm] Z #h/2-22.5[mm] MNR 4
QSP NR 6 Y -3000+#y[mm] Z #h-30[mm] MNR 4

\$Querschnitt Fahrbahnblech zwischen Hohlkästen
BA 21

\$Fahrbahnblech zwischen Hohlkästen

BLEC 50 YA -3000+#y[mm] ZA -45.00[mm] YE -3310+#y[mm] ZE -49.65[mm] D 12[mm] mnr 7
BLEC 51 YA -3310+#y[mm] ZA -49.65[mm] YE -3600+#y[mm] ZE -54.00[mm] D 12[mm] mnr 7
BLEC 52 YA -3600+#y[mm] ZA -54.00[mm] YE -3890+#y[mm] ZE -58.35[mm] D 12[mm] mnr 7
BLEC 53 YA -3890+#y[mm] ZA -58.35[mm] YE -4180+#y[mm] ZE -62.70[mm] D 12[mm] mnr 7
BLEC 54 YA -4180+#y[mm] ZA -62.70[mm] YE -4470+#y[mm] ZE -67.05[mm] D 12[mm] mnr 7
BLEC 55 YA -4470+#y[mm] ZA -67.05[mm] YE -4760+#y[mm] ZE -71.40[mm] D 12[mm] mnr 7
BLEC 56 YA -4760+#y[mm] ZA -71.40[mm] YE -5050+#y[mm] ZE -75.75[mm] D 12[mm] mnr 7
BLEC 57 YA -5050+#y[mm] ZA -75.75[mm] YE -5340+#y[mm] ZE -80.10[mm] D 12[mm] mnr 7
BLEC 58 YA -5340+#y[mm] ZA -80.10[mm] YE -5630+#y[mm] ZE -84.45[mm] D 12[mm] mnr 7
BLEC 59 YA -5630+#y[mm] ZA -84.45[mm] YE -5920+#y[mm] ZE -88.80[mm] D 12[mm] mnr 7
BLEC 60 YA -5920+#y[mm] ZA -88.80[mm] YE -6075+#y[mm] ZE -91.125[mm] D 12[mm] mnr 7

\$ Spannungspunkte

QSP NR 41 Y -3010+#y[mm] Z -45.15[mm] MNR 7
QSP NR 42 Y -6065+#y[mm] Z -90.975[mm] MNR 7

\$Längssteifen des Fahrbahnblechs

BLEC 70 YA -3310+#y[mm] ZA -49.65[mm] YE -3310+#y[mm] ZE -49.65+#hmst[mm] D 12[mm] mnr 8
BLEC 71 YA -3600+#y[mm] ZA -54.00[mm] YE -3600+#y[mm] ZE -54.00+#hmst[mm] D 12[mm] mnr 8
BLEC 72 YA -3890+#y[mm] ZA -58.35[mm] YE -3890+#y[mm] ZE -58.35+#hmst[mm] D 12[mm] mnr 8
BLEC 73 YA -4180+#y[mm] ZA -62.70[mm] YE -4180+#y[mm] ZE -62.70+#hmst[mm] D 12[mm] mnr 8
BLEC 74 YA -4470+#y[mm] ZA -67.05[mm] YE -4470+#y[mm] ZE -67.05+#hmst[mm] D 12[mm] mnr 8
BLEC 75 YA -4760+#y[mm] ZA -71.40[mm] YE -4760+#y[mm] ZE -71.40+#hmst[mm] D 12[mm] mnr 8
BLEC 76 YA -5050+#y[mm] ZA -75.75[mm] YE -5050+#y[mm] ZE -75.75+#hmst[mm] D 12[mm] mnr 8
BLEC 77 YA -5340+#y[mm] ZA -80.10[mm] YE -5340+#y[mm] ZE -80.10+#hmst[mm] D 12[mm] mnr 8
BLEC 78 YA -5630+#y[mm] ZA -84.45[mm] YE -5630+#y[mm] ZE -84.45+#hmst[mm] D 12[mm] mnr 8
BLEC 79 YA -5920+#y[mm] ZA -88.80[mm] YE -5920+#y[mm] ZE -88.80+#hmst[mm] D 12[mm] mnr 8

\$Querschnitt Fußgängerweg und Konsole
BA 30

\$Vertikales Blech

BLEC 80 YA 0+#y[mm] ZA 0[mm] YE 0+#y[mm] ZE -253.00[mm] D 10[mm] mnr 9

\$Fußgängerweg

BLEC 81 YA 0+#y[mm] ZA -253.00[mm] YE 585+#y[mm] ZE -261.78[mm] D 10[mm] mnr 10
BLEC 82 YA 585+#y[mm] ZA -261.78[mm] YE 1099+#y[mm] ZE -269.49[mm] D 10[mm] mnr 10
BLEC 83 YA 1099+#y[mm] ZA -269.49[mm] YE 1613+#y[mm] ZE -277.20[mm] D 10[mm] mnr 10
BLEC 84 YA 1613+#y[mm] ZA -277.20[mm] YE 2127+#y[mm] ZE -284.91[mm] D 10[mm] mnr 10
BLEC 85 YA 2127+#y[mm] ZA -284.91[mm] YE 2641+#y[mm] ZE -292.62[mm] D 10[mm] mnr 10
BLEC 86 YA 2641+#y[mm] ZA -292.62[mm] YE 3150+#y[mm] ZE -300.25[mm] D 10[mm] mnr 10

\$Längssteifen

BLEC 90 YA 585+#y[mm] ZA -261.78[mm] YE 585+#y[mm] ZE -141.78[mm] D 10[mm] mnr 11
BLEC 91 YA 1099+#y[mm] ZA -269.49[mm] YE 1099+#y[mm] ZE -149.49[mm] D 10[mm] mnr 11
BLEC 92 YA 1613+#y[mm] ZA -277.20[mm] YE 1613+#y[mm] ZE -157.20[mm] D 10[mm] mnr 11

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BLEC 93 YA 2127+#y[mm] ZA -284.91[mm] YE 2127+#y[mm] ZE -164.91[mm] D 10[mm] mnr 11
BLEC 94 YA 2641+#y[mm] ZA -292.62[mm] YE 2641+#y[mm] ZE -172.62[mm] D 10[mm] mnr 11

\$Endsteife

BLEC 95 YA 3150+#y[mm] ZA -300.25[mm] YE 3150+#y[mm] ZE 199.75[mm] D 20[mm] mnr 12

\$ nichtmitwirkende Flächen:

BA 40

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m1'		3150+#y-#m1	-310	3160+#y		199.75

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m2'		-#m2	-35	#m2		350

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m3'		-6075+#y	-100	-6075+#m3+#y		300

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m4'		-#m4	#h-250	#m4		#h+25

#endef

! *!Label Querschnitt Längsträger 2 Schuss 1-6 und 14-19

#define quer02

BA 10

let#y1 10650[mm] \$Verschiebung Querschnitt in Kastenmittelpunkt

\$Hohlkastendeckblech

BLEC 101	YA	-9150+#y1[mm]	ZA	-45.000[mm]	YE	-9443+#y1[mm]	ZE	-40.685[mm]	D	12[mm]	mnr 1
BLEC 102	YA	-9443+#y1[mm]	ZA	-40.685[mm]	YE	-9736+#y1[mm]	ZE	-36.210[mm]	D	12[mm]	mnr 1
BLEC 103	YA	-9736+#y1[mm]	ZA	-36.210[mm]	YE	-10029+#y1[mm]	ZE	-31.815[mm]	D	12[mm]	mnr 1
BLEC 104	YA	-10029+#y1[mm]	ZA	-31.815[mm]	YE	-10322+#y1[mm]	ZE	-27.420[mm]	D	12[mm]	mnr 1
BLEC 105	YA	-10322+#y1[mm]	ZA	-27.420[mm]	YE	-10615+#y1[mm]	ZE	-23.025[mm]	D	12[mm]	mnr 1
BLEC 106	YA	-10615+#y1[mm]	ZA	-23.025[mm]	YE	-10908+#y1[mm]	ZE	-18.630[mm]	D	12[mm]	mnr 1
BLEC 107	YA	-10908+#y1[mm]	ZA	-18.630[mm]	YE	-11201+#y1[mm]	ZE	-14.235[mm]	D	12[mm]	mnr 1
BLEC 108	YA	-11201+#y1[mm]	ZA	-14.235[mm]	YE	-11494+#y1[mm]	ZE	-9.840[mm]	D	12[mm]	mnr 1
BLEC 109	YA	-11494+#y1[mm]	ZA	-9.840[mm]	YE	-11787+#y1[mm]	ZE	-5.445[mm]	D	12[mm]	mnr 1
BLEC 110	YA	-11787+#y1[mm]	ZA	-5.445[mm]	YE	-12150+#y1[mm]	ZE	0.000[mm]	D	12[mm]	mnr 1

\$Längssteifen unter Hohlkastendeckblech

BLEC 111	YA	-9443+#y1[mm]	ZA	-40.685[mm]	YE	-9443+#y1[mm]	ZE	-40.685+#h1st[mm]	D	12[mm]	mnr 2
BLEC 112	YA	-9736+#y1[mm]	ZA	-36.210[mm]	YE	-9736+#y1[mm]	ZE	-36.210+#h1st[mm]	D	12[mm]	mnr 2
BLEC 113	YA	-10029+#y1[mm]	ZA	-31.815[mm]	YE	-10029+#y1[mm]	ZE	-31.815+#h1st[mm]	D	12[mm]	mnr 2
BLEC 114	YA	-10322+#y1[mm]	ZA	-27.420[mm]	YE	-10322+#y1[mm]	ZE	-27.420+#h1st[mm]	D	12[mm]	mnr 2
BLEC 115	YA	-10615+#y1[mm]	ZA	-23.025[mm]	YE	-10615+#y1[mm]	ZE	-23.025+#h1st[mm]	D	12[mm]	mnr 2
BLEC 116	YA	-10908+#y1[mm]	ZA	-18.630[mm]	YE	-10908+#y1[mm]	ZE	-18.630+#h1st[mm]	D	12[mm]	mnr 2
BLEC 117	YA	-11201+#y1[mm]	ZA	-14.235[mm]	YE	-11201+#y1[mm]	ZE	-14.235+#h1st[mm]	D	12[mm]	mnr 2
BLEC 118	YA	-11494+#y1[mm]	ZA	-9.840[mm]	YE	-11494+#y1[mm]	ZE	-9.840+#h1st[mm]	D	12[mm]	mnr 2
BLEC 119	YA	-11787+#y1[mm]	ZA	-5.445[mm]	YE	-11787+#y1[mm]	ZE	-5.445+#h1st[mm]	D	12[mm]	mnr 2

\$Steg des Hohlkastens oberstrom Innen

BLEC 120 YA -9150+#y1[mm] ZA -45.0[mm] YE -9150+#y1[mm] ZE #h[mm] D 10[mm] mnr 3

\$Steg des Hohlkastens oberstrom Aussen

BLEC 121 YA -12150+#y1[mm] ZA 0[mm] YE -12150+#y1[mm] ZE #h[mm] D 10[mm] mnr 4

\$Bodenblech des Hohlkastens

BLEC 130	YA	-9150+#y1[mm]	ZA	#h[mm]	YE	-9650+#y1[mm]	ZE	#h[mm]	D	#bo6[mm]	mnr	5
BLEC 131	YA	-9650+#y1[mm]	ZA	#h[mm]	YE	-10150+#y1[mm]	ZE	#h[mm]	D	#bo5[mm]	mnr	5
BLEC 132	YA	-10150+#y1[mm]	ZA	#h[mm]	YE	-10650+#y1[mm]	ZE	#h[mm]	D	#bo4[mm]	mnr	5
BLEC 133	YA	-10650+#y1[mm]	ZA	#h[mm]	YE	-11150+#y1[mm]	ZE	#h[mm]	D	#bo3[mm]	mnr	5
BLEC 134	YA	-11150+#y1[mm]	ZA	#h[mm]	YE	-11650+#y1[mm]	ZE	#h[mm]	D	#bo2[mm]	mnr	5
BLEC 135	YA	-11650+#y1[mm]	ZA	#h[mm]	YE	-12150+#y1[mm]	ZE	#h[mm]	D	#bo1[mm]	mnr	5

\$Längssteifen auf Bodenblech

BLEC 140	YA	-9650+#y1[mm]	ZA	#h[mm]	YE	-9650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 141	YA	-10150+#y1[mm]	ZA	#h[mm]	YE	-10150+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 142	YA	-10650+#y1[mm]	ZA	#h[mm]	YE	-10650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 143	YA	-11150+#y1[mm]	ZA	#h[mm]	YE	-11150+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 144	YA	-11650+#y1[mm]	ZA	#h[mm]	YE	-11650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6

If #tbst

BLEC 145	YA	-9650+#y1[mm]	ZA	#h-200[mm]	YE	-9750+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 146	YA	-10150+#y1[mm]	ZA	#h-200[mm]	YE	-10250+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 147	YA	-10650+#y1[mm]	ZA	#h-200[mm]	YE	-10750+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 148	YA	-11150+#y1[mm]	ZA	#h-200[mm]	YE	-11050+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 149	YA	-11650+#y1[mm]	ZA	#h-200[mm]	YE	-11550+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6

endif

\$ Spannungspunkte

QSP NR 7	Y	-9150+#y1[mm]	Z	-15[mm]	MNR	3
QSP NR 8	Y	-9150+#y1[mm]	Z	#h/2-22.5[mm]	MNR	3
QSP NR 9	Y	-9150+#y1[mm]	Z	#h-30[mm]	MNR	3
QSP NR 10	Y	-12150+#y1[mm]	Z	30[mm]	MNR	4
QSP NR 11	Y	-12150+#y1[mm]	Z	#h/2[mm]	MNR	4
QSP NR 12	Y	-12150+#y1[mm]	Z	#h-30[mm]	MNR	4

\$Querschnitt Fahrbahnblech zwischen Hohlkästen
BA 23

\$Fahrbahnblech zwischen Hohlkästen

BLEC 150	YA	-6075+#y1[mm]	ZA	-91.125[mm]	YE	-6230+#y1[mm]	ZE	-88.80[mm]	D	12[mm]	mnr	7
BLEC 151	YA	-6230+#y1[mm]	ZA	-88.80[mm]	YE	-6520+#y1[mm]	ZE	-84.45[mm]	D	12[mm]	mnr	7
BLEC 152	YA	-6520+#y1[mm]	ZA	-84.45[mm]	YE	-6810+#y1[mm]	ZE	-80.10[mm]	D	12[mm]	mnr	7
BLEC 153	YA	-6810+#y1[mm]	ZA	-80.10[mm]	YE	-7100+#y1[mm]	ZE	-75.75[mm]	D	12[mm]	mnr	7
BLEC 154	YA	-7100+#y1[mm]	ZA	-75.75[mm]	YE	-7390+#y1[mm]	ZE	-71.40[mm]	D	12[mm]	mnr	7
BLEC 155	YA	-7390+#y1[mm]	ZA	-71.40[mm]	YE	-7680+#y1[mm]	ZE	-67.05[mm]	D	12[mm]	mnr	7
BLEC 156	YA	-7680+#y1[mm]	ZA	-67.05[mm]	YE	-7970+#y1[mm]	ZE	-62.70[mm]	D	12[mm]	mnr	7
BLEC 157	YA	-7970+#y1[mm]	ZA	-62.70[mm]	YE	-8260+#y1[mm]	ZE	-58.35[mm]	D	12[mm]	mnr	7
BLEC 158	YA	-8260+#y1[mm]	ZA	-58.35[mm]	YE	-8550+#y1[mm]	ZE	-54.00[mm]	D	12[mm]	mnr	7
BLEC 159	YA	-8550+#y1[mm]	ZA	-54.00[mm]	YE	-8840+#y1[mm]	ZE	-49.65[mm]	D	12[mm]	mnr	7
BLEC 160	YA	-8840+#y1[mm]	ZA	-49.65[mm]	YE	-9150+#y1[mm]	ZE	-45.00[mm]	D	12[mm]	mnr	7

\$Längssteifen des Fahrbahnblechs

BLEC 170	YA	-6230+#y1[mm]	ZA	-88.80[mm]	YE	-6230+#y1[mm]	ZE	-88.80+#hmst[mm]	D	12[mm]	mnr	8
BLEC 171	YA	-6520+#y1[mm]	ZA	-84.45[mm]	YE	-6520+#y1[mm]	ZE	-84.45+#hmst[mm]	D	12[mm]	mnr	8
BLEC 172	YA	-6810+#y1[mm]	ZA	-80.10[mm]	YE	-6810+#y1[mm]	ZE	-80.10+#hmst[mm]	D	12[mm]	mnr	8
BLEC 173	YA	-7100+#y1[mm]	ZA	-75.75[mm]	YE	-7100+#y1[mm]	ZE	-75.75+#hmst[mm]	D	12[mm]	mnr	8
BLEC 174	YA	-7390+#y1[mm]	ZA	-71.40[mm]	YE	-7390+#y1[mm]	ZE	-71.40+#hmst[mm]	D	12[mm]	mnr	8
BLEC 175	YA	-7680+#y1[mm]	ZA	-67.05[mm]	YE	-7680+#y1[mm]	ZE	-67.05+#hmst[mm]	D	12[mm]	mnr	8
BLEC 176	YA	-7970+#y1[mm]	ZA	-62.70[mm]	YE	-7970+#y1[mm]	ZE	-62.70+#hmst[mm]	D	12[mm]	mnr	8

SOFISTIK CADINP Eingabe
C:\...\Europabrücke Längssystem\Modell Europabrücke.dat

BLEC 177 YA -8260+#y1[mm] ZA -58.35[mm] YE -8260+#y1[mm] ZE -58.35+#hmst[mm] D 12[mm] mnr 8
BLEC 178 YA -8550+#y1[mm] ZA -54.00[mm] YE -8550+#y1[mm] ZE -54.00+#hmst[mm] D 12[mm] mnr 8
BLEC 179 YA -8840+#y1[mm] ZA -49.65[mm] YE -8840+#y1[mm] ZE -49.65+#hmst[mm] D 12[mm] mnr 8

\$Querschnitt Fußgängerweg und Konsole
BA 30

\$Vertikales Blech

BLEC 180 YA -12150+#y1[mm] ZA 0[mm] YE -12150+#y1[mm] ZE -253.00[mm] D 10[mm] mnr 9

\$Fußgängerweg

BLEC 181 YA -12150+#y1[mm] ZA -253.00[mm] YE -12735+#y1[mm] ZE -261.78[mm] D 10[mm] mnr 10
BLEC 182 YA -12735+#y1[mm] ZA -261.78[mm] YE -13249+#y1[mm] ZE -269.49[mm] D 10[mm] mnr 10
BLEC 183 YA -13249+#y1[mm] ZA -269.49[mm] YE -13763+#y1[mm] ZE -277.20[mm] D 10[mm] mnr 10
BLEC 184 YA -13763+#y1[mm] ZA -277.20[mm] YE -14277+#y1[mm] ZE -284.91[mm] D 10[mm] mnr 10
BLEC 185 YA -14277+#y1[mm] ZA -284.91[mm] YE -14791+#y1[mm] ZE -292.62[mm] D 10[mm] mnr 10
BLEC 186 YA -14791+#y1[mm] ZA -292.62[mm] YE -15300+#y1[mm] ZE -300.25[mm] D 10[mm] mnr 10

\$Längssteifen

BLEC 190 YA -12735+#y1[mm] ZA -261.78[mm] YE -12735+#y1[mm] ZE -141.78[mm] D 10[mm] mnr 11
BLEC 191 YA -13249+#y1[mm] ZA -269.49[mm] YE -13249+#y1[mm] ZE -149.49[mm] D 10[mm] mnr 11
BLEC 192 YA -13763+#y1[mm] ZA -277.20[mm] YE -13763+#y1[mm] ZE -157.20[mm] D 10[mm] mnr 11
BLEC 193 YA -14277+#y1[mm] ZA -284.91[mm] YE -14277+#y1[mm] ZE -164.91[mm] D 10[mm] mnr 11
BLEC 194 YA -14791+#y1[mm] ZA -292.62[mm] YE -14791+#y1[mm] ZE -172.62[mm] D 10[mm] mnr 11

\$Endsteife

BLEC 195 YA -15300+#y1[mm] ZA -300.25[mm] YE -15300+#y1[mm] ZE 199.75[mm] D 20[mm] mnr 12

\$ nichtmitwirkende Flächen:

BA 40

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m1'		-15310+#y1	-310	-15300+#m1+#y1	199.75	

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m2'		-#m2	-35	#m2	350	

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m3'		-6075+#y1-#m3	-100	-6075+#y1	300	

neff	type	nr	ymin	zmin	ymin	ymax	zmax
z	'#m4'		-#m4	#h-250	#m4	#h+25	

#enddef

!\$Label Querschnitt Längsträger 2 Schuss 7-13

#define quer2.1

BA 10

let#y1 10650[mm] \$Verschiebung Querschnitt in Kastenmittelpunkt

\$Hohlkastendeckblech

BLEC 101 YA -9150+#y1[mm] ZA -45.000[mm] YE -9443+#y1[mm] ZE -40.685[mm] D 12[mm] mnr 1
BLEC 102 YA -9443+#y1[mm] ZA -40.685[mm] YE -9736+#y1[mm] ZE -36.210[mm] D 12[mm] mnr 1
BLEC 103 YA -9736+#y1[mm] ZA -36.210[mm] YE -10029+#y1[mm] ZE -31.815[mm] D 12[mm] mnr 1
BLEC 104 YA -10029+#y1[mm] ZA -31.815[mm] YE -10322+#y1[mm] ZE -27.420[mm] D 12[mm] mnr 1

BLEC 105	YA	-10322+#y1[mm]	ZA	-27.420[mm]	YE	-10615+#y1[mm]	ZE	-23.025[mm]	D	12[mm]	mnr	1
BLEC 106	YA	-10615+#y1[mm]	ZA	-23.025[mm]	YE	-10908+#y1[mm]	ZE	-18.630[mm]	D	12[mm]	mnr	1
BLEC 107	YA	-10908+#y1[mm]	ZA	-18.630[mm]	YE	-11201+#y1[mm]	ZE	-14.235[mm]	D	12[mm]	mnr	1
BLEC 108	YA	-11201+#y1[mm]	ZA	-14.235[mm]	YE	-11494+#y1[mm]	ZE	-9.840[mm]	D	12[mm]	mnr	1
BLEC 109	YA	-11494+#y1[mm]	ZA	-9.840[mm]	YE	-11787+#y1[mm]	ZE	-5.445[mm]	D	12[mm]	mnr	1
BLEC 110	YA	-11787+#y1[mm]	ZA	-5.445[mm]	YE	-12150+#y1[mm]	ZE	0.000[mm]	D	12[mm]	mnr	1

\$Längssteifen unter Hohlkastendeckblech

BLEC 111	YA	-9443+#y1[mm]	ZA	-40.685[mm]	YE	-9443+#y1[mm]	ZE	-40.685+#h1st[mm]	D	12[mm]	mnr	2
BLEC 112	YA	-9736+#y1[mm]	ZA	-36.210[mm]	YE	-9736+#y1[mm]	ZE	-36.210+#h1st[mm]	D	12[mm]	mnr	2
BLEC 113	YA	-10029+#y1[mm]	ZA	-31.815[mm]	YE	-10029+#y1[mm]	ZE	-31.815+#h1st[mm]	D	12[mm]	mnr	2
BLEC 114	YA	-10322+#y1[mm]	ZA	-27.420[mm]	YE	-10322+#y1[mm]	ZE	-27.420+#h1st[mm]	D	12[mm]	mnr	2
BLEC 115	YA	-10615+#y1[mm]	ZA	-23.025[mm]	YE	-10615+#y1[mm]	ZE	-23.025+#h1st[mm]	D	12[mm]	mnr	2
BLEC 116	YA	-10908+#y1[mm]	ZA	-18.630[mm]	YE	-10908+#y1[mm]	ZE	-18.630+#h1st[mm]	D	12[mm]	mnr	2
BLEC 117	YA	-11201+#y1[mm]	ZA	-14.235[mm]	YE	-11201+#y1[mm]	ZE	-14.235+#h1st[mm]	D	12[mm]	mnr	2
BLEC 118	YA	-11494+#y1[mm]	ZA	-9.840[mm]	YE	-11494+#y1[mm]	ZE	-9.840+#h1st[mm]	D	12[mm]	mnr	2
BLEC 119	YA	-11787+#y1[mm]	ZA	-5.445[mm]	YE	-11787+#y1[mm]	ZE	-5.445+#h1st[mm]	D	12[mm]	mnr	2

\$Steg des Hohlkastens oberstrom Innen

BLEC 120	YA	-9150+#y1[mm]	ZA	-45.0[mm]	YE	-9150+#y1[mm]	ZE	#h[mm]	D	10[mm]	mnr	3
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\$Steg des Hohlkastens oberstrom Aussen

BLEC 121	YA	-12150+#y1[mm]	ZA	0[mm]	YE	-12150+#y1[mm]	ZE	#h[mm]	D	10[mm]	mnr	4
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\$Bodenblech des Hohlkastens

BLEC 130	YA	-9150+#y1[mm]	ZA	#h[mm]	YE	-9650+#y1[mm]	ZE	#h[mm]	D	#bo6[mm]	mnr	5
BLEC 131	YA	-9650+#y1[mm]	ZA	#h[mm]	YE	-10150+#y1[mm]	ZE	#h[mm]	D	#bo5[mm]	mnr	5
BLEC 132	YA	-10150+#y1[mm]	ZA	#h[mm]	YE	-10650+#y1[mm]	ZE	#h[mm]	D	#bo4[mm]	mnr	5
BLEC 133	YA	-10650+#y1[mm]	ZA	#h[mm]	YE	-11150+#y1[mm]	ZE	#h[mm]	D	#bo3[mm]	mnr	5
BLEC 134	YA	-11150+#y1[mm]	ZA	#h[mm]	YE	-11650+#y1[mm]	ZE	#h[mm]	D	#bo2[mm]	mnr	5
BLEC 135	YA	-11650+#y1[mm]	ZA	#h[mm]	YE	-12150+#y1[mm]	ZE	#h[mm]	D	#bo1[mm]	mnr	5

\$Längssteifen auf Bodenblech

BLEC 140	YA	-9650+#y1[mm]	ZA	#h[mm]	YE	-9650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 141	YA	-10150+#y1[mm]	ZA	#h[mm]	YE	-10150+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 142	YA	-10650+#y1[mm]	ZA	#h[mm]	YE	-10650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 143	YA	-11150+#y1[mm]	ZA	#h[mm]	YE	-11150+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6
BLEC 144	YA	-11650+#y1[mm]	ZA	#h[mm]	YE	-11650+#y1[mm]	ZE	#h-200[mm]	D	10[mm]	mnr	6

If #tbst

BLEC 145	YA	-9650+#y1[mm]	ZA	#h-200[mm]	YE	-9750+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 146	YA	-10150+#y1[mm]	ZA	#h-200[mm]	YE	-10250+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 147	YA	-10650+#y1[mm]	ZA	#h-200[mm]	YE	-10750+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 148	YA	-11150+#y1[mm]	ZA	#h-200[mm]	YE	-11050+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6
BLEC 149	YA	-11650+#y1[mm]	ZA	#h-200[mm]	YE	-11550+#y1[mm]	ZE	#h-200[mm]	D	#tbst[mm]	mnr	6

endif

\$ Spannungspunkte

QSP NR 7	Y	-9150+#y1[mm]	Z	-15[mm]	MNR	3
QSP NR 8	Y	-9150+#y1[mm]	Z	#h/2-22.5[mm]	MNR	3
QSP NR 9	Y	-9150+#y1[mm]	Z	#h-30[mm]	MNR	3
QSP NR 10	Y	-12150+#y1[mm]	Z	30[mm]	MNR	4
QSP NR 11	Y	-12150+#y1[mm]	Z	#h/2[mm]	MNR	4
QSP NR 12	Y	-12150+#y1[mm]	Z	#h-30[mm]	MNR	4

\$Querschnitt Fahrbahnblech zwischen Hohlkästen

BA 21

\$Fahrbahnblech zwischen Hohlkästen

BLEC 150	YA	-6075+#y1[mm]	ZA	-91.125[mm]	YE	-6230+#y1[mm]	ZE	-88.80[mm]	D 12[mm]	mnr 7
BLEC 151	YA	-6230+#y1[mm]	ZA	-88.80[mm]	YE	-6520+#y1[mm]	ZE	-84.45[mm]	D 12[mm]	mnr 7
BLEC 152	YA	-6520+#y1[mm]	ZA	-84.45[mm]	YE	-6810+#y1[mm]	ZE	-80.10[mm]	D 12[mm]	mnr 7
BLEC 153	YA	-6810+#y1[mm]	ZA	-80.10[mm]	YE	-7100+#y1[mm]	ZE	-75.75[mm]	D 12[mm]	mnr 7
BLEC 154	YA	-7100+#y1[mm]	ZA	-75.75[mm]	YE	-7390+#y1[mm]	ZE	-71.40[mm]	D 12[mm]	mnr 7
BLEC 155	YA	-7390+#y1[mm]	ZA	-71.40[mm]	YE	-7680+#y1[mm]	ZE	-67.05[mm]	D 12[mm]	mnr 7
BLEC 156	YA	-7680+#y1[mm]	ZA	-67.05[mm]	YE	-7970+#y1[mm]	ZE	-62.70[mm]	D 12[mm]	mnr 7
BLEC 157	YA	-7970+#y1[mm]	ZA	-62.70[mm]	YE	-8260+#y1[mm]	ZE	-58.35[mm]	D 12[mm]	mnr 7
BLEC 158	YA	-8260+#y1[mm]	ZA	-58.35[mm]	YE	-8550+#y1[mm]	ZE	-54.00[mm]	D 12[mm]	mnr 7
BLEC 159	YA	-8550+#y1[mm]	ZA	-54.00[mm]	YE	-8840+#y1[mm]	ZE	-49.65[mm]	D 12[mm]	mnr 7
BLEC 160	YA	-8840+#y1[mm]	ZA	-49.65[mm]	YE	-9150+#y1[mm]	ZE	-45.00[mm]	D 12[mm]	mnr 7

\$Längssteifen des Fahrbahnblechs

BLEC 170	YA	-6230+#y1[mm]	ZA	-88.80[mm]	YE	-6230+#y1[mm]	ZE	-88.80+#hmst[mm]	D 12[mm]	mnr 8
BLEC 171	YA	-6520+#y1[mm]	ZA	-84.45[mm]	YE	-6520+#y1[mm]	ZE	-84.45+#hmst[mm]	D 12[mm]	mnr 8
BLEC 172	YA	-6810+#y1[mm]	ZA	-80.10[mm]	YE	-6810+#y1[mm]	ZE	-80.10+#hmst[mm]	D 12[mm]	mnr 8
BLEC 173	YA	-7100+#y1[mm]	ZA	-75.75[mm]	YE	-7100+#y1[mm]	ZE	-75.75+#hmst[mm]	D 12[mm]	mnr 8
BLEC 174	YA	-7390+#y1[mm]	ZA	-71.40[mm]	YE	-7390+#y1[mm]	ZE	-71.40+#hmst[mm]	D 12[mm]	mnr 8
BLEC 175	YA	-7680+#y1[mm]	ZA	-67.05[mm]	YE	-7680+#y1[mm]	ZE	-67.05+#hmst[mm]	D 12[mm]	mnr 8
BLEC 176	YA	-7970+#y1[mm]	ZA	-62.70[mm]	YE	-7970+#y1[mm]	ZE	-62.70+#hmst[mm]	D 12[mm]	mnr 8
BLEC 177	YA	-8260+#y1[mm]	ZA	-58.35[mm]	YE	-8260+#y1[mm]	ZE	-58.35+#hmst[mm]	D 12[mm]	mnr 8
BLEC 178	YA	-8550+#y1[mm]	ZA	-54.00[mm]	YE	-8550+#y1[mm]	ZE	-54.00+#hmst[mm]	D 12[mm]	mnr 8
BLEC 179	YA	-8840+#y1[mm]	ZA	-49.65[mm]	YE	-8840+#y1[mm]	ZE	-49.65+#hmst[mm]	D 12[mm]	mnr 8

\$Querschnitt Fußgängerweg und Konsole

BA 30

\$Vertikales Blech

BLEC 180	YA	-12150+#y1[mm]	ZA	0[mm]	YE	-12150+#y1[mm]	ZE	-253.00[mm]	D 10[mm]	mnr 9
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\$Fußgängerweg

BLEC 181	YA	-12150+#y1[mm]	ZA	-253.00[mm]	YE	-12735+#y1[mm]	ZE	-261.78[mm]	D 10[mm]	mnr 10
BLEC 182	YA	-12735+#y1[mm]	ZA	-261.78[mm]	YE	-13249+#y1[mm]	ZE	-269.49[mm]	D 10[mm]	mnr 10
BLEC 183	YA	-13249+#y1[mm]	ZA	-269.49[mm]	YE	-13763+#y1[mm]	ZE	-277.20[mm]	D 10[mm]	mnr 10
BLEC 184	YA	-13763+#y1[mm]	ZA	-277.20[mm]	YE	-14277+#y1[mm]	ZE	-284.91[mm]	D 10[mm]	mnr 10
BLEC 185	YA	-14277+#y1[mm]	ZA	-284.91[mm]	YE	-14791+#y1[mm]	ZE	-292.62[mm]	D 10[mm]	mnr 10
BLEC 186	YA	-14791+#y1[mm]	ZA	-292.62[mm]	YE	-15300+#y1[mm]	ZE	-300.25[mm]	D 10[mm]	mnr 10

\$Längssteifen

BLEC 190	YA	-12735+#y1[mm]	ZA	-261.78[mm]	YE	-12735+#y1[mm]	ZE	-141.78[mm]	D 10[mm]	mnr 11
BLEC 191	YA	-13249+#y1[mm]	ZA	-269.49[mm]	YE	-13249+#y1[mm]	ZE	-149.49[mm]	D 10[mm]	mnr 11
BLEC 192	YA	-13763+#y1[mm]	ZA	-277.20[mm]	YE	-13763+#y1[mm]	ZE	-157.20[mm]	D 10[mm]	mnr 11
BLEC 193	YA	-14277+#y1[mm]	ZA	-284.91[mm]	YE	-14277+#y1[mm]	ZE	-164.91[mm]	D 10[mm]	mnr 11
BLEC 194	YA	-14791+#y1[mm]	ZA	-292.62[mm]	YE	-14791+#y1[mm]	ZE	-172.62[mm]	D 10[mm]	mnr 11

\$Endsteife

BLEC 195	YA	-15300+#y1[mm]	ZA	-300.25[mm]	YE	-15300+#y1[mm]	ZE	199.75[mm]	D 20[mm]	mnr 12
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\$ nichtmitwirkende Flächen:

BA 40

neff	type	nr	ymin	zmin	ymax	zmax
	z	'#m1'	-15310+#y1	-310	-15300+#m1+#y1	199.75

SOFiSTIK CADINP Eingabe
C:\...\Europabrücke Längssystem\Modell Europabrücke.dat

```
neff type nr      ymin      zmin      ymax      zmax
z      '#m2'    -#m2      -35      #m2      350

neff type nr      ymin      zmin      ymax      zmax
z      '#m3'    -6075+#y1-#m3 -100     -6075+#y1 300

neff type nr      ymin      zmin      ymax      zmax
z      '#m4'    -#m4      #h-250   #m4      #h+250

#enddef
```

! *!Label Variabeln für quer01

\$Stabanfangsquerschnitte

```
QNR 1 ;let#h 2517 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 2 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 3 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 4 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 5 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 6 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 7 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 8 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 9 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 10 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 11 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 12 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 13 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 14 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 15 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 16 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 17 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 18 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 19 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 20 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 21 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
```

```

QNR 22 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 23 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 24 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 25 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 26 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 27 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 28 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 29 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 30 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 31 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 32 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 33 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 34 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 35 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 36 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 37 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 38 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 39 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 40 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 41 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 42 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 43 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 44 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 14 ; let#m3
#include quer1.1
QNR 45 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer1.1
QNR 46 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 43 ; let#m3
#include quer1.1
QNR 47 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 58 ; let#m3
#include quer1.1
QNR 48 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 329 ; let#m2 72 ; let#m3
#include quer1.1
QNR 49 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 359 ; let#m2 79 ; let#m3
#include quer1.1
QNR 50 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 389 ; let#m2 87 ; let#m3
#include quer1.1

```


QNR 51 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 449 ; let#m2 101 ; let#m3
#include quer1.1
QNR 52 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
#include quer1.1
QNR 53 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 130 ; let#m3
#include quer1.1
QNR 54 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 145 ; let#m3
#include quer1.1
QNR 55 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 152 ; let#m3
#include quer1.1
QNR 56 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
#include quer1.1
QNR 57 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 751 ; let#m2 174 ; let#m3
#include quer1.1
QNR 58 ;let#h 4811 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 811 ; let#m2 188 ; let#m3
#include quer1.1
QNR 59 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 750 ; let#m2 174 ; let#m3
#include quer1.1
QNR 60 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
#include quer1.1
QNR 61 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 151 ; let#m3
#include quer1.1
QNR 62 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 144 ; let#m3
#include quer1.1
QNR 63 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 131 ; let#m3
#include quer1.1
QNR 64 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
#include quer1.1
QNR 65 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 450 ; let#m2 102 ; let#m3
#include quer1.1
QNR 66 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 387 ; let#m2 87 ; let#m3
#include quer1.1
QNR 67 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 357 ; let#m2 79 ; let#m3
#include quer1.1
QNR 68 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 328 ; let#m2 72 ; let#m3
#include quer1.1
QNR 69 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 59 ; let#m3
#include quer1.1
QNR 70 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 44 ; let#m3
#include quer1.1
QNR 71 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer1.1
QNR 72 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 15 ; let#m3
#include quer1.1
QNR 73 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 74 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 75 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 76 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 77 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 78 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 79 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01

QNR 80 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 81 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 82 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 83 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 84 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 85 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 86 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 87 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 88 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 89 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 90 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 91 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 92 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 93 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 94 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 95 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 96 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 97 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 98 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 99 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 100 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 101 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 102 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 103 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 104 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 105 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 106 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 107 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 108 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01

```
QNR 109 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 110 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 111 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 112 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 113 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 114 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
```

\$Stabendquerschnitte

```
QNR 401 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 402 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 403 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 404 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 405 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 406 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 407 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 408 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 409 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 410 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 411 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 412 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 413 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 414 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 415 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 416 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 417 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 418 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 419 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 420 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 421 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 422 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
```



```
#include quer01
QNR 423 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 424 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 425 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 426 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 427 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 428 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 429 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 430 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 431 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 432 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 433 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 434 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 435 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 436 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 437 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 438 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 439 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 440 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 441 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 442 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 443 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 14 ; let#m3
#include quer1.1
QNR 444 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer1.1
QNR 445 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 208 ; let#m2 43 ; let#m3
#include quer1.1
QNR 446 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 58 ; let#m3
#include quer1.1
QNR 447 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 329 ; let#m2 72 ; let#m3
#include quer1.1
QNR 448 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 359 ; let#m2 79 ; let#m3
#include quer1.1
QNR 449 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 389 ; let#m2 87 ; let#m3
#include quer1.1
QNR 450 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 449 ; let#m2 101 ; let#m3
#include quer1.1
QNR 451 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
```

```
#include quer1.1
QNR 452 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 130 ; let#m3
#include quer1.1
QNR 453 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 145 ; let#m3
#include quer1.1
QNR 454 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 152 ; let#m3
#include quer1.1
QNR 455 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
#include quer1.1
QNR 456 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 751 ; let#m2 174 ; let#m3
#include quer1.1
QNR 457 ;let#h 4811 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 811 ; let#m2 188 ; let#m3
#include quer1.1
QNR 458 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 750 ; let#m2 174 ; let#m3
#include quer1.1
QNR 459 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
#include quer1.1
QNR 460 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 151 ; let#m3
#include quer1.1
QNR 461 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 144 ; let#m3
#include quer1.1
QNR 462 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 131 ; let#m3
#include quer1.1
QNR 463 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
#include quer1.1
QNR 464 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 450 ; let#m2 102 ; let#m3
#include quer1.1
QNR 465 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 387 ; let#m2 87 ; let#m3
#include quer1.1
QNR 466 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 357 ; let#m2 79 ; let#m3
#include quer1.1
QNR 467 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 328 ; let#m2 72 ; let#m3
#include quer1.1
QNR 468 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 59 ; let#m3
#include quer1.1
QNR 469 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 44 ; let#m3
#include quer1.1
QNR 470 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer1.1
QNR 471 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 15 ; let#m3
#include quer1.1
QNR 472 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 473 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 474 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 475 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 476 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 477 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 478 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer1.1
QNR 479 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 480 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
```



```
#include quer01
QNR 481 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 482 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 483 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 484 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 485 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 486 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 487 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 488 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 489 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 490 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 491 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 492 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 493 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 494 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 495 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 496 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 497 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 498 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 499 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 500 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 501 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 502 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 503 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 504 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 505 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 506 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 507 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 508 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 509 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
```

```
#include quer01
QNR 510 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 511 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 512 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 513 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
QNR 514 ;let#h 2517 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer01
```

!*/Label Variabeln für quer02

\$Stabanfangsquerschnitte

```
QNR 201 ;let#h 2517 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 202 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 203 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 204 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 205 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 206 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 207 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 208 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 209 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 210 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 211 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 212 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 213 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 214 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 215 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 216 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 217 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 218 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 219 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 220 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 221 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
```



```
#include quer02
QNR 222 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 223 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 224 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 225 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 226 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 227 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 228 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 229 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 230 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 231 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 232 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 233 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 234 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 235 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 236 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 237 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 238 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 239 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 240 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 241 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 242 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 243 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 244 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 14 ; let#m3
#include quer2.1
QNR 245 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer2.1
QNR 246 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 43 ; let#m3
#include quer2.1
QNR 247 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 58 ; let#m3
#include quer2.1
QNR 248 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 329 ; let#m2 72 ; let#m3
#include quer2.1
QNR 249 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 359 ; let#m2 79 ; let#m3
#include quer2.1
QNR 250 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 389 ; let#m2 87 ; let#m3
```

#include quer2.1
QNR 251 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 449 ; let#m2 101 ; let#m3
#include quer2.1
QNR 252 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
#include quer2.1
QNR 253 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 130 ; let#m3
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QNR 254 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 145 ; let#m3
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QNR 255 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 152 ; let#m3
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QNR 269 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 59 ; let#m3
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QNR 270 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 44 ; let#m3
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QNR 274 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 275 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 276 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 277 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 278 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 279 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3

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QNR 281 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 282 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 283 ;let#h 3432 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 284 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 285 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 286 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 287 ;let#h 3319 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 288 ;let#h 3285 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 289 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 290 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 291 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 292 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 293 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 294 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 295 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 296 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 297 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 298 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 299 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 300 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 306 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 307 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 308 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3

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QNR 309 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 310 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 311 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 312 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 313 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 314 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02

\$Stabendquerschnitte
QNR 601 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 602 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 603 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 604 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 605 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 606 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 607 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 608 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 609 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 610 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 611 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 612 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 613 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 614 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 615 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 616 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 617 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 618 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 619 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 620 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 621 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 623 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 624 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 625 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 626 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 629 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 630 ;let#h 3375 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 631 ;let#h 3398 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 633 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 634 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 635 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 636 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 637 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 638 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 639 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 640 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 641 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
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#include quer2.1
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#include quer2.1
QNR 644 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer2.1
QNR 645 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 208 ; let#m2 43 ; let#m3
#include quer2.1
QNR 646 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 58 ; let#m3
#include quer2.1
QNR 647 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 329 ; let#m2 72 ; let#m3
#include quer2.1
QNR 648 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 359 ; let#m2 79 ; let#m3
#include quer2.1
QNR 649 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 389 ; let#m2 87 ; let#m3
#include quer2.1
QNR 650 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 449 ; let#m2 101 ; let#m3
#include quer2.1

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QNR 651 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
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QNR 652 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 130 ; let#m3
#include quer2.1
QNR 653 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 145 ; let#m3
#include quer2.1
QNR 654 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 152 ; let#m3
#include quer2.1
QNR 655 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
#include quer2.1
QNR 656 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 751 ; let#m2 174 ; let#m3
#include quer2.1
QNR 657 ;let#h 4811 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 811 ; let#m2 188 ; let#m3
#include quer2.1
QNR 658 ;let#h 4669 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 750 ; let#m2 174 ; let#m3
#include quer2.1
QNR 659 ;let#h 4508 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 690 ; let#m2 159 ; let#m3
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QNR 660 ;let#h 4433 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 660 ; let#m2 151 ; let#m3
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QNR 661 ;let#h 4363 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 630 ; let#m2 144 ; let#m3
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QNR 662 ;let#h 4234 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 570 ; let#m2 131 ; let#m3
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QNR 663 ;let#h 4121 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 510 ; let#m2 116 ; let#m3
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QNR 664 ;let#h 4025 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 450 ; let#m2 102 ; let#m3
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QNR 665 ;let#h 3945 ; let#hlst 350 ; let#hmst 350 ; let#tbst 10 ; let#m1 387 ; let#m2 87 ; let#m3
#include quer2.1
QNR 666 ;let#h 3910 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 357 ; let#m2 79 ; let#m3
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QNR 667 ;let#h 3891 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 328 ; let#m2 72 ; let#m3
#include quer2.1
QNR 668 ;let#h 3843 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 268 ; let#m2 59 ; let#m3
#include quer2.1
QNR 669 ;let#h 3807 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 208 ; let#m2 44 ; let#m3
#include quer2.1
QNR 670 ;let#h 3773 ; let#hlst 300 ; let#hmst 300 ; let#tbst 10 ; let#m1 148 ; let#m2 29 ; let#m3
#include quer2.1
QNR 671 ;let#h 3739 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 88 ; let#m2 15 ; let#m3
#include quer2.1
QNR 672 ;let#h 3722 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 673 ;let#h 3709 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 674 ;let#h 3674 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 675 ;let#h 3640 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 676 ;let#h 3606 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 677 ;let#h 3572 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 678 ;let#h 3553 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer2.1
QNR 679 ;let#h 3534 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02

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QNR 680 ;let#h 3500 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 681 ;let#h 3466 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 685 ;let#h 3353 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 688 ;let#h 3251 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 689 ;let#h 3217 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
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QNR 690 ;let#h 3200 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 691 ;let#h 3183 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 692 ;let#h 3149 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 693 ;let#h 3114 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 694 ;let#h 3080 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 695 ;let#h 3046 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 696 ;let#h 3029 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 697 ;let#h 3012 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 698 ;let#h 2978 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 699 ;let#h 2944 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 700 ;let#h 2909 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 701 ;let#h 2875 ; let#hlst 300 ; let#hmst 300 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 702 ;let#h 2860 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 703 ;let#h 2845 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 704 ;let#h 2811 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 705 ;let#h 2777 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 706 ;let#h 2743 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 707 ;let#h 2709 ; let#hlst 300 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 708 ;let#h 2692 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02

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QNR 709 ;let#h 2685 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 710 ;let#h 2651 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 711 ;let#h 2617 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 712 ;let#h 2583 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 713 ;let#h 2549 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02
QNR 714 ;let#h 2517 ; let#hlst 250 ; let#hmst 250 ; let#tbst 0 ; let#m1 27 ; let#m2 1 ; let#m3
#include quer02

```

!*/Label Querschnitt Querträger

```

QNR NR 801 mnr 14
BLEC 200 YA 0[mm] ZA -22.5[mm] YE 1280[mm] ZE -22.5[mm] D 12[mm] mnr 14
BLEC 200 YA 0[mm] ZA -22.5[mm] YE -1280[mm] ZE -22.5[mm] D 12[mm] mnr 14
BLEC 201 YA 0[mm] ZA -22.5[mm] YE 0[mm] ZE 450[mm] D 10[mm] mnr 13
BLEC 202 YA 0[mm] ZA 450[mm] YE -90[mm] ZE 450[mm] D 12[mm] mnr 13
BLEC 202 YA 0[mm] ZA 450[mm] YE 90[mm] ZE 450[mm] D 12[mm] mnr 13

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QNR NR 802 mnr 14
BLEC 203 YA 0[mm] ZA -91.125[mm] YE 1280[mm] ZE -91.125[mm] D 12[mm] mnr 14
BLEC 203 YA 0[mm] ZA -91.125[mm] YE -1280[mm] ZE -91.125[mm] D 12[mm] mnr 14
BLEC 204 YA 0[mm] ZA -91.125[mm] YE 0[mm] ZE 450[mm] D 10[mm] mnr 13
BLEC 205 YA 0[mm] ZA 450[mm] YE -90[mm] ZE 450[mm] D 12[mm] mnr 13
BLEC 205 YA 0[mm] ZA 450[mm] YE 90[mm] ZE 450[mm] D 12[mm] mnr 13

```

!*/Label Lagerersatzquerschnitt

\$Lagerersatzquerschnitt

QUER 1000 MNR 40 A 1.0[m2]

ende

ende

!+/Kapitel 2. Modellierung Längssystem

+PROG SOFIMSHA urs:bri.msha1

TXA <u>2. Modellierung Längssystem</u>

<text>

Im Nachfolgenden werden die Knoten und Stäbe dargestellt. Letztere definieren sich durch ihre Elementnummer, Gruppennummer sowie ihre Eigenschaften am Anfang und Ende des Stabes. Dazu gehören X-Wert, Knotennummer, Querschnittsnummer und Lagerungsbedingungen. Die Knotendefinition sowie weitere Stabwerte werden aufgrund der Übersichtlichkeit nicht gezeigt.

Folgende Knotennummern wurden vergeben:

Knoten	1-115	Knoten Hauptträger Unterstrom
Knoten	201-315	Knoten Hauptträger Oberstrom

Knoten 401-515 Knoten zwischen den Hohlkästen für Querträger

Die Gruppeneinteilung der Stäbe ist wie folgt:

Gruppe 1:	Widerlager Kehl
Gruppe 2:	Strompfeiler
Gruppe 3:	Widerlager Straßburg
Gruppe 4:	Hilfsstütze in Schuss 9
Gruppe 5:	Hilfsstütze in Schuss 13
Gruppe 6:	Hilfsstütze in Schuss 16
Gruppe 8:	Querträger in Schuss 1-6 und 14-19
Gruppe 9:	Querträger in Schuss 7-13
Gruppe 11-29:	Schüsse 1-19 des Hohlkastens Unterstrom
Gruppe 31-49:	Schüsse 1-19 des Hohlkastens Oberstrom

Die Stäbe haben folgende Nummerierung

Stäbe 1-114	Stäbe Hohlkasten Unterstrom
Stäbe 201-314	Stäbe Hohlkasten Oberstrom
Stäbe 401-599	Querträger

Die Widerlager sind wie folgt konstruiert:

Widerlager Kehl:	Knoten 601-632	Stäbe 601-604
Strompfeiler:	Knoten 701-732	Stäbe 701-704
Widerlager Straßburg:	Knoten 801-832	Stäbe 801-804
Hilfsstütze in Schuss 9:	Knoten 901-908	Stäbe 901-904
Hilfsstütze in Schuss 13:	Knoten 921-928	Stäbe 921-924
Hilfsstütze in Schuss 16:	Knoten 941-948	Stäbe 941-944

</text>

SEIT SPRA 0 PRIL -2 FORM 2 BEZ "S. 3/"
syst raum gdiv 1000
ECHO VOLL NEIN
ECHO KNOT JA
ECHO STAB JA

!*/Label Knoten Hauptträger 1

\$ Box Girder 1:

KNOT Nr	x	y	z
1	0.00	0	0
2	2.46	0	0
3	5.02	0	0
4	7.58	0	0
5	10.14	0	0
6	12.70	0	0
7	13.98	0	0
8	15.26	0	0
9	17.82	0	0
10	20.38	0	0
11	22.94	0	0
12	25.50	0	0
13	26.78	0	0
14	28.06	0	0
15	30.62	0	0

16	33.18	0	0
17	35.74	0	0
18	38.30	0	0
19	39.58	0	0
20	40.86	0	0
21	43.42	0	0
22	45.98	0	0
23	48.54	0	0
24	51.10	0	0
25	52.39	0	0
26	53.67	0	0
27	56.23	0	0
28	58.79	0	0
29	61.35	0	0
30	63.91	0	0
31	65.19	0	0
32	66.47	0	0
33	69.03	0	0
34	71.59	0	0
35	74.15	0	0
36	76.71	0	0
37	77.99	0	0
38	79.27	0	0
39	81.83	0	0
40	84.39	0	0
41	86.95	0	0
42	89.51	0	0
43	90.79	0	0
44	92.07	0	0
45	94.63	0	0
46	97.19	0	0
47	99.75	0	0
48	102.31	0	0
49	103.59	0	0
50	104.87	0	0
51	107.43	0	0
52	109.99	0	0
53	112.55	0	0
54	115.11	0	0
55	116.40	0	0
56	117.68	0	0
57	120.24	0	0
58	122.80	0	0
59	125.36	0	0
60	127.92	0	0
61	129.20	0	0
62	130.48	0	0
63	133.04	0	0
64	135.60	0	0
65	138.16	0	0

66	140.72	0	0
67	142.00	0	0
68	143.28	0	0
69	145.84	0	0
70	148.40	0	0
71	150.96	0	0
72	153.52	0	0
73	154.80	0	0
74	156.08	0	0
75	158.64	0	0
76	161.20	0	0
77	163.76	0	0
78	166.32	0	0
79	167.60	0	0
80	168.88	0	0
81	171.44	0	0
82	174.00	0	0
83	176.56	0	0
84	179.12	0	0
85	180.41	0	0
86	181.69	0	0
87	184.25	0	0
88	186.81	0	0
89	189.37	0	0
90	191.93	0	0
91	193.21	0	0
92	194.49	0	0
93	197.05	0	0
94	199.61	0	0
95	202.17	0	0
96	204.73	0	0
97	206.01	0	0
98	207.29	0	0
99	209.85	0	0
100	212.41	0	0
101	214.97	0	0
102	217.53	0	0
103	218.81	0	0
104	220.09	0	0
105	222.65	0	0
106	225.21	0	0
107	227.77	0	0
108	230.33	0	0
109	231.61	0	0
110	232.89	0	0
111	235.45	0	0
112	238.01	0	0
113	240.57	0	0
114	243.13	0	0
115	245.59	0	0

! *!Label Knoten Hauptträger 2

\$ Box Girder 2:

KNOT	Nr	x	y	z
	201	0.00	-9.15	0
	202	2.46	-9.15	0
	203	5.02	-9.15	0
	204	7.58	-9.15	0
	205	10.14	-9.15	0
	206	12.70	-9.15	0
	207	13.98	-9.15	0
	208	15.26	-9.15	0
	209	17.82	-9.15	0
	210	20.38	-9.15	0
	211	22.94	-9.15	0
	212	25.50	-9.15	0
	213	26.78	-9.15	0
	214	28.06	-9.15	0
	215	30.62	-9.15	0
	216	33.18	-9.15	0
	217	35.74	-9.15	0
	218	38.30	-9.15	0
	219	39.58	-9.15	0
	220	40.86	-9.15	0
	221	43.42	-9.15	0
	222	45.98	-9.15	0
	223	48.54	-9.15	0
	224	51.10	-9.15	0
	225	52.39	-9.15	0
	226	53.67	-9.15	0
	227	56.23	-9.15	0
	228	58.79	-9.15	0
	229	61.35	-9.15	0
	230	63.91	-9.15	0
	231	65.19	-9.15	0
	232	66.47	-9.15	0
	233	69.03	-9.15	0
	234	71.59	-9.15	0
	235	74.15	-9.15	0
	236	76.71	-9.15	0
	237	77.99	-9.15	0
	238	79.27	-9.15	0
	239	81.83	-9.15	0
	240	84.39	-9.15	0
	241	86.95	-9.15	0
	242	89.51	-9.15	0
	243	90.79	-9.15	0
	244	92.07	-9.15	0
	245	94.63	-9.15	0

246	97.19	-9.15	0
247	99.75	-9.15	0
248	102.31	-9.15	0
249	103.59	-9.15	0
250	104.87	-9.15	0
251	107.43	-9.15	0
252	109.99	-9.15	0
253	112.55	-9.15	0
254	115.11	-9.15	0
255	116.40	-9.15	0
256	117.68	-9.15	0
257	120.24	-9.15	0
258	122.80	-9.15	0
259	125.36	-9.15	0
260	127.92	-9.15	0
261	129.20	-9.15	0
262	130.48	-9.15	0
263	133.04	-9.15	0
264	135.60	-9.15	0
265	138.16	-9.15	0
266	140.72	-9.15	0
267	142.00	-9.15	0
268	143.28	-9.15	0
269	145.84	-9.15	0
270	148.40	-9.15	0
271	150.96	-9.15	0
272	153.52	-9.15	0
273	154.80	-9.15	0
274	156.08	-9.15	0
275	158.64	-9.15	0
276	161.20	-9.15	0
277	163.76	-9.15	0
278	166.32	-9.15	0
279	167.60	-9.15	0
280	168.88	-9.15	0
281	171.44	-9.15	0
282	174.00	-9.15	0
283	176.56	-9.15	0
284	179.12	-9.15	0
285	180.41	-9.15	0
286	181.69	-9.15	0
287	184.25	-9.15	0
288	186.81	-9.15	0
289	189.37	-9.15	0
290	191.93	-9.15	0
291	193.21	-9.15	0
292	194.49	-9.15	0
293	197.05	-9.15	0
294	199.61	-9.15	0
295	202.17	-9.15	0

296	204.73	-9.15	0
297	206.01	-9.15	0
298	207.29	-9.15	0
299	209.85	-9.15	0
300	212.41	-9.15	0
301	214.97	-9.15	0
302	217.53	-9.15	0
303	218.81	-9.15	0
304	220.09	-9.15	0
305	222.65	-9.15	0
306	225.21	-9.15	0
307	227.77	-9.15	0
308	230.33	-9.15	0
309	231.61	-9.15	0
310	232.89	-9.15	0
311	235.45	-9.15	0
312	238.01	-9.15	0
313	240.57	-9.15	0
314	243.13	-9.15	0
315	245.59	-9.15	0

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! *!Label Knoten Querträger

\$Querträger:

KNOT	Nr	x	y	z
	401	0.00	-4.575	0
	402	2.46	-4.575	0
	403	5.02	-4.575	0
	404	7.58	-4.575	0
	405	10.14	-4.575	0
	406	12.70	-4.575	0
	408	15.26	-4.575	0
	409	17.82	-4.575	0
	410	20.38	-4.575	0
	411	22.94	-4.575	0
	412	25.50	-4.575	0
	414	28.06	-4.575	0
	415	30.62	-4.575	0
	416	33.18	-4.575	0
	417	35.74	-4.575	0
	418	38.30	-4.575	0
	420	40.86	-4.575	0
	421	43.42	-4.575	0
	422	45.98	-4.575	0
	423	48.54	-4.575	0
	424	51.10	-4.575	0
	426	53.67	-4.575	0
	427	56.23	-4.575	0
	428	58.79	-4.575	0
	429	61.35	-4.575	0

430	63.91	-4.575	0
432	66.47	-4.575	0
433	69.03	-4.575	0
434	71.59	-4.575	0
435	74.15	-4.575	0
436	76.71	-4.575	0
438	79.27	-4.575	0
439	81.83	-4.575	0
440	84.39	-4.575	0
441	86.95	-4.575	0
442	89.51	-4.575	0
444	92.07	-4.575	0
445	94.63	-4.575	0
446	97.19	-4.575	0
447	99.75	-4.575	0
448	102.31	-4.575	0
450	104.87	-4.575	0
451	107.43	-4.575	0
452	109.99	-4.575	0
453	112.55	-4.575	0
454	115.11	-4.575	0
456	117.68	-4.575	0
457	120.24	-4.575	0
458	122.80	-4.575	0
459	125.36	-4.575	0
460	127.92	-4.575	0
462	130.48	-4.575	0
463	133.04	-4.575	0
464	135.60	-4.575	0
465	138.16	-4.575	0
466	140.72	-4.575	0
468	143.28	-4.575	0
469	145.84	-4.575	0
470	148.40	-4.575	0
471	150.96	-4.575	0
472	153.52	-4.575	0
474	156.08	-4.575	0
475	158.64	-4.575	0
476	161.20	-4.575	0
477	163.76	-4.575	0
478	166.32	-4.575	0
480	168.88	-4.575	0
481	171.44	-4.575	0
482	174.00	-4.575	0
483	176.56	-4.575	0
484	179.12	-4.575	0
486	181.69	-4.575	0
487	184.25	-4.575	0

488	186.81	-4.575	0
489	189.37	-4.575	0
490	191.93	-4.575	0
492	194.49	-4.575	0
493	197.05	-4.575	0
494	199.61	-4.575	0
495	202.17	-4.575	0
496	204.73	-4.575	0
498	207.29	-4.575	0
499	209.85	-4.575	0
500	212.41	-4.575	0
501	214.97	-4.575	0
502	217.53	-4.575	0
504	220.09	-4.575	0
505	222.65	-4.575	0
506	225.21	-4.575	0
507	227.77	-4.575	0
508	230.33	-4.575	0
510	232.89	-4.575	0
511	235.45	-4.575	0
512	238.01	-4.575	0
513	240.57	-4.575	0
514	243.13	-4.575	0
515	245.59	-4.575	0

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! *!Label Knoten Lager

\$Wiederlager Kehl

KNOT	Nr	x	y	z	fix
601	0.00[m]	1220[mm]	2517[mm]		
602	0.00[m]	1220[mm]	2967[mm]	f	
611	0.00[m]	-1220[mm]	2517[mm]		
612	0.00[m]	-1220[mm]	2967[mm]	f	
621	0.00[m]	-7930[mm]	2517[mm]		
622	0.00[m]	-7930[mm]	2967[mm]	f	
631	0.00[m]	-10370[mm]	2517[mm]		
632	0.00[m]	-10370[mm]	2967[mm]	f	

\$Lager Strompfeiler

KNOT	Nr	x	y	z	fix
701	122.80[m]	1300[mm]	4811[mm]		
702	122.80[m]	1300[mm]	5319[mm]	f	
711	122.80[m]	-1300[mm]	4811[mm]		
712	122.80[m]	-1300[mm]	5319[mm]	f	
721	122.80[m]	-7850[mm]	4811[mm]		
722	122.80[m]	-7850[mm]	5319[mm]	f	
731	122.80[m]	-10450[mm]	4811[mm]		
732	122.80[m]	-10450[mm]	5319[mm]	f	

\$Widerlager Straßburg

KNOT	Nr	x	y	z	fix
801	245.59[m]	1220[mm]	2517[mm]		
802	245.59[m]	1220[mm]	2967[mm]	f	

811	245.59[m]	-1220[mm]	2517[mm]	
812	245.59[m]	-1220[mm]	2967[mm]	f
821	245.59[m]	-7930[mm]	2517[mm]	
822	245.59[m]	-7930[mm]	2967[mm]	f
831	245.59[m]	-10370[mm]	2517[mm]	
832	245.59[m]	-10370[mm]	2967[mm]	f

\$Hilfsstützen Bauablauf Schuss 9

KNOT	Nr	x	y	z	fix
	901	115.11[m]	1300[mm]	4363[mm]	
	902	115.11[m]	1300[mm]	4863[mm]	f
	903	115.11[m]	-1300[mm]	4363[mm]	
	904	115.11[m]	-1300[mm]	4863[mm]	f
	905	115.11[m]	-7850[mm]	4363[mm]	
	906	115.11[m]	-7850[mm]	4863[mm]	f
	907	115.11[m]	-10450[mm]	4363[mm]	
	908	115.11[m]	-10450[mm]	4863[mm]	f

\$Hilfsstützen Bauablauf Schuss 13

KNOT	Nr	x	y	z	fix
	921	163.76[m]	1300[mm]	3606[mm]	
	922	163.76[m]	1300[mm]	4106[mm]	f
	923	163.76[m]	-1300[mm]	3606[mm]	
	924	163.76[m]	-1300[mm]	4106[mm]	f
	925	163.76[m]	-7850[mm]	3606[mm]	
	926	163.76[m]	-7850[mm]	4106[mm]	f
	927	163.76[m]	-10450[mm]	3606[mm]	
	928	163.76[m]	-10450[mm]	4106[mm]	f

\$Hilfsstützen Bauablauf Schuss 16

KNOT	Nr	x	y	z	fix
	941	202.17[m]	1300[mm]	3080[mm]	
	942	202.17[m]	1300[mm]	3580[mm]	f
	943	202.17[m]	-1300[mm]	3080[mm]	
	944	202.17[m]	-1300[mm]	3580[mm]	f
	945	202.17[m]	-7850[mm]	3080[mm]	
	946	202.17[m]	-7850[mm]	3580[mm]	f
	947	202.17[m]	-10450[mm]	3080[mm]	
	948	202.17[m]	-10450[mm]	3580[mm]	f

!*!Label Stäbe Hauptträger 1

grup 11

Stab	Nr	KA	KE	QNR	NP=-1
	1	1	2	1.401	
	2	2	3	2.402	
	3	3	4	3.403	
	4	4	5	4.404	
	5	5	6	5.405	
	6	6	7	6.406	

grup 12

Stab	Nr	KA	KE	QNR	NP=-1
	7	7	8	7.407	
	8	8	9	8.408	
	9	9	10	9.409	

10	10	11	10.410
11	11	12	11.411
12	12	13	12.412

grup 13

Stab	Nr	KA	KE	QNR	NP=-1
	13	13	14	13.413	
	14	14	15	14.414	
	15	15	16	15.415	
	16	16	17	16.416	
	17	17	18	17.417	
	18	18	19	18.418	

grup 14

Stab	Nr	KA	KE	QNR	NP=-1
	19	19	20	19.419	
	20	20	21	20.420	
	21	21	22	21.421	
	22	22	23	22.422	
	23	23	24	23.423	
	24	24	25	24.424	

grup 15

Stab	Nr	KA	KE	QNR	NP=-1
	25	25	26	25.425	
	26	26	27	26.426	
	27	27	28	27.427	
	28	28	29	28.428	
	29	29	30	29.429	
	30	30	31	30.430	

grup 16

Stab	Nr	KA	KE	QNR	NP=-1
	31	31	32	31.431	
	32	32	33	32.432	
	33	33	34	33.433	
	34	34	35	34.434	
	35	35	36	35.435	
	36	36	37	36.436	

grup 17

Stab	Nr	KA	KE	QNR	NP=-1
	37	37	38	37.437	
	38	38	39	38.438	
	39	39	40	39.439	
	40	40	41	40.440	
	41	41	42	41.441	
	42	42	43	42.442	

grup 18

Stab	Nr	KA	KE	QNR	NP=-1
	43	43	44	43.443	
	44	44	45	44.444	
	45	45	46	45.445	
	46	46	47	46.446	
	47	47	48	47.447	
	48	48	49	48.448	

grup 19
Stab Nr KA KE QNR NP=-1
49 49 50 49.449
50 50 51 50.450
51 51 52 51.451
52 52 53 52.452
53 53 54 53.453
54 54 55 54.454

grup 20
Stab Nr KA KE QNR NP=-1
55 55 56 55.455
56 56 57 56.456
57 57 58 57.457
58 58 59 58.458
59 59 60 59.459
60 60 61 60.460

grup 21
Stab Nr KA KE QNR NP=-1
61 61 62 61.461
62 62 63 62.462
63 63 64 63.463
64 64 65 64.464
65 65 66 65.465
66 66 67 66.466

grup 22
Stab Nr KA KE QNR NP=-1
67 67 68 67.467
68 68 69 68.468
69 69 70 69.469
70 70 71 70.470
71 71 72 71.471
72 72 73 72.472

grup 23
Stab Nr KA KE QNR NP=-1
73 73 74 73.473
74 74 75 74.474
75 75 76 75.475
76 76 77 76.476
77 77 78 77.477
78 78 79 78.478

grup 24
Stab Nr KA KE QNR NP=-1
79 79 80 79.479
80 80 81 80.480
81 81 82 81.481
82 82 83 82.482
83 83 84 83.483
84 84 85 84.484

grup 25
Stab Nr KA KE QNR NP=-1
85 85 86 85.485
86 86 87 86.486

87	87	88	87.487
88	88	89	88.488
89	89	90	89.489
90	90	91	90.490

grup 26

Stab	Nr	KA	KE	QNR	NP=-1
	91	91	92	91.491	
	92	92	93	92.492	
	93	93	94	93.493	
	94	94	95	94.494	
	95	95	96	95.495	
	96	96	97	96.496	

grup 27

Stab	Nr	KA	KE	QNR	NP=-1
	97	97	98	97.497	
	98	98	99	98.498	
	99	99	100	99.499	
	100	100	101	100.500	
	101	101	102	101.501	
	102	102	103	102.502	

grup 28

Stab	Nr	KA	KE	QNR	NP=-1
	103	103	104	103.503	
	104	104	105	104.504	
	105	105	106	105.505	
	106	106	107	106.506	
	107	107	108	107.507	
	108	108	109	108.508	

grup 29

Stab	Nr	KA	KE	QNR	NP=-1
	109	109	110	109.509	
	110	110	111	110.510	
	111	111	112	111.511	
	112	112	113	112.512	
	113	113	114	113.513	
	114	114	115	114.514	

! *!Label Stäbe Hauptträger 2

grup 49

Stab	Nr	KA	KE	QNR	NP=-1
	201	201	202	201.601	
	202	202	203	202.602	
	203	203	204	203.603	
	204	204	205	204.604	
	205	205	206	205.605	
	206	206	207	206.606	

grup 48

Stab	Nr	KA	KE	QNR	NP=-1
	207	207	208	207.607	
	208	208	209	208.608	
	209	209	210	209.609	

210	210	211	210.610
211	211	212	211.611
212	212	213	212.612

grup 47

Stab	Nr	KA	KE	QNR	NP=-1
	213	213	214	213.613	
	214	214	215	214.614	
	215	215	216	215.615	
	216	216	217	216.616	
	217	217	218	217.617	
	218	218	219	218.618	

grup 46

Stab	Nr	KA	KE	QNR	NP=-1
	219	219	220	219.619	
	220	220	221	220.620	
	221	221	222	221.621	
	222	222	223	222.622	
	223	223	224	223.623	
	224	224	225	224.624	

grup 45

Stab	Nr	KA	KE	QNR	NP=-1
	225	225	226	225.625	
	226	226	227	226.626	
	227	227	228	227.627	
	228	228	229	228.628	
	229	229	230	229.629	
	230	230	231	230.630	

grup 44

Stab	Nr	KA	KE	QNR	NP=-1
	231	231	232	231.631	
	232	232	233	232.632	
	233	233	234	233.633	
	234	234	235	234.634	
	235	235	236	235.635	
	236	236	237	236.636	

grup 43

Stab	Nr	KA	KE	QNR	NP=-1
	237	237	238	237.637	
	238	238	239	238.638	
	239	239	240	239.639	
	240	240	241	240.640	
	241	241	242	241.641	
	242	242	243	242.642	

grup 42

Stab	Nr	KA	KE	QNR	NP=-1
	243	243	244	243.643	
	244	244	245	244.644	
	245	245	246	245.645	
	246	246	247	246.646	
	247	247	248	247.647	
	248	248	249	248.648	

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grup 41					
Stab	Nr	KA	KE	QNR	NP=-1
	249	249	250	249.649	
	250	250	251	250.650	
	251	251	252	251.651	
	252	252	253	252.652	
	253	253	254	253.653	
	254	254	255	254.654	
grup 40					
Stab	Nr	KA	KE	QNR	NP=-1
	255	255	256	255.655	
	256	256	257	256.656	
	257	257	258	257.657	
	258	258	259	258.658	
	259	259	260	259.659	
	260	260	261	260.660	
grup 39					
Stab	Nr	KA	KE	QNR	NP=-1
	261	261	262	261.661	
	262	262	263	262.662	
	263	263	264	263.663	
	264	264	265	264.664	
	265	265	266	265.665	
	266	266	267	266.666	
grup 38					
Stab	Nr	KA	KE	QNR	NP=-1
	267	267	268	267.667	
	268	268	269	268.668	
	269	269	270	269.669	
	270	270	271	270.670	
	271	271	272	271.671	
	272	272	273	272.672	
grup 37					
Stab	Nr	KA	KE	QNR	NP=-1
	273	273	274	273.673	
	274	274	275	274.674	
	275	275	276	275.675	
	276	276	277	276.676	
	277	277	278	277.677	
	278	278	279	278.678	
grup 36					
Stab	Nr	KA	KE	QNR	NP=-1
	279	279	280	279.679	
	280	280	281	280.680	
	281	281	282	281.681	
	282	282	283	282.682	
	283	283	284	283.683	
	284	284	285	284.684	
grup 35					
Stab	Nr	KA	KE	QNR	NP=-1
	285	285	286	285.685	
	286	286	287	286.686	

287	287	288	287.687
288	288	289	288.688
289	289	290	289.689
290	290	291	290.690

grup 34					
Stab	Nr	KA	KE	QNR	NP=-1
	291	291	292	291.691	
	292	292	293	292.692	
	293	293	294	293.693	
	294	294	295	294.694	
	295	295	296	295.695	
	296	296	297	296.696	

grup 33					
Stab	Nr	KA	KE	QNR	NP=-1
	297	297	298	297.697	
	298	298	299	298.698	
	299	299	300	299.699	
	300	300	301	300.700	
	301	301	302	301.701	
	302	302	303	302.702	

grup 32					
Stab	Nr	KA	KE	QNR	NP=-1
	303	303	304	303.703	
	304	304	305	304.704	
	305	305	306	305.705	
	306	306	307	306.706	
	307	307	308	307.707	
	308	308	309	308.708	

grup 31					
Stab	Nr	KA	KE	QNR	NP=-1
	309	309	310	309.709	
	310	310	311	310.710	
	311	311	312	311.711	
	312	312	313	312.712	
	313	313	314	313.713	
	314	314	315	314.714	

!*/Label Stäbe Querträger

grup 8					
Stab	Nr	KA	KE	QNR	NP=-1
	401	1	401	801.802	
	402	2	402	801.802	
	403	3	403	801.802	
	404	4	404	801.802	
	405	5	405	801.802	
	406	6	406	801.802	
	407	401	201	802.801	
	408	402	202	802.801	
	409	403	203	802.801	
	410	404	204	802.801	
	411	405	205	802.801	

\$Schuss 1/19

412	406	206	802.801	
420	8	408	801.802	\$Schuss 2/18
421	9	409	801.802	
422	10	410	801.802	
423	11	411	801.802	
424	12	412	801.802	
425	408	208	802.801	
426	409	209	802.801	
427	410	210	802.801	
428	411	211	802.801	
429	412	212	802.801	
430	14	414	801.802	\$Schuss 3/17
431	15	415	801.802	
432	16	416	801.802	
433	17	417	801.802	
434	18	418	801.802	
435	414	214	802.801	
436	415	215	802.801	
437	416	216	802.801	
438	417	217	802.801	
439	418	218	802.801	
440	20	420	801.802	\$Schuss 4/16
441	21	421	801.802	
442	22	422	801.802	
443	23	423	801.802	
444	24	424	801.802	
445	420	220	802.801	
446	421	221	802.801	
447	422	222	802.801	
448	423	223	802.801	
449	424	224	802.801	
450	26	426	801.802	\$Schuss 5/15
451	27	427	801.802	
452	28	428	801.802	
453	29	429	801.802	
454	30	430	801.802	
455	426	226	802.801	
456	427	227	802.801	
457	428	228	802.801	
458	429	229	802.801	
459	430	230	802.801	
460	32	432	801.802	\$Schuss 6/14
461	33	433	801.802	
462	34	434	801.802	
463	35	435	801.802	
464	36	436	801.802	
465	432	232	802.801	
466	433	233	802.801	
467	434	234	802.801	
468	435	235	802.801	
469	436	236	802.801	

Stab	Nr	KA	KE	QNR	NP=-1
	470	38	438	801.802	<i>\$Schuss 7/13</i>
	471	39	439	801.802	
	472	40	440	801.802	
	473	41	441	801.802	
	474	42	442	801.802	
	475	438	238	802.801	
	476	439	239	802.801	
	477	440	240	802.801	
	478	441	241	802.801	
	479	442	242	802.801	
	480	44	444	801.802	<i>\$Schuss 8/12</i>
	481	45	445	801.802	
	482	46	446	801.802	
	483	47	447	801.802	
	484	48	448	801.802	
	485	444	244	802.801	
	486	445	245	802.801	
	487	446	246	802.801	
	488	447	247	802.801	
	489	448	248	802.801	
	490	50	450	801.802	<i>\$Schuss 9/11</i>
	491	51	451	801.802	
	492	52	452	801.802	
	493	53	453	801.802	
	494	54	454	801.802	
	495	450	250	802.801	
	496	451	251	802.801	
	497	452	252	802.801	
	498	453	253	802.801	
	499	454	254	802.801	
	500	56	456	801.802	<i>\$Schuss 10</i>
	501	57	457	801.802	
	502	58	458	801.802	
	503	59	459	801.802	
	504	60	460	801.802	
	505	456	256	802.801	
	506	457	257	802.801	
	507	458	258	802.801	
	508	459	259	802.801	
	509	460	260	802.801	
	510	62	462	801.802	<i>\$Schuss 11/9</i>
	511	63	463	801.802	
	512	64	464	801.802	
	513	65	465	801.802	
	514	66	466	801.802	
	515	462	262	802.801	
	516	463	263	802.801	
	517	464	264	802.801	
	518	465	265	802.801	
	519	466	266	802.801	
	520	68	468	801.802	<i>\$Schuss 12/8</i>
	521	69	469	801.802	

NP=-1
\$Schuss 14/6

573	101	501	801.802	
574	102	502	801.802	
575	498	298	802.801	
576	499	299	802.801	
577	500	300	802.801	
578	501	301	802.801	
579	502	302	802.801	
580	104	504	801.802	\$Schuss 18/2
581	105	505	801.802	
582	106	506	801.802	
583	107	507	801.802	
584	108	508	801.802	
585	504	304	802.801	
586	505	305	802.801	
587	506	306	802.801	
588	507	307	802.801	
589	508	308	802.801	
590	110	510	801.802	\$Schuss 19/1
591	111	511	801.802	
592	112	512	801.802	
593	113	513	801.802	
594	114	514	801.802	
595	510	310	802.801	
596	511	311	802.801	
597	512	312	802.801	
598	513	313	802.801	
599	514	314	802.801	

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! *!Label Stäbe Lager

\$ Lager Wiederlager Kehl

grup 1

Stab	Nr	KA	KE	QNR	ENDE	
	601	601	602	1000	MTMYMZVYZ	\$ VZ = quer
	602	611	612	1000	MTMYMZVY	\$ VZ = quer
	603	621	622	1000	MTMYMZVY	\$ VZ = quer
	604	631	632	1000	MTMYMZVYZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	601	KF	611	\$ Wiederlager Kehl unterstrom
	601	KF	1	
	611	KF	1	
	621	KF	631	\$ Wiederlager Kehl oberstrom
	621	KF	201	
	631	KF	201	

\$ Lager Strompfeiler

grup 2

Stab	Nr	KA	KE	QNR	ENDE	
	701	701	702	1000	MTMYMZ	\$ VZ = quer
	702	711	712	1000	MTMYMZ	\$ VZ = quer
	703	721	722	1000	MTMYMZ	\$ VZ = quer
	704	731	732	1000	MTMYMZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	701	KF	711	\$ Strompfeiler unterstrom
	701	KF	58	
	711	KF	58	

	721	KF	731	\$ Strompfeiler oberstrom
	721	KF	258	
	731	KF	258	

\$ Lager Wiederlager Straßburg

grup 3

Stab	Nr	KA	KE	QNR	ENDE	
	801	801	802	1000	MTMYMZVVZ	\$ VZ = quer
	802	811	812	1000	MTMYMZVY	\$ VZ = quer
	803	821	822	1000	MTMYMZVY	\$ VZ = quer
	804	831	832	1000	MTMYMZVVZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	801	KF	811	\$ Widerlager Straßburg unterstrom
	801	KF	115	
	811	KF	115	
	821	KF	831	\$ Widerlager Straßburg oberstrom
	821	KF	315	
	831	KF	315	

\$ Lager Hilfsstützen Schuss 9

grup 4

Stab	Nr	KA	KE	QNR	ENDE	
	901	901	902	1000	MTMYMZVZ	\$ VZ = quer
	902	903	904	1000	MTMYMZ	\$ VZ = quer
	903	905	906	1000	MTMYMZ	\$ VZ = quer
	904	907	908	1000	MTMYMZVZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	901	KF	903	\$ Hilfsstütze unterstrom
	901	KF	54	
	903	KF	54	
	905	KF	907	\$ Hilfsstütze oberstrom
	905	KF	254	
	907	KF	254	

\$ Lager Hilfsstützen Schuss 13

grup 5

Stab	Nr	KA	KE	QNR	ENDE	
	921	921	922	1000	MTMYMZVVZ	\$ VZ = quer
	922	923	924	1000	MTMYMZVVZ	\$ VZ = quer
	923	925	926	1000	MTMYMZVVZ	\$ VZ = quer
	924	927	928	1000	MTMYMZVVZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	921	KF	923	\$ Hilfsstütze unterstrom
	921	KF	77	
	923	KF	77	

925	KF	927		\$ Hilfsstütze oberstrom
925	KF	277		
927	KF	277		

\$ Lager Hilfsstützen Schuss 16

grup 6

Stab	Nr	KA	KE	QNR	ENDE	
	941	941	942	1000	MTMYMZVYVZ	\$ VZ = quer
	942	943	944	1000	MTMYMZVYVZ	\$ VZ = quer
	943	945	946	1000	MTMYMZVYVZ	\$ VZ = quer
	944	947	948	1000	MTMYMZVYVZ	\$ VZ = quer

\$Kopplungen

KNOT	NR	FIX	NR1	
	941	KF	943	\$ Hilfsstütze unterstrom
	941	KF	95	
	943	KF	95	
	945	KF	947	\$ Hilfsstütze oberstrom
	945	KF	295	
	947	KF	295	

ende

!+!Kapitel 3. Belastung

+PROG SOFILOAD urs:bri.load1 \$ 3.1 Überlagerungsvorschriften

ECHO ACT ja

TXA <u>3. Belastung</u>

TXA <u>3.1 Überlagerungsvorschriften</u>

<text>

<u>Überlagerungsvorschriften, Einwirkungstypen und -faktoren</u>

Nachfolgend werden die verwendeten Einwirkungstypen, deren Kombinationsfaktoren, Überlagerungsvorschriften und Bezeichnungen abgedruckt.

</text>

\$ Einwirkungsfaktoren:

ACT	TYP	GAMU	GAMF	PSI0	PSI1	PSI2	PSI5	GAMA	PART	SUP	BEZ
	G_1	1.35	1.00	1.00	1.00	1.00	1.00	1.00	G	perm	'Ständige Lasten g_1'
	G_2	1.35	1.00	1.00	1.00	1.00	1.00	1.00	G	perm	'Andere ständige Lasten g_2'
	L_U	1.50	0.00	0.40	0.40	0.20	0.80	0.00	Q	excl	'UDL Grenzlinie'
	L_T	1.50	0.00	0.75	0.75	0.20	0.80	0.00	Q	excl	'TS Tandemsystem'
	ZL	1.50	0.00	0.00	0.00	0.00	0.00	0.00	Q	usex	'Bremsen u Zentrifugal'
	SF	1.00	0.00	1.00	1.00	1.00	1.00	0.00	Q	cond	'mögl.Setzung'
	ZF	1.00	0.00	1.00	1.00	1.00	1.00	0.00	Q	cond	'wahr.Setzung'
	ZW	1.50	0.00	0.50	0.50	0.00	0.60	0.00	Q	unsi	'Wind bei Verkehr'
	SW	1.50	0.00	0.50	0.50	0.00	0.60	0.00	Q	unsi	'Wind ohne Verkehr'
	ZQ	1.50	0.00	1.00	1.00	1.00	1.00	0.00	Q	unsi	'Lagerrückstellkräfte'
	T	1.35	0.00	0.80	0.60	0.50	0.80	0.00	Q	excl	'Temperatur'
	X	1.00	1.00	1.00	1.00	1.00	1.00	0.00	Q	perm	'Einzellastfaelle'
	XL3	1.00	0.00	1.00	1.00	1.00	1.00	0.00	Q	excl	'LM3 Lastbild'

ENDE

+PROG SOFILOAD urs:bri.load2 \$ 3.2 Grundlasten

TXA <u>3.2 Grundlasten</u>

<text> <u> Lastfallnummerierung Grundlasten</u>

Lastanteil	Lasttyp	LF	Überlagerung innerhalb der Gruppe:
Eingengewicht & Bauablauf	X	1-19	echte G_1, G_2 erst vom CSM erzeugt!
Ausbaulasten	X	21	echte G_1, G_2 erst vom CSM erzeugt!
Bremsen	ZL	31-32	USEX es darf nur einer genommen werden mit wechs. Vorz.
Wind ohne Verkehr quer	SW	41	USEX es darf nur einer genommen werden mit wechs. Vorz.
Wind mit Verkehr quer	ZW	42	USEX es darf nur einer genommen werden mit wechs. Vorz.
wahrscheinliche Setzung GZG	ZF	51-53	COND können gleichzeitig addiert werden
mögliche Setzung GZT	SF	61-63	COND können gleichzeitig addiert werden
Lagerreibung	ZQ	81	UNSI können mit wechselndem Vorzeichen gleichzeitig wirken
Temperatur	T	90-97	EXCL es darf nur einer genommen werden

</text>
ECHO VOLL NEIN
ECHO ACT JA

! *Label Eigengewicht

\$ Lastfall Eigengewicht

LF 1 EGZ 1 BEZ 'G_1' TYP X Fakt 1.0 \$ Typ X, da G_1, G_2 + P vom CSM erzeugt und benutzt werden !

! *Label Anpassungsfaktoren Eigengewicht

\$ Lastfall Eigengewicht

LF 2 EGZ 0 BEZ 'Eigengewicht Anpassung Kasten Schuss 1-11' TYP X
\$Kasten Unterstrom

stab von 11001 bis 11006 typ pg pa 4.920 REFT null \$Schuss 1
stab von 12007 bis 12012 typ pg pa 2.740 REFT null \$Schuss 2
stab von 13013 bis 13018 typ pg pa 3.040 REFT null \$Schuss 3
stab von 14019 bis 14024 typ pg pa 2.990 REFT null \$Schuss 4
stab von 15025 bis 15030 typ pg pa 3.370 REFT null \$Schuss 5
stab von 16031 bis 16036 typ pg pa 4.350 REFT null \$Schuss 6
stab von 17037 bis 17042 typ pg pa 4.570 REFT null \$Schuss 7
stab von 18043 bis 18048 typ pg pa 4.330 REFT null \$Schuss 8
stab von 19049 bis 19054 typ pg pa 2.390 REFT null \$Schuss 9
stab von 20055 bis 20060 typ pg pa 4.500 REFT null \$Schuss 10
stab von 21061 bis 21066 typ pg pa 2.390 REFT null \$Schuss 11
\$Kasten Oberstrom
stab von 49201 bis 49206 typ pg pa 4.920 REFT null \$Schuss 19
stab von 48207 bis 48212 typ pg pa 2.740 REFT null \$Schuss 18
stab von 47213 bis 47218 typ pg pa 3.040 REFT null \$Schuss 17
stab von 46219 bis 46224 typ pg pa 2.990 REFT null \$Schuss 16
stab von 45225 bis 45230 typ pg pa 3.370 REFT null \$Schuss 15
stab von 44231 bis 44236 typ pg pa 4.350 REFT null \$Schuss 14
stab von 43237 bis 43242 typ pg pa 4.570 REFT null \$Schuss 13
stab von 42243 bis 42248 typ pg pa 4.330 REFT null \$Schuss 12
stab von 41249 bis 41254 typ pg pa 2.390 REFT null \$Schuss 11
stab von 40255 bis 40260 typ pg pa 4.500 REFT null \$Schuss 10
stab von 39261 bis 39266 typ pg pa 2.390 REFT null \$Schuss 9

LF 3 EGZ 0 BEZ 'Eigengewicht Anpassung Kasten Schuss 12' TYP X

\$Kasten Unterstrom

stab von 22067 bis 22072 typ pg pa 4.330 REFT null \$Schuss 12

\$Kasten Oberstrom

stab von 38267 bis 38272 typ pg pa 4.330 REFT null \$Schuss 8

LF 4 EGZ 0 BEZ 'Eigengewicht Anpassung Kasten Schuss 13-15' TYP X

\$Kasten Unterstrom

stab von 23073 bis 23078 typ pg pa 4.570 REFT null *\$Schuss 13*

stab von 24079 bis 24084 typ pg pa 4.350 REFT null *\$Schuss 14*

stab von 25085 bis 25090 typ pg pa 3.370 REFT null *\$Schuss 15*

\$Kasten Oberstrom

stab von 37273 bis 37278 typ pg pa 4.570 REFT null *\$Schuss 7*

stab von 36279 bis 36284 typ pg pa 4.350 REFT null *\$Schuss 6*

stab von 35285 bis 35290 typ pg pa 3.370 REFT null *\$Schuss 5*

LF 5 EGZ 0 BEZ 'Eigengewicht Anpassung Kasten Schuss 16-18' TYP X

\$Kasten Unterstrom

stab von 26091 bis 26096 typ pg pa 2.990 REFT null *\$Schuss 16*

stab von 27097 bis 27102 typ pg pa 3.040 REFT null *\$Schuss 17*

stab von 28103 bis 28108 typ pg pa 2.740 REFT null *\$Schuss 18*

\$Kasten Oberstrom

stab von 34291 bis 34296 typ pg pa 2.990 REFT null *\$Schuss 4*

stab von 33297 bis 33302 typ pg pa 3.040 REFT null *\$Schuss 3*

stab von 32303 bis 32308 typ pg pa 2.740 REFT null *\$Schuss 2*

LF 6 EGZ 0 BEZ 'Eigengewicht Anpassung Kasten Schuss 19' TYP X

\$Kasten Unterstrom

stab von 29109 bis 29114 typ pg pa 4.920 REFT null *\$Schuss 19*

\$Kasten Oberstrom

stab von 31309 bis 31314 typ pg pa 4.920 REFT null *\$Schuss 1*

LF 7 EGZ 0 BEZ 'Eigengewicht ortho. Fbpl. Schuss 7-13' TYP X

\$Kasten Unterstrom

stab von 17037 bis 17042 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 7*

stab von 18043 bis 18048 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 8*

stab von 19049 bis 19054 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 9*

stab von 20055 bis 20060 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 10*

stab von 21061 bis 21066 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 11*

stab von 22067 bis 22072 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 12*

stab von 23073 bis 23078 typ pg pa 0.950 eya -3.038[m] REFT null *\$Schuss 13*

\$Kasten Oberstrom

stab von 43237 bis 43242 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 13*

stab von 42243 bis 42248 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 12*

stab von 41249 bis 41254 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 11*

stab von 40255 bis 40260 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 10*

stab von 39261 bis 39266 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 9*

stab von 38267 bis 38272 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 8*

stab von 37273 bis 37278 typ pg pa 0.950 eya 3.038[m] REFT null *\$Schuss 7*

\$Eigengewicht Fbpl. Schuss 1-6 und 14-19 da schon alle eingehoben

\$Kasten Unterstrom

stab von 11001 bis 11006 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 1*

stab von 12007 bis 12012 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 2*

stab von 13013 bis 13018 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 3*

stab von 14019 bis 14024 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 4*

stab von 15025 bis 15030 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 5*

stab von 16031 bis 16036 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 6*

stab von 24079 bis 24084 typ pg pa 5.500 eya -3.038[m] REFT null *\$Schuss 14*

stab von 25085 bis 25090 typ pg pa 5.500 eya -3.038[m] REFT null \$Schuss 15
stab von 26091 bis 26096 typ pg pa 5.500 eya -3.038[m] REFT null \$Schuss 16
stab von 27097 bis 27102 typ pg pa 5.500 eya -3.038[m] REFT null \$Schuss 17
stab von 28103 bis 28108 typ pg pa 5.500 eya -3.038[m] REFT null \$Schuss 18
stab von 29109 bis 29114 typ pg pa 5.500 eya -3.038[m] REFT null \$Schuss 19
\$Kasten Oberstrom
stab von 49201 bis 49206 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 19
stab von 48207 bis 48212 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 18
stab von 47213 bis 47218 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 17
stab von 46219 bis 46224 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 16
stab von 45225 bis 45230 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 15
stab von 44231 bis 44236 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 14
stab von 36279 bis 36284 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 6
stab von 35285 bis 35290 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 5
stab von 34291 bis 34296 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 4
stab von 33297 bis 33302 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 3
stab von 32303 bis 32308 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 2
stab von 31309 bis 31314 typ pg pa 5.500 eya 3.038[m] REFT null \$Schuss 1

LF 8 EGZ 0 BEZ 'Eigengewicht ortho. Fbpl. Schuss 1-6 und 14-19' TYP X

\$Kasten Unterstrom
stab von 11001 bis 11006 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 1
stab von 12007 bis 12012 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 2
stab von 13013 bis 13018 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 3
stab von 14019 bis 14024 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 4
stab von 15025 bis 15030 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 5
stab von 16031 bis 16036 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 6
stab von 24079 bis 24084 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 14
stab von 25085 bis 25090 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 15
stab von 26091 bis 26096 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 16
stab von 27097 bis 27102 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 17
stab von 28103 bis 28108 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 18
stab von 29109 bis 29114 typ pg pa 0.950 eya -3.038[m] REFT null \$Schuss 19
\$Kasten Unterstrom
stab von 49201 bis 49206 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 19
stab von 48207 bis 48212 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 18
stab von 47213 bis 47218 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 17
stab von 46219 bis 46224 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 16
stab von 45225 bis 45230 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 15
stab von 44231 bis 44236 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 14
stab von 36279 bis 36284 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 6
stab von 35285 bis 35290 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 5
stab von 34291 bis 34296 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 4
stab von 33297 bis 33302 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 3
stab von 32303 bis 32308 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 2
stab von 31309 bis 31314 typ pg pa 0.950 eya 3.038[m] REFT null \$Schuss 1

\$Eigengewicht Fbpl. Schuss 1-6 und 14-19 wieder weg da EG jetzt normal wirkt

\$Kasten Unterstrom
stab von 11001 bis 11006 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 1
stab von 12007 bis 12012 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 2
stab von 13013 bis 13018 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 3
stab von 14019 bis 14024 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 4
stab von 15025 bis 15030 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 5
stab von 16031 bis 16036 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 6
stab von 24079 bis 24084 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 14
stab von 25085 bis 25090 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 15

stab von 26091 bis 26096 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 16
stab von 27097 bis 27102 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 17
stab von 28103 bis 28108 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 18
stab von 29109 bis 29114 typ pg pa -5.500 eya -3.038[m] REFT null \$Schuss 19
\$Kasten Oberstrom
stab von 49201 bis 49206 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 19
stab von 48207 bis 48212 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 18
stab von 47213 bis 47218 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 17
stab von 46219 bis 46224 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 16
stab von 45225 bis 45230 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 15
stab von 44231 bis 44236 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 14
stab von 36279 bis 36284 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 6
stab von 35285 bis 35290 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 5
stab von 34291 bis 34296 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 4
stab von 33297 bis 33302 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 3
stab von 32303 bis 32308 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 2
stab von 31309 bis 31314 typ pg pa -5.500 eya 3.038[m] REFT null \$Schuss 1

LF 9 EGZ 0 BEZ 'Eigengewicht Gehweg Schuss 1-19' TYP X

\$Kasten Unterstrom

stab von 11001 bis 11006 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 1
stab von 12007 bis 12012 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 2
stab von 13013 bis 13018 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 3
stab von 14019 bis 14024 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 4
stab von 15025 bis 15030 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 5
stab von 16031 bis 16036 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 6
stab von 17037 bis 17042 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 7
stab von 18043 bis 18048 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 8
stab von 19049 bis 19054 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 9
stab von 20055 bis 20060 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 10
stab von 21061 bis 21066 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 11
stab von 22067 bis 22072 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 12
stab von 23073 bis 23078 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 13
stab von 24079 bis 24084 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 14
stab von 25085 bis 25090 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 15
stab von 26091 bis 26096 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 16
stab von 27097 bis 27102 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 17
stab von 28103 bis 28108 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 18
stab von 29109 bis 29114 typ pg pa 1.564 eya 3.000[m] REFT null \$Schuss 19

\$Kasten Oberstrom

stab von 49201 bis 49206 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 19
stab von 48207 bis 48212 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 18
stab von 47213 bis 47218 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 17
stab von 46219 bis 46224 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 16
stab von 45225 bis 45230 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 15
stab von 44231 bis 44236 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 14
stab von 43237 bis 43242 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 13
stab von 42243 bis 42248 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 12
stab von 41249 bis 41254 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 11
stab von 40255 bis 40260 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 10
stab von 39261 bis 39266 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 9
stab von 38267 bis 38272 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 8
stab von 37273 bis 37278 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 7
stab von 36279 bis 36284 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 6
stab von 35285 bis 35290 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 5
stab von 34291 bis 34296 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 4
stab von 33297 bis 33302 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 3

stab von 32303 bis 32308 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 2
 stab von 31309 bis 31314 typ pg pa 1.564 eya -3.000[m] REFT null \$Schuss 1

!*/Label Lasten Bauablauf

\$ Lastfall Derricklasten

LF 10 EGZ 0 BEZ 'Stellung in Schuss 11' TYP X

KNOT NR 24 TYP pg p1 -48.90[kN]
 KNOT NR 224 TYP pg p1 -48.90[kN]
 KNOT NR 24 TYP mxx p1 61.13[kNm]
 KNOT NR 224 TYP mxx p1 -61.13[kNm]
 KNOT NR 64 TYP pg p1 319.50[kN]
 KNOT NR 264 TYP pg p1 319.50[kN]

\$ Lastfall Derricklasten

LF 11 EGZ 0 BEZ 'Stellung in Schuss 12' TYP X

KNOT NR 36 TYP pg p1 -51.20[kN]
 KNOT NR 236 TYP pg p1 -51.20[kN]
 KNOT NR 36 TYP mxx p1 64.00[kNm]
 KNOT NR 236 TYP mxx p1 -64.00[kNm]
 KNOT NR 70 TYP pg p1 305.60[kN]
 KNOT NR 270 TYP pg p1 305.60[kN]

\$ Lastfall Derricklasten

LF 12 EGZ 0 BEZ 'Stellung in Schuss 15' TYP X

KNOT NR 48 TYP pg p1 -48.90[kN]
 KNOT NR 248 TYP pg p1 -48.90[kN]
 KNOT NR 48 TYP mxx p1 61.13[kNm]
 KNOT NR 248 TYP mxx p1 -61.13[kNm]
 KNOT NR 88 TYP pg p1 319.50[kN]
 KNOT NR 288 TYP pg p1 319.50[kN]

\$ Lastfall Derricklasten

LF 13 EGZ 0 BEZ 'Stellung in Schuss 18' TYP X

KNOT NR 75 TYP pg p1 -57.40[kN]
 KNOT NR 275 TYP pg p1 -57.40[kN]
 KNOT NR 75 TYP mxx p1 71.80[kNm]
 KNOT NR 275 TYP mxx p1 -71.80[kNm]
 KNOT NR 106 TYP pg p1 313.50[kN]
 KNOT NR 306 TYP pg p1 313.50[kN]

\$ Lastfall Anheben Widerlager um 1630

LF 17 EGZ 0 BEZ 'Anheben um 1630mm' TYP X

KNOT NR 602 TYP wzz -1630 \$ mm
 KNOT NR 612 TYP wzz -1630 \$ mm
 KNOT NR 622 TYP wzz -1630 \$ mm
 KNOT NR 632 TYP wzz -1630 \$ mm

KNOT NR 802 TYP wzz -1630 \$ mm

KNOT NR 812 TYP wzz -1630 \$ mm

KNOT NR 822 TYP wzz -1630 \$ mm

KNOT NR 832 TYP wzz -1630 \$ mm

\$ Lastfall Absenken Widerlager um 2030

LF 18 EGZ 0 BEZ 'Absenken um 2030mm' TYP X

KNOT NR 602 TYP wzz 2030 \$ mm

KNOT NR 612 TYP wzz 2030 \$ mm
KNOT NR 622 TYP wzz 2030 \$ mm
KNOT NR 632 TYP wzz 2030 \$ mm

KNOT NR 802 TYP wzz 2030 \$ mm
KNOT NR 812 TYP wzz 2030 \$ mm
KNOT NR 822 TYP wzz 2030 \$ mm
KNOT NR 832 TYP wzz 2030 \$ mm

\$ Lastfall Anheben Widerlager um 400

LF 19 EGZ 0 BEZ 'Anheben um 400mm' TYP X

KNOT NR 602 TYP wzz -400 \$ mm
KNOT NR 612 TYP wzz -400 \$ mm
KNOT NR 622 TYP wzz -400 \$ mm
KNOT NR 632 TYP wzz -400 \$ mm

KNOT NR 802 TYP wzz -400 \$ mm
KNOT NR 812 TYP wzz -400 \$ mm
KNOT NR 822 TYP wzz -400 \$ mm
KNOT NR 832 TYP wzz -400 \$ mm

! *!Label Ausbaulasten

LF 21 EGZ 0 BEZ 'Ausbaulasten' TYP X

\$ Belag Fahrbahnplatte

stab von grp bis (11 29 1) typ pg pa 5.22 eya -3.038[m] REFT null \$Hohlkasten Unterstrom
stab von grp bis (31 49 1) typ pg pa 5.22 eya 3.038[m] REFT null \$Hohlkasten Oberstrom

\$ Belag Hohlkasten

stab von grp bis (11 29 1) typ pg pa 6.00 eya 0.000[m] REFT null \$Hohlkasten Unterstrom
stab von grp bis (31 49 1) typ pg pa 6.00 eya 0.000[m] REFT null \$Hohlkasten Oberstrom

\$ Belag Gehweg

stab von grp bis (11 29 1) typ pg pa 0.99 eya 3.000[m] REFT null \$Hohlkasten Unterstrom
stab von grp bis (31 49 1) typ pg pa 0.99 eya -3.000[m] REFT null \$Hohlkasten Oberstrom

\$ Eigengewicht Geländer

stab von grp bis (11 29 1) typ pg pa 0.60 eya 4.500[m] REFT null \$Hohlkasten Unterstrom
stab von grp bis (31 49 1) typ pg pa 0.60 eya -4.500[m] REFT null \$Hohlkasten Oberstrom

\$ Gehweg, Kabeltrog, Entwässerungsleitung in HK

stab von grp bis (11 29 1) typ pg pa 2.80 eya 0.000[m] REFT null \$Hohlkasten Unterstrom
stab von grp bis (31 49 1) typ pg pa 2.80 eya 0.000[m] REFT null \$Hohlkasten Oberstrom

! *!Label Bremsen

\$ Lastfall Bremsen: Vorzeichenwechsel in Kombinationsvorschrift berücksichtigt

LF 31 BEZ 'Bremsen HT 1' TYP ZL

stab von grp bis (11 29 1) typ pxx pa 3.66

LF 32 BEZ 'Bremsen HT 2' TYP ZL

stab von grp bis (31 49 1) typ pxx pa 3.66

! *!Label Wind

\$ Lastfall Wind: Vorzeichenwechsel in Kombinationsvorschrift berücksichtigt

LF 41 BEZ 'Wind ohne Verkehr' TYP SW

stab von 11001 bis 20057 typ pyy pa 2.68 pe 5.35 eza 1.110[m] eze 2.255[m]
stab von 20058 bis 29114 typ pyy pa 5.35 pe 2.68 eza 2.255[m] eze 1.110[m]

LF 42 BEZ 'Wind mit Verkehr' TYP ZW
stab von 11001 bis 20057 typ pyy pa 3.69 pe 7.25 eza 0.215[m] eze 1.360[m]
stab von 20058 bis 29114 typ pyy pa 7.25 pe 3.69 eza 1.360[m] eze 0.215[m]

!*/Label Setzung

\$ Lastfall wahrscheinliche Setzung

LF 51 BEZ 'wahrscheinliche Setzung GZG' TYP ZF

KNOT NR 602 TYP wzz 10 \$ mm

KNOT NR 612 TYP wzz 10 \$ mm

KNOT NR 622 TYP wzz 10 \$ mm

KNOT NR 632 TYP wzz 10 \$ mm

LF 52 BEZ 'wahrscheinliche Setzung GZG' TYP ZF

KNOT NR 702 TYP wzz 10 \$ mm

KNOT NR 712 TYP wzz 10 \$ mm

KNOT NR 722 TYP wzz 10 \$ mm

KNOT NR 732 TYP wzz 10 \$ mm

LF 53 BEZ 'wahrscheinliche Setzung GZG' TYP ZF

KNOT NR 802 TYP wzz 10 \$ mm

KNOT NR 812 TYP wzz 10 \$ mm

KNOT NR 822 TYP wzz 10 \$ mm

KNOT NR 832 TYP wzz 10 \$ mm

\$ Lastfall mögliche Setzung

LF 61 BEZ 'mögliche Setzung GZT' TYP SF

KNOT NR 602 TYP wzz 10 \$ mm

KNOT NR 612 TYP wzz 10 \$ mm

KNOT NR 622 TYP wzz 10 \$ mm

KNOT NR 632 TYP wzz 10 \$ mm

LF 62 BEZ 'mögliche Setzung GZT' TYP SF

KNOT NR 702 TYP wzz 10 \$ mm

KNOT NR 712 TYP wzz 10 \$ mm

KNOT NR 722 TYP wzz 10 \$ mm

KNOT NR 732 TYP wzz 10 \$ mm

LF 63 BEZ 'mögliche Setzung GZT' TYP SF

KNOT NR 802 TYP wzz 10 \$ mm

KNOT NR 812 TYP wzz 10 \$ mm

KNOT NR 822 TYP wzz 10 \$ mm

KNOT NR 832 TYP wzz 10 \$ mm

!*/Label Lagerreibung

\$ Lastfall Lagerreibung

LF 81 BEZ 'Lagerreibung' TYP ZQ

knot nr 731 typ pxx p1 47.5

knot nr 721 typ pxx p1 47.5

knot nr 711 typ pxx p1 47.5

knot nr 701 typ pxx p1 47.5

!*/Label Temperatur

\$ Temperatur - Eingangsdaten:

\$ Temp_N Sommer = 51

\$ Temp_N Winter = -26

\$ Temp erection = 10

let#1 18*1.00 \$ pos. Temperaturdifferenz nach DIN FB 101 Tabelle 6.1 und 6.2

let#2 -13*1.00 \$ neg. Temperaturdifferenz nach DIN FB 101 Tabelle 6.1

LF 91 TYP T BEZ 'T Sommer posdt TN+wm*dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	41	\$ Überbau (konstanter Anteil)
grp	(11 29 1)	-	dtz	0.75*#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	41	\$ Überbau (konstanter Anteil)
grp	(31 49 1)	-	dtz	0.75*#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 92 TYP T BEZ 'T Sommer negdt TN+wm*dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	41	\$ Überbau (konstanter Anteil)
grp	(11 29 1)	-	dtz	0.75*#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	41	\$ Überbau (konstanter Anteil)
grp	(31 49 1)	-	dtz	0.75*#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 93 TYP T BEZ 'T Winter posdt TN+wm*dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	-36	\$ Überbau (konstanter Anteil)
grp	(11 29 1)	-	dtz	0.75*#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	-36	\$ Überbau (konstanter Anteil)
grp	(31 49 1)	-	dtz	0.75*#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 94 TYP T BEZ 'T Winter negdt TN+wm*dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	-36	\$ Überbau (konstanter Anteil)
grp	(11 29 1)	-	dtz	0.75*#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	-36	\$ Überbau (konstanter Anteil)
grp	(31 49 1)	-	dtz	0.75*#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 95 TYP T BEZ 'T Sommer posdt wn*TN+dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	14.35	\$ Überbau konstanter Anteil (14,35=41*0,35)
grp	(11 29 1)	-	dtz	#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	14.35	\$ Überbau konstanter Anteil (14,35=41*0,35)
grp	(31 49 1)	-	dtz	#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 96 TYP T BEZ 'T Sommer negdt wn*TN+dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	14.35	\$ Überbau konstanter Anteil (14,35=41*0,35)
grp	(11 29 1)	-	dtz	#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	14.35	\$ Überbau konstanter Anteil (14,35=41*0,35)
grp	(31 49 1)	-	dtz	#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 97 TYP T BEZ 'T Winter posdt wn*TN+dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	-12.6	\$ Überbau konstanter Anteil (-12.6=-36*0,35)
grp	(11 29 1)	-	dtz	#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	-12.6	\$ Überbau konstanter Anteil (-12.6=-36*0,35)
grp	(31 49 1)	-	dtz	#1*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

LF 98 TYP T BEZ 'T Winter negdt wn*TN+dT' \$ Temperatur Kombinationen

STAB	VON	BIS	DELT	TYP	PA
grp	(11 29 1)	-	dt	-12.6	\$ Überbau konstanter Anteil (-12.6=-36*0,35)
grp	(11 29 1)	-	dtz	#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein
grp	(31 49 1)	-	dt	-12.6	\$ Überbau konstanter Anteil (-12.6=-36*0,35)
grp	(31 49 1)	-	dtz	#2*(-1)	\$ *(-1) da +dtz in SOFISTIK = unten warm - Überbau allein

ENDE

+PROG WING urs:bri.wing1 \$ 3.2 Grundlasten

SIZE dina -win form urs teil 2x1 hleg 1.5 tleg 1.0
SIZ2 UMBR AB \$ Zu Lange Zeilen auch in der Mitte eines Wortes kürzen

STEU MESS 2D
und msca nein \$ Zentrierung Bilder auf Systemgrenzen
STEU LEER JA
LEGO TYP BLEG PAR1 JA PAR2 NEIN PAR3 JA \$ PAR2 Schreiben der Auswahlzeile
LET#2 0.25 \$ Schrifthoehe
grup (1 9 1) VOLL
grup (11 49 1) VOLL

\$ Eigengewicht

LF 2 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 3 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 4 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 5 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 6 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

grup (1 3 1) VOLL
grup (4 6 1) NEIN
grup (8 9 1) VOLL
grup (11 49 1) VOLL

LF 7 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 8 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 9 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

grup (1 9 1) VOLL
grup (11 49 1) VOLL

LF 10; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 11; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 12; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 13; LAST ALLE UNIT -1002 SCHR #2 ND 1

grup (1 3 1) VOLL
grup (4 6 1) NEIN
grup (8 9 1) VOLL
grup (11 49 1) VOLL

LF 17; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 18; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 19; LAST ALLE UNIT -1002 SCHR #2 ND 1

\$ Ausbaulasten

LF 21 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

\$ Bremsen

LF 31 ; LAST ALLE UNIT -1009 SCHR #2 ND 1
LF 32 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

\$ Wind

LF 41 ; LAST ALLE UNIT -1009 SCHR #2 ND 1
LF 42 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

\$ wahrscheinliche Setzung

LF 51 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 52 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

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LF 53 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

\$ mögliche Setzung

LF 61 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

LF 62 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

LF 63 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

\$ Lagerrückstellkräfte

LF 81 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

\$ Temperatur

LF 91 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 92 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 93 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 94 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 95 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 96 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 97 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

LF 98 ; LAST ALLE UNIT -1009 SCHR #2 ND 1

ENDE

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+PROG SOFILOAD urs:1 \$ 3.3 Verkehrslasten

TXA <u>3.3 Verkehrslasten</u>

<text> <u> Lastfallnumerierung Verkehrslasten</u>

Lastenteil	Lasttyp	LF
UDL Lasten Feld 1	X	101-104
UDL Lasten Feld 2	X	105-108
Tandem Lasten Unterstrom	X	151-264
Tandem Lasten Oberstrom	X	301-414
LM3 Lasten Unterstrom	X	501-630
LM3 Lasten Oberstrom	X	701-830

</text>

ECHO VOLL NEIN

ECHO ACT JA

! *!Label UDL-Lasten Feld 1

\$ #####

\$ UDL-Grundlast $p=2,5 \text{ kN/m}^2$

\$ UDL-Überlast $p=6,5 \text{ kN/m}^2$

\$ #####

\$ UDL Feld 1

lf 101 typ X bez 'UDL + Überlast Feld 1 Unterstrom'

stab von 11001 bis 20057 typ pzz pa 22.688 eya -0.038[m] REFT null

stab von 11001 bis 20057 typ pzz pa 19.50 eya -0.112[m] REFT null

lf 102 typ X bez 'UDL + Überlast Feld 1 Oberstrom'

stab von 41249 bis 49207 typ pzz pa 22.688 eya 0.038[m] REFT null

stab 40257 typ pzz pa 22.688 eya 0.038[m] REFT null

stab 40256 typ pzz pa 22.688 eya 0.038[m] REFT null

```

stab 40255 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 41249 bis 49207 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40257 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40256 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40255 typ pzz pa 19.50 eya 0.112[m] REFT null
lf 103 typ X bez 'UDL Feld 1 + Überlast Unterstrom'
stab von 41249 bis 49207 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40257 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40256 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40255 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 11001 bis 20057 typ pzz pa 22.688 eya -0.038[m] REFT null
stab von 11001 bis 20057 typ pzz pa 19.50 eya -0.112[m] REFT null
lf 104 typ X bez 'UDL Feld 1 + Überlast Oberstrom'
stab von 11001 bis 20057 typ pzz pa 22.688 eya -0.038[m] REFT null
stab von 41249 bis 49207 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40257 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40256 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40255 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 41249 bis 49207 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40257 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40256 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40255 typ pzz pa 19.50 eya 0.112[m] REFT null

```

```

!*/Label UDL-Lasten Feld 2

```

```

$ #####
$ UDL-Grundlast p=2,5 kN/m²
$ UDL-Überlast p=6,5 kN/m²
$ #####

```

```

$ UDL Feld 2

```

```

lf 105 typ X bez 'UDL + Überlast Feld 2 Unterstrom'
stab von 20058 bis 29114 typ pzz pa 22.688 eya -0.038[m] REFT null
stab von 20058 bis 29114 typ pzz pa 19.50 eya -0.112[m] REFT null
lf 106 typ X bez 'UDL + Überlast Feld 2 Oberstrom'
stab von 31307 bis 39266 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40258 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40259 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40260 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 31307 bis 39266 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40258 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40259 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40260 typ pzz pa 19.50 eya 0.112[m] REFT null
lf 107 typ X bez 'UDL Feld 2 + Überlast Unterstrom'
stab von 31307 bis 39266 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40258 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40259 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40260 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 20058 bis 29114 typ pzz pa 22.688 eya -0.038[m] REFT null
stab von 20058 bis 29114 typ pzz pa 19.50 eya -0.112[m] REFT null
lf 108 typ X bez 'UDL Feld 2 + Überlast Oberstrom'
stab von 20058 bis 29114 typ pzz pa 22.688 eya -0.038[m] REFT null
stab von 31307 bis 39266 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40258 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40259 typ pzz pa 22.688 eya 0.038[m] REFT null
stab 40260 typ pzz pa 22.688 eya 0.038[m] REFT null
stab von 31307 bis 39266 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40258 typ pzz pa 19.50 eya 0.112[m] REFT null

```


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--

```

stab 40259 typ pzz pa 19.50 eya 0.112[m] REFT null
stab 40260 typ pzz pa 19.50 eya 0.112[m] REFT null

```

```

!*/Label Tandem Unterstrom

```

```

$ #####
$ Tandem Achsen Laststellungen LF 151-max.264
$ #####

```

```

$Tandem Unterstrom

```

```

let#i 1
loop 114
LF 150+#i TYP X
KNOT NR #i TYP pzz p1 240[kN] eyy -0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 240[kN] eyy -0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 160[kN] eyy -3.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 160[kN] eyy -3.112[m] exx 1.20[m]
let#i #i+1
endloop

```

```

!*/Label Tandem Oberstrom

```

```

$ #####
$ Tandem Achsen Laststellungen LF 301-max.414
$ #####

```

```

$Tandem Oberstrom

```

```

let#i 1
loop 114
LF 300+#i TYP X
KNOT NR 200+#i TYP pzz p1 240[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR 200+#i TYP pzz p1 240[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR 200+#i TYP pzz p1 160[kN] eyy 3.112[m] exx 0.00[m]
KNOT NR 200+#i TYP pzz p1 160[kN] eyy 3.112[m] exx 1.20[m]
let#i #i+1
endloop

```

```

ende

```

```

!*/Label Ermüdung LM3 Unterstrom

```

```

$ #####
$ LM3 Laststellungen LF 501-630
$ #####

```

```

$LM3 Unterstrom

```

```

let#i 1
loop 19
LF 500+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop

```

```

let#i 20

```

```

loop 92
LF 500+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -40.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -38.80[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -32.80[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -31.60[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop

```

```

let#i 93
loop 19
LF 500+19+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop

```

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```

!*/Label Ermüdung LM3 Oberstrom
$ #####
$ LM3 Laststellungen LF 701-830
$ #####

```

```

$LM3 Oberstrom
let#i 201
loop 19
LF 500+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop

```

```

let#i 220
loop 92
LF 500+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -40.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -38.80[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -32.80[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx -31.60[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop

```

```

let#i 293
loop 19
LF 500+19+#i TYP X
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]

```

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```
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]
KNOT NR #i TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]
let#i #i+1
endloop
```

ende

```
+PROG WING urs:58 $ 3.3 Verkehrslasten
SIZE dina -win form urs teil 3x1 hleg 1.0 tleg 0.5
SI22 UMBR AB $ Zu lange Zeilen auch in der Mitte eines Wortes kürzen
```

```
grup (1 3 1) VOLL
grup (4 6 1) NEIN
grup (8 9 1) VOLL
grup (11 49 1) VOLL
```

```
STEU MESS 2D
und msca nein $ Zentrierung Bilder auf Systemgrenzen
SCHR HS 0.1 prue 0 $ Größe Auflager/Federsymbole Schriftprüfung - möglichst wenig Textüberschreibungen
STEU LEER JA
LEGO TYP BLEG PAR1 JA PAR2 NEIN PAR3 JA $ PAR2 Schreiben der Auswahlzeile
LET#2 0.25 $ Schrifthoehe
```

```
LF 101 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 102 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 103 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 104 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 105 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 106 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 107 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL
LF 108 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ UDL

LF 151 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 161 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 171 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 182 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 192 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 202 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 213 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 223 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 233 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 244 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 254 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom
LF 264 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Unterstrom

LF 301 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 311 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 321 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 332 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 342 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 352 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 363 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 373 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 383 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
LF 394 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 $ TL Oberstrom
```


LF 404 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ TL Oberstrom
LF 414 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ TL Oberstrom

LF 501 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 511 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 521 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 531 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 541 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 551 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 561 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 571 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 581 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 591 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 601 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 611 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 621 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 630 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom

LF 701 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 711 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 721 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 731 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 741 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 751 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 761 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 771 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 781 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 791 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 801 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 811 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 821 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom
LF 830 ; LAST ALLE UNIT -1002 SCHR #2 ND 1 \$ LM 3 Unterstrom

ENDE

+PROG SOFILOAD urs:4 \$ 3.4 Lasten für Auflagerbedingungen Quersystem

TXA <u>3.4 Lasten für Auflagerbedingungen Quersystem</u>

!*/Label Einzellasten in Feldmitte

LF 997 EGZ 0 BEZ 'Einzellast' TYP X
KNOT NR 25 TYP pg p1 1000[kN]
LF 998 EGZ 0 BEZ 'Einzelmoment' TYP X
KNOT NR 25 TYP mxx p1 1000[kNm]

!*/Label LM3 in Feldmitte

LF 999 TYP X BEZ 'LM3 Knoten 23'
KNOT NR 23 TYP pzz p1 120[kN] eyy 0.112[m] exx 0.00[m]
KNOT NR 23 TYP pzz p1 120[kN] eyy 0.112[m] exx 1.20[m]
KNOT NR 23 TYP pzz p1 120[kN] eyy 0.112[m] exx 7.20[m]

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KNOT NR 23 TYP pzz p1 120[kN] eyy 0.112[m] exx 8.40[m]

ENDE

+PROG WING urs:5 \$ 3.4 Lasten für Auflagerbedingungen Quersystem

SIZE dina -win form urs teil 2x1 hleg 1.5 tleg 1.0
SIZ2 UMBR AB \$ Zu lange Zeilen auch in der Mitte eines Wortes kürzen

STEU MESS 2D
und msca nein \$ Zentrierung Bilder auf Systemgrenzen
STEU LEER JA
LEGO TYP BLEG PAR1 JA PAR2 NEIN PAR3 JA \$ PAR2 Schreiben der Auswahlzeile
LET#2 0.25 \$ Schrifthöhe
grup (1 3 1) VOLL
grup (4 6 1) NEIN
grup (8 9 1) VOLL
grup (11 49 1) VOLL

\$ Lasten in Feldmitte

LF 997 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 998 ; LAST ALLE UNIT -1002 SCHR #2 ND 1
LF 999 ; LAST ALLE UNIT -1002 SCHR #2 ND 1

ENDE

+prog ase urs:2
grup 4,5,6 nein
LF alle
ende

!+Kapitel 4. Einzelschnittgrößen, Lastgruppen

+PROG MAXIMA urs:bri.max2 \$ 4.1 Zwischenüberlagerung Verkehr und Temperatur

TXA <u>4. Einzelschnittgrößen, Lastgruppen</u>
TXA <u>4.1 Zwischenüberlagerungen Verkehr und Temperatur</u>

<text> <u>Zwischenüberlagerung Verkehr</u>
Die Einzellastfälle wurden zunächst in SOFILOAD+ASE als TYP X
angelegt. Die in folgender Zwischenüberlagerung erzeugten Lastfälle
werden jetzt als L_U bzw. L_T Einwirkungen abgelegt (für LM3: XL3):

UDL Gleichlast	-	KOMB 8	Grenzlinie in Lastfall 901-912 als Einwirkung L_U
TS Tandemsystem	-	KOMB 9	Grenzlinie in Lastfall 921-932 als Einwirkung L_T
XL3 LM3	-	KOMB 10	Grenzlinie in Lastfall 941-952 als Einwirkung SL

Zusätzlich werden zur Erstellung der Grenzlinien die möglichen bzw. wahrscheinlichen Setzungen
ungünstig miteinander überlagert. Ebenso die Temperaturlastfälle.

ds wahrscheinlich	GZG	-	KOMB 11	Grenzlinie in Lastfall 961-970 als Einwirkung ZF
ds möglich	GZT	-	KOMB 12	Grenzlinie in Lastfall 971-980 als Einwirkung SF

dT Temperatur - KOMB 13 Grenzlinie in Lastfall 981-990 als Einwirkung T
</text>
echo voll nein

! *!Label Maxima UDL

KOMB Nr 8 EXTR STAN TYPE L_U

LF Nr TYP=A1 \$Kombination Feld 1

101

102

103

104

LF Nr TYP=A2 \$Kombination Feld 2

105

106

107

108

! *!Label Maxima Tandem

KOMB Nr 9 EXTR STAN TYPE L_T

LF Nr TYP=A1 \$Kombination Feld 1

(151 264 1)

(301 414 1)

! *!Label Maxima Ermüdung LM 3

KOMB Nr 10 EXTR STAN TYPE XL3

LF Nr TYP=A1 \$Kombination Feld 1

(501 630 1)

(701 830 1)

! *!Label Maxima wahrscheinliche Setzung

KOMB Nr 11 EXTR STAN TYPE ZF

LF Nr TYP=A1 \$Kombination Feld 1

51

52

53

! *!Label Maxima mögliche Setzung

KOMB Nr 12 EXTR STAN TYPE SF

LF Nr TYP=A1 \$Kombination Feld 1

61

62

63

! *!Label Maxima Temperatur

KOMB Nr 13 EXTR STAN TYPE T

LF Nr TYP=A1 \$Kombination Feld 1

(90 97 1)

SUPP ETYP ZUST LF KOMB=8 EXTR=MAMI \$UDL Grenzlinien

'STAB' MY 901

'STAB' VZ 903

'STAB' MT 905

'STAB' N 907

'STAB' MZ 909

'STAB' VY 911

SUPP ETYP ZUST LF KOMB=9 EXTR=MAMI \$Tandem Grenzlinien

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'STAB' MY 921
'STAB' VZ 923
'STAB' MT 925
'STAB' N 927
'STAB' MZ 929
'STAB' VY 931

SUPP ETYP ZUST LF KOMB=10 EXTR=MAMI \$LM3 Grenzlinien
'STAB' MY 941
'STAB' VZ 943
'STAB' MT 945
'STAB' N 947
'STAB' MZ 949
'STAB' VY 951

SUPP ETYP ZUST LF KOMB=11 EXTR=MAMI \$wahrscheinliche Setzung Grenzlinien
'STAB' MY 961
'STAB' VZ 963
'STAB' VY 965
'STAB' N 967
'STAB' MZ 969

SUPP ETYP ZUST LF KOMB=12 EXTR=MAMI \$mögliche Setzung Grenzlinien
'STAB' MY 971
'STAB' VZ 973
'STAB' VY 975
'STAB' N 977
'STAB' MZ 979

SUPP ETYP ZUST LF KOMB=13 EXTR=MAMI \$Temperatur Grenzlinien
'STAB' MY 981
'STAB' VZ 983
'STAB' VY 985
'STAB' N 987
'STAB' MZ 989

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ende

+PROG CSM urs:bri.csm1 \$ 4.2 Berücksichtigung des Bauablaufs

TXA <u>4.2 Berücksichtigung Bauablauf</u>

STEU EG AUTO \$ Eigengewicht aus gamma automatisch ansetzen
STEU KRAG 2 \$ 1 = Vorbau mit Ausgangsneigung - 2 = tangentialer Vorbau
STEU ase text
STEU aqb text
ECHO GRUP nein
ECHO LF nein
ECHO KRIP nein
ECHO EXPO nein

!*/Label Bauphasen
BA 10 TYP G_1 bez 'Zusammenbau bis Schuss 11 und einfahren'
BA 11 TYP G_1 bez 'Absetzen auf Strompfeiler'
BA 12 TYP G_1 bez 'Zusammenbau bis Schuss 12'

BA 13 TYP G_1 bez 'Zusammenbau bis Schuss 15'
 BA 14 TYP G_1 bez 'Zusammenbau bis Schuss 18'
 BA 15 TYP G_1 bez 'Zusammenbau bis Schuss 19'
 BA 16 TYP G_1 bez 'Abbau Hilfsstützen und Derrick'

 BA 20 TYP G_1 bez 'Anheben Überbau um 1630mm'
 BA 21 TYP G_1 bez 'Einbau Fahrbahnplatte Schuss 7-13'
 BA 22 TYP G_1 bez 'Absenken Überbau um 2030mm'
 BA 23 TYP G_1 bez 'Einbau Fahrbahnplatte Schuss 1-6 und 14-19'
 BA 24 TYP G_1 bez 'Anheben um 400mm'

 BA 30 TYP G_1 bez 'Einbau Fußgängerweg'

 BA 40 TYP G_1 bez 'Mitwirkende Breite'

!*/Label Aktivierung Gruppen

GRUP	NR	IBA1	IBAG	wbis	gfix	PHIF=1.0
1	10	10	-	-		\$Widerlager Kehl
2	11	11	-	-		\$Strompfeiler
3	15	15	-	-		\$Widerlager Straßburg
4	10	10	10	-		\$Hilfsstütze Schuss 9
5	13	14	15	-		\$Hilfsstütze Schuss 13
6	14	15	15	-		\$Hilfsstütze Schuss 16
8	23	23	-	-		\$Querträger Schuss 1-6 und 14-19
9	21	21	-	-		\$Querträger Schuss 7-13
11	10	10	-	-		
12	10	10	-	-		
13	10	10	-	-		
14	10	10	-	-		
15	10	10	-	-		
16	10	10	-	-		
17	10	10	-	-		
18	10	10	-	-		
19	10	10	-	-		
20	10	10	-	-		
21	10	10	-	-		
22	12	12	-	-		
23	13	13	-	-		
24	13	13	-	-		
25	13	13	-	-		
26	14	14	-	-		
27	14	14	-	-		
28	14	14	-	-		
29	15	15	-	-		
31	15	15	-	-		
32	14	14	-	-		
33	14	14	-	-		
34	14	14	-	-		
35	13	13	-	-		
36	13	13	-	-		
37	13	13	-	-		
38	12	12	-	-		
39	10	10	-	-		
40	10	10	-	-		
41	10	10	-	-		
42	10	10	-	-		
43	10	10	-	-		

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44	10	10	-	-
45	10	10	-	-
46	10	10	-	-
47	10	10	-	-
48	10	10	-	-
49	10	10	-	-

!*/!Label Aktivierung Baulasten

LF	Nr	IBA1	WBIS	\$Aktivierung von Zusatzlasten
	2	10	-	\$EG bis Schuss 11
	3	12	-	\$EG bis Schuss 12
	4	13	-	\$EG bis Schuss 15
	5	14	-	\$EG bis Schuss 18
	6	15	-	\$EG bis Schuss 19
	7	21	-	\$EG Fahrbahnplatte Schuss 7-13
	8	23	-	\$EG Fahrbahnplatte Schuss 1-6 und 14-19
	9	30	-	\$EG Gehweg
	10	11	11	\$Derrick in Schuss 11
	11	12	12	\$Derrick in Schuss 12
	12	13	13	\$Derrick in Schuss 15
	13	14	15	\$Derrick in Schuss 18
	17	20	20	\$Anheben um 1630mm
	18	22	22	\$Absenken um 2030mm
	19	24	24	\$Anheben um 400mm
	21	40	-	\$Ausbaulasten

UEBE 15

ENDE

+apply \$(NAME)_csm.dat

\$ Alternativer Aufruf für Ergebnisse in getrennter Datei _csm.*:

\$ +sys wps \$(NAME)_csm.dat /B

\$ CONSTRUCTION STAGE MANAGER - DESIGN: +PROG 20

!*/!Kapitel Kap. 5. Berücksichtigte Lastfallkombinationen

+PROG CSM urs:bri.csm2 \$ Nachweiskonzept

TXA <u>5. Nachweiskonzept, Design Kombinationen und Spannungen</u>

TXA <u>5.1 Nachweiskonzept</u>

ECHO VOLL NEIN

<text> <u>Übersicht über die verwendeten Einwirkungen</u>

Typ Verwendung

G : wird aus dem CSM BA Bauablauf übernommen

L_U : UDL Verkehr "Uniform distributed load"

L_T : Verkehr Tandemachse

XL3 : Ermüdung LM3

T : Temperatur

ZL : Brems-, Zentrifugallasten und Bremslasten

ZW : Wind bei Verkehr [ohne Vertikallast]

SW : Wind ohne Verkehr

ZQ : Lagerrückstellkräfte

ZF : wahrscheinliche Setzung Gebrauch

SF : mögliche Setzung GZT Tragfähigkeit

</text>

Act Typ fuer \$ Definition der Einwirkungen zusätzlich zu g+p+c:
 L_U norm \$ fuer GZG und GZT- Nachweise
 L_T norm \$ fuer GZG und GZT- Nachweise
 T norm \$ Zum Ansatz der Temperatur im Bruchzustand siehe DIN_FB_SOFiSTiK.doc
 ZL norm \$ Brems + Zentrifugallasten
 ZW norm \$ Wind bei Verkehr
 SW norm \$ Wind ohne Verkehr
 ZQ norm \$ Lagerreibung
 ZF norm \$ wahrscheinliche Setzung nur für die Gebrauchsnachweise
 SF norm \$ mögliche Setzung nur für die Tragfähigkeitsnachweise
 DESI STAN ETYP STAB

ENDE

+apply \$(NAME)_desi.dat
 \$ Alternativer Aufruf für Ergebnisse in getrennter Datei _desi.*:
 \$ +sys wps \$(NAME)_desi.dat /B

+PROG WING urs:73 \$ Design Kombination
 TXA <u>5.2 Schnittgrößen Design Kombinationen</u>

<text>

Es folgen die maximalen und minimalen Schnittkräfte im GZT
 für die Größen:

My, Mz, MT

Vy, Vz

N

</text>

SIZE URS 0 teil 3x2 hleg 1.5 tleg 1.0
 BEOB TYP BLIC X 0.864813 Y -0.422351 Z 0.271511 ACHS POSZ DREH 0
 SIZ2 UMBR AB \$ Zu Lange Zeilen auch in der Mitte eines Wortes kürzen

grup (1 3 1) VOLL
 grup (4 6 1) NEIN
 grup (8 9 1) VOLL
 grup (11 49 1) VOLL

farb f25 0008 ; farb f31 0008

STEU MESS 2D

und msca nein \$ Zentrierung Bilder auf Systemgrenzen

SCHR HS 0.1 prue 0 \$ Größe Auflager/Federsymbole Schriftprüfung - möglichst wenig Textüberschreibungen

STEU LEER JA

LEGO TYP BLEG PAR1 JA PAR2 NEIN PAR3 JA \$ PAR2 Schreiben der Auswahlzeile

LET#2 0.25 \$ Schrifthoehe

SIZE dina -win form URS teil 2*0 hleg 1.5 tleg 1.0

MOVE X DEL DTYP TEXT ;MOVE X 1 14 UNIT PR SCHR .3 F 1001

LF 2121 ; SCH2 MIN1 0 MAX1 999999 ; STAB MY UNIT -1002 SCHR #2 ND 0
 LF 2122 ; SCH2 MIN1 -999999 MAX1 0 ; STAB MY UNIT -1002 SCHR #2 ND 0
 LF 2129 ; SCH2 MIN1 0 MAX1 999999 ; STAB MZ UNIT -1002 SCHR #2 ND 0
 LF 2130 ; SCH2 MIN1 -999999 MAX1 0 ; STAB MZ UNIT -1002 SCHR #2 ND 0
 LF 2125 ; SCH2 MIN1 0 MAX1 999999 ; STAB MT UNIT -1002 SCHR #2 ND 0
 LF 2126 ; SCH2 MIN1 -999999 MAX1 0 ; STAB MT UNIT -1002 SCHR #2 ND 0

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```
LF 2123 ; SCH2 MIN1 0 MAX1 999999 ; STAB VZ UNIT -1002 SCHR #2 ND 0
LF 2124 ; SCH2 MIN1 -999999 MAX1 0 ; STAB VZ UNIT -1002 SCHR #2 ND 0
LF 2131 ; SCH2 MIN1 0 MAX1 999999 ; STAB VY UNIT -1002 SCHR #2 ND 0
LF 2132 ; SCH2 MIN1 -999999 MAX1 0 ; STAB VY UNIT -1002 SCHR #2 ND 0
LF 2127 ; SCH2 MIN1 0 MAX1 999999 ; STAB N UNIT -1002 SCHR #2 ND 0
LF 2128 ; SCH2 MIN1 -999999 MAX1 0 ; STAB N UNIT -1002 SCHR #2 ND 0
SCH2 MIN1 STAN MAX1 STAN
ENDE
```

```
+PROG AQB urs:mdesi02 $ Grenzzustand der Tragfähigkeit Bruchnachweis
KOPF Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009
SEIT UNIE 0 ! Standard Eingabeeinheiten
ECHO SCHN,SPAN,DEHN,QUER,BEW,KOMB,SCHU,LF,RISS,BEME,AUSN,C2T NEIN
ECHO BEME,AUSN JA
```

```
$ zu bearbeitende Stäbe:
STAB von - x - BA auto
```

```
$ zu verwendende Lastfälle:
```

```
LF 5??? $ alle 5000...GPC-Lastfälle entsprechend der LF-Liste in der Datei _csmf.dat
ECHO SCHN JA $ zur Kontrolle der automatisch gefundenen und angesetzten Lastfälle -> Untersuchte Lastfälle
LF TYP 'Y_1 ' QT 9998 REF BRUT $ QT 9998 = wirkt auf den Endquerschnitt
LF TYP 'Y_2 ' QT 9998 REF BRUT
LF TYP 'Y_3 ' QT 9998 REF BRUT
LF TYP 'Y_4 ' QT 9998 REF BRUT
LF TYP 'Y_9 ' QT 9998 REF BRUT
LF TYP 'Y_D ' QT 9998 REF BRUT
LF TYP 'Y_G ' QT 9998 REF BRUT
$
```

```
$ Kombinationen:
```

```
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD MY BEZ 'Bruchzustand_maxMY' LFSP 3101 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND MY BEZ 'Bruchzustand_minMY' LFSP 3102 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD VZ BEZ 'Bruchzustand_maxVZ' LFSP 3103 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND VZ BEZ 'Bruchzustand_minVZ' LFSP 3104 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD MT BEZ 'Bruchzustand_maxMT' LFSP 3105 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND MT BEZ 'Bruchzustand_minMT' LFSP 3106 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD N BEZ 'Bruchzustand_maxN' LFSP 3107 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND N BEZ 'Bruchzustand_minN' LFSP 3108 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD VY BEZ 'Bruchzustand_maxVY' LFSP 3109 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND VY BEZ 'Bruchzustand_minVY' LFSP 3110 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
$ Mit in MAXIMA vorueberlagerten Containern der veraenderlichen Einwirkungen Y_:
KOMB MAXD MZ BEZ 'Bruchzustand_maxMZ' LFSP 3111 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB MIND MZ BEZ 'Bruchzustand_minMZ' LFSP 3112 LF1 G LF2 Y_D 1.0 $ Y_ aus MAXIMA Vorüberlagerung ohne gpc
KOMB GMAX LFSP 3113 BEZ 'Bruchzustand_max'
KOMB GMIN LFSP 3114 BEZ 'Bruchzustand_min' $ GMIN nur fuer WINGRAF - min-MY
```

```
SPAN E
```

```
ENDE
```

+PROG RESULTS urs:6

TXA <u>5.3 Spannungen für Querschnittsnachweise</u>

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\$ Begin Page 1

<text>

Die folgenden Tabellen zeigen die Druck-, Zug-, Schub- und Vergleichsspannungen der nachzuweisenden Bauteile für die Lastfälle maxMy, minMy in der Designkombination. Zusätzlich ist der Lastfall 3113 abgebildet der eine Überlagerung aus allen 3100er Lastfällen bildet. Die Bauteile können anhand der Materialnummer identifiziert werden. Aufgelistet ist das Fahrbahnblech (MNR 1), der äußere Steg des Hohlkastens (MNR 3), der innere Steg (MNR 4), das Bodenblech (MNR 5), die orthotrope Fahrbahnplatte (MNR 7) sowie der Gehweg (MNR 10). Da nur der Hauptträger unterstrom nachgewiesen wurde, werden die Ergebnisse auch nur für diesen angezeigt.

</text>

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graphic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 1

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3101

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:7

KOPF

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\$ Begin Page 1

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graphic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 3

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3101

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:8

KOPF

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\$ Begin Page 1

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graphic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 4

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FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3101
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:9

KOPF

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\$ Begin Page 1

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graftic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 5

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3101

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:10

KOPF

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\$ Begin Page 1

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graftic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 7

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3101

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:11

KOPF

\$ C:/Users/Leono/Documents/Studium/Vorlesung/Master/Masterarbeit/Sofistik/Europabrücke Längssystem/Modell Eui

\$ Begin Page 1

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graftic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3101

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

SOFISTIK CADINP Eingabe
C:\...\Europabrücke Längssystem\Modell Europabrücke.dat

STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:12

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafik/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 1

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:13

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafik/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 3

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:14

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafik/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 4

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

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+PROG RESULTS urs:15

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 5

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:16

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 7

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:17

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafic/Table/Diagram 1

BILD M STAN W STAN H STAN SPLT NEIN

DBO

GRUP

FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10

FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114

LF NR 3102

STAB TYP SIGD STYP STAB DARS DLST

STAB TYP SIGZ STYP STAB DARS DLST

STAB TYP STAU STYP STAB DARS DLST

STAB TYP SIGV STYP STAB DARS DLST

ENDE

+PROG RESULTS urs:18

KOPF

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SIZE DINA "-URS" TEIL "2x1"
$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 1
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE
```

+PROG RESULTS urs:19

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KOPF
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SIZE DINA "-URS" TEIL "2x1"
$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 3
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE
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+PROG RESULTS urs:20

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KOPF
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SIZE DINA "-URS" TEIL "2x1"
$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 4
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE
```

+PROG RESULTS urs:21

```
KOPF
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$ Begin Page 1
SIZE DINA "-URS" TEIL "2x1"
$ Begin Graftic/Table/Diagram 1
```

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BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 5
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:22

KOPF
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SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 7
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:23

KOPF
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\$ Begin Page 1
SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
LF NR 3113
STAB TYP SIGD STYP STAB DARS DLST
STAB TYP SIGZ STYP STAB DARS DLST
STAB TYP STAU STYP STAB DARS DLST
STAB TYP SIGV STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:24

KOPF
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\$ Begin Page 1

<text>

Nachfolgend finden sich die Längsspannungen und Schubspannungen im

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inneren Steg des Hohlkastens unterstrom die benötigt werden um den
Beulnachweis des Steges durchzuführen
</text>

SIZE DINA "-URS" TEIL "2x1"
\$ Begin Grafic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "4"
LF NR 3101
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:25

KOPF
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\$ Begin Page 1
SIZE DINA "-URS" TEIL "2x1"
\$ Begin Grafic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "5"
LF NR 3101
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:26

KOPF
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SIZE DINA "-URS" TEIL "2x1"
\$ Begin Grafic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "6"
LF NR 3101
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:27

KOPF
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SIZE DINA "-URS" TEIL "2x1"

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BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "4"
LF NR 3102
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE
```

+PROG RESULTS urs:28

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafic/Table/Diagram 1

```
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "5"
LF NR 3102
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE
```

+PROG RESULTS urs:29

KOPF

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SIZE DINA "-URS" TEIL "2x1"

\$ Begin Grafic/Table/Diagram 1

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BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "6"
LF NR 3102
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP STPT STYP STAB DARS DLST
ENDE
```

+PROG AQB urs:3 \$ Spannungen LM3

TXA <u>5.4 Lastkombination LM3 zur Ermittlung der Schwingbreiten</u>

SEIT UNIE 0 ! Standard Eingabeeinheiten

ECHO SCHN,SPAN,DEHN,QUER,BEW,KOMB,SCHU,LF

ECHO BEME,AUSN JA

\$ zu bearbeitende Stäbe:

STAB von 11001 bis 29114 BA auto

\$ zu verwendende Lastfälle:

ECHO SCHN JA

LF NR 941 QT 9998 REF BRUT \$ QT 9998 = wirkt auf den Endquerschnitt
LF NR 942 QT 9998 REF BRUT
LF NR 943 QT 9998 REF BRUT
LF NR 944 QT 9998 REF BRUT
LF NR 945 QT 9998 REF BRUT
LF NR 946 QT 9998 REF BRUT
LF NR 947 QT 9998 REF BRUT
LF NR 948 QT 9998 REF BRUT
LF NR 949 QT 9998 REF BRUT
LF NR 950 QT 9998 REF BRUT
LF NR 951 QT 9998 REF BRUT
LF NR 952 QT 9998 REF BRUT

\$ Kombinationen:

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD MY BEZ 'LM3_maxMY' LFSP 3201 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND MY BEZ 'LM3_minMY' LFSP 3202 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD VZ BEZ 'LM3_maxVZ' LFSP 3203 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND VZ BEZ 'LM3_minVZ' LFSP 3204 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD MT BEZ 'LM3_maxMT' LFSP 3205 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND MT BEZ 'LM3_minMT' LFSP 3206 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD N BEZ 'LM3_maxN' LFSP 3207 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND N BEZ 'LM3_minN' LFSP 3208 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD VY BEZ 'LM3_maxVY' LFSP 3209 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND VY BEZ 'LM3_minVY' LFSP 3210 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

\$ Mit in MAXIMA vorüberlagerten Containern der veränderlichen Einwirkungen Y_:

KOMB MAXD MZ BEZ 'LM3_maxMZ' LFSP 3211 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB MIND MZ BEZ 'LM3_minMZ' LFSP 3212 LF1 XL3 \$XL3 aus MAXIMA Vorüberlagerung ohne gpc

KOMB GMAX LFSP 3213 BEZ 'LM3_max'

KOMB GMIN LFSP 3214 BEZ 'LM3_min' \$ GMIN nur fuer WINGRAF - min-MY

span e

ENDE

+PROG RESULTS urs:30

TXA <u>5.5 Schwingbreiten</u>

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\$ Begin Page 1

<text>

Nachfolgend finden sich die Schwingbreiten in der Bodenplatte und in dem Deckblech des Hohlkastens die für den Ermüdungsnachweis der jeweiligen Bauteile benötigt werden

</text>

SIZE DINA "-URS" TEIL "2x1"

\$ Begin Graphic/Table/Diagram 1

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BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "21"
LF NR 3213
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP SZPT STYP STAB DARS DLST
STAB TYP SBPT STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:31

KOPF
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SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "beam__sm.__mnr" TYP EQ OPTI JA VAL1 10
FILT NAME "beam__sm.nr" TYP BT OPTI JA VAL1 11001 VAL2 29114
FILT NAME "beam__sp.__mnr" TYP TEXT OPTI JA VAL1 "31"
LF NR 3213
STAB TYP SDPT STYP STAB DARS DLST
STAB TYP SZPT STYP STAB DARS DLST
STAB TYP SBPT STYP STAB DARS DLST
ENDE

+PROG RESULTS urs:32

TXA <u>5.6 Ausgangswerte für Berechnung der Lagerbedingungen des Quersystems</u>
\$ C:/Users/Leono/Documents/Studium/Vorlesung/Master/Masterarbeit/Sofistik/Europabrücke Längssystem/Modell Eu
\$ Begin Page 1
<text>
Nachfolgend finden sich die Knotenverschiebungen und
Verdrehungen zur Bestimmung der Auflagerbedingungen des Quersystems
</text>
SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "n_disp.nr" TYP BT OPTI JA VAL1 1 VAL2 114
LF NR 997
KNOT TYP UZ DARS DLST
ENDE

+PROG RESULTS urs:33

KOPF
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SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "n_disp.nr" TYP BT OPTI JA VAL1 1 VAL2 114

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LF NR 998
KNOT TYP DX DARS DLST
ENDE

+PROG RESULTS urs:34

KOPF
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SIZE DINA "-URS" TEIL "2x1"
\$ Begin Graftic/Table/Diagram 1
BILD M STAN W STAN H STAN SPLT NEIN
DBO
GRUP
FILT NAME "n_disp.nr" TYP BT OPTI JA VAL1 1 VAL2 114
LF NR 999
KNOT TYP UZ DARS DLST
KNOT TYP DX DARS DLST
ENDE

Appendix G Excel Sheets with Check of Gross Section

Equivalent Stress in the Plate above the Box-Girder				
Component	Beam number	Material Strength [N/mm ²]	Equivalent Stress [N/mm ²]	Load Factor
Plate over Box-Girder	1	355.00	122.20	0.344
Plate over Box-Girder	2	355.00	121.00	0.341
Plate over Box-Girder	3	355.00	131.00	0.369
Plate over Box-Girder	4	355.00	160.50	0.452
Plate over Box-Girder	5	355.00	188.40	0.531
Plate over Box-Girder	6	355.00	218.00	0.614
Plate over Box-Girder	7	355.00	230.90	0.650
Plate over Box-Girder	8	355.00	232.60	0.655
Plate over Box-Girder	9	355.00	254.90	0.718
Plate over Box-Girder	10	355.00	267.80	0.754
Plate over Box-Girder	11	355.00	288.30	0.812
Plate over Box-Girder	12	355.00	302.70	0.853
Plate over Box-Girder	13	355.00	317.60	0.895
Plate over Box-Girder	14	355.00	307.40	0.866
Plate over Box-Girder	15	355.00	316.70	0.892
Plate over Box-Girder	16	355.00	327.30	0.922
Plate over Box-Girder	17	355.00	332.20	0.936
Plate over Box-Girder	18	355.00	335.10	0.944
Plate over Box-Girder	19	355.00	336.00	0.946
Plate over Box-Girder	20	355.00	336.10	0.947
Plate over Box-Girder	21	355.00	335.30	0.945
Plate over Box-Girder	22	355.00	332.80	0.937
Plate over Box-Girder	23	355.00	328.40	0.925
Plate over Box-Girder	24	355.00	319.10	0.899
Plate over Box-Girder	25	355.00	315.60	0.889
Plate over Box-Girder	26	355.00	311.60	0.878
Plate over Box-Girder	27	355.00	302.30	0.852
Plate over Box-Girder	28	355.00	297.70	0.839
Plate over Box-Girder	29	355.00	285.00	0.803
Plate over Box-Girder	30	355.00	271.30	0.764
Plate over Box-Girder	31	355.00	271.90	0.766
Plate over Box-Girder	32	355.00	262.20	0.739
Plate over Box-Girder	33	355.00	245.00	0.690
Plate over Box-Girder	34	355.00	230.10	0.648
Plate over Box-Girder	35	355.00	210.00	0.592
Plate over Box-Girder	36	355.00	188.90	0.532
Plate over Box-Girder	37	355.00	248.10	0.699
Plate over Box-Girder	38	355.00	235.70	0.664
Plate over Box-Girder	39	355.00	211.70	0.596

Plate over Box-Girder	40	355.00	165.00	0.465
Plate over Box-Girder	41	355.00	144.00	0.406
Plate over Box-Girder	42	355.00	129.90	0.366
Plate over Box-Girder	43	355.00	121.00	0.341
Plate over Box-Girder	44	355.00	111.00	0.313
Plate over Box-Girder	45	355.00	116.30	0.328
Plate over Box-Girder	46	355.00	129.90	0.366
Plate over Box-Girder	47	355.00	151.10	0.426
Plate over Box-Girder	48	355.00	190.00	0.535
Plate over Box-Girder	49	355.00	219.30	0.618
Plate over Box-Girder	50	355.00	205.00	0.577
Plate over Box-Girder	51	355.00	228.00	0.642
Plate over Box-Girder	52	355.00	253.40	0.714
Plate over Box-Girder	53	355.00	280.70	0.791
Plate over Box-Girder	54	355.00	307.40	0.866
Plate over Box-Girder	55	355.00	320.90	0.904
Plate over Box-Girder	56	355.00	330.30	0.930
Plate over Box-Girder	57	355.00	355.70	1.002
Plate over Box-Girder	58	355.00	382.80	1.078
Plate over Box-Girder	59	355.00	355.60	1.002
Plate over Box-Girder	60	355.00	331.20	0.933
Plate over Box-Girder	61	355.00	319.20	0.899
Plate over Box-Girder	62	355.00	308.40	0.869
Plate over Box-Girder	63	355.00	282.10	0.795
Plate over Box-Girder	64	355.00	255.00	0.718
Plate over Box-Girder	65	355.00	232.60	0.655
Plate over Box-Girder	66	355.00	206.00	0.580
Plate over Box-Girder	67	355.00	211.90	0.597
Plate over Box-Girder	68	355.00	189.80	0.535
Plate over Box-Girder	69	355.00	152.20	0.429
Plate over Box-Girder	70	355.00	131.20	0.370
Plate over Box-Girder	71	355.00	118.10	0.333
Plate over Box-Girder	72	355.00	101.60	0.286
Plate over Box-Girder	73	355.00	121.50	0.342
Plate over Box-Girder	74	355.00	130.70	0.368
Plate over Box-Girder	75	355.00	145.80	0.411
Plate over Box-Girder	76	355.00	169.20	0.477
Plate over Box-Girder	77	355.00	214.40	0.604
Plate over Box-Girder	78	355.00	235.50	0.663
Plate over Box-Girder	79	355.00	247.80	0.698
Plate over Box-Girder	80	355.00	188.30	0.530
Plate over Box-Girder	81	355.00	209.50	0.590
Plate over Box-Girder	82	355.00	229.60	0.647
Plate over Box-Girder	83	355.00	244.50	0.689
Plate over Box-Girder	84	355.00	261.90	0.738
Plate over Box-Girder	85	355.00	272.90	0.769
Plate over Box-Girder	86	355.00	270.60	0.762

Plate over Box-Girder	87	355.00	284.50	0.801
Plate over Box-Girder	88	355.00	297.10	0.837
Plate over Box-Girder	89	355.00	301.90	0.850
Plate over Box-Girder	90	355.00	311.30	0.877
Plate over Box-Girder	91	355.00	315.60	0.889
Plate over Box-Girder	92	355.00	319.10	0.899
Plate over Box-Girder	93	355.00	328.40	0.925
Plate over Box-Girder	94	355.00	332.80	0.937
Plate over Box-Girder	95	355.00	335.40	0.945
Plate over Box-Girder	96	355.00	336.20	0.947
Plate over Box-Girder	97	355.00	335.90	0.946
Plate over Box-Girder	98	355.00	335.10	0.944
Plate over Box-Girder	99	355.00	332.20	0.936
Plate over Box-Girder	100	355.00	327.30	0.922
Plate over Box-Girder	101	355.00	316.70	0.892
Plate over Box-Girder	102	355.00	307.70	0.867
Plate over Box-Girder	103	355.00	310.00	0.873
Plate over Box-Girder	104	355.00	302.80	0.853
Plate over Box-Girder	105	355.00	288.40	0.812
Plate over Box-Girder	106	355.00	267.90	0.755
Plate over Box-Girder	107	355.00	255.10	0.719
Plate over Box-Girder	108	355.00	232.70	0.655
Plate over Box-Girder	109	355.00	226.50	0.638
Plate over Box-Girder	110	355.00	217.00	0.611
Plate over Box-Girder	111	355.00	187.90	0.529
Plate over Box-Girder	112	355.00	159.80	0.450
Plate over Box-Girder	113	355.00	132.10	0.372
Plate over Box-Girder	114	355.00	121.50	0.342

Equivalent Stress in the Orthotropic Plate				
Component	Beam Number	Material Strength [N/mm ²]	Equivalent Stress [N/mm ²]	Load Factor
Orthotropic Plate	1	355.00	113.00	0.318
Orthotropic Plate	2	355.00	113.80	0.321
Orthotropic Plate	3	355.00	116.00	0.327
Orthotropic Plate	4	355.00	123.90	0.349
Orthotropic Plate	5	355.00	131.50	0.370
Orthotropic Plate	6	355.00	146.10	0.412
Orthotropic Plate	7	355.00	154.20	0.434
Orthotropic Plate	8	355.00	148.80	0.419
Orthotropic Plate	9	355.00	160.20	0.451
Orthotropic Plate	10	355.00	171.10	0.482
Orthotropic Plate	11	355.00	178.00	0.501
Orthotropic Plate	12	355.00	188.10	0.530
Orthotropic Plate	13	355.00	193.20	0.544
Orthotropic Plate	14	355.00	190.50	0.537
Orthotropic Plate	15	355.00	197.20	0.555
Orthotropic Plate	16	355.00	200.50	0.565
Orthotropic Plate	17	355.00	205.30	0.578
Orthotropic Plate	18	355.00	209.10	0.589
Orthotropic Plate	19	355.00	210.60	0.593
Orthotropic Plate	20	355.00	211.80	0.597
Orthotropic Plate	21	355.00	213.50	0.601
Orthotropic Plate	22	355.00	214.30	0.604
Orthotropic Plate	23	355.00	213.90	0.603
Orthotropic Plate	24	355.00	215.50	0.607
Orthotropic Plate	25	355.00	214.60	0.605
Orthotropic Plate	26	355.00	213.40	0.601
Orthotropic Plate	27	355.00	210.40	0.593
Orthotropic Plate	28	355.00	207.00	0.583
Orthotropic Plate	29	355.00	202.60	0.571
Orthotropic Plate	30	355.00	197.70	0.557
Orthotropic Plate	31	355.00	199.80	0.563
Orthotropic Plate	32	355.00	201.40	0.567
Orthotropic Plate	33	355.00	194.20	0.547
Orthotropic Plate	34	355.00	190.10	0.535
Orthotropic Plate	35	355.00	181.60	0.512
Orthotropic Plate	36	355.00	172.70	0.486
Orthotropic Plate	37	355.00	170.00	0.479
Orthotropic Plate	38	355.00	154.80	0.436
Orthotropic Plate	39	355.00	164.40	0.463

Orthotropic Plate	40	355.00	199.60	0.562
Orthotropic Plate	41	355.00	206.50	0.582
Orthotropic Plate	42	355.00	215.60	0.607
Orthotropic Plate	43	355.00	221.60	0.624
Orthotropic Plate	44	355.00	209.90	0.591
Orthotropic Plate	45	355.00	223.40	0.629
Orthotropic Plate	46	355.00	234.40	0.660
Orthotropic Plate	47	355.00	239.00	0.673
Orthotropic Plate	48	355.00	254.30	0.716
Orthotropic Plate	49	355.00	264.70	0.746
Orthotropic Plate	50	355.00	251.80	0.709
Orthotropic Plate	51	355.00	275.90	0.777
Orthotropic Plate	52	355.00	289.30	0.815
Orthotropic Plate	53	355.00	305.90	0.862
Orthotropic Plate	54	355.00	321.80	0.906
Orthotropic Plate	55	355.00	334.40	0.942
Orthotropic Plate	56	355.00	336.00	0.946
Orthotropic Plate	57	355.00	352.00	0.992
Orthotropic Plate	58	355.00	369.30	1.040
Orthotropic Plate	59	355.00	351.70	0.991
Orthotropic Plate	60	355.00	336.80	0.949
Orthotropic Plate	61	355.00	329.40	0.928
Orthotropic Plate	62	355.00	322.30	0.908
Orthotropic Plate	63	355.00	306.90	0.865
Orthotropic Plate	64	355.00	290.60	0.819
Orthotropic Plate	65	355.00	272.50	0.768
Orthotropic Plate	66	355.00	253.40	0.714
Orthotropic Plate	67	355.00	265.00	0.746
Orthotropic Plate	68	355.00	255.10	0.719
Orthotropic Plate	69	355.00	239.80	0.675
Orthotropic Plate	70	355.00	233.60	0.658
Orthotropic Plate	71	355.00	224.30	0.632
Orthotropic Plate	72	355.00	211.50	0.596
Orthotropic Plate	73	355.00	221.70	0.625
Orthotropic Plate	74	355.00	217.80	0.614
Orthotropic Plate	75	355.00	210.70	0.594
Orthotropic Plate	76	355.00	204.00	0.575
Orthotropic Plate	77	355.00	163.20	0.460
Orthotropic Plate	78	355.00	142.80	0.402
Orthotropic Plate	79	355.00	171.70	0.484
Orthotropic Plate	80	355.00	168.20	0.474
Orthotropic Plate	81	355.00	177.70	0.501
Orthotropic Plate	82	355.00	186.70	0.526
Orthotropic Plate	83	355.00	191.20	0.539
Orthotropic Plate	84	355.00	198.90	0.560
Orthotropic Plate	85	355.00	204.50	0.576
Orthotropic Plate	86	355.00	194.70	0.548

Orthotropic Plate	87	355.00	200.30	0.564
Orthotropic Plate	88	355.00	205.10	0.578
Orthotropic Plate	89	355.00	208.90	0.588
Orthotropic Plate	90	355.00	212.10	0.597
Orthotropic Plate	91	355.00	213.50	0.601
Orthotropic Plate	92	355.00	214.50	0.604
Orthotropic Plate	93	355.00	213.10	0.600
Orthotropic Plate	94	355.00	213.90	0.603
Orthotropic Plate	95	355.00	213.60	0.602
Orthotropic Plate	96	355.00	212.40	0.598
Orthotropic Plate	97	355.00	211.50	0.596
Orthotropic Plate	98	355.00	210.20	0.592
Orthotropic Plate	99	355.00	207.00	0.583
Orthotropic Plate	100	355.00	202.70	0.571
Orthotropic Plate	101	355.00	200.20	0.564
Orthotropic Plate	102	355.00	193.90	0.546
Orthotropic Plate	103	355.00	194.60	0.548
Orthotropic Plate	104	355.00	190.00	0.535
Orthotropic Plate	105	355.00	181.10	0.510
Orthotropic Plate	106	355.00	174.20	0.491
Orthotropic Plate	107	355.00	163.20	0.460
Orthotropic Plate	108	355.00	151.70	0.427
Orthotropic Plate	109	355.00	149.80	0.422
Orthotropic Plate	110	355.00	146.50	0.413
Orthotropic Plate	111	355.00	134.30	0.378
Orthotropic Plate	112	355.00	126.70	0.357
Orthotropic Plate	113	355.00	118.90	0.335
Orthotropic Plate	114	355.00	116.80	0.329

Equivalent Stress Sidewalk				
Component	Beam Number	Material Strength [N/mm ²]	Equivalent Stress [N/mm ²]	Load Factor
Sidewalk	1	355.00	108.00	0.304
Sidewalk	2	355.00	106.40	0.300
Sidewalk	3	355.00	118.10	0.333
Sidewalk	4	355.00	136.40	0.384
Sidewalk	5	355.00	153.70	0.433
Sidewalk	6	355.00	181.60	0.512
Sidewalk	7	355.00	192.90	0.543
Sidewalk	8	355.00	194.00	0.546
Sidewalk	9	355.00	214.20	0.603
Sidewalk	10	355.00	223.20	0.629
Sidewalk	11	355.00	240.40	0.677
Sidewalk	12	355.00	252.40	0.711
Sidewalk	13	355.00	257.50	0.725
Sidewalk	14	355.00	257.70	0.726
Sidewalk	15	355.00	265.40	0.748
Sidewalk	16	355.00	274.50	0.773
Sidewalk	17	355.00	279.00	0.786
Sidewalk	18	355.00	282.10	0.795
Sidewalk	19	355.00	283.40	0.798
Sidewalk	20	355.00	284.00	0.800
Sidewalk	21	355.00	284.70	0.802
Sidewalk	22	355.00	284.30	0.801
Sidewalk	23	355.00	282.70	0.796
Sidewalk	24	355.00	276.80	0.780
Sidewalk	25	355.00	275.30	0.775
Sidewalk	26	355.00	273.00	0.769
Sidewalk	27	355.00	267.90	0.755
Sidewalk	28	355.00	270.00	0.761
Sidewalk	29	355.00	262.40	0.739
Sidewalk	30	355.00	254.00	0.715
Sidewalk	31	355.00	246.70	0.695
Sidewalk	32	355.00	250.90	0.707
Sidewalk	33	355.00	240.10	0.676
Sidewalk	34	355.00	234.20	0.660
Sidewalk	35	355.00	220.60	0.621
Sidewalk	36	355.00	205.80	0.580
Sidewalk	37	355.00	209.80	0.591
Sidewalk	38	355.00	200.80	0.566
Sidewalk	39	355.00	182.80	0.515

Sidewalk	40	355.00	163.30	0.460
Sidewalk	41	355.00	145.00	0.408
Sidewalk	42	355.00	144.40	0.407
Sidewalk	43	355.00	149.20	0.420
Sidewalk	44	355.00	147.40	0.415
Sidewalk	45	355.00	156.10	0.440
Sidewalk	46	355.00	155.20	0.437
Sidewalk	47	355.00	167.40	0.472
Sidewalk	48	355.00	176.80	0.498
Sidewalk	49	355.00	187.00	0.527
Sidewalk	50	355.00	186.50	0.525
Sidewalk	51	355.00	202.90	0.572
Sidewalk	52	355.00	221.70	0.625
Sidewalk	53	355.00	241.20	0.679
Sidewalk	54	355.00	260.10	0.733
Sidewalk	55	355.00	268.30	0.756
Sidewalk	56	355.00	273.20	0.770
Sidewalk	57	355.00	291.90	0.822
Sidewalk	58	355.00	312.30	0.880
Sidewalk	59	355.00	291.80	0.822
Sidewalk	60	355.00	273.10	0.769
Sidewalk	61	355.00	269.00	0.758
Sidewalk	62	355.00	260.20	0.733
Sidewalk	63	355.00	241.30	0.680
Sidewalk	64	355.00	221.70	0.625
Sidewalk	65	355.00	203.40	0.573
Sidewalk	66	355.00	186.10	0.524
Sidewalk	67	355.00	186.80	0.526
Sidewalk	68	355.00	176.30	0.497
Sidewalk	69	355.00	167.50	0.472
Sidewalk	70	355.00	155.40	0.438
Sidewalk	71	355.00	156.50	0.441
Sidewalk	72	355.00	147.80	0.416
Sidewalk	73	355.00	149.40	0.421
Sidewalk	74	355.00	144.90	0.408
Sidewalk	75	355.00	145.70	0.410
Sidewalk	76	355.00	164.00	0.462
Sidewalk	77	355.00	183.40	0.517
Sidewalk	78	355.00	201.40	0.567
Sidewalk	79	355.00	210.30	0.592
Sidewalk	80	355.00	206.50	0.582
Sidewalk	81	355.00	221.20	0.623
Sidewalk	82	355.00	234.80	0.661
Sidewalk	83	355.00	240.60	0.678
Sidewalk	84	355.00	251.30	0.708
Sidewalk	85	355.00	255.10	0.719
Sidewalk	86	355.00	254.20	0.716

Sidewalk	87	355.00	262.60	0.740
Sidewalk	88	355.00	270.10	0.761
Sidewalk	89	355.00	268.00	0.755
Sidewalk	90	355.00	273.40	0.770
Sidewalk	91	355.00	275.60	0.776
Sidewalk	92	355.00	277.40	0.781
Sidewalk	93	355.00	283.30	0.798
Sidewalk	94	355.00	284.80	0.802
Sidewalk	95	355.00	285.00	0.803
Sidewalk	96	355.00	284.00	0.800
Sidewalk	97	355.00	283.20	0.798
Sidewalk	98	355.00	281.90	0.794
Sidewalk	99	355.00	278.50	0.785
Sidewalk	100	355.00	273.80	0.771
Sidewalk	101	355.00	264.70	0.746
Sidewalk	102	355.00	257.00	0.724
Sidewalk	103	355.00	257.00	0.724
Sidewalk	104	355.00	251.60	0.709
Sidewalk	105	355.00	239.50	0.675
Sidewalk	106	355.00	222.30	0.626
Sidewalk	107	355.00	213.20	0.601
Sidewalk	108	355.00	192.80	0.543
Sidewalk	109	355.00	184.30	0.519
Sidewalk	110	355.00	180.10	0.507
Sidewalk	111	355.00	154.20	0.434
Sidewalk	112	355.00	139.60	0.393
Sidewalk	113	355.00	120.90	0.341
Sidewalk	114	355.00	109.10	0.307

Equivalent Stress in the Bottom Plate				
Component	Beam Number	Material Strength [N/mm ²]	Equivalent Stress [N/mm ²]	Load Factor
Bottom Plate	1	355.00	186.50	0.525
Bottom Plate	2	355.00	192.40	0.542
Bottom Plate	3	355.00	265.50	0.748
Bottom Plate	4	355.00	349.80	0.985
Bottom Plate	5	355.00	373.60	1.052
Bottom Plate	6	355.00	439.30	1.237
Bottom Plate	7	355.00	473.10	1.333
		355.00	362.30	1.021
Bottom Plate	8	355.00	384.80	1.084
Bottom Plate	9	355.00	426.00	1.200
Bottom Plate	10	355.00	423.50	1.193
Bottom Plate	11	355.00	426.90	1.203
Bottom Plate	12	355.00	450.00	1.268
Bottom Plate	13	355.00	460.10	1.296
Bottom Plate	14	355.00	446.40	1.257
Bottom Plate	15	355.00	461.40	1.300
Bottom Plate	16	355.00	450.00	1.268
Bottom Plate	17	355.00	458.20	1.291
Bottom Plate	18	355.00	463.70	1.306
Bottom Plate	19	355.00	465.60	1.312
Bottom Plate	20	355.00	466.50	1.314
Bottom Plate	21	355.00	466.80	1.315
Bottom Plate	22	355.00	464.60	1.309
Bottom Plate	23	355.00	459.90	1.295
Bottom Plate	24	355.00	476.10	1.341
Bottom Plate	25	355.00	471.70	1.329
Bottom Plate	26	355.00	466.50	1.314
Bottom Plate	27	355.00	454.60	1.281
Bottom Plate	28	355.00	473.80	1.335
Bottom Plate	29	355.00	456.00	1.285
Bottom Plate	30	355.00	436.20	1.229
Bottom Plate	31	355.00	422.20	1.189
Bottom Plate	32	355.00	505.10	1.423
Bottom Plate	33	355.00	475.50	1.339
Bottom Plate	34	355.00	500.60	1.410
Bottom Plate	35	355.00	461.30	1.299
Bottom Plate	36	355.00	419.70	1.182
Bottom Plate	37	355.00	395.40	1.114
		355.00	499.20	1.406

Bottom Plate	38	355.00	471.20	1.327
Bottom Plate	39	355.00	408.80	1.152
Bottom Plate	40	355.00	335.80	0.946
Bottom Plate	41	355.00	303.80	0.856
Bottom Plate	42	355.00	336.40	0.948
Bottom Plate	43	355.00	355.30	1.001
Bottom Plate	44	355.00	316.00	0.890
Bottom Plate	45	355.00	349.50	0.985
Bottom Plate	46	355.00	318.90	0.898
Bottom Plate	47	355.00	311.00	0.876
Bottom Plate	48	355.00	346.40	0.976
Bottom Plate	49	355.00	369.80	1.042
Bottom Plate	50	355.00	303.60	0.855
Bottom Plate	51	355.00	332.50	0.937
Bottom Plate	52	355.00	315.90	0.890
Bottom Plate	53	355.00	343.40	0.967
Bottom Plate	54	355.00	369.60	1.041
Bottom Plate	55	355.00	381.50	1.075
Bottom Plate	56	355.00	343.60	0.968
Bottom Plate	57	355.00	365.30	1.029
Bottom Plate	58	355.00	388.90	1.095
Bottom Plate	59	355.00	365.80	1.030
Bottom Plate	60	355.00	344.30	0.970
Bottom Plate	61	355.00	384.10	1.082
Bottom Plate	62	355.00	370.70	1.044
Bottom Plate	63	355.00	344.40	0.970
Bottom Plate	64	355.00	316.90	0.893
Bottom Plate	65	355.00	335.00	0.944
Bottom Plate	66	355.00	304.50	0.858
Bottom Plate	67	355.00	369.50	1.041
Bottom Plate	68	355.00	346.80	0.977
Bottom Plate	69	355.00	312.00	0.879
Bottom Plate	70	355.00	319.80	0.901
Bottom Plate	71	355.00	350.70	0.988
Bottom Plate	72	355.00	317.10	0.893
Bottom Plate	73	355.00	356.20	1.003
Bottom Plate	74	355.00	337.50	0.951
Bottom Plate	75	355.00	305.30	0.860
Bottom Plate	76	355.00	335.40	0.945
Bottom Plate	77	355.00	409.50	1.154
Bottom Plate	78	355.00	473.90	1.335
Bottom Plate	79	355.00	496.80	1.399
Bottom Plate	80	355.00	417.30	1.175
Bottom Plate	81	355.00	459.20	1.294
Bottom Plate	82	355.00	498.70	1.405
Bottom Plate	83	355.00	473.30	1.333
Bottom Plate	84	355.00	503.20	1.417

Bottom Plate	85	355.00	517.40	1.457
		355.00	420.30	1.184
Bottom Plate	86	355.00	435.10	1.226
Bottom Plate	87	355.00	455.10	1.282
Bottom Plate	88	355.00	472.90	1.332
Bottom Plate	89	355.00	453.80	1.278
Bottom Plate	90	355.00	465.90	1.312
Bottom Plate	91	355.00	471.10	1.327
Bottom Plate	92	355.00	475.70	1.340
Bottom Plate	93	355.00	459.60	1.295
Bottom Plate	94	355.00	464.40	1.308
Bottom Plate	95	355.00	466.60	1.314
Bottom Plate	96	355.00	466.30	1.314
Bottom Plate	97	355.00	465.40	1.311
Bottom Plate	98	355.00	463.60	1.306
Bottom Plate	99	355.00	458.20	1.291
Bottom Plate	100	355.00	450.00	1.268
Bottom Plate	101	355.00	461.50	1.300
Bottom Plate	102	355.00	446.70	1.258
Bottom Plate	103	355.00	432.00	1.217
		355.00	461.20	1.299
Bottom Plate	104	355.00	450.60	1.269
Bottom Plate	105	355.00	427.80	1.205
Bottom Plate	106	355.00	424.70	1.196
Bottom Plate	107	355.00	427.10	1.203
Bottom Plate	108	355.00	386.30	1.088
Bottom Plate	109	355.00	364.70	1.027
Bottom Plate	110	355.00	443.20	1.248
Bottom Plate	111	355.00	380.70	1.072
Bottom Plate	112	355.00	357.20	1.006
Bottom Plate	113	355.00	271.90	0.766
Bottom Plate	114	355.00	196.90	0.555

Equivalent Stress in the Box-Girder Web					
Component	Beam Number	Material Strength [N/mm ²]	Equivalent Stress [N/mm ²] Outside Web	Equivalent Stress [N/mm ²] Inside Web	Load Factor
Box-Girder Web	1	355.00	241.60	244.30	0.688
Box-Girder Web	2	355.00	226.30	220.90	0.637
Box-Girder Web	3	355.00	265.60	263.70	0.748
Box-Girder Web	4	355.00	348.30	348.60	0.982
Box-Girder Web	5	355.00	367.20	372.40	1.049
Box-Girder Web	6	355.00	427.00	438.00	1.234
Box-Girder Web	7	355.00	455.90	471.80	1.329
Box-Girder Web	8	355.00	374.20	387.50	1.092
Box-Girder Web	9	355.00	408.90	425.40	1.198
Box-Girder Web	10	355.00	411.30	422.40	1.190
Box-Girder Web	11	355.00	402.20	425.30	1.198
Box-Girder Web	12	355.00	422.10	447.90	1.262
Box-Girder Web	13	355.00	440.50	459.60	1.295
Box-Girder Web	14	355.00	420.50	443.60	1.250
Box-Girder Web	15	355.00	433.40	458.40	1.291
Box-Girder Web	16	355.00	411.40	447.10	1.259
Box-Girder Web	17	355.00	418.20	455.40	1.283
Box-Girder Web	18	355.00	422.60	461.00	1.299
Box-Girder Web	19	355.00	423.80	463.00	1.304
Box-Girder Web	20	355.00	424.40	464.00	1.307
Box-Girder Web	21	355.00	423.90	464.60	1.309
Box-Girder Web	22	355.00	421.10	462.80	1.304
Box-Girder Web	23	355.00	415.90	458.60	1.292
Box-Girder Web	24	355.00	439.80	475.10	1.338
Box-Girder Web	25	355.00	434.90	471.20	1.327
Box-Girder Web	26	355.00	429.60	466.10	1.313
Box-Girder Web	27	355.00	417.40	454.90	1.281
Box-Girder Web	28	355.00	429.00	474.30	1.336
Box-Girder Web	29	355.00	411.90	457.30	1.288
Box-Girder Web	30	355.00	393.40	438.80	1.236
Box-Girder Web	31	355.00	392.90	425.70	1.199
Box-Girder Web	32	355.00	463.40	505.90	1.425
Box-Girder Web	33	355.00	434.40	476.80	1.343
Box-Girder Web	34	355.00	458.90	501.80	1.414
Box-Girder Web	35	355.00	420.90	463.10	1.305
Box-Girder Web	36	355.00	381.10	422.30	1.190
Box-Girder Web	37	355.00	498.60	419.20	1.405
Box-Girder Web	38	355.00	470.70	393.80	1.326
Box-Girder Web	39	355.00	408.30	353.90	1.150

Box-Girder Web	40	355.00	335.50	312.70	0.945
Box-Girder Web	41	355.00	283.00	303.40	0.855
Box-Girder Web	42	355.00	309.40	335.80	0.946
Box-Girder Web	43	355.00	335.70	354.70	0.999
Box-Girder Web	44	355.00	297.80	318.90	0.898
Box-Girder Web	45	355.00	335.30	352.20	0.992
Box-Girder Web	46	355.00	306.80	323.20	0.910
Box-Girder Web	47	355.00	301.20	315.30	0.888
Box-Girder Web	48	355.00	356.10	350.70	1.003
Box-Girder Web	49	355.00	388.60	373.00	1.095
Box-Girder Web	50	355.00	317.30	312.70	0.894
Box-Girder Web	51	355.00	340.20	347.50	0.979
Box-Girder Web	52	355.00	323.20	332.00	0.935
Box-Girder Web	53	355.00	346.00	356.80	1.005
Box-Girder Web	54	355.00	368.90	381.00	1.073
Box-Girder Web	55	355.00	380.90	393.70	1.109
Box-Girder Web	56	355.00	349.70	356.10	1.003
Box-Girder Web	57	355.00	371.90	378.50	1.066
Box-Girder Web	58	355.00	394.80	401.30	1.130
Box-Girder Web	59	355.00	369.30	377.30	1.063
Box-Girder Web	60	355.00	351.00	358.10	1.009
Box-Girder Web	61	355.00	378.30	396.30	1.116
Box-Girder Web	62	355.00	369.60	383.00	1.079
Box-Girder Web	63	355.00	347.40	359.20	1.012
Box-Girder Web	64	355.00	324.80	334.50	0.942
Box-Girder Web	65	355.00	346.20	343.60	0.975
Box-Girder Web	66	355.00	318.10	314.40	0.896
Box-Girder Web	67	355.00	375.30	373.90	1.057
Box-Girder Web	68	355.00	354.70	351.10	0.999
Box-Girder Web	69	355.00	300.70	316.60	0.892
Box-Girder Web	70	355.00	305.40	324.20	0.913
Box-Girder Web	71	355.00	333.90	353.40	0.995
Box-Girder Web	72	355.00	296.20	320.10	0.902
Box-Girder Web	73	355.00	329.80	355.60	1.002
Box-Girder Web	74	355.00	307.70	336.90	0.949
Box-Girder Web	75	355.00	281.90	304.80	0.859
Box-Girder Web	76	355.00	335.00	307.60	0.944
Box-Girder Web	77	355.00	409.00	347.60	1.152
Box-Girder Web	78	355.00	473.30	387.20	1.333
Box-Girder Web	79	355.00	496.20	468.30	1.398
Box-Girder Web	80	355.00	379.70	417.60	1.176
Box-Girder Web	81	355.00	419.80	459.10	1.293
Box-Girder Web	82	355.00	458.00	498.20	1.403
Box-Girder Web	83	355.00	433.20	472.80	1.332
Box-Girder Web	84	355.00	462.80	502.50	1.415
Box-Girder Web	85	355.00	476.60	518.20	1.460
Box-Girder Web	86	355.00	391.50	433.90	1.222

Box-Girder Web	87	355.00	410.80	453.40	1.277
Box-Girder Web	88	355.00	428.00	470.80	1.326
Box-Girder Web	89	355.00	416.60	451.50	1.272
Box-Girder Web	90	355.00	428.90	463.40	1.305
Box-Girder Web	91	355.00	434.50	468.80	1.321
Box-Girder Web	92	355.00	439.20	472.90	1.332
Box-Girder Web	93	355.00	415.40	456.80	1.287
Box-Girder Web	94	355.00	421.00	461.50	1.300
Box-Girder Web	95	355.00	424.20	463.80	1.306
Box-Girder Web	96	355.00	425.10	463.70	1.306
Box-Girder Web	97	355.00	424.70	463.00	1.304
Box-Girder Web	98	355.00	423.60	461.20	1.299
Box-Girder Web	99	355.00	419.70	456.20	1.285
Box-Girder Web	100	355.00	413.20	448.50	1.263
Box-Girder Web	101	355.00	435.60	460.60	1.297
Box-Girder Web	102	355.00	423.20	446.90	1.259
Box-Girder Web	103	355.00	433.70	462.00	1.301
Box-Girder Web	104	355.00	424.70	451.50	1.272
Box-Girder Web	105	355.00	405.50	430.00	1.211
Box-Girder Web	106	355.00	414.60	428.30	1.206
Box-Girder Web	107	355.00	412.50	431.60	1.216
Box-Girder Web	108	355.00	378.50	393.80	1.109
Box-Girder Web	109	355.00	361.40	375.60	1.058
Box-Girder Web	110	355.00	428.50	441.90	1.245
Box-Girder Web	111	355.00	370.50	379.50	1.069
Box-Girder Web	112	355.00	350.30	356.00	1.003
Box-Girder Web	113	355.00	268.60	270.60	0.762
Box-Girder Web	114	355.00	226.50	230.10	0.648

Appendix H Excel Sheet Net Section and Load Combinations for Box Girder Web

Net Cross-Section Box Web Combination MaxMy Equivalent Net Stress Top & Bottom																											Combination MaxMy for Max Shear														
Beam Number	#h [mm]	Agross [mm²]	Number Rivets	Anet [mm²]	Anet/Agross	Fy/(0,9* Fu)	Aeff for Shear	Factor Shear	Stress Top [N/mm²]	Stress Bottom [N/mm²]	Shear Stress Top [N/mm²]	Shear Stress Bottom [N/mm²]	Shear Net Top [N/mm²]	Shear Net Bottom [N/mm²]	Zgross [mm]	Wgross [mm³]	Htension [mm]	Rivets in Tension Area	ΔA Rivets [mm²]	zΔA Rivets [mm]	ΔI Rivets [mm^4]	Znet [mm]	Wnet,top [mm³]	Wnet,bot [mm³]	Factor Top	Factor Bottom	Net Stress Top [N/mm²]	Net Stress Bottom [N/mm²]	Equivalent Net Stress Top	Equivalent Net Stress Bottom	Shear Stress [N/mm²]	Factor Shear	Shear Net [N/mm²]	Longitudinal Stress [N/mm²]	Factor	Tension Net [N/mm²]	Equivalent Net Stress Middle	Max Equivalent Stress Combination MaxMy			
7	2692	26920	32	19560	0.73	0.80	24298	1.108	-200.7	453.0	80.9	61.1	89.6	67.7	1346	12078107	1865	22	5100	1759	871014583	1249	12314774	10665569	0.981	1.132	-196.8	513.0	250.7	526.7	84.1	1.108	93.2	126.2	1.132	142.9	215.5	526.2			
13	2860	28600	34	20780	0.73	0.80	25814	1.108	-277.7	449.5	42.0	36.7	46.5	40.7	1430	13632667	1768	21	4834	1976	1441446981	1319	13687767	11714794	0.996	1.164	-276.6	523.1	288.1	527.8	44.8	1.108	49.6	85.9	1.164	100.0	131.9	527.8			
19	3029	30290	35	22240	0.73	0.80	27628	1.096	-299.3	455.0	16.9	14.1	18.5	15.5	1515	15291402	1827	21	4856	2115	1735858489	1400	15291972	13138256	1.000	1.164	-299.3	529.6	301.0	530.2	17.1	1.096	18.7	77.9	1.164	90.7	96.3	530.2			
25	3200	32000	37	23490	0.73	0.80	29181	1.097	-282.4	461.5	-30.3	-29.4	-33.2	-32.2	1600	17066667	1985	23	5279	2207	1947721864	1480	17134517	14743502	0.996	1.158	-281.3	534.2	287.1	537.1	-33.7	1.097	-37.0	89.5	1.158	103.6	121.8	537.1			
31	3375	33750	38	25010	0.74	0.80	31069	1.086	-222.1	413.1	-48.4	-44.5	-52.6	-48.3	1688	18984375	2195	25	5684	2278	1978881733	1568	19169132	16633811	0.990	1.141	-220.0	471.5	238.1	478.9	-54.0	1.086	-58.6	95.5	1.141	109.0	149.0	478.9			
37	3553	35530	39	26560	0.75	0.80	32994	1.077	-238.7	407.0	-68.2	-48.5	-73.4	-52.2	1777	21039682	2240	25	5654	2433	2438593275	1652	21146440	18381061	0.995	1.145	-237.5	465.9	269.4	474.6	-70.7	1.077	-76.1	128.5	1.145	147.1	197.6	474.6			
43	3722	37220	41	27790	0.75	0.80	34522	1.078	-105.2	185.1	-74.4	-41.2	-80.2	-55.2	1861	2375466724	1731	23242138	20088093	2373	26	6013	2535	2734646724	1731	23242138	20088093	0.994	1.143	-104.5	211.5	173.9	232.1	-78.0	1.078	-84.1	39.9	1.143	45.6	152.6	232.1
49	3910	39100	43	29210	0.75	0.80	36286	1.078	16.9	-45.0	-81.4	-73.9	-87.7	-79.6	1955	25480167	1068	12	2700	534	5454181678	2060	21529272	23983699	1.184	1.062	20.0	-47.8	153.2	146.0	-88.0	1.078	-94.9	-14.0	1.062	-14.9	165.0	165.0			
55	4433	44330	48	33290	0.75	0.80	41355	1.072	82.1	-100.4	-43.4	-44.6	-46.5	-47.8	2217	32752482	1994	22	4966	997	7384592265	2370	27511261	31615274	1.191	1.036	97.7	-104.0	126.7	132.9	-50.2	1.072	-53.8	-9.2	1.036	-9.5	93.7	132.9			
61	4433	44330	48	33290	0.75	0.80	41355	1.072	80.6	-100.1	30.0	32.3	32.2	34.6	2217	32752482	1977	21	4924	989	7423920008	2370	27499444	31589904	1.191	1.037	96.0	-103.8	111.0	119.9	35.6	1.072	38.2	-9.8	1.037	-10.2	66.9	119.9			
67	3910	39100	43	29210	0.75	0.80	36286	1.078	16.4	-42.6	79.5	77.0	85.7	83.0	1955	25480167	1087	12	2749	543	5477682128	2062	21504060	23988150	1.185	1.062	19.4	-45.2	149.6	150.7	87.1	1.078	93.9	-13.9	1.062	-14.8	163.3	163.3			
73	3722	37220	41	27790	0.75	0.80	34522	1.078	-106.7	184.7	71.7	54.9	77.3	59.2	1861	23088807	2359	26	5977	2542	2775438005	1731	23224316	20183565	0.994	1.144	-106.1	211.3	170.8	234.8	76.6	1.078	82.6	39.0	1.144	44.6	149.8	234.8			
79	3553	35530	39	26560	0.75	0.80	32994	1.077	-238.5	461.2	67.7	43.6	72.9	47.0	1777	21039682	2342	26	5912	2382	2167970210	1656	21266398	18556631	0.989	1.134	-236.0	522.9	267.6	529.2	70.2	1.077	75.6	163.8	1.134	185.7	227.3	529.2			
85	3375	33750	38	25010	0.74	0.80	31069	1.086	-226.8	506.8	48.9	41.4	53.1	45.0	1688	18984375	2332	26	6038	2209	1643401709	1574	19311323	16873879	0.983	1.125	-223.0	570.2	241.2	575.5	53.8	1.086	58.4	140.0	1.125	157.5	187.2	575.5			
91	3200	32000	37	23490	0.73	0.80	29181	1.097	-282.8	461.3	30.0	29.0	32.9	31.8	1600	17066667	1984	23	5276	2208	1950823042	1480	17132847	14741385	0.996	1.158	-281.7	534.1	287.4	536.9	33.3	1.097	36.5	89.3	1.158	103.4	121.2	536.9			
97	3029	30290	35	22240	0.73	0.80	27628	1.096	-299.8	454.8	-17.2	-14.4	-18.9	-15.8	1515	15291402	1826	21	4852	2116	1756579242	1400	15290178	13136165	1.000	1.164	-299.8	529.4	301.6	530.1	-17.4	1.096	-19.1	77.5	1.164	90.2	96.1	530.1			
103	2860	28600	34	20780	0.73	0.80	25814	1.108	-280.5	449.9	-47.4	-48.1	-47.0	-41.1	1430	13632667	1762	21	4817	1979	1452707768	1319	13680877	11706280	0.996	1.165	-279.5	523.9	291.1	528.8	-45.3	1.108	-50.2	85.6	1.165	99.7	132.3	528.8			
109	2692	26920	32	19560	0.73	0.80	24298	1.108	-196.7	352.0	-78.3	-66.5	-86.7	-73.7	1346	12078107	1727	21	4722	1829	1099295466	1243	12190937	10463561	0.991	1.154	-194.9	406.3	246.1	425.9	-83.2	1.108	-92.2	77.6	1.154	89.6	183.1	425.9			
Net Cross-Section Box-Girder Web Combination MinMy Equivalent Net Stress Top & Bottom																											Combination MinMy for Max Shear														
Beam Number	#h [mm]	Agross [mm²]	Number Rivets	Anet [mm²]	Anet/Agross	Fy/(0,9* Fu)	Aeff for Shear	Factor Shear	Stress Top [N/mm²]	Stress Bottom [N/mm²]	Shear Stress Top [N/mm²]	Shear Stress Bottom [N/mm²]	Shear Net Top [N/mm²]	Shear Net Bottom [N/mm²]	Zgross [mm]	Wgross [mm³]	Htension [mm]	Rivets in Tension Area	ΔA Rivets [mm²]	zΔA Rivets [mm]	ΔI Rivets [mm^4]	Znet [mm]	Wnet,top [mm³]	Wnet,bot [mm³]	Factor Top	Factor Bottom	Net Stress Top [N/mm²]	Net Stress Bottom [N/mm²]	Equivalent Net Stress Top	Equivalent Net Stress Bottom	Shear Stress [N/mm²]	Factor Shear	Shear Net [N/mm²]	Longitudinal Stress [N/mm²]	Factor	Tension Net [N/mm²]	Equivalent Net Stress Middle	Max Equivalent Stress Combination MinMy			
7	2692	26920	32	19560	0.73	0.80	24298	1.108	-64.0	88.8	14.3	12.8	15.8	14.2	1346	12078107	1564	19	4277	1910	1359473621	1240	12019065	10256579	1.005	1.178	-64.3	104.6	69.9	107.4	16.1	1.108	17.8	12.4	1.178	14.6	34.2	107.4			
13	2860	28600	34	20780	0.73	0.80	25814	1.108	-78.8	77.0	-3.3	-3.0	-3.7	-3.3	1430	13632667	1413	17	3865	2153	2027113579	1317	13267356	11323984	1.028	1.204	-81.0	92.7	81.2	92.9	-2.8	1.108	-3.1	-0.9	1.028	-0.9	5.5	92.9			
19	3029	30290	35	22240	0.73	0.80	27628	1.096	-71.9	59.3	-9.0	-8.7	-9.9	-9.5	1515	15291402	1369	16	3638	2344	2506371276	1401	14739200	12687284	1.037	1.205	-74.6	71.5	76.5	73.4	-10.0	1.096	-11.0	-6.3	1.037	-6.5	20.1	76.5			
25	3200	32000	37	23490	0.73	0.80	29181	1.097	-45.4	26.7	-18.1	-17.6	-19.8	-19.3	1600	17066667	1185	14	3151	2607	3198797135	1490	16180408	14097691	1.055	1.211	-47.9	32.3	58.9	46.5	-20.4	1.097	-22.4	-9.3	1.055	-9.8	40.0	58.9			
31	3375	33750	38	25010	0.74	0.80	31069	1.086	3.5	-27.9	-27.6	-26.4	-30.0	-28.7	1688	18984375	376	4	974	188	2190213756	1732	17231387	18166244	1.102	1.045	3.9	-29.2	52.1	57.6	-31.0	1.086	-33.7	-12.3	1.045	-12.9	59.7	57.6			
37	3553	35530	39	26560	0.75	0.80	32994	1.077	72.4	-215.8	-35.4	-26.3	-38.1	-28.3	1777	21039682	893	10	2253	446	3987331872	1867	17888165	19799119	1.176	1.063	85.2	-229.3	107.8	234.5	-37.1	1.077	-40.0	-110.8	1.063	-117.8	136.6	234.5			
43	3722	37220	41	27790	0.75	0.80	34522	1.078	64.6	-345.4	-50.5	-38.0	-54.4	-41.0	1861	23088807	586	6	1486	293	3651993983	1926	20411453	21893302	1.131	1.055	73.1	-364.3	119.3	371.1	-55.0	1.078	-59.3	-140.5	1.055	-148.2	180.3	371.1			
49	3910	39100	43	29210	0.75	0.80	36286	1.078	169.0	-357.8	-63.1	-53.1	-68.0	-57.2	1955	25480167	1254	14	3173	627	5593966913	2072	21338891	24062049	1.194	1.059	201.8	-378.9	233.6	391.6	-72.1	1.078	-77.7	-94.5	1.059	-100.1	167.7	391.6			
55	4433	44330	48	33290	0.75	0.80	41355	1.072	305.2	-372.0	-66.2	-66.7	-71.0	-71.5	2217	32752482	1998	22	4975	999	7376054304	2370	27513868	31620727	1.190	1.036	363.3	-385.3	383.5	404.7	-77.6	1.072	-83.2	-33.4	1.036	-34.6	148.2	404.7			
61	4433	44330	48	33290	0.75	0.80	41355	1.072	300.6	-374.7	66.7	67.0	71.5	71.8	2217	32752482	1973	21	4914	987	7433111679	2370	27496729	31583913	1.191	1.037	358.1	-388.6	378.9	408.0	77.9	1.072	83.5	-38.2	1.037	-39.6	150.0	408.0			
67	3910	39100	43	29210	0.75	0.80	36286	1.078	168.0	-358.7	63.2	53.2	68.1	57.3	1955	25480167	1247	14	3155	624	5592060934	2072	21344090	24057649	1.194	1.059	200.6	-379.9	232.7	392.7	72.3	1.078	77.9	-95.4	1.059	-101.0	168.6	392.7			
73	3722	37220	41	27790	0.75	0.80	34522	1.078	63.4	-346.4	50.6	38.0	54.6	41.0	1861	23088807	576	6	1459	288	3610219448	1925	20443874	21904228	1.129	1.054	71.6	-365.1	118.6	372.0	55.0	1.078	59.3	-141.5	1.054	-149.1	181.1	372.0			

Net Cross-Section Box-Girder Web Combination MinVz Equivalent Net Stress Top & Bottom																																														
Beam Number	#h [mm]	Agross [mm²]	Number Rivets	Anet [mm²]	Anet/Agross	Fy/(0,9* Fu)	Aeff for Shear	Factor Shear	Stress Top [N/mm²]	Stress Bottom [N/mm²]	Shear Stress Top [N/mm²]	Shear Stress Bottom [N/mm²]	Shear Net Top [N/mm²]	Shear Net Bottom [N/mm²]	Zgross [mm]	Wgross [mm³]	Htension [mm]	Rivets in Tension Area	ΔA Rivets [mm²]	zΔA Rivets [mm]	ΔI Rivets [mm⁴]	Znet [mm]	Wnet,top [mm³]	Wnet,bot [mm³]	Factor Top	Factor Bottom	Net Stress Top [N/mm²]	Net Stress Bottom [N/mm²]	Equivalent Net Stress Top	Equivalent Net Stress Bottom	Combination MinVz for Max Shear			Max Equivalent Stress Combination MinVz	Total Max Equivalent Stress											
7	2692	26920	32	19560	0.73	0.80	24298	1.108	-86.2	155.0	2.3	2.1	2.5	2.3	1346	12078107	1730	21	4730	1827	1094415546	1243	12193857	10467670	0.991	1.154	-85.4	178.8	85.5	178.9	4.0	1.108	4.4	34.4	1.154	39.7	40.4	178.9	526.7							
13	2860	28600	34	20780	0.73	0.80	25814	1.108	-110.3	142.4	-22.9	-21.3	-25.4	-23.6	1430	13632667	1612	19	4407	2054	1716817440	1316	13505858	11516493	1.009	1.184	-111.3	168.6	119.7	173.5	-22.7	1.108	-25.2	16.1	1.184	19.1	47.6	173.5	527.8							
19	3029	30290	35	22240	0.73	0.80	27628	1.096	-146.2	172.7	-23.7	-22.4	-26.0	-24.6	1515	15291402	1640	19	4359	2209	2101638234	1398	15064852	12908776	1.015	1.185	-148.4	204.6	155.1	209.0	-25.3	1.096	-27.7	13.2	1.185	15.6	50.5	209.0	530.2							
25	3200	32000	37	23490	0.73	0.80	29181	1.097	-189.7	286.4	-38.5	-36.5	-42.2	-40.0	1600	17066667	1925	22	5119	2238	2080571554	1479	17060904	14654328	1.000	1.165	-189.8	333.5	203.4	340.7	-42.3	1.097	-46.4	48.4	1.165	56.4	98.2	340.7	537.1							
31	3375	33750	38	25010	0.74	0.80	31069	1.086	-150.6	270.9	-56	-51	-60.8	-55.4	1688	18984375	2169	24	5617	2290	2042044526	1567	19139717	16590682	0.992	1.144	-149.4	310.0	182.8	324.5	-62.0	1.086	-67.3	60.2	1.144	68.9	135.4	324.5	478.9							
37	3553	35530	39	26560	0.75	0.80	32994	1.077	-149.1	161.5	-75.8	-53.6	-81.6	-57.7	1777	21039682	1847	20	4664	2629	3391925666	1648	20626540	17836540	1.020	1.180	-152.1	190.5	207.6	215.1	-78.4	1.077	-84.4	60.1	1.180	70.9	162.5	215.1	474.6							
43	3722	37220	41	27790	0.75	0.80	34522	1.078	-11.4	-133.3	-85.8	-57.7	-92.5	-62.2	1861	23088807	0	0	0	0	0	1861	23088807	23088807	1.000	1.000	-11.4	-133.3	160.6	171.4	-90.8	1.078	-97.9	-71.9	1.000	-71.9	184.2	184.2	371.1							
49	3910	39100	43	29210	0.75	0.80	36286	1.078	144.8	-308.4	-96.9	-83.4	-104.4	-89.9	1955	25480167	1249	14	3160	625	5592647051	2072	21342549	24058928	1.194	1.059	172.9	-326.6	250.2	361.8	-107.2	1.078	-115.6	-81.8	1.059	-86.6	218.1	361.8	391.6							
55	4433	44330	48	33290	0.75	0.80	41355	1.072	274.9	-336.2	-83.5	-83.8	-89.5	-89.8	2217	32752482	1994	22	4966	997	7384784927	2370	27511202	31615151	1.191	1.036	327.3	-348.3	362.1	381.5	-96.7	1.072	-103.7	-30.7	1.036	-31.8	182.3	381.5	404.7							
61	4433	44330	48	33290	0.75	0.80	41355	1.072	134.4	-143.5	29.3	31	31.4	33.2	2217	32752482	2144	23	5339	1072	6994263265	2373	27642345	31848983	1.185	1.028	159.2	-147.6	168.3	158.4	34.5	1.072	37.0	-13.7	1.028	-14.1	65.6	168.3	408.0							
67	3910	39100	43	29210	0.75	0.80	36286	1.078	16.5	-61.1	29.6	26.8	31.9	28.9	1955	25480167	831	9	2103	416	4982772008	2042	21949126	24005785	1.161	1.061	19.2	-64.9	58.5	81.9	34.1	1.078	36.8	-22.8	1.061	-24.2	68.1	81.9	392.7							
73	3722	37220	41	27790	0.75	0.80	34522	1.078	-60.4	53.9	21.8	18.6	23.5	20.1	1861	23088807	1755	19	4447	2844	4300593461	1728	22382776	19387774	1.032	1.191	-62.3	64.2	74.4	73.0	25.3	1.078	27.3	-7.2	1.032	-7.4	47.8	74.4	372.0							
79	3553	35530	39	26560	0.75	0.80	32994	1.077	-127.1	195.2	17	10.7	18.3	11.5	1777	21039682	2152	24	5433	2477	2666323649	1650	21036190	18240411	1.000	1.153	-127.1	225.2	131.0	226.0	18.6	1.077	20.0	72.7	1.153	83.8	90.7	226.0	529.2							
85	3375	33750	38	25010	0.74	0.80	31069	1.086	-104.2	223.9	6.4	6.7	7.0	7.3	1688	18984375	2303	26	5964	2223	1713049198	1572	19283832	16822433	0.984	1.129	-102.6	252.7	103.3	253.0	9.1	1.086	9.9	59.9	1.129	67.6	69.8	253.0	575.5							
91	3200	32000	37	23490	0.73	0.80	29181	1.097	-202.8	325.1	-2.6	-1	-2.9	-1.1	1600	17066667	1971	23	5241	2215	1980010121	1480	17117011	14721540	0.997	1.159	-202.2	376.9	202.3	376.9	-1.1	1.097	-1.2	61.1	1.159	70.8	70.8	376.9	536.9							
97	3029	30290	35	22240	0.73	0.80	27628	1.096	-254.1	392.1	-26	-23.5	-28.5	-25.8	1515	15291402	1838	21	4885	2110	1732366381	1400	15304617	13153136	0.999	1.163	-253.9	455.8	258.6	458.0	-26.5	1.096	-29.0	69.0	1.163	80.2	94.7	458.0	530.1							
103	2860	28600	34	20780	0.73	0.80	25814	1.108	-280.5	449.9	-42.4	-37.1	-47.0	-41.1	1430	13632667	1762	21	4817	1979	1452707768	1319	13680877	11706280	0.996	1.165	-279.5	523.9	291.7	528.8	-45.3	1.108	-50.2	85.6	1.165	99.7	132.3	528.8	528.8							
109	2692	26920	32	19560	0.73	0.80	24298	1.108	-196.7	352.0	-78.3	-66.5	-86.7	-73.7	1346	12078107	1727	21	4722	1829	1099295466	1243	12190937	10463561	0.991	1.154	-194.9	406.3	246.1	425.9	-83.2	1.108	-92.2	77.6	1.154	89.6	183.1	425.9	425.9							
Net Cross-Section Box-Girder Web Combination MaxMz Equivalent Net Stress Top & Bottom																																														
Beam Number	#h [mm]	Agross [mm²]	Number Rivets	Anet [mm²]	Anet/Agross	Fy/(0,9* Fu)	Aeff for Shear	Factor Shear	Stress Top [N/mm²]	Stress Bottom [N/mm²]	Shear Stress Top [N/mm²]	Shear Stress Bottom [N/mm²]	Shear Net Top [N/mm²]	Shear Net Bottom [N/mm²]	Zgross [mm]	Wgross [mm³]	Htension [mm]	Rivets in Tension Area	ΔA Rivets [mm²]	zΔA Rivets [mm]	ΔI Rivets [mm⁴]	Znet [mm]	Wnet,top [mm³]	Wnet,bot [mm³]	Factor Top	Factor Bottom	Net Stress Top [N/mm²]	Net Stress Bottom [N/mm²]	Equivalent Net Stress Top	Equivalent Net Stress Bottom	Combination MaxMz for Max Shear			Max Equivalent Stress Combination MaxMz												
7	2692	26920	32	19560	0.73	0.80	24298	1.108	-134.6	298.9	26.7	15.6	29.6	17.3	1346	12078107	1856	22	5075	1764	886373296	1249	12307304	10651308	0.981	1.134	-132.1	338.9	141.7	340.3	28.9	1.108	32.0	82.2	1.134	93.2	108.5	340.3								
13	2860	28600	34	20780	0.73	0.80	25814	1.108	-170.2	266.6	-30.3	-31.1	-33.6	-34.5	1430	13632667	1746	21	4773	1987	1481870305	1318	13662820	11684390	0.998	1.167	-169.8	311.1	179.5	316.7	-29.5	1.108	-32.7	48.2	1.167	56.2	79.8	316.7								
19	3029	30290	35	22240	0.73	0.80	27628	1.096	-127.4	162.7	-6.2	-6.7	-7.3	-7.5	1515	15291402	1699	20	4515	2180	1997182069	1398	15137080	12974649	1.010	1.179	-128.7	191.8	129.2	192.2	-															

Appendix I Excel Sheets for Buckling Verification

	Buckling Verification Stage 1 for Local Buckling of the Subpanels according to DIN FB-103 III-10 Check (10.1) with the Method of Reduced Stresses for the Inner Box-Girder Web Downstream																														
	Geometry Buckling Fields				Stresses and Factors						Check Boundary Condition				Buckling Values					α-Factors				Reduction Factors for Plate			Column like Behaviour				Check
	a [mm]	b [mm]	t [mm]	f _y Steel	σ _{x1,Ed}	σ _{x2,Ed}	τ _{Ed}	Ψ _x	σ _{v,Ed}	ε	λ'-W ([S2] S.215)	limit c/t (for QKL 3 [S2] S.45)	actual c/t	Limit met?	σ _E (S.236)	k _σ ([S2] S.207)	σ _{cr,p} (S.236)	k _τ ([S2] S.241)	τ _{cr} (S.215)	α _{ult} (S.234)	α _{cr,x} (S.235)	α _{cr,τ} (S.235)	α _{cr} (S.235)	λ' _p (S.234)	ρ _x (S.205)	χ _w ([S2] S.214)	σ _{cr,c} (S.210)	ξ (S.212)	ξ _{actual}	ρ _{c,x} (S.212)	Load Factor (S.233)
Section 1 Beam 5	2560	662	10	355	186.10	39.03	78.6	0.210	230.58	0.81	0.942	46.228	66.2	no	43.35	6.509	282.21	5.607	243.11	1.540	1.516	3.093	1.313	1.083	0.773	0.768	2.896	96.44	1	0.773	0.926
	2560	1112	10	355	39.03	-208.01	81.8	-5.329	146.96	0.81	1.582	737.094	111.2	yes																	
	2560	956	10	355	-208.01	-420.40	-																								
Section 2 Beam 11	2560	625	10	355	270.30	117.27	42.2	0.434	280.01	0.81	0.889	42.023	62.5	no	48.64	5.526	268.79	5.578	271.33	1.268	0.994	6.430	0.976	1.139	0.732	0.728	2.896	91.81	1	0.732	1.185
	2560	1150	10	355	117.27	-164.30	45.1	-1.401	140.91	0.81	1.636	143.363	115	yes																	
	2560	1115	10	355	-164.30	-437.30	-																								
Section 3 Beam 17	2560	625	10	355	297.50	144.47	17.4	0.486	299.02	0.81	0.889	41.158	62.5	no	48.64	5.340	259.73	5.578	271.33	1.187	0.873	15.594	0.871	1.168	0.716	0.734	2.896	88.68	1	0.716	1.294
	2560	1149	10	355	144.47	-136.86	17.9	-0.947	147.76	0.81	1.635	95.617	114.9	no	14.39	22.545	324.47	6.146	88.45	2.403	2.246	4.941	2.042	1.085	0.826	0.768	2.896	111.04	1	0.826	0.556
	2560	1283	10	355	-136.86	-451.00	-																								
Section 4 Beam 20	2559	625	10	355	299.30	148.26	12.4	0.495	300.07	0.81	0.889	41.000	62.5	no	48.64	5.306	258.09	5.579	271.34	1.183	0.862	21.883	0.861	1.172	0.713	0.732	2.898	88.05	1	0.713	1.303
	2559	1153	10	355	148.26	-130.38	13.4	-0.879	150.07	0.81	1.640	89.974	115.3	no	14.29	20.905	298.77	6.152	87.93	2.366	2.015	6.562	1.924	1.109	0.807	0.757	2.898	102.08	1	0.807	0.577
	2559	1347	10	355	-130.38	-455.90	-																								
Section 5 Beam 26	2560	625	10	355	277.70	138.50	30.8	0.499	282.78	0.81	0.889	40.945	62.5	no	48.64	5.295	257.53	5.578	271.33	1.255	0.927	8.810	0.919	1.169	0.715	0.733	2.896	87.92	1	0.715	1.225
	2560	1153	10	355	138.50	-118.30	34.4	-0.854	150.77	0.81	1.640	88.042	115.3	no	14.29	20.318	290.38	6.151	87.92	2.355	2.097	2.556	1.610	1.209	0.746	0.718	2.896	99.27	1	0.746	0.630
	2560	1518	10	355	-118.30	-456.40																									
Section 6 Beam 32	2560	625	10	355	218.10	89.94	47.4	0.412	233.04	0.81	0.889	42.392	62.5	no	48.64	5.607	272.74	5.578	271.33	1.523	1.251	5.724	1.207	1.123	0.741	0.751	2.896	93.17	1	0.741	0.972
	2560	1151	10	355	89.94	-146.09	52.3	-1.624	127.65	0.81	1.637	168.717	115.1	yes																	
	2560	1701	10	355	-146.09	-494.40	-																								
Section 7 Beam 41	2560	908	10	355	38.33	-53.80	52.1	-1.404	98.04	0.81	1.292	143.647	90.8	yes																	
	2560	689	10	355	108.24	38.33	52.1	0.354	140.92	0.81	0.980	43.428	68.9	no	40.02	5.840	233.74	5.630	225.32	2.519	2.159	4.325	1.850	1.167	0.721	0.734	2.896	79.71	1	0.721	0.601
	2560	612	10	355	170.34	108.24	52.1	0.635	192.77	0.81	0.871	38.845	61.2	no	50.73	4.865	246.80	5.569	282.49	1.842	1.449	5.422	1.370	1.159	0.714	0.737	2.896	84.22	1	0.714	0.831
	2560	512	10	355	222.29	170.34	52.1	0.766	239.91	0.81	0.728	37.028	51.2	no	72.48	4.515	327.22	5.500	398.64	1.480	1.472	7.651	1.426	1.019	0.782	0.815	2.896	111.99	1	0.782	0.945
	2560	484	10	355	271.40	222.29	52.1	0.819	286.01	0.81	0.689	36.342	48.4	no	81.11	4.387	355.84	5.483	444.71	1.241	1.311	8.536	1.284	0.983	0.800	0.844	2.896	121.87	1	0.800	1.102
	2560	549	10	355	327.10	271.40	37.4	0.830	333.45	0.81	0.781	36.206	54.9	no	63.04	4.362	275.00	5.524	348.22	1.065	0.841	9.311	0.834	1.130	0.720	0.749	2.896	93.95	1	0.720	1.433
Section 8 Beam 45	2560	1049	10	355	17.39	-117.60	59.6	-6.763	104.68	0.81	1.492	1018.280	104.9	yes																	
	2560	646	10	355	100.52	17.39	59.6	0.173	144.09	0.81	0.919	46.998	64.6	no	45.53	6.705	305.26	5.595	254.72	2.464	3.037	4.274	2.344	1.025	0.809	0.810	2.896	104.40	1	0.809	0.552
	2560	563	10	355	172.97	100.52	59.6	0.581	201.43	0.81	0.801	39.653	56.3	no	59.94	5.027	301.34	5.533	331.69	1.762	1.742	5.565	1.619	1.043	0.777	0.795	2.896	103.05	1	0.777	0.798
	2560	564	10	355	245.55	172.97	59.6	0.704	266.37	0.81	0.802	37.865	56.4	no	59.73	4.674	279.17	5.534	330.56	1.333	1.137	5.546	1.098	1.102	0.740	0.760	2.896	95.40	1	0.740	1.111
	2560	565	10	355	318.26	245.55	59.6	0.772	334.58	0.81	0.804	36.958	56.5	no	59.52	4.502	267.94	5.535	329.43	1.061	0.842	5.527	0.825	1.134	0.721	0.747	2.896	91.52	1	0.721	1.434
	2560	465	10	355	378.10	318.26	43.2	0.842	385.43	0.81	0.661	36.055	46.5	no	87.87	4.335	380.89	5.472	480.83	0.921	1.007	11.130	1.000	0.960	0.813	0.865	2.896	130.52	1	0.813	1.467
Section 9 Beam 53	2560	1095	10	355	-125.58	-286.																									

Section 11 Beam 62	2560	1095	10	355	-104.33	-258.30	-																									
	2560	599	10	355	-20.11	-104.33	-																									
	2560	1004	10	355	121.06	-20.11	80.0	-0.166	184.00	0.81	1.428	55.548	100.4	no	18.85	9.125	171.99	5.955	112.25	1.929	1.421	1.403	0.951	1.424	0.625	0.645	2.896	58.39	1	0.625	0.896	
	2560	690	10	355	218.08	121.06	80.0	0.555	258.38	0.81	0.982	40.052	69	no	39.91	5.109	203.87	5.631	224.70	1.374	0.935	2.809	0.862	1.263	0.669	0.698	2.896	69.40	1	0.669	1.182	
	2560	565	10	355	297.52	218.08	80.0	0.733	328.20	0.81	0.804	37.474	56.5	no	59.52	4.599	273.73	5.535	329.43	1.082	0.920	4.118	0.883	1.107	0.736	0.758	2.896	93.52	1	0.736	1.375	
	2560	455	10	355	361.50	297.52	65.9	0.823	379.09	0.81	0.647	36.291	45.5	no	91.78	4.378	401.79	5.466	501.68	0.936	1.111	7.613	1.090	0.927	0.834	0.896	2.896	137.73	1	0.834	1.400	
Section 12 Beam 68	2560	1095	10	355	-16.94	-153.20	68.6																									
	2560	599	10	355	57.60	-16.94	68.6	-0.294	132.04	0.81	0.852	59.642	59.9	no	52.95	10.506	556.32	5.559	294.37	2.688	9.658	4.291	3.753	0.846	0.974	0.981	2.896	191.09	1	0.974	0.418	
	2560	606	10	355	133.01	57.60	68.6	0.433	178.35	0.81	0.862	42.037	60.6	no	51.74	5.529	286.07	5.564	287.88	1.990	2.151	4.196	1.823	1.045	0.784	0.794	2.896	97.78	1	0.784	0.701	
	2560	606	10	355	208.43	133.01	68.6	0.638	239.92	0.81	0.862	38.806	60.6	no	51.74	4.857	251.31	5.564	287.88	1.480	1.206	4.196	1.131	1.144	0.721	0.743	2.896	85.77	1	0.721	1.023	
	2560	565	10	355	278.73	208.43	68.6	0.748	303.00	0.81	0.804	37.274	56.5	no	59.52	4.561	271.48	5.535	329.43	1.172	0.974	4.802	0.941	1.116	0.731	0.754	2.896	92.74	1	0.731	1.279	
	2560	465	10	355	336.60	278.73	50.5	0.828	347.78	0.81	0.661	36.227	46.5	no	87.87	4.366	383.66	5.472	480.83	1.021	1.140	9.521	1.125	0.952	0.818	0.871	2.896	131.47	1	0.818	1.313	
Section 13 Beam 74	2560	908	10	355	40.72	-52.90	51.6	-1.299	98.21	0.81	1.292	132.189	90.8	yes																		
	2560	689	10	355	110.25	40.72	51.6	0.369	141.93	0.81	0.980	43.153	68.9	no	40.02	5.777	231.23	5.630	225.32	2.501	2.097	4.367	1.813	1.175	0.717	0.731	2.896	78.84	1	0.717	0.609	
	2560	612	10	355	172.00	110.25	51.6	0.641	193.83	0.81	0.871	38.764	61.2	no	50.73	4.849	245.99	5.569	282.49	1.831	1.430	5.475	1.355	1.162	0.712	0.736	2.896	83.94	1	0.712	0.838	
	2560	512	10	355	223.66	172.00	51.6	0.769	240.86	0.81	0.728	36.991	51.2	no	72.48	4.508	326.73	5.500	398.64	1.474	1.461	7.726	1.417	1.020	0.781	0.814	2.896	111.82	1	0.781	0.950	
	2560	484	10	355	272.50	223.66	51.6	0.821	286.78	0.81	0.689	36.320	48.4	no	81.11	4.383	355.51	5.483	444.71	1.238	1.305	8.618	1.278	0.984	0.799	0.843	2.896	121.75	1	0.799	1.106	
	2560	549	10	355	327.90	272.50	36.9	0.831	334.07	0.81	0.781	36.190	54.9	no	63.04	4.359	274.80	5.524	348.22	1.063	0.838	9.437	0.832	1.130	0.720	0.749	2.896	93.89	1	0.720	1.436	
Section 14 Beam 83	2560	625	10	355	217.60	90.08	46.8	0.414	232.21	0.81	0.889	42.365	62.5	no	48.64	5.601	272.44	5.578	271.33	1.529	1.252	5.798	1.210	1.124	0.741	0.751	2.896	93.07	1	0.741	0.970	
	2560	1151	10	355	90.08	-144.75	51.7	-1.607	127.02	0.81	1.637	166.699	115.1	yes																		
	2560	1701	10	355	-144.75	-491.80	-																									
Section 15 Beam 89	2560	625	10	355	277.10	138.48	30.2	0.500	281.99	0.81	0.889	40.929	62.5	no	48.64	5.291	257.36	5.578	271.33	1.259	0.929	8.985	0.921	1.169	0.714	0.733	2.896	87.86	1	0.714	1.222	
	2560	1153	10	355	138.48	-117.23	33.8	-0.847	150.35	0.81	1.640	87.477	115.3	no	14.29	20.144	287.89	6.151	87.92	2.361	2.079	2.601	1.613	1.210	0.746	0.717	2.896	98.41	1	0.746	0.629	
	2560	1518	10	355	-117.23	-453.90	-																									
Section 16 Beam 95	2559	625	10	355	298.60	148.18	11.6	0.496	299.28	0.81	0.889	40.985	62.5	no	48.64	5.303	257.95	5.579	271.34	1.186	0.864	23.392	0.863	1.172	0.713	0.732	2.898	88.00	1	0.713	1.300	
	2559	1153	10	355	148.18	-129.31	12.7	-0.873	149.80	0.81	1.640	89.450	115.3	no	14.29	20.747	296.51	6.152	87.93	2.370	2.001	6.923	1.920	1.111	0.805	0.756	2.898	101.30	1	0.805	0.577	
	2559	1347	10	355	-129.31	-453.50	-																									
Section 17 Beam 98	2560	625	10	355	299.30	145.51	17.6	0.486	300.85	0.81	0.889	41.149	62.5	no	48.64	5.338	259.64	5.578	271.33	1.180	0.867	15.417	0.865	1.168	0.716	0.733	2.896	88.65	1	0.716	1.302	
	2560	1149	10	355	145.51	-137.21	18.0	-0.943	148.81	0.81	1.635	95.233	114.9	no	14.39	22.437	322.91	6.146	88.45	2.386	2.219	4.914	2.020	1.087	0.824	0.767	2.896	110.50	1	0.824	0.561	
	2560	1283	10	355	-137.21	-452.90	-																									
Section 18 Beam 104	2560	625	10	355	272.30	118.39	42.5	0.435	282.07	0.81	0.889	42.007	62.5	no	48.64	5.523	268.62	5.578	271.33	1.259	0.987	6.384	0.969	1.140	0.732	0.745	2.896	91.75	1	0.732	1.193	
	2560	1150	10	355	118.39	-164.82	45.5	-1.392	142.22	0.81	1.636	142.381	115	yes																		
	2560	1115	10	355	-164.82	-439.40	-																									
Section 19 Beam 104	2560	662	10	355	188.00	39.81	79.8	0.212	233.34	0.81	0.942	46.186	66.2	no	43.35	6.499	281.76	5.607	243.11	1.521	1.499	3.047	1.296	1.083	0.773	0.768	2.896	96.29	1	0.773	0.938	
	2560	1112	10	355	39.81	-209.10	82.8	-5.252	148.84	0.81	1.582	722.841	111.2	yes																		
	2560	956	10	355	-209.10	-423.10	-																									

Buckling Verification Stage 1 for Global Buckling according to DIN FB-103 III-10 Check (10.1) with the Method of Reduced Stresses for the Bottom Plate																																	
Geometry Buckling Fields								Values for Stiffeners				Stresses and Factors			Check Boundary Condition			α-Factors			Reduction Factors for Plate Slenderness			Column like Behaviour								Check	
Beam Number	a [mm]	b [mm]	t [mm]	f _y Steel	I- Stiff ener	L- Stiff ener	b _{eff} [mm]	A _{st} [mm²]	y _c [mm]	I _{y,sl} [mm^4]	σ _{cr,st} (S.210)	σ _{x1,Ed}	ψ _x	ε	limit c/t (for QKL 3 [S2] S.45)	actual c/t	Limit met?	σ _{cr,p} (S.236)	α _{ult} (S.234)	α _{cr} (S.235)	λ' _p (S.234)	ρ _x (S.205)	χ _w ([S2] S.214)	ξ (S.212)	ξ _{actual}	i [mm]	e [mm]	α _e	φ	χ _c	ρ _{c,x} (S.212)	Load Factor (S.233)	Type of Failure
28	5120	3000	24	355	1	0	500	14000	28.00	28746667	162.335	22.10	1.0	0.81	34.172	125.0	no	868.93	16.063	24.756	0.806	0.902	1.000	4.353	1.00	45.31	96.00	0.68	1.03	0.60	0.902	0.076	Platebuckling
29	5120	3000	24	355	1	0	500	14000	28.00	28746667	162.335	35.10	1.0	0.81	34.172	125.0	no	868.93	10.114	24.756	0.639	1.000	1.000	4.353	1.00	45.31	96.00	0.68	0.85	0.70	1.000	0.109	Platebuckling
32	5120	3000	17.33	355	1	0	433	9504	31.53	25500838	212.132	77.40	1.0	0.81	34.172	173.1	no	865.95	4.587	9.039	0.712	0.970	1.000	3.082	1.00	51.80	85.80	0.64	0.92	0.67	0.970	0.247	Platebuckling
33	5120	3000	17.33	355	1	0	433	9504	31.53	25500838	212.132	95.80	1.0	0.81	34.172	173.1	no	865.95	3.706	9.039	0.640	1.000	1.000	3.082	1.00	51.80	85.80	0.64	0.85	0.72	1.000	0.297	Platebuckling
34	5120	3000	14	355	1	0	352	6924	37.91	23031059	262.97	130.20	1.0	0.81	34.172	214.3	no	703.59	2.727	4.611	0.769	0.928	1.000	1.676	1.00	57.67	76.09	0.61	0.97	0.64	0.928	0.435	Platebuckling
35	5120	3000	14	355	1	0	352	6924	37.91	23031059	262.97	152.60	1.0	0.81	34.172	214.3	no	703.59	2.326	4.611	0.710	0.972	1.000	1.676	1.00	57.67	76.09	0.61	0.91	0.68	0.972	0.487	Platebuckling
38	2560	3000	10	355	1	0	254	4541	51.25	19026001	1325.02	248.00	1.0	0.81	34.172	300.0	no	419.76	1.431	1.693	0.920	0.827	0.903	-0.683	0.00	64.73	58.75	0.57	1.13	0.56	0.561	1.370	Buckling
39	2560	3000	10	355	1	0	254	4541	51.25	19026001	1325.02	270.40	1.0	0.81	34.172	300.0	no	419.76	1.313	1.552	0.920	0.827	0.903	-0.683	0.00	64.73	58.75	0.57	1.13	0.56	0.561	1.494	Buckling
40	2560	3000	10	355	1	0	254	4541	51.25	19026001	1325.02	298.10	1.0	0.81	34.172	300.0	no	419.76	1.191	1.408	0.920	0.827	0.903	-0.683	0.00	64.73	58.75	0.57	1.13	0.56	0.561	1.647	Buckling
41	2560	3000	10	355	1	0	254	4541	51.25	19026001	1325.02	330.70	1.0	0.81	34.172	300.0	no	419.76	1.073	1.269	0.920	0.827	0.903	-0.683	0.00	64.73	58.75	0.57	1.13	0.56	0.561	1.827	Buckling
44	2560	3000	14	355	1	0	352	6924	37.91	23031059	1051.88	346.00	1.0	0.81	34.172	214.3	no	716.42	1.026	2.071	0.704	0.977	1.000	-0.319	0.00	57.67	76.09	0.61	0.90	0.68	0.683	1.569	Buckling
45	2560	3000	14	355	1	0	352	6924	37.91	23031059	1051.88	382.90	1.0	0.81	34.172	214.3	no	716.42	0.927	1.871	0.704	0.977	1.000	-0.319	0.00	57.67	76.09	0.61	0.90	0.68	0.683	1.737	Buckling
46	2560	3000	18	355	0	1	449	10988	45.55	53429729	1537.67	344.30	1.0	0.81	34.172	166.7	no	1152.54	1.031	3.348	0.555	1.000	1.000	-0.250	0.00	69.73	101.93	0.62	0.76	0.78	0.775	1.376	Buckling
47	2560	3000	22	355	0	1	500	13900	40.31	58009824	1319.78	340.60	1.0	0.81	34.172	136.4	no	1674.38	1.042	4.916	0.460	1.000	1.000	0.269	0.27	64.60	111.17	0.64	0.69	0.83	0.909	1.160	Hybrid Failure
50	2560	3000	32	355	0	1	500	18900	38.32	65600461	1097.64	329.10	1.0	0.81	34.172	93.8	no	3452.70	1.079	10.491	0.321	0.979	1.000	2.146	1.00	58.91	123.16	0.68	0.59	0.92	0.979	1.042	Platebuckling
51	2560	3000	32	355	0	1	500	18900	38.32	65600461	1097.64	363.90	1.0	0.81	34.172	93.8	no	3452.70	0.976	9.488	0.321	0.979	1.000	2.146	1.00	58.91	123.16	0.68	0.59	0.92	0.979	1.152	Platebuckling
52	2560	3000	40	355	0	1	500	22900	38.93	71535033	987.863	340.50	1.0	0.81	34.172	75.0	no	4514.88	1.043	13.260	0.280	0.768	1.000	3.570	1.00	55.89	130.55	0.70	0.57	0.94	0.768	1.373	Platebuckling
53	2560	3000	40	355	0	1	500	22900	38.93	71535033	987.863	367.20	1.0	0.81	34.172	75.0	no	4514.88	0.967	12.295	0.280	0.768	1.000	3.570	1.00	55.89	130.55	0.70	0.57	0.94	0.768	1.481	Platebuckling
56	2560	3000	48	355	0	1	500	26900	40.55	77832043	914.997	365.00	1.0	0.81	34.172	62.5	no	4417.17	0.973	12.102	0.283	0.790	1.000	3.828	1.00	53.79	136.93	0.72	0.57	0.94	0.790	1.432	Platebuckling
57	2560	3000	48	355	0	1	500	26900	40.55	77832043	914.997	388.10	1.0	0.81	34.172	62.5	no	4417.17	0.915	11.382	0.283	0.790	1.000	3.828	1.00	53.79	136.93	0.72	0.57	0.94	0.790	1.522	Platebuckling
58	2560	3000	48	355	0	1	500	26900	40.55	77832043	914.997	388.20	1.0	0.81	34.172	62.5	no	4417.17	0.914	11.379	0.283	0.790	1.000	3.828	1.00	53.79	136.93	0.72	0.57	0.94	0.790	1.523	Platebuckling
59	2560	3000	48	355	0	1	500	26900	40.55	77832043	914.997	365.10	1.0	0.81	34.172	62.5	no	4417.17	0.972	12.099	0.283	0.790	1.000	3.828	1.00	53.79	136.93	0.72	0.57	0.94	0.790	1.432	Platebuckling
62	2560	3000	40	355	0	1	500	22900	38.93	71535033	987.863	367.70	1.0	0.81	34.172	75.0	no	4514.88	0.965	12.279	0.280	0.768	1.000	3.570	1.00	55.89	130.55	0.70	0.57	0.94	0.768	1.483	Platebuckling
63	2560	3000	40	355	0	1	500	22900	38.93	71535033	987.863	340.80	1.0	0.81	34.172	75.0	no	4514.88	1.042	13.248	0.280	0.768	1.000	3.570	1.00	55.89	130.55	0.70	0.57	0.94	0.768	1.375	Platebuckling
64	2560	3000	40	355	0	1	500	22900	38.93	71535033	987.863	312.70	1.0	0.81	34.172	75.0	no	4514.88	1.135	14.438	0.280	0.768	1.000	3.570	1.00	55.89	130.55	0.70	0.57	0.94	0.768	1.261	Platebuckling
65	2560	3000	32	355	0	1	500	18900	38.32	65600461	1097.64	332.80	1.0	0.81	34.172																		

Buckling Verification Stage 1 for Global Buckling according to DIN FB-103 III-10 Check (10.1) with the Method of Reduced Stresses for the Deck Plate																																	
Geometry Buckling Fields					Values Stiffeners					Stresses and Factors			Check Boundary Condition			α-Factors			Reduction Factors for Plate Slenderness			Column like Behaviour										Check	
Beam Number	a [mm]	b [mm]	t [mm]	f _y Steel	#h _{st} [mm]	A _{st} [mm²]	y _c [mm]	I _{y,sl} [mm^4]	σ _{cr,st} (S.210)	σ _{x1,Ed}	Ψ _x	ε	limit c/t (for QKL 3 [S2] S.45)	actual c/t	Limit met?	σ _{cr,p} (S.236)	α _{ult} (S.234)	α _{cr} (S.235)	λ' _p (S.234)	ρ _x (S.205)	χ _w ([S2] S.214)	ξ (S.212)	ξ _{actual}	i [mm]	e [mm]	α _e	φ	χ _c	ρ _{c,x} (S.212)	Load Factor (S.233)	Type of failure		
1	2560	3000	12	355	250	6516	66.31	43447153	2108.6	48.80	1.0	0.81	34.172	250.0	no	8773.85	7.275	179.792	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.151	Platebuckling		
2	2560	3000	12	355	250	6516	66.31	43447153	2108.6	94.80	1.0	0.81	34.172	250.0	no	8774.07	3.745	92.554	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.294	Platebuckling		
3	2560	3000	12	355	250	6516	66.31	43447153	2108.6	136.40	1.0	0.81	34.172	250.0	no	8774.07	2.603	64.326	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.423	Platebuckling		
4	2560	3000	12	355	250	6516	66.31	43447153	2108.6	173.80	1.0	0.81	34.172	250.0	no	8773.75	2.043	50.482	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.539	Platebuckling		
5	2560	3000	12	355	250	6516	66.31	43447153	2108.6	203.80	1.0	0.81	34.172	250.0	no	8773.75	1.742	43.051	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.631	Platebuckling		
8	2560	3000	12	355	300	7116	84.92	70329903	3125.5	246.40	1.0	0.81	34.172	250.0	no	12959.64	1.441	52.596	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.763	Platebuckling		
9	2560	3000	12	355	300	7116	84.92	70329903	3125.5	267.90	1.0	0.81	34.172	250.0	no	12959.64	1.325	48.375	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.830	Platebuckling		
10	2560	3000	12	355	300	7116	84.92	70329903	3125.5	279.00	1.0	0.81	34.172	250.0	no	12959.64	1.272	46.450	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.865	Platebuckling		
11	2560	3000	12	355	300	7116	84.92	70329903	3125.5	298.20	1.0	0.81	34.172	250.0	no	12959.64	1.190	43.460	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.924	Platebuckling		
14	2559	3000	12	355	300	7116	84.92	70329903	3127.9	313.80	1.0	0.81	34.172	250.0	no	12969.80	1.131	41.331	0.165	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.972	Platebuckling		
15	2559	3000	12	355	300	7116	84.92	70329903	3127.9	321.30	1.0	0.81	34.172	250.0	no	12969.80	1.105	40.367	0.165	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.996	Platebuckling		
16	2559	3000	12	355	300	7116	84.92	70329903	3127.9	330.40	1.0	0.81	34.172	250.0	no	12969.80	1.074	39.255	0.165	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.024	Platebuckling		
17	2559	3000	12	355	300	7116	84.92	70329903	3127.9	333.60	1.0	0.81	34.172	250.0	no	12969.80	1.064	38.878	0.165	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.034	Platebuckling		
20	2560	3000	12	355	300	7116	84.92	70329903	3125.5	336.10	1.0	0.81	34.172	250.0	no	12959.64	1.056	38.559	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.041	Platebuckling		
21	2560	3000	12	355	300	7116	84.92	70329903	3125.5	335.30	1.0	0.81	34.172	250.0	no	12959.64	1.059	38.651	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.039	Platebuckling		
22	2560	3000	12	355	300	7116	84.92	70329903	3125.5	332.70	1.0	0.81	34.172	250.0	no	12959.64	1.067	38.953	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.031	Platebuckling		
23	2560	3000	12	355	300	7116	84.92	70329903	3125.5	328.20	1.0	0.81	34.172	250.0	no	12959.64	1.082	39.487	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	1.017	Platebuckling		
26	2560	3000	12	355	300	7116	84.92	70329903	3125.5	310.90	1.0	0.81	34.172	250.0	no	12959.64	1.142	41.684	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.963	Platebuckling		
27	2560	3000	12	355	300	7116	84.92	70329903	3125.5	301.30	1.0	0.81	34.172	250.0	no	12959.64	1.178	43.012	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.934	Platebuckling		
28	2560	3000	12	355	300	7116	84.92	70329903	3125.5	296.30	1.0	0.81	34.172	250.0	no	12959.64	1.198	43.738	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.918	Platebuckling		
29	2560	3000	12	355	300	7116	84.92	70329903	3125.5	283.10	1.0	0.81	34.172	250.0	no	12959.64	1.254	45.778	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.877	Platebuckling		
32	2560	3000	12	355	300	7116	84.92	70329903	3125.5	258.70	1.0	0.81	34.172	250.0	no	12959.64	1.372	50.095	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.802	Platebuckling		
33	2560	3000	12	355	300	7116	84.92	70329903	3125.5	240.70	1.0	0.81	34.172	250.0	no	12959.64	1.475	53.841	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.746	Platebuckling		
34	2560	3000	12	355	300	7116	84.92	70329903	3125.5	224.70	1.0	0.81	34.172	250.0	no	12959.64	1.580	57.675	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.696	Platebuckling		
35	2560	3000	12	355	300	7116	84.92	70329903	3125.5	203.30	1.0	0.81	34.172	250.0	no	12959.64	1.746	63.745	0.166	1.000	1.000	3.146	1.00	99.42	78.92	0.56	0.50	1.00	1.000	0.630	Platebuckling		
38	2560	3000	12	355	250	6516	66.31	43447153	2108.6	233.70	1.0	0.81	34.172	250.0	no	8773.75	1.519	37.543	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.724	Platebuckling		
39	2560	3000	12	355	250	6516	66.31	43447153	2108.6	209.20	1.0	0.81	34.172	250.0	no	8773.75	1.697	41.940	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.648	Platebuckling		
40	2560	3000	12	355	250	6516	66.31	43447153	2108.6	164.70	1.0	0.81	34.172	250.0	no	8773.75	2.155	53.271	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.510	Platebuckling		
41	2560	3000	12	355	250	6516	66.31	43447153	2108.6	142.80	1.0	0.81	34.172	250.0	no	8773.75	2.486	61.442	0.201	1.000	1.000	3.161	1.00	81.66	70.69	0.57	0.52	1.00	1.000	0.442	Platebuckling		
44	2560	3000	12	355	300	7116	84.92	70329903	3125.5	90.40	1.0	0.81	34.172	250.0	no	12959.84	3.927	143.360	0.166	1.000	1.000	3.147	1.00	99.42	78.92	0.56	0.5						

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Appendix J Exemplary output of EBPlate for Beam 58 of the Bottom Plate

Berechnungseinstellungen

Verformungsansatz

☒ Automatisch

Eigenformkomplexität :

1 **2** **3**

☐ Benutzerdefiniert

10 x 11

Anzahl der Eigenformen

1 **20** **N**

Höhenlinien

☐ Berechnen

plattenartiges Verhalten

☐ lokales Beulen unterbinden

Ergebnisse

Bezugsspannung $\sigma_E = 48.59$ MPa

Verzweigungsfaktor $\phi_{cr} = 11.379$

Beulwerte		Beulspannungen	
$k_{\sigma_{xtl}}$	= 90.910	$\sigma_{xtl,cr}$	= 4417.19 MPa
$k_{\sigma_{xbl}}$	= 90.910	$\sigma_{xbl,cr}$	= 4417.19 MPa
$k_{\sigma_{xtr}}$	= 90.910	$\sigma_{xtr,cr}$	= 4417.19 MPa
$k_{\sigma_{xbr}}$	= 90.910	$\sigma_{xbr,cr}$	= 4417.19 MPa
$k_{\sigma_{yut}}$	=	$\sigma_{yut,cr}$	= MPa
$k_{\sigma_{yub}}$	=	$\sigma_{yub,cr}$	= MPa
$k_{\sigma_{ypt}}$	=	$\sigma_{ypt,cr}$	= MPa
$k_{\sigma_{ypb}}$	=	$\sigma_{ypb,cr}$	= MPa
k_{τ}	=	τ_{cr}	= MPa

Appendix K Stresses $\Delta\sigma$ in the Corners of the Lateral Frame with and without Crack

without crack

with crack

Appendix L SOFiSTiK Output of Longitudinal System

Nachrechnung Europabrücke zwischen Kehl und Straßbourg
Masterarbeit an der Hochschule Karlsruhe und der Ryerson University Toronto
in Zusammenarbeit mit der Ingenieurgruppe Bauen

Appendix L EDV-Anhänge Sofistik

Inhalt

1. Materialiel und Querschnitte
 - 1.1 Materialien
 - 1.2 Querschnitte
2. Modellierung Längssystem
3. Belastung
 - 3.1 Überlagerungsvorschriften
 - 3.2 Grundlasten
 - 3.3 Verkehrslasten
 - 3.4 Lasten für Auflagerbedingungen Quersystem
4. Einzelschnittgrößen und Lastgruppen
 - 4.1 Zwischenüberlagerung Verkehr, Setzung und Temperatur
 - 4.2 Berücksichtigung Bauablauf
5. Nachweiskonzept, Design Kombinationen und Spannungen
 - 5.1 Nachweiskonzept
 - 5.2 Schnittgrößen Design Kombinationen
 - 5.3 Spannungen für Querschnittsnachweise
 - 5.4 Lastkombination LM3 zur Ermittlung der Schwingbreiten
 - 5.5 Schwingbreiten
 - 5.6 Ausgangswerte für Berechnung der Lagerbedingungen des Quersystems

1. Materialien und Querschnitte

1.1 Materialien

Nachfolgend werden nur die Eigenschaften der Materialien 1 (S 355),
5 (S 355T) und 30 (S235) dargestellt. Die anderen haben die gleichen
Eigenschaften.

Standardnorm ist DIN Fachbericht 103 Stahlbrücken (2009) (Germany) V 2018
Windzone : 1 cat. B (Binnenland)

Materialien

Mat	Materialbezeichnung
1	S 355 (EN 1993) ST 52 Hohlkasten
2	S 355 (EN 1993) ST 52 Hohlkasten
3	S 355 (EN 1993) ST 52 Aussensteg
4	S 355 (EN 1993) ST 52 Innensteg
5	S 355 T (EN 1993) ST 52 Bodenble
6	S 355 (EN 1993) ST 52 Bodenblech
7	S 355 (EN 1993) ST 52 Fahrbahnbl
8	S 355 (EN 1993) ST 52 Fahrbahnbl
9	S 355 (EN 1993) ST 52 Vertikales
10	S 355 (EN 1993) ST 52 Fußgängerw
11	S 355 (EN 1993) ST 52 Fußgängerw
12	S 355 (EN 1993) ST 52 Endsteife
13	S 355 (EN 1993) ST 52 Querträger
14	S 355 (EN 1993) ST 52 Fahrbahnbl
30	S 235 (EN 1993) St 37
40	S 235 (EN 1993) Lagerstab

Mat 1 S 355 (EN 1993) ST 52 Hohlkasten

Elastizitätsmodul	E	210000	[N/mm ²]	Materialsicherheit	1.10	[-]
Querdehnzahl	μ	0.30	[-]	Fließgrenze	f_y	355.0 [MPa]
Schubmodul	G	80769	[N/mm ²]	Druckfließgrenze	f_{yc}	355.0 [MPa]
Kompressionsmodul	K	175000	[N/mm ²]	Zugfestigkeit	f_t	490.0 [MPa]
Nominelle Wichte	γ	78.5	[kN/m ³]	Druckfestigkeit	f_c	490.0 [MPa]
Rohdichte	ρ	7850.0	[kg/m ³]	Bruchdehnung		100.00 [o/oo]
Ausdehnungskoeffizient	α	1.20E-05	[1/K]	Verbundwert relativ		0.00 [-]
max. Erzeugnisdicke	t-max	40.00	[mm]	Verbundwert k_1 (EN1992) k_1		0.00 [-]
				Verfestigungsmodul	E_h	0.0 [MPa]
				Proportionalitätsgrenzefp		355.0 [MPa]
				Schwingbreite	σ_{-dyn}	0.0 [MPa]

Arbeitslinie Gebrauchszustand	ϵ [o/oo]	σ_m [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	490.0	0
Dehnungsbereichs fortgesetzt	100.000	490.0	0
	1.690	355.0	1373
	0.000	0.0	210000
	-1.690	-355.0	1373
	-100.000	-490.0	0
	-1000.000	-490.0	0
	Materialsicherheit		1.10

Arbeitslinie Bruchzustand	ϵ [o/oo]	σ_u [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	490.0	0
Dehnungsbereichs fortgesetzt	100.000	490.0	0
	1.690	355.0	1373
	0.000	0.0	210000
	-1.690	-355.0	1373
	-100.000	-490.0	0

Arbeitslinie Bruchzustand	ϵ [o/oo]	σ -u [MPa]	E-t [N/mm ²]
	-1000.000	-490.0	0
Materialsicherheit			1.10

S 355 (EN 1993) ST 52 Hohlkasten

Mat 5 S 355 T (EN 1993) ST 52 Bodenble

Elastizitätsmodul	E	210000	[N/mm ²]	Materialsicherheit	1.10	[-]
Querdehnzahl	μ	0.30	[-]	Fließgrenze	f_y	335.0 [MPa]
Schubmodul	G	80769	[N/mm ²]	Druckfließgrenze	f_{yc}	335.0 [MPa]
Kompressionsmodul	K	175000	[N/mm ²]	Zugfestigkeit	f_t	470.0 [MPa]
Nominelle Wichte	γ	78.5	[kN/m ³]	Druckfestigkeit	f_c	470.0 [MPa]
Rohdichte	ρ	7850.0	[kg/m ³]	Bruchdehnung		100.00 [o/oo]
Ausdehnungskoeffizient	α	1.20E-05	[1/K]	Verbundwert relativ		0.00 [-]
max. Erzeugnisdicke	t-max	80.00	[mm]	Verbundwert k1 (EN1992)k1		0.00 [-]
				Verfestigungsmodul	E_h	0.0 [MPa]
				Proportionalitätsgrenzefp		335.0 [MPa]
				Schwingbreite	σ -dyn	0.0 [MPa]

Arbeitslinie Gebrauchszustand	ϵ [o/oo]	σ -m [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	470.0	0
Dehnungsbereichs fortgesetzt	100.000	470.0	0
	1.595	335.0	1372
	0.000	0.0	210000
	-1.595	-335.0	1372
	-100.000	-470.0	0
	-1000.000	-470.0	0
Materialsicherheit			1.10

Arbeitslinie Bruchzustand	ϵ [o/oo]	σ -u [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	470.0	0
Dehnungsbereichs fortgesetzt	100.000	470.0	0
	1.595	335.0	1372
	0.000	0.0	210000
	-1.595	-335.0	1372
	-100.000	-470.0	0
	-1000.000	-470.0	0
Materialsicherheit			1.10

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Elastizitätsmodul	E	210000	[N/mm ²]	Materialsicherheit	1.10	[-]
Querdehnzahl	μ	0.30	[-]	Fließgrenze	f_y	235.0 [MPa]
Schubmodul	G	80769	[N/mm ²]	Druckfließgrenze	f_{yc}	235.0 [MPa]
Kompressionsmodul	K	175000	[N/mm ²]	Zugfestigkeit	f_t	360.0 [MPa]
Nominelle Wichte	γ	78.5	[kN/m ³]	Druckfestigkeit	f_c	360.0 [MPa]
Rohdichte	ρ	7850.0	[kg/m ³]	Bruchdehnung		100.00 [‰]
Ausdehnungskoeffizient	α	1.20E-05	[1/K]	Verbundwert relativ		0.00 [-]
max. Erzeugnisdicke	t-max	40.00	[mm]	Verbundwert k_1 (EN1992) k_1		0.00 [-]
				Verfestigungsmodul	E_h	0.0 [MPa]
				Proportionalitätsgrenzefp		235.0 [MPa]
				Schwingbreite	σ_{dyn}	0.0 [MPa]

Arbeitslinie Gebrauchszustand	ϵ [‰]	σ -m [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	360.0	0
Dehnungsbereichs fortgesetzt	100.000	360.0	0
	1.119	235.0	1264
	0.000	0.0	210000
	-1.119	-235.0	1264
	-100.000	-360.0	0
	-1000.000	-360.0	0
Materialsicherheit			1.10

Arbeitslinie Bruchzustand	ϵ [‰]	σ -u [MPa]	E-t [N/mm ²]
wird außerhalb des definierten	1000.000	360.0	0
Dehnungsbereichs fortgesetzt	100.000	360.0	0
	1.119	235.0	1264
	0.000	0.0	210000
	-1.119	-235.0	1264
	-100.000	-360.0	0
	-1000.000	-360.0	0
Materialsicherheit			1.10

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1.2 Querschnitte

Nachfolgend werden die Querschnitte und ihre Bruttoquerschnittswerte dargestellt. Auf die Darstellung weiterer Querschnittseigenschaften wird verzichtet. Des weiteren wird von der Darstellung der Querschnitte in ihren jeweiligen Bauphasen abgesehen um den Programmausdruck übersichtlich zu halten.

Die Nummerierung der Querschnitte ist wie folgt.

Querschnitt	1-114	Stabanfangsquerschnitte Unterstrom
Querschnitt	201-314	Stabanfangsquerschnitte Oberstrom
Querschnitt	401-514	Stabanfangsquerschnitte Unterstrom
Querschnitt	601-714	Stabanfangsquerschnitte Oberstrom
Querschnitt	801	Äußerer Querschnitt Querträger
Querschnitt	802	Mittlerer Querschnitt Querträger
Querschnitt	1000	Lagerersatzquerschnitt

Standardnorm ist DIN Fachbericht 103 Stahlbrücken (2009) (Germany) V 2018
Windzone : 1 cat. B (Binnenland)

Querschnitt Nr. 1

Querschnitt Nr. 1

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2707.32	1071.58	27190327.8	-152.6	21.5	210000	2125.2	146665240.2
	21946561.5	389.28	146661151.3	566.2	499.5	80769	(BIEGE)	27186233.0
		11678.78	-699325.1					89.66
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 2

Querschnitt Nr. 2

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2713.72	1071.25	27932623.2	-152.3	21.8	210000	2130.3	146810306.0
	22367800.9	395.43	146806634.4	575.6	504.9	80769	(BIEGE)	27928948.6
		11773.86	-660669.7					89.68

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul

Querschnitt Nr. 3

Querschnitt Nr. 3

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2720.52	1070.90	28733942.1	-151.9	22.1	210000	2135.6	146964455.5
	22817401.7	401.97	146961201.1	585.5	510.7	80769	(BIEGE)	28730696.6
		11875.31	-619455.7					89.70

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul

Querschnitt Nr. 4

Querschnitt Nr. 4

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	2727.32	1070.56	29548305.5	-151.5	22.5	210000	2140.9	147118617.0
	23269045.5	408.52	147115767.9	595.5	516.4	80769	(BIEGE)	29545456.4
		11977.19	-578097.6					89.72
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 5

Querschnitt Nr. 5

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2834.12	1089.42	34411904.4	-145.8	27.6	210000	2224.8	147876192.0
	24869197.8	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411406.7
		12316.62	-238384.1					89.88
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 6

Querschnitt Nr. 6

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2840.92	1089.04	35347879.1	-145.4	28.0	210000	2230.1	148030472.7
	25339216.1	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347545.4
		12158.77	-193973.5					89.90
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 7

Querschnitt Nr. 7

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3042.32	1141.58	43026045.2	-135.8	36.0	210000	2388.2	149769307.1
	28134104.8	445.37	149768091.2	822.3	672.4	80769	(BIEGE)	43024832.3
		12421.06	358804.2					-89.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 8

Querschnitt Nr. 8

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3099.72	1140.94	43764913.3	-133.9	34.6	210000	2433.3	150160850.0
	28385254.9	448.11	150159646.0	818.2	676.6	80769	(BIEGE)	43763709.3
		12639.20	357465.9					-89.81

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 9

Querschnitt Nr. 9

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3106.52	1140.41	44909343.4	-133.6	35.0	210000	2438.6	150315428.7
	28888681.7	454.75	150313867.1	830.1	683.1	80769	(BIEGE)	44907778.8
		12760.58	406600.9					-89.78

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 10

Querschnitt Nr. 10

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3183.32	1148.38	48633584.7	-146.9	50.6	210000	2498.9	150744296.0
	29712775.5	461.57	150743008.6	884.5	703.3	80769	(BIEGE)	48632306.2
		12787.24	-361111.8					89.80

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 11

Querschnitt Nr. 11

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3260.12	1157.94	52379674.0	-127.3	42.6	210000	2559.2	151470018.4
	30551746.7	470.74	151462663.1	937.9	725.8	80769	(BIEGE)	52372312.9
		13006.98	854025.3					-89.51

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 12

Querschnitt Nr. 12

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3266.92	1157.40	53690201.4	-127.1	43.0	210000	2564.5	151625157.3
	31066024.5	477.41	151616765.0	950.5	732.4	80769	(BIEGE)	53681803.1
		13133.57	906643.6					-89.47
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 13

Querschnitt Nr. 13

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3269.92	1157.16	54274005.0	-126.9	43.2	210000	2566.9	151693619.2
	31293350.6	480.35	151684750.0	956.1	735.3	80769	(BIEGE)	54265129.9
		13189.48	929881.8					-89.45
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 14

Querschnitt Nr. 14

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3382.92	1165.01	57027149.5	-193.5	63.4	210000	2655.6	157764149.7
	31923547.6	482.88	157742835.0	976.6	741.6	80769	(BIEGE)	57005840.9
		10665.57	1465149.8					-89.17

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

yc[mm], zc[mm] Ordinate des elastischen Zentrums
 ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
 E[N/mm²] Elastizitätsmodul
 g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 15

Querschnitt Nr. 15

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3389.72	1164.46	58423483.7	-193.1	64.0	210000	2660.9	157921923.2
	32444086.9	489.54	157898367.4	989.4	748.2	80769	(BIEGE)	58399928.0
		10771.44	1530874.0					-89.12

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

yc[mm], zc[mm] Ordinate des elastischen Zentrums
 ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
 E[N/mm²] Elastizitätsmodul
 g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 16

Querschnitt Nr. 16

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3466.72	1173.20	62465298.6	-173.6	53.6	21000	2721.4	158767140.9
	33247584.3	498.88	158682561.9	1041.7	769.0	80769	(BIEGE)	62380731.5
		11674.64	2853901.9					-88.30

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 17

Querschnitt Nr. 17

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3473.52	1172.65	63955861.7	-173.3	54.0	21000	2726.7	158928180.7
	33773026.1	505.56	158837605.5	1054.9	775.7	80769	(BIEGE)	63865274.6
		11790.90	2933087.8					-88.23

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 18

Querschnitt Nr. 18

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3480.32	1172.11	65465474.5	-173.0	54.5	210000	2732.0	159089566.2
	34299683.8	512.24	158992637.2	1068.1	782.3	80769	(BIEGE)	65368557.4
		11907.29	3012364.2					-88.16

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 19

Querschnitt Nr. 19

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3483.72	1171.84	66227436.5	-172.8	54.7	210000	2734.7	159170378.2
	34563461.2	515.59	159070159.0	1074.7	785.6	80769	(BIEGE)	66127217.2
		11965.53	3052035.9					-88.12

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 20

Querschnitt Nr. 20

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3487.12	1171.57	66994196.6	-172.6	54.9	210000	2737.4	159251273.6
	34827533.6	518.93	159147668.9	1081.3	789.0	80769	(BIEGE)	66890585.8
		12023.78	3091731.3					-88.08

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

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Querschnitt Nr. 21

Querschnitt Nr. 21

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3493.92	1171.05	68542051.7	-172.3	55.3	210000	2742.7	159413362.5
	35356554.6	525.62	159302688.6	1094.5	795.6	80769	(BIEGE)	68431383.8
		12140.39	3171186.9					-88.00

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 22

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3500.72	1170.54	70109099.6	-172.0	55.8	210000	2748.1	159575820.9
	35886717.1	532.31	159457708.4	1107.7	802.2	80769	(BIEGE)	69990987.0
		12257.11	3250731.9					-87.92
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 23

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3507.72	1170.02	71742332.4	-171.6	56.2	210000	2753.6	159743476.9
	36433640.3	539.20	159617270.0	1121.3	809.0	80769	(BIEGE)	71616119.6
		12377.39	3332708.8					-87.83
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 24

Querschnitt Nr. 24

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3444.52	1160.40	70351404.4	-190.0	68.8	210000	2703.9	159199441.4
	36684045.4	543.33	159151471.6	1092.9	801.0	80769	(BIEGE)	70303428.6
		11629.19	2064525.2					-88.67

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 25

Querschnitt Nr. 25

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3447.92	1160.16	71131337.1	-189.8	69.1	210000	2706.6	159279144.8
	36949578.2	546.67	159229208.0	1099.4	804.3	80769	(BIEGE)	71081412.3
		11682.68	2097863.9					-88.64

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 26

Querschnitt Nr. 26

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3451.32	1159.93	71915984.6	-189.6	69.4	210000	2709.3	159358883.9
	37215388.0	550.01	159306932.5	1105.8	807.5	80769	(BIEGE)	71864039.1
		11736.22	2131230.4					-88.60
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 27

Querschnitt Nr. 27

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3458.12	1159.48	73499358.1	-189.3	70.0	210000	2714.6	159518529.0
	37747794.6	556.70	159462369.5	1118.8	814.0	80769	(BIEGE)	73443192.7
		11843.37	2198040.1					-88.54
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 28

Querschnitt Nr. 28

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3394.92	1151.58	71788985.0	-177.3	51.2	210000	2665.0	159489859.1
	37997120.8	563.54	159378279.2	1087.3	807.8	80769	(BIEGE)	71677411.0
		12782.97	3128157.2					-87.96

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 29

Querschnitt Nr. 29

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3401.72	1151.15	73345226.5	-177.0	51.7	210000	2670.3	159652365.2
	38529530.4	570.23	159533418.2	1099.9	814.2	80769	(BIEGE)	73226273.5
		12897.69	3204146.8					-87.87

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 30

Querschnitt Nr. 30

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3408.52	1150.73	74919814.3	-176.6	52.1	210000	2675.7	159815288.6
	39062971.1	576.93	159688545.2	1112.6	820.6	80769	(BIEGE)	74793077.0
		13012.50	3280241.1					-87.79
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 31

Querschnitt Nr. 31

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3352.92	1152.80	75436956.1	-123.8	48.4	210000	2632.0	154134536.7
	39408654.2	584.14	154098630.9	1137.1	839.9	80769	(BIEGE)	75401044.4
		15171.63	1681150.5					-88.78
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 32

Querschnitt Nr. 32

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3157.52	1111.13	65723926.2	-131.5	39.8	210000	2478.7	152518237.6
	37653714.6	574.84	152503658.3	1003.2	762.3	80769	(BIEGE)	65709341.0
		14959.84	1125115.3					-89.26
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 33

Querschnitt Nr. 33

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3164.32	1110.79	67125064.5	-131.2	40.2	210000	2484.0	152673960.7
	38173923.1	581.52	152657831.6	1015.0	768.4	80769	(BIEGE)	67108947.4
		15082.82	1174281.4					-89.21
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 34

Querschnitt Nr. 34

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3071.12	1094.69	62399822.9	-135.2	35.5	210000	2410.8	152219868.6
	37703836.2	584.76	152210975.6	947.5	738.9	80769	(BIEGE)	62390923.9
		15113.54	893870.5					-89.43
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 35

Querschnitt Nr. 35

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3077.92	1094.39	63722813.5	-134.9	35.9	210000	2416.2	152375186.4
	38218695.2	591.42	152365208.6	958.8	744.8	80769	(BIEGE)	63712823.8
		15232.24	940966.6					-89.39
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 36

Querschnitt Nr. 36

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3084.72	1094.08	65061617.3	-134.6	36.3	210000	2421.5	152530599.6
	38734674.7	598.07	152519441.6	970.2	750.7	80769	(BIEGE)	65050453.3
		15351.14	988165.5					-89.35

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 37

Querschnitt Nr. 37

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2914.52	1062.73	57317066.5	-141.8	32.7	210000	2287.9	151371980.6
	36379498.5	590.09	151367975.2	883.9	669.9	80769	(BIEGE)	57313067.1
		14916.01	613402.2					-89.63

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 38

Querschnitt Nr. 38

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2918.32	1062.59	57991987.8	-141.6	33.0	210000	2290.9	151458610.0
	36657053.5	593.79	151454247.0	890.0	673.0	80769	(BIEGE)	57987630.7
		14977.97	638574.8					-89.61

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

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Querschnitt Nr. 39

Querschnitt Nr. 39

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2925.12	1062.34	59211188.9	-141.3	33.3	210000	2296.2	151613665.5
	37154680.7	600.42	151608599.2	900.9	678.5	80769	(BIEGE)	59206134.4
		15089.02	683711.7					-89.58

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 40

Querschnitt Nr. 40

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1062.08	60445148.1	-140.9	33.7	210000	2301.6	151768780.7
	37653523.9	607.04	151762951.3	911.9	684.0	80769	(BIEGE)	60439330.7
		15200.33	728965.0					-89.54

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 41

Querschnitt Nr. 41

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2938.72	1061.83	61693931.0	-140.6	34.1	210000	2306.9	151923943.5
	38153556.2	613.67	151917303.5	922.8	689.5	80769	(BIEGE)	61687279.1
		15311.93	774334.3					-89.51

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 42

Querschnitt Nr. 42

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2945.72	1061.56	62994957.4	-140.3	34.5	210000	2312.4	152083755.5
	38669526.8	620.49	152076185.7	934.2	695.2	80769	(BIEGE)	62987399.5
		15427.07	821157.5					-89.47

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul
yc[mm], zc[mm] Ordinate des elastischen Zentrums
ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
E[N/mm²] Elastizitätsmodul
g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 43

Querschnitt Nr. 43

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2948.32	1061.47	63482225.3	-140.1	34.7	210000	2314.4	152143121.7
	38861483.6	623.03	152135194.3	938.4	697.3	80769	(BIEGE)	63474297.9
		15469.91	838579.9					-89.46

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul
yc[mm], zc[mm] Ordinate des elastischen Zentrums
ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
E[N/mm²] Elastizitätsmodul
g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 44

Querschnitt Nr. 44

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3185.72	1091.80	73881453.7	-189.0	40.8	210000	2500.8	159189463.6
	41868517.1	636.16	159101177.2	1023.6	771.8	80769	(BIEGE)	73793167.3
		13753.44	2744432.9					-88.16
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 45

Querschnitt Nr. 45

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3192.52	1092.09	75344449.7	-188.6	25.8	210000	2506.1	159350777.6
	42391878.6	647.20	159256602.3	1034.9	777.3	80769	(BIEGE)	75250268.4
		17739.38	2812807.7					-88.08
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 46

Querschnitt Nr. 46

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3369.32	1105.91	88622010.3	-205.2	55.4	210000	2644.9	160072828.3
	43718654.2	650.45	160047246.0	1182.6	814.5	80769	(BIEGE)	88596416.1
		15728.58	1352167.9					-88.92
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 47

Querschnitt Nr. 47

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3496.52	1123.10	98539072.9	-172.0	34.7	210000	2744.8	161592269.9
	45118993.8	664.72	161293686.4	1286.5	855.2	80769	(BIEGE)	98240495.3
		17337.08	4338924.2					-86.06
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 48

Querschnitt Nr. 48

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3506.12	1122.99	101154232.6	-171.6	34.2	210000	2752.3	161838604.0
	45877054.6	675.05	161512518.9	1304.6	863.9	80769	(BIEGE)	100828147.5
		17313.81	4448364.0					-85.81

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmomente
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 49

Querschnitt Nr. 49

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3509.92	1122.99	102199876.9	-171.4	33.9	210000	2755.3	161936868.2
	46177584.2	679.22	161599136.4	1311.8	867.3	80769	(BIEGE)	101862133.2
		17304.41	4491736.0					-85.70

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmomente
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 50

Querschnitt Nr. 50

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3930.92	1172.39	124854863.4	-201.0	42.4	210000	3085.8	171352590.2
	49381253.4	698.61	169996560.7	1494.7	962.0	80769	(BIEGE)	123498833.9
		15413.68	7940561.4					-80.31

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 51

Querschnitt Nr. 51

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3946.92	1173.46	130196131.1	-200.2	20.2	210000	3098.3	171971977.8
	50685996.1	718.52	170362998.1	1527.3	976.2	80769	(BIEGE)	128587163.3
		20642.84	8198543.7					-78.90
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 52

Querschnitt Nr. 52

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4206.12	1190.19	151534880.1	-187.9	28.1	210000	3301.8	175059748.8
	53196490.1	737.51	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567654.6
		18116.55	9660675.4					-67.67

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 53

Querschnitt Nr. 53

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4228.72	1189.50	160282481.7	-186.9	27.4	210000	3319.5	177481914.6
	55066311.7	760.57	171608949.8	1761.5	1050.5	80769	(BIEGE)	154409528.7
		18334.15	10050454.8					-59.70

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 54

Querschnitt Nr. 54

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	4254.52	1188.65	170593477.3	-185.8	26.6	210000	3339.8	181922746.8
	57208359.6	786.83	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869146.4
		18623.57	10496170.9					-47.19
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 55

Querschnitt Nr. 55

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4268.52	1190.10	176334191.4	-185.1	4.2	210000	3350.8	185332740.5
	58373898.6	804.36	172518218.6	1848.4	1087.5	80769	(BIEGE)	163519657.7
		26084.79	10738355.7					-39.96
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 56

Querschnitt Nr. 56

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4523.52	1243.40	198280860.2	-174.7	9.3	210000	3551.0	203708888.3
	60647458.2	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
		26796.33	12099491.1					-24.16
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 57

Querschnitt Nr. 57

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1242.17	213235999.4	-173.5	8.6	210000	3576.2	217279960.0
	63359761.6	867.30	177472449.4	2094.9	1222.6	80769	(BIEGE)	173428488.8
		27316.81	12687797.9					-17.68
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 58

Querschnitt Nr. 58

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4584.12	1241.24	226913382.0	-172.4	7.9	210000	3598.5	230258871.5
	65759754.6	896.15	178119946.6	2160.5	1252.3	80769	(BIEGE)	174774421.3
		27793.28	13207247.9					-14.21

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 59

Querschnitt Nr. 59

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1242.17	213235999.4	-173.5	8.6	210000	3576.2	217279960.0
	63359761.6	867.29	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428488.8
		27350.84	12687797.9					-17.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 60

Querschnitt Nr. 60

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4523.52	1243.40	198280860.2	-174.7	9.3	210000	3551.0	203708888.3
	60647458.2	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
		26796.33	12099491.1					-24.16
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 61

Querschnitt Nr. 61

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	4268.52	1187.94	176334191.4	-185.1	28.2	210000	3350.8	185332740.5
	58373898.6	800.84	172518218.6	1848.4	1089.0	80769	(BIEGE)	163519657.7
		18356.90	10738355.7					-39.96
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 62

Querschnitt Nr. 62

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	4254.52	1188.58	170593477.3	-185.8	26.5	210000	3339.8	181922746.8
	57208365.5	786.84	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869146.4
		18604.23	10496170.9					-47.19
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 63

Querschnitt Nr. 63

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	4228.72	1189.50	160282481.7	-186.9	27.4	210000	3319.5	177481914.6
	55066311.7	760.56	171608949.8	1761.5	1050.5	80769	(BIEGE)	154409528.7
		18318.55	10050454.8					-59.70
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 64

Querschnitt Nr. 64

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4206.12	1190.20	151534880.1	-187.9	28.0	210000	3301.8	175059748.8
	53196490.1	737.53	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567654.6
		18142.40	9660675.4					-67.67
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 65

Querschnitt Nr. 65

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3946.92	1173.47	130196131.1	-200.2	20.2	210000	3098.3	171971977.8
	50685996.1	718.52	170362998.1	1527.3	976.2	80769	(BIEGE)	128587163.3
		20634.25	8198543.7					-78.90
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 66

Querschnitt Nr. 66

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3930.92	1172.36	124854863.4	-201.0	42.2	210000	3085.8	171352590.2
	49381253.4	698.62	169996560.7	1494.7	962.0	80769	(BIEGE)	123498833.9
		15443.90	7940561.4					-80.31
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 67

Querschnitt Nr. 67

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3509.92	1122.98	102199876.9	-171.4	33.8	210000	2755.3	161936868.2
	46177584.2	679.21	161599136.4	1311.8	867.3	80769	(BIEGE)	101862133.2
		17339.06	4491736.0					-85.70
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 68

Querschnitt Nr. 68

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3506.12	1123.00	101154232.6	-171.6	34.2	210000	2752.3	161838604.0
	45877054.6	675.04	161512518.9	1304.6	863.9	80769	(BIEGE)	100828147.5
		17335.22	4448364.0					-85.81
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 69

Querschnitt Nr. 69

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3496.52	1123.10	98539072.9	-172.0	34.8	210000	2744.8	161592269.9
	45118993.8	664.71	161293686.4	1286.5	855.2	80769	(BIEGE)	98240495.3
		17319.94	4338924.2					-86.06
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 70

Querschnitt Nr. 70

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3369.32	1105.91	88622010.3	-205.2	55.5	210000	2644.9	160072828.3
	43718654.2	650.43	160047246.0	1182.6	814.5	80769	(BIEGE)	88596416.1
		15713.39	1352167.9					-88.92

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 71

Querschnitt Nr. 71

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3192.52	1092.08	75344449.7	-188.6	25.7	210000	2506.1	159350777.6
	42391878.6	647.22	159256602.3	1034.9	777.3	80769	(BIEGE)	75250268.4
		17750.25	2812807.7					-88.08

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 72

Querschnitt Nr. 72

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3185.72	1091.81	73881453.7	-189.0	40.9	210000	2500.8	159189463.6
	41868517.1	636.14	159101177.2	1023.6	771.8	80769	(BIEGE)	73793167.3
		13754.22	2744432.9					-88.16

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 73

Querschnitt Nr. 73

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2948.32	1061.47	63482225.3	-140.1	34.7	210000	2314.4	152143121.7
	38861483.6	623.03	152135194.3	938.4	697.3	80769	(BIEGE)	63474297.9
		15469.91	838579.9					-89.46

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 74

Querschnitt Nr. 74

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2945.72	1061.56	62994957.4	-140.3	34.5	210000	2312.4	152083755.5
	38669526.8	620.49	152076185.7	934.2	695.2	80769	(BIEGE)	62987399.5
		15427.07	821157.5					-89.47
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 75

Querschnitt Nr. 75

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2938.72	1061.83	61693931.0	-140.6	34.1	210000	2306.9	151923943.5
	38153556.2	613.67	151917303.5	922.8	689.5	80769	(BIEGE)	61687279.1
		15311.93	774334.3					-89.51
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 76

Querschnitt Nr. 76

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1062.08	60445148.1	-140.9	33.7	210000	2301.6	151768780.7
	37653523.9	607.04	151762951.3	911.9	684.0	80769	(BIEGE)	60439330.7
		15200.33	728965.0					-89.54
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 77

Querschnitt Nr. 77

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2925.12	1062.34	59211188.9	-141.3	33.3	210000	2296.2	151613665.5
	37154680.7	600.42	151608599.2	900.9	678.5	80769	(BIEGE)	59206134.4
		15089.02	683711.7					-89.58
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 78

Querschnitt Nr. 78

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.59	57991987.8	-141.6	33.0	210000	2290.9	151458610.0
	36657053.5	593.79	151454247.0	890.0	673.0	80769	(BIEGE)	57987630.7
		14977.97	638574.8					-89.61
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 79

Querschnitt Nr. 79

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2914.52	1062.73	57317066.5	-141.8	32.7	210000	2287.9	151371980.6
	36379498.5	590.09	151367975.2	883.9	669.9	80769	(BIEGE)	57313067.1
		14916.01	613402.2					-89.63
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 80

Querschnitt Nr. 80

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3084.72	1094.08	65061617.3	-134.6	36.3	210000	2421.5	152530599.6
	38734674.7	598.07	152519441.6	970.2	750.7	80769	(BIEGE)	65050453.3
		15351.14	988165.5					-89.35
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 81

Querschnitt Nr. 81

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3077.92	1094.39	63722813.5	-134.9	35.9	210000	2416.2	152375186.4
	38218695.2	591.42	152365208.6	958.8	744.8	80769	(BIEGE)	63712823.8
		15232.24	940966.6					-89.39
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 82

Querschnitt Nr. 82

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3071.12	1094.69	62399822.9	-135.2	35.5	210000	2410.8	152219868.6
	37703836.2	584.76	152210975.6	947.5	738.9	80769	(BIEGE)	62390923.9
		15113.54	893870.5					-89.43
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 83

Querschnitt Nr. 83

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3164.32	1110.79	67125064.5	-131.2	40.2	210000	2484.0	152673960.7
	38173923.1	581.52	152657831.6	1015.0	768.4	80769	(BIEGE)	67108947.4
		15082.82	1174281.4					-89.21
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 84

Querschnitt Nr. 84

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3157.52	1111.13	65723926.2	-131.5	39.8	210000	2478.7	152518237.6
	37653714.6	574.84	152503658.3	1003.2	762.3	80769	(BIEGE)	65709341.0
		14959.84	1125115.3					-89.26

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 85

Querschnitt Nr. 85

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3352.92	1152.80	75436956.1	-123.8	48.4	210000	2632.0	154134536.7
	39408654.2	584.14	154098630.9	1137.1	839.9	80769	(BIEGE)	75401044.4
		15171.63	1681150.5					-88.78

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 86

Querschnitt Nr. 86

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3408.52	1150.73	74919814.3	-176.6	52.1	210000	2675.7	159815288.6
	39062971.1	576.93	159688545.2	1112.6	820.6	80769	(BIEGE)	74793077.0
		13012.50	3280241.1					-87.79

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 87

Querschnitt Nr. 87

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3401.72	1151.15	73345226.5	-177.0	51.7	210000	2670.3	159652365.2
	38529530.4	570.23	159533418.2	1099.9	814.2	80769	(BIEGE)	73226273.5
		12897.69	3204146.8					-87.87

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 88

Querschnitt Nr. 88

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3394.92	1151.58	71788985.0	-177.3	51.2	210000	2665.0	159489859.1
	37997120.8	563.54	159378279.2	1087.3	807.8	80769	(BIEGE)	71677411.0
		12782.97	3128157.2					-87.96

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

yc[mm], zc[mm] Ordinate des elastischen Zentrums
 ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
 E[N/mm²] Elastizitätsmodul
 g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 89

Querschnitt Nr. 89

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3458.12	1159.48	73499358.1	-189.3	70.0	210000	2714.6	159518529.0
	37747794.6	556.70	159462369.5	1118.8	814.0	80769	(BIEGE)	73443192.7
		11843.37	2198040.1					-88.54

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

yc[mm], zc[mm] Ordinate des elastischen Zentrums
 ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
 E[N/mm²] Elastizitätsmodul
 g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 90

Querschnitt Nr. 90

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3451.32	1159.93	71915984.6	-189.6	69.4	210000	2709.3	159358883.9
	37215388.0	550.01	159306932.5	1105.8	807.5	80769	(BIEGE)	71864039.1
		11736.22	2131230.4					-88.60

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 91

Querschnitt Nr. 91

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3447.92	1160.16	71131337.1	-189.8	69.1	210000	2706.6	159279144.8
	36949578.2	546.67	159229208.0	1099.4	804.3	80769	(BIEGE)	71081412.3
		11682.68	2097863.9					-88.64

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 92

Querschnitt Nr. 92

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3444.52	1160.40	70351404.4	-190.0	68.8	210000	2703.9	159199441.4
	36684045.4	543.33	159151471.6	1092.9	801.0	80769	(BIEGE)	70303428.6
		11629.19	2064525.2					-88.67

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

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Querschnitt Nr. 93

Querschnitt Nr. 93

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3507.72	1170.02	71742332.4	-171.6	56.2	210000	2753.6	159743476.9
	36433640.3	539.20	159617270.0	1121.3	809.0	80769	(BIEGE)	71616119.6
		12377.39	3332708.8					-87.83

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 94

Querschnitt Nr. 94

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3500.72	1170.54	70109099.6	-172.0	55.8	210000	2748.1	159575820.9
	35886717.1	532.31	159457708.4	1107.7	802.2	80769	(BIEGE)	69990987.0
		12257.11	3250731.9					-87.92
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 95

Querschnitt Nr. 95

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3493.92	1171.05	68542051.7	-172.3	55.3	210000	2742.7	159413362.5
	35356554.6	525.62	159302688.6	1094.5	795.6	80769	(BIEGE)	68431383.8
		12140.39	3171186.9					-88.00
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 96

Querschnitt Nr. 96

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3487.12	1171.57	66994196.6	-172.6	54.9	210000	2737.4	159251273.6
	34827533.6	518.93	159147668.9	1081.3	789.0	80769	(BIEGE)	66890585.8
		12023.78	3091731.3					-88.08
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 97

Querschnitt Nr. 97

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3483.72	1171.84	66227436.5	-172.8	54.7	210000	2734.7	159170378.2
	34563461.2	515.59	159070159.0	1074.7	785.6	80769	(BIEGE)	66127217.2
		11965.53	3052035.9					-88.12
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 98

Querschnitt Nr. 98

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3480.32	1172.11	65465474.5	-173.0	54.5	210000	2732.0	159089566.2
	34299683.8	512.24	158992637.2	1068.1	782.3	80769	(BIEGE)	65368557.4
		11907.29	3012364.2					-88.16

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 99

Querschnitt Nr. 99

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3473.52	1172.65	63955861.7	-173.3	54.0	210000	2726.7	158928180.7
	33773026.1	505.56	158837605.5	1054.9	775.7	80769	(BIEGE)	63865274.6
		11790.90	2933087.8					-88.23

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 100

Querschnitt Nr. 100

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3466.72	1173.20	62465298.6	-173.6	53.6	210000	2721.4	158767140.9
	33247584.3	498.88	158682561.9	1041.7	769.0	80769	(BIEGE)	62380731.5
		11674.64	2853901.9					-88.30
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 101

Querschnitt Nr. 101

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3389.72	1164.46	58423483.7	-193.1	64.0	210000	2660.9	157921923.2
	32444086.9	489.54	157898367.4	989.4	748.2	80769	(BIEGE)	58399928.0
		10771.44	1530874.0					-89.12
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 102

Querschnitt Nr. 102

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3382.92	1165.01	57027149.5	-193.5	63.4	210000	2655.6	157764149.7
	31923547.6	482.88	157742835.0	976.6	741.6	80769	(BIEGE)	57005840.9
		10665.57	1465149.8					-89.17

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 103

Querschnitt Nr. 103

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3269.92	1157.16	54274005.0	-126.9	43.2	210000	2566.9	151693619.2
	31293350.6	480.35	151684750.0	956.1	735.3	80769	(BIEGE)	54265129.9
		13189.48	929881.8					-89.45

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 104

Querschnitt Nr. 104

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3266.92	1157.40	53690201.4	-127.1	43.0	210000	2564.5	151625157.3
	31066024.5	477.41	151616765.0	950.5	732.4	80769	(BIEGE)	53681803.1
		13133.57	906643.6					-89.47

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

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Querschnitt Nr. 105

Querschnitt Nr. 105

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3260.12	1157.94	52379674.0	-127.3	42.6	210000	2559.2	151470018.4
	30551746.7	470.74	151462663.1	937.9	725.8	80769	(BIEGE)	52372312.9
		13006.98	854025.3					-89.51

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 106

Querschnitt Nr. 106

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3183.32	1148.38	48633584.7	-146.9	50.6	210000	2498.9	150744296.0
	29712775.5	461.57	150743008.6	884.5	703.3	80769	(BIEGE)	48632306.2
		12787.24	-361111.8					89.80
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 107

Querschnitt Nr. 107

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3106.52	1140.41	44909343.4	-133.6	35.0	210000	2438.6	150315428.7
	28888681.7	454.75	150313867.1	830.1	683.1	80769	(BIEGE)	44907778.8
		12760.58	406600.9					-89.78
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 108

Querschnitt Nr. 108

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3099.72	1140.94	43764913.3	-133.9	34.6	210000	2433.3	150160850.0
	28385254.9	448.11	150159646.0	818.2	676.6	80769	(BIEGE)	43763709.3
		12639.20	357465.9					-89.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 109

Querschnitt Nr. 109

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3042.32	1141.58	43026045.2	-135.8	36.0	210000	2388.2	149769307.1
	28134104.8	445.37	149768091.2	822.3	672.4	80769	(BIEGE)	43024832.3
		12421.06	358804.2					-89.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 110

Querschnitt Nr. 110

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2840.92	1089.04	35347879.1	-145.4	28.0	210000	2230.1	148030472.7
	25339216.1	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347545.4
		12158.77	-193973.5					89.90
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 111

Querschnitt Nr. 111

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2834.12	1089.42	34411904.4	-145.8	27.6	210000	2224.8	147876192.0
	24869197.8	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411406.7
		12316.62	-238384.1					89.88
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 112

Querschnitt Nr. 112

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2727.32	1070.56	29548305.5	-151.5	22.5	210000	2140.9	147118617.0
	23269045.5	408.52	147115767.9	595.5	516.4	80769	(BIEGE)	29545456.4
		11977.19	-578097.6					89.72

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 113

Querschnitt Nr. 113

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2720.52	1070.90	28733942.1	-151.9	22.1	210000	2135.6	146964455.5
	22817401.7	401.97	146961201.1	585.5	510.7	80769	(BIEGE)	28730696.6
		11875.31	-619455.7					89.70

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 114

Querschnitt Nr. 114

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2713.72	1071.25	27932623.2	-152.3	21.8	210000	2130.3	146810306.0
	22367800.9	395.43	146806634.4	575.6	504.9	80769	(BIEGE)	27928948.6
		11773.86	-660669.7					89.68

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 201

Querschnitt Nr. 201

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2707.32	1071.86	27190384.4	152.6	-21.5	210000	2125.2	146665240.2
	21946697.1	389.35	146661139.4	566.2	499.5	80769	(BIEGE)	27186292.6
			699270.4					-89.66

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 202

Querschnitt Nr. 202

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2713.72	1071.50	27932682.8	152.3	-21.8	210000	2130.3	146810306.0
	22367936.5	395.49	146806634.4	575.5	504.9	80769	(BIEGE)	27929008.2
			660615.0					-89.68

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 203

Querschnitt Nr. 203

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2720.52	1071.13	28734001.7	151.9	-22.1	210000	2135.6	146964443.6
	22817537.3	402.03	146961201.1	585.5	510.7	80769	(BIEGE)	28730762.2
			619400.9					-89.70

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 204

Querschnitt Nr. 204

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2727.32	1070.77	29548365.1	151.5	-22.4	210000	2140.9	147118617.0
	23269181.1	408.57	147115767.9	595.5	516.4	80769	(BIEGE)	29545527.9
			578042.8					-89.72
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 205

Querschnitt Nr. 205

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2834.12	1089.42	34411973.0	145.8	-27.6	210000	2224.8	147876192.0
	24869342.3	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411478.3
			238329.0					-89.88
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 206

Querschnitt Nr. 206

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2840.92	1089.04	35347947.7	145.4	-28.0	210000	2230.1	148030472.7
	25339362.2	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347616.9
			193918.5					-89.90

Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums	
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts	
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul	
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht	
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen					
MBw	Bewehrungsmaterialnummer					
It[cm ⁴]	Torsionsträgheitsmoment					
G[N/mm ²]	Schubmodul					

Querschnitt Nr. 207

Querschnitt Nr. 207

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3042.32	1141.19	43026128.7	135.8	-36.0	210000	2388.2	149769307.1
	28134265.7	445.32	149768091.2	822.3	672.4	80769	(BIEGE)	43024915.7
			-358859.7					89.81
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 208

Querschnitt Nr. 208

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3099.72	1140.57	43765002.8	133.9	-34.6	210000	2433.3	150160838.1
	28385418.8	448.06	150159646.0	818.2	676.6	80769	(BIEGE)	43763798.7
			-357526.7					89.81
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 209

Querschnitt Nr. 209

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3106.52	1140.01	44909432.8	133.6	-35.0	210000	2438.6	150315428.7
	28888842.6	454.69	150313867.1	830.1	683.1	80769	(BIEGE)	44907862.2
			-406661.6					89.78
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 210

Querschnitt Nr. 210

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3183.32	1148.38	48633680.0	146.9	-50.6	210000	2498.9	150744284.1
	29712942.4	461.57	150743008.6	884.5	703.3	80769	(BIEGE)	48632407.5
			361051.8					-89.80
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 211

Querschnitt Nr. 211

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3260.12	1157.20	52379775.4	127.3	-42.6	210000	2559.2	151470030.3
	30551919.5	470.66	151462663.1	937.9	725.8	80769	(BIEGE)	52372420.2
			-854086.4					89.51
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 212

Querschnitt Nr. 212

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3266.92	1156.63	53690308.7	127.1	-43.0	210000	2564.5	151625157.3
	31066191.4	477.32	151616765.0	950.5	732.4	80769	(BIEGE)	53681916.3
			-906704.7					89.47

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul

Querschnitt Nr. 213

Querschnitt Nr. 213

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3269.92	1156.38	54274106.4	126.9	-43.2	210000	2566.9	151693619.2
	31293523.5	480.26	151684750.0	956.1	735.3	80769	(BIEGE)	54265225.3
			-929942.9					89.45

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul

Querschnitt Nr. 214

Querschnitt Nr. 214

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3382.92	1163.94	57027256.8	193.5	-63.4	210000	2655.6	157764149.7
	31923720.4	482.75	157742835.0	976.6	741.6	80769	(BIEGE)	57005936.3
			-1465207.1					89.17
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 215

Querschnitt Nr. 215

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3389.72	1163.36	58423597.0	193.1	-64.0	210000	2660.9	157921923.2
	32444259.7	489.40	157898367.4	989.4	748.2	80769	(BIEGE)	58400047.2
			-1530931.2					89.12
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 216

Querschnitt Nr. 216

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3466.72	1171.21	62465411.8	173.6	-53.6	210000	2721.4	158767129.0
	33247760.1	498.66	158682550.0	1041.7	769.0	80769	(BIEGE)	62380838.8
			-2853960.2					88.30

Mat Materialnummer yc [mm], zc [mm] Ordinate des elastischen Zentrums
 A [cm²] Querschnittsfläche ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche E [N/mm²] Elastizitätsmodul
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment g [kg/m] längenbezogenes Eigengewicht
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 217

Querschnitt Nr. 217

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3473.52	1170.62	63955975.0	173.3	-54.0	210000	2726.7	158928192.6
	33773201.9	505.34	158837605.5	1054.9	775.7	80769	(BIEGE)	63865387.8
			-2933146.3					88.23

Mat Materialnummer yc [mm], zc [mm] Ordinate des elastischen Zentrums
 A [cm²] Querschnittsfläche ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche E [N/mm²] Elastizitätsmodul
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment g [kg/m] längenbezogenes Eigengewicht
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 218

Querschnitt Nr. 218

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3480.32	1170.05	65465593.7	173.0	-54.5	210000	2732.0	159089554.3
	34299859.6	512.02	158992637.2	1068.1	782.3	80769	(BIEGE)	65368664.7
			-3012422.7					88.16
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 219

Querschnitt Nr. 219

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3483.72	1169.77	66227555.7	172.8	-54.7	210000	2734.7	159170390.1
	34563637.0	515.36	159070159.0	1074.7	785.6	80769	(BIEGE)	66127330.5
			-3052094.4					88.12
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 220

Querschnitt Nr. 220

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3487.12	1169.49	66994315.8	172.6	-54.9	210000	2737.4	159251285.6
	34827715.4	518.70	159147668.9	1081.3	788.9	80769	(BIEGE)	66890699.1
			-3091789.8					88.08
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 221

Querschnitt Nr. 221

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3493.92	1168.94	68542170.9	172.3	-55.3	210000	2742.7	159413362.5
	35356730.4	525.38	159302688.6	1094.5	795.6	80769	(BIEGE)	68431497.0
			-3171245.4					88.00
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 222

Querschnitt Nr. 222

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3500.72	1168.40	70109218.8	172.0	-55.8	210000	2748.1	159575832.9
	35886892.9	532.07	159457708.4	1107.7	802.2	80769	(BIEGE)	69991100.3
			-3250790.4					87.92
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 223

Querschnitt Nr. 223

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3507.72	1167.86	71742457.6	171.6	-56.2	210000	2753.6	159743488.8
	36433819.2	538.96	159617270.0	1121.3	809.0	80769	(BIEGE)	71616232.8
			-3332767.3					87.83
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 224

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3444.52	1159.07	70351523.6	190.0	-68.8	210000	2703.9	159199441.4
	36684221.3	543.16	159151471.6	1092.9	801.0	80769	(BIEGE)	70303547.8
			-2064582.5					88.67
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 225

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3447.92	1158.83	71131456.3	189.8	-69.1	210000	2706.6	159279132.9
	36949757.0	546.50	159229208.0	1099.4	804.2	80769	(BIEGE)	71081519.6
			-2097921.5					88.64
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 226

Querschnitt Nr. 226

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3451.32	1158.58	71916103.8	189.6	-69.4	210000	2709.3	159358883.9
	37215560.9	549.84	159306932.5	1105.8	807.5	80769	(BIEGE)	71864158.4
			-2131287.8					88.60
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 227

Querschnitt Nr. 227

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3458.12	1158.10	73499483.3	189.3	-70.0	210000	2714.6	159518529.0
	37747973.4	556.53	159462369.5	1118.8	814.0	80769	(BIEGE)	73443311.9
			-2198097.7					88.54
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsnummer					
MBw	Bewehrungsnummer		Torsionsträgheitsmoment					
It [cm ⁴]	Torsionsträgheitsmoment		Schubmodul					
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 228

Querschnitt Nr. 228

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3394.92	1149.73	71789104.2	177.3	-51.2	210000	2665.0	159489859.1
	37997305.6	563.30	159378279.2	1087.3	807.8	80769	(BIEGE)	71677530.2
			-3128215.3					87.96

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 229

Querschnitt Nr. 229

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3401.72	1149.27	73345345.7	177.0	-51.7	210000	2670.3	159652377.1
	38529715.2	569.98	159533418.2	1099.9	814.2	80769	(BIEGE)	73226380.8
			-3204204.9					87.87

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 230

Querschnitt Nr. 230

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3408.52	1148.83	74919933.5	176.6	-52.1	210000	2675.7	159815300.5
	39063152.9	576.67	159688545.2	1112.6	820.6	80769	(BIEGE)	74793184.3
			-3280299.2					87.79

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

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Querschnitt Nr. 231

Querschnitt Nr. 231

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3352.92	1151.70	75437081.3	123.8	-48.4	210000	2632.0	154134536.7
	39408836.0	584.00	154098619.0	1137.1	839.9	80769	(BIEGE)	75401163.6
			-1681211.6					88.78

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 232

Querschnitt Nr. 232

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3157.52	1110.45	65724033.5	131.5	-39.8	210000	2478.7	152518249.5
	37653887.5	574.73	152503658.3	1003.2	762.3	80769	(BIEGE)	65709448.3
			-1125176.2					89.26
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 233

Querschnitt Nr. 233

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3164.32	1110.09	67125177.8	131.2	-40.2	210000	2484.0	152673960.7
	38174096.0	581.41	152657831.6	1015.0	768.4	80769	(BIEGE)	67109060.7
			-1174342.3					89.21
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 234

Querschnitt Nr. 234

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3071.12	1094.18	62399930.1	135.2	-35.5	210000	2410.8	152219868.6
	37704003.1	584.66	152210975.6	947.5	738.9	80769	(BIEGE)	62391037.1
			-893931.1					89.43

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 235

Querschnitt Nr. 235

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3077.92	1093.86	63722920.8	134.9	-35.9	210000	2416.2	152375198.3
	38218865.0	591.32	152365208.6	958.8	744.8	80769	(BIEGE)	63712931.1
			-941027.2					89.39

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 236

Querschnitt Nr. 236

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3084.72	1093.54	65061724.6	134.6	-36.3	210000	2421.5	152530611.5
	38734847.5	597.97	152519441.6	970.2	750.7	80769	(BIEGE)	65050566.6
			-988226.1					89.35
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 237

Querschnitt Nr. 237

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	2914.52	1062.40	57317161.9	141.8	-32.7	210000	2287.9	151371980.6
	36379659.4	590.01	151367975.2	883.9	669.9	80769	(BIEGE)	57313156.5
			-613457.3					89.63
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 238

Querschnitt Nr. 238

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.25	57992077.2	141.6	-33.0	210000	2290.9	151458621.9
	36657208.4	593.71	151454247.0	890.0	672.9	80769	(BIEGE)	57987720.1
			-638630.0					89.61
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 239

Querschnitt Nr. 239

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2925.12	1061.97	59211278.3	141.3	-33.3	210000	2296.2	151613653.6
	37154838.7	600.33	151608599.2	900.9	678.5	80769	(BIEGE)	59206211.9
			-683766.9					89.58
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 240

Querschnitt Nr. 240

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2931.92	1061.70	60445243.5	140.9	-33.7	210000	2301.6	151768780.7
	37653678.9	606.95	151762951.3	911.9	684.0	80769	(BIEGE)	60439426.1
			-729020.2					89.54
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 241

Querschnitt Nr. 241

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2938.72	1061.43	61694026.4	140.6	-34.1	210000	2306.9	151923943.5
	38153720.1	613.57	151917303.5	922.8	689.5	80769	(BIEGE)	61687374.5
			-774389.6					89.51
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2945.72	1061.15	62995052.7	140.3	-34.5	210000	2312.4	152083755.5
	38669690.7	620.39	152076185.7	934.2	695.2	80769	(BIEGE)	62987488.9
			-821212.8					89.47
Mat	Materialnummer			yc [mm], zc [mm]	Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]	Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]	längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2948.32	1061.05	63482320.7	140.1	-34.7	210000	2314.4	152143121.7
	38861644.5	622.92	152135194.3	938.4	697.3	80769	(BIEGE)	63474387.3
			-838635.1					89.46

Mat Materialnummer

A [cm²] Querschnittsfläche

Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche

Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment

I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen

MBw Bewehrungsmaterialnummer

It [cm⁴] Torsionsträgheitsmoment

G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums

ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts

E [N/mm²] Elastizitätsmodul

g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 244

Querschnitt Nr. 244

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3185.72	1090.26	73881567.0	189.0	-40.8	210000	2500.8	159189463.6
	41868686.9	635.90	159101177.2	1023.6	771.8	80769	(BIEGE)	73793268.7
			-2744490.5					88.16
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 245

Querschnitt Nr. 245

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3192.52	1089.31	75344563.0	188.6	-25.8	210000	2506.1	159350789.6
	42392051.5	647.04	159256602.3	1034.9	777.3	80769	(BIEGE)	75250375.7
			-2812865.2					88.08
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 246

Querschnitt Nr. 246

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3369.32	1103.80	88622141.4	205.2	-55.4	210000	2644.9	160072840.2
	43718830.0	650.37	160047246.0	1182.6	814.5	80769	(BIEGE)	88596547.2
			-1352224.5					88.92
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 247

Querschnitt Nr. 247

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3496.52	1116.47	98539215.9	172.0	-34.7	210000	2744.8	161592269.9
	45119181.5	664.53	161293686.4	1286.5	855.2	80769	(BIEGE)	98240632.4
			-4338982.4					86.06
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 248

Querschnitt Nr. 248

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3506.12	1115.67	101154375.7	171.6	-34.2	210000	2752.3	161838604.0
	45877239.4	674.86	161512518.9	1304.6	863.9	80769	(BIEGE)	100828290.6
			-4448422.4					85.81

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 249

Querschnitt Nr. 249

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3509.92	1115.30	102200020.0	171.4	-33.9	210000	2755.3	161936880.1
	46177760.0	679.03	161599136.4	1311.8	867.3	80769	(BIEGE)	101862264.3
			-4491794.5					85.70

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 250

Querschnitt Nr. 250

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3930.92	1159.38	124855042.3	201.0	-42.4	210000	3085.8	171352614.0
	49381453.1	698.34	169996560.7	1494.7	962.0	80769	(BIEGE)	123498977.0
			-7940623.2					80.31
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 251

Querschnitt Nr. 251

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3946.92	1156.56	130196309.9	200.2	-20.2	210000	3098.3	171972001.6
	50686192.8	718.42	170362998.1	1527.3	976.1	80769	(BIEGE)	128587306.3
			-8198605.5					78.90
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 252

Querschnitt Nr. 252

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4206.12	1170.37	151535082.8	187.9	-28.1	210000	3301.8	175059820.3
	53196692.8	737.35	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567773.8
			-9660738.0					67.67
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 253

Querschnitt Nr. 253

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4228.72	1168.54	160282696.3	186.9	-27.4	210000	3319.5	177482010.0
	55066508.4	760.40	171608937.8	1761.5	1050.5	80769	(BIEGE)	154409624.1
			-10050517.4					59.70
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 254

Querschnitt Nr. 254

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4254.52	1166.60	170593691.9	185.8	-26.6	210000	3339.8	181922901.8
	57208568.2	786.66	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869182.1
			-10496232.7					47.19

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
 A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
 Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
 Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
 I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 255

Querschnitt Nr. 255

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4268.52	1163.66	176334417.9	185.1	-4.2	210000	3350.8	185332943.1
	58374101.3	804.35	172518218.6	1848.4	1087.5	80769	(BIEGE)	163519693.4
			-10738418.3					39.96

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
 A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
 Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
 Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
 I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 256

Querschnitt Nr. 256

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4523.52	1211.88	198281098.6	174.7	-9.3	210000	3551.0	203709150.6
	60647666.8	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
			-12099554.5					24.16

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 257

Querschnitt Nr. 257

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1209.22	213236261.7	173.5	-8.6	210000	3576.2	217280246.1
	63359976.2	867.30	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428465.0
			-12687860.5					17.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 258

Querschnitt Nr. 258

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4584.12	1206.79	226913644.3	172.4	-7.9	210000	3598.5	230259181.5
	65759969.2	896.15	178119946.6	2160.5	1252.3	80769	(BIEGE)	174774421.3
			-13207310.5					14.21

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 259

Querschnitt Nr. 259

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1209.23	213236261.7	173.5	-8.6	210000	3576.2	217280246.1
	63359976.2	867.29	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428465.0
			-12687860.5					17.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 260

Querschnitt Nr. 260

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4523.52	1211.88	198281098.6	174.7	-9.3	210000	3551.0	203709150.6
	60647666.8	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
			-12099554.5					24.16

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 261

Querschnitt Nr. 261

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4268.52	1165.76	176334417.9	185.1	-28.2	210000	3350.8	185332943.1
	58374101.3	800.64	172518218.6	1848.4	1089.0	80769	(BIEGE)	163519693.4
			-10738418.3					39.96

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 262

Querschnitt Nr. 262

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4254.52	1166.67	170593691.9	185.8	-26.5	210000	3339.8	181922901.8
	57208568.2	786.67	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869182.1
			-10496232.7					47.19
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 263

Querschnitt Nr. 263

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	4228.72	1168.53	160282696.3	186.9	-27.4	210000	3319.5	177482010.0
	55066508.4	760.39	171608937.8	1761.5	1050.5	80769	(BIEGE)	154409624.1
			-10050517.4					59.70
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 264

Querschnitt Nr. 264

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	4206.12	1170.36	151535082.8	187.9	-28.0	210000	3301.8	175059820.3
	53196692.8	737.36	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567773.8
			-9660738.0					67.67
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 265

Querschnitt Nr. 265

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3946.92	1156.54	130196309.9	200.2	-20.2	210000	3098.3	171972001.6
	50686192.8	718.42	170362998.1	1527.3	976.1	80769	(BIEGE)	128587306.3
			-8198605.5					78.90
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 266

Querschnitt Nr. 266

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3930.92	1159.42	124855042.3	201.0	-42.2	210000	3085.8	171352614.0
	49381453.1	698.35	169996560.7	1494.7	962.0	80769	(BIEGE)	123498977.0
			-7940623.2					80.31
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 267

Querschnitt Nr. 267

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3509.92	1115.31	102200020.0	171.4	-33.8	210000	2755.3	161936880.1
	46177760.0	679.02	161599136.4	1311.8	867.3	80769	(BIEGE)	101862264.3
			-4491794.5					85.70
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 268

Querschnitt Nr. 268

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3506.12	1115.66	101154375.7	171.6	-34.2	210000	2752.3	161838604.0
	45877239.4	674.84	161512518.9	1304.6	863.9	80769	(BIEGE)	100828290.6
			-4448422.4					85.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 269

Querschnitt Nr. 269

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3496.52	1116.46	98539215.9	172.0	-34.8	210000	2744.8	161592269.9
	45119181.5	664.52	161293686.4	1286.5	855.2	80769	(BIEGE)	98240632.4
			-4338982.7					86.06
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 270

Querschnitt Nr. 270

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3369.32	1103.80	88622141.4	205.2	-55.5	210000	2644.9	160072840.2
	43718830.0	650.35	160047246.0	1182.6	814.5	80769	(BIEGE)	88596547.2
			-1352224.5					88.92
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 271

Querschnitt Nr. 271

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3192.52	1089.32	75344563.0	188.6	-25.7	210000	2506.1	159350789.6
	42392048.5	647.06	159256602.3	1034.9	777.3	80769	(BIEGE)	75250375.7
			-2812865.2					88.08
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 272

Querschnitt Nr. 272

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3185.72	1090.24	73881567.0	189.0	-40.9	210000	2500.8	159189463.6
	41868686.9	635.89	159101177.2	1023.6	771.8	80769	(BIEGE)	73793268.7
			-2744490.5					88.16

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 273

Querschnitt Nr. 273

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2948.32	1061.05	63482320.7	140.1	-34.7	210000	2314.4	152143121.7
	38861644.5	622.92	152135194.3	938.4	697.3	80769	(BIEGE)	63474387.3
			-838635.1					89.46

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 274

Querschnitt Nr. 274

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2945.72	1061.15	62995052.7	140.3	-34.5	210000	2312.4	152083755.5
	38669690.7	620.39	152076185.7	934.2	695.2	80769	(BIEGE)	62987488.9
			-821212.8					89.47
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 275

Querschnitt Nr. 275

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2938.72	1061.43	61694026.4	140.6	-34.1	210000	2306.9	151923943.5
	38153720.1	613.57	151917303.5	922.8	689.5	80769	(BIEGE)	61687374.5
			-774389.6					89.51
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 276

Querschnitt Nr. 276

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2931.92	1061.70	60445243.5	140.9	-33.7	210000	2301.6	151768780.7
	37653678.9	606.95	151762951.3	911.9	684.0	80769	(BIEGE)	60439426.1
			-729020.2					89.54
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 277

Querschnitt Nr. 277

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2925.12	1061.97	59211278.3	141.3	-33.3	210000	2296.2	151613653.6
	37154838.7	600.33	151608599.2	900.9	678.5	80769	(BIEGE)	59206211.9
			-683766.9					89.58
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 278

Querschnitt Nr. 278

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.25	57992077.2	141.6	-33.0	210000	2290.9	151458621.9
	36657208.4	593.71	151454247.0	890.0	672.9	80769	(BIEGE)	57987720.1
			-638630.0					89.61
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 279

Querschnitt Nr. 279

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2914.52	1062.40	57317161.9	141.8	-32.7	210000	2287.9	151371980.6
	36379659.4	590.01	151367975.2	883.9	669.9	80769	(BIEGE)	57313156.5
			-613457.3					89.63
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 280

Querschnitt Nr. 280

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3084.72	1093.54	65061724.6	134.6	-36.3	210000	2421.5	152530611.5
	38734847.5	597.97	152519441.6	970.2	750.7	80769	(BIEGE)	65050566.6
			-988226.1					89.35

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 281

Querschnitt Nr. 281

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3077.92	1093.86	63722920.8	134.9	-35.9	210000	2416.2	152375198.3
	38218865.0	591.32	152365208.6	958.8	744.8	80769	(BIEGE)	63712931.1
			-941027.2					89.39

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 282

Querschnitt Nr. 282

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3071.12	1094.18	62399930.1	135.2	-35.5	210000	2410.8	152219868.6
	37704003.1	584.66	152210975.6	947.5	738.9	80769	(BIEGE)	62391037.1
			-893931.1					89.43
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 283

Querschnitt Nr. 283

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3164.32	1110.09	67125177.8	131.2	-40.2	210000	2484.0	152673960.7
	38174096.0	581.41	152657831.6	1015.0	768.4	80769	(BIEGE)	67109060.7
			-1174342.3					89.21
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 284

Querschnitt Nr. 284

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3157.52	1110.45	65724033.5	131.5	-39.8	210000	2478.7	152518249.5
	37653887.5	574.73	152503658.3	1003.2	762.3	80769	(BIEGE)	65709448.3
			-1125176.2					89.26
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 285

Querschnitt Nr. 285

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3352.92	1151.70	75437081.3	123.8	-48.4	210000	2632.0	154134536.7
	39408836.0	584.00	154098619.0	1137.1	839.9	80769	(BIEGE)	75401163.6
			-1681211.6					88.78
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 286

Querschnitt Nr. 286

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3408.52	1148.83	74919933.5	176.6	-52.1	210000	2675.7	159815300.5
	39063152.9	576.67	159688545.2	1112.6	820.6	80769	(BIEGE)	74793184.3
			-3280299.2					87.79

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 287

Querschnitt Nr. 287

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3401.72	1149.27	73345345.7	177.0	-51.7	210000	2670.3	159652377.1
	38529715.2	569.98	159533418.2	1099.9	814.2	80769	(BIEGE)	73226380.8
			-3204204.9					87.87

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 288

Querschnitt Nr. 288

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3394.92	1149.73	71789104.2	177.3	-51.2	210000	2665.0	159489859.1
	37997305.6	563.30	159378279.2	1087.3	807.8	80769	(BIEGE)	71677530.2
			-3128215.3					87.96

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 289

Querschnitt Nr. 289

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3458.12	1158.10	73499483.3	189.3	-70.0	210000	2714.6	159518529.0
	37747973.4	556.53	159462369.5	1118.8	814.0	80769	(BIEGE)	73443311.9
			-2198097.7					88.54

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 290

Querschnitt Nr. 290

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3451.32	1158.58	71916103.8	189.6	-69.4	210000	2709.3	159358883.9
	37215560.9	549.84	159306932.5	1105.8	807.5	80769	(BIEGE)	71864158.4
			-2131287.8					88.60

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 291

Querschnitt Nr. 291

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3447.92	1158.83	71131456.3	189.8	-69.1	210000	2706.6	159279132.9
	36949757.0	546.50	159229208.0	1099.4	804.2	80769	(BIEGE)	71081519.6
			-2097921.5					88.64

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 292

Querschnitt Nr. 292

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3444.52	1159.07	70351523.6	190.0	-68.8	210000	2703.9	159199441.4
	36684221.3	543.16	159151471.6	1092.9	801.0	80769	(BIEGE)	70303547.8
			-2064582.5					88.67

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 293

Querschnitt Nr. 293

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3507.72	1167.86	71742457.6	171.6	-56.2	210000	2753.6	159743488.8
	36433819.2	538.96	159617270.0	1121.3	809.0	80769	(BIEGE)	71616232.8
			-3332767.3					87.83

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 294

Querschnitt Nr. 294

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3500.72	1168.40	70109218.8	172.0	-55.8	210000	2748.1	159575832.9
	35886892.9	532.07	159457708.4	1107.7	802.2	80769	(BIEGE)	69991100.3
			-3250790.4					87.92

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 295

Querschnitt Nr. 295

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3493.92	1168.94	68542170.9	172.3	-55.3	210000	2742.7	159413362.5
	35356730.4	525.38	159302688.6	1094.5	795.6	80769	(BIEGE)	68431497.0
			-3171245.4					88.00

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 296

Querschnitt Nr. 296

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3487.12	1169.49	66994315.8	172.6	-54.9	210000	2737.4	159251285.6
	34827715.4	518.70	159147668.9	1081.3	788.9	80769	(BIEGE)	66890699.1
			-3091789.8					88.08

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 297

Querschnitt Nr. 297

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3483.72	1169.77	66227555.7	172.8	-54.7	210000	2734.7	159170390.1
	34563637.0	515.36	159070159.0	1074.7	785.6	80769	(BIEGE)	66127330.5
			-3052094.4					88.12

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 298

Querschnitt Nr. 298

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3480.32	1170.05	65465593.7	173.0	-54.5	210000	2732.0	159089554.3
	34299859.6	512.02	158992637.2	1068.1	782.3	80769	(BIEGE)	65368664.7
			-3012422.7					88.16

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 299

Querschnitt Nr. 299

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3473.52	1170.62	63955975.0	173.3	-54.0	210000	2726.7	158928192.6
	33773201.9	505.34	158837605.5	1054.9	775.7	80769	(BIEGE)	63865387.8
			-2933146.3					88.23

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 300

Querschnitt Nr. 300

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3466.72	1171.21	62465411.8	173.6	-53.6	210000	2721.4	158767129.0
	33247760.1	498.66	158682550.0	1041.7	769.0	80769	(BIEGE)	62380838.8
			-2853960.2					88.30

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 301

Querschnitt Nr. 301

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3389.72	1163.36	58423597.0	193.1	-64.0	210000	2660.9	157921923.2
	32444259.7	489.40	157898367.4	989.4	748.2	80769	(BIEGE)	58400047.2
			-1530931.2					89.12

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 302

Querschnitt Nr. 302

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3382.92	1163.94	57027256.8	193.5	-63.4	210000	2655.6	157764149.7
	31923720.4	482.75	157742835.0	976.6	741.6	80769	(BIEGE)	57005936.3
			-1465207.1					89.17
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 303

Querschnitt Nr. 303

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3269.92	1156.38	54274106.4	126.9	-43.2	210000	2566.9	151693619.2
	31293523.5	480.26	151684750.0	956.1	735.3	80769	(BIEGE)	54265225.3
			-929942.9					89.45
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 304

Querschnitt Nr. 304

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3266.92	1156.63	53690308.7	127.1	-43.0	210000	2564.5	151625157.3
	31066191.4	477.32	151616765.0	950.5	732.4	80769	(BIEGE)	53681916.3
			-906704.7					89.47
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 305

Querschnitt Nr. 305

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3260.12	1157.20	52379775.4	127.3	-42.6	210000	2559.2	151470030.3
	30551919.5	470.66	151462663.1	937.9	725.8	80769	(BIEGE)	52372420.2
			-854086.4					89.51
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 306

Querschnitt Nr. 306

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3183.32	1148.38	48633680.0	146.9	-50.6	210000	2498.9	150744284.1
	29712942.4	461.57	150743008.6	884.5	703.3	80769	(BIEGE)	48632407.5
			361051.8					-89.80
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 307

Querschnitt Nr. 307

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3106.52	1140.01	44909432.8	133.6	-35.0	210000	2438.6	150315428.7
	28888842.6	454.69	150313867.1	830.1	683.1	80769	(BIEGE)	44907862.2
			-406661.6					89.78
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 308

Querschnitt Nr. 308

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3099.72	1140.57	43765002.8	133.9	-34.6	210000	2433.3	150160838.1
	28385418.8	448.06	150159646.0	818.2	676.6	80769	(BIEGE)	43763798.7
			-357526.7					89.81
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment							
It [cm ⁴]	Schubmodul							
G [N/mm ²]								

Querschnitt Nr. 309

Querschnitt Nr. 309

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3042.32	1141.19	43026128.7	135.8	-36.0	210000	2388.2	149769307.1
	28134265.7	445.32	149768091.2	822.3	672.4	80769	(BIEGE)	43024915.7
			-358859.7					89.81
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment							
It [cm ⁴]	Schubmodul							
G [N/mm ²]								

Querschnitt Nr. 310

Querschnitt Nr. 310

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2840.92	1089.04	35347947.7	145.4	-28.0	210000	2230.1	148030472.7
	25339362.2	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347616.9
			193918.5					-89.90
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 311

Querschnitt Nr. 311

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2834.12	1089.42	34411973.0	145.8	-27.6	210000	2224.8	147876192.0
	24869342.3	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411478.3
			238329.0					-89.88
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 312

Querschnitt Nr. 312

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2727.32	1070.77	29548365.1	151.5	-22.4	210000	2140.9	147118617.0
	23269181.1	408.57	147115767.9	595.5	516.4	80769	(BIEGE)	29545527.9
			578042.8					-89.72
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 313

Querschnitt Nr. 313

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2720.52	1071.13	28734001.7	151.9	-22.1	210000	2135.6	146964443.6
	22817537.3	402.03	146961201.1	585.5	510.7	80769	(BIEGE)	28730762.2
			619400.9					-89.70
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 314

Querschnitt Nr. 314

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2713.72	1071.50	27932682.8	152.3	-21.8	210000	2130.3	146810306.0
	22367936.5	395.49	146806634.4	575.5	504.9	80769	(BIEGE)	27929008.2
			660615.0					-89.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 401

Querschnitt Nr. 401

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2713.72	1071.25	27932623.2	-152.3	21.8	210000	2130.3	146810306.0
	22367800.9	395.43	146806634.4	575.6	504.9	80769	(BIEGE)	27928948.6
		11773.86	-660669.7					89.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 402

Querschnitt Nr. 402

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2720.52	1070.90	28733942.1	-151.9	22.1	210000	2135.6	146964455.5
	22817401.7	401.97	146961201.1	585.5	510.7	80769	(BIEGE)	28730696.6
		11875.31	-619455.7					89.70
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 403

Querschnitt Nr. 403

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	2727.32	1070.56	29548305.5	-151.5	22.5	210000	2140.9	147118617.0
	23269045.5	408.52	147115767.9	595.5	516.4	80769	(BIEGE)	29545456.4
		11977.19	-578097.6					89.72
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 404

Querschnitt Nr. 404

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2734.12	1070.22	30375772.9	-151.1	22.8	210000	2146.3	147272778.5
	23722699.4	415.07	147270322.7	605.6	522.1	80769	(BIEGE)	30373305.3
		12079.48	-536596.1					89.74
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 405

Querschnitt Nr. 405

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2840.92	1089.04	35347879.1	-145.4	28.0	210000	2230.1	148030472.7
	25339216.1	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347545.4
		12158.77	-193973.5					89.90
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 406

Querschnitt Nr. 406

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2842.32	1088.96	35542339.3	-145.4	28.1	210000	2231.2	148062230.1
	25436216.7	426.39	148061932.0	690.7	570.8	80769	(BIEGE)	35542029.4
		12127.93	-184815.0					89.91
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 407

Querschnitt Nr. 407

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3099.72	1140.94	43764913.3	-133.9	34.6	210000	2433.3	150160850.0
	28385254.9	448.11	150159646.0	818.2	676.6	80769	(BIEGE)	43763709.3
		12639.20	357465.9					-89.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 408

Querschnitt Nr. 408

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3106.52	1140.41	44909343.4	-133.6	35.0	210000	2438.6	150315428.7
	28888681.7	454.75	150313867.1	830.1	683.1	80769	(BIEGE)	44907778.8
		12760.58	406600.9					-89.78
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 409

Querschnitt Nr. 409

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3113.32	1139.89	46070096.2	-133.3	35.4	210000	2444.0	150470067.0
	29393646.3	461.39	150468076.2	841.9	689.6	80769	(BIEGE)	46068108.4
		12882.15	455830.4					-89.75
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 410

Querschnitt Nr. 410

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3190.12	1147.84	49869743.3	-146.6	51.3	210000	2504.2	150898493.3
	30222428.0	468.17	150897468.1	896.8	709.9	80769	(BIEGE)	49868715.1
		12703.82	-321556.5					89.82

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 411

Querschnitt Nr. 411

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3266.92	1157.40	53690201.4	-127.1	43.0	210000	2564.5	151625157.3
	31066024.5	477.41	151616765.0	950.5	732.4	80769	(BIEGE)	53681803.1
		13133.57	906643.6					-89.47

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 412

Querschnitt Nr. 412

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3269.92	1157.16	54274005.0	-126.9	43.2	210000	2566.9	151693619.2
	31293350.6	480.35	151684750.0	956.1	735.3	80769	(BIEGE)	54265129.9
		13189.48	929881.8					-89.45
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 413

Querschnitt Nr. 413

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3332.92	1154.59	55198181.0	-180.6	47.3	210000	2616.3	157481385.2
	31520977.8	480.67	157430089.5	948.1	724.8	80769	(BIEGE)	55146891.2
		11355.07	2290359.9					-88.72
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 414

Querschnitt Nr. 414

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3389.72	1164.46	58423483.7	-193.1	64.0	210000	2660.9	157921923.2
	32444086.9	489.54	157898367.4	989.4	748.2	80769	(BIEGE)	58399928.0
		10771.44	1530874.0					-89.12
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 415

Querschnitt Nr. 415

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3396.72	1163.91	59880102.0	-192.7	64.6	210000	2666.4	158084488.9
	32981288.6	496.40	158058477.4	1002.5	755.0	80769	(BIEGE)	59854072.7
		10880.57	1598647.2					-89.07
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 416

Querschnitt Nr. 416

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3473.52	1172.65	63955861.7	-173.3	54.0	210000	2726.7	158928180.7
	33773026.1	505.56	158837605.5	1054.9	775.7	80769	(BIEGE)	63865274.6
		11790.90	2933087.8					-88.23

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 417

Querschnitt Nr. 417

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3480.32	1172.11	65465474.5	-173.0	54.5	210000	2732.0	159089566.2
	34299683.8	512.24	158992637.2	1068.1	782.3	80769	(BIEGE)	65368557.4
		11907.29	3012364.2					-88.16

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 418

Querschnitt Nr. 418

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3483.72	1171.84	66227436.5	-172.8	54.7	210000	2734.7	159170378.2
	34563461.2	515.59	159070159.0	1074.7	785.6	80769	(BIEGE)	66127217.2
		11965.53	3052035.9					-88.12

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 419

Querschnitt Nr. 419

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3487.12	1171.57	66994196.6	-172.6	54.9	210000	2737.4	159251273.6
	34827533.6	518.93	159147668.9	1081.3	789.0	80769	(BIEGE)	66890585.8
		12023.78	3091731.3					-88.08

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 420

Querschnitt Nr. 420

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3493.92	1171.05	68542051.7	-172.3	55.3	210000	2742.7	159413362.5
	35356554.6	525.62	159302688.6	1094.5	795.6	80769	(BIEGE)	68431383.8
		12140.39	3171186.9					-88.00

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul
yc[mm], zc[mm] Ordinate des elastischen Zentrums
ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
E[N/mm²] Elastizitätsmodul
g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 421

Querschnitt Nr. 421

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3500.72	1170.54	70109099.6	-172.0	55.8	210000	2748.1	159575820.9
	35886717.1	532.31	159457708.4	1107.7	802.2	80769	(BIEGE)	69990987.0
		12257.11	3250731.9					-87.92

Mat Materialnummer
A[cm²] Querschnittsfläche
Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
MBw Bewehrungsmaterialnummer
It[cm⁴] Torsionsträgheitsmoment
G[N/mm²] Schubmodul
yc[mm], zc[mm] Ordinate des elastischen Zentrums
ysc[mm], zsc[mm] Ordinate des Schubmittelpunkts
E[N/mm²] Elastizitätsmodul
g[kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 422

Querschnitt Nr. 422

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3507.72	1170.02	71742332.4	-171.6	56.2	210000	2753.6	159743476.9
	36433640.3	539.20	159617270.0	1121.3	809.0	80769	(BIEGE)	71616119.6
		12377.39	3332708.8					-87.83
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 423

Querschnitt Nr. 423

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3514.52	1169.53	73348457.1	-171.3	56.6	210000	2758.9	159906805.5
	36966052.9	545.90	159772277.8	1134.5	815.6	80769	(BIEGE)	73213923.4
		12494.37	3412432.2					-87.74
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 424

Querschnitt Nr. 424

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3447.92	1160.16	71131337.1	-189.8	69.1	210000	2706.6	159279144.8
	36949578.2	546.67	159229208.0	1099.4	804.3	80769	(BIEGE)	71081412.3
		11682.68	2097863.9					-88.64
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 425

Querschnitt Nr. 425

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3451.32	1159.93	71915984.6	-189.6	69.4	210000	2709.3	159358883.9
	37215388.0	550.01	159306932.5	1105.8	807.5	80769	(BIEGE)	71864039.1
		11736.22	2131230.4					-88.60
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 426

Querschnitt Nr. 426

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3458.12	1159.48	73499358.1	-189.3	70.0	210000	2714.6	159518529.0
	37747794.6	556.70	159462369.5	1118.8	814.0	80769	(BIEGE)	73443192.7
		11843.37	2198040.1					-88.54
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 427

Querschnitt Nr. 427

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3464.92	1159.03	75101584.7	-188.9	70.5	210000	2720.0	159678448.2
	38281253.2	563.40	159617794.5	1131.7	820.5	80769	(BIEGE)	75040925.0
		11950.65	2264954.3					-88.47
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 428

Querschnitt Nr. 428

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3401.72	1151.15	73345226.5	-177.0	51.7	210000	2670.3	159652365.2
	38529530.4	570.23	159533418.2	1099.9	814.2	80769	(BIEGE)	73226273.5
		12897.69	3204146.8					-87.87
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 429

Querschnitt Nr. 429

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3408.52	1150.73	74919814.3	-176.6	52.1	210000	2675.7	159815288.6
	39062971.1	576.93	159688545.2	1112.6	820.6	80769	(BIEGE)	74793077.0
		13012.50	3280241.1					-87.79
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 430

Querschnitt Nr. 430

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3352.92	1152.80	75436956.1	-123.8	48.3	210000	2632.0	154134536.7
	39408654.2	584.16	154098630.9	1137.1	839.9	80769	(BIEGE)	75401044.4
		15194.75	1681150.5					-88.78
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 431

Querschnitt Nr. 431

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3357.52	1152.51	76511019.9	-123.6	48.7	210000	2635.7	154240764.1
	39770517.0	588.68	154202831.7	1145.8	844.3	80769	(BIEGE)	76473081.6
		15258.30	1717259.2					-88.73
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 432

Querschnitt Nr. 432

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3164.32	1110.79	67125064.5	-131.2	40.2	210000	2484.0	152673960.7
	38173923.1	581.52	152657831.6	1015.0	768.4	80769	(BIEGE)	67108947.4
		15082.82	1174281.4					-89.21

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 433

Querschnitt Nr. 433

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3171.12	1110.46	68542808.7	-130.9	40.6	210000	2489.3	152829755.3
	38695234.3	588.20	152811993.1	1026.9	774.5	80769	(BIEGE)	68525040.6
		15206.01	1223538.8					-89.17

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 434

Querschnitt Nr. 434

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3077.92	1094.39	63722813.5	-134.9	35.9	210000	2416.2	152375186.4
	38218695.2	591.42	152365208.6	958.8	744.8	80769	(BIEGE)	63712823.8
		15232.24	940966.6					-89.39
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 435

Querschnitt Nr. 435

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3084.72	1094.08	65061617.3	-134.6	36.3	210000	2421.5	152530599.6
	38734674.7	598.07	152519441.6	970.2	750.7	80769	(BIEGE)	65050453.3
		15351.14	988165.5					-89.35
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 436

Querschnitt Nr. 436

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3034.52	1094.47	65527964.0	-136.2	38.2	210000	2382.1	152303839.7
	39023477.1	602.49	152291143.9	989.4	753.1	80769	(BIEGE)	65515280.2
		15205.39	1049533.8					-89.31
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 437

Querschnitt Nr. 437

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.59	57991987.8	-141.6	33.0	210000	2290.9	151458610.0
	36657053.5	593.79	151454247.0	890.0	673.0	80769	(BIEGE)	57987630.7
		14977.97	638574.8					-89.61
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 438

Querschnitt Nr. 438

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2925.12	1062.34	59211188.9	-141.3	33.3	210000	2296.2	151613665.5
	37154680.7	600.42	151608599.2	900.9	678.5	80769	(BIEGE)	59206134.4
		15089.02	683711.7					-89.58

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 439

Querschnitt Nr. 439

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1062.08	60445148.1	-140.9	33.7	210000	2301.6	151768780.7
	37653523.9	607.04	151762951.3	911.9	684.0	80769	(BIEGE)	60439330.7
		15200.33	728965.0					-89.54

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 440

Querschnitt Nr. 440

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2938.72	1061.83	61693931.0	-140.6	34.1	210000	2306.9	151923943.5
	38153556.2	613.67	151917303.5	922.8	689.5	80769	(BIEGE)	61687279.1
		15311.93	774334.3					-89.51

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 441

Querschnitt Nr. 441

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2945.72	1061.56	62994957.4	-140.3	34.5	210000	2312.4	152083755.5
	38669526.8	620.49	152076185.7	934.2	695.2	80769	(BIEGE)	62987399.5
		15427.07	821157.5					-89.47

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 442

Querschnitt Nr. 442

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	2948.32	1061.47	63482225.3	-140.1	34.7	210000	2314.4	152143121.7
	38861483.6	623.03	152135194.3	938.4	697.3	80769	(BIEGE)	63474297.9
		15469.91	838579.9					-89.46
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 443

Querschnitt Nr. 443

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3065.72	1061.07	64686799.4	-196.4	34.8	210000	2406.6	158204020.0
	39112815.5	623.67	158156658.2	917.3	687.7	80769	(BIEGE)	64639437.6
		13485.81	2104583.6					-88.71
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 444

Querschnitt Nr. 444

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3192.52	1092.09	75344449.7	-188.6	25.8	210000	2506.1	159350777.6
	42391878.6	647.20	159256602.3	1034.9	777.3	80769	(BIEGE)	75250268.4
		17739.38	2812807.7					-88.08

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 445

Querschnitt Nr. 445

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3199.32	1092.43	76823854.9	-188.2	24.7	210000	2511.5	159512413.5
	42916214.7	654.90	159412015.5	1046.3	783.1	80769	(BIEGE)	76723444.9
		17287.21	2881325.8					-88.00

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 446

Querschnitt Nr. 446

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3376.52	1105.75	90417361.8	-204.8	55.1	210000	2650.6	160240746.5
	44280463.7	658.43	160212279.3	1195.6	820.8	80769	(BIEGE)	90388894.6
		15737.82	1409780.9					-88.84
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment		Schubmodul					
It[cm ⁴]								
G[N/mm ²]								

Querschnitt Nr. 447

Querschnitt Nr. 447

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3506.12	1122.99	101154232.6	-171.6	34.2	210000	2752.3	161838604.0
	45877054.6	675.05	161512518.9	1304.6	863.9	80769	(BIEGE)	100828147.5
		17313.81	4448364.0					-85.81
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment		Schubmodul					
It[cm ⁴]								
G[N/mm ²]								

Querschnitt Nr. 448

Querschnitt Nr. 448

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3509.92	1122.99	102199876.9	-171.4	33.9	210000	2755.3	161936868.2
	46177584.2	679.22	161599136.4	1311.8	867.3	80769	(BIEGE)	101862133.2
		17304.41	4491736.0					-85.70
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 449

Querschnitt Nr. 449

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3630.92	1121.55	105354166.7	-217.7	33.0	210000	2850.3	168254436.1
	46731922.3	682.15	167615283.6	1292.2	857.6	80769	(BIEGE)	104715002.2
		15172.11	6340593.1					-84.24
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 450

Querschnitt Nr. 450

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3946.92	1173.46	130196131.1	-200.2	20.2	210000	3098.3	171971977.8
	50685996.1	718.52	170362998.1	1527.3	976.2	80769	(BIEGE)	128587163.3
		20642.84	8198543.7					-78.90
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 451

Querschnitt Nr. 451

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3966.12	1173.59	136766780.3	-199.3	26.2	210000	3113.4	172811247.0
	52256518.9	738.71	170802653.9	1566.4	994.7	80769	(BIEGE)	134758187.2
		18261.84	8508747.9					-76.72
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 452

Querschnitt Nr. 452

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4228.72	1189.50	160282481.7	-186.9	27.4	210000	3319.5	177481914.6
	55066311.7	760.57	171608949.8	1761.5	1050.5	80769	(BIEGE)	154409528.7
		18334.15	10050454.8					-59.70
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 453

Querschnitt Nr. 453

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4254.52	1188.65	170593477.3	-185.8	26.6	210000	3339.8	181922746.8
	57208359.6	786.83	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869146.4
		18623.57	10496170.9					-47.19
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 454

Querschnitt Nr. 454

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4268.52	1190.10	176334191.4	-185.1	4.2	21000	3350.8	185332740.5
	58373898.6	804.36	172518218.6	1848.4	1087.5	80769	(BIEGE)	163519657.7
		26084.79	10738355.7					-39.96
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 455

Querschnitt Nr. 455

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4283.52	1189.58	182599283.4	-184.5	3.7	21000	3362.6	189757837.0
	59625047.8	819.60	172860838.0	1881.2	1101.9	80769	(BIEGE)	165702284.4
		26315.89	10998097.1					-33.06
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 456

Querschnitt Nr. 456

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1242.17	213235999.4	-173.5	8.6	210000	3576.2	217279960.0
	63359761.6	867.30	177472449.4	2094.9	1222.6	80769	(BIEGE)	173428488.8
		27316.81	12687797.9					-17.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 457

Querschnitt Nr. 457

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4584.12	1241.24	226913382.0	-172.4	7.9	210000	3598.5	230258871.5
	65759754.6	896.15	178119946.6	2160.5	1252.3	80769	(BIEGE)	174774421.3
		27793.28	13207247.9					-14.21

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 458

Querschnitt Nr. 458

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4555.72	1242.17	213235999.4	-173.5	8.6	210000	3576.2	217279960.0
	63359761.6	867.29	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428488.8
		27350.84	12687797.9					-17.68

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 459

Querschnitt Nr. 459

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4523.52	1243.40	198280860.2	-174.7	9.3	210000	3551.0	203708888.3
	60647458.2	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
		26796.33	12099491.1					-24.16

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 460

Querschnitt Nr. 460

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4508.52	1243.92	191513360.7	-175.3	9.7	210000	3539.2	197989667.7
	59387344.5	819.39	176396096.8	1986.0	1173.2	80769	(BIEGE)	169919789.9
		26538.92	11825670.4					-28.71

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 461

Querschnitt Nr. 461

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4254.52	1188.58	170593477.3	-185.8	26.5	210000	3339.8	181922746.8
	57208365.5	786.84	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869146.4
		18604.23	10496170.9					-47.19

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 462

Querschnitt Nr. 462

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4228.72	1189.50	160282481.7	-186.9	27.4	210000	3319.5	177481914.6
	55066311.7	760.56	171608949.8	1761.5	1050.5	80769	(BIEGE)	154409528.7
		18318.55	10050454.8					-59.70
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 463

Querschnitt Nr. 463

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4206.12	1190.20	151534880.1	-187.9	28.0	210000	3301.8	175059748.8
	53196490.1	737.53	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567654.6
		18142.40	9660675.4					-67.67
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 464

Querschnitt Nr. 464

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4186.92	1190.22	144310785.2	-188.7	21.8	210000	3286.7	173623396.0
	51613074.9	717.37	170653701.9	1670.4	1010.0	80769	(BIEGE)	141341091.1
		20369.68	9330020.2					-72.34

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 465

Querschnitt Nr. 465

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3930.92	1172.36	124854863.4	-201.0	42.2	210000	3085.8	171352590.2
	49381253.4	698.62	169996560.7	1494.7	962.0	80769	(BIEGE)	123498833.9
		15443.90	7940561.4					-80.31

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 466

Querschnitt Nr. 466

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3809.92	1175.24	120856738.8	-157.9	42.9	210000	2990.8	164677537.5
	48811573.1	695.83	163930297.9	1516.4	973.1	80769	(BIEGE)	120109499.2
		17615.00	5722293.7					-82.56

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 467

Querschnitt Nr. 467

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3506.12	1123.00	101154232.6	-171.6	34.2	210000	2752.3	161838604.0
	45877054.6	675.04	161512518.9	1304.6	863.9	80769	(BIEGE)	100828147.5
		17335.22	4448364.0					-85.81

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 468

Querschnitt Nr. 468

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3496.52	1123.10	98539072.9	-172.0	34.8	210000	2744.8	161592269.9
	45118993.8	664.71	161293686.4	1286.5	855.2	80769	(BIEGE)	98240495.3
		17319.94	4338924.2					-86.06
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 469

Querschnitt Nr. 469

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3489.32	1123.12	96602571.6	-172.4	35.5	210000	2739.1	161409164.5
	44551587.4	656.76	161129547.1	1272.9	848.8	80769	(BIEGE)	96322936.4
		17364.54	4256971.6					-86.24
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 470

Querschnitt Nr. 470

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3362.52	1105.86	86944890.6	-205.6	56.5	210000	2639.6	159914470.7
	43189004.3	642.80	159891379.9	1170.4	808.6	80769	(BIEGE)	86921811.6
		16069.14	1297892.0					-88.98
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 471

Querschnitt Nr. 471

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3185.72	1091.81	73881453.7	-189.0	40.9	210000	2500.8	159189463.6
	41868517.1	636.14	159101177.2	1023.6	771.8	80769	(BIEGE)	73793167.3
		13754.22	2744432.9					-88.16
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 472

Querschnitt Nr. 472

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3068.32	1093.03	72416764.9	-134.7	40.2	210000	2408.6	153078413.9
	41607156.6	635.64	153057838.4	1047.3	782.4	80769	(BIEGE)	72396183.5
		15788.25	1288411.0					-89.08
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 473

Querschnitt Nr. 473

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	2945.72	1061.56	62994957.4	-140.3	34.5	210000	2312.4	152083755.5
	38669526.8	620.49	152076185.7	934.2	695.2	80769	(BIEGE)	62987399.5
		15427.07	821157.5					-89.47
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 474

Querschnitt Nr. 474

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2938.72	1061.83	61693931.0	-140.6	34.1	210000	2306.9	151923943.5
	38153556.2	613.67	151917303.5	922.8	689.5	80769	(BIEGE)	61687279.1
		15311.93	774334.3					-89.51

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 475

Querschnitt Nr. 475

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1062.08	60445148.1	-140.9	33.7	210000	2301.6	151768780.7
	37653523.9	607.04	151762951.3	911.9	684.0	80769	(BIEGE)	60439330.7
		15200.33	728965.0					-89.54

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 476

Querschnitt Nr. 476

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	2925.12	1062.34	59211188.9	-141.3	33.3	210000	2296.2	151613665.5
	37154680.7	600.42	151608599.2	900.9	678.5	80769	(BIEGE)	59206134.4
		15089.02	683711.7					-89.58
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 477

Querschnitt Nr. 477

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2918.32	1062.59	57991987.8	-141.6	33.0	210000	2290.9	151458610.0
	36657053.5	593.79	151454247.0	890.0	673.0	80769	(BIEGE)	57987630.7
		14977.97	638574.8					-89.61

Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums	
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts	
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul	
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht	
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen					
MBw	Bewehrungsmaterialnummer					
It[cm ⁴]	Torsionsträgheitsmoment					
G[N/mm ²]	Schubmodul					

Querschnitt Nr. 478

Querschnitt Nr. 478

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2914.52	1062.73	57317066.5	-141.8	32.7	210000	2287.9	151371980.6
	36379498.5	590.09	151367975.2	883.9	669.9	80769	(BIEGE)	57313067.1
		14916.01	613402.2					-89.63
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 479

Querschnitt Nr. 479

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2964.72	1062.34	56854564.3	-140.0	31.1	210000	2327.3	151600111.5
	36102363.7	585.77	151596833.2	866.4	667.7	80769	(BIEGE)	56851280.1
		15056.58	557414.0					-89.66
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 480

Querschnitt Nr. 480

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3077.92	1094.39	63722813.5	-134.9	35.9	210000	2416.2	152375186.4
	38218695.2	591.42	152365208.6	958.8	744.8	80769	(BIEGE)	63712823.8
		15232.24	940966.6					-89.39
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 481

Querschnitt Nr. 481

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3071.12	1094.69	62399822.9	-135.2	35.5	210000	2410.8	152219868.6
	37703836.2	584.76	152210975.6	947.5	738.9	80769	(BIEGE)	62390923.9
		15113.54	893870.5					-89.43
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 482

Querschnitt Nr. 482

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3064.32	1095.00	61092639.3	-135.5	35.1	210000	2405.5	152064610.5
	37190124.6	578.11	152056730.7	936.1	733.0	80769	(BIEGE)	61084747.7
		14995.07	846879.7					-89.47
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 483

Querschnitt Nr. 483

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3157.52	1111.13	65723926.2	-131.5	39.8	210000	2478.7	152518237.6
	37653714.6	574.84	152503658.3	1003.2	762.3	80769	(BIEGE)	65709341.0
		14959.84	1125115.3					-89.26
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 484

Querschnitt Nr. 484

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3152.92	1111.36	64785492.8	-131.7	39.5	210000	2475.0	152412963.8
	37302449.6	570.32	152399362.1	995.2	758.2	80769	(BIEGE)	64771891.0
		14876.76	1091908.2					-89.29
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 485

Querschnitt Nr. 485

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3408.52	1150.72	74919814.3	-176.6	52.2	210000	2675.7	159815288.6
	39062971.1	576.91	159688545.2	1112.6	820.6	80769	(BIEGE)	74793077.0
		12996.91	3280241.1					-87.79
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 486

Querschnitt Nr. 486

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3401.72	1151.15	73345226.5	-177.0	51.7	210000	2670.3	159652365.2
	38529530.4	570.23	159533418.2	1099.9	814.2	80769	(BIEGE)	73226273.5
		12897.69	3204146.8					-87.87
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 487

Querschnitt Nr. 487

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3394.92	1151.58	71788985.0	-177.3	51.2	210000	2665.0	159489859.1
	37997120.8	563.54	159378279.2	1087.3	807.8	80769	(BIEGE)	71677411.0
		12782.97	3128157.2					-87.96
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 488

Querschnitt Nr. 488

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3388.12	1152.01	70251071.9	-177.7	50.8	210000	2659.7	159327722.6
	37465769.3	556.85	159223140.3	1074.7	801.4	80769	(BIEGE)	70146483.6
		12668.43	3052274.0					-88.04

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 489

Querschnitt Nr. 489

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3451.32	1159.93	71915984.6	-189.6	69.4	210000	2709.3	159358883.9
	37215388.0	550.01	159306932.5	1105.8	807.5	80769	(BIEGE)	71864039.1
		11736.22	2131230.4					-88.60
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 490

Querschnitt Nr. 490

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3447.92	1160.16	71131337.1	-189.8	69.1	210000	2706.6	159279144.8
	36949578.2	546.67	159229208.0	1099.4	804.3	80769	(BIEGE)	71081412.3
		11682.68	2097863.9					-88.64
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 491

Querschnitt Nr. 491

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3444.52	1160.40	70351404.4	-190.0	68.8	210000	2703.9	159199441.4
	36684045.4	543.33	159151471.6	1092.9	801.0	80769	(BIEGE)	70303428.6
		11629.19	2064525.2					-88.67
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 492

Querschnitt Nr. 492

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3437.72	1160.87	68805587.7	-190.4	68.2	210000	2698.6	159040261.3
	36153805.5	536.64	158996022.7	1080.0	794.5	80769	(BIEGE)	68761349.1
		11522.31	1997926.1					-88.73
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 493

Querschnitt Nr. 493

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3500.72	1170.54	70109099.6	-172.0	55.8	210000	2748.1	159575820.9
	35886717.1	532.31	159457708.4	1107.7	802.2	80769	(BIEGE)	69990987.0
		12257.11	3250731.9					-87.92
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 494

Querschnitt Nr. 494

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3493.92	1171.05	68542051.7	-172.3	55.3	210000	2742.7	159413362.5
	35356554.6	525.62	159302688.6	1094.5	795.6	80769	(BIEGE)	68431383.8
		12140.39	3171186.9					-88.00
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 495

Querschnitt Nr. 495

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3487.12	1171.57	66994196.6	-172.6	54.9	210000	2737.4	159251273.6
	34827533.6	518.93	159147668.9	1081.3	789.0	80769	(BIEGE)	66890585.8
		12023.78	3091731.3					-88.08
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 496

Querschnitt Nr. 496

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBW	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3483.72	1171.84	66227436.5	-172.8	54.7	210000	2734.7	159170378.2
	34563461.2	515.59	159070159.0	1074.7	785.6	80769	(BIEGE)	66127217.2
		11965.53	3052035.9					-88.12

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBW Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 497

Querschnitt Nr. 497

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBW	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3480.32	1172.11	65465474.5	-173.0	54.5	210000	2732.0	159089566.2
	34299683.8	512.24	158992637.2	1068.1	782.3	80769	(BIEGE)	65368557.4
		11907.29	3012364.2					-88.16

Mat Materialnummer
 A[cm²] Querschnittsfläche
 Ay[cm²], Az[cm²], Ayz[cm²] Schubverformungsfläche
 Iy[cm⁴], Iz[cm⁴], Iyz[cm⁴] Flächenträgheitsmoment
 I-1[cm⁴], I-2[cm⁴], α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBW Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 498

Querschnitt Nr. 498

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3473.52	1172.65	63955861.7	-173.3	54.0	210000	2726.7	158928180.7
	33773026.1	505.56	158837605.5	1054.9	775.7	80769	(BIEGE)	63865274.6
		11790.90	2933087.8					-88.23

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 499

Querschnitt Nr. 499

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3466.72	1173.20	62465298.6	-173.6	53.6	210000	2721.4	158767140.9
	33247584.3	498.88	158682561.9	1041.7	769.0	80769	(BIEGE)	62380731.5
		11674.64	2853901.9					-88.30

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 500

Querschnitt Nr. 500

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3459.72	1173.78	60950744.5	-174.0	53.2	210000	2715.9	158601666.5
	32707989.4	492.01	158522940.6	1028.2	762.1	80769	(BIEGE)	60872030.6
		11555.05	2772481.6					-88.37

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

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Querschnitt Nr. 501

Querschnitt Nr. 501

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3382.92	1165.01	57027149.5	-193.5	63.4	210000	2655.6	157764149.7
	31923547.6	482.88	157742835.0	976.6	741.6	80769	(BIEGE)	57005840.9
		10665.57	1465149.8					-89.17

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 502

Querschnitt Nr. 502

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3319.92	1167.96	56059044.9	-140.8	59.0	210000	2606.1	152044762.1
	31694287.3	482.72	152044762.1	984.8	752.3	80769	(BIEGE)	56059039.0
		12292.47						-90.00
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 503

Querschnitt Nr. 503

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3266.92	1157.40	53690201.4	-127.1	43.0	210000	2564.5	151625157.3
	31066024.5	477.41	151616765.0	950.5	732.4	80769	(BIEGE)	53681803.1
		13133.57	906643.6					-89.47
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 504

Querschnitt Nr. 504

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3260.12	1157.94	52379674.0	-127.3	42.6	210000	2559.2	151470018.4
	30551746.7	470.74	151462663.1	937.9	725.8	80769	(BIEGE)	52372312.9
		13006.98	854025.3					-89.51
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 505

Querschnitt Nr. 505

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3253.32	1158.50	51086759.9	-127.6	42.1	210000	2553.9	151314974.8
	30038890.4	464.08	151308561.3	925.2	719.1	80769	(BIEGE)	51080352.4
		12880.53	801481.9					-89.54
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 506

Querschnitt Nr. 506

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3176.52	1148.87	47414386.6	-147.2	49.9	210000	2493.6	150590086.9
	29204595.3	454.72	150588537.2	872.2	696.7	80769	(BIEGE)	47412830.9
		11831.91	-400573.1					89.78

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

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Querschnitt Nr. 507

Querschnitt Nr. 507

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3099.72	1140.94	43764913.3	-133.9	34.6	210000	2433.3	150160850.0
	28385254.9	448.11	150159646.0	818.2	676.6	80769	(BIEGE)	43763709.3
		12639.20	357465.9					-89.81

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 508

Querschnitt Nr. 508

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3042.32	1141.58	43026045.2	-135.8	36.0	210000	2388.2	149769307.1
	28134104.8	445.37	149768091.2	822.3	672.4	80769	(BIEGE)	43024832.3
		12421.06	358804.2					-89.81
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 509

Querschnitt Nr. 509

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3040.92	1141.69	42795610.7	-135.9	35.9	210000	2387.1	149737478.2
	28030818.9	444.00	149736333.8	819.8	671.1	80769	(BIEGE)	42794472.2
		12396.62	348596.0					-89.81
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 510

Querschnitt Nr. 510

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2834.12	1089.42	34411904.4	-145.8	27.6	210000	2224.8	147876192.0
	24869197.8	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411406.7
		12316.62	-238384.1					89.88
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 511

Querschnitt Nr. 511

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2827.32	1089.81	33490100.7	-146.1	27.3	210000	2219.4	147721935.2
	24401061.4	412.03	147721243.8	667.0	557.7	80769	(BIEGE)	33489400.4
		12488.81	-282669.4					89.86
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 512

Querschnitt Nr. 512

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2720.52	1070.90	28733942.1	-151.9	22.1	210000	2135.6	146964455.5
	22817401.7	401.97	146961201.1	585.5	510.7	80769	(BIEGE)	28730696.6
		11875.31	-619455.7					89.70

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 513

Querschnitt Nr. 513

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2713.72	1071.25	27932623.2	-152.3	21.8	210000	2130.3	146810306.0
	22367800.9	395.43	146806634.4	575.6	504.9	80769	(BIEGE)	27928948.6
		11773.86	-660669.7					89.68

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 514

Querschnitt Nr. 514

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2707.32	1071.58	27190327.8	-152.6	21.5	210000	2125.2	146665240.2
	21946561.5	389.28	146661151.3	566.2	499.5	80769	(BIEGE)	27186233.0
		11678.78	-699325.1					89.66
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 601

Querschnitt Nr. 601

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2713.72	1071.50	27932682.8	152.3	-21.8	210000	2130.3	146810306.0
	22367936.5	395.49	146806634.4	575.5	504.9	80769	(BIEGE)	27929008.2
			660615.0					-89.68
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 602

Querschnitt Nr. 602

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2720.52	1071.13	28734001.7	151.9	-22.1	210000	2135.6	146964443.6
	22817537.3	402.03	146961201.1	585.5	510.7	80769	(BIEGE)	28730762.2
			619400.9					-89.70

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 603

Querschnitt Nr. 603

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2727.32	1070.77	29548365.1	151.5	-22.4	210000	2140.9	147118617.0
	23269181.1	408.57	147115767.9	595.5	516.4	80769	(BIEGE)	29545527.9
			578042.8					-89.72

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 604

Querschnitt Nr. 604

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2734.12	1070.41	30375835.5	151.1	-22.8	210000	2146.3	147272778.5
	23722838.0	415.11	147270322.7	605.6	522.1	80769	(BIEGE)	30373376.8
			536541.3					-89.74

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 605

Querschnitt Nr. 605

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2840.92	1089.04	35347947.7	145.4	-28.0	210000	2230.1	148030472.7
	25339362.2	425.05	148030138.9	688.5	569.6	80769	(BIEGE)	35347616.9
			193918.5					-89.90

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 606

Querschnitt Nr. 606

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2842.32	1088.96	35542407.8	145.4	-28.1	210000	2231.2	148062230.1
	25436359.8	426.40	148061932.0	690.7	570.8	80769	(BIEGE)	35542100.9
			184759.9					-89.91
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 607

Querschnitt Nr. 607

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3099.72	1140.57	43765002.8	133.9	-34.6	210000	2433.3	150160838.1
	28385418.8	448.06	150159646.0	818.2	676.6	80769	(BIEGE)	43763798.7
			-357526.7					89.81
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 608

Querschnitt Nr. 608

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3106.52	1140.01	44909432.8	133.6	-35.0	210000	2438.6	150315428.7
	28888842.6	454.69	150313867.1	830.1	683.1	80769	(BIEGE)	44907862.2
			-406661.6					89.78

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 609

Querschnitt Nr. 609

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3113.32	1139.46	46070188.6	133.3	-35.4	210000	2444.0	150470067.0
	29393810.2	461.33	150468076.2	841.9	689.6	80769	(BIEGE)	46068191.8
			-455891.2					89.75

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 610

Querschnitt Nr. 610

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3190.12	1147.84	49869841.6	146.6	-51.3	210000	2504.2	150898493.3
	30222597.9	468.17	150897468.1	896.8	709.9	80769	(BIEGE)	49868810.5
			321496.4					-89.82

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 611

Querschnitt Nr. 611

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3266.92	1156.63	53690308.7	127.1	-43.0	210000	2564.5	151625157.3
	31066191.4	477.32	151616765.0	950.5	732.4	80769	(BIEGE)	53681916.3
			-906704.7					89.47

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 612

Querschnitt Nr. 612

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3269.92	1156.38	54274106.4	126.9	-43.2	210000	2566.9	151693619.2
	31293523.5	480.26	151684750.0	956.1	735.3	80769	(BIEGE)	54265225.3
			-929942.9					89.45
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 613

Querschnitt Nr. 613

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3332.92	1153.01	55198282.3	180.6	-47.3	210000	2616.3	157481385.2
	31521144.7	480.47	157430089.5	948.1	724.8	80769	(BIEGE)	55146986.6
			-2290417.8					88.72
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 614

Querschnitt Nr. 614

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3389.72	1163.36	58423597.0	193.1	-64.0	210000	2660.9	157921923.2
	32444259.7	489.40	157898367.4	989.4	748.2	80769	(BIEGE)	58400047.2
			-1530931.2					89.12
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 615

Querschnitt Nr. 615

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3396.72	1162.77	59880215.3	192.7	-64.6	210000	2666.4	158084500.8
	32981464.5	496.26	158058477.4	1002.5	755.0	80769	(BIEGE)	59854185.9
			-1598704.6					89.07
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 616

Querschnitt Nr. 616

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3473.52	1170.62	63955975.0	173.3	-54.0	210000	2726.7	158928192.6
	33773201.9	505.34	158837605.5	1054.9	775.7	80769	(BIEGE)	63865387.8
			-2933146.3					88.23
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 617

Querschnitt Nr. 617

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3480.32	1170.05	65465593.7	173.0	-54.5	210000	2732.0	159089554.3
	34299859.6	512.02	158992637.2	1068.1	782.3	80769	(BIEGE)	65368664.7
			-3012422.7					88.16
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 618

Querschnitt Nr. 618

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3483.72	1169.77	66227555.7	172.8	-54.7	210000	2734.7	159170390.1
	34563637.0	515.36	159070159.0	1074.7	785.6	80769	(BIEGE)	66127330.5
			-3052094.4					88.12

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 619

Querschnitt Nr. 619

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3487.12	1169.49	66994315.8	172.6	-54.9	210000	2737.4	159251285.6
	34827715.4	518.70	159147668.9	1081.3	788.9	80769	(BIEGE)	66890699.1
			-3091789.8					88.08

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 620

Querschnitt Nr. 620

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3493.92	1168.94	68542170.9	172.3	-55.3	210000	2742.7	159413362.5
	35356730.4	525.38	159302688.6	1094.5	795.6	80769	(BIEGE)	68431497.0
			-3171245.4					88.00

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 621

Querschnitt Nr. 621

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3500.72	1168.40	70109218.8	172.0	-55.8	210000	2748.1	159575832.9
	35886892.9	532.07	159457708.4	1107.7	802.2	80769	(BIEGE)	69991100.3
			-3250790.4					87.92

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 622

Querschnitt Nr. 622

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3507.72	1167.86	71742457.6	171.6	-56.2	210000	2753.6	159743488.8
	36433819.2	538.96	159617270.0	1121.3	809.0	80769	(BIEGE)	71616232.8
			-3332767.3					87.83

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 623

Querschnitt Nr. 623

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3514.52	1167.34	73348582.2	171.3	-56.6	210000	2758.9	159906817.5
	36966225.7	545.65	159772277.8	1134.5	815.6	80769	(BIEGE)	73214054.6
			-3412490.7					87.74

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 624

Querschnitt Nr. 624

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3447.92	1158.83	71131456.3	189.8	-69.1	210000	2706.6	159279132.9
	36949757.0	546.50	159229208.0	1099.4	804.2	80769	(BIEGE)	71081519.6
			-2097921.5					88.64
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 625

Querschnitt Nr. 625

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3451.32	1158.58	71916103.8	189.6	-69.4	210000	2709.3	159358883.9
	37215560.9	549.84	159306932.5	1105.8	807.5	80769	(BIEGE)	71864158.4
			-2131287.8					88.60
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 626

Querschnitt Nr. 626

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3458.12	1158.10	73499483.3	189.3	-70.0	210000	2714.6	159518529.0
	37747973.4	556.53	159462369.5	1118.8	814.0	80769	(BIEGE)	73443311.9
			-2198097.7					88.54
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 627

Querschnitt Nr. 627

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3464.92	1157.63	75101709.8	188.9	-70.5	210000	2720.0	159678460.1
	38281435.0	563.22	159617794.5	1131.7	820.5	80769	(BIEGE)	75041056.1
			-2265011.9					88.47
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 628

Querschnitt Nr. 628

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3401.72	1149.27	73345345.7	177.0	-51.7	210000	2670.3	159652377.1
	38529715.2	569.98	159533418.2	1099.9	814.2	80769	(BIEGE)	73226380.8
			-3204204.9					87.87
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 629

Querschnitt Nr. 629

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3408.52	1148.83	74919933.5	176.6	-52.1	210000	2675.7	159815300.5
	39063152.9	576.67	159688545.2	1112.6	820.6	80769	(BIEGE)	74793184.3
			-3280299.2					87.79
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 630

Querschnitt Nr. 630

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3352.92	1151.70	75437081.3	123.8	-48.3	210000	2632.0	154134536.7
	39408836.0	584.02	154098619.0	1137.1	839.9	80769	(BIEGE)	75401163.6
			-1681211.8					88.78

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 631

Querschnitt Nr. 631

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3357.52	1151.40	76511151.1	123.6	-48.7	210000	2635.7	154240776.0
	39770704.7	588.54	154202831.7	1145.8	844.3	80769	(BIEGE)	76473212.7
			-1717320.3					88.73

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 632

Querschnitt Nr. 632

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3164.32	1110.09	67125177.8	131.2	-40.2	210000	2484.0	152673960.7
	38174096.0	581.41	152657831.6	1015.0	768.4	80769	(BIEGE)	67109060.7
			-1174342.3					89.21

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 633

Querschnitt Nr. 633

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3171.12	1109.74	68542922.0	130.9	-40.6	210000	2489.3	152829755.3
	38695407.1	588.09	152811993.1	1026.9	774.5	80769	(BIEGE)	68525159.8
			-1223599.6					89.17

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 634

Querschnitt Nr. 634

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3077.92	1093.86	63722920.8	134.9	-35.9	210000	2416.2	152375198.3
	38218865.0	591.32	152365208.6	958.8	744.8	80769	(BIEGE)	63712931.1
			-941027.2					89.39

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 635

Querschnitt Nr. 635

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3084.72	1093.54	65061724.6	134.6	-36.3	210000	2421.5	152530611.5
	38734847.5	597.97	152519441.6	970.2	750.7	80769	(BIEGE)	65050566.6
			-988226.1					89.35

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 636

Querschnitt Nr. 636

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3034.52	1093.87	65528065.4	136.2	-38.2	210000	2382.1	152303839.7
	39023644.0	602.38	152291143.9	989.4	753.1	80769	(BIEGE)	65515375.5
			-1049589.2					89.31
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 637

Querschnitt Nr. 637

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.25	57992077.2	141.6	-33.0	210000	2290.9	151458621.9
	36657208.4	593.71	151454247.0	890.0	672.9	80769	(BIEGE)	57987720.1
			-638630.0					89.61
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 638

Querschnitt Nr. 638

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2925.12	1061.97	59211278.3	141.3	-33.3	210000	2296.2	151613653.6
	37154838.7	600.33	151608599.2	900.9	678.5	80769	(BIEGE)	59206211.9
			-683766.9					89.58
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 639

Querschnitt Nr. 639

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1061.70	60445243.5	140.9	-33.7	210000	2301.6	151768780.7
	37653678.9	606.95	151762951.3	911.9	684.0	80769	(BIEGE)	60439426.1
			-729020.2					89.54
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 640

Querschnitt Nr. 640

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2938.72	1061.43	61694026.4	140.6	-34.1	210000	2306.9	151923943.5
	38153720.1	613.57	151917303.5	922.8	689.5	80769	(BIEGE)	61687374.5
			-774389.6					89.51
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 641

Querschnitt Nr. 641

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2945.72	1061.15	62995052.7	140.3	-34.5	210000	2312.4	152083755.5
	38669690.7	620.39	152076185.7	934.2	695.2	80769	(BIEGE)	62987488.9
			-821212.8					89.47
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 642

Querschnitt Nr. 642

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2948.32	1061.05	63482320.7	140.1	-34.7	210000	2314.4	152143121.7
	38861644.5	622.92	152135194.3	938.4	697.3	80769	(BIEGE)	63474387.3
			-838635.1					89.46

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 643

Querschnitt Nr. 643

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3065.72	1059.96	64686900.8	196.4	-34.8	210000	2406.6	158204020.0
	39112976.4	623.45	158156658.2	917.3	687.7	80769	(BIEGE)	64639533.0
			-2104640.8					88.71

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 644

Querschnitt Nr. 644

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3192.52	1089.31	75344563.0	188.6	-25.8	210000	2506.1	159350789.6
	42392051.5	647.04	159256602.3	1034.9	777.3	80769	(BIEGE)	75250375.7
			-2812865.2					88.08

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 645

Querschnitt Nr. 645

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3199.32	1088.43	76823968.2	188.2	-24.7	210000	2511.5	159512413.5
	42916390.6	654.73	159412015.5	1046.3	783.1	80769	(BIEGE)	76723564.1
			-2881383.4					88.00

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 646

Querschnitt Nr. 646

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3376.52	1103.35	90417492.9	204.8	-55.1	210000	2650.6	160240734.6
	44280639.6	658.35	160212267.4	1195.6	820.8	80769	(BIEGE)	90389025.8
			-1409837.4					88.84
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 647

Querschnitt Nr. 647

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3506.12	1115.67	101154375.7	171.6	-34.2	210000	2752.3	161838604.0
	45877239.4	674.86	161512518.9	1304.6	863.9	80769	(BIEGE)	100828290.6
			-4448422.4					85.81
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 648

Querschnitt Nr. 648

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3509.92	1115.30	102200020.0	171.4	-33.9	210000	2755.3	161936880.1
	46177760.0	679.03	161599136.4	1311.8	867.3	80769	(BIEGE)	101862264.3
			-4491794.5					85.70
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 649

Querschnitt Nr. 649

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3630.92	1111.09	105354321.6	217.7	-33.0	210000	2850.3	168254448.0
	46732110.1	681.90	167615283.6	1292.2	857.6	80769	(BIEGE)	104715157.2
			-6340653.5					84.24
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 650

Querschnitt Nr. 650

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3946.92	1156.56	130196309.9	200.2	-20.2	210000	3098.3	171972001.6
	50686192.8	718.42	170362998.1	1527.3	976.1	80769	(BIEGE)	128587306.3
			-8198605.5					78.90

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 651

Querschnitt Nr. 651

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3966.12	1154.28	136766971.0	199.3	-26.2	210000	3113.4	172811282.7
	52256715.6	738.55	170802653.9	1566.4	994.7	80769	(BIEGE)	134758342.1
			-8508809.0					76.72

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 652

Querschnitt Nr. 652

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4228.72	1168.54	160282696.3	186.9	-27.4	210000	3319.5	177482010.0
	55066508.4	760.40	171608937.8	1761.5	1050.5	80769	(BIEGE)	154409624.1
			-10050517.4					59.70
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 653

Querschnitt Nr. 653

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4254.52	1166.60	170593691.9	185.8	-26.6	210000	3339.8	181922901.8
	57208568.2	786.66	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869182.1
			-10496232.7					47.19
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 654

Querschnitt Nr. 654

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4268.52	1163.66	176334417.9	185.1	-4.2	210000	3350.8	185332943.1
	58374101.3	804.35	172518218.6	1848.4	1087.5	80769	(BIEGE)	163519693.4
			-10738418.3					39.96

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 655

Querschnitt Nr. 655

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4283.52	1162.60	182599509.9	184.5	-3.7	210000	3362.6	189758063.5
	59625256.4	819.60	172860838.0	1881.2	1101.9	80769	(BIEGE)	165702296.3
			-10998159.0					33.06

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 656

Querschnitt Nr. 656

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4555.72	1209.22	213236261.7	173.5	-8.6	210000	3576.2	217280246.1
	63359976.2	867.30	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428465.0
			-12687860.5					17.68
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 657

Querschnitt Nr. 657

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α [°]
1	4584.12	1206.79	226913644.3	172.4	-7.9	210000	3598.5	230259181.5
	65759969.2	896.15	178119946.6	2160.5	1252.3	80769	(BIEGE)	174774421.3
			-13207310.5					14.21
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 658

Querschnitt Nr. 658

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4555.72	1209.23	213236261.7	173.5	-8.6	210000	3576.2	217280246.1
	63359976.2	867.29	177472449.4	2094.9	1222.5	80769	(BIEGE)	173428465.0
			-12687860.5					17.68

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 659

Querschnitt Nr. 659

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	4523.52	1211.88	198281098.6	174.7	-9.3	210000	3551.0	203709150.6
	60647666.8	834.62	176738203.6	2020.6	1188.9	80769	(BIEGE)	171310175.5
			-12099554.5					24.16

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 660

Querschnitt Nr. 660

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4508.52	1213.18	191513599.1	175.3	-9.7	210000	3539.2	197989894.2
	59387553.1	819.38	176396096.8	1986.0	1173.2	80769	(BIEGE)	169919801.8
			-11825733.0					28.71

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 661

Querschnitt Nr. 661

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4254.52	1166.67	170593691.9	185.8	-26.5	210000	3339.8	181922901.8
	57208568.2	786.67	172198403.9	1817.8	1075.4	80769	(BIEGE)	160869182.1
			-10496232.7					47.19

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 662

Querschnitt Nr. 662

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4228.72	1168.53	160282696.3	186.9	-27.4	210000	3319.5	177482010.0
	55066508.4	760.39	171608937.8	1761.5	1050.5	80769	(BIEGE)	154409624.1
			-10050517.4					59.70

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 663

Querschnitt Nr. 663

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	4206.12	1170.36	151535082.8	187.9	-28.0	210000	3301.8	175059820.3
	53196692.8	737.36	171092511.3	1712.2	1028.8	80769	(BIEGE)	147567773.8
			-9660738.0					67.67

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 664

Querschnitt Nr. 664

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	4186.92	1172.64	144310987.9	188.7	-21.8	210000	3286.7	173623443.7
	51613271.6	717.27	170653701.9	1670.4	1010.0	80769	(BIEGE)	141341234.1
			-9330082.0					72.34
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 665

Querschnitt Nr. 665

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3930.92	1159.42	124855042.3	201.0	-42.2	210000	3085.8	171352614.0
	49381453.1	698.35	169996560.7	1494.7	962.0	80769	(BIEGE)	123498977.0
			-7940623.2					80.31
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 666

Querschnitt Nr. 666

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3809.92	1165.54	120856917.6	157.9	-42.9	210000	2990.8	164677561.3
	48811766.8	695.62	163930297.9	1516.4	973.1	80769	(BIEGE)	120109666.1
			-5722352.9					82.56

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmomente
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 667

Querschnitt Nr. 667

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3506.12	1115.66	101154375.7	171.6	-34.2	210000	2752.3	161838604.0
	45877239.4	674.84	161512518.9	1304.6	863.9	80769	(BIEGE)	100828290.6
			-4448422.4					85.81

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmomente
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

Querschnitt Nr. 668

Querschnitt Nr. 668

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3496.52	1116.46	98539215.9	172.0	-34.8	210000	2744.8	161592269.9
	45119181.5	664.52	161293686.4	1286.5	855.2	80769	(BIEGE)	98240632.4
			-4338982.7					86.06
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm2]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche			E [N/mm2]		Elastizitätsmodul		
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 669

Querschnitt Nr. 669

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	3489.32	1117.14	96602714.6	172.4	-35.5	210000	2739.1	161409176.4
	44551769.2	656.57	161129547.1	1272.9	848.8	80769	(BIEGE)	96323073.5
			-4257029.7					86.24
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 670

Querschnitt Nr. 670

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3362.52	1104.41	86945021.7	205.6	-56.5	210000	2639.6	159914470.7
	43189186.1	642.73	159891379.9	1170.4	808.5	80769	(BIEGE)	86921930.8
			-1297948.5					88.98
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 671

Querschnitt Nr. 671

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3185.72	1090.24	73881567.0	189.0	-40.9	210000	2500.8	159189463.6
	41868686.9	635.89	159101177.2	1023.6	771.8	80769	(BIEGE)	73793268.7
			-2744490.5					88.16
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 672

Querschnitt Nr. 672

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3068.32	1092.35	72416872.2	134.7	-40.2	210000	2408.6	153078425.9
	41607326.5	635.51	153057838.4	1047.3	782.4	80769	(BIEGE)	72396290.7
			-1288466.4					89.08
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 673

Querschnitt Nr. 673

Querschnittswerte

Mat	A [cm2]	Ay [cm2]	Iy [cm4]	yc [mm]	ysc [mm]	E [N/mm2]	g [kg/m]	I-1 [cm4]
MBw	It [cm4]	Az [cm2]	Iz [cm4]	zc [mm]	zsc [mm]	G [N/mm2]		I-2 [cm4]
		Ayz [cm2]	Iyz [cm4]					α [°]
1	2945.72	1061.15	62995052.7	140.3	-34.5	210000	2312.4	152083755.5
	38669690.7	620.39	152076185.7	934.2	695.2	80769	(BIEGE)	62987488.9
			-821212.8					89.47
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm2]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm2], Az [cm2], Ayz [cm2]	Schubverformungsfläche		E [N/mm2]		Elastizitätsmodul			
Iy [cm4], Iz [cm4], Iyz [cm4]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm4], I-2 [cm4], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm4]	Torsionsträgheitsmoment							
G [N/mm2]	Schubmodul							

Querschnitt Nr. 674

Querschnitt Nr. 674

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2938.72	1061.43	61694026.4	140.6	-34.1	210000	2306.9	151923943.5
	38153720.1	613.57	151917303.5	922.8	689.5	80769	(BIEGE)	61687374.5
			-774389.6					89.51

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 675

Querschnitt Nr. 675

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2931.92	1061.70	60445243.5	140.9	-33.7	210000	2301.6	151768780.7
	37653678.9	606.95	151762951.3	911.9	684.0	80769	(BIEGE)	60439426.1
			-729020.2					89.54

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 676

Querschnitt Nr. 676

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2925.12	1061.97	59211278.3	141.3	-33.3	210000	2296.2	151613653.6
	37154838.7	600.33	151608599.2	900.9	678.5	80769	(BIEGE)	59206211.9
			-683766.9					89.58

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 677

Querschnitt Nr. 677

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2918.32	1062.25	57992077.2	141.6	-33.0	210000	2290.9	151458621.9
	36657208.4	593.71	151454247.0	890.0	672.9	80769	(BIEGE)	57987720.1
			-638630.0					89.61

Mat Materialnummer
 A [cm²] Querschnittsfläche
 Ay [cm²], Az [cm²], Ayz [cm²] Schubverformungsfläche
 Iy [cm⁴], Iz [cm⁴], Iyz [cm⁴] Flächenträgheitsmoment
 I-1 [cm⁴], I-2 [cm⁴], α [°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsnummer
 It [cm⁴] Torsionsträgheitsmoment
 G [N/mm²] Schubmodul

yc [mm], zc [mm] Ordinate des elastischen Zentrums
 ysc [mm], zsc [mm] Ordinate des Schubmittelpunkts
 E [N/mm²] Elastizitätsmodul
 g [kg/m] längenbezogenes Eigengewicht

Querschnitt Nr. 678

Querschnitt Nr. 678

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2914.52	1062.40	57317161.9	141.8	-32.7	210000	2287.9	151371980.6
	36379659.4	590.01	151367975.2	883.9	669.9	80769	(BIEGE)	57313156.5
			-613457.3					89.63

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 679

Querschnitt Nr. 679

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	2964.72	1062.04	56854659.7	140.0	-31.1	210000	2327.3	151600111.5
	36102524.6	585.69	151596833.2	866.4	667.7	80769	(BIEGE)	56851375.4
			-557474.4					89.66

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 680

Querschnitt Nr. 680

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3077.92	1093.86	63722920.8	134.9	-35.9	210000	2416.2	152375198.3
	38218865.0	591.32	152365208.6	958.8	744.8	80769	(BIEGE)	63712931.1
			-941027.2					89.39

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 681

Querschnitt Nr. 681

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3071.12	1094.18	62399930.1	135.2	-35.5	210000	2410.8	152219868.6
	37704003.1	584.66	152210975.6	947.5	738.9	80769	(BIEGE)	62391037.1
			-893931.1					89.43

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 682

Querschnitt Nr. 682

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3064.32	1094.51	61092740.7	135.5	-35.1	210000	2405.5	152064622.4
	37190291.5	578.01	152056730.7	936.1	733.0	80769	(BIEGE)	61084855.0
			-846940.3					89.47
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 683

Querschnitt Nr. 683

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3157.52	1110.45	65724033.5	131.5	-39.8	210000	2478.7	152518249.5
	37653887.5	574.73	152503658.3	1003.2	762.3	80769	(BIEGE)	65709448.3
			-1125176.2					89.26

Mat	Materialnummer	yc[mm],zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm],zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	längenbezogenes Eigengewicht
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 684

Querschnitt Nr. 684

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3152.92	1110.69	64785600.1	131.7	-39.5	210000	2475.0	152412975.8
	37302616.5	570.21	152399362.1	995.2	758.2	80769	(BIEGE)	64771998.3
			-1091969.1					89.29

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 685

Querschnitt Nr. 685

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3408.52	1148.83	74919933.5	176.6	-52.2	210000	2675.7	159815300.5
	39063152.9	576.66	159688545.2	1112.6	820.6	80769	(BIEGE)	74793184.3
			-3280299.2					87.79

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 686

Querschnitt Nr. 686

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3401.72	1149.27	73345345.7	177.0	-51.7	210000	2670.3	159652377.1
	38529715.2	569.98	159533418.2	1099.9	814.2	80769	(BIEGE)	73226380.8
			-3204204.9					87.87
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 687

Querschnitt Nr. 687

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3394.92	1149.73	71789104.2	177.3	-51.2	210000	2665.0	159489859.1
	37997305.6	563.30	159378279.2	1087.3	807.8	80769	(BIEGE)	71677530.2
			-3128215.3					87.96
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 688

Querschnitt Nr. 688

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3388.12	1150.19	70251191.1	177.7	-50.8	210000	2659.7	159327734.5
	37465945.1	556.61	159223140.3	1074.7	801.4	80769	(BIEGE)	70146596.9
			-3052332.1					88.04
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 689

Querschnitt Nr. 689

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3451.32	1158.58	71916103.8	189.6	-69.4	210000	2709.3	159358883.9
	37215560.9	549.84	159306932.5	1105.8	807.5	80769	(BIEGE)	71864158.4
			-2131287.8					88.60
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 690

Querschnitt Nr. 690

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3447.92	1158.83	71131456.3	189.8	-69.1	210000	2706.6	159279132.9
	36949757.0	546.50	159229208.0	1099.4	804.2	80769	(BIEGE)	71081519.6
			-2097921.5					88.64
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 691

Querschnitt Nr. 691

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3444.52	1159.07	70351523.6	190.0	-68.8	210000	2703.9	159199441.4
	36684221.3	543.16	159151471.6	1092.9	801.0	80769	(BIEGE)	70303547.8
			-2064582.5					88.67
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 692

Querschnitt Nr. 692

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3437.72	1159.57	68805706.9	190.4	-68.2	210000	2698.6	159040261.3
	36153981.3	536.48	158996022.7	1080.0	794.5	80769	(BIEGE)	68761468.4
			-1997983.7					88.73

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
 A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
 Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
 Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
 I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 693

Querschnitt Nr. 693

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3500.72	1168.40	70109218.8	172.0	-55.8	210000	2748.1	159575832.9
	35886892.9	532.07	159457708.4	1107.7	802.2	80769	(BIEGE)	69991100.3
			-3250790.4					87.92

Mat Materialnummer yc[mm],zc[mm] Ordinate des elastischen Zentrums
 A[cm²] Querschnittsfläche ysc[mm],zsc[mm] Ordinate des Schubmittelpunkts
 Ay[cm²],Az[cm²],Ayz[cm²] Schubverformungsfläche E[N/mm²] Elastizitätsmodul
 Iy[cm⁴],Iz[cm⁴],Iyz[cm⁴] Flächenträgheitsmoment g[kg/m] längenbezogenes Eigengewicht
 I-1[cm⁴],I-2[cm⁴],α[°] Hauptträgheitsmomente und Winkel der Hauptachsen
 MBw Bewehrungsmaterialnummer
 It[cm⁴] Torsionsträgheitsmoment
 G[N/mm²] Schubmodul

Querschnitt Nr. 694

Querschnitt Nr. 694

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3493.92	1168.94	68542170.9	172.3	-55.3	210000	2742.7	159413362.5
	35356730.4	525.38	159302688.6	1094.5	795.6	80769	(BIEGE)	68431497.0
			-3171245.4					88.00
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 695

Querschnitt Nr. 695

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3487.12	1169.49	66994315.8	172.6	-54.9	210000	2737.4	159251285.6
	34827715.4	518.70	159147668.9	1081.3	788.9	80769	(BIEGE)	66890699.1
			-3091789.8					88.08
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 696

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3483.72	1169.77	66227555.7	172.8	-54.7	210000	2734.7	159170390.1
	34563637.0	515.36	159070159.0	1074.7	785.6	80769	(BIEGE)	66127330.5
			-3052094.4					88.12
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment		Schubmodul					
It [cm ⁴]								
G [N/mm ²]								

Querschnitt Nr. 697

Querschnitt Nr. 697

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3480.32	1170.05	65465593.7	173.0	-54.5	210000	2732.0	159089554.3
	34299859.6	512.02	158992637.2	1068.1	782.3	80769	(BIEGE)	65368664.7
			-3012422.7					88.16
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		Bewehrungsmaterialnummer					
MBw	Torsionsträgheitsmoment		Schubmodul					
It [cm ⁴]								
G [N/mm ²]								

Querschnitt Nr. 698

Querschnitt Nr. 698

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	3473.52	1170.62	63955975.0	173.3	-54.0	210000	2726.7	158928192.6
	33773201.9	505.34	158837605.5	1054.9	775.7	80769	(BIEGE)	63865387.8
			-2933146.3					88.23
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 699

Querschnitt Nr. 699

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3466.72	1171.21	62465411.8	173.6	-53.6	210000	2721.4	158767129.0
	33247760.1	498.66	158682550.0	1041.7	769.0	80769	(BIEGE)	62380838.8
			-2853960.2					88.30
Mat	Materialnummer			yc [mm], zc [mm]		Ordinate des elastischen Zentrums		
A [cm ²]	Querschnittsfläche			ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts		
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche			E [N/mm ²]		Elastizitätsmodul		
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment			g [kg/m]		längenbezogenes Eigengewicht		
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 700

Querschnitt Nr. 700

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3459.72	1171.82	60950857.8	174.0	-53.2	210000	2715.9	158601654.5
	32708162.3	491.79	158522940.6	1028.2	762.1	80769	(BIEGE)	60872137.9
			-2772539.9					88.37
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 701

Querschnitt Nr. 701

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3382.92	1163.94	57027256.8	193.5	-63.4	210000	2655.6	157764149.7
	31923720.4	482.75	157742835.0	976.6	741.6	80769	(BIEGE)	57005936.3
			-1465207.1					89.17
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 702

Querschnitt Nr. 702

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3319.92	1167.78	56059152.2	140.8	-59.0	210000	2606.1	152044762.1
	31694457.1	482.70	152044762.1	984.8	752.3	80769	(BIEGE)	56059158.2

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 703

Querschnitt Nr. 703

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3266.92	1156.63	53690308.7	127.1	-43.0	210000	2564.5	151625157.3
	31066191.4	477.32	151616765.0	950.5	732.4	80769	(BIEGE)	53681916.3
			-906704.7					89.47

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 704

Querschnitt Nr. 704

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3260.12	1157.20	52379775.4	127.3	-42.6	210000	2559.2	151470030.3
	30551919.5	470.66	151462663.1	937.9	725.8	80769	(BIEGE)	52372420.2
			-854086.4					89.51
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

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Querschnitt Nr. 705

Querschnitt Nr. 705

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3253.32	1157.79	51086861.2	127.6	-42.1	210000	2553.9	151314974.8
	30039057.3	464.00	151308561.3	925.2	719.1	80769	(BIEGE)	51080447.7
			-801543.0					89.54
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 706

Querschnitt Nr. 706

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3176.52	1149.02	47414481.9	147.2	-49.9	210000	2493.6	150590086.9
	29204759.2	454.74	150588537.2	872.2	696.7	80769	(BIEGE)	47412926.2
			400513.1					-89.78
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 707

Querschnitt Nr. 707

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	3099.72	1140.57	43765002.8	133.9	-34.6	210000	2433.3	150160838.1
	28385418.8	448.06	150159646.0	818.2	676.6	80769	(BIEGE)	43763798.7
			-357526.7					89.81
Mat	Materialnummer		yc[mm], zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm], zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 708

Querschnitt Nr. 708

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3042.32	1141.19	43026128.7	135.8	-36.0	210000	2388.2	149769307.1
	28134265.7	445.32	149768091.2	822.3	672.4	80769	(BIEGE)	43024915.7
			-358859.7					89.81

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 709

Querschnitt Nr. 709

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
1	3040.92	1141.31	42795694.1	135.9	-35.9	210000	2387.1	149737478.2
	28030979.8	443.95	149736333.8	819.8	671.1	80769	(BIEGE)	42794555.7
			-348651.5					89.81

Mat	Materialnummer	yc [mm], zc [mm]	Ordinate des elastischen Zentrums
A [cm ²]	Querschnittsfläche	ysc [mm], zsc [mm]	Ordinate des Schubmittelpunkts
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche	E [N/mm ²]	Elastizitätsmodul
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment	g [kg/m]	Längenbezogenes Eigengewicht
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It [cm ⁴]	Torsionsträgheitsmoment		
G [N/mm ²]	Schubmodul		

Querschnitt Nr. 710

Querschnitt Nr. 710

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2834.12	1089.42	34411973.0	145.8	-27.6	210000	2224.8	147876192.0
	24869342.3	418.54	147875691.4	677.7	563.6	80769	(BIEGE)	34411478.3
			238329.0					-89.88

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 711

Querschnitt Nr. 711

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2827.32	1089.81	33490169.3	146.1	-27.3	210000	2219.4	147721935.2
	24401202.9	412.03	147721243.8	667.0	557.7	80769	(BIEGE)	33489471.9
			282614.4					-89.86

Mat	Materialnummer	yc[mm], zc[mm]	Ordinate des elastischen Zentrums
A[cm ²]	Querschnittsfläche	ysc[mm], zsc[mm]	Ordinate des Schubmittelpunkts
Ay[cm ²], Az[cm ²], Ayz[cm ²]	Schubverformungsfläche	E[N/mm ²]	Elastizitätsmodul
Iy[cm ⁴], Iz[cm ⁴], Iyz[cm ⁴]	Flächenträgheitsmoment	g[kg/m]	Längenbezogenes Eigengewicht
I-1[cm ⁴], I-2[cm ⁴], α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen		
MBw	Bewehrungsmaterialnummer		
It[cm ⁴]	Torsionsträgheitsmoment		
G[N/mm ²]	Schubmodul		

Querschnitt Nr. 712

Querschnitt Nr. 712

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2720.52	1071.13	28734001.7	151.9	-22.1	210000	2135.6	146964443.6
	22817537.3	402.03	146961201.1	585.5	510.7	80769	(BIEGE)	28730762.2
			619400.9					-89.70
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm ²]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche			E[N/mm ²]		Elastizitätsmodul		
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 713

Querschnitt Nr. 713

Querschnittswerte

Mat	A[cm ²]	Ay[cm ²]	Iy[cm ⁴]	yc[mm]	ysc[mm]	E[N/mm ²]	g[kg/m]	I-1[cm ⁴]
MBw	It[cm ⁴]	Az[cm ²]	Iz[cm ⁴]	zc[mm]	zsc[mm]	G[N/mm ²]		I-2[cm ⁴]
		Ayz[cm ²]	Iyz[cm ⁴]					α[°]
1	2713.72	1071.50	27932682.8	152.3	-21.8	210000	2130.3	146810306.0
	22367936.5	395.49	146806634.4	575.5	504.9	80769	(BIEGE)	27929008.2
			660615.0					-89.68
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm ²]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm ²],Az[cm ²],Ayz[cm ²]	Schubverformungsfläche		E[N/mm ²]		Elastizitätsmodul			
Iy[cm ⁴],Iz[cm ⁴],Iyz[cm ⁴]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm ⁴],I-2[cm ⁴],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm ⁴]	Torsionsträgheitsmoment							
G[N/mm ²]	Schubmodul							

Querschnitt Nr. 714

Querschnitt Nr. 714

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
1	2707.32	1071.86	27190384.4	152.6	-21.5	210000	2125.2	146665240.2
	21946697.1	389.35	146661139.4	566.2	499.5	80769	(BIEGE)	27186292.6
			699270.4					-89.66
Mat	Materialnummer		yc[mm],zc[mm]		Ordinate des elastischen Zentrums			
A[cm2]	Querschnittsfläche		ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts			
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche		E[N/mm2]		Elastizitätsmodul			
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment		g[kg/m]		längenbezogenes Eigengewicht			
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 801

Querschnitt Nr. 801

Querschnittswerte

Mat	A[cm2]	Ay[cm2]	Iy[cm4]	yc[mm]	ysc[mm]	E[N/mm2]	g[kg/m]	I-1[cm4]
MBw	It[cm4]	Az[cm2]	Iz[cm4]	zc[mm]	zsc[mm]	G[N/mm2]		I-2[cm4]
		Ayz[cm2]	Iyz[cm4]					α[°]
14	376.05	256.18	71243.5	0.0	0.0	210000	0.0	1678305.1
	173.6	30.62	1678305.1	34.3	-22.3	80769	(BIEGE)	71243.6
Mat	Materialnummer			yc[mm],zc[mm]		Ordinate des elastischen Zentrums		
A[cm2]	Querschnittsfläche			ysc[mm],zsc[mm]		Ordinate des Schubmittelpunkts		
Ay[cm2],Az[cm2],Ayz[cm2]	Schubverformungsfläche			E[N/mm2]		Elastizitätsmodul		
Iy[cm4],Iz[cm4],Iyz[cm4]	Flächenträgheitsmoment			g[kg/m]		längenbezogenes Eigengewicht		
I-1[cm4],I-2[cm4],α[°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It[cm4]	Torsionsträgheitsmoment							
G[N/mm2]	Schubmodul							

Querschnitt Nr. 802

Querschnitt Nr. 802

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
14	382.91	256.18	97961.1	0.0	0.0	210000	0.0	1678305.1
	175.9	36.35	1678305.1	-22.4	-90.9	80769	(BIEGE)	97961.2
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

Querschnitt Nr. 1000

Querschnittswerte

Mat	A [cm ²]	Ay [cm ²]	Iy [cm ⁴]	yc [mm]	ysc [mm]	E [N/mm ²]	g [kg/m]	I-1 [cm ⁴]
MBw	It [cm ⁴]	Az [cm ²]	Iz [cm ⁴]	zc [mm]	zsc [mm]	G [N/mm ²]		I-2 [cm ⁴]
		Ayz [cm ²]	Iyz [cm ⁴]					α [°]
40	10000.00		8333333.6	0.0	0.0	210000	0.0	
	15198178.7		8333333.6	0.0	0.0	80769		
Mat	Materialnummer		yc [mm], zc [mm]		Ordinate des elastischen Zentrums			
A [cm ²]	Querschnittsfläche		ysc [mm], zsc [mm]		Ordinate des Schubmittelpunkts			
Ay [cm ²], Az [cm ²], Ayz [cm ²]	Schubverformungsfläche		E [N/mm ²]		Elastizitätsmodul			
Iy [cm ⁴], Iz [cm ⁴], Iyz [cm ⁴]	Flächenträgheitsmoment		g [kg/m]		längenbezogenes Eigengewicht			
I-1 [cm ⁴], I-2 [cm ⁴], α [°]	Hauptträgheitsmomente und Winkel der Hauptachsen							
MBw	Bewehrungsmaterialnummer							
It [cm ⁴]	Torsionsträgheitsmoment							
G [N/mm ²]	Schubmodul							

2. Modellierung Längssystem

Im Nachfolgenden werden die Knoten und Stäbe dargestellt. Letztere definieren sich durch ihre Elementnummer, Gruppennummer sowie ihre Eigenschaften am Anfang und Ende des Stabes. Dazu gehören X-Wert, Knotennummer, Querschnittsnummer und Lagerungsbedingungen. Die Knotendefinition sowie weitere Stabwerte werden aufgrund der Übersichtlichkeit nicht gezeigt.

Folgende Knotennummern wurden vergeben:

Knoten	1-115	Knoten Hauptträger Unterstrom
Knoten	201-315	Knoten Hauptträger Oberstrom
Knoten	401-515	Knoten zwischen den Hohlkästen für Querträger

Die Gruppeneinteilung der Stäbe ist wie folgt:

Gruppe 1:	Widerlager Kehl
Gruppe 2:	Strompfeiler
Gruppe 3:	Widerlager Straßburg
Gruppe 4:	Hilfsstütze in Schuss 9
Gruppe 5:	Hilfsstütze in Schuss 13
Gruppe 6:	Hilfsstütze in Schuss 16
Gruppe 8:	Querträger in Schuss 1-6 und 14-19
Gruppe 9:	Querträger in Schuss 7-13
Gruppe 11-29:	Schüsse 1-19 des Hohlkastens Unterstrom
Gruppe 31-49:	Schüsse 1-19 des Hohlkastens Oberstrom

Die Stäbe haben folgende Nummerierung

Stäbe 1-114	Stäbe Hohlkasten Unterstrom
Stäbe 201-314	Stäbe Hohlkasten Oberstrom
Stäbe 401-599	Querträger

Die Widerlager sind wie folgt konstruiert:

Widerlager Kehl:	Knoten 601-632	Stäbe 601-604
Strompfeiler:	Knoten 701-732	Stäbe 701-704
Widerlager Straßburg:	Knoten 801-832	Stäbe 801-804
Hilfsstütze in Schuss 9:	Knoten 901-908	Stäbe 901-904
Hilfsstütze in Schuss 13:	Knoten 921-928	Stäbe 921-924
Hilfsstütze in Schuss 16:	Knoten 941-948	Stäbe 941-944

Knoten

Numer	X[m]	Y[m]	Z[m]	Auflager					
1	0.000	0.000	0.000						
2	2.460	0.000	0.000						
3	5.020	0.000	0.000						
4	7.580	0.000	0.000						
5	10.140	0.000	0.000						
6	12.700	0.000	0.000						
7	13.980	0.000	0.000						
8	15.260	0.000	0.000						
9	17.820	0.000	0.000						
10	20.380	0.000	0.000						
11	22.940	0.000	0.000						
12	25.500	0.000	0.000						
13	26.780	0.000	0.000						
14	28.060	0.000	0.000						
15	30.620	0.000	0.000						
16	33.180	0.000	0.000						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager					
17	35.740	0.000	0.000						
18	38.300	0.000	0.000						
19	39.580	0.000	0.000						
20	40.860	0.000	0.000						
21	43.420	0.000	0.000						
22	45.980	0.000	0.000						
23	48.540	0.000	0.000						
24	51.100	0.000	0.000						
25	52.390	0.000	0.000						
26	53.670	0.000	0.000						
27	56.230	0.000	0.000						
28	58.790	0.000	0.000						
29	61.350	0.000	0.000						
30	63.910	0.000	0.000						
31	65.190	0.000	0.000						
32	66.470	0.000	0.000						
33	69.030	0.000	0.000						
34	71.590	0.000	0.000						
35	74.150	0.000	0.000						
36	76.710	0.000	0.000						
37	77.990	0.000	0.000						
38	79.270	0.000	0.000						
39	81.830	0.000	0.000						
40	84.390	0.000	0.000						
41	86.950	0.000	0.000						
42	89.510	0.000	0.000						
43	90.790	0.000	0.000						
44	92.070	0.000	0.000						
45	94.630	0.000	0.000						
46	97.190	0.000	0.000						
47	99.750	0.000	0.000						
48	102.310	0.000	0.000						
49	103.590	0.000	0.000						
50	104.870	0.000	0.000						
51	107.430	0.000	0.000						
52	109.990	0.000	0.000						
53	112.550	0.000	0.000						
54	115.110	0.000	0.000						
55	116.400	0.000	0.000						
56	117.680	0.000	0.000						
57	120.240	0.000	0.000						
58	122.800	0.000	0.000						
59	125.360	0.000	0.000						
60	127.920	0.000	0.000						
61	129.200	0.000	0.000						
62	130.480	0.000	0.000						
63	133.040	0.000	0.000						
64	135.600	0.000	0.000						
65	138.160	0.000	0.000						
66	140.720	0.000	0.000						
67	142.000	0.000	0.000						
68	143.280	0.000	0.000						
69	145.840	0.000	0.000						
70	148.400	0.000	0.000						
71	150.960	0.000	0.000						
72	153.520	0.000	0.000						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager					
73	154.800	0.000	0.000						
74	156.080	0.000	0.000						
75	158.640	0.000	0.000						
76	161.200	0.000	0.000						
77	163.760	0.000	0.000						
78	166.320	0.000	0.000						
79	167.600	0.000	0.000						
80	168.880	0.000	0.000						
81	171.440	0.000	0.000						
82	174.000	0.000	0.000						
83	176.560	0.000	0.000						
84	179.120	0.000	0.000						
85	180.410	0.000	0.000						
86	181.690	0.000	0.000						
87	184.250	0.000	0.000						
88	186.810	0.000	0.000						
89	189.370	0.000	0.000						
90	191.930	0.000	0.000						
91	193.210	0.000	0.000						
92	194.490	0.000	0.000						
93	197.050	0.000	0.000						
94	199.610	0.000	0.000						
95	202.170	0.000	0.000						
96	204.730	0.000	0.000						
97	206.010	0.000	0.000						
98	207.290	0.000	0.000						
99	209.850	0.000	0.000						
100	212.410	0.000	0.000						
101	214.970	0.000	0.000						
102	217.530	0.000	0.000						
103	218.810	0.000	0.000						
104	220.090	0.000	0.000						
105	222.650	0.000	0.000						
106	225.210	0.000	0.000						
107	227.770	0.000	0.000						
108	230.330	0.000	0.000						
109	231.610	0.000	0.000						
110	232.890	0.000	0.000						
111	235.450	0.000	0.000						
112	238.010	0.000	0.000						
113	240.570	0.000	0.000						
114	243.130	0.000	0.000						
115	245.590	0.000	0.000						
201	0.000	-9.150	0.000						
202	2.460	-9.150	0.000						
203	5.020	-9.150	0.000						
204	7.580	-9.150	0.000						
205	10.140	-9.150	0.000						
206	12.700	-9.150	0.000						
207	13.980	-9.150	0.000						
208	15.260	-9.150	0.000						
209	17.820	-9.150	0.000						
210	20.380	-9.150	0.000						
211	22.940	-9.150	0.000						
212	25.500	-9.150	0.000						
213	26.780	-9.150	0.000						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager					
214	28.060	-9.150	0.000						
215	30.620	-9.150	0.000						
216	33.180	-9.150	0.000						
217	35.740	-9.150	0.000						
218	38.300	-9.150	0.000						
219	39.580	-9.150	0.000						
220	40.860	-9.150	0.000						
221	43.420	-9.150	0.000						
222	45.980	-9.150	0.000						
223	48.540	-9.150	0.000						
224	51.100	-9.150	0.000						
225	52.390	-9.150	0.000						
226	53.670	-9.150	0.000						
227	56.230	-9.150	0.000						
228	58.790	-9.150	0.000						
229	61.350	-9.150	0.000						
230	63.910	-9.150	0.000						
231	65.190	-9.150	0.000						
232	66.470	-9.150	0.000						
233	69.030	-9.150	0.000						
234	71.590	-9.150	0.000						
235	74.150	-9.150	0.000						
236	76.710	-9.150	0.000						
237	77.990	-9.150	0.000						
238	79.270	-9.150	0.000						
239	81.830	-9.150	0.000						
240	84.390	-9.150	0.000						
241	86.950	-9.150	0.000						
242	89.510	-9.150	0.000						
243	90.790	-9.150	0.000						
244	92.070	-9.150	0.000						
245	94.630	-9.150	0.000						
246	97.190	-9.150	0.000						
247	99.750	-9.150	0.000						
248	102.310	-9.150	0.000						
249	103.590	-9.150	0.000						
250	104.870	-9.150	0.000						
251	107.430	-9.150	0.000						
252	109.990	-9.150	0.000						
253	112.550	-9.150	0.000						
254	115.110	-9.150	0.000						
255	116.400	-9.150	0.000						
256	117.680	-9.150	0.000						
257	120.240	-9.150	0.000						
258	122.800	-9.150	0.000						
259	125.360	-9.150	0.000						
260	127.920	-9.150	0.000						
261	129.200	-9.150	0.000						
262	130.480	-9.150	0.000						
263	133.040	-9.150	0.000						
264	135.600	-9.150	0.000						
265	138.160	-9.150	0.000						
266	140.720	-9.150	0.000						
267	142.000	-9.150	0.000						
268	143.280	-9.150	0.000						
269	145.840	-9.150	0.000						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager				
270	148.400	-9.150	0.000					
271	150.960	-9.150	0.000					
272	153.520	-9.150	0.000					
273	154.800	-9.150	0.000					
274	156.080	-9.150	0.000					
275	158.640	-9.150	0.000					
276	161.200	-9.150	0.000					
277	163.760	-9.150	0.000					
278	166.320	-9.150	0.000					
279	167.600	-9.150	0.000					
280	168.880	-9.150	0.000					
281	171.440	-9.150	0.000					
282	174.000	-9.150	0.000					
283	176.560	-9.150	0.000					
284	179.120	-9.150	0.000					
285	180.410	-9.150	0.000					
286	181.690	-9.150	0.000					
287	184.250	-9.150	0.000					
288	186.810	-9.150	0.000					
289	189.370	-9.150	0.000					
290	191.930	-9.150	0.000					
291	193.210	-9.150	0.000					
292	194.490	-9.150	0.000					
293	197.050	-9.150	0.000					
294	199.610	-9.150	0.000					
295	202.170	-9.150	0.000					
296	204.730	-9.150	0.000					
297	206.010	-9.150	0.000					
298	207.290	-9.150	0.000					
299	209.850	-9.150	0.000					
300	212.410	-9.150	0.000					
301	214.970	-9.150	0.000					
302	217.530	-9.150	0.000					
303	218.810	-9.150	0.000					
304	220.090	-9.150	0.000					
305	222.650	-9.150	0.000					
306	225.210	-9.150	0.000					
307	227.770	-9.150	0.000					
308	230.330	-9.150	0.000					
309	231.610	-9.150	0.000					
310	232.890	-9.150	0.000					
311	235.450	-9.150	0.000					
312	238.010	-9.150	0.000					
313	240.570	-9.150	0.000					
314	243.130	-9.150	0.000					
315	245.590	-9.150	0.000					
401	0.000	-4.575	0.000					
402	2.460	-4.575	0.000					
403	5.020	-4.575	0.000					
404	7.580	-4.575	0.000					
405	10.140	-4.575	0.000					
406	12.700	-4.575	0.000					
408	15.260	-4.575	0.000					
409	17.820	-4.575	0.000					
410	20.380	-4.575	0.000					
411	22.940	-4.575	0.000					

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager					
412	25.500	-4.575	0.000						
414	28.060	-4.575	0.000						
415	30.620	-4.575	0.000						
416	33.180	-4.575	0.000						
417	35.740	-4.575	0.000						
418	38.300	-4.575	0.000						
420	40.860	-4.575	0.000						
421	43.420	-4.575	0.000						
422	45.980	-4.575	0.000						
423	48.540	-4.575	0.000						
424	51.100	-4.575	0.000						
426	53.670	-4.575	0.000						
427	56.230	-4.575	0.000						
428	58.790	-4.575	0.000						
429	61.350	-4.575	0.000						
430	63.910	-4.575	0.000						
432	66.470	-4.575	0.000						
433	69.030	-4.575	0.000						
434	71.590	-4.575	0.000						
435	74.150	-4.575	0.000						
436	76.710	-4.575	0.000						
438	79.270	-4.575	0.000						
439	81.830	-4.575	0.000						
440	84.390	-4.575	0.000						
441	86.950	-4.575	0.000						
442	89.510	-4.575	0.000						
444	92.070	-4.575	0.000						
445	94.630	-4.575	0.000						
446	97.190	-4.575	0.000						
447	99.750	-4.575	0.000						
448	102.310	-4.575	0.000						
450	104.870	-4.575	0.000						
451	107.430	-4.575	0.000						
452	109.990	-4.575	0.000						
453	112.550	-4.575	0.000						
454	115.110	-4.575	0.000						
456	117.680	-4.575	0.000						
457	120.240	-4.575	0.000						
458	122.800	-4.575	0.000						
459	125.360	-4.575	0.000						
460	127.920	-4.575	0.000						
462	130.480	-4.575	0.000						
463	133.040	-4.575	0.000						
464	135.600	-4.575	0.000						
465	138.160	-4.575	0.000						
466	140.720	-4.575	0.000						
468	143.280	-4.575	0.000						
469	145.840	-4.575	0.000						
470	148.400	-4.575	0.000						
471	150.960	-4.575	0.000						
472	153.520	-4.575	0.000						
474	156.080	-4.575	0.000						
475	158.640	-4.575	0.000						
476	161.200	-4.575	0.000						
477	163.760	-4.575	0.000						
478	166.320	-4.575	0.000						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager					
480	168.880	-4.575	0.000						
481	171.440	-4.575	0.000						
482	174.000	-4.575	0.000						
483	176.560	-4.575	0.000						
484	179.120	-4.575	0.000						
486	181.690	-4.575	0.000						
487	184.250	-4.575	0.000						
488	186.810	-4.575	0.000						
489	189.370	-4.575	0.000						
490	191.930	-4.575	0.000						
492	194.490	-4.575	0.000						
493	197.050	-4.575	0.000						
494	199.610	-4.575	0.000						
495	202.170	-4.575	0.000						
496	204.730	-4.575	0.000						
498	207.290	-4.575	0.000						
499	209.850	-4.575	0.000						
500	212.410	-4.575	0.000						
501	214.970	-4.575	0.000						
502	217.530	-4.575	0.000						
504	220.090	-4.575	0.000						
505	222.650	-4.575	0.000						
506	225.210	-4.575	0.000						
507	227.770	-4.575	0.000						
508	230.330	-4.575	0.000						
510	232.890	-4.575	0.000						
511	235.450	-4.575	0.000						
512	238.010	-4.575	0.000						
513	240.570	-4.575	0.000						
514	243.130	-4.575	0.000						
515	245.590	-4.575	0.000						
601	0.000	1.220	2.517						
602	0.000	1.220	2.967	PX	PY	PZ	MX	MY	MZ
611	0.000	-1.220	2.517						
612	0.000	-1.220	2.967	PX	PY	PZ	MX	MY	MZ
621	0.000	-7.930	2.517						
622	0.000	-7.930	2.967	PX	PY	PZ	MX	MY	MZ
631	0.000	-10.370	2.517						
632	0.000	-10.370	2.967	PX	PY	PZ	MX	MY	MZ
701	122.800	1.300	4.811						
702	122.800	1.300	5.319	PX	PY	PZ	MX	MY	MZ
711	122.800	-1.300	4.811						
712	122.800	-1.300	5.319	PX	PY	PZ	MX	MY	MZ
721	122.800	-7.850	4.811						
722	122.800	-7.850	5.319	PX	PY	PZ	MX	MY	MZ
731	122.800	-10.450	4.811						
732	122.800	-10.450	5.319	PX	PY	PZ	MX	MY	MZ
801	245.590	1.220	2.517						
802	245.590	1.220	2.967	PX	PY	PZ	MX	MY	MZ
811	245.590	-1.220	2.517						
812	245.590	-1.220	2.967	PX	PY	PZ	MX	MY	MZ
821	245.590	-7.930	2.517						
822	245.590	-7.930	2.967	PX	PY	PZ	MX	MY	MZ
831	245.590	-10.370	2.517						
832	245.590	-10.370	2.967	PX	PY	PZ	MX	MY	MZ
901	115.110	1.300	4.363						

Knoten

Nummer	X[m]	Y[m]	Z[m]	Auflager						
902	115.110	1.300	4.863	PX	PY	PZ	MX	MY	MZ	MB
903	115.110	-1.300	4.363							
904	115.110	-1.300	4.863	PX	PY	PZ	MX	MY	MZ	MB
905	115.110	-7.850	4.363							
906	115.110	-7.850	4.863	PX	PY	PZ	MX	MY	MZ	MB
907	115.110	-10.450	4.363							
908	115.110	-10.450	4.863	PX	PY	PZ	MX	MY	MZ	MB
921	163.760	1.300	3.606							
922	163.760	1.300	4.106	PX	PY	PZ	MX	MY	MZ	MB
923	163.760	-1.300	3.606							
924	163.760	-1.300	4.106	PX	PY	PZ	MX	MY	MZ	MB
925	163.760	-7.850	3.606							
926	163.760	-7.850	4.106	PX	PY	PZ	MX	MY	MZ	MB
927	163.760	-10.450	3.606							
928	163.760	-10.450	4.106	PX	PY	PZ	MX	MY	MZ	MB
941	202.170	1.300	3.080							
942	202.170	1.300	3.580	PX	PY	PZ	MX	MY	MZ	MB
943	202.170	-1.300	3.080							
944	202.170	-1.300	3.580	PX	PY	PZ	MX	MY	MZ	MB
945	202.170	-7.850	3.080							
946	202.170	-7.850	3.580	PX	PY	PZ	MX	MY	MZ	MB
947	202.170	-10.450	3.080							
948	202.170	-10.450	3.580	PX	PY	PZ	MX	MY	MZ	MB
MIN	0.000	-10.450	0.000							
MAX	245.590	1.300	5.319							

Kinematische Abhängigkeiten

Grp	Knoten	Typ	Referenz	$\Delta X[m]$	$\Delta Y[m]$	$\Delta Z[m]$	dX	dY	dZ	df
1	601	F	611	0.000	2.440	0.000				
1	601	F	1	0.000	1.220	2.517				
1	611	F	1	0.000	-1.220	2.517				
1	621	F	631	0.000	2.440	0.000				
1	621	F	201	0.000	1.220	2.517				
1	631	F	201	0.000	-1.220	2.517				
2	701	F	711	0.000	2.600	0.000				
2	701	F	58	0.000	1.300	4.811				
2	711	F	58	0.000	-1.300	4.811				
2	721	F	731	0.000	2.600	0.000				
2	721	F	258	0.000	1.300	4.811				
2	731	F	258	0.000	-1.300	4.811				
3	801	F	811	0.000	2.440	0.000				
3	801	F	115	0.000	1.220	2.517				
3	811	F	115	0.000	-1.220	2.517				
3	821	F	831	0.000	2.440	0.000				
3	821	F	315	0.000	1.220	2.517				
3	831	F	315	0.000	-1.220	2.517				
4	901	F	903	0.000	2.600	0.000				
4	901	F	54	0.000	1.300	4.363				
4	903	F	54	0.000	-1.300	4.363				
4	905	F	907	0.000	2.600	0.000				
4	905	F	254	0.000	1.300	4.363				
4	907	F	254	0.000	-1.300	4.363				
5	921	F	923	0.000	2.600	0.000				
5	921	F	77	0.000	1.300	3.606				
5	923	F	77	0.000	-1.300	3.606				

Kinematische Abhängigkeiten

Grp	Knoten	Typ	Referenz	$\Delta X[m]$	$\Delta Y[m]$	$\Delta Z[m]$	dX	dY	dZ	df
5	925	F	927	0.000	2.600	0.000				
5	925	F	277	0.000	1.300	3.606				
5	927	F	277	0.000	-1.300	3.606				
6	941	F	943	0.000	2.600	0.000				
6	941	F	95	0.000	1.300	3.080				
6	943	F	95	0.000	-1.300	3.080				
6	945	F	947	0.000	2.600	0.000				
6	945	F	295	0.000	1.300	3.080				
6	947	F	295	0.000	-1.300	3.080				
Grp primäre Gruppennummer Typ Koppelbedingungen $\Delta X[m], \Delta Y[m], \Delta Z[m]$ Abstand der Knoten dX,dY,dZ Richtung der Kopplung df Faktor für Zwischenknoten										

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
1	1601	601	0.000	1000		S	0.000	
		602	0.450	1000		S	0.450	Gelenke: VyVzMtMyMz
1	1602	611	0.000	1000		S	0.000	
		612	0.450	1000		S	0.450	Gelenke: VyMtMyMz
1	1603	621	0.000	1000		S	0.000	
		622	0.450	1000		S	0.450	Gelenke: VyMtMyMz
1	1604	631	0.000	1000		S	0.000	
		632	0.450	1000		S	0.450	Gelenke: VyVzMtMyMz
2	2701	701	0.000	1000		S	0.000	
		702	0.508	1000		S	0.508	Gelenke: MtMyMz
2	2702	711	0.000	1000		S	0.000	
		712	0.508	1000		S	0.508	Gelenke: MtMyMz
2	2703	721	0.000	1000		S	0.000	
		722	0.508	1000		S	0.508	Gelenke: MtMyMz
2	2704	731	0.000	1000		S	0.000	
		732	0.508	1000		S	0.508	Gelenke: MtMyMz
3	3801	801	0.000	1000		S	0.000	
		802	0.450	1000		S	0.450	Gelenke: VyVzMtMyMz
3	3802	811	0.000	1000		S	0.000	
		812	0.450	1000		S	0.450	Gelenke: VyMtMyMz
3	3803	821	0.000	1000		S	0.000	
		822	0.450	1000		S	0.450	Gelenke: VyMtMyMz
3	3804	831	0.000	1000		S	0.000	
		832	0.450	1000		S	0.450	Gelenke: VyVzMtMyMz
4	4901	901	0.000	1000		S	0.000	
		902	0.500	1000		S	0.500	Gelenke: VzMtMyMz
4	4902	903	0.000	1000		S	0.000	
		904	0.500	1000		S	0.500	Gelenke: MtMyMz
4	4903	905	0.000	1000		S	0.000	
		906	0.500	1000		S	0.500	Gelenke: MtMyMz
4	4904	907	0.000	1000		S	0.000	
		908	0.500	1000		S	0.500	Gelenke: VzMtMyMz
5	5921	921	0.000	1000		S	0.000	
		922	0.500	1000		S	0.500	Gelenke: VyVzMtMyMz
5	5922	923	0.000	1000		S	0.000	
		924	0.500	1000		S	0.500	Gelenke: VyVzMtMyMz
5	5923	925	0.000	1000		S	0.000	
		926	0.500	1000		S	0.500	Gelenke: VyVzMtMyMz
5	5924	927	0.000	1000		S	0.000	
		928	0.500	1000		S	0.500	Gelenke: VyVzMtMyMz
6	6941	941	0.000	1000		S	0.000	
		942	0.500	1000		S	0.500	Gelenke: VyVzMtMyMz

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
6	6942	943	0.000	1000		S	0.000	Gelenke: VyVzMtMyMz
		944	0.500	1000		S	0.500	
6	6943	945	0.000	1000		S	0.000	Gelenke: VyVzMtMyMz
		946	0.500	1000		S	0.500	
6	6944	947	0.000	1000		S	0.000	Gelenke: VyVzMtMyMz
		948	0.500	1000		S	0.500	
8	8401	1	0.000	801		0	0.000	
		401	4.575	802		0	4.575	
8	8402	2	0.000	801		0	0.000	
		402	4.575	802		0	4.575	
8	8403	3	0.000	801		0	0.000	
		403	4.575	802		0	4.575	
8	8404	4	0.000	801		0	0.000	
		404	4.575	802		0	4.575	
8	8405	5	0.000	801		0	0.000	
		405	4.575	802		0	4.575	
8	8406	6	0.000	801		0	0.000	
		406	4.575	802		0	4.575	
8	8407	401	0.000	802		0	0.000	
		201	4.575	801		0	4.575	
8	8408	402	0.000	802		0	0.000	
		202	4.575	801		0	4.575	
8	8409	403	0.000	802		0	0.000	
		203	4.575	801		0	4.575	
8	8410	404	0.000	802		0	0.000	
		204	4.575	801		0	4.575	
8	8411	405	0.000	802		0	0.000	
		205	4.575	801		0	4.575	
8	8412	406	0.000	802		0	0.000	
		206	4.575	801		0	4.575	
8	8420	8	0.000	801		0	0.000	
		408	4.575	802		0	4.575	
8	8421	9	0.000	801		0	0.000	
		409	4.575	802		0	4.575	
8	8422	10	0.000	801		0	0.000	
		410	4.575	802		0	4.575	
8	8423	11	0.000	801		0	0.000	
		411	4.575	802		0	4.575	
8	8424	12	0.000	801		0	0.000	
		412	4.575	802		0	4.575	
8	8425	408	0.000	802		0	0.000	
		208	4.575	801		0	4.575	
8	8426	409	0.000	802		0	0.000	
		209	4.575	801		0	4.575	
8	8427	410	0.000	802		0	0.000	
		210	4.575	801		0	4.575	
8	8428	411	0.000	802		0	0.000	
		211	4.575	801		0	4.575	
8	8429	412	0.000	802		0	0.000	
		212	4.575	801		0	4.575	
8	8430	14	0.000	801		0	0.000	
		414	4.575	802		0	4.575	
8	8431	15	0.000	801		0	0.000	
		415	4.575	802		0	4.575	
8	8432	16	0.000	801		0	0.000	
		416	4.575	802		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
8	8433	17	0.000	801		0	0.000	
		417	4.575	802		0	4.575	
8	8434	18	0.000	801		0	0.000	
		418	4.575	802		0	4.575	
8	8435	414	0.000	802		0	0.000	
		214	4.575	801		0	4.575	
8	8436	415	0.000	802		0	0.000	
		215	4.575	801		0	4.575	
8	8437	416	0.000	802		0	0.000	
		216	4.575	801		0	4.575	
8	8438	417	0.000	802		0	0.000	
		217	4.575	801		0	4.575	
8	8439	418	0.000	802		0	0.000	
		218	4.575	801		0	4.575	
8	8440	20	0.000	801		0	0.000	
		420	4.575	802		0	4.575	
8	8441	21	0.000	801		0	0.000	
		421	4.575	802		0	4.575	
8	8442	22	0.000	801		0	0.000	
		422	4.575	802		0	4.575	
8	8443	23	0.000	801		0	0.000	
		423	4.575	802		0	4.575	
8	8444	24	0.000	801		0	0.000	
		424	4.575	802		0	4.575	
8	8445	420	0.000	802		0	0.000	
		220	4.575	801		0	4.575	
8	8446	421	0.000	802		0	0.000	
		221	4.575	801		0	4.575	
8	8447	422	0.000	802		0	0.000	
		222	4.575	801		0	4.575	
8	8448	423	0.000	802		0	0.000	
		223	4.575	801		0	4.575	
8	8449	424	0.000	802		0	0.000	
		224	4.575	801		0	4.575	
8	8450	26	0.000	801		0	0.000	
		426	4.575	802		0	4.575	
8	8451	27	0.000	801		0	0.000	
		427	4.575	802		0	4.575	
8	8452	28	0.000	801		0	0.000	
		428	4.575	802		0	4.575	
8	8453	29	0.000	801		0	0.000	
		429	4.575	802		0	4.575	
8	8454	30	0.000	801		0	0.000	
		430	4.575	802		0	4.575	
8	8455	426	0.000	802		0	0.000	
		226	4.575	801		0	4.575	
8	8456	427	0.000	802		0	0.000	
		227	4.575	801		0	4.575	
8	8457	428	0.000	802		0	0.000	
		228	4.575	801		0	4.575	
8	8458	429	0.000	802		0	0.000	
		229	4.575	801		0	4.575	
8	8459	430	0.000	802		0	0.000	
		230	4.575	801		0	4.575	
8	8460	32	0.000	801		0	0.000	
		432	4.575	802		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x [m]	QNr	NrP	E	Referenz	Eigenschaften
8	8461	33	0.000	801		0	0.000	
		433	4.575	802		0	4.575	
8	8462	34	0.000	801		0	0.000	
		434	4.575	802		0	4.575	
8	8463	35	0.000	801		0	0.000	
		435	4.575	802		0	4.575	
8	8464	36	0.000	801		0	0.000	
		436	4.575	802		0	4.575	
8	8465	432	0.000	802		0	0.000	
		232	4.575	801		0	4.575	
8	8466	433	0.000	802		0	0.000	
		233	4.575	801		0	4.575	
8	8467	434	0.000	802		0	0.000	
		234	4.575	801		0	4.575	
8	8468	435	0.000	802		0	0.000	
		235	4.575	801		0	4.575	
8	8469	436	0.000	802		0	0.000	
		236	4.575	801		0	4.575	
8	8540	80	0.000	801		0	0.000	
		480	4.575	802		0	4.575	
8	8541	81	0.000	801		0	0.000	
		481	4.575	802		0	4.575	
8	8542	82	0.000	801		0	0.000	
		482	4.575	802		0	4.575	
8	8543	83	0.000	801		0	0.000	
		483	4.575	802		0	4.575	
8	8544	84	0.000	801		0	0.000	
		484	4.575	802		0	4.575	
8	8545	480	0.000	802		0	0.000	
		280	4.575	801		0	4.575	
8	8546	481	0.000	802		0	0.000	
		281	4.575	801		0	4.575	
8	8547	482	0.000	802		0	0.000	
		282	4.575	801		0	4.575	
8	8548	483	0.000	802		0	0.000	
		283	4.575	801		0	4.575	
8	8549	484	0.000	802		0	0.000	
		284	4.575	801		0	4.575	
8	8550	86	0.000	801		0	0.000	
		486	4.575	802		0	4.575	
8	8551	87	0.000	801		0	0.000	
		487	4.575	802		0	4.575	
8	8552	88	0.000	801		0	0.000	
		488	4.575	802		0	4.575	
8	8553	89	0.000	801		0	0.000	
		489	4.575	802		0	4.575	
8	8554	90	0.000	801		0	0.000	
		490	4.575	802		0	4.575	
8	8555	486	0.000	802		0	0.000	
		286	4.575	801		0	4.575	
8	8556	487	0.000	802		0	0.000	
		287	4.575	801		0	4.575	
8	8557	488	0.000	802		0	0.000	
		288	4.575	801		0	4.575	
8	8558	489	0.000	802		0	0.000	
		289	4.575	801		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
8	8559	490	0.000	802		0	0.000	
		290	4.575	801		0	4.575	
8	8560	92	0.000	801		0	0.000	
		492	4.575	802		0	4.575	
8	8561	93	0.000	801		0	0.000	
		493	4.575	802		0	4.575	
8	8562	94	0.000	801		0	0.000	
		494	4.575	802		0	4.575	
8	8563	95	0.000	801		0	0.000	
		495	4.575	802		0	4.575	
8	8564	96	0.000	801		0	0.000	
		496	4.575	802		0	4.575	
8	8565	492	0.000	802		0	0.000	
		292	4.575	801		0	4.575	
8	8566	493	0.000	802		0	0.000	
		293	4.575	801		0	4.575	
8	8567	494	0.000	802		0	0.000	
		294	4.575	801		0	4.575	
8	8568	495	0.000	802		0	0.000	
		295	4.575	801		0	4.575	
8	8569	496	0.000	802		0	0.000	
		296	4.575	801		0	4.575	
8	8570	98	0.000	801		0	0.000	
		498	4.575	802		0	4.575	
8	8571	99	0.000	801		0	0.000	
		499	4.575	802		0	4.575	
8	8572	100	0.000	801		0	0.000	
		500	4.575	802		0	4.575	
8	8573	101	0.000	801		0	0.000	
		501	4.575	802		0	4.575	
8	8574	102	0.000	801		0	0.000	
		502	4.575	802		0	4.575	
8	8575	498	0.000	802		0	0.000	
		298	4.575	801		0	4.575	
8	8576	499	0.000	802		0	0.000	
		299	4.575	801		0	4.575	
8	8577	500	0.000	802		0	0.000	
		300	4.575	801		0	4.575	
8	8578	501	0.000	802		0	0.000	
		301	4.575	801		0	4.575	
8	8579	502	0.000	802		0	0.000	
		302	4.575	801		0	4.575	
8	8580	104	0.000	801		0	0.000	
		504	4.575	802		0	4.575	
8	8581	105	0.000	801		0	0.000	
		505	4.575	802		0	4.575	
8	8582	106	0.000	801		0	0.000	
		506	4.575	802		0	4.575	
8	8583	107	0.000	801		0	0.000	
		507	4.575	802		0	4.575	
8	8584	108	0.000	801		0	0.000	
		508	4.575	802		0	4.575	
8	8585	504	0.000	802		0	0.000	
		304	4.575	801		0	4.575	
8	8586	505	0.000	802		0	0.000	
		305	4.575	801		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
8	8587	506	0.000	802		0	0.000	
		306	4.575	801		0	4.575	
8	8588	507	0.000	802		0	0.000	
		307	4.575	801		0	4.575	
8	8589	508	0.000	802		0	0.000	
		308	4.575	801		0	4.575	
8	8590	110	0.000	801		0	0.000	
		510	4.575	802		0	4.575	
8	8591	111	0.000	801		0	0.000	
		511	4.575	802		0	4.575	
8	8592	112	0.000	801		0	0.000	
		512	4.575	802		0	4.575	
8	8593	113	0.000	801		0	0.000	
		513	4.575	802		0	4.575	
8	8594	114	0.000	801		0	0.000	
		514	4.575	802		0	4.575	
8	8595	510	0.000	802		0	0.000	
		310	4.575	801		0	4.575	
8	8596	511	0.000	802		0	0.000	
		311	4.575	801		0	4.575	
8	8597	512	0.000	802		0	0.000	
		312	4.575	801		0	4.575	
8	8598	513	0.000	802		0	0.000	
		313	4.575	801		0	4.575	
8	8599	514	0.000	802		0	0.000	
		314	4.575	801		0	4.575	
9	9470	38	0.000	801		0	0.000	
		438	4.575	802		0	4.575	
9	9471	39	0.000	801		0	0.000	
		439	4.575	802		0	4.575	
9	9472	40	0.000	801		0	0.000	
		440	4.575	802		0	4.575	
9	9473	41	0.000	801		0	0.000	
		441	4.575	802		0	4.575	
9	9474	42	0.000	801		0	0.000	
		442	4.575	802		0	4.575	
9	9475	438	0.000	802		0	0.000	
		238	4.575	801		0	4.575	
9	9476	439	0.000	802		0	0.000	
		239	4.575	801		0	4.575	
9	9477	440	0.000	802		0	0.000	
		240	4.575	801		0	4.575	
9	9478	441	0.000	802		0	0.000	
		241	4.575	801		0	4.575	
9	9479	442	0.000	802		0	0.000	
		242	4.575	801		0	4.575	
9	9480	44	0.000	801		0	0.000	
		444	4.575	802		0	4.575	
9	9481	45	0.000	801		0	0.000	
		445	4.575	802		0	4.575	
9	9482	46	0.000	801		0	0.000	
		446	4.575	802		0	4.575	
9	9483	47	0.000	801		0	0.000	
		447	4.575	802		0	4.575	
9	9484	48	0.000	801		0	0.000	
		448	4.575	802		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
9	9485	444	0.000	802		0	0.000	
		244	4.575	801		0	4.575	
9	9486	445	0.000	802		0	0.000	
		245	4.575	801		0	4.575	
9	9487	446	0.000	802		0	0.000	
		246	4.575	801		0	4.575	
9	9488	447	0.000	802		0	0.000	
		247	4.575	801		0	4.575	
9	9489	448	0.000	802		0	0.000	
		248	4.575	801		0	4.575	
9	9490	50	0.000	801		0	0.000	
		450	4.575	802		0	4.575	
9	9491	51	0.000	801		0	0.000	
		451	4.575	802		0	4.575	
9	9492	52	0.000	801		0	0.000	
		452	4.575	802		0	4.575	
9	9493	53	0.000	801		0	0.000	
		453	4.575	802		0	4.575	
9	9494	54	0.000	801		0	0.000	
		454	4.575	802		0	4.575	
9	9495	450	0.000	802		0	0.000	
		250	4.575	801		0	4.575	
9	9496	451	0.000	802		0	0.000	
		251	4.575	801		0	4.575	
9	9497	452	0.000	802		0	0.000	
		252	4.575	801		0	4.575	
9	9498	453	0.000	802		0	0.000	
		253	4.575	801		0	4.575	
9	9499	454	0.000	802		0	0.000	
		254	4.575	801		0	4.575	
9	9500	56	0.000	801		0	0.000	
		456	4.575	802		0	4.575	
9	9501	57	0.000	801		0	0.000	
		457	4.575	802		0	4.575	
9	9502	58	0.000	801		0	0.000	
		458	4.575	802		0	4.575	
9	9503	59	0.000	801		0	0.000	
		459	4.575	802		0	4.575	
9	9504	60	0.000	801		0	0.000	
		460	4.575	802		0	4.575	
9	9505	456	0.000	802		0	0.000	
		256	4.575	801		0	4.575	
9	9506	457	0.000	802		0	0.000	
		257	4.575	801		0	4.575	
9	9507	458	0.000	802		0	0.000	
		258	4.575	801		0	4.575	
9	9508	459	0.000	802		0	0.000	
		259	4.575	801		0	4.575	
9	9509	460	0.000	802		0	0.000	
		260	4.575	801		0	4.575	
9	9510	62	0.000	801		0	0.000	
		462	4.575	802		0	4.575	
9	9511	63	0.000	801		0	0.000	
		463	4.575	802		0	4.575	
9	9512	64	0.000	801		0	0.000	
		464	4.575	802		0	4.575	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
9	9513	65	0.000	801		0	0.000	
		465	4.575	802		0	4.575	
9	9514	66	0.000	801		0	0.000	
		466	4.575	802		0	4.575	
9	9515	462	0.000	802		0	0.000	
		262	4.575	801		0	4.575	
9	9516	463	0.000	802		0	0.000	
		263	4.575	801		0	4.575	
9	9517	464	0.000	802		0	0.000	
		264	4.575	801		0	4.575	
9	9518	465	0.000	802		0	0.000	
		265	4.575	801		0	4.575	
9	9519	466	0.000	802		0	0.000	
		266	4.575	801		0	4.575	
9	9520	68	0.000	801		0	0.000	
		468	4.575	802		0	4.575	
9	9521	69	0.000	801		0	0.000	
		469	4.575	802		0	4.575	
9	9522	70	0.000	801		0	0.000	
		470	4.575	802		0	4.575	
9	9523	71	0.000	801		0	0.000	
		471	4.575	802		0	4.575	
9	9524	72	0.000	801		0	0.000	
		472	4.575	802		0	4.575	
9	9525	468	0.000	802		0	0.000	
		268	4.575	801		0	4.575	
9	9526	469	0.000	802		0	0.000	
		269	4.575	801		0	4.575	
9	9527	470	0.000	802		0	0.000	
		270	4.575	801		0	4.575	
9	9528	471	0.000	802		0	0.000	
		271	4.575	801		0	4.575	
9	9529	472	0.000	802		0	0.000	
		272	4.575	801		0	4.575	
9	9530	74	0.000	801		0	0.000	
		474	4.575	802		0	4.575	
9	9531	75	0.000	801		0	0.000	
		475	4.575	802		0	4.575	
9	9532	76	0.000	801		0	0.000	
		476	4.575	802		0	4.575	
9	9533	77	0.000	801		0	0.000	
		477	4.575	802		0	4.575	
9	9534	78	0.000	801		0	0.000	
		478	4.575	802		0	4.575	
9	9535	474	0.000	802		0	0.000	
		274	4.575	801		0	4.575	
9	9536	475	0.000	802		0	0.000	
		275	4.575	801		0	4.575	
9	9537	476	0.000	802		0	0.000	
		276	4.575	801		0	4.575	
9	9538	477	0.000	802		0	0.000	
		277	4.575	801		0	4.575	
9	9539	478	0.000	802		0	0.000	
		278	4.575	801		0	4.575	
11	11001	1	0.000	1		0	0.000	
		2	2.460	401		0	2.460	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
11	11002	2	0.000	2		0	2.460	
		3	2.560	402		0	5.020	
11	11003	3	0.000	3		0	5.020	
		4	2.560	403		0	7.580	
11	11004	4	0.000	4		0	7.580	
		5	2.560	404		0	10.140	
11	11005	5	0.000	5		0	10.140	
		6	2.560	405		0	12.700	
11	11006	6	0.000	6		0	12.700	
		7	1.280	406		0	13.980	
12	12007	7	0.000	7		0	0.000	
		8	1.280	407		0	1.280	
12	12008	8	0.000	8		0	1.280	
		9	2.560	408		0	3.840	
12	12009	9	0.000	9		0	3.840	
		10	2.560	409		0	6.400	
12	12010	10	0.000	10		0	6.400	
		11	2.560	410		0	8.960	
12	12011	11	0.000	11		0	8.960	
		12	2.560	411		0	11.520	
12	12012	12	0.000	12		0	11.520	
		13	1.280	412		0	12.800	
13	13013	13	0.000	13		0	0.000	
		14	1.280	413		0	1.280	
13	13014	14	0.000	14		0	1.280	
		15	2.560	414		0	3.840	
13	13015	15	0.000	15		0	3.840	
		16	2.560	415		0	6.400	
13	13016	16	0.000	16		0	6.400	
		17	2.560	416		0	8.960	
13	13017	17	0.000	17		0	8.960	
		18	2.560	417		0	11.520	
13	13018	18	0.000	18		0	11.520	
		19	1.280	418		0	12.800	
14	14019	19	0.000	19		0	0.000	
		20	1.280	419		0	1.280	
14	14020	20	0.000	20		0	1.280	
		21	2.560	420		0	3.840	
14	14021	21	0.000	21		0	3.840	
		22	2.560	421		0	6.400	
14	14022	22	0.000	22		0	6.400	
		23	2.560	422		0	8.960	
14	14023	23	0.000	23		0	8.960	
		24	2.560	423		0	11.520	
14	14024	24	0.000	24		0	11.520	
		25	1.290	424		0	12.810	
15	15025	25	0.000	25		0	0.000	
		26	1.280	425		0	1.280	
15	15026	26	0.000	26		0	1.280	
		27	2.560	426		0	3.840	
15	15027	27	0.000	27		0	3.840	
		28	2.560	427		0	6.400	
15	15028	28	0.000	28		0	6.400	
		29	2.560	428		0	8.960	
15	15029	29	0.000	29		0	8.960	
		30	2.560	429		0	11.520	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
15	15030	30	0.000	30		0	11.520	
		31	1.280	430		0	12.800	
16	16031	31	0.000	31		0	0.000	
		32	1.280	431		0	1.280	
16	16032	32	0.000	32		0	1.280	
		33	2.560	432		0	3.840	
16	16033	33	0.000	33		0	3.840	
		34	2.560	433		0	6.400	
16	16034	34	0.000	34		0	6.400	
		35	2.560	434		0	8.960	
16	16035	35	0.000	35		0	8.960	
		36	2.560	435		0	11.520	
16	16036	36	0.000	36		0	11.520	
		37	1.280	436		0	12.800	
17	17037	37	0.000	37		0	0.000	
		38	1.280	437		0	1.280	
17	17038	38	0.000	38		0	1.280	
		39	2.560	438		0	3.840	
17	17039	39	0.000	39		0	3.840	
		40	2.560	439		0	6.400	
17	17040	40	0.000	40		0	6.400	
		41	2.560	440		0	8.960	
17	17041	41	0.000	41		0	8.960	
		42	2.560	441		0	11.520	
17	17042	42	0.000	42		0	11.520	
		43	1.280	442		0	12.800	
18	18043	43	0.000	43		0	0.000	
		44	1.280	443		0	1.280	
18	18044	44	0.000	44		0	1.280	
		45	2.560	444		0	3.840	
18	18045	45	0.000	45		0	3.840	
		46	2.560	445		0	6.400	
18	18046	46	0.000	46		0	6.400	
		47	2.560	446		0	8.960	
18	18047	47	0.000	47		0	8.960	
		48	2.560	447		0	11.520	
18	18048	48	0.000	48		0	11.520	
		49	1.280	448		0	12.800	
19	19049	49	0.000	49		0	0.000	
		50	1.280	449		0	1.280	
19	19050	50	0.000	50		0	1.280	
		51	2.560	450		0	3.840	
19	19051	51	0.000	51		0	3.840	
		52	2.560	451		0	6.400	
19	19052	52	0.000	52		0	6.400	
		53	2.560	452		0	8.960	
19	19053	53	0.000	53		0	8.960	
		54	2.560	453		0	11.520	
19	19054	54	0.000	54		0	11.520	
		55	1.290	454		0	12.810	
20	20055	55	0.000	55		0	0.000	
		56	1.280	455		0	1.280	
20	20056	56	0.000	56		0	1.280	
		57	2.560	456		0	3.840	
20	20057	57	0.000	57		0	3.840	
		58	2.560	457		0	6.400	

Stabelemente

Grp	Nummer	Knoten	x [m]	QNr	NrP	E	Referenz	Eigenschaften
20	20058	58	0.000	58		0	6.400	
		59	2.560	458		0	8.960	
20	20059	59	0.000	59		0	8.960	
		60	2.560	459		0	11.520	
20	20060	60	0.000	60		0	11.520	
		61	1.280	460		0	12.800	
21	21061	61	0.000	61		0	0.000	
		62	1.280	461		0	1.280	
21	21062	62	0.000	62		0	1.280	
		63	2.560	462		0	3.840	
21	21063	63	0.000	63		0	3.840	
		64	2.560	463		0	6.400	
21	21064	64	0.000	64		0	6.400	
		65	2.560	464		0	8.960	
21	21065	65	0.000	65		0	8.960	
		66	2.560	465		0	11.520	
21	21066	66	0.000	66		0	11.520	
		67	1.280	466		0	12.800	
22	22067	67	0.000	67		0	0.000	
		68	1.280	467		0	1.280	
22	22068	68	0.000	68		0	1.280	
		69	2.560	468		0	3.840	
22	22069	69	0.000	69		0	3.840	
		70	2.560	469		0	6.400	
22	22070	70	0.000	70		0	6.400	
		71	2.560	470		0	8.960	
22	22071	71	0.000	71		0	8.960	
		72	2.560	471		0	11.520	
22	22072	72	0.000	72		0	11.520	
		73	1.280	472		0	12.800	
23	23073	73	0.000	73		0	0.000	
		74	1.280	473		0	1.280	
23	23074	74	0.000	74		0	1.280	
		75	2.560	474		0	3.840	
23	23075	75	0.000	75		0	3.840	
		76	2.560	475		0	6.400	
23	23076	76	0.000	76		0	6.400	
		77	2.560	476		0	8.960	
23	23077	77	0.000	77		0	8.960	
		78	2.560	477		0	11.520	
23	23078	78	0.000	78		0	11.520	
		79	1.280	478		0	12.800	
24	24079	79	0.000	79		0	0.000	
		80	1.280	479		0	1.280	
24	24080	80	0.000	80		0	1.280	
		81	2.560	480		0	3.840	
24	24081	81	0.000	81		0	3.840	
		82	2.560	481		0	6.400	
24	24082	82	0.000	82		0	6.400	
		83	2.560	482		0	8.960	
24	24083	83	0.000	83		0	8.960	
		84	2.560	483		0	11.520	
24	24084	84	0.000	84		0	11.520	
		85	1.290	484		0	12.810	
25	25085	85	0.000	85		0	0.000	
		86	1.280	485		0	1.280	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
25	25086	86	0.000	86		0	1.280	
		87	2.560	486		0	3.840	
25	25087	87	0.000	87		0	3.840	
		88	2.560	487		0	6.400	
25	25088	88	0.000	88		0	6.400	
		89	2.560	488		0	8.960	
25	25089	89	0.000	89		0	8.960	
		90	2.560	489		0	11.520	
25	25090	90	0.000	90		0	11.520	
		91	1.280	490		0	12.800	
26	26091	91	0.000	91		0	0.000	
		92	1.280	491		0	1.280	
26	26092	92	0.000	92		0	1.280	
		93	2.560	492		0	3.840	
26	26093	93	0.000	93		0	3.840	
		94	2.560	493		0	6.400	
26	26094	94	0.000	94		0	6.400	
		95	2.560	494		0	8.960	
26	26095	95	0.000	95		0	8.960	
		96	2.560	495		0	11.520	
26	26096	96	0.000	96		0	11.520	
		97	1.280	496		0	12.800	
27	27097	97	0.000	97		0	0.000	
		98	1.280	497		0	1.280	
27	27098	98	0.000	98		0	1.280	
		99	2.560	498		0	3.840	
27	27099	99	0.000	99		0	3.840	
		100	2.560	499		0	6.400	
27	27100	100	0.000	100		0	6.400	
		101	2.560	500		0	8.960	
27	27101	101	0.000	101		0	8.960	
		102	2.560	501		0	11.520	
27	27102	102	0.000	102		0	11.520	
		103	1.280	502		0	12.800	
28	28103	103	0.000	103		0	0.000	
		104	1.280	503		0	1.280	
28	28104	104	0.000	104		0	1.280	
		105	2.560	504		0	3.840	
28	28105	105	0.000	105		0	3.840	
		106	2.560	505		0	6.400	
28	28106	106	0.000	106		0	6.400	
		107	2.560	506		0	8.960	
28	28107	107	0.000	107		0	8.960	
		108	2.560	507		0	11.520	
28	28108	108	0.000	108		0	11.520	
		109	1.280	508		0	12.800	
29	29109	109	0.000	109		0	0.000	
		110	1.280	509		0	1.280	
29	29110	110	0.000	110		0	1.280	
		111	2.560	510		0	3.840	
29	29111	111	0.000	111		0	3.840	
		112	2.560	511		0	6.400	
29	29112	112	0.000	112		0	6.400	
		113	2.560	512		0	8.960	
29	29113	113	0.000	113		0	8.960	
		114	2.560	513		0	11.520	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
29	29114	114	0.000	114		0	11.520	
		115	2.460	514		0	13.980	
31	31309	309	0.000	309		0	0.000	
		310	1.280	709		0	1.280	
31	31310	310	0.000	310		0	1.280	
		311	2.560	710		0	3.840	
31	31311	311	0.000	311		0	3.840	
		312	2.560	711		0	6.400	
31	31312	312	0.000	312		0	6.400	
		313	2.560	712		0	8.960	
31	31313	313	0.000	313		0	8.960	
		314	2.560	713		0	11.520	
31	31314	314	0.000	314		0	11.520	
		315	2.460	714		0	13.980	
32	32303	303	0.000	303		0	0.000	
		304	1.280	703		0	1.280	
32	32304	304	0.000	304		0	1.280	
		305	2.560	704		0	3.840	
32	32305	305	0.000	305		0	3.840	
		306	2.560	705		0	6.400	
32	32306	306	0.000	306		0	6.400	
		307	2.560	706		0	8.960	
32	32307	307	0.000	307		0	8.960	
		308	2.560	707		0	11.520	
32	32308	308	0.000	308		0	11.520	
		309	1.280	708		0	12.800	
33	33297	297	0.000	297		0	0.000	
		298	1.280	697		0	1.280	
33	33298	298	0.000	298		0	1.280	
		299	2.560	698		0	3.840	
33	33299	299	0.000	299		0	3.840	
		300	2.560	699		0	6.400	
33	33300	300	0.000	300		0	6.400	
		301	2.560	700		0	8.960	
33	33301	301	0.000	301		0	8.960	
		302	2.560	701		0	11.520	
33	33302	302	0.000	302		0	11.520	
		303	1.280	702		0	12.800	
34	34291	291	0.000	291		0	0.000	
		292	1.280	691		0	1.280	
34	34292	292	0.000	292		0	1.280	
		293	2.560	692		0	3.840	
34	34293	293	0.000	293		0	3.840	
		294	2.560	693		0	6.400	
34	34294	294	0.000	294		0	6.400	
		295	2.560	694		0	8.960	
34	34295	295	0.000	295		0	8.960	
		296	2.560	695		0	11.520	
34	34296	296	0.000	296		0	11.520	
		297	1.280	696		0	12.800	
35	35285	285	0.000	285		0	0.000	
		286	1.280	685		0	1.280	
35	35286	286	0.000	286		0	1.280	
		287	2.560	686		0	3.840	
35	35287	287	0.000	287		0	3.840	
		288	2.560	687		0	6.400	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
35	35288	288	0.000	288		0	6.400	
		289	2.560	688		0	8.960	
35	35289	289	0.000	289		0	8.960	
		290	2.560	689		0	11.520	
35	35290	290	0.000	290		0	11.520	
		291	1.280	690		0	12.800	
36	36279	279	0.000	279		0	0.000	
		280	1.280	679		0	1.280	
36	36280	280	0.000	280		0	1.280	
		281	2.560	680		0	3.840	
36	36281	281	0.000	281		0	3.840	
		282	2.560	681		0	6.400	
36	36282	282	0.000	282		0	6.400	
		283	2.560	682		0	8.960	
36	36283	283	0.000	283		0	8.960	
		284	2.560	683		0	11.520	
36	36284	284	0.000	284		0	11.520	
		285	1.290	684		0	12.810	
37	37273	273	0.000	273		0	0.000	
		274	1.280	673		0	1.280	
37	37274	274	0.000	274		0	1.280	
		275	2.560	674		0	3.840	
37	37275	275	0.000	275		0	3.840	
		276	2.560	675		0	6.400	
37	37276	276	0.000	276		0	6.400	
		277	2.560	676		0	8.960	
37	37277	277	0.000	277		0	8.960	
		278	2.560	677		0	11.520	
37	37278	278	0.000	278		0	11.520	
		279	1.280	678		0	12.800	
38	38267	267	0.000	267		0	0.000	
		268	1.280	667		0	1.280	
38	38268	268	0.000	268		0	1.280	
		269	2.560	668		0	3.840	
38	38269	269	0.000	269		0	3.840	
		270	2.560	669		0	6.400	
38	38270	270	0.000	270		0	6.400	
		271	2.560	670		0	8.960	
38	38271	271	0.000	271		0	8.960	
		272	2.560	671		0	11.520	
38	38272	272	0.000	272		0	11.520	
		273	1.280	672		0	12.800	
39	39261	261	0.000	261		0	0.000	
		262	1.280	661		0	1.280	
39	39262	262	0.000	262		0	1.280	
		263	2.560	662		0	3.840	
39	39263	263	0.000	263		0	3.840	
		264	2.560	663		0	6.400	
39	39264	264	0.000	264		0	6.400	
		265	2.560	664		0	8.960	
39	39265	265	0.000	265		0	8.960	
		266	2.560	665		0	11.520	
39	39266	266	0.000	266		0	11.520	
		267	1.280	666		0	12.800	
40	40255	255	0.000	255		0	0.000	
		256	1.280	655		0	1.280	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
40	40256	256	0.000	256		0	1.280	
		257	2.560	656		0	3.840	
40	40257	257	0.000	257		0	3.840	
		258	2.560	657		0	6.400	
40	40258	258	0.000	258		0	6.400	
		259	2.560	658		0	8.960	
40	40259	259	0.000	259		0	8.960	
		260	2.560	659		0	11.520	
40	40260	260	0.000	260		0	11.520	
		261	1.280	660		0	12.800	
41	41249	249	0.000	249		0	0.000	
		250	1.280	649		0	1.280	
41	41250	250	0.000	250		0	1.280	
		251	2.560	650		0	3.840	
41	41251	251	0.000	251		0	3.840	
		252	2.560	651		0	6.400	
41	41252	252	0.000	252		0	6.400	
		253	2.560	652		0	8.960	
41	41253	253	0.000	253		0	8.960	
		254	2.560	653		0	11.520	
41	41254	254	0.000	254		0	11.520	
		255	1.290	654		0	12.810	
42	42243	243	0.000	243		0	0.000	
		244	1.280	643		0	1.280	
42	42244	244	0.000	244		0	1.280	
		245	2.560	644		0	3.840	
42	42245	245	0.000	245		0	3.840	
		246	2.560	645		0	6.400	
42	42246	246	0.000	246		0	6.400	
		247	2.560	646		0	8.960	
42	42247	247	0.000	247		0	8.960	
		248	2.560	647		0	11.520	
42	42248	248	0.000	248		0	11.520	
		249	1.280	648		0	12.800	
43	43237	237	0.000	237		0	0.000	
		238	1.280	637		0	1.280	
43	43238	238	0.000	238		0	1.280	
		239	2.560	638		0	3.840	
43	43239	239	0.000	239		0	3.840	
		240	2.560	639		0	6.400	
43	43240	240	0.000	240		0	6.400	
		241	2.560	640		0	8.960	
43	43241	241	0.000	241		0	8.960	
		242	2.560	641		0	11.520	
43	43242	242	0.000	242		0	11.520	
		243	1.280	642		0	12.800	
44	44231	231	0.000	231		0	0.000	
		232	1.280	631		0	1.280	
44	44232	232	0.000	232		0	1.280	
		233	2.560	632		0	3.840	
44	44233	233	0.000	233		0	3.840	
		234	2.560	633		0	6.400	
44	44234	234	0.000	234		0	6.400	
		235	2.560	634		0	8.960	
44	44235	235	0.000	235		0	8.960	
		236	2.560	635		0	11.520	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
44	44236	236	0.000	236		0	11.520	
		237	1.280	636		0	12.800	
45	45225	225	0.000	225		0	0.000	
		226	1.280	625		0	1.280	
45	45226	226	0.000	226		0	1.280	
		227	2.560	626		0	3.840	
45	45227	227	0.000	227		0	3.840	
		228	2.560	627		0	6.400	
45	45228	228	0.000	228		0	6.400	
		229	2.560	628		0	8.960	
45	45229	229	0.000	229		0	8.960	
		230	2.560	629		0	11.520	
45	45230	230	0.000	230		0	11.520	
		231	1.280	630		0	12.800	
46	46219	219	0.000	219		0	0.000	
		220	1.280	619		0	1.280	
46	46220	220	0.000	220		0	1.280	
		221	2.560	620		0	3.840	
46	46221	221	0.000	221		0	3.840	
		222	2.560	621		0	6.400	
46	46222	222	0.000	222		0	6.400	
		223	2.560	622		0	8.960	
46	46223	223	0.000	223		0	8.960	
		224	2.560	623		0	11.520	
46	46224	224	0.000	224		0	11.520	
		225	1.280	624		0	12.810	
47	47213	213	0.000	213		0	0.000	
		214	1.280	613		0	1.280	
47	47214	214	0.000	214		0	1.280	
		215	2.560	614		0	3.840	
47	47215	215	0.000	215		0	3.840	
		216	2.560	615		0	6.400	
47	47216	216	0.000	216		0	6.400	
		217	2.560	616		0	8.960	
47	47217	217	0.000	217		0	8.960	
		218	2.560	617		0	11.520	
47	47218	218	0.000	218		0	11.520	
		219	1.280	618		0	12.800	
48	48207	207	0.000	207		0	0.000	
		208	1.280	607		0	1.280	
48	48208	208	0.000	208		0	1.280	
		209	2.560	608		0	3.840	
48	48209	209	0.000	209		0	3.840	
		210	2.560	609		0	6.400	
48	48210	210	0.000	210		0	6.400	
		211	2.560	610		0	8.960	
48	48211	211	0.000	211		0	8.960	
		212	2.560	611		0	11.520	
48	48212	212	0.000	212		0	11.520	
		213	1.280	612		0	12.800	
49	49201	201	0.000	201		0	0.000	
		202	2.460	601		0	2.460	
49	49202	202	0.000	202		0	2.460	
		203	2.560	602		0	5.020	
49	49203	203	0.000	203		0	5.020	
		204	2.560	603		0	7.580	

Stabelemente

Grp	Nummer	Knoten	x[m]	QNr	NrP	E	Referenz	Eigenschaften
49	49204	204	0.000	204		0	7.580	
		205	2.560	604		0	10.140	
49	49205	205	0.000	205		0	10.140	
		206	2.560	605		0	12.700	
49	49206	206	0.000	206		0	12.700	
		207	1.280	606		0	13.980	

Grp primäre Gruppennummer QNr Querschnittsnummer
 x[m] Abstand des Schnittes vom Stabanfang NrP Nummer des Bettungsprofils
 E "0": Stabachse ist bezogen auf den Querschnittsnulldpunkt, "5": auf den Schwerpunkt
 Referenz Referenzachse mit Stationierung

3. Belastung

3.1 Überlagerungsvorschriften

Überlagerungsvorschriften, Einwirkungstypen und -faktoren

Nachfolgend werden die verwendeten Einwirkungstypen, deren Kombinationsfaktoren, Überlagerungsvorschriften und Bezeichnungen abgedruckt.

Einwirkungen

Typ	part	sup	Bezeichnung	γ -u	γ -f	γ -a	ψ_0	ψ_1	ψ_2	ψ_1'
G_1	G	perm	Ständige Lasten g_1	1.35	1.00	1.00	1.00	1.00	1.00	1.00
G_2	G	perm	Andere ständige Lasten g_2	1.35	1.00	1.00	1.00	1.00	1.00	1.00
L_T	Q	excl	TS Tandemsystem	1.50	0.00	0.00	0.75	0.75	0.20	0.80
L_U	Q	excl	UDL Grenzlinie	1.50	0.00	0.00	0.40	0.40	0.20	0.80
SF	Q	cond	mögl.Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
SW	Q	unsi	Wind ohne Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
T	Q	excl	Temperatur	1.35	0.00	0.00	0.80	0.60	0.50	0.80
X	Q	perm	Einzellastfaelle	1.00	1.00	0.00	1.00	1.00	1.00	1.00
XL3	Q	excl	LM3 Lastbild	1.00	0.00	0.00	1.00	1.00	1.00	1.00
Y_1	Q	exex	rare without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_2	Q	exex	nonf without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_3	Q	exex	freq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_4	Q	exex	perm without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_5	Q	exex	L_5 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_6	Q	exex	L_6 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_7	Q	exex	L_7 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_8	Q	exex	L_8 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_9	Q	exex	1.0* without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_A	Q	exex	acci without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_D	Q	exex	desi without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_E	Q	exex	earq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_F	Q	exex	fati without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_G	Q	exex	stress range L+Q	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_R	Q	exex	robust without p	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_X	Q	exex	extra-temporary	1.00	0.00	1.00	1.00	1.00	1.00	1.00
ZF	Q	cond	wahr.Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
ZL	Q	usex	Bremsen u Zentrifugal	1.50	0.00	0.00	0.00	0.00	0.00	0.00
ZQ	Q	unsi	Lagerrückstellkräfte	1.50	0.00	0.00	1.00	1.00	1.00	1.00
ZW	Q	unsi	Wind bei Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
Typ	Einwirkung		γ -u, γ -f, γ -a	Teilsicherheitsfaktoren ungünstig/günstig/außergewöhnlich						
part	Einteilung der Einwirkung		$\psi_0, \psi_1, \psi_2, \psi_1'$	Kombinationsbeiwerte						
sup	Überlagerungstyp									

3.2 Grundlasten

Lastfallnumerierung Grundlasten

Lastenteil	Lasttyp	LF	Überlagerung innerhalb der Gruppe:
Eingengewicht & Bauablauf	X	1-19	echte G_1, G_2 erst vom CSM erzeugt!
Ausbaulasten	X	21	echte G_1, G_2 erst vom CSM erzeugt!
Bremsen	ZL	31-32	USEX es darf nur einer genommen werden mit wechs. Vorz.
Wind ohne Verkehr quer	SW	41	USEX es darf nur einer genommen werden mit wechs. Vorz.
Wind mit Verkehr quer	ZW	42	USEX es darf nur einer genommen werden mit wechs. Vorz.
wahrscheinliche Setzung GZG	ZF	51-53	COND können gleichzeitig addiert werden
mögliche Setzung GZT	SF	61-63	COND können gleichzeitig addiert werden
Lagerreibung	ZQ	81	UNSI können mit wechselndem Vorzeichen gleichzeitig wirken
Temperatur	T	90-97	EXCL es darf nur einer genommen werden

Einwirkungen

Typ	part	sup	Bezeichnung	γ -u	γ -f	γ -a	ψ_0	ψ_1	ψ_2	ψ_1'
G_1	G	perm	Ständige Lasten g_1	1.35	1.00	1.00	1.00	1.00	1.00	1.00
G_2	G	perm	Andere ständige Lasten g_2	1.35	1.00	1.00	1.00	1.00	1.00	1.00
L_T	Q	excl	TS Tandemsystem	1.50	0.00	0.00	0.75	0.75	0.20	0.80
L_U	Q	excl	UDL Grenzlinie	1.50	0.00	0.00	0.40	0.40	0.20	0.80
SF	Q	cond	mögl. Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
SW	Q	unsi	Wind ohne Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
T	Q	excl	Temperatur	1.35	0.00	0.00	0.80	0.60	0.50	0.80
X	Q	perm	Einzellastfaelle	1.00	1.00	0.00	1.00	1.00	1.00	1.00
XL3	Q	excl	LM3 Lastbild	1.00	0.00	0.00	1.00	1.00	1.00	1.00
Y_1	Q	exex	rare without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_2	Q	exex	nonf without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_3	Q	exex	freq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_4	Q	exex	perm without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_5	Q	exex	L_5 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_6	Q	exex	L_6 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_7	Q	exex	L_7 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_8	Q	exex	L_8 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_9	Q	exex	1.0* without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_A	Q	exex	acci without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_D	Q	exex	desi without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_E	Q	exex	earq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_F	Q	exex	fati without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_G	Q	exex	stress range L+Q	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_R	Q	exex	robust without p	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_X	Q	exex	extra-temporary	1.00	0.00	1.00	1.00	1.00	1.00	1.00
ZF	Q	cond	wahr. Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
ZL	Q	usex	Bremsen u Zentrifugal	1.50	0.00	0.00	0.00	0.00	0.00	0.00
ZQ	Q	unsi	Lagerrückstellkräfte	1.50	0.00	0.00	1.00	1.00	1.00	1.00
ZW	Q	unsi	Wind bei Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
Typ	Einwirkung			γ -u, γ -f, γ -a			Teilsicherheitsfaktoren ungünstig/günstig/außergewöhnlich			
part	Einteilung der Einwirkung			$\psi_0, \psi_1, \psi_2, \psi_1'$			Kombinationsbeiwerte			
sup	Überlagerungstyp

X
Y
Z

Alle Lasten (in Komponenten), Lastfall 4 Eigengewicht Anpassung Kasten Sc, (1 cm im Raum =

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

X
Y
Z

Alle Lasten (in Komponenten), Lastfall 5 Eigengewicht Anpassung Kasten Sc, (1 cm im Raum =

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 19 Anheben um 400mm , (1 cm im Raum = Unit) Auflagerv

M 1 : 750
X : 0.502
Y : 0.906
Z : 0.962

Alle Lasten (in Komponenten), Lastfall 21 Ausbaulasten , (1 cm im Raum = Unit) Stablinienlas

M 1 : 750
X : 0.502
Y : 0.906
Z : 0.962

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 53 wahrscheinliche Setzung GZG , (1 cm im Raum = Unit)

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 61 mögliche Setzung GZT , (1 cm im Raum = Unit) Aufl

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

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Alle Lasten (in Komponenten), Lastfall 62 mögliche Setzung GZT , (1 cm im Raum = Unit) Aufl

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 63 mögliche Setzung GZT , (1 cm im Raum = Unit) Aufl

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 81 Lagerreibung , (1 cm im Raum = Unit) Knotenlast (K)

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 91 T Sommer posdt TN+wm*dT , (1 cm im Raum = Unit) St

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 96 T Sommer negdt wn*TN+dT , (1 cm im Raum = Unit) St

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 97 T Winter posdtt wn*TN+dT , (1 cm im Raum = Unit) St

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

3.3 Verkehrslasten

Lastfallnummerierung Verkehrslasten

Lastanteil	Lasttyp	LF
UDL Lasten Feld 1	X	101-104
UDL Lasten Feld 2	X	105-108
Tandem Lasten Unterstrom	X	151-264
Tandem Lasten Oberstrom	X	301-414
LM3 Lasten Unterstrom	X	501-630
LM3 Lasten Oberstrom	X	701-830

Einwirkungen

Typ	part	sup	Bezeichnung	γ_u	γ_f	γ_a	ψ_0	ψ_1	ψ_2	ψ_1'
G_1	G	perm	Ständige Lasten g_1	1.35	1.00	1.00	1.00	1.00	1.00	1.00
G_2	G	perm	Andere ständige Lasten g_2	1.35	1.00	1.00	1.00	1.00	1.00	1.00
L_T	Q	excl	TS Tandemsystem	1.50	0.00	0.00	0.75	0.75	0.20	0.80
L_U	Q	excl	UDL Grenzlinie	1.50	0.00	0.00	0.40	0.40	0.20	0.80
SF	Q	cond	mögl. Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
SW	Q	unsi	Wind ohne Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
T	Q	excl	Temperatur	1.35	0.00	0.00	0.80	0.60	0.50	0.80
X	Q	perm	Einzellastfaelle	1.00	1.00	0.00	1.00	1.00	1.00	1.00
XL3	Q	excl	LM3 Lastbild	1.00	0.00	0.00	1.00	1.00	1.00	1.00
Y_1	Q	exex	rare without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_2	Q	exex	nonf without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_3	Q	exex	freq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_4	Q	exex	perm without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_5	Q	exex	L_5 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_6	Q	exex	L_6 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_7	Q	exex	L_7 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_8	Q	exex	L_8 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_9	Q	exex	1.0* without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_A	Q	exex	acci without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_D	Q	exex	desi without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_E	Q	exex	earq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_F	Q	exex	fati without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_G	Q	exex	stress range L+Q	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_R	Q	exex	robust without p	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_X	Q	exex	extra-temporary	1.00	0.00	1.00	1.00	1.00	1.00	1.00
ZF	Q	cond	wahr. Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
ZL	Q	usex	Bremsen u Zentrifugal	1.50	0.00	0.00	0.00	0.00	0.00	0.00
ZQ	Q	unsi	Lagerrückstellkräfte	1.50	0.00	0.00	1.00	1.00	1.00	1.00
ZW	Q	unsi	Wind bei Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
Typ Einwirkung				$\gamma_u, \gamma_f, \gamma_a$ Teilsicherheitsfaktoren ungünstig/günstig/außergewöhnlich						
part Einteilung der Einwirkung				$\psi_0, \psi_1, \psi_2, \psi_1'$ Kombinationsbeiwerte						
sup Überlagerungstyp

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 192 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
 X * 0.502
 Y * 0.906
 Z * 0.962

Alle Lasten (in Komponenten), Lastfall 202 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
 X * 0.502
 Y * 0.906
 Z * 0.962

Alle Lasten (in Komponenten), Lastfall 213 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
 X * 0.502
 Y * 0.906
 Z * 0.962

X
Y
Z

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

X
Y
Z

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

X
Y
Z

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 541 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 551 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 561 Einzellastfaelle , (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 1250
X * 0.502
Y * 0.906
Z * 0.962

Alle Lasten (in Komponenten), Lastfall 811 Einzellastfaelle, (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X : 0.502
Y : 0.906
Z : 0.962

Alle Lasten (in Komponenten), Lastfall 821 Einzellastfaelle, (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X : 0.502
Y : 0.906
Z : 0.962

Alle Lasten (in Komponenten), Lastfall 830 Einzellastfaelle, (1 cm im Raum = Unit) Knotenl

M 1 : 1250
X : 0.502
Y : 0.906
Z : 0.962

3.4 Lasten für Auflagerbedingungen Quersystem

Einwirkungen

Typ	part	sup	Bezeichnung	γ -u	γ -f	γ -a	ψ_0	ψ_1	ψ_2	ψ_1'
G_1	G	perm	Ständige Lasten g_1	1.35	1.00	1.00	1.00	1.00	1.00	1.00
G_2	G	perm	Andere ständige Lasten g_2	1.35	1.00	1.00	1.00	1.00	1.00	1.00
L_T	Q	excl	TS Tandemsystem	1.50	0.00	0.00	0.75	0.75	0.20	0.80
L_U	Q	excl	UDL Grenzlinie	1.50	0.00	0.00	0.40	0.40	0.20	0.80
SF	Q	cond	mögl.Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
SW	Q	unsi	Wind ohne Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
T	Q	excl	Temperatur	1.35	0.00	0.00	0.80	0.60	0.50	0.80
X	Q	perm	Einzellastfaelle	1.00	1.00	0.00	1.00	1.00	1.00	1.00
XL3	Q	excl	LM3 Lastbild	1.00	0.00	0.00	1.00	1.00	1.00	1.00
Y_1	Q	exex	rare without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_2	Q	exex	nonf without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_3	Q	exex	freq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_4	Q	exex	perm without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_5	Q	exex	L_5 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_6	Q	exex	L_6 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_7	Q	exex	L_7 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_8	Q	exex	L_8 without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_9	Q	exex	1.0* without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_A	Q	exex	acci without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_D	Q	exex	desi without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_E	Q	exex	earq without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_F	Q	exex	fati without gpc	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_G	Q	exex	stress range L+Q	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_R	Q	exex	robust without p	1.00	0.00	1.00	1.00	1.00	1.00	1.00
Y_X	Q	exex	extra-temporary	1.00	0.00	1.00	1.00	1.00	1.00	1.00
ZF	Q	cond	wahr.Setzung	1.00	0.00	0.00	1.00	1.00	1.00	1.00
ZL	Q	usex	Bremsen u Zentrifugal	1.50	0.00	0.00	0.00	0.00	0.00	0.00
ZQ	Q	unsi	Lagerrückstellkräfte	1.50	0.00	0.00	1.00	1.00	1.00	1.00
ZW	Q	unsi	Wind bei Verkehr	1.50	0.00	0.00	0.50	0.50	0.00	0.60
Typ	Einwirkung			γ -u, γ -f, γ -a			Teilsicherheitsfaktoren ungünstig/günstig/außergewöhnlich			
part	Einteilung der Einwirkung			$\psi_0,\psi_1,\psi_2,\psi_1'$			Kombinationsbeiwerte			
sup	Überlagerungstyp

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

M 1 : 750
X * 0.502
Y * 0.906
Z * 0.962

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
1	0.0	0.0	12977.6	G_1
2	0.0	0.0	1025.2	Eigengewicht Anpassung Kasten Sc
3	0.0	0.0	110.8	Eigengewicht Anpassung Kasten Sc
4	0.0	0.0	314.7	Eigengewicht Anpassung Kasten Sc
5	0.0	0.0	224.5	Eigengewicht Anpassung Kasten Sc
6	0.0	0.0	137.6	Eigengewicht Anpassung Kasten Sc
7	0.0	0.0	1886.0	Eigengewicht ortho. Fbpl. Schuss
8	0.0	0.0	-1419.4	Eigengewicht ortho. Fbpl. Schuss
9	0.0	0.0	768.2	Eigengewicht Gehweg Schuss 1-19
10	0.0	0.0	541.2	Stellung in Schuss 11
11	0.0	0.0	508.8	Stellung in Schuss 12
12	0.0	0.0	541.2	Stellung in Schuss 15
13	0.0	0.0	512.2	Stellung in Schuss 18
17	0.0	0.0	0.0	Anheben um 1630mm
18	0.0	0.0	0.0	Absenken um 2030mm
19	0.0	0.0	0.0	Anheben um 400mm
21	0.0	0.0	7667.3	Ausbaulasten
31	898.9	0.0	0.0	Bremsen HT 1
32	898.9	0.0	0.0	Bremsen HT 2
41	0.0	986.0	0.0	Wind ohne Verkehr
42	0.0	1343.4	0.0	Wind mit Verkehr
51	0.0	0.0	0.0	wahrscheinliche Setzung GZG
52	0.0	0.0	0.0	wahrscheinliche Setzung GZG
53	0.0	0.0	0.0	wahrscheinliche Setzung GZG
61	0.0	0.0	0.0	mögliche Setzung GZT
62	0.0	0.0	0.0	mögliche Setzung GZT
63	0.0	0.0	0.0	mögliche Setzung GZT
81	190.0	0.0	0.0	Lagerreibung
91	0.0	0.0	0.0	T Sommer posdt TN+wm*dT
92	0.0	0.0	0.0	T Sommer negdt TN+wm*dT
93	0.0	0.0	0.0	T Winter posdt TN+wm*dT
94	0.0	0.0	0.0	T Winter negdt TN+wm*dT
95	0.0	0.0	0.0	T Sommer posdt wn*TN+dT
96	0.0	0.0	0.0	T Sommer negdt wn*TN+dT
97	0.0	0.0	0.0	T Winter posdt wn*TN+dT
98	0.0	0.0	0.0	T Winter negdt wn*TN+dT
101	0.0	0.0	5180.7	UDL + Überlast Feld 1 Unterstro
102	0.0	0.0	5180.7	UDL + Überlast Feld 1 Oberstrom
103	0.0	0.0	7966.8	UDL Feld 1 + Überlast Unterstro
104	0.0	0.0	7966.8	UDL Feld 1 + Überlast Oberstrom
105	0.0	0.0	5180.3	UDL + Überlast Feld 2 Unterstro
106	0.0	0.0	5180.3	UDL + Überlast Feld 2 Oberstrom
107	0.0	0.0	7966.1	UDL Feld 2 + Überlast Unterstro
108	0.0	0.0	7966.1	UDL Feld 2 + Überlast Oberstrom
151	0.0	0.0	800.0	Einzellastfaelle
152	0.0	0.0	800.0	Einzellastfaelle
153	0.0	0.0	800.0	Einzellastfaelle
154	0.0	0.0	800.0	Einzellastfaelle
155	0.0	0.0	800.0	Einzellastfaelle
156	0.0	0.0	800.0	Einzellastfaelle
157	0.0	0.0	800.0	Einzellastfaelle
158	0.0	0.0	800.0	Einzellastfaelle
159	0.0	0.0	800.0	Einzellastfaelle
160	0.0	0.0	800.0	Einzellastfaelle
161	0.0	0.0	800.0	Einzellastfaelle

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
162	0.0	0.0	800.0	Einzellastfaelle
163	0.0	0.0	800.0	Einzellastfaelle
164	0.0	0.0	800.0	Einzellastfaelle
165	0.0	0.0	800.0	Einzellastfaelle
166	0.0	0.0	800.0	Einzellastfaelle
167	0.0	0.0	800.0	Einzellastfaelle
168	0.0	0.0	800.0	Einzellastfaelle
169	0.0	0.0	800.0	Einzellastfaelle
170	0.0	0.0	800.0	Einzellastfaelle
171	0.0	0.0	800.0	Einzellastfaelle
172	0.0	0.0	800.0	Einzellastfaelle
173	0.0	0.0	800.0	Einzellastfaelle
174	0.0	0.0	800.0	Einzellastfaelle
175	0.0	0.0	800.0	Einzellastfaelle
176	0.0	0.0	800.0	Einzellastfaelle
177	0.0	0.0	800.0	Einzellastfaelle
178	0.0	0.0	800.0	Einzellastfaelle
179	0.0	0.0	800.0	Einzellastfaelle
180	0.0	0.0	800.0	Einzellastfaelle
181	0.0	0.0	800.0	Einzellastfaelle
182	0.0	0.0	800.0	Einzellastfaelle
183	0.0	0.0	800.0	Einzellastfaelle
184	0.0	0.0	800.0	Einzellastfaelle
185	0.0	0.0	800.0	Einzellastfaelle
186	0.0	0.0	800.0	Einzellastfaelle
187	0.0	0.0	800.0	Einzellastfaelle
188	0.0	0.0	800.0	Einzellastfaelle
189	0.0	0.0	800.0	Einzellastfaelle
190	0.0	0.0	800.0	Einzellastfaelle
191	0.0	0.0	800.0	Einzellastfaelle
192	0.0	0.0	800.0	Einzellastfaelle
193	0.0	0.0	800.0	Einzellastfaelle
194	0.0	0.0	800.0	Einzellastfaelle
195	0.0	0.0	800.0	Einzellastfaelle
196	0.0	0.0	800.0	Einzellastfaelle
197	0.0	0.0	800.0	Einzellastfaelle
198	0.0	0.0	800.0	Einzellastfaelle
199	0.0	0.0	800.0	Einzellastfaelle
200	0.0	0.0	800.0	Einzellastfaelle
201	0.0	0.0	800.0	Einzellastfaelle
202	0.0	0.0	800.0	Einzellastfaelle
203	0.0	0.0	800.0	Einzellastfaelle
204	0.0	0.0	800.0	Einzellastfaelle
205	0.0	0.0	800.0	Einzellastfaelle
206	0.0	0.0	800.0	Einzellastfaelle
207	0.0	0.0	800.0	Einzellastfaelle
208	0.0	0.0	800.0	Einzellastfaelle
209	0.0	0.0	800.0	Einzellastfaelle
210	0.0	0.0	800.0	Einzellastfaelle
211	0.0	0.0	800.0	Einzellastfaelle
212	0.0	0.0	800.0	Einzellastfaelle
213	0.0	0.0	800.0	Einzellastfaelle
214	0.0	0.0	800.0	Einzellastfaelle
215	0.0	0.0	800.0	Einzellastfaelle
216	0.0	0.0	800.0	Einzellastfaelle

Summe der Lasten

Lastfall	Σ (Lasten)			Bezeichnung
	X [kN]	Y [kN]	Z [kN]	
217	0.0	0.0	800.0	Einzellastfaelle
218	0.0	0.0	800.0	Einzellastfaelle
219	0.0	0.0	800.0	Einzellastfaelle
220	0.0	0.0	800.0	Einzellastfaelle
221	0.0	0.0	800.0	Einzellastfaelle
222	0.0	0.0	800.0	Einzellastfaelle
223	0.0	0.0	800.0	Einzellastfaelle
224	0.0	0.0	800.0	Einzellastfaelle
225	0.0	0.0	800.0	Einzellastfaelle
226	0.0	0.0	800.0	Einzellastfaelle
227	0.0	0.0	800.0	Einzellastfaelle
228	0.0	0.0	800.0	Einzellastfaelle
229	0.0	0.0	800.0	Einzellastfaelle
230	0.0	0.0	800.0	Einzellastfaelle
231	0.0	0.0	800.0	Einzellastfaelle
232	0.0	0.0	800.0	Einzellastfaelle
233	0.0	0.0	800.0	Einzellastfaelle
234	0.0	0.0	800.0	Einzellastfaelle
235	0.0	0.0	800.0	Einzellastfaelle
236	0.0	0.0	800.0	Einzellastfaelle
237	0.0	0.0	800.0	Einzellastfaelle
238	0.0	0.0	800.0	Einzellastfaelle
239	0.0	0.0	800.0	Einzellastfaelle
240	0.0	0.0	800.0	Einzellastfaelle
241	0.0	0.0	800.0	Einzellastfaelle
242	0.0	0.0	800.0	Einzellastfaelle
243	0.0	0.0	800.0	Einzellastfaelle
244	0.0	0.0	800.0	Einzellastfaelle
245	0.0	0.0	800.0	Einzellastfaelle
246	0.0	0.0	800.0	Einzellastfaelle
247	0.0	0.0	800.0	Einzellastfaelle
248	0.0	0.0	800.0	Einzellastfaelle
249	0.0	0.0	800.0	Einzellastfaelle
250	0.0	0.0	800.0	Einzellastfaelle
251	0.0	0.0	800.0	Einzellastfaelle
252	0.0	0.0	800.0	Einzellastfaelle
253	0.0	0.0	800.0	Einzellastfaelle
254	0.0	0.0	800.0	Einzellastfaelle
255	0.0	0.0	800.0	Einzellastfaelle
256	0.0	0.0	800.0	Einzellastfaelle
257	0.0	0.0	800.0	Einzellastfaelle
258	0.0	0.0	800.0	Einzellastfaelle
259	0.0	0.0	800.0	Einzellastfaelle
260	0.0	0.0	800.0	Einzellastfaelle
261	0.0	0.0	800.0	Einzellastfaelle
262	0.0	0.0	800.0	Einzellastfaelle
263	0.0	0.0	800.0	Einzellastfaelle
264	0.0	0.0	800.0	Einzellastfaelle
301	0.0	0.0	800.0	Einzellastfaelle
302	0.0	0.0	800.0	Einzellastfaelle
303	0.0	0.0	800.0	Einzellastfaelle
304	0.0	0.0	800.0	Einzellastfaelle
305	0.0	0.0	800.0	Einzellastfaelle
306	0.0	0.0	800.0	Einzellastfaelle
307	0.0	0.0	800.0	Einzellastfaelle

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
308	0.0	0.0	800.0	Einzellastfaelle
309	0.0	0.0	800.0	Einzellastfaelle
310	0.0	0.0	800.0	Einzellastfaelle
311	0.0	0.0	800.0	Einzellastfaelle
312	0.0	0.0	800.0	Einzellastfaelle
313	0.0	0.0	800.0	Einzellastfaelle
314	0.0	0.0	800.0	Einzellastfaelle
315	0.0	0.0	800.0	Einzellastfaelle
316	0.0	0.0	800.0	Einzellastfaelle
317	0.0	0.0	800.0	Einzellastfaelle
318	0.0	0.0	800.0	Einzellastfaelle
319	0.0	0.0	800.0	Einzellastfaelle
320	0.0	0.0	800.0	Einzellastfaelle
321	0.0	0.0	800.0	Einzellastfaelle
322	0.0	0.0	800.0	Einzellastfaelle
323	0.0	0.0	800.0	Einzellastfaelle
324	0.0	0.0	800.0	Einzellastfaelle
325	0.0	0.0	800.0	Einzellastfaelle
326	0.0	0.0	800.0	Einzellastfaelle
327	0.0	0.0	800.0	Einzellastfaelle
328	0.0	0.0	800.0	Einzellastfaelle
329	0.0	0.0	800.0	Einzellastfaelle
330	0.0	0.0	800.0	Einzellastfaelle
331	0.0	0.0	800.0	Einzellastfaelle
332	0.0	0.0	800.0	Einzellastfaelle
333	0.0	0.0	800.0	Einzellastfaelle
334	0.0	0.0	800.0	Einzellastfaelle
335	0.0	0.0	800.0	Einzellastfaelle
336	0.0	0.0	800.0	Einzellastfaelle
337	0.0	0.0	800.0	Einzellastfaelle
338	0.0	0.0	800.0	Einzellastfaelle
339	0.0	0.0	800.0	Einzellastfaelle
340	0.0	0.0	800.0	Einzellastfaelle
341	0.0	0.0	800.0	Einzellastfaelle
342	0.0	0.0	800.0	Einzellastfaelle
343	0.0	0.0	800.0	Einzellastfaelle
344	0.0	0.0	800.0	Einzellastfaelle
345	0.0	0.0	800.0	Einzellastfaelle
346	0.0	0.0	800.0	Einzellastfaelle
347	0.0	0.0	800.0	Einzellastfaelle
348	0.0	0.0	800.0	Einzellastfaelle
349	0.0	0.0	800.0	Einzellastfaelle
350	0.0	0.0	800.0	Einzellastfaelle
351	0.0	0.0	800.0	Einzellastfaelle
352	0.0	0.0	800.0	Einzellastfaelle
353	0.0	0.0	800.0	Einzellastfaelle
354	0.0	0.0	800.0	Einzellastfaelle
355	0.0	0.0	800.0	Einzellastfaelle
356	0.0	0.0	800.0	Einzellastfaelle
357	0.0	0.0	800.0	Einzellastfaelle
358	0.0	0.0	800.0	Einzellastfaelle
359	0.0	0.0	800.0	Einzellastfaelle
360	0.0	0.0	800.0	Einzellastfaelle
361	0.0	0.0	800.0	Einzellastfaelle
362	0.0	0.0	800.0	Einzellastfaelle

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
363	0.0	0.0	800.0	Einzellastfaelle
364	0.0	0.0	800.0	Einzellastfaelle
365	0.0	0.0	800.0	Einzellastfaelle
366	0.0	0.0	800.0	Einzellastfaelle
367	0.0	0.0	800.0	Einzellastfaelle
368	0.0	0.0	800.0	Einzellastfaelle
369	0.0	0.0	800.0	Einzellastfaelle
370	0.0	0.0	800.0	Einzellastfaelle
371	0.0	0.0	800.0	Einzellastfaelle
372	0.0	0.0	800.0	Einzellastfaelle
373	0.0	0.0	800.0	Einzellastfaelle
374	0.0	0.0	800.0	Einzellastfaelle
375	0.0	0.0	800.0	Einzellastfaelle
376	0.0	0.0	800.0	Einzellastfaelle
377	0.0	0.0	800.0	Einzellastfaelle
378	0.0	0.0	800.0	Einzellastfaelle
379	0.0	0.0	800.0	Einzellastfaelle
380	0.0	0.0	800.0	Einzellastfaelle
381	0.0	0.0	800.0	Einzellastfaelle
382	0.0	0.0	800.0	Einzellastfaelle
383	0.0	0.0	800.0	Einzellastfaelle
384	0.0	0.0	800.0	Einzellastfaelle
385	0.0	0.0	800.0	Einzellastfaelle
386	0.0	0.0	800.0	Einzellastfaelle
387	0.0	0.0	800.0	Einzellastfaelle
388	0.0	0.0	800.0	Einzellastfaelle
389	0.0	0.0	800.0	Einzellastfaelle
390	0.0	0.0	800.0	Einzellastfaelle
391	0.0	0.0	800.0	Einzellastfaelle
392	0.0	0.0	800.0	Einzellastfaelle
393	0.0	0.0	800.0	Einzellastfaelle
394	0.0	0.0	800.0	Einzellastfaelle
395	0.0	0.0	800.0	Einzellastfaelle
396	0.0	0.0	800.0	Einzellastfaelle
397	0.0	0.0	800.0	Einzellastfaelle
398	0.0	0.0	800.0	Einzellastfaelle
399	0.0	0.0	800.0	Einzellastfaelle
400	0.0	0.0	800.0	Einzellastfaelle
401	0.0	0.0	800.0	Einzellastfaelle
402	0.0	0.0	800.0	Einzellastfaelle
403	0.0	0.0	800.0	Einzellastfaelle
404	0.0	0.0	800.0	Einzellastfaelle
405	0.0	0.0	800.0	Einzellastfaelle
406	0.0	0.0	800.0	Einzellastfaelle
407	0.0	0.0	800.0	Einzellastfaelle
408	0.0	0.0	800.0	Einzellastfaelle
409	0.0	0.0	800.0	Einzellastfaelle
410	0.0	0.0	800.0	Einzellastfaelle
411	0.0	0.0	800.0	Einzellastfaelle
412	0.0	0.0	800.0	Einzellastfaelle
413	0.0	0.0	800.0	Einzellastfaelle
414	0.0	0.0	800.0	Einzellastfaelle
501	0.0	0.0	480.0	Einzellastfaelle
502	0.0	0.0	480.0	Einzellastfaelle
503	0.0	0.0	480.0	Einzellastfaelle

Summe der Lasten

Lastfall	Σ (Lasten)			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
504	0.0	0.0	480.0	Einzellastfaelle
505	0.0	0.0	480.0	Einzellastfaelle
506	0.0	0.0	480.0	Einzellastfaelle
507	0.0	0.0	480.0	Einzellastfaelle
508	0.0	0.0	480.0	Einzellastfaelle
509	0.0	0.0	480.0	Einzellastfaelle
510	0.0	0.0	480.0	Einzellastfaelle
511	0.0	0.0	480.0	Einzellastfaelle
512	0.0	0.0	480.0	Einzellastfaelle
513	0.0	0.0	480.0	Einzellastfaelle
514	0.0	0.0	480.0	Einzellastfaelle
515	0.0	0.0	480.0	Einzellastfaelle
516	0.0	0.0	480.0	Einzellastfaelle
517	0.0	0.0	480.0	Einzellastfaelle
518	0.0	0.0	480.0	Einzellastfaelle
519	0.0	0.0	480.0	Einzellastfaelle
520	0.0	0.0	960.0	Einzellastfaelle
521	0.0	0.0	960.0	Einzellastfaelle
522	0.0	0.0	960.0	Einzellastfaelle
523	0.0	0.0	960.0	Einzellastfaelle
524	0.0	0.0	960.0	Einzellastfaelle
525	0.0	0.0	960.0	Einzellastfaelle
526	0.0	0.0	960.0	Einzellastfaelle
527	0.0	0.0	960.0	Einzellastfaelle
528	0.0	0.0	960.0	Einzellastfaelle
529	0.0	0.0	960.0	Einzellastfaelle
530	0.0	0.0	960.0	Einzellastfaelle
531	0.0	0.0	960.0	Einzellastfaelle
532	0.0	0.0	960.0	Einzellastfaelle
533	0.0	0.0	960.0	Einzellastfaelle
534	0.0	0.0	960.0	Einzellastfaelle
535	0.0	0.0	960.0	Einzellastfaelle
536	0.0	0.0	960.0	Einzellastfaelle
537	0.0	0.0	960.0	Einzellastfaelle
538	0.0	0.0	960.0	Einzellastfaelle
539	0.0	0.0	960.0	Einzellastfaelle
540	0.0	0.0	960.0	Einzellastfaelle
541	0.0	0.0	960.0	Einzellastfaelle
542	0.0	0.0	960.0	Einzellastfaelle
543	0.0	0.0	960.0	Einzellastfaelle
544	0.0	0.0	960.0	Einzellastfaelle
545	0.0	0.0	960.0	Einzellastfaelle
546	0.0	0.0	960.0	Einzellastfaelle
547	0.0	0.0	960.0	Einzellastfaelle
548	0.0	0.0	960.0	Einzellastfaelle
549	0.0	0.0	960.0	Einzellastfaelle
550	0.0	0.0	960.0	Einzellastfaelle
551	0.0	0.0	960.0	Einzellastfaelle
552	0.0	0.0	960.0	Einzellastfaelle
553	0.0	0.0	960.0	Einzellastfaelle
554	0.0	0.0	960.0	Einzellastfaelle
555	0.0	0.0	960.0	Einzellastfaelle
556	0.0	0.0	960.0	Einzellastfaelle
557	0.0	0.0	960.0	Einzellastfaelle
558	0.0	0.0	960.0	Einzellastfaelle

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
559	0.0	0.0	960.0	Einzellastfaelle
560	0.0	0.0	960.0	Einzellastfaelle
561	0.0	0.0	960.0	Einzellastfaelle
562	0.0	0.0	960.0	Einzellastfaelle
563	0.0	0.0	960.0	Einzellastfaelle
564	0.0	0.0	960.0	Einzellastfaelle
565	0.0	0.0	960.0	Einzellastfaelle
566	0.0	0.0	960.0	Einzellastfaelle
567	0.0	0.0	960.0	Einzellastfaelle
568	0.0	0.0	960.0	Einzellastfaelle
569	0.0	0.0	960.0	Einzellastfaelle
570	0.0	0.0	960.0	Einzellastfaelle
571	0.0	0.0	960.0	Einzellastfaelle
572	0.0	0.0	960.0	Einzellastfaelle
573	0.0	0.0	960.0	Einzellastfaelle
574	0.0	0.0	960.0	Einzellastfaelle
575	0.0	0.0	960.0	Einzellastfaelle
576	0.0	0.0	960.0	Einzellastfaelle
577	0.0	0.0	960.0	Einzellastfaelle
578	0.0	0.0	960.0	Einzellastfaelle
579	0.0	0.0	960.0	Einzellastfaelle
580	0.0	0.0	960.0	Einzellastfaelle
581	0.0	0.0	960.0	Einzellastfaelle
582	0.0	0.0	960.0	Einzellastfaelle
583	0.0	0.0	960.0	Einzellastfaelle
584	0.0	0.0	960.0	Einzellastfaelle
585	0.0	0.0	960.0	Einzellastfaelle
586	0.0	0.0	960.0	Einzellastfaelle
587	0.0	0.0	960.0	Einzellastfaelle
588	0.0	0.0	960.0	Einzellastfaelle
589	0.0	0.0	960.0	Einzellastfaelle
590	0.0	0.0	960.0	Einzellastfaelle
591	0.0	0.0	960.0	Einzellastfaelle
592	0.0	0.0	960.0	Einzellastfaelle
593	0.0	0.0	960.0	Einzellastfaelle
594	0.0	0.0	960.0	Einzellastfaelle
595	0.0	0.0	960.0	Einzellastfaelle
596	0.0	0.0	960.0	Einzellastfaelle
597	0.0	0.0	960.0	Einzellastfaelle
598	0.0	0.0	960.0	Einzellastfaelle
599	0.0	0.0	960.0	Einzellastfaelle
600	0.0	0.0	960.0	Einzellastfaelle
601	0.0	0.0	960.0	Einzellastfaelle
602	0.0	0.0	960.0	Einzellastfaelle
603	0.0	0.0	960.0	Einzellastfaelle
604	0.0	0.0	960.0	Einzellastfaelle
605	0.0	0.0	960.0	Einzellastfaelle
606	0.0	0.0	960.0	Einzellastfaelle
607	0.0	0.0	960.0	Einzellastfaelle
608	0.0	0.0	960.0	Einzellastfaelle
609	0.0	0.0	960.0	Einzellastfaelle
610	0.0	0.0	960.0	Einzellastfaelle
611	0.0	0.0	960.0	Einzellastfaelle
612	0.0	0.0	480.0	Einzellastfaelle
613	0.0	0.0	480.0	Einzellastfaelle

Summe der Lasten

Lastfall	Σ (Lasten)			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
614	0.0	0.0	480.0	Einzellastfaelle
615	0.0	0.0	480.0	Einzellastfaelle
616	0.0	0.0	480.0	Einzellastfaelle
617	0.0	0.0	480.0	Einzellastfaelle
618	0.0	0.0	480.0	Einzellastfaelle
619	0.0	0.0	480.0	Einzellastfaelle
620	0.0	0.0	480.0	Einzellastfaelle
621	0.0	0.0	480.0	Einzellastfaelle
622	0.0	0.0	480.0	Einzellastfaelle
623	0.0	0.0	480.0	Einzellastfaelle
624	0.0	0.0	480.0	Einzellastfaelle
625	0.0	0.0	480.0	Einzellastfaelle
626	0.0	0.0	480.0	Einzellastfaelle
627	0.0	0.0	480.0	Einzellastfaelle
628	0.0	0.0	480.0	Einzellastfaelle
629	0.0	0.0	480.0	Einzellastfaelle
630	0.0	0.0	480.0	Einzellastfaelle
701	0.0	0.0	480.0	Einzellastfaelle
702	0.0	0.0	480.0	Einzellastfaelle
703	0.0	0.0	480.0	Einzellastfaelle
704	0.0	0.0	480.0	Einzellastfaelle
705	0.0	0.0	480.0	Einzellastfaelle
706	0.0	0.0	480.0	Einzellastfaelle
707	0.0	0.0	480.0	Einzellastfaelle
708	0.0	0.0	480.0	Einzellastfaelle
709	0.0	0.0	480.0	Einzellastfaelle
710	0.0	0.0	480.0	Einzellastfaelle
711	0.0	0.0	480.0	Einzellastfaelle
712	0.0	0.0	480.0	Einzellastfaelle
713	0.0	0.0	480.0	Einzellastfaelle
714	0.0	0.0	480.0	Einzellastfaelle
715	0.0	0.0	480.0	Einzellastfaelle
716	0.0	0.0	480.0	Einzellastfaelle
717	0.0	0.0	480.0	Einzellastfaelle
718	0.0	0.0	480.0	Einzellastfaelle
719	0.0	0.0	480.0	Einzellastfaelle
720	0.0	0.0	960.0	Einzellastfaelle
721	0.0	0.0	960.0	Einzellastfaelle
722	0.0	0.0	960.0	Einzellastfaelle
723	0.0	0.0	960.0	Einzellastfaelle
724	0.0	0.0	960.0	Einzellastfaelle
725	0.0	0.0	960.0	Einzellastfaelle
726	0.0	0.0	960.0	Einzellastfaelle
727	0.0	0.0	960.0	Einzellastfaelle
728	0.0	0.0	960.0	Einzellastfaelle
729	0.0	0.0	960.0	Einzellastfaelle
730	0.0	0.0	960.0	Einzellastfaelle
731	0.0	0.0	960.0	Einzellastfaelle
732	0.0	0.0	960.0	Einzellastfaelle
733	0.0	0.0	960.0	Einzellastfaelle
734	0.0	0.0	960.0	Einzellastfaelle
735	0.0	0.0	960.0	Einzellastfaelle
736	0.0	0.0	960.0	Einzellastfaelle
737	0.0	0.0	960.0	Einzellastfaelle
738	0.0	0.0	960.0	Einzellastfaelle

Summe der Lasten

Lastfall	$\Sigma(\text{Lasten})$			Bezeichnung
	X[kN]	Y[kN]	Z[kN]	
739	0.0	0.0	960.0	Einzellastfaelle
740	0.0	0.0	960.0	Einzellastfaelle
741	0.0	0.0	960.0	Einzellastfaelle
742	0.0	0.0	960.0	Einzellastfaelle
743	0.0	0.0	960.0	Einzellastfaelle
744	0.0	0.0	960.0	Einzellastfaelle
745	0.0	0.0	960.0	Einzellastfaelle
746	0.0	0.0	960.0	Einzellastfaelle
747	0.0	0.0	960.0	Einzellastfaelle
748	0.0	0.0	960.0	Einzellastfaelle
749	0.0	0.0	960.0	Einzellastfaelle
750	0.0	0.0	960.0	Einzellastfaelle
751	0.0	0.0	960.0	Einzellastfaelle
752	0.0	0.0	960.0	Einzellastfaelle
753	0.0	0.0	960.0	Einzellastfaelle
754	0.0	0.0	960.0	Einzellastfaelle
755	0.0	0.0	960.0	Einzellastfaelle
756	0.0	0.0	960.0	Einzellastfaelle
757	0.0	0.0	960.0	Einzellastfaelle
758	0.0	0.0	960.0	Einzellastfaelle
759	0.0	0.0	960.0	Einzellastfaelle
760	0.0	0.0	960.0	Einzellastfaelle
761	0.0	0.0	960.0	Einzellastfaelle
762	0.0	0.0	960.0	Einzellastfaelle
763	0.0	0.0	960.0	Einzellastfaelle
764	0.0	0.0	960.0	Einzellastfaelle
765	0.0	0.0	960.0	Einzellastfaelle
766	0.0	0.0	960.0	Einzellastfaelle
767	0.0	0.0	960.0	Einzellastfaelle
768	0.0	0.0	960.0	Einzellastfaelle
769	0.0	0.0	960.0	Einzellastfaelle
770	0.0	0.0	960.0	Einzellastfaelle
771	0.0	0.0	960.0	Einzellastfaelle
772	0.0	0.0	960.0	Einzellastfaelle
773	0.0	0.0	960.0	Einzellastfaelle
774	0.0	0.0	960.0	Einzellastfaelle
775	0.0	0.0	960.0	Einzellastfaelle
776	0.0	0.0	960.0	Einzellastfaelle
777	0.0	0.0	960.0	Einzellastfaelle
778	0.0	0.0	960.0	Einzellastfaelle
779	0.0	0.0	960.0	Einzellastfaelle
780	0.0	0.0	960.0	Einzellastfaelle
781	0.0	0.0	960.0	Einzellastfaelle
782	0.0	0.0	960.0	Einzellastfaelle
783	0.0	0.0	960.0	Einzellastfaelle
784	0.0	0.0	960.0	Einzellastfaelle
785	0.0	0.0	960.0	Einzellastfaelle
786	0.0	0.0	960.0	Einzellastfaelle
787	0.0	0.0	960.0	Einzellastfaelle
788	0.0	0.0	960.0	Einzellastfaelle
789	0.0	0.0	960.0	Einzellastfaelle
790	0.0	0.0	960.0	Einzellastfaelle
791	0.0	0.0	960.0	Einzellastfaelle
792	0.0	0.0	960.0	Einzellastfaelle
793	0.0	0.0	960.0	Einzellastfaelle

Summe der Lasten

Lastfall	Σ(Lasten)			Bezeichnung
	X [kN]	Y [kN]	Z [kN]	
794	0.0	0.0	960.0	Einzellastfaelle
795	0.0	0.0	960.0	Einzellastfaelle
796	0.0	0.0	960.0	Einzellastfaelle
797	0.0	0.0	960.0	Einzellastfaelle
798	0.0	0.0	960.0	Einzellastfaelle
799	0.0	0.0	960.0	Einzellastfaelle
800	0.0	0.0	960.0	Einzellastfaelle
801	0.0	0.0	960.0	Einzellastfaelle
802	0.0	0.0	960.0	Einzellastfaelle
803	0.0	0.0	960.0	Einzellastfaelle
804	0.0	0.0	960.0	Einzellastfaelle
805	0.0	0.0	960.0	Einzellastfaelle
806	0.0	0.0	960.0	Einzellastfaelle
807	0.0	0.0	960.0	Einzellastfaelle
808	0.0	0.0	960.0	Einzellastfaelle
809	0.0	0.0	960.0	Einzellastfaelle
810	0.0	0.0	960.0	Einzellastfaelle
811	0.0	0.0	960.0	Einzellastfaelle
812	0.0	0.0	480.0	Einzellastfaelle
813	0.0	0.0	480.0	Einzellastfaelle
814	0.0	0.0	480.0	Einzellastfaelle
815	0.0	0.0	480.0	Einzellastfaelle
816	0.0	0.0	480.0	Einzellastfaelle
817	0.0	0.0	480.0	Einzellastfaelle
818	0.0	0.0	480.0	Einzellastfaelle
819	0.0	0.0	480.0	Einzellastfaelle
820	0.0	0.0	480.0	Einzellastfaelle
821	0.0	0.0	480.0	Einzellastfaelle
822	0.0	0.0	480.0	Einzellastfaelle
823	0.0	0.0	480.0	Einzellastfaelle
824	0.0	0.0	480.0	Einzellastfaelle
825	0.0	0.0	480.0	Einzellastfaelle
826	0.0	0.0	480.0	Einzellastfaelle
827	0.0	0.0	480.0	Einzellastfaelle
828	0.0	0.0	480.0	Einzellastfaelle
829	0.0	0.0	480.0	Einzellastfaelle
830	0.0	0.0	480.0	Einzellastfaelle
997	0.0	0.0	1000.0	Einzellast
998	0.0	0.0	0.0	Einzelmoment
999	0.0	0.0	480.0	LM3 Knoten 23

4. Einzelschnittgrößen, Lastgruppen

4.1 Zwischenüberlagerungen Verkehr und Temperatur

Zwischenüberlagerung Verkehr

Die Einzellastfälle wurden zunächst in SOFILOAD+ASE als TYP X angelegt. Die in folgender Zwischenüberlagerung erzeugten Lastfälle werden jetzt als L_U bzw. L_T Einwirkungen abgelegt (für LM3: XL3):

UDL Gleichlast	-	KOMB 8 Grenzlinie in Lastfall 901-912 als Einwirkung L_U
TS Tandemsystem	-	KOMB 9 Grenzlinie in Lastfall 921-932 als Einwirkung L_T
XL3 LM3	-	KOMB 10 Grenzlinie in Lastfall 941-952 als Einwirkung SL

Zusätzlich werden zur Erstellung der Grenzlinien die möglichen bzw. wahrscheinlichen Setzungen ungünstig miteinander überlagert. Ebenso die Temperaturlastfälle.

ds wahrscheinlich GZG	-	KOMB 11 Grenzlinie in Lastfall 961-970 als Einwirkung ZF
ds möglich GZT	-	KOMB 12 Grenzlinie in Lastfall 971-980 als Einwirkung SF
dT Temperatur	-	KOMB 13 Grenzlinie in Lastfall 981-990 als Einwirkung T

4.2 Berücksichtigung Bauablauf

Globale Steuerungen

Das Eigengewicht der Elemente wird automatisch aktiviert.

Vorkrümmungen für eine Überhöhungsberechnung werden ermittelt für BA 15

Bauabschnitte

BA	TYP	t [d]	RH [%]	T [°C]	Takt_1 [m]	Takt_2 [m]	Bezeichnung
10	G_1						Zusammenbau bis Schuss 11 und ei
11	G_1						Absetzen auf Strompfeiler
12	G_1						Zusammenbau bis Schuss 12
13	G_1						Zusammenbau bis Schuss 15
14	G_1						Zusammenbau bis Schuss 18
15	G_1						Zusammenbau bis Schuss 19
16	G_1						Abbau Hilfsstützen und Derrick
20	G_1						Anheben Überbau um 1630mm
21	G_1						Einbau Fahrbahnplatte Schuss 7-1
22	G_1						Absenken Überbau um 2030mm
23	G_1						Einbau Fahrbahnplatte Schuss 1-6
24	G_1						Anheben um 400mm
30	G_1						Einbau Fußgängerweg
40	G_1						Mitwirkende Breite
BA Bauabschnittsnummer		RH relative Luftfeuchtigkeit					
TYP Typ der Einwirkung		T Temperatur im Kriechabschnitt					
t Zeitdauer des Kriechabschnitts							
Takt_1 Taktschiebeweg dieses Bauzustands für Einschleiben von Seite 1							
Takt_2 Taktschiebeweg dieses Bauzustands für Einschleiben von Seite 2							

Übersicht über CSM Lastfallnummern (siehe auch CSM Handbuch Kapitel 2)

Summenlastfälle mit Gesamtverschiebungen und -Schnittgrößen ab Nr. 4000
Differenzverschiebungen und Diff.-Schnittgrößen ab Lastfallnummer. 5000
AQB-Eigenspannungen aus Kriechen und Schwinden ab Lastfallnummer. 6000
Ergebnisspannungen der AQB-LFSP-Auswertung ab Lastfallnummer. 7000
[zu verwenden für Vorspann-Normalkraft nach Kriechen+Schwinden:
-> WINGRAF Stabnormalkraft LF 7000ff]

Ausführen der Ueberhoeungs-Modifikation BA 15

Für die Überhöhungsberechnung wurden die Verschiebungen des BA 15
als Null Lage verwendet und die Verschiebungen der 4000-er Lastfälle modifiziert.
In den Lastfällen 14000ff stehen zur Kontrolle die zunächst ermittelten
Verformungen ohne Modifikation zur Verfügung!

5. Nachweiskonzept, Design Kombinationen und Spannungen

5.1 Nachweiskonzept

Übersicht über die verwendeten Einwirkungen

Typ	Verwendung
G	: wird aus dem CSM BA Bauablauf übernommen
L_U	: UDL Verkehr Uniform distributed load
L_T	: Verkehr Tandemachse
XL3	: Ermüdung LM3
T	: Temperatur
ZL	: Brems-, Zentrifugallasten und Bremslasten
ZW	: Wind bei Verkehr [ohne Vertikallast]
SW	: Wind ohne Verkehr
ZQ	: Lagerrückstellkräfte
ZF	: wahrscheinliche Setzung Gebrauch
SF	: mögliche Setzung GZT Tragfähigkeit

5.2 Schnittgrößen Design Kombinationen

Es folgen die maximalen und minimalen Schnittkräfte im GZT
für die Größen:

M_y , M_z , M_T

V_y , V_z

N

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SOFISTIK AG - www.sofistik.de

SOFiSTiK AG - www.sofistik.de

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Standardnorm ist DIN Fachbericht 103 Stahlbrücken (2009) (Germany) V 2018

Gewählte Stabelemente

Selektion	NrA	NrE	x[m]	Typ	BA
STAB	alle Elemente				AUTO
NrA, NrE Bereich der Elementnummern			Typ Elementtyp		
x[m] x-Wert des Stabschnitts oder Station			BA Bauphasen		

Schlaffe Bewehrung wird bei Querschnitten so wie in AQUA berücksichtigt
Speicherung der Bewehrung als Bemessungsfall 1

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	γ_u	γ_f	ψ_0	ψ_1	ψ_2	ψ_1'	SUP
1141	Y_1	Brutto	BA 9998	R_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1142	Y_1	Brutto	BA 9998	R_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1143	Y_1	Brutto	BA 9998	R_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1144	Y_1	Brutto	BA 9998	R_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1145	Y_1	Brutto	BA 9998	R_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1146	Y_1	Brutto	BA 9998	R_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1147	Y_1	Brutto	BA 9998	R_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1148	Y_1	Brutto	BA 9998	R_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1149	Y_1	Brutto	BA 9998	R_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1150	Y_1	Brutto	BA 9998	R_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1151	Y_1	Brutto	BA 9998	R_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1152	Y_1	Brutto	BA 9998	R_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1161	Y_1	Brutto	BA 9998	R_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1162	Y_1	Brutto	BA 9998	R_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1163	Y_1	Brutto	BA 9998	R_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1164	Y_1	Brutto	BA 9998	R_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1165	Y_1	Brutto	BA 9998	R_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1166	Y_1	Brutto	BA 9998	R_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1167	Y_1	Brutto	BA 9998	R_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1168	Y_1	Brutto	BA 9998	R_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1169	Y_1	Brutto	BA 9998	R_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1170	Y_1	Brutto	BA 9998	R_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1171	Y_1	Brutto	BA 9998	R_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1172	Y_1	Brutto	BA 9998	R_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1181	Y_1	Brutto	BA 9998	R_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1182	Y_1	Brutto	BA 9998	R_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1183	Y_1	Brutto	BA 9998	R_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1184	Y_1	Brutto	BA 9998	R_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1185	Y_1	Brutto	BA 9998	R_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1186	Y_1	Brutto	BA 9998	R_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1187	Y_1	Brutto	BA 9998	R_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1188	Y_1	Brutto	BA 9998	R_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1189	Y_1	Brutto	BA 9998	R_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1190	Y_1	Brutto	BA 9998	R_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1191	Y_1	Brutto	BA 9998	R_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1192	Y_1	Brutto	BA 9998	R_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1241	Y_2	Brutto	BA 9998	N_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1242	Y_2	Brutto	BA 9998	N_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1243	Y_2	Brutto	BA 9998	N_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1244	Y_2	Brutto	BA 9998	N_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1245	Y_2	Brutto	BA 9998	N_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1246	Y_2	Brutto	BA 9998	N_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1247	Y_2	Brutto	BA 9998	N_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1248	Y_2	Brutto	BA 9998	N_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	γ_u	γ_f	ψ_0	ψ_1	ψ_2	ψ_1'	SUP
1249	Y_2	Brutto	BA 9998	N_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1250	Y_2	Brutto	BA 9998	N_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1251	Y_2	Brutto	BA 9998	N_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1252	Y_2	Brutto	BA 9998	N_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1261	Y_2	Brutto	BA 9998	N_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1262	Y_2	Brutto	BA 9998	N_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1263	Y_2	Brutto	BA 9998	N_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1264	Y_2	Brutto	BA 9998	N_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1265	Y_2	Brutto	BA 9998	N_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1266	Y_2	Brutto	BA 9998	N_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1267	Y_2	Brutto	BA 9998	N_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1268	Y_2	Brutto	BA 9998	N_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1269	Y_2	Brutto	BA 9998	N_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1270	Y_2	Brutto	BA 9998	N_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1271	Y_2	Brutto	BA 9998	N_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1272	Y_2	Brutto	BA 9998	N_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1281	Y_2	Brutto	BA 9998	N_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1282	Y_2	Brutto	BA 9998	N_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1283	Y_2	Brutto	BA 9998	N_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1284	Y_2	Brutto	BA 9998	N_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1285	Y_2	Brutto	BA 9998	N_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1286	Y_2	Brutto	BA 9998	N_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1287	Y_2	Brutto	BA 9998	N_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1288	Y_2	Brutto	BA 9998	N_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1289	Y_2	Brutto	BA 9998	N_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1290	Y_2	Brutto	BA 9998	N_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1291	Y_2	Brutto	BA 9998	N_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1292	Y_2	Brutto	BA 9998	N_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1341	Y_3	Brutto	BA 9998	F_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1342	Y_3	Brutto	BA 9998	F_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1343	Y_3	Brutto	BA 9998	F_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1344	Y_3	Brutto	BA 9998	F_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1345	Y_3	Brutto	BA 9998	F_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1346	Y_3	Brutto	BA 9998	F_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1347	Y_3	Brutto	BA 9998	F_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1348	Y_3	Brutto	BA 9998	F_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1349	Y_3	Brutto	BA 9998	F_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1350	Y_3	Brutto	BA 9998	F_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1351	Y_3	Brutto	BA 9998	F_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1352	Y_3	Brutto	BA 9998	F_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1361	Y_3	Brutto	BA 9998	F_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1362	Y_3	Brutto	BA 9998	F_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1363	Y_3	Brutto	BA 9998	F_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1364	Y_3	Brutto	BA 9998	F_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1365	Y_3	Brutto	BA 9998	F_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1366	Y_3	Brutto	BA 9998	F_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1367	Y_3	Brutto	BA 9998	F_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1368	Y_3	Brutto	BA 9998	F_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1369	Y_3	Brutto	BA 9998	F_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1370	Y_3	Brutto	BA 9998	F_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1371	Y_3	Brutto	BA 9998	F_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1372	Y_3	Brutto	BA 9998	F_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1381	Y_3	Brutto	BA 9998	F_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1382	Y_3	Brutto	BA 9998	F_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	$\gamma-u$	$\gamma-f$	ψ_0	ψ_1	ψ_2	ψ_1'	SUP
1383	Y_3	Brutto	BA 9998	F_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1384	Y_3	Brutto	BA 9998	F_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1385	Y_3	Brutto	BA 9998	F_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1386	Y_3	Brutto	BA 9998	F_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1387	Y_3	Brutto	BA 9998	F_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1388	Y_3	Brutto	BA 9998	F_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1389	Y_3	Brutto	BA 9998	F_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1390	Y_3	Brutto	BA 9998	F_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1391	Y_3	Brutto	BA 9998	F_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1392	Y_3	Brutto	BA 9998	F_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1441	Y_4	Brutto	BA 9998	P_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1442	Y_4	Brutto	BA 9998	P_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1443	Y_4	Brutto	BA 9998	P_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1444	Y_4	Brutto	BA 9998	P_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1445	Y_4	Brutto	BA 9998	P_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1446	Y_4	Brutto	BA 9998	P_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1447	Y_4	Brutto	BA 9998	P_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1448	Y_4	Brutto	BA 9998	P_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1449	Y_4	Brutto	BA 9998	P_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1450	Y_4	Brutto	BA 9998	P_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1451	Y_4	Brutto	BA 9998	P_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1452	Y_4	Brutto	BA 9998	P_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1461	Y_4	Brutto	BA 9998	P_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1462	Y_4	Brutto	BA 9998	P_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1463	Y_4	Brutto	BA 9998	P_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1464	Y_4	Brutto	BA 9998	P_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1465	Y_4	Brutto	BA 9998	P_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1466	Y_4	Brutto	BA 9998	P_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1467	Y_4	Brutto	BA 9998	P_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1468	Y_4	Brutto	BA 9998	P_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1469	Y_4	Brutto	BA 9998	P_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1470	Y_4	Brutto	BA 9998	P_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1471	Y_4	Brutto	BA 9998	P_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1472	Y_4	Brutto	BA 9998	P_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1481	Y_4	Brutto	BA 9998	P_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1482	Y_4	Brutto	BA 9998	P_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1483	Y_4	Brutto	BA 9998	P_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1484	Y_4	Brutto	BA 9998	P_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1485	Y_4	Brutto	BA 9998	P_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1486	Y_4	Brutto	BA 9998	P_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1487	Y_4	Brutto	BA 9998	P_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1488	Y_4	Brutto	BA 9998	P_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1489	Y_4	Brutto	BA 9998	P_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1490	Y_4	Brutto	BA 9998	P_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1491	Y_4	Brutto	BA 9998	P_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1492	Y_4	Brutto	BA 9998	P_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1941	Y_9	Brutto	BA 9998	1_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1942	Y_9	Brutto	BA 9998	1_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1943	Y_9	Brutto	BA 9998	1_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1944	Y_9	Brutto	BA 9998	1_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1945	Y_9	Brutto	BA 9998	1_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1946	Y_9	Brutto	BA 9998	1_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1947	Y_9	Brutto	BA 9998	1_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1948	Y_9	Brutto	BA 9998	1_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	$\gamma-u$	$\gamma-f$	ψ_0	ψ_1	ψ_2	ψ_1'	SUP
1949	Y_9	Brutto	BA 9998	1_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1950	Y_9	Brutto	BA 9998	1_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1951	Y_9	Brutto	BA 9998	1_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1952	Y_9	Brutto	BA 9998	1_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1961	Y_9	Brutto	BA 9998	1_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1962	Y_9	Brutto	BA 9998	1_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1963	Y_9	Brutto	BA 9998	1_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1964	Y_9	Brutto	BA 9998	1_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1965	Y_9	Brutto	BA 9998	1_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1966	Y_9	Brutto	BA 9998	1_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1967	Y_9	Brutto	BA 9998	1_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1968	Y_9	Brutto	BA 9998	1_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1969	Y_9	Brutto	BA 9998	1_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1970	Y_9	Brutto	BA 9998	1_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1971	Y_9	Brutto	BA 9998	1_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1972	Y_9	Brutto	BA 9998	1_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1981	Y_9	Brutto	BA 9998	1_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1982	Y_9	Brutto	BA 9998	1_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1983	Y_9	Brutto	BA 9998	1_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1984	Y_9	Brutto	BA 9998	1_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1985	Y_9	Brutto	BA 9998	1_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1986	Y_9	Brutto	BA 9998	1_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1987	Y_9	Brutto	BA 9998	1_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1988	Y_9	Brutto	BA 9998	1_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1989	Y_9	Brutto	BA 9998	1_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1990	Y_9	Brutto	BA 9998	1_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1991	Y_9	Brutto	BA 9998	1_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
1992	Y_9	Brutto	BA 9998	1_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2141	Y_D	Brutto	BA 9998	D_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2142	Y_D	Brutto	BA 9998	D_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2143	Y_D	Brutto	BA 9998	D_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2144	Y_D	Brutto	BA 9998	D_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2145	Y_D	Brutto	BA 9998	D_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2146	Y_D	Brutto	BA 9998	D_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2147	Y_D	Brutto	BA 9998	D_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2148	Y_D	Brutto	BA 9998	D_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2149	Y_D	Brutto	BA 9998	D_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2150	Y_D	Brutto	BA 9998	D_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2151	Y_D	Brutto	BA 9998	D_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2152	Y_D	Brutto	BA 9998	D_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2161	Y_D	Brutto	BA 9998	D_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2162	Y_D	Brutto	BA 9998	D_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2163	Y_D	Brutto	BA 9998	D_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2164	Y_D	Brutto	BA 9998	D_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2165	Y_D	Brutto	BA 9998	D_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2166	Y_D	Brutto	BA 9998	D_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2167	Y_D	Brutto	BA 9998	D_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2168	Y_D	Brutto	BA 9998	D_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2169	Y_D	Brutto	BA 9998	D_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2170	Y_D	Brutto	BA 9998	D_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2171	Y_D	Brutto	BA 9998	D_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2172	Y_D	Brutto	BA 9998	D_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2181	Y_D	Brutto	BA 9998	D_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2182	Y_D	Brutto	BA 9998	D_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	$\gamma-u$	$\gamma-f$	ψ_0	ψ_1	ψ_2	ψ_3	SUP
2183	Y_D	Brutto	BA 9998	D_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2184	Y_D	Brutto	BA 9998	D_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2185	Y_D	Brutto	BA 9998	D_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2186	Y_D	Brutto	BA 9998	D_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2187	Y_D	Brutto	BA 9998	D_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2188	Y_D	Brutto	BA 9998	D_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2189	Y_D	Brutto	BA 9998	D_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2190	Y_D	Brutto	BA 9998	D_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2191	Y_D	Brutto	BA 9998	D_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2192	Y_D	Brutto	BA 9998	D_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2941	Y_G	Brutto	BA 9998	F_temp BEAM-MY_NODE-PX_SPRI-P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2942	Y_G	Brutto	BA 9998	F_temp min-MY PX P	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2943	Y_G	Brutto	BA 9998	F_temp max-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2944	Y_G	Brutto	BA 9998	F_temp min-VZ PY T	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2945	Y_G	Brutto	BA 9998	F_temp max-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2946	Y_G	Brutto	BA 9998	F_temp min-MT PZ M	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2947	Y_G	Brutto	BA 9998	F_temp max--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2948	Y_G	Brutto	BA 9998	F_temp min--N UX PTX	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2949	Y_G	Brutto	BA 9998	F_temp max-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2950	Y_G	Brutto	BA 9998	F_temp min-MZ UY PTY	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2951	Y_G	Brutto	BA 9998	F_temp max-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
2952	Y_G	Brutto	BA 9998	F_temp min-VY UZ PTZ	1.00	0.00	1.00	1.00	1.00	1.00	Q EXEX
5010	G_1	BA	BA 10	Zusammenbau bis Schuss 11 und ei	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5011	G_1	BA	BA 11	Absetzen auf Strompfeller	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5012	G_1	BA	BA 12	Zusammenbau bis Schuss 12	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5013	G_1	BA	BA 13	Zusammenbau bis Schuss 15	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5014	G_1	BA	BA 14	Zusammenbau bis Schuss 18	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5015	G_1	BA	BA 15	Zusammenbau bis Schuss 19	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5016	G_1	BA	BA 16	Abbau Hilfsstützen und Derrick	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5020	G_1	BA	BA 20	Anheben Überbau um 1630mm	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5021	G_1	BA	BA 21	Einbau Fahrbahnplatte Schuss 7-1	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5022	G_1	BA	BA 22	Absenken Überbau um 2030mm	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5023	G_1	BA	BA 23	Einbau Fahrbahnplatte Schuss 1-6	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5024	G_1	BA	BA 24	Anheben um 400mm	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5030	G_1	BA	BA 30	Einbau Fußgängerweg	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
5040	G_1	BA	BA 40	Mitwirkende Breite	1.35	1.00	1.00	1.00	1.00	1.00	G PERM
LF Lastfall					BA Querschnitt auf den die Schnittgrößen wirken						
ACT Einwirkung					SUP Art und Gruppe der Einwirkung, sowie Überlagerungsmethode						
REF Referenzpunkt der Schnittgrößen											

Spannungsnachweis

Maximale Ergebnisse werden gespeichert unter Lastfall 3113

Maximale Ergebnisse werden gespeichert unter Lastfall 3114

Spannungen

Stab	x[m]	QNr	LF	Mat	$\sigma-x$	$\sigma+x$	$\Delta\sigma$	τ	$\sigma-I$	$\sigma-II$	$\sigma-v$	N[kN]
Gesamt			min	1	17.0	-7.0		1.0	0.0	-1.6	22.4	
Gesamt			max	1	-336.1	376.8		*****	*****	*****	*****	
Gesamt			min	2	63.7	-235.0		0.1	0.0	-0.0	2.7	
Gesamt			max	2	-331.3	375.3		4.3	375.3	-331.3	375.3	
Gesamt			min	3	0.4	-64.3		0.5	13.1	-22.3	36.7	
Gesamt			max	3	-391.9	530.2		142.7	533.0	-402.8	534.4	
Gesamt			min	4	0.3	-64.2		0.5	13.0	-21.3	36.6	
Gesamt			max	4	-391.9	530.2		142.8	533.1	-402.8	534.5	
Gesamt			min	5	33.7	-10.4		0.3	0.3	-0.1	15.6	

Bemessung im Grenzzustand der Tragfähigkeit nach DIN-FB 102:2009

Spannungen

Stab	x[m]	QNr	LF	Mat	$\sigma-x$	$\sigma+x$	$\Delta\sigma$	τ	$\sigma-I$	$\sigma-II$	$\sigma-v$	N[kN]
Gesamt			max	5	-393.8	531.6		*****	*****	*****	*****	
Gesamt			min	6	33.6	-10.4		0.0	0.1	0.0	3.5	
Gesamt			max	6	-389.8	523.2		9.6	523.2	-389.8	523.2	
Gesamt			min	7	23.8	-57.7		0.1	0.0	-0.6	7.7	
Gesamt			max	7	-215.0	364.9		75.7	367.9	-215.4	369.5	
Gesamt			min	8	150.8	-148.3		0.0	0.0	0.0	0.4	
Gesamt			max	8	-213.0	363.8		4.4	363.8	-213.0	363.8	
Gesamt			min	9	267.9	-208.9		0.0	0.0	-0.5	2.7	
Gesamt			max	9	-253.3	296.0		66.3	297.5	-253.5	298.3	
Gesamt			min	10	23.6	-35.2		0.1	0.0	-0.7	2.8	
Gesamt			max	10	-285.0	312.3		62.8	312.3	-285.0	312.3	
Gesamt			min	11	181.2	-237.9		0.0	0.0	0.0	0.2	
Gesamt			max	11	-279.4	310.3		2.0	310.3	-279.4	310.3	
Gesamt			min	12	30.0	-35.3		0.0	0.0	0.0	0.3	
Gesamt			max	12	-35.4	30.1		1.1	30.1	-35.4	35.4	
Gesamt			min	13	12.9	-52.6		0.0	0.0	0.0	0.1	
Gesamt			max	13	-307.3	323.3		118.8	324.9	-309.0	326.0	
Gesamt			min	14	29.4	-78.4		0.0	0.1	0.0	0.1	
Gesamt			max	14	-136.7	114.2		128.6	166.4	-202.2	241.8	
Gesamt			min	40	1.3	-14.2		0.0	0.0	0.0	0.0	
Gesamt			max	40	-14.2	1.3		0.0	0.0	0.0	0.0	

$\sigma-x$ Längsdruckspannung
 $\sigma+x$ Längszugspannung
 $\Delta\sigma$ Schwingbreite der Bewehrung
 τ Schubspannung
 $\sigma-I$ Hauptzugspannung
 $\sigma-II$ Hauptdruckspannung
 $\sigma-v$ Vergleichsspannung
N[kN] anteilige Längskraft im Verbundquerschnitt

5.3 Spannungen für Querschnittsnachweise

Die folgenden Tabellen zeigen die Druck-, Zug-, Schub- und Vergleichsspannungen der nachzuweisenden Bauteile für die Lastfälle maxMy, minMy in der Designkombination. Zusätzlich ist der Lastfall 3113 abgebildet der eine Überlagerung aus allen 3100er Lastfällen bildet. Die Bauteile können anhand der Materialnummer identifiziert werden. Aufgelistet ist das Fahrbahnblech (MNR 1), der äußere Steg des Hohlkastens (MNR 3), der innere Steg (MNR 4), das Bodenblech (MNR 5), die orthotrope Fahrbahnplatte (MNR 7) sowie der Gehweg (MNR 10). Da nur der Hauptträger unterstrom nachgewiesen wurde, werden die Ergebnisse auch nur für diesen angezeigt.

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	1	-2.1	-0.1	53.8	93.1
			2.460	1	-48.8	0.0	52.1	102.6
		11002	0.000	1	-50.5	0.0	52.6	104.2
			2.560	1	-94.8	0.0	49.6	128.0
		11003	0.000	1	-96.5	0.0	50.0	129.7
			2.560	1	-136.4	0.0	47.0	158.8
		11004	0.000	1	-138.1	-0.1	47.2	160.5
			2.560	1	-173.8	-0.1	44.2	189.9
		11005	0.000	1	-172.5	-0.1	43.7	188.4
			2.560	1	-203.8	-0.1	40.6	215.6
		11006	0.000	1	-205.4	-0.1	42.1	218.0
			1.280	1	-219.8	-0.2	40.9	230.9
		12007	0.000	1	-216.2	-0.2	38.5	226.2
			1.280	1	-221.9	-0.2	37.3	231.1
		12008	0.000	1	-223.3	-0.1	37.5	232.6
			2.560	1	-246.4	-0.1	34.6	253.6
		12009	0.000	1	-247.9	-0.2	34.2	254.9
			2.560	1	-267.9	-0.1	31.4	273.3
		12010	0.000	1	-262.4	0.0	30.8	267.8
			2.560	1	-279.0	0.0	28.0	283.1
		12011	0.000	1	-284.3	-0.2	27.7	288.3
			2.560	1	-298.2	-0.2	24.9	301.3
		12012	0.000	1	-299.6	-0.2	24.8	302.7
			1.280	1	-305.1	-0.2	23.1	307.7
		13013	0.000	1	-306.2	-0.2	48.6	317.6
			1.280	1	-310.2	-0.9	47.3	320.8
		13014	0.000	1	-305.3	-0.8	20.8	307.4
			2.560	1	-313.8	-0.7	18.1	315.4
		13015	0.000	1	-315.2	-0.8	17.4	316.7
			2.560	1	-321.3	-0.7	14.7	322.3
		13016	0.000	1	-326.4	-0.9	14.1	327.3
			2.560	1	-330.4	-0.9	11.5	331.0
		13017	0.000	1	-331.7	-0.9	10.5	332.2
			2.560	1	-333.6	-0.9	8.0	333.8
		13018	0.000	1	-334.9	-1.0	8.5	335.1
			1.280	1	-334.5	-1.0	5.2	334.6
		14019	0.000	1	-335.8	-1.0	10.0	336.0
			1.280	1	-334.7	-1.0	4.5	334.8
		14020	0.000	1	-336.1	-1.0	9.1	336.1
			2.560	1	-334.0	-1.0	1.1	334.0
		14021	0.000	1	-335.3	-1.1	9.7	335.3
			2.560	1	-331.4	-1.1	2.2	331.4
		14022	0.000	1	-332.7	-1.2	10.3	332.8
			2.560	1	-326.9	-1.2	5.5	327.0

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	14023	0.000	1	-328.2	-1.2	10.9	328.4
			2.560	1	-320.7	-1.3	8.4	321.0
		14024	0.000	1	-318.7	-1.2	11.8	319.1
			1.290	1	-313.9	-1.3	10.6	314.4
		15025	0.000	1	-315.1	-1.3	13.2	315.6
			1.280	1	-309.7	-1.3	11.1	310.3
		15026	0.000	1	-310.9	-1.3	12.9	311.6
			2.560	1	-300.1	-1.4	13.5	301.0
		15027	0.000	1	-301.3	-1.4	14.0	302.3
			2.560	1	-288.8	-1.5	15.9	290.1
		15028	0.000	1	-296.3	-1.7	16.7	297.7
			2.560	1	-281.8	-1.7	18.4	283.6
		15029	0.000	1	-283.1	-1.8	19.4	285.0
			2.560	1	-267.2	-1.8	21.0	269.7
		15030	0.000	1	-268.4	-1.9	22.8	271.3
			1.280	1	-259.9	-1.3	46.0	271.9
		16031	0.000	1	-261.2	-1.2	23.7	264.4
			1.280	1	-251.2	-1.2	24.3	254.7
		16032	0.000	1	-258.7	-1.5	24.6	262.2
			2.560	1	-239.5	-1.5	25.9	243.6
		16033	0.000	1	-240.7	-1.6	26.5	245.0
			2.560	1	-219.9	-1.6	27.7	225.1
		16034	0.000	1	-224.7	-1.9	28.6	230.1
			2.560	1	-202.1	-1.9	29.7	208.6
		16035	0.000	1	-203.3	-2.0	30.3	210.0
			2.560	1	-179.3	-2.0	31.4	187.3
		16036	0.000	1	-180.4	-2.0	32.2	188.9
			1.280	1	-170.9	-2.4	31.6	179.5
		17037	0.000	1	-245.2	25.3	30.7	248.1
			1.280	1	-232.3	25.7	31.2	235.6
		17038	0.000	1	-233.7	24.7	47.3	235.7
			2.560	1	-207.8	18.4	48.2	212.3
		17039	0.000	1	-209.2	17.7	49.9	211.7
			2.560	1	-163.2	7.6	42.0	167.2
		17040	0.000	1	-164.7	7.2	40.3	165.0
			2.560	1	-141.2	3.5	40.8	144.8
		17041	0.000	1	-142.8	3.3	38.9	144.0
			2.560	1	-118.5	0.9	39.2	130.0
		17042	0.000	1	-120.1	0.7	37.8	129.9
			1.280	1	-107.3	0.1	38.1	121.0
		18043	0.000	1	-108.1	0.3	32.0	116.5
			1.280	1	-91.7	-0.1	34.0	106.5
		18044	0.000	1	-90.4	-1.1	37.8	111.0
			2.560	1	-65.7	1.9	20.4	74.5
		18045	0.000	1	-66.5	2.0	31.4	85.9
			2.560	1	-43.8	1.9	23.1	59.3
		18046	0.000	1	-47.5	0.3	32.3	73.5
			2.560	1	-22.9	0.3	24.8	48.6
		18047	0.000	1	-22.4	1.3	33.3	60.9
			2.560	1	3.5	6.9	32.4	56.6
		18048	0.000	1	3.0	6.6	41.4	72.0
			1.280	1	3.9	17.5	33.1	59.9
		19049	0.000	1	4.1	17.2	37.7	67.5
			1.280	1	4.4	26.3	28.3	55.6
		19050	0.000	1	3.5	24.9	41.8	76.5

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	19050	2.560	1	-0.3	36.5	15.8	45.6
		19051	0.000	1	-0.3	35.8	20.1	49.4
			2.560	1	-0.3	51.2	15.1	57.5
		19052	0.000	1	-0.4	48.7	19.9	59.6
			2.560	1	-0.5	63.5	15.2	68.4
		19053	0.000	1	-0.4	62.9	19.8	71.3
			2.560	1	-0.6	77.1	15.3	81.1
		19054	0.000	1	-0.4	76.5	19.4	83.3
			1.290	1	-0.6	83.7	15.0	87.5
		20055	0.000	1	-0.7	82.9	21.3	90.6
			1.280	1	-0.7	90.1	15.1	93.8
		20056	0.000	1	-0.5	88.5	18.6	94.2
			2.560	1	-0.9	101.4	14.7	104.6
		20057	0.000	1	-0.7	101.1	18.6	106.1
			2.560	1	-0.9	114.4	14.7	117.2
		20058	0.000	1	-0.6	114.3	13.0	116.5
			2.560	1	-1.0	100.9	20.2	106.8
		20059	0.000	1	-0.7	100.7	12.8	103.1
			2.560	1	-0.9	88.3	20.3	95.0
		20060	0.000	1	-0.6	88.1	13.3	91.0
			1.280	1	-0.8	82.1	15.1	86.0
		21061	0.000	1	-0.7	83.3	14.7	86.0
			1.280	1	-0.6	77.6	14.7	80.6
		21062	0.000	1	-0.4	77.0	14.3	80.8
			2.560	1	-0.6	64.0	21.1	72.2
		21063	0.000	1	-0.4	63.3	15.2	68.5
			2.560	1	-0.6	49.7	21.0	60.5
		21064	0.000	1	-0.4	49.0	16.0	56.3
			2.560	1	-0.6	35.2	20.7	49.5
		21065	0.000	1	-0.2	36.1	16.8	46.3
			2.560	1	3.5	24.5	42.5	77.6
		21066	0.000	1	3.5	23.1	32.6	61.0
			1.280	1	3.5	16.8	37.0	66.3
		22067	0.000	1	4.1	15.3	32.8	58.8
			1.280	1	3.9	6.3	41.6	72.2
		22068	0.000	1	3.1	4.7	31.6	55.0
			2.560	1	-21.2	1.3	33.5	61.3
		22069	0.000	1	-22.3	1.4	23.7	46.0
			2.560	1	-44.4	1.2	31.8	69.6
		22070	0.000	1	-49.0	0.5	22.0	62.1
			2.560	1	-69.7	0.6	30.7	87.7
		22071	0.000	1	-68.0	2.2	20.6	76.3
			2.560	1	-90.6	-1.0	37.5	109.5
		22072	0.000	1	-88.0	2.5	21.2	93.0
			1.280	1	-104.6	-0.2	31.5	114.1
		23073	0.000	1	-109.5	0.2	37.9	121.5
			1.280	1	-120.1	0.8	37.5	128.3
		23074	0.000	1	-120.7	1.1	39.3	130.7
			2.560	1	-142.8	3.2	38.6	142.8
		23075	0.000	1	-143.4	3.6	40.8	145.8
			2.560	1	-164.5	7.1	40.1	164.9
		23076	0.000	1	-165.2	7.6	42.0	169.2
			2.560	1	-209.2	17.6	49.6	211.7
		23077	0.000	1	-210.0	18.4	48.0	214.4
			2.560	1	-233.6	24.5	47.2	235.6

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	23078	0.000	1	-234.4	25.7	31.1	235.5
			1.280	1	-245.0	25.2	30.6	247.8
		24079	0.000	1	-176.5	-2.7	32.3	185.2
			1.280	1	-184.1	-2.6	32.4	192.5
		24080	0.000	1	-180.4	-2.0	31.2	188.3
			2.560	1	-202.0	-2.0	30.4	208.7
		24081	0.000	1	-203.2	-1.9	29.6	209.5
			2.560	1	-223.3	-1.9	28.7	228.8
		24082	0.000	1	-224.5	-1.8	27.9	229.6
			2.560	1	-243.1	-1.8	27.0	247.6
		24083	0.000	1	-240.4	-1.5	25.9	244.5
			2.560	1	-257.1	-1.5	24.8	260.7
		24084	0.000	1	-258.4	-1.4	24.8	261.9
			1.290	1	-266.2	-1.4	24.2	269.5
		25085	0.000	1	-260.7	-1.3	46.5	272.9
			1.280	1	-266.9	-2.0	46.0	278.5
		25086	0.000	1	-268.1	-1.8	21.0	270.6
			2.560	1	-281.5	-1.8	19.7	283.6
		25087	0.000	1	-282.7	-1.7	18.3	284.5
			2.560	1	-294.7	-1.7	16.9	296.1
		25088	0.000	1	-295.9	-1.6	15.5	297.1
			2.560	1	-306.3	-1.7	14.1	307.3
		25089	0.000	1	-301.0	-1.4	12.9	301.9
			2.560	1	-309.5	-1.4	13.0	310.2
		25090	0.000	1	-310.8	-1.3	10.6	311.3
			1.280	1	-313.8	-1.3	13.4	314.2
		26091	0.000	1	-315.1	-1.3	10.3	315.6
			1.280	1	-317.5	-1.3	11.9	317.9
		26092	0.000	1	-318.8	-1.2	8200994701705216.0	14204540253372416.0
			2.560	1	-323.6	-1.2	10.7	323.8
		26093	0.000	1	-328.3	-1.3	5.5	328.4
			2.560	1	-331.5	-1.2	9.8	331.5
		26094	0.000	1	-332.8	-1.2	2.3	332.8
			2.560	1	-334.0	-1.1	9.0	334.0
		26095	0.000	1	-335.4	-1.1	1.0	335.4
			2.560	1	-334.7	-1.0	8.4	334.7
		26096	0.000	1	-336.1	-1.0	4.3	336.2
			1.280	1	-334.5	-1.0	5.2	334.6
		27097	0.000	1	-335.8	-1.0	4.8	335.9
			1.280	1	-333.6	-1.0	5.9	333.7
		27098	0.000	1	-334.9	-1.0	7.8	335.1
			2.560	1	-330.2	-0.9	10.0	330.6
		27099	0.000	1	-331.6	-0.9	11.4	332.2
			2.560	1	-324.8	-0.9	13.6	325.7
		27100	0.000	1	-326.3	-0.9	14.9	327.3
			2.560	1	-317.4	-0.9	17.2	318.8
		27101	0.000	1	-315.1	-0.7	18.4	316.7
			2.560	1	-303.8	-0.7	20.8	305.9
		27102	0.000	1	-305.3	-0.7	22.0	307.7
			1.280	1	-298.8	-0.1	47.6	310.0
		28103	0.000	1	-306.5	-0.2	23.1	309.1
			1.280	1	-298.4	-0.2	24.5	301.4
		28104	0.000	1	-299.6	-0.2	25.1	302.8
			2.560	1	-282.7	-0.2	27.6	286.7
		28105	0.000	1	-284.3	-0.2	28.2	288.4

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	28105	2.560	1	-264.5	-0.2	30.8	269.8
		28106	0.000	1	-262.4	-0.1	31.2	267.9
			2.560	1	-239.9	0.0	34.0	247.0
		28107	0.000	1	-247.9	-0.2	34.7	255.1
			2.560	1	-221.6	-0.1	37.4	230.9
		28108	0.000	1	-223.3	-0.2	37.8	232.7
			1.280	1	-215.1	-0.3	37.9	224.9
		29109	0.000	1	-215.9	-0.2	39.4	226.5
			1.280	1	-199.4	-0.1	40.8	211.5
		29110	0.000	1	-205.2	-0.3	40.6	217.0
			2.560	1	-170.4	-0.1	43.6	186.4
		29111	0.000	1	-172.1	-0.2	43.6	187.9
			2.560	1	-133.7	0.0	46.8	156.4
		29112	0.000	1	-137.4	-0.2	47.0	159.8
			2.560	1	-94.5	0.0	50.5	128.7
		29113	0.000	1	-95.6	-0.2	49.6	128.6
			2.560	1	-48.5	0.0	53.2	104.1
		29114	0.000	1	-49.2	-0.2	52.0	102.7
				2.460	1	0.1	0.1	62.7
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =1)							

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	3	-1.6	5.6	23.5	40.8
			2.460	3	-48.4	116.1	130.4	225.9
		11002	0.000	3	-50.1	121.2	115.8	200.6
			2.560	3	-94.1	224.2	121.4	267.0
		11003	0.000	3	-95.8	229.2	107.0	265.6
			2.560	3	-135.4	320.5	112.6	347.8
		11004	0.000	3	-137.0	325.4	98.2	348.3
			2.560	3	-172.6	406.2	104.0	425.0
		11005	0.000	3	-171.4	347.1	88.3	367.2
			2.560	3	-202.5	407.5	93.7	425.3
		11006	0.000	3	-204.1	411.6	83.6	427.0
			1.280	3	-218.4	439.0	94.9	455.9
		12007	0.000	3	-215.0	337.5	74.5	354.9
			1.280	3	-220.7	356.2	83.6	375.4
		12008	0.000	3	-222.1	359.3	71.1	374.2
			2.560	3	-245.0	395.1	76.3	409.6
		12009	0.000	3	-246.5	398.1	63.3	408.9
			2.560	3	-266.4	429.1	68.6	439.9
		12010	0.000	3	-261.0	403.0	54.9	411.3
			2.560	3	-277.5	427.7	59.9	436.3
		12011	0.000	3	-282.9	395.4	48.0	402.2
			2.560	3	-296.7	414.6	53.2	421.9
		12012	0.000	3	-298.2	417.2	41.8	422.1
			1.280	3	-303.7	424.6	50.3	430.9
		13013	0.000	3	-304.8	426.4	68.3	440.5
			1.280	3	-308.7	431.3	77.5	448.0
		13014	0.000	3	-303.8	417.3	33.3	420.5
			2.560	3	-312.4	429.1	38.3	432.7
		13015	0.000	3	-313.7	431.5	26.3	433.4
			2.560	3	-319.8	440.0	31.3	442.4
		13016	0.000	3	-325.0	410.1	20.1	411.4
			2.560	3	-328.9	415.4	25.4	417.1
		13017	0.000	3	-330.3	417.6	13.6	418.2
			2.560	3	-332.1	420.2	18.9	421.1
		13018	0.000	3	-333.5	422.4	7.6	422.6
			1.280	3	-333.0	421.7	15.3	422.2
		14019	0.000	3	-334.4	423.7	5.1	423.8
			1.280	3	-333.3	422.3	12.6	422.7
		14020	0.000	3	-334.6	424.4	2.3	424.4
			2.560	3	-332.6	421.8	6.6	421.9
		14021	0.000	3	-333.9	423.9	4.9	423.9
			2.560	3	-330.0	418.8	1.1	418.8
		14022	0.000	3	-331.3	420.9	10.9	421.1
			2.560	3	-325.5	413.2	5.4	413.3
		14023	0.000	3	-326.8	415.3	16.2	415.9
			2.560	3	-319.4	405.6	10.6	405.9
		14024	0.000	3	-317.4	438.8	21.4	439.8
			1.290	3	-312.5	431.6	13.5	432.1
		15025	0.000	3	-313.8	433.7	23.9	434.9
			1.280	3	-308.4	425.9	15.9	426.5
		15026	0.000	3	-309.6	428.1	26.6	429.6
			2.560	3	-298.8	413.0	20.9	414.1
		15027	0.000	3	-300.1	415.2	31.5	417.4
			2.560	3	-287.6	398.0	25.9	399.8
		15028	0.000	3	-295.0	425.9	37.0	429.0

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	15028	2.560	3	-280.7	405.6	31.0	408.1
		15029	0.000	3	-281.9	407.9	41.8	411.9
			2.560	3	-266.1	385.4	35.7	388.9
		15030	0.000	3	-267.3	387.6	48.7	393.4
			1.280	3	-258.8	375.6	77.1	392.9
		16031	0.000	3	-260.1	378.1	51.1	384.6
			1.280	3	-250.1	363.7	52.8	370.9
		16032	0.000	3	-257.5	458.8	51.6	463.4
			2.560	3	-238.4	425.8	45.1	430.1
		16033	0.000	3	-239.6	428.5	55.9	434.4
			2.560	3	-218.9	393.3	49.4	398.9
		16034	0.000	3	-223.6	453.1	60.8	458.9
			2.560	3	-201.2	410.5	54.0	416.2
		16035	0.000	3	-202.3	413.6	64.8	420.9
			2.560	3	-178.4	368.8	58.1	376.1
		16036	0.000	3	-179.6	371.9	69.4	381.1
			1.280	3	-170.1	346.2	70.3	356.4
		17037	0.000	3	-156.3	492.4	70.7	498.6
			1.280	3	-141.7	463.1	72.3	469.9
		17038	0.000	3	-146.2	465.3	84.3	470.7
			2.560	3	-141.8	398.7	77.3	404.4
		17039	0.000	3	-145.1	401.4	88.9	408.3
			2.560	3	-133.8	324.3	69.0	330.5
		17040	0.000	3	-135.9	327.6	77.4	335.5
			2.560	3	-125.0	268.8	69.5	277.4
		17041	0.000	3	-126.6	272.1	78.4	283.0
			2.560	3	-110.3	213.3	70.3	225.6
		17042	0.000	3	-111.7	216.7	79.1	231.5
			1.280	3	-100.9	186.1	70.0	201.3
		18043	0.000	3	-102.0	189.5	74.2	202.4
			1.280	3	-88.3	158.4	66.7	172.9
		18044	0.000	3	-89.3	134.1	80.3	163.7
			2.560	3	-64.9	90.4	49.2	103.8
		18045	0.000	3	-66.1	93.0	59.2	113.3
			2.560	3	-43.3	45.3	50.5	89.8
		18046	0.000	3	-45.0	40.7	57.6	101.3
			2.560	3	-21.0	0.0	49.7	87.0
		18047	0.000	3	-22.3	-0.8	60.4	105.6
			2.560	3	-33.6	4.2	25.3	46.3
		18048	0.000	3	-32.1	3.1	35.2	62.4
			1.280	3	-47.5	14.6	25.9	54.9
		19049	0.000	3	-46.1	14.0	38.6	68.4
			1.280	3	-60.8	24.8	30.4	70.1
		19050	0.000	3	-47.1	20.8	33.7	62.8
			2.560	3	-67.5	36.3	30.8	81.0
		19051	0.000	3	-66.3	35.6	37.9	85.4
			2.560	3	-81.9	51.0	29.9	92.5
		19052	0.000	3	-68.9	48.5	36.6	87.6
			2.560	3	-82.0	63.3	28.4	92.2
		19053	0.000	3	-81.0	62.7	35.4	96.1
			2.560	3	-93.8	76.8	26.9	101.7
		19054	0.000	3	-92.8	76.3	34.3	105.2
			1.290	3	-99.6	83.4	26.1	106.6
		20055	0.000	3	-98.9	82.6	31.4	108.4
			1.280	3	-105.3	89.7	24.9	111.3

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	20056	0.000	3	-91.2	87.2	32.2	102.8
			2.560	3	-101.9	99.2	23.4	107.5
		20057	0.000	3	-101.0	98.8	33.0	112.0
			2.560	3	-111.6	110.5	24.8	117.2
		20058	0.000	3	-110.9	111.1	26.9	117.8
			2.560	3	-101.6	99.7	31.1	111.1
		20059	0.000	3	-100.8	99.2	25.8	107.8
			2.560	3	-91.7	88.1	30.0	101.5
		20060	0.000	3	-90.9	87.6	27.0	99.6
			1.280	3	-86.7	81.9	25.0	94.4
		21061	0.000	3	-98.3	83.0	26.1	105.3
			1.280	3	-93.2	77.4	26.2	100.7
		21062	0.000	3	-92.4	76.7	28.8	101.8
			2.560	3	-81.4	63.8	33.7	94.9
		21063	0.000	3	-80.5	63.1	30.1	92.3
			2.560	3	-69.3	49.5	35.2	86.3
		21064	0.000	3	-68.4	48.9	31.1	83.0
			2.560	3	-56.9	35.0	36.4	78.3
		21065	0.000	3	-65.6	36.0	31.9	80.5
			2.560	3	-47.1	21.9	32.9	61.9
		21066	0.000	3	-45.3	20.9	25.1	55.0
			1.280	3	-37.1	13.0	37.5	66.4
		22067	0.000	3	-44.0	13.6	26.0	52.0
			1.280	3	-32.3	4.2	34.8	61.6
		22068	0.000	3	-30.0	3.1	25.8	46.5
			2.560	3	-21.2	-1.1	59.9	104.6
		22069	0.000	3	-22.2	1.0	51.0	89.3
			2.560	3	-44.3	32.5	58.4	102.5
		22070	0.000	3	-44.6	42.8	48.4	87.1
			2.560	3	-63.8	78.1	55.7	107.0
		22071	0.000	3	-65.5	95.3	49.3	108.3
			2.560	3	-87.8	132.8	79.7	162.3
		22072	0.000	3	-85.1	138.8	48.0	147.1
			1.280	3	-99.9	156.5	72.6	175.6
		23073	0.000	3	-101.7	190.9	69.7	205.7
			1.280	3	-110.2	214.9	78.6	229.7
		23074	0.000	3	-111.1	218.0	70.3	230.2
			2.560	3	-125.3	270.1	77.8	280.9
		23075	0.000	3	-125.9	273.4	69.4	281.9
			2.560	3	-134.7	325.3	76.9	333.3
		23076	0.000	3	-134.9	328.8	68.8	335.0
			2.560	3	-143.9	399.3	88.4	406.2
		23077	0.000	3	-142.9	403.4	77.0	409.0
			2.560	3	-145.1	462.9	84.0	468.4
		23078	0.000	3	-142.9	467.6	61.4	473.3
			1.280	3	-155.0	490.1	70.4	496.2
		24079	0.000	3	-175.6	421.9	60.9	427.8
			1.280	3	-183.1	445.8	70.2	452.1
		24080	0.000	3	-179.5	372.6	57.8	379.7
			2.560	3	-201.0	411.5	64.6	418.8
		24081	0.000	3	-202.2	414.2	53.7	419.8
			2.560	3	-222.2	450.8	60.6	456.7
		24082	0.000	3	-223.4	453.6	49.6	458.0
			2.560	3	-241.9	487.8	56.4	492.5
		24083	0.000	3	-239.3	429.0	44.8	433.2

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	24083	2.560	3	-256.0	456.7	51.5	461.4
		24084	0.000	3	-257.2	459.2	42.8	462.8
			1.290	3	-264.9	472.1	51.6	476.6
		25085	0.000	3	-259.7	378.1	67.0	392.2
			1.280	3	-265.8	385.7	75.9	402.2
		25086	0.000	3	-267.0	388.1	35.4	391.5
			2.560	3	-280.3	406.3	41.8	410.4
		25087	0.000	3	-281.5	408.4	30.6	410.8
			2.560	3	-293.4	424.3	37.0	427.4
		25088	0.000	3	-294.7	426.4	25.7	428.0
			2.560	3	-305.0	440.1	32.0	442.3
		25089	0.000	3	-299.8	415.5	20.5	416.6
			2.560	3	-308.2	426.4	26.5	427.9
		25090	0.000	3	-309.5	428.3	15.4	428.9
			1.280	3	-312.5	431.9	23.6	433.1
		26091	0.000	3	-313.7	434.0	13.4	434.5
			1.280	3	-316.1	436.9	21.4	437.9
		26092	0.000	3	-317.4	438.9	10.2	439.2
			2.560	3	-322.2	445.3	16.1	445.8
		26093	0.000	3	-326.9	415.4	5.0	415.4
			2.560	3	-330.1	419.0	11.0	419.3
		26094	0.000	3	-331.4	421.0	1.4	421.0
			2.560	3	-332.6	422.1	5.0	422.1
		26095	0.000	3	-334.0	424.0	7.0	424.2
			2.560	3	-333.3	422.7	2.2	422.7
		26096	0.000	3	-334.7	424.6	13.0	425.1
			1.280	3	-333.1	422.1	15.5	422.7
		27097	0.000	3	-334.3	424.1	15.4	424.7
			1.280	3	-332.1	420.8	18.2	421.7
		27098	0.000	3	-333.4	422.6	19.3	423.6
			2.560	3	-328.7	415.9	13.5	416.5
		27099	0.000	3	-330.2	418.0	25.7	419.7
			2.560	3	-323.4	408.4	20.1	409.7
		27100	0.000	3	-324.9	410.5	32.1	413.2
			2.560	3	-316.0	398.2	26.5	400.4
		27101	0.000	3	-313.6	431.9	38.8	435.6
			2.560	3	-302.3	415.3	33.4	418.5
		27102	0.000	3	-303.8	417.6	46.7	423.2
			1.280	3	-297.4	408.4	78.8	426.6
		28103	0.000	3	-305.0	427.5	50.5	433.7
			1.280	3	-297.0	415.5	53.7	422.8
		28104	0.000	3	-298.2	417.4	53.5	424.7
			2.560	3	-281.3	393.1	48.1	399.9
		28105	0.000	3	-282.9	395.6	60.8	405.5
			2.560	3	-263.2	367.6	55.5	377.2
		28106	0.000	3	-261.0	403.1	67.7	414.6
			2.560	3	-238.6	368.4	62.6	380.0
		28107	0.000	3	-246.5	398.0	76.7	412.5
			2.560	3	-220.4	355.9	71.4	371.0
		28108	0.000	3	-222.0	359.0	84.6	378.5
			1.280	3	-213.9	335.1	87.5	357.4
		29109	0.000	3	-214.7	337.1	91.8	361.4
			1.280	3	-198.3	311.1	95.2	339.1
		29110	0.000	3	-203.9	410.8	94.1	428.5
			2.560	3	-169.3	341.7	88.6	362.1

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	29111	0.000	3	-171.0	345.9	102.5	370.5
			2.560	3	-132.8	269.2	110.9	305.2
		29112	0.000	3	-136.4	323.2	113.1	350.3
			2.560	3	-93.7	223.0	121.9	266.5
		29113	0.000	3	-94.9	226.1	121.8	268.6
			2.560	3	-48.2	115.4	131.0	226.9
		29114	0.000	3	-48.9	117.1	130.8	226.5
			2.460	3	0.1	0.1	121.0	209.5
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =3)							

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	4	-2.1	5.3	97.0	168.1
			2.460	4	-47.0	120.4	131.1	227.1
		11002	0.000	4	-48.6	125.7	95.8	166.1
			2.560	4	-91.2	232.7	117.5	268.2
		11003	0.000	4	-92.8	237.8	83.3	253.9
			2.560	4	-130.8	332.9	105.4	353.2
		11004	0.000	4	-132.4	338.0	72.1	346.2
			2.560	4	-166.3	422.3	94.6	435.0
		11005	0.000	4	-163.6	363.7	61.0	370.1
			2.560	4	-193.0	427.3	83.6	438.9
		11006	0.000	4	-194.5	431.4	55.9	435.9
			1.280	4	-208.0	460.3	86.0	471.8
		12007	0.000	4	-202.7	359.1	46.5	363.9
			1.280	4	-208.0	378.4	74.6	391.4
		12008	0.000	4	-209.3	381.8	43.4	385.6
			2.560	4	-230.6	419.9	66.1	429.0
		12009	0.000	4	-232.1	423.1	36.1	425.4
			2.560	4	-250.6	456.1	58.8	462.7
		12010	0.000	4	-254.0	420.7	29.9	422.4
			2.560	4	-269.9	446.7	52.8	452.4
		12011	0.000	4	-264.9	424.3	22.9	425.3
			2.560	4	-277.8	444.8	45.4	449.2
		12012	0.000	4	-279.3	447.4	18.0	447.9
			1.280	4	-284.4	455.4	45.1	459.6
		13013	0.000	4	-285.4	457.2	20.8	458.6
			1.280	4	-284.8	466.8	10.9	466.8
		13014	0.000	4	-289.0	443.4	11.8	443.6
			2.560	4	-296.9	456.0	34.5	458.5
		13015	0.000	4	-298.4	458.4	6.0	458.4
			2.560	4	-303.8	467.6	28.6	469.3
		13016	0.000	4	-299.2	447.1	1.1	447.1
			2.560	4	-302.5	453.1	23.1	454.2
		13017	0.000	4	-303.9	455.3	5.1	455.4
			2.560	4	-305.1	458.5	18.2	459.2
		13018	0.000	4	-306.4	460.7	9.0	461.0
			1.280	4	-305.6	460.3	17.4	461.0
		14019	0.000	4	-306.8	462.6	12.6	463.0
			1.280	4	-305.4	461.3	13.4	461.7
		14020	0.000	4	-306.8	463.5	13.4	464.0
			2.560	4	-303.8	461.6	9.1	461.7
		14021	0.000	4	-305.1	463.7	17.8	464.6
			2.560	4	-300.2	459.4	5.1	459.5
		14022	0.000	4	-301.5	461.5	22.3	462.8
			2.560	4	-294.6	454.8	1.1	454.8
		14023	0.000	4	-295.9	456.8	26.1	458.6
			2.560	4	-287.3	447.9	4.8	448.0
		14024	0.000	4	-294.0	472.9	30.3	475.1
			1.290	4	-288.3	466.3	5.4	466.4
		15025	0.000	4	-289.5	468.5	33.7	471.2
			1.280	4	-283.4	461.2	9.0	461.3
		15026	0.000	4	-284.7	463.3	34.4	466.1
			2.560	4	-272.4	449.2	13.0	449.6
		15027	0.000	4	-273.7	451.4	38.3	454.9
			2.560	4	-259.9	435.0	17.0	435.7
		15028	0.000	4	-260.3	470.5	41.7	474.3

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	15028	2.560	4	-245.1	450.5	20.7	451.4
		15029	0.000	4	-246.4	452.8	45.3	457.3
			2.560	4	-229.6	430.6	24.4	431.9
		15030	0.000	4	-230.9	432.8	51.1	438.8
			1.280	4	-226.7	416.2	26.5	417.2
		16031	0.000	4	-227.9	418.8	54.0	425.7
			1.280	4	-217.4	404.6	56.1	412.2
		16032	0.000	4	-224.5	501.3	52.7	505.9
			2.560	4	-204.2	468.7	31.9	470.3
		16033	0.000	4	-205.5	471.3	56.1	476.8
			2.560	4	-183.9	436.3	35.5	438.4
		16034	0.000	4	-188.9	496.6	60.1	501.8
			2.560	4	-165.5	454.0	39.5	456.1
		16035	0.000	4	-166.9	456.9	63.5	463.1
			2.560	4	-142.4	411.8	43.0	414.6
		16036	0.000	4	-143.8	414.7	67.4	422.3
			1.280	4	-132.9	390.0	69.4	398.5
		17037	0.000	4	-244.3	412.6	73.1	419.2
			1.280	4	-231.5	381.0	75.0	388.5
		17038	0.000	4	-232.8	386.4	65.1	393.8
			2.560	4	-207.0	340.3	44.8	344.1
		17039	0.000	4	-208.4	344.9	67.8	353.9
			2.560	4	-162.4	301.4	37.8	304.1
		17040	0.000	4	-164.0	305.2	62.5	312.7
			2.560	4	-140.6	257.9	42.0	261.5
		17041	0.000	4	-142.2	261.5	66.9	270.7
			2.560	4	-118.0	209.5	46.5	214.3
		17042	0.000	4	-119.6	212.9	70.4	224.4
			1.280	4	-106.8	183.7	47.8	188.9
		18043	0.000	4	-107.6	187.4	80.2	206.3
			1.280	4	-91.3	158.4	56.5	168.0
		18044	0.000	4	-90.1	136.1	73.5	159.0
			2.560	4	-65.5	91.7	66.7	125.4
		18045	0.000	4	-66.3	94.6	90.9	161.4
			2.560	4	-43.6	46.0	70.1	122.7
		18046	0.000	4	-47.4	39.3	94.7	165.0
			2.560	4	-22.9	-1.6	74.0	128.9
		18047	0.000	4	-19.5	2.4	94.7	164.4
			2.560	4	-31.4	6.8	69.9	121.4
		18048	0.000	4	-29.0	6.6	92.9	161.1
			1.280	4	-45.4	17.4	71.1	123.5
		19049	0.000	4	-43.7	17.1	88.4	153.3
			1.280	4	-60.4	26.2	64.9	113.3
		19050	0.000	4	-43.9	24.8	92.1	159.7
			2.560	4	-69.3	35.7	36.4	87.5
		19051	0.000	4	-68.1	35.0	51.1	101.6
			2.560	4	-84.4	50.0	36.7	100.1
		19052	0.000	4	-70.3	48.4	50.6	104.3
			2.560	4	-83.9	62.9	36.6	100.7
		19053	0.000	4	-82.9	62.3	49.9	112.4
			2.560	4	-95.9	76.4	36.2	110.7
		19054	0.000	4	-94.9	76.0	49.1	120.8
			1.290	4	-101.6	83.3	35.6	115.4
		20055	0.000	4	-100.8	82.5	50.2	126.8
			1.280	4	-107.1	89.8	35.2	119.9

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	20056	0.000	4	-91.9	88.3	47.1	117.9
			2.560	4	-101.8	101.2	34.8	115.7
		20057	0.000	4	-100.8	100.9	48.2	125.8
			2.560	4	-110.0	114.1	37.2	125.8
		20058	0.000	4	-110.0	114.0	35.2	124.3
			2.560	4	-102.5	100.7	50.0	129.1
		20059	0.000	4	-101.4	100.5	32.7	113.6
			2.560	4	-93.6	88.0	49.2	121.5
		20060	0.000	4	-92.4	87.8	33.3	106.1
			1.280	4	-88.6	81.7	35.4	104.7
		21061	0.000	4	-101.4	81.8	35.6	115.1
			1.280	4	-96.5	75.8	35.7	111.0
		21062	0.000	4	-95.4	75.5	34.5	108.8
			2.560	4	-84.6	62.1	51.4	115.5
		21063	0.000	4	-83.3	61.8	35.1	98.8
			2.560	4	-72.0	48.1	51.9	107.1
		21064	0.000	4	-70.7	47.8	35.3	88.6
			2.560	4	-58.9	34.0	51.9	98.8
		21065	0.000	4	-68.4	34.3	35.3	85.6
			2.560	4	-45.5	24.4	93.0	161.3
		21066	0.000	4	-44.0	23.0	69.4	120.6
			1.280	4	-33.9	16.8	87.1	151.2
		22067	0.000	4	-43.0	15.2	70.7	122.8
			1.280	4	-30.7	6.3	93.0	161.3
		22068	0.000	4	-28.8	4.7	68.8	119.5
			2.560	4	-19.8	0.5	94.8	164.7
		22069	0.000	4	-20.9	2.6	71.0	123.6
			2.560	4	-42.5	35.2	91.9	159.8
		22070	0.000	4	-48.9	39.6	70.0	122.8
			2.560	4	-69.5	74.1	91.5	162.4
		22071	0.000	4	-67.7	95.1	66.0	125.5
			2.560	4	-90.2	133.0	73.2	156.3
		22072	0.000	4	-87.6	139.0	62.3	159.3
			1.280	4	-104.2	155.2	77.8	180.9
		23073	0.000	4	-109.1	187.1	47.4	192.1
			1.280	4	-119.6	209.5	70.1	221.1
		23074	0.000	4	-120.2	212.9	46.0	217.5
			2.560	4	-142.1	258.2	66.6	267.3
		23075	0.000	4	-142.7	261.5	41.5	264.8
			2.560	4	-163.8	301.9	62.1	309.3
		23076	0.000	4	-164.5	305.0	37.4	307.6
			2.560	4	-208.4	341.6	67.4	350.5
		23077	0.000	4	-209.2	343.9	44.5	347.6
			2.560	4	-232.7	383.0	64.4	390.3
		23078	0.000	4	-233.6	384.6	49.4	387.2
			1.280	4	-244.1	409.2	72.6	415.7
		24079	0.000	4	-138.8	466.3	44.8	468.3
			1.280	4	-148.2	488.7	68.6	494.0
		24080	0.000	4	-144.2	414.8	42.7	417.6
			2.560	4	-166.6	453.7	62.8	459.8
		24081	0.000	4	-167.3	457.0	39.2	459.1
			2.560	4	-188.5	493.3	59.4	498.3
		24082	0.000	4	-189.2	496.6	35.7	498.2
			2.560	4	-209.1	530.2	56.0	534.5
		24083	0.000	4	-205.9	471.2	31.7	472.8

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	24083	2.560	4	-224.0	498.1	52.0	502.6
		24084	0.000	4	-224.8	501.1	30.6	502.5
			1.290	4	-233.4	513.4	54.2	518.2
		25085	0.000	4	-228.2	418.1	6.0	418.2
			1.280	4	-230.4	429.8	23.3	430.5
		25086	0.000	4	-231.3	432.6	24.3	433.9
			2.560	4	-245.9	450.0	44.6	454.4
		25087	0.000	4	-246.8	452.5	20.6	453.4
			2.560	4	-259.8	467.8	41.0	471.4
		25088	0.000	4	-260.7	470.3	16.8	470.8
			2.560	4	-272.1	483.3	37.3	486.2
		25089	0.000	4	-274.1	451.1	12.9	451.5
			2.560	4	-284.0	460.8	33.8	463.5
		25090	0.000	4	-284.9	463.2	8.9	463.4
			1.280	4	-288.7	466.1	33.3	468.8
		26091	0.000	4	-289.9	468.4	5.1	468.4
			1.280	4	-293.2	470.5	29.8	472.6
		26092	0.000	4	-294.1	472.9	4.8	472.9
			2.560	4	-300.7	477.7	25.7	479.3
		26093	0.000	4	-296.1	456.8	1.1	456.8
			2.560	4	-300.7	459.2	21.6	460.5
		26094	0.000	4	-301.7	461.5	5.2	461.5
			2.560	4	-304.4	461.3	17.1	462.1
		26095	0.000	4	-305.4	463.7	9.2	463.8
			2.560	4	-306.1	461.0	12.7	461.5
		26096	0.000	4	-307.2	463.3	13.6	463.7
			1.280	4	-306.2	460.2	16.9	460.8
		27097	0.000	4	-307.3	462.3	17.8	463.0
			1.280	4	-305.8	458.4	21.0	459.3
		27098	0.000	4	-306.9	460.5	18.3	461.2
			2.560	4	-303.3	452.6	4.5	452.7
		27099	0.000	4	-304.4	455.0	23.3	456.2
			2.560	4	-298.7	444.4	1.6	444.4
		27100	0.000	4	-299.8	446.8	28.2	448.5
			2.560	4	-291.8	433.4	6.4	433.4
		27101	0.000	4	-299.0	458.1	34.7	460.6
			2.560	4	-288.4	440.5	12.5	440.8
		27102	0.000	4	-289.6	443.1	41.7	446.9
			1.280	4	-287.9	429.0	16.6	429.3
		28103	0.000	4	-286.4	457.6	45.5	462.0
			1.280	4	-278.8	444.9	49.2	450.2
		28104	0.000	4	-279.9	447.0	45.8	451.5
			2.560	4	-264.1	421.2	23.6	422.2
		28105	0.000	4	-265.4	423.9	52.2	430.0
			2.560	4	-247.0	394.0	29.9	395.9
		28106	0.000	4	-254.6	420.3	60.2	428.3
			2.560	4	-232.9	384.0	37.6	387.1
		28107	0.000	4	-232.6	422.4	66.7	431.6
			2.560	4	-208.2	377.7	44.4	381.8
		28108	0.000	4	-209.7	380.9	74.7	393.8
			1.280	4	-202.1	356.1	79.4	371.8
		29109	0.000	4	-202.9	358.2	84.0	375.6
			1.280	4	-187.4	330.5	87.7	351.1
		29110	0.000	4	-194.9	430.0	84.6	441.9
			2.560	4	-162.0	357.6	62.3	364.5

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	29111	0.000	4	-163.8	361.8	94.3	379.5
			2.560	4	-127.3	281.7	103.6	308.8
		29112	0.000	4	-132.3	335.2	106.8	356.0
			2.560	4	-91.0	231.3	116.5	266.2
		29113	0.000	4	-92.3	234.2	119.1	270.6
			2.560	4	-46.9	119.6	129.1	223.7
		29114	0.000	4	-47.7	121.2	132.8	230.1
			2.460	4	0.1	0.1	53.8	93.2
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =4)							

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	5	-0.1	5.6	77.8	134.9
			2.460	5	0.0	120.7	88.4	194.6
		11002	0.000	5	0.0	126.0	82.5	187.6
			2.560	5	0.0	233.3	82.8	269.4
		11003	0.000	5	0.0	238.5	76.8	265.5
			2.560	5	0.0	333.8	77.1	354.4
		11004	0.000	5	-0.1	338.9	71.1	348.8
			2.560	5	-0.1	423.3	71.4	436.3
		11005	0.000	5	-0.1	364.6	68.8	371.2
			2.560	5	-0.1	428.4	69.6	440.2
		11006	0.000	5	-0.2	432.6	65.3	437.1
			1.280	5	-0.2	461.5	70.3	473.2
		12007	0.000	5	-0.2	361.1	31.7	362.3
			1.280	5	-0.2	380.5	34.0	383.9
		12008	0.000	5	-0.1	383.9	30.2	384.8
			2.560	5	-0.1	422.2	31.1	424.5
		12009	0.000	5	-0.2	425.4	27.0	426.0
			2.560	5	-0.2	458.6	27.9	460.3
		12010	0.000	5	-0.1	423.1	23.7	423.5
			2.560	5	0.0	449.1	24.6	450.6
		12011	0.000	5	-0.2	426.7	21.2	426.9
			2.560	5	-0.2	447.3	22.3	448.4
		12012	0.000	5	-0.2	449.8	18.5	450.0
			1.280	5	-0.2	457.8	21.0	458.9
		13013	0.000	5	-0.3	459.7	32.4	460.1
			1.280	5	-1.0	469.3	35.2	469.3
		13014	0.000	5	-0.8	446.4	12.5	446.4
			2.560	5	-0.7	459.0	13.4	459.5
		13015	0.000	5	-0.8	461.4	10.0	461.4
			2.560	5	-0.7	470.6	10.9	470.9
		13016	0.000	5	-1.0	450.0	7.9	450.0
			2.560	5	-0.9	456.0	9.0	456.2
		13017	0.000	5	-1.0	458.2	5.5	458.2
			2.560	5	-0.9	461.5	6.6	461.6
		13018	0.000	5	-1.0	463.6	3.9	463.7
			1.280	5	-1.0	463.3	5.9	463.4
		14019	0.000	5	-1.0	465.5	5.2	465.6
			1.280	5	-1.0	464.2	4.4	464.3
		14020	0.000	5	-1.1	466.4	5.4	466.5
			2.560	5	-1.1	464.5	2.8	464.5
		14021	0.000	5	-1.1	466.6	6.9	466.8
			2.560	5	-1.1	462.2	1.4	462.3
		14022	0.000	5	-1.2	464.4	8.4	464.6
			2.560	5	-1.2	457.5	2.0	457.5
		14023	0.000	5	-1.3	459.6	9.7	459.9
			2.560	5	-1.3	450.6	3.9	450.6
		14024	0.000	5	-1.3	475.7	11.1	476.1
			1.290	5	-1.3	469.0	4.9	469.0
		15025	0.000	5	-1.3	471.3	12.2	471.7
			1.280	5	-1.3	463.8	5.7	463.9
		15026	0.000	5	-1.4	466.0	12.4	466.5
			2.560	5	-1.4	451.8	7.5	451.9
		15027	0.000	5	-1.5	454.0	13.7	454.6
			2.560	5	-1.5	437.5	9.2	437.6
		15028	0.000	5	-1.7	473.1	14.4	473.8

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	15028	2.560	5	-1.8	452.9	10.9	453.1
		15029	0.000	5	-1.8	455.2	15.6	456.0
			2.560	5	-1.9	432.9	12.5	433.1
		15030	0.000	5	-1.9	435.1	17.4	436.2
			1.280	5	-1.3	418.4	27.9	418.6
		16031	0.000	5	-1.3	421.0	18.4	422.2
			1.280	5	-1.2	406.7	19.1	408.0
		16032	0.000	5	-1.5	502.7	28.3	505.1
			2.560	5	-1.6	470.0	24.9	470.8
		16033	0.000	5	-1.6	472.6	30.0	475.5
			2.560	5	-1.7	437.4	27.2	438.5
		16034	0.000	5	-1.9	497.9	30.0	500.6
			2.560	5	-1.9	455.2	28.2	456.3
		16035	0.000	5	-2.0	458.1	31.8	461.3
			2.560	5	-2.0	412.9	30.2	414.3
		16036	0.000	5	-2.1	415.7	34.0	419.7
			1.280	5	-2.5	390.9	34.4	395.4
		17037	0.000	5	25.2	493.2	44.5	499.2
			1.280	5	25.7	463.8	45.3	470.4
		17038	0.000	5	24.6	466.0	44.6	471.2
			2.560	5	18.3	399.3	38.7	404.9
		17039	0.000	5	17.6	402.1	46.4	408.8
			2.560	5	7.5	324.9	36.4	331.0
		17040	0.000	5	7.2	328.2	41.2	335.8
			2.560	5	3.5	269.3	39.1	277.7
		17041	0.000	5	3.2	272.7	44.1	283.1
			2.560	5	0.9	213.7	41.9	225.7
		17042	0.000	5	0.7	217.2	46.2	231.5
			1.280	5	0.1	186.5	43.8	201.3
		18043	0.000	5	0.3	189.9	50.5	207.2
			1.280	5	-0.1	158.8	39.5	172.9
		18044	0.000	5	-1.1	136.5	38.2	150.0
			2.560	5	1.9	92.0	34.3	109.5
		18045	0.000	5	2.0	94.9	46.9	124.9
			2.560	5	1.9	46.2	35.6	77.1
		18046	0.000	5	0.3	40.8	53.5	100.7
			2.560	5	-1.6	0.3	41.4	71.7
		18047	0.000	5	-0.8	2.4	54.8	94.9
			2.560	5	-33.6	3.6	42.2	79.6
		18048	0.000	5	-32.1	3.9	55.7	100.7
			1.280	5	-47.6	4.0	42.8	87.0
		19049	0.000	5	-46.2	4.2	52.7	101.3
			1.280	5	-61.2	4.4	38.5	90.1
		19050	0.000	5	-47.3	3.6	34.1	73.8
			2.560	5	-69.6	-0.2	12.9	73.1
		19051	0.000	5	-68.4	-0.2	18.2	75.3
			2.560	5	-84.8	-0.2	13.0	87.7
		19052	0.000	5	-70.8	-0.3	18.6	77.7
			2.560	5	-84.4	-0.4	13.5	87.5
		19053	0.000	5	-83.4	-0.3	18.4	89.2
			2.560	5	-96.5	-0.4	13.4	99.1
		19054	0.000	5	-95.4	-0.2	18.1	100.3
			1.290	5	-102.3	-0.5	13.2	104.7
		20055	0.000	5	-101.5	-0.5	18.6	106.3
			1.280	5	-107.9	-0.5	13.0	110.0

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	20056	0.000	5	-92.9	-0.5	9.0	94.2
			2.560	5	-102.9	-0.9	6.7	103.5
		20057	0.000	5	-102.1	-0.6	9.2	103.1
			2.560	5	-112.7	-0.7	7.1	112.9
		20058	0.000	5	-112.0	-0.5	6.7	112.3
			2.560	5	-103.6	-0.9	9.6	104.9
		20059	0.000	5	-102.4	-0.7	6.2	103.0
			2.560	5	-94.6	-0.8	9.5	96.0
		20060	0.000	5	-93.4	-0.5	6.3	94.0
			1.280	5	-89.5	-0.6	6.8	90.3
		21061	0.000	5	-101.9	-0.5	13.2	104.4
			1.280	5	-97.0	-0.4	13.2	99.6
		21062	0.000	5	-95.8	-0.2	12.6	98.3
			2.560	5	-85.0	-0.4	19.0	91.2
		21063	0.000	5	-83.7	-0.2	12.8	86.6
			2.560	5	-72.3	-0.4	19.2	79.6
		21064	0.000	5	-71.0	-0.3	12.9	74.5
			2.560	5	-59.2	-0.5	19.2	67.9
		21065	0.000	5	-68.7	-0.1	12.4	72.0
			2.560	5	-47.4	3.6	34.5	75.2
		21066	0.000	5	-45.5	3.5	25.8	62.8
			1.280	5	-37.3	3.6	32.2	65.4
		22067	0.000	5	-44.1	4.1	42.5	85.4
			1.280	5	-32.3	4.0	55.8	101.3
		22068	0.000	5	-30.1	3.8	41.5	77.5
			2.560	5	-1.1	1.3	54.9	95.1
		22069	0.000	5	0.9	2.6	40.8	70.7
			2.560	5	1.1	35.3	53.3	98.9
		22070	0.000	5	0.4	42.9	39.3	78.8
			2.560	5	0.5	78.4	51.8	116.6
		22071	0.000	5	2.2	95.6	33.8	111.9
			2.560	5	-1.0	133.4	38.0	148.6
		22072	0.000	5	2.5	139.4	32.4	150.3
			1.280	5	-0.2	157.0	38.8	169.6
		23073	0.000	5	0.2	191.3	43.8	205.8
			1.280	5	0.8	215.4	46.0	229.6
		23074	0.000	5	1.1	218.5	42.2	230.4
			2.560	5	3.2	270.6	43.8	281.1
		23075	0.000	5	3.6	273.9	39.3	282.3
			2.560	5	7.1	325.9	41.0	333.6
		23076	0.000	5	7.6	329.4	36.4	335.4
			2.560	5	17.5	400.0	46.0	406.6
		23077	0.000	5	18.4	404.0	38.7	409.5
			2.560	5	24.5	463.7	44.1	468.9
		23078	0.000	5	25.7	468.3	41.9	473.9
			1.280	5	25.2	490.9	44.4	496.8
		24079	0.000	5	-2.8	467.1	40.5	469.1
			1.280	5	-2.6	489.5	42.9	494.9
		24080	0.000	5	-2.0	415.9	30.1	417.3
			2.560	5	-2.1	454.9	31.7	458.0
		24081	0.000	5	-1.9	458.1	28.0	459.2
			2.560	5	-2.0	494.6	29.7	497.2
		24082	0.000	5	-1.8	497.8	25.9	498.7
			2.560	5	-1.8	531.6	28.1	533.9
		24083	0.000	5	-1.5	472.5	24.7	473.3

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	24083	2.560	5	-1.6	499.5	28.0	501.9
		24084	0.000	5	-1.4	502.5	23.6	503.2
			1.290	5	-1.5	514.9	29.3	517.4
		25085	0.000	5	-1.3	420.3	25.4	420.3
			1.280	5	-2.1	432.1	27.6	432.2
		25086	0.000	5	-1.9	434.9	12.3	435.1
			2.560	5	-1.9	452.5	15.3	453.2
		25087	0.000	5	-1.8	454.9	10.7	455.1
			2.560	5	-1.8	470.3	14.1	471.0
		25088	0.000	5	-1.7	472.8	9.1	472.9
			2.560	5	-1.7	486.0	13.0	486.5
		25089	0.000	5	-1.4	453.7	7.3	453.8
			2.560	5	-1.4	463.5	12.1	464.0
		25090	0.000	5	-1.3	465.9	5.5	465.9
			1.280	5	-1.3	468.8	12.1	469.3
		26091	0.000	5	-1.3	471.1	4.9	471.1
			1.280	5	-1.3	473.3	10.8	473.7
		26092	0.000	5	-1.3	475.7	3.7	475.7
			2.560	5	-1.2	480.6	9.5	480.9
		26093	0.000	5	-1.3	459.6	1.9	459.6
			2.560	5	-1.2	462.1	8.2	462.3
		26094	0.000	5	-1.2	464.4	1.4	464.4
			2.560	5	-1.1	464.2	6.6	464.4
		26095	0.000	5	-1.1	466.5	2.8	466.6
			2.560	5	-1.1	463.9	5.2	464.0
		26096	0.000	5	-1.0	466.3	4.5	466.3
			1.280	5	-1.0	463.2	5.7	463.3
		27097	0.000	5	-1.0	465.3	6.0	465.4
			1.280	5	-1.0	461.3	7.1	461.5
		27098	0.000	5	-1.0	463.4	6.8	463.6
			2.560	5	-1.0	455.6	5.5	455.6
		27099	0.000	5	-1.0	458.0	9.1	458.2
			2.560	5	-0.9	447.3	7.8	447.3
		27100	0.000	5	-0.9	449.7	11.4	450.0
			2.560	5	-0.9	436.3	10.2	436.3
		27101	0.000	5	-0.8	461.1	13.6	461.5
			2.560	5	-0.7	443.5	12.5	443.5
		27102	0.000	5	-0.8	446.1	16.4	446.7
			1.280	5	-0.2	432.0	29.9	432.0
		28103	0.000	5	-0.2	460.1	21.1	461.2
			1.280	5	-0.2	447.4	22.4	448.7
		28104	0.000	5	-0.3	449.5	22.5	450.6
			2.560	5	-0.2	423.5	21.2	423.8
		28105	0.000	5	-0.3	426.3	25.6	427.8
			2.560	5	-0.2	396.2	24.5	396.7
		28106	0.000	5	-0.1	422.6	27.9	424.7
			2.560	5	0.0	386.2	26.9	387.0
		28107	0.000	5	-0.3	424.8	31.2	427.1
			2.560	5	-0.1	379.8	30.3	380.8
		28108	0.000	5	-0.2	383.0	34.4	386.3
			1.280	5	-0.3	358.1	35.6	362.1
		29109	0.000	5	-0.2	360.2	37.4	364.7
			1.280	5	-0.2	332.4	38.7	337.7
		29110	0.000	5	-0.3	431.2	69.8	443.2
			2.560	5	-0.1	358.5	68.9	365.6

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	29111	0.000	5	-0.3	362.7	76.0	380.7
			2.560	5	0.0	282.4	82.3	310.0
		29112	0.000	5	-0.2	336.0	77.2	357.2
			2.560	5	0.0	231.9	83.3	267.4
		29113	0.000	5	-0.2	234.8	82.8	271.9
			2.560	5	0.0	119.9	89.2	193.1
		29114	0.000	5	-0.2	121.5	89.5	196.9
			2.460	5	0.1	0.1	93.9	162.7
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =5)							

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	7	-2.7	-0.8	24.1	41.7
			2.460	7	-30.0	3.7	64.5	115.6
		11002	0.000	7	-31.5	4.0	49.3	91.0
			2.560	7	-58.0	7.2	59.1	117.6
		11003	0.000	7	-59.5	7.6	44.2	97.0
			2.560	7	-83.2	10.6	54.1	125.3
		11004	0.000	7	-84.7	11.0	39.7	109.1
			2.560	7	-105.8	13.6	49.7	136.4
		11005	0.000	7	-104.6	14.9	34.7	120.6
			2.560	7	-122.9	17.4	44.5	145.1
		11006	0.000	7	-124.4	17.7	32.6	136.7
			1.280	7	-132.6	18.7	45.4	154.2
		12007	0.000	7	-129.7	20.4	28.1	138.5
			1.280	7	-134.3	20.5	39.1	150.4
		12008	0.000	7	-135.7	20.8	26.2	143.1
			2.560	7	-149.5	22.5	35.7	161.8
		12009	0.000	7	-151.0	22.7	23.1	156.2
			2.560	7	-163.1	24.0	32.6	172.6
		12010	0.000	7	-164.5	19.1	20.5	168.3
			2.560	7	-175.2	19.6	30.1	182.7
		12011	0.000	7	-173.8	25.8	17.5	176.4
			2.560	7	-182.9	26.2	26.8	188.6
		12012	0.000	7	-184.3	26.2	15.3	186.2
			1.280	7	-187.8	26.2	26.1	193.2
		13013	0.000	7	-188.8	26.5	14.0	190.3
			1.280	7	-186.8	32.1	25.3	191.9
		13014	0.000	7	-188.8	26.8	12.7	190.1
			2.560	7	-195.0	26.7	22.2	198.8
		13015	0.000	7	-196.5	26.7	9.9	197.2
			2.560	7	-201.4	26.4	19.4	204.2
		13016	0.000	7	-200.1	32.4	7.1	200.5
			2.560	7	-203.8	32.1	16.3	205.8
		13017	0.000	7	-205.2	32.1	4.3	205.3
			2.560	7	-207.7	31.9	13.5	209.0
		13018	0.000	7	-209.1	31.8	1.5	209.1
			1.280	7	-209.3	31.8	12.0	210.3
		14019	0.000	7	-210.6	32.0	0.3	210.6
			1.280	7	-210.5	31.7	10.7	211.3
		14020	0.000	7	-211.8	31.7	1.3	211.8
			2.560	7	-212.1	31.7	7.9	212.5
		14021	0.000	7	-213.4	31.7	3.9	213.5
			2.560	7	-212.6	31.8	5.3	212.8
		14022	0.000	7	-214.0	31.8	6.5	214.3
			2.560	7	-212.0	32.0	2.6	212.1
		14023	0.000	7	-213.4	32.0	8.7	213.9
			2.560	7	-210.5	32.3	0.4	210.5
		14024	0.000	7	-214.7	25.9	10.9	215.5
			1.290	7	-212.3	26.1	0.6	212.4
		15025	0.000	7	-213.5	26.3	12.0	214.6
			1.280	7	-210.9	26.2	1.8	210.9
		15026	0.000	7	-212.3	26.1	12.7	213.4
			2.560	7	-207.6	26.1	3.7	207.7
		15027	0.000	7	-208.9	26.0	14.5	210.4
			2.560	7	-203.4	25.8	5.5	203.6
		15028	0.000	7	-205.0	31.2	16.3	207.0

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	15028	2.560	7	-198.7	30.9	7.5	199.1
		15029	0.000	7	-200.0	30.7	18.5	202.6
			2.560	7	-192.8	30.4	9.7	193.5
		15030	0.000	7	-194.1	30.3	21.6	197.7
			1.280	7	-194.8	23.7	22.0	198.5
		16031	0.000	7	-196.1	23.8	22.1	199.8
			1.280	7	-190.9	23.6	22.9	195.0
		16032	0.000	7	-197.8	23.2	22.0	201.4
			2.560	7	-188.6	23.0	13.3	190.0
		16033	0.000	7	-190.0	22.7	23.3	194.2
			2.560	7	-180.0	22.3	14.7	181.8
		16034	0.000	7	-185.1	21.8	25.1	190.1
			2.560	7	-174.3	21.1	16.4	176.6
		16035	0.000	7	-175.7	20.7	26.5	181.6
			2.560	7	-164.2	19.6	17.8	167.1
		16036	0.000	7	-165.7	19.1	28.2	172.7
			1.280	7	-162.2	19.6	29.3	170.0
		17037	0.000	7	-144.8	-57.6	34.8	144.8
			1.280	7	-137.3	-48.6	35.5	137.3
		17038	0.000	7	-135.5	-49.9	66.1	135.5
			2.560	7	-95.5	-31.8	57.1	104.0
		17039	0.000	7	-95.1	-33.2	69.2	124.6
			2.560	7	-66.1	-3.1	48.1	92.0
		17040	0.000	7	-67.1	-2.7	53.4	101.1
			2.560	7	-37.3	12.2	44.4	80.5
		17041	0.000	7	-38.8	12.2	49.3	89.0
			2.560	7	-13.3	21.6	40.3	70.3
		17042	0.000	7	-15.0	21.2	46.1	80.3
			1.280	7	-4.6	23.7	36.5	63.2
		18043	0.000	7	-4.4	24.1	46.7	81.0
			1.280	7	-1.6	24.3	37.4	65.2
		18044	0.000	7	0.9	24.3	43.9	76.2
			2.560	7	3.2	26.1	31.1	58.7
		18045	0.000	7	3.9	26.7	39.4	71.8
			2.560	7	2.8	39.6	30.8	65.5
		18046	0.000	7	9.4	42.5	40.6	78.7
			2.560	7	8.2	59.2	31.5	75.8
		18047	0.000	7	5.9	55.5	39.2	84.9
			2.560	7	7.3	74.0	21.2	79.0
		18048	0.000	7	8.7	74.4	30.5	87.2
			1.280	7	7.5	80.8	21.5	85.2
		19049	0.000	7	8.1	80.6	30.2	92.4
			1.280	7	5.6	81.5	21.2	87.0
		19050	0.000	7	8.7	80.6	29.1	90.9
			2.560	7	-1.7	79.9	11.8	81.6
		19051	0.000	7	-1.7	79.0	17.5	83.9
			2.560	7	-2.4	85.7	11.3	87.4
		19052	0.000	7	-0.9	84.1	16.8	87.8
			2.560	7	-1.4	90.5	10.6	91.3
		19053	0.000	7	-1.4	89.7	16.2	93.0
			2.560	7	-1.5	96.0	10.2	96.5
		19054	0.000	7	-1.4	95.3	15.9	98.2
			1.290	7	-1.2	99.0	9.9	99.3
		20055	0.000	7	-1.2	98.2	14.9	100.3
			1.280	7	-0.7	101.9	9.4	101.9

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	20056	0.000	7	0.3	100.4	14.7	101.6
			2.560	7	1.2	106.5	9.2	106.5
		20057	0.000	7	1.5	106.0	15.3	106.6
			2.560	7	3.4	113.1	10.8	113.1
		20058	0.000	7	3.5	113.1	10.8	113.1
			2.560	7	0.8	106.2	15.2	107.0
		20059	0.000	7	1.3	106.0	9.3	106.0
			2.560	7	-0.4	100.5	14.7	102.0
		20060	0.000	7	0.2	100.4	9.4	100.4
			1.280	7	-0.4	98.0	9.4	98.1
		21061	0.000	7	-1.6	97.9	10.2	98.4
			1.280	7	-2.0	95.7	10.2	96.5
		21062	0.000	7	-1.6	95.3	10.2	96.0
			2.560	7	-2.3	89.9	16.2	93.5
		21063	0.000	7	-1.6	89.7	10.7	90.7
			2.560	7	-1.8	84.2	16.8	88.3
		21064	0.000	7	-1.2	84.1	11.2	85.2
			2.560	7	-1.2	78.5	17.3	82.9
		21065	0.000	7	-2.0	78.9	11.8	80.9
			2.560	7	7.7	80.5	29.1	91.3
		21066	0.000	7	7.3	78.8	20.4	82.7
			1.280	7	9.7	80.3	29.3	90.4
		22067	0.000	7	7.3	79.2	21.4	84.0
			1.280	7	7.9	74.5	30.4	87.7
		22068	0.000	7	7.2	72.5	21.1	77.8
			2.560	7	5.0	55.5	39.2	85.3
		22069	0.000	7	5.0	54.3	30.1	72.7
			2.560	7	6.1	40.2	38.8	76.2
		22070	0.000	7	8.2	41.2	31.2	64.4
			2.560	7	8.0	28.4	39.8	72.3
		22071	0.000	7	2.5	25.3	30.8	57.7
			2.560	7	-0.4	23.0	43.6	75.8
		22072	0.000	7	3.2	26.6	33.1	58.0
			1.280	7	-2.1	23.5	45.2	78.3
		23073	0.000	7	-5.4	23.0	36.1	62.6
			1.280	7	-14.8	20.2	45.7	79.5
		23074	0.000	7	-15.1	21.0	40.0	69.8
			2.560	7	-38.3	11.5	48.8	88.0
		23075	0.000	7	-38.9	11.9	44.1	80.4
			2.560	7	-66.3	-3.1	53.0	100.1
		23076	0.000	7	-67.5	-3.2	47.8	92.1
			2.560	7	-94.2	-32.3	68.8	123.6
		23077	0.000	7	-96.8	-33.0	56.9	104.0
			2.560	7	-134.6	-48.9	65.7	134.6
		23078	0.000	7	-138.5	-49.7	24.8	138.5
			1.280	7	-143.7	-56.5	34.6	143.7
		24079	0.000	7	-168.4	20.0	19.4	171.7
			1.280	7	-170.0	18.9	28.8	177.2
		24080	0.000	7	-165.4	19.8	17.7	168.2
			2.560	7	-174.7	20.4	26.3	180.5
		24081	0.000	7	-175.5	21.3	16.3	177.7
			2.560	7	-184.0	21.5	25.0	189.1
		24082	0.000	7	-184.8	22.3	14.9	186.7
			2.560	7	-192.7	22.2	23.7	197.0
		24083	0.000	7	-189.8	23.1	13.3	191.2

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	24083	2.560	7	-196.8	22.8	21.9	200.4
		24084	0.000	7	-197.6	23.5	13.0	198.9
			1.290	7	-200.7	23.2	22.6	204.5
		25085	0.000	7	-195.9	23.8	11.7	196.9
			1.280	7	-192.9	29.8	21.7	196.6
		25086	0.000	7	-194.0	30.4	9.7	194.7
			2.560	7	-199.0	30.1	18.4	201.6
		25087	0.000	7	-199.9	30.8	7.5	200.3
			2.560	7	-204.0	30.5	16.2	206.0
		25088	0.000	7	-204.9	31.2	5.2	205.1
			2.560	7	-208.1	31.2	14.0	209.6
		25089	0.000	7	-208.8	26.1	3.1	208.9
			2.560	7	-211.1	25.9	12.1	212.1
		25090	0.000	7	-212.1	26.5	1.3	212.1
			1.280	7	-212.3	26.2	11.5	213.2
		26091	0.000	7	-213.5	26.5	0.2	213.5
			1.280	7	-213.5	26.0	10.3	214.2
		26092	0.000	7	-214.5	26.6	0.6	214.5
			2.560	7	-215.0	25.8	8.5	215.5
		26093	0.000	7	-213.1	32.7	2.6	213.1
			2.560	7	-212.7	31.8	6.4	213.0
		26094	0.000	7	-213.7	32.4	5.2	213.9
			2.560	7	-212.2	31.5	3.9	212.3
		26095	0.000	7	-213.2	32.1	7.8	213.6
			2.560	7	-210.6	31.3	1.4	210.6
		26096	0.000	7	-211.6	31.9	10.5	212.4
			1.280	7	-209.4	31.6	11.8	210.4
		27097	0.000	7	-210.5	31.8	11.8	211.5
			1.280	7	-207.9	31.3	13.1	209.2
		27098	0.000	7	-209.0	31.8	13.3	210.2
			2.560	7	-204.0	31.2	4.2	204.1
		27099	0.000	7	-205.1	31.8	16.3	207.0
			2.560	7	-198.9	31.4	7.1	199.3
		27100	0.000	7	-200.0	32.0	19.1	202.7
			2.560	7	-192.6	31.6	9.9	193.4
		27101	0.000	7	-196.4	26.2	22.6	200.2
			2.560	7	-187.5	25.9	13.1	188.9
		27102	0.000	7	-188.7	26.5	25.8	193.9
			1.280	7	-188.3	20.2	26.8	194.0
		28103	0.000	7	-189.2	25.8	26.4	194.6
			1.280	7	-183.2	25.5	27.9	189.4
		28104	0.000	7	-184.2	25.8	27.0	190.0
			2.560	7	-172.3	24.9	17.7	175.0
		28105	0.000	7	-173.6	25.3	29.7	181.1
			2.560	7	-160.3	24.1	20.4	164.2
		28106	0.000	7	-164.4	18.7	33.3	174.2
			2.560	7	-149.2	17.4	23.8	154.8
		28107	0.000	7	-150.8	22.2	36.0	163.2
			2.560	7	-134.0	20.0	26.5	141.7
		28108	0.000	7	-135.5	20.2	39.3	151.7
			1.280	7	-128.4	19.7	41.8	147.4
		29109	0.000	7	-129.3	19.8	43.7	149.8
			1.280	7	-119.0	18.4	45.2	142.4
		29110	0.000	7	-124.2	16.9	44.9	146.5
			2.560	7	-102.5	14.0	35.1	119.2

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	29111	0.000	7	-104.2	14.1	48.9	134.3
			2.560	7	-80.4	11.2	52.8	121.8
		29112	0.000	7	-84.2	10.0	54.7	126.7
			2.560	7	-57.5	7.1	58.9	117.2
		29113	0.000	7	-58.8	6.7	59.6	118.9
			2.560	7	-29.7	3.6	64.1	114.9
		29114	0.000	7	-30.5	3.3	65.1	116.8
			2.460	7	0.0	0.0	39.1	67.8
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =7)							

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	11001	0.000	10	-2.4	0.4	22.4	38.9
			2.460	10	-44.8	-3.5	58.1	108.4
		11002	0.000	10	-47.7	-3.9	44.4	87.8
			2.560	10	-86.6	-7.0	52.9	120.0
		11003	0.000	10	-89.4	-7.5	39.4	105.1
			2.560	10	-123.8	-10.3	48.0	138.6
		11004	0.000	10	-126.5	-10.7	34.8	128.2
			2.560	10	-156.8	-13.2	43.4	159.3
		11005	0.000	10	-153.7	-14.8	29.3	153.7
			2.560	10	-179.2	-17.1	37.6	179.2
		11006	0.000	10	-181.6	-17.4	27.0	181.6
			1.280	10	-192.9	-18.4	38.3	192.9
		12007	0.000	10	-185.7	-20.6	22.2	185.7
			1.280	10	-191.9	-20.9	31.6	191.9
		12008	0.000	10	-194.0	-21.1	20.6	194.0
			2.560	10	-212.0	-22.7	28.3	212.0
		12009	0.000	10	-214.2	-23.0	17.4	214.2
			2.560	10	-229.5	-24.2	25.2	229.5
		12010	0.000	10	-223.2	-19.9	13.9	223.2
			2.560	10	-235.5	-20.3	21.4	235.5
		12011	0.000	10	-240.4	-26.4	11.1	240.4
			2.560	10	-250.4	-26.8	18.6	250.4
		12012	0.000	10	-252.4	-26.9	9.0	252.4
			1.280	10	-255.9	-26.9	18.1	255.9
		13013	0.000	10	-257.5	-27.2	7.5	257.5
			1.280	10	-263.1	-33.4	16.7	263.1
		13014	0.000	10	-257.7	-28.5	6.1	257.7
			2.560	10	-263.6	-28.4	13.4	263.6
		13015	0.000	10	-265.4	-28.5	3.9	265.4
			2.560	10	-269.5	-28.1	11.1	269.5
		13016	0.000	10	-274.5	-34.2	2.2	274.5
			2.560	10	-277.2	-33.9	9.4	277.2
		13017	0.000	10	-279.0	-34.0	0.6	279.0
			2.560	10	-280.3	-33.7	7.7	280.3
		13018	0.000	10	-282.1	-33.9	1.0	282.1
			1.280	10	-281.6	-33.8	7.7	281.6
		14019	0.000	10	-283.4	-34.0	2.4	283.4
			1.280	10	-282.3	-33.7	6.2	282.3
		14020	0.000	10	-284.0	-33.9	2.3	284.0
			2.560	10	-283.0	-33.9	4.8	283.0
		14021	0.000	10	-284.7	-34.0	3.7	284.7
			2.560	10	-282.6	-34.1	3.4	282.6
		14022	0.000	10	-284.3	-34.2	5.0	284.3
			2.560	10	-281.0	-34.4	2.0	281.0
		14023	0.000	10	-282.7	-34.5	6.2	282.7
			2.560	10	-278.4	-34.7	0.8	278.4
		14024	0.000	10	-276.8	-28.9	7.6	276.8
			1.290	10	-273.5	-29.0	0.6	273.5
		15025	0.000	10	-275.3	-29.3	8.9	275.3
			1.280	10	-271.4	-29.2	0.8	271.4
		15026	0.000	10	-273.0	-29.2	9.2	273.0
			2.560	10	-266.4	-29.3	2.4	266.4
		15027	0.000	10	-267.9	-29.3	10.7	267.9
			2.560	10	-260.1	-29.2	3.9	260.1
		15028	0.000	10	-270.0	-34.2	12.3	270.0

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	15028	2.560	10	-260.9	-33.9	5.4	260.9
		15029	0.000	10	-262.4	-33.9	13.3	262.4
			2.560	10	-252.5	-33.7	6.5	252.5
		15030	0.000	10	-254.0	-33.7	15.3	254.0
			1.280	10	-244.9	-27.4	15.9	244.9
		16031	0.000	10	-246.7	-27.5	16.5	246.7
			1.280	10	-239.8	-27.4	17.1	239.8
		16032	0.000	10	-250.9	-26.5	16.4	250.9
			2.560	10	-238.7	-26.6	9.4	238.7
		16033	0.000	10	-240.1	-26.5	17.9	240.1
			2.560	10	-226.7	-26.3	11.0	226.7
		16034	0.000	10	-234.2	-25.6	20.0	234.2
			2.560	10	-219.2	-25.2	12.9	219.2
		16035	0.000	10	-220.6	-25.0	21.6	220.6
			2.560	10	-204.5	-24.3	14.5	204.5
		16036	0.000	10	-205.8	-24.1	23.3	205.8
			1.280	10	-200.0	-24.4	24.3	200.0
		17037	0.000	10	-209.8	-23.8	25.7	209.8
			1.280	10	-199.5	-23.2	26.4	199.5
		17038	0.000	10	-200.8	-22.9	25.9	200.8
			2.560	10	-181.4	-21.8	18.5	181.4
		17039	0.000	10	-182.8	-21.5	27.3	182.8
			2.560	10	-162.0	-20.0	17.5	162.0
		17040	0.000	10	-163.3	-19.6	26.3	163.3
			2.560	10	-143.8	-18.2	18.9	143.8
		17041	0.000	10	-145.0	-17.8	27.6	145.0
			2.560	10	-124.5	-16.2	20.2	124.5
		17042	0.000	10	-125.7	-15.7	28.3	125.7
			1.280	10	-114.6	-14.9	20.1	114.6
		18043	0.000	10	-116.1	-14.8	29.9	116.3
			1.280	10	-104.5	-15.8	21.3	104.5
		18044	0.000	10	-101.7	-15.8	27.7	102.2
			2.560	10	-78.5	-8.6	19.1	78.5
		18045	0.000	10	-80.3	-9.0	26.9	85.5
			2.560	10	-61.8	-7.1	19.7	64.7
		18046	0.000	10	-58.8	-5.5	25.7	69.3
			2.560	10	-40.1	-4.3	18.7	48.3
		18047	0.000	10	-42.4	-6.3	26.2	58.5
			2.560	10	-22.6	-3.3	12.6	28.3
		18048	0.000	10	-24.8	-4.3	19.7	39.1
			1.280	10	-16.9	-3.5	12.3	24.5
		19049	0.000	10	-18.1	-3.8	19.4	36.0
			1.280	10	-9.9	-2.8	11.7	21.1
		19050	0.000	10	-11.5	-3.9	18.5	32.7
			2.560	10	-1.4	0.4	6.0	10.4
		19051	0.000	10	-1.4	-0.5	10.9	18.9
			2.560	10	-0.7	6.4	5.8	11.9
		19052	0.000	10	-0.6	5.4	10.2	18.5
			2.560	10	0.1	12.7	5.6	15.6
		19053	0.000	10	0.1	11.9	10.0	20.7
			2.560	10	0.8	19.1	5.6	20.5
		19054	0.000	10	0.8	18.3	9.8	24.2
			1.290	10	0.9	22.3	5.5	23.2
		20055	0.000	10	0.8	21.4	9.8	26.5
			1.280	10	1.2	25.4	5.5	25.9

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	20056	0.000	10	1.3	24.1	9.4	28.1
			2.560	10	1.9	30.9	5.4	31.0
		20057	0.000	10	1.9	30.2	9.5	33.0
			2.560	10	1.9	35.9	5.3	35.9
		20058	0.000	10	2.1	36.0	5.3	36.0
			2.560	10	2.0	31.2	9.4	33.6
		20059	0.000	10	1.9	30.4	5.4	30.4
			2.560	10	1.3	25.1	9.3	28.7
		20060	0.000	10	1.3	24.3	5.4	24.8
			1.280	10	1.0	21.9	5.5	22.9
		21061	0.000	10	1.0	21.5	5.4	22.3
			1.280	10	0.8	19.3	5.4	20.5
		21062	0.000	10	0.7	18.4	5.5	19.9
			2.560	10	0.2	12.9	9.9	21.0
		21063	0.000	10	0.0	11.9	5.6	15.0
			2.560	10	-0.5	6.4	10.1	18.5
		21064	0.000	10	-0.7	5.4	5.7	11.2
			2.560	10	-1.2	0.3	10.5	18.2
		21065	0.000	10	-1.5	-0.5	5.9	10.3
			2.560	10	-10.3	-3.5	18.4	32.5
		21066	0.000	10	-11.2	-3.0	11.8	21.5
			1.280	10	-16.1	-3.7	18.4	33.8
		22067	0.000	10	-18.7	-3.6	12.2	25.2
			1.280	10	-23.5	-4.0	19.6	38.5
		22068	0.000	10	-24.5	-3.4	12.5	29.2
			2.560	10	-41.3	-6.1	26.1	57.7
		22069	0.000	10	-42.5	-6.0	18.8	49.4
			2.560	10	-58.7	-7.7	25.8	68.4
		22070	0.000	10	-59.0	-5.3	18.3	62.2
			2.560	10	-73.0	-6.2	24.9	79.3
		22071	0.000	10	-80.6	-8.8	18.9	80.6
			2.560	10	-100.4	-15.7	27.5	101.0
		22072	0.000	10	-98.3	-12.4	18.1	98.3
			1.280	10	-110.2	-14.9	28.5	110.4
		23073	0.000	10	-116.6	-15.2	20.0	116.6
			1.280	10	-124.3	-15.7	28.1	124.3
		23074	0.000	10	-126.5	-16.4	20.1	126.5
			2.560	10	-143.6	-17.8	27.4	143.6
		23075	0.000	10	-145.7	-18.5	18.8	145.7
			2.560	10	-161.9	-19.6	26.1	161.9
		23076	0.000	10	-164.0	-20.3	17.5	164.0
			2.560	10	-181.3	-21.5	27.2	181.3
		23077	0.000	10	-183.4	-22.1	18.4	183.4
			2.560	10	-199.3	-23.0	25.8	199.3
		23078	0.000	10	-201.4	-23.6	17.1	201.4
			1.280	10	-208.3	-23.8	25.6	208.3
		24079	0.000	10	-210.3	-24.2	16.0	210.3
			1.280	10	-213.2	-23.6	24.2	213.2
		24080	0.000	10	-206.5	-24.8	14.4	206.5
			2.560	10	-219.2	-25.1	21.4	219.2
		24081	0.000	10	-221.2	-25.6	12.8	221.2
			2.560	10	-232.8	-25.7	19.8	232.8
		24082	0.000	10	-234.8	-26.2	11.1	234.8
			2.560	10	-245.2	-25.9	18.2	245.2
		24083	0.000	10	-240.6	-27.0	9.2	240.6

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	24083	2.560	10	-249.4	-26.4	16.1	249.4
		24084	0.000	10	-251.3	-26.9	8.6	251.3
			1.290	10	-255.1	-26.5	16.8	255.1
		25085	0.000	10	-246.7	-27.8	7.0	246.7
			1.280	10	-252.3	-33.7	15.0	252.3
		25086	0.000	10	-254.2	-34.0	6.2	254.2
			2.560	10	-260.7	-33.5	13.0	260.7
		25087	0.000	10	-262.6	-34.0	5.2	262.6
			2.560	10	-268.2	-33.7	12.0	268.2
		25088	0.000	10	-270.1	-34.3	4.0	270.1
			2.560	10	-274.8	-34.1	11.0	274.8
		25089	0.000	10	-268.0	-29.5	2.6	268.0
			2.560	10	-271.4	-29.2	9.3	271.4
		25090	0.000	10	-273.4	-29.6	0.9	273.4
			1.280	10	-273.8	-29.3	9.0	273.8
		26091	0.000	10	-275.6	-29.6	0.4	275.6
			1.280	10	-275.4	-29.1	7.7	275.4
		26092	0.000	10	-277.4	-29.5	0.9	277.4
			2.560	10	-278.0	-28.7	6.1	278.0
		26093	0.000	10	-283.3	-35.2	2.3	283.3
			2.560	10	-282.8	-34.3	4.7	282.8
		26094	0.000	10	-284.8	-34.8	3.9	284.8
			2.560	10	-282.9	-33.9	3.2	282.9
		26095	0.000	10	-285.0	-34.4	5.3	285.0
			2.560	10	-282.0	-33.5	1.8	282.0
		26096	0.000	10	-284.0	-34.0	6.7	284.0
			1.280	10	-281.4	-33.6	7.8	281.4
		27097	0.000	10	-283.2	-33.9	8.1	283.2
			1.280	10	-280.0	-33.4	9.2	280.0
		27098	0.000	10	-281.9	-33.8	8.2	281.9
			2.560	10	-276.4	-33.2	1.1	276.4
		27099	0.000	10	-278.5	-33.7	9.8	278.5
			2.560	10	-271.6	-33.2	2.6	271.6
		27100	0.000	10	-273.8	-33.7	11.4	273.8
			2.560	10	-265.6	-33.2	4.2	265.6
		27101	0.000	10	-264.7	-28.0	13.4	264.7
			2.560	10	-254.8	-27.6	6.2	254.8
		27102	0.000	10	-257.0	-28.1	16.2	257.0
			1.280	10	-247.7	-21.5	17.6	247.7
		28103	0.000	10	-257.0	-26.5	18.2	257.0
			1.280	10	-249.9	-26.2	19.5	249.9
		28104	0.000	10	-251.6	-26.5	18.7	251.6
			2.560	10	-237.3	-25.5	11.4	237.3
		28105	0.000	10	-239.5	-26.0	21.6	239.5
			2.560	10	-222.8	-24.6	14.1	222.8
		28106	0.000	10	-222.3	-19.4	24.5	222.3
			2.560	10	-203.2	-18.0	17.0	203.2
		28107	0.000	10	-213.2	-22.5	28.6	213.2
			2.560	10	-190.5	-20.3	20.9	190.5
		28108	0.000	10	-192.8	-20.6	31.9	192.8
			1.280	10	-183.1	-19.9	34.0	183.1
		29109	0.000	10	-184.3	-19.9	36.1	184.3
			1.280	10	-170.1	-18.6	37.5	170.1
		29110	0.000	10	-180.1	-16.8	37.9	180.1
			2.560	10	-149.5	-13.9	29.7	149.5

LF: 3101, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3101	Bruchzustand_maxMY	29111	0.000	10	-151.9	-14.1	42.0	154.2
			2.560	10	-118.1	-11.0	45.8	132.0
		29112	0.000	10	-124.4	-9.9	48.3	139.6
			2.560	10	-85.7	-6.8	52.3	118.8
		29113	0.000	10	-87.0	-6.7	53.2	120.9
			2.560	10	-44.3	-3.4	57.5	107.1
		29114	0.000	10	-45.1	-3.3	58.5	109.1
			2.460	10	0.1	0.1	39.1	67.7
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =10)							

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	1	0.1	0.9	68.2	118.1
			2.460	1	-16.2	0.0	17.5	33.9
		11002	0.000	1	-16.1	0.1	17.7	34.2
			2.560	1	-31.4	-0.1	15.7	40.3
		11003	0.000	1	-31.3	-0.1	15.7	40.4
			2.560	1	-44.9	-0.2	14.1	49.0
		11004	0.000	1	-44.9	-0.2	14.1	49.1
			2.560	1	-56.9	-0.2	12.5	58.8
		11005	0.000	1	-55.3	-0.2	12.3	57.2
			2.560	1	-65.6	-0.2	10.8	66.7
		11006	0.000	1	-65.5	-0.3	11.3	66.9
			1.280	1	-70.4	-0.3	10.8	71.5
		12007	0.000	1	-67.7	-0.2	9.9	68.6
			1.280	1	-68.6	-0.2	9.3	69.4
		12008	0.000	1	-68.6	-0.2	9.3	69.4
			2.560	1	-75.4	-0.2	7.9	75.8
		12009	0.000	1	-75.4	-0.3	7.9	75.8
			2.560	1	-80.9	-0.3	6.5	81.2
		12010	0.000	1	-77.6	-0.2	6.4	77.9
			2.560	1	-81.8	-0.2	5.0	81.9
		12011	0.000	1	-83.5	-0.3	5.0	83.6
			2.560	1	-86.6	-0.3	3.7	86.6
		12012	0.000	1	-86.6	-0.3	3.8	86.6
			1.280	1	-87.8	-0.3	3.2	87.8
		13013	0.000	1	-87.7	-0.3	4.9	88.2
			1.280	1	-88.8	-0.4	4.5	89.1
		13014	0.000	1	-85.8	-0.4	2.5	85.8
			2.560	1	-86.6	-0.4	1.2	86.6
		13015	0.000	1	-86.6	-0.4	1.2	86.6
			2.560	1	-86.3	-0.4	1.7	86.4
		13016	0.000	1	-88.0	-0.4	1.6	88.0
			2.560	1	-86.7	-0.4	2.6	86.8
		13017	0.000	1	-86.7	-0.4	2.6	86.8
			2.560	1	-84.5	-0.4	3.5	84.7
		13018	0.000	1	-84.5	-0.4	3.5	84.7
			1.280	1	-83.0	-0.4	4.0	83.3
		14019	0.000	1	-83.0	-0.4	4.0	83.3
			1.280	1	-81.3	-0.4	4.4	81.7
		14020	0.000	1	-81.3	-0.4	4.3	81.6
			2.560	1	-77.3	-0.4	5.2	77.8
		14021	0.000	1	-77.2	-0.4	5.2	77.7
			2.560	1	-72.3	-0.5	6.0	73.1
		14022	0.000	1	-72.3	-0.5	6.0	73.0
			2.560	1	-66.5	-0.5	6.8	67.5
		14023	0.000	1	-66.5	-0.5	6.7	67.5
			2.560	1	-59.9	-0.5	7.5	61.3
		14024	0.000	1	-58.7	-0.5	7.5	60.1
			1.290	1	-55.2	-0.5	7.9	56.8
		15025	0.000	1	-55.2	-0.5	7.9	56.8
			1.280	1	-51.4	-0.5	8.4	53.3
		15026	0.000	1	-51.4	-0.5	8.5	53.3
			2.560	1	-43.4	-0.6	9.4	46.0
		15027	0.000	1	-43.3	-0.6	9.5	45.9
			2.560	1	-34.6	-0.6	10.3	38.3
		15028	0.000	1	-36.4	-0.6	10.5	40.0

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	1	-26.7	-0.6	11.3	31.9
		15029	0.000	1	-26.6	-0.6	11.4	31.8
			2.560	1	-16.3	-0.6	12.2	24.6
		15030	0.000	1	-16.2	-0.6	12.4	24.5
			1.280	1	-10.5	3.6	14.7	25.7
		16031	0.000	1	-10.3	3.8	12.8	22.5
			1.280	1	-4.7	9.6	13.2	24.8
		16032	0.000	1	-6.1	10.1	13.4	25.4
			2.560	1	-0.7	22.5	14.2	33.3
		16033	0.000	1	-0.7	22.4	14.2	33.3
			2.560	1	-0.7	35.4	14.9	43.8
		16034	0.000	1	-0.8	36.1	15.1	44.6
			2.560	1	-0.8	49.9	15.8	56.9
		16035	0.000	1	-0.8	49.8	15.7	56.8
			2.560	1	-0.8	64.2	16.4	70.2
		16036	0.000	1	1.4	66.0	16.7	72.1
			1.280	1	1.2	74.6	16.2	79.8
		17037	0.000	1	-4.4	69.0	15.4	72.7
			1.280	1	2.3	77.1	15.7	80.5
		17038	0.000	1	4.4	77.4	25.1	88.6
			2.560	1	16.9	76.2	25.4	87.9
		17039	0.000	1	16.5	74.6	26.7	87.5
			2.560	1	15.1	66.3	35.6	90.1
		17040	0.000	1	14.9	65.1	32.4	86.0
			2.560	1	10.0	68.2	32.8	88.8
		17041	0.000	1	9.9	67.6	29.7	84.9
			2.560	1	6.7	77.2	29.9	93.0
		17042	0.000	1	6.7	76.9	28.0	90.9
			1.280	1	5.8	84.4	28.1	97.4
		18043	0.000	1	5.9	84.3	42.2	111.6
			1.280	1	5.7	92.3	43.6	119.3
		18044	0.000	1	4.6	88.0	26.4	99.1
			2.560	1	3.6	107.3	26.5	116.7
		18045	0.000	1	3.7	107.3	26.0	116.3
			2.560	1	3.4	130.5	25.9	138.0
		18046	0.000	1	0.9	122.3	25.3	129.9
			2.560	1	0.8	143.7	25.4	150.3
		18047	0.000	1	2.3	144.7	25.2	151.1
			2.560	1	-2.1	164.9	52.8	188.5
		18048	0.000	1	-2.1	165.1	54.3	190.0
			1.280	1	-2.1	181.1	54.1	203.9
		19049	0.000	1	-1.7	181.3	71.3	219.3
			1.280	1	-1.0	191.9	73.2	230.0
		19050	0.000	1	-2.0	184.2	51.9	205.0
			2.560	1	-0.1	215.0	43.3	227.7
		19051	0.000	1	0.1	215.3	43.3	228.0
			2.560	1	-0.2	247.7	41.7	258.0
		19052	0.000	1	-0.2	243.2	41.1	253.4
			2.560	1	-0.7	272.0	38.5	280.1
		19053	0.000	1	-0.3	272.5	38.8	280.7
			2.560	1	-1.0	300.0	35.7	306.3
		19054	0.000	1	-0.5	300.6	37.2	307.4
			1.290	1	-1.2	315.5	33.8	320.9
		20055	0.000	1	-1.2	315.4	32.7	320.5
			1.280	1	-3.0	328.3	37.0	334.5

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	1	-2.5	323.6	38.4	330.3
			2.560	1	-3.6	348.3	34.1	353.3
		20057	0.000	1	-3.0	349.1	39.3	355.7
			2.560	1	-4.0	375.6	35.7	380.6
		20058	0.000	1	-3.5	376.8	38.9	382.8
			2.560	1	-3.7	348.9	36.3	354.5
		20059	0.000	1	-3.0	349.6	37.7	355.6
			2.560	1	-3.3	323.3	34.9	328.9
		20060	0.000	1	-2.5	324.0	39.8	331.2
			1.280	1	-1.5	310.7	32.2	315.6
		21061	0.000	1	-1.2	313.8	33.7	319.2
			1.280	1	-1.1	300.6	34.0	306.3
		21062	0.000	1	-0.5	301.1	38.5	308.4
			2.560	1	-0.8	272.6	36.1	279.7
		21063	0.000	1	-0.3	273.1	40.9	282.1
			2.560	1	-0.6	243.4	38.8	252.5
		21064	0.000	1	-0.2	243.8	43.2	255.0
			2.560	1	-0.5	211.2	40.8	222.8
		21065	0.000	1	-2.1	214.7	51.7	232.6
			2.560	1	-2.3	184.4	50.3	204.0
		21066	0.000	1	-1.9	184.8	52.5	206.0
			1.280	1	-2.2	174.7	69.3	211.9
		22067	0.000	1	-2.1	181.6	54.0	204.3
			1.280	1	-2.2	165.4	53.6	189.7
		22068	0.000	1	-1.9	165.6	53.6	189.8
			2.560	1	2.3	145.2	24.5	151.2
		22069	0.000	1	2.3	145.3	26.2	152.2
			2.560	1	2.3	123.6	25.0	131.0
		22070	0.000	1	1.1	123.3	26.0	131.2
			2.560	1	1.4	101.7	25.1	110.6
		22071	0.000	1	4.0	108.6	26.9	118.1
			2.560	1	4.8	89.1	25.9	99.7
		22072	0.000	1	4.8	89.3	27.9	101.6
			1.280	1	5.1	81.6	41.0	108.2
		23073	0.000	1	6.1	85.4	27.9	98.1
			1.280	1	6.9	77.8	27.5	91.2
		23074	0.000	1	7.0	78.2	30.1	94.0
			2.560	1	10.0	68.2	29.2	84.9
		23075	0.000	1	10.2	69.0	32.9	89.4
			2.560	1	14.4	65.5	32.0	85.9
		23076	0.000	1	14.3	66.9	35.6	90.6
			2.560	1	16.5	75.0	26.5	87.6
		23077	0.000	1	17.0	76.6	25.4	88.3
			2.560	1	3.8	77.7	25.0	88.8
		23078	0.000	1	3.7	80.3	16.0	83.4
			1.280	1	-4.9	69.5	15.3	73.1
		24079	0.000	1	-1.1	74.7	16.1	79.7
			1.280	1	-1.0	65.7	16.2	71.5
		24080	0.000	1	1.4	65.5	16.7	71.6
			2.560	1	-0.8	49.4	15.7	56.4
		24081	0.000	1	-0.7	49.6	15.8	56.6
			2.560	1	-0.8	35.7	15.1	44.2
		24082	0.000	1	-0.7	35.9	15.1	44.4
			2.560	1	-0.8	22.6	14.4	33.6
		24083	0.000	1	-0.6	22.3	14.2	33.2

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	1	-5.6	9.8	13.5	25.3
		24084	0.000	1	-5.6	10.0	13.5	25.4
			1.290	1	-11.5	3.9	13.1	23.1
		25085	0.000	1	-10.0	3.4	14.8	25.8
			1.280	1	-16.0	-0.6	14.0	24.4
		25086	0.000	1	-15.8	-0.5	12.3	24.2
			2.560	1	-26.3	-0.6	11.4	31.4
		25087	0.000	1	-26.2	-0.5	11.4	31.5
			2.560	1	-36.1	-0.6	10.5	39.6
		25088	0.000	1	-36.0	-0.5	10.4	39.6
			2.560	1	-45.1	-0.6	9.5	47.7
		25089	0.000	1	-43.0	-0.5	9.5	45.7
			2.560	1	-51.1	-0.5	8.5	53.0
		25090	0.000	1	-51.1	-0.5	8.5	53.0
			1.280	1	-54.9	-0.5	8.0	56.5
		26091	0.000	1	-54.9	-0.5	8.0	56.5
			1.280	1	-58.4	-0.5	7.5	59.9
		26092	0.000	1	-58.4	-0.5	6074810870267904.0	10521881748701184.0
			2.560	1	-65.0	-0.5	6.8	66.0
		26093	0.000	1	-66.3	-0.5	6.8	67.3
			2.560	1	-72.1	-0.5	6.0	72.9
		26094	0.000	1	-72.1	-0.4	6.0	72.9
			2.560	1	-77.1	-0.4	5.2	77.6
		26095	0.000	1	-77.1	-0.4	5.2	77.6
			2.560	1	-81.2	-0.4	4.4	81.6
		26096	0.000	1	-81.2	-0.4	4.4	81.6
			1.280	1	-83.0	-0.4	4.0	83.2
		27097	0.000	1	-83.0	-0.4	4.0	83.2
			1.280	1	-84.4	-0.4	3.5	84.7
		27098	0.000	1	-84.4	-0.4	3.5	84.7
			2.560	1	-86.7	-0.4	2.6	86.8
		27099	0.000	1	-86.7	-0.4	2.6	86.8
			2.560	1	-88.0	-0.4	1.7	88.1
		27100	0.000	1	-88.0	-0.4	1.7	88.1
			2.560	1	-88.4	-0.4	1.2	88.4
		27101	0.000	1	-86.7	-0.3	1.1	86.7
			2.560	1	-86.0	-0.3	2.4	86.0
		27102	0.000	1	-86.0	-0.3	2.5	86.0
			1.280	1	-85.0	-0.2	4.9	85.4
		28103	0.000	1	-87.9	-0.3	3.2	87.9
			1.280	1	-86.8	-0.3	3.8	86.8
		28104	0.000	1	-86.8	-0.3	3.6	86.8
			2.560	1	-83.8	-0.3	5.0	83.9
		28105	0.000	1	-83.8	-0.3	4.9	83.9
			2.560	1	-79.6	-0.3	6.3	79.8
		28106	0.000	1	-77.9	-0.2	6.3	78.2
			2.560	1	-72.6	-0.2	7.8	73.4
		28107	0.000	1	-75.7	-0.3	7.8	76.1
			2.560	1	-68.9	-0.2	9.3	69.7
		28108	0.000	1	-68.9	-0.2	9.2	69.7
			1.280	1	-68.1	-0.2	9.9	68.9
		29109	0.000	1	-68.1	-0.2	10.3	69.1
			1.280	1	-63.3	-0.2	11.0	64.6
		29110	0.000	1	-65.9	-0.3	10.8	67.1
			2.560	1	-55.6	-0.2	12.4	57.5

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]	
3102	Bruchzustand_minMY	29111	0.000	1	-55.7	-0.2	12.3	57.6	
			2.560	1	-43.9	-0.1	13.9	48.1	
		29112	0.000	1	-45.2	-0.2	14.1	49.3	
			2.560	1	-31.5	-0.1	15.8	40.6	
		29113	0.000	1	-31.5	-0.1	15.8	40.5	
			2.560	1	-16.3	0.0	17.5	34.0	
		29114	0.000	1	-16.3	0.0	17.5	34.0	
			2.460	1	0.0	0.1	70.4	121.9	
LF	Lastfall				SIGC	Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung			
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung			
MNR	Materialnummer (Filter: =1)								

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	3	-0.4	0.1	134.8	233.6
			2.460	3	-16.1	23.3	21.8	37.7
		11002	0.000	3	-16.0	23.5	21.2	36.7
			2.560	3	-31.2	44.8	19.0	50.2
		11003	0.000	3	-31.2	44.8	19.1	50.3
			2.560	3	-44.7	63.4	16.4	66.3
		11004	0.000	3	-44.6	63.4	16.4	66.4
			2.560	3	-56.6	79.3	13.9	81.0
		11005	0.000	3	-55.1	67.1	13.7	69.4
			2.560	3	-65.2	78.3	11.3	79.6
		11006	0.000	3	-65.2	78.4	12.1	79.9
			1.280	3	-70.1	83.5	11.2	84.8
		12007	0.000	3	-67.5	63.8	9.9	68.7
			1.280	3	-68.3	67.1	8.8	69.3
		12008	0.000	3	-68.3	67.2	8.9	69.3
			2.560	3	-75.1	72.6	6.7	75.5
		12009	0.000	3	-75.1	72.7	6.7	75.5
			2.560	3	-80.6	76.7	4.6	80.8
		12010	0.000	3	-77.3	73.0	4.6	77.5
			2.560	3	-81.4	75.5	2.5	81.5
		12011	0.000	3	-83.2	68.0	2.6	83.3
			2.560	3	-86.3	69.0	0.7	86.3
		12012	0.000	3	-86.3	69.1	0.8	86.3
			1.280	3	-87.4	69.2	1.4	87.5
		13013	0.000	3	-87.4	69.2	4.7	87.6
			1.280	3	-88.4	68.9	3.8	88.6
		13014	0.000	3	-85.5	67.7	2.3	85.6
			2.560	3	-86.3	66.5	3.9	86.6
		13015	0.000	3	-86.3	66.6	3.9	86.6
			2.560	3	-86.0	64.3	5.5	86.6
		13016	0.000	3	-87.7	58.3	5.5	88.2
			2.560	3	-86.5	55.3	7.3	87.3
		13017	0.000	3	-86.4	55.3	7.2	87.3
			2.560	3	-84.2	51.4	9.0	85.5
		13018	0.000	3	-84.2	51.4	9.0	85.5
			1.280	3	-82.8	49.1	9.9	84.3
		14019	0.000	3	-82.8	49.1	9.9	84.3
			1.280	3	-81.1	46.6	10.7	82.9
		14020	0.000	3	-81.1	46.6	10.7	82.9
			2.560	3	-77.0	40.9	12.3	79.5
		14021	0.000	3	-77.0	41.0	12.3	79.4
			2.560	3	-72.1	34.5	13.9	75.4
		14022	0.000	3	-72.1	34.5	13.9	75.3
			2.560	3	-66.4	27.2	15.5	70.6
		14023	0.000	3	-66.3	27.3	15.4	70.5
			2.560	3	-59.8	19.2	16.9	65.3
		14024	0.000	3	-58.6	22.2	16.7	64.1
			1.290	3	-55.0	17.5	17.5	61.3
		15025	0.000	3	-55.0	17.5	17.5	61.3
			1.280	3	-51.3	12.6	18.2	58.5
		15026	0.000	3	-51.3	12.7	18.2	58.4
			2.560	3	-43.3	2.4	19.6	52.7
		15027	0.000	3	-43.3	2.5	19.5	52.6
			2.560	3	-34.5	-8.5	20.9	47.0
		15028	0.000	3	-36.4	-9.8	21.2	48.7

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	3	-26.7	-22.1	22.5	46.3
		15029	0.000	3	-26.7	-22.0	22.5	46.2
			2.560	3	-35.0	-16.2	23.8	49.2
		15030	0.000	3	-35.0	-16.2	23.6	49.0
			1.280	3	-41.7	-10.4	21.7	50.8
		16031	0.000	3	-41.7	-10.2	24.2	53.4
			1.280	3	-48.5	-4.6	24.7	59.2
		16032	0.000	3	-59.6	-6.0	25.4	67.5
			2.560	3	-77.3	6.0	26.6	84.1
		16033	0.000	3	-77.2	6.1	26.6	84.0
			2.560	3	-95.6	18.7	27.7	101.7
		16034	0.000	3	-108.2	18.4	28.1	113.0
			2.560	3	-129.9	31.9	29.2	134.2
		16035	0.000	3	-129.8	31.9	29.2	134.2
			2.560	3	-152.3	46.0	30.3	156.3
		16036	0.000	3	-149.8	48.6	30.4	153.9
			1.280	3	-161.4	56.7	31.2	165.5
		17037	0.000	3	-142.3	68.8	29.9	145.9
			1.280	3	-155.2	76.8	30.4	158.6
		17038	0.000	3	-153.6	77.1	40.6	155.9
			2.560	3	-187.9	75.8	41.3	189.9
		17039	0.000	3	-188.6	74.3	42.4	190.5
			2.560	3	-216.4	65.9	55.8	219.2
		17040	0.000	3	-216.9	64.7	52.2	220.2
			2.560	3	-262.0	67.7	53.0	264.8
		17041	0.000	3	-262.3	67.1	49.8	265.5
			2.560	3	-305.9	76.6	50.7	308.7
		17042	0.000	3	-306.1	76.3	49.7	309.4
			1.280	3	-327.8	83.8	50.1	330.9
		18043	0.000	3	-327.5	83.7	66.3	335.7
			1.280	3	-349.1	91.6	68.0	357.2
		18044	0.000	3	-293.2	87.4	48.2	297.8
			2.560	3	-330.8	106.6	49.0	334.9
		18045	0.000	3	-330.9	106.6	48.9	335.3
			2.560	3	-367.9	129.8	49.6	372.0
		18046	0.000	3	-301.3	121.7	47.7	306.8
			2.560	3	-333.0	143.0	48.3	338.0
		18047	0.000	3	-294.5	144.0	48.0	301.2
			2.560	3	-327.6	164.2	97.1	354.8
		18048	0.000	3	-327.2	164.3	99.7	356.1
			1.280	3	-348.5	180.3	100.2	375.8
		19049	0.000	3	-347.5	180.5	118.6	388.6
			1.280	3	-365.8	191.1	120.6	406.3
		19050	0.000	3	-284.5	183.5	93.7	317.3
			2.560	3	-315.5	214.2	88.6	340.8
		19051	0.000	3	-315.2	214.6	87.7	340.2
			2.560	3	-347.7	246.8	85.5	369.1
		19052	0.000	3	-297.4	242.5	83.9	323.2
			2.560	3	-324.7	271.2	80.8	346.4
		19053	0.000	3	-324.3	271.7	80.3	346.0
			2.560	3	-350.6	299.1	76.4	368.4
		19054	0.000	3	-350.1	299.7	77.8	368.9
			1.290	3	-364.9	314.6	74.0	380.9
		20055	0.000	3	-365.0	314.5	71.4	379.8
			1.280	3	-378.8	327.4	78.9	396.3

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	3	-327.6	322.7	79.9	349.7
			2.560	3	-350.2	347.4	74.4	367.7
		20057	0.000	3	-349.4	348.2	83.6	371.9
			2.560	3	-373.1	374.6	79.0	391.6
		20058	0.000	3	-372.3	375.9	83.0	394.8
			2.560	3	-349.7	348.1	79.7	369.9
		20059	0.000	3	-349.3	348.7	78.9	369.3
			2.560	3	-327.9	322.5	75.6	347.4
		20060	0.000	3	-327.5	323.1	82.5	351.0
			1.280	3	-316.0	309.8	70.9	334.0
		21061	0.000	3	-362.5	312.9	73.4	378.3
			1.280	3	-350.3	299.7	73.8	366.9
		21062	0.000	3	-349.8	300.2	79.9	369.6
			2.560	3	-324.1	271.8	77.1	343.9
		21063	0.000	3	-323.8	272.2	83.9	347.4
			2.560	3	-297.1	242.6	81.2	321.1
		21064	0.000	3	-296.8	243.0	87.5	324.8
			2.560	3	-269.0	210.5	84.9	297.9
		21065	0.000	3	-316.0	213.9	94.7	346.2
			2.560	3	-284.4	183.8	91.8	315.8
		21066	0.000	3	-284.4	184.1	95.2	318.1
			1.280	3	-269.6	174.1	116.1	323.7
		22067	0.000	3	-348.0	180.8	100.1	375.3
			1.280	3	-326.7	164.7	98.9	355.1
		22068	0.000	3	-326.9	164.9	98.1	354.7
			2.560	3	-293.7	144.5	47.1	300.2
		22069	0.000	3	-293.5	144.7	49.8	300.7
			2.560	3	-266.0	123.0	48.0	273.3
		22070	0.000	3	-299.9	122.7	48.2	305.4
			2.560	3	-268.6	101.2	46.4	274.2
		22071	0.000	3	-329.6	107.9	49.4	333.9
			2.560	3	-291.9	88.5	47.6	296.4
		22072	0.000	3	-291.7	88.7	49.2	296.2
			1.280	3	-273.4	81.1	64.6	284.3
		23073	0.000	3	-326.7	84.8	49.9	329.8
			1.280	3	-305.1	77.2	49.2	308.3
		23074	0.000	3	-304.8	77.6	50.8	307.7
			2.560	3	-261.5	67.7	49.3	264.6
		23075	0.000	3	-261.1	68.5	53.1	263.9
			2.560	3	-216.3	65.1	51.7	219.5
		23076	0.000	3	-215.6	66.5	55.8	218.5
			2.560	3	-188.4	74.6	42.1	190.3
		23077	0.000	3	-187.6	76.3	41.3	189.6
			2.560	3	-153.5	77.4	40.5	155.8
		23078	0.000	3	-152.3	80.0	30.7	155.9
			1.280	3	-142.1	69.2	29.8	145.6
		24079	0.000	3	-194.9	54.7	31.2	197.6
			1.280	3	-181.2	46.5	30.9	184.0
		24080	0.000	3	-149.6	49.0	30.6	153.8
			2.560	3	-129.6	32.4	29.1	133.9
		24081	0.000	3	-129.7	32.4	29.1	134.0
			2.560	3	-108.0	18.9	28.0	112.8
		24082	0.000	3	-108.1	18.9	28.0	112.9
			2.560	3	-87.2	6.0	26.8	92.7
		24083	0.000	3	-77.1	6.6	26.6	84.0

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	3	-59.5	-5.5	25.3	67.4
		24084	0.000	3	-59.5	-5.5	25.1	67.4
			1.290	3	-51.1	-11.4	24.6	59.7
		25085	0.000	3	-41.5	-9.9	21.7	50.6
			1.280	3	-34.8	-15.9	21.6	46.0
		25086	0.000	3	-34.8	-15.8	23.8	49.0
			2.560	3	-26.3	-21.9	22.5	46.0
		25087	0.000	3	-26.3	-21.9	22.5	46.1
			2.560	3	-36.0	-9.7	21.2	48.4
		25088	0.000	3	-36.0	-9.7	21.2	48.4
			2.560	3	-45.1	1.8	19.9	54.4
		25089	0.000	3	-42.9	2.6	19.6	52.3
			2.560	3	-51.0	12.8	18.2	58.2
		25090	0.000	3	-51.0	12.8	18.2	58.2
			1.280	3	-54.8	17.6	17.5	61.1
		26091	0.000	3	-54.8	17.6	17.5	61.1
			1.280	3	-58.3	22.3	16.8	63.8
		26092	0.000	3	-58.3	22.2	16.8	63.9
			2.560	3	-64.8	31.0	15.3	69.1
		26093	0.000	3	-66.1	27.3	15.5	70.4
			2.560	3	-72.0	34.7	14.0	75.2
		26094	0.000	3	-72.0	34.6	13.9	75.2
			2.560	3	-76.9	41.2	12.4	79.4
		26095	0.000	3	-76.9	41.1	12.4	79.4
			2.560	3	-81.0	46.8	10.7	82.8
		26096	0.000	3	-81.0	46.8	10.7	82.8
			1.280	3	-82.7	49.3	9.9	84.3
		27097	0.000	3	-82.7	49.3	9.9	84.3
			1.280	3	-84.2	51.6	9.0	85.5
		27098	0.000	3	-84.2	51.6	9.0	85.5
			2.560	3	-86.4	55.6	7.3	87.3
		27099	0.000	3	-86.5	55.5	7.3	87.3
			2.560	3	-87.7	58.6	5.6	88.3
		27100	0.000	3	-87.8	58.5	5.6	88.3
			2.560	3	-88.1	60.6	4.0	88.3
		27101	0.000	3	-86.4	66.8	3.9	86.7
			2.560	3	-85.6	68.0	2.3	85.7
		27102	0.000	3	-85.7	67.9	2.1	85.7
			1.280	3	-84.7	68.2	4.6	84.9
		28103	0.000	3	-87.6	69.5	1.4	87.6
			1.280	3	-86.4	69.4	0.8	86.5
		28104	0.000	3	-86.5	69.4	0.6	86.5
			2.560	3	-83.5	68.3	2.5	83.5
		28105	0.000	3	-83.5	68.3	2.5	83.5
			2.560	3	-79.3	66.1	4.6	79.5
		28106	0.000	3	-77.6	73.3	4.5	77.8
			2.560	3	-72.3	69.4	6.6	72.8
		28107	0.000	3	-75.4	73.0	6.7	75.9
			2.560	3	-68.6	67.5	8.9	69.6
		28108	0.000	3	-68.6	67.4	9.0	69.6
			1.280	3	-67.8	64.1	9.9	69.0
		29109	0.000	3	-67.8	64.1	10.8	69.2
			1.280	3	-63.1	60.1	12.0	65.1
		29110	0.000	3	-65.6	78.7	11.4	80.0
			2.560	3	-55.3	67.4	13.8	69.7

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	29111	0.000	3	-55.4	67.3	13.8	69.7
			2.560	3	-43.7	53.8	16.3	57.9
		29112	0.000	3	-44.9	63.6	16.5	66.6
			2.560	3	-31.3	45.0	19.2	50.5
		29113	0.000	3	-31.4	44.9	19.2	50.4
			2.560	3	-16.2	23.5	21.9	37.9
		29114	0.000	3	-16.2	23.4	21.9	37.9
			2.460	3	0.0	0.0	33.4	57.8
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =3)							

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	4	0.3	0.9	85.7	148.5
			2.460	4	-15.3	24.9	29.1	50.4
		11002	0.000	4	-15.2	24.9	30.1	52.1
			2.560	4	-29.5	47.7	25.8	58.0
		11003	0.000	4	-29.7	47.6	25.8	57.9
			2.560	4	-42.2	67.7	22.7	73.6
		11004	0.000	4	-42.4	67.6	22.7	73.5
			2.560	4	-53.3	84.8	19.7	88.5
		11005	0.000	4	-52.0	72.2	19.4	76.8
			2.560	4	-61.2	84.7	16.5	87.6
		11006	0.000	4	-61.4	84.6	17.2	87.8
			1.280	4	-65.7	90.5	16.2	93.1
		12007	0.000	4	-63.5	69.9	15.0	73.3
			1.280	4	-64.1	73.6	13.7	76.3
		12008	0.000	4	-64.1	73.6	13.5	76.2
			2.560	4	-70.0	80.1	10.8	81.7
		12009	0.000	4	-70.2	80.0	10.8	81.6
			2.560	4	-74.8	85.0	8.2	85.8
		12010	0.000	4	-76.3	76.4	8.1	77.4
			2.560	4	-79.9	79.5	5.6	80.3
		12011	0.000	4	-77.2	76.5	5.5	77.6
			2.560	4	-79.5	78.2	3.0	79.6
		12012	0.000	4	-79.6	78.2	3.2	79.8
			1.280	4	-80.4	78.7	2.0	80.5
		13013	0.000	4	-80.5	78.7	3.3	80.7
			1.280	4	-80.8	79.0	4.4	81.1
		13014	0.000	4	-82.5	73.1	0.5	82.5
			2.560	4	-82.7	72.5	2.1	82.7
		13015	0.000	4	-82.7	72.5	2.2	82.8
			2.560	4	-81.9	70.8	4.5	82.2
		13016	0.000	4	-79.5	68.8	4.4	79.8
			2.560	4	-77.6	66.3	6.6	78.3
		13017	0.000	4	-77.7	66.2	6.7	78.4
			2.560	4	-74.9	62.7	8.9	76.2
		13018	0.000	4	-75.0	62.7	9.0	76.3
			1.280	4	-73.3	60.6	10.0	74.9
		14019	0.000	4	-73.3	60.6	10.0	74.9
			1.280	4	-71.3	58.3	11.1	73.3
		14020	0.000	4	-71.4	58.2	11.2	73.4
			2.560	4	-66.8	52.9	13.2	69.8
		14021	0.000	4	-66.8	52.9	13.3	69.9
			2.560	4	-61.4	46.7	15.2	65.8
		14022	0.000	4	-61.5	46.7	15.3	65.9
			2.560	4	-55.2	39.7	17.3	61.2
		14023	0.000	4	-55.3	39.7	17.3	61.3
			2.560	4	-48.2	31.9	19.2	56.5
		14024	0.000	4	-50.0	31.9	19.5	58.3
			1.290	4	-46.1	27.4	20.4	55.7
		15025	0.000	4	-46.1	27.4	20.4	55.7
			1.280	4	-42.0	22.8	21.3	53.2
		15026	0.000	4	-42.0	22.8	21.4	53.3
			2.560	4	-33.3	13.0	23.2	48.6
		15027	0.000	4	-33.3	13.0	23.3	48.7
			2.560	4	-23.9	2.5	25.0	45.5
		15028	0.000	4	-23.2	3.8	24.8	45.1

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	4	-13.1	-8.5	26.5	47.1
		15029	0.000	4	-13.2	-8.5	26.5	47.2
			2.560	4	-21.6	-2.5	28.1	50.1
		15030	0.000	4	-21.6	-2.5	28.0	50.0
			1.280	4	-28.1	3.6	31.0	55.3
		16031	0.000	4	-28.2	3.8	28.6	51.3
			1.280	4	-35.0	9.5	29.3	54.8
		16032	0.000	4	-44.3	10.0	29.9	59.6
			2.560	4	-62.1	22.3	31.4	74.8
		16033	0.000	4	-62.1	22.3	31.4	74.8
			2.560	4	-80.6	35.2	32.9	91.6
		16034	0.000	4	-92.3	35.9	33.2	101.3
			2.560	4	-114.2	49.6	34.6	122.1
		16035	0.000	4	-114.2	49.6	34.5	122.1
			2.560	4	-136.9	63.9	35.9	144.0
		16036	0.000	4	-135.2	65.7	35.7	142.3
			1.280	4	-146.6	74.3	36.0	153.3
		17037	0.000	4	-217.7	-3.9	38.1	221.6
			1.280	4	-232.2	2.8	38.8	235.9
		17038	0.000	4	-228.7	4.9	33.4	232.9
			2.560	4	-247.7	19.3	34.8	251.9
		17039	0.000	4	-246.7	19.5	34.3	250.8
			2.560	4	-270.1	15.7	45.8	276.9
		17040	0.000	4	-269.2	15.9	47.1	275.8
			2.560	4	-297.7	36.0	49.2	304.2
		17041	0.000	4	-297.2	36.3	50.4	303.4
			2.560	4	-330.2	57.0	52.5	336.3
		17042	0.000	4	-329.8	57.2	54.5	335.8
			1.280	4	-348.8	67.8	55.8	354.7
		18043	0.000	4	-348.2	68.0	38.2	350.0
			1.280	4	-370.2	75.9	38.4	371.7
		18044	0.000	4	-311.4	73.8	55.9	318.9
			2.560	4	-345.2	97.4	58.1	352.6
		18045	0.000	4	-345.0	97.7	58.1	352.2
			2.560	4	-382.0	121.5	60.3	389.1
		18046	0.000	4	-312.8	115.2	60.4	323.2
			2.560	4	-343.5	138.1	62.8	353.8
		18047	0.000	4	-304.7	139.0	58.5	315.3
			2.560	4	-339.7	157.8	69.7	350.7
		18048	0.000	4	-339.8	157.4	70.1	350.7
			1.280	4	-361.9	172.9	72.5	373.0
		19049	0.000	4	-361.0	173.0	44.0	363.6
			1.280	4	-383.6	179.7	44.4	385.9
		19050	0.000	4	-300.0	173.5	64.6	312.7
			2.560	4	-327.5	208.2	87.3	350.4
		19051	0.000	4	-327.3	208.4	82.3	347.5
			2.560	4	-362.2	238.9	85.6	382.2
		19052	0.000	4	-310.5	235.2	79.6	332.0
			2.560	4	-338.9	263.4	83.0	360.4
		19053	0.000	4	-338.5	263.9	76.7	356.8
			2.560	4	-365.5	290.9	80.1	384.1
		19054	0.000	4	-365.0	291.5	74.3	381.0
			1.290	4	-376.6	309.8	77.6	393.7
		20055	0.000	4	-376.7	309.8	75.0	392.7
			1.280	4	-391.9	321.3	77.9	408.3

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	4	-339.4	317.4	71.2	356.1
			2.560	4	-361.5	342.9	75.2	379.1
		20057	0.000	4	-360.9	343.5	76.0	378.5
			2.560	4	-384.4	370.3	80.0	402.9
		20058	0.000	4	-384.5	370.7	76.7	401.3
			2.560	4	-362.2	342.3	79.6	381.7
		20059	0.000	4	-361.5	343.2	71.7	377.3
			2.560	4	-340.8	316.0	75.4	359.7
		20060	0.000	4	-340.0	317.1	74.5	358.1
			1.280	4	-327.3	304.9	75.1	346.9
		21061	0.000	4	-379.3	302.9	77.9	396.3
			1.280	4	-366.5	290.2	77.9	384.2
		21062	0.000	4	-366.0	290.8	77.1	383.0
			2.560	4	-339.7	262.6	80.0	359.8
		21063	0.000	4	-339.2	263.2	80.4	359.2
			2.560	4	-311.6	234.0	82.5	334.8
		21064	0.000	4	-311.1	234.5	83.3	334.5
			2.560	4	-281.1	203.8	84.3	307.8
		21065	0.000	4	-331.2	204.6	66.8	343.6
			2.560	4	-301.1	172.4	66.3	314.6
		21066	0.000	4	-300.6	173.2	67.0	314.4
			1.280	4	-281.7	167.1	44.6	286.8
		22067	0.000	4	-362.8	172.1	72.7	373.9
			1.280	4	-340.7	156.4	70.9	351.9
		22068	0.000	4	-340.4	157.1	69.0	351.1
			2.560	4	-305.4	137.9	59.6	316.5
		22069	0.000	4	-305.4	137.8	60.2	316.6
			2.560	4	-277.9	115.7	59.2	289.9
		22070	0.000	4	-313.6	113.9	60.4	324.2
			2.560	4	-284.2	89.9	59.2	295.4
		22071	0.000	4	-346.2	96.5	57.5	353.4
			2.560	4	-312.3	72.7	56.4	320.1
		22072	0.000	4	-312.5	72.6	55.1	320.1
			1.280	4	-293.4	65.3	37.7	296.2
		23073	0.000	4	-349.7	66.7	55.8	355.6
			1.280	4	-330.8	56.1	54.9	336.8
		23074	0.000	4	-331.1	56.0	52.1	336.9
			2.560	4	-298.0	35.3	50.8	304.3
		23075	0.000	4	-298.5	35.1	48.8	304.8
			2.560	4	-269.9	15.0	47.3	276.6
		23076	0.000	4	-270.8	14.8	45.6	277.5
			2.560	4	-247.4	18.9	34.4	251.5
		23077	0.000	4	-248.4	18.8	34.6	252.5
			2.560	4	-229.5	4.4	33.4	233.6
		23078	0.000	4	-231.0	4.2	38.8	234.7
			1.280	4	-218.4	-4.4	38.1	222.2
		24079	0.000	4	-178.6	74.3	36.3	183.2
			1.280	4	-165.3	65.3	35.8	170.2
		24080	0.000	4	-135.9	65.2	35.8	143.0
			2.560	4	-114.9	49.2	34.5	122.7
		24081	0.000	4	-114.8	49.3	34.5	122.7
			2.560	4	-93.0	35.5	33.1	101.9
		24082	0.000	4	-93.0	35.7	33.1	101.8
			2.560	4	-72.0	22.4	31.7	82.3
		24083	0.000	4	-62.7	22.1	31.4	75.3

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	4	-45.0	9.8	29.9	60.1
		24084	0.000	4	-44.9	9.9	29.7	59.8
			1.290	4	-36.4	3.8	28.9	53.2
		25085	0.000	4	-28.6	3.3	31.0	55.5
			1.280	4	-22.1	-3.0	29.9	53.3
		25086	0.000	4	-22.0	-2.7	28.2	50.3
			2.560	4	-13.4	-9.0	26.5	47.3
		25087	0.000	4	-13.3	-8.9	26.5	47.3
			2.560	4	-23.4	3.3	24.8	45.2
		25088	0.000	4	-23.3	3.4	24.8	45.2
			2.560	4	-32.7	14.8	23.0	48.2
		25089	0.000	4	-33.5	12.7	23.3	48.8
			2.560	4	-42.3	22.4	21.4	53.5
		25090	0.000	4	-42.2	22.5	21.4	53.4
			1.280	4	-46.3	27.1	20.5	55.9
		26091	0.000	4	-46.3	27.1	20.5	55.9
			1.280	4	-50.2	31.5	19.5	58.5
		26092	0.000	4	-50.1	31.6	19.5	58.4
			2.560	4	-57.4	39.7	17.6	63.4
		26093	0.000	4	-55.4	39.4	17.4	61.5
			2.560	4	-61.7	46.4	15.4	66.1
		26094	0.000	4	-61.6	46.5	15.4	66.0
			2.560	4	-67.1	52.7	13.3	70.2
		26095	0.000	4	-67.0	52.7	13.3	70.1
			2.560	4	-71.7	58.0	11.2	73.7
		26096	0.000	4	-71.6	58.1	11.2	73.7
			1.280	4	-73.6	60.4	10.1	75.2
		27097	0.000	4	-73.6	60.4	10.1	75.2
			1.280	4	-75.3	62.5	9.0	76.6
		27098	0.000	4	-75.2	62.6	9.0	76.6
			2.560	4	-78.0	66.1	6.7	78.8
		27099	0.000	4	-78.0	66.2	6.8	78.7
			2.560	4	-79.8	68.7	4.4	80.1
		27100	0.000	4	-79.7	68.8	4.5	80.1
			2.560	4	-80.6	70.4	2.1	80.7
		27101	0.000	4	-83.1	72.5	2.2	83.2
			2.560	4	-82.8	73.2	0.5	82.8
		27102	0.000	4	-82.8	73.2	0.7	82.8
			1.280	4	-82.5	72.9	3.4	82.7
		28103	0.000	4	-80.8	78.8	1.9	80.9
			1.280	4	-80.0	78.3	3.1	80.1
		28104	0.000	4	-80.0	78.3	2.9	80.1
			2.560	4	-77.6	76.6	5.5	78.0
		28105	0.000	4	-77.5	76.6	5.4	77.9
			2.560	4	-74.0	73.7	8.1	75.0
		28106	0.000	4	-76.7	76.6	8.1	77.6
			2.560	4	-71.8	72.2	10.8	74.1
		28107	0.000	4	-70.5	80.3	10.8	81.9
			2.560	4	-64.5	73.9	13.5	76.5
		28108	0.000	4	-64.4	73.9	13.5	76.5
			1.280	4	-63.9	70.2	15.0	73.5
		29109	0.000	4	-63.8	70.2	15.7	73.9
			1.280	4	-59.6	65.7	17.0	70.2
		29110	0.000	4	-61.6	85.0	16.5	87.9
			2.560	4	-52.3	72.5	19.5	77.2

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	29111	0.000	4	-52.2	72.5	19.4	77.2
			2.560	4	-41.4	57.8	22.5	65.4
		29112	0.000	4	-42.5	67.9	22.8	73.9
			2.560	4	-29.8	47.9	25.9	58.1
		29113	0.000	4	-29.7	47.9	25.9	58.2
			2.560	4	-15.4	24.9	29.2	50.5
		29114	0.000	4	-15.3	25.0	29.2	50.5
			2.460	4	0.1	0.1	133.7	231.6
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =4)							

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	5	-0.4	0.4	100.3	173.8
			2.460	5	0.0	24.9	21.4	44.7
		11002	0.000	5	0.0	25.0	22.4	46.1
			2.560	5	-0.1	47.9	19.0	58.1
		11003	0.000	5	-0.1	47.8	19.0	58.0
			2.560	5	-0.2	67.9	16.7	73.8
		11004	0.000	5	-0.2	67.8	16.6	73.6
			2.560	5	-0.2	85.1	14.5	88.7
		11005	0.000	5	-0.2	72.4	15.2	77.0
			2.560	5	-0.3	85.0	12.9	87.9
		11006	0.000	5	-0.3	84.9	13.4	88.0
			1.280	5	-0.3	90.8	12.6	93.3
		12007	0.000	5	-0.3	70.4	6.4	71.2
			1.280	5	-0.2	74.1	5.8	74.8
		12008	0.000	5	-0.2	74.1	5.7	74.7
			2.560	5	-0.2	80.6	4.6	81.0
		12009	0.000	5	-0.3	80.5	4.6	80.9
			2.560	5	-0.3	85.5	3.5	85.7
		12010	0.000	5	-0.2	76.9	3.6	77.2
			2.560	5	-0.2	80.1	2.5	80.2
		12011	0.000	5	-0.3	77.0	2.4	77.1
			2.560	5	-0.3	78.8	1.4	78.8
		12012	0.000	5	-0.3	78.7	1.4	78.8
			1.280	5	-0.3	79.2	0.9	79.2
		13013	0.000	5	-0.3	79.2	2.4	79.2
			1.280	5	-0.4	79.6	2.2	79.7
		13014	0.000	5	-0.4	73.8	0.7	73.8
			2.560	5	-0.4	73.2	1.1	73.2
		13015	0.000	5	-0.4	73.1	1.1	73.1
			2.560	5	-0.4	71.4	1.7	71.5
		13016	0.000	5	-0.4	69.4	1.8	69.4
			2.560	5	-0.4	66.8	2.4	66.9
		13017	0.000	5	-0.4	66.8	2.4	66.9
			2.560	5	-0.4	63.2	3.2	63.5
		13018	0.000	5	-0.4	63.2	3.2	63.4
			1.280	5	-0.4	61.1	3.6	61.4
		14019	0.000	5	-0.4	61.1	3.6	61.4
			1.280	5	-0.4	58.7	4.0	59.2
		14020	0.000	5	-0.4	58.7	4.0	59.1
			2.560	5	-0.4	53.4	4.8	54.0
		14021	0.000	5	-0.5	53.3	4.8	54.0
			2.560	5	-0.5	47.1	5.5	48.1
		14022	0.000	5	-0.5	47.1	5.5	48.1
			2.560	5	-0.5	40.0	6.2	41.5
		14023	0.000	5	-0.5	40.0	6.3	41.4
			2.560	5	-0.5	32.1	6.9	34.3
		14024	0.000	5	-0.5	32.2	7.0	34.4
			1.290	5	-0.5	27.7	7.3	30.4
		15025	0.000	5	-0.6	27.7	7.3	30.4
			1.280	5	-0.6	23.1	7.6	26.6
		15026	0.000	5	-0.6	23.0	7.7	26.6
			2.560	5	-0.6	13.2	8.3	19.5
		15027	0.000	5	-0.6	13.2	8.3	19.5
			2.560	5	-8.6	2.5	8.9	15.7
		15028	0.000	5	-10.0	3.8	8.6	15.7

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	5	-22.1	-0.6	9.2	25.6
		15029	0.000	5	-22.1	-0.6	9.2	25.5
			2.560	5	-35.1	-0.6	9.8	37.6
		15030	0.000	5	-35.0	-0.6	9.7	37.5
			1.280	5	-41.8	-0.7	11.0	43.5
		16031	0.000	5	-41.8	-0.6	9.9	44.0
			1.280	5	-48.7	-0.6	10.2	50.7
		16032	0.000	5	-59.7	-0.7	16.5	63.8
			2.560	5	-77.4	-0.7	17.3	80.9
		16033	0.000	5	-77.3	-0.7	17.3	80.8
			2.560	5	-95.8	-0.7	18.1	98.9
		16034	0.000	5	-108.4	-0.8	17.3	110.9
			2.560	5	-130.2	-0.8	18.0	132.4
		16035	0.000	5	-130.1	-0.8	18.0	132.3
			2.560	5	-152.6	-0.7	18.7	154.6
		16036	0.000	5	-150.2	1.4	18.5	152.3
			1.280	5	-161.8	1.2	18.6	163.9
		17037	0.000	5	-217.9	19.6	23.9	221.8
			1.280	5	-232.4	19.9	24.3	236.2
		17038	0.000	5	-228.9	21.6	25.6	233.2
			2.560	5	-248.0	16.9	26.6	252.2
		17039	0.000	5	-246.9	16.6	26.5	251.2
			2.560	5	-270.4	15.2	35.7	277.3
		17040	0.000	5	-269.5	15.0	35.0	276.2
			2.560	5	-298.1	10.0	36.4	304.7
		17041	0.000	5	-297.5	9.9	35.5	303.8
			2.560	5	-330.7	6.7	37.0	336.8
		17042	0.000	5	-330.3	6.7	36.7	336.4
			1.280	5	-349.3	5.9	37.6	355.3
		18043	0.000	5	-348.7	6.0	42.2	350.5
			1.280	5	-370.7	5.9	43.6	372.3
		18044	0.000	5	-312.1	4.7	28.7	316.0
			2.560	5	-346.0	3.8	29.8	349.8
		18045	0.000	5	-345.8	3.9	29.3	349.5
			2.560	5	-382.9	3.7	30.5	386.5
		18046	0.000	5	-313.5	1.2	33.8	318.9
			2.560	5	-344.3	1.1	35.1	349.7
		18047	0.000	5	-305.5	2.5	33.6	311.0
			2.560	5	-340.6	-1.6	55.9	346.3
		18048	0.000	5	-340.7	-1.6	57.7	346.4
			1.280	5	-362.8	-1.6	57.8	368.6
		19049	0.000	5	-361.9	-1.2	71.7	369.8
			1.280	5	-384.5	-0.2	72.8	387.8
		19050	0.000	5	-301.4	-1.4	33.8	303.6
			2.560	5	-329.1	0.5	30.9	333.2
		19051	0.000	5	-328.8	0.7	30.7	332.5
			2.560	5	-363.9	0.6	29.6	367.5
		19052	0.000	5	-312.1	0.5	30.4	315.9
			2.560	5	-340.5	0.2	29.7	344.4
		19053	0.000	5	-340.1	0.6	28.9	343.4
			2.560	5	-367.2	0.1	28.6	370.6
		19054	0.000	5	-366.8	0.6	27.8	369.6
			1.290	5	-378.4	-0.3	27.7	381.5
		20055	0.000	5	-378.5	-0.4	26.8	381.3
			1.280	5	-393.8	-2.0	28.0	396.7

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	5	-342.9	-1.5	14.8	343.6
			2.560	5	-365.0	-2.6	13.8	365.8
		20057	0.000	5	-364.5	-2.0	15.4	365.3
			2.560	5	-388.1	-2.9	14.6	388.9
		20058	0.000	5	-388.2	-2.4	15.2	388.9
			2.560	5	-365.8	-2.6	14.5	366.6
		20059	0.000	5	-365.1	-2.0	14.5	365.8
			2.560	5	-344.3	-2.3	13.9	345.1
		20060	0.000	5	-343.5	-1.6	15.3	344.3
			1.280	5	-330.7	-0.6	13.9	331.6
		21061	0.000	5	-381.1	0.0	27.8	384.1
			1.280	5	-368.3	0.1	27.9	371.4
		21062	0.000	5	-367.7	0.6	28.6	370.7
			2.560	5	-341.4	0.2	28.7	344.9
		21063	0.000	5	-340.8	0.6	30.2	344.4
			2.560	5	-313.1	0.2	29.6	317.3
		21064	0.000	5	-312.7	0.6	31.7	316.9
			2.560	5	-282.6	0.1	30.7	287.4
		21065	0.000	5	-332.8	-1.4	34.1	335.0
			2.560	5	-302.5	-1.6	33.0	304.9
		21066	0.000	5	-302.0	-1.2	34.3	304.5
			1.280	5	-283.0	-1.7	43.3	283.9
		22067	0.000	5	-363.7	-1.6	57.8	369.5
			1.280	5	-341.6	-1.7	57.2	347.4
		22068	0.000	5	-341.3	-1.4	56.6	346.8
			2.560	5	-306.2	2.6	34.4	311.9
		22069	0.000	5	-306.2	2.7	34.6	312.0
			2.560	5	-278.6	2.6	34.2	284.8
		22070	0.000	5	-314.4	1.4	33.9	319.8
			2.560	5	-284.8	1.6	33.4	290.7
		22071	0.000	5	-347.0	4.2	29.4	350.7
			2.560	5	-313.0	4.9	29.0	317.0
		22072	0.000	5	-313.1	5.0	28.8	317.1
			1.280	5	-294.1	5.1	32.1	295.5
		23073	0.000	5	-350.2	6.1	37.5	356.2
			1.280	5	-331.3	6.9	36.9	337.4
		23074	0.000	5	-331.5	7.0	36.5	337.5
			2.560	5	-298.4	10.0	35.8	304.8
		23075	0.000	5	-298.9	10.2	36.0	305.3
			2.560	5	-270.2	15.0	35.2	277.0
		23076	0.000	5	-271.1	15.4	35.4	277.9
			2.560	5	-247.6	16.5	26.6	251.9
		23077	0.000	5	-248.7	17.0	26.4	252.8
			2.560	5	-229.6	21.5	25.6	233.9
		23078	0.000	5	-231.2	22.3	24.2	235.0
			1.280	5	-218.5	19.6	23.9	222.4
		24079	0.000	5	-195.3	-1.1	24.0	197.9
			1.280	5	-181.5	-1.0	23.6	184.2
		24080	0.000	5	-150.0	1.4	18.5	152.1
			2.560	5	-129.9	-0.8	18.0	132.1
		24081	0.000	5	-130.0	-0.7	18.0	132.2
			2.560	5	-108.3	-0.8	17.3	110.7
		24082	0.000	5	-108.3	-0.7	17.3	110.8
			2.560	5	-87.4	-0.8	16.5	90.2
		24083	0.000	5	-77.2	-0.6	17.3	80.8

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	5	-59.6	-0.7	16.5	63.7
		24084	0.000	5	-59.6	-0.6	16.4	63.7
			1.290	5	-51.1	-0.7	16.0	55.6
		25085	0.000	5	-41.6	-0.6	11.0	43.3
			1.280	5	-34.8	-0.6	10.6	36.8
		25086	0.000	5	-34.9	-0.5	9.8	37.4
			2.560	5	-21.9	-0.6	9.2	25.4
		25087	0.000	5	-22.0	-0.5	9.2	25.4
			2.560	5	-9.8	3.4	8.6	15.6
		25088	0.000	5	-9.8	3.4	8.6	15.6
			2.560	5	-0.6	15.0	8.0	20.4
		25089	0.000	5	-0.5	12.8	8.3	19.3
			2.560	5	-0.5	22.7	7.7	26.3
		25090	0.000	5	-0.5	22.7	7.7	26.3
			1.280	5	-0.5	27.3	7.3	30.1
		26091	0.000	5	-0.5	27.3	7.3	30.1
			1.280	5	-0.5	31.8	7.0	34.0
		26092	0.000	5	-0.5	31.8	7.0	34.1
			2.560	5	-0.5	40.1	6.3	41.6
		26093	0.000	5	-0.5	39.7	6.3	41.2
			2.560	5	-0.5	46.8	5.6	47.8
		26094	0.000	5	-0.4	46.9	5.6	47.9
			2.560	5	-0.5	53.1	4.8	53.8
		26095	0.000	5	-0.4	53.2	4.8	53.8
			2.560	5	-0.4	58.5	4.0	58.9
		26096	0.000	5	-0.4	58.6	4.0	59.0
			1.280	5	-0.4	60.9	3.6	61.3
		27097	0.000	5	-0.4	60.9	3.6	61.3
			1.280	5	-0.4	63.1	3.2	63.3
		27098	0.000	5	-0.4	63.1	3.3	63.4
			2.560	5	-0.4	66.7	2.4	66.8
		27099	0.000	5	-0.4	66.7	2.4	66.8
			2.560	5	-0.4	69.3	1.8	69.4
		27100	0.000	5	-0.4	69.4	1.8	69.4
			2.560	5	-0.4	71.0	1.2	71.0
		27101	0.000	5	-0.3	73.2	1.1	73.2
			2.560	5	-0.3	73.8	0.7	73.8
		27102	0.000	5	-0.3	73.9	0.7	73.9
			1.280	5	-0.3	73.5	1.9	73.5
		28103	0.000	5	-0.3	79.3	0.9	79.3
			1.280	5	-0.3	78.8	1.4	78.9
		28104	0.000	5	-0.3	78.9	1.3	78.9
			2.560	5	-0.3	77.1	2.4	77.2
		28105	0.000	5	-0.3	77.2	2.4	77.3
			2.560	5	-0.3	74.2	3.5	74.4
		28106	0.000	5	-0.2	77.2	3.6	77.4
			2.560	5	-0.2	72.8	4.7	73.2
		28107	0.000	5	-0.3	80.8	4.6	81.2
			2.560	5	-0.2	74.4	5.7	75.0
		28108	0.000	5	-0.2	74.4	5.7	75.0
			1.280	5	-0.3	70.6	6.4	71.5
		29109	0.000	5	-0.2	70.7	6.6	71.6
			1.280	5	-0.2	66.1	7.2	67.3
		29110	0.000	5	-0.3	85.3	12.9	88.1
			2.560	5	-0.2	72.7	15.2	77.4

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	29111	0.000	5	-0.2	72.8	15.2	77.4
			2.560	5	-0.1	58.0	17.6	65.5
		29112	0.000	5	-0.2	68.1	16.7	74.0
			2.560	5	-0.1	48.0	19.0	58.3
		29113	0.000	5	-0.1	48.0	19.0	58.3
			2.560	5	0.0	25.0	21.5	44.8
		29114	0.000	5	-0.1	25.0	21.5	44.8
			2.460	5	0.0	0.1	107.6	186.4
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =5)							

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	7	0.8	1.5	51.7	89.6
			2.460	7	-2.5	0.1	4.4	8.0
		11002	0.000	7	-2.4	0.3	4.9	8.9
			2.560	7	-4.7	0.2	3.6	7.8
		11003	0.000	7	-4.9	0.0	3.6	7.8
			2.560	7	-6.5	0.3	2.9	8.1
		11004	0.000	7	-6.7	0.1	2.8	8.1
			2.560	7	-7.9	0.3	2.1	8.6
		11005	0.000	7	-8.0	0.0	2.0	8.5
			2.560	7	-8.8	0.2	1.4	9.0
		11006	0.000	7	-9.0	0.0	1.4	9.1
			1.280	7	-9.3	0.2	1.1	9.3
		12007	0.000	7	-9.1	0.0	1.0	9.1
			1.280	7	-9.2	-0.1	0.6	9.2
		12008	0.000	7	-9.4	-0.3	0.6	9.4
			2.560	7	-9.6	-0.2	0.1	9.6
		12009	0.000	7	-9.8	-0.4	0.1	9.8
			2.560	7	-9.7	-0.3	0.6	9.7
		12010	0.000	7	-10.2	-0.9	0.6	10.2
			2.560	7	-9.8	-0.9	1.2	9.8
		12011	0.000	7	-9.7	-0.8	1.2	9.7
			2.560	7	-9.1	-0.8	1.7	9.1
		12012	0.000	7	-9.3	-1.0	1.8	9.3
			1.280	7	-8.9	-1.0	2.0	8.9
		13013	0.000	7	-8.9	-1.0	2.0	8.9
			1.280	7	-7.8	-0.6	2.3	8.4
		13014	0.000	7	-8.3	-1.1	2.4	8.6
			2.560	7	-7.2	-1.2	2.9	8.1
		13015	0.000	7	-7.4	-1.4	3.0	8.3
			2.560	7	-6.1	-1.5	3.5	7.9
		13016	0.000	7	-6.1	-1.5	3.5	7.9
			2.560	7	-4.6	-1.7	3.9	7.7
		13017	0.000	7	-4.8	-1.9	4.0	7.9
			2.560	7	-5.1	-2.0	4.4	7.9
		13018	0.000	7	-5.2	-2.1	4.5	8.1
			1.280	7	-5.3	-1.1	4.7	8.3
		14019	0.000	7	-5.3	-1.1	4.7	8.3
			1.280	7	-5.5	-0.1	4.9	8.6
		14020	0.000	7	-5.6	-0.2	5.0	8.7
			2.560	7	-5.9	2.0	5.4	9.6
		14021	0.000	7	-6.0	1.9	5.5	9.7
			2.560	7	-6.3	4.3	5.9	11.0
		14022	0.000	7	-6.5	4.2	5.9	11.1
			2.560	7	-6.8	6.8	6.3	12.8
		14023	0.000	7	-6.9	6.7	6.3	12.8
			2.560	7	-7.2	9.4	6.7	14.9
		14024	0.000	7	-7.3	9.6	6.9	15.3
			1.290	7	-7.4	11.0	7.1	16.5
		15025	0.000	7	-7.4	11.0	7.1	16.5
			1.280	7	-7.5	12.5	7.2	17.7
		15026	0.000	7	-7.7	12.5	7.3	17.7
			2.560	7	-8.0	15.6	7.6	20.4
		15027	0.000	7	-8.2	15.5	7.6	20.4
			2.560	7	-8.5	18.8	7.9	23.3
		15028	0.000	7	-9.1	18.7	7.8	23.1

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	7	-9.6	22.1	8.2	26.2
		15029	0.000	7	-9.7	22.0	8.1	26.1
			2.560	7	-10.3	25.6	8.4	29.5
		15030	0.000	7	-10.5	25.5	8.2	29.2
			1.280	7	-10.5	28.0	8.2	31.4
		16031	0.000	7	-10.4	28.1	8.1	31.4
			1.280	7	-10.7	30.0	8.2	33.2
		16032	0.000	7	-10.8	30.8	8.7	34.2
			2.560	7	-11.4	34.8	9.0	38.1
		16033	0.000	7	-11.6	34.8	9.0	38.1
			2.560	7	-12.2	39.0	9.3	42.1
		16034	0.000	7	-12.3	39.7	9.5	42.9
			2.560	7	-12.9	44.1	9.8	47.3
		16035	0.000	7	-13.1	44.0	9.9	47.2
			2.560	7	-13.7	48.6	10.1	51.7
		16036	0.000	7	-12.8	50.4	9.8	53.2
			1.280	7	-13.2	53.5	10.1	56.3
		17037	0.000	7	-98.2	134.7	14.0	136.9
			1.280	7	-100.1	138.7	14.2	140.8
		17038	0.000	7	-95.6	140.8	37.2	154.8
			2.560	7	-76.6	149.6	37.5	163.1
		17039	0.000	7	-74.3	149.8	39.0	164.4
			2.560	7	-69.3	183.4	51.5	203.9
		17040	0.000	7	-67.4	183.6	45.1	199.6
			2.560	7	-46.6	195.3	45.5	210.6
		17041	0.000	7	-45.4	195.5	38.3	206.5
			2.560	7	-32.0	207.2	38.7	217.8
		17042	0.000	7	-31.1	207.4	33.9	215.6
			1.280	7	-27.6	213.6	34.1	221.6
		18043	0.000	7	-27.5	213.4	33.9	221.3
			1.280	7	-28.1	210.0	34.4	218.3
		18044	0.000	7	-24.3	203.6	29.5	209.9
			2.560	7	-18.9	218.2	29.5	224.1
		18045	0.000	7	-18.4	218.4	27.1	223.4
			2.560	7	-18.1	232.8	27.7	237.7
		18046	0.000	7	-0.6	234.3	27.0	234.4
			2.560	7	-0.2	247.5	27.3	247.5
		18047	0.000	7	-12.8	235.1	24.8	239.0
			2.560	7	-19.3	243.8	42.3	254.6
		18048	0.000	7	-20.3	243.3	42.8	254.3
			1.280	7	-21.2	253.8	43.3	264.7
		19049	0.000	7	-21.2	253.6	40.2	263.0
			1.280	7	-26.7	251.4	40.8	261.2
		19050	0.000	7	-23.9	242.9	38.3	251.8
			2.560	7	-16.3	267.2	41.8	276.8
		19051	0.000	7	-16.2	267.3	39.4	275.9
			2.560	7	-19.6	287.0	39.7	295.1
		19052	0.000	7	-17.7	282.2	36.7	289.3
			2.560	7	-19.1	299.7	36.6	306.3
		19053	0.000	7	-18.8	300.0	34.3	305.9
			2.560	7	-20.0	316.4	34.0	321.8
		19054	0.000	7	-19.7	316.8	32.7	321.8
			1.290	7	-15.1	329.9	31.4	334.4
		20055	0.000	7	-15.2	329.9	30.2	334.0
			1.280	7	-18.9	336.1	33.2	341.0

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	7	-17.0	331.6	31.6	336.0
			2.560	7	-16.7	346.9	31.1	351.1
		20057	0.000	7	-16.6	347.2	33.4	352.0
			2.560	7	-16.8	364.2	33.1	368.7
		20058	0.000	7	-16.4	364.8	33.2	369.3
			2.560	7	-17.2	346.9	33.3	351.6
		20059	0.000	7	-16.3	347.5	31.3	351.7
			2.560	7	-17.7	331.1	31.5	335.6
		20060	0.000	7	-16.7	331.9	33.0	336.8
			1.280	7	-13.7	325.3	29.8	329.4
		21061	0.000	7	-21.1	323.8	32.5	328.7
			1.280	7	-20.4	316.5	32.6	321.5
		21062	0.000	7	-19.9	316.9	34.1	322.3
			2.560	7	-19.6	299.8	34.3	305.7
		21063	0.000	7	-19.1	300.2	36.7	306.9
			2.560	7	-18.4	282.2	36.7	289.2
		21064	0.000	7	-17.9	282.5	39.2	290.6
			2.560	7	-15.2	262.7	38.9	271.2
		21065	0.000	7	-21.6	264.6	37.7	272.5
			2.560	7	-24.4	243.1	38.1	251.9
		21066	0.000	7	-23.3	243.8	40.0	253.4
			1.280	7	-17.9	246.1	39.2	255.3
		22067	0.000	7	-21.6	254.2	43.3	265.0
			1.280	7	-20.7	243.6	42.7	254.5
		22068	0.000	7	-19.7	244.2	42.5	255.1
			2.560	7	-13.3	235.4	25.0	239.3
		22069	0.000	7	-13.7	235.3	26.7	239.8
			2.560	7	-14.1	222.7	26.5	227.3
		22070	0.000	7	-2.0	233.4	28.6	233.6
			2.560	7	-3.6	217.8	28.0	219.4
		22071	0.000	7	-20.3	218.5	29.4	224.3
			2.560	7	-25.7	203.7	29.5	210.0
		22072	0.000	7	-26.3	203.6	33.2	211.5
			1.280	7	-25.4	207.1	32.9	214.8
		23073	0.000	7	-28.8	213.8	33.9	221.7
			1.280	7	-32.3	207.6	33.7	215.6
		23074	0.000	7	-33.1	207.4	38.4	217.8
			2.560	7	-46.2	195.7	38.1	206.5
		23075	0.000	7	-47.4	195.5	45.3	210.7
			2.560	7	-67.9	183.8	44.9	199.6
		23076	0.000	7	-69.8	183.6	51.4	204.0
			2.560	7	-74.6	150.0	38.9	164.4
		23077	0.000	7	-76.9	149.8	37.4	163.2
			2.560	7	-95.8	141.0	37.2	155.0
		23078	0.000	7	-99.3	140.8	13.9	142.8
			1.280	7	-98.4	134.9	14.1	137.1
		24079	0.000	7	-14.2	53.4	10.8	56.6
			1.280	7	-14.0	50.3	10.5	53.4
		24080	0.000	7	-13.2	50.5	9.8	53.2
			2.560	7	-13.3	44.2	9.9	47.4
		24081	0.000	7	-13.1	44.3	9.8	47.4
			2.560	7	-12.6	39.8	9.5	43.1
		24082	0.000	7	-12.3	39.9	9.5	43.2
			2.560	7	-11.8	35.6	9.2	39.0
		24083	0.000	7	-11.6	35.0	9.0	38.3

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	7	-11.1	30.9	8.6	34.3
		24084	0.000	7	-10.8	31.0	8.4	34.2
			1.290	7	-10.6	29.0	8.3	32.4
		25085	0.000	7	-10.7	28.1	8.2	31.5
			1.280	7	-10.7	25.6	8.2	29.2
		25086	0.000	7	-10.5	25.8	8.4	29.6
			2.560	7	-9.9	22.2	8.1	26.2
		25087	0.000	7	-9.7	22.3	8.1	26.3
			2.560	7	-9.2	18.8	7.8	23.1
		25088	0.000	7	-9.0	18.9	7.8	23.3
			2.560	7	-8.5	15.6	7.5	20.3
		25089	0.000	7	-8.1	15.8	7.6	20.5
			2.560	7	-7.7	12.6	7.2	17.8
		25090	0.000	7	-7.6	12.7	7.3	17.8
			1.280	7	-7.4	11.2	7.1	16.5
		26091	0.000	7	-7.4	11.2	7.1	16.5
			1.280	7	-7.3	9.7	6.9	15.3
		26092	0.000	7	-7.1	9.8	6.9	15.4
			2.560	7	-6.9	7.0	6.5	13.2
		26093	0.000	7	-6.8	6.9	6.3	12.9
			2.560	7	-6.5	4.3	5.9	11.1
		26094	0.000	7	-6.3	4.4	5.9	11.1
			2.560	7	-6.1	2.0	5.5	9.7
		26095	0.000	7	-5.9	2.1	5.4	9.6
			2.560	7	-5.6	-0.1	5.0	8.7
		26096	0.000	7	-5.5	0.0	5.0	8.6
			1.280	7	-5.3	-1.0	4.7	8.3
		27097	0.000	7	-5.3	-1.0	4.7	8.3
			1.280	7	-5.2	-2.0	4.5	8.1
		27098	0.000	7	-5.1	-1.9	4.5	7.9
			2.560	7	-4.8	-1.9	4.0	7.8
		27099	0.000	7	-4.6	-1.7	3.9	7.7
			2.560	7	-6.0	-1.5	3.5	7.9
		27100	0.000	7	-5.8	-1.4	3.4	7.7
			2.560	7	-7.1	-1.2	2.9	8.1
		27101	0.000	7	-7.1	-1.2	2.9	8.1
			2.560	7	-8.2	-1.1	2.4	8.5
		27102	0.000	7	-8.0	-0.9	2.3	8.3
			1.280	7	-9.0	-1.4	2.0	9.0
		28103	0.000	7	-8.8	-1.0	2.0	8.8
			1.280	7	-9.2	-0.9	1.8	9.2
		28104	0.000	7	-9.0	-0.8	1.7	9.0
			2.560	7	-9.5	-0.7	1.2	9.5
		28105	0.000	7	-9.3	-0.5	1.2	9.3
			2.560	7	-9.7	-0.5	0.6	9.7
		28106	0.000	7	-9.8	-0.7	0.6	9.8
			2.560	7	-9.9	-0.7	0.1	9.9
		28107	0.000	7	-9.4	-0.1	0.1	9.4
			2.560	7	-9.3	-0.2	0.6	9.3
		28108	0.000	7	-9.1	0.0	0.6	9.1
			1.280	7	-8.9	0.1	0.9	8.9
		29109	0.000	7	-8.9	0.1	1.0	8.9
			1.280	7	-8.6	0.0	1.3	8.7
		29110	0.000	7	-8.6	0.4	1.3	8.9
			2.560	7	-7.8	0.2	2.0	8.4

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	29111	0.000	7	-7.6	0.4	2.1	8.3
			2.560	7	-6.4	0.2	2.8	7.9
		29112	0.000	7	-6.3	0.4	2.8	8.0
			2.560	7	-4.7	0.2	3.6	7.7
		29113	0.000	7	-4.5	0.4	3.6	7.7
			2.560	7	-2.5	0.1	4.4	8.0
		29114	0.000	7	-2.4	0.3	4.4	7.9
			2.460	7	0.1	0.1	36.7	63.6
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =7)							

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	11001	0.000	10	-0.8	0.1	44.7	77.4
			2.460	10	-1.9	-0.1	3.1	5.6
		11002	0.000	10	-1.9	-0.1	2.6	4.9
			2.560	10	-3.3	-0.2	2.3	5.1
		11003	0.000	10	-3.3	-0.1	2.3	5.0
			2.560	10	-4.3	-0.2	1.6	4.8
		11004	0.000	10	-4.2	-0.1	1.6	4.8
			2.560	10	-4.7	-0.2	0.9	4.7
		11005	0.000	10	-4.4	-0.2	0.9	4.5
			2.560	10	-4.5	-0.2	0.4	4.5
		11006	0.000	10	-4.4	-0.1	0.4	4.4
			1.280	10	-4.3	-0.1	0.4	4.3
		12007	0.000	10	-4.1	-0.2	0.4	4.1
			1.280	10	-3.8	-0.2	0.4	3.9
		12008	0.000	10	-3.7	-0.1	0.4	3.8
			2.560	10	-3.0	-0.1	0.8	3.2
		12009	0.000	10	-2.9	0.0	0.8	3.2
			2.560	10	-1.9	0.0	1.3	2.9
		12010	0.000	10	-1.8	0.1	1.2	2.8
			2.560	10	-0.5	0.1	1.7	3.0
		12011	0.000	10	-0.5	0.2	1.7	2.9
			2.560	10	0.3	1.5	2.1	3.8
		12012	0.000	10	0.4	1.6	2.1	3.8
			1.280	10	0.4	2.5	2.3	4.5
		13013	0.000	10	0.4	2.6	2.4	4.6
			1.280	10	0.5	3.6	2.6	5.4
		13014	0.000	10	0.5	3.6	2.5	5.2
			2.560	10	0.6	5.8	2.9	7.1
		13015	0.000	10	0.7	5.9	2.9	7.0
			2.560	10	0.8	8.4	3.3	9.3
		13016	0.000	10	1.1	8.6	3.3	9.3
			2.560	10	1.2	11.4	3.6	11.8
		13017	0.000	10	1.3	11.4	3.6	11.8
			2.560	10	1.5	14.5	4.0	14.6
		13018	0.000	10	1.6	14.6	4.0	14.6
			1.280	10	1.7	16.2	4.2	16.2
		14019	0.000	10	1.7	16.2	4.2	16.2
			1.280	10	1.9	17.9	4.4	17.9
		14020	0.000	10	2.0	18.0	4.4	18.0
			2.560	10	2.2	21.5	4.7	21.5
		14021	0.000	10	2.3	21.6	4.7	21.6
			2.560	10	2.6	25.4	5.1	25.4
		14022	0.000	10	2.7	25.5	5.1	25.5
			2.560	10	3.1	29.5	5.4	29.5
		14023	0.000	10	3.2	29.6	5.4	29.6
			2.560	10	3.6	33.9	5.7	33.9
		14024	0.000	10	3.0	33.6	5.7	33.6
			1.290	10	3.1	35.8	5.9	35.8
		15025	0.000	10	3.1	35.8	5.9	35.8
			1.280	10	3.3	38.0	6.0	38.0
		15026	0.000	10	3.4	38.1	6.0	38.1
			2.560	10	3.8	42.8	6.3	42.8
		15027	0.000	10	3.9	42.9	6.3	42.9
			2.560	10	4.3	47.7	6.6	47.7
		15028	0.000	10	5.3	49.4	6.8	49.4

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	15028	2.560	10	5.9	54.6	7.1	54.6
		15029	0.000	10	6.0	54.7	7.2	54.7
			2.560	10	6.7	60.2	7.5	60.2
		15030	0.000	10	6.8	60.3	7.3	60.3
			1.280	10	5.5	62.3	7.3	62.3
		16031	0.000	10	5.5	62.4	7.4	62.4
			1.280	10	5.8	65.1	7.5	65.1
		16032	0.000	10	5.7	68.0	8.0	68.0
			2.560	10	6.3	74.1	8.3	74.1
		16033	0.000	10	6.4	74.2	8.3	74.2
			2.560	10	7.0	80.3	8.5	80.3
		16034	0.000	10	6.9	82.7	8.7	82.7
			2.560	10	7.5	89.2	8.9	89.2
		16035	0.000	10	7.6	89.3	8.8	89.3
			2.560	10	8.1	95.8	9.0	95.8
		16036	0.000	10	11.4	99.2	9.3	99.2
			1.280	10	12.1	104.3	9.6	104.3
		17037	0.000	10	8.3	105.2	9.4	105.2
			1.280	10	8.5	108.7	9.5	108.7
		17038	0.000	10	12.1	112.2	10.1	112.2
			2.560	10	12.7	119.7	10.3	119.7
		17039	0.000	10	12.6	119.6	10.1	119.6
			2.560	10	13.0	126.6	12.8	126.6
		17040	0.000	10	12.8	126.5	12.5	126.5
			2.560	10	13.2	135.7	12.8	135.7
		17041	0.000	10	13.0	135.5	12.4	135.5
			2.560	10	13.2	144.6	12.7	144.6
		17042	0.000	10	13.0	144.4	12.8	144.4
			1.280	10	13.0	149.1	13.0	149.1
		18043	0.000	10	13.1	149.2	12.5	149.2
			1.280	10	16.5	153.9	12.4	153.9
		18044	0.000	10	16.5	147.4	11.8	147.4
			2.560	10	13.8	156.3	12.2	156.3
		18045	0.000	10	13.5	156.1	12.0	156.1
			2.560	10	13.6	168.4	12.3	168.4
		18046	0.000	10	7.5	155.2	10.9	155.2
			2.560	10	6.8	164.7	11.1	164.7
		18047	0.000	10	13.3	167.4	10.3	167.4
			2.560	10	10.7	176.2	22.9	176.2
		18048	0.000	10	11.4	176.8	23.2	176.8
			1.280	10	11.4	186.9	23.5	186.9
		19049	0.000	10	11.9	187.0	22.3	187.0
			1.280	10	15.9	194.6	22.2	194.6
		19050	0.000	10	16.4	186.5	20.1	186.5
			2.560	10	12.3	202.7	23.9	202.7
		19051	0.000	10	12.6	202.9	23.2	202.9
			2.560	10	15.0	226.4	22.3	226.4
		19052	0.000	10	15.5	221.7	21.3	221.7
			2.560	10	16.2	240.8	20.9	240.8
		19053	0.000	10	16.6	241.2	20.6	241.2
			2.560	10	17.5	259.7	20.1	259.7
		19054	0.000	10	17.9	260.1	20.2	260.1
			1.290	10	13.3	268.3	20.3	268.3
		20055	0.000	10	13.3	268.2	19.6	268.2
			1.280	10	14.3	278.4	21.0	278.4

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	20056	0.000	10	14.8	273.2	20.6	273.2
			2.560	10	15.6	291.2	19.9	291.2
		20057	0.000	10	16.4	291.9	21.9	291.9
			2.560	10	17.6	311.7	21.3	311.7
		20058	0.000	10	18.0	312.3	21.4	312.3
			2.560	10	15.6	291.3	21.8	291.3
		20059	0.000	10	16.0	291.8	20.0	291.8
			2.560	10	14.0	272.5	20.5	272.5
		20060	0.000	10	14.4	273.1	20.7	273.1
			1.280	10	12.8	262.6	19.2	262.6
		21061	0.000	10	18.6	269.0	19.9	269.0
			1.280	10	17.3	259.6	20.1	259.6
		21062	0.000	10	17.8	260.2	20.2	260.2
			2.560	10	16.0	240.8	20.6	240.8
		21063	0.000	10	16.5	241.3	21.1	241.3
			2.560	10	14.9	221.2	21.4	221.2
		21064	0.000	10	15.3	221.6	21.9	221.7
			2.560	10	12.2	198.0	22.8	198.0
		21065	0.000	10	12.7	203.4	20.8	203.4
			2.560	10	15.6	186.1	20.2	186.1
		21066	0.000	10	15.4	186.1	20.7	186.1
			1.280	10	11.9	179.0	21.4	179.0
		22067	0.000	10	10.8	186.8	23.6	186.8
			1.280	10	10.8	176.5	23.2	176.5
		22068	0.000	10	10.3	176.3	22.9	176.3
			2.560	10	12.9	167.2	10.3	167.2
		22069	0.000	10	13.3	167.5	11.0	167.5
			2.560	10	13.7	158.0	10.9	158.0
		22070	0.000	10	7.5	155.4	11.1	155.4
			2.560	10	7.8	144.0	10.8	144.0
		22071	0.000	10	13.7	156.5	12.0	156.5
			2.560	10	16.4	147.6	11.7	147.6
		22072	0.000	10	16.7	147.8	12.0	147.8
			1.280	10	13.5	143.5	11.9	143.5
		23073	0.000	10	12.9	149.4	12.9	149.4
			1.280	10	12.9	144.7	12.7	144.7
		23074	0.000	10	13.2	144.9	12.7	144.9
			2.560	10	13.0	135.8	12.4	135.8
		23075	0.000	10	13.2	136.0	12.8	136.0
			2.560	10	12.8	126.8	12.5	126.8
		23076	0.000	10	13.0	127.0	12.7	127.0
			2.560	10	12.6	119.9	10.1	119.9
		23077	0.000	10	12.8	120.0	10.3	120.0
			2.560	10	12.1	112.5	10.1	112.5
		23078	0.000	10	12.3	112.7	10.1	112.7
			1.280	10	8.4	105.6	9.4	105.6
		24079	0.000	10	8.4	105.5	9.4	105.5
			1.280	10	7.9	100.5	9.1	100.5
		24080	0.000	10	11.7	99.6	9.6	99.6
			2.560	10	7.7	89.6	8.8	89.6
		24081	0.000	10	7.6	89.6	8.9	89.6
			2.560	10	7.0	83.1	8.7	83.1
		24082	0.000	10	6.9	83.0	8.8	83.0
			2.560	10	6.3	76.6	8.5	76.6
		24083	0.000	10	6.4	74.4	8.4	74.4

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	24083	2.560	10	5.8	68.3	8.1	68.3
		24084	0.000	10	5.7	68.2	7.8	68.2
			1.290	10	5.3	65.3	7.7	65.3
		25085	0.000	10	5.6	62.6	7.3	62.6
			1.280	10	6.8	60.5	7.3	60.5
		25086	0.000	10	6.7	60.5	7.5	60.5
			2.560	10	6.0	54.9	7.3	54.9
		25087	0.000	10	5.9	54.8	7.2	54.8
			2.560	10	5.3	49.5	6.9	49.5
		25088	0.000	10	5.2	49.5	6.8	49.5
			2.560	10	4.7	44.4	6.5	44.4
		25089	0.000	10	3.8	42.9	6.3	42.9
			2.560	10	3.4	38.3	6.0	38.3
		25090	0.000	10	3.3	38.2	6.0	38.2
			1.280	10	3.2	36.0	5.8	36.0
		26091	0.000	10	3.2	36.0	5.8	36.0
			1.280	10	3.0	33.8	5.7	33.8
		26092	0.000	10	2.9	33.7	5.7	33.7
			2.560	10	2.6	29.5	5.4	29.5
		26093	0.000	10	3.2	29.8	5.4	29.8
			2.560	10	2.8	25.7	5.1	25.7
		26094	0.000	10	2.7	25.6	5.1	25.6
			2.560	10	2.4	21.8	4.7	21.8
		26095	0.000	10	2.3	21.7	4.7	21.7
			2.560	10	2.0	18.1	4.4	18.1
		26096	0.000	10	1.9	18.1	4.4	18.1
			1.280	10	1.8	16.3	4.2	16.4
		27097	0.000	10	1.8	16.3	4.2	16.4
			1.280	10	1.6	14.7	4.0	14.7
		27098	0.000	10	1.6	14.6	4.0	14.7
			2.560	10	1.3	11.6	3.7	11.9
		27099	0.000	10	1.2	11.5	3.7	11.9
			2.560	10	1.1	8.7	3.3	9.4
		27100	0.000	10	1.0	8.6	3.3	9.4
			2.560	10	0.8	6.0	2.9	7.1
		27101	0.000	10	0.6	5.9	2.9	7.2
			2.560	10	0.5	3.6	2.5	5.2
		27102	0.000	10	0.4	3.6	2.5	5.3
			1.280	10	0.3	2.6	2.3	4.5
		28103	0.000	10	0.4	2.6	2.3	4.6
			1.280	10	0.4	1.7	2.1	3.8
		28104	0.000	10	0.2	1.6	2.1	3.9
			2.560	10	-0.4	0.2	1.7	2.9
		28105	0.000	10	-0.4	0.1	1.7	3.0
			2.560	10	-1.8	0.1	1.2	2.8
		28106	0.000	10	-1.8	0.0	1.3	2.8
			2.560	10	-2.8	0.0	0.8	3.1
		28107	0.000	10	-2.9	-0.1	0.8	3.2
			2.560	10	-3.7	-0.1	0.4	3.7
		28108	0.000	10	-3.8	-0.2	0.4	3.8
			1.280	10	-4.0	-0.2	0.4	4.1
		29109	0.000	10	-4.0	-0.2	0.4	4.1
			1.280	10	-4.2	-0.2	0.4	4.2
		29110	0.000	10	-4.4	-0.3	0.4	4.5
			2.560	10	-4.4	-0.2	0.9	4.5

LF: 3102, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3102	Bruchzustand_minMY	29111	0.000	10	-4.5	-0.3	0.9	4.6
			2.560	10	-4.0	-0.2	1.5	4.6
		29112	0.000	10	-4.3	-0.3	1.6	4.8
			2.560	10	-3.3	-0.1	2.3	5.0
		29113	0.000	10	-3.4	-0.3	2.3	5.0
			2.560	10	-1.9	-0.1	3.0	5.5
		29114	0.000	10	-2.0	-0.2	3.0	5.5
			2.460	10	0.0	0.0	28.2	48.8
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =10)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	1	-2.1	0.9	70.5	122.2
			2.460	1	-48.8	0.3	67.6	121.7
		11002	0.000	1	-50.5	0.5	67.2	121.0
			2.560	1	-94.8	0.4	64.3	131.5
		11003	0.000	1	-96.5	0.6	63.4	131.0
			2.560	1	-136.4	0.6	60.7	158.8
		11004	0.000	1	-138.1	0.8	59.5	160.5
			2.560	1	-173.8	0.7	56.8	189.9
		11005	0.000	1	-172.5	0.9	55.0	188.4
			2.560	1	-203.8	0.9	52.5	215.6
		11006	0.000	1	-205.4	1.0	51.8	218.0
			1.280	1	-219.8	1.0	51.2	230.9
		12007	0.000	1	-216.2	0.9	49.7	226.2
			1.280	1	-221.9	0.9	49.1	231.1
		12008	0.000	1	-223.3	1.1	47.0	232.6
			2.560	1	-246.4	1.1	44.8	253.6
		12009	0.000	1	-247.9	1.4	42.6	254.9
			2.560	1	-267.9	1.4	40.5	273.3
		12010	0.000	1	-262.4	1.6	38.2	267.8
			2.560	1	-279.0	1.7	36.2	283.1
		12011	0.000	1	-284.3	1.6	33.5	288.3
			2.560	1	-298.2	1.6	31.6	301.3
		12012	0.000	1	-299.6	1.7	29.5	302.7
			1.280	1	-305.1	1.7	28.7	307.7
		13013	0.000	1	-306.2	1.7	48.6	317.6
			1.280	1	-310.2	1.4	47.3	320.8
		13014	0.000	1	-305.3	1.5	25.0	307.4
			2.560	1	-313.8	1.6	23.3	315.4
		13015	0.000	1	-315.2	1.6	20.7	316.7
			2.560	1	-321.3	1.6	19.1	322.3
		13016	0.000	1	-326.4	1.5	16.9	327.3
			2.560	1	-330.4	1.6	16.8	331.0
		13017	0.000	1	-331.7	1.8	14.4	332.2
			2.560	1	-333.6	1.9	16.2	333.8
		13018	0.000	1	-334.9	2.1	13.8	335.1
			1.280	1	-334.5	2.1	14.7	334.6
		14019	0.000	1	-335.8	2.1	15.3	336.0
			1.280	1	-334.7	2.1	16.2	334.8
		14020	0.000	1	-336.1	2.2	13.2	336.1
			2.560	1	-334.0	2.2	14.8	334.0
		14021	0.000	1	-335.3	2.3	12.5	335.3
			2.560	1	-331.4	2.3	15.3	331.4
		14022	0.000	1	-332.7	2.3	13.0	332.8
			2.560	1	-326.9	2.3	15.2	327.0
		14023	0.000	1	-328.2	2.5	13.2	328.4
			2.560	1	-320.7	2.6	15.2	321.0
		14024	0.000	1	-318.7	2.8	15.1	319.1
			1.290	1	-313.9	2.9	15.6	314.4
		15025	0.000	1	-315.1	2.9	16.2	315.6
			1.280	1	-309.7	2.9	16.9	310.3
		15026	0.000	1	-310.9	3.0	18.2	311.6
			2.560	1	-300.1	3.0	19.3	301.0
		15027	0.000	1	-301.3	3.1	21.4	302.3
			2.560	1	-288.8	3.2	22.2	290.1
		15028	0.000	1	-296.3	3.2	22.7	297.7

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	1	-281.8	3.3	23.6	283.6
		15029	0.000	1	-283.1	3.4	25.5	285.0
			2.560	1	-267.2	3.5	26.4	269.7
		15030	0.000	1	-268.4	3.6	28.2	271.3
			1.280	1	-259.9	3.9	46.0	271.9
		16031	0.000	1	-261.2	4.0	29.1	264.4
			1.280	1	-251.2	9.6	29.5	254.7
		16032	0.000	1	-258.7	10.1	31.0	262.2
			2.560	1	-239.5	22.5	31.7	243.6
		16033	0.000	1	-240.7	22.4	33.8	245.0
			2.560	1	-219.9	35.4	34.4	225.1
		16034	0.000	1	-224.7	36.1	36.7	230.1
			2.560	1	-202.1	49.9	37.2	208.6
		16035	0.000	1	-203.3	49.8	39.1	210.0
			2.560	1	-179.3	64.2	39.6	187.3
		16036	0.000	1	-180.4	66.0	41.9	188.9
			1.280	1	-170.9	74.6	41.2	179.5
		17037	0.000	1	-245.2	69.0	40.4	248.1
			1.280	1	-232.3	77.1	40.6	235.6
		17038	0.000	1	-233.7	77.4	55.7	235.7
			2.560	1	-207.8	76.2	56.9	212.3
		17039	0.000	1	-209.2	74.6	58.9	211.7
			2.560	1	-163.2	66.3	59.9	167.2
		17040	0.000	1	-164.7	65.1	57.7	165.0
			2.560	1	-141.2	68.2	58.6	144.8
		17041	0.000	1	-142.8	67.6	56.9	144.0
			2.560	1	-118.5	77.2	57.6	130.0
		17042	0.000	1	-120.1	76.9	56.0	129.9
			1.280	1	-107.3	84.4	56.3	121.0
		18043	0.000	1	-108.1	84.3	62.7	116.5
			1.280	1	-91.7	92.3	65.2	119.3
		18044	0.000	1	-90.4	88.0	55.7	111.0
			2.560	1	-65.7	107.3	56.2	116.7
		18045	0.000	1	-66.5	107.3	56.3	116.3
			2.560	1	-43.8	130.5	56.5	138.0
		18046	0.000	1	-47.5	122.3	56.0	129.9
			2.560	1	-22.9	143.7	56.7	150.3
		18047	0.000	1	-22.4	144.7	51.4	151.1
			2.560	1	-7.1	164.9	57.1	188.5
		18048	0.000	1	-7.6	165.1	54.3	190.0
			1.280	1	-7.5	181.1	58.6	203.9
		19049	0.000	1	-7.3	181.3	71.3	219.3
			1.280	1	-6.6	191.9	73.2	230.0
		19050	0.000	1	-7.3	184.2	51.9	205.0
			2.560	1	-7.5	215.0	55.8	227.7
		19051	0.000	1	-7.8	215.3	51.1	228.0
			2.560	1	-8.0	247.7	54.8	258.0
		19052	0.000	1	-8.1	243.2	49.8	253.4
			2.560	1	-8.5	272.0	52.0	280.1
		19053	0.000	1	-8.6	272.5	48.3	280.7
			2.560	1	-9.2	300.0	49.7	306.3
		19054	0.000	1	-9.3	300.6	47.0	307.4
			1.290	1	-9.9	315.5	48.1	320.9
		20055	0.000	1	-10.0	315.4	48.7	320.5
			1.280	1	-10.1	328.3	48.0	334.5

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	1	-9.6	323.6	44.5	330.3
			2.560	1	-10.7	348.3	46.0	353.3
		20057	0.000	1	-10.4	349.1	45.0	355.7
			2.560	1	-11.4	375.6	45.8	380.6
		20058	0.000	1	-10.7	376.8	44.5	382.8
			2.560	1	-11.3	348.9	46.8	354.5
		20059	0.000	1	-10.0	349.6	43.8	355.6
			2.560	1	-10.5	323.3	47.3	328.9
		20060	0.000	1	-9.2	324.0	45.3	331.2
			1.280	1	-9.8	310.7	46.7	315.6
		21061	0.000	1	-10.0	313.8	48.1	319.2
			1.280	1	-9.9	300.6	48.4	306.3
		21062	0.000	1	-8.9	301.1	47.6	308.4
			2.560	1	-9.2	272.6	50.3	279.7
		21063	0.000	1	-8.2	273.1	49.5	282.1
			2.560	1	-8.5	243.4	52.6	252.5
		21064	0.000	1	-7.7	243.8	51.0	255.0
			2.560	1	-7.9	211.2	54.1	222.8
		21065	0.000	1	-7.4	214.7	51.8	232.6
			2.560	1	-7.5	184.4	56.0	204.0
		21066	0.000	1	-6.9	184.8	52.5	206.0
			1.280	1	-7.2	174.7	69.3	211.9
		22067	0.000	1	-7.5	181.6	58.6	204.3
			1.280	1	-7.6	165.4	58.1	189.7
		22068	0.000	1	-7.1	165.6	53.6	189.8
			2.560	1	-21.2	145.2	56.6	151.2
		22069	0.000	1	-22.3	145.3	57.3	152.2
			2.560	1	-44.4	123.6	55.8	131.0
		22070	0.000	1	-49.0	123.3	56.1	131.2
			2.560	1	-69.7	101.7	55.0	110.6
		22071	0.000	1	-68.0	108.6	56.6	118.1
			2.560	1	-90.6	89.1	55.2	109.5
		22072	0.000	1	-88.0	89.3	56.6	101.6
			1.280	1	-104.6	81.6	61.7	114.1
		23073	0.000	1	-109.5	85.4	56.1	121.5
			1.280	1	-120.1	77.8	55.5	128.3
		23074	0.000	1	-120.7	78.2	57.4	130.7
			2.560	1	-142.8	68.2	56.0	142.8
		23075	0.000	1	-143.4	69.0	58.6	145.8
			2.560	1	-164.5	65.5	57.3	164.9
		23076	0.000	1	-165.2	66.9	59.9	169.2
			2.560	1	-209.2	75.0	58.6	211.7
		23077	0.000	1	-210.0	76.6	56.8	214.4
			2.560	1	-233.6	77.7	55.6	235.6
		23078	0.000	1	-234.4	80.3	40.5	235.5
			1.280	1	-245.0	69.5	40.2	247.8
		24079	0.000	1	-176.5	74.7	41.6	185.2
			1.280	1	-184.1	65.7	42.2	192.5
		24080	0.000	1	-180.4	65.5	39.6	188.3
			2.560	1	-202.0	49.4	38.8	208.7
		24081	0.000	1	-203.2	49.6	37.2	209.5
			2.560	1	-223.3	35.7	36.4	228.8
		24082	0.000	1	-224.5	35.9	34.6	229.6
			2.560	1	-243.1	22.6	33.8	247.6
		24083	0.000	1	-240.4	22.3	31.7	244.5

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	1	-257.1	9.8	30.7	260.7
		24084	0.000	1	-258.4	10.0	29.3	261.9
			1.290	1	-266.2	4.2	29.3	269.5
		25085	0.000	1	-260.7	4.0	46.5	272.9
			1.280	1	-266.9	3.7	46.0	278.5
		25086	0.000	1	-268.1	3.6	26.4	270.6
			2.560	1	-281.5	3.6	25.2	283.6
		25087	0.000	1	-282.7	3.4	23.7	284.5
			2.560	1	-294.7	3.4	22.4	296.1
		25088	0.000	1	-295.9	3.2	20.8	297.1
			2.560	1	-306.3	3.2	19.3	307.3
		25089	0.000	1	-301.0	3.1	19.5	301.9
			2.560	1	-309.5	3.1	18.1	310.2
		25090	0.000	1	-310.8	2.9	17.1	311.3
			1.280	1	-313.8	2.9	16.3	314.2
		26091	0.000	1	-315.1	2.9	15.6	315.6
			1.280	1	-317.5	2.9	15.0	317.9
		26092	0.000	1	-318.8	2.7	8200994701705216.0	14204540253372416.0
			2.560	1	-323.6	2.7	13.1	323.8
		26093	0.000	1	-328.3	2.4	15.1	328.4
			2.560	1	-331.5	2.3	12.7	331.5
		26094	0.000	1	-332.8	2.3	15.1	332.8
			2.560	1	-334.0	2.3	12.1	334.0
		26095	0.000	1	-335.4	2.2	14.6	335.4
			2.560	1	-334.7	2.2	12.8	334.7
		26096	0.000	1	-336.1	2.1	16.0	336.2
			1.280	1	-334.5	2.1	15.0	334.6
		27097	0.000	1	-335.8	2.1	14.3	335.9
			1.280	1	-333.6	2.1	13.4	333.7
		27098	0.000	1	-334.9	1.8	16.0	335.1
			2.560	1	-330.2	1.9	14.1	330.6
		27099	0.000	1	-331.6	1.5	16.6	332.2
			2.560	1	-324.8	1.5	17.2	325.7
		27100	0.000	1	-326.3	1.4	18.8	327.3
			2.560	1	-317.4	1.5	20.9	318.8
		27101	0.000	1	-315.1	1.5	22.8	316.7
			2.560	1	-303.8	1.5	25.0	305.9
		27102	0.000	1	-305.3	1.4	27.3	307.7
			1.280	1	-298.8	1.7	47.6	310.0
		28103	0.000	1	-306.5	1.7	28.6	309.1
			1.280	1	-298.4	1.7	29.6	301.4
		28104	0.000	1	-299.6	1.5	31.4	302.8
			2.560	1	-282.7	1.6	33.7	286.7
		28105	0.000	1	-284.3	1.4	35.7	288.4
			2.560	1	-264.5	1.4	38.1	269.8
		28106	0.000	1	-262.4	1.4	40.3	267.9
			2.560	1	-239.9	1.4	42.7	247.0
		28107	0.000	1	-247.9	0.9	44.7	255.1
			2.560	1	-221.6	1.0	47.2	230.9
		28108	0.000	1	-223.3	0.8	48.8	232.7
			1.280	1	-215.1	0.8	49.7	224.9
		29109	0.000	1	-215.9	0.8	50.4	226.5
			1.280	1	-199.4	0.8	51.4	211.5
		29110	0.000	1	-205.2	0.6	52.4	217.0
			2.560	1	-170.4	0.8	55.1	186.5

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	1	-172.1	0.5	56.3	187.9
			2.560	1	-133.7	0.6	59.2	156.4
		29112	0.000	1	-137.4	0.3	60.5	159.8
			2.560	1	-94.5	0.5	63.4	131.5
		29113	0.000	1	-95.6	0.1	64.1	132.1
			2.560	1	-48.5	0.3	67.1	120.9
		29114	0.000	1	-49.2	0.0	67.5	121.5
			2.460	1	0.0	0.2	70.4	121.9
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =1)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	3	-1.6	5.6	139.5	241.6
			2.460	3	-48.4	116.1	130.4	225.9
		11002	0.000	3	-50.1	121.2	130.6	226.3
			2.560	3	-94.1	224.2	121.4	267.0
		11003	0.000	3	-95.8	229.2	121.5	265.6
			2.560	3	-135.4	320.5	112.6	347.8
		11004	0.000	3	-137.0	325.4	112.6	348.3
			2.560	3	-172.6	406.2	104.0	425.0
		11005	0.000	3	-171.4	347.1	101.9	367.2
			2.560	3	-202.5	407.5	93.7	425.3
		11006	0.000	3	-204.1	411.6	97.0	427.0
			1.280	3	-218.4	439.0	94.9	455.9
		12007	0.000	3	-215.0	337.5	87.2	354.9
			1.280	3	-220.7	356.2	83.6	375.4
		12008	0.000	3	-222.1	359.3	83.9	374.2
			2.560	3	-245.0	395.1	76.3	409.6
		12009	0.000	3	-246.5	398.1	75.9	408.9
			2.560	3	-266.4	429.1	68.6	439.9
		12010	0.000	3	-261.0	403.0	66.8	411.3
			2.560	3	-277.5	427.7	59.9	436.3
		12011	0.000	3	-282.9	395.4	60.0	402.2
			2.560	3	-296.7	414.6	53.2	421.9
		12012	0.000	3	-298.2	417.2	53.7	422.1
			1.280	3	-303.7	424.6	50.3	430.9
		13013	0.000	3	-304.8	426.4	79.8	440.5
			1.280	3	-308.7	431.3	77.5	448.0
		13014	0.000	3	-303.8	417.3	44.7	420.5
			2.560	3	-312.4	429.1	38.3	432.7
		13015	0.000	3	-313.7	431.5	37.6	433.4
			2.560	3	-319.8	440.0	31.3	442.4
		13016	0.000	3	-325.0	410.1	31.5	411.4
			2.560	3	-328.9	415.4	25.4	417.1
		13017	0.000	3	-330.3	417.6	24.8	418.2
			2.560	3	-332.1	420.2	18.9	421.1
		13018	0.000	3	-333.5	422.4	18.4	422.6
			1.280	3	-333.0	421.7	15.3	422.2
		14019	0.000	3	-334.4	423.7	14.6	423.8
			1.280	3	-333.3	422.3	15.8	422.7
		14020	0.000	3	-334.6	424.4	16.2	424.4
			2.560	3	-332.6	421.8	18.4	421.9
		14021	0.000	3	-333.9	423.9	18.9	423.9
			2.560	3	-330.0	418.8	21.1	418.8
		14022	0.000	3	-331.3	420.9	21.6	421.1
			2.560	3	-325.5	413.2	21.0	413.3
		14023	0.000	3	-326.8	415.3	24.0	415.9
			2.560	3	-319.4	405.6	28.7	405.9
		14024	0.000	3	-317.4	438.8	26.2	439.8
			1.290	3	-312.5	431.6	31.7	432.1
		15025	0.000	3	-313.8	433.7	31.7	434.9
			1.280	3	-308.4	425.9	33.8	426.5
		15026	0.000	3	-309.6	428.1	35.0	429.6
			2.560	3	-298.8	413.0	39.2	414.1
		15027	0.000	3	-300.1	415.2	39.8	417.4
			2.560	3	-287.6	398.0	43.9	399.8
		15028	0.000	3	-295.0	425.9	45.3	429.0

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	3	-280.7	405.6	49.3	408.1
		15029	0.000	3	-281.9	407.9	49.9	411.9
			2.560	3	-266.1	385.4	53.8	388.9
		15030	0.000	3	-267.3	387.6	55.9	393.4
			1.280	3	-258.8	375.6	77.1	392.9
		16031	0.000	3	-260.1	378.1	58.0	384.6
			1.280	3	-250.1	363.7	59.6	370.9
		16032	0.000	3	-257.5	458.8	59.5	463.4
			2.560	3	-238.4	425.8	63.2	430.1
		16033	0.000	3	-239.6	428.5	64.0	434.4
			2.560	3	-218.9	393.3	67.5	398.9
		16034	0.000	3	-223.6	453.1	68.8	458.9
			2.560	3	-201.2	410.5	72.3	416.2
		16035	0.000	3	-202.3	413.6	72.7	420.9
			2.560	3	-178.4	368.8	76.1	376.1
		16036	0.000	3	-179.6	371.9	76.8	381.1
			1.280	3	-170.1	346.2	78.0	356.4
		17037	0.000	3	-156.3	492.4	78.2	498.6
			1.280	3	-155.2	463.1	79.7	469.9
		17038	0.000	3	-153.6	465.3	91.9	470.7
			2.560	3	-187.9	398.7	96.0	404.4
		17039	0.000	3	-188.6	401.4	96.4	408.3
			2.560	3	-216.4	324.3	99.0	330.5
		17040	0.000	3	-216.9	327.6	96.5	335.5
			2.560	3	-262.0	268.8	99.1	277.4
		17041	0.000	3	-262.3	272.1	98.6	283.0
			2.560	3	-305.9	213.3	100.9	308.7
		17042	0.000	3	-306.1	216.7	100.0	309.4
			1.280	3	-327.8	186.1	101.2	330.9
		18043	0.000	3	-327.5	189.5	109.8	335.7
			1.280	3	-349.1	158.4	113.0	357.2
		18044	0.000	3	-293.2	134.1	100.4	297.8
			2.560	3	-330.8	106.6	102.6	334.9
		18045	0.000	3	-330.9	106.6	103.2	335.3
			2.560	3	-367.9	129.8	105.1	372.0
		18046	0.000	3	-301.3	121.7	102.0	306.8
			2.560	3	-333.0	143.0	103.7	338.0
		18047	0.000	3	-294.5	144.0	102.1	301.2
			2.560	3	-327.6	164.2	104.5	354.8
		18048	0.000	3	-327.2	164.3	105.4	356.1
			1.280	3	-348.5	180.3	107.2	375.8
		19049	0.000	3	-347.5	180.5	121.9	388.6
			1.280	3	-365.8	191.1	124.0	406.3
		19050	0.000	3	-284.5	183.5	99.8	317.3
			2.560	3	-315.5	214.2	101.3	340.8
		19051	0.000	3	-315.2	214.6	97.6	340.2
			2.560	3	-347.7	246.8	98.7	369.1
		19052	0.000	3	-297.4	242.5	93.9	323.2
			2.560	3	-324.7	271.2	94.5	346.4
		19053	0.000	3	-324.3	271.7	89.8	346.0
			2.560	3	-350.6	299.1	90.4	368.4
		19054	0.000	3	-350.1	299.7	87.0	368.9
			1.290	3	-364.9	314.6	88.4	380.9
		20055	0.000	3	-365.0	314.5	86.2	379.8
			1.280	3	-378.8	327.4	85.5	396.3

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	3	-327.6	322.7	81.2	349.7
			2.560	3	-350.2	347.4	81.4	367.7
		20057	0.000	3	-349.4	348.2	84.1	371.9
			2.560	3	-373.1	374.6	85.1	391.6
		20058	0.000	3	-372.3	375.9	83.0	394.8
			2.560	3	-349.7	348.1	86.1	369.9
		20059	0.000	3	-349.3	348.7	79.7	369.3
			2.560	3	-327.9	322.5	82.9	347.4
		20060	0.000	3	-327.5	323.1	83.3	351.0
			1.280	3	-316.0	309.8	85.7	334.0
		21061	0.000	3	-362.5	312.9	87.7	378.3
			1.280	3	-350.3	299.7	88.4	366.9
		21062	0.000	3	-349.8	300.2	88.6	369.6
			2.560	3	-324.1	271.8	91.6	343.9
		21063	0.000	3	-323.8	272.2	93.2	347.4
			2.560	3	-297.1	242.6	95.2	321.1
		21064	0.000	3	-296.8	243.0	96.9	324.8
			2.560	3	-269.0	210.5	98.3	297.9
		21065	0.000	3	-316.0	213.9	100.3	346.2
			2.560	3	-284.4	183.8	100.6	315.8
		21066	0.000	3	-284.4	184.1	100.9	318.1
			1.280	3	-269.6	174.1	119.2	323.7
		22067	0.000	3	-348.0	180.8	107.0	375.3
			1.280	3	-326.7	164.7	105.9	355.1
		22068	0.000	3	-326.9	164.9	103.9	354.7
			2.560	3	-293.7	144.5	102.4	300.2
		22069	0.000	3	-293.5	144.7	105.9	300.7
			2.560	3	-266.0	123.0	102.7	273.3
		22070	0.000	3	-299.9	122.7	101.8	305.4
			2.560	3	-268.6	101.2	98.7	274.2
		22071	0.000	3	-329.6	107.9	102.9	333.9
			2.560	3	-291.9	132.8	99.5	296.4
		22072	0.000	3	-291.7	138.8	100.6	296.2
			1.280	3	-273.4	156.5	107.6	284.3
		23073	0.000	3	-326.7	190.9	100.8	329.8
			1.280	3	-305.1	214.9	99.2	308.3
		23074	0.000	3	-304.8	218.0	101.0	307.7
			2.560	3	-261.5	270.1	97.8	280.9
		23075	0.000	3	-261.1	273.4	99.0	281.9
			2.560	3	-216.3	325.3	95.9	333.3
		23076	0.000	3	-215.6	328.8	98.8	335.0
			2.560	3	-188.4	399.3	95.9	406.2
		23077	0.000	3	-187.6	403.4	94.5	409.0
			2.560	3	-153.5	462.9	91.6	468.4
		23078	0.000	3	-152.3	467.6	79.3	473.3
			1.280	3	-155.0	490.1	77.9	496.2
		24079	0.000	3	-194.9	421.9	79.4	427.8
			1.280	3	-183.1	445.8	78.2	452.1
		24080	0.000	3	-179.5	372.6	75.7	379.7
			2.560	3	-201.0	411.5	72.5	418.8
		24081	0.000	3	-202.2	414.2	71.9	419.8
			2.560	3	-222.2	450.8	68.6	456.7
		24082	0.000	3	-223.4	453.6	68.0	458.0
			2.560	3	-241.9	487.8	64.6	492.5
		24083	0.000	3	-239.3	429.0	62.8	433.2

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	3	-256.0	456.7	59.3	461.4
		24084	0.000	3	-257.2	459.2	60.2	462.8
			1.290	3	-264.9	472.1	58.7	476.6
		25085	0.000	3	-259.7	378.1	74.5	392.2
			1.280	3	-265.8	385.7	75.9	402.2
		25086	0.000	3	-267.0	388.1	53.4	391.5
			2.560	3	-280.3	406.3	49.8	410.4
		25087	0.000	3	-281.5	408.4	48.9	410.8
			2.560	3	-293.4	424.3	45.2	427.4
		25088	0.000	3	-294.7	426.4	44.3	428.0
			2.560	3	-305.0	440.1	40.4	442.3
		25089	0.000	3	-299.8	415.5	38.8	416.6
			2.560	3	-308.2	426.4	34.9	427.9
		25090	0.000	3	-309.5	428.3	33.4	428.9
			1.280	3	-312.5	431.9	31.5	433.1
		26091	0.000	3	-313.7	434.0	31.4	434.5
			1.280	3	-316.1	436.9	26.1	437.9
		26092	0.000	3	-317.4	438.9	28.1	439.2
			2.560	3	-322.2	445.3	23.7	445.8
		26093	0.000	3	-326.9	415.4	20.7	415.4
			2.560	3	-330.1	419.0	21.5	419.3
		26094	0.000	3	-331.4	421.0	20.8	421.0
			2.560	3	-332.6	422.1	18.8	422.1
		26095	0.000	3	-334.0	424.0	18.2	424.2
			2.560	3	-333.3	422.7	16.1	422.7
		26096	0.000	3	-334.7	424.6	15.5	425.1
			1.280	3	-333.1	422.1	15.5	422.7
		27097	0.000	3	-334.3	424.1	15.4	424.7
			1.280	3	-332.1	420.8	18.2	421.7
		27098	0.000	3	-333.4	422.6	19.3	423.6
			2.560	3	-328.7	415.9	24.7	416.5
		27099	0.000	3	-330.2	418.0	25.7	419.7
			2.560	3	-323.4	408.4	31.3	409.7
		27100	0.000	3	-324.9	410.5	32.1	413.2
			2.560	3	-316.0	398.2	37.9	400.7
		27101	0.000	3	-313.6	431.9	38.8	435.6
			2.560	3	-302.3	415.3	44.7	419.0
		27102	0.000	3	-303.8	417.6	46.7	423.2
			1.280	3	-297.4	408.4	78.8	426.6
		28103	0.000	3	-305.0	427.5	50.5	433.7
			1.280	3	-297.0	415.5	53.7	422.8
		28104	0.000	3	-298.2	417.4	53.5	424.7
			2.560	3	-281.3	393.1	60.1	401.6
		28105	0.000	3	-282.9	395.6	60.8	405.5
			2.560	3	-263.2	367.6	67.6	379.7
		28106	0.000	3	-261.0	403.1	67.7	414.6
			2.560	3	-238.6	368.4	74.6	382.6
		28107	0.000	3	-246.5	398.0	76.7	412.5
			2.560	3	-220.4	355.9	84.0	374.5
		28108	0.000	3	-222.0	359.0	84.6	378.5
			1.280	3	-213.9	335.1	87.5	357.4
		29109	0.000	3	-214.7	337.1	91.8	361.4
			1.280	3	-198.3	311.1	95.2	339.1
		29110	0.000	3	-203.9	410.8	94.1	428.5
			2.560	3	-169.3	341.7	102.2	366.5

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	3	-171.0	345.9	102.5	370.5
			2.560	3	-132.8	269.2	110.9	305.2
		29112	0.000	3	-136.4	323.2	113.1	350.3
			2.560	3	-93.7	223.0	121.9	266.5
		29113	0.000	3	-94.9	226.1	121.8	268.6
			2.560	3	-48.2	115.4	131.0	226.9
		29114	0.000	3	-48.9	117.1	130.8	226.5
			2.460	3	0.0	0.1	139.9	242.3
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =3)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	4	-2.1	5.3	141.1	244.3
			2.460	4	-47.0	120.4	131.1	227.1
		11002	0.000	4	-48.6	125.7	127.5	220.9
			2.560	4	-91.2	232.7	121.3	268.2
		11003	0.000	4	-92.8	237.8	120.1	263.7
			2.560	4	-130.8	332.9	114.4	353.2
		11004	0.000	4	-132.4	338.0	112.6	348.6
			2.560	4	-166.3	422.3	107.1	435.0
		11005	0.000	4	-163.6	363.7	104.0	372.4
			2.560	4	-193.0	427.3	98.8	438.9
		11006	0.000	4	-194.5	431.4	98.6	438.0
			1.280	4	-208.0	460.3	97.4	471.8
		12007	0.000	4	-202.7	359.1	93.5	369.3
			1.280	4	-208.0	378.4	91.1	391.4
		12008	0.000	4	-209.3	381.8	87.9	387.5
			2.560	4	-230.6	419.9	83.2	429.0
		12009	0.000	4	-232.1	423.1	79.6	425.4
			2.560	4	-250.6	456.1	75.0	462.7
		12010	0.000	4	-254.0	420.7	72.5	422.4
			2.560	4	-269.9	446.7	68.9	452.4
		12011	0.000	4	-264.9	424.3	63.6	425.3
			2.560	4	-277.8	444.8	64.9	449.2
		12012	0.000	4	-279.3	447.4	56.4	447.9
			1.280	4	-284.4	455.4	55.5	459.6
		13013	0.000	4	-285.4	457.2	35.8	458.6
			1.280	4	-284.8	466.8	38.6	466.8
		13014	0.000	4	-289.0	443.4	48.6	443.6
			2.560	4	-296.9	456.0	50.9	458.5
		13015	0.000	4	-298.4	458.4	40.1	458.4
			2.560	4	-303.8	467.6	43.4	469.3
		13016	0.000	4	-299.2	447.1	32.4	447.1
			2.560	4	-302.5	453.1	36.1	454.2
		13017	0.000	4	-303.9	455.3	24.9	455.4
			2.560	4	-305.1	458.5	29.4	459.2
		13018	0.000	4	-306.4	460.7	25.6	461.0
			1.280	4	-305.6	460.3	26.9	461.0
		14019	0.000	4	-306.8	462.6	27.8	463.0
			1.280	4	-305.4	461.3	30.2	461.7
		14020	0.000	4	-306.8	463.5	26.2	464.0
			2.560	4	-303.8	461.6	30.8	461.7
		14021	0.000	4	-305.1	463.7	28.8	464.6
			2.560	4	-300.2	459.4	34.3	459.5
		14022	0.000	4	-301.5	461.5	31.6	462.8
			2.560	4	-294.6	454.8	37.7	454.8
		14023	0.000	4	-295.9	456.8	34.2	458.6
			2.560	4	-287.3	447.9	41.4	448.0
		14024	0.000	4	-294.0	472.9	37.2	475.1
			1.290	4	-288.3	466.3	41.4	466.4
		15025	0.000	4	-289.5	468.5	42.3	471.2
			1.280	4	-283.4	461.2	44.8	461.3
		15026	0.000	4	-284.7	463.3	44.2	466.1
			2.560	4	-272.4	449.2	49.0	449.6
		15027	0.000	4	-273.7	451.4	49.2	454.9
			2.560	4	-259.9	435.0	52.6	435.7
		15028	0.000	4	-260.3	470.5	51.1	474.3

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	4	-245.1	450.5	55.5	451.4
		15029	0.000	4	-246.4	452.8	54.5	457.3
			2.560	4	-229.6	430.6	58.8	431.9
		15030	0.000	4	-230.9	432.8	59.3	438.8
			1.280	4	-226.7	416.2	44.1	417.2
		16031	0.000	4	-227.9	418.8	62.1	425.7
			1.280	4	-217.4	404.6	64.0	412.2
		16032	0.000	4	-224.5	501.3	61.5	505.9
			2.560	4	-204.2	468.7	65.6	470.3
		16033	0.000	4	-205.5	471.3	65.8	476.8
			2.560	4	-183.9	436.3	68.5	438.4
		16034	0.000	4	-188.9	496.6	70.8	501.8
			2.560	4	-165.5	454.0	72.4	456.1
		16035	0.000	4	-166.9	456.9	75.2	463.1
			2.560	4	-142.4	411.8	76.6	414.6
		16036	0.000	4	-143.8	414.7	81.2	422.3
			1.280	4	-146.6	390.0	81.6	398.5
		17037	0.000	4	-244.3	412.6	84.6	419.2
			1.280	4	-232.2	381.0	85.3	388.5
		17038	0.000	4	-232.8	386.4	73.2	393.8
			2.560	4	-247.7	340.3	77.1	344.1
		17039	0.000	4	-246.7	344.9	75.9	353.9
			2.560	4	-270.1	301.4	79.8	304.1
		17040	0.000	4	-269.2	305.2	80.8	312.7
			2.560	4	-297.7	257.9	84.7	304.2
		17041	0.000	4	-297.2	261.5	86.0	303.4
			2.560	4	-330.2	209.5	89.8	336.3
		17042	0.000	4	-329.8	212.9	95.8	335.8
			1.280	4	-348.8	183.7	96.9	354.7
		18043	0.000	4	-348.2	187.4	86.4	350.0
			1.280	4	-370.2	158.4	87.2	371.7
		18044	0.000	4	-311.4	136.1	98.5	318.9
			2.560	4	-345.2	97.4	100.3	352.6
		18045	0.000	4	-345.0	97.7	101.6	352.2
			2.560	4	-382.0	121.5	103.4	389.1
		18046	0.000	4	-312.8	115.2	105.0	323.2
			2.560	4	-343.5	138.1	106.9	353.8
		18047	0.000	4	-304.7	139.0	103.7	315.3
			2.560	4	-339.7	157.8	105.5	350.7
		18048	0.000	4	-339.8	157.4	106.5	350.7
			1.280	4	-361.9	172.9	107.9	373.0
		19049	0.000	4	-361.0	173.0	88.4	363.6
			1.280	4	-383.6	179.7	83.1	385.9
		19050	0.000	4	-300.0	173.5	101.9	312.7
			2.560	4	-327.5	208.2	103.5	350.4
		19051	0.000	4	-327.3	208.4	100.5	347.5
			2.560	4	-362.2	238.9	103.1	382.2
		19052	0.000	4	-310.5	235.2	98.6	332.0
			2.560	4	-338.9	263.4	100.9	360.4
		19053	0.000	4	-338.5	263.9	96.2	356.8
			2.560	4	-365.5	290.9	98.5	384.1
		19054	0.000	4	-365.0	291.5	94.2	381.0
			1.280	4	-376.6	309.8	96.7	393.7
		20055	0.000	4	-376.7	309.8	101.4	392.7
			1.280	4	-391.9	321.3	100.1	408.3

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	4	-339.4	317.4	93.5	356.1
			2.560	4	-361.5	342.9	96.4	379.1
		20057	0.000	4	-360.9	343.5	95.0	378.5
			2.560	4	-384.4	370.3	98.0	402.9
		20058	0.000	4	-384.5	370.7	92.9	401.3
			2.560	4	-362.2	342.3	99.9	381.7
		20059	0.000	4	-361.5	343.2	90.8	377.3
			2.560	4	-340.8	316.0	98.8	359.7
		20060	0.000	4	-340.0	317.1	90.5	358.1
			1.280	4	-327.3	304.9	94.6	346.9
		21061	0.000	4	-379.3	302.9	96.8	396.3
			1.280	4	-366.5	290.2	97.2	384.2
		21062	0.000	4	-366.0	290.8	95.4	383.0
			2.560	4	-339.7	262.6	98.9	359.8
		21063	0.000	4	-339.2	263.2	98.2	359.2
			2.560	4	-311.6	234.0	100.8	334.8
		21064	0.000	4	-311.1	234.5	100.5	334.5
			2.560	4	-281.1	203.8	102.3	307.8
		21065	0.000	4	-331.2	204.6	101.6	343.6
			2.560	4	-301.1	172.4	104.3	314.6
		21066	0.000	4	-300.6	173.2	102.5	314.4
			1.280	4	-281.7	167.1	87.1	286.8
		22067	0.000	4	-362.8	172.1	108.0	373.9
			1.280	4	-340.7	156.4	107.4	351.9
		22068	0.000	4	-340.4	157.1	104.3	351.1
			2.560	4	-305.4	137.9	104.8	316.5
		22069	0.000	4	-305.4	137.8	103.6	316.6
			2.560	4	-277.9	115.7	103.2	289.9
		22070	0.000	4	-313.6	113.9	103.6	324.2
			2.560	4	-284.2	89.9	102.9	295.4
		22071	0.000	4	-346.2	96.5	99.6	353.4
			2.560	4	-312.3	133.0	99.0	320.1
		22072	0.000	4	-312.5	139.0	96.0	320.1
			1.280	4	-293.4	155.2	86.1	296.2
		23073	0.000	4	-349.7	187.1	96.9	355.6
			1.280	4	-330.8	209.5	96.1	336.8
		23074	0.000	4	-331.1	212.9	89.1	336.9
			2.560	4	-298.0	258.2	85.8	304.3
		23075	0.000	4	-298.5	261.5	84.0	304.8
			2.560	4	-269.9	301.9	80.6	309.3
		23076	0.000	4	-270.8	305.0	79.2	307.6
			2.560	4	-247.4	341.6	75.5	350.5
		23077	0.000	4	-248.4	343.9	76.6	347.6
			2.560	4	-232.7	383.0	72.7	390.3
		23078	0.000	4	-233.6	384.6	85.1	387.2
			1.280	4	-244.1	409.2	84.4	415.7
		24079	0.000	4	-178.6	466.3	82.4	468.3
			1.280	4	-165.3	488.7	82.0	494.0
		24080	0.000	4	-144.2	414.8	76.5	417.6
			2.560	4	-166.6	453.7	74.8	459.8
		24081	0.000	4	-167.3	457.0	72.2	459.1
			2.560	4	-188.5	493.3	70.5	498.3
		24082	0.000	4	-189.2	496.6	68.8	498.2
			2.560	4	-209.1	530.2	65.9	534.5
		24083	0.000	4	-205.9	471.2	65.3	472.8

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	4	-224.0	498.1	60.9	502.6
		24084	0.000	4	-224.8	501.1	64.5	502.5
			1.290	4	-233.4	513.4	62.3	518.2
		25085	0.000	4	-228.2	418.1	43.8	418.2
			1.280	4	-230.4	429.8	40.9	430.5
		25086	0.000	4	-231.3	432.6	58.5	433.9
			2.560	4	-245.9	450.0	53.9	454.4
		25087	0.000	4	-246.8	452.5	55.2	453.4
			2.560	4	-259.8	467.8	50.4	471.4
		25088	0.000	4	-260.7	470.3	51.9	470.8
			2.560	4	-272.1	483.3	46.9	486.2
		25089	0.000	4	-274.1	451.1	48.8	451.5
			2.560	4	-284.0	460.8	43.7	463.5
		25090	0.000	4	-284.9	463.2	44.6	463.4
			1.280	4	-288.7	466.1	42.0	468.8
		26091	0.000	4	-289.9	468.4	41.1	468.4
			1.280	4	-293.2	470.5	36.7	472.6
		26092	0.000	4	-294.1	472.9	41.7	472.9
			2.560	4	-300.7	477.7	34.1	479.3
		26093	0.000	4	-296.1	456.8	37.5	456.8
			2.560	4	-300.7	459.2	31.1	460.5
		26094	0.000	4	-301.7	461.5	34.1	461.5
			2.560	4	-304.4	461.3	28.3	462.1
		26095	0.000	4	-305.4	463.7	30.6	463.8
			2.560	4	-306.1	461.0	25.7	461.5
		26096	0.000	4	-307.2	463.3	29.9	463.7
			1.280	4	-306.2	460.2	27.4	460.8
		27097	0.000	4	-307.3	462.3	26.8	463.0
			1.280	4	-305.8	458.4	26.3	459.3
		27098	0.000	4	-306.9	460.5	29.6	461.2
			2.560	4	-303.3	452.6	25.6	452.7
		27099	0.000	4	-304.4	455.0	36.3	456.2
			2.560	4	-298.7	444.4	32.6	444.8
		27100	0.000	4	-299.8	446.8	43.0	448.5
			2.560	4	-291.8	433.4	40.1	434.8
		27101	0.000	4	-299.0	458.1	51.1	460.6
			2.560	4	-288.4	440.5	48.4	443.1
		27102	0.000	4	-289.6	443.1	59.7	446.9
			1.280	4	-287.9	429.0	34.8	429.3
		28103	0.000	4	-286.4	457.6	55.2	462.0
			1.280	4	-278.8	444.9	56.4	450.2
		28104	0.000	4	-279.9	447.0	65.3	451.5
			2.560	4	-264.1	421.2	63.6	426.5
		28105	0.000	4	-265.4	423.9	66.8	430.0
			2.560	4	-247.0	394.0	71.5	401.8
		28106	0.000	4	-254.6	420.3	75.8	428.3
			2.560	4	-232.9	384.0	80.7	394.6
		28107	0.000	4	-232.6	422.4	83.1	431.6
			2.560	4	-208.2	377.7	88.1	390.1
		28108	0.000	4	-209.7	380.9	90.7	393.8
			1.280	4	-202.1	356.1	93.5	371.8
		29109	0.000	4	-202.9	358.2	95.7	375.6
			1.280	4	-187.4	330.5	97.8	351.1
		29110	0.000	4	-194.9	430.0	98.7	441.9
			2.560	4	-162.0	357.7	104.1	375.2

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	4	-163.8	361.8	106.1	379.5
			2.560	4	-127.3	281.7	111.7	308.8
		29112	0.000	4	-132.3	335.2	114.3	356.0
			2.560	4	-91.0	231.3	120.1	266.2
		29113	0.000	4	-92.3	234.2	121.2	270.6
			2.560	4	-46.9	119.6	129.1	223.7
		29114	0.000	4	-47.7	121.2	132.8	230.1
			2.460	4	0.0	0.2	142.8	247.4
LF	Lastfall				SIGC	Druckspannung		
LF-Name	Lastfallbezeichnung				SIGT	Zugspannung		
NR	Stabnummer (Filter: >=1001 und <=29114)				TAU	Schubspannung		
X	Abstand zu Stabanfang				SIGV	Vergleichsspannung		
MNR	Materialnummer (Filter: =4)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	5	-0.4	5.6	107.7	186.5
			2.460	5	-0.3	120.7	103.1	194.6
		11002	0.000	5	-0.6	126.0	102.5	192.4
			2.560	5	-0.6	233.3	97.9	269.4
		11003	0.000	5	-0.9	238.5	96.9	265.5
			2.560	5	-1.0	333.8	92.5	354.4
		11004	0.000	5	-1.2	338.9	91.0	349.8
			2.560	5	-1.3	423.3	86.8	436.3
		11005	0.000	5	-1.4	364.6	87.8	373.6
			2.560	5	-1.5	428.4	83.6	440.2
		11006	0.000	5	-1.7	432.6	83.1	439.3
			1.280	5	-1.7	461.5	82.2	473.2
		12007	0.000	5	-1.7	361.1	42.0	362.3
			1.280	5	-1.6	380.5	40.9	383.9
		12008	0.000	5	-1.7	383.9	39.5	384.8
			2.560	5	-1.7	422.2	37.4	424.5
		12009	0.000	5	-1.9	425.4	35.7	426.0
			2.560	5	-1.9	458.6	33.8	460.3
		12010	0.000	5	-1.9	423.1	33.1	423.5
			2.560	5	-1.9	449.1	31.2	450.6
		12011	0.000	5	-2.1	426.7	29.2	426.9
			2.560	5	-2.1	447.3	28.1	448.4
		12012	0.000	5	-2.2	449.8	26.0	450.0
			1.280	5	-2.2	457.8	25.4	458.9
		13013	0.000	5	-2.2	459.7	36.1	460.1
			1.280	5	-2.5	469.3	35.2	469.3
		13014	0.000	5	-2.3	446.4	19.0	446.4
			2.560	5	-2.3	459.0	18.6	459.5
		13015	0.000	5	-2.4	461.4	15.8	461.4
			2.560	5	-2.4	470.6	15.9	470.9
		13016	0.000	5	-2.5	450.0	12.9	450.0
			2.560	5	-2.5	456.0	13.3	456.2
		13017	0.000	5	-2.7	458.2	10.0	458.2
			2.560	5	-2.7	461.5	10.9	461.6
		13018	0.000	5	-2.8	463.6	9.9	463.7
			1.280	5	-2.9	463.3	10.6	463.4
		14019	0.000	5	-2.9	465.5	11.0	465.6
			1.280	5	-2.9	464.2	11.8	464.3
		14020	0.000	5	-2.9	466.4	10.3	466.5
			2.560	5	-3.0	464.5	11.9	464.5
		14021	0.000	5	-3.1	466.6	10.7	466.8
			2.560	5	-3.1	462.2	13.0	462.3
		14022	0.000	5	-3.4	464.4	11.9	464.6
			2.560	5	-3.4	457.5	14.0	457.5
		14023	0.000	5	-3.6	459.6	12.5	459.9
			2.560	5	-3.7	450.6	15.1	450.6
		14024	0.000	5	-3.8	475.7	13.4	476.1
			1.290	5	-3.9	469.0	14.9	469.0
		15025	0.000	5	-3.9	471.3	15.2	471.7
			1.280	5	-3.9	463.8	16.1	463.9
		15026	0.000	5	-3.9	466.0	15.8	466.5
			2.560	5	-4.0	451.8	17.4	451.9
		15027	0.000	5	-4.1	454.0	18.0	454.6
			2.560	5	-8.6	437.5	18.6	437.6
		15028	0.000	5	-10.0	473.1	17.5	473.8

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	5	-22.1	452.9	19.0	453.1
		15029	0.000	5	-22.1	455.2	18.7	456.0
			2.560	5	-35.1	432.9	20.0	433.1
		15030	0.000	5	-35.0	435.1	20.7	436.2
			1.280	5	-41.8	418.4	27.9	418.6
		16031	0.000	5	-41.8	421.0	21.2	422.2
			1.280	5	-48.7	406.7	21.7	408.0
		16032	0.000	5	-59.7	502.7	36.0	505.1
			2.560	5	-77.4	470.0	36.9	470.8
		16033	0.000	5	-77.3	472.6	38.9	475.5
			2.560	5	-95.8	437.4	39.7	438.5
		16034	0.000	5	-108.4	497.9	40.2	500.6
			2.560	5	-130.2	455.2	40.9	456.3
		16035	0.000	5	-130.1	458.1	42.7	461.3
			2.560	5	-152.6	412.9	43.3	414.3
		16036	0.000	5	-150.2	415.7	45.9	419.7
			1.280	5	-161.8	390.9	46.1	395.4
		17037	0.000	5	-217.9	493.2	60.3	499.2
			1.280	5	-232.4	463.8	60.7	470.4
		17038	0.000	5	-228.9	466.0	57.4	471.2
			2.560	5	-248.0	399.3	56.3	404.9
		17039	0.000	5	-246.9	402.1	59.6	408.8
			2.560	5	-270.4	324.9	58.8	331.0
		17040	0.000	5	-269.5	328.2	62.5	335.8
			2.560	5	-298.1	269.3	60.6	304.7
		17041	0.000	5	-297.5	272.7	64.9	303.8
			2.560	5	-330.7	213.7	62.3	336.8
		17042	0.000	5	-330.3	217.2	71.5	336.4
			1.280	5	-349.3	186.5	72.3	355.3
		18043	0.000	5	-348.7	189.9	71.2	350.5
			1.280	5	-370.7	158.8	73.6	372.3
		18044	0.000	5	-312.1	136.5	55.3	316.0
			2.560	5	-346.0	92.0	56.1	349.8
		18045	0.000	5	-345.8	94.9	56.4	349.5
			2.560	5	-382.9	46.2	57.4	386.5
		18046	0.000	5	-313.5	40.8	62.5	318.9
			2.560	5	-344.3	6.9	63.6	349.7
		18047	0.000	5	-305.5	8.3	63.0	311.0
			2.560	5	-340.6	8.2	64.0	346.3
		18048	0.000	5	-340.7	8.9	64.3	346.4
			1.280	5	-362.8	8.8	65.2	368.6
		19049	0.000	5	-361.9	9.4	71.7	369.8
			1.280	5	-384.5	9.8	72.8	387.8
		19050	0.000	5	-301.4	8.5	38.1	303.6
			2.560	5	-329.1	8.2	38.8	333.2
		19051	0.000	5	-328.8	9.0	37.3	332.5
			2.560	5	-363.9	8.7	38.0	367.5
		19052	0.000	5	-312.1	8.7	36.9	315.9
			2.560	5	-340.5	8.4	37.8	344.4
		19053	0.000	5	-340.1	9.1	35.5	343.4
			2.560	5	-367.2	8.7	36.5	370.6
		19054	0.000	5	-366.8	9.4	34.1	369.6
			1.290	5	-378.4	8.9	35.7	381.5
		20055	0.000	5	-378.5	8.9	38.7	381.3
			1.280	5	-393.8	8.8	38.2	396.7

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	5	-342.9	8.9	18.7	343.6
			2.560	5	-365.0	8.3	19.3	365.8
		20057	0.000	5	-364.5	9.0	18.9	365.3
			2.560	5	-388.1	8.6	19.5	388.9
		20058	0.000	5	-388.2	8.8	18.4	388.9
			2.560	5	-365.8	9.0	19.9	366.6
		20059	0.000	5	-365.1	8.6	18.1	365.8
			2.560	5	-344.3	8.7	19.9	345.1
		20060	0.000	5	-343.5	8.5	17.1	344.3
			1.280	5	-330.7	8.4	18.5	331.6
		21061	0.000	5	-381.1	9.2	35.8	384.1
			1.280	5	-368.3	9.3	36.2	371.4
		21062	0.000	5	-367.7	9.2	34.8	370.7
			2.560	5	-341.4	8.9	37.3	344.9
		21063	0.000	5	-340.8	8.9	36.3	344.4
			2.560	5	-313.1	8.5	38.5	317.3
		21064	0.000	5	-312.7	8.5	37.7	316.9
			2.560	5	-282.6	8.0	39.3	287.4
		21065	0.000	5	-332.8	8.8	37.9	335.0
			2.560	5	-302.5	8.4	39.1	304.9
		21066	0.000	5	-302.0	8.3	38.3	304.5
			1.280	5	-283.0	8.2	43.3	283.9
		22067	0.000	5	-363.7	9.1	65.3	369.5
			1.280	5	-341.6	8.9	65.0	347.4
		22068	0.000	5	-341.3	8.7	63.3	346.8
			2.560	5	-306.2	8.3	63.8	311.9
		22069	0.000	5	-306.2	8.2	62.9	312.0
			2.560	5	-278.6	35.3	62.8	284.8
		22070	0.000	5	-314.4	42.9	61.8	319.8
			2.560	5	-284.8	78.4	61.5	290.7
		22071	0.000	5	-347.0	95.6	55.6	350.7
			2.560	5	-313.0	133.4	55.5	317.0
		22072	0.000	5	-313.1	139.4	54.3	317.1
			1.280	5	-294.1	157.0	54.5	295.5
		23073	0.000	5	-350.2	191.3	72.1	356.2
			1.280	5	-331.3	215.4	71.7	337.4
		23074	0.000	5	-331.5	218.5	66.3	337.5
			2.560	5	-298.4	270.6	61.8	304.8
		23075	0.000	5	-298.9	273.9	63.4	305.3
			2.560	5	-270.2	325.9	59.9	333.6
		23076	0.000	5	-271.1	329.4	60.5	335.4
			2.560	5	-247.6	400.0	58.1	406.6
		23077	0.000	5	-248.7	404.0	57.4	409.5
			2.560	5	-229.6	463.7	57.4	468.9
		23078	0.000	5	-231.2	468.3	60.6	473.9
			1.280	5	-218.5	490.9	60.1	496.8
		24079	0.000	5	-195.3	467.1	60.7	469.1
			1.280	5	-181.5	489.5	60.3	494.9
		24080	0.000	5	-150.0	415.9	43.3	417.3
			2.560	5	-129.9	454.9	42.4	458.0
		24081	0.000	5	-130.0	458.1	40.9	459.2
			2.560	5	-108.3	494.6	40.0	497.2
		24082	0.000	5	-108.3	497.8	38.3	498.7
			2.560	5	-87.4	531.6	37.4	533.9
		24083	0.000	5	-77.2	472.5	36.9	473.3

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	5	-59.6	499.5	35.8	501.9
		24084	0.000	5	-59.6	502.5	34.7	503.2
			1.290	5	-51.1	514.9	34.4	517.4
		25085	0.000	5	-41.6	420.3	26.4	420.3
			1.280	5	-34.8	432.1	27.6	432.2
		25086	0.000	5	-34.9	434.9	19.9	435.1
			2.560	5	-21.9	452.5	18.5	453.2
		25087	0.000	5	-22.0	454.9	18.9	455.1
			2.560	5	-9.8	470.3	17.3	471.0
		25088	0.000	5	-9.8	472.8	17.9	472.9
			2.560	5	-4.4	486.0	16.2	486.5
		25089	0.000	5	-4.0	453.7	17.3	453.8
			2.560	5	-4.0	463.5	15.5	464.0
		25090	0.000	5	-3.8	465.9	16.0	465.9
			1.280	5	-3.9	468.8	15.1	469.3
		26091	0.000	5	-3.9	471.1	14.7	471.1
			1.280	5	-3.9	473.3	13.2	473.7
		26092	0.000	5	-3.7	475.7	15.1	475.7
			2.560	5	-3.6	480.6	12.3	480.9
		26093	0.000	5	-3.5	459.6	14.0	459.6
			2.560	5	-3.4	462.1	11.7	462.3
		26094	0.000	5	-3.1	464.4	12.9	464.4
			2.560	5	-3.1	464.2	10.5	464.4
		26095	0.000	5	-3.0	466.5	11.8	466.6
			2.560	5	-2.9	463.9	10.1	464.0
		26096	0.000	5	-2.9	466.3	11.7	466.3
			1.280	5	-2.8	463.2	10.9	463.3
		27097	0.000	5	-2.8	465.3	10.5	465.4
			1.280	5	-2.8	461.3	10.2	461.5
		27098	0.000	5	-2.7	463.4	11.0	463.6
			2.560	5	-2.7	455.6	10.3	455.6
		27099	0.000	5	-2.4	458.0	13.4	458.2
			2.560	5	-2.4	447.3	13.0	447.3
		27100	0.000	5	-2.3	449.7	15.9	450.0
			2.560	5	-2.3	436.3	15.9	436.3
		27101	0.000	5	-2.3	461.1	18.7	461.5
			2.560	5	-2.2	443.5	19.0	443.5
		27102	0.000	5	-2.2	446.1	21.8	446.7
			1.280	5	-2.0	432.0	29.9	432.0
		28103	0.000	5	-2.1	460.1	25.3	461.2
			1.280	5	-2.1	447.4	26.1	448.7
		28104	0.000	5	-2.0	449.5	28.3	450.6
			2.560	5	-2.0	423.5	29.4	423.9
		28105	0.000	5	-1.9	426.3	30.9	427.8
			2.560	5	-1.8	396.2	32.9	397.4
		28106	0.000	5	-1.7	422.6	34.7	424.7
			2.560	5	-1.7	386.2	36.8	388.2
		28107	0.000	5	-1.7	424.8	37.4	427.1
			2.560	5	-1.6	379.8	39.5	382.5
		28108	0.000	5	-1.4	383.0	40.7	386.3
			1.280	5	-1.5	358.1	42.0	362.1
		29109	0.000	5	-1.4	360.2	42.9	364.7
			1.280	5	-1.4	332.4	43.8	337.7
		29110	0.000	5	-1.4	431.2	83.6	443.2
			2.560	5	-1.2	358.6	88.0	376.5

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	5	-1.1	362.7	89.7	380.7
			2.560	5	-1.0	282.4	94.2	310.0
		29112	0.000	5	-0.8	336.0	92.4	357.2
			2.560	5	-0.7	231.9	96.9	267.4
		29113	0.000	5	-0.5	234.8	97.8	271.9
			2.560	5	-0.3	119.9	102.5	193.1
		29114	0.000	5	-0.2	121.5	103.0	196.9
			2.460	5	0.0	0.1	107.6	186.4
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =5)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	7	-2.7	1.5	68.9	119.3
			2.460	7	-30.0	3.7	64.5	115.6
		11002	0.000	7	-31.5	4.5	63.5	113.8
			2.560	7	-58.0	7.2	59.1	117.6
		11003	0.000	7	-59.5	7.6	58.4	116.0
			2.560	7	-83.2	10.6	54.1	125.3
		11004	0.000	7	-84.7	11.0	53.8	123.9
			2.560	7	-105.8	13.6	49.7	136.4
		11005	0.000	7	-104.6	14.9	48.3	131.5
			2.560	7	-122.9	17.4	44.5	145.1
		11006	0.000	7	-124.4	17.7	46.4	146.1
			1.280	7	-132.6	18.7	45.4	154.2
		12007	0.000	7	-129.7	20.4	41.5	146.2
			1.280	7	-134.3	20.5	39.1	150.4
		12008	0.000	7	-135.7	20.8	39.1	148.8
			2.560	7	-149.5	22.5	35.7	161.8
		12009	0.000	7	-151.0	22.7	35.9	160.2
			2.560	7	-163.1	24.0	32.6	172.6
		12010	0.000	7	-164.5	19.1	33.3	171.1
			2.560	7	-175.2	19.6	30.1	182.7
		12011	0.000	7	-173.8	25.8	29.8	178.0
			2.560	7	-182.9	26.2	27.6	188.6
		12012	0.000	7	-184.3	26.2	27.6	188.1
			1.280	7	-187.8	26.2	26.1	193.2
		13013	0.000	7	-188.8	26.5	26.2	192.0
			1.280	7	-186.8	32.1	26.2	191.9
		13014	0.000	7	-188.8	26.8	25.2	190.5
			2.560	7	-195.0	26.7	23.3	198.8
		13015	0.000	7	-196.5	26.7	22.2	197.2
			2.560	7	-201.4	26.4	20.6	204.2
		13016	0.000	7	-200.1	32.4	19.0	200.5
			2.560	7	-203.8	32.1	17.6	205.8
		13017	0.000	7	-205.2	32.1	16.1	205.3
			2.560	7	-207.7	31.9	14.8	209.0
		13018	0.000	7	-209.1	31.8	13.2	209.1
			1.280	7	-209.3	31.8	12.6	210.3
		14019	0.000	7	-210.6	32.0	12.5	210.6
			1.280	7	-210.5	31.7	11.7	211.3
		14020	0.000	7	-211.8	31.7	10.4	211.8
			2.560	7	-212.1	31.7	10.9	212.5
		14021	0.000	7	-213.4	31.7	11.2	213.5
			2.560	7	-212.6	31.8	11.7	212.8
		14022	0.000	7	-214.0	31.8	12.0	214.3
			2.560	7	-212.0	32.0	13.7	212.1
		14023	0.000	7	-213.4	32.0	12.8	213.9
			2.560	7	-210.5	32.3	16.2	210.5
		14024	0.000	7	-214.7	25.9	13.7	215.5
			1.290	7	-212.3	26.1	17.1	212.4
		15025	0.000	7	-213.5	26.3	17.2	214.6
			1.280	7	-210.9	26.2	18.1	210.9
		15026	0.000	7	-212.3	26.1	18.3	213.4
			2.560	7	-207.6	26.1	20.1	207.7
		15027	0.000	7	-208.9	26.0	19.9	210.4
			2.560	7	-203.4	25.8	21.7	203.6
		15028	0.000	7	-205.0	31.2	21.5	207.0

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	7	-198.7	30.9	23.2	199.1
		15029	0.000	7	-200.0	30.7	23.4	202.6
			2.560	7	-192.8	30.4	25.0	193.5
		15030	0.000	7	-194.1	30.3	25.8	197.7
			1.280	7	-194.8	28.0	26.1	198.5
		16031	0.000	7	-196.1	28.1	26.1	199.8
			1.280	7	-190.9	30.0	26.8	195.0
		16032	0.000	7	-197.8	30.8	26.6	201.4
			2.560	7	-188.6	34.8	28.1	190.0
		16033	0.000	7	-190.0	34.8	27.6	194.2
			2.560	7	-180.0	39.0	29.1	181.8
		16034	0.000	7	-185.1	39.7	29.5	190.1
			2.560	7	-174.3	44.1	31.0	176.6
		16035	0.000	7	-175.7	44.0	30.9	181.6
			2.560	7	-164.2	48.6	32.3	167.1
		16036	0.000	7	-165.7	50.4	32.4	172.7
			1.280	7	-162.2	53.5	33.7	170.0
		17037	0.000	7	-144.8	134.7	39.2	144.8
			1.280	7	-137.3	138.7	39.9	140.8
		17038	0.000	7	-135.5	140.8	70.9	154.8
			2.560	7	-95.5	149.6	72.3	163.1
		17039	0.000	7	-95.1	149.8	74.2	164.4
			2.560	7	-69.3	183.4	75.6	203.9
		17040	0.000	7	-67.4	183.6	69.1	199.6
			2.560	7	-46.6	195.3	70.5	210.6
		17041	0.000	7	-45.4	195.5	63.3	206.5
			2.560	7	-32.0	207.2	64.6	217.8
		17042	0.000	7	-31.1	207.4	59.5	215.6
			1.280	7	-27.6	213.6	60.2	221.6
		18043	0.000	7	-27.5	213.4	60.0	221.3
			1.280	7	-29.7	210.0	61.1	218.3
		18044	0.000	7	-24.3	203.6	55.9	209.9
			2.560	7	-20.6	218.2	55.8	224.1
		18045	0.000	7	-19.4	218.4	53.8	223.4
			2.560	7	-18.9	232.8	55.5	237.7
		18046	0.000	7	-6.7	234.3	55.4	234.4
			2.560	7	-6.2	247.5	56.4	247.5
		18047	0.000	7	-15.8	235.1	53.2	239.0
			2.560	7	-19.3	243.8	53.9	254.6
		18048	0.000	7	-20.3	243.3	54.5	254.3
			1.280	7	-21.2	253.8	54.9	264.7
		19049	0.000	7	-21.2	253.6	52.2	263.0
			1.280	7	-26.7	251.4	52.8	261.2
		19050	0.000	7	-24.3	242.9	50.7	251.8
			2.560	7	-23.7	267.2	49.4	276.8
		19051	0.000	7	-25.8	267.3	48.3	275.9
			2.560	7	-28.5	287.0	48.3	295.1
		19052	0.000	7	-28.9	282.2	45.9	289.3
			2.560	7	-30.3	299.7	45.5	306.3
		19053	0.000	7	-32.7	300.0	43.8	305.9
			2.560	7	-33.9	316.4	43.2	321.8
		19054	0.000	7	-36.4	316.8	42.3	321.8
			1.290	7	-33.4	329.9	40.5	334.4
		20055	0.000	7	-33.4	329.9	39.4	334.0
			1.280	7	-33.7	336.1	39.1	341.0

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	7	-34.3	331.6	37.9	336.0
			2.560	7	-34.4	346.9	37.0	351.1
		20057	0.000	7	-37.0	347.2	39.3	352.0
			2.560	7	-37.6	364.2	38.7	368.7
		20058	0.000	7	-37.6	364.8	38.7	369.3
			2.560	7	-37.2	346.9	39.2	351.6
		20059	0.000	7	-34.5	347.5	37.1	351.7
			2.560	7	-34.5	331.1	37.7	335.6
		20060	0.000	7	-31.9	331.9	38.7	336.8
			1.280	7	-31.7	325.3	38.9	329.4
		21061	0.000	7	-37.7	323.8	41.9	328.7
			1.280	7	-36.8	316.5	42.1	321.5
		21062	0.000	7	-34.3	316.9	43.2	322.3
			2.560	7	-33.2	299.8	43.7	305.7
		21063	0.000	7	-30.7	300.2	45.5	306.9
			2.560	7	-29.3	282.2	45.8	289.2
		21064	0.000	7	-27.1	282.5	47.7	290.6
			2.560	7	-24.5	262.7	47.5	271.2
		21065	0.000	7	-24.2	264.6	49.4	272.5
			2.560	7	-24.8	243.1	50.4	251.9
		21066	0.000	7	-23.3	243.8	51.7	253.4
			1.280	7	-17.9	246.1	50.9	255.3
		22067	0.000	7	-21.6	254.2	54.8	265.0
			1.280	7	-20.8	243.6	54.3	254.5
		22068	0.000	7	-19.7	244.2	53.9	255.1
			2.560	7	-18.1	235.4	53.1	239.3
		22069	0.000	7	-16.5	235.3	54.4	239.8
			2.560	7	-16.9	222.7	53.3	227.3
		22070	0.000	7	-4.9	233.4	56.4	233.6
			2.560	7	-7.0	217.8	54.7	219.4
		22071	0.000	7	-22.0	218.5	55.6	224.3
			2.560	7	-25.7	203.7	55.7	210.0
		22072	0.000	7	-27.6	203.6	59.2	211.5
			1.280	7	-25.4	207.1	58.2	214.8
		23073	0.000	7	-28.8	213.8	59.8	221.7
			1.280	7	-32.3	207.6	59.1	215.6
		23074	0.000	7	-33.1	207.4	64.2	217.8
			2.560	7	-46.2	195.7	62.8	206.5
		23075	0.000	7	-47.4	195.5	70.1	210.7
			2.560	7	-67.9	183.8	68.7	199.6
		23076	0.000	7	-69.8	183.6	75.3	204.0
			2.560	7	-94.2	150.0	73.9	164.4
		23077	0.000	7	-96.8	149.8	72.1	163.2
			2.560	7	-134.6	141.0	70.6	155.0
		23078	0.000	7	-138.5	140.8	39.8	142.8
			1.280	7	-143.7	134.9	39.1	143.7
		24079	0.000	7	-168.4	53.4	34.6	171.7
			1.280	7	-170.0	50.3	33.3	177.2
		24080	0.000	7	-165.4	50.5	32.2	168.2
			2.560	7	-174.7	44.2	30.7	180.5
		24081	0.000	7	-175.5	44.3	30.9	177.7
			2.560	7	-184.0	39.8	29.4	189.1
		24082	0.000	7	-184.8	39.9	29.6	186.7
			2.560	7	-192.7	35.6	28.0	197.0
		24083	0.000	7	-189.8	35.0	28.0	191.2

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	7	-196.8	30.9	26.4	200.4
		24084	0.000	7	-197.6	31.0	27.4	198.9
			1.290	7	-200.7	29.0	26.7	204.5
		25085	0.000	7	-195.9	28.1	26.0	196.9
			1.280	7	-192.9	29.8	25.9	196.6
		25086	0.000	7	-194.0	30.4	24.9	194.7
			2.560	7	-199.0	30.1	23.3	201.6
		25087	0.000	7	-199.9	30.8	23.1	200.3
			2.560	7	-204.0	30.5	21.3	206.0
		25088	0.000	7	-204.9	31.2	21.2	205.1
			2.560	7	-208.1	31.2	19.4	209.6
		25089	0.000	7	-208.8	26.1	19.6	208.9
			2.560	7	-211.1	25.9	17.8	212.1
		25090	0.000	7	-212.1	26.5	17.8	212.1
			1.280	7	-212.3	26.2	16.8	213.2
		26091	0.000	7	-213.5	26.5	16.7	213.5
			1.280	7	-213.5	26.0	13.5	214.2
		26092	0.000	7	-214.5	26.6	16.4	214.5
			2.560	7	-215.0	25.8	12.8	215.5
		26093	0.000	7	-213.1	32.7	13.6	213.1
			2.560	7	-212.7	31.8	11.9	213.0
		26094	0.000	7	-213.7	32.4	11.5	213.9
			2.560	7	-212.2	31.5	11.1	212.3
		26095	0.000	7	-213.2	32.1	10.7	213.6
			2.560	7	-210.6	31.3	10.2	210.6
		26096	0.000	7	-211.6	31.9	11.6	212.4
			1.280	7	-209.4	31.6	12.4	210.4
		27097	0.000	7	-210.5	31.8	12.5	211.5
			1.280	7	-207.9	31.3	13.1	209.2
		27098	0.000	7	-209.0	31.8	14.7	210.2
			2.560	7	-204.0	31.2	15.9	204.9
		27099	0.000	7	-205.1	31.8	17.6	207.0
			2.560	7	-198.9	31.4	19.0	200.7
		27100	0.000	7	-200.0	32.0	20.4	202.7
			2.560	7	-192.6	31.6	21.9	195.4
		27101	0.000	7	-196.4	26.2	23.7	200.2
			2.560	7	-187.5	25.9	25.5	191.8
		27102	0.000	7	-188.7	26.5	26.8	193.9
			1.280	7	-188.3	20.2	26.8	194.0
		28103	0.000	7	-189.2	25.8	26.4	194.6
			1.280	7	-183.2	25.5	27.9	189.4
		28104	0.000	7	-184.2	25.8	27.9	190.0
			2.560	7	-172.3	25.0	30.0	179.3
		28105	0.000	7	-173.6	25.3	29.7	181.1
			2.560	7	-160.3	24.2	32.8	169.4
		28106	0.000	7	-164.4	18.7	33.3	174.2
			2.560	7	-149.2	17.6	36.7	161.7
		28107	0.000	7	-150.8	22.2	36.0	163.2
			2.560	7	-134.0	20.2	39.4	149.9
		28108	0.000	7	-135.5	20.2	39.3	151.7
			1.280	7	-128.4	19.7	41.8	147.4
		29109	0.000	7	-129.3	19.8	43.7	149.8
			1.280	7	-119.0	18.4	45.2	142.4
		29110	0.000	7	-124.2	16.9	44.9	146.5
			2.560	7	-102.5	14.3	48.7	132.6

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	7	-104.2	14.1	48.9	134.3
			2.560	7	-80.4	11.2	52.8	121.8
		29112	0.000	7	-84.2	10.0	54.7	126.7
			2.560	7	-57.5	7.1	58.9	117.2
		29113	0.000	7	-58.8	6.7	59.6	118.9
			2.560	7	-29.7	3.6	64.1	114.9
		29114	0.000	7	-30.5	3.3	65.1	116.8
			2.460	7	0.0	0.1	69.5	120.4
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =7)							

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	11001	0.000	10	-2.4	0.8	62.4	108.0
			2.460	10	-44.8	0.7	58.1	108.4
		11002	0.000	10	-47.7	0.5	57.1	106.4
			2.560	10	-86.6	1.2	52.9	120.0
		11003	0.000	10	-89.4	0.8	52.0	118.1
			2.560	10	-123.8	1.6	48.0	138.6
		11004	0.000	10	-126.5	1.1	47.3	136.4
			2.560	10	-156.8	1.3	43.4	159.3
		11005	0.000	10	-153.7	0.2	41.2	153.7
			2.560	10	-179.2	0.8	37.6	179.2
		11006	0.000	10	-181.6	0.2	39.2	181.6
			1.280	10	-192.9	0.8	38.3	192.9
		12007	0.000	10	-185.7	-0.2	33.7	185.7
			1.280	10	-191.9	0.2	31.6	191.9
		12008	0.000	10	-194.0	-0.1	31.4	194.0
			2.560	10	-212.0	0.2	28.3	212.0
		12009	0.000	10	-214.2	0.0	28.1	214.2
			2.560	10	-229.5	0.5	25.2	229.5
		12010	0.000	10	-223.2	0.6	24.2	223.2
			2.560	10	-235.5	1.6	21.4	235.5
		12011	0.000	10	-240.4	0.2	21.3	240.4
			2.560	10	-250.4	1.5	18.6	250.4
		12012	0.000	10	-252.4	1.6	19.4	252.4
			1.280	10	-255.9	2.5	18.1	255.9
		13013	0.000	10	-257.5	2.6	17.9	257.5
			1.280	10	-263.1	3.6	16.7	263.1
		13014	0.000	10	-257.7	3.6	15.8	257.7
			2.560	10	-263.6	5.8	13.4	263.6
		13015	0.000	10	-265.4	5.9	13.5	265.4
			2.560	10	-269.5	8.4	11.1	269.5
		13016	0.000	10	-274.5	8.6	11.7	274.5
			2.560	10	-277.2	11.4	9.4	277.2
		13017	0.000	10	-279.0	11.4	10.0	279.0
			2.560	10	-280.3	14.5	8.5	280.3
		13018	0.000	10	-282.1	14.6	8.8	282.1
			1.280	10	-281.6	16.2	8.8	281.6
		14019	0.000	10	-283.4	16.2	9.3	283.4
			1.280	10	-282.3	17.9	9.5	282.3
		14020	0.000	10	-284.0	18.0	9.1	284.0
			2.560	10	-283.0	21.5	9.5	283.0
		14021	0.000	10	-284.7	21.6	9.6	284.7
			2.560	10	-282.6	25.4	10.0	282.6
		14022	0.000	10	-284.3	25.5	10.1	284.3
			2.560	10	-281.0	29.5	9.8	281.0
		14023	0.000	10	-282.7	29.6	10.6	282.7
			2.560	10	-278.4	33.9	11.9	278.4
		14024	0.000	10	-276.8	33.6	11.0	276.8
			1.290	10	-273.5	35.8	12.1	273.5
		15025	0.000	10	-275.3	35.8	12.5	275.3
			1.280	10	-271.4	38.0	13.3	271.4
		15026	0.000	10	-273.0	38.1	13.4	273.0
			2.560	10	-266.4	42.8	14.9	266.4
		15027	0.000	10	-267.9	42.9	14.8	267.9
			2.560	10	-260.1	47.7	16.3	260.1
		15028	0.000	10	-270.0	49.4	16.5	270.0

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	15028	2.560	10	-260.9	54.6	18.0	260.9
		15029	0.000	10	-262.4	54.7	17.7	262.4
			2.560	10	-252.5	60.2	19.0	252.5
		15030	0.000	10	-254.0	60.3	19.3	254.0
			1.280	10	-244.9	62.3	19.7	244.9
		16031	0.000	10	-246.7	62.4	20.3	246.7
			1.280	10	-239.8	65.1	20.9	239.8
		16032	0.000	10	-250.9	68.0	20.8	250.9
			2.560	10	-238.7	74.1	22.1	238.7
		16033	0.000	10	-240.1	74.2	22.5	240.1
			2.560	10	-226.7	80.3	23.8	226.7
		16034	0.000	10	-234.2	82.7	24.5	234.2
			2.560	10	-219.2	89.2	25.8	219.2
		16035	0.000	10	-220.6	89.3	25.8	220.6
			2.560	10	-204.5	95.8	27.1	204.5
		16036	0.000	10	-205.8	99.2	27.2	205.8
			1.280	10	-200.0	104.3	28.2	200.0
		17037	0.000	10	-209.8	105.2	29.9	209.8
			1.280	10	-199.5	108.7	30.5	199.5
		17038	0.000	10	-200.8	112.2	30.0	200.8
			2.560	10	-181.4	119.7	31.2	181.4
		17039	0.000	10	-182.8	119.6	31.1	182.8
			2.560	10	-162.0	126.6	32.3	162.0
		17040	0.000	10	-163.3	126.5	32.1	163.3
			2.560	10	-143.8	135.7	33.3	143.8
		17041	0.000	10	-145.0	135.5	33.0	145.0
			2.560	10	-124.5	144.6	34.2	144.6
		17042	0.000	10	-125.7	144.4	33.9	144.4
			1.280	10	-114.6	149.1	34.6	149.1
		18043	0.000	10	-116.1	149.2	35.1	149.2
			1.280	10	-104.5	153.9	35.0	153.9
		18044	0.000	10	-101.7	147.4	32.6	147.4
			2.560	10	-78.5	156.3	33.8	156.3
		18045	0.000	10	-80.3	156.1	33.5	156.1
			2.560	10	-61.8	168.4	34.7	168.4
		18046	0.000	10	-58.8	155.2	31.7	155.2
			2.560	10	-40.1	164.7	32.3	164.7
		18047	0.000	10	-42.4	167.4	31.8	167.4
			2.560	10	-22.6	176.2	32.1	176.2
		18048	0.000	10	-24.8	176.8	32.5	176.8
			1.280	10	-16.9	186.9	32.7	186.9
		19049	0.000	10	-18.1	187.0	31.9	187.0
			1.280	10	-9.9	194.6	31.4	194.6
		19050	0.000	10	-11.5	186.5	29.1	186.5
			2.560	10	-1.4	202.7	29.4	202.7
		19051	0.000	10	-1.4	202.9	27.9	202.9
			2.560	10	-0.7	226.4	26.3	226.4
		19052	0.000	10	-0.6	221.7	25.5	221.7
			2.560	10	0.1	240.8	24.6	240.8
		19053	0.000	10	-0.6	241.2	24.6	241.2
			2.560	10	-1.7	259.7	23.5	259.7
		19054	0.000	10	-1.0	260.1	23.9	260.1
			1.290	10	-3.7	268.3	23.8	268.3
		20055	0.000	10	-3.7	268.2	23.5	268.2
			1.280	10	-4.3	278.4	22.9	278.4

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	20056	0.000	10	-4.9	273.2	22.5	273.2
			2.560	10	-4.4	291.2	21.2	291.2
		20057	0.000	10	-6.3	291.9	23.5	291.9
			2.560	10	-5.8	311.7	22.4	311.7
		20058	0.000	10	-6.1	312.3	22.4	312.3
			2.560	10	-6.1	291.3	23.3	291.3
		20059	0.000	10	-4.6	291.8	21.3	291.8
			2.560	10	-4.4	272.5	22.3	272.5
		20060	0.000	10	-3.9	273.1	22.5	273.1
			1.280	10	-3.8	262.6	22.9	262.6
		21061	0.000	10	-1.3	269.0	23.1	269.0
			1.280	10	-1.1	259.6	23.7	259.6
		21062	0.000	10	-1.5	260.2	23.6	260.2
			2.560	10	-0.9	240.8	24.4	240.8
		21063	0.000	10	0.0	241.3	24.6	241.3
			2.560	10	-0.5	221.2	25.4	221.2
		21064	0.000	10	-0.7	221.6	25.6	221.7
			2.560	10	-1.2	198.0	27.1	198.0
		21065	0.000	10	-1.5	203.4	29.3	203.4
			2.560	10	-10.3	186.1	29.0	186.1
		21066	0.000	10	-11.2	186.1	29.6	186.1
			1.280	10	-16.1	179.0	30.4	179.0
		22067	0.000	10	-18.7	186.8	32.6	186.8
			1.280	10	-23.5	176.5	32.4	176.5
		22068	0.000	10	-24.5	176.3	32.0	176.3
			2.560	10	-41.3	167.2	31.6	167.2
		22069	0.000	10	-42.5	167.5	32.3	167.5
			2.560	10	-58.7	158.0	31.7	158.0
		22070	0.000	10	-59.0	155.4	31.8	155.4
			2.560	10	-73.0	144.0	30.7	144.0
		22071	0.000	10	-80.6	156.5	33.6	156.5
			2.560	10	-100.4	147.6	32.3	147.6
		22072	0.000	10	-98.3	147.8	33.0	147.8
			1.280	10	-110.2	143.5	33.4	143.5
		23073	0.000	10	-116.6	149.4	34.3	149.4
			1.280	10	-124.3	144.7	33.7	144.7
		23074	0.000	10	-126.5	144.9	34.0	144.9
			2.560	10	-143.6	135.8	32.8	143.6
		23075	0.000	10	-145.7	136.0	33.1	145.7
			2.560	10	-161.9	126.8	31.9	161.9
		23076	0.000	10	-164.0	127.0	32.2	164.0
			2.560	10	-181.3	119.9	30.9	181.3
		23077	0.000	10	-183.4	120.0	31.1	183.4
			2.560	10	-199.3	112.5	29.8	199.3
		23078	0.000	10	-201.4	112.7	30.3	201.4
			1.280	10	-208.3	105.6	29.7	208.3
		24079	0.000	10	-210.3	105.5	29.3	210.3
			1.280	10	-213.2	100.5	28.3	213.2
		24080	0.000	10	-206.5	99.6	27.0	206.5
			2.560	10	-219.2	89.6	25.7	219.2
		24081	0.000	10	-221.2	89.6	25.7	221.2
			2.560	10	-232.8	83.1	24.4	232.8
		24082	0.000	10	-234.8	83.0	24.3	234.8
			2.560	10	-245.2	76.6	23.0	245.2
		24083	0.000	10	-240.6	74.4	21.9	240.6

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	24083	2.560	10	-249.4	68.3	20.5	249.4
		24084	0.000	10	-251.3	68.2	21.5	251.3
			1.290	10	-255.1	65.3	20.9	255.1
		25085	0.000	10	-246.7	62.6	19.4	246.7
			1.280	10	-252.3	60.5	18.9	252.3
		25086	0.000	10	-254.2	60.5	18.8	254.2
			2.560	10	-260.7	54.9	17.4	260.7
		25087	0.000	10	-262.6	54.8	17.8	262.6
			2.560	10	-268.2	49.5	16.3	268.2
		25088	0.000	10	-270.1	49.5	16.7	270.1
			2.560	10	-274.8	44.4	15.2	274.8
		25089	0.000	10	-268.0	42.9	15.0	268.0
			2.560	10	-271.4	38.3	13.5	271.4
		25090	0.000	10	-273.4	38.2	13.2	273.4
			1.280	10	-273.8	36.0	12.5	273.8
		26091	0.000	10	-275.6	36.0	12.1	275.6
			1.280	10	-275.4	33.8	10.9	275.4
		26092	0.000	10	-277.4	33.7	11.7	277.4
			2.560	10	-278.0	29.5	10.3	278.0
		26093	0.000	10	-283.3	29.8	9.6	283.3
			2.560	10	-282.8	25.7	9.9	282.8
		26094	0.000	10	-284.8	25.6	9.8	284.8
			2.560	10	-282.9	21.8	9.4	282.9
		26095	0.000	10	-285.0	21.7	9.3	285.0
			2.560	10	-282.0	18.1	8.9	282.0
		26096	0.000	10	-284.0	18.1	9.2	284.0
			1.280	10	-281.4	16.3	9.0	281.4
		27097	0.000	10	-283.2	16.3	8.6	283.2
			1.280	10	-280.0	14.7	9.2	280.0
		27098	0.000	10	-281.9	14.6	8.3	281.9
			2.560	10	-276.4	11.6	10.4	276.4
		27099	0.000	10	-278.5	11.5	9.8	278.5
			2.560	10	-271.6	8.7	12.1	271.6
		27100	0.000	10	-273.8	8.6	11.4	273.8
			2.560	10	-265.6	6.0	13.8	265.6
		27101	0.000	10	-264.7	5.9	13.4	264.7
			2.560	10	-254.8	3.6	15.9	254.8
		27102	0.000	10	-257.0	3.6	16.2	257.0
			1.280	10	-247.7	2.6	17.6	247.7
		28103	0.000	10	-257.0	2.6	18.2	257.0
			1.280	10	-249.9	1.7	19.5	249.9
		28104	0.000	10	-251.6	1.6	18.7	251.6
			2.560	10	-237.3	0.2	21.4	237.3
		28105	0.000	10	-239.5	0.7	21.6	239.5
			2.560	10	-222.8	0.1	24.4	222.8
		28106	0.000	10	-222.3	3.2	24.5	222.3
			2.560	10	-203.2	1.8	27.3	203.2
		28107	0.000	10	-213.2	0.5	28.6	213.2
			2.560	10	-190.5	-0.1	31.7	190.5
		28108	0.000	10	-192.8	0.4	31.9	192.8
			1.280	10	-183.1	0.0	34.0	183.1
		29109	0.000	10	-184.3	-0.1	36.1	184.3
			1.280	10	-170.1	-0.2	37.5	170.1
		29110	0.000	10	-180.1	1.1	37.9	180.1
			2.560	10	-149.7	0.6	41.5	151.8

LF: 3113, Stabelemente Spannungen im Material

LF	LF-Name	NR	X [m]	MNR	SIGC [MPa]	SIGT [MPa]	TAU [MPa]	SIGV [MPa]
3113	Bruchzustand_max	29111	0.000	10	-151.9	0.9	42.0	154.2
			2.560	10	-118.1	1.0	45.8	132.0
		29112	0.000	10	-124.4	2.0	48.3	139.6
			2.560	10	-85.7	1.0	52.3	118.8
		29113	0.000	10	-87.0	1.5	53.2	120.9
			2.560	10	-44.3	0.6	57.5	107.1
		29114	0.000	10	-45.1	1.0	58.5	109.1
			2.460	10	0.0	0.1	62.8	108.7
LF	Lastfall				SIGC Druckspannung			
LF-Name	Lastfallbezeichnung				SIGT Zugspannung			
NR	Stabnummer (Filter: >=11001 und <=29114)				TAU Schubspannung			
X	Abstand zu Stabanfang				SIGV Vergleichsspannung			
MNR	Materialnummer (Filter: =10)							

Nachfolgend finden sich die Längsspannungen und Schubspannungen im inneren Steg des Hohlkastens unterstrom die benötigt werden um den Beulnachweis des Steges durchzuführen

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	11001	0.000	4	-2.0	93.0
			2.460	4	-45.1	124.7
		11002	0.000	4	-46.6	90.1
			2.560	4	-87.5	111.5
		11003	0.000	4	-89.0	78.0
			2.560	4	-125.6	99.9
		11004	0.000	4	-127.1	67.3
			2.560	4	-159.8	89.5
		11005	0.000	4	-157.7	56.3
			2.560	4	-186.1	78.6
		11006	0.000	4	-187.6	51.4
			1.280	4	-200.7	80.9
		12007	0.000	4	-196.5	42.0
			1.280	4	-201.6	69.7
		12008	0.000	4	-202.8	39.4
			2.560	4	-223.6	61.7
		12009	0.000	4	-225.0	32.6
			2.560	4	-243.0	54.9
		12010	0.000	4	-246.8	26.6
			2.560	4	-262.3	49.1
		12011	0.000	4	-257.6	20.1
			2.560	4	-270.3	42.2
		12012	0.000	4	-271.7	15.7
			1.280	4	-276.7	42.0
		13013	0.000	4	-277.7	-17.9
			1.280	4	-277.0	8.0
		13014	0.000	4	-281.4	10.0
			2.560	4	-289.2	32.2
		13015	0.000	4	-290.6	4.8
			2.560	4	-296.1	26.9
		13016	0.000	4	-291.7	0.2
			2.560	4	-295.0	21.9
		13017	0.000	4	-296.3	-4.2
			2.560	4	-297.5	17.4
		13018	0.000	4	-298.8	-8.4
			1.280	4	-298.0	16.9
		14019	0.000	4	-299.3	-11.8
			1.280	4	-297.9	13.1
		14020	0.000	4	-299.3	-12.4
			2.560	4	-296.4	9.0
		14021	0.000	4	-297.7	-16.2
			2.560	4	-292.9	5.1
		14022	0.000	4	-294.2	-20.2
			2.560	4	-287.5	1.0
		14023	0.000	4	-288.8	-23.5
			2.560	4	-280.4	-2.5
		14024	0.000	4	-286.8	-27.2
			1.290	4	-281.3	-2.8
		15025	0.000	4	-282.4	-30.3
			1.280	4	-276.4	-6.2
		15026	0.000	4	-277.7	-30.8

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	15026	2.560	4	-265.8	-9.9
		15027	0.000	4	-267.1	-34.3
			2.560	4	-253.6	-13.4
		15028	0.000	4	-253.6	-37.5
			2.560	4	-238.8	-16.9
		15029	0.000	4	-240.1	-40.6
			2.560	4	-223.7	-20.1
		15030	0.000	4	-225.0	-45.8
			1.280	4	-221.0	-20.7
		16031	0.000	4	-222.1	-48.4
			1.280	4	-212.0	-50.2
		16032	0.000	4	-218.1	-47.4
			2.560	4	-198.3	-27.1
		16033	0.000	4	-199.6	-50.5
			2.560	4	-178.5	-30.3
		16034	0.000	4	-182.9	-54.5
			2.560	4	-160.2	-34.2
		16035	0.000	4	-161.6	-57.5
			2.560	4	-137.7	-37.4
		16036	0.000	4	-139.0	-61.1
			1.280	4	-128.5	-62.5
		17037	0.000	4	-238.7	-68.2
			1.280	4	-226.2	-69.9
		17038	0.000	4	-227.5	-58.6
			2.560	4	-202.4	-38.6
		17039	0.000	4	-203.8	-61.0
			2.560	4	-158.6	-32.7
		17040	0.000	4	-160.1	-57.0
			2.560	4	-137.4	-37.0
		17041	0.000	4	-138.9	-61.3
			2.560	4	-115.4	-41.4
		17042	0.000	4	-116.9	-64.7
			1.280	4	-104.5	-42.9
		18043	0.000	4	-105.2	-74.4
			1.280	4	-89.4	-51.8
		18044	0.000	4	-88.3	-67.7
			2.560	4	-64.3	-61.8
		18045	0.000	4	-65.0	-85.0
			2.560	4	-42.9	-64.9
		18046	0.000	4	-46.7	-87.6
			2.560	4	-22.7	-67.6
		18047	0.000	4	-19.3	-87.1
			2.560	4	6.5	-64.3
		18048	0.000	4	6.3	-86.1
			1.280	4	16.9	-65.3
		19049	0.000	4	16.7	-81.4
			1.280	4	25.5	-59.4
		19050	0.000	4	24.2	-84.9
			2.560	4	34.9	-31.4
		19051	0.000	4	34.2	-45.2
			2.560	4	49.0	-31.6
		19052	0.000	4	47.6	-44.2
			2.560	4	61.9	-31.1
		19053	0.000	4	61.3	-43.3
			2.560	4	75.3	-30.6

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	19054	0.000	4	74.8	-42.4
			1.290	4	82.1	-30.0
		20055	0.000	4	81.3	-43.4
			1.280	4	88.5	-29.5
		20056	0.000	4	87.1	-40.0
			2.560	4	99.9	-28.7
		20057	0.000	4	99.6	-40.8
			2.560	4	112.8	-30.6
		20058	0.000	4	112.7	28.6
			2.560	4	99.4	42.6
		20059	0.000	4	99.2	26.6
			2.560	4	86.8	42.0
		20060	0.000	4	86.6	27.3
			1.280	4	80.6	29.5
		21061	0.000	4	80.6	30.0
			1.280	4	74.7	30.1
		21062	0.000	4	74.3	28.9
			2.560	4	61.0	44.8
		21063	0.000	4	60.8	29.6
			2.560	4	47.3	45.4
		21064	0.000	4	46.9	29.9
			2.560	4	33.4	45.6
		21065	0.000	4	33.6	30.3
			2.560	4	23.9	85.8
		21066	0.000	4	22.5	63.4
			1.280	4	16.4	79.5
		22067	0.000	4	14.7	65.0
			1.280	4	6.0	86.2
		22068	0.000	4	4.4	63.3
			2.560	4	-19.6	87.2
		22069	0.000	4	-20.7	64.7
			2.560	4	-41.9	84.7
		22070	0.000	4	-48.2	64.0
			2.560	4	-68.3	84.8
		22071	0.000	4	-66.4	61.1
			2.560	4	-88.4	67.5
		22072	0.000	4	-85.8	57.7
			1.280	4	-102.1	71.7
		23073	0.000	4	-106.7	42.6
			1.280	4	-117.0	64.5
		23074	0.000	4	-117.5	41.0
			2.560	4	-138.9	61.0
		23075	0.000	4	-139.4	36.5
			2.560	4	-160.0	56.6
		23076	0.000	4	-160.6	32.3
			2.560	4	-203.8	60.5
		23077	0.000	4	-204.5	38.3
			2.560	4	-227.5	58.0
		23078	0.000	4	-228.3	45.1
			1.280	4	-238.5	67.7
		24079	0.000	4	-133.7	39.2
			1.280	4	-142.8	62.6
		24080	0.000	4	-139.5	37.1
			2.560	4	-161.3	56.9
		24081	0.000	4	-162.0	34.0

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	24081	2.560	4	-182.6	53.8
		24082	0.000	4	-183.3	30.8
			2.560	4	-202.6	50.7
		24083	0.000	4	-200.0	26.9
			2.560	4	-217.6	46.8
		24084	0.000	4	-218.4	26.0
			1.290	4	-226.8	48.9
		25085	0.000	4	-222.5	-4.7
			1.280	4	-224.5	17.9
		25086	0.000	4	-225.3	20.0
			2.560	4	-239.6	39.9
		25087	0.000	4	-240.4	16.7
			2.560	4	-253.2	36.8
		25088	0.000	4	-254.0	13.4
			2.560	4	-265.2	33.6
		25089	0.000	4	-267.4	9.8
			2.560	4	-277.1	30.2
		25090	0.000	4	-278.0	6.2
			1.280	4	-281.7	30.0
		26091	0.000	4	-282.8	2.6
			1.280	4	-286.0	26.7
		26092	0.000	4	-287.0	2.4
			2.560	4	-293.3	23.1
		26093	0.000	4	-288.9	-1.1
			2.560	4	-293.5	19.5
		26094	0.000	4	-294.4	-5.2
			2.560	4	-297.0	15.5
		26095	0.000	4	-298.0	-9.1
			2.560	4	-298.6	11.6
		26096	0.000	4	-299.6	-13.3
			1.280	4	-298.7	-16.4
		27097	0.000	4	-299.8	-17.2
			1.280	4	-298.3	-20.2
		27098	0.000	4	-299.3	-17.6
			2.560	4	-295.8	3.5
		27099	0.000	4	-296.8	-22.0
			2.560	4	-291.1	-0.9
		27100	0.000	4	-292.3	-26.5
			2.560	4	-284.4	-5.2
		27101	0.000	4	-291.2	-32.4
			2.560	4	-280.8	-10.7
		27102	0.000	4	-282.0	-38.8
			1.280	4	-280.5	-13.1
		28103	0.000	4	-278.7	-42.4
			1.280	4	-271.2	-45.8
		28104	0.000	4	-272.3	-42.5
			2.560	4	-256.8	-20.8
		28105	0.000	4	-258.1	-48.4
			2.560	4	-240.1	-26.6
		28106	0.000	4	-247.4	-55.9
			2.560	4	-226.3	-33.8
		28107	0.000	4	-225.5	-62.3
			2.560	4	-201.7	-40.3
		28108	0.000	4	-203.3	-69.8
			1.280	4	-195.9	-74.0

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	29109	0.000	4	-196.7	-78.3
			1.280	4	-181.6	-81.8
		29110	0.000	4	-188.0	-79.5
			2.560	4	-156.2	-57.6
		29111	0.000	4	-157.9	-88.8
			2.560	4	-122.6	-97.5
		29112	0.000	4	-127.0	-101.2
			2.560	4	-87.3	-110.4
		29113	0.000	4	-88.6	-113.0
			2.560	4	-44.9	-122.6
		29114	0.000	4	-45.8	-126.3
			2.460	4	0.1	-49.1
LF	Lastfall		NR	Stabnummer		
LF-Name	Lastfallbezeichnung		X	Abstand zu Stabanfang		
Punkt	Spannungspunkt (Filter: = '4')					
SIGC	Druckspannung					
TAU	Schubspannung					

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	11001	0.000	5	1.6	95.4
			2.460	5	36.7	127.4
		11002	0.000	5	38.5	92.9
			2.560	5	70.7	114.1
		11003	0.000	5	72.5	80.6
			2.560	5	101.0	102.2
		11004	0.000	5	102.8	69.7
			2.560	5	128.0	91.7
		11005	0.000	5	100.0	59.6
			2.560	5	117.1	81.8
		11006	0.000	5	118.5	54.6
			1.280	5	126.2	84.1
		12007	0.000	5	78.2	46.0
			1.280	5	85.2	73.9
		12008	0.000	5	86.2	42.9
			2.560	5	94.7	65.4
		12009	0.000	5	95.5	35.7
			2.560	5	102.8	58.2
		12010	0.000	5	83.4	29.6
			2.560	5	88.4	52.4
		12011	0.000	5	79.7	22.7
			2.560	5	83.5	45.1
		12012	0.000	5	84.0	17.9
			1.280	5	85.5	44.8
		13013	0.000	5	85.9	-15.9
			1.280	5	91.0	10.4
		13014	0.000	5	77.2	11.6
			2.560	5	79.5	34.2
		13015	0.000	5	80.0	5.9
			2.560	5	81.9	28.4
		13016	0.000	5	73.9	0.8
			2.560	5	75.3	22.9
		13017	0.000	5	75.7	-4.1
			2.560	5	76.7	17.9
		13018	0.000	5	77.1	-8.9
			1.280	5	77.4	17.1
		14019	0.000	5	77.9	-12.5
			1.280	5	77.9	13.1
		14020	0.000	5	78.3	-13.4
			2.560	5	78.9	8.5
		14021	0.000	5	79.3	-17.8
			2.560	5	79.6	4.0
		14022	0.000	5	80.0	-22.3
			2.560	5	80.1	-0.7
		14023	0.000	5	80.5	-26.1
			2.560	5	80.3	-4.6
		14024	0.000	5	89.5	-30.3
			1.290	5	89.0	-5.2
		15025	0.000	5	89.5	-33.7
			1.280	5	88.9	-8.9
		15026	0.000	5	89.3	-34.4
			2.560	5	88.4	-13.0
		15027	0.000	5	88.8	-38.3
			2.560	5	87.6	-17.0
		15028	0.000	5	105.1	-41.7

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	15028	2.560	5	102.7	-20.7
		15029	0.000	5	103.2	-45.3
			2.560	5	100.5	-24.4
		15030	0.000	5	101.0	-51.0
			1.280	5	94.8	-26.4
		16031	0.000	5	95.5	-54.0
			1.280	5	93.6	-56.1
		16032	0.000	5	138.4	-52.3
			2.560	5	132.2	-31.8
		16033	0.000	5	132.9	-55.7
			2.560	5	126.2	-35.3
		16034	0.000	5	153.9	-59.4
			2.560	5	144.2	-39.0
		16035	0.000	5	145.0	-62.7
			2.560	5	134.7	-42.5
		16036	0.000	5	135.5	-66.6
			1.280	5	128.5	-68.6
		17037	0.000	5	84.2	-70.7
			1.280	5	74.8	-72.5
		17038	0.000	5	76.8	-64.3
			2.560	5	66.7	-44.4
		17039	0.000	5	68.3	-67.0
			2.560	5	69.5	-37.3
		17040	0.000	5	70.6	-61.2
			2.560	5	58.7	-41.2
		17041	0.000	5	59.7	-65.2
			2.560	5	45.7	-45.3
		17042	0.000	5	46.6	-68.3
			1.280	5	38.5	-46.3
		18043	0.000	5	39.9	-78.0
			1.280	5	33.5	-54.8
		18044	0.000	5	23.0	-71.9
			2.560	5	13.1	-65.7
		18045	0.000	5	14.2	-89.3
			2.560	5	1.2	-69.0
		18046	0.000	5	-4.0	-94.0
			2.560	5	-12.2	-73.4
		18047	0.000	5	-8.6	-94.2
			2.560	5	-12.3	-69.6
		18048	0.000	5	-11.2	-92.4
			1.280	5	-14.0	-70.8
		19049	0.000	5	-13.3	-88.0
			1.280	5	-17.1	-64.6
		19050	0.000	5	-9.6	-92.0
			2.560	5	-16.8	-36.4
		19051	0.000	5	-16.6	-51.1
			2.560	5	-17.2	-36.7
		19052	0.000	5	-11.0	-50.6
			2.560	5	-10.5	-36.6
		19053	0.000	5	-10.3	-49.9
			2.560	5	-9.7	-36.2
		19054	0.000	5	-9.5	-49.1
			1.290	5	-9.2	-35.6
		20055	0.000	5	-9.2	-50.2
			1.280	5	-8.6	-35.2

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	20056	0.000	5	-1.8	-47.1
			2.560	5	-0.3	-34.7
		20057	0.000	5	0.0	-48.1
			2.560	5	2.1	-37.0
		20058	0.000	5	2.0	35.1
			2.560	5	-0.9	50.0
		20059	0.000	5	-0.5	32.6
			2.560	5	-2.8	49.1
		20060	0.000	5	-2.3	33.2
			1.280	5	-3.4	35.3
		21061	0.000	5	-9.8	35.6
			1.280	5	-10.3	35.7
		21062	0.000	5	-9.9	34.5
			2.560	5	-11.3	51.3
		21063	0.000	5	-10.8	35.1
			2.560	5	-11.9	51.8
		21064	0.000	5	-11.5	35.3
			2.560	5	-12.4	51.9
		21065	0.000	5	-17.1	35.3
			2.560	5	-10.6	92.8
		21066	0.000	5	-10.5	69.3
			1.280	5	-8.6	87.1
		22067	0.000	5	-13.9	70.4
			1.280	5	-12.2	92.5
		22068	0.000	5	-12.1	68.6
			2.560	5	-9.6	94.3
		22069	0.000	5	-9.2	70.7
			2.560	5	-3.7	91.4
		22070	0.000	5	-4.6	69.5
			2.560	5	2.3	90.7
		22071	0.000	5	13.7	65.0
			2.560	5	21.4	71.7
		22072	0.000	5	25.7	61.5
			1.280	5	25.5	76.6
		23073	0.000	5	39.0	46.0
			1.280	5	45.0	68.0
		23074	0.000	5	46.4	44.8
			2.560	5	58.0	64.9
		23075	0.000	5	59.4	40.8
			2.560	5	69.0	60.8
		23076	0.000	5	70.2	36.9
			2.560	5	66.6	66.5
		23077	0.000	5	67.4	44.0
			2.560	5	75.1	63.7
		23078	0.000	5	75.5	47.6
			1.280	5	82.6	70.2
		24079	0.000	5	163.8	44.0
			1.280	5	170.3	66.9
		24080	0.000	5	135.3	42.2
			2.560	5	143.5	62.0
		24081	0.000	5	144.8	38.8
			2.560	5	152.4	58.7
		24082	0.000	5	153.7	35.3
			2.560	5	160.6	55.4
		24083	0.000	5	132.7	31.6

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	24083	2.560	5	137.1	51.7
		24084	0.000	5	138.1	30.5
			1.290	5	140.0	53.8
		25085	0.000	5	94.9	0.0
			1.280	5	99.7	23.1
		25086	0.000	5	100.7	24.3
			2.560	5	102.1	44.6
		25087	0.000	5	102.9	20.6
			2.560	5	104.0	41.0
		25088	0.000	5	104.8	16.8
			2.560	5	105.6	37.3
		25089	0.000	5	88.5	12.9
			2.560	5	88.4	33.8
		25090	0.000	5	89.1	8.8
			1.280	5	88.7	33.3
		26091	0.000	5	89.3	5.0
			1.280	5	88.7	29.8
		26092	0.000	5	89.4	4.6
			2.560	5	88.5	25.7
		26093	0.000	5	80.4	0.6
			2.560	5	79.2	21.6
		26094	0.000	5	79.9	-4.0
			2.560	5	78.5	17.1
		26095	0.000	5	79.1	-8.5
			2.560	5	77.4	12.7
		26096	0.000	5	78.1	-13.2
			1.280	5	77.0	-16.6
		27097	0.000	5	77.5	-17.4
			1.280	5	76.3	-20.7
		27098	0.000	5	76.8	-18.0
			2.560	5	74.6	3.4
		27099	0.000	5	75.3	-23.1
			2.560	5	72.8	-1.5
		27100	0.000	5	73.5	-28.0
			2.560	5	70.8	-6.3
		27101	0.000	5	79.5	-34.4
			2.560	5	76.1	-12.4
		27102	0.000	5	76.8	-41.4
			1.280	5	70.6	-16.2
		28103	0.000	5	85.6	-45.3
			1.280	5	83.1	-48.9
		28104	0.000	5	83.6	-45.5
			2.560	5	78.5	-23.4
		28105	0.000	5	79.2	-51.9
			2.560	5	73.5	-29.7
		28106	0.000	5	82.9	-59.7
			2.560	5	75.5	-37.3
		28107	0.000	5	94.9	-66.1
			2.560	5	84.8	-43.9
		28108	0.000	5	85.6	-74.0
			1.280	5	77.0	-78.7
		29109	0.000	5	77.6	-83.2
			1.280	5	71.6	-87.0
		29110	0.000	5	117.6	-82.8
			2.560	5	97.8	-60.9

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	29111	0.000	5	99.0	-92.4
			2.560	5	77.2	-101.5
		29112	0.000	5	101.4	-103.6
			2.560	5	70.2	-113.0
		29113	0.000	5	70.9	-115.6
			2.560	5	36.4	-125.4
		29114	0.000	5	36.7	-129.1
			2.460	5	0.1	-51.2
LF	Lastfall		NR Stabnummer			
LF-Name	Lastfallbezeichnung		X Abstand zu Stabanfang			
Punkt	Spannungspunkt (Filter: =5')					
SIGC	Druckspannung					
TAU	Schubspannung					

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	11001	0.000	6	5.2	78.2
			2.460	6	118.5	89.5
		11002	0.000	6	123.7	62.3
			2.560	6	228.9	79.1
		11003	0.000	6	234.1	52.9
			2.560	6	327.7	70.0
		11004	0.000	6	332.7	44.6
			2.560	6	415.7	62.1
		11005	0.000	6	357.8	40.9
			2.560	6	420.4	59.3
		11006	0.000	6	424.5	36.9
			1.280	6	453.0	61.1
		12007	0.000	6	352.9	34.6
			1.280	6	372.0	58.7
		12008	0.000	6	375.3	31.9
			2.560	6	412.9	51.6
		12009	0.000	6	416.0	26.1
			2.560	6	448.6	45.7
		12010	0.000	6	413.5	22.2
			2.560	6	439.1	42.4
		12011	0.000	6	417.0	16.8
			2.560	6	437.3	36.8
		12012	0.000	6	439.8	12.9
			1.280	6	447.7	36.7
		13013	0.000	6	449.5	-20.3
			1.280	6	459.0	2.8
		13014	0.000	6	435.8	8.1
			2.560	6	448.3	28.3
		13015	0.000	6	450.6	-3.3
			2.560	6	459.8	23.4
		13016	0.000	6	439.5	-0.9
			2.560	6	445.5	19.0
		13017	0.000	6	447.7	-5.0
			2.560	6	451.0	14.8
		13018	0.000	6	453.1	-9.0
			1.280	6	452.8	14.1
		14019	0.000	6	455.0	-12.1
			1.280	6	453.8	10.7
		14020	0.000	6	455.9	-12.8
			2.560	6	454.2	6.8
		14021	0.000	6	456.3	-16.4
			2.560	6	452.2	3.0
		14022	0.000	6	454.2	-20.2
			2.560	6	447.6	-0.9
		14023	0.000	6	449.7	-23.3
			2.560	6	441.0	-4.1
		14024	0.000	6	465.7	-26.6
			1.290	6	459.3	-4.5
		15025	0.000	6	461.5	-29.4
			1.280	6	454.3	-7.6
		15026	0.000	6	456.4	-29.8
			2.560	6	442.6	-10.9
		15027	0.000	6	444.7	-32.9
			2.560	6	428.7	-14.1
		15028	0.000	6	463.9	-34.8

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	15028	2.560	6	444.2	-16.5
		15029	0.000	6	446.4	-37.6
			2.560	6	424.7	-19.4
		15030	0.000	6	426.9	-42.1
			1.280	6	410.5	-17.1
		16031	0.000	6	413.1	-44.5
			1.280	6	399.1	-46.2
		16032	0.000	6	494.9	-40.1
			2.560	6	462.8	-23.0
		16033	0.000	6	465.4	-42.4
			2.560	6	430.9	-25.4
		16034	0.000	6	490.7	-42.4
			2.560	6	448.7	-26.1
		16035	0.000	6	451.6	-44.5
			2.560	6	407.1	-28.3
		16036	0.000	6	410.0	-47.0
			1.280	6	385.5	-48.5
		17037	0.000	6	407.0	-44.0
			1.280	6	375.8	-45.1
		17038	0.000	6	381.1	-45.1
			2.560	6	335.7	-30.2
		17039	0.000	6	340.3	-46.9
			2.560	6	297.5	-24.1
		17040	0.000	6	301.4	-40.3
			2.560	6	254.7	-25.5
		17041	0.000	6	258.2	-41.6
			2.560	6	206.9	-26.9
		17042	0.000	6	210.2	-42.5
			1.280	6	181.4	-26.4
		18043	0.000	6	185.1	-51.2
			1.280	6	156.4	-33.4
		18044	0.000	6	134.3	-48.7
			2.560	6	90.4	-48.4
		18045	0.000	6	93.4	-66.0
			2.560	6	45.3	-50.3
		18046	0.000	6	38.6	-75.2
			2.560	6	-1.8	-58.3
		18047	0.000	6	2.2	-77.0
			2.560	6	-31.1	-59.2
		18048	0.000	6	-28.7	-78.0
			1.280	6	-45.0	-60.0
		19049	0.000	6	-43.2	-73.9
			1.280	6	-59.8	-54.0
		19050	0.000	6	-43.4	-81.5
			2.560	6	-68.5	-31.0
		19051	0.000	6	-67.4	-43.8
			2.560	6	-83.4	-31.3
		19052	0.000	6	-69.5	-44.8
			2.560	6	-82.9	-32.3
		19053	0.000	6	-81.9	-44.1
			2.560	6	-94.7	-32.1
		19054	0.000	6	-93.7	-43.4
			1.290	6	-100.4	-31.7
		20055	0.000	6	-99.6	-44.6
			1.280	6	-105.8	-31.3

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X	Punkt	SIGC	TAU
			[m]		[MPa]	[MPa]
3101	Bruchzustand_maxMY	20056	0.000	6	-90.7	-42.8
			2.560	6	-100.6	-31.8
		20057	0.000	6	-99.6	-43.6
			2.560	6	-108.6	-33.9
		20058	0.000	6	-108.7	31.9
			2.560	6	-101.2	45.4
		20059	0.000	6	-100.1	29.6
			2.560	6	-92.4	44.9
		20060	0.000	6	-91.2	30.2
			1.280	6	-87.4	32.3
		21061	0.000	6	-100.1	31.7
			1.280	6	-95.3	31.8
		21062	0.000	6	-94.2	30.4
			2.560	6	-83.6	45.6
		21063	0.000	6	-82.3	30.9
			2.560	6	-71.1	46.0
		21064	0.000	6	-69.8	31.1
			2.560	6	-58.2	46.1
		21065	0.000	6	-67.7	29.9
			2.560	6	-45.0	82.3
		21066	0.000	6	-43.5	61.6
			1.280	6	-33.5	77.0
		22067	0.000	6	-42.6	59.6
			1.280	6	-30.4	78.2
		22068	0.000	6	-28.6	58.2
			2.560	6	0.4	77.2
		22069	0.000	6	2.4	57.4
			2.560	6	34.6	75.0
		22070	0.000	6	38.9	55.3
			2.560	6	73.0	72.9
		22071	0.000	6	93.8	47.7
			2.560	6	131.2	48.6
		22072	0.000	6	137.2	45.8
			1.280	6	153.2	54.9
		23073	0.000	6	184.7	26.1
			1.280	6	206.9	42.2
		23074	0.000	6	210.3	26.4
			2.560	6	254.9	41.3
		23075	0.000	6	258.2	25.0
			2.560	6	298.1	40.0
		23076	0.000	6	301.1	23.7
			2.560	6	337.0	46.5
		23077	0.000	6	339.3	29.9
			2.560	6	377.7	44.6
		23078	0.000	6	379.3	26.8
			1.280	6	403.6	43.6
		24079	0.000	6	461.2	25.9
			1.280	6	483.3	42.8
		24080	0.000	6	410.1	28.1
			2.560	6	448.4	44.0
		24081	0.000	6	451.6	25.9
			2.560	6	487.4	41.9
		24082	0.000	6	490.6	23.7
			2.560	6	523.8	39.8
		24083	0.000	6	465.3	22.9

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3101	Bruchzustand_maxMY	24083	2.560	6	491.8	39.5
		24084	0.000	6	494.7	22.2
			1.290	6	506.8	41.4
		25085	0.000	6	412.3	-5.5
			1.280	6	423.9	14.3
		25086	0.000	6	426.7	19.3
			2.560	6	443.8	37.0
		25087	0.000	6	446.2	16.4
			2.560	6	461.1	34.2
		25088	0.000	6	463.6	13.4
			2.560	6	476.3	31.3
		25089	0.000	6	444.5	10.8
			2.560	6	453.9	29.2
		25090	0.000	6	456.3	7.5
			1.280	6	459.1	29.0
		26091	0.000	6	461.3	4.2
			1.280	6	463.4	26.0
		26092	0.000	6	465.7	4.1
			2.560	6	470.4	22.8
		26093	0.000	6	449.7	0.9
			2.560	6	451.9	19.6
		26094	0.000	6	454.2	-3.0
			2.560	6	453.9	15.8
		26095	0.000	6	456.2	-6.8
			2.560	6	453.5	12.2
		26096	0.000	6	455.8	-10.7
			1.280	6	452.7	-13.7
		27097	0.000	6	454.8	-14.4
			1.280	6	450.8	-17.2
		27098	0.000	6	452.9	-14.8
			2.560	6	445.1	4.4
		27099	0.000	6	447.4	-19.1
			2.560	6	436.8	0.3
		27100	0.000	6	439.2	-23.3
			2.560	6	425.9	-3.8
		27101	0.000	6	450.3	-28.5
			2.560	6	433.0	-8.8
		27102	0.000	6	435.5	-34.3
			1.280	6	421.6	-8.8
		28103	0.000	6	449.9	-37.1
			1.280	6	437.4	-40.2
		28104	0.000	6	439.4	-37.1
			2.560	6	413.9	-17.5
		28105	0.000	6	416.6	-42.5
			2.560	6	387.1	-22.7
		28106	0.000	6	413.1	-48.5
			2.560	6	377.3	-28.7
		28107	0.000	6	415.4	-52.2
			2.560	6	371.3	-32.8
		28108	0.000	6	374.4	-58.7
			1.280	6	349.9	-62.9
		29109	0.000	6	352.0	-66.5
			1.280	6	324.8	-69.6
		29110	0.000	6	423.1	-60.1
			2.560	6	351.7	-42.0

LF: 3101, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]	
3101	Bruchzustand_maxMY	29111	0.000	6	355.9	-67.6	
			2.560	6	277.0	-74.8	
		29112	0.000	6	329.9	-71.1	
			2.560	6	227.6	-78.2	
		29113	0.000	6	230.5	-80.4	
			2.560	6	117.7	-87.8	
		29114	0.000	6	119.2	-90.9	
			2.460	6	0.1	-26.0	
LF	Lastfall	NR	Stabnummer				
LF-Name	Lastfallbezeichnung	X	Abstand zu Stabanfang				
Punkt	Spannungspunkt (Filter: =6')						
SIGC	Druckspannung						
TAU	Schubspannung						

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	11001	0.000	4	0.9	79.5
			2.460	4	-14.8	26.3
		11002	0.000	4	-14.7	27.3
			2.560	4	-28.7	23.3
		11003	0.000	4	-28.8	23.3
			2.560	4	-41.0	20.4
		11004	0.000	4	-41.1	20.4
			2.560	4	-51.8	17.6
		11005	0.000	4	-50.6	17.3
			2.560	4	-59.6	14.6
		11006	0.000	4	-59.7	15.2
			1.280	4	-64.0	14.3
		12007	0.000	4	-62.0	13.1
			1.280	4	-62.6	12.0
		12008	0.000	4	-62.6	11.9
			2.560	4	-68.4	9.5
		12009	0.000	4	-68.5	9.4
			2.560	4	-73.1	7.1
		12010	0.000	4	-74.7	6.9
			2.560	4	-78.2	4.7
		12011	0.000	4	-75.6	4.6
			2.560	4	-77.9	2.4
		12012	0.000	4	-78.0	2.5
			1.280	4	-78.8	1.5
		13013	0.000	4	-78.8	-3.3
			1.280	4	-79.1	-4.4
		13014	0.000	4	-80.8	0.1
			2.560	4	-81.1	-2.0
		13015	0.000	4	-81.2	-2.2
			2.560	4	-80.3	-4.2
		13016	0.000	4	-77.9	-4.1
			2.560	4	-76.2	-6.1
		13017	0.000	4	-76.3	-6.2
			2.560	4	-73.6	-8.1
		13018	0.000	4	-73.6	-8.1
			1.280	4	-71.9	-9.0
		14019	0.000	4	-71.9	-9.0
			1.280	4	-70.0	-10.0
		14020	0.000	4	-70.1	-10.0
			2.560	4	-65.6	-11.8
		14021	0.000	4	-65.7	-11.9
			2.560	4	-60.4	-13.6
		14022	0.000	4	-60.4	-13.7
			2.560	4	-54.3	-15.3
		14023	0.000	4	-54.4	-15.4
			2.560	4	-47.5	-17.0
		14024	0.000	4	-49.2	-17.3
			1.290	4	-45.4	-18.1
		15025	0.000	4	-45.4	-18.1
			1.280	4	-41.4	-18.9
		15026	0.000	4	-41.4	-19.0
			2.560	4	-32.9	-20.5
		15027	0.000	4	-32.9	-20.6
			2.560	4	-23.6	-22.0
		15028	0.000	4	-22.9	-22.0

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	15028	2.560	4	-13.1	-23.5
		15029	0.000	4	-13.1	-23.5
			2.560	4	-2.7	-24.9
		15030	0.000	4	-2.7	-24.8
			1.280	4	3.3	-27.6
		16031	0.000	4	3.5	-25.2
			1.280	4	9.1	-25.8
		16032	0.000	4	9.5	-26.7
			2.560	4	21.6	-27.9
		16033	0.000	4	21.6	-28.0
			2.560	4	34.2	-29.2
		16034	0.000	4	34.8	-29.7
			2.560	4	48.2	-30.9
		16035	0.000	4	48.2	-30.8
			2.560	4	62.2	-32.0
		16036	0.000	4	64.0	-31.8
			1.280	4	72.4	-31.8
		17037	0.000	4	-5.8	-35.4
			1.280	4	0.7	-35.9
		17038	0.000	4	2.9	-29.3
			2.560	4	17.0	-30.5
		17039	0.000	4	17.2	-29.9
			2.560	4	13.2	-39.8
		17040	0.000	4	13.5	-41.5
			2.560	4	33.3	-43.3
		17041	0.000	4	33.6	-45.1
			2.560	4	53.8	-46.9
		17042	0.000	4	54.1	-49.3
			1.280	4	64.4	-50.5
		18043	0.000	4	64.6	-32.7
			1.280	4	72.3	-33.4
		18044	0.000	4	70.7	-50.7
			2.560	4	93.9	-52.6
		18045	0.000	4	94.2	-52.7
			2.560	4	117.6	-54.7
		18046	0.000	4	111.8	-53.9
			2.560	4	134.4	-55.9
		18047	0.000	4	135.5	-51.9
			2.560	4	154.0	-60.5
		18048	0.000	4	153.6	-60.9
			1.280	4	168.9	-63.1
		19049	0.000	4	169.0	-34.7
			1.280	4	175.4	-35.6
		19050	0.000	4	169.9	-55.1
			2.560	4	204.2	-76.8
		19051	0.000	4	204.5	-72.0
			2.560	4	234.5	-74.9
		19052	0.000	4	231.2	-68.5
			2.560	4	259.1	-71.5
		19053	0.000	4	259.6	-65.6
			2.560	4	286.4	-68.7
		19054	0.000	4	287.0	-63.2
			1.290	4	305.2	-66.2
		20055	0.000	4	305.1	-63.8
			1.280	4	316.6	-65.9

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	20056	0.000	4	313.1	-58.9
			2.560	4	338.4	-62.7
		20057	0.000	4	338.9	-62.9
			2.560	4	365.7	-66.6
		20058	0.000	4	366.0	63.2
			2.560	4	337.8	66.5
		20059	0.000	4	338.7	59.1
			2.560	4	311.7	63.1
		20060	0.000	4	312.7	61.8
			1.280	4	300.6	63.4
		21061	0.000	4	298.4	66.7
			1.280	4	285.7	66.8
		21062	0.000	4	286.3	65.7
			2.560	4	258.3	68.9
		21063	0.000	4	258.9	69.0
			2.560	4	230.0	71.4
		21064	0.000	4	230.6	71.9
			2.560	4	200.2	73.3
		21065	0.000	4	200.7	56.8
			2.560	4	168.8	56.9
		21066	0.000	4	169.6	57.5
			1.280	4	163.7	34.4
		22067	0.000	4	168.0	63.2
			1.280	4	152.5	61.7
		22068	0.000	4	153.2	59.8
			2.560	4	134.5	52.9
		22069	0.000	4	134.4	53.4
			2.560	4	112.6	52.7
		22070	0.000	4	110.6	53.8
			2.560	4	87.0	52.9
		22071	0.000	4	93.0	52.0
			2.560	4	69.6	51.2
		22072	0.000	4	69.5	49.7
			1.280	4	62.4	31.8
		23073	0.000	4	63.4	50.6
			1.280	4	53.0	49.7
		23074	0.000	4	52.9	46.6
			2.560	4	32.5	45.5
		23075	0.000	4	32.4	43.0
			2.560	4	12.6	41.8
		23076	0.000	4	12.4	39.5
			2.560	4	16.6	30.1
		23077	0.000	4	16.5	30.4
			2.560	4	2.3	29.3
		23078	0.000	4	2.1	36.0
			1.280	4	-6.3	35.3
		24079	0.000	4	72.2	32.4
			1.280	4	63.4	32.2
		24080	0.000	4	63.5	31.9
			2.560	4	47.8	30.8
		24081	0.000	4	47.9	30.9
			2.560	4	34.4	29.6
		24082	0.000	4	34.5	29.7
			2.560	4	21.6	28.4
		24083	0.000	4	21.4	28.0

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	24083	2.560	4	9.3	26.6
		24084	0.000	4	9.4	26.4
			1.290	4	3.5	25.8
		25085	0.000	4	3.0	27.6
			1.280	4	-3.2	26.7
		25086	0.000	4	-2.9	25.0
			2.560	4	-13.4	23.5
		25087	0.000	4	-13.3	23.5
			2.560	4	-23.1	22.0
		25088	0.000	4	-23.0	22.0
			2.560	4	-32.3	20.5
		25089	0.000	4	-33.0	20.6
			2.560	4	-41.7	19.0
		25090	0.000	4	-41.6	19.0
			1.280	4	-45.6	18.1
		26091	0.000	4	-45.6	18.1
			1.280	4	-49.5	17.3
		26092	0.000	4	-49.3	17.3
			2.560	4	-56.5	15.6
		26093	0.000	4	-54.5	15.5
			2.560	4	-60.7	13.7
		26094	0.000	4	-60.6	13.7
			2.560	4	-66.0	11.9
		26095	0.000	4	-65.9	11.9
			2.560	4	-70.4	10.1
		26096	0.000	4	-70.3	10.1
			1.280	4	-72.2	9.1
		27097	0.000	4	-72.2	9.1
			1.280	4	-73.9	8.2
		27098	0.000	4	-73.9	8.2
			2.560	4	-76.6	6.2
		27099	0.000	4	-76.5	6.2
			2.560	4	-78.3	4.2
		27100	0.000	4	-78.2	4.2
			2.560	4	-79.1	2.1
		27101	0.000	4	-81.5	2.2
			2.560	4	-81.2	0.0
		27102	0.000	4	-81.2	-0.2
			1.280	4	-80.8	3.3
		28103	0.000	4	-79.2	-1.4
			1.280	4	-78.4	-2.5
		28104	0.000	4	-78.3	-2.3
			2.560	4	-76.0	-4.6
		28105	0.000	4	-75.9	-4.6
			2.560	4	-72.5	-6.9
		28106	0.000	4	-75.1	-6.9
			2.560	4	-70.3	-9.3
		28107	0.000	4	-68.8	-9.4
			2.560	4	-62.9	-11.9
		28108	0.000	4	-62.9	-11.9
			1.280	4	-62.4	-13.1
		29109	0.000	4	-62.4	-13.6
			1.280	4	-58.2	-14.9
		29110	0.000	4	-60.0	-14.6
			2.560	4	-50.9	-17.3

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]					
3102	Bruchzustand_minMY	29111	0.000	4	-50.8	-17.3					
			2.560	4	-40.3	-20.1					
		29112	0.000	4	-41.2	-20.5					
			2.560	4	-28.9	-23.4					
		29113	0.000	4	-28.8	-23.4					
			2.560	4	-14.9	-26.4					
		29114	0.000	4	-14.9	-26.4					
			2.460	4	0.1	-128.1					
LF	Lastfall		NR		Stabnummer						
LF-Name	Lastfallbezeichnung		X	Abstand zu Stabanfang							
Punkt	Spannungspunkt (Filter: ='4')										
SIGC	Druckspannung										
TAU	Schubspannung										

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	11001	0.000	5	0.6	82.7
			2.460	5	4.8	28.8
		11002	0.000	5	4.9	29.8
			2.560	5	9.1	25.6
		11003	0.000	5	9.0	25.6
			2.560	5	12.7	22.5
		11004	0.000	5	12.6	22.4
			2.560	5	15.8	19.5
		11005	0.000	5	10.1	19.3
			2.560	5	11.7	16.4
		11006	0.000	5	11.6	17.1
			1.280	5	12.4	16.1
		12007	0.000	5	3.2	15.0
			1.280	5	4.8	13.6
		12008	0.000	5	4.7	13.5
			2.560	5	5.0	10.8
		12009	0.000	5	4.9	10.7
			2.560	5	5.1	8.2
		12010	0.000	5	0.0	8.1
			2.560	5	-0.2	5.6
		12011	0.000	5	-0.4	5.5
			2.560	5	-0.6	3.0
		12012	0.000	5	-0.7	3.1
			1.280	5	-0.9	1.9
		13013	0.000	5	-0.9	-2.8
			1.280	5	-0.9	-4.0
		13014	0.000	5	-4.7	0.4
			2.560	5	-5.1	-2.0
		13015	0.000	5	-5.1	-2.1
			2.560	5	-5.5	-4.4
		13016	0.000	5	-5.3	-4.4
			2.560	5	-5.7	-6.6
		13017	0.000	5	-5.7	-6.7
			2.560	5	-6.1	-8.9
		13018	0.000	5	-6.2	-9.0
			1.280	5	-6.3	-10.0
		14019	0.000	5	-6.3	-10.0
			1.280	5	-6.5	-11.1
		14020	0.000	5	-6.6	-11.2
			2.560	5	-6.9	-13.2
		14021	0.000	5	-7.0	-13.3
			2.560	5	-7.3	-15.2
		14022	0.000	5	-7.4	-15.3
			2.560	5	-7.8	-17.3
		14023	0.000	5	-7.8	-17.3
			2.560	5	-8.2	-19.2
		14024	0.000	5	-9.1	-19.5
			1.290	5	-9.3	-20.4
		15025	0.000	5	-9.3	-20.4
			1.280	5	-9.6	-21.3
		15026	0.000	5	-9.6	-21.4
			2.560	5	-10.1	-23.2
		15027	0.000	5	-10.2	-23.3
			2.560	5	-10.7	-25.0
		15028	0.000	5	-9.7	-24.8

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	15028	2.560	5	-10.8	-26.5
		15029	0.000	5	-10.8	-26.5
			2.560	5	-12.0	-28.1
		15030	0.000	5	-12.0	-28.0
			1.280	5	-12.3	-31.0
		16031	0.000	5	-12.2	-28.6
			1.280	5	-12.7	-29.3
		16032	0.000	5	-17.1	-29.8
			2.560	5	-19.9	-31.3
		16033	0.000	5	-19.9	-31.3
			2.560	5	-22.7	-32.7
		16034	0.000	5	-28.2	-32.9
			2.560	5	-32.3	-34.3
		16035	0.000	5	-32.3	-34.3
			2.560	5	-36.5	-35.6
		16036	0.000	5	-34.7	-35.4
			1.280	5	-36.1	-35.7
		17037	0.000	5	-110.8	-37.1
			1.280	5	-114.7	-37.7
		17038	0.000	5	-111.9	-33.3
			2.560	5	-114.2	-34.7
		17039	0.000	5	-113.6	-34.3
			2.560	5	-127.2	-45.8
		17040	0.000	5	-126.6	-46.8
			2.560	5	-130.8	-48.9
		17041	0.000	5	-130.4	-50.0
			2.560	5	-136.6	-52.1
		17042	0.000	5	-136.3	-53.8
			1.280	5	-140.5	-55.0
		18043	0.000	5	-140.1	-37.4
			1.280	5	-147.1	-37.5
		18044	0.000	5	-118.8	-55.3
			2.560	5	-123.9	-57.5
		18045	0.000	5	-123.6	-57.4
			2.560	5	-130.2	-59.6
		18046	0.000	5	-98.8	-60.2
			2.560	5	-102.7	-62.5
		18047	0.000	5	-82.9	-58.5
			2.560	5	-91.0	-69.3
		18048	0.000	5	-91.2	-69.7
			1.280	5	-94.5	-72.1
		19049	0.000	5	-94.0	-43.6
			1.280	5	-102.0	-43.8
		19050	0.000	5	-63.2	-64.6
			2.560	5	-59.7	-87.3
		19051	0.000	5	-59.4	-82.3
			2.560	5	-61.7	-85.6
		19052	0.000	5	-37.7	-79.6
			2.560	5	-37.7	-83.0
		19053	0.000	5	-37.3	-76.7
			2.560	5	-37.3	-80.1
		19054	0.000	5	-36.8	-74.3
			1.290	5	-33.4	-77.6
		20055	0.000	5	-33.4	-75.0
			1.280	5	-35.3	-77.9

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	20056	0.000	5	-11.0	-71.2
			2.560	5	-9.3	-75.2
		20057	0.000	5	-8.7	-76.0
			2.560	5	-7.0	-80.0
		20058	0.000	5	-6.9	76.7
			2.560	5	-10.0	79.6
		20059	0.000	5	-9.2	71.7
			2.560	5	-12.4	75.4
		20060	0.000	5	-11.5	74.5
			1.280	5	-11.2	75.1
		21061	0.000	5	-38.2	77.9
			1.280	5	-38.2	77.9
		21062	0.000	5	-37.6	77.1
			2.560	5	-38.5	80.0
		21063	0.000	5	-38.0	80.4
			2.560	5	-38.8	82.5
		21064	0.000	5	-38.3	83.3
			2.560	5	-38.7	84.3
		21065	0.000	5	-63.3	66.8
			2.560	5	-64.3	66.3
		21066	0.000	5	-63.7	67.0
			1.280	5	-57.3	44.5
		22067	0.000	5	-95.4	72.3
			1.280	5	-92.2	70.5
		22068	0.000	5	-91.7	68.6
			2.560	5	-83.7	59.5
		22069	0.000	5	-83.8	60.1
			2.560	5	-81.1	59.1
		22070	0.000	5	-99.8	60.2
			2.560	5	-97.1	59.0
		22071	0.000	5	-124.9	56.9
			2.560	5	-119.8	55.8
		22072	0.000	5	-119.9	54.6
			1.280	5	-114.0	37.2
		23073	0.000	5	-141.5	55.0
			1.280	5	-137.3	54.1
		23074	0.000	5	-137.5	51.6
			2.560	5	-131.4	50.4
		23075	0.000	5	-131.7	48.6
			2.560	5	-127.5	47.1
		23076	0.000	5	-128.0	45.5
			2.560	5	-114.2	34.4
		23077	0.000	5	-114.8	34.5
			2.560	5	-112.5	33.3
		23078	0.000	5	-113.4	37.7
			1.280	5	-111.4	37.0
		24079	0.000	5	-52.1	35.8
			1.280	5	-50.0	35.3
		24080	0.000	5	-35.3	35.5
			2.560	5	-32.9	34.2
		24081	0.000	5	-32.7	34.3
			2.560	5	-28.8	32.8
		24082	0.000	5	-28.6	32.9
			2.560	5	-24.8	31.4
		24083	0.000	5	-20.3	31.3

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	24083	2.560	5	-17.6	29.7
		24084	0.000	5	-17.5	29.5
			1.290	5	-16.3	28.8
		25085	0.000	5	-12.7	31.0
			1.280	5	-12.6	29.9
		25086	0.000	5	-12.3	28.2
			2.560	5	-11.2	26.5
		25087	0.000	5	-11.1	26.5
			2.560	5	-10.1	24.8
		25088	0.000	5	-10.0	24.8
			2.560	5	-9.0	23.0
		25089	0.000	5	-10.4	23.3
			2.560	5	-9.9	21.4
		25090	0.000	5	-9.8	21.4
			1.280	5	-9.6	20.5
		26091	0.000	5	-9.6	20.5
			1.280	5	-9.4	19.5
		26092	0.000	5	-9.3	19.5
			2.560	5	-8.8	17.6
		26093	0.000	5	-8.0	17.4
			2.560	5	-7.7	15.4
		26094	0.000	5	-7.6	15.4
			2.560	5	-7.2	13.3
		26095	0.000	5	-7.2	13.3
			2.560	5	-6.8	11.2
		26096	0.000	5	-6.7	11.2
			1.280	5	-6.6	10.1
		27097	0.000	5	-6.6	10.1
			1.280	5	-6.4	9.0
		27098	0.000	5	-6.3	9.0
			2.560	5	-6.0	6.7
		27099	0.000	5	-5.9	6.8
			2.560	5	-5.5	4.4
		27100	0.000	5	-5.5	4.5
			2.560	5	-5.1	2.1
		27101	0.000	5	-5.3	2.1
			2.560	5	-4.8	-0.4
		27102	0.000	5	-4.8	-0.6
			1.280	5	-4.8	2.8
		28103	0.000	5	-1.0	-1.9
			1.280	5	-0.9	-3.1
		28104	0.000	5	-0.8	-2.9
			2.560	5	-0.5	-5.4
		28105	0.000	5	-0.4	-5.4
			2.560	5	-0.2	-8.0
		28106	0.000	5	0.0	-8.1
			2.560	5	0.2	-10.8
		28107	0.000	5	4.9	-10.8
			2.560	5	4.7	-13.5
		28108	0.000	5	4.7	-13.5
			1.280	5	3.1	-15.0
		29109	0.000	5	3.2	-15.7
			1.280	5	3.0	-17.0
		29110	0.000	5	11.7	-16.4
			2.560	5	10.1	-19.4

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	29111	0.000	5	10.2	-19.3
			2.560	5	8.2	-22.4
		29112	0.000	5	12.7	-22.5
			2.560	5	9.1	-25.6
		29113	0.000	5	9.1	-25.6
			2.560	5	4.8	-28.9
		29114	0.000	5	4.8	-28.9
			2.460	5	0.1	-131.6
LF	Lastfall		NR Stabnummer			
LF-Name	Lastfallbezeichnung		X Abstand zu Stabanfang			
Punkt	Spannungspunkt (Filter: = '5')					
SIGC	Druckspannung					
TAU	Schubspannung					

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	11001	0.000	6	0.4	51.3
			2.460	6	24.4	21.7
		11002	0.000	6	24.5	22.6
			2.560	6	46.8	19.2
		11003	0.000	6	46.7	19.2
			2.560	6	66.4	16.9
		11004	0.000	6	66.3	16.8
			2.560	6	83.3	14.6
		11005	0.000	6	70.8	15.3
			2.560	6	83.1	13.0
		11006	0.000	6	83.0	13.5
			1.280	6	88.8	12.7
		12007	0.000	6	68.4	12.8
			1.280	6	72.1	11.6
		12008	0.000	6	72.1	11.4
			2.560	6	78.5	9.2
		12009	0.000	6	78.4	9.1
			2.560	6	83.3	7.0
		12010	0.000	6	74.8	7.1
			2.560	6	77.8	4.9
		12011	0.000	6	74.8	4.8
			2.560	6	76.6	2.7
		12012	0.000	6	76.5	2.8
			1.280	6	77.0	1.8
		13013	0.000	6	77.0	-3.0
			1.280	6	77.4	-4.0
		13014	0.000	6	71.5	0.5
			2.560	6	71.0	-1.6
		13015	0.000	6	70.9	-1.8
			2.560	6	69.3	-3.8
		13016	0.000	6	67.3	-3.8
			2.560	6	64.8	-5.8
		13017	0.000	6	64.8	-5.8
			2.560	6	61.3	-7.7
		13018	0.000	6	61.3	-7.8
			1.280	6	59.3	-8.7
		14019	0.000	6	59.3	-8.7
			1.280	6	57.0	-9.6
		14020	0.000	6	57.0	-9.7
			2.560	6	51.8	-11.5
		14021	0.000	6	51.7	-11.6
			2.560	6	45.7	-13.3
		14022	0.000	6	45.7	-13.4
			2.560	6	38.8	-15.0
		14023	0.000	6	38.8	-15.1
			2.560	6	31.1	-16.7
		14024	0.000	6	31.1	-16.8
			1.290	6	26.7	-17.6
		15025	0.000	6	26.7	-17.6
			1.280	6	22.2	-18.4
		15026	0.000	6	22.2	-18.5
			2.560	6	12.6	-20.0
		15027	0.000	6	12.6	-20.0
			2.560	6	2.2	-21.5
		15028	0.000	6	3.5	-20.8

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	15028	2.560	6	-8.6	-22.2
		15029	0.000	6	-8.6	-22.2
			2.560	6	-21.4	-23.5
		15030	0.000	6	-21.4	-23.5
			1.280	6	-27.8	-26.4
		16031	0.000	6	-27.9	-24.0
			1.280	6	-34.6	-24.5
		16032	0.000	6	-43.8	-23.3
			2.560	6	-61.3	-24.4
		16033	0.000	6	-61.3	-24.5
			2.560	6	-79.6	-25.5
		16034	0.000	6	-91.2	-24.4
			2.560	6	-112.8	-25.4
		16035	0.000	6	-112.8	-25.4
			2.560	6	-135.2	-26.4
		16036	0.000	6	-133.5	-26.1
			1.280	6	-144.7	-26.3
		17037	0.000	6	-215.8	-24.3
			1.280	6	-230.1	-24.6
		17038	0.000	6	-226.7	-25.8
			2.560	6	-245.4	-26.8
		17039	0.000	6	-244.4	-26.7
			2.560	6	-267.7	-35.9
		17040	0.000	6	-266.8	-35.3
			2.560	6	-295.0	-36.7
		17041	0.000	6	-294.4	-35.9
			2.560	6	-327.1	-37.4
		17042	0.000	6	-326.7	-37.1
			1.280	6	-345.4	-38.0
		18043	0.000	6	-344.9	-20.8
			1.280	6	-366.6	-20.2
		18044	0.000	6	-308.3	-40.5
			2.560	6	-341.7	-42.2
		18045	0.000	6	-341.5	-41.5
			2.560	6	-378.1	-43.2
		18046	0.000	6	-309.4	-47.6
			2.560	6	-339.7	-49.5
		18047	0.000	6	-301.3	-47.3
			2.560	6	-335.9	-51.2
		18048	0.000	6	-336.0	-51.0
			1.280	6	-357.8	-53.1
		19049	0.000	6	-356.9	-25.9
			1.280	6	-379.3	-25.5
		19050	0.000	6	-296.4	-51.7
			2.560	6	-323.5	-72.7
		19051	0.000	6	-323.3	-68.2
			2.560	6	-357.9	-71.1
		19052	0.000	6	-306.6	-68.5
			2.560	6	-334.6	-71.5
		19053	0.000	6	-334.2	-65.8
			2.560	6	-361.0	-68.9
		19054	0.000	6	-360.5	-63.5
			1.290	6	-372.0	-66.7
		20055	0.000	6	-372.0	-64.6
			1.280	6	-387.2	-66.6

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	20056	0.000	6	-335.1	-62.5
			2.560	6	-357.0	-66.3
		20057	0.000	6	-356.4	-66.3
			2.560	6	-379.7	-70.1
		20058	0.000	6	-379.8	66.8
			2.560	6	-357.7	69.9
		20059	0.000	6	-357.0	62.8
			2.560	6	-336.5	66.7
		20060	0.000	6	-335.7	65.3
			1.280	6	-323.1	66.8
		21061	0.000	6	-374.7	67.0
			1.280	6	-362.0	67.2
		21062	0.000	6	-361.5	65.9
			2.560	6	-335.4	69.1
		21063	0.000	6	-334.9	68.9
			2.560	6	-307.6	71.4
		21064	0.000	6	-307.2	71.6
			2.560	6	-277.6	73.0
		21065	0.000	6	-327.3	53.5
			2.560	6	-297.5	53.5
		21066	0.000	6	-297.0	53.9
			1.280	6	-278.2	31.9
		22067	0.000	6	-358.7	53.2
			1.280	6	-336.9	51.9
		22068	0.000	6	-336.6	50.5
			2.560	6	-302.0	48.4
		22069	0.000	6	-302.0	48.7
			2.560	6	-274.9	48.1
		22070	0.000	6	-310.3	47.9
			2.560	6	-281.2	47.1
		22071	0.000	6	-342.7	41.6
			2.560	6	-309.2	41.0
		22072	0.000	6	-309.4	40.7
			1.280	6	-290.5	24.0
		23073	0.000	6	-346.4	38.0
			1.280	6	-327.7	37.4
		23074	0.000	6	-327.9	36.9
			2.560	6	-295.3	36.2
		23075	0.000	6	-295.7	36.3
			2.560	6	-267.5	35.5
		23076	0.000	6	-268.4	35.6
			2.560	6	-245.1	26.8
		23077	0.000	6	-246.1	26.7
			2.560	6	-227.4	25.8
		23078	0.000	6	-228.9	24.5
			1.280	6	-216.4	24.2
		24079	0.000	6	-176.4	24.3
			1.280	6	-163.4	23.9
		24080	0.000	6	-134.2	26.1
			2.560	6	-113.5	25.4
		24081	0.000	6	-113.4	25.4
			2.560	6	-91.9	24.4
		24082	0.000	6	-91.8	24.4
			2.560	6	-71.2	23.4
		24083	0.000	6	-61.9	24.5

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	24083	2.560	6	-44.5	23.3
		24084	0.000	6	-44.4	23.1
			1.290	6	-36.0	22.6
		25085	0.000	6	-28.3	26.4
			1.280	6	-21.9	25.4
		25086	0.000	6	-21.8	23.6
			2.560	6	-9.1	22.2
		25087	0.000	6	-9.0	22.2
			2.560	6	3.0	20.8
		25088	0.000	6	3.1	20.8
			2.560	6	14.3	19.4
		25089	0.000	6	12.2	20.1
			2.560	6	21.8	18.5
		25090	0.000	6	21.9	18.5
			1.280	6	26.4	17.6
		26091	0.000	6	26.4	17.6
			1.280	6	30.7	16.8
		26092	0.000	6	30.8	16.9
			2.560	6	38.8	15.2
		26093	0.000	6	38.5	15.1
			2.560	6	45.4	13.4
		26094	0.000	6	45.4	13.4
			2.560	6	51.5	11.6
		26095	0.000	6	51.5	11.6
			2.560	6	56.8	9.7
		26096	0.000	6	56.8	9.8
			1.280	6	59.1	8.8
		27097	0.000	6	59.1	8.8
			1.280	6	61.2	7.8
		27098	0.000	6	61.2	7.9
			2.560	6	64.7	5.9
		27099	0.000	6	64.7	5.9
			2.560	6	67.2	3.8
		27100	0.000	6	67.3	3.9
			2.560	6	68.8	1.8
		27101	0.000	6	71.0	1.7
			2.560	6	71.6	-0.5
		27102	0.000	6	71.6	-0.6
			1.280	6	71.2	2.9
		28103	0.000	6	77.1	-1.7
			1.280	6	76.6	-2.8
		28104	0.000	6	76.7	-2.6
			2.560	6	75.0	-4.8
		28105	0.000	6	75.0	-4.8
			2.560	6	72.1	-7.1
		28106	0.000	6	75.0	-7.1
			2.560	6	70.7	-9.5
		28107	0.000	6	78.7	-9.2
			2.560	6	72.4	-11.5
		28108	0.000	6	72.4	-11.5
			1.280	6	68.7	-12.8
		29109	0.000	6	68.7	-13.3
			1.280	6	64.3	-14.5
		29110	0.000	6	83.4	-13.0
			2.560	6	71.1	-15.4

LF: 3102, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	TAU [MPa]
3102	Bruchzustand_minMY	29111	0.000	6	71.1	-15.4
			2.560	6	56.7	-17.8
		29112	0.000	6	66.7	-16.9
			2.560	6	47.0	-19.3
		29113	0.000	6	47.0	-19.3
			2.560	6	24.5	-21.7
		29114	0.000	6	24.5	-21.7
			2.460	6	0.1	-108.2
LF	Lastfall	NR	Stabnummer			
LF-Name	Lastfallbezeichnung	X	Abstand zu Stabanfang			
Punkt	Spannungspunkt (Filter: #'6')					
SIGC	Druckspannung					
TAU	Schubspannung					

5.4 Lastkombination LM3 zur Ermittlung der Schwingbreiten

Standardnorm ist DIN Fachbericht 103 Stahlbrücken (2009) (Germany) V 2018

Gewählte Stabelemente

Selektion	NrA	NrE	x[m]	Typ	BA
STAB	11001	29114			AUTO
NrA,NrE Bereich der Elementnummern			Typ Elementtyp		
x[m] x-Wert des Stabschnitts oder Station			BA Bauphasen		

Schlaffe Bewehrung wird bei Querschnitten so wie in AQUA berücksichtigt
Speicherung der Bewehrung als Bemessungsfall 1

Untersuchte Lastfälle

LF	ACT	REF	BA	Bezeichnung	$\gamma-u$	$\gamma-f$	ψ_0	ψ_1	ψ_2	ψ_1'	SUP
941	XL3	Brutto	BA 9998	MAX-MY STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
942	XL3	Brutto	BA 9998	MIN-MY STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
943	XL3	Brutto	BA 9998	MAX-VZ STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
944	XL3	Brutto	BA 9998	MIN-VZ STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
945	XL3	Brutto	BA 9998	MAX-MT STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
946	XL3	Brutto	BA 9998	MIN-MT STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
947	XL3	Brutto	BA 9998	MAX-N STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
948	XL3	Brutto	BA 9998	MIN-N STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
949	XL3	Brutto	BA 9998	MAX-MZ STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
950	XL3	Brutto	BA 9998	MIN-MZ STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
951	XL3	Brutto	BA 9998	MAX-VY STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
952	XL3	Brutto	BA 9998	MIN-VY STAB	1.00	0.00	1.00	1.00	1.00	1.00	Q EXCL
LF Lastfall				BA Querschnitt auf den die Schnittgrößen wirken							
ACT Einwirkung				SUP Art und Gruppe der Einwirkung, sowie Überlagerungsmethode							
REF Referenzpunkt der Schnittgrößen											

Spannungsnachweis

Lastfallkombinationen

3201 LM3_maxMY
MAXD + My :
y * XL3

3202 LM3_minMY
MIND + My :
y * XL3

3203 LM3_maxVZ
MAXD + Vz :
y * XL3

3204 LM3_minVZ
MIND + Vz :
y * XL3

3205 LM3_maxMT
MAXD + Mt :
y * XL3

3206 LM3_minMT
MIND + Mt :
y * XL3

3207 LM3_maxN
MAXD + N :
y * XL3

3208 LM3_minN
MIND + N :
y * XL3

3209 LM3_maxVY
MAXD + Vy :
y * XL3

Lastfallkombinationen

3210 LM3_minVY

MIND + Vy :
y * XL3

3211 LM3_maxMZ

MAXD + Mz :
y * XL3

3212 LM3_minMZ

MIND + Mz :
y * XL3

Maximale Ergebnisse werden gespeichert unter Lastfall 3213

Maximale Ergebnisse werden gespeichert unter Lastfall 3214

5.5 Schwingbreiten

Nachfolgend finden sich die Schwingbreiten in der Bodenplatte und in dem Deckblech des Hohlkastens die für den Ermüdungsnachweis der jeweiligen Bauteile benötigt werden

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	11001	0.000	21	-0.1	14.8	14.9
			2.460	21	-1.1	13.6	14.7
		11002	0.000	21	-1.1	21.4	22.5
			2.560	21	-2.2	19.5	21.7
		11003	0.000	21	-2.2	27.0	29.2
			2.560	21	-3.3	24.5	27.8
		11004	0.000	21	-3.3	31.5	34.8
			2.560	21	-4.3	29.2	33.5
		11005	0.000	21	-3.7	29.7	33.4
			2.560	21	-4.5	30.6	35.2
		11006	0.000	21	-4.5	32.3	36.8
			1.280	21	-5.0	33.8	38.8
		12007	0.000	21	-3.8	25.6	29.4
			1.280	21	-4.1	28.0	32.2
		12008	0.000	21	-4.1	28.0	32.1
			2.560	21	-4.7	32.8	37.5
		12009	0.000	21	-4.7	32.7	37.4
			2.560	21	-5.4	37.6	42.9
		12010	0.000	21	-5.0	34.7	39.6
			2.560	21	-5.5	39.3	44.8
		12011	0.000	21	-5.1	36.3	41.4
			2.560	21	-5.6	40.6	46.3
		12012	0.000	21	-5.6	40.6	46.2
			1.280	21	-5.9	42.9	48.8
		13013	0.000	21	-5.8	42.8	48.6
			1.280	21	-6.1	44.8	50.9
		13014	0.000	21	-5.8	42.9	48.7
			2.560	21	-6.3	47.3	53.6
		13015	0.000	21	-6.3	47.3	53.5
			2.560	21	-6.7	51.8	58.5
		13016	0.000	21	-6.2	48.3	54.5
			2.560	21	-6.7	52.6	59.3
		13017	0.000	21	-6.6	52.6	59.3
			2.560	21	-7.1	57.1	64.1
		13018	0.000	21	-7.0	57.1	64.2
			1.280	21	-7.2	59.4	66.6
		14019	0.000	21	-7.2	59.4	66.6
			1.280	21	-7.4	61.6	69.1
		14020	0.000	21	-7.4	57.6	65.0
			2.560	21	-7.8	61.9	69.7
		14021	0.000	21	-7.8	57.8	65.6
			2.560	21	-8.2	62.0	70.1
		14022	0.000	21	-8.2	57.8	66.0
			2.560	21	-8.5	61.8	70.4
		14023	0.000	21	-8.5	57.7	66.2
			2.560	21	-8.8	61.6	70.4
		14024	0.000	21	-9.5	63.8	73.2
			1.290	21	-9.6	65.9	75.5
		15025	0.000	21	-9.6	63.5	73.2

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	15025	1.280	21	-9.8	65.5	75.3
		15026	0.000	21	-9.8	61.0	70.8
			2.560	21	-10.2	64.8	75.0
		15027	0.000	21	-10.2	60.3	70.5
			2.560	21	-10.5	64.1	74.6
		15028	0.000	21	-11.2	63.6	74.7
			2.560	21	-11.5	67.4	78.9
		15029	0.000	21	-11.5	62.5	74.0
			2.560	21	-11.9	66.2	78.1
		15030	0.000	21	-11.9	63.8	75.7
			1.280	21	-12.0	65.7	77.8
		16031	0.000	21	-12.1	63.3	75.4
			1.280	21	-12.2	65.0	77.1
		16032	0.000	21	-15.2	75.0	90.2
			2.560	21	-15.6	79.3	94.9
		16033	0.000	21	-15.6	72.9	88.5
			2.560	21	-16.0	77.0	93.0
		16034	0.000	21	-18.2	80.6	98.8
			2.560	21	-18.6	85.1	103.7
		16035	0.000	21	-18.6	77.8	96.4
			2.560	21	-19.0	82.2	101.2
		16036	0.000	21	-18.3	78.6	96.9
			1.280	21	-18.5	80.7	99.1
		17037	0.000	21	-22.9	92.3	115.2
			1.280	21	-23.2	94.7	117.8
		17038	0.000	21	-22.4	85.8	108.2
			2.560	21	-22.9	90.5	113.4
		17039	0.000	21	-22.9	81.7	104.7
			2.560	21	-23.4	86.2	109.6
		17040	0.000	21	-23.4	77.7	101.1
			2.560	21	-23.9	81.9	105.8
		17041	0.000	21	-23.9	73.5	97.4
			2.560	21	-24.4	77.5	101.9
		17042	0.000	21	-24.4	73.4	97.8
			1.280	21	-24.7	75.5	100.2
		18043	0.000	21	-24.6	71.3	96.0
			1.280	21	-24.9	73.3	98.1
		18044	0.000	21	-20.8	54.6	75.4
			2.560	21	-21.4	58.0	79.4
		18045	0.000	21	-21.4	51.5	72.9
			2.560	21	-21.9	54.5	76.4
		18046	0.000	21	-18.1	39.8	57.8
			2.560	21	-18.5	42.0	60.5
		18047	0.000	21	-16.2	32.5	48.7
			2.560	21	-16.5	34.2	50.7
		18048	0.000	21	-16.5	32.2	48.8
			1.280	21	-16.7	33.1	49.8
		19049	0.000	21	-16.7	30.9	47.6
			1.280	21	-16.7	31.4	48.2
		19050	0.000	21	-13.0	21.3	34.2
			2.560	21	-13.2	22.3	35.5
		19051	0.000	21	-13.2	19.4	32.6
			2.560	21	-13.3	20.0	33.3
		19052	0.000	21	-11.5	14.8	26.3
			2.560	21	-13.2	15.2	28.4

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	19053	0.000	21	-13.0	13.0	26.0
			2.560	21	-14.7	13.3	27.9
		19054	0.000	21	-14.5	12.3	26.8
			1.290	21	-15.5	12.5	28.0
		20055	0.000	21	-15.5	11.3	26.7
			1.280	21	-16.2	11.4	27.6
		20056	0.000	21	-13.7	8.1	21.8
			2.560	21	-15.0	8.1	23.2
		20057	0.000	21	-14.9	6.4	21.3
			2.560	21	-16.2	6.5	22.7
		20058	0.000	21	-14.2	9.2	23.4
			2.560	21	-13.0	12.6	25.5
		20059	0.000	21	-13.0	10.4	23.4
			2.560	21	-11.8	13.9	25.7
		20060	0.000	21	-11.8	12.9	24.7
			1.280	21	-11.1	14.7	25.8
		21061	0.000	21	-12.9	15.5	28.4
			1.280	21	-12.2	17.7	29.9
		21062	0.000	21	-12.2	14.9	27.1
			2.560	21	-12.1	19.3	31.4
		21063	0.000	21	-12.0	16.4	28.5
			2.560	21	-12.0	20.8	32.8
		21064	0.000	21	-11.9	18.0	29.9
			2.560	21	-11.9	22.4	34.3
		21065	0.000	21	-13.8	22.9	36.7
			2.560	21	-13.6	27.9	41.5
		21066	0.000	21	-13.5	26.2	39.7
			1.280	21	-13.5	28.9	42.4
		22067	0.000	21	-17.5	35.1	52.5
			1.280	21	-17.3	38.3	55.6
		22068	0.000	21	-17.2	33.5	50.8
			2.560	21	-16.9	40.1	57.0
		22069	0.000	21	-16.9	35.4	52.3
			2.560	21	-16.5	41.9	58.3
		22070	0.000	21	-18.8	42.4	61.3
			2.560	21	-18.4	49.8	68.1
		22071	0.000	21	-22.3	53.8	76.1
			2.560	21	-21.7	62.5	84.2
		22072	0.000	21	-21.7	59.1	80.8
			1.280	21	-21.4	63.7	85.2
		23073	0.000	21	-25.7	72.1	97.8
			1.280	21	-25.4	77.5	102.9
		23074	0.000	21	-25.4	69.1	94.6
			2.560	21	-24.9	80.1	105.0
		23075	0.000	21	-24.9	71.9	96.8
			2.560	21	-24.4	82.9	107.3
		23076	0.000	21	-24.4	74.8	99.2
			2.560	21	-23.9	85.8	109.7
		23077	0.000	21	-23.9	77.8	101.7
			2.560	21	-23.4	88.8	112.2
		23078	0.000	21	-23.4	84.8	108.1
			1.280	21	-23.9	90.5	114.4
		24079	0.000	21	-23.9	86.3	110.2
			1.280	21	-23.7	92.1	115.8
		24080	0.000	21	-19.1	70.2	89.3

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	24080	2.560	21	-19.4	79.4	98.8
		24081	0.000	21	-19.4	73.0	92.4
			2.560	21	-19.0	82.2	101.2
		24082	0.000	21	-19.0	75.7	94.7
			2.560	21	-18.5	85.0	103.5
		24083	0.000	21	-16.3	68.7	85.0
			2.560	21	-15.9	76.8	92.7
		24084	0.000	21	-15.9	73.9	89.8
			1.290	21	-15.7	78.3	94.0
		25085	0.000	21	-12.6	60.1	72.6
			1.280	21	-12.3	63.2	75.5
		25086	0.000	21	-12.4	58.8	71.2
			2.560	21	-12.0	65.2	77.3
		25087	0.000	21	-12.0	60.7	72.7
			2.560	21	-11.7	67.1	78.8
		25088	0.000	21	-11.7	62.4	74.1
			2.560	21	-11.3	68.8	80.1
		25089	0.000	21	-10.6	59.9	70.5
			2.560	21	-10.2	65.9	76.1
		25090	0.000	21	-10.2	63.6	73.9
			1.280	21	-10.1	66.7	76.7
		26091	0.000	21	-10.1	64.3	74.3
			1.280	21	-9.9	67.3	77.2
		26092	0.000	21	-9.9	62.5	72.4
			2.560	21	-9.5	68.5	78.0
		26093	0.000	21	-8.9	59.4	68.3
			2.560	21	-8.5	65.0	73.5
		26094	0.000	21	-8.5	60.4	68.9
			2.560	21	-8.1	66.0	74.1
		26095	0.000	21	-8.1	61.2	69.4
			2.560	21	-7.7	66.8	74.5
		26096	0.000	21	-7.8	64.4	72.1
			1.280	21	-7.6	67.2	74.8
		27097	0.000	21	-7.6	64.7	72.2
			1.280	21	-7.3	67.5	74.8
		27098	0.000	21	-7.4	62.4	69.8
			2.560	21	-6.9	68.0	74.9
		27099	0.000	21	-6.9	62.8	69.7
			2.560	21	-6.5	68.3	74.8
		27100	0.000	21	-6.5	63.0	69.5
			2.560	21	-6.1	68.5	74.6
		27101	0.000	21	-6.5	67.6	74.1
			2.560	21	-6.0	73.5	79.6
		27102	0.000	21	-6.1	70.5	76.5
			1.280	21	-5.8	73.7	79.5
		28103	0.000	21	-6.1	73.9	80.0
			1.280	21	-5.8	77.0	82.9
		28104	0.000	21	-5.8	70.4	76.2
			2.560	21	-5.3	76.6	82.0
		28105	0.000	21	-5.3	69.8	75.2
			2.560	21	-4.8	76.1	80.9
		28106	0.000	21	-5.2	74.8	80.0
			2.560	21	-4.6	81.6	86.1
		28107	0.000	21	-5.0	79.7	84.6
			2.560	21	-4.3	87.0	91.3

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X	Punkt	SIGC	SIGT	dSIG
			[m]		[MPa]	[MPa]	[MPa]
3213	LM3_max	28108	0.000	21	-4.3	82.7	87.0
			1.280	21	-3.9	86.3	90.3
		29109	0.000	21	-4.0	81.8	85.8
			1.280	21	-3.6	85.1	88.7
		29110	0.000	21	-4.7	100.1	104.9
			2.560	21	-3.8	109.7	113.5
		29111	0.000	21	-3.8	23.4	27.2
			2.560	21	-2.9	17.6	20.5
		29112	0.000	21	-3.4	21.0	24.4
			2.560	21	-2.3	14.0	16.3
		29113	0.000	21	-2.3	14.1	16.4
			2.560	21	-1.2	7.0	8.1
		29114	0.000	21	-1.2	7.0	8.2
			2.460	21	0.0	0.0	0.0
LF	Lastfall		NR Stabnummer				
LF-Name	Lastfallbezeichnung		X Abstand zu Stabanfang				
Punkt	Spannungspunkt (Filter: ='21')						
SIGC	Druckspannung						
SIGT	Zugspannung						
dSIG	Schwingbreite Normalspannung						

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	11001	0.000	31	-4.7	0.0	4.7
			2.460	31	-4.3	0.3	4.6
		11002	0.000	31	-6.8	0.4	7.2
			2.560	31	-6.3	0.7	6.9
		11003	0.000	31	-8.7	0.7	9.4
			2.560	31	-8.0	1.0	9.0
		11004	0.000	31	-10.2	1.0	11.2
			2.560	31	-9.5	1.3	10.8
		11005	0.000	31	-11.4	1.3	12.7
			2.560	31	-11.8	1.6	13.4
		11006	0.000	31	-12.5	1.6	14.1
			1.280	31	-13.0	1.8	14.8
		12007	0.000	31	-12.9	1.8	14.7
			1.280	31	-13.8	1.9	15.7
		12008	0.000	31	-13.8	1.9	15.7
			2.560	31	-16.1	2.2	18.3
		12009	0.000	31	-16.1	2.2	18.3
			2.560	31	-18.5	2.4	21.0
		12010	0.000	31	-18.2	2.4	20.6
			2.560	31	-20.6	2.7	23.3
		12011	0.000	31	-20.8	2.7	23.5
			2.560	31	-23.3	3.0	26.3
		12012	0.000	31	-23.3	3.0	26.3
			1.280	31	-24.6	3.1	27.7
		13013	0.000	31	-24.6	3.1	27.6
			1.280	31	-25.7	3.2	28.9
		13014	0.000	31	-25.4	3.2	28.6
			2.560	31	-28.0	3.4	31.4
		13015	0.000	31	-28.0	3.4	31.4
			2.560	31	-30.7	3.6	34.4
		13016	0.000	31	-31.0	3.7	34.6
			2.560	31	-33.8	3.9	37.7
		13017	0.000	31	-33.8	3.9	37.7
			2.560	31	-36.7	4.1	40.9
		13018	0.000	31	-36.8	4.1	40.9
			1.280	31	-38.3	4.2	42.5
		14019	0.000	31	-38.3	4.2	42.5
			1.280	31	-39.8	4.3	44.1
		14020	0.000	31	-37.1	4.3	41.4
			2.560	31	-40.0	4.6	44.6
		14021	0.000	31	-37.3	4.6	41.8
			2.560	31	-40.1	4.8	44.9
		14022	0.000	31	-37.3	4.8	42.1
			2.560	31	-40.1	5.0	45.1
		14023	0.000	31	-37.3	5.0	42.3
			2.560	31	-40.0	5.2	45.2
		14024	0.000	31	-38.4	5.2	43.5
			1.290	31	-39.7	5.3	45.0
		15025	0.000	31	-38.3	5.3	43.6
			1.280	31	-39.6	5.4	45.0
		15026	0.000	31	-36.8	5.4	42.2
			2.560	31	-39.4	5.6	44.9
		15027	0.000	31	-36.6	5.6	42.1
			2.560	31	-39.0	5.8	44.8
		15028	0.000	31	-36.7	5.9	42.6

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	15028	2.560	31	-39.1	6.1	45.2
		15029	0.000	31	-36.2	6.1	42.3
			2.560	31	-38.5	6.3	44.8
		15030	0.000	31	-37.1	6.3	43.4
			1.280	31	-38.4	6.4	44.7
		16031	0.000	31	-37.0	6.4	43.4
			1.280	31	-38.1	6.5	44.5
		16032	0.000	31	-35.7	6.6	42.3
			2.560	31	-38.0	6.8	44.8
		16033	0.000	31	-35.0	6.8	41.8
			2.560	31	-37.2	7.0	44.1
		16034	0.000	31	-34.5	7.1	41.6
			2.560	31	-36.7	7.3	43.9
		16035	0.000	31	-33.6	7.3	40.9
			2.560	31	-35.7	7.4	43.1
		16036	0.000	31	-34.1	8.1	42.3
			1.280	31	-35.8	8.4	44.2
		17037	0.000	31	-34.9	7.8	42.7
			1.280	31	-35.9	7.9	43.8
		17038	0.000	31	-32.7	8.6	41.3
			2.560	31	-34.7	8.9	43.5
		17039	0.000	31	-31.5	8.9	40.4
			2.560	31	-33.4	9.1	42.5
		17040	0.000	31	-30.3	9.1	39.4
			2.560	31	-32.1	9.3	41.4
		17041	0.000	31	-29.0	9.3	38.3
			2.560	31	-30.7	9.5	40.2
		17042	0.000	31	-29.2	9.5	38.7
			1.280	31	-30.1	9.6	39.7
		18043	0.000	31	-28.6	9.6	38.2
			1.280	31	-29.0	9.5	38.5
		18044	0.000	31	-25.5	9.3	34.9
			2.560	31	-27.4	9.7	37.1
		18045	0.000	31	-24.6	9.7	34.2
			2.560	31	-26.6	10.1	36.8
		18046	0.000	31	-23.0	9.7	32.8
			2.560	31	-24.6	10.0	34.6
		18047	0.000	31	-22.0	10.1	32.1
			2.560	31	-23.4	10.3	33.8
		18048	0.000	31	-22.1	10.3	32.4
			1.280	31	-22.8	10.5	33.3
		19049	0.000	31	-21.4	10.5	31.9
			1.280	31	-21.5	10.3	31.8
		19050	0.000	31	-18.5	10.1	28.6
			2.560	31	-19.6	10.3	29.9
		19051	0.000	31	-17.0	10.3	27.4
			2.560	31	-18.1	10.6	28.7
		19052	0.000	31	-15.4	10.5	25.9
			2.560	31	-16.1	10.1	26.2
		19053	0.000	31	-13.6	10.2	23.8
			2.560	31	-14.2	11.5	25.7
		19054	0.000	31	-12.9	11.5	24.5
			1.290	31	-13.2	12.3	25.5
		20055	0.000	31	-12.0	12.3	24.3
			1.280	31	-12.2	13.0	25.2

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	20056	0.000	31	-9.7	12.8	22.6
			2.560	31	-10.0	14.1	24.1
		20057	0.000	31	-7.7	14.2	21.8
			2.560	31	-7.9	15.6	23.5
		20058	0.000	31	-9.3	14.0	23.3
			2.560	31	-13.3	12.5	25.8
		20059	0.000	31	-10.5	12.6	23.1
			2.560	31	-14.7	11.2	25.9
		20060	0.000	31	-13.3	11.3	24.6
			1.280	31	-15.4	11.3	26.7
		21061	0.000	31	-14.1	11.3	25.4
			1.280	31	-16.3	11.3	27.5
		21062	0.000	31	-13.5	11.3	24.8
			2.560	31	-17.7	11.2	28.9
		21063	0.000	31	-15.0	11.2	26.2
			2.560	31	-19.2	11.1	30.3
		21064	0.000	31	-16.5	11.0	27.5
			2.560	31	-20.4	10.8	31.2
		21065	0.000	31	-17.9	10.9	28.8
			2.560	31	-21.8	10.6	32.4
		21066	0.000	31	-20.4	10.6	31.0
			1.280	31	-22.9	10.8	33.7
		22067	0.000	31	-22.1	11.0	33.1
			1.280	31	-24.0	10.8	34.9
		22068	0.000	31	-21.2	10.8	32.0
			2.560	31	-25.1	10.6	35.7
		22069	0.000	31	-22.3	10.6	32.9
			2.560	31	-26.1	10.3	36.4
		22070	0.000	31	-23.2	10.2	33.4
			2.560	31	-26.5	9.8	36.2
		22071	0.000	31	-24.6	10.1	34.7
			2.560	31	-28.1	9.8	37.9
		22072	0.000	31	-26.7	9.8	36.5
			1.280	31	-29.1	9.9	38.9
		23073	0.000	31	-28.2	10.0	38.2
			1.280	31	-30.2	9.9	40.1
		23074	0.000	31	-27.2	9.9	37.1
			2.560	31	-31.2	9.7	40.9
		23075	0.000	31	-28.3	9.7	38.0
			2.560	31	-32.3	9.5	41.7
		23076	0.000	31	-29.3	9.5	38.8
			2.560	31	-33.3	9.2	42.5
		23077	0.000	31	-30.3	9.2	39.6
			2.560	31	-34.3	9.0	43.3
		23078	0.000	31	-32.8	9.0	41.8
			1.280	31	-34.8	8.1	42.9
		24079	0.000	31	-33.3	8.1	41.4
			1.280	31	-34.6	7.9	42.6
		24080	0.000	31	-31.2	8.5	39.7
			2.560	31	-35.0	7.6	42.5
		24081	0.000	31	-32.2	7.6	39.7
			2.560	31	-35.9	7.4	43.3
		24082	0.000	31	-33.1	7.4	40.5
			2.560	31	-36.9	7.2	44.0
		24083	0.000	31	-33.7	7.1	40.8

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]
3213	LM3_max	24083	2.560	31	-37.4	6.9	44.2
		24084	0.000	31	-35.9	6.9	42.8
			1.290	31	-37.9	6.8	44.7
		25085	0.000	31	-35.9	6.6	42.6
			1.280	31	-37.6	6.5	44.1
		25086	0.000	31	-34.8	6.5	41.3
			2.560	31	-38.4	6.3	44.8
		25087	0.000	31	-35.6	6.3	41.9
			2.560	31	-39.3	6.1	45.4
		25088	0.000	31	-36.4	6.1	42.5
			2.560	31	-40.0	5.9	45.9
		25089	0.000	31	-36.6	5.8	42.4
			2.560	31	-40.2	5.6	45.8
		25090	0.000	31	-38.8	5.6	44.3
			1.280	31	-40.6	5.5	46.1
		26091	0.000	31	-39.1	5.5	44.6
			1.280	31	-40.9	5.4	46.3
		26092	0.000	31	-37.9	5.4	43.3
			2.560	31	-41.5	5.2	46.7
		26093	0.000	31	-38.7	5.2	43.9
			2.560	31	-42.3	5.0	47.3
		26094	0.000	31	-39.2	5.0	44.2
			2.560	31	-42.8	4.7	47.5
		26095	0.000	31	-39.6	4.7	44.3
			2.560	31	-43.1	4.5	47.7
		26096	0.000	31	-41.5	4.5	46.0
			1.280	31	-43.3	4.4	47.7
		27097	0.000	31	-41.6	4.4	46.0
			1.280	31	-43.4	4.3	47.7
		27098	0.000	31	-40.1	4.3	44.4
			2.560	31	-43.7	4.0	47.7
		27099	0.000	31	-40.2	4.0	44.3
			2.560	31	-43.8	3.8	47.6
		27100	0.000	31	-40.3	3.8	44.1
			2.560	31	-43.9	3.6	47.5
		27101	0.000	31	-40.0	3.5	43.5
			2.560	31	-43.5	3.3	46.8
		27102	0.000	31	-41.7	3.3	45.0
			1.280	31	-43.6	3.2	46.8
		28103	0.000	31	-42.4	3.2	45.6
			1.280	31	-44.2	3.1	47.2
		28104	0.000	31	-40.3	3.1	43.4
			2.560	31	-43.9	2.8	46.7
		28105	0.000	31	-40.0	2.8	42.8
			2.560	31	-43.6	2.5	46.1
		28106	0.000	31	-39.2	2.5	41.7
			2.560	31	-42.7	2.2	44.9
		28107	0.000	31	-39.2	2.3	41.4
			2.560	31	-42.7	2.0	44.6
		28108	0.000	31	-40.5	2.0	42.5
			1.280	31	-43.1	1.8	44.9
		29109	0.000	31	-40.9	1.8	42.7
			1.280	31	-42.5	1.7	44.2
		29110	0.000	31	-38.4	1.7	40.1
			2.560	31	-41.9	1.4	43.3

LF: 3213, Stabelemente Spannungen im Spannungspunkt

LF	LF-Name	NR	X [m]	Punkt	SIGC [MPa]	SIGT [MPa]	dSIG [MPa]	
3213	LM3_max	29111	0.000	31	-9.0	1.4	10.4	
			2.560	31	-6.7	1.0	7.8	
		29112	0.000	31	-6.8	1.0	7.9	
			2.560	31	-4.5	0.7	5.2	
		29113	0.000	31	-4.5	0.7	5.2	
			2.560	31	-2.2	0.3	2.6	
		29114	0.000	31	-2.2	0.4	2.6	
			2.460	31	0.0	0.0	0.0	
LF Lastfall NR Stabnummer LF-Name Lastfallbezeichnung X Abstand zu Stabanfang Punkt Spannungspunkt (Filter: = '31') SIGC Druckspannung SIGT Zugspannung dSIG Schwingbreite Normalspannung								

5.6 Ausgangswerte für Berechnung der Lagerbedingungen des Quersystems

Nachfolgend finden sich die Knotenverschiebungen und Verdrehungen zur Bestimmung der Auflagerbedingungen des Quersystems

LF: 997, Knotenverschiebung in global Z Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

LF	LF-Name	Nummer	u-Z [mm]
997	Einzellast	1	0.000
		2	7.987
		3	16.230
		4	24.337
		5	32.248
		6	39.916
		7	43.651
		8	47.313
		9	54.434
		10	61.250
		11	67.735
		12	73.873
		13	76.806
		14	79.641
		15	85.014
		16	89.970
		17	94.488
		18	98.547
		19	100.397
		20	102.118
		21	105.169
		22	107.667
		23	109.580
		24	110.873
		25	111.277
		26	111.210
		27	110.595
		28	109.388
		29	107.641
		30	105.402
		31	104.117
		32	102.727
		33	99.631
		34	96.141
		35	92.291
		36	88.118
		37	85.926
		38	83.665
		39	78.955
		40	74.035
		41	68.953
		42	63.757
		43	61.129
		44	58.488
		45	53.193
		46	47.906
		47	42.659
		48	37.474
		49	34.912
		50	32.374

LF: 997, Knotenverschiebung in global Z Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

LF	LF-Name	Nummer	u-Z [mm]
997	Einzellast	51	27.376
		52	22.488
		53	17.722
		54	13.083
		55	10.798
		56	8.567
		57	4.213
		58	0.000
		59	-3.939
		60	-7.756
		61	-9.616
		62	-11.443
		63	-14.992
		64	-18.395
		65	-21.652
		66	-24.754
		67	-26.244
		68	-27.689
		69	-30.436
		70	-32.992
		71	-35.353
		72	-37.499
		73	-38.488
		74	-39.415
		75	-41.079
		76	-42.491
		77	-43.651
		78	-44.565
		79	-44.930
		80	-45.234
		81	-45.678
		82	-45.915
		83	-45.948
		84	-45.789
		85	-45.641
		86	-45.453
		87	-44.963
		88	-44.324
		89	-43.541
		90	-42.619
		91	-42.108
		92	-41.564
		93	-40.381
		94	-39.076
		95	-37.654
		96	-36.119
		97	-35.311
		98	-34.477
		99	-32.730
		100	-30.885
		101	-28.945
		102	-26.913
		103	-25.864
		104	-24.794
		105	-22.591

LF: 997, Knotenverschiebung in global Z Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25

LF	LF-Name	Nummer	u-Z [mm]
997	Einzellast	106	-20.309
		107	-17.955
		108	-15.531
		109	-14.296
		110	-13.046
		111	-10.500
		112	-7.901
		113	-5.259
		114	-2.585
LF	Lastfall		
LF-Name	Lastfallbezeichnung		
Nummer	Knoten (Filter: >=1 und <=114)		
u-Z	Knotenverschiebungen		

LF: 998, Knotenverdrehung um global X Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,2

LF	LF-Name	Nummer	phi-X [mrad]
998	Einzelmoment	1	0.000
		2	0.045
		3	0.090
		4	0.135
		5	0.179
		6	0.220
		7	0.241
		8	0.260
		9	0.297
		10	0.334
		11	0.370
		12	0.406
		13	0.424
		14	0.441
		15	0.477
		16	0.512
		17	0.547
		18	0.582
		19	0.600
		20	0.618
		21	0.654
		22	0.690
		23	0.727
		24	0.766
		25	0.786
		26	0.764
		27	0.723
		28	0.684
		29	0.646
		30	0.610
		31	0.593
		32	0.575
		33	0.540
		34	0.506
		35	0.472
		36	0.439
		37	0.423
		38	0.406
		39	0.373
		40	0.341
		41	0.310
		42	0.280
		43	0.265
		44	0.250
		45	0.224
		46	0.198
		47	0.173
		48	0.149
		49	0.138
		50	0.126
		51	0.105
		52	0.085
		53	0.066
		54	0.048
		55	0.039

LF: 998, Knotenverdrehung um global X Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,2

LF	LF-Name	Numer	phi-X [mrad]
998	Einzelmoment	56	0.031
		57	0.015
		58	0.000
		59	0.000
		60	-0.001
		61	-0.001
		62	-0.001
		63	-0.002
		64	-0.002
		65	-0.003
		66	-0.003
		67	-0.003
		68	-0.004
		69	-0.004
		70	-0.004
		71	-0.004
		72	-0.005
		73	-0.005
		74	-0.005
		75	-0.005
		76	-0.005
		77	-0.005
		78	-0.005
		79	-0.005
		80	-0.005
		81	-0.005
		82	-0.005
		83	-0.005
		84	-0.005
		85	-0.005
		86	-0.005
		87	-0.005
		88	-0.004
		89	-0.004
		90	-0.004
		91	-0.004
		92	-0.004
		93	-0.004
		94	-0.004
		95	-0.004
		96	-0.003
		97	-0.003
		98	-0.003
		99	-0.003
		100	-0.003
		101	-0.003
		102	-0.002
		103	-0.002
		104	-0.002
		105	-0.002
		106	-0.002
		107	-0.002
		108	-0.001
		109	-0.001
		110	-0.001

LF: 998, Knotenverdrehung um global X Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,2

LF	LF-Name	Nummer	phi-X [mrad]
998	Einzelmoment	111	-0.001
		112	-0.001
		113	-0.001
		114	0.000
LF Lastfall			
LF-Name	Lastfallbezeichnung		
Nummer	Knoten (Filter: >=1 und <=114)		
phi-X	Knotenverschiebungen		

LF: 999, Knoten Knotenverschiebung; Knoten Knotenverdrehung Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,

LF	LF-Name	Nummer	u-Z [mm]	phi-X [mrad]
999	LM3 Knoten 23	1	0.000	0.000
		2	3.851	0.071
		3	7.826	0.142
		4	11.737	0.212
		5	15.554	0.280
		6	19.258	0.344
		7	21.062	0.375
		8	22.833	0.402
		9	26.277	0.456
		10	29.578	0.508
		11	32.722	0.556
		12	35.702	0.602
		13	37.128	0.623
		14	38.508	0.644
		15	41.127	0.683
		16	43.550	0.718
		17	45.766	0.750
		18	47.767	0.777
		19	48.682	0.788
		20	49.537	0.800
		21	51.062	0.818
		22	52.327	0.831
		23	53.315	0.839
		24	53.695	0.840
		25	53.754	0.838
		26	53.725	0.836
		27	53.434	0.827
		28	52.857	0.814
		29	52.018	0.796
		30	50.941	0.775
		31	50.322	0.763
		32	49.652	0.750
		33	48.159	0.721
		34	46.475	0.690
		35	44.616	0.656
		36	42.600	0.621
		37	41.542	0.603
		38	40.449	0.583
		39	38.173	0.543
		40	35.795	0.502
		41	33.338	0.461
		42	30.826	0.420
		43	29.555	0.399
		44	28.278	0.379
		45	25.718	0.341
		46	23.161	0.303
		47	20.624	0.266
		48	18.116	0.231
		49	16.877	0.213
		50	15.650	0.196
		51	13.233	0.164
		52	10.870	0.133
		53	8.566	0.104
		54	6.323	0.076
		55	5.219	0.063

LF: 999, Knoten Knotenverschiebung; Knoten Knotenverdrehung Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,

LF	LF-Name	Nummer	u-Z [mm]	phi-X [mrad]
999	LM3 Knoten 23	56	4.140	0.049
		57	2.036	0.024
		58	0.000	0.000
		59	-1.903	-0.001
		60	-3.747	-0.002
		61	-4.646	-0.003
		62	-5.528	-0.003
		63	-7.242	-0.005
		64	-8.886	-0.006
		65	-10.460	-0.007
		66	-11.958	-0.008
		67	-12.677	-0.008
		68	-13.375	-0.008
		69	-14.701	-0.009
		70	-15.936	-0.009
		71	-17.076	-0.010
		72	-18.112	-0.010
		73	-18.590	-0.010
		74	-19.037	-0.011
		75	-19.841	-0.011
		76	-20.522	-0.011
		77	-21.083	-0.011
		78	-21.524	-0.011
		79	-21.700	-0.011
		80	-21.846	-0.011
		81	-22.061	-0.011
		82	-22.175	-0.011
		83	-22.191	-0.011
		84	-22.114	-0.011
		85	-22.042	-0.011
		86	-21.951	-0.011
		87	-21.715	-0.011
		88	-21.406	-0.011
		89	-21.028	-0.010
		90	-20.582	-0.010
		91	-20.336	-0.010
		92	-20.073	-0.010
		93	-19.502	-0.010
		94	-18.871	-0.009
		95	-18.184	-0.009
		96	-17.443	-0.008
		97	-17.053	-0.008
		98	-16.650	-0.008
		99	-15.807	-0.008
		100	-14.915	-0.007
		101	-13.978	-0.007
		102	-12.997	-0.006
		103	-12.491	-0.006
		104	-11.974	-0.006
		105	-10.910	-0.005
		106	-9.808	-0.004
		107	-8.671	-0.004
		108	-7.500	-0.003
		109	-6.904	-0.003
		110	-6.300	-0.003

LF: 999, Knoten Knotenverschiebung; Knoten Knotenverdrehung Gruppen 1,2,3,4,5,6,8,9,11,12,13,14,15,16,17,18,

LF	LF-Name	Nummer	u-Z [mm]	phi-X [mrad]
999	LM3 Knoten 23	111	-5.071	-0.002
		112	-3.816	-0.002
		113	-2.540	-0.001
		114	-1.248	-0.001
LF	Lastfall			
LF-Name	Lastfallbezeichnung			
Nummer	Knoten (Filter: >=1 und <=114)			
u-Z, phi-X	Knotenverschiebungen			

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