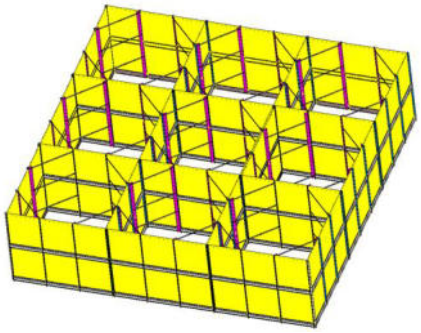
seit 1913
schmelzer
WIR MEISTERN METALL

DE	Deutsch	Bedienungs- und Montageanleitung
EN	English	Operating and installation manual
FR	Français	Manuel d´utilisation

Viereckzelle

Modular wall cells

Cellules carrées



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seit 1913
schmelzer
WIR MEISTERN METALL

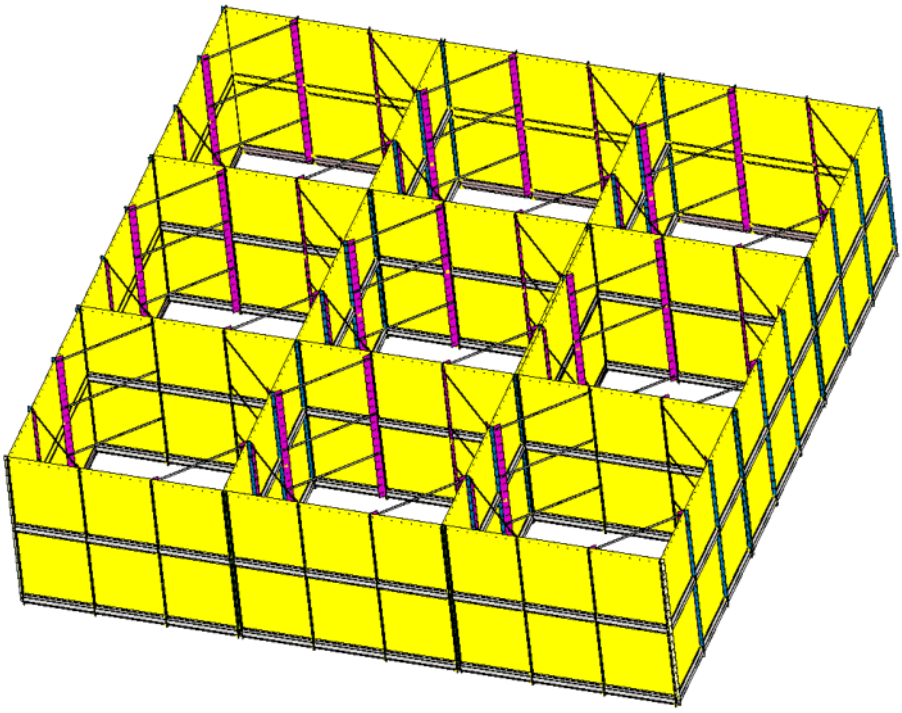
Betriebsanleitung

Originalbetriebsanleitung

Viereckzellen

sowie mit Trichterunterbau

Technische Änderungen vorbehalten



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Vor Inbetriebnahme diese Anleitung lesen und beachten

1 Allgemeines

1.1 Vorwort

Diese Anleitung wurde unter Beachtung der Maschinen-Richtlinie der EU (06/42/EG) erstellt und soll es erleichtern, die bestimmungsgemäßen Einsatzmöglichkeiten zu nutzen. Die Anleitung enthält wichtige Hinweise, um das Produkt sicher und sachgerecht zu betreiben.

Die Anleitung muss ständig am Einsatzort des Produktes verfügbar sein.

Die Anleitung ist von jeder Person zu lesen und anzuwenden, die mit Bedienung und Handhabung, Instandhaltung (Wartung, Inspektion, Instandsetzung) beauftragt ist.

Die Anleitung ist an jeden nachfolgenden Besitzer oder Benutzer weiterzugeben.

Neben der Anleitung und den im Verwendungsland und am Einsatzort geltenden, verbindlichen Regelungen zur Unfallverhütung wie „Vorschriften für Sicherheit und Gesundheitsschutz der landwirtschaftlichen Berufsgenossenschaft“ sind auch die anerkannten fachtechnischen Regeln für sicherheits- und fachgerechtes Arbeiten zu beachten.

Das Urheberrecht für die Anleitung bleibt Eigentum der Fa. Schmelzer und darf ohne deren schriftliche Einwilligung nicht kopiert oder Dritten zugänglich gemacht werden.

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1.2 Symbolerklärung

	Fußschutz verwenden
	Augenschutz verwenden
	Gehörschutz tragen
	Gebrauchsanweisung beachten
	Kopfschutz verwenden
	Warnung vor einer Gefahrenstelle
	Warnung vor giftigen Stoffen
	Warnung vor spitzem Gegenstand
	Warnung vor Hindernissen im Kopfbereich
	Warnung vor Rutschgefahr

2 Anlagenbeschreibung

2.1 Bezeichnung

Viereckzellen zur Lagerung von Getreide (Weizen, Roggen, Gerste, Hafer, Mais) in überdachten Gebäuden. Optional kann eine Belüftungseinrichtung angebracht werden, um das Material zu belüften.

2.2 Allgemeine Beschreibung

Die Viereckzellen sind ausschließlich für die Innenaufstellung in einem Gebäude konzipiert und müssen ausreichend vor von außen eindringender Feuchtigkeit und Wind geschützt werden. Es ist auf eine ausreichende Tragfähigkeit des Untergrundes zu achten, ansonsten müssen entsprechende Vorkehrungen getroffen werden, die auch unter Belastung eine ausreichende Standsicherheit der Siloanlage gewährleisten. Es ist darauf zu achten, dass die Anlage eben und lotrecht aufgestellt wird. Die Viereckzellen sind individuell lieferbar und können den baulichen Gegebenheiten angepasst werden, da es sich um ein modulares System handelt. Dadurch kann jeder verfügbare Platz in einem Gebäude optimal ausgenutzt werden. Eine Zelle beginnt in der Größe von 1,10 m x 1,10 m und ist in Schritten von 1 m bis zu einer Größe von 5,10 m x 6,10 m möglich. Optionale Trichter sind ebenfalls erhältlich. Auch Sondermaße können angefragt werden. Aufbauhöhen sind von 1,25 m bis 7,50 m in 1,25 m Schritten möglich (optional in 139 mm Schritten reduzierbar).

Diese Silozellen bestehen aus Blechtafeln, die zu Wänden zusammengesetzt werden. Je nach Größe der Zellen werden zusätzliche Versteifungsstreben benötigt, siehe Anleitung weiter unten. Die Silowände können direkt auf den Betonboden oder auf einen Auslauftrichter mit Gestell (optional) montiert werden.

Die Wandbleche sind nicht biegesteif, d.h. es können beim Befüllen und Entleeren Verformungen auftreten.

Es können mehrere Zellen nebeneinander angeordnet werden, dazu gibt es sogenannte A-, B- und C-Zellen (siehe Abbildung 1). Eine A-Zelle hat vier Wände, eine B-Zelle hat drei und eine C-Zelle hat nur noch zwei Wände. Somit werden Teile der Außenwände zu Innenwänden. Bei den optionalen Trichterunterbauten gibt es dieselben Baugruppen.

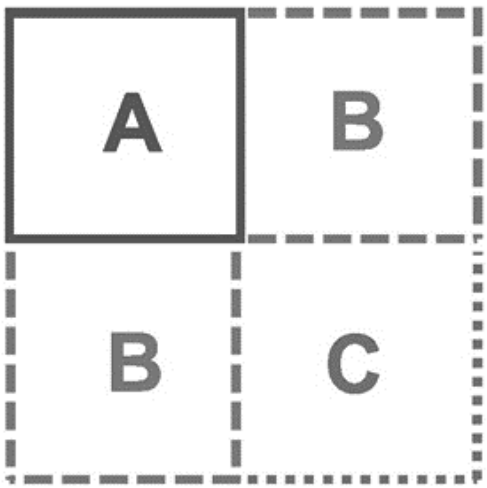


Abbildung 1

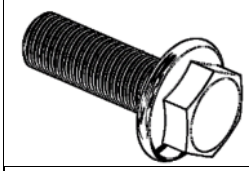
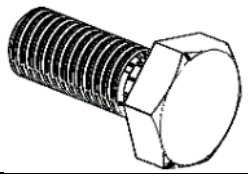
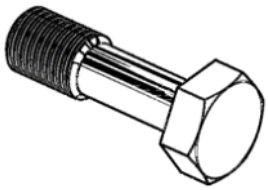
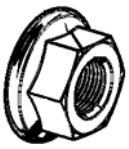
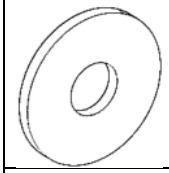
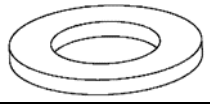
2.3 Technische Daten

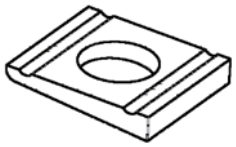
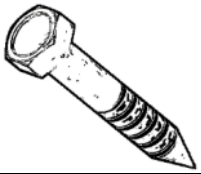
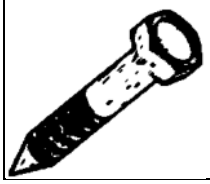
2.3.1 Lieferumfang

Die Einzelteile sind anhand der **mitgelieferten Teileliste** zu überprüfen, um einen vollständigen und ordnungsgemäßen Aufbau zu gewährleisten und spätere Reklamationen zu vermeiden.

Anbei finden Sie eine generelle Übersichtsdarstellung über die verwendeten Schraub- und Zubehörteile

Tabelle 1: Übersicht der Verbindungselemente

Beispielhafte Abbildung	Norm
	Schraube mit integrierter Unterlegscheibe DIN 6921
	Sechskantschraube DIN 933
	Sechskantschraube mit Schaft DIN 931
	Sechskantmutter mit integrierter Unterlegscheibe DIN 6923
	Sechskantmutter DIN 934
	Unterlegscheibe 3xAussendurchmesser DIN 9021
	Unterlegscheibe DIN 125

	Keilscheibe DIN 434
	Betonschraube
	Schraube DIN 571

2.3.2 Umgebungsbedingungen

Trocken und nicht in aggressiven oder korrosiven Medien lagern bzw aufstellen. Paletten nicht übereinanderstellen oder stapeln.

Betriebsbedingungen:	Temperaturbereich:	-20…0	°C
	Druck:	Üblicher Atmosphärischer Luftdruck	

3 Bestimmungsgemäße Verwendung

3.1 Bestimmungsgemäße Verwendung

Die Viereckzelle dient zur Lagerung von Getreide, sowie trockenen und rieselfähigen Schüttgütern mit gleichen Eigenschaften: maximale Schüttwichte = 7,5 $\frac{kN}{m^3}$ bzw. Schüttgewicht von max. 750 $\frac{kg}{m^3}$ und Schüttwinkel = 30 °. Abweichende Schüttwichten und die sich daraus ergebenden Aufbauhöhen und Querschnitte sind gesondert zu projektieren.

Die Viereckzellen sind ausschließlich für die Innenaufstellung in einem Gebäude konzipiert und müssen ausreichend vor von außen eindringender Feuchtigkeit, Schnee, Eis und Wind geschützt werden.

Jede anderweitige Verwendung gilt als nicht bestimmungsgemäß. Für resultierende Schäden übernimmt der Hersteller keine Haftung, das Risiko trägt ausschließlich der Benutzer.

Kohäsive, zur Brückenbildung neigende Schüttgüter dürfen nicht eingelagert werden.

Das Lagersilo ist nur für mittiges Befüllen und Entleeren ausgelegt.

Für die angebauten Entnahme- und Befüllförderer ist die entsprechende Bedienungsanleitung dieser Förderer zu beachten.

Die Befestigung der Silostützen auf dem Fundament / der Bodenplatte sind entsprechend den Angaben des Herstellers des Fundaments / der Bodenplatte zu setzen.

Die Silos sind durch mechanische Einwirkung von außen leicht zu beschädigen. Sollten die Silos an Durchfahrten aufgebaut werden, ist bauseitig ein entsprechender Anfahrschutz zu errichten.

Das Betreten der Silos im gefüllten oder teilgefüllten Zustand ist verboten. Im leeren Zustand sind geeignete Schutzmaßnahmen zu treffen, sowie für ausreichende Belüftung zu sorgen. Siehe auch dazu die Vorschriften für Sicherheit und Gesundheitsschutz der Berufsgenossenschaften.

Eigenmächtige Umbauten sind nicht zulässig.

3.2 Warnhinweise zur Fehlanwendung

Bei der Reinigung ist beim Betreten der leeren Viereckzelle stets für eine ausreichende Belüftung zu sorgen. Erstickungsgefahr.

Es sind immer geeignete Sicherheitsmaßnahmen gegen Schnittverletzungen zu treffen.

Bei Wartungsarbeiten unterhalb der Viereckzellen oder im Inneren ist auf Hindernissen im Kopfbereich zu achten.

Im Inneren der Viereckzellen besteht erhöhte Rutschgefahr, daher ist immer geeignetes Schuhwerk zu tragen.

4 Sicherheitshinweise

4.1 Standsicherheit

Im fertig montierten Zustand ist die Standsicherheit der Viereckzelle sichergestellt. Insbesondere bei der Montage sind die Einzelteile gegen Umfallen zu sichern. Der Boden darf keine Unebenheiten aufweisen, auch ein Gefälle darf nicht vorhanden sein, diese könnte zu Verformungen oder gar zum Einsturz des Silos führen. Sollte dies nicht der Fall sein, muss an den Stellen der Auflageflächen mit entsprechenden Unterlegplatten oder ähnlichem geeignetem Unterlegmaterial gearbeitet werden.

Da für den Betrieb der Anlage eine Lasteintragung in den Boden möglich sein muss, ist eine ausreichende Stahlbetonkonstruktion notwendig, d.h. sowohl die Betondruckfestigkeit, die Dicke der Bodenplatte und die Bewehrung müssen ausreichend dimensioniert sein. Sollten Ihnen die Daten nicht vorliegen, sind diese beim Hersteller des Bodens anzufordern.

Die Verschraubungen und Verdübelungen müssen vollständig und kraftschlüssig unter Verwendung der beigestellten Befestigungsmittel ausgeführt werden. Verwenden Sie ggf. Unterlegbleche, um Bodenunebenheiten auszugleichen.

Es wird Ihnen ausdrücklich empfohlen, sich auf jeden Fall die Zeit für die Vorbereitung des Untergrundes zu nehmen. Die Folgen einer falschen Vorbereitung des Untergrundes und einer nicht waagrechten Oberkante des Unterbaus, können Schiefstellungen des Silos und verzogene Wandbleche sein.

4.2 Zu treffende Schutzmaßnahmen

Insbesondere bei der Montage der Teile ist ein ausreichender Fuß- und Handschutz zu tragen. Bei der Anhebung eines der Bauteile über Kopf ist ein angemessener Kopfschutz zu tragen.

Weiterhin ist aufgrund der Staub- und Lärmemission, während der Montage und entsprechender Tätigkeiten, Augen- und Gehörschutz zu tragen.

4.3 Sicherheitshinweise zum Transport, zur Handhabung und zur Lagerung

Bei allen Transport-, Hebe- oder Verschiebearbeiten sind alle einschlägigen Sicherheitsvorschriften einzuhalten. Dazu gehört auch, dass nur geprüfte und geeignete Hebezeuge verwendet werden.

- Der Aufenthalt unter einer schwebenden Last ist generell verboten.
- Hebezeuge mit ausreichender Tragkraft verwenden.
- Ggf. erforderliche Transportsicherung anbringen.
- Gegen Abrutschen sichern.
- Unfallverhütungsvorschriften beachten.

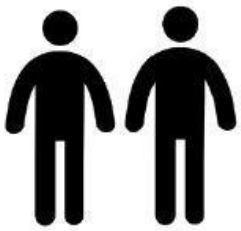
Aufgrund der Absturzgefahr von Personen sind Sicherheitsmaßnahmen wie bspw. Gurte oder Arbeitsbühnen zu verwenden und die Unfallverhütungsvorschriften und sonstige Regeln zu beachten.

4.4 Vorgehen bei Störungen und Unfällen

Bei Unregelmäßigkeiten und Störungen ist die Arbeit sofort einzustellen.

In diesem Falle ist die Störung oder der Defekt falls möglich zu beseitigen oder ggf. der betriebliche Vorgesetzte oder Fachhändler zu kontaktieren.

5 Montage

<table>
<tr><td>  </td><td> </td><td></td></tr>
<tr><td>
Montageeisen</td><td>
Wasserwaage</td><td></td></tr>
<tr><td> </td><td colspan="2">Alle Schrauben sind <u>nach kompletter</u> Montage „handfest“ (ohne Verlängerung) nachzuziehen. Dadurch ist eine Überbeanspruchung ausgeschlossen.
Auszug aus DIN EN1090-2 8.3:
„Unter dem Begriff „handfest“ kann im Allgemeinen der Zustand verstanden werden, der von einer Person mit einem Schraubenschlüssel normaler Größe ohne Verlängerung erreicht werden kann.“</td></tr>
</table>

5.1 Bodenniveau

Die Viereckzellen sind senkrecht zu montieren. Mithilfe eines Lotes oder durch andere geeignete Mittel (Wasserwaage, Kreuzlinienlaser, Nivelliergerät) ist dies zu kontrollieren.

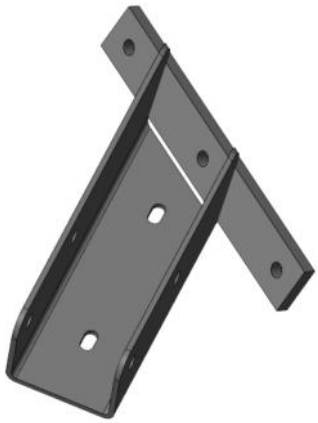
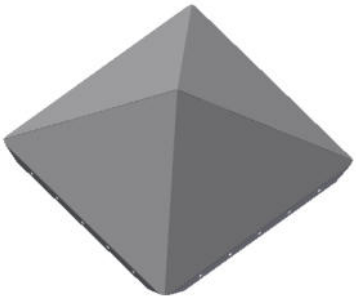
Es wird immer ein entsprechender Aufstellplan der bestellten Silovariante mitgeliefert. Im Zweifel bitten wir Sie, diesen anzufordern.

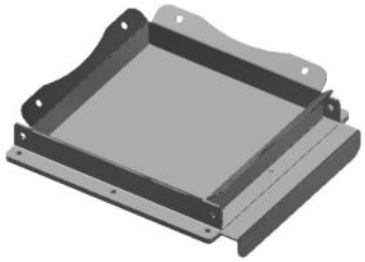
Falls Sie das Bodenniveau anpassen müssen, verwenden Sie geeignete Unterlegbleche.

5.2 Optionaler Trichter 2x2

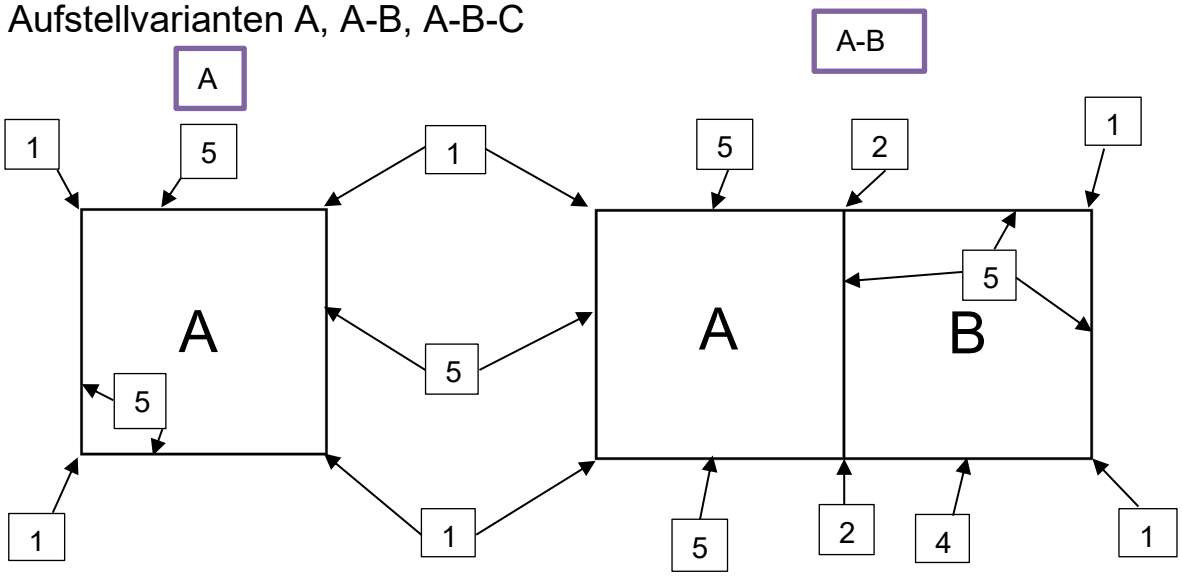
5.2.1 Teileliste

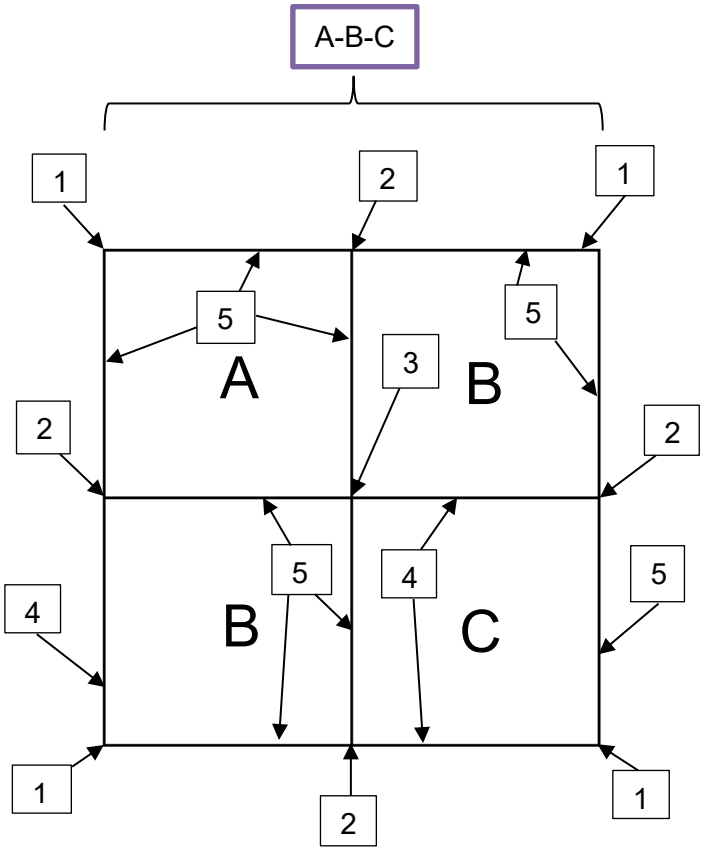
#1 Fuß L für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 Niedrigerer Fuß L 1,5m Art.Nr.:4009092015908 	#2 Fuß T für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 Niedrigerer Fuß T 1,5m Art.Nr.:4009092015909 	#3 Fuß X für 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814 Niedrigerer Fuß X 1,5m Art.Nr.:4009092015910
#4 U140 - l=1995 ArtNr.: 4009092015804 L=1995 mm 	#5 U140 - l=2055 ArtNr.: 4009092015805 L=2055 mm 	#6 Strebe 60,3x4 für Trichtergestell 2x2+3x3 ArtNr.:4009092015810 Kürzere Strebe für 1,5m Fuß ArtNr.:4009092015911

#7 Aussenverst. 2x2m 40° ArtNr.: 4009092015833 	#8 Aussenverst. links 40° ArtNr.: 4009092015823 	#9 Aussenverst. rechts 40° ArtNr.: 4009092015824 
#10 Innenverstrebung 2x2m 40° ArtNr.:4009092015877 	#11 (Optional) Belüftungshaube 2x2 40° Trichter ArtNr.: 4009092015912 	#12 (Optional) Anschlussstutzen NW300 f. Belüftungseinrichtung ArtNr.: 4009003016990
#13 Trichterblech 2x2m 40° ArtNr.: 4009092015855 	#14 (optional, nur wenn #12 eingebaut wird) Trichterblech 2x2m 40° Belüftung ArtNr.: 4009092015856 	#15 Versteifungsblech für 2x2m 40° Trichter ArtNr.: 4009092015850

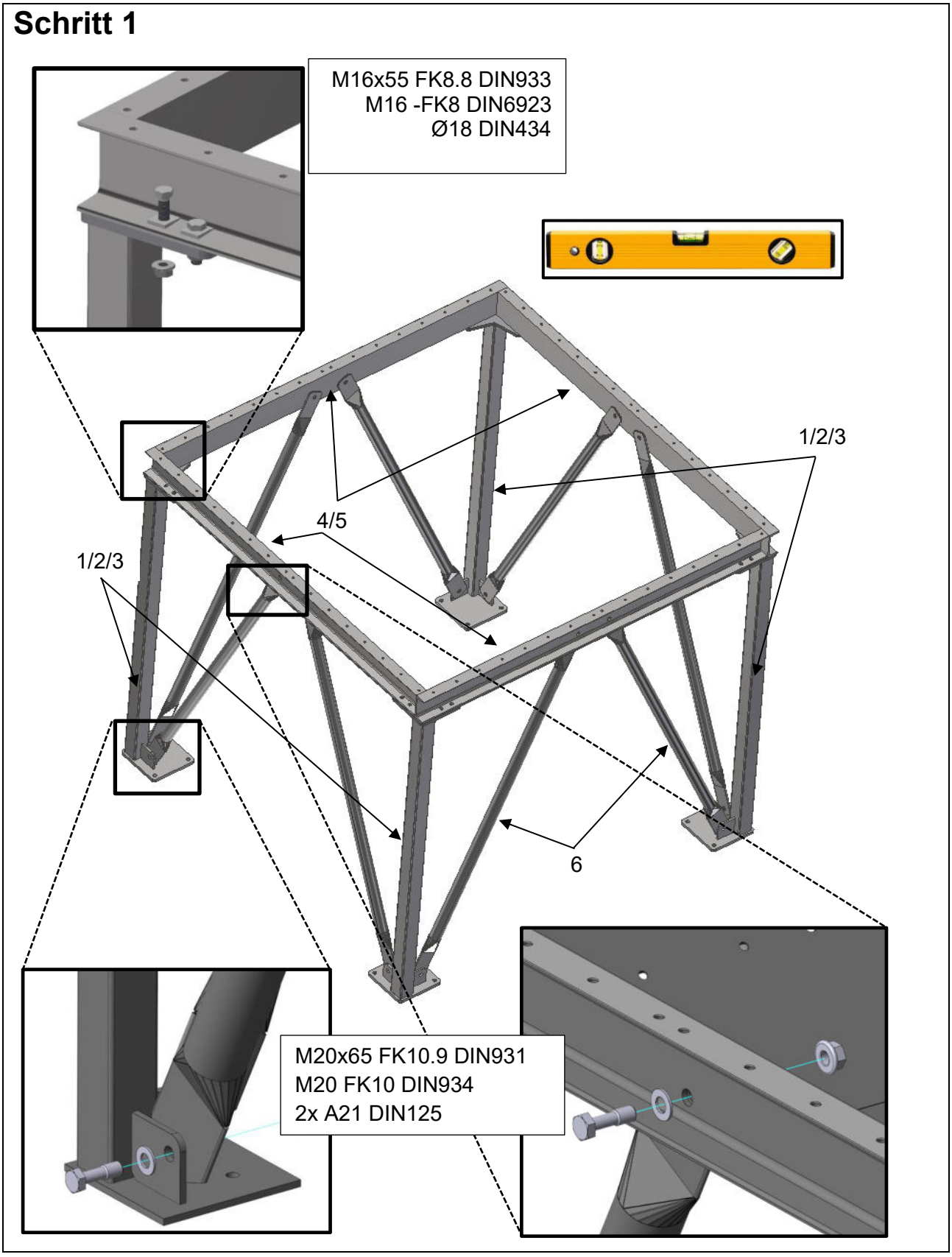
#16 Auslauf mit Schieber 300x300 Art.Nr.: 4009092015820 Übergänge auf 150,200,250 4009023015782, 783, 784 		

Aufstellvarianten A, A-B, A-B-C

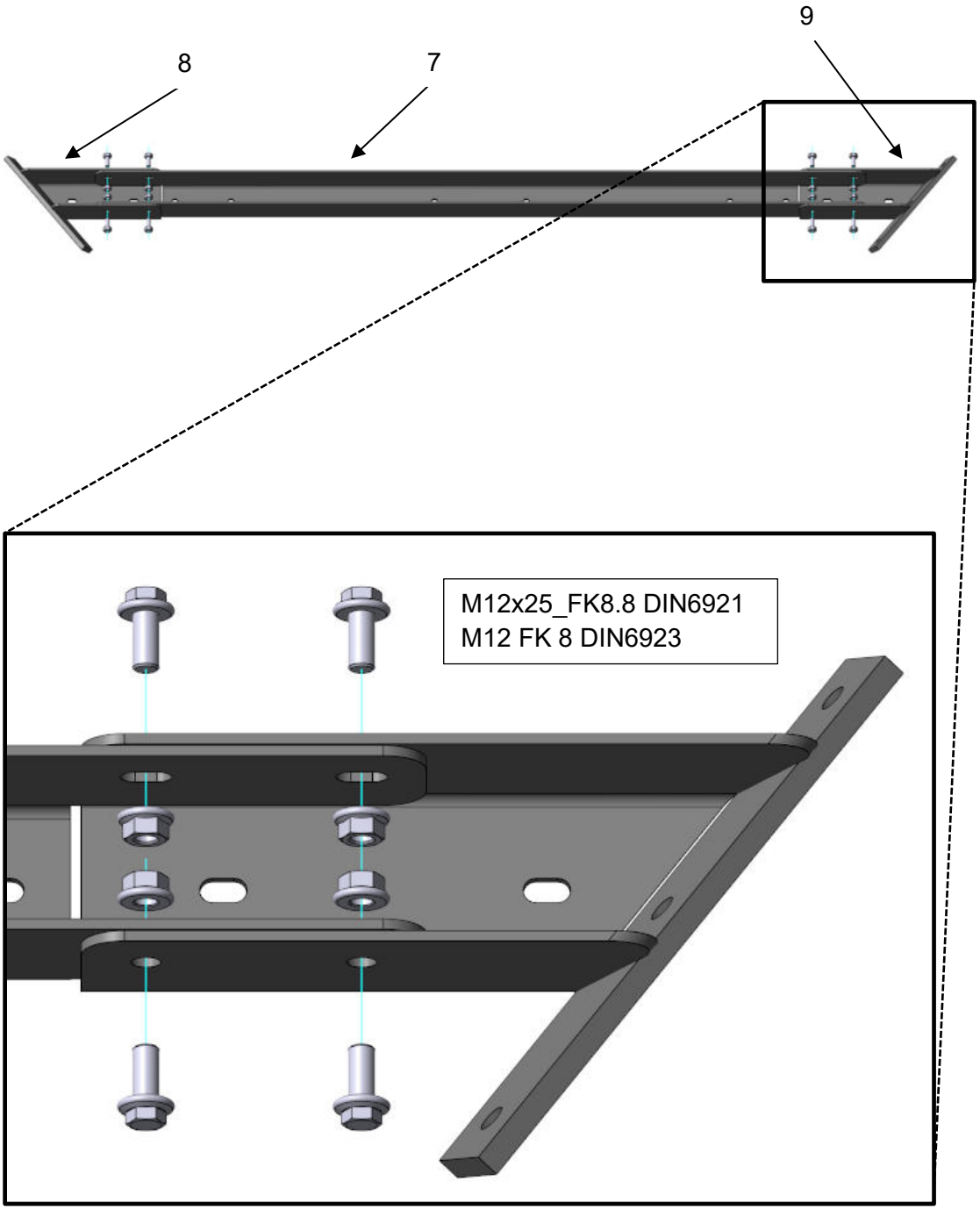




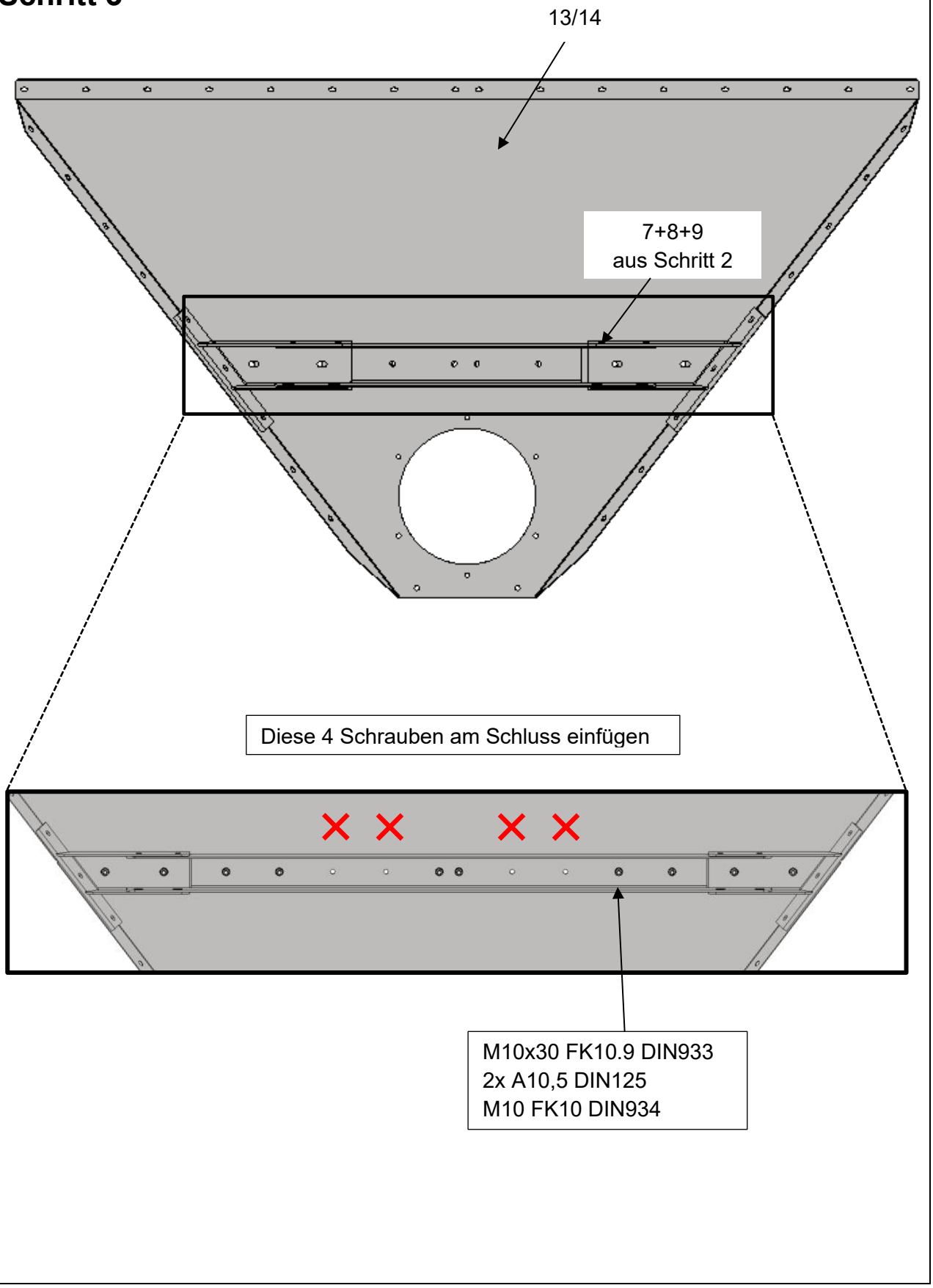
5.2.2 Montage Trichterunterbau 2x2



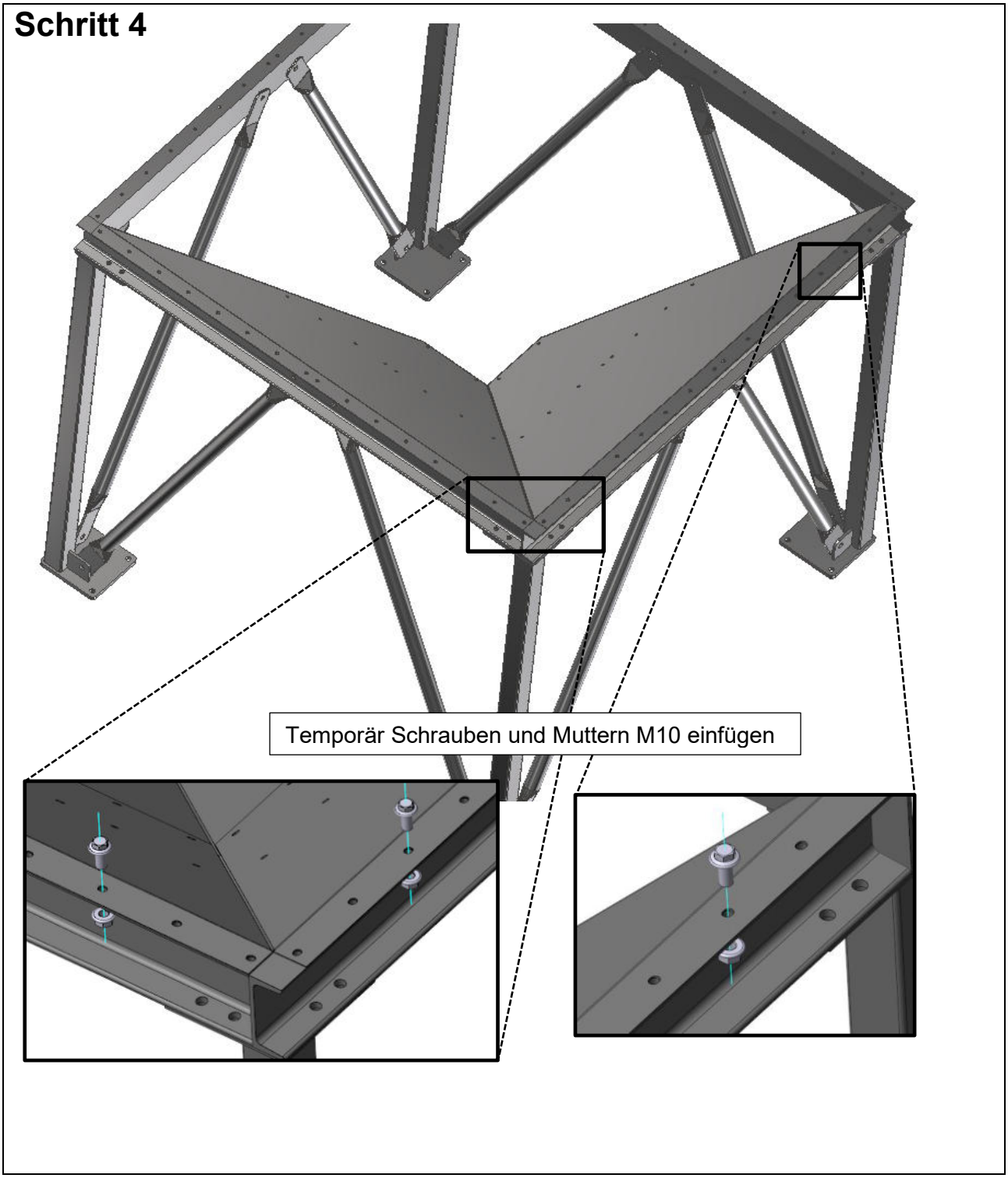
Schritt 2



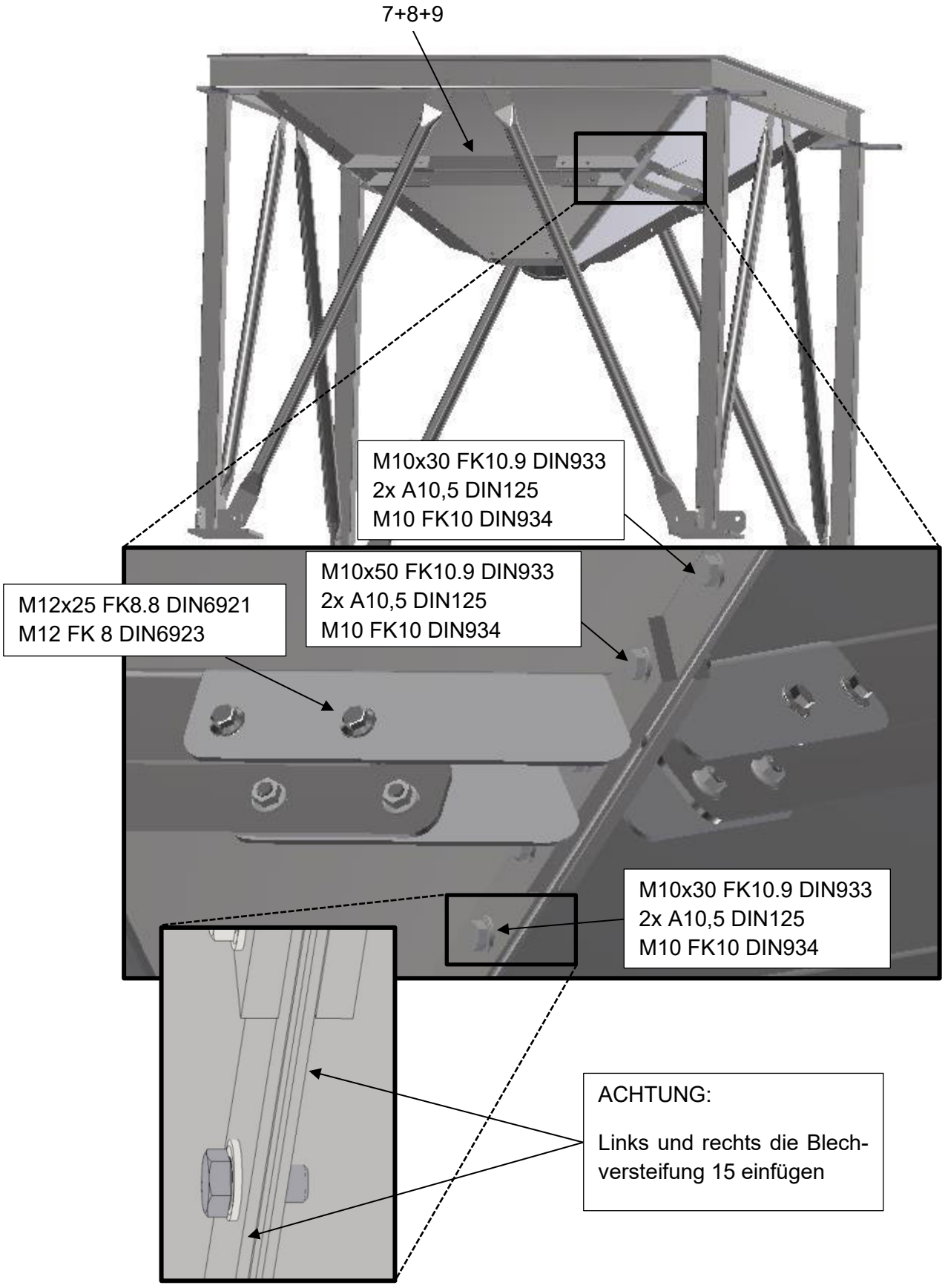
Schritt 3

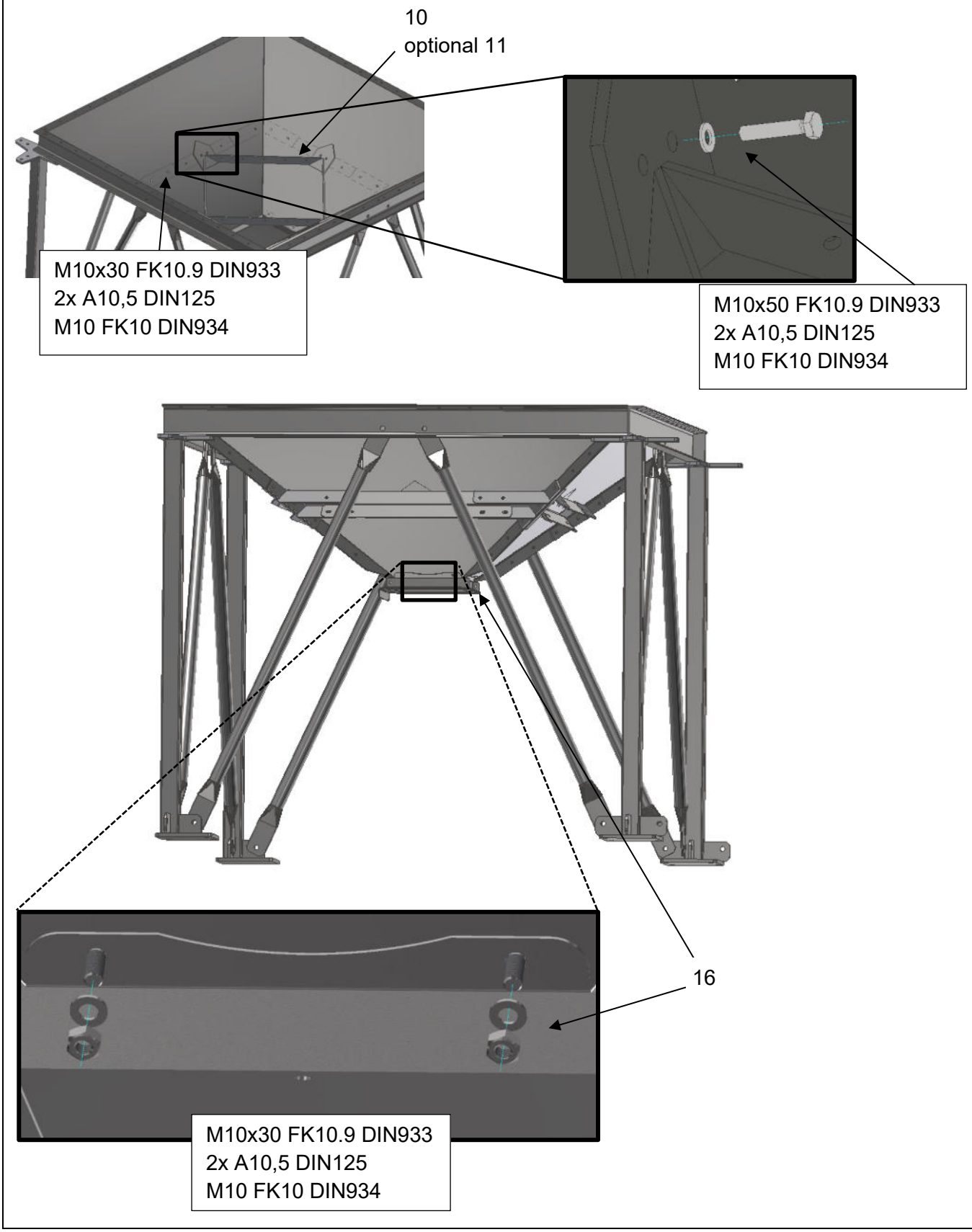

13/14
7+8+9
aus Schritt 2
Diese 4 Schrauben am Schluss einfügen
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 4

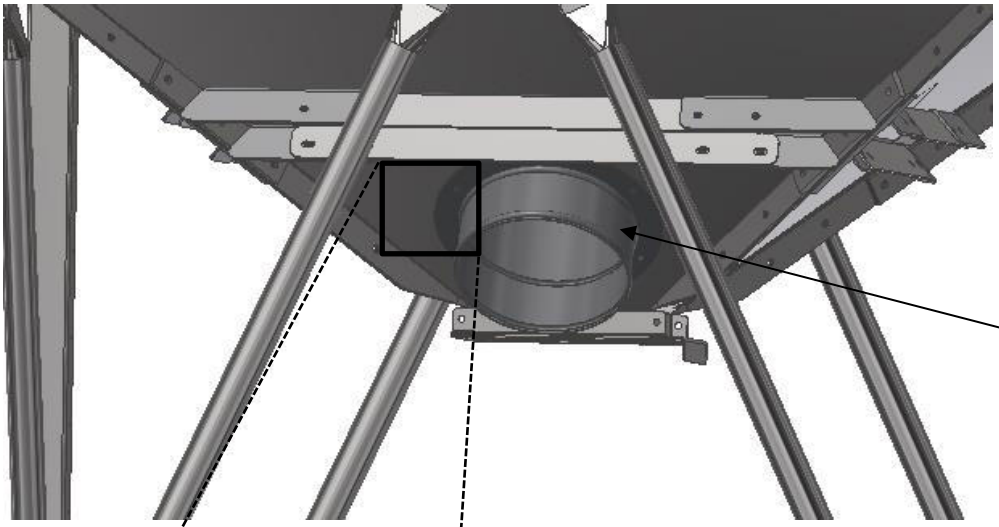


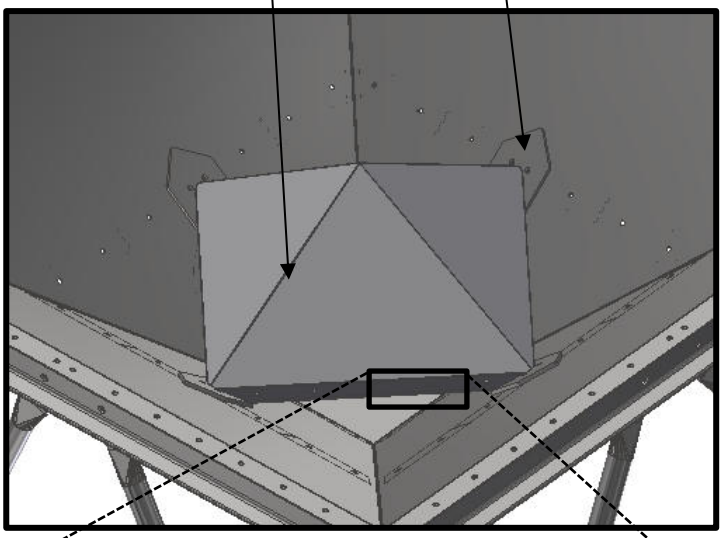
Schritt 5

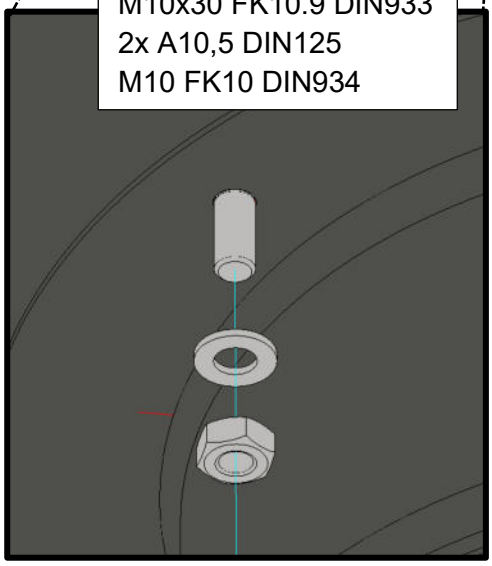

7+8+9
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ACHTUNG:
Links und rechts die Blech-versteifung 15 einfügen


10
optional 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
16
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

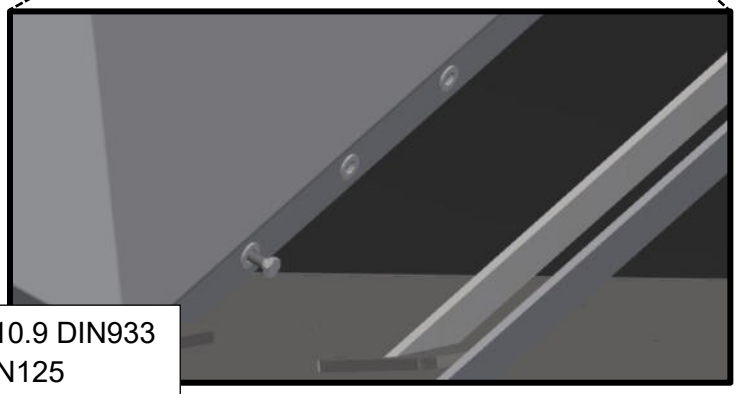
Schritt 7 Optional







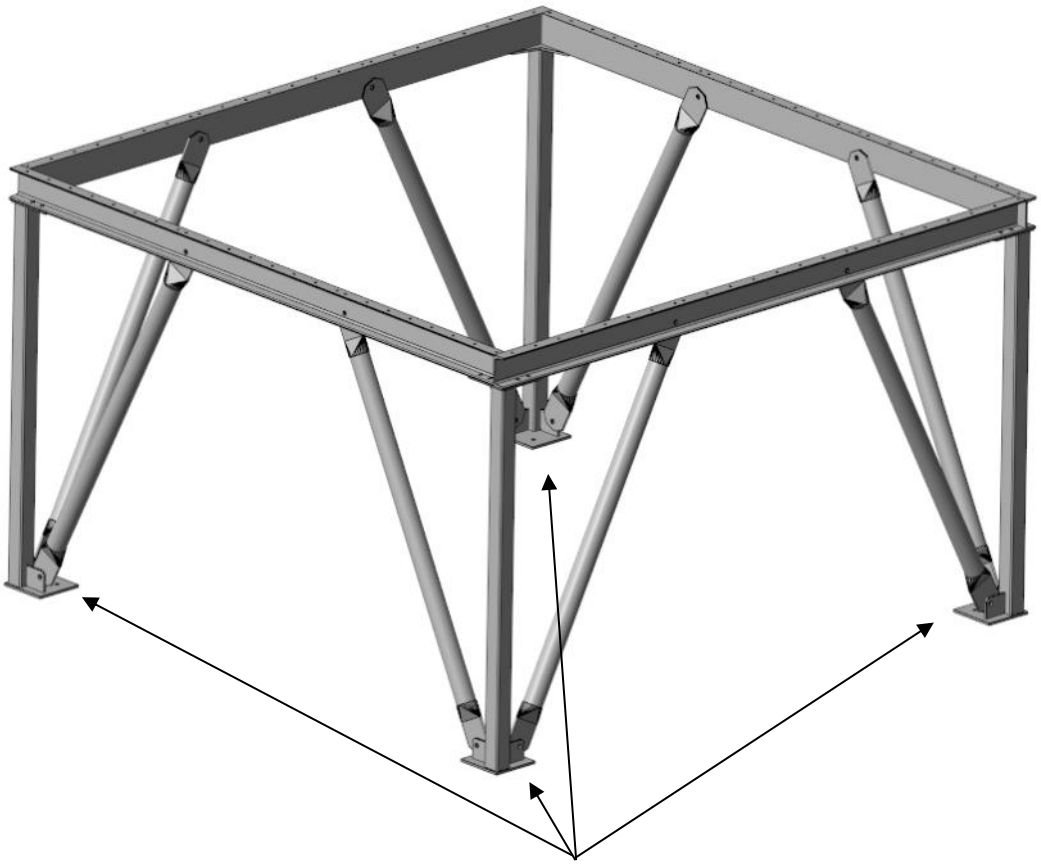
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934



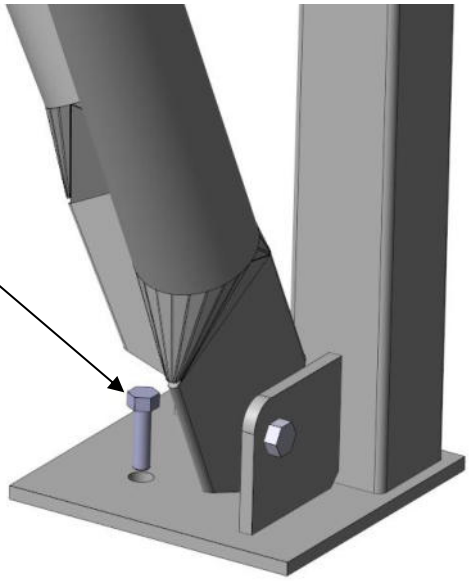
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

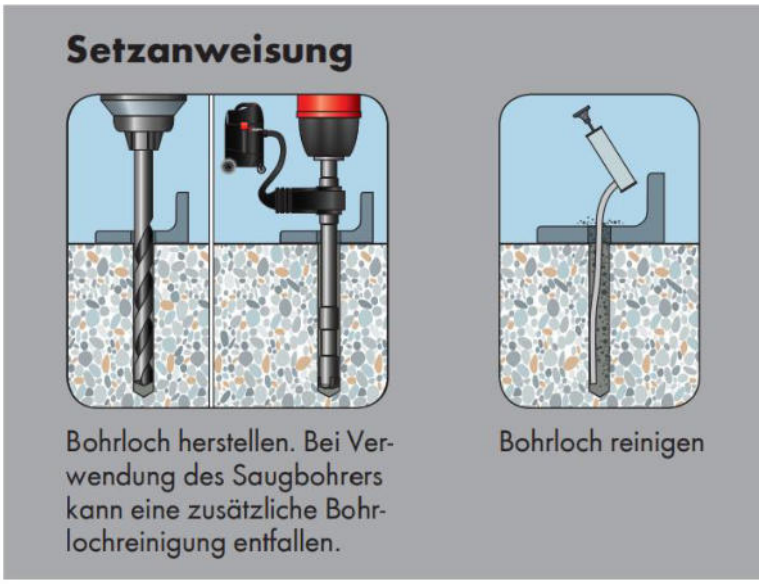
Schritt 8

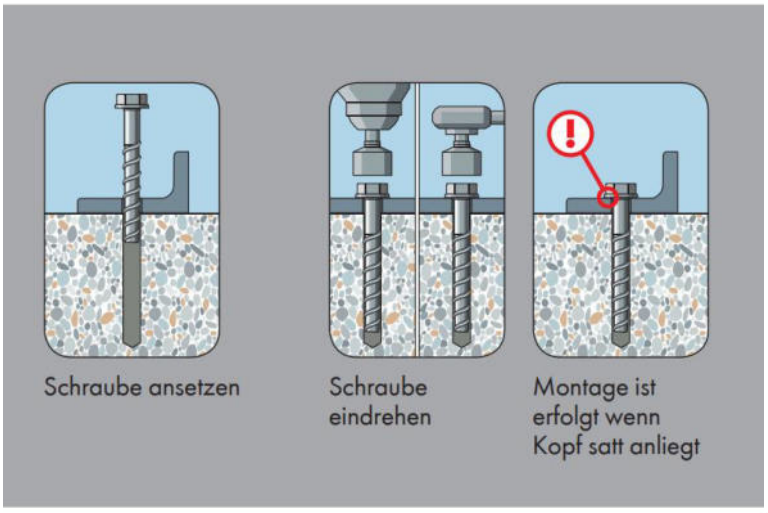
Auf eine Lotrechte und rechtwinkelige Montage achten

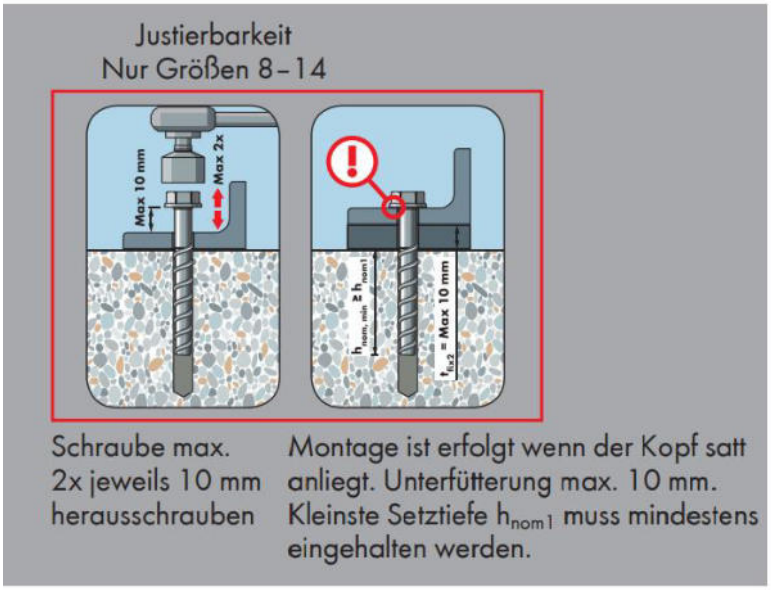


2x Betonschrauben pro Fuß





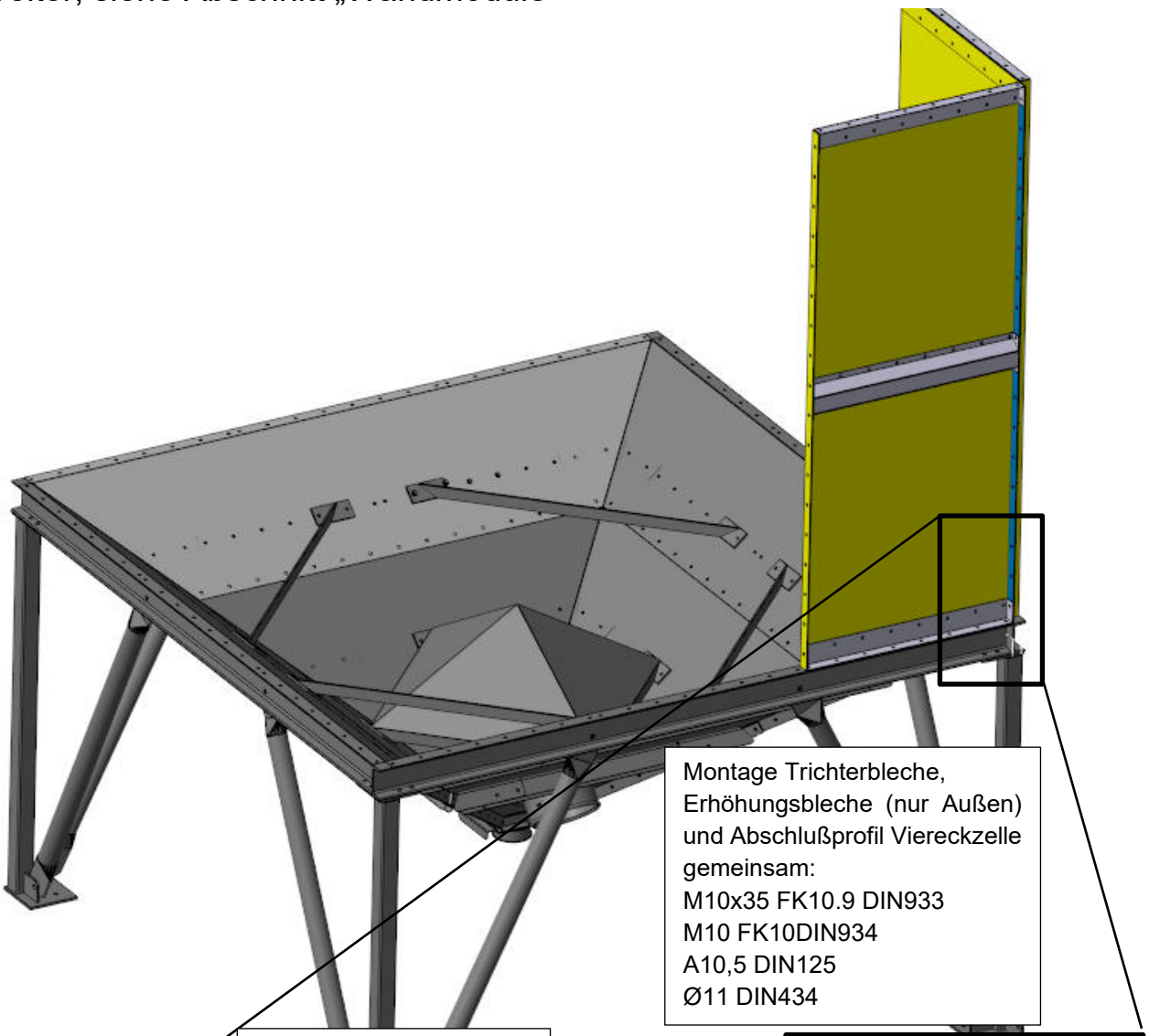




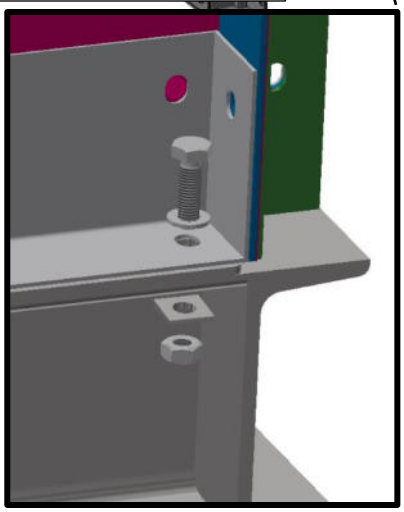
Weitere Informationen: Würth Betonschraube Betonschraube W-BS Typ S Sechskantkopf DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

Schritt 9 (Optional, bei dem Aufbau einer Viereckzelle)

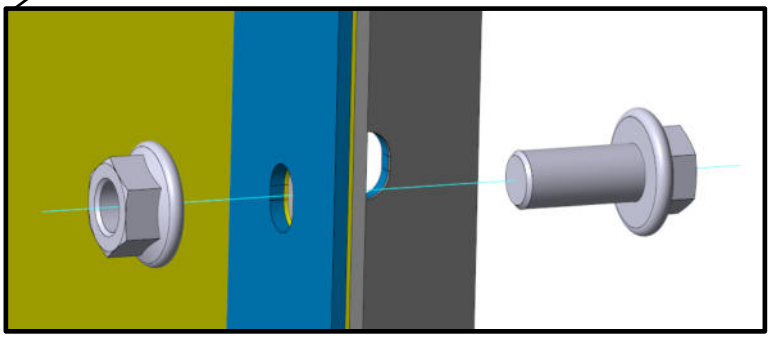
Weiter, siehe Abschnitt „Wandmodule“



Montage Trichterbleche, Erhöhungsbleche (nur Außen) und Abschlußprofil Viereckzelle gemeinsam:
M10x35 FK10.9 DIN933
M10 FK10DIN934
A10,5 DIN125
Ø11 DIN434

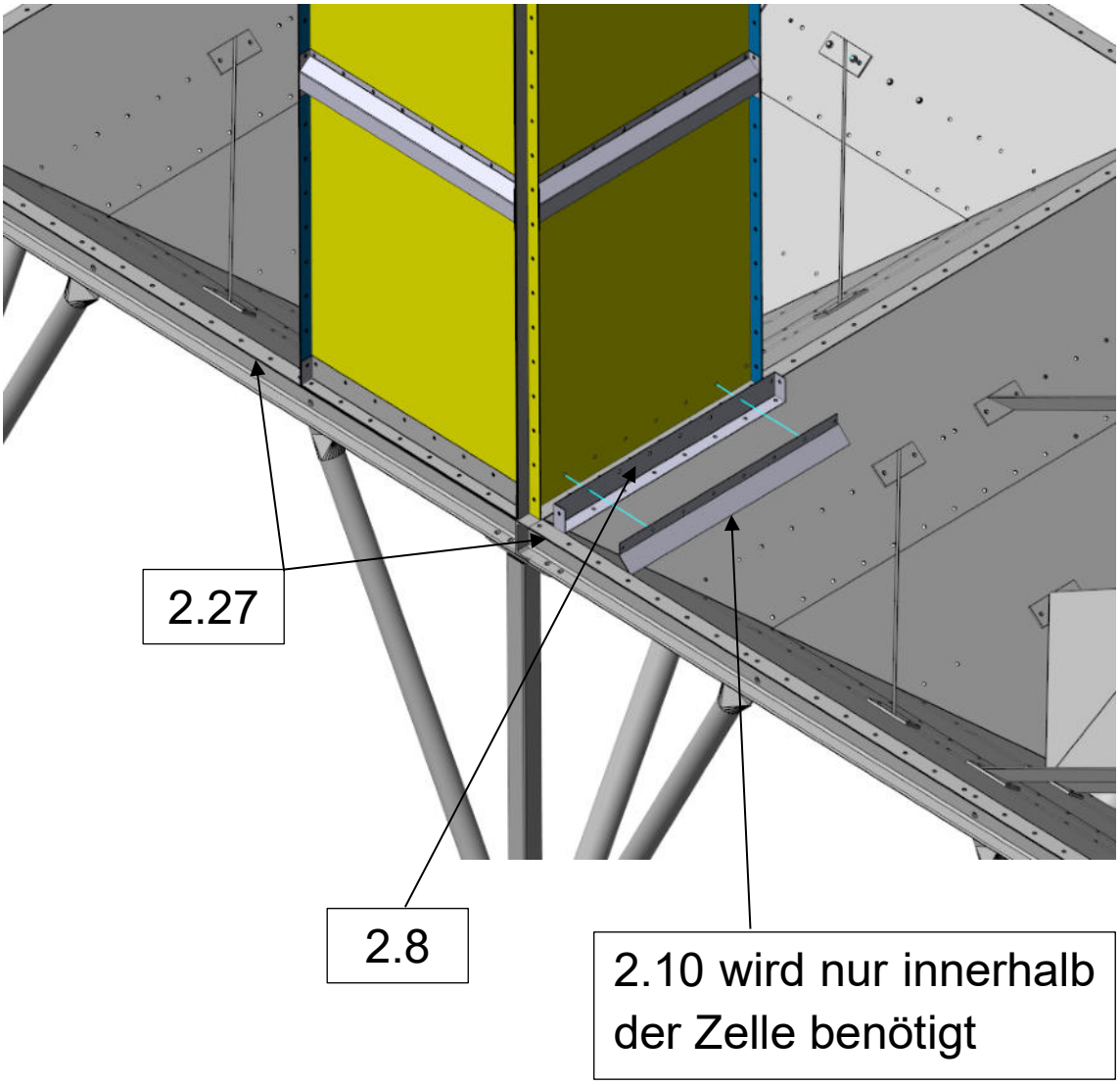


Montage längs (außer Kreuzverbindung)
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923



Bei mehreren Trichterunterbauten

- nebeneinander müssen an den Zwischenwänden am unteren Abschlussprofil zusätzliche Abschräg-bleche verwendet werden, damit das Getreide sauber ablaufen kann.
- An Stellen, an denen zwei Trichterbleche übereinander liegen ist die Aufbauhöhe leicht erhöht -> zum Ausgleich müssen an den anderen Stellen zusätzlich Erhöhungsbleche (2.26) montiert werden

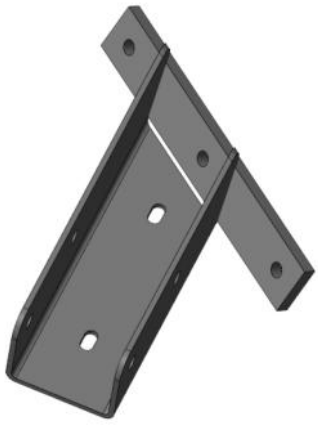
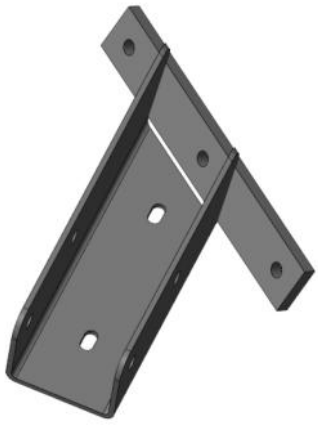


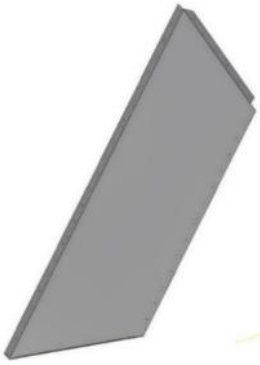
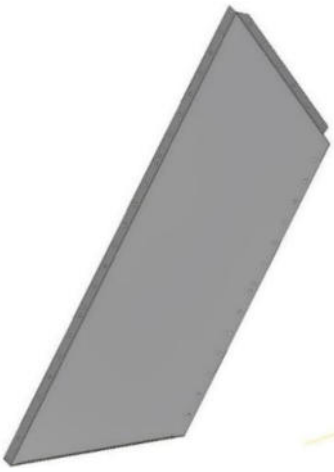
5.3 Optionaler Trichter 3x2

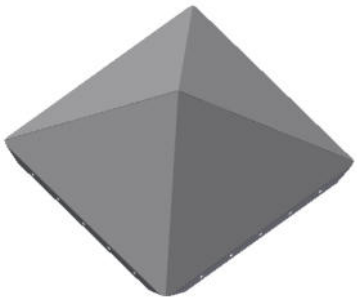
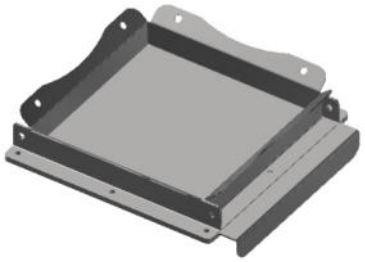
5.3.1 Teileliste

#1 Fuß L für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 	#2 Fuß T für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 	#3 Fuß X für 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814
#4 U140 - l=1995 ArtNr.: 4009092015804 L=1995 mm 	#5 U140 - l=2055 ArtNr.: 4009092015805 L=2055 mm 	#6 Strebe 60,3x4 für Trichtergestell 2x2+3x3 ArtNr.:4009092015810
#7 U140 - l=2995	#8 U140 - l=3055	#9

ArtNr.: 4009092015806 L=2995 mm 	ArtNr.: 4009092015807 L=3055 mm 	Strebe 88,9x4 für Trichtergestell 3x3+2x3 ArtNr.:4009092015738
#10 Aussenverst. 2x3m – 3m unten ArtNr.: 4009092015839 	#11 Aussenverst. 2x3m – 3m mitte ArtNr.: 4009092015838 	#12 Aussenverst. 2x3m – 3m oben ArtNr.: 4009092015837

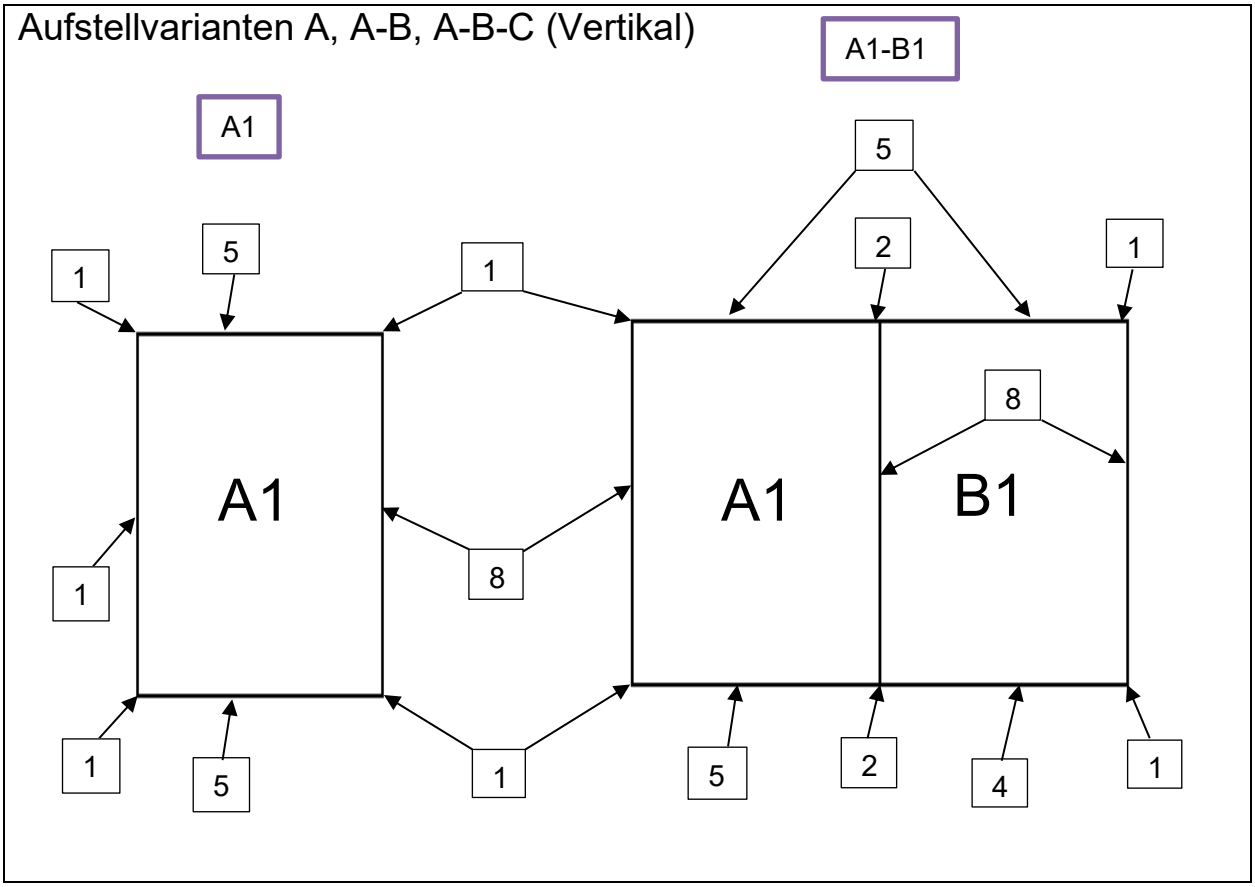
#13 Aussenverst. 2x3m – 2m unten ArtNr.: 4009092015836 	#14 Aussenverst. 2x3m – 2m mitte ArtNr.: 4009092015835 	#15 Aussenverst. 2x3m – 2m oben ArtNr.: 4009092015834
#16 Aussenverst. rechts 40° 2x3m – 3m ArtNr.: 4009092015828 	#17 Aussenverst. links 40° 3x2m – 3m ArtNr.: 4009092015827 	#18 Aussenverst. rechts 40° 2x3m – 2m ArtNr.: 4009092015826 

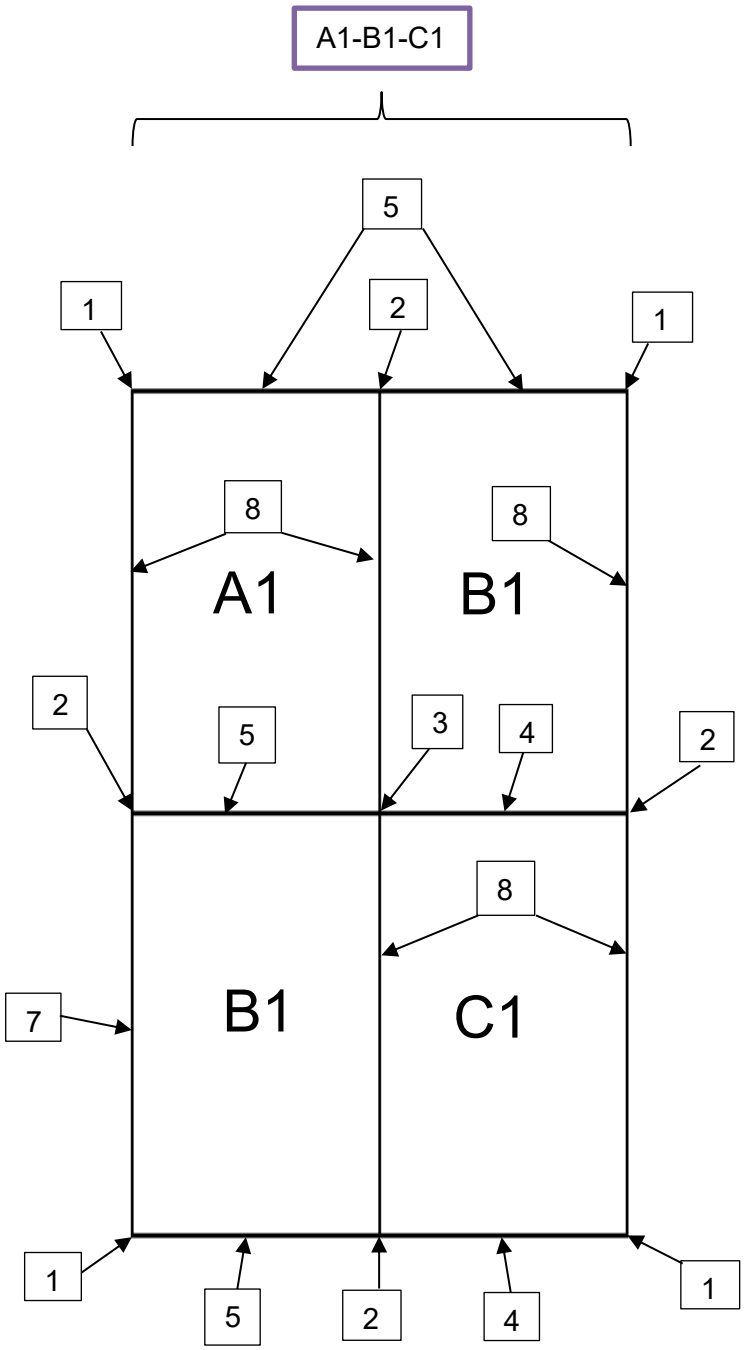
#19 Aussenverst. links 40° 2x3m – 2m ArtNr.: 4009092015825 	#20 Trichterblech 2x3m 40° - 2m oben ArtNr.: 4009092015858 	#21 Trichterblech 2x3m 40° - 3m oben ArtNr.: 4009092015857 
#22 Trichterblech 2x3m 40° - 2m unten ArtNr.: 4009092015860 	#23 Trichterblech 2x3m 40° - 3m unten ArtNr.: 4009092015859 	#24 (optional, nur wenn #32 eingebaut wird) Trichterblech 2x3m 40° – 2m unten Belüftung ArtNr.: 4009092015862

#25 (optional, nur wenn #32 eingebaut wird) Trichterblech 2x3m 40° - 3m unten Belüftung ArtNr.: 4009092015861 	#26 Inneneckversteifung mitte1 2x3m 40° ArtNr.: 4009092015883 	#27 Inneneckversteifung mitte2 2x3m 40° ArtNr.: 4009092015884
#28 Inneneckversteifung oben1 2x3m 40° ArtNr.: 4009092015881 	#29 Inneneckversteifung oben2 2x3m 40° ArtNr.: 4009092015882 	#30 Innenverstrebung unten 2x3m 40° ArtNr.:4009092015878
#31 (Optional) Belüftungshaube 2x3m 40° Trichter ArtNr.: 40090920615913 	#32 (Optional) Anschlussstutzen NW300 f. Belüftungseinrichtung ArtNr.: 4009003016990 	#33 Auslauf mit Schieber 300x300 2x3m Art.Nr.: 4009092015821 Übergänge auf 150,200,250 4009023015782, 783, 784 

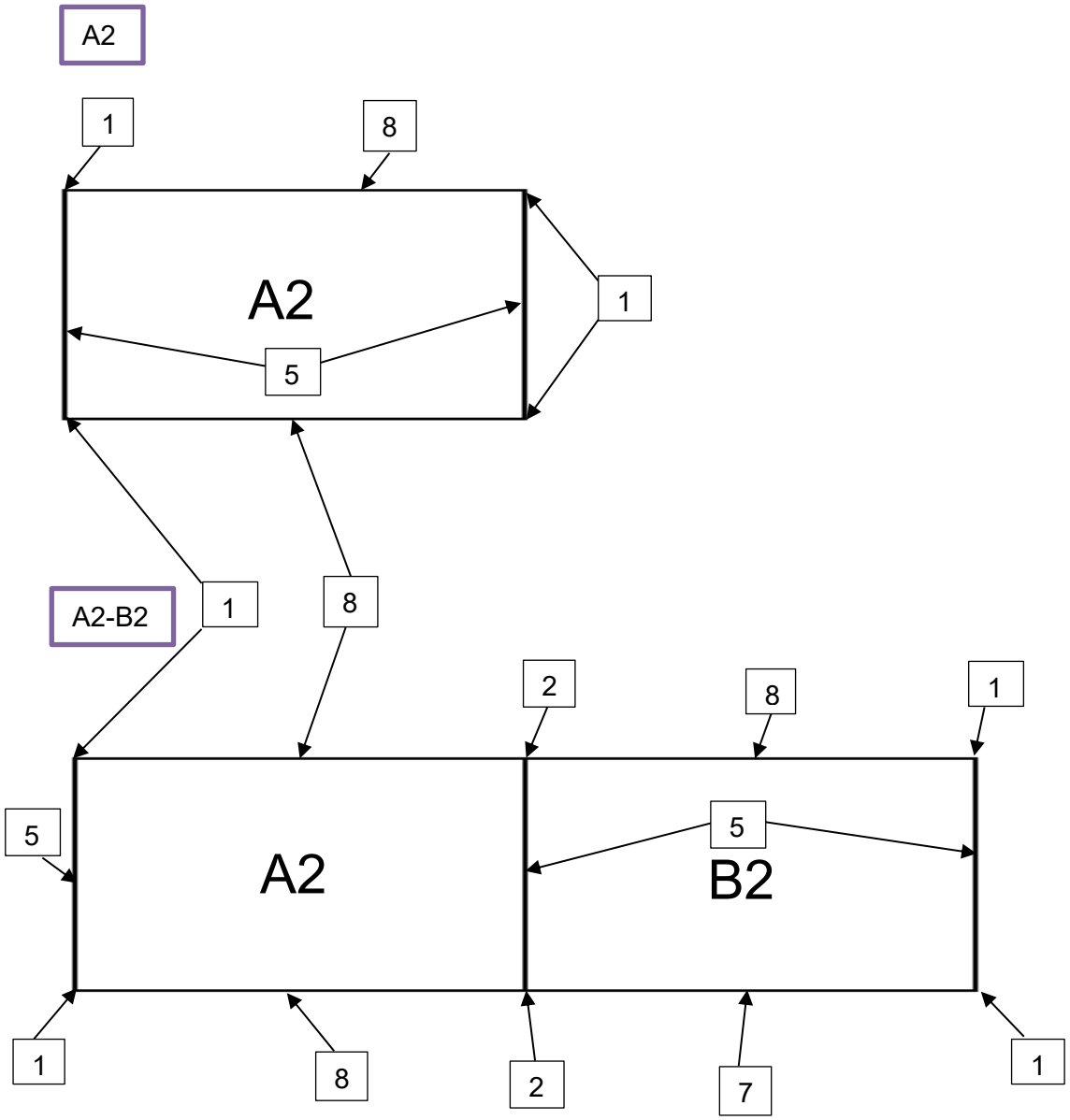
#34 Versteifungsblech für 2x3m 40° Trichter ArtNr.: 4009092015851 		

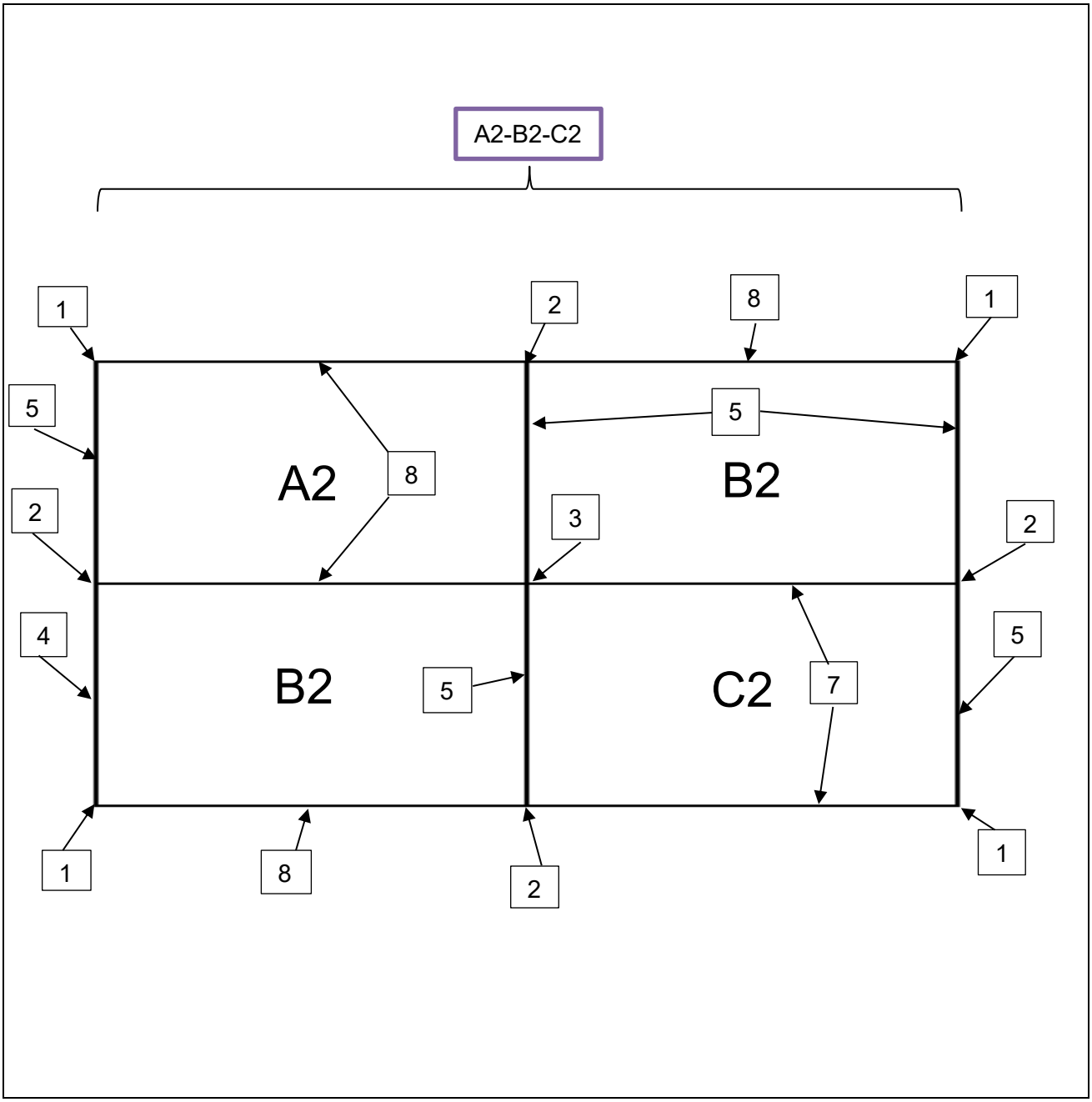
Aufstellvarianten A, A-B, A-B-C (Vertikal)




A1-B1-C1
5
1
2
1
8
8
A1
B1
2
5
3
4
2
8
B1
C1
7
1
5
2
4
1

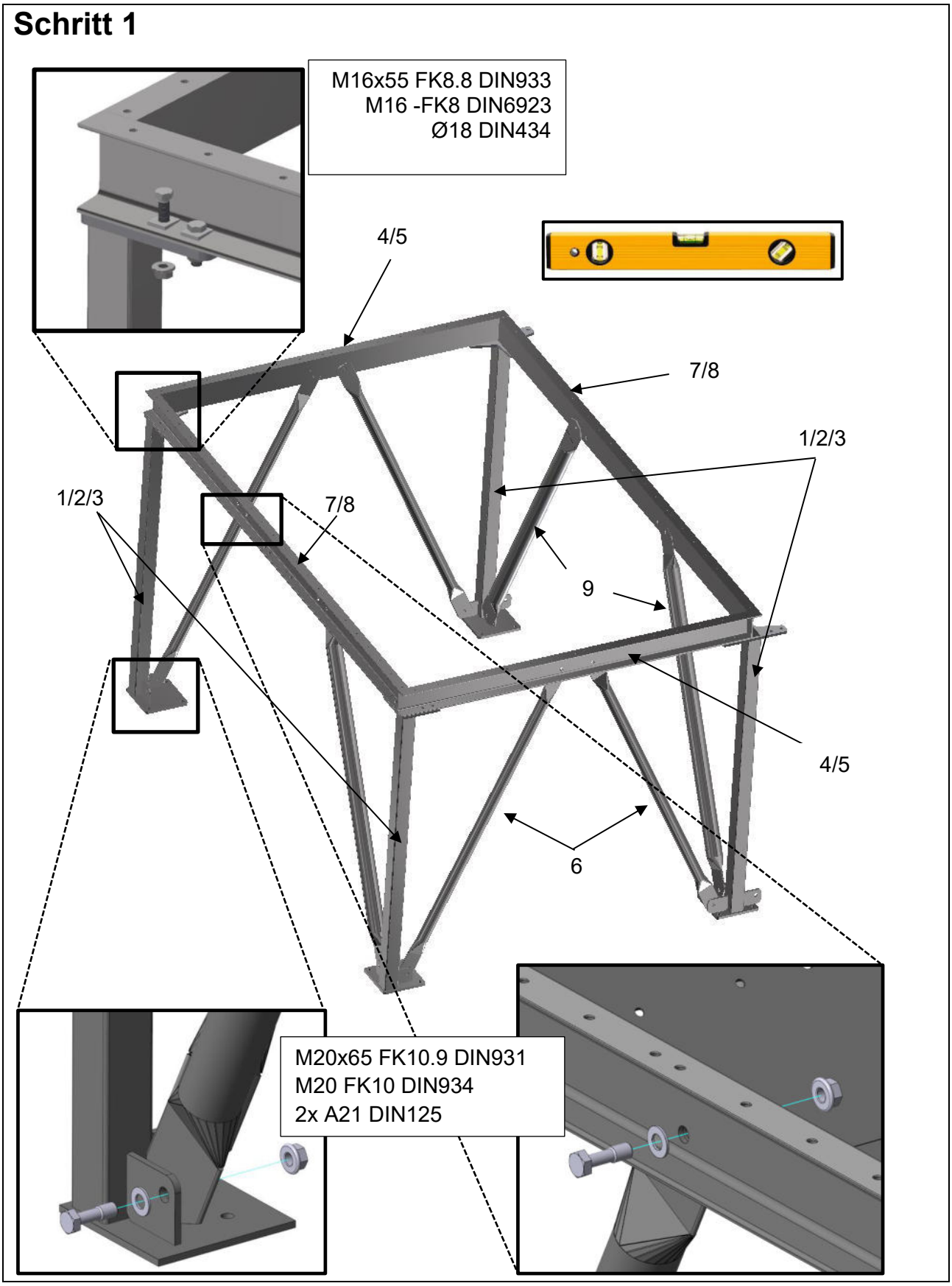
Aufstellvarianten A, A-B, A-B-C (Horizontal)




A2-B2-C2
1
2
8
1
5
5
A2
8
B2
2
3
2
4
B2
5
C2
7
5
1
8
2
1

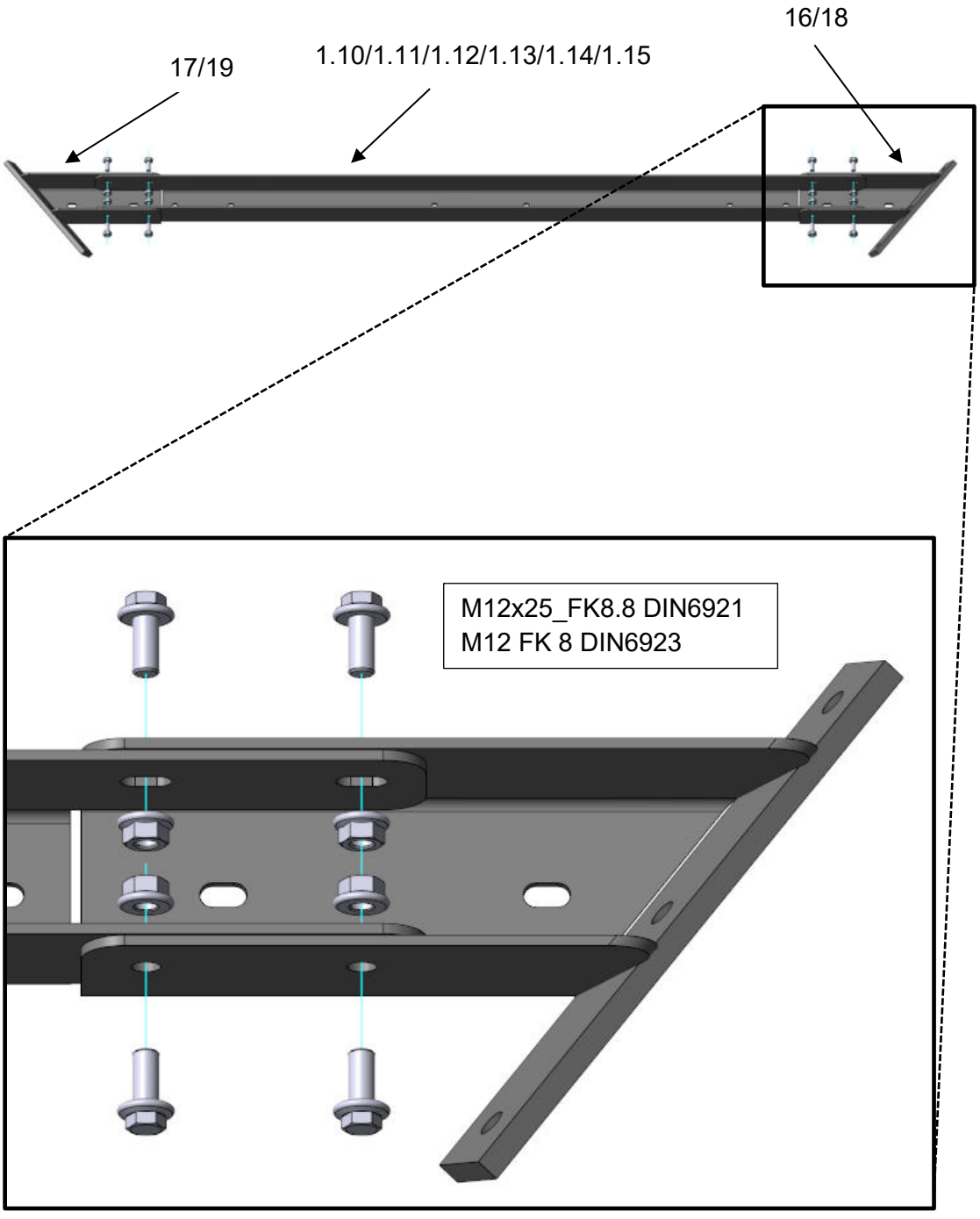
5.3.2 Montage Trichterunterbau 3x2

Schritt 1

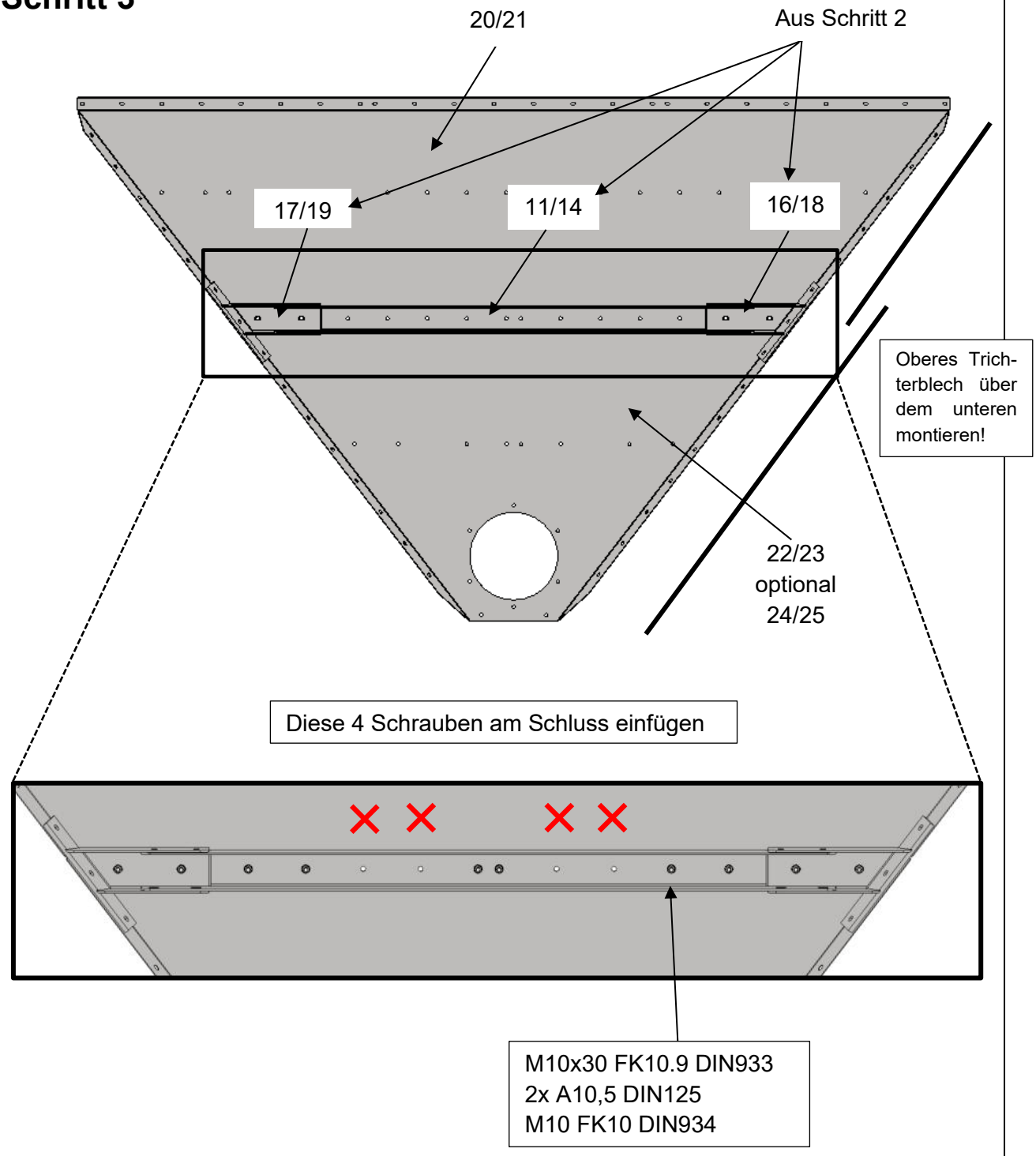


Schritt 2

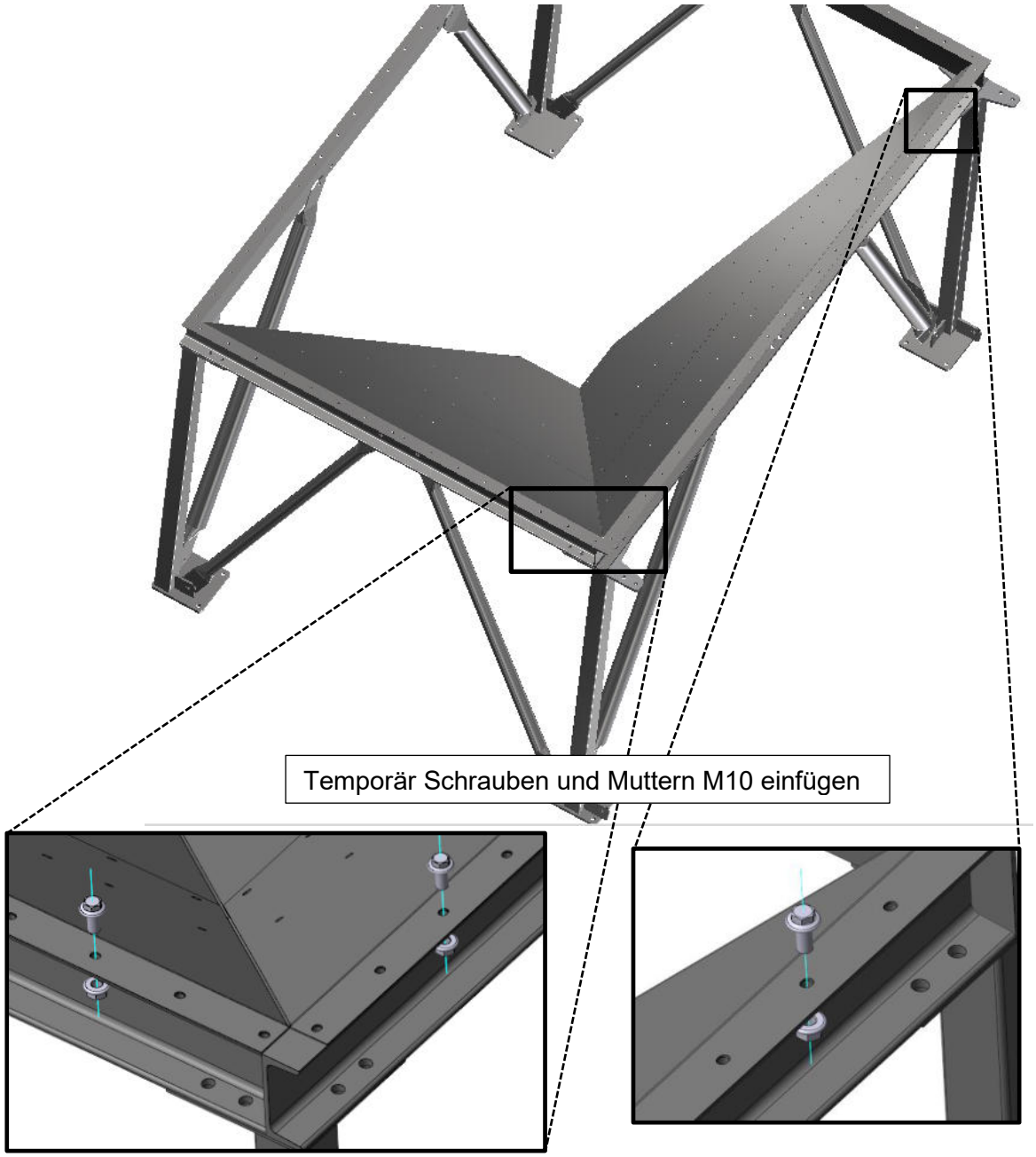
Nur 2m Teile mit 2m Teilen und nur 3m Teile mit 3m Teilen zusammenfügen



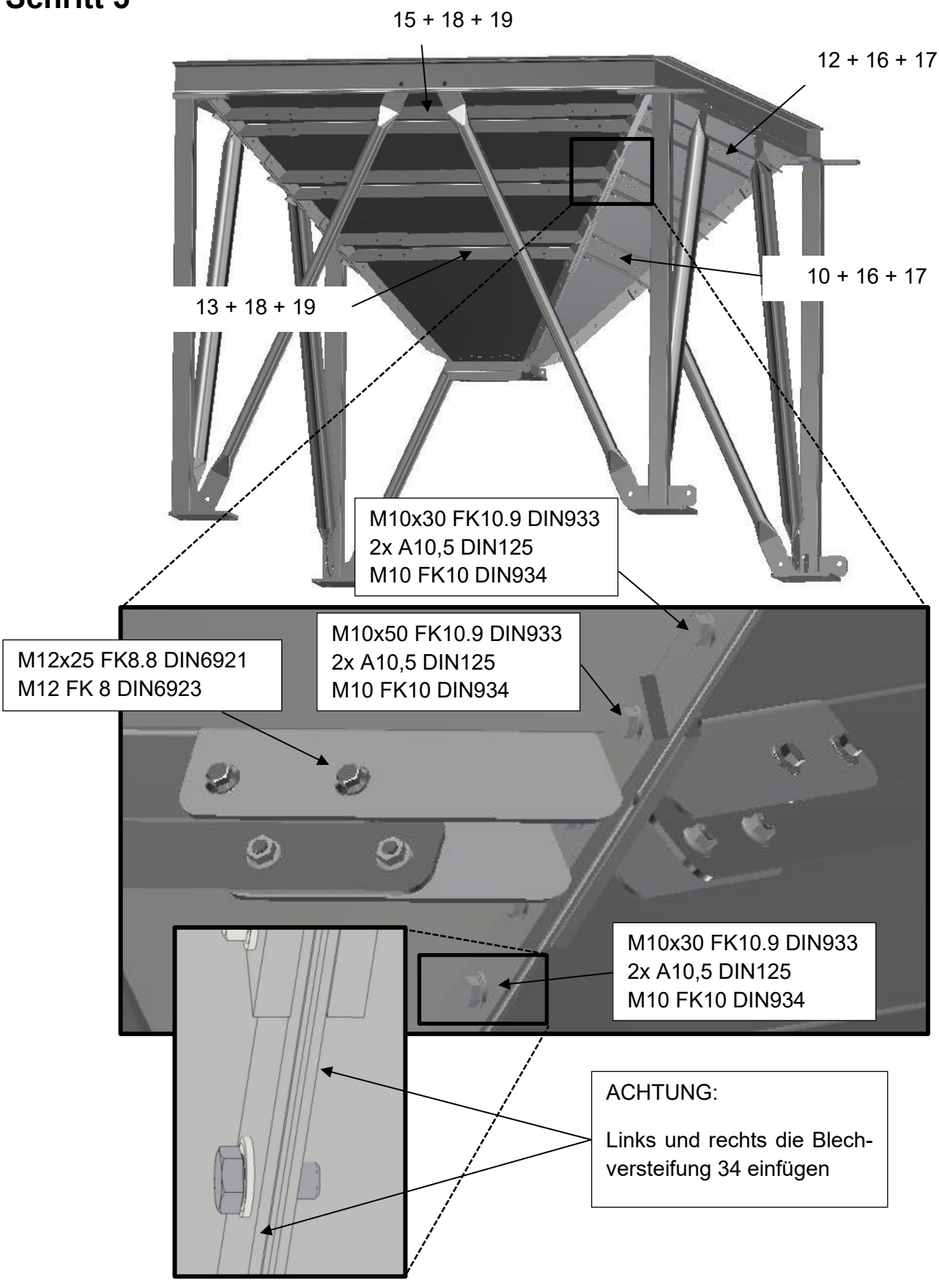
Schritt 3

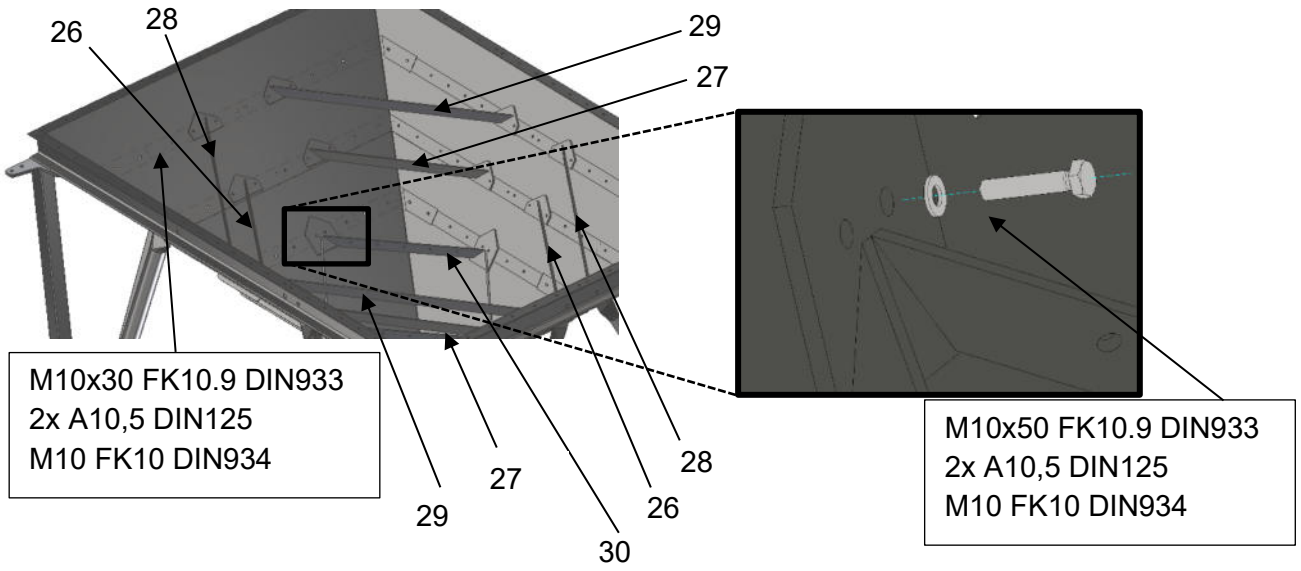

20/21
Aus Schritt 2
17/19
11/14
16/18
Oberes Trich-terblech über dem unteren montieren!
22/23
optional
24/25
Diese 4 Schrauben am Schluss einfügen
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

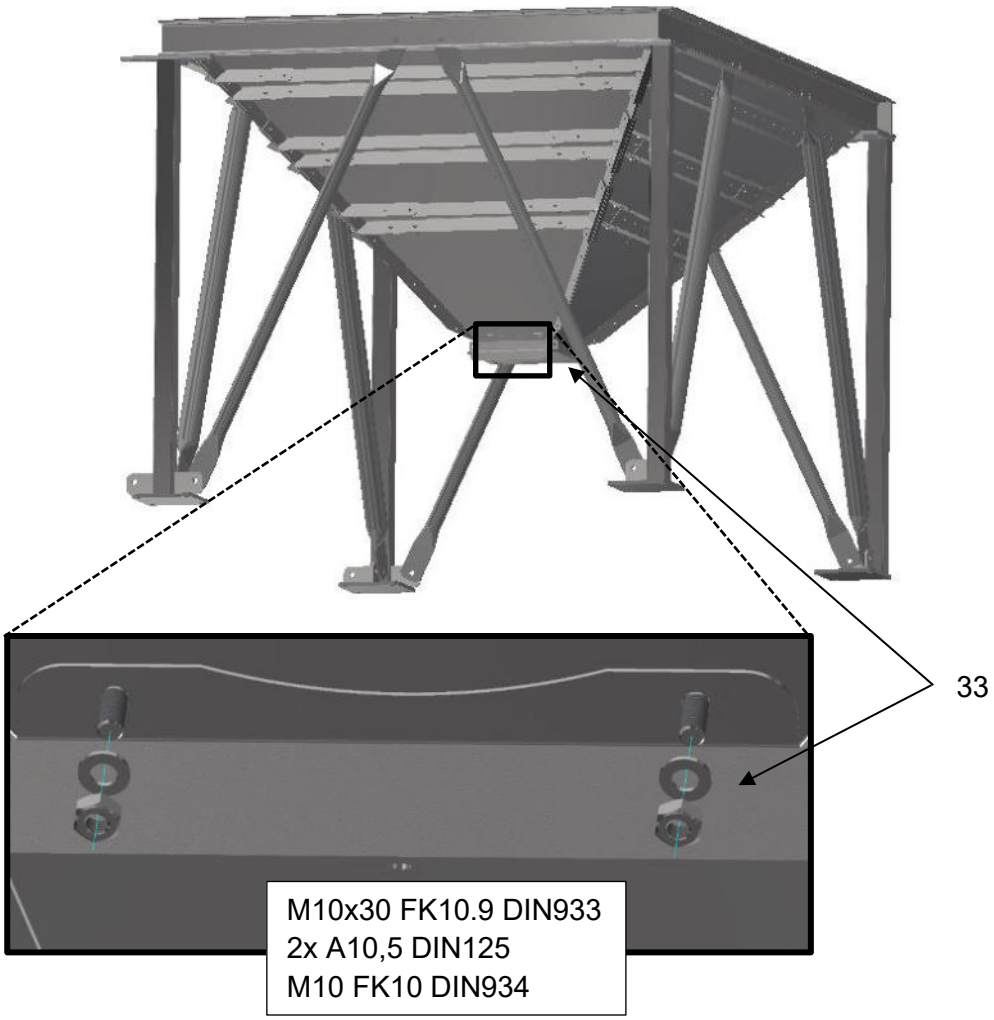
Schritt 4



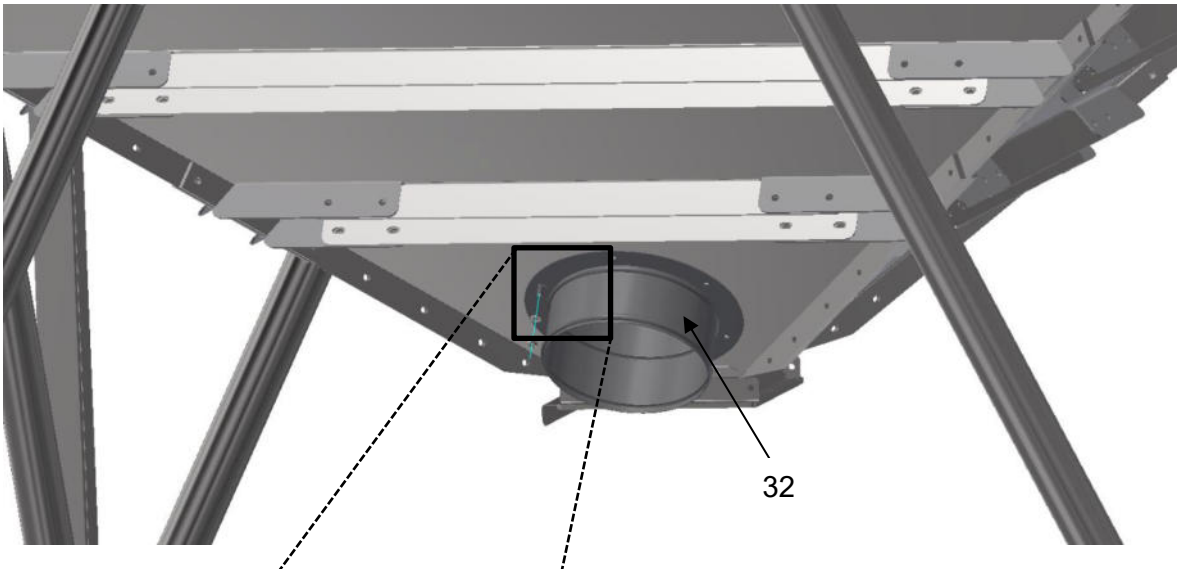
Schritt 5

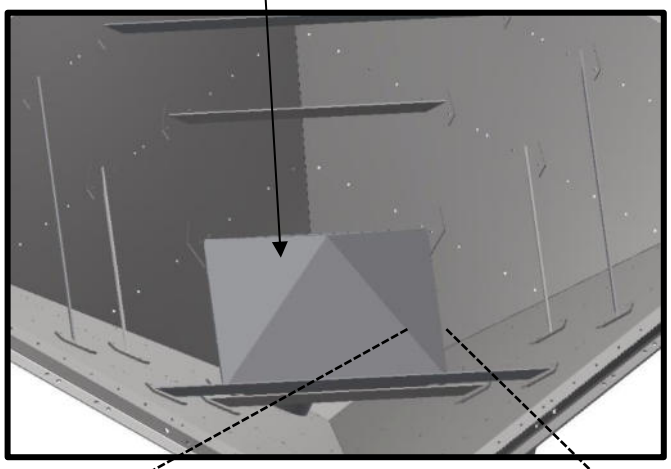

15 + 18 + 19
12 + 16 + 17
10 + 16 + 17
13 + 18 + 19
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ACHTUNG:
Links und rechts die Blech-versteifung 34 einfügen

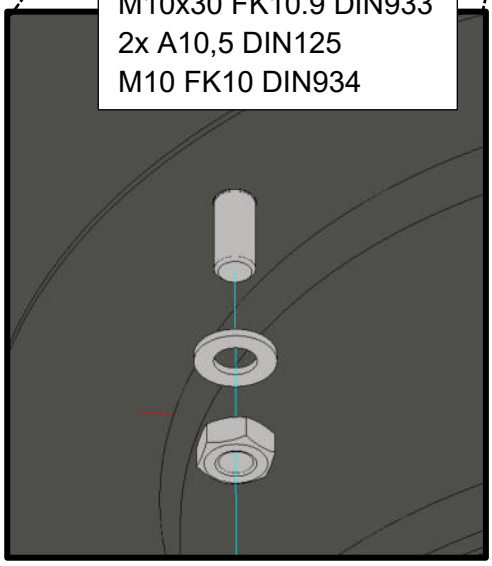

26
28
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
30
26
28
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

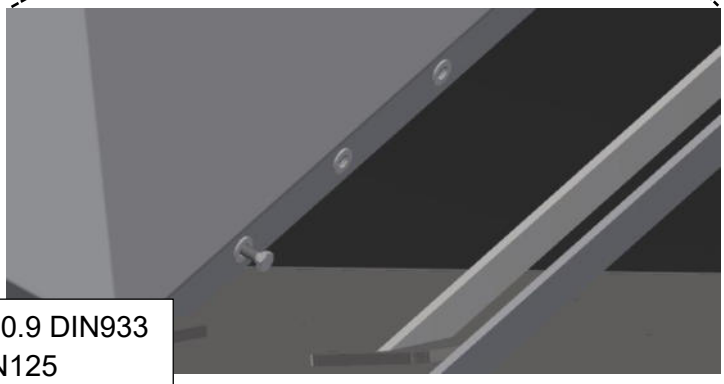

33
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 7 Optional



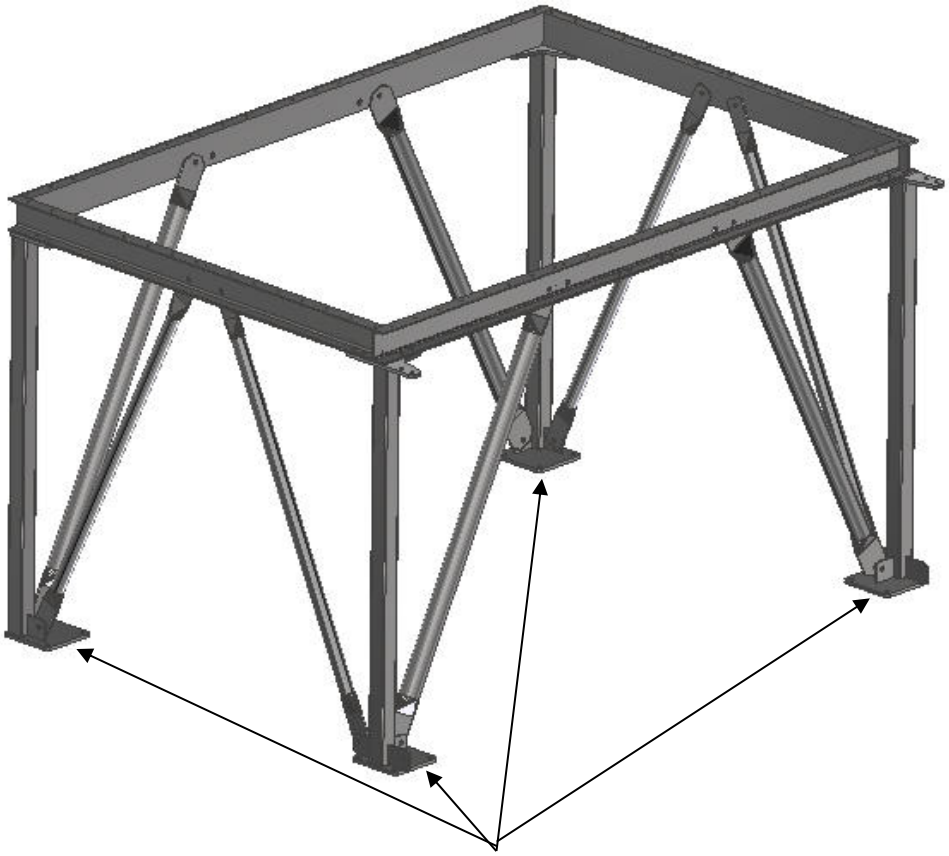




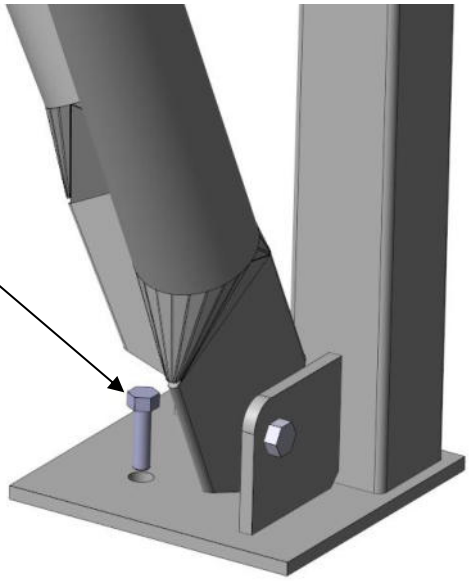


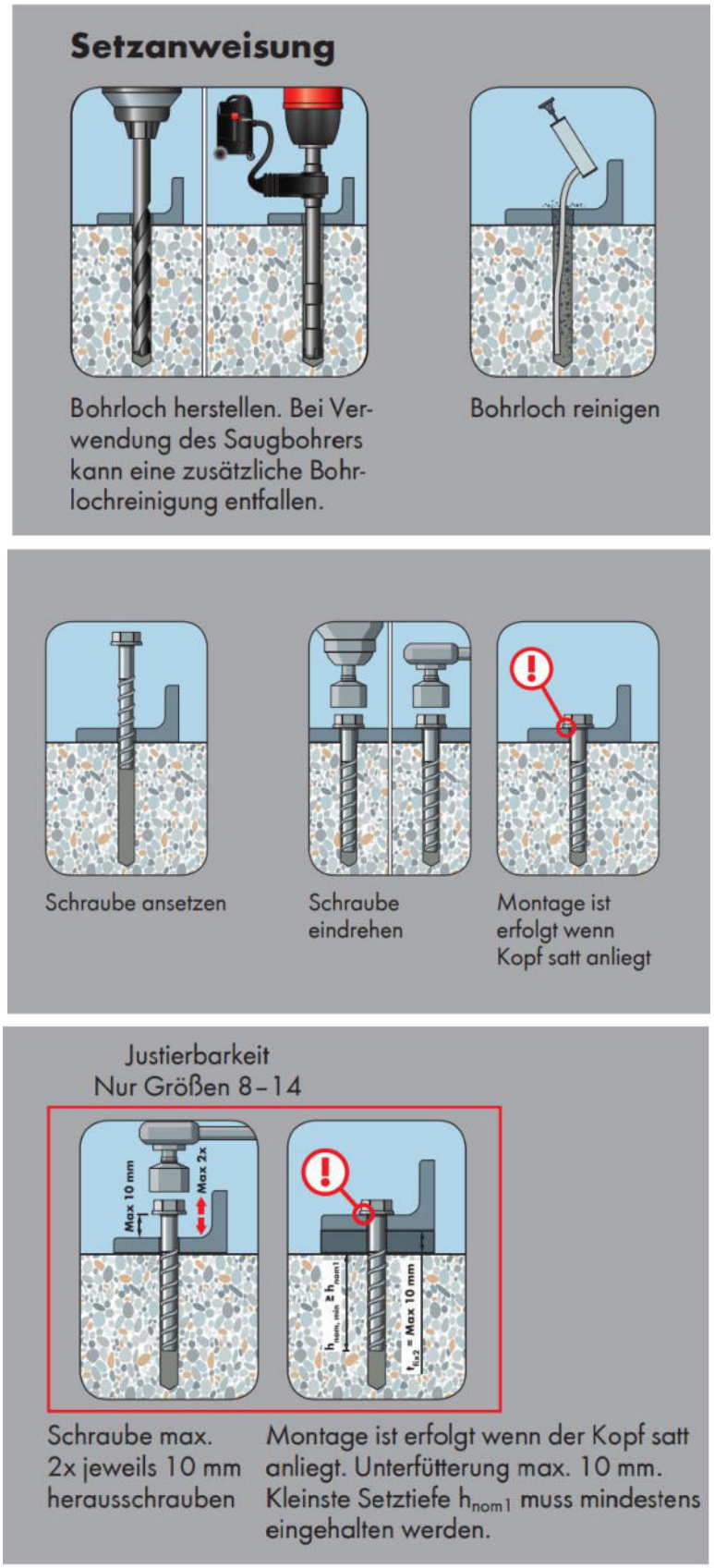
Schritt 8

Auf eine Lotrechte und rechtwinkelige Montage achten



2x Betonschrauben pro Fuß

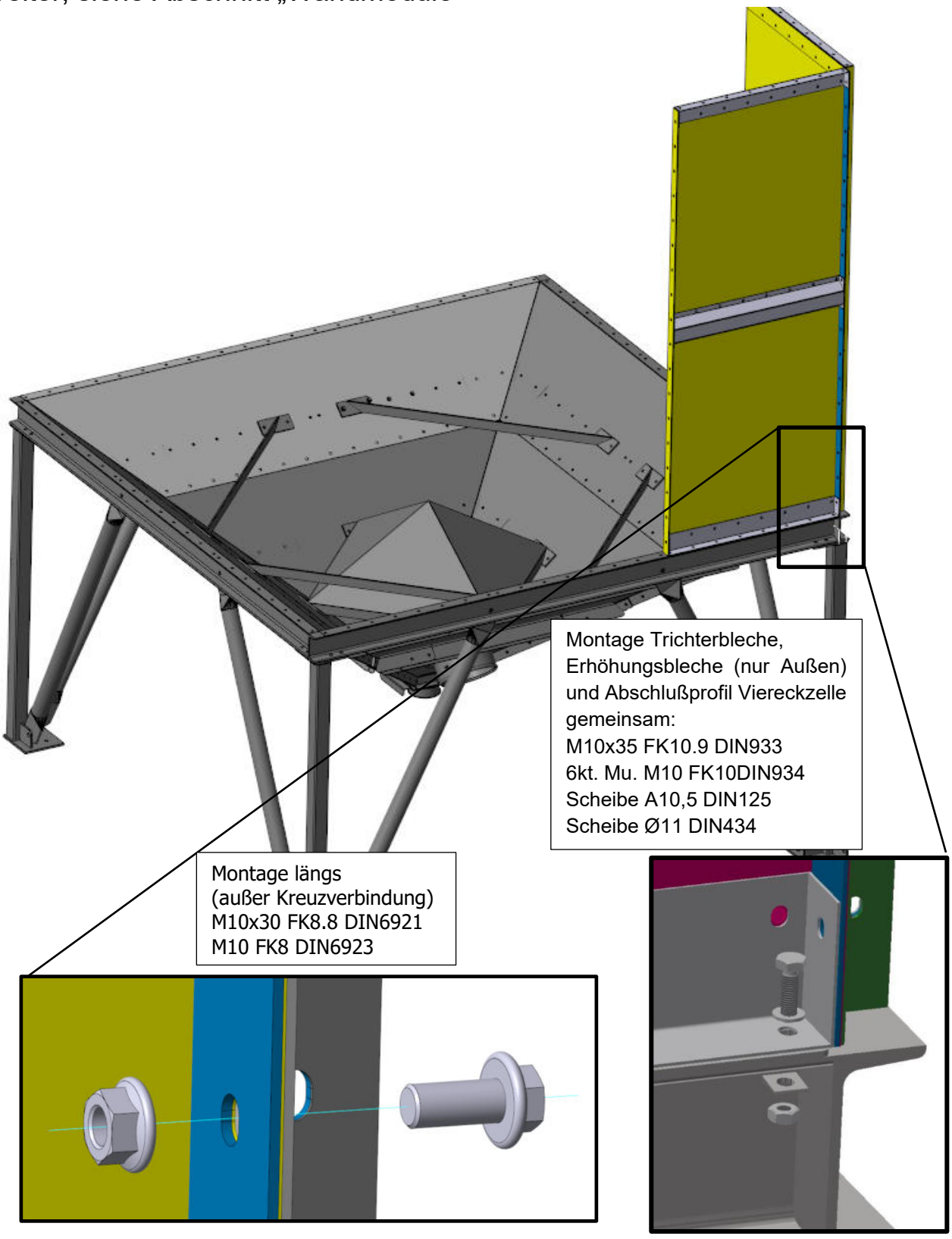




Weitere Informationen: Würth Betonschraube Betonschraube W-BS Typ S Sechskantkopf DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

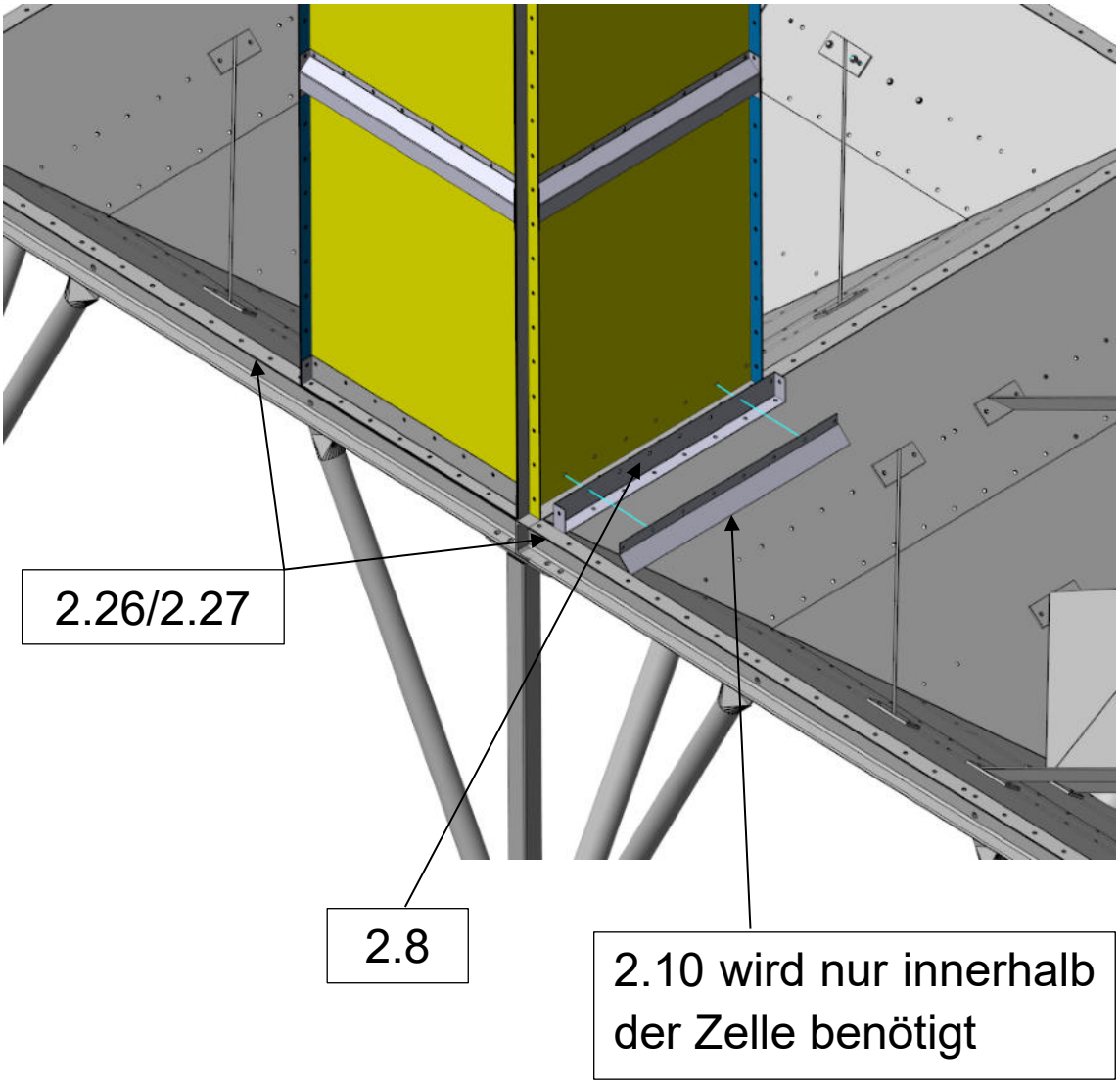
Schritt 9 (Optional, bei dem Aufbau einer Viereckzelle)

Weiter, siehe Abschnitt „Wandmodule“



Bei mehreren Trichterunterbauten

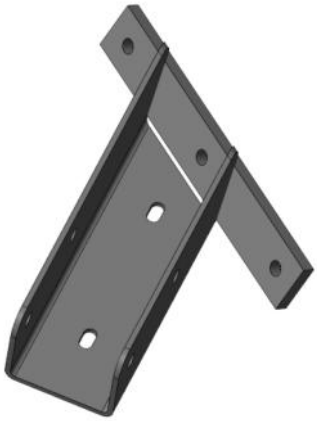
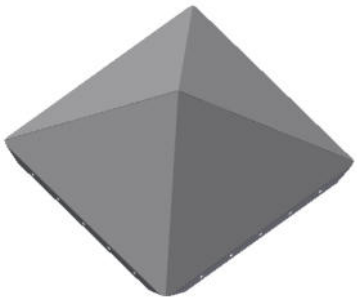
- nebeneinander müssen an den Zwischenwänden am unteren Abschlussprofil zusätzliche Abschräg-bleche verwendet werden, damit das Getreide sauber ablaufen kann.
- An Stellen, an denen zwei Trichterbleche übereinander liegen ist die Aufbauhöhe leicht erhöht -> zum Ausgleich müssen an den anderen Stellen zusätzlich Erhöhungsbleche (2.26) montiert werden

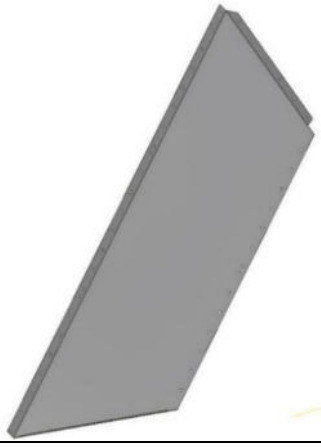
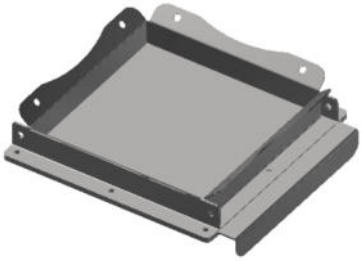


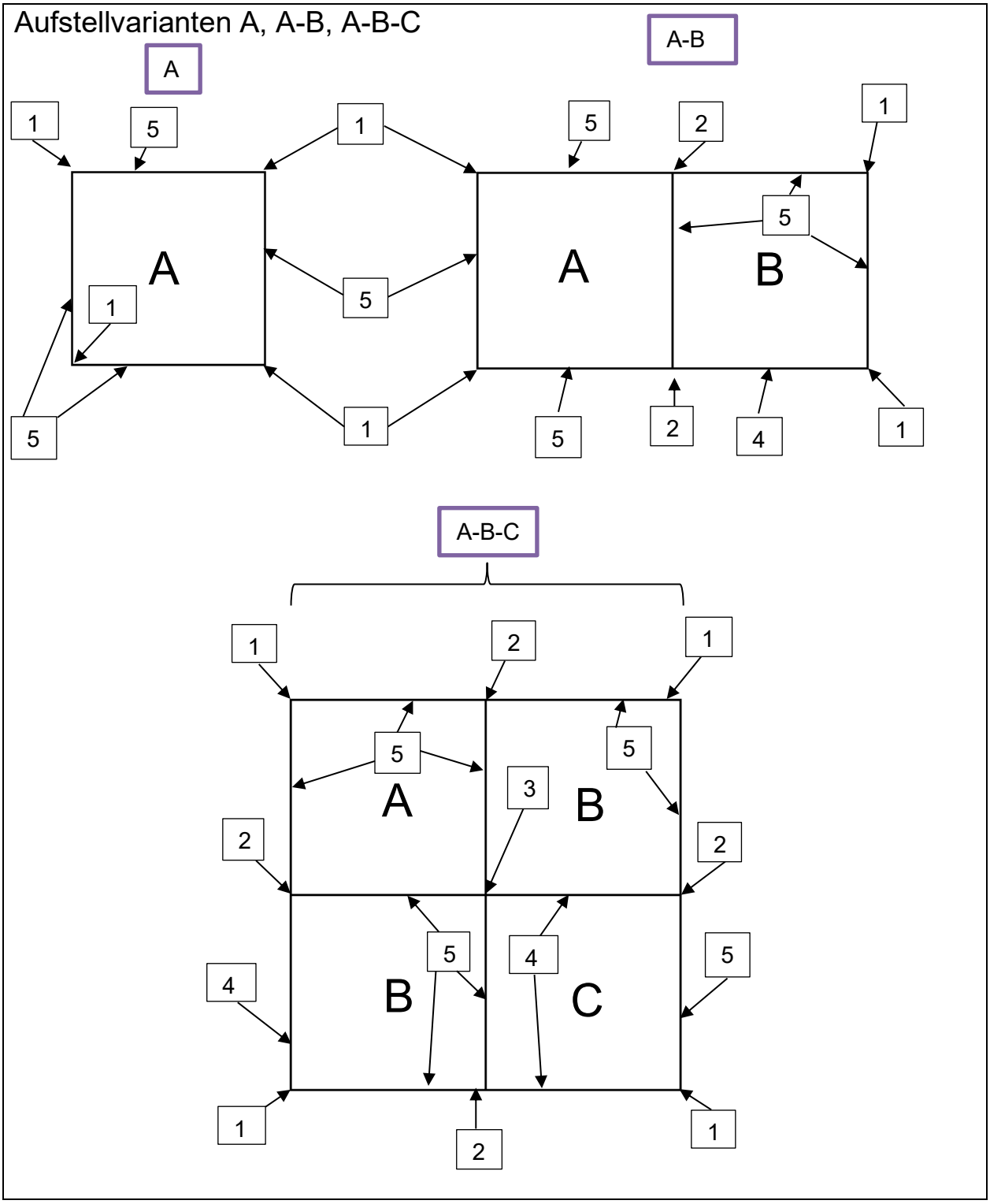
5.4 Optionaler Trichter 3x3

5.4.1 Teileliste

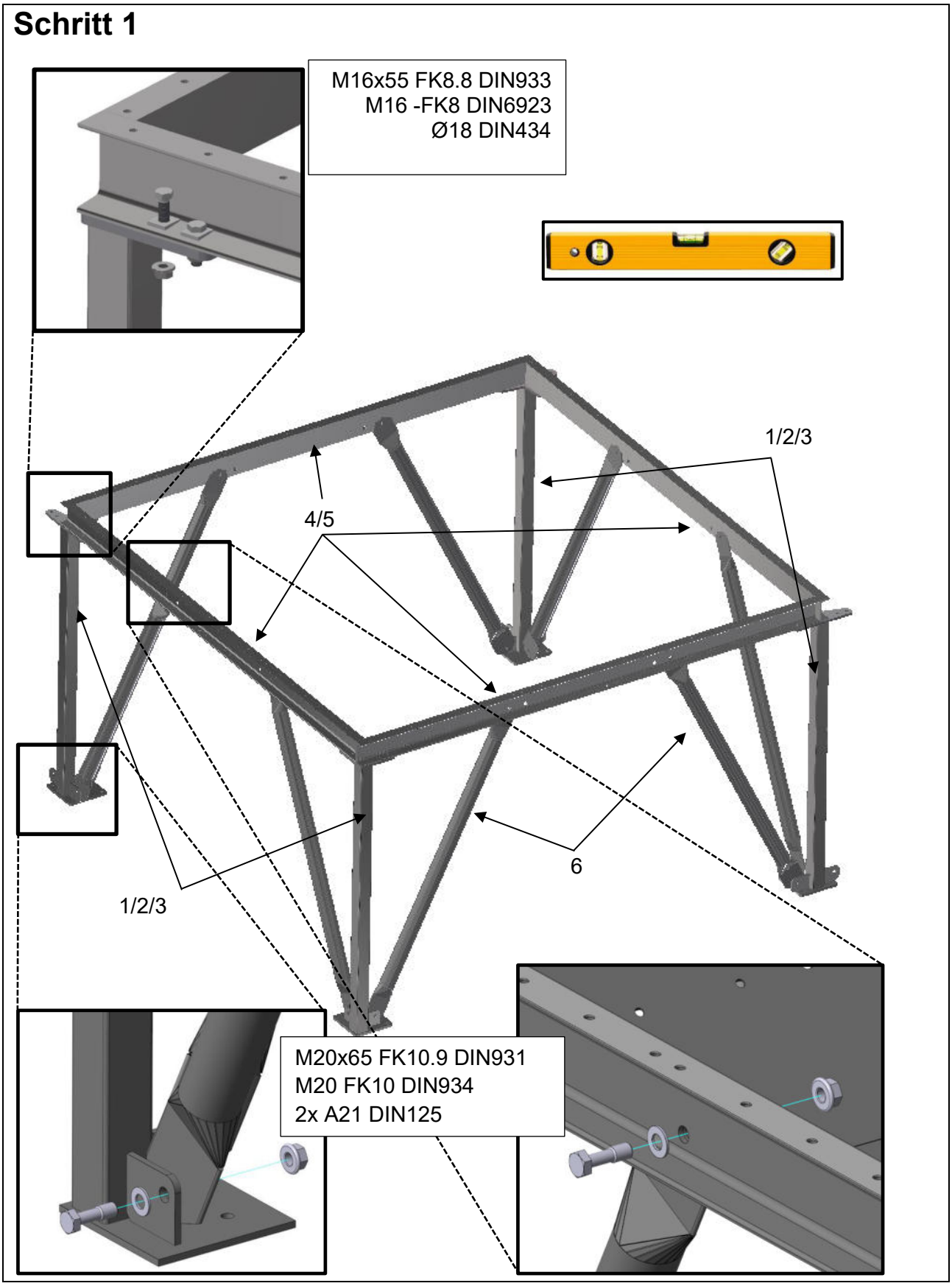
#1 Fuß L für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 	#2 Fuß T für 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 	#3 Fuß X für 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814
#4 U140 - l=2995 ArtNr.: 4009092015806 L=2995 mm 	#5 U140 - l=3055 ArtNr.: 4009092015807 L=3055 mm 	#6 Strebe 88,9x4 für Trichtergestell 3x3+2x3 ArtNr.:4009092015738

#7 Aussenverst. 3x3m & 4x4m unten ArtNr.: 4009092015840 	#8 Aussenverst. 3x3m & 4x4m mitte ArtNr.: 4009092015841 	#9 Aussenverst. 3x3m & 4x4m oben ArtNr.: 4009092015842
#10 Aussenverst. links 40° ArtNr.: 4009092015823 	#11 Aussenverst. rechts 40° ArtNr.: 4009092015824 	#12 Inneneckversteifung oben für Trichter 3mx3m ArtNr.: 4009092015886
#13 Inneneckversteifung mitte 3x3m & 4x4m 40° ArtNr.: 4009092015885 	#14 Innenverstrebung unten 3x3m & 4x4m 40° ArtNr.:4009092015879 	#15 (Optional) Belüftungshaube 3x3 & 4x4m 40° Trichter ArtNr.: 4009092015914 
#16 (Optional) Anschlussstutzen NW300 f. Belüftungseinrichtung	#17 Trichterblech 3x3m 40° oben	#18 Trichterblech 3x3xm & 4x4m 40° unten

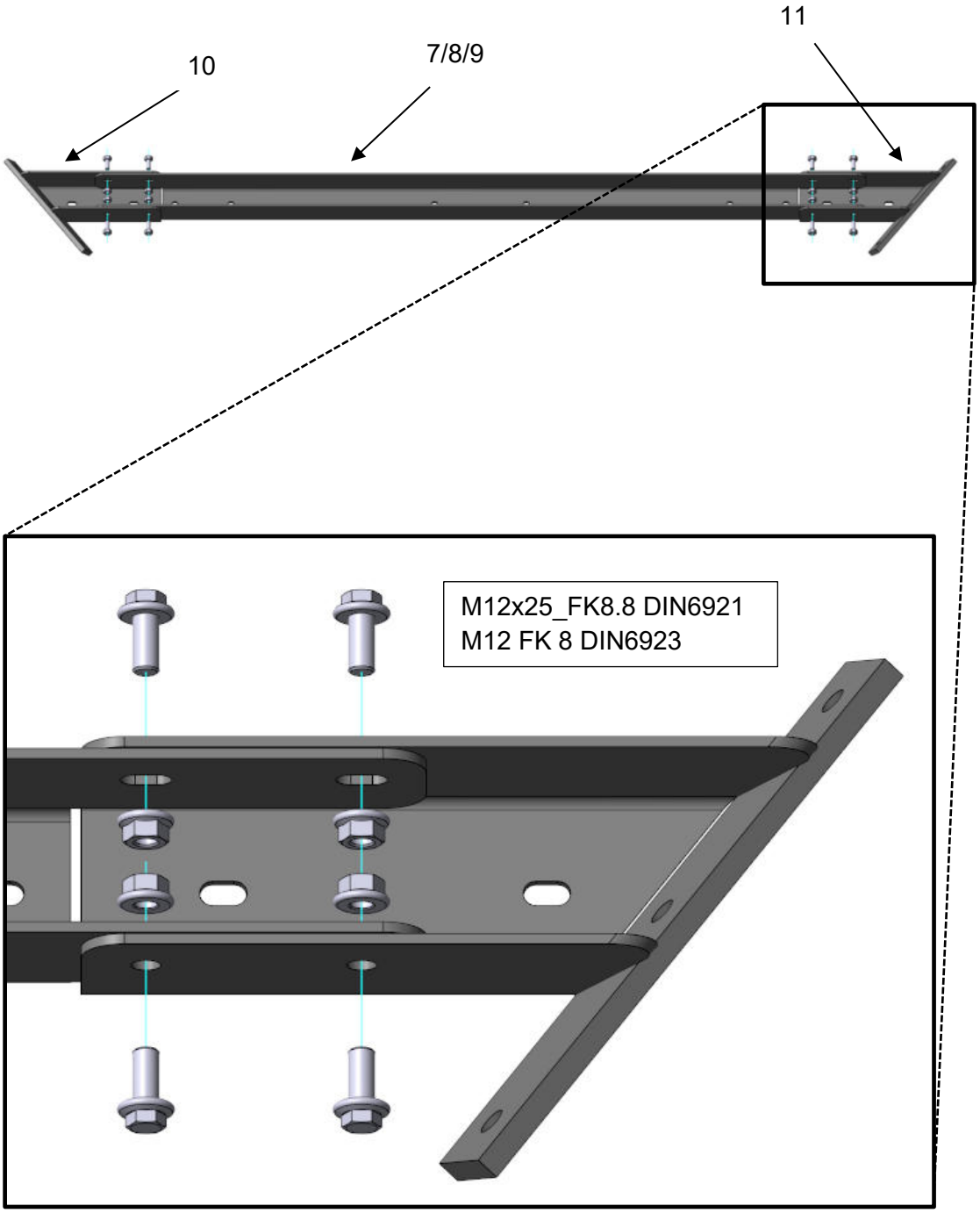
ArtNr.: 4009003016990 	ArtNr.: 4009092015865 	ArtNr.: 4009092015863
#19 (optional, nur wenn #16 eingebaut wird) Trichterblech 3x3m & 4x4m 40° Belüftung ArtNr.: 4009092015864 	#20 Versteifungsblech für 3x3m 40° Trichter ArtNr.: 4009092015852 	#21 Auslauf mit Schieber 300x300 Art.Nr.: 4009092015820 Übergänge auf 150,200,250 4009023015782, 783, 784 


Aufstellvarianten A, A-B, A-B-C
A
A-B
A-B-C
A
B
C

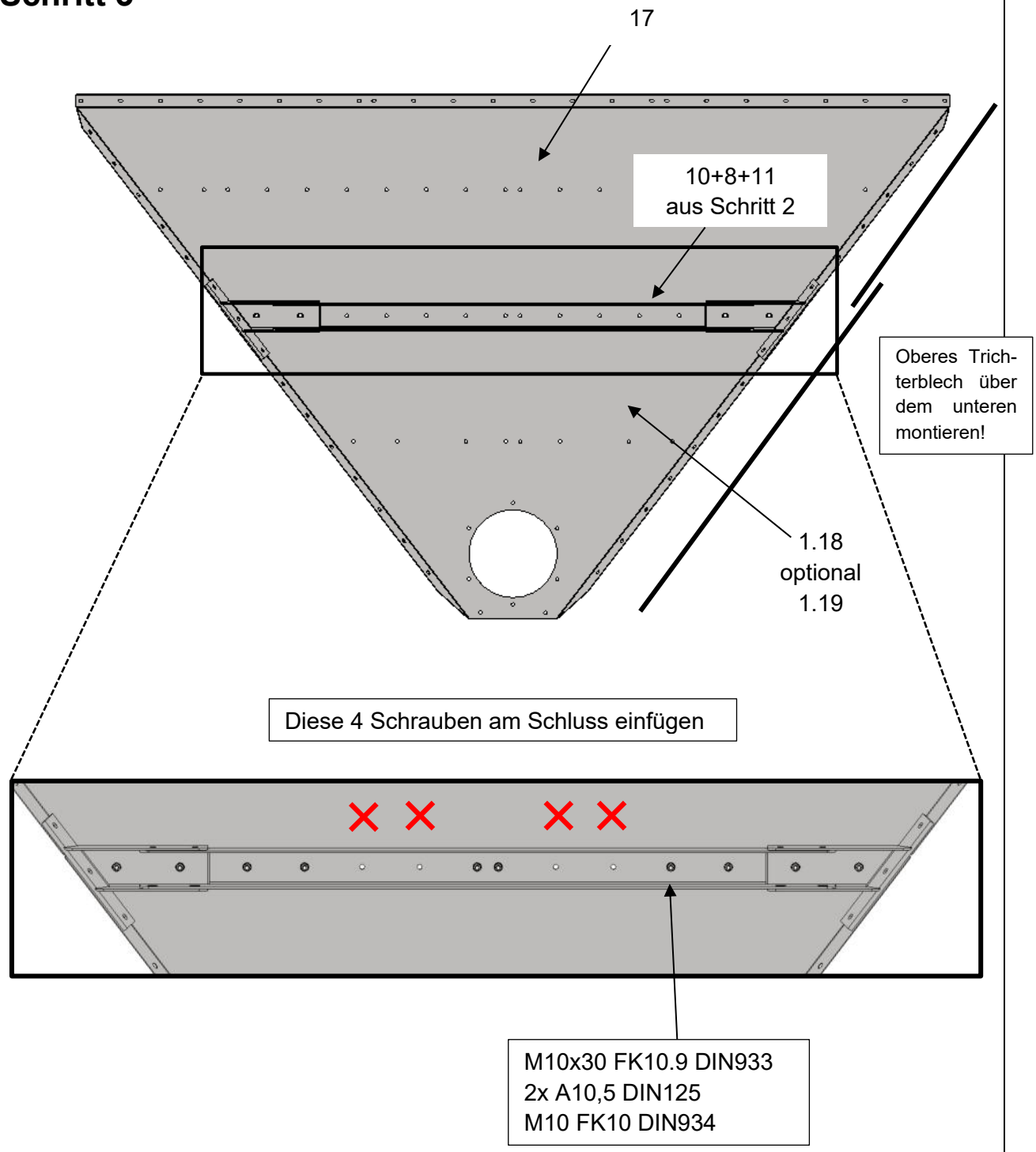
5.4.2 Montage Trichterunterbau 3x3



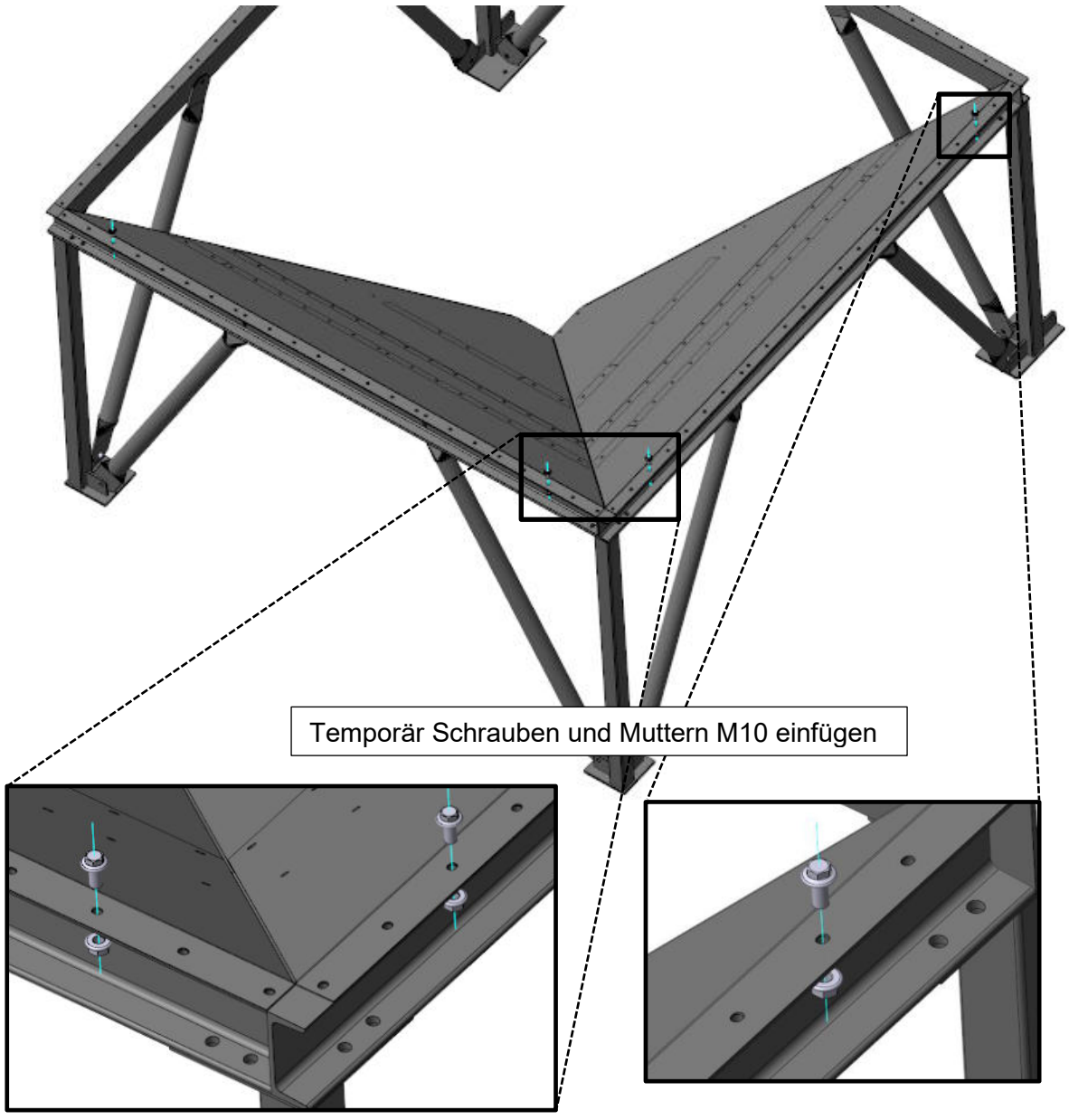
Schritt 2



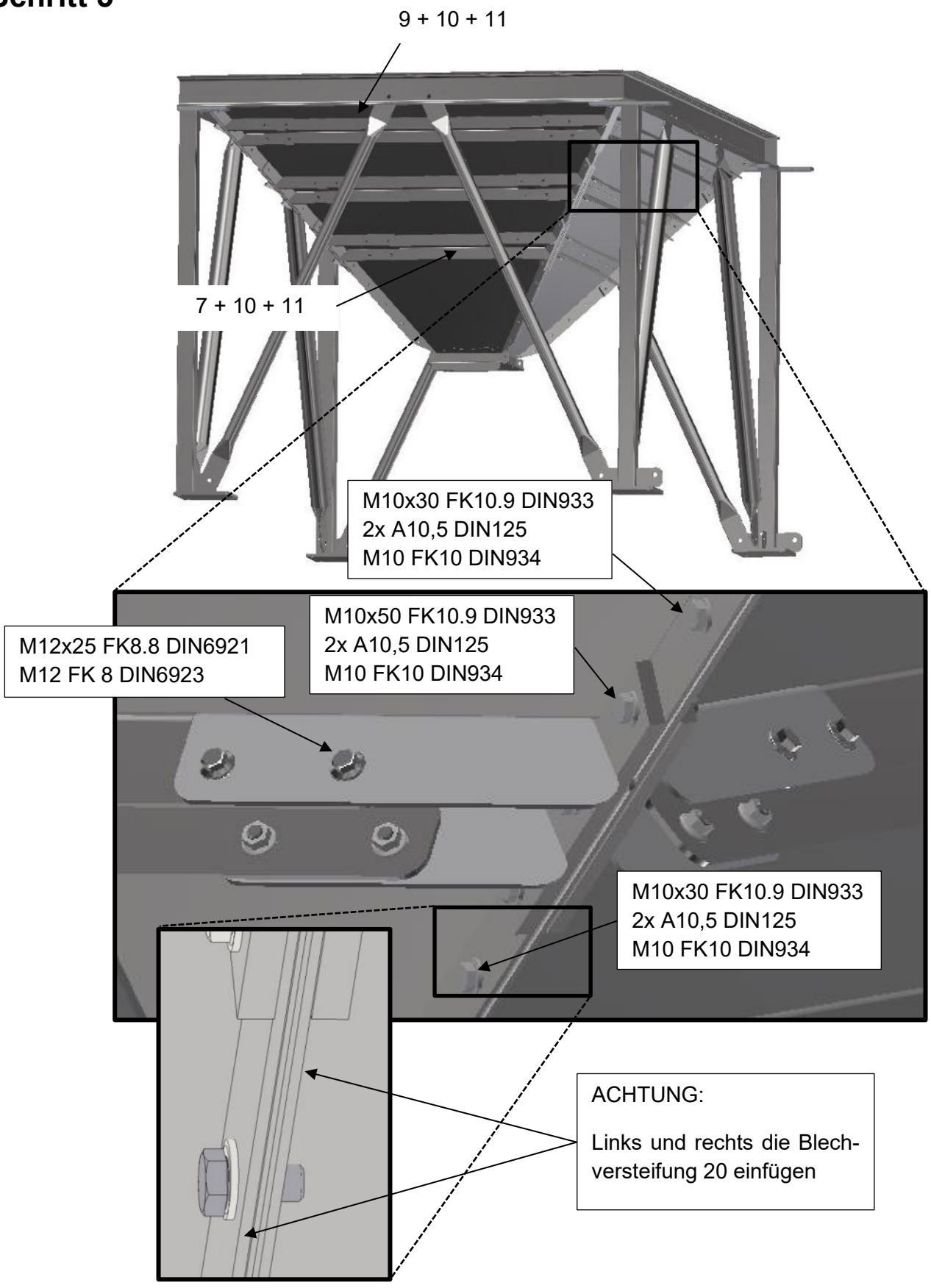
Schritt 3

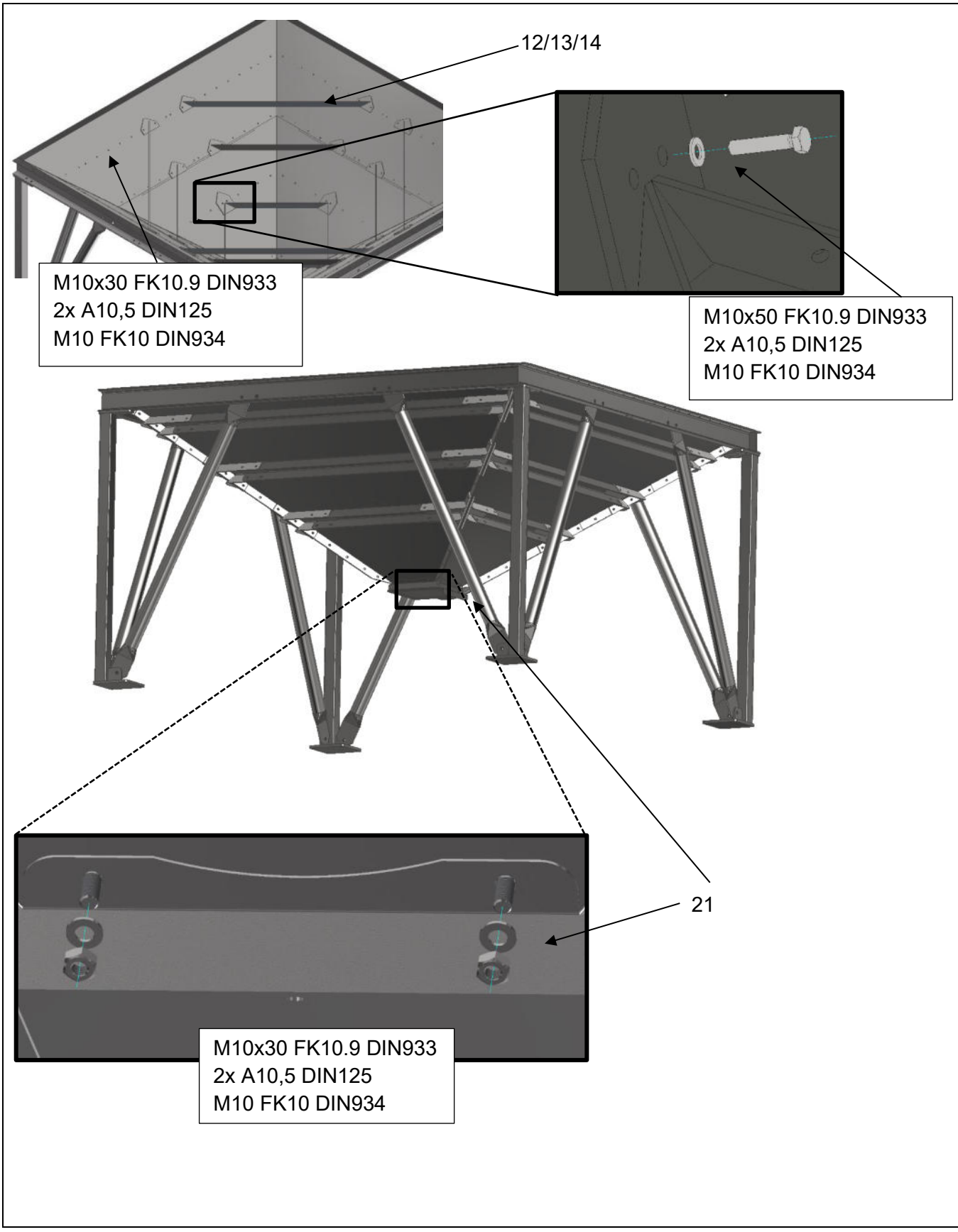

17
10+8+11
aus Schritt 2
Oberes Trich-
terblech über
dem unteren
montieren!
1.18
optional
1.19
Diese 4 Schrauben am Schluss einfügen
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 4

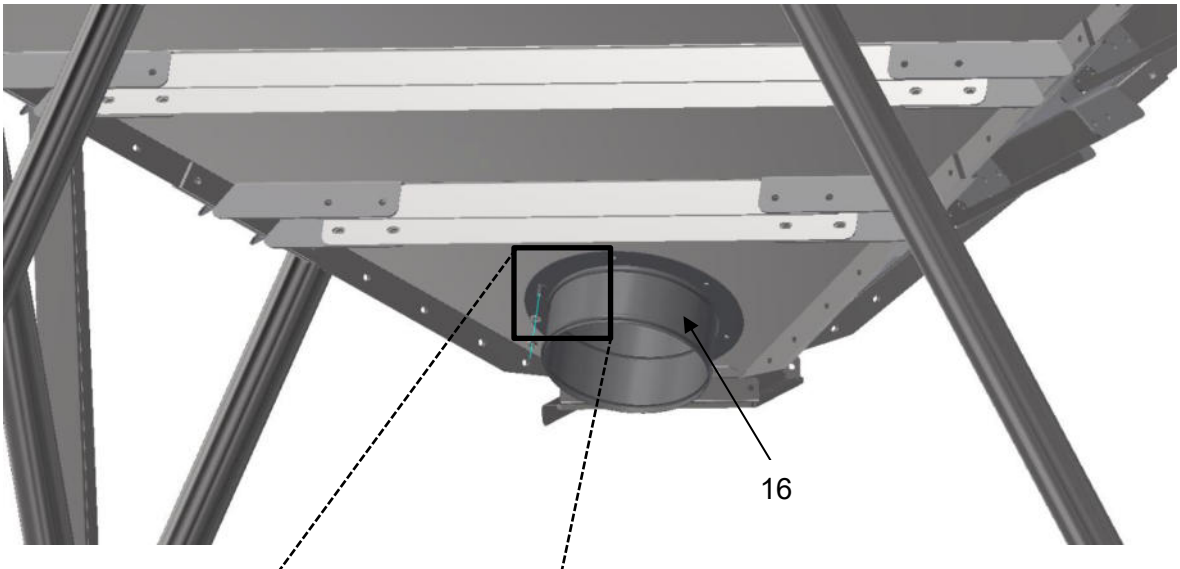


Schritt 5

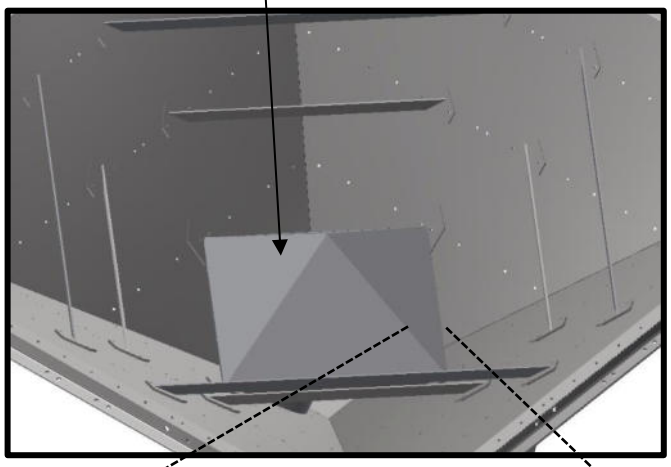

9 + 10 + 11
7 + 10 + 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ACHTUNG:
Links und rechts die Blech-versteifung 20 einfügen


12/13/14
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
21
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

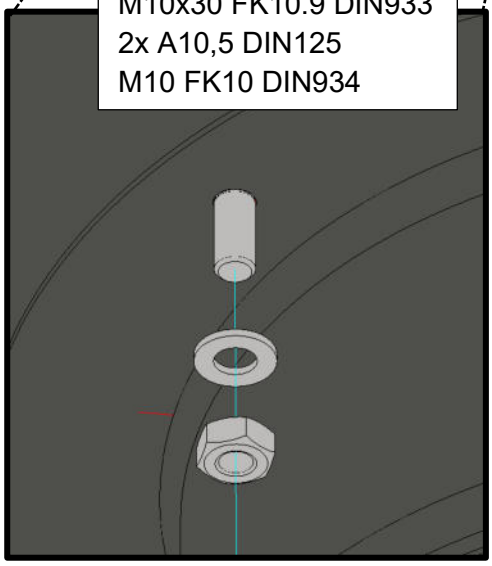
Schritt 7 Optional

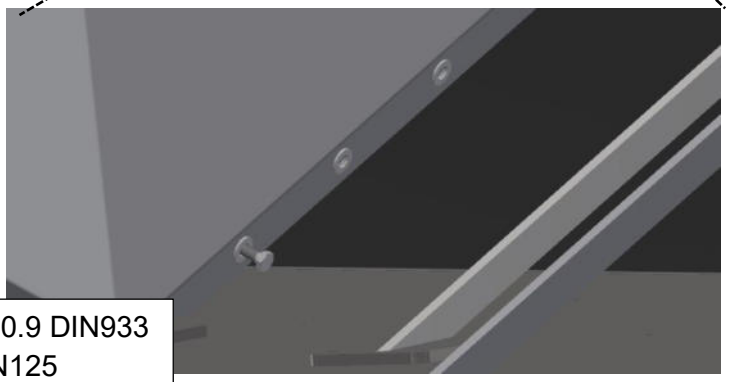


15



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

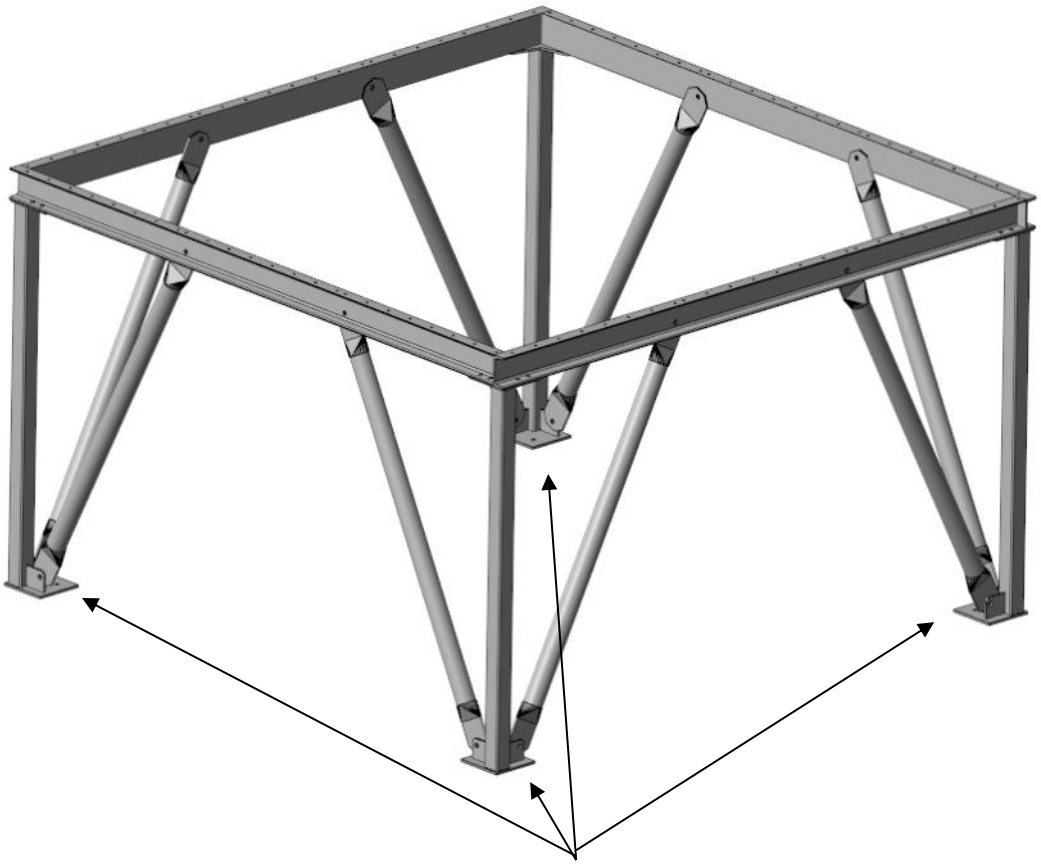




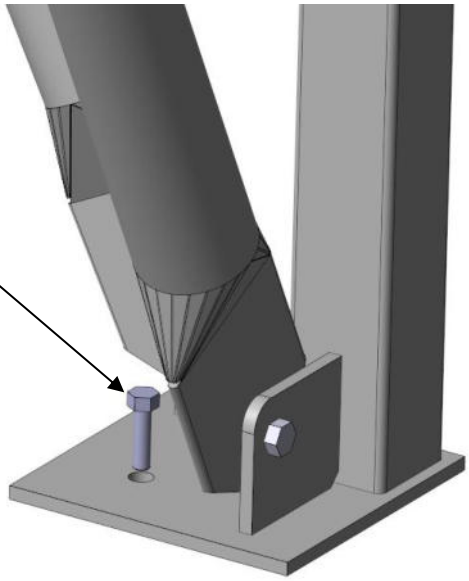
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

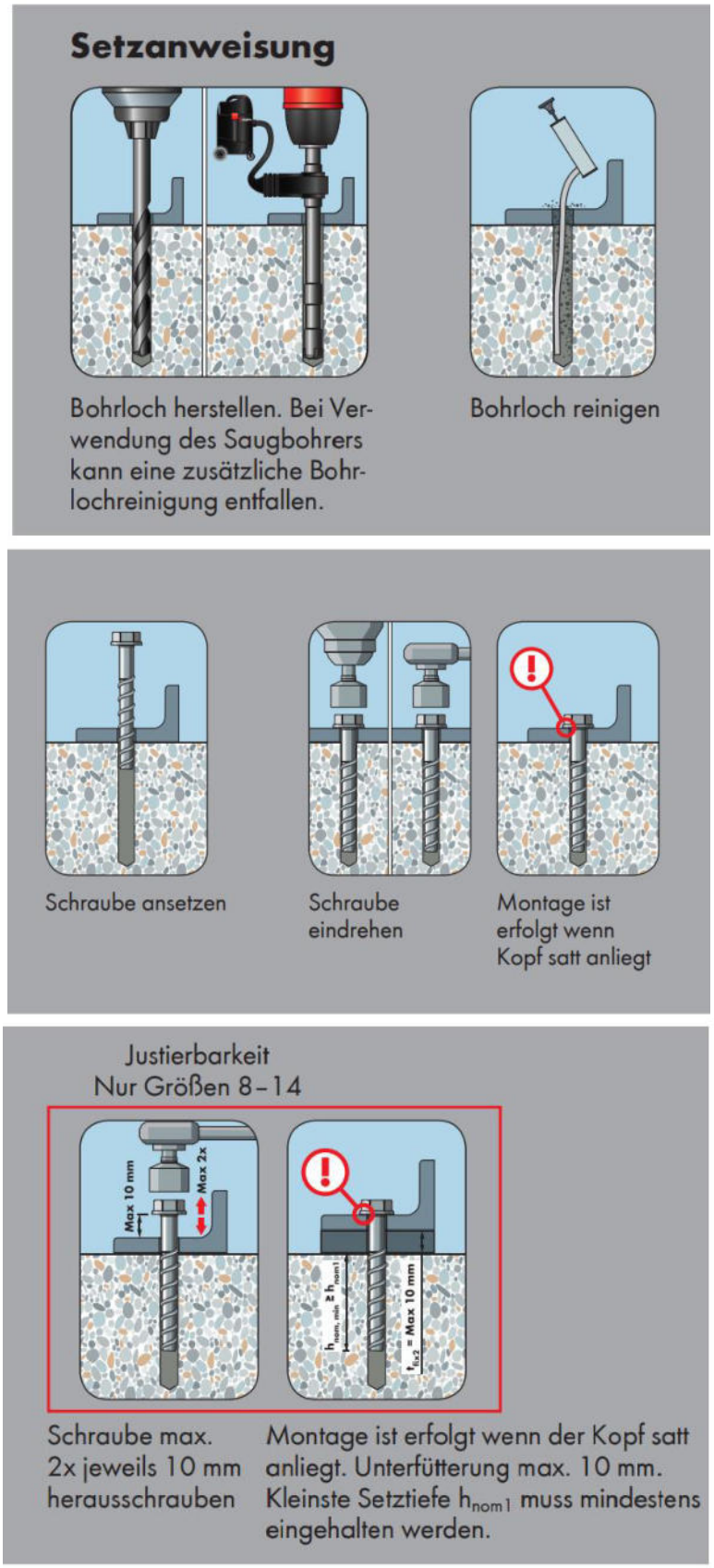
Schritt 8

Auf eine Lotrechte und rechtwinkelige Montage achten



2x Betonschrauben pro Fuß

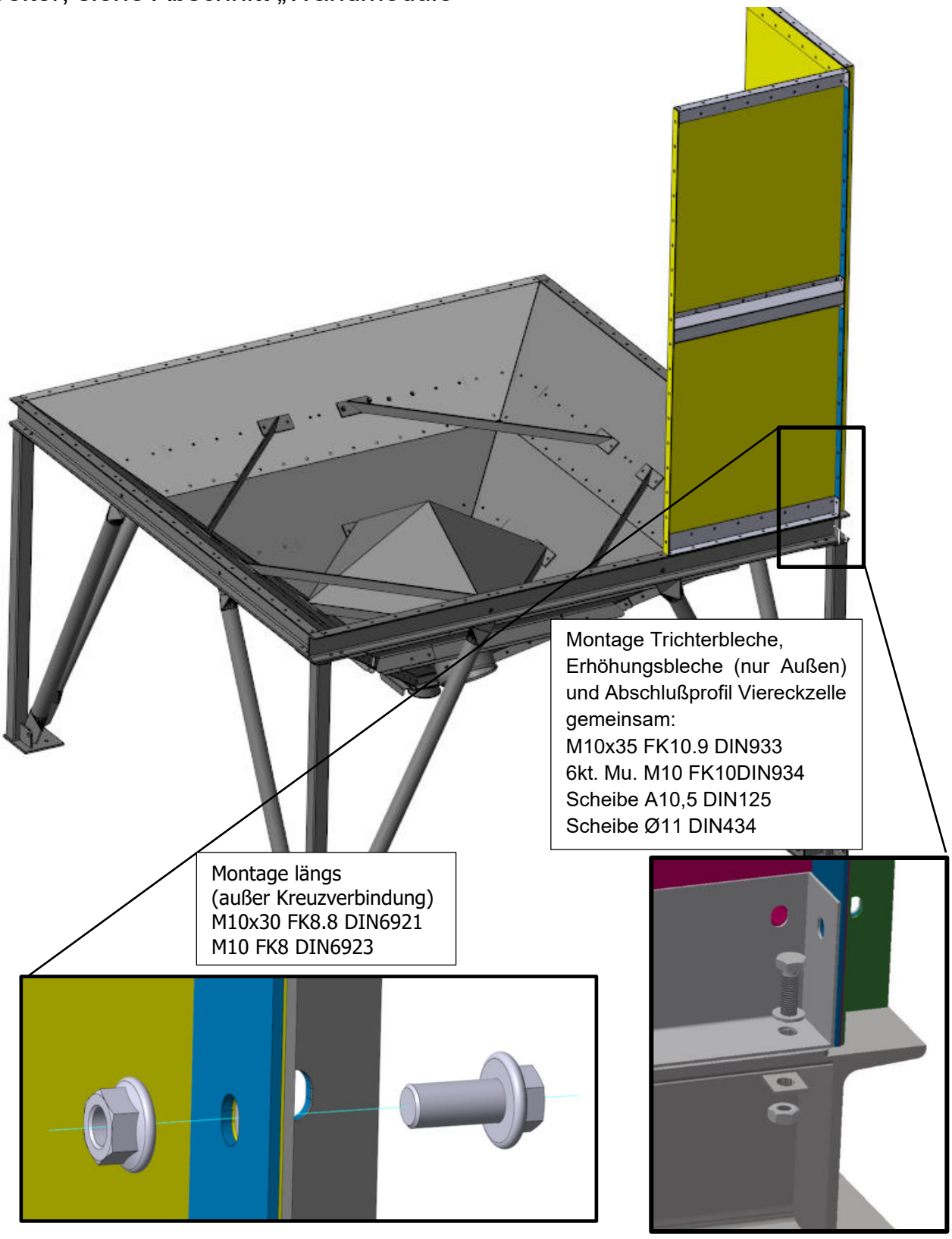




Weitere Informationen: Würth Betonschraube Betonschraube W-BS Typ S Sechskantkopf DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

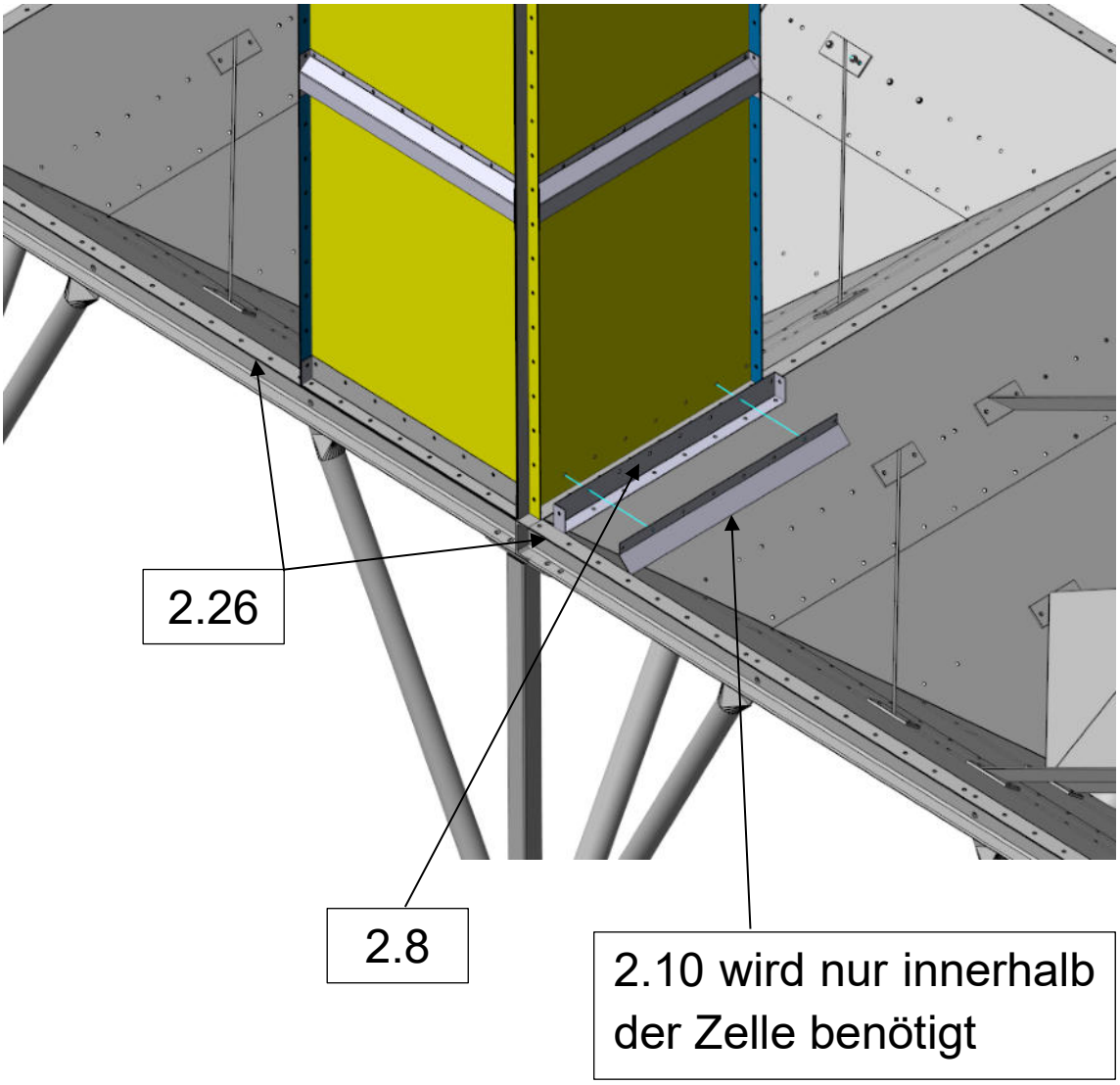
Schritt 9 (Optional, bei dem Aufbau einer Viereckzelle)

Weiter, siehe Abschnitt „Wandmodule“



Bei mehreren Trichterunterbauten

- nebeneinander müssen an den Zwischenwänden am unteren Abschlussprofil zusätzliche Abschräg-bleche verwendet werden, damit das Getreide sauber ablaufen kann.
- An Stellen, an denen zwei Trichterbleche übereinander liegen ist die Aufbauhöhe leicht erhöht -> zum Ausgleich müssen an den anderen Stellen zusätzlich Erhöhungsbleche (2.26) montiert werden



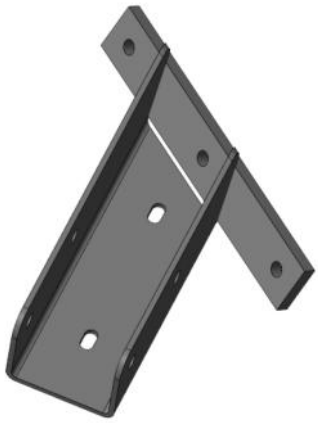
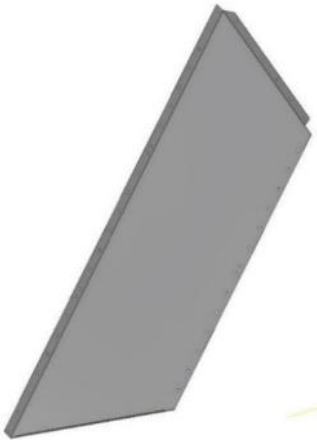
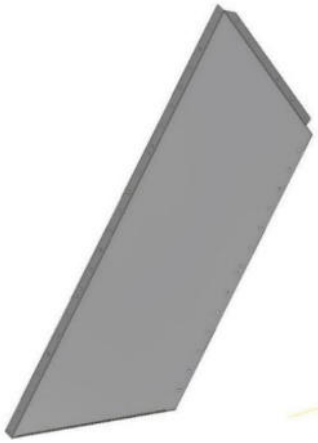
5.5 Optionaler Trichter 4x3

5.5.1 Teileliste

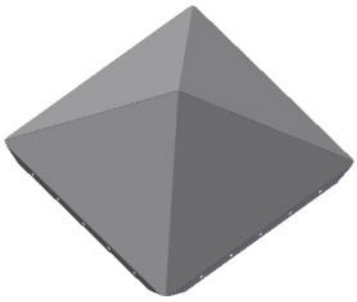
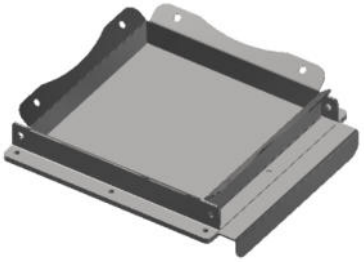
#1 Fuß L für 4x4 & 4x3 Art.Nr.:4009092015817 	#2 Fuß T für 4x4 & 4x3 Art.Nr.:4009092015818 	#3 Fuß X für 4x4 & 4x3 ArtNr.: 4009092015819
#4 Fuß I außen für 4x4 & 4x3 ArtNr.: 4009092015815 	#5 Fuß I innen für 4x4 & 4x3 ArtNr.: 4009092015816 	#6 U140 - l=2995 ArtNr.: 4009092015806 L=2995 mm

#7 U140 - l=3055 ArtNr.: 4009092015807 L=3055 mm 	#8 U140 - l=3997,5 ArtNr.: 4009092015808 L=3997,5 mm 	#9 U140 - l=4057,5 ArtNr.: 4009092015809 L=4057,5mm
#10 Strebe 88,9x4 für Trichtergestell 4x4+4x3 ArtNr.:4009092015811 		

#11 Aussenverst. 3x4m – 4m unten ArtNr.: 4009092015846 	#12 Aussenverst. 3x4m – 4m mitte ArtNr.: 4009092015845 	#13 Aussenverst. 3x4m – 4m oben ArtNr.: 4009092015844
#14 Aussenverst. 3x4m – 3m unten ArtNr.: 4009092015849 	#15 Aussenverst. 3x4m – 3m mitte ArtNr.: 4009092015848 	#16 Aussenverst. 3x4m – 3m oben ArtNr.: 4009092015847

#17 Aussenverst. rechts 40° 3x4m - 4m ArtNr.: 4009092015830 	#18 Aussenverst. links 40° 3x4m – 4m ArtNr.: 4009092015829 	#19 Aussenverst. rechts 40° 3x4m – 3m ArtNr.: 4009092015832
#20 Aussenverst. links 40° 3x4m – 3m ArtNr.: 4009092015831 	#21 Trichterblech 3x4m 40° - 3m oben ArtNr.: 4009092015868 	#22 Trichterblech 3x4m 40° - 4m oben ArtNr.: 4009092015867 

#23 Trichterblech 3x4m 40° - 3m unten ArtNr.: 4009092015870 	#24 Trichterblech 3x4m 40° - 4m unten ArtNr.: 4009092015869 	#25 (optional, nur wenn #33 eingebaut wird) Trichterblech 3x4m 40° – 3m Belüftung ArtNr.: 4009092015872
#26 (optional, nur wenn #33 eingebaut wird) Trichterblech 3x4m 40° - 4m Belüftung ArtNr.: 4009092015871 	#27 Inneneckversteifung mitte1 3x4m 40° ArtNr.: 4009092015890 	#28 Inneneckversteifung mitte2 3x4m 40° ArtNr.: 4009092015891

#29 Inneneckversteifung oben1 3x4m 40° ArtNr.: 4009092015888 	#30 Inneneckversteifung oben2 3x4m 40° ArtNr.: 4009092015889 	#31 Innenverstrebung unten 3x4m 40° ArtNr.:4009092015880
#32 (Optional) Belüftungshaube 3x4m 40° Trichter ArtNr.: 4009092015915 	#33 (Optional) Anschlussstutzen NW300 f. Belüftungseinrichtung ArtNr.: 4009003016990 	#34 Auslauf mit Schieber 300x300 3x4m Art.Nr.: 4009092015822 Übergänge auf 150,200,250 4009023015782, 783, 784 

#35 Versteifungsblech für 3x4m 40° Trichter ArtNr.: 4009092015853 		

Möglichkeiten für die Zwischenstutzen

Bei den jeder Seite muss mindestens ein zusätzlicher Stützfuss eingeschraubt werden (Bild 1). Wenn Sie bspw. Über eine Fördereinrichtung verfügen, welche mittig unter den Silos verläuft, können auch zwei Stützfüsse auf der 4m Seite (Bild 2) eingeschraubt werden.

Bild 1

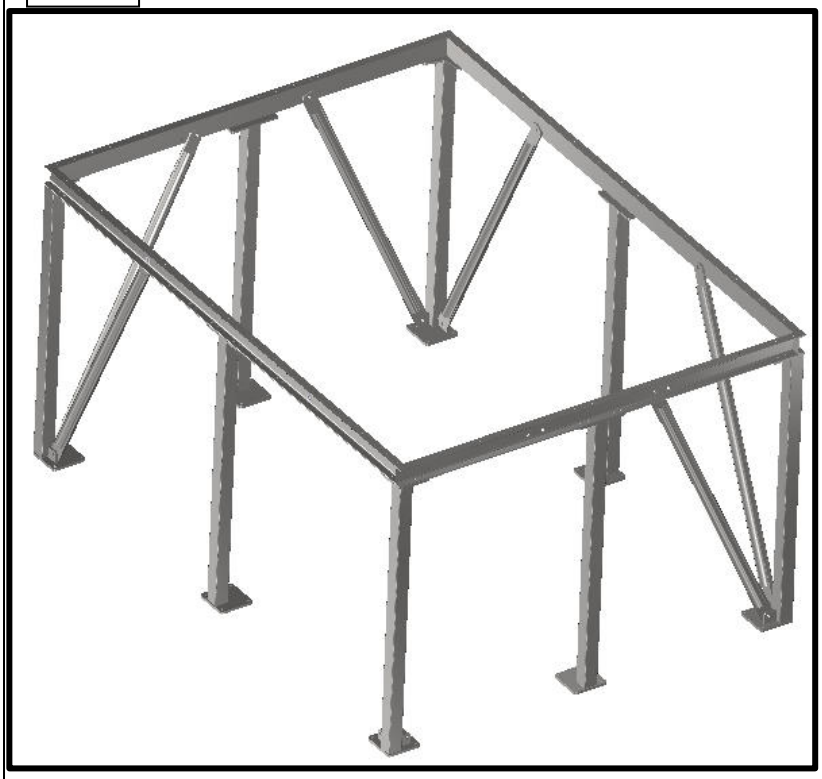
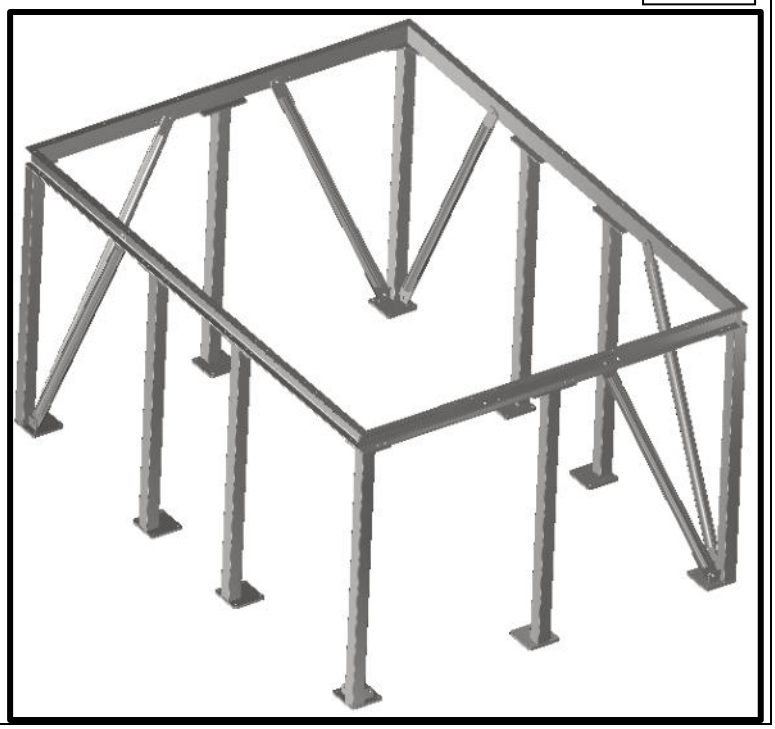
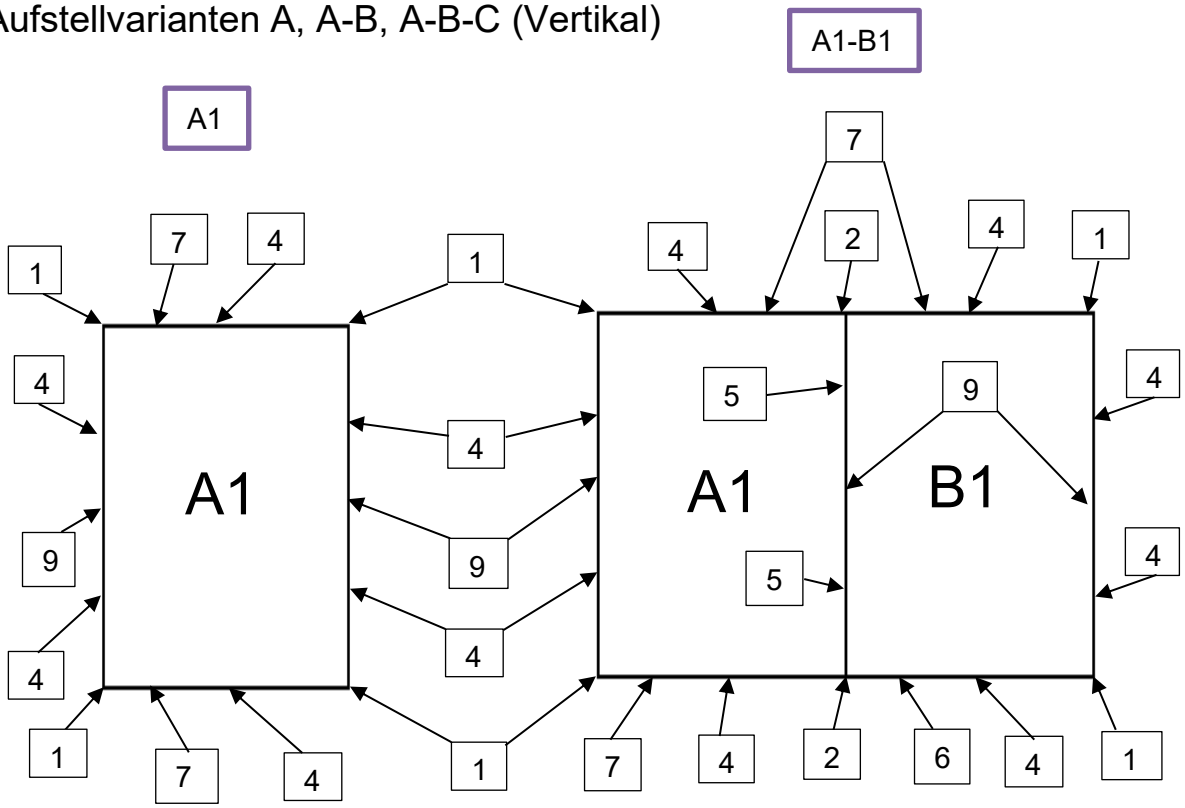


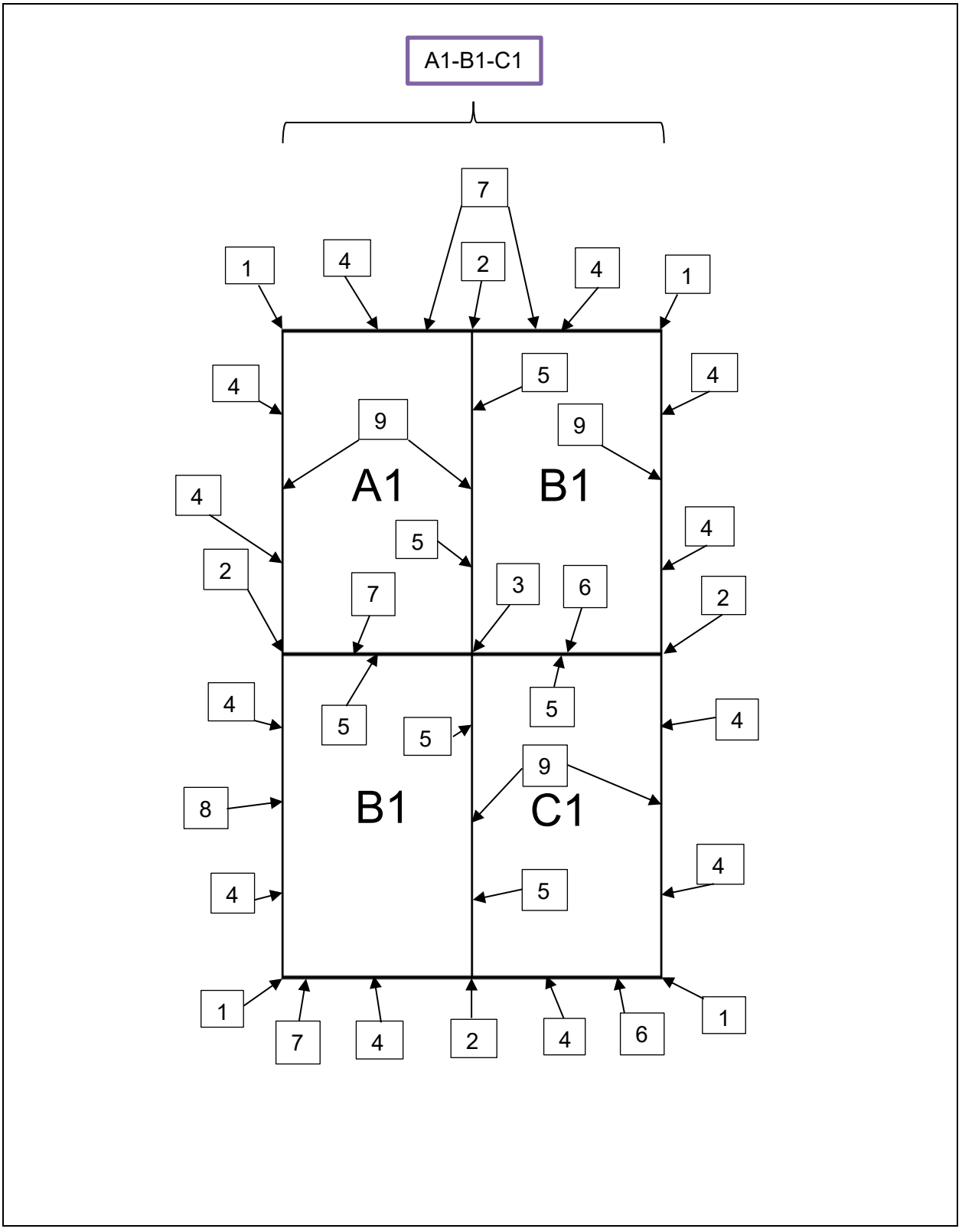
Bild 2



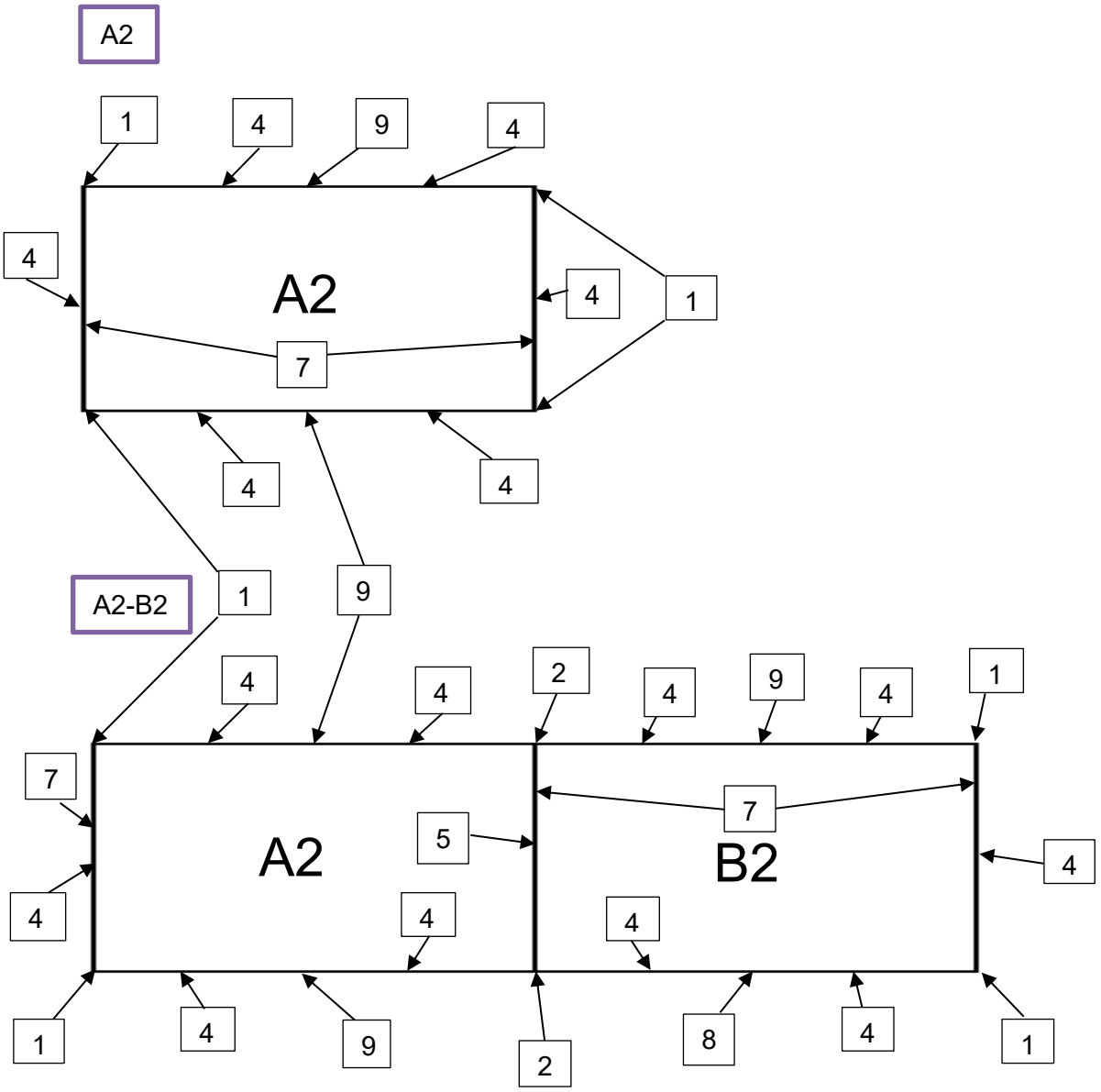
Im folgenden Beispiel werden auf der 4m Seite 2 Stützfüße verwendet

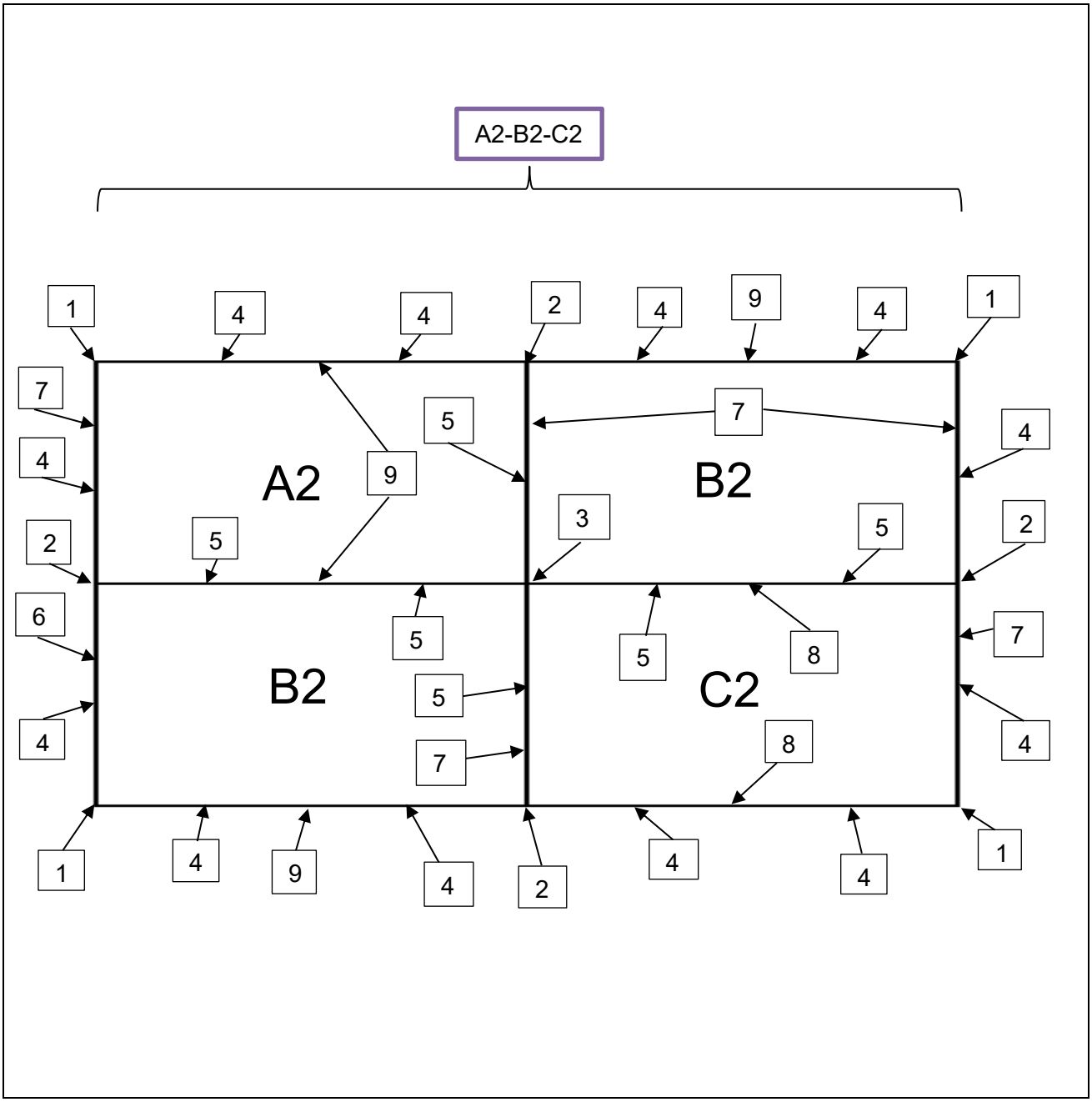
Aufstellvarianten A, A-B, A-B-C (Vertikal)




A1-B1-C1
A1
B1
B1
C1

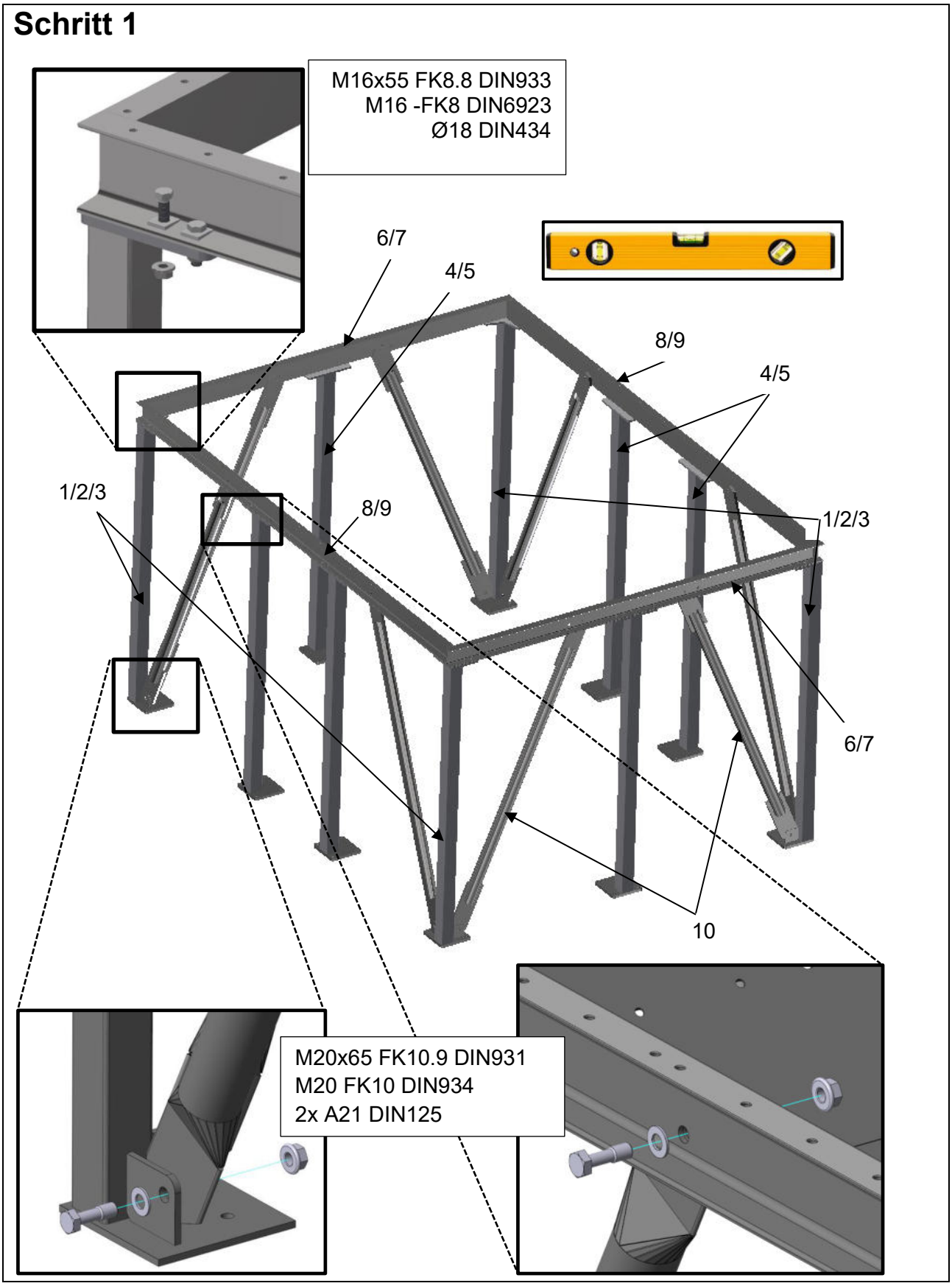
Aufstellvarianten A, A-B, A-B-C (Horizontal)




A2-B2-C2
A2
B2
B2
C2

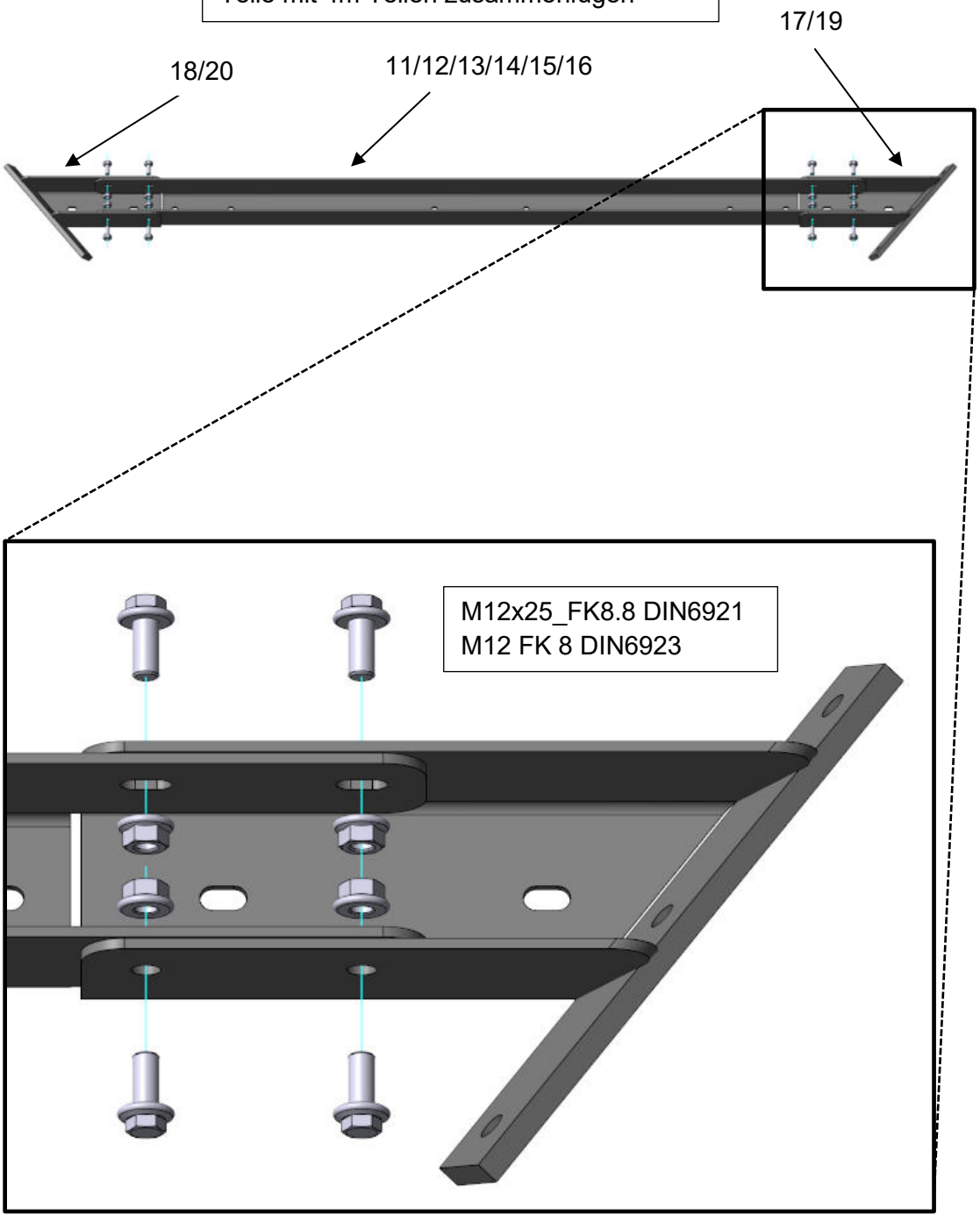
5.5.2 Montage Trichterunterbau 4x3

Schritt 1

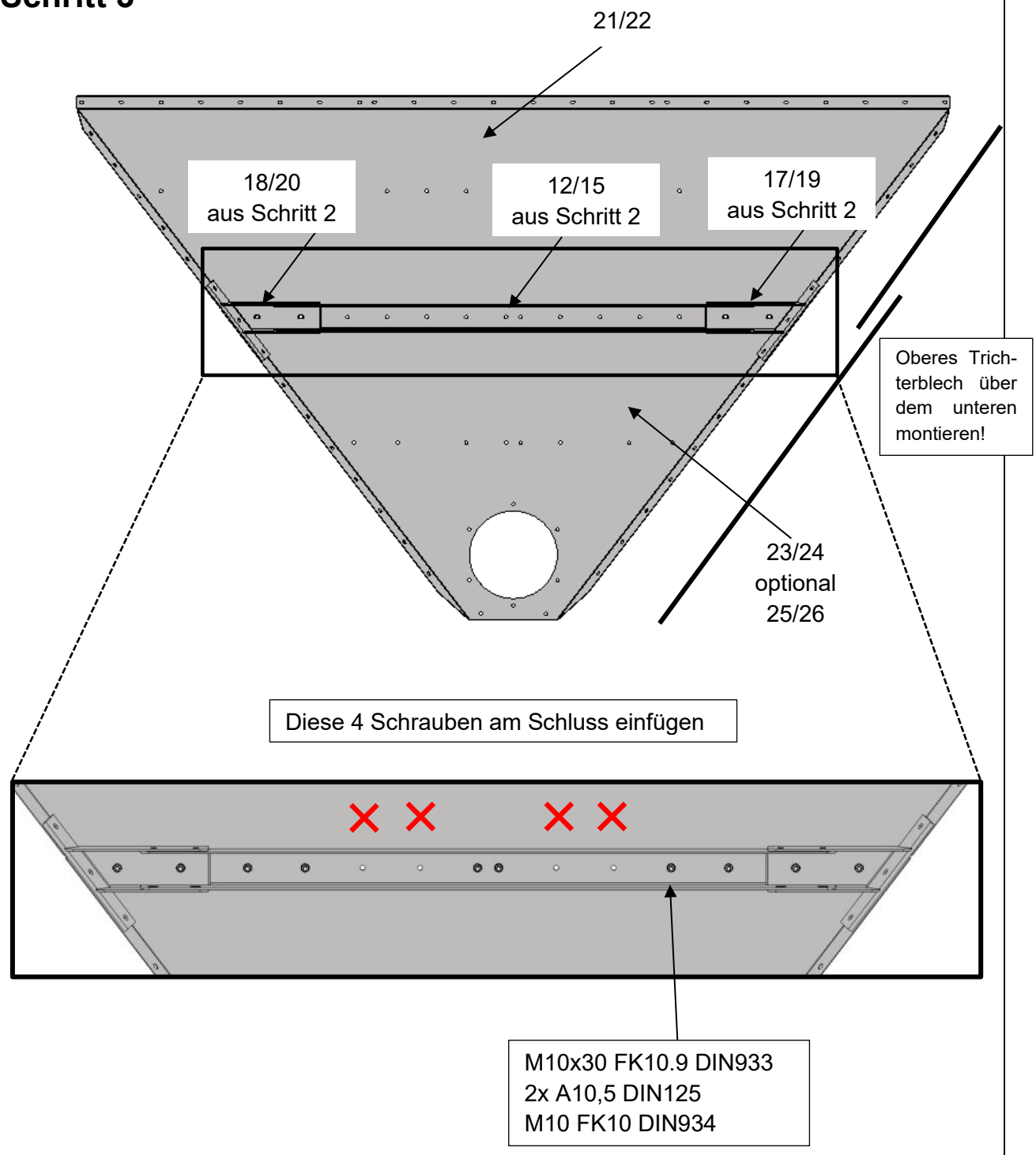


Schritt 2

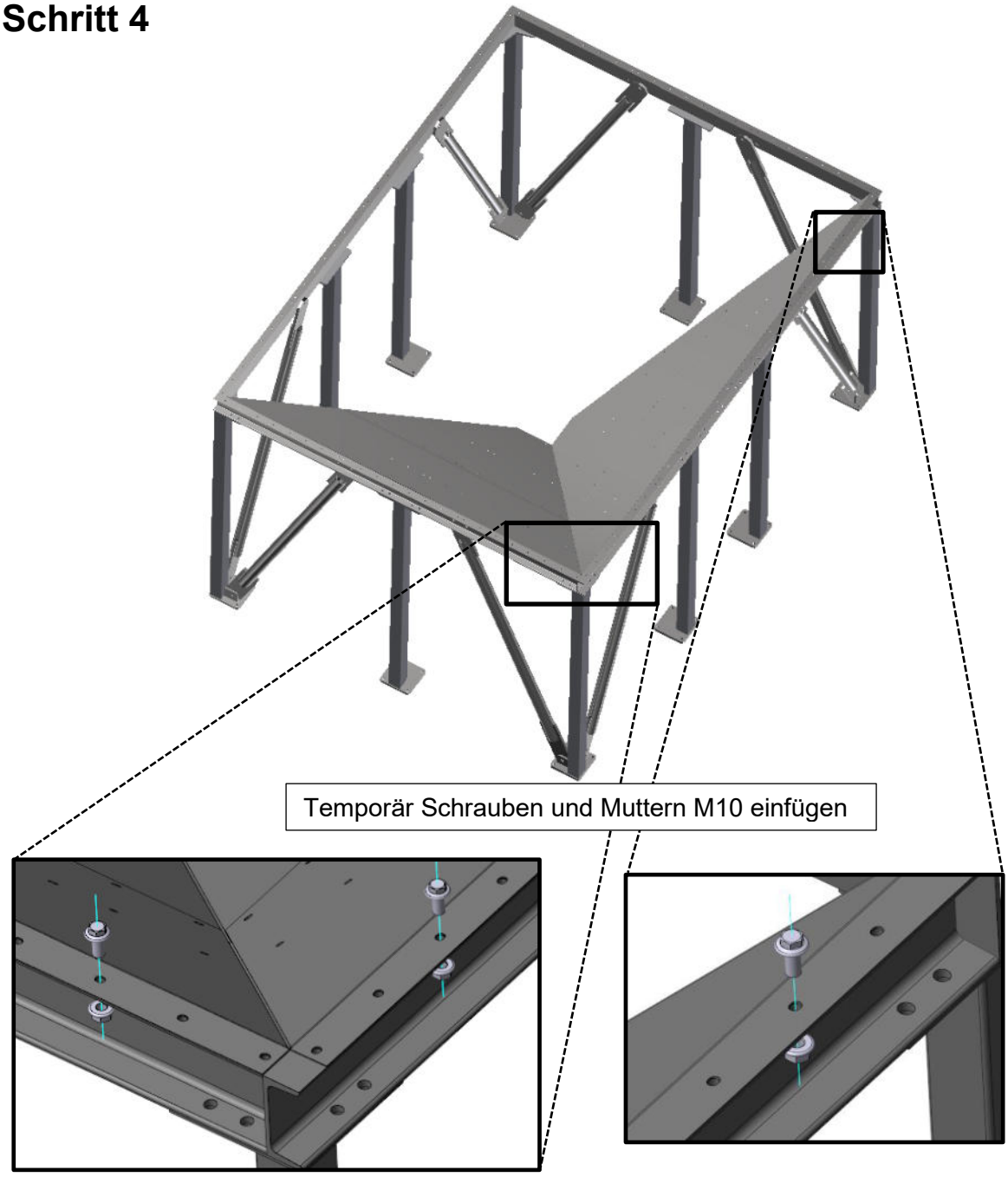
Nur 3m Teile mit 3m Teilen und nur 4m Teile mit 4m Teilen zusammenfügen



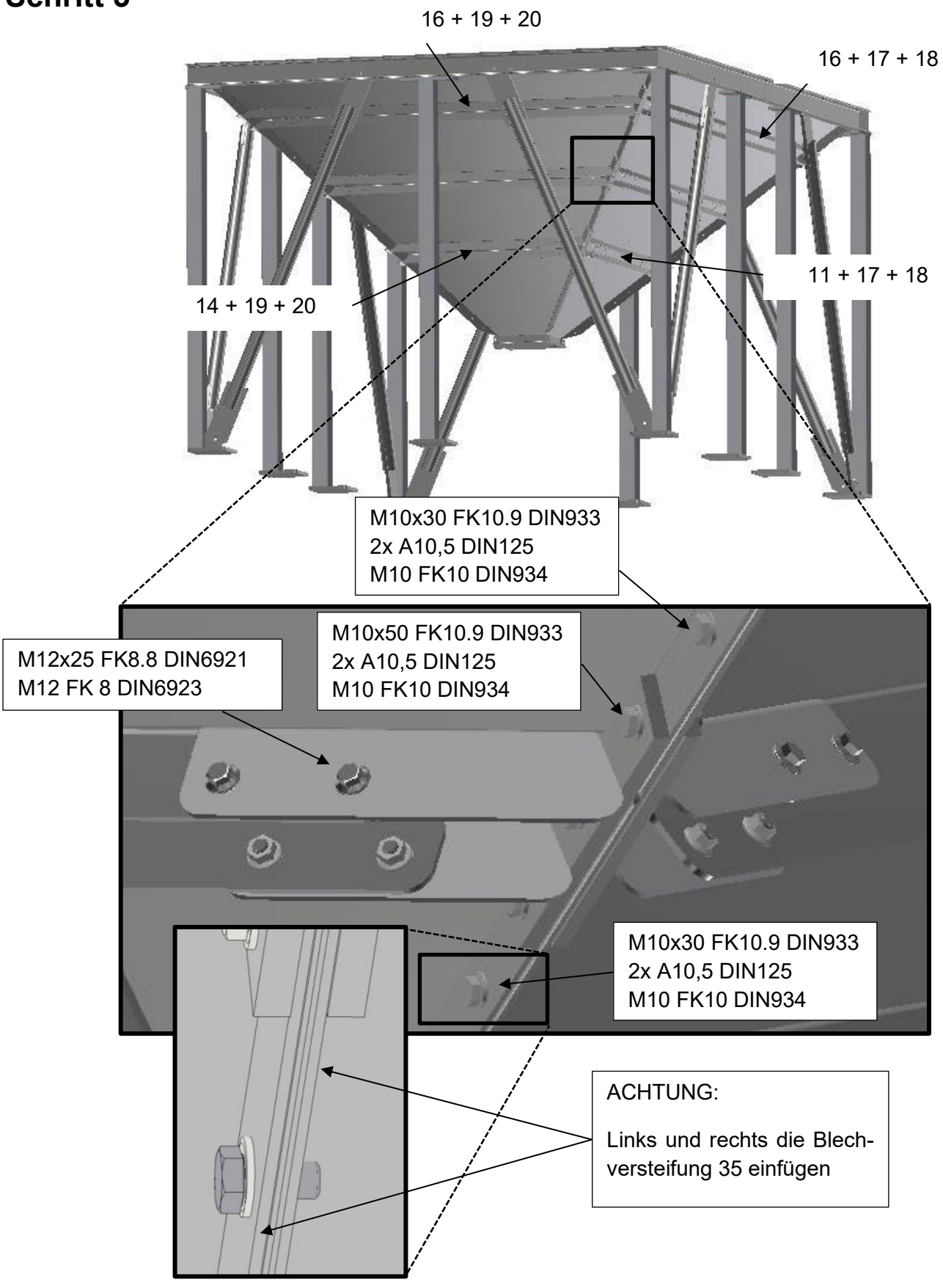
Schritt 3

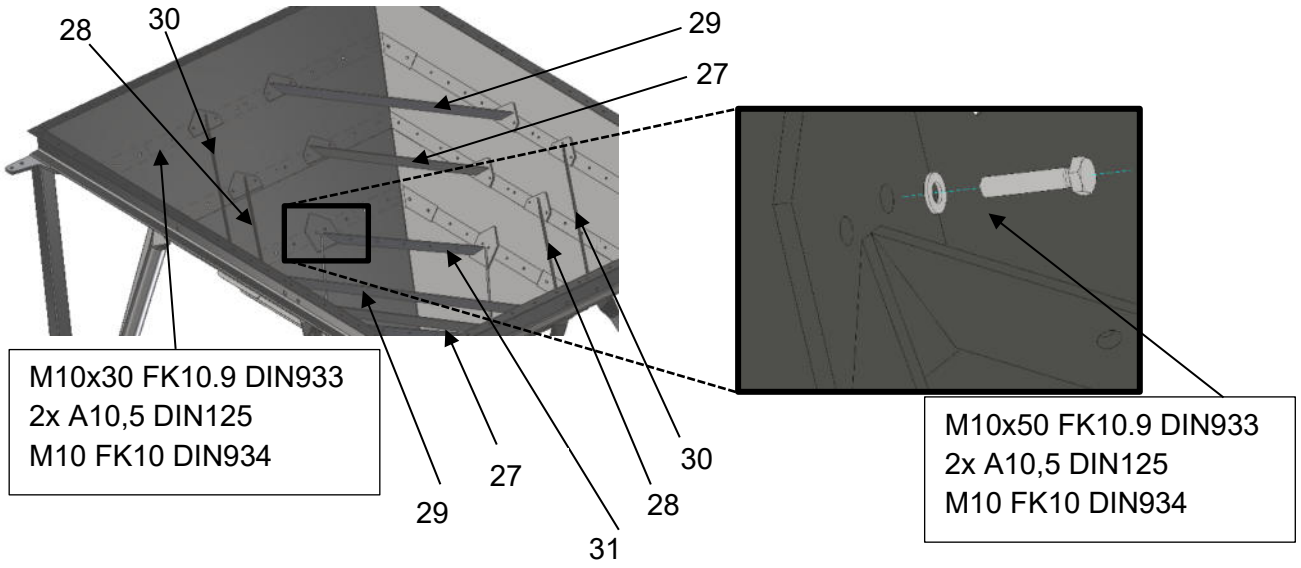

21/22
18/20
aus Schritt 2
12/15
aus Schritt 2
17/19
aus Schritt 2
Oberes Trich-
terblech über
dem unteren
montieren!
23/24
optional
25/26
Diese 4 Schrauben am Schluss einfügen
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

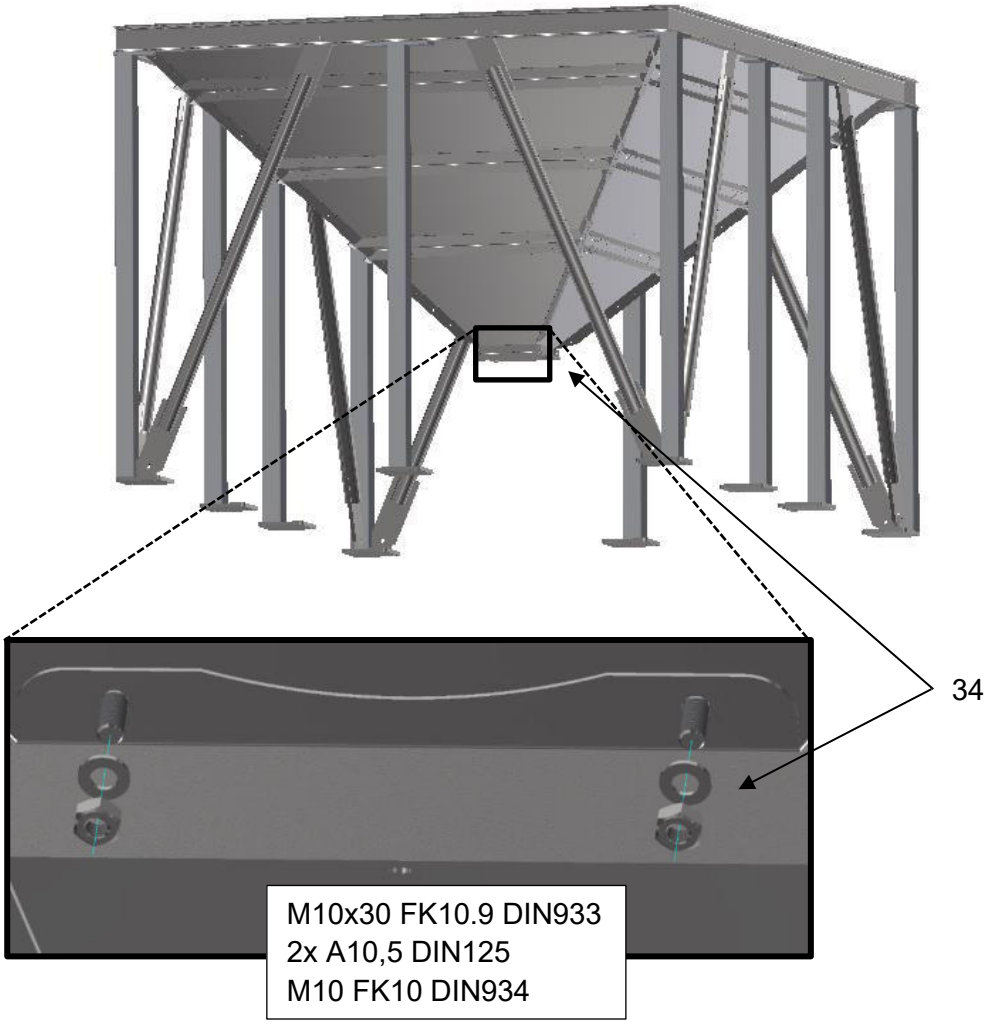
Schritt 4



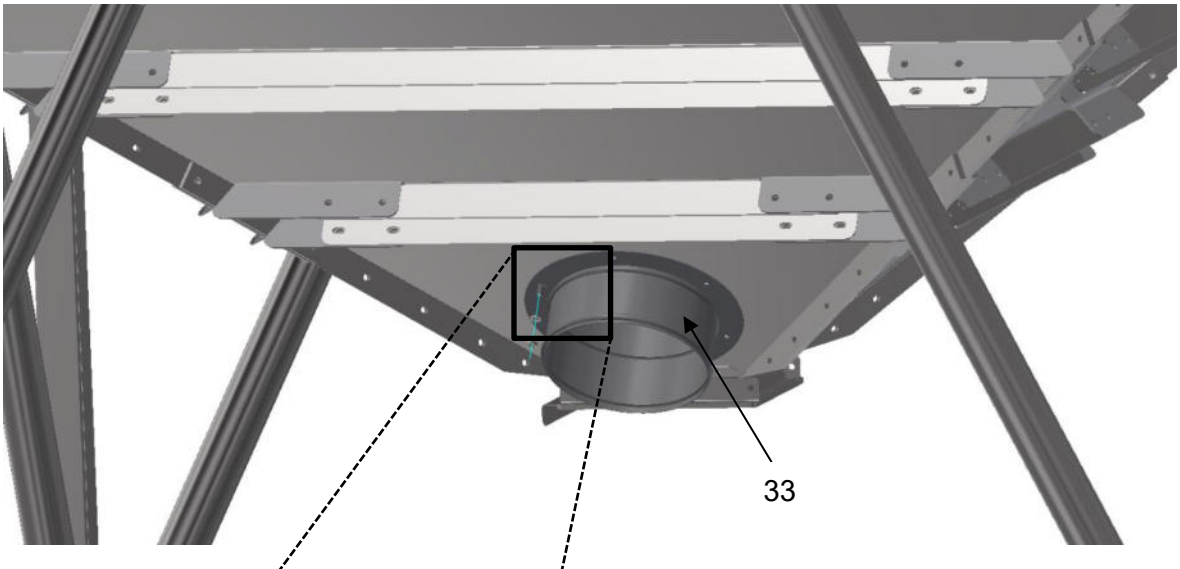
Schritt 5

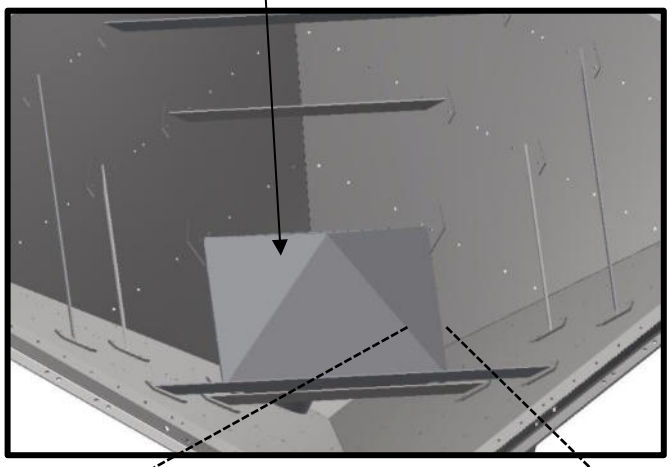

16 + 19 + 20
16 + 17 + 18
11 + 17 + 18
14 + 19 + 20
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ACHTUNG:
Links und rechts die Blech-versteifung 35 einfügen

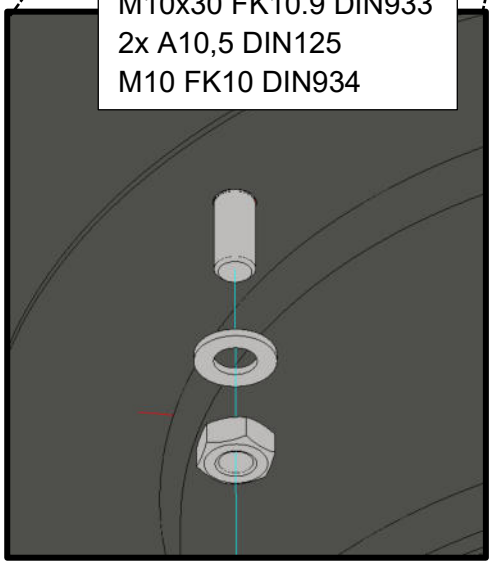

28
30
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
31
28
30
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

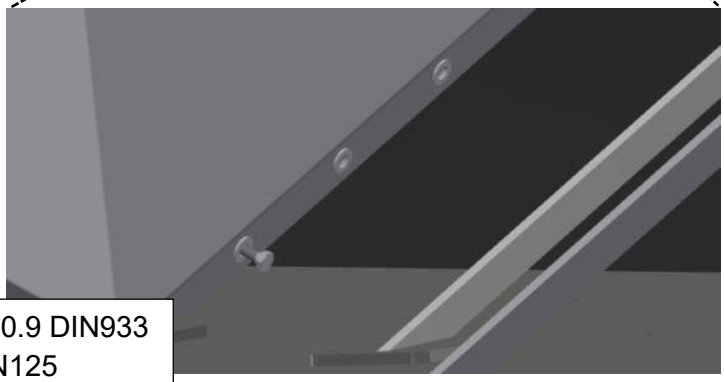

34
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 7 Optional





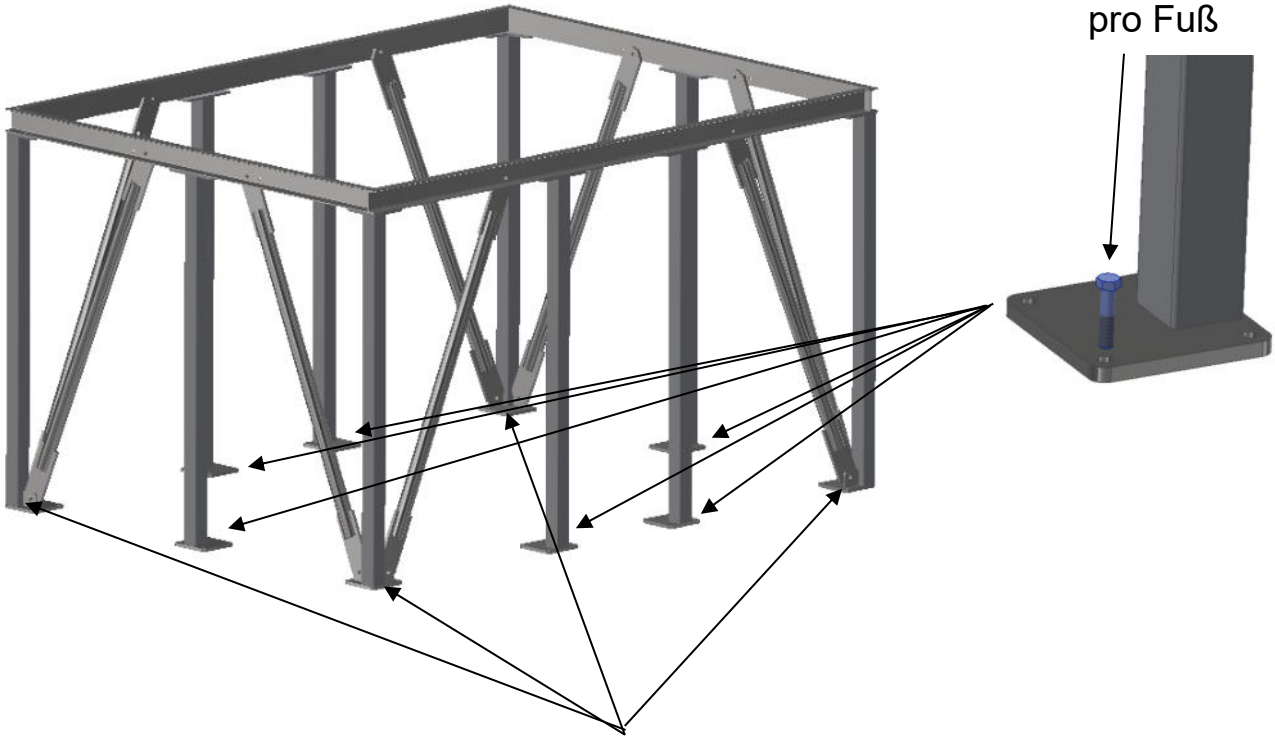




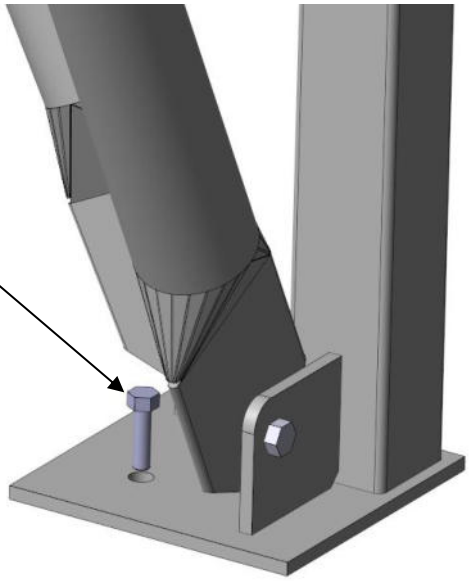
Schritt 8

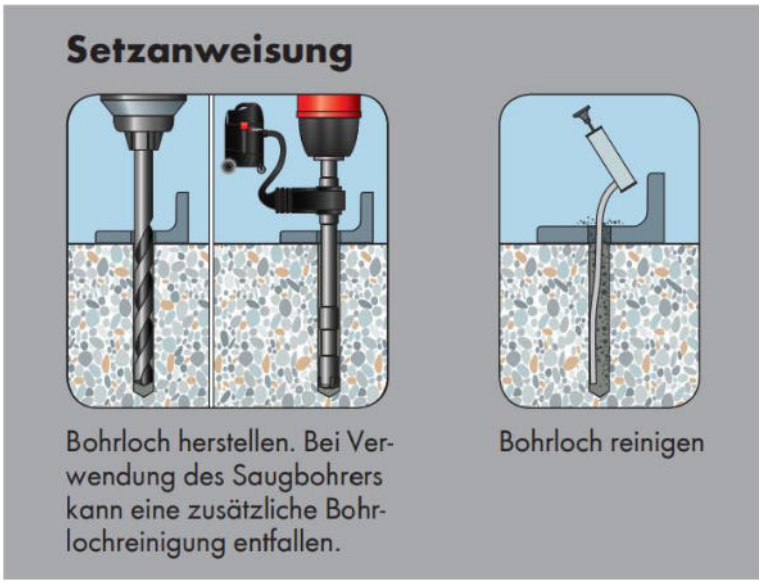
Auf eine Lotrechte und rechtwinkelige Montage achten

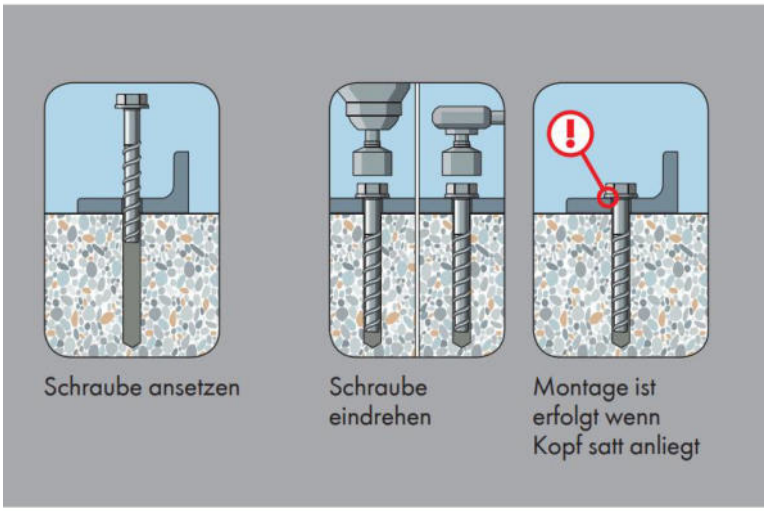
2x Beton-schrauben pro Fuß

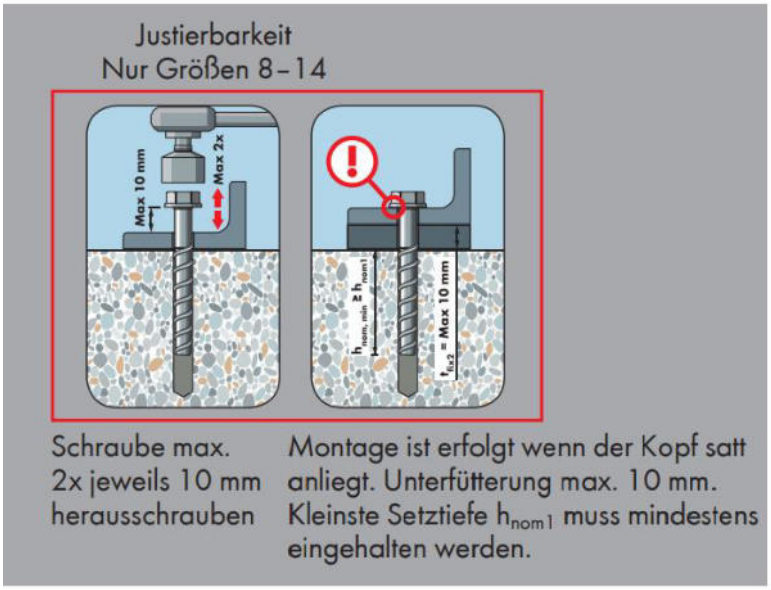


2x Betonschrau-ben pro Fuß





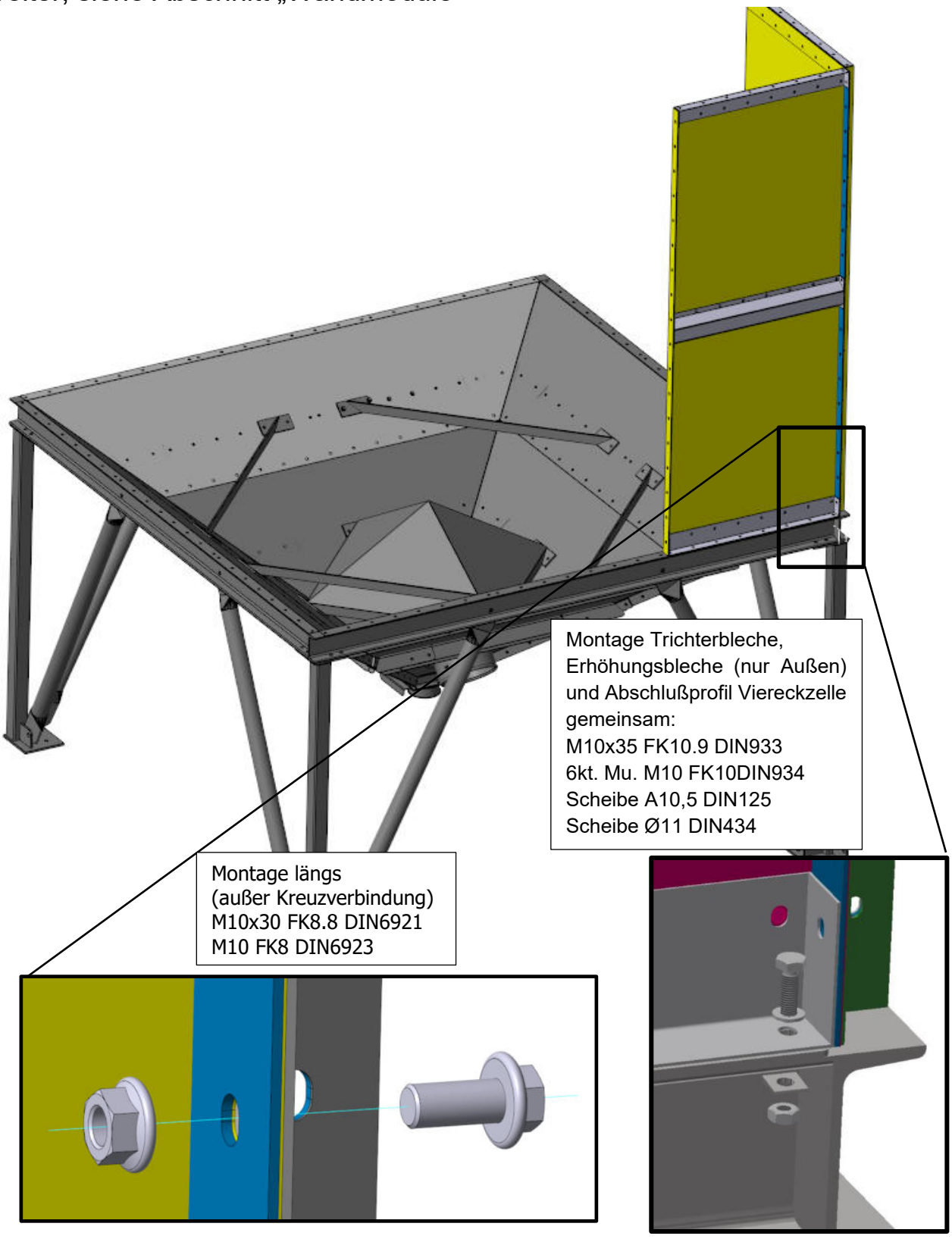




Weitere Informationen: Würth Betonschraube Betonschraube W-BS Typ S Sechskantkopf DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

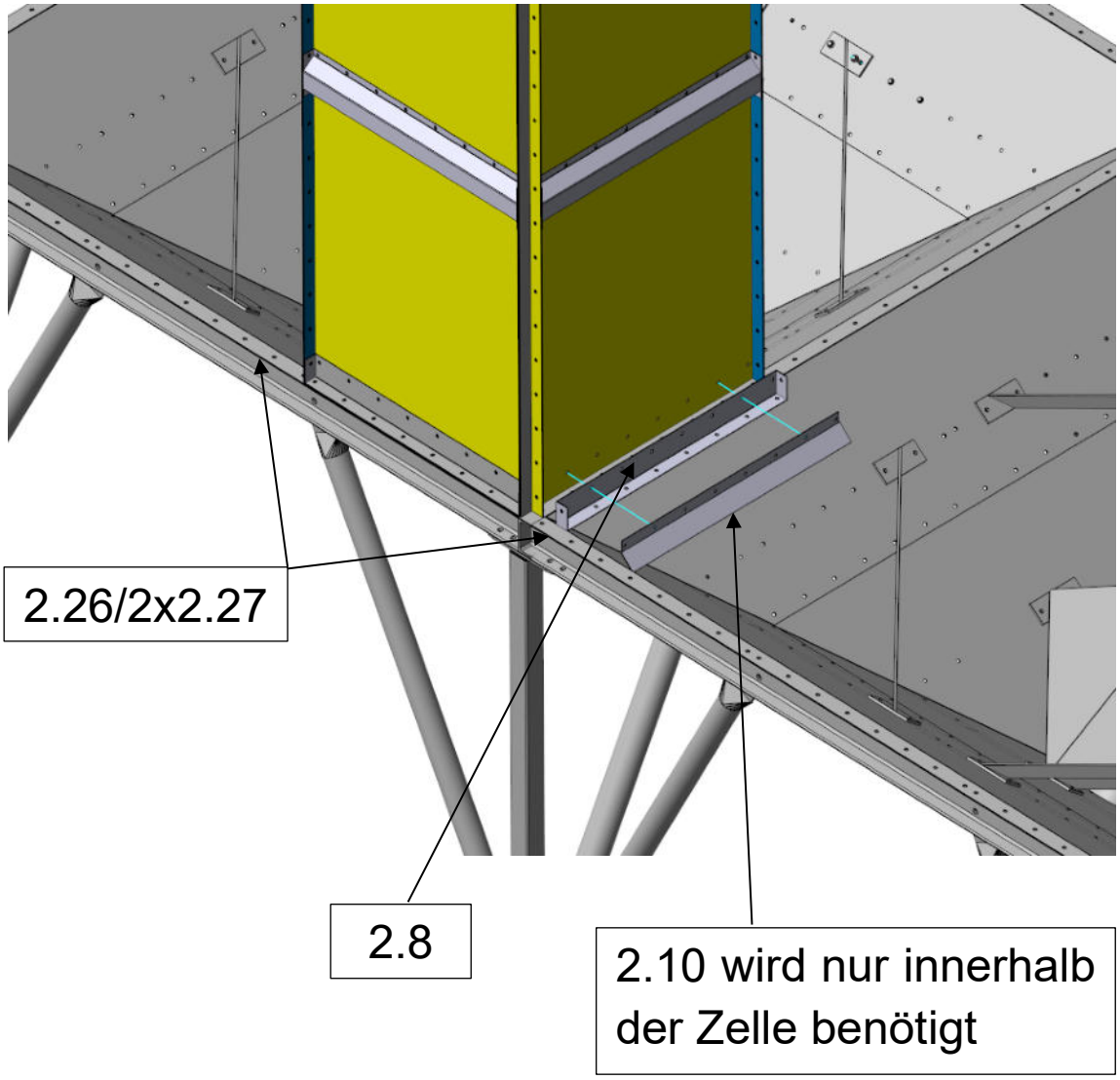
Schritt 9 (Optional, bei dem Aufbau einer Viereckzelle)

Weiter, siehe Abschnitt „Wandmodule“



Bei mehreren Trichterunterbauten

- nebeneinander müssen an den Zwischenwänden am unteren Abschlussprofil zusätzliche Abschräg-bleche verwendet werden, damit das Getreide sauber ablaufen kann.
- An Stellen, an denen zwei Trichterbleche übereinander liegen ist die Aufbauhöhe leicht erhöht -> zum Ausgleich müssen an den anderen Stellen zusätzlich Erhöhungsbleche (2.26) montiert werden

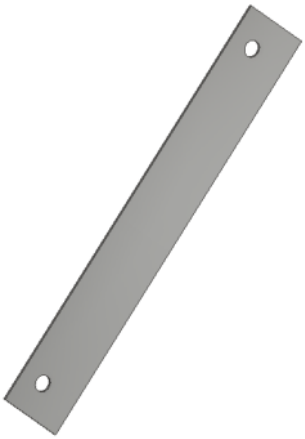
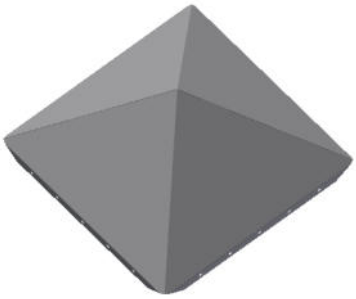
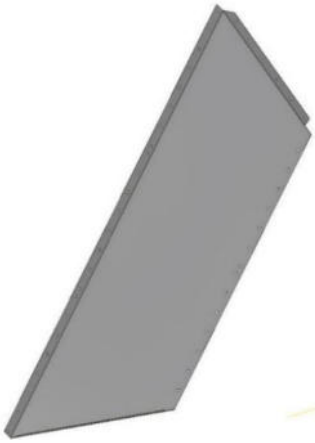


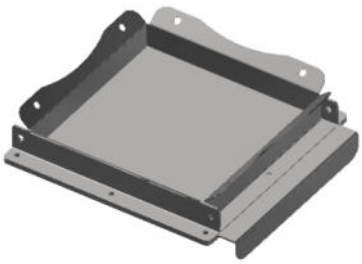
5.6 Optionaler Trichter 4x4

5.6.1 Teileliste

#1 Fuß L für 4x4 & 4x3 Art.Nr.:4009092015817 	#2 Fuß T für 4x4 & 4x3 Art.Nr.:4009092015818 	#3 Fuß X für 4x4 & 4x3 ArtNr.: 4009092015819
#4 Fuß I außen für 4x4 & 4x3 ArtNr.: 4009092015815 	#5 Fuß I innen für 4x4 & 4x3 ArtNr.: 4009092015816 	#6 U140 - l=3997,5 ArtNr.: 4009092015808 L=3997,5 mm

#7 U140 - l=4057,5 ArtNr.: 4009092015809 L=4057.5mm 	#8 Strebe 88,9x4 für Trichtergestell 3x3+2x3 ArtNr.:4009092015811 	#9 Aussenverst. 3x3m & 4x4m unten ArtNr.: 4009092015840
#10 Aussenverst. 3x3m & 4x4m mitte ArtNr.: 4009092015841 	#11 Aussenverst. 3x3m & 4x4m oben ArtNr.: 4009092015842 	#12 Aussenverst. 4x4m ganz oben ArtNr.: 4009092015843
#13 Aussenverst. rechts 40° ArtNr.: 4009092015824 	#14 Aussenverst. links 40° ArtNr.: 4009092015823 	#15 Inneneckversteifung ganz oben 4x4m 40° ArtNr.: 4009092015887
#16	#17	#18

Inneneckversteifung oben 3x3m & 4x4m 40° ArtNr.: 4009092015886 	Inneneckversteifung mitte 3x3m & 4x4m 40° ArtNr.: 4009092015885 	Innenverstrebung unten 3x3m & 4x4m 40° ArtNr.:4009092015879
#19 Halterung Spannstangenstütze ArtNr.: 4009092015907 	#20 Distanzplatte Spannstangenstütze ArtNr.: 4009027016318 	#21 (Optional) Belüftungshaube 3x3 & 4x4m 40° Trichter ArtNr.: 4009092015914 
#23 (Optional) Anschlussstutzen NW300 f. Belüftungseinrichtung ArtNr.: 4009003016990 	#24 Trichterblech 4x4m 40° oben ArtNr.: 4009092015866 	#25 Trichterblech 3x3xm & 4x4m 40° unten ArtNr.: 4009092015863

#26 (optional, nur wenn #21 eingebaut wird) Trichterblech 3x3m & 4x4m 40° Belüftung ArtNr.: 4009092015864 	#27 Versteifungsblech für 4x4m 40° Trichter ArtNr.: 4009092015854 	#28 Auslauf mit Schieber 300x300 Art.Nr.: 4009092015820 Übergänge auf 150,200,250 4009023015782, 783, 784 

Möglichkeiten für die Zwischenstutzen

Pro Seite muss mindestens ein zusätzlicher Stützfuss eingeschraubt werden (Bild 1). Wenn Sie bspw. Über eine Fördereinrichtung verfügen, welche mittig unter den Silos verläuft, können auch zwei Stützfüsse (Bild 2) eingeschraubt werden.

Bild 1

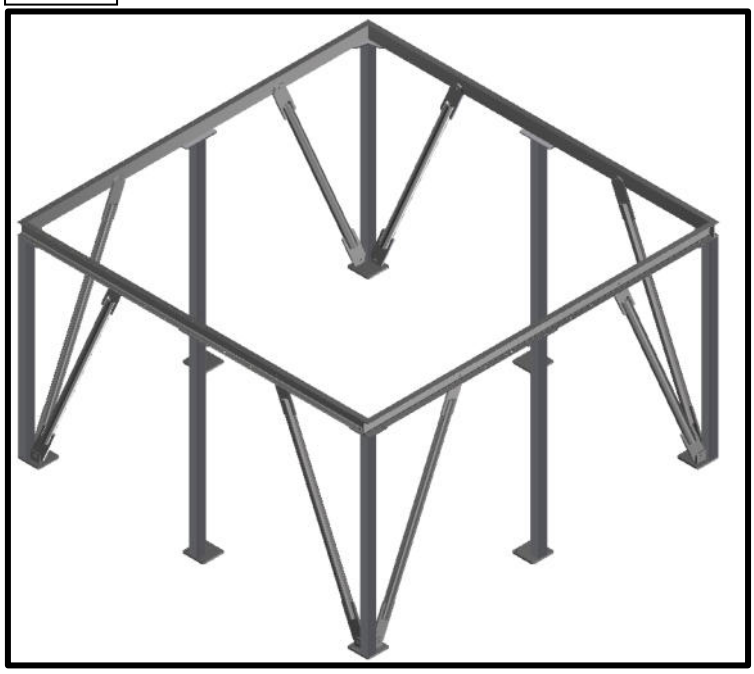
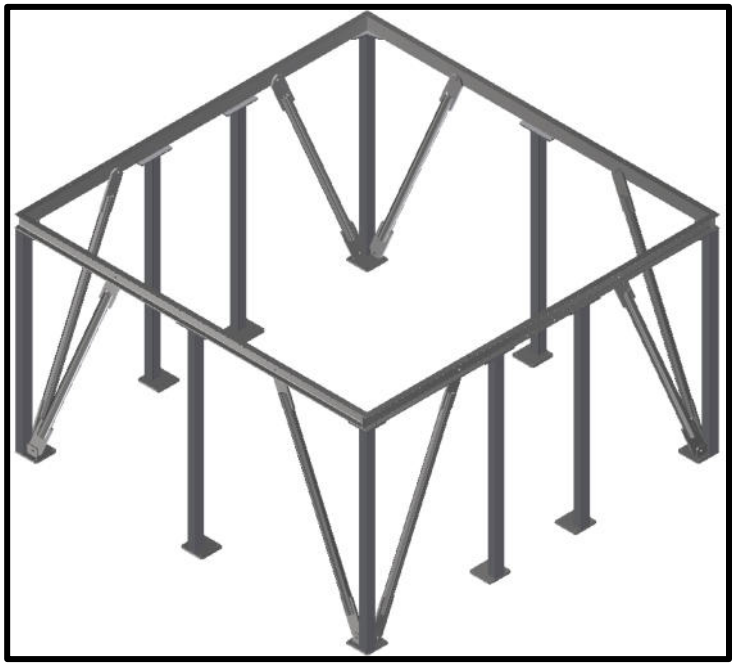


Bild 2

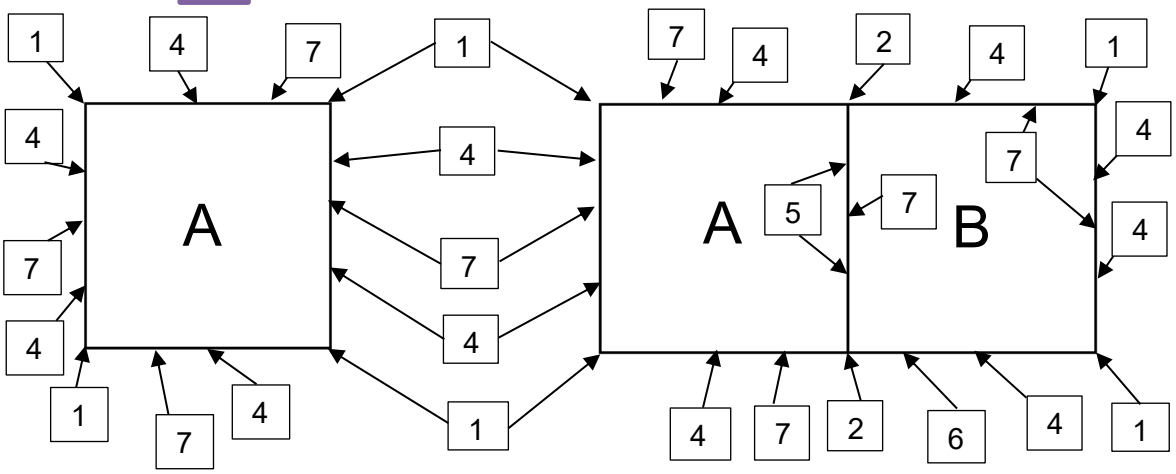


Im folgenden Beispiel werden werden 2 Stützfüße verwendet

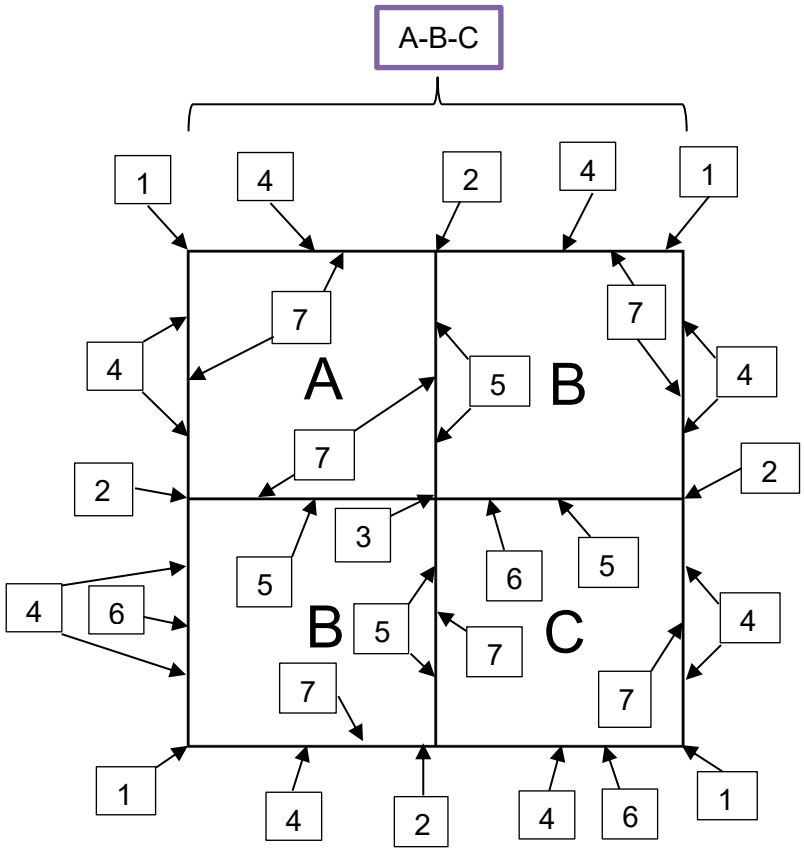
Aufstellvarianten A, A-B, A-B-C

A

A-B

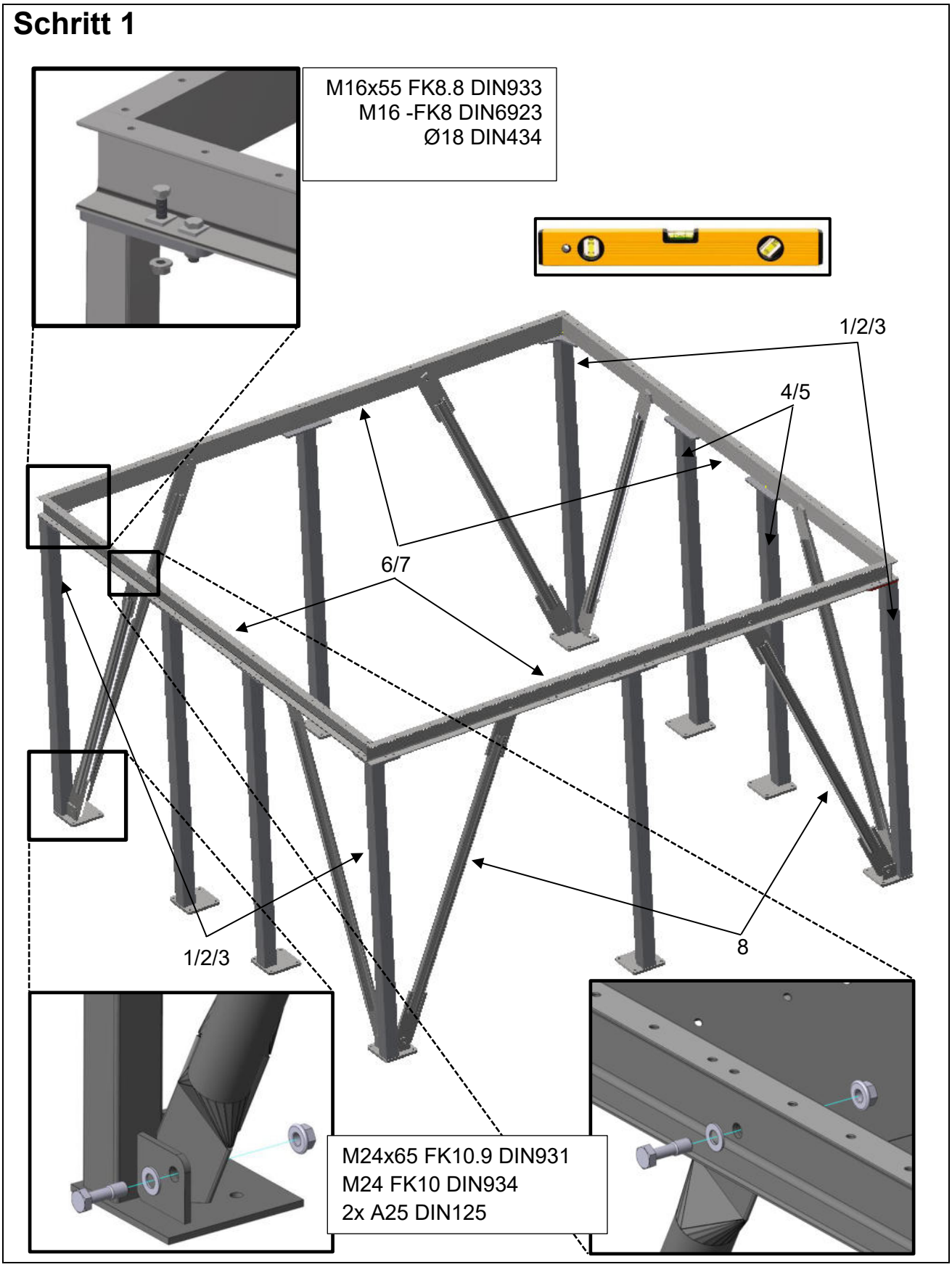


A-B-C

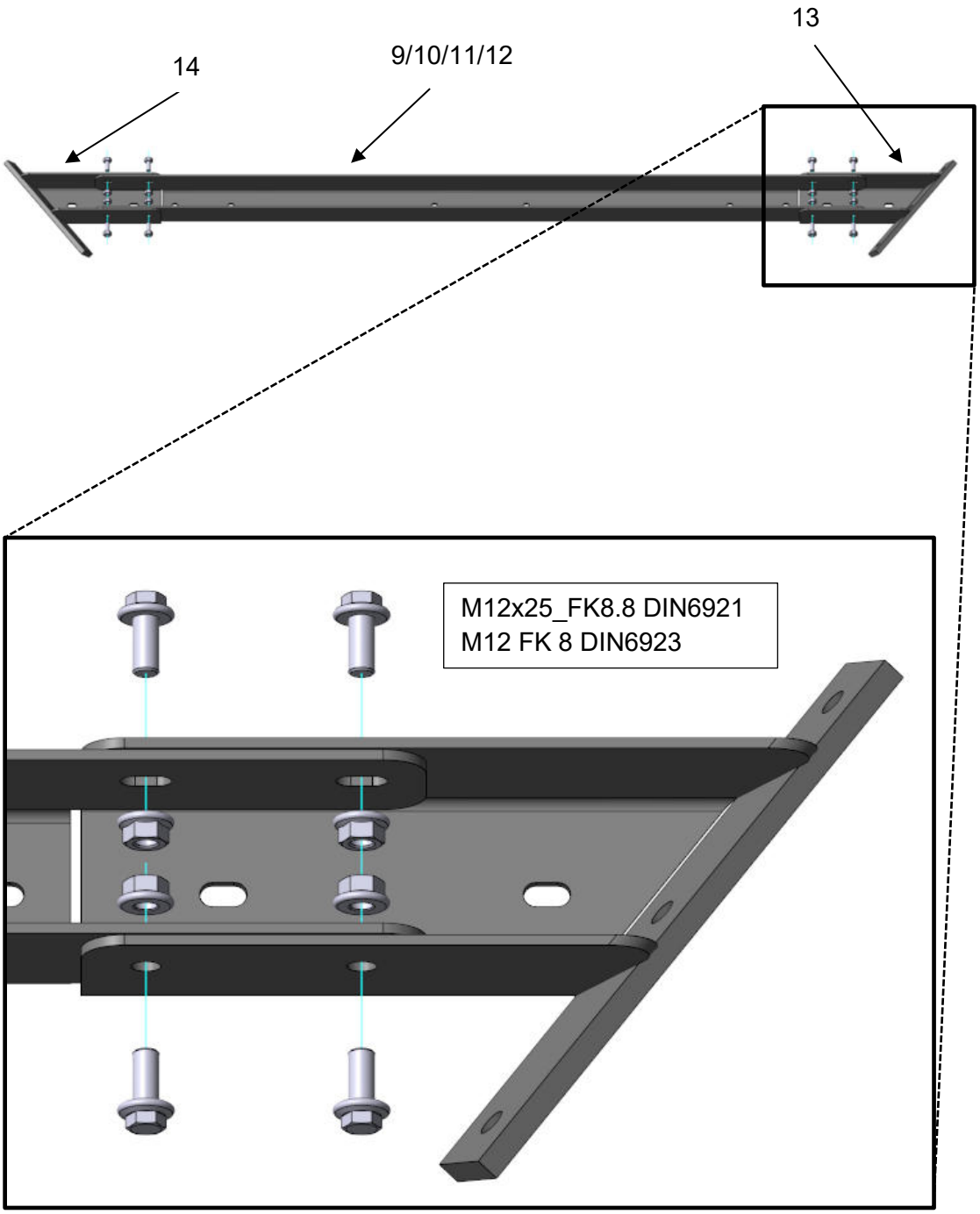


5.6.2 Montage Trichterunterbau 4x4

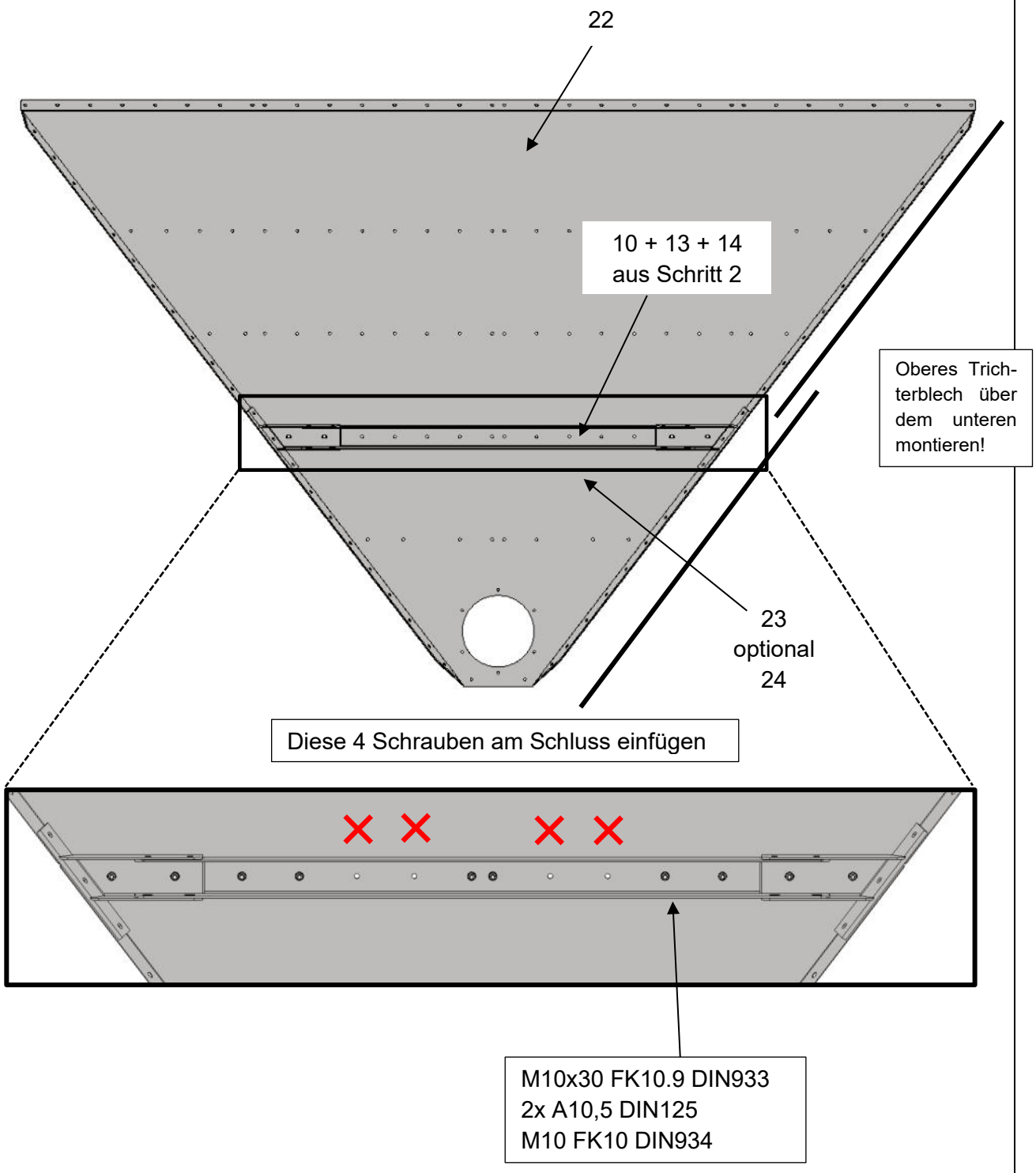
Schritt 1



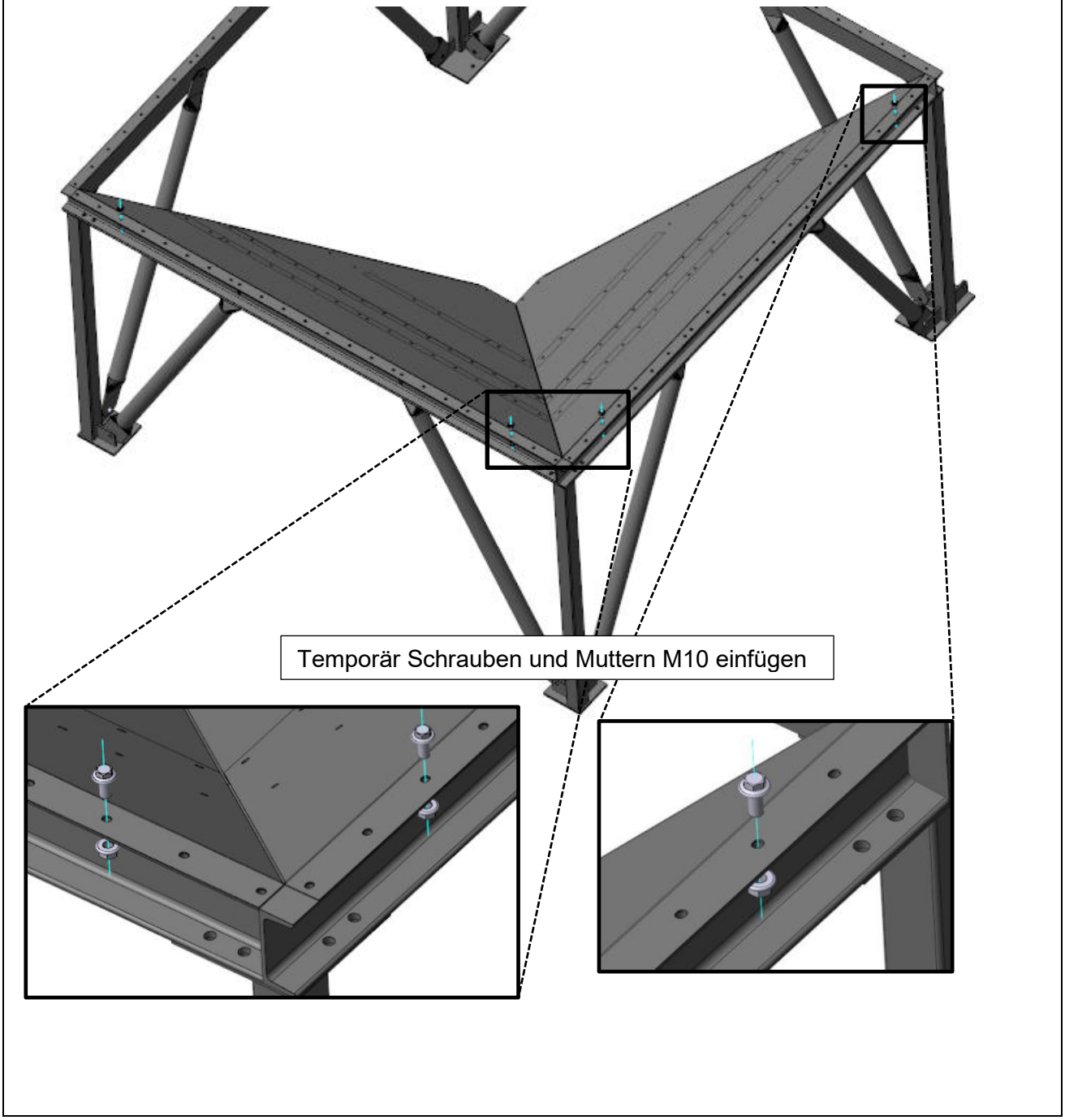
Schritt 2



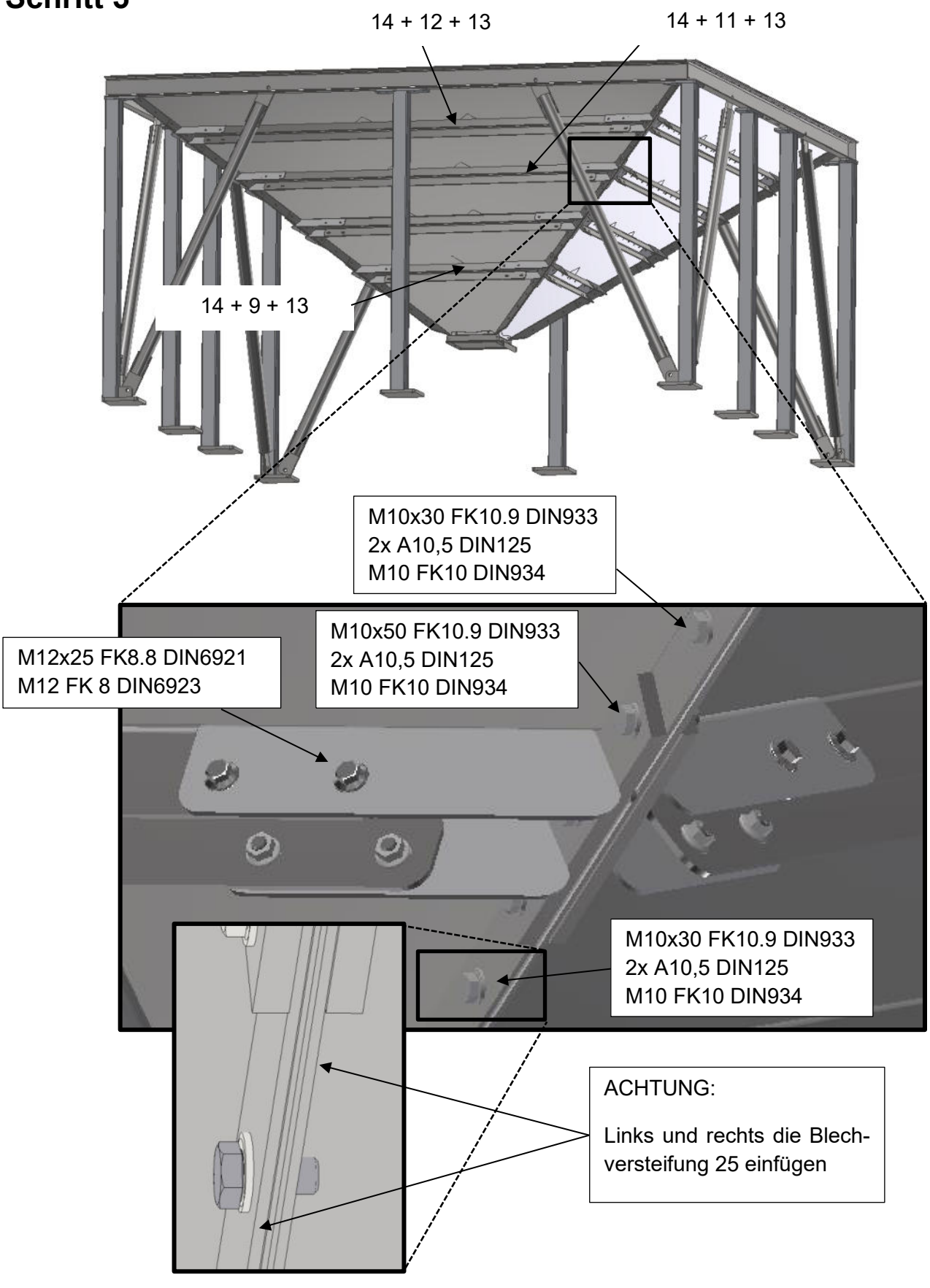
Schritt 3

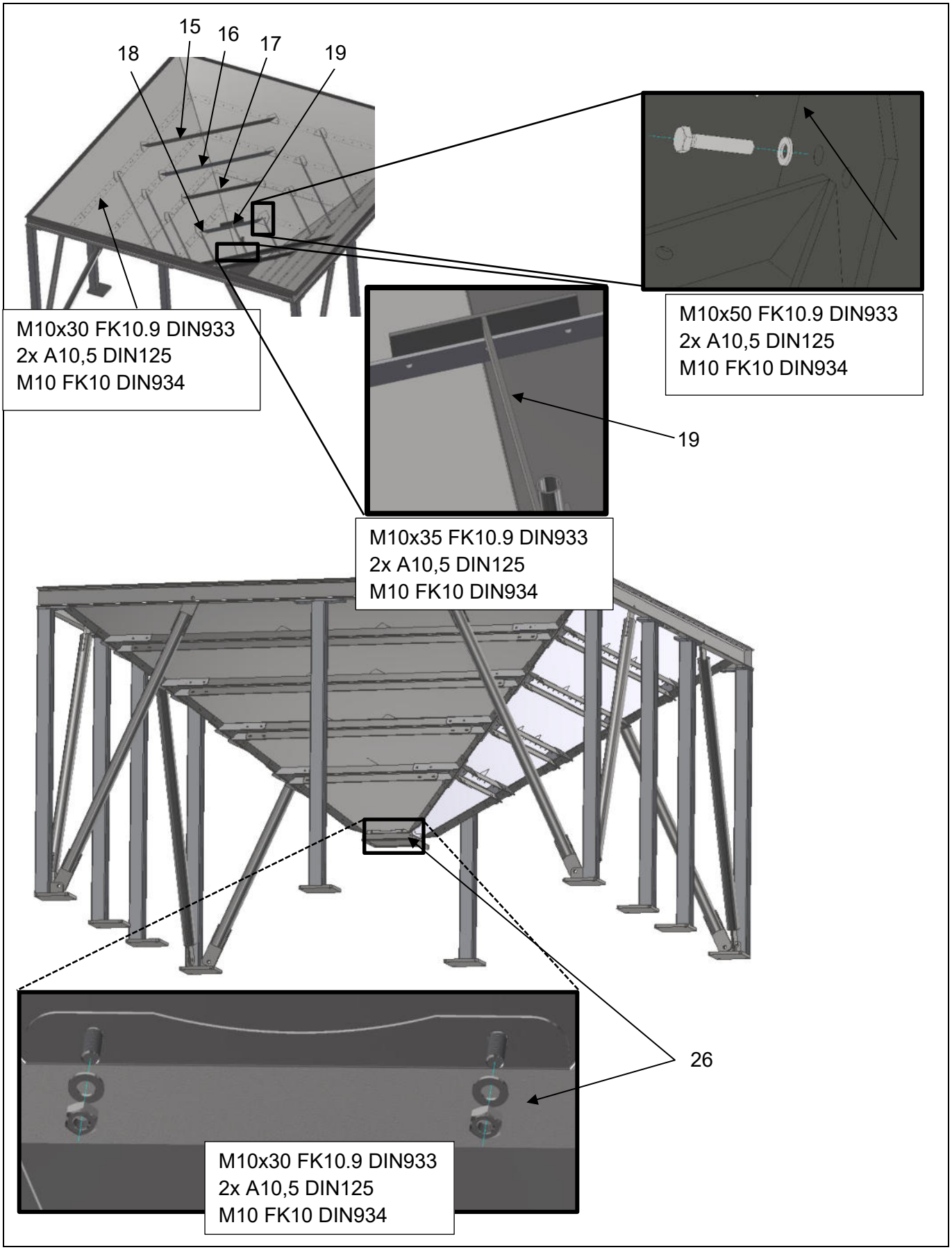

22
10 + 13 + 14
aus Schritt 2
Oberes Trich-
terblech über
dem unteren
montieren!
23
optional
24
Diese 4 Schrauben am Schluss einfügen
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 4

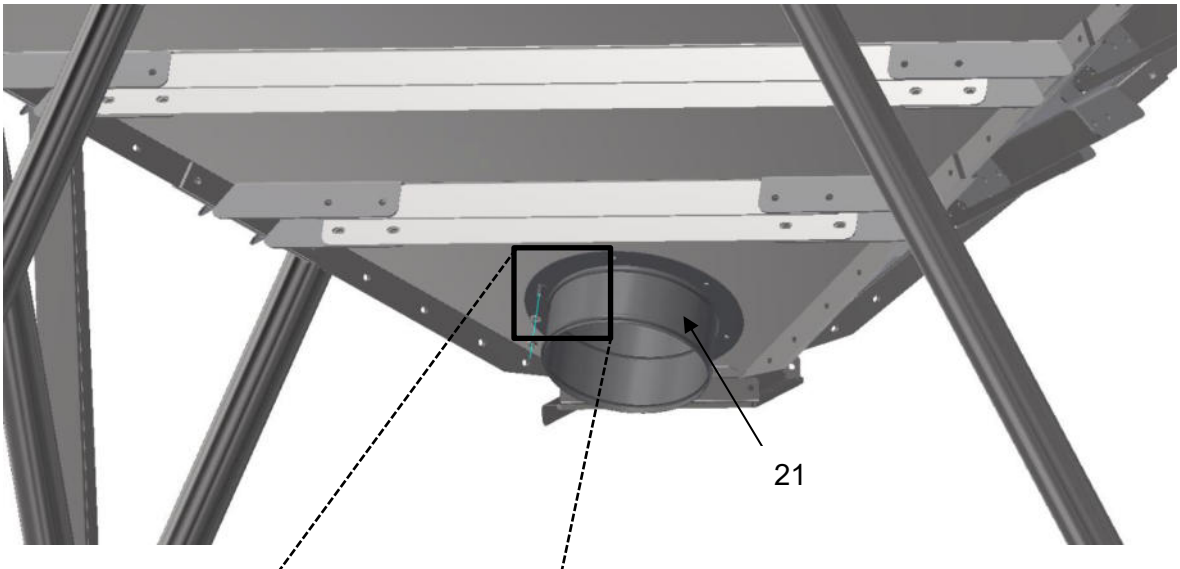


Schritt 5

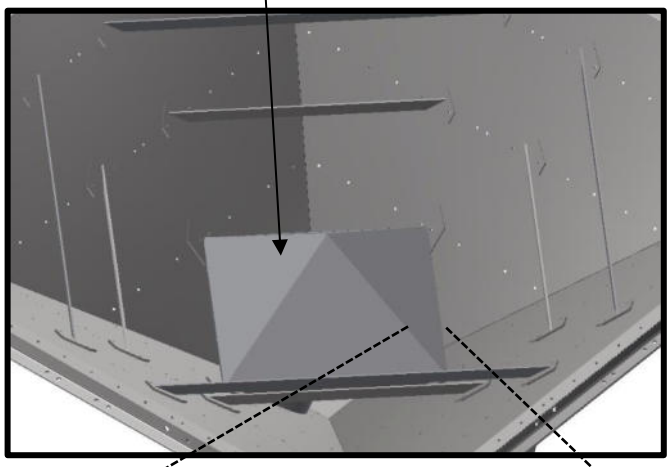

14 + 12 + 13
14 + 11 + 13
14 + 9 + 13
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ACHTUNG:
Links und rechts die Blech-versteifung 25 einfügen


15
16
17
18
19
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
19
M10x35 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
26
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

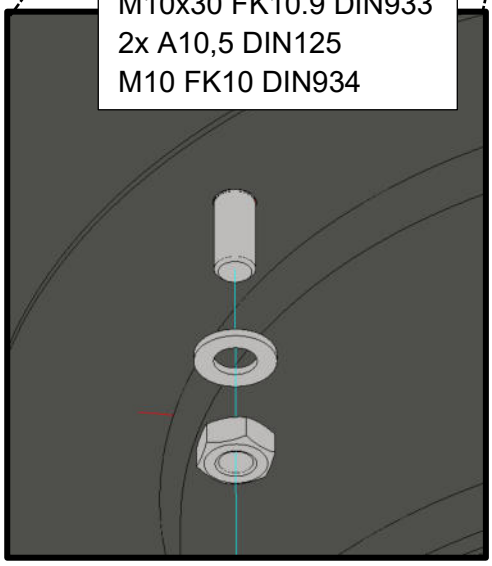
Schritt 7 Optional

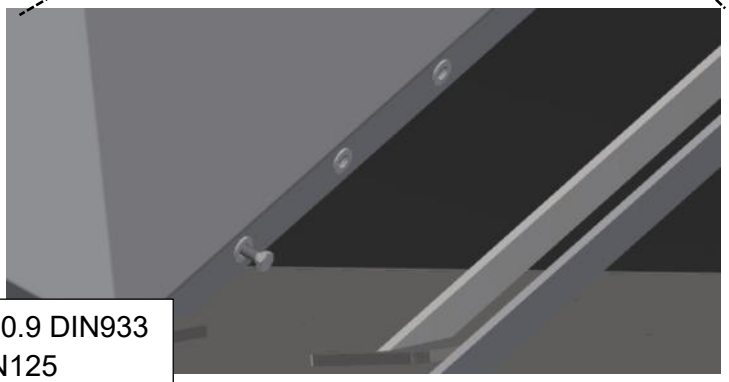


20



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934



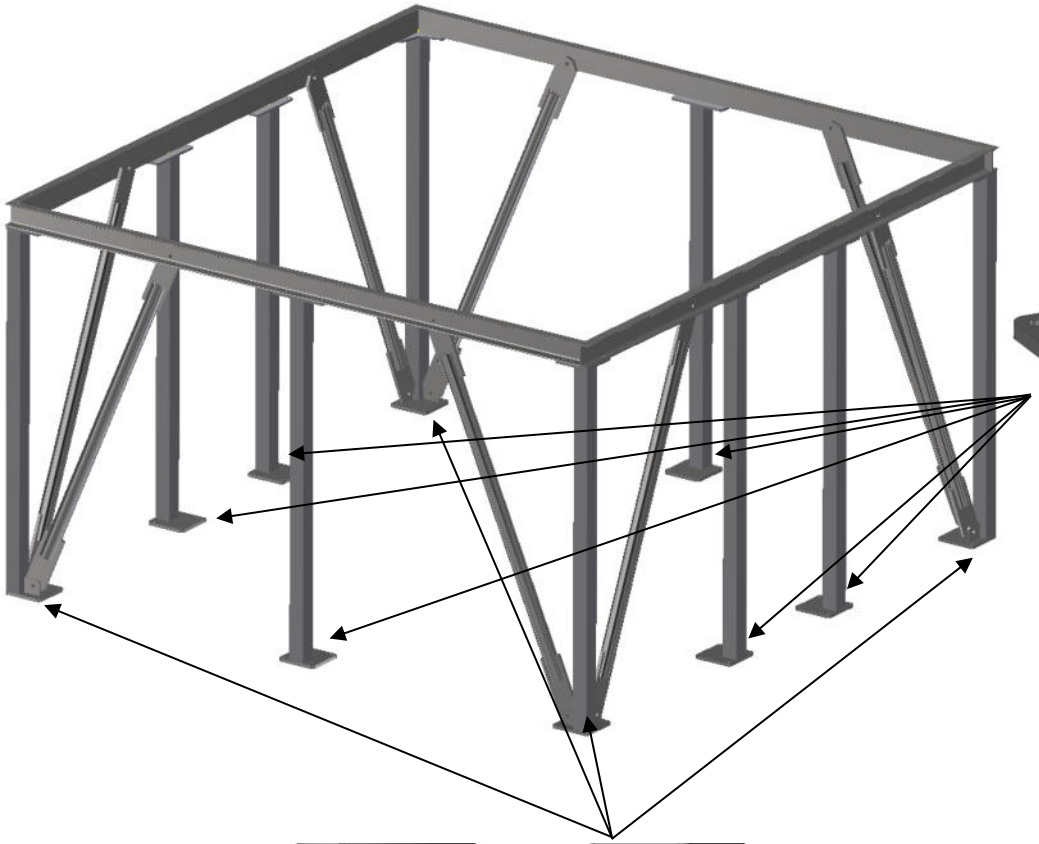


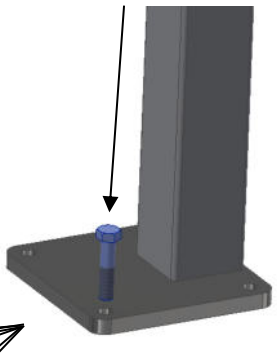
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Schritt 8

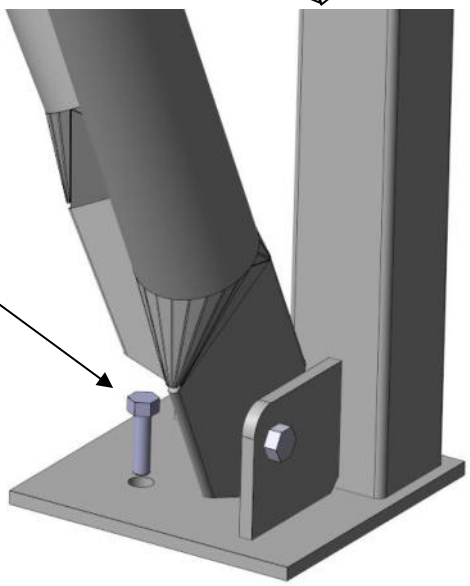
Auf eine Lotrechte und rechtwinkelige Montage achten

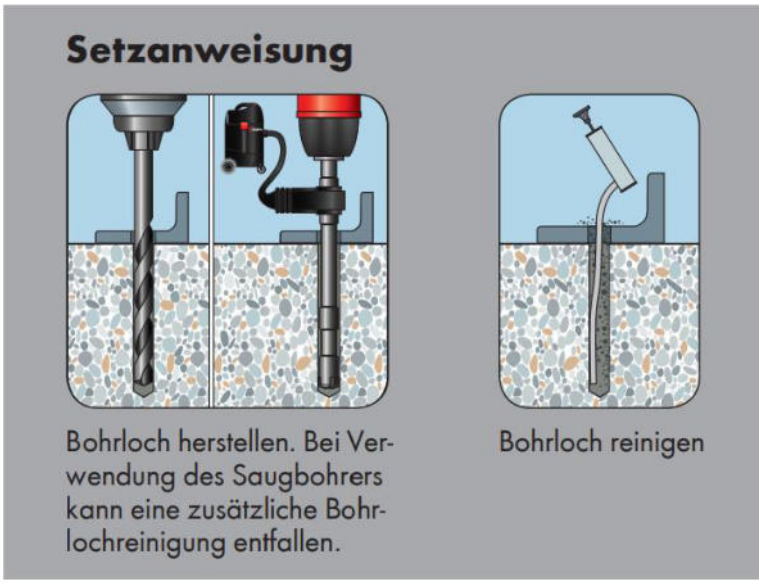
2x Beton-schrauben pro Fuß

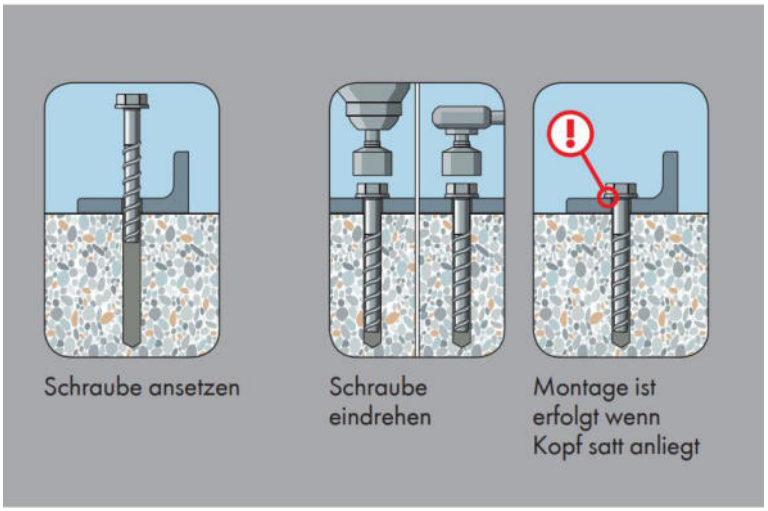


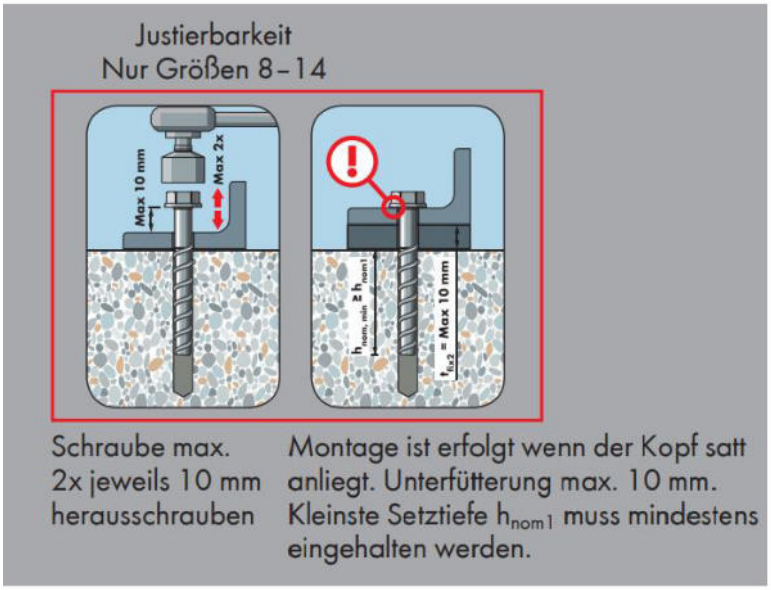


2x Betonschrau-ben pro Fuß





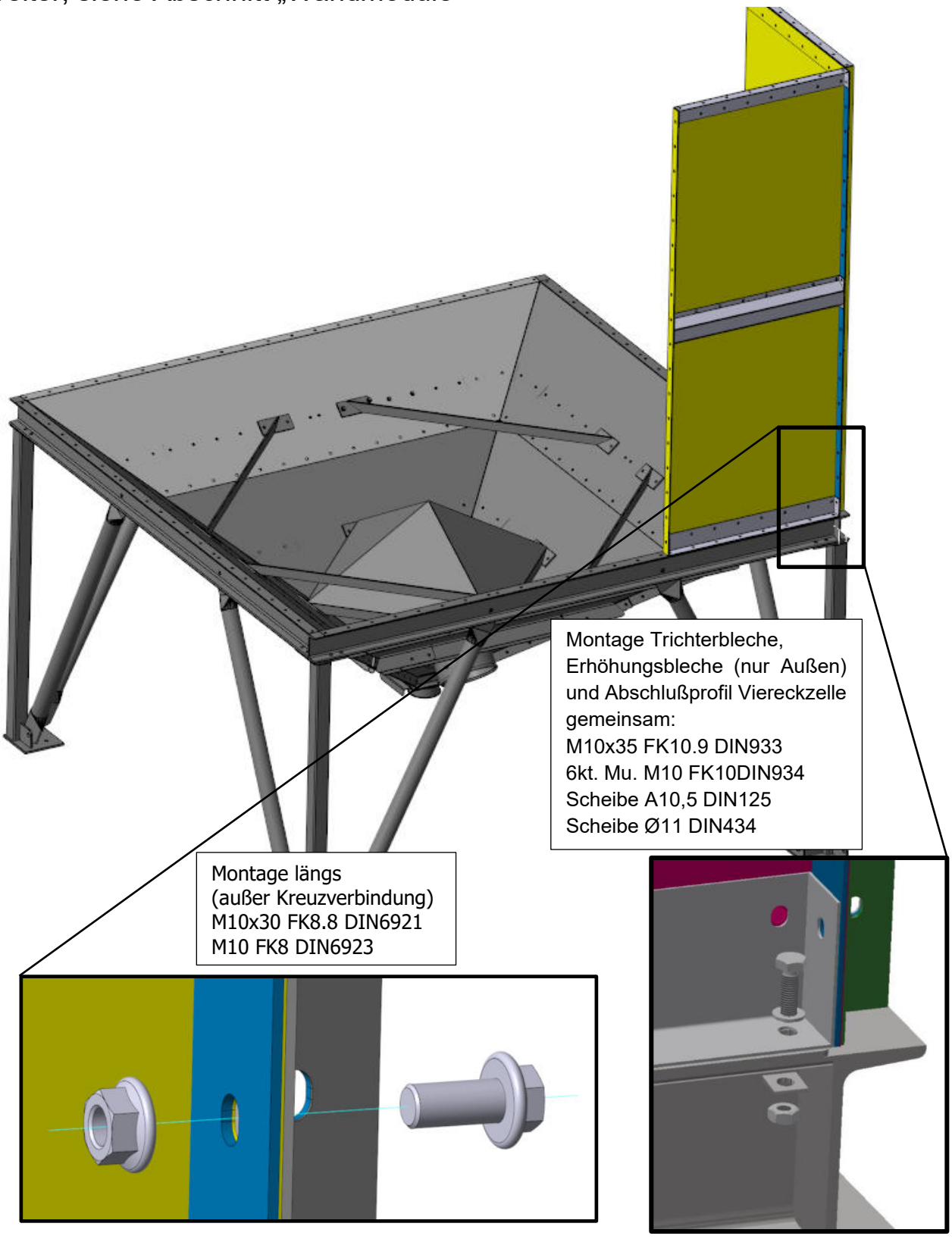




Weitere Informationen: Würth Betonschraube Betonschraube W-BS Typ S Sechskantkopf DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

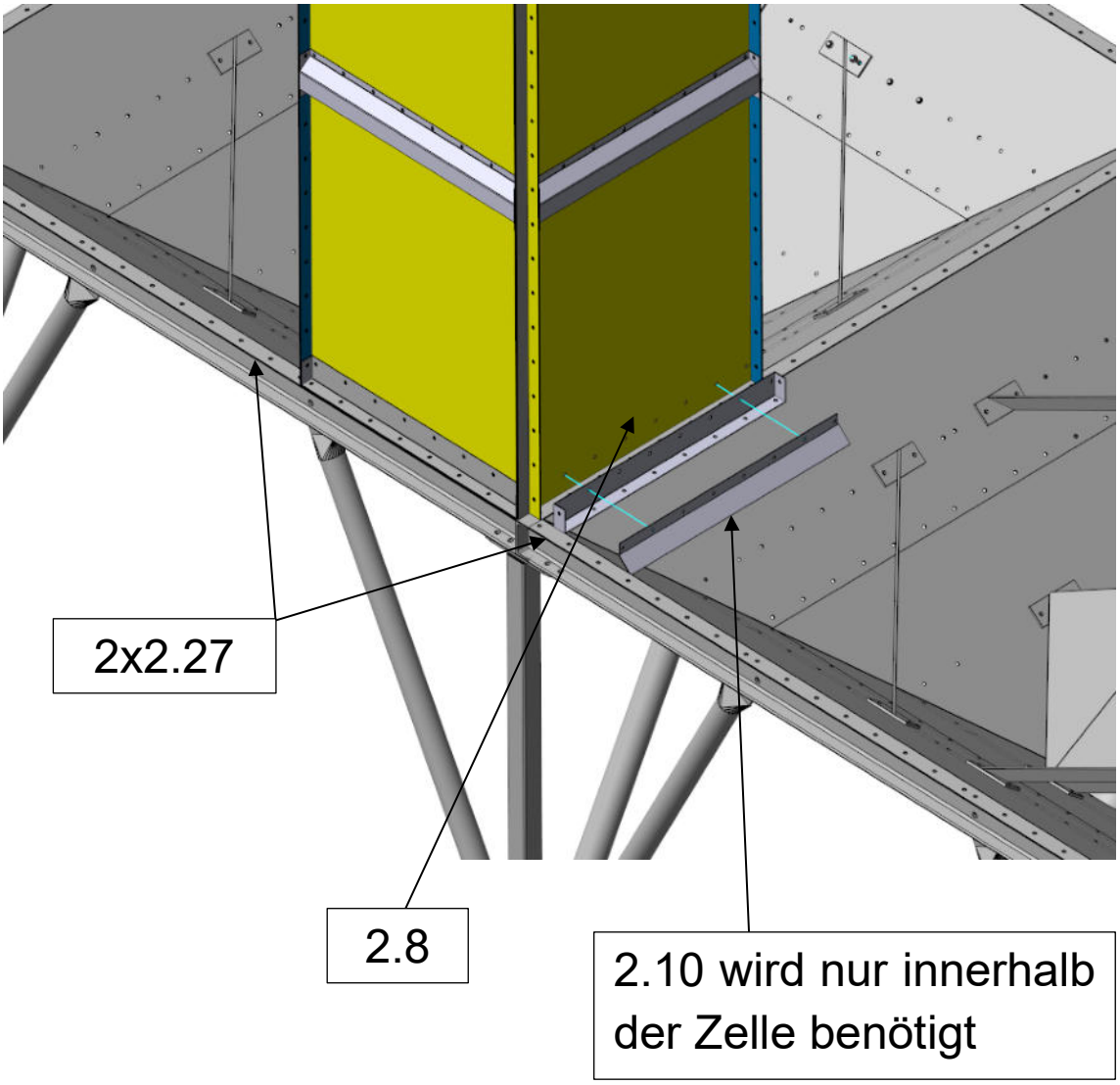
Schritt 9 (Optional, bei dem Aufbau einer Viereckzelle)

Weiter, siehe Abschnitt „Wandmodule“



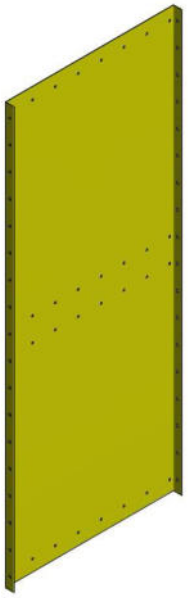
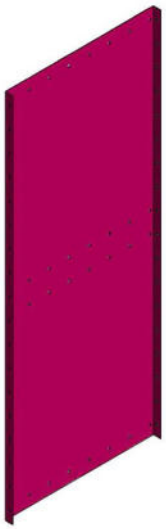
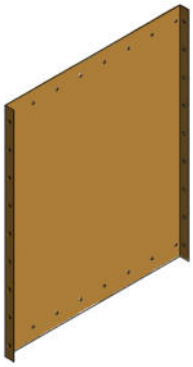
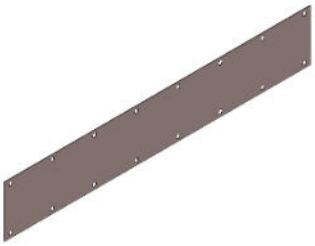
Bei mehreren Trichterunterbauten

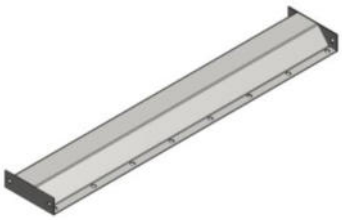
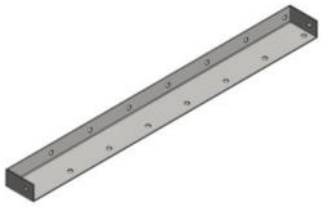
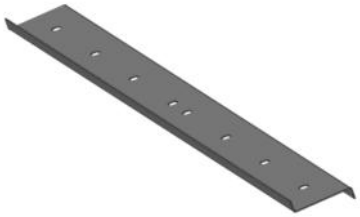
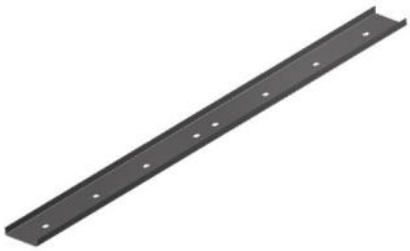
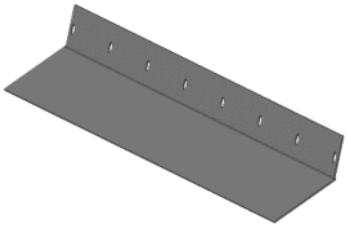
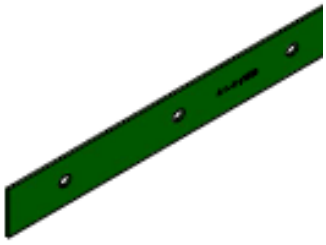
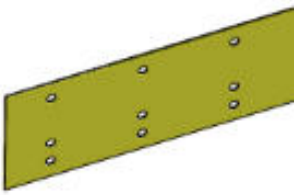
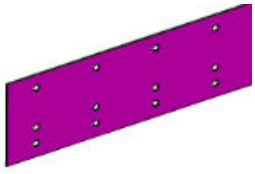
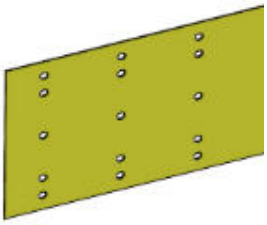
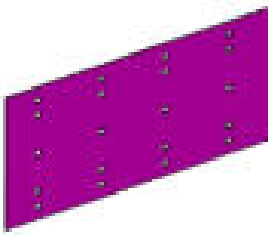
- nebeneinander müssen an den Zwischenwänden am unteren Abschlussprofil zusätzliche Abschräg-bleche verwendet werden, damit das Getreide sauber ablaufen kann.
- An Stellen, an denen zwei Trichterbleche übereinander liegen ist die Aufbauhöhe leicht erhöht -> zum Ausgleich müssen an den anderen Stellen zusätzlich Erhöhungsbleche (2.26) montiert werden



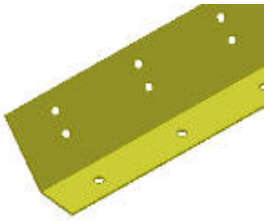
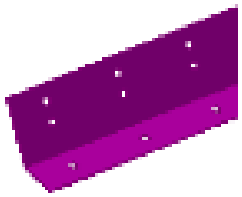
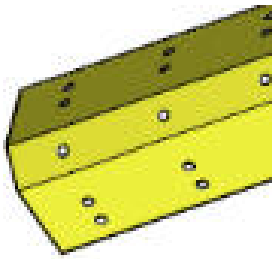
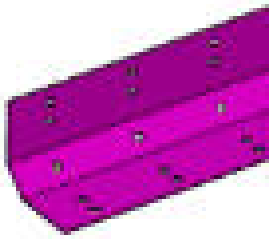
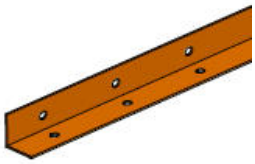
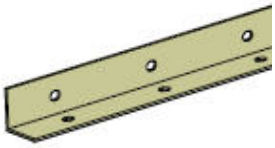
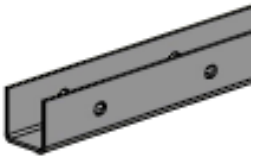
5.7 Wandmodule

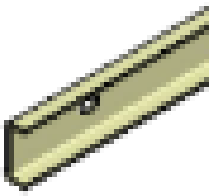
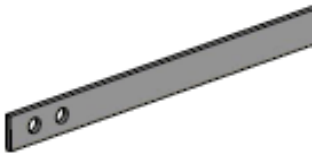
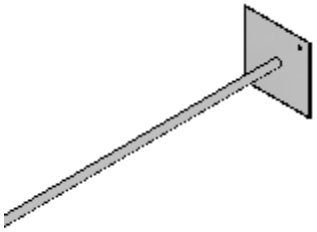
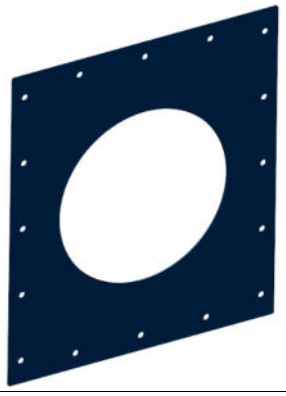
5.7.1 Teileliste

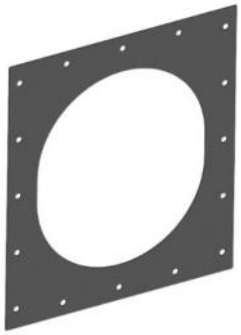
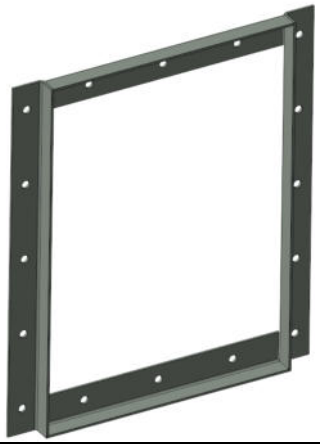
#2.1 (s=1,25mm H=2,50m) Wandblech “Grün” ArtNr.: 4009099015712 Mit Ausschnitt für Türe ArtNr.: 4009099016041 	#2.2 (s=1,25mm H=2,50m) Wandblech “Blau” ArtNr.: 4009099015696 Mit Ausschnitt für Türe ArtNr.: 4009099016040 	#2.3 (s=1,0mm H=2,50m) Wandblech “Gelb” ArtNr.: 4009099015680 Mit Ausschnitt für Türe ArtNr.: 4009099016039 
#2.4 (s=0,75mm H=2,50m) Wandblech “Rot” ArtNr.: 4009099015664 Mit Ausschnitt für Türe ArtNr.: 4009099016038 	#2.5 (s=0,75mm H=1,25m) Wandblech „Schwarz“ ArtNr.: 4009099015728 Mit Ausschnitt für Türe ArtNr.: 4009099016043 	#2.6 Abdeckblech ArtNr.: 4009099015748 

#2.7 Aussteifprofil ArtNr.: 4009099015744 	#2.8 Abschlussprofil ArtNr.: 4009099015745 	#2.9 L1 = 1,0 m ArtNr.: 4009099015767 Winkelblech für Oberkante 
#2.9a Winkelblech U für Oberkante ArtNr.: 4009099016045 	#2.10 Abschrägblech ArtNr.: 4009099015988 	
#2.11 Blechwinkelversteifung ArtNr.: 4009099015750 L=1250 	#2.12 Blechwinkelversteifung ArtNr.: 4009099015749 L=2500 	#2.13 Zwischenblech gerade ArtNr.: 4009099015754 L=1250 
#2.14 Zwischenblech gerade ArtNr.: 4009099015753 L=2500 	#2.15 Zwischenblech gerade ArtNr.: 4009099015758 L=1250 	#2.16 Zwischenblech gerade ArtNr.: 4009099015757 L=2500 

#2.17 Zwischenblech 1x45°	#2.18 Zwischenblech 1x45°	#2.19 Zwischenblech 2x45°

ArtNr.: 4009099015752 L=1250 	ArtNr.:4009099015751 L=2500 	ArtNr.:4009099015756 L=1250 
#2.20 Zwischenblech 2x45° ArtNr.: 4009099015755 L=2500 	#2.21 Eckprofil ArtNr.: 4009099015760 L=1250 	#2.22 Eckpofil ArtNr.: 4009099015759 L=2500 
#2.23 U-Profil ArtNr.:4009099015762 L=1250 	#2.24 U-Profil ArtNr.:4009099015761 L=2500 	#2.25 U-Profil Kreuzverbindung ArtNr.: 4009099015764 L=1250
#2.26 Erhöhungsblech 3m für Trichterausgleich ArtNr.: 4009027016133 	#2.27 Erhöhungsblech 2m für Trichterausgleich ArtNr.: 4009027016132 	

#2.28 U-Profil-Kreuzverb. ArtNr.:4009099015763 L=2500 	#2.29 Einstiegstüre Rahmen ArtNr.:4009099015881 Türe ArtNr.:4009099015879 Dichtung ArtNr: 1081004000128 	#2.30 Eckstrebe ArtNr.:4009099015768 
#2.31 L1= 969mm ArtNr.:400909915769 #2.32 L2=1976mm ArtNr.:4009099015770 #2.33 L3=2978mm ArtNr.:4009099015771 #2.34 L4=3982mm ArtNr.: 400909915772 #2.35 L5=4987mm ArtNr.:4009099015773	#2.31 - #2.35 Spannstange 	2.37 Spannstangenstütze mit Fußplatte (diverse Längen) 1,25m – 7,5m ArtNr.: 4009099016046-51 
#2.38 Spannstangenstütze auf Belüftungshaube (diverse Längen) ArtNr.: 4009099016052-57 	#2.39 Spannstangenstütze Trichter ohne Belüftungshaube ArtNr.:4009027016058-63 	#2.40 Gummi Schneckenentnahme ArtNr.: 4009099015853 

#2.41 Dichtungsblech ArtNr.:4009027016029 	#2.42 Rahmen für Siloschnecke ArtNr.: 4009099015863 	

5.7.2 Blechdicken

Beachten Sie bei der Montage die Sicherheitsanweisungen unter Punkt 4. Die Viereckzellen werden in Einzelteilen zusammen auf Paletten geliefert. Nach dem Auspacken der Einzelteile kann mit der Montage begonnen werden. Bei höheren Silos ist es möglich, dass es verschiedene Blechstärken gibt. Aus diesem Grund ist auf die farbliche Kennzeichnung der Bleche zu achten. Die Bleche mit der stärksten Blechdicke müssen immer zuerst, d.h. ganz unten montiert werden. Werksseitig werden die Bleche farbig markiert, um Ihnen die Sortierung zu erleichtern.

Blech:	Höhe:	Dicke:	Abkürzung:
Grün (zwei Reihen)	2,5m	1,25mm	GR
Blau (eine Reihe)	2,5m	1,25mm	BL
Gelb	2,5m	1,00mm	GE
Rot	2,5m	0,75mm	RO
Schwarz	1,25m	0,75mm	SW

Tabelle 2: Wandbleche in Abhängigkeit der Silohöhe und des Querschnitts (Links= unterstes, Rechts=oberstes Blech)

Silo-Typ	Silohöhe	Silohöhe	Silohöhe	Silohöhe	Silohöhe	Silohöhe
	1,25 m	2,50 m	3,75 m	5,00 m	6,25 m	7,50 m
1,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x4,10m	SW	RO	GE SW	GE RO	GR GE SW	GR BL RO
4,10x5,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO
5,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x4,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO

5.7.3 Bestimmung der Anzahl an Eckstreben- und Spannstangenetagen

Tabelle 3: Anzahl der ben. Eckstreben

Zelle/Höhe in m	2,50	3,75	5,00	6,25	7,50
1x2	2	3	5	7	9
1x3	2	3	5	7	9
1x4	2	3	5	7	9
1x5	2	3	5	7	9
1x6	2	3	5	7	9
2x2	2	3	5	7	9
2x3	2	3	5	7	9
2x4	2	3	5	7	9
2x5	2	3	5	7	9
2x6	2	3	5	7	9
3x3	2	3	5	7	9
3x4	3	3	6	8	9
3x5	3	4	6	8	9
3x6	3	4	6	8	9
4x4	3	4	6	8	9
4x5	3	4	6	8	9
4x6	3	4	6	8	9

5.7.4 Einbauhöhe der Eckstreben- und Spannstangenetagen

Tabelle 4: Einbauhöhen der Eckstreben

Höhe der Zelle in m								
2,50		3,75		5,00		6,25		7,50
Vertikale Anzahl der Streben bzw. Spannstangen								
2	3	3	4	5	6	7	8	9
Position; Höhe in m								
1; 1,18 2; 2,43	1; 0,76 2; 1,60 3; 2,43	1; 1,18 2; 2,43 3; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68 5; 4,93	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,68 6; 4,93	1; 0,62 2; 1,18 3; 2,02 4; 2,85 5; 3,68 6; 4,93 7; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18 9; 7,43

Falls ein Trichterunterbau verwendet wird, muss zusätzlich eine Eckstreben- bzw. Spannstangenetage an Position 0; in 0,07 m Höhe eingebaut werden.

5.7.5 Beispiel

Sie möchten eine Zelle mit 3x3m inkl. Trichter aufbauen. Diese Zelle ist oberhalb des Trichters 5m hoch:

Tabelle 2 geht somit hervor, dass Sie in der untersten Blechreihe das gelbe und dann oben darauf das rote Wandblech verwenden müssen

Aus der Tabelle 3 geht hervor, dass sie jede dieser Zellen mit 5 Eckstreben pro Ecke verteilt auf die 5m Höhe versteifen müssen.

Aus der Tabelle 4 geht hervor, dass diese Eckstreben von unten in den Lochreihen

0,76m	1,60m	2,43m	3,68m	4,93m

verschraubt werden.

Da Sie einen Trichter haben, müssen Sie in diesem Fall in der untersten Lochreihe bei 0,07m auch eine Eckstrebe pro Ecke anbringen:

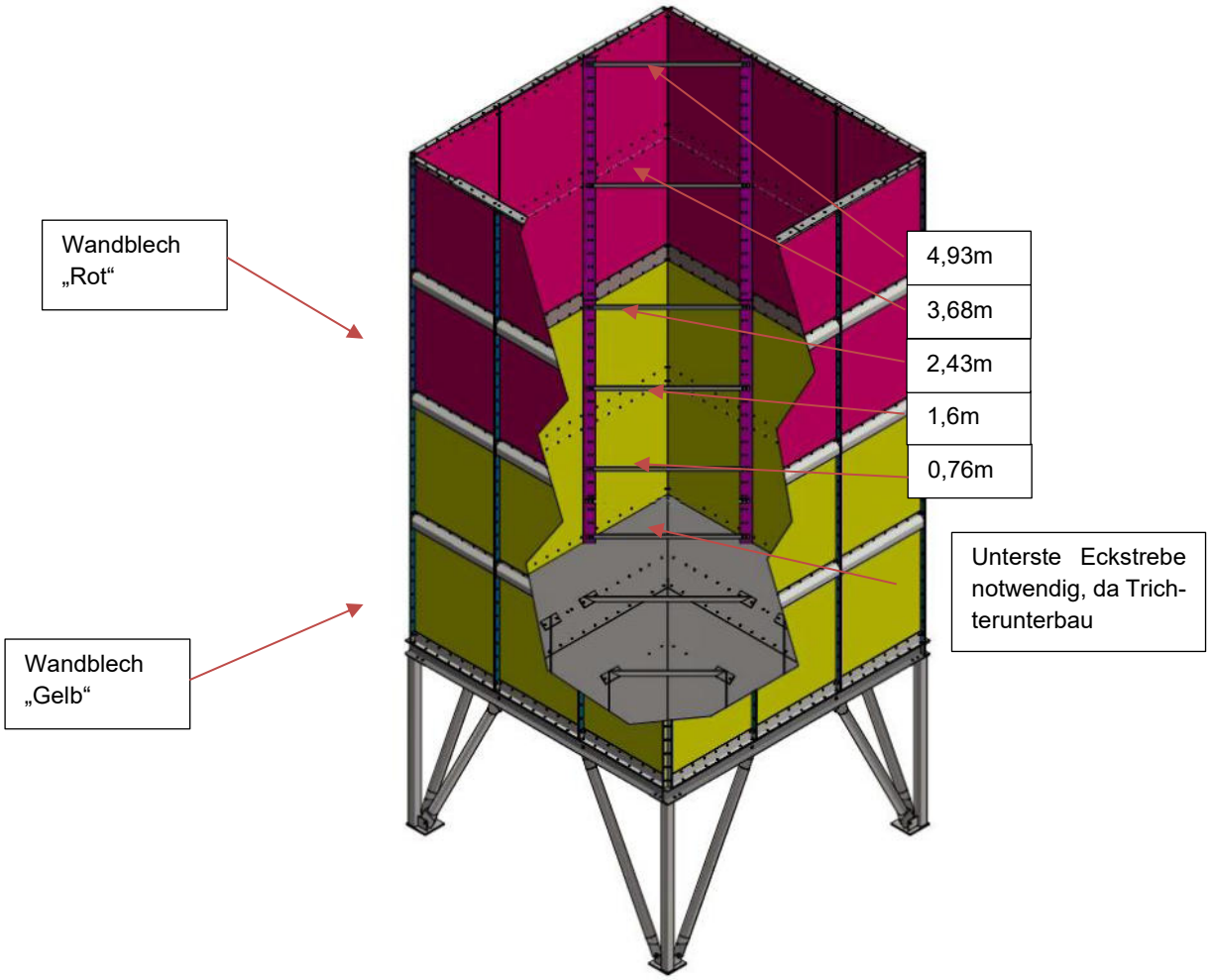
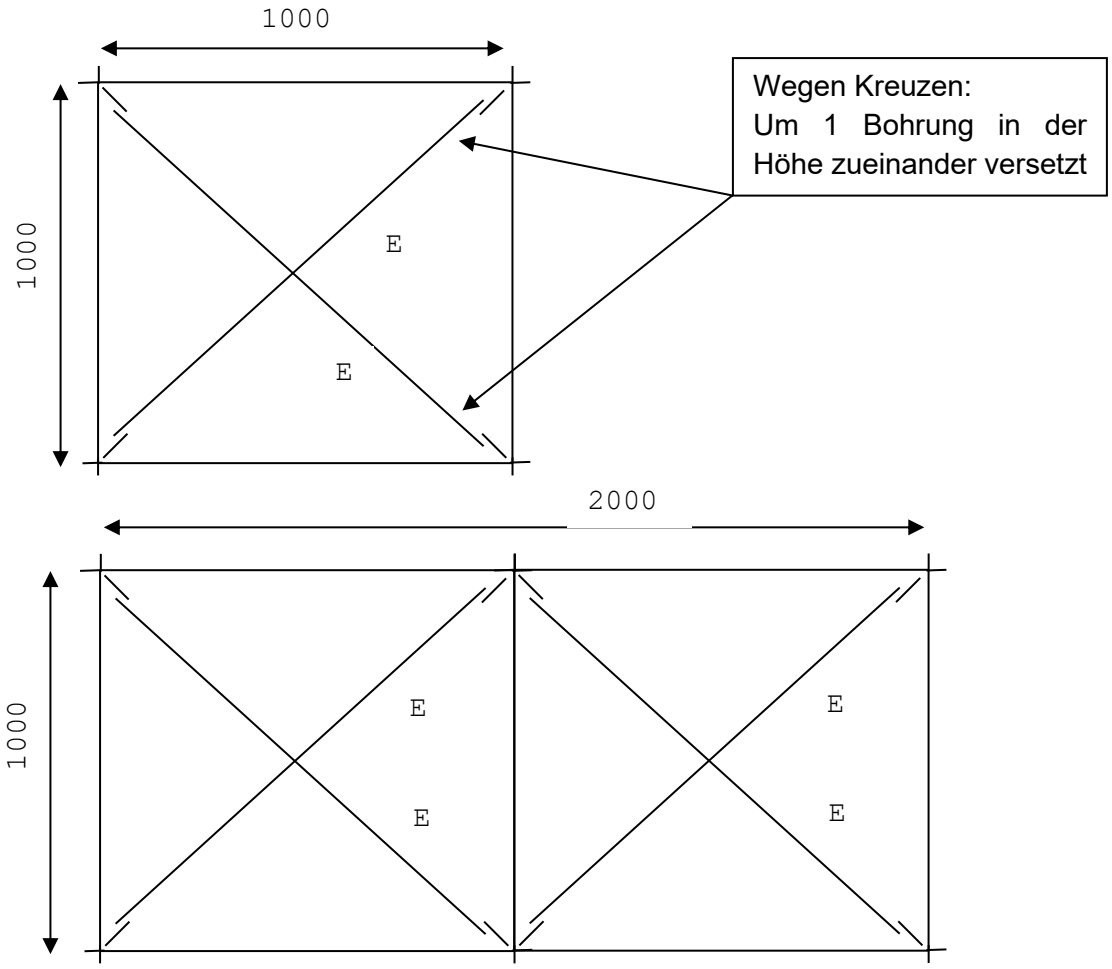


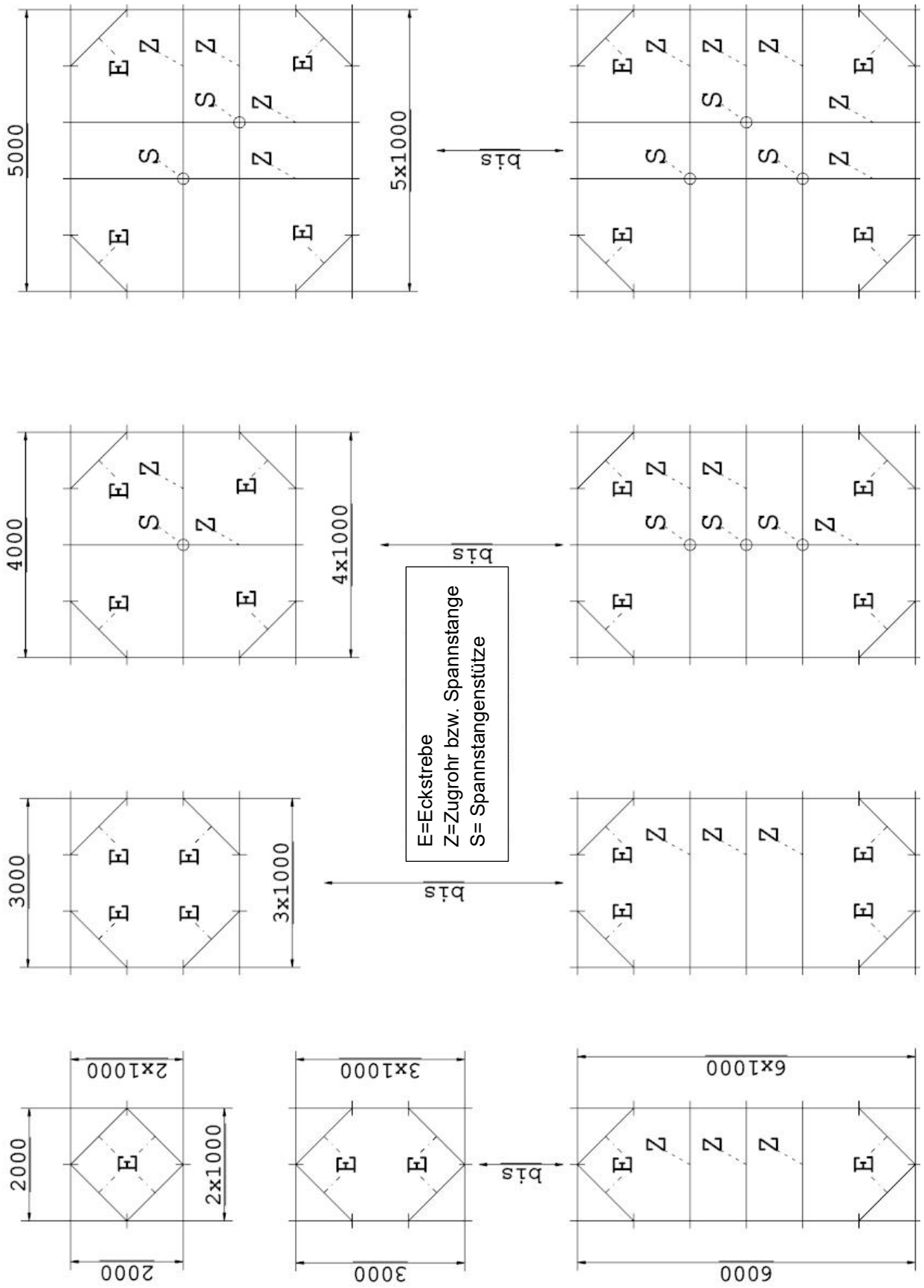
Abbildung 2: Silozelle aufgebaut mit Schnitt

Bei Zellen, welche größer als 3m in mindestens einer Richtung sind, werden neben den Eckstreben auch Spannstangen bzw. Zugrohre verwendet. Die Lage der Spannstangen ergibt sich analog zu denen der Eckstreben.

Um die Spannstangen bei großen Spannweiten am Durchhängen zu hindern, werden diese mit der Spannstangenstütze mittig unterstützt.

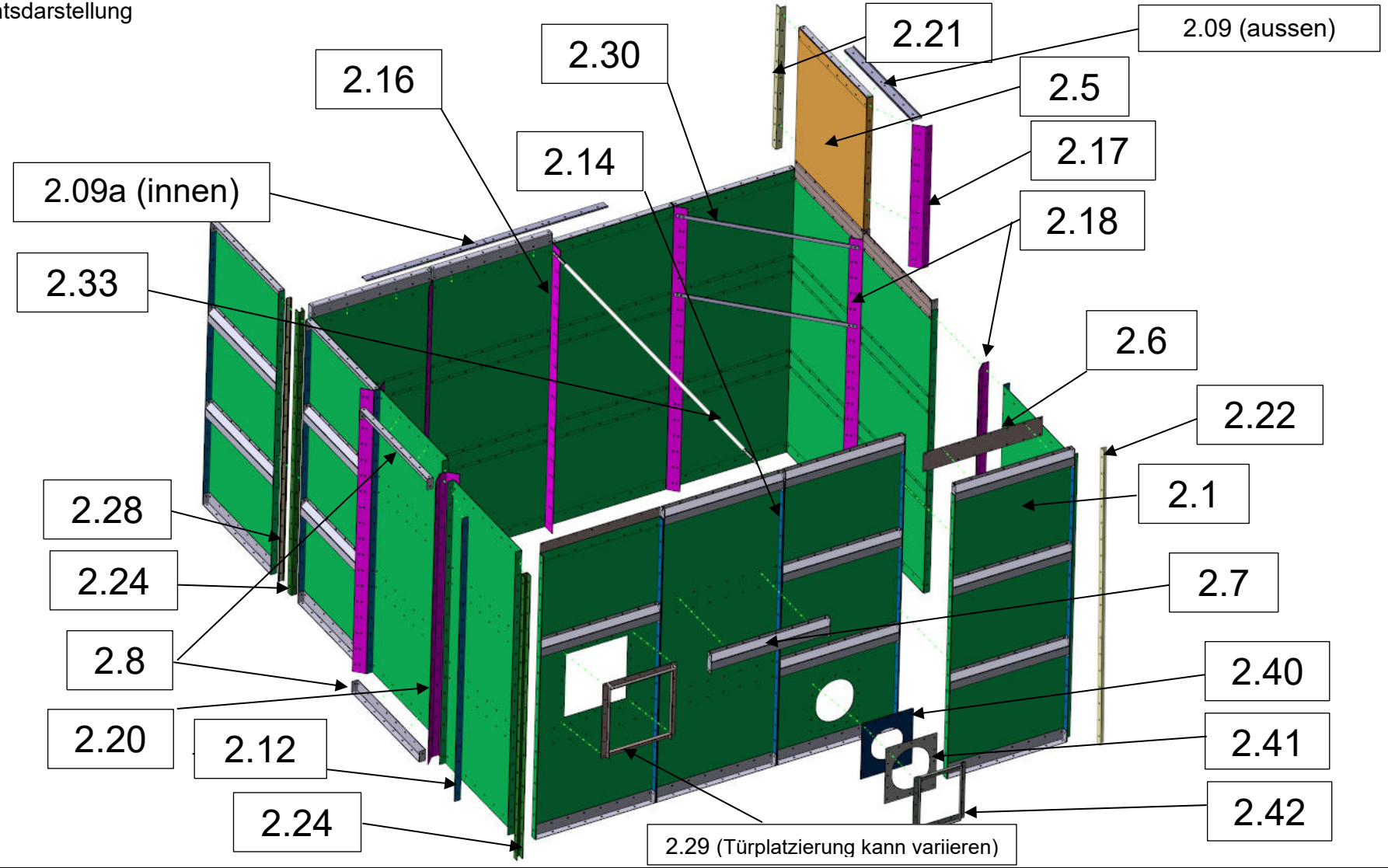
5.7.6 Eckstreben, Spannstangen und -stützen

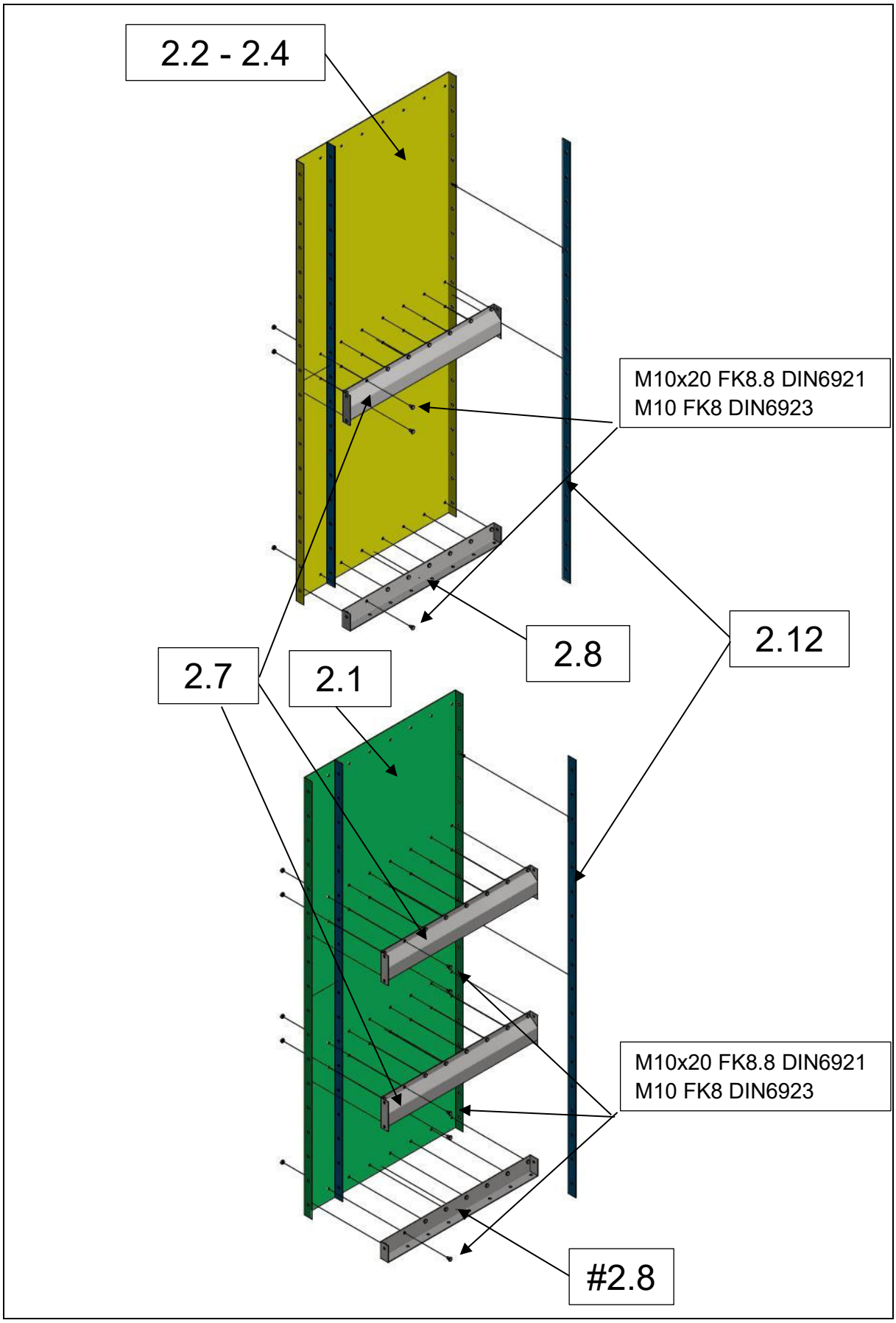




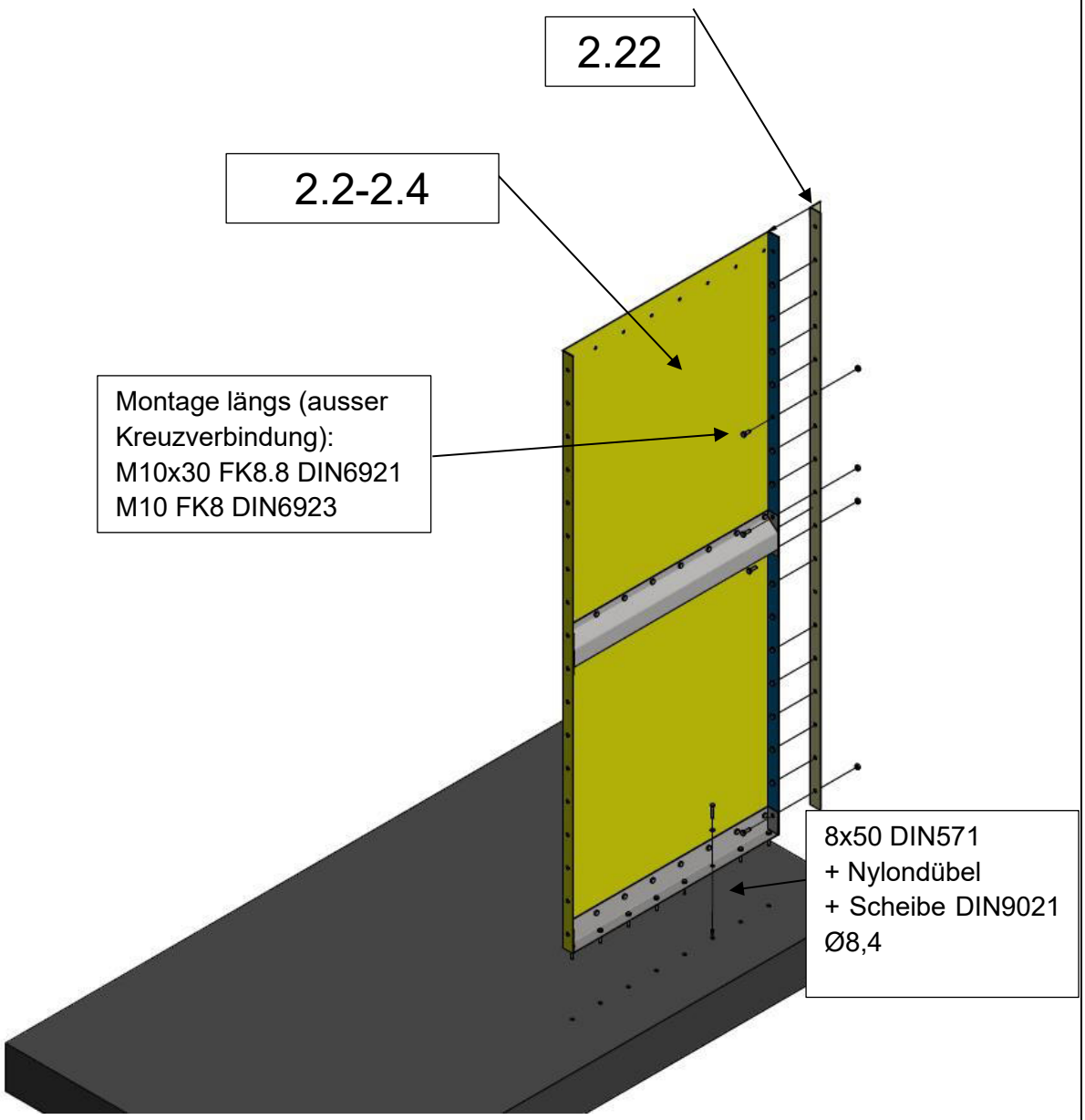
5.7.7 Montage Wand

Übersichtsdarstellung

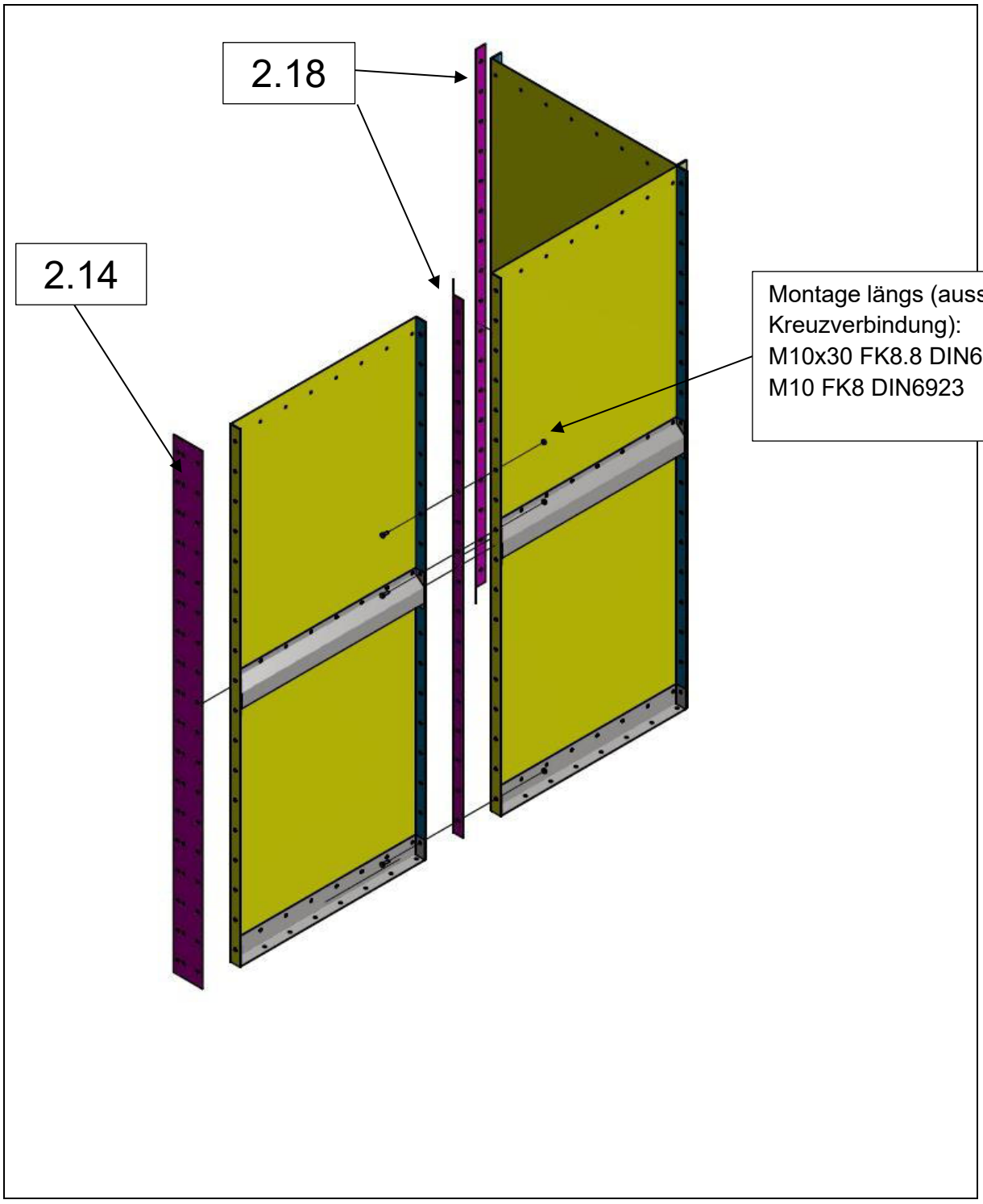



2.2 - 2.4
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
2.8
2.12
2.7
2.1
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
#2.8

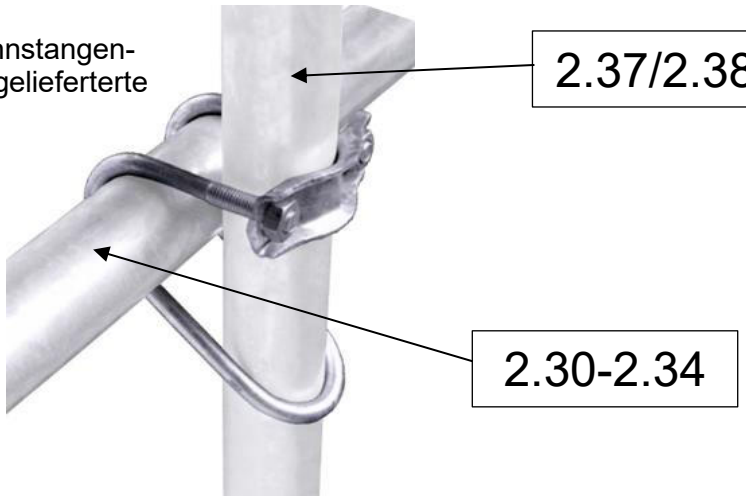
Beispiel: Bodenmontage, ohne Trichter !

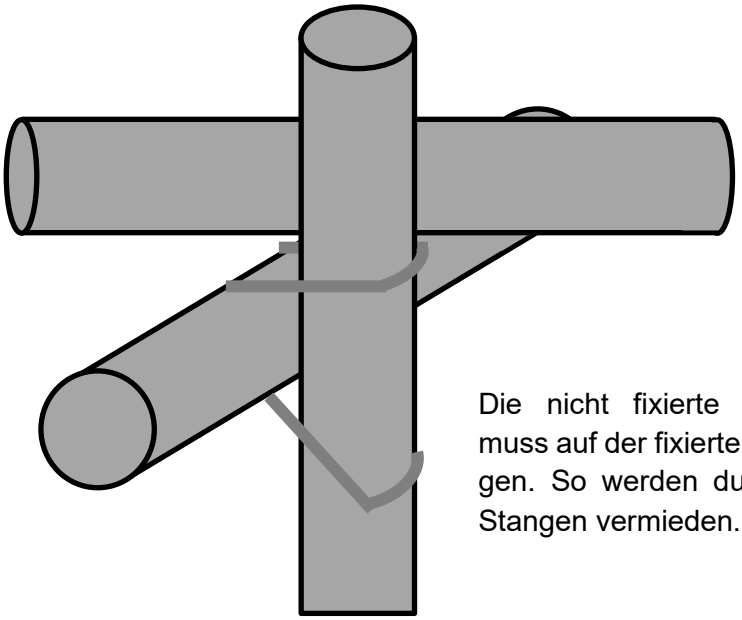


Auf eine Lotrechte und rechtwinkelige Montage achten

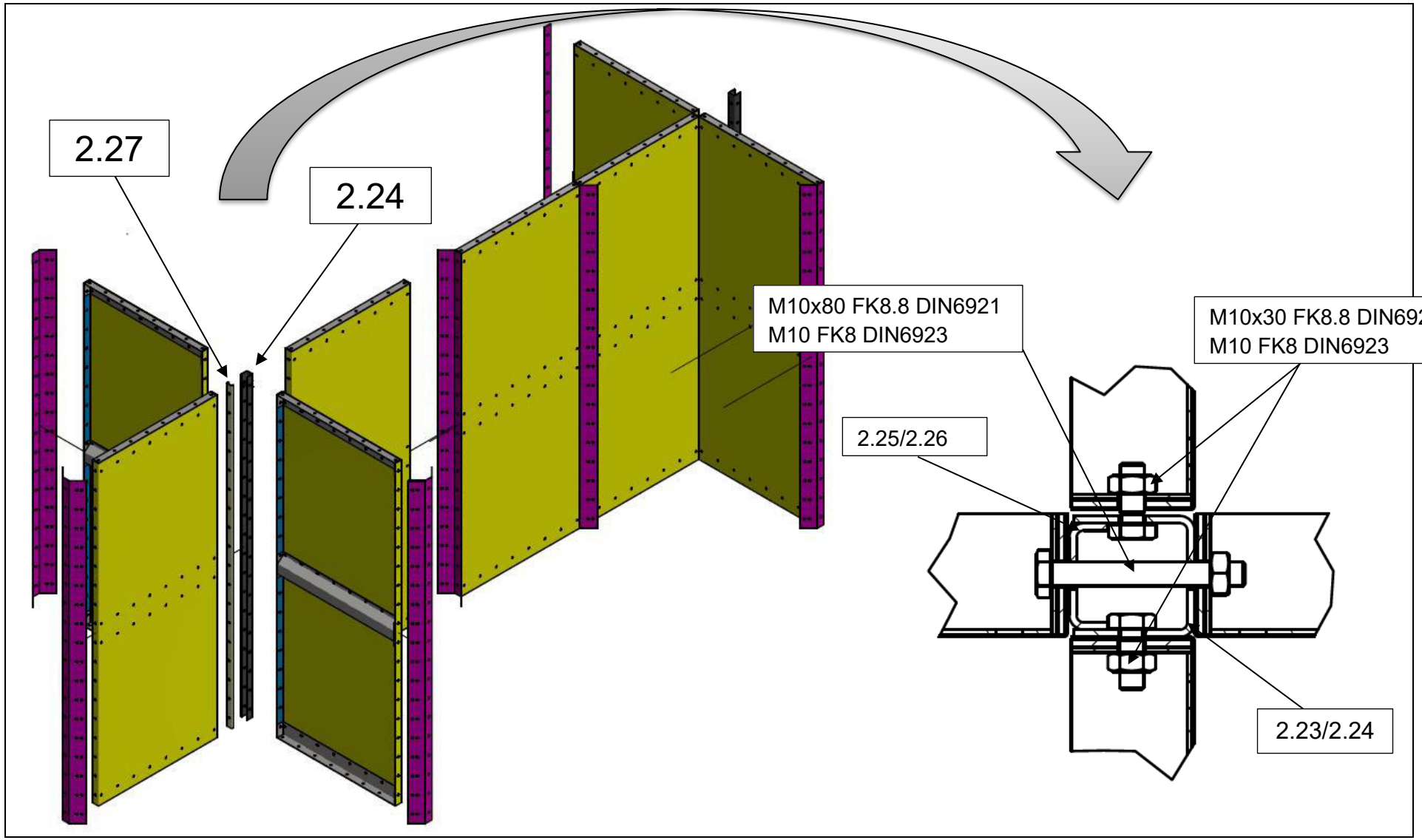

2.18
2.14
Montage längs (ausser Kreuzverbindung):
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923

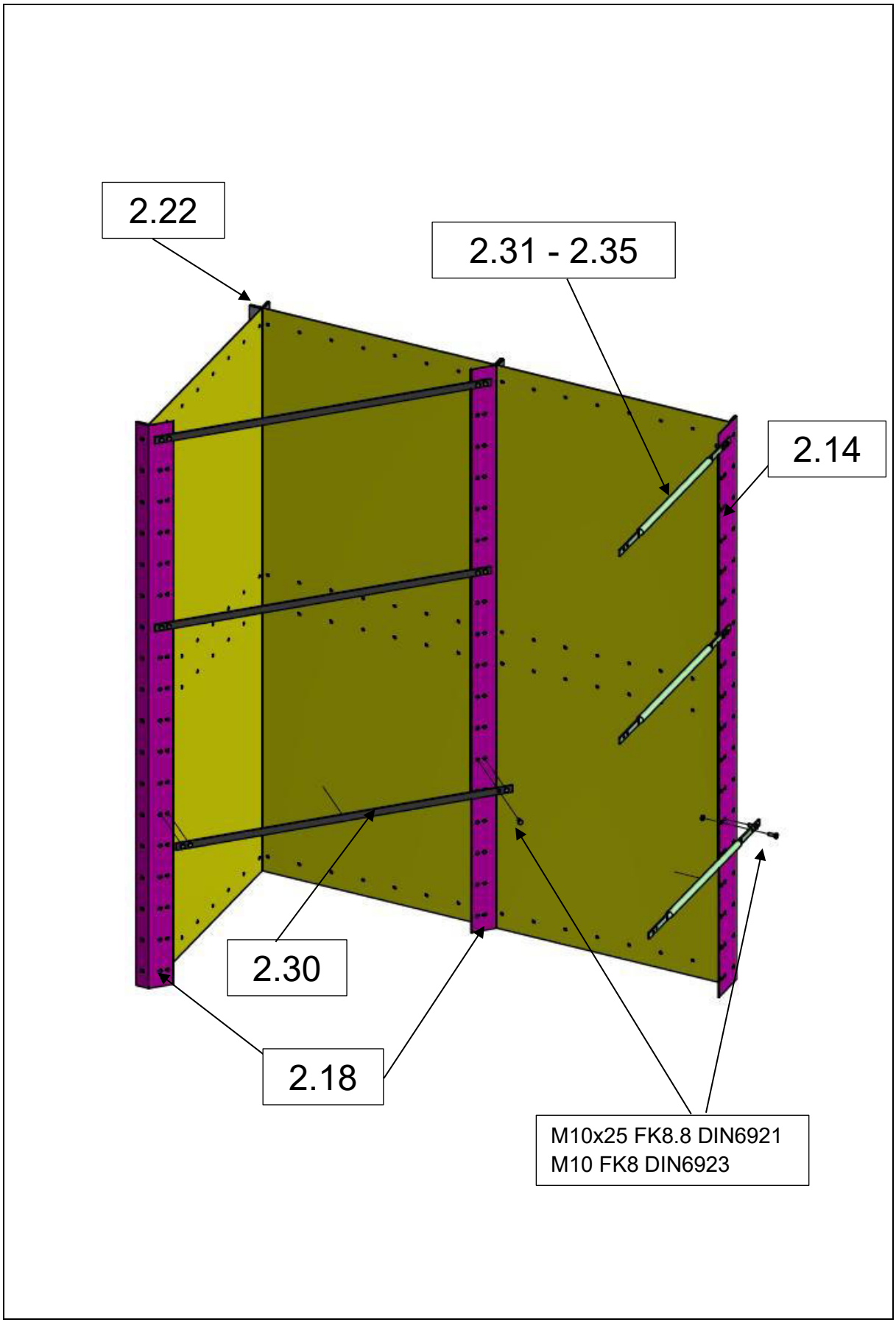
Ab 4 m
Verbinden Sie die Spannstangen-Stütze mittels einer mitgelieferterte Schelle
mit den Spannstangen

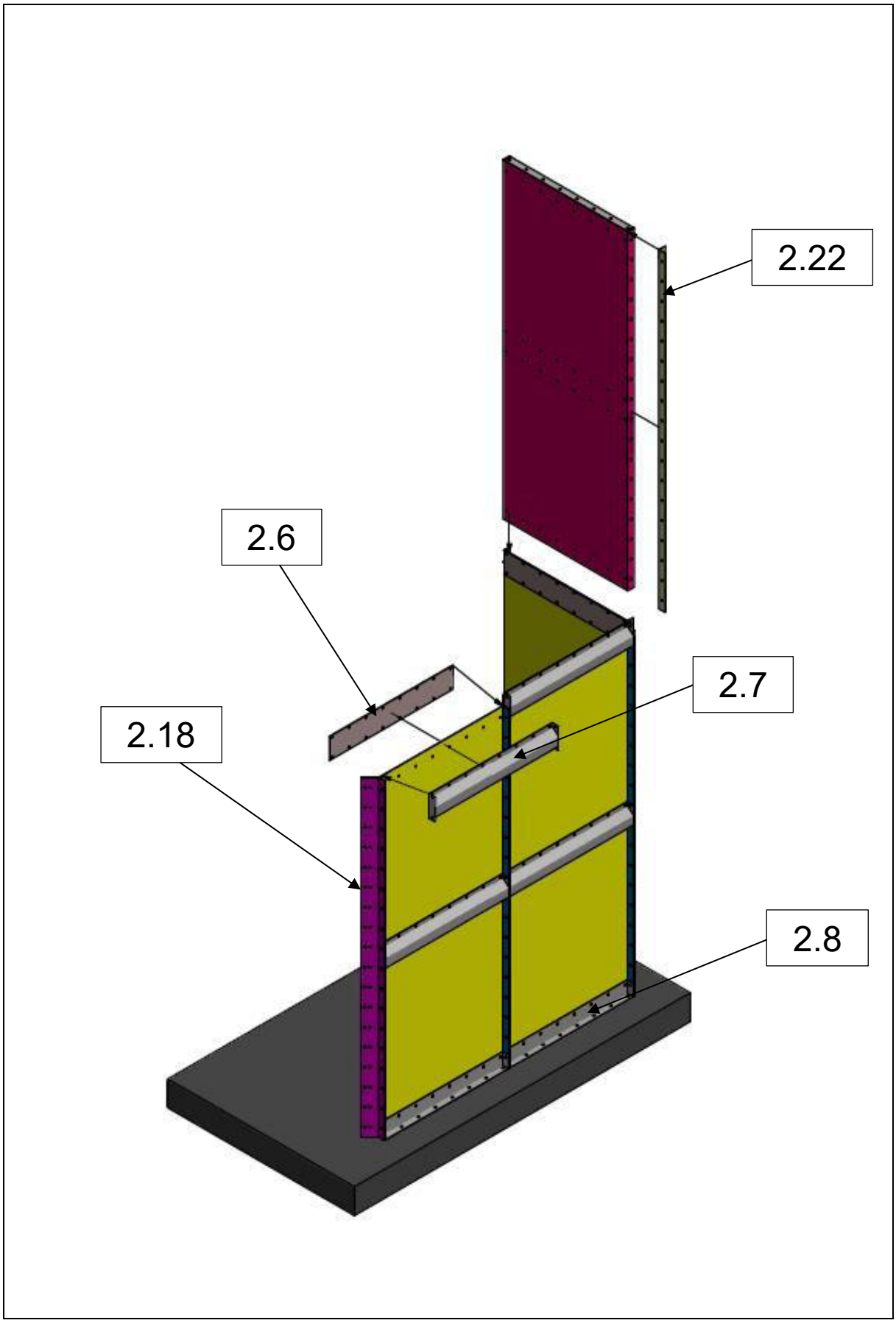




Die nicht fixierte Spannstange muss auf der fixierten oben aufliegen. So werden durchhängende Stangen vermieden.


2.27
2.24
M10x80 FK8.8 DIN6921
M10 FK8 DIN6923
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923
2.25/2.26
2.23/2.24


2.22
2.31 - 2.35
2.14
2.30
2.18
M10x25 FK8.8 DIN6921
M10 FK8 DIN6923


2.22
2.6
2.7
2.18
2.8

5.8 Hinweise zur Inbetriebnahme und Ausbildung des Betriebspersonals

Vor Inbetriebnahme muss diese Anleitung gelesen und verstanden werden. Bei weiteren Fragen wenden Sie sich vor Inbetriebnahme an Ihren Fachhändler.

Die Anleitung ist jederzeit insbesondere dem Bedienpersonal zugänglich aufzubewahren. Das Betriebspersonal sollte mit den allgemeinen Unfallverhütungsvorschriften vertraut sein.

5.9 Betrieb

Stellen Sie sicher, dass keine Person Wartungs-, Instandsetzungs- oder Reinigungsarbeiten während des Betriebs in unmittelbarer Nähe von Gefahrstellen durchführt (Sekundärunfallgefahr). Stellen Sie weiterhin sicher, dass die Einstiegstür nach den Wartungs- oder Reinigungsarbeiten stets von außen verschlossen ist (Sicherheitsbestimmungen beachten).

Das Befüllen und Entleeren der Viereckzellen muss stets zentrisch erfolgen, ansonsten kann es zu Beschädigungen des Silos kommen.

Beim Befüllen des Silos kommt es zu Verformungen der Wandbleche, sogenanntes Ausbeulen. Dies ist kein Reklamationsgrund, da sich die Verformung nach dem Entleeren teilweise wieder zurückbildet.

Sollte eine gemeinsame Schnecke verwendet werden und **eine Zelle** mehrere Trichter haben, ist zu beachten, dass nicht nur von einem Trichter das Material abgelassen wird, sondern versetzt jeder Schieber geöffnet werden muss. Das ist nötig, da sonst keine zentrische Entleerung des gesamten Systems stattfindet. Es reicht nicht aus alle Schieber gleichzeitig geöffnet zu haben, denn ist die Schnecke erst einmal gefüllt, werden die nachkommenden Trichterausläufe kein Material mehr abgeben können und somit wäre eine unsymmetrische Entleerung vorprogrammiert (d.h. der Trichter, welcher am Ende der Schnecke ist, wird zuerst komplett leer, bevor die anderen überhaupt Material abgeben können).

6 Wartung und Instandsetzung

Generell gilt: Nur Warten oder Instandsetzen, wenn keine Befüllung des Silos stattfindet und wenn für eine ausreichende Belüftung gesorgt ist.

Bei starker Korrosion oder sonstigen Mängeln, welche die bestimmungsgemäße Verwendung einschränken können, darf das Silo nicht mehr verwendet werden. Die verschlissenen Bauteile sind ordnungsgemäß auszutauschen.

Generell sind die unter Punkt 4 genannten Sicherheitshinweise zu beachten.

Nur Originalersatzteile des Herstellers verwenden.

seit 1913
schmelzer
WIR MEISTERN METALL

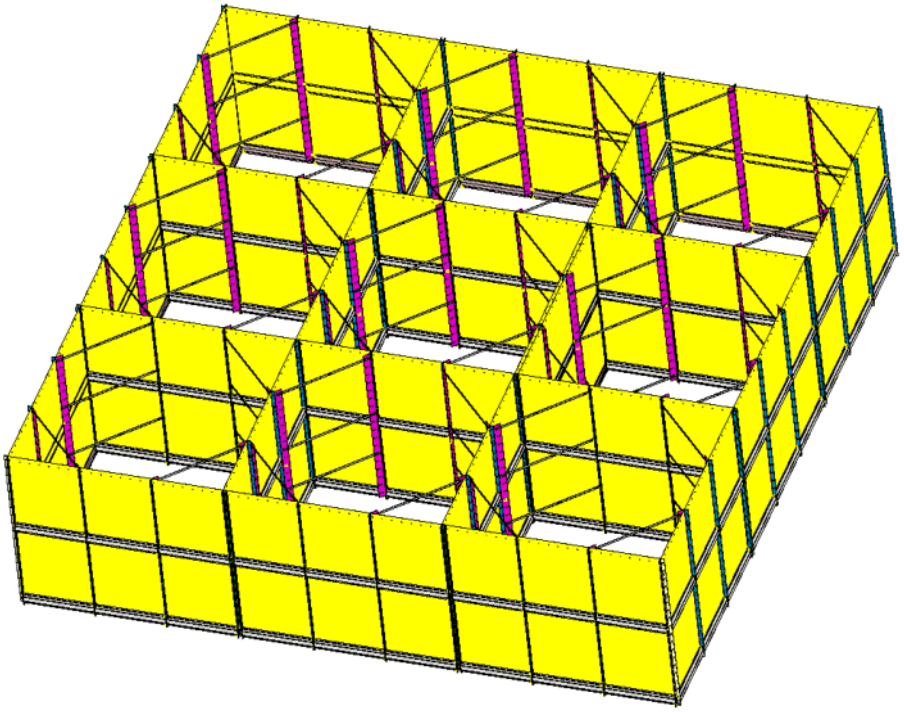
Operating manual

Translation of the original

Modular wall cells

and funnel

Subject to modifications



Ersteller: Matthias Heindl, Dominik Wild
Revision 7 23.10.2023

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Please read user information before start-up !

1 General

1.1 Foreword

These instructions have been prepared in accordance with the EU Machinery Directive (06/42 / EC) implemented by the product safety law (Germany) and to make it easier to use it. The instructions contain important information to use the fan safely and correctly. Your attention will help to reduce the residual risks, repair costs and downtime. This will increase the reliability and service life of the fan and its accessories.

The instructions must always be available where the product is used.

The manual must be read and applied by every person which is responsible for operation and manual handling, maintenance (maintenance, inspection, repair).

The instructions have to be passed to any subsequent owner or user.

In addition to the instructions and in the country and at the site in force, binding regulations for accident prevention as "rules for safety and health of agricultural trade association" and the recognized technical re-rules for safe and professional work must be observed.

The copyright for the manual remains property of the company Schmelzer and may be without their written consent not be copied or reposted.

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1.2 Explanation of symbols

	Foot protection must be worn
	Use eye protection
	Wear ear protection
	Follow the directions
	Use head guard
	Warning about a danger
	Warning of toxic substances
	Warning of sharp objects
	Warning of obstacles in the head area
	Warning against slipping

2 Plant description

2.1 Description

Modular wall cells used for the storage of grain (wheat, rye, barley, out, corn) in roofed buildings. The attachement of a ventilation system is optional.

2.2 General Description

The modular wall cells are specially designed to be set up inside of a building and need to be protected from moisture and wind. The sufficient sustainability of the underground has to be ensured. Otherwise you have to take precautions so the stability of the silo is ensured, even under pressure. The plant also has to be set up even and vertical. Because it is a modular system the parts can be delivered individually and also adjusted to the structural conditions. Due to this fact every available space in the building can be used optimally. The size of the cell starts with 1,10 m and can be delivered in the size from 1 m up to 5,10 m x 7,10. Optional standard funnels are available. Special dimensions can also be requested. Installation heights are possible from 1,25 m up to 7,50 m.

These silo cells consist of metal sheets which can be put together as walls. Depending on the size additional braces are needed which are available for each ordered size. It's possible to directly assemble the silo walls onto the concrete ground or onto the discharge hopper with frame (optional).

The wall sheets are not bend-proof, meaning distortions can appear while filling or emptying.

It's possible to arrange various cells next to each other. You can purchase A-, B- and C-cells for this matter (Figure 1). The A-cell consists of four walls, the B-cell consists of three walls and the C-cell only has two walls. Because of that outer walls can be used as inner walls. The same components are available for the optional hoppers.

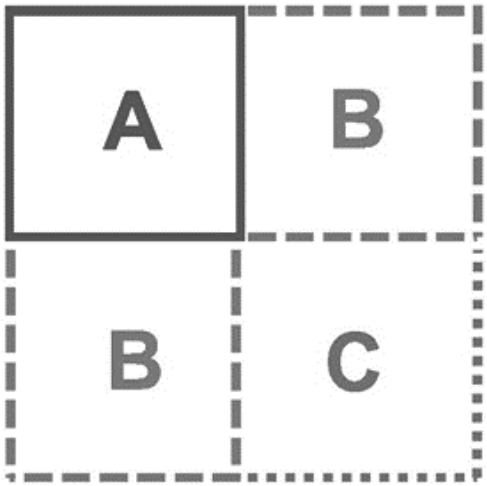


Figure 1

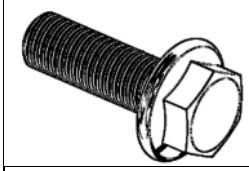
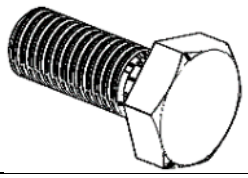
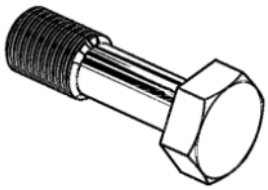
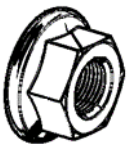
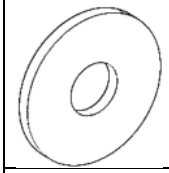
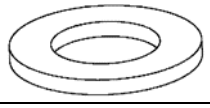
2.3 Technical Date

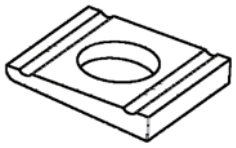
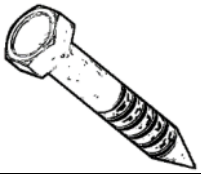
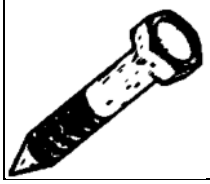
2.3.1 Scope of delivery

To ensure a complete and proper assembly and also to avoid complaints the individual parts have to be checked by means of the parts list. The part list is individual and can not be described here.

Enclosed you will find a general overview of the screw and accessory parts used

Table 1: Fastener overview

Example illustration	Standard (Norm)
	Screw with integrated washer DIN 6921
	Hexagon head screw DIN 933
	Hexagon bolt with shank- DIN 931
	Hexagon nut with in-tegrated washer DIN 6923
	Hexagon nut DIN 934
	Washer 3xd = outer Diameter DIN 9021
	Washer DIN 125

	V-Plate DIN 434
	Screw for concrete
	Screw DIN 571

2.3.2 Environmental conditions

Store dry and not in aggressive or corrosive media. Don't stack the pallets and do not put one on top of the other.

Operating conditions: temperature range: -20…60 °C

Pressure: usual atmospheric pressure

3 Intended use

3.1 Intended use

The modular cell walls are designed for the storage of grain. Dry and pourable bulk material with the same characteristics can also be stored.
Maximum bulk density = 7,5 $\frac{kN}{m^3}$ or bulk weight of maximum 750 $\frac{kg}{m^3}$ and angle of repose = 30°
Other bulk densities and the resulting structure heights and cross-sections must be planned separately.

The modular cell walls are exclusively designed for indoor installation inside of a building and have to be protected sufficiently from moisture, wind, snow and ice.

Every other usage doesn't apply to the intended use. The manufacturer doesn't take responsibility for consequential damages, the risk is solely the responsibility of the user.

Bulk goods which are cohesive or have a tendency to bridge are not allowed to be stored.

The storage silo is only designed for centered filling and emptying.

Please take the operating instructions for the attached removal conveyers and filling conveyers under consideration.

The mounting of the silo bracket has to be placed on the foundation according to the assembly instructions of the manufacturer.

The silos can be easily damaged due to mechanical influence from the outside. Bumper buffer devices need to be put up if the silos are placed at passageways.

It is forbidden to step into the silo in case they are filled or partly filled. Suitable protection measures have to be taken in case the silo is entered while being empty. There also has to be a sufficient ventilation. For this please check the requirements for safety and health protection of the trade association.

Unauthorized rebuilds or modifications are not allowed.

3.2 Warnings about misuse of the machine

Cleaning: Different than the mentioned points there always has to be a sufficient ventilation when entering the modular wall cells. Risk of suffocation.

There always have to be taken safety measures against cut injuries.

Be cautious of obstacles in the head area while doing maintenance work below or in the modular cell walls.

Due to increased danger of slipping in the modular wall cells you always have to wear suitable footwear.

4 Safety instructions

4.1 Stability

The stability of the modular wall cells is ensured as soon as they are completely assembled. To prevent the parts from falling they have to be especially secured during the assembly. The silo has to stand on the same ground level, which means there can't be any uneven surfaces on the ground. A slope also shouldn't exist because it could lead to distortions or even cause the silo to collapse. Packing plates and fast assembly grout are necessary in the contact area if this is not the case.

To ensure the load transfer during the operation of the plant a sufficient reinforced concrete structure is needed, meaning the concrete compressive strength, the thickness of the base plate and the reinforcement have to be sufficiently dimensioned.

The screw fittings as well as the dowelled joints have to be completely and force-fitting executed using the provided fastening elements.

The checking of the subsurfaces is an important aspect in case of a complaint. For example: the manufacturer comes to your plant and checks the ground. There's no warranty claime if the ground hasn't been checked before. That's why we explicitly advice you to invest time for this preparation.

4.2 Protective measures to be taken

A sufficient foot and hand protection has to be worn, especially during the assembly. In case the parts are being lifted above your head an appropriate head protection is necessary.

Because of the dust and noise emission there's also an appropriate eyes and hearing protection needed during the assembly and other respective activities.

4.3 Safety instructions for transport, handling and storage

All relevant safety regulations have to be kept during the transport, lifting works or relocating works. This includes the solely usage of tested and suitable lifting gear.

- It's forbidden to stay under a floating load.
- Lifting devices with enough load capacity have to be used.
- Attach needed transport protection if needed.
- Secure against slipping off
- Consider accident prevention regulations

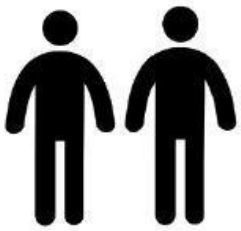
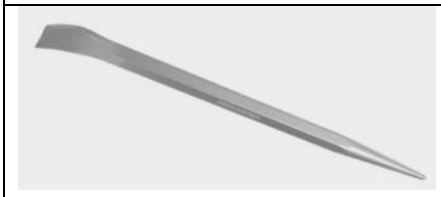
Security measures like belts or working platforms have to be used to prevent people from falling down. The accident prevention regulations and other rules also need to be considered

4.4 Measures to be taken in the event of disruption and accidents

It's necessary to stop working immediately in case of irregularity or disturbances.

If possible, the disturbance needs to be fixed. Contact your supervisor or retailer if this is not possible.

5 Assembly

<table>
<tr><td>  </td><td> </td><td></td></tr>
<tr><td> 
Assembly iron</td><td>
Level</td><td></td></tr>
<tr><td> </td><td colspan="2">To exclude an overuse all screws need to be adjusted hand-tight (without extension) after the assembly is completed.
Excerpt from DIN EN1090-2 8.3:
„The term „hand-tight“ generally means the state which a person can achieve with a screwdriver of normal size without extension. Also it can be used as working point on which an impact wrench starts hammering.“</td></tr>
</table>

5.1 Ground level

The modular wall cells have to be installed vertically. This has to be controlled with the help of the suitable means (spirit level, cross line laser, leveling device).

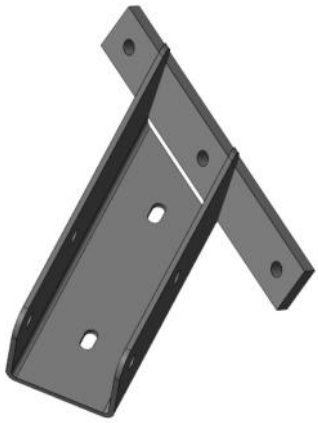
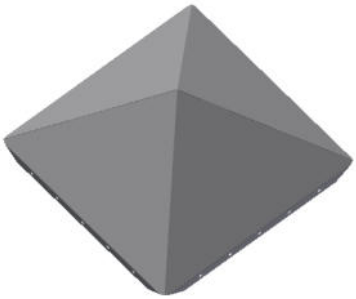
The delivery always includes a corresponding floor plan for the ordered type of silo. If in doubt, please ask your supplier for it. The assembly always has to start with the A-cell. The B-cells can be installed after that. If a second row exists a B-cell has to be mounted on an A-cell. After that the silo can be expanded with C-cells on both sides.

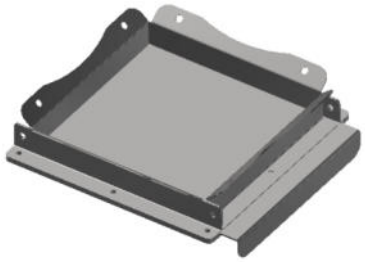
Use suitable shims if you need to adjust the ground level.

5.2 Optional funnel 2x2

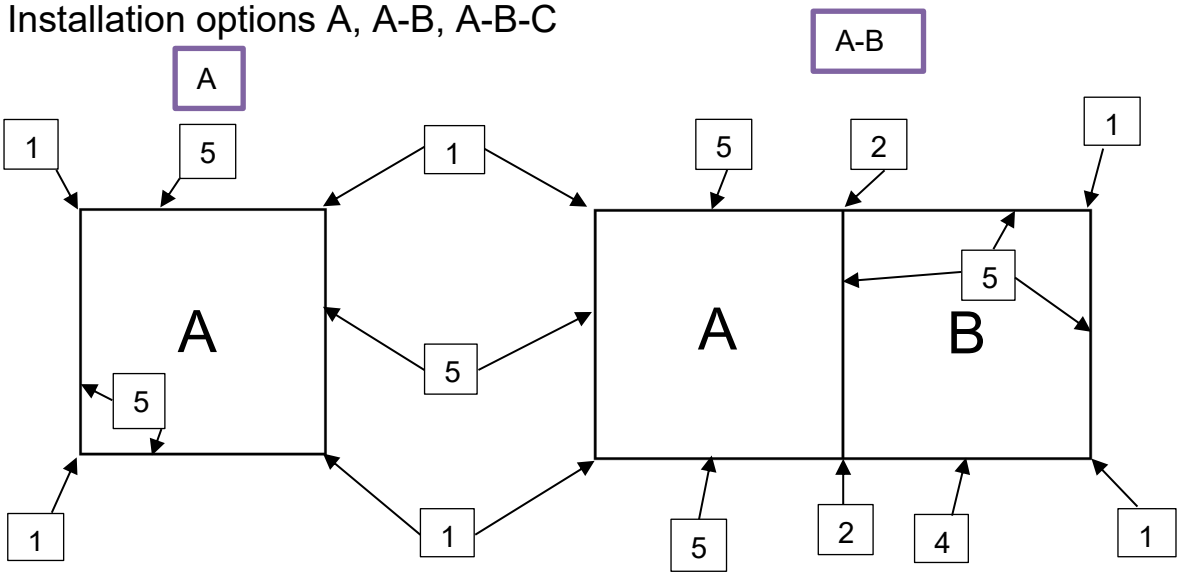
5.2.1 Scope of delivery

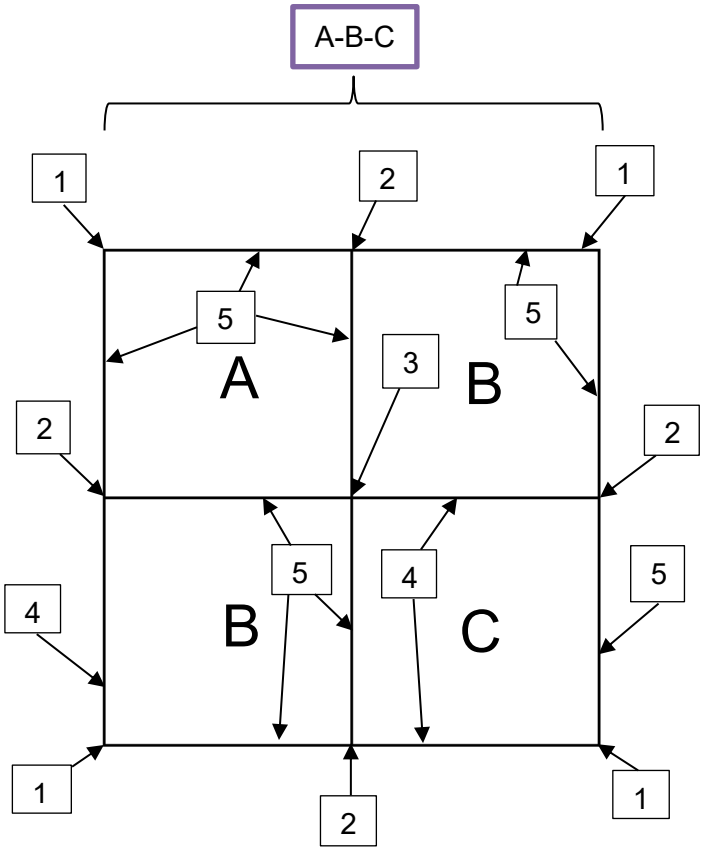
#1 Support L 2x2 & 2x3 & 3x3 Art.No.:4009092015812 Lower support L 1,5m Art.No.:4009092015908 	#2 Support T 2x2 & 2x3 & 3x3 Art.No.:4009092015813 Lower Support T 1,5m Art.No.:4009092015909 	#3 Support X 2x2 & 2x3 & 3x3 Art.No.: 4009092015814 Lower Support X 1,5m Art.No.:4009092015910
#4 U140 - l=1995 Art.No.: 4009092015804 L=1995 mm 	#5 U140 - l=2055 Art.No.: 4009092015805 L=2055 mm 	#6 Strut 60,3x4 for frame 2x2+3x3 Art.No.:4009092015810 Short Strut for 1,5m support Art.No.:4009092015911

#7 External reinforcement 2x2m 40° Art.No.: 4009092015833 	#8 Reinforcement console left 40° Art.No.: 4009092015823 	#9 Reinforcement console right 40° Art.No.: 4009092015824 
#10 Inner corner reinforcement 2x2m 40° Art.No.:4009092015877 	#11 (Optional) Ventilation cover 2x2 40° Funnel Art.No.: 4009092015912 	#12 (Optional) Ventilation pipe NW300 Art.No.: 4009003016990
#13 Metal sheet for funnel 2x2m 40° Art.No.: 4009092015855 	#14 (optional) Metal sheet for funnel 2x2m 40° Art.No.: 4009092015856 	#15 Reinforcement of metal sheet 2x2m 40° Funnel Art.No.: 4009092015850

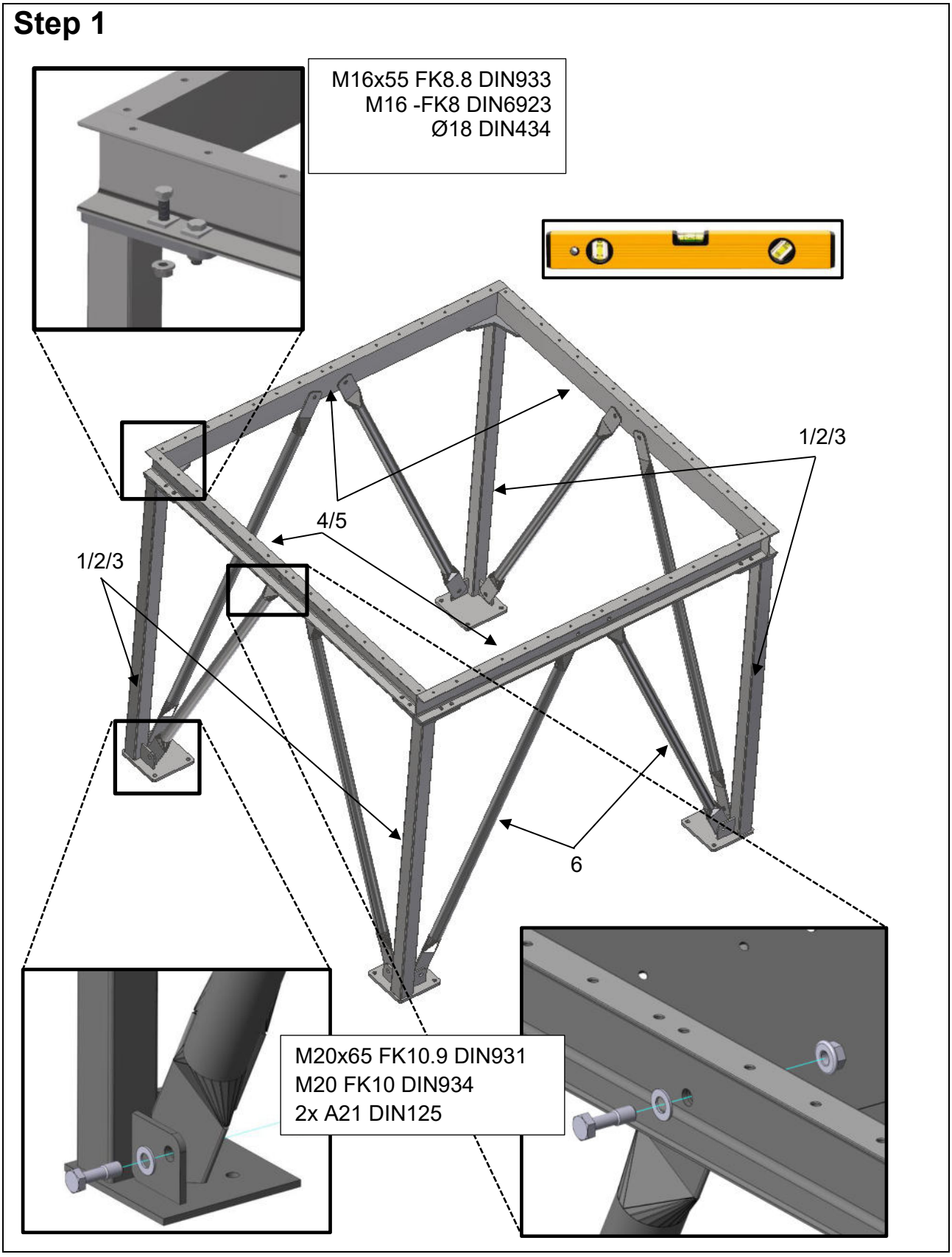
#16 Outlet with slide valve 300x300 Art.No.: 4009092015820 Transitions to 150,200,250 4009023015782, 783, 784 		

Installation options A, A-B, A-B-C

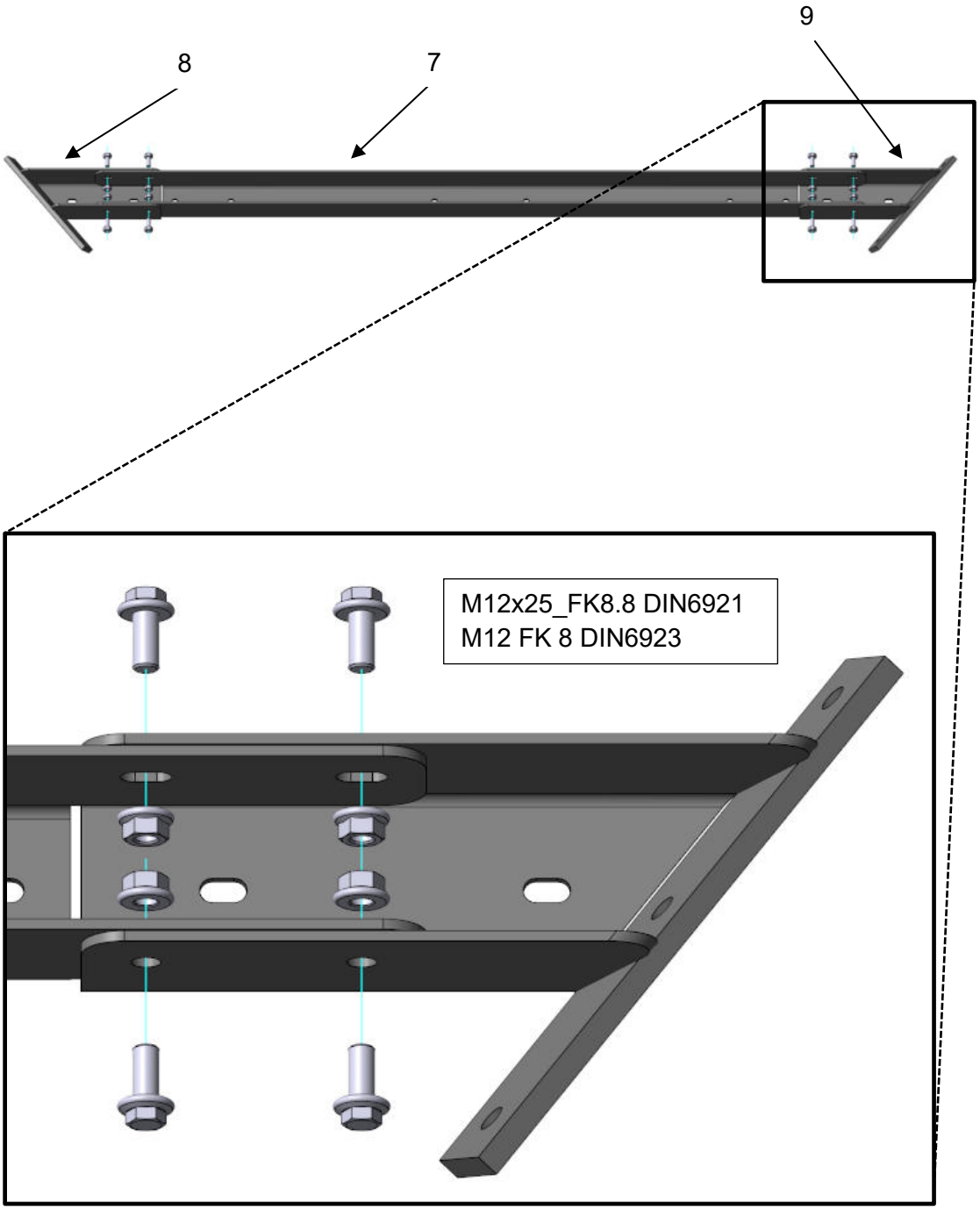




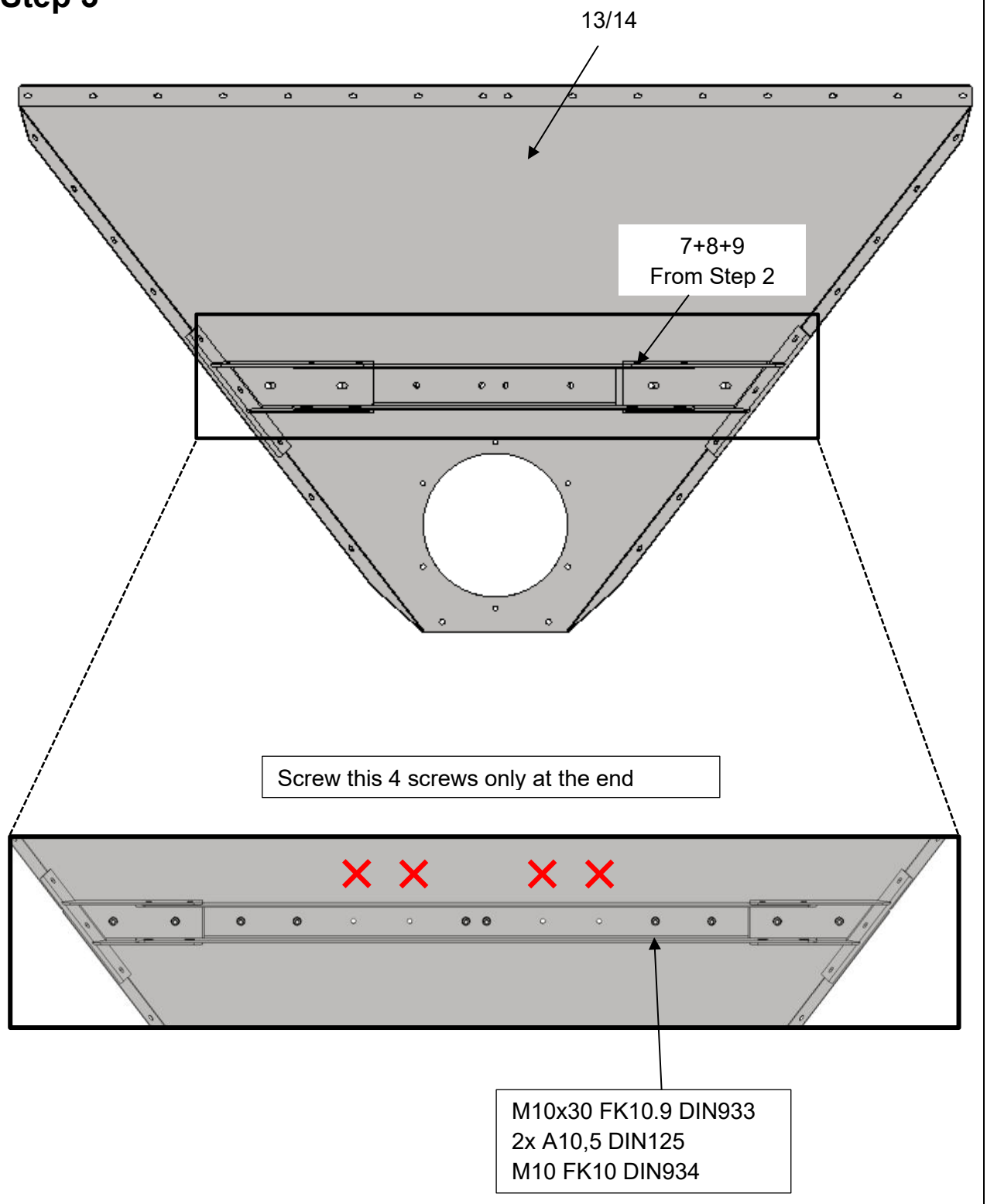
5.2.2 Assembly funnel 2x2



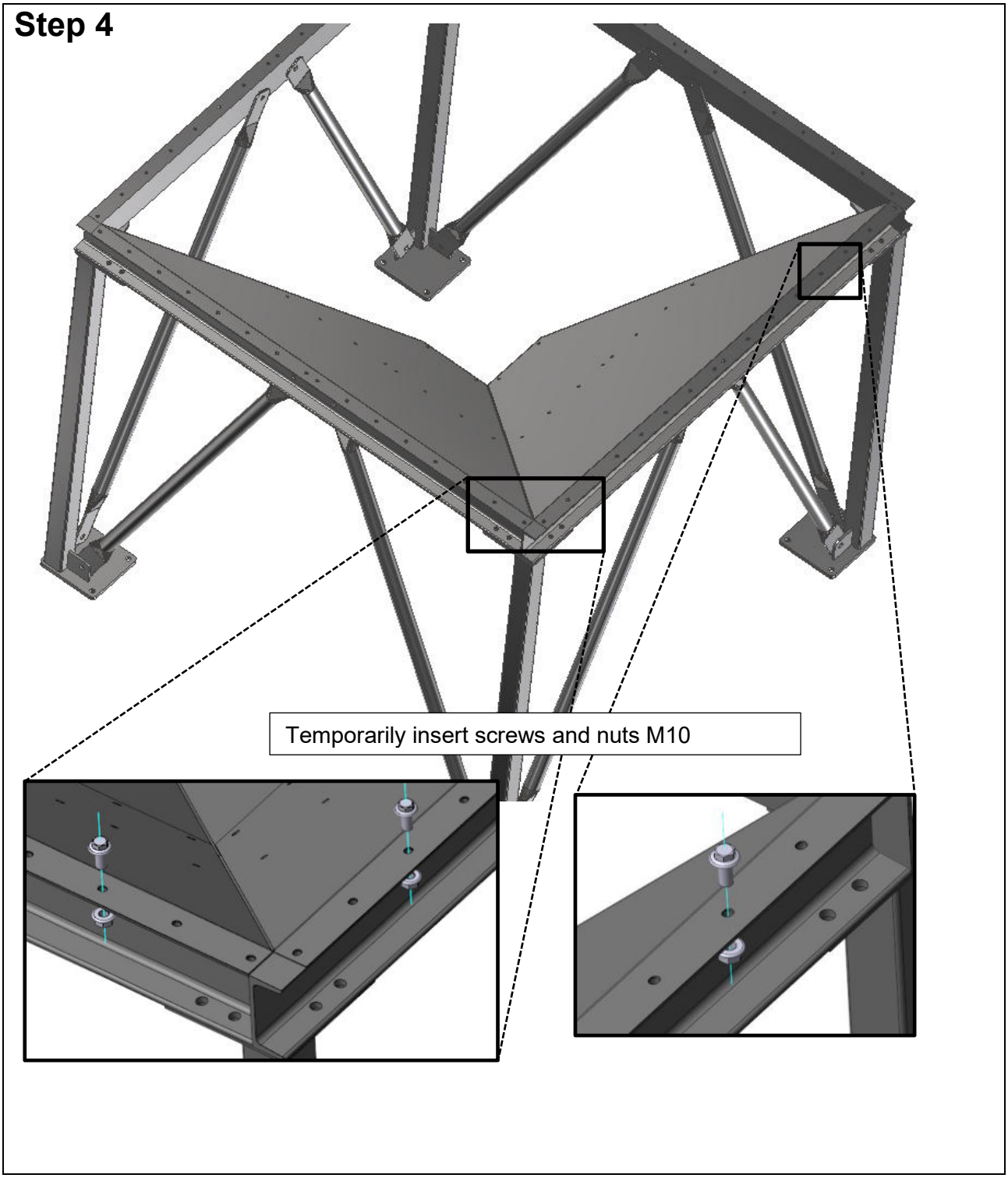
Step 2



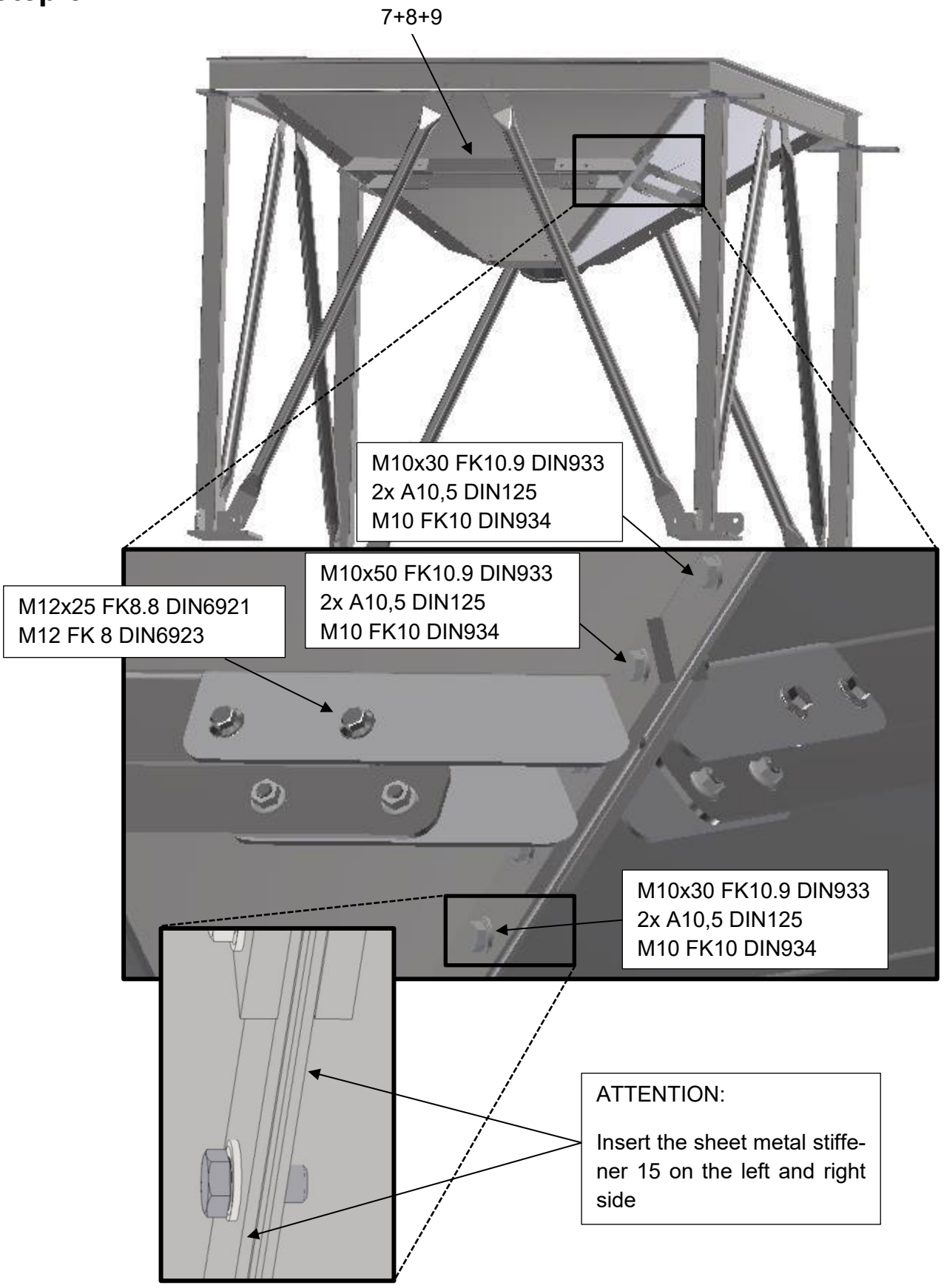
Step 3

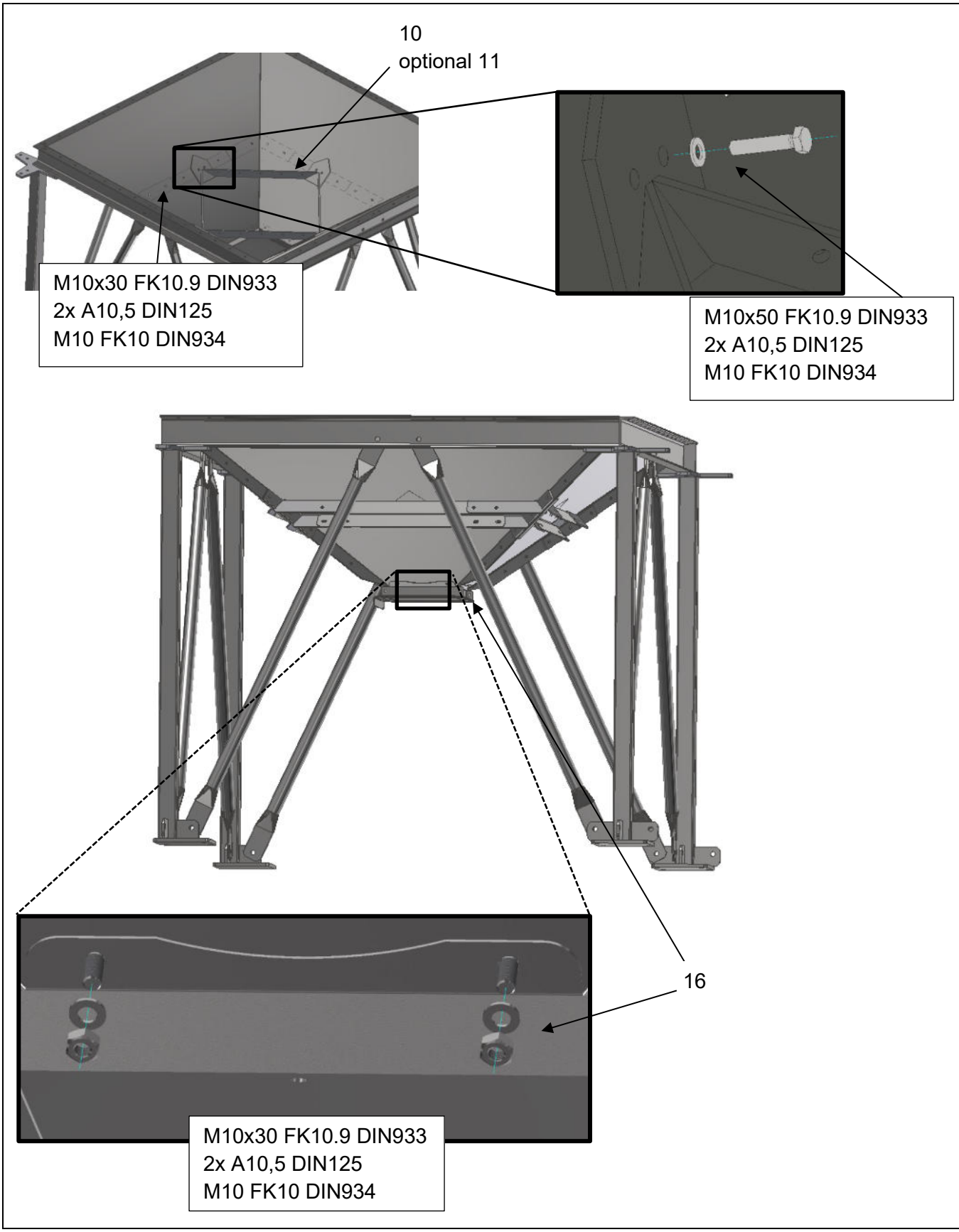

13/14
7+8+9
From Step 2
Screw this 4 screws only at the end
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 4

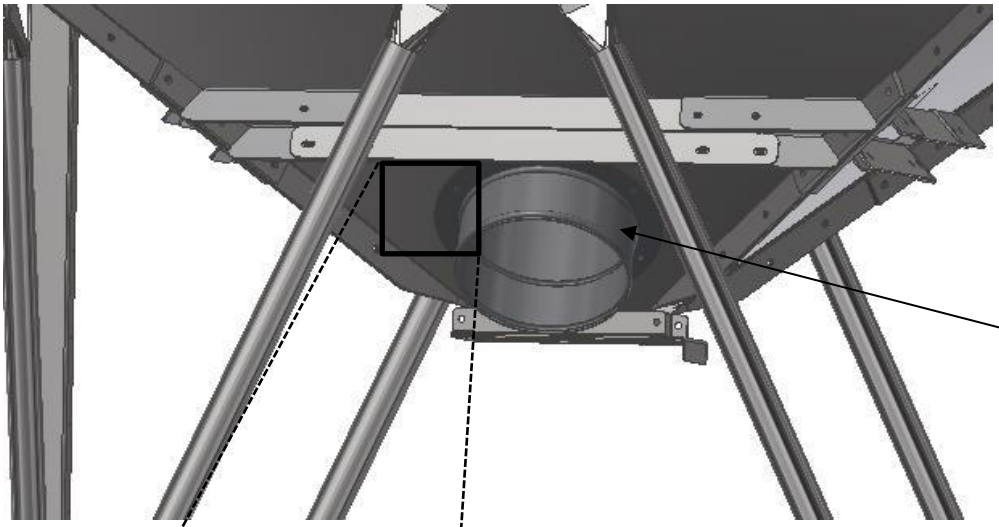


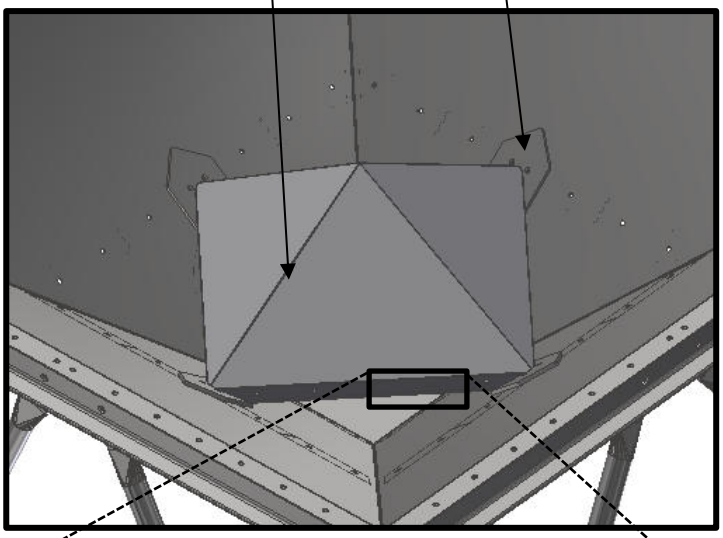
Step 5

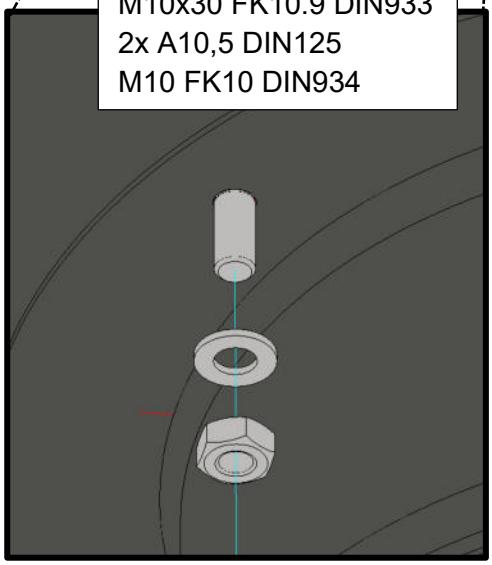

7+8+9
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ATTENTION:
Insert the sheet metal stiffener 15 on the left and right side

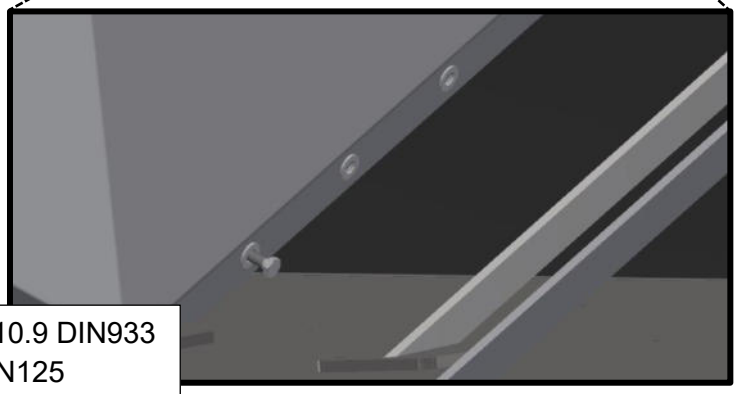

10
optional 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
16
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 7 Optional



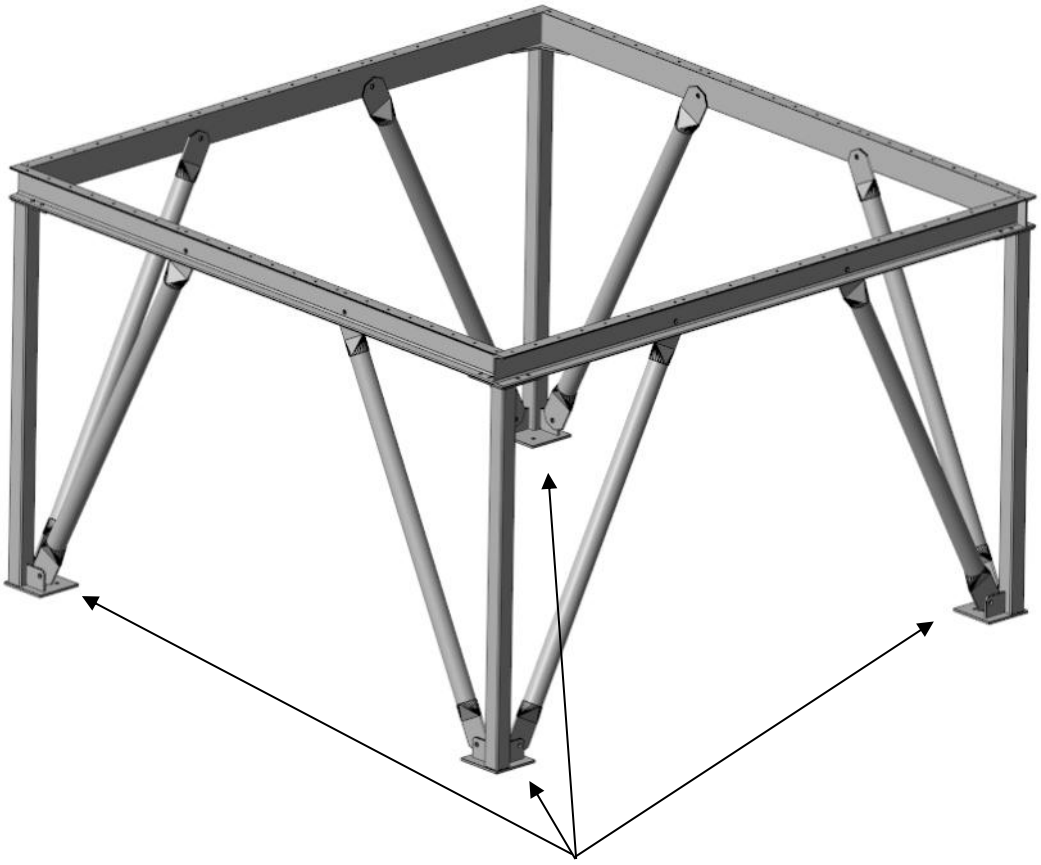




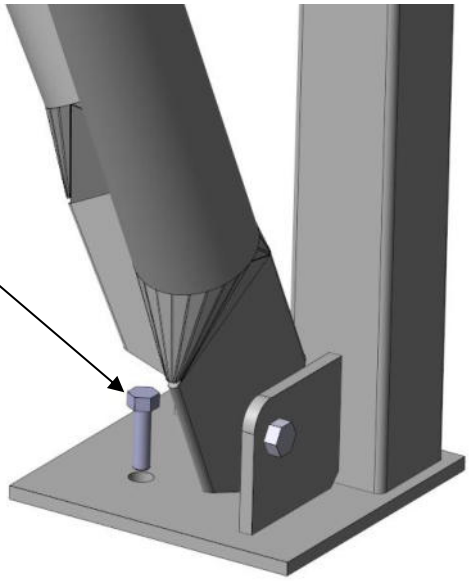


Step 8

Pay attention to a vertical alignment and right-angled mounting.

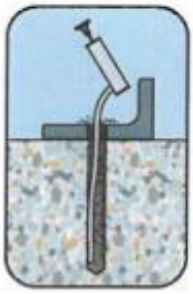


2x Srew for concrete each support

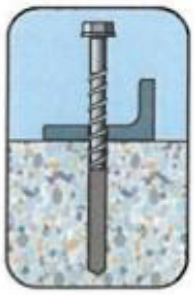


.Installations Instructions

Create hammer drilled or hollow drilled borehole.

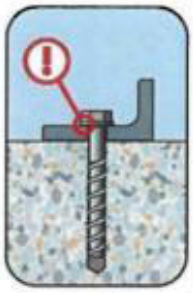


Clean the borehole. If using a hollow drill an additional cleaning of the borehole is not necessary.



Set the screw

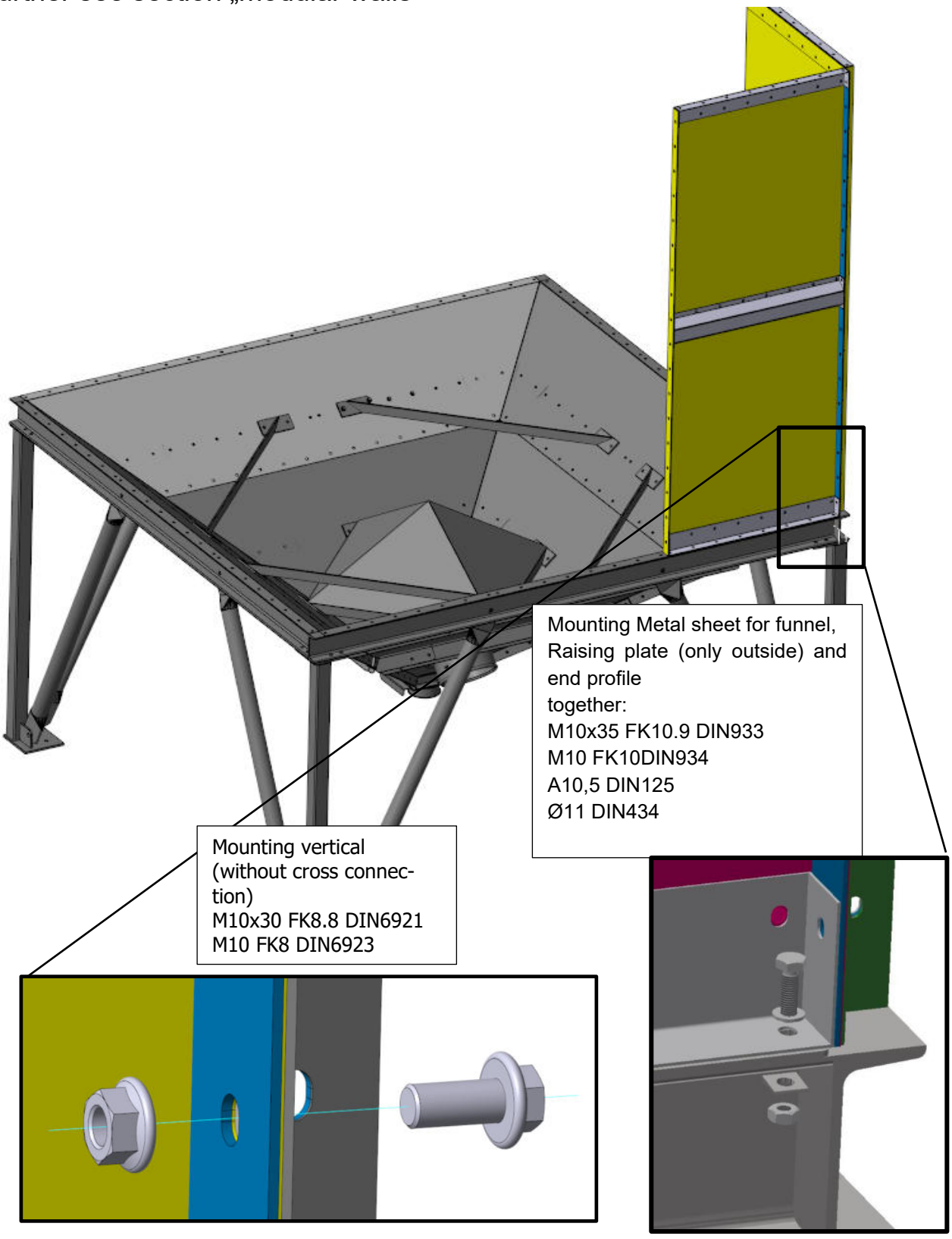
Install the screw by hand or using a impact screw driver. Consider $T_{imp,max}$ und T_{inst}



Installation was successful when the head of the anchor is fully supported and in contact to the fixture without damaging it.

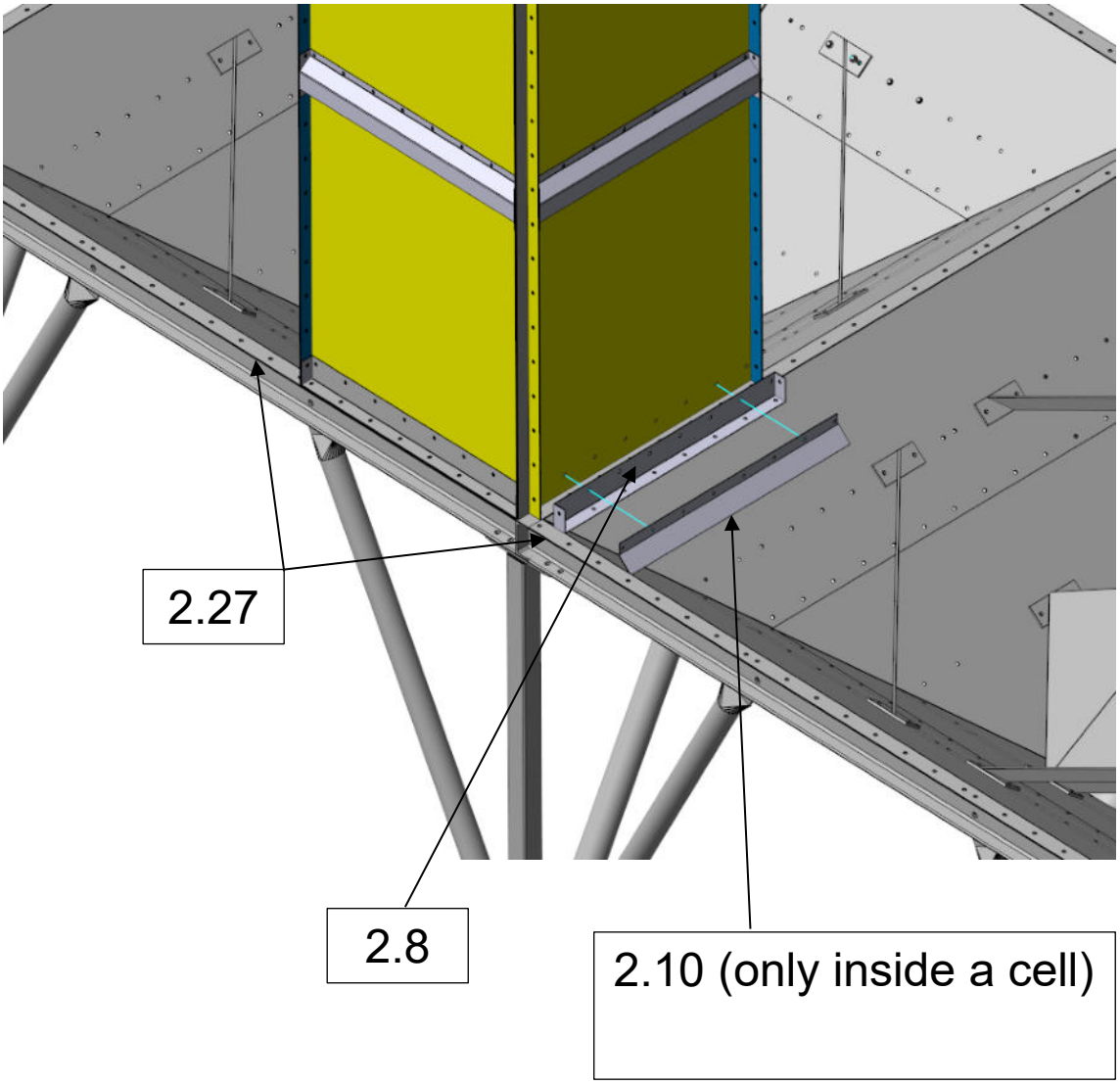
Step 9 (Optional, for the construction of a square cell)

Further see section „modular walls“



If there are several funnel substructures

- If the grain is to be stored next to each other, additional bevelling plates must be used on the lower end profile of the partition walls so that the grain can run off cleanly.
- - At points where two funnel plates are on top of each other, the superstructure height is slightly increased -> to compensate for this, additional raising plates (2.26) must be fitted at the other points.

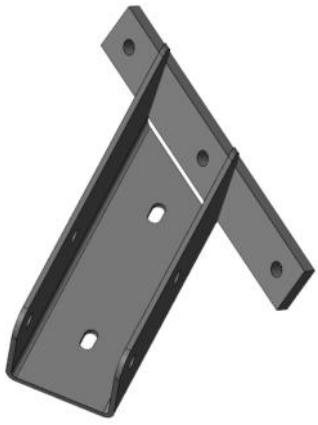
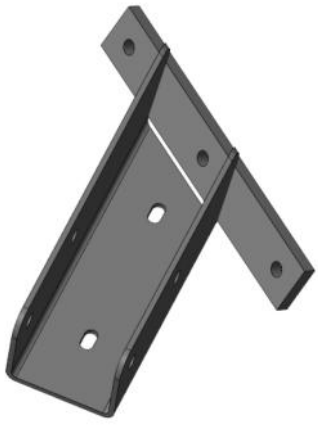


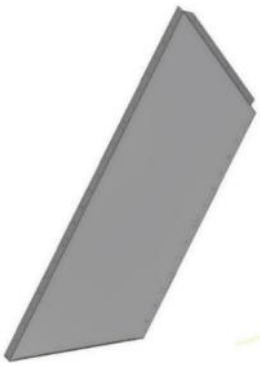
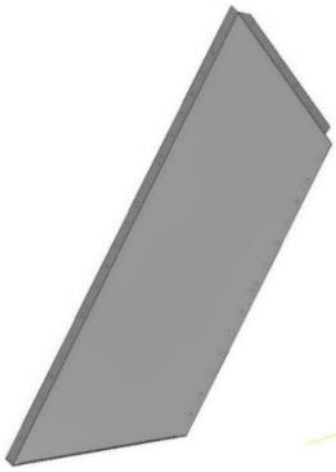
5.3 Optional Funnel 3x2

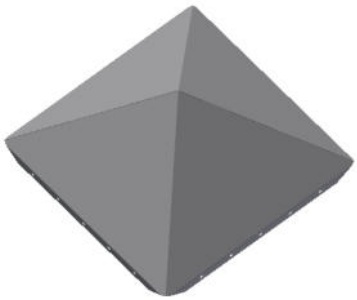
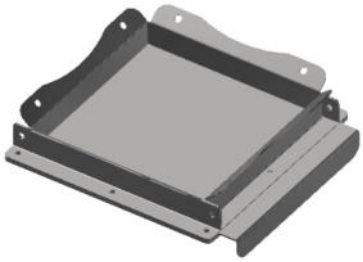
5.3.1 Scope of Delivery

#1 Support L for 2x2 & 2x3 & 3x3 Art.No.:4009092015812 	#2 Support T for 2x2 & 2x3 & 3x3 Art.No.:4009092015813 	#3 Support X for 2x2 & 2x3 & 3x3 Art.No.: 4009092015814
#4 U140 - l=1995 Art.No.: 4009092015804 L=1995 mm 	#5 U140 - l=2055 Art.No.: 4009092015805 L=2055 mm 	#6 Strut 60,3x4 for frame 2x2+3x3 Art.No.:4009092015810

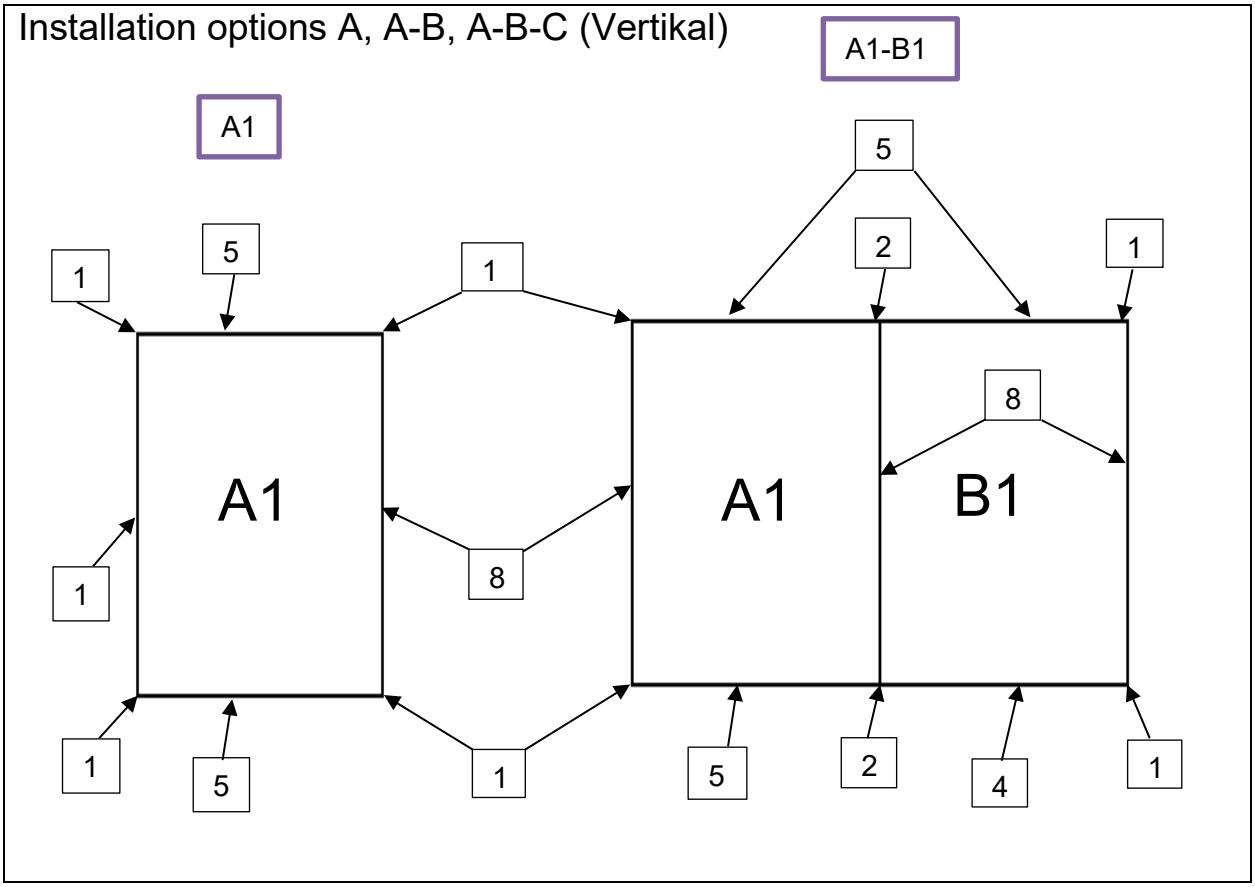
#7 U140 - l=2995 Art.No.: 4009092015806 L=2995 mm 	#8 U140 - l=3055 Art.No.: 4009092015807 L=3055 mm 	#9 Strut 88,9x4 for frame 3x3+2x3 Art.No.:4009092015738
#10 External reinforcement 2x3m – 3m below Art.No.: 4009092015839 	#11 External reinforcement 2x3m – 3m middle Art.No.: 4009092015838 	#12 External reinforcement 2x3m – 3m top Art.No.: 4009092015837

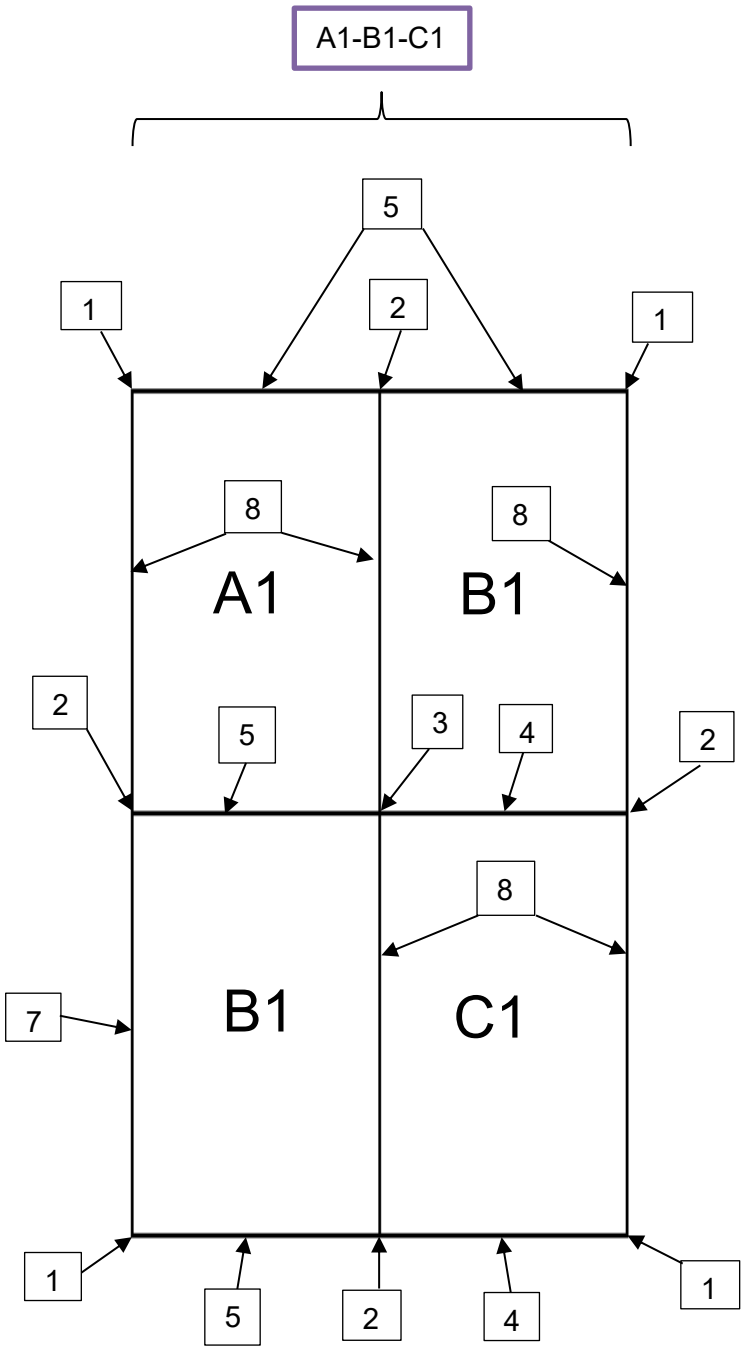
#13 External reinforcement 2x3m – 2m below Art.No.: 4009092015836 	#14 External reinforcement 2x3m – 2m middle Art.No.: 4009092015835 	#15 External reinforcement 2x3m – 2m top Art.No.: 4009092015834
#16 Reinforcement console right 40° 2x3m – 3m Art.No.: 4009092015828 	#17 Reinforcement console left 40° 3x2m – 3m Art.No.: 4009092015827 	#18 Reinforcement console right 40° 2x3m – 2m Art.No.: 4009092015826 

#19 Reinforcement console left 40° 2x3m – 2m Art.No.: 4009092015825 	#20 Metal sheet for funnel 2x3m 40° - 2m top Art.No.: 4009092015858 	#21 Metal sheet for funnel 2x3m 40° - 3m top Art.No.: 4009092015857 
#22 Metal sheet for funnel 2x3m 40° - 2m below Art.No.: 4009092015860 	#23 Metal sheet for funnel 2x3m 40° - 3m below Art.No.: 4009092015859 	#24 (optional, only if #32 is installed) Metal sheet for funnel 2x3m 40° – 2m below Belüftung Art.No.: 4009092015862

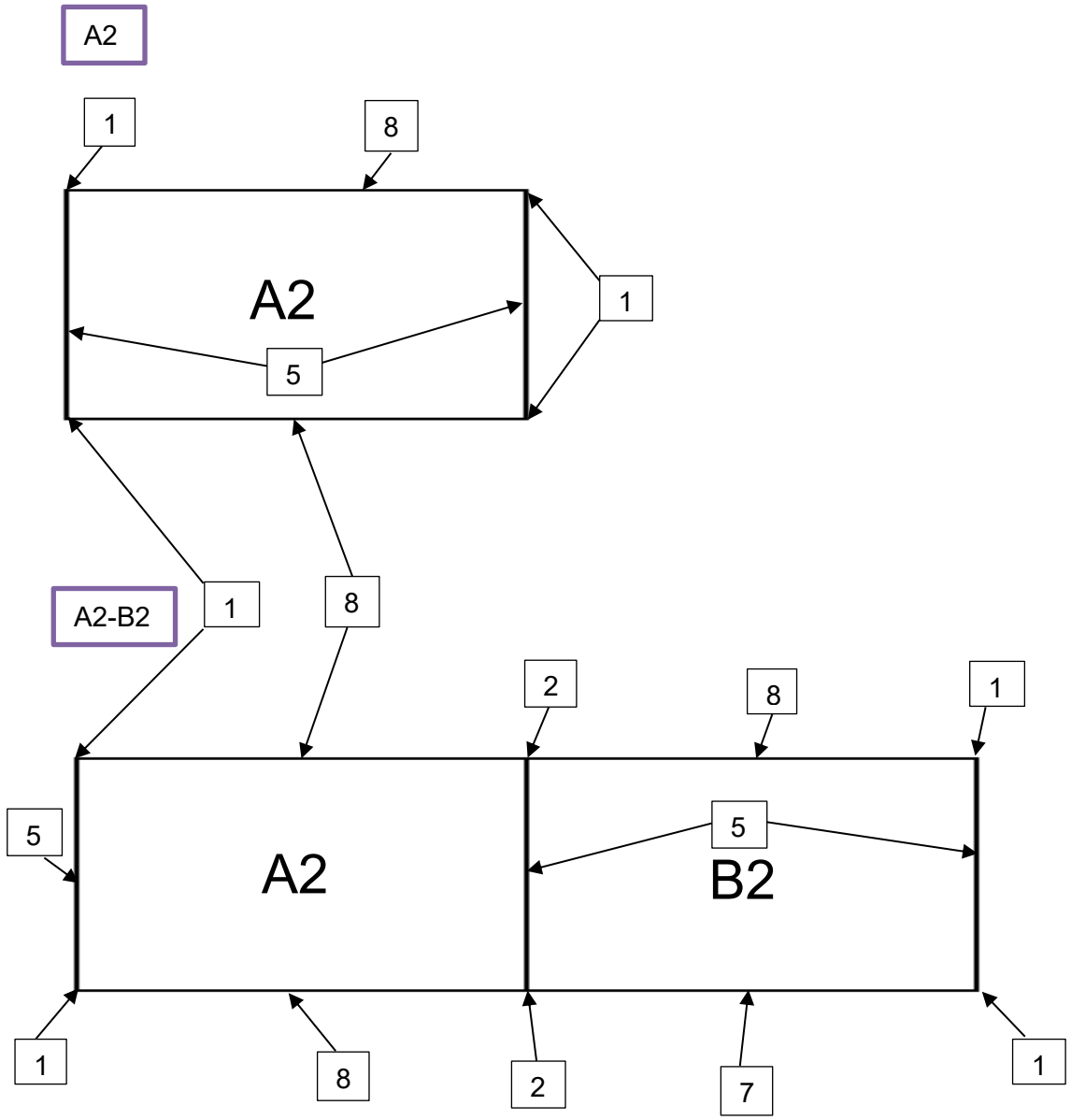
#25 (optional, only if #32 is installed) Metal sheet for funnel 2x3m 40° - 3m below Aeration Art.No.: 4009092015861 	#26 Inner corner reinforcement middle1 2x3m 40° Art.No.: 4009092015883 	#27 Inner corner reinforcement middle2 2x3m 40° Art.No.: 4009092015884
#28 Inner corner reinforcement top1 2x3m 40° Art.No.: 4009092015881 	#29 Inner corner reinforcement top2 2x3m 40° Art.No.: 4009092015882 	#30 Inner corner reinfoorcement below 2x3m 40° Art.No.:4009092015878
#31 (Optional) Ventilation cover 2x3m 40° Funnel Art.No.: 40090920615913 	#32 (Optional) Ventilation pipe NW300 f. Ventilation device Art.No.: 4009003016990 	#33 Outlet with slide valve 300x300 2x3m Art.No.: 4009092015821 Transitions to 150,200,250 4009023015782, 783, 784 

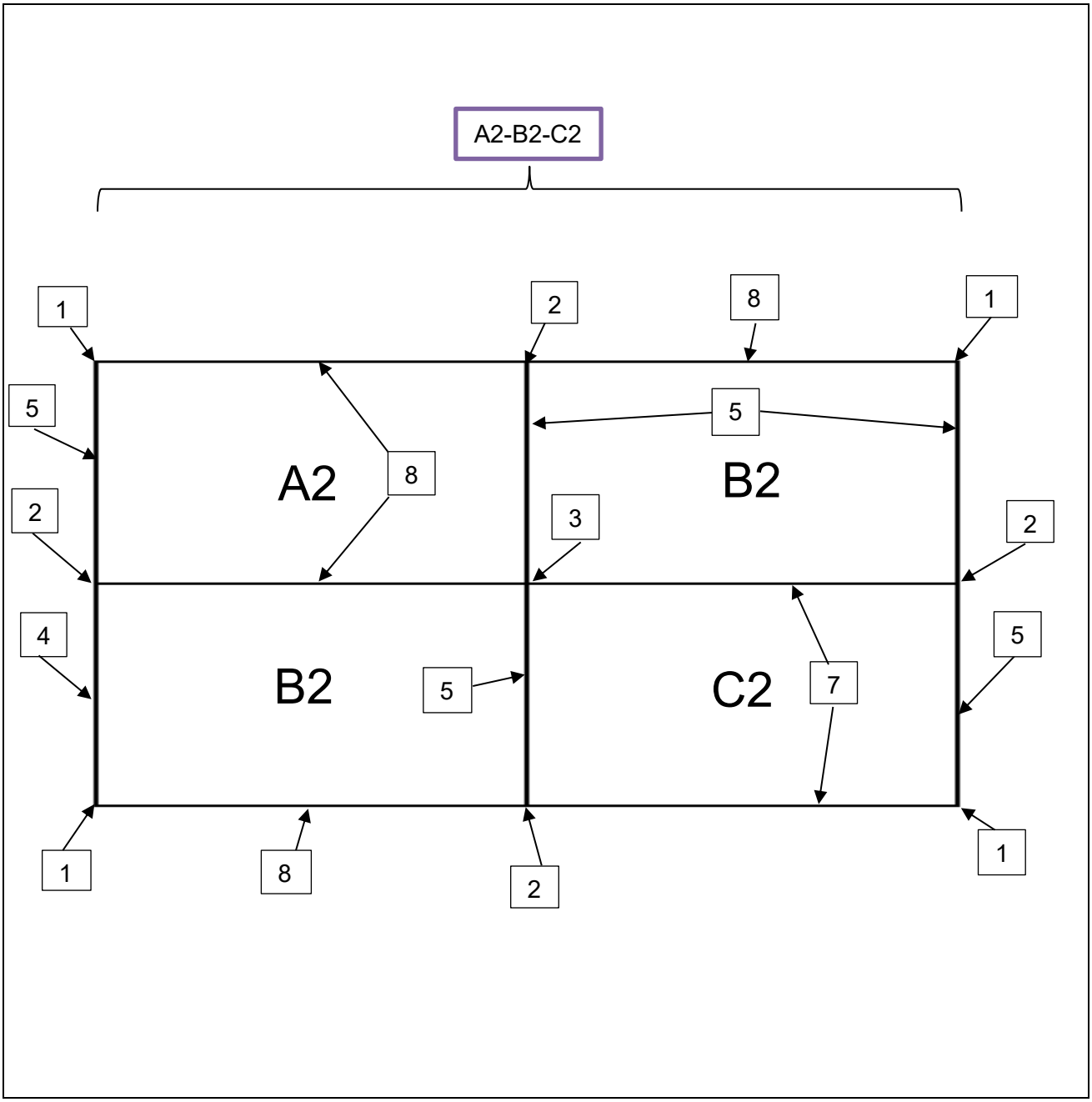
#34 Reinforcement of metal sheet for 2x3m 40° Funnel Art.No.: 4009092015851 		



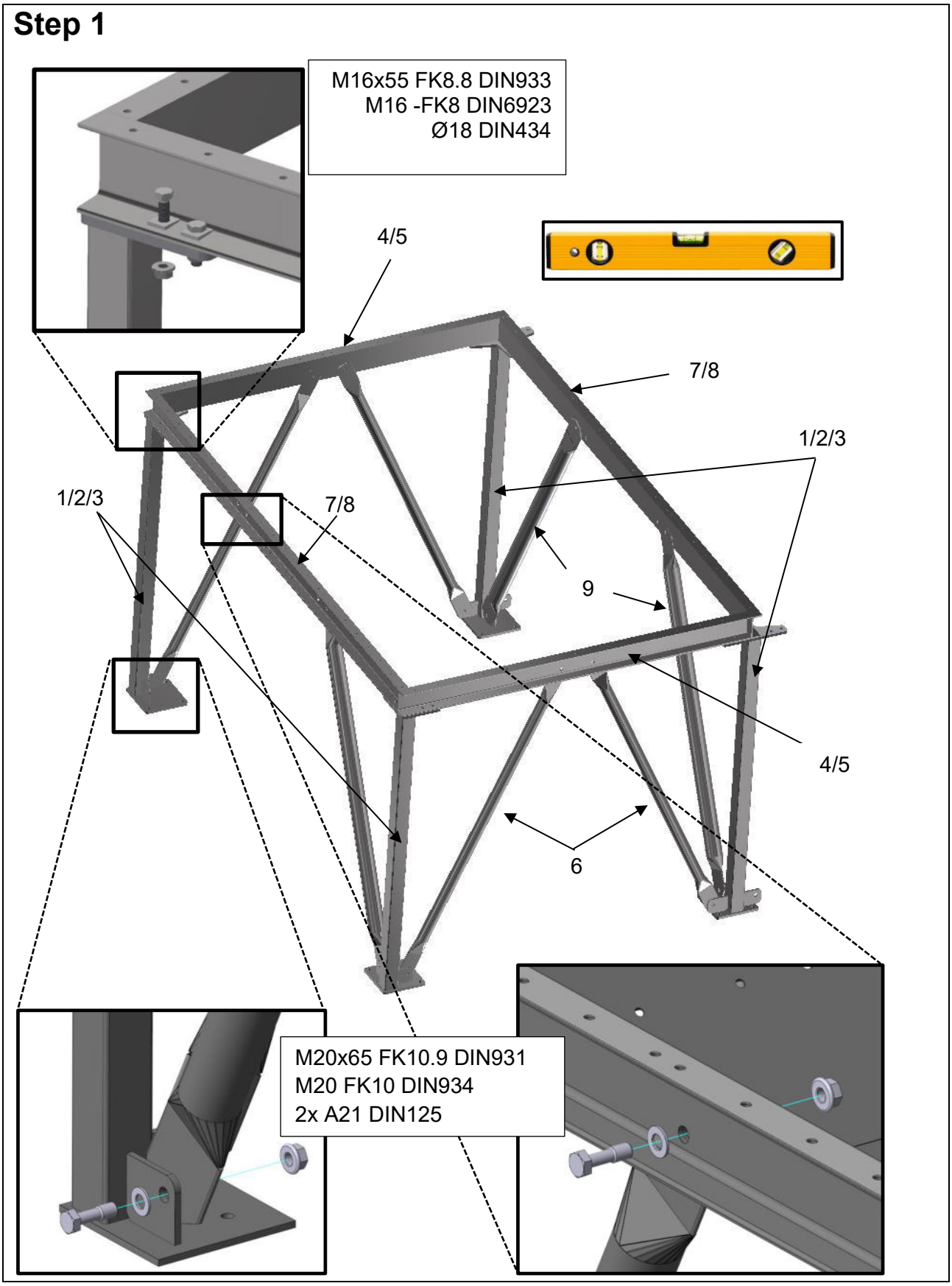

A1-B1-C1
5
1
2
1
8
8
A1
B1
2
5
3
4
2
8
B1
C1
7
1
5
2
4
1

Installation options A, A-B, A-B-C (Horizontal)



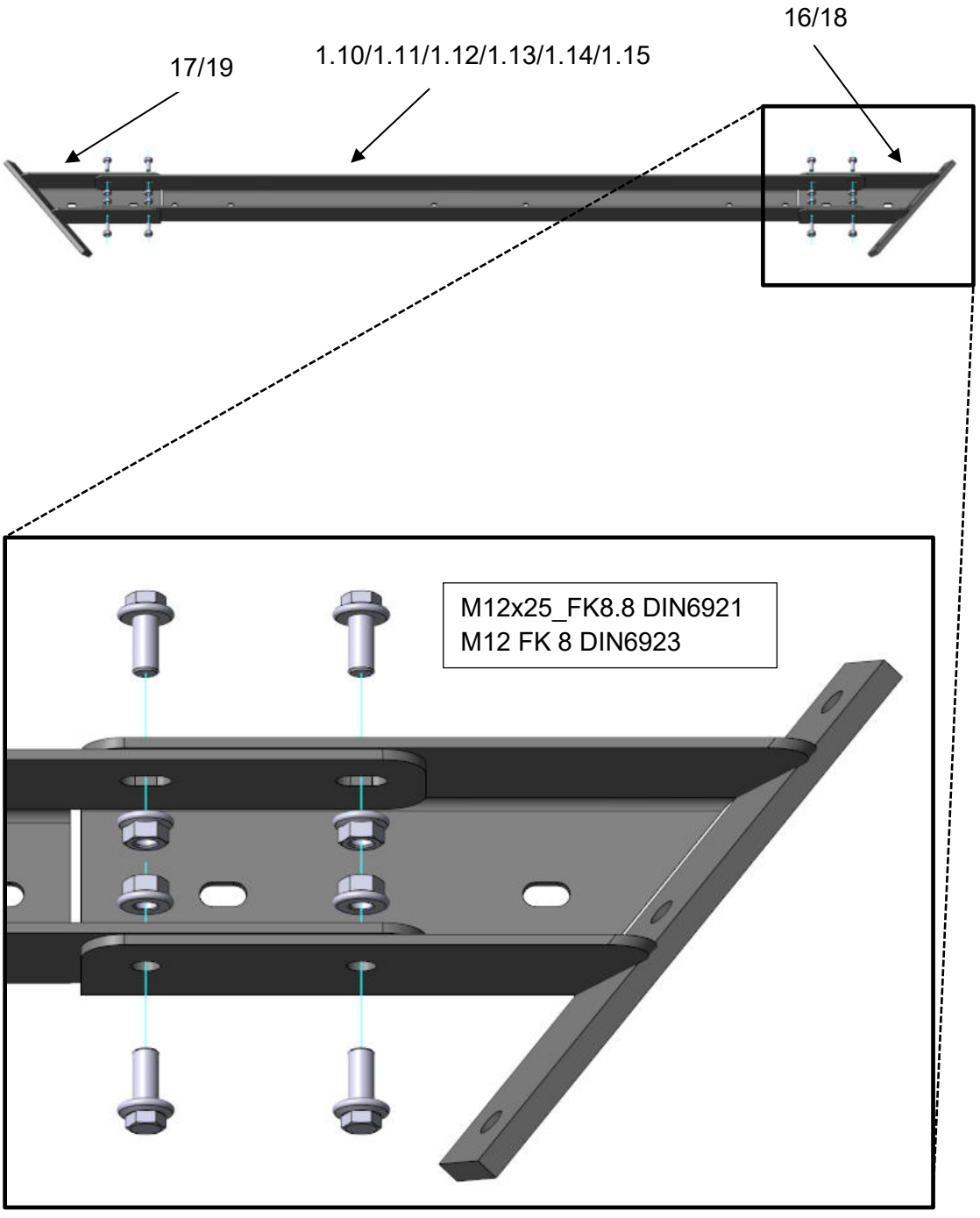

A2-B2-C2
1
2
8
1
5
5
A2
8
B2
2
3
2
4
B2
5
C2
7
5
1
8
2
1

5.3.2 Assembly funnel 3x2

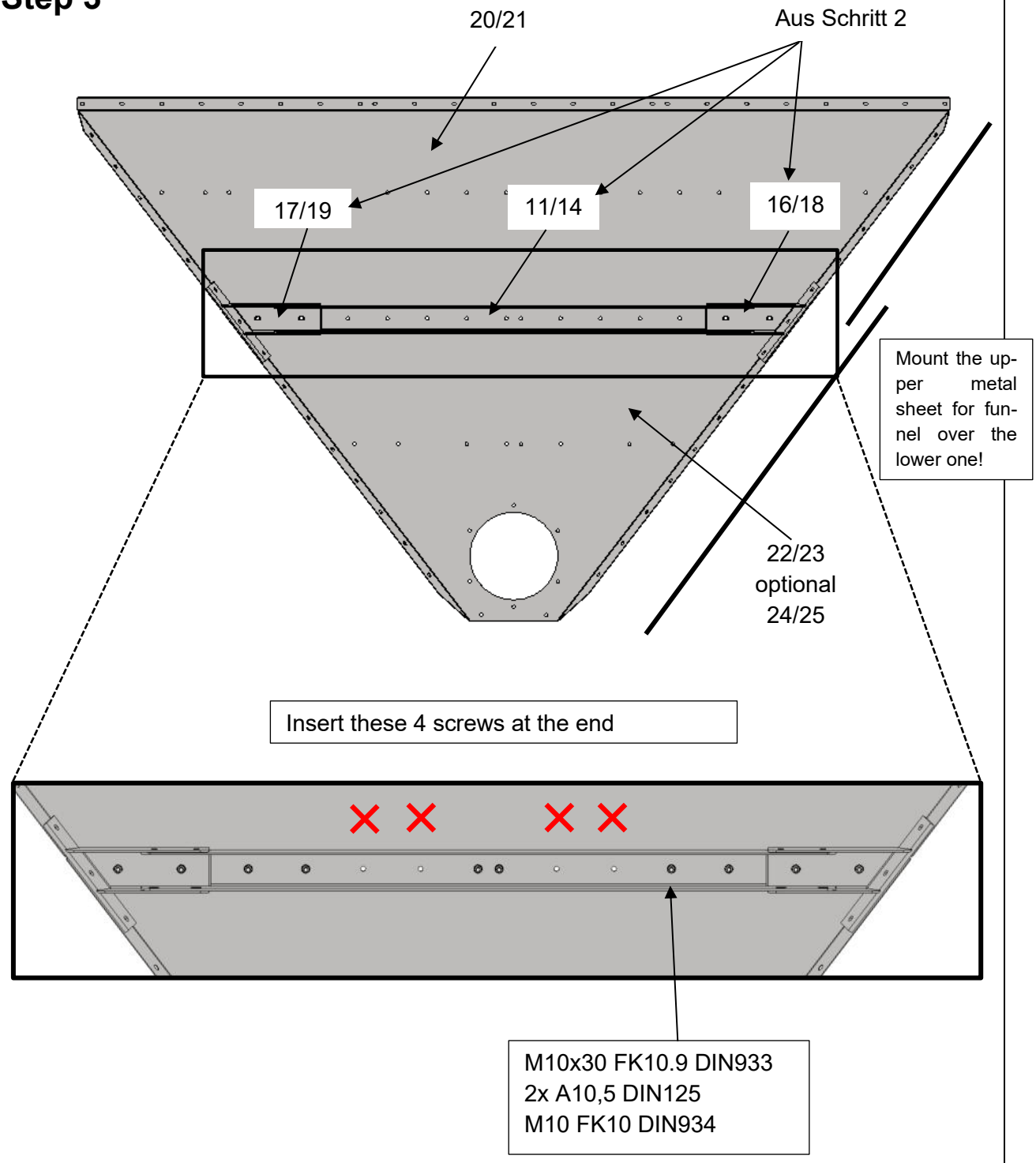


Step 2

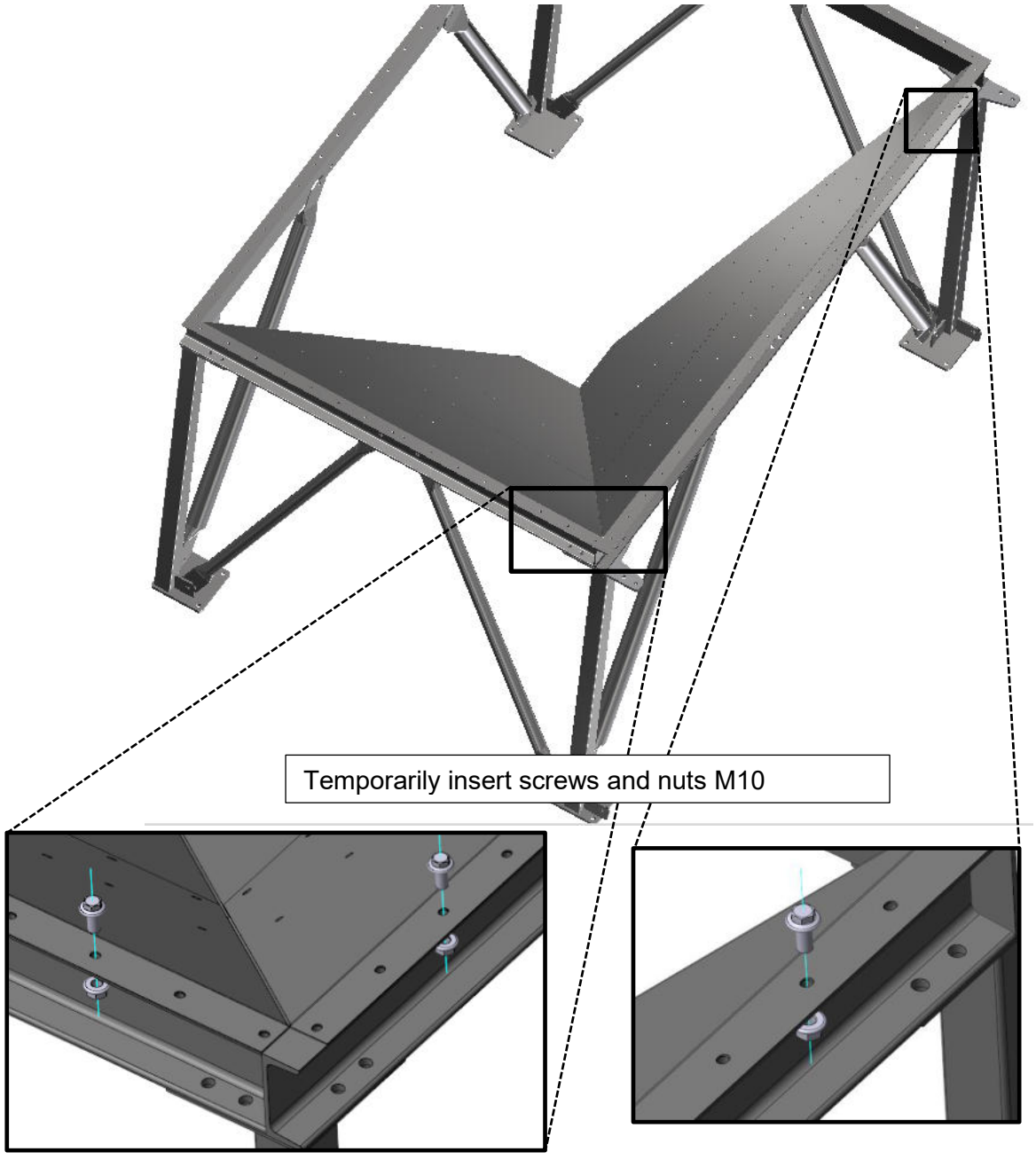
Only join 2m parts with 2m parts and only join 3m parts with 3m parts



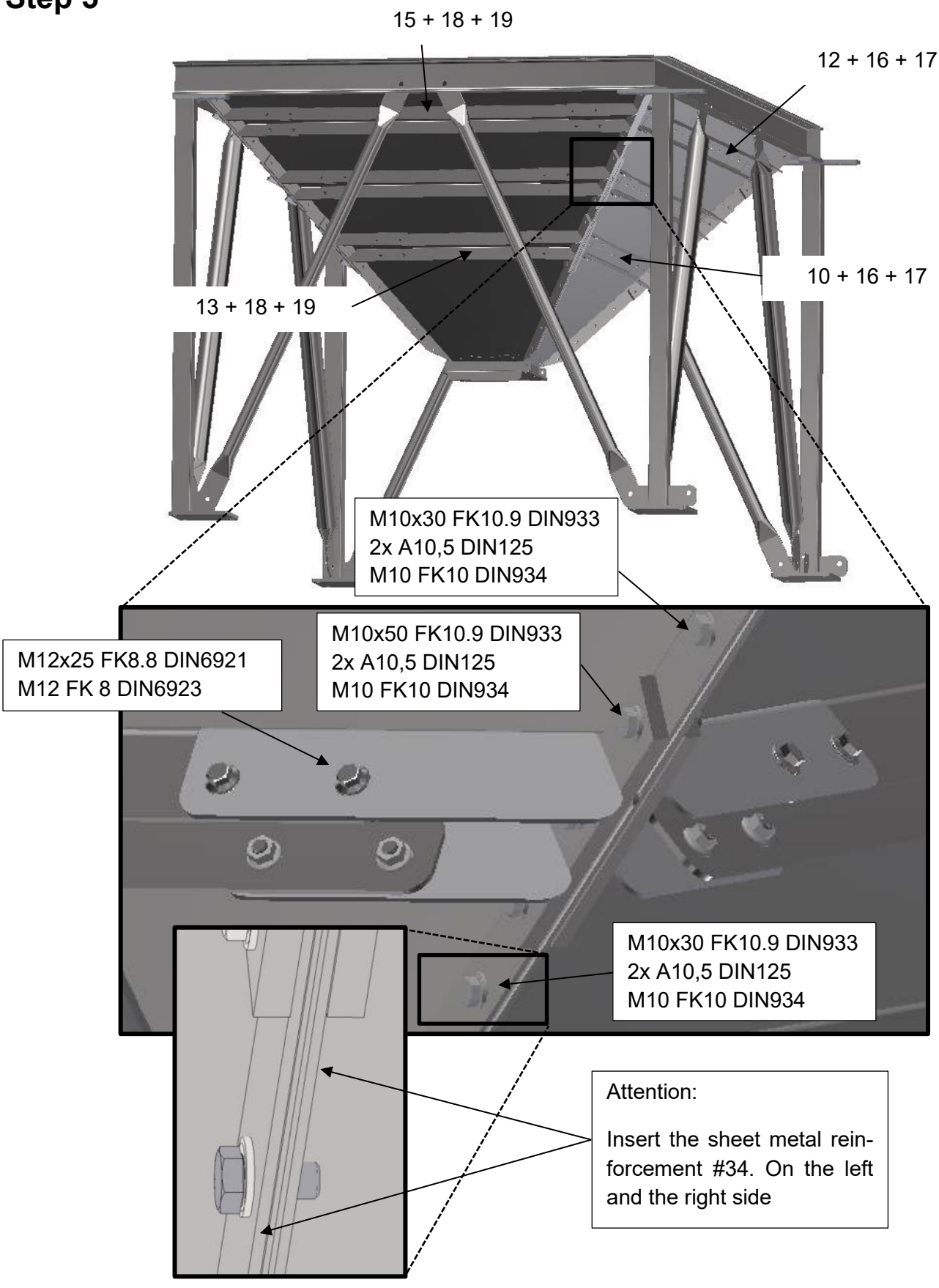
Step 3

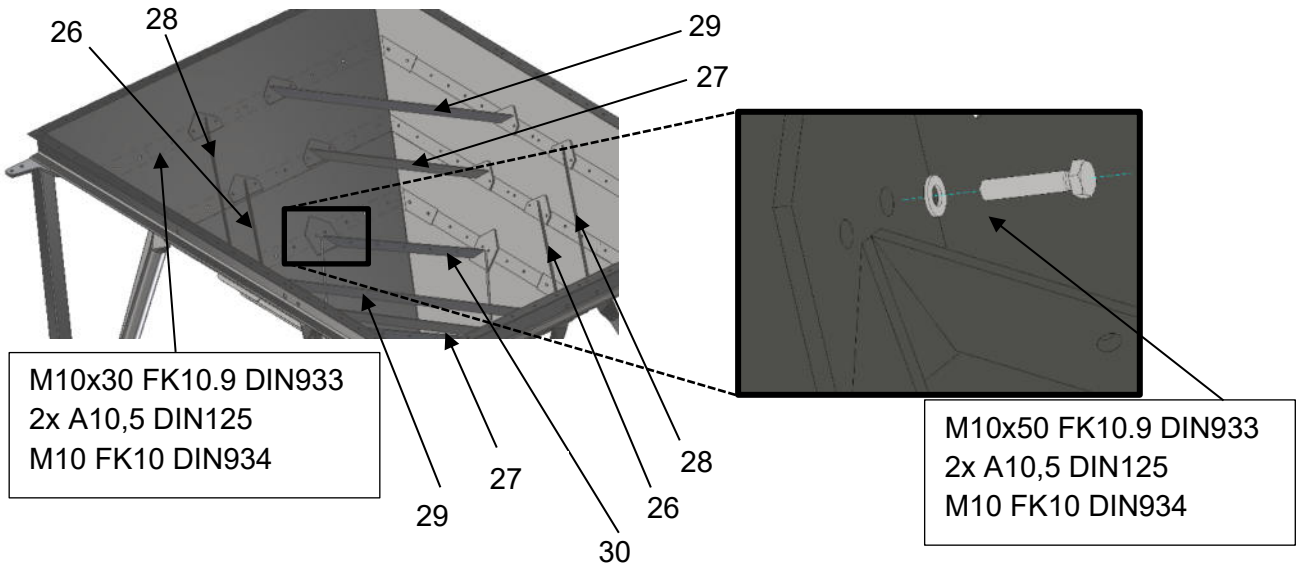

20/21
Aus Schritt 2
17/19
11/14
16/18
Mount the upper metal sheet for funnel over the lower one!
22/23
optional
24/25
Insert these 4 screws at the end
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

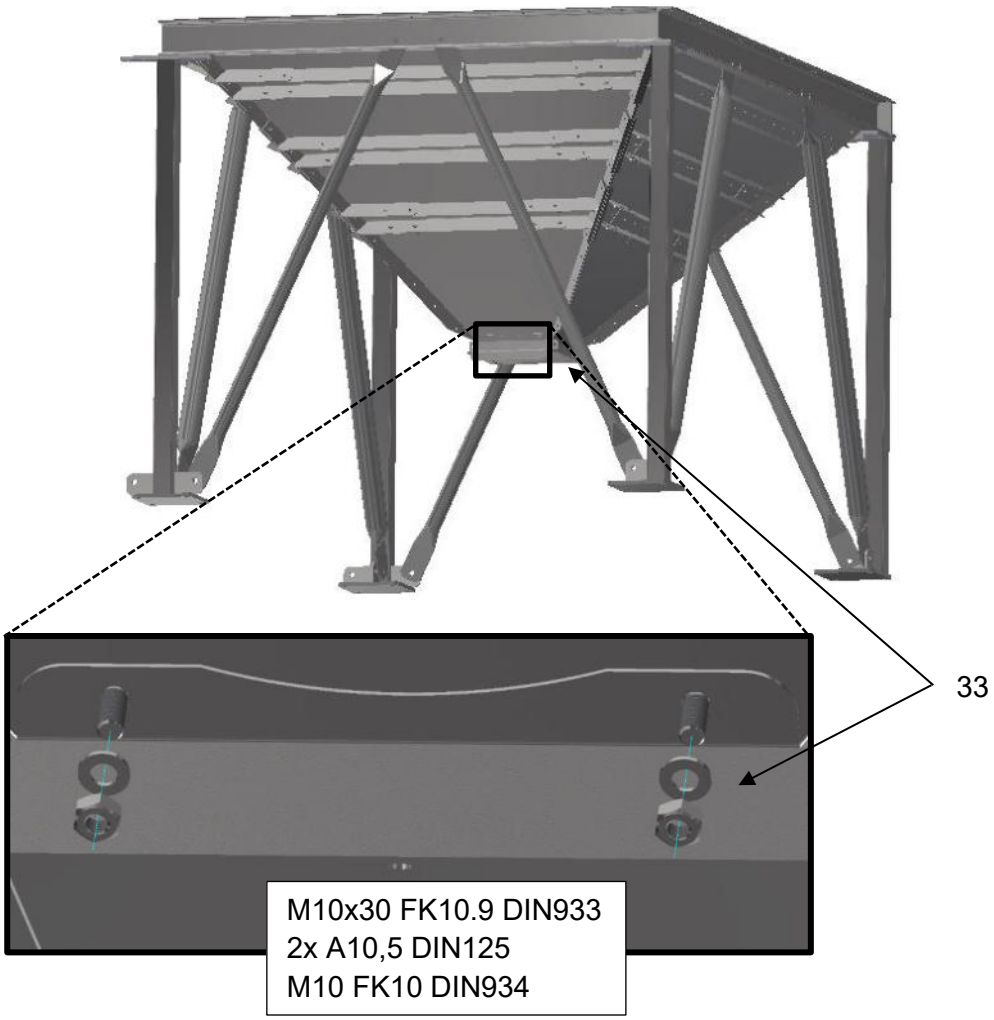
Step 4



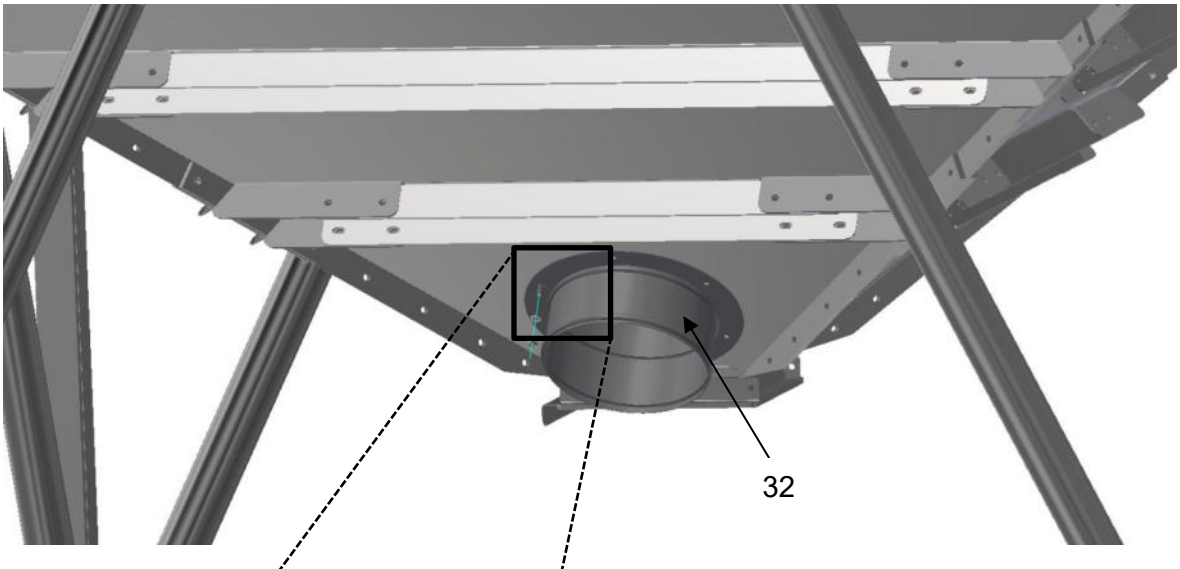
Step 5


15 + 18 + 19
12 + 16 + 17
10 + 16 + 17
13 + 18 + 19
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
Attention:
Insert the sheet metal reinforcement #34. On the left and the right side

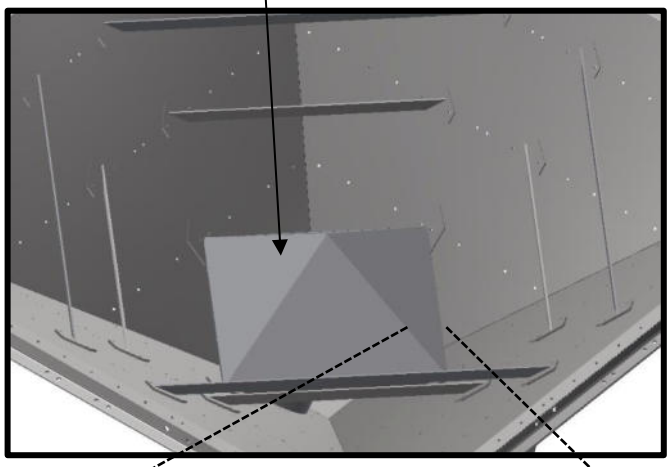

26
28
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
30
26
28
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934


33
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

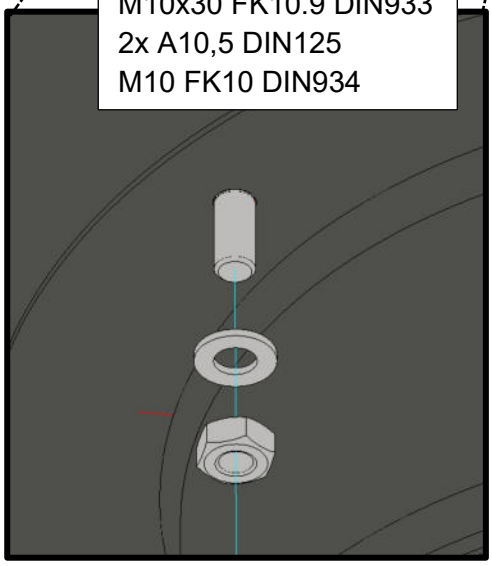
Step 7 Optional

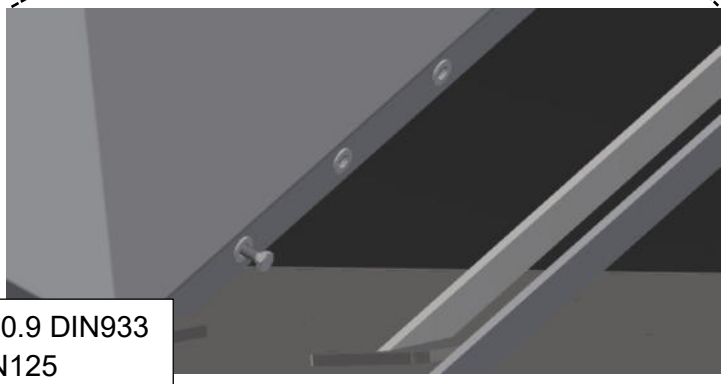


31



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

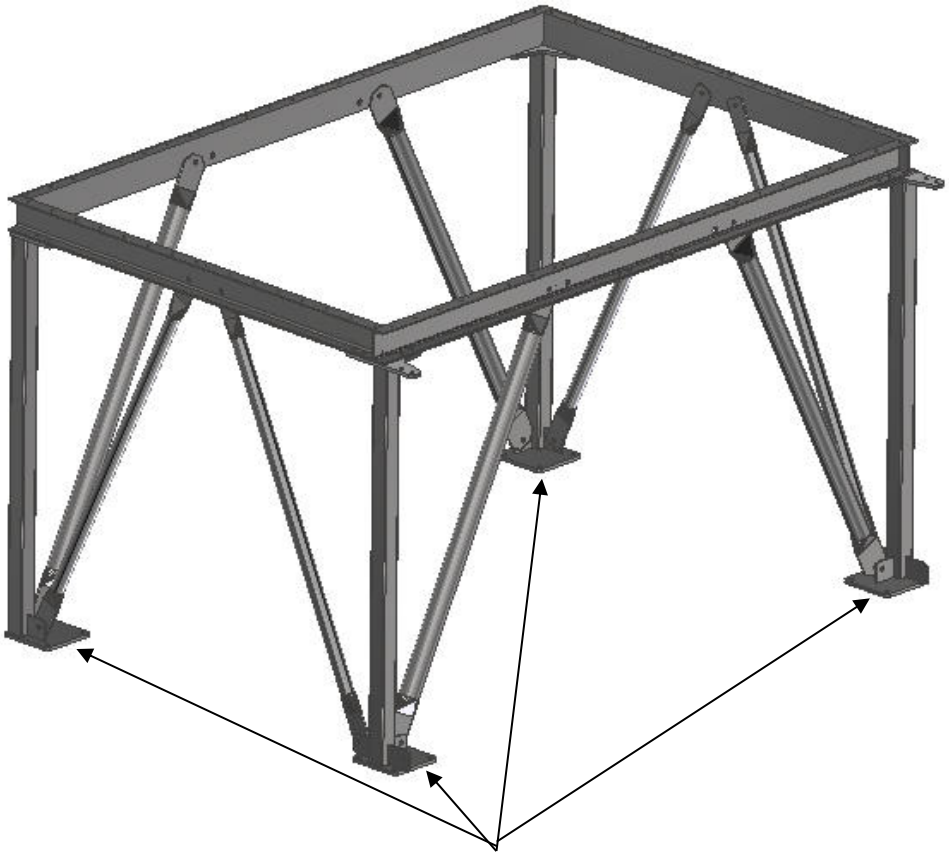




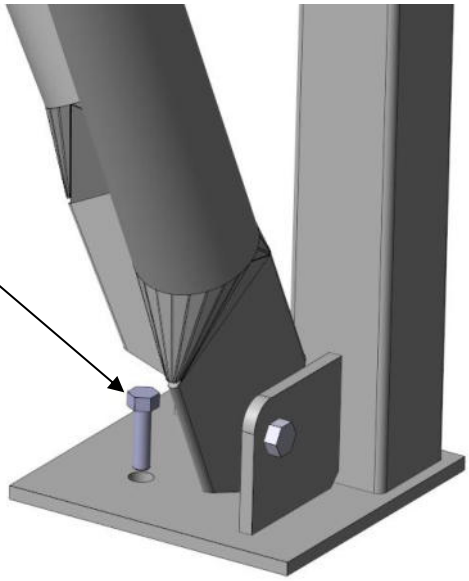
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 8

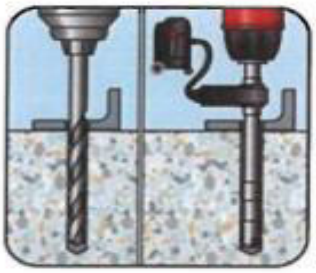
Pay attention to a vertical alignment and right-angle mounting



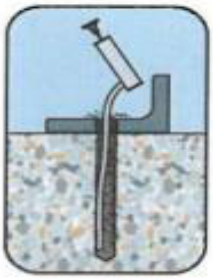
2x Screw for concrete each support



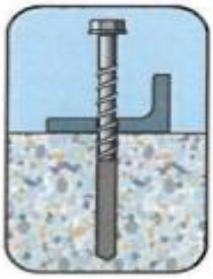
.Installations Instructions



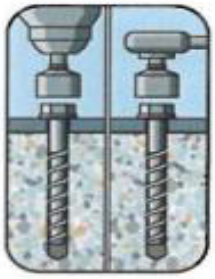
Create hammer drilled or hollow drilled borehole.



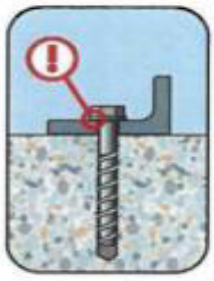
Clean the borehole. If using a hollow drill an additional cleaning of the borehole is not necessary.



Set the screw



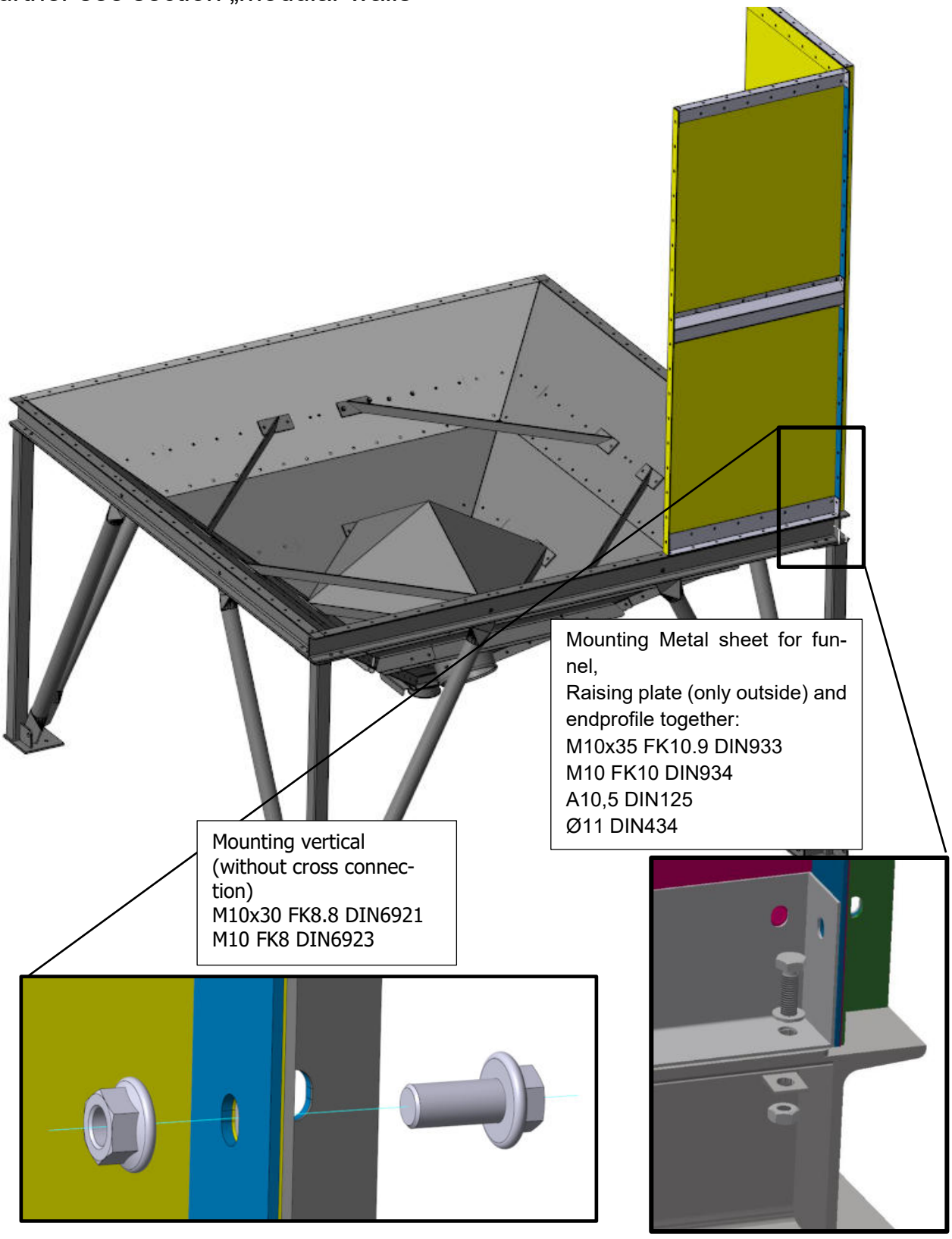
Install the screw by hand or using a impact screw driver. Consider $T_{imp,max}$ und T_{inst}



Installation was successful when the head of the anchor is fully supported and in contact to the fixture without damaging it.

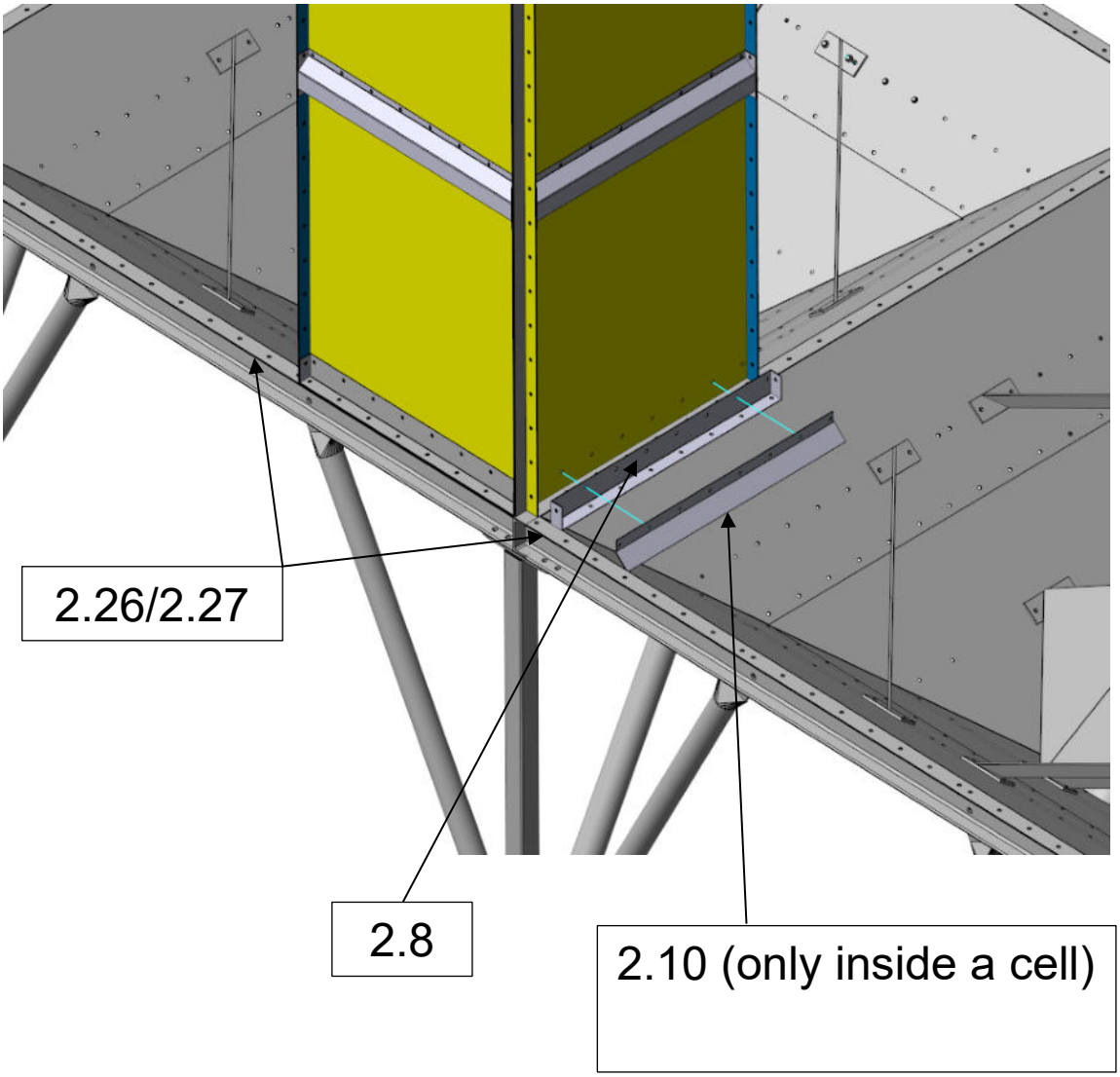
Step 9 (Optional, for the construction of a square cell)

Further see section „modular walls“



there are several funnel substructures

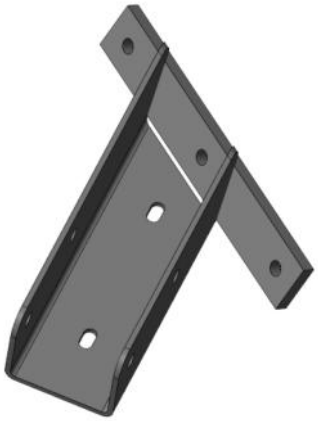
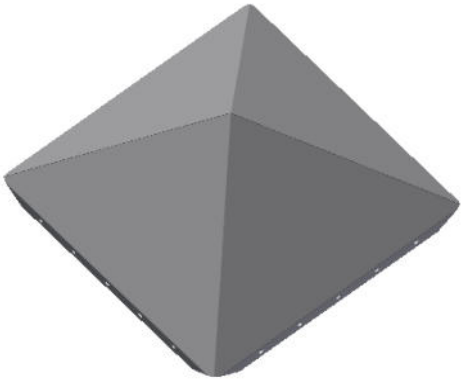
- If the grain is to be stored next to each other, additional bevelling plates must be used on the lower end profile of the partition walls so that the grain can run off cleanly.
- - At points where two funnel plates are on top of each other, the superstructure height is slightly increased -> to compensate for this, additional raising plates (2.26) must be fitted at the other points.

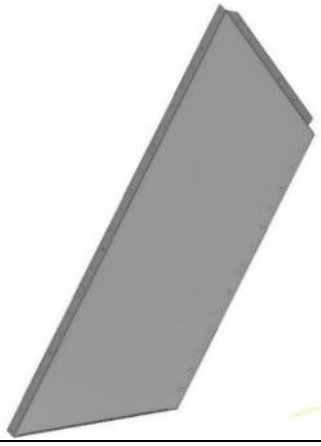
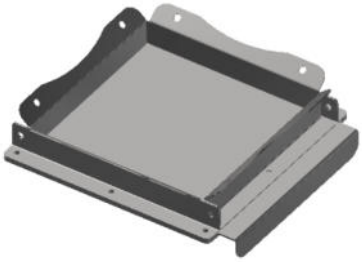


5.4 Optional funnel 3x3

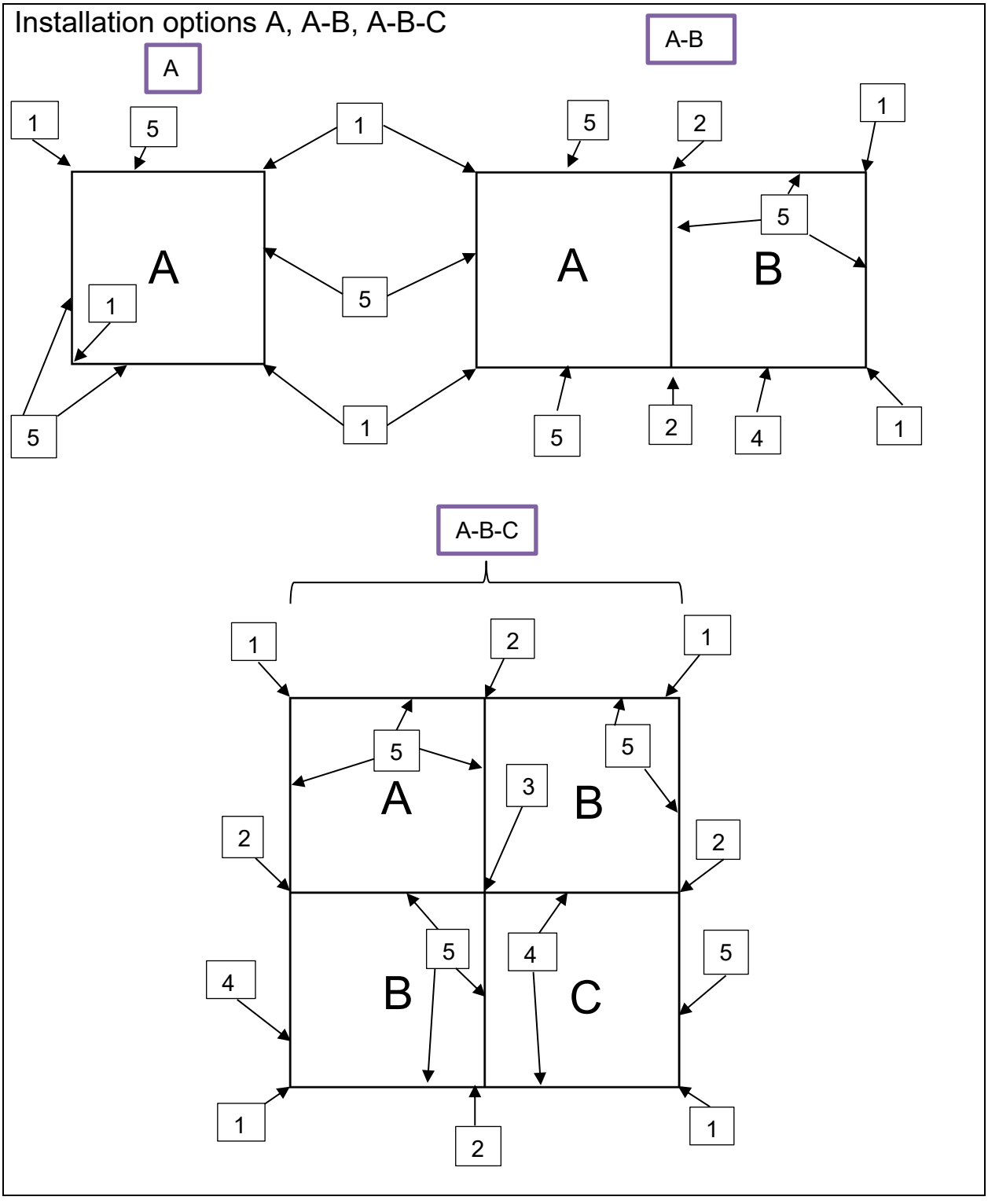
5.4.1 Scope of delivery

#1 Support L for 2x2 & 2x3 & 3x3 Art.No.:4009092015812 	#2 Support T for 2x2 & 2x3 & 3x3 Art.No.:4009092015813 	#3 Support X for 2x2 & 2x3 & 3x3 Art.No.: 4009092015814
#4 U140 - l=2995 Art.No.: 4009092015806 L=2995 mm 	#5 U140 - l=3055 Art.No.: 4009092015807 L=3055 mm 	#6 Strebe 88,9x4 for frame 3x3+2x3 Art.No.:4009092015738

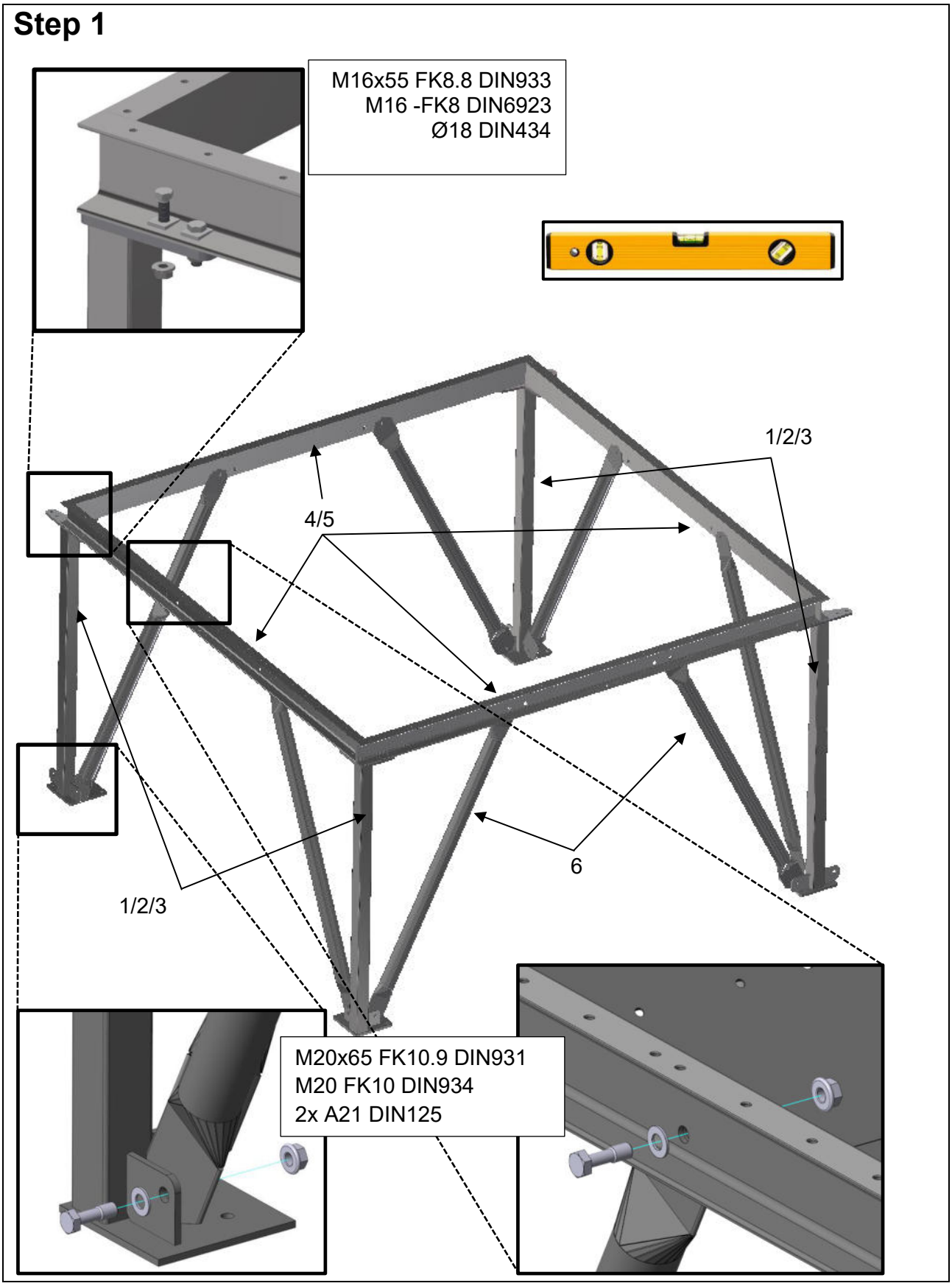
#7 External reinforcement 3x3m & 4x4m below Art.No.: 4009092015840 	#8 External reinforcement 3x3m & 4x4m middle Art.No.: 4009092015841 	#9 External reinforcement 3x3m & 4x4m top Art.No.: 4009092015842
#10 External reinforcement console left 40° Art.No.: 4009092015823 	#11 External reinforcement console right 40° Art.No.: 4009092015824 	#12 Inner corner reinforcement top for funnel 3mx3m Art.No.: 4009092015886
#13 Inner corner reinforcement middle 3x3m & 4x4m 40° Art.No.: 4009092015885 	#14 Innenverstrebung below 3x3m & 4x4m 40° Art.No.:4009092015879 	#15 (Optional) Ventilation cover 3x3 & 4x4m 40° Funnel Art.No.: 4009092015914 

#16 (Optional) Ventilation pipe NW300 f. ventilation device Art.No.: 4009003016990 	#17 Metal sheet for funnel 3x3m 40° top Art.No.: 4009092015865 	#18 Metal sheet for funnel 3x3xm & 4x4m 40° below Art.No.: 4009092015863
#19 (optional, only if #16 is installed) Metal sheet for funnel 3x3m & 4x4m 40° Belüftung Art.No.: 4009092015864 	#20 Reinforcement of metal sheet for 3x3m 40° funnel Art.No.: 4009092015852 	#21 Outlet with slide valve 300x300 Art.No.: 4009092015820 Transition to 150,200,250 4009023015782, 783, 784 

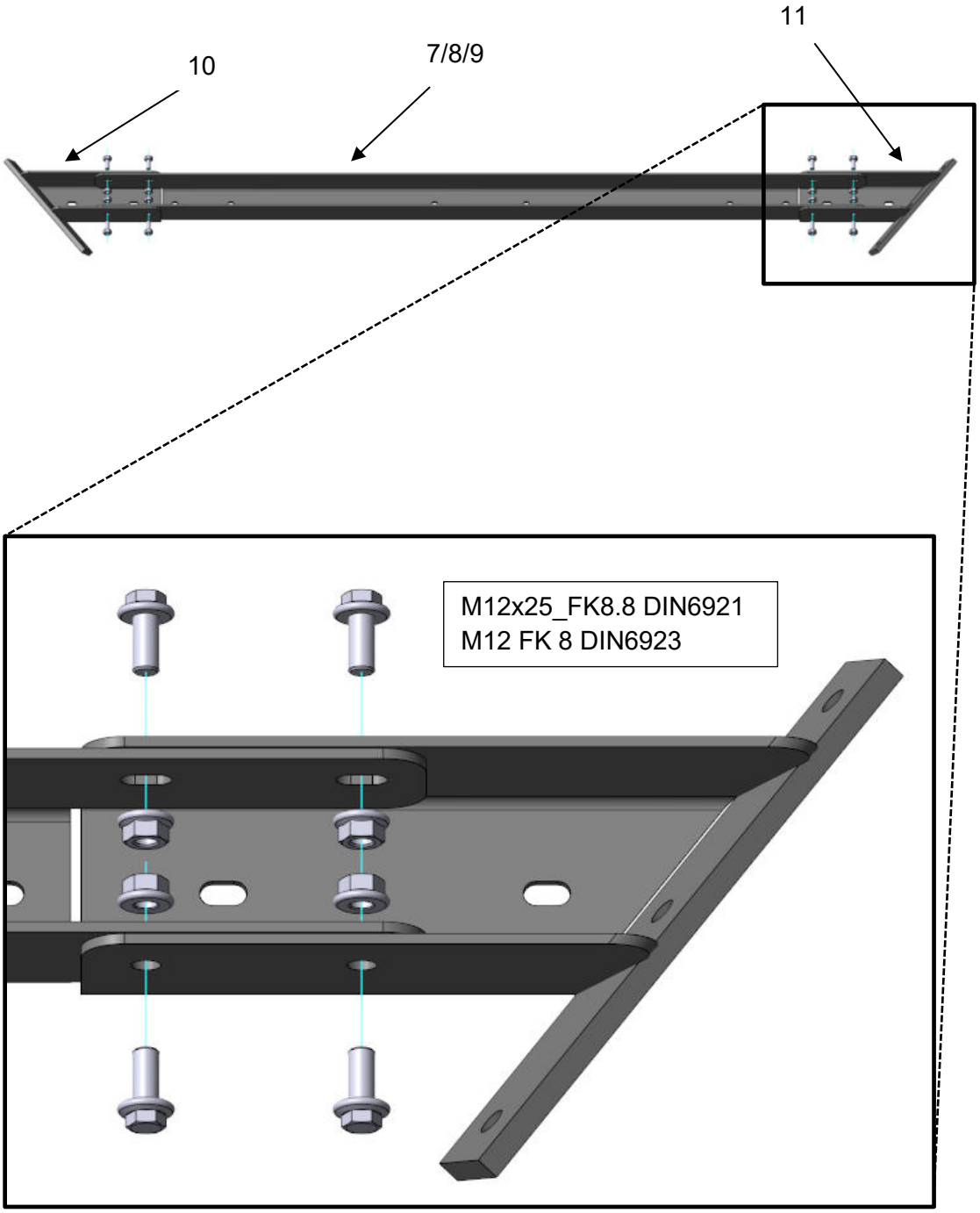
Installation options A, A-B, A-B-C



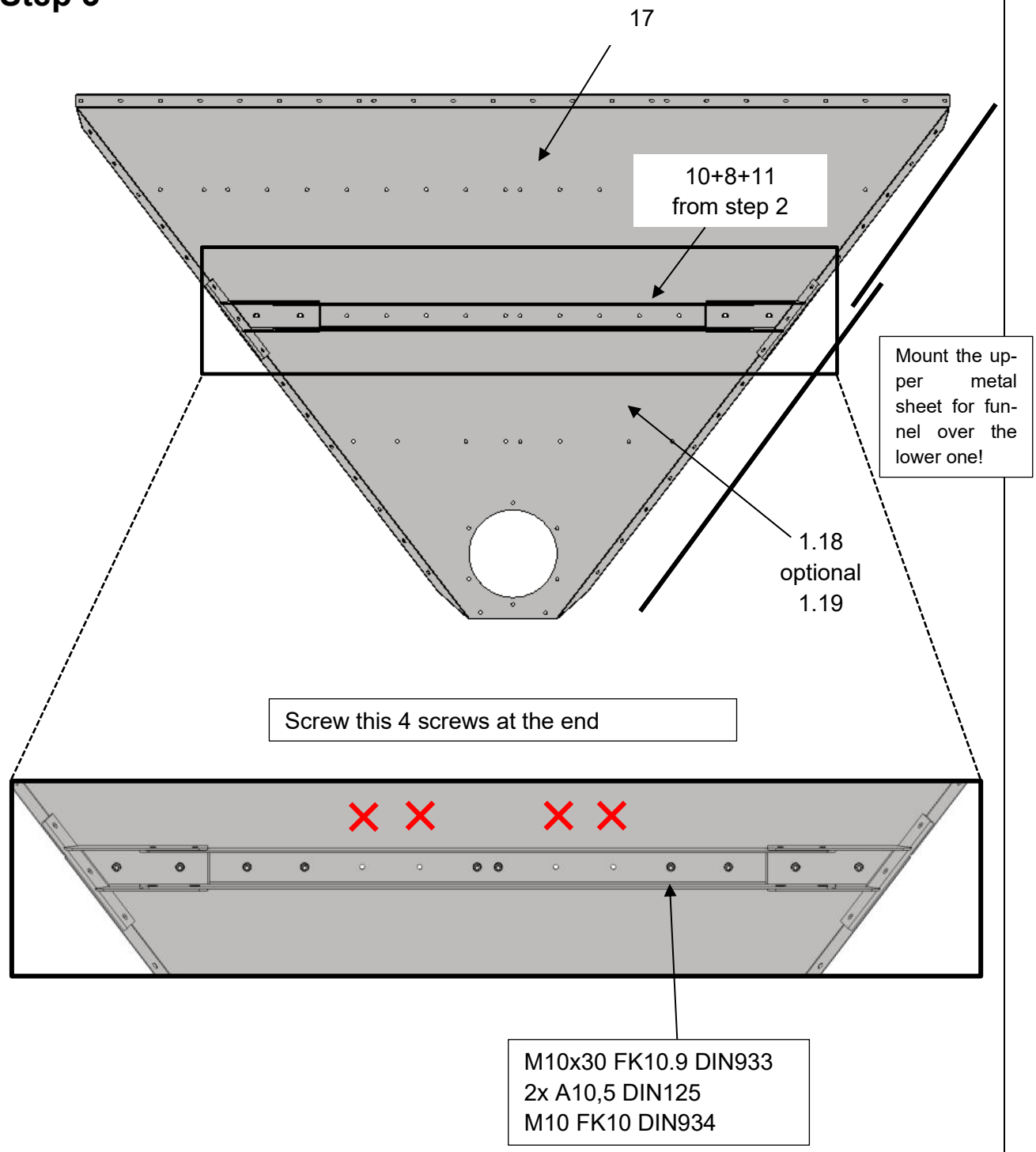
5.4.2 Assembly funnel 3x3



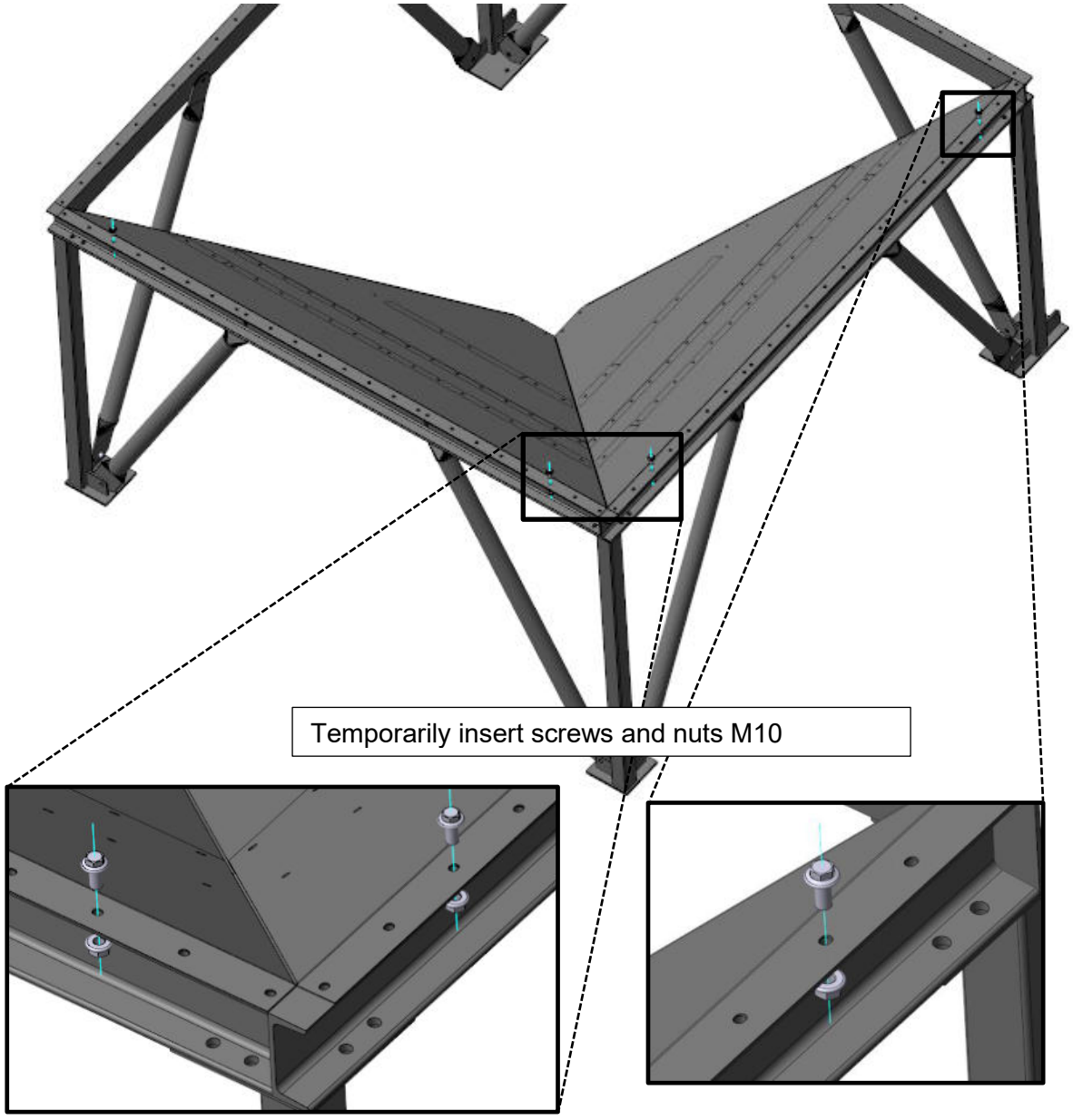
Step 2



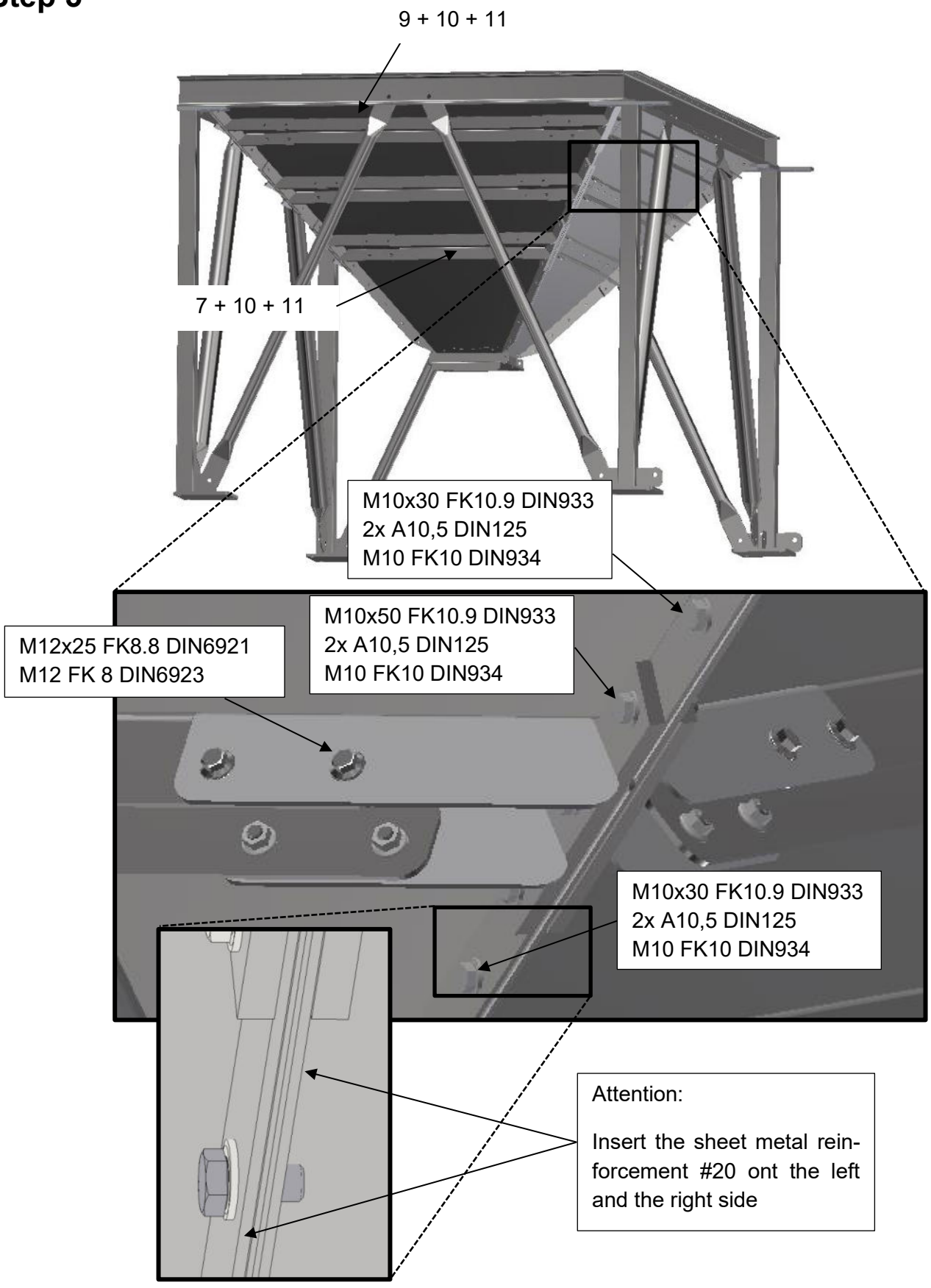
Step 3

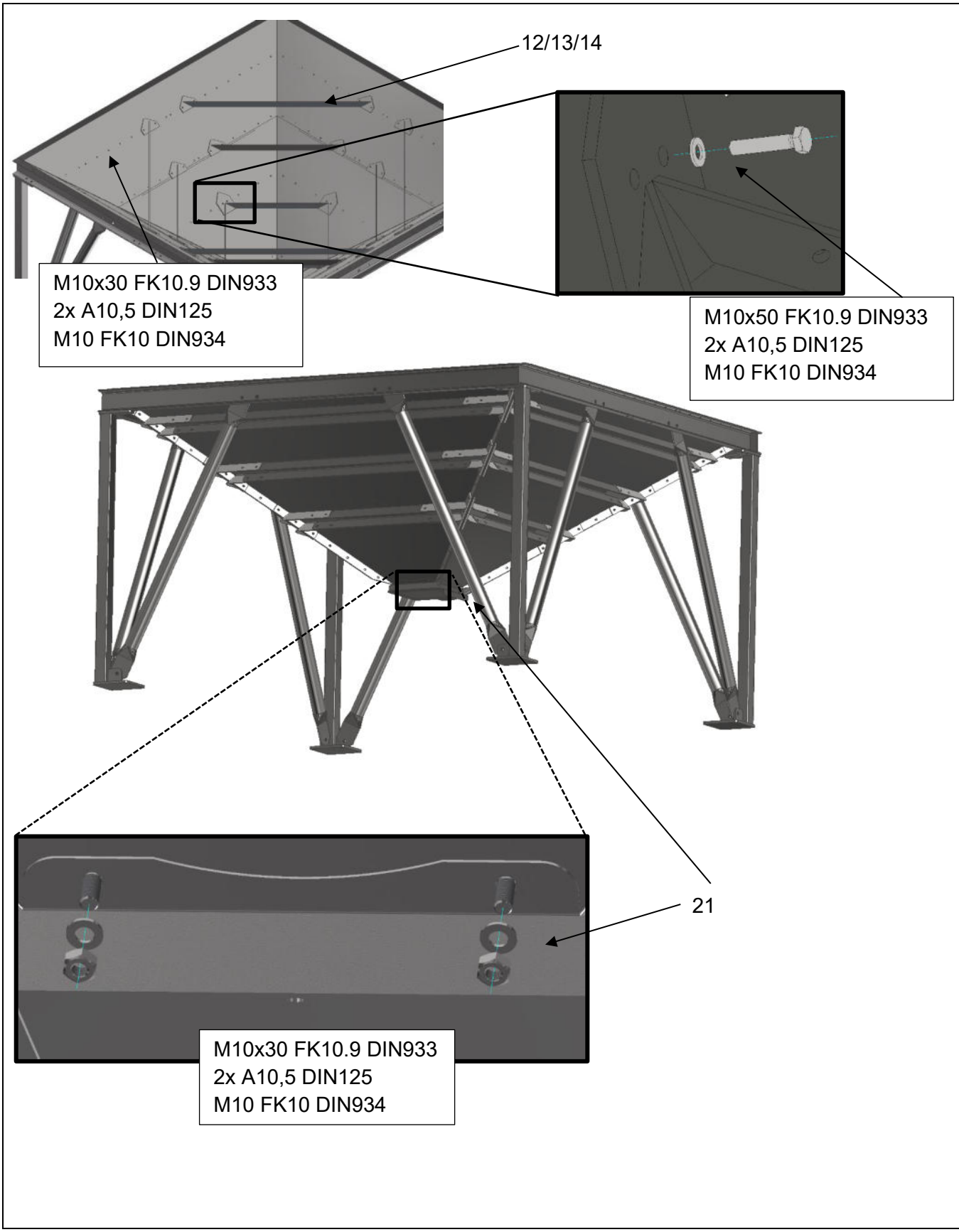

17
10+8+11
from step 2
Mount the upper metal sheet for funnel over the lower one!
1.18
optional
1.19
Screw this 4 screws at the end
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 4

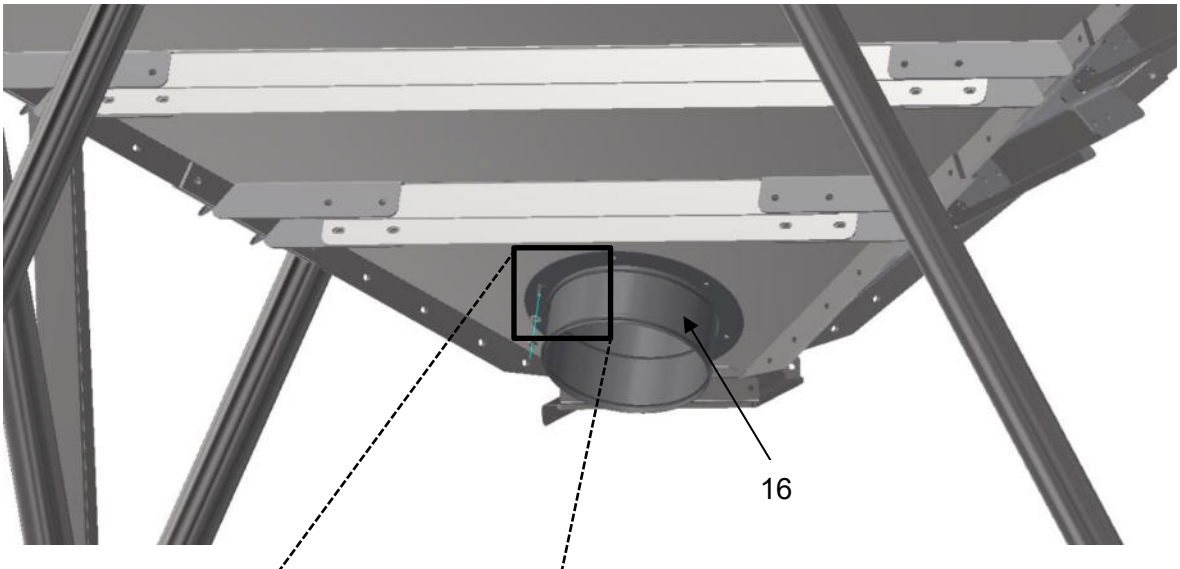


Step 5

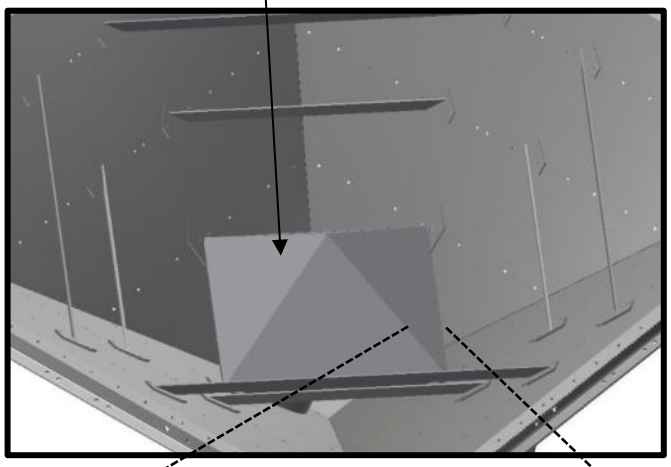

9 + 10 + 11
7 + 10 + 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
Attention:
Insert the sheet metal reinforcement #20 ont the left and the right side


12/13/14
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
21
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

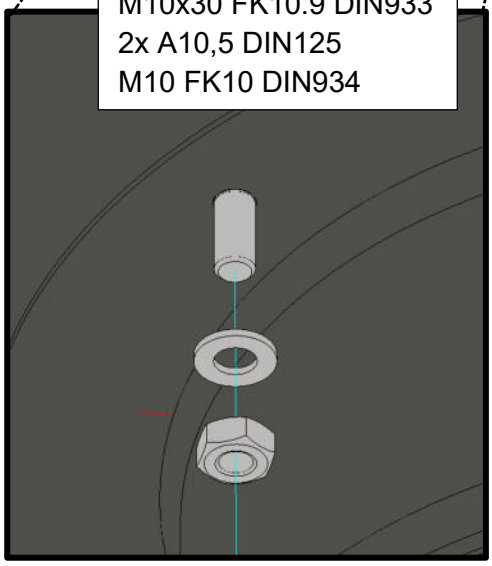
Step 7 Optional

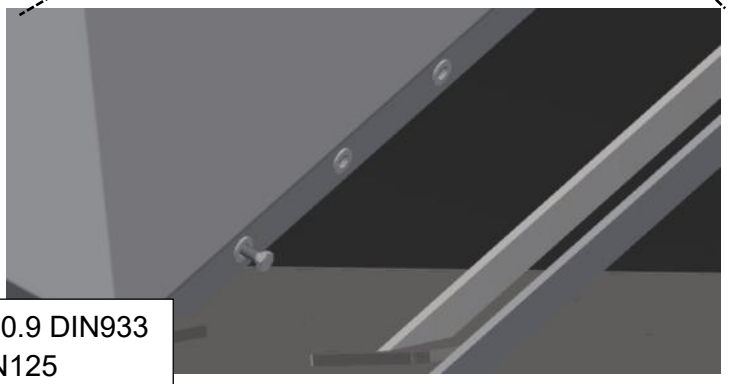


15



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

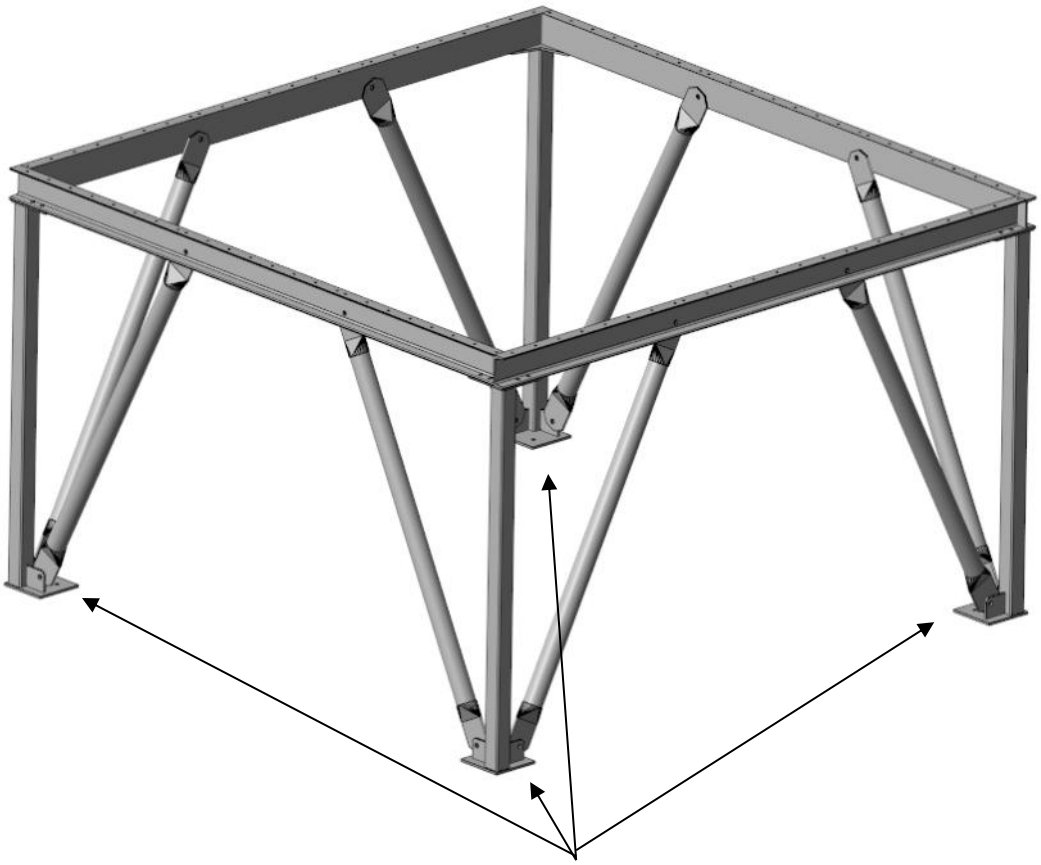




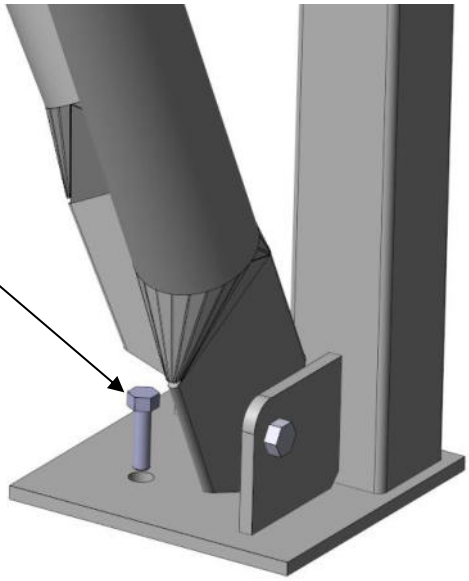
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 8

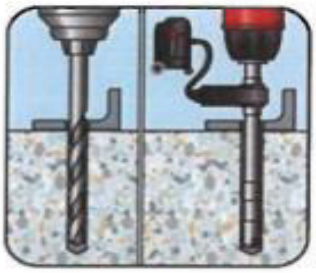
Pay attention to a vertival alignment and a right-angled mounting



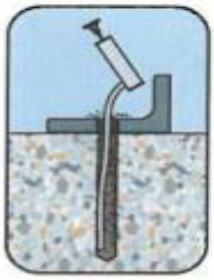
2x Screw for concrete each support



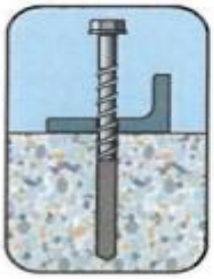
.Installations Instructions



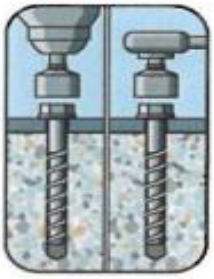
Create hammer drilled or hollow drilled borehole.



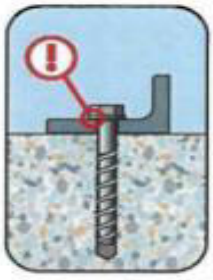
Clean the borehole. If using a hollow drill an additional cleaning of the borehole is not necessary.



Set the screw



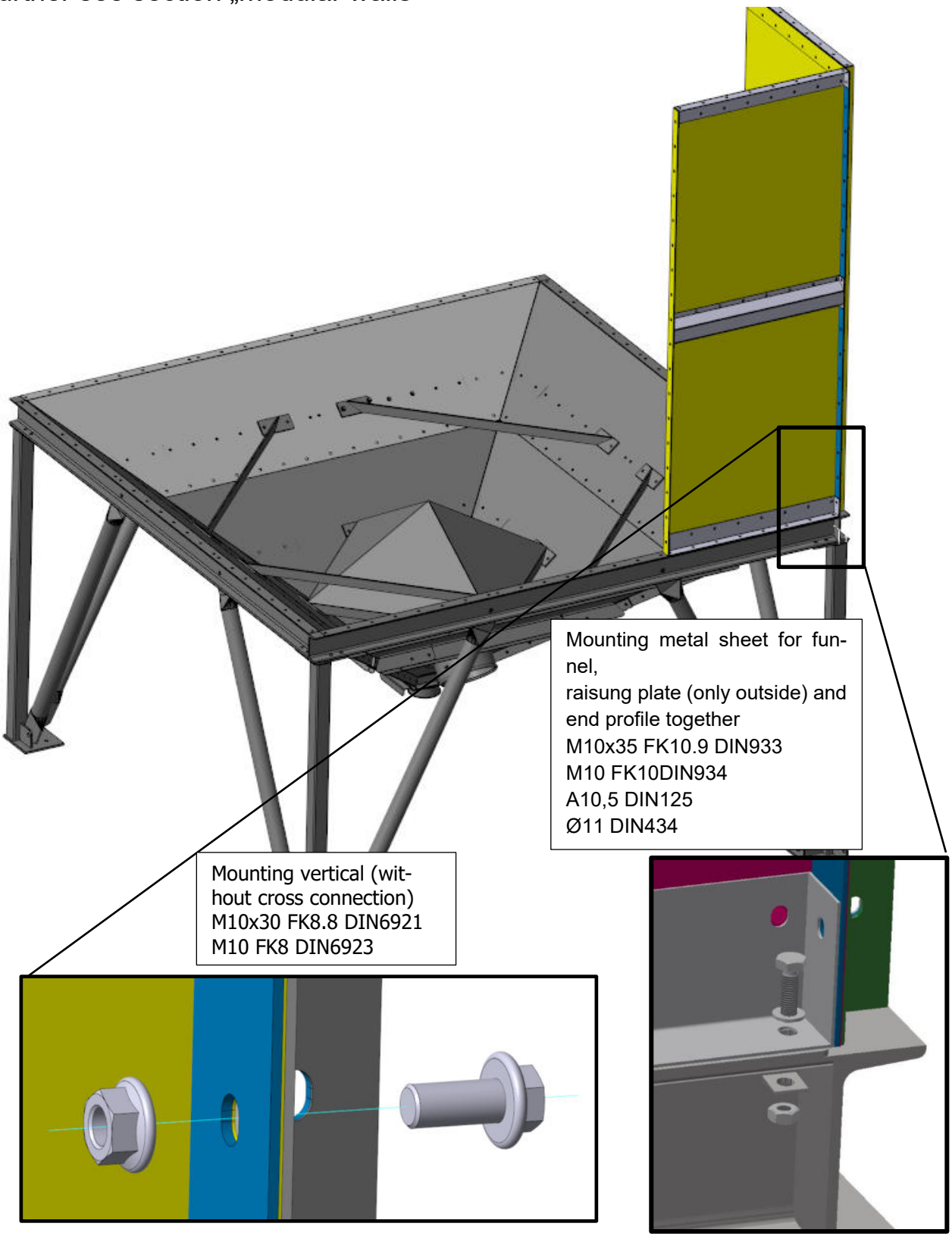
Install the screw by hand or using a impact screw driver. Consider $T_{imp,max}$ und T_{inst}



Installation was successful when the head of the anchor is fully supported and in contact to the fixture without damaging it.

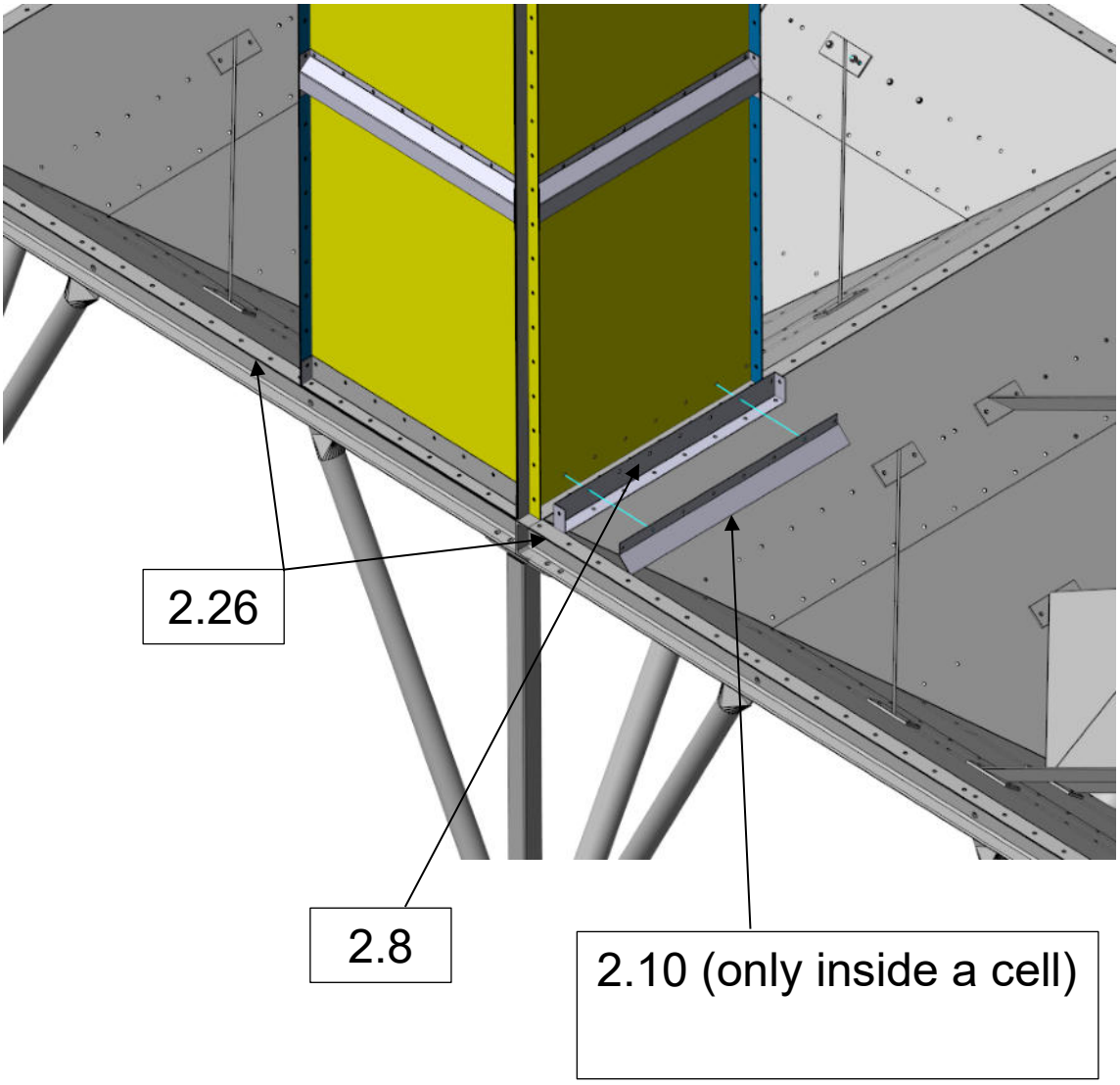
Step 9 (Optional, for the construction of a square cell)

Further see section „modular walls“



If there are several funnel substructures

- If the grain is to be stored next to each other, additional bevelling plates must be used on the lower end profile of the partition walls so that the grain can run off cleanly.
- - At points where two funnel plates are on top of each other, the superstructure height is slightly increased -> to compensate for this, additional raising plates (2.26) must be fitted at the other points.



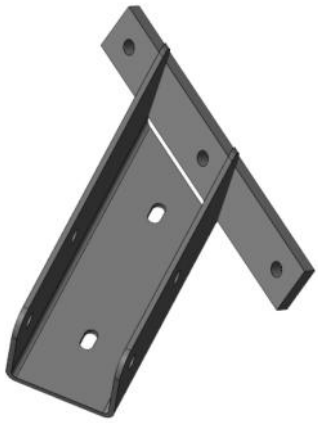
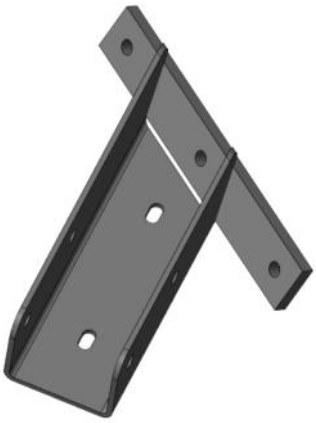
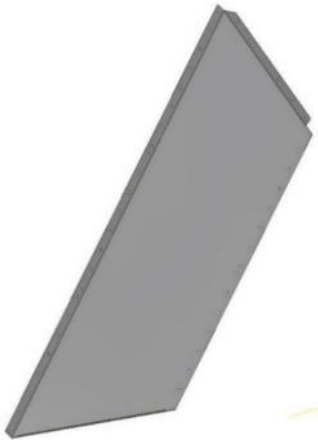
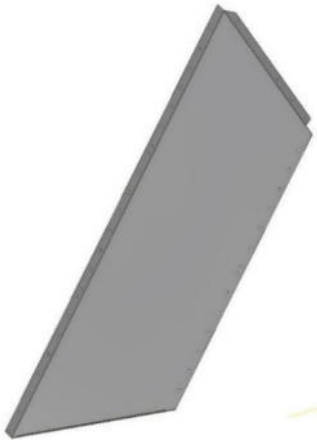
5.5 Optional funnel 4x3

5.5.1 Scope of delivery

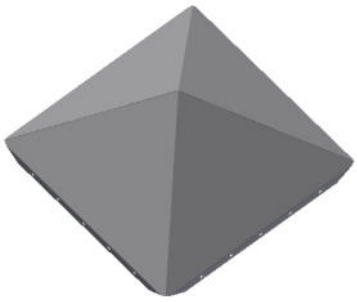
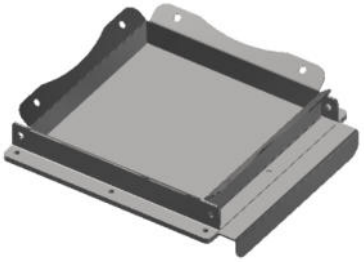
#1 Support L for 4x4 & 4x3 Art.No.:4009092015817 	#2 Support T for 4x4 & 4x3 Art.No.:4009092015818 	#3 Support X for 4x4 & 4x3 Art.No.: 4009092015819
#4 Support I outside for 4x4 & 4x3 Art.No.: 4009092015815 	#5 Support I inside for 4x4 & 4x3 Art.No.: 4009092015816 	#6 U140 - l=2995 Art.No.: 4009092015806 L=2995 mm

#7 U140 - l=3055 Art.No.: 4009092015807 L=3055 mm 	#8 U140 - l=3997,5 Art.No.: 4009092015808 L=3997,5 mm 	#9 U140 - l=4057,5 Art.No.: 4009092015809 L=4057,5mm
#10 Strut 88,9x4 for frame 4x4+4x3 Art.No.:4009092015811 		

#11 External reinforcement 3x4m – 4m below Art.No.: 4009092015846 	#12 External reinforcement 3x4m – 4m middle Art.No.: 4009092015845 	#13 External reinforcement 3x4m – 4m top Art.No.: 4009092015844
#14 External reinforcement 3x4m – 3m below Art.No.: 4009092015849 	#15 External reinforcement 3x4m – 3m middle Art.No.: 4009092015848 	#16 External reinforcement 3x4m – 3m top Art.No.: 4009092015847

#17 External reinforcement console right 40° 3x4m - 4m Art.No.: 4009092015830 	#18 External reinforcement console left 40° 3x4m – 4m Art.No.: 4009092015829 	#19 External reinforcement console right 40° 3x4m – 3m Art.No.: 4009092015832 
#20 External reinforcement console left 40° 3x4m – 3m Art.No.: 4009092015831 	#21 Metal sheet for funnel 3x4m 40° - 3m top Art.No.: 4009092015868 	#22 Metal sheet for funnel 3x4m 40° - 4m top Art.No.: 4009092015867 

#23 Metal sheet for funnel 3x4m 40° - 3m below Art.No.: 4009092015870 	#24 Metal sheet for funnel 3x4m 40° - 4m below Art.No.: 4009092015869 	#25 (optional, only #33 is installed) Metal sheet for funnel 3x4m 40° – 3m Aeration Art.No.: 4009092015872
#26 (optional, only #33 is installed) Metal sheet for funnel 3x4m 40° - 4m Aeration Art.No.: 4009092015871 	#27 Inner corner reinforcement middle1 3x4m 40° Art.No.: 4009092015890 	#28 Inner corner reinforcement middle2 3x4m 40° Art.No.: 4009092015891

#29 Inner corner reinforcement top1 3x4m 40° Art.No.: 4009092015888 	#30 Inner corner reinforcement top2 3x4m 40° Art.No.: 4009092015889 	#31 Inner corner reinforcement below 3x4m 40° Art.No.:4009092015880
#32 (Optional) Ventilation cover 3x4m 40° Funnel Art.No.: 4009092015915 	#33 (Optional) Ventilation pipe NW300 f. Ventilation device Art.No.: 4009003016990 	#34 Outlet with slide valve 300x300 3x4m Art.No.: 4009092015822 Transition to 150,200,250 4009023015782, 783, 784 

#35 Reinforcement of metal sheet for 3x4m 40° funnel Art.No.: 4009092015853 		

Options for intermediate supports

At least one additional support foot must be screwed in on each side (Figure 1). For example, if you have a conveyor system that runs centrally under the silos, two support feet can also be screwed in on the 4m side (Figure 2).

Figure1

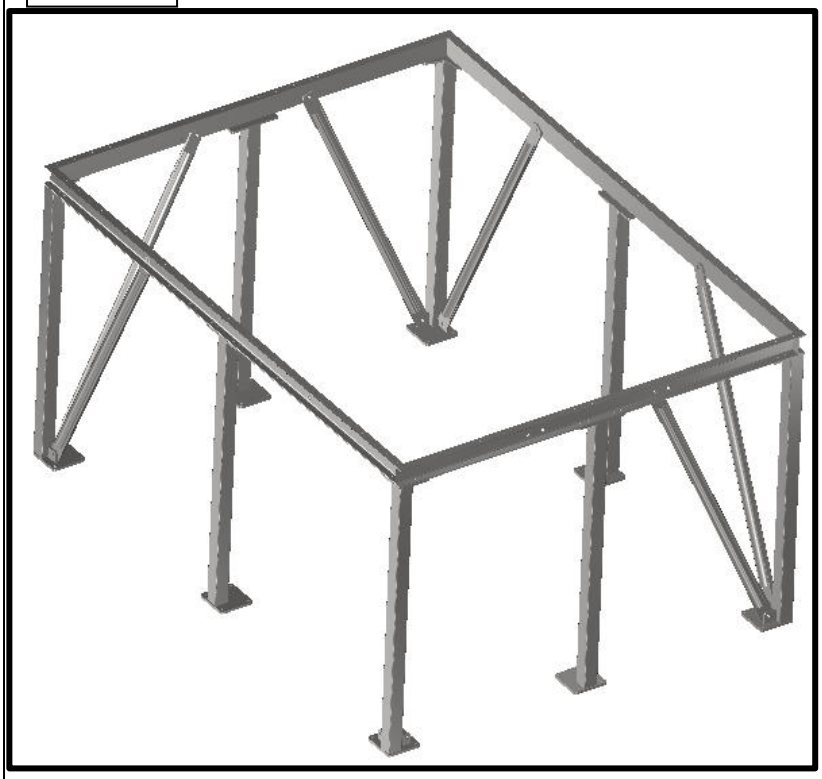
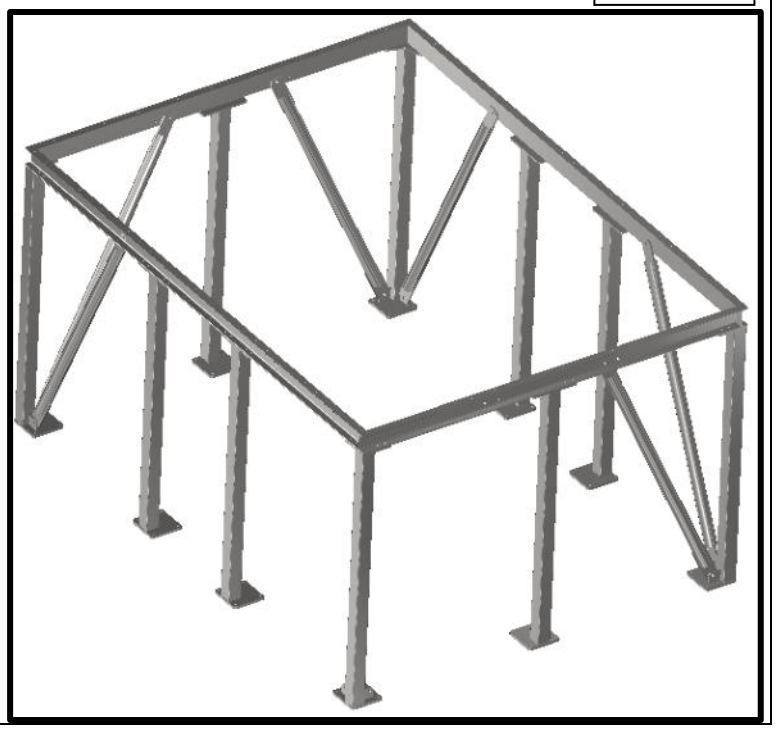
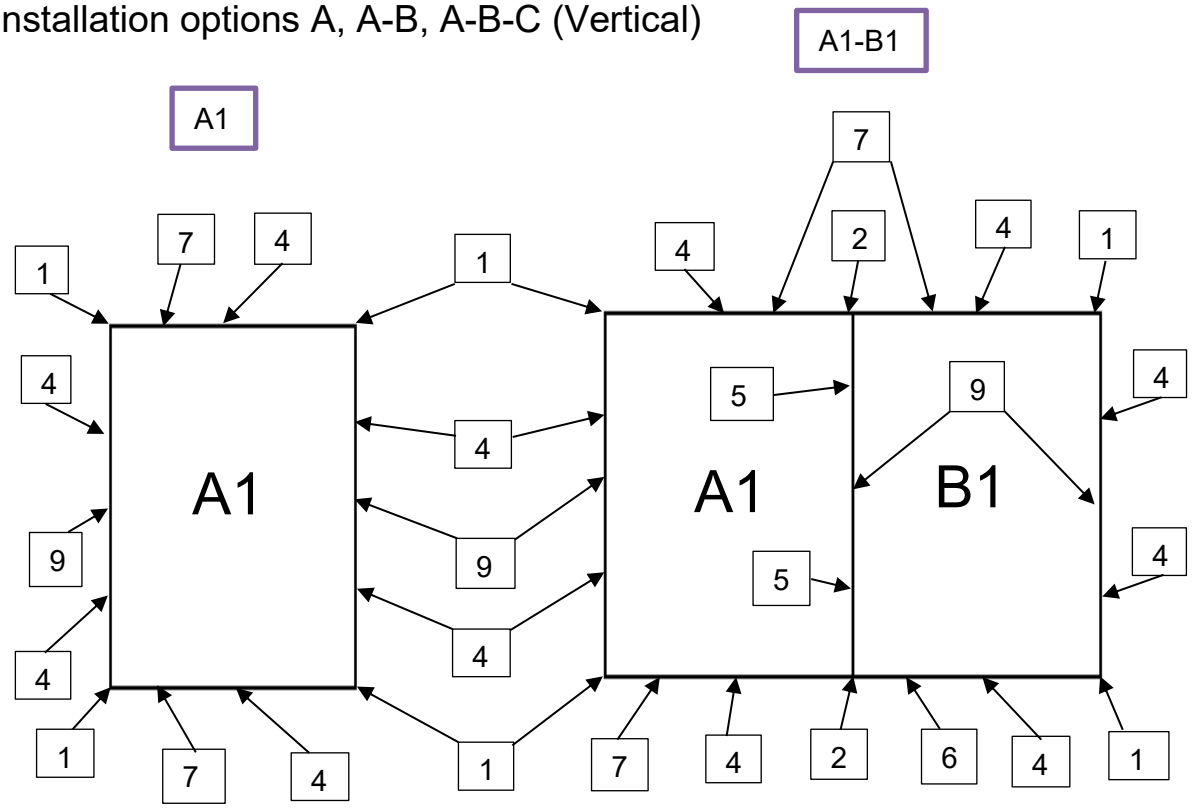


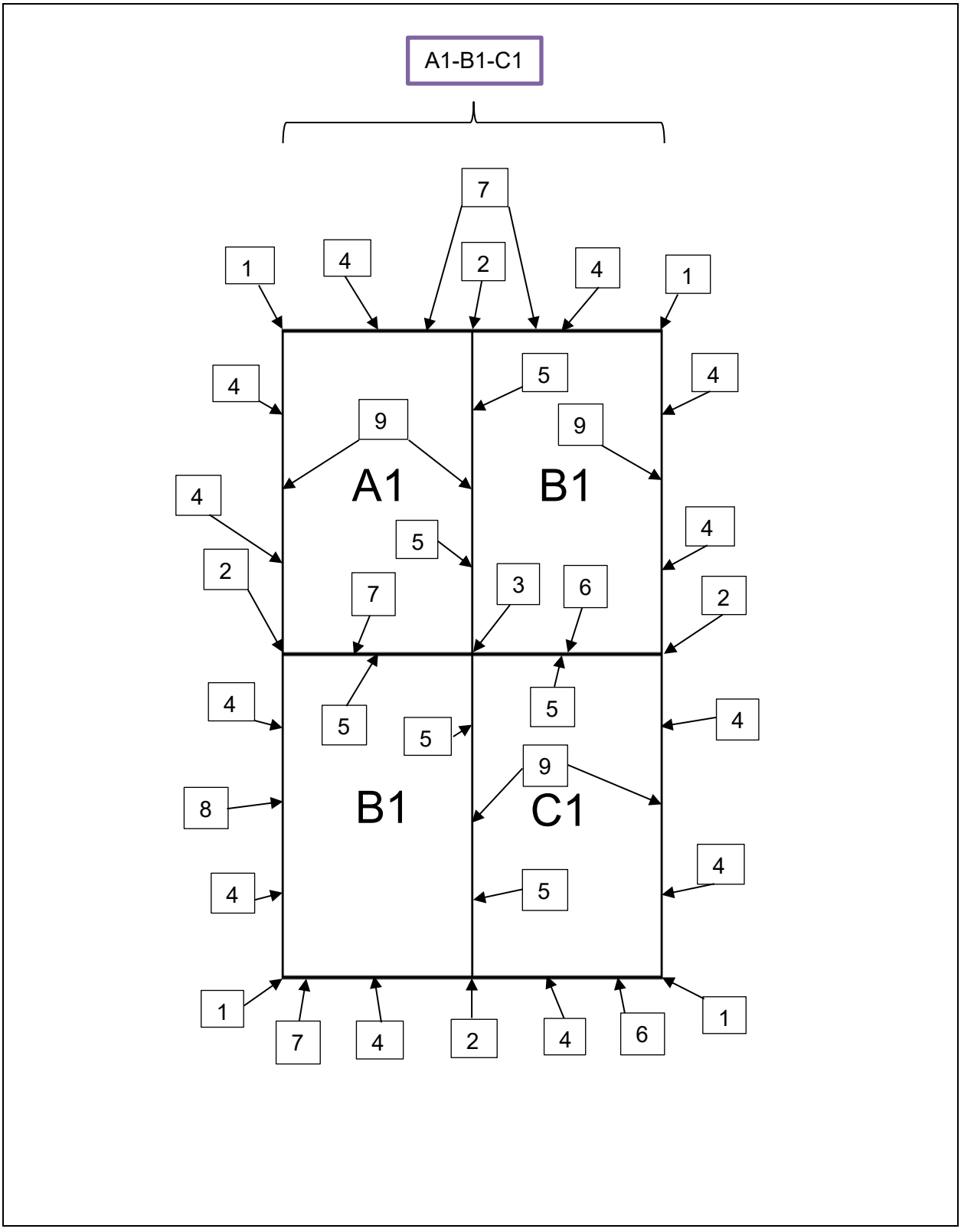
Figure 2



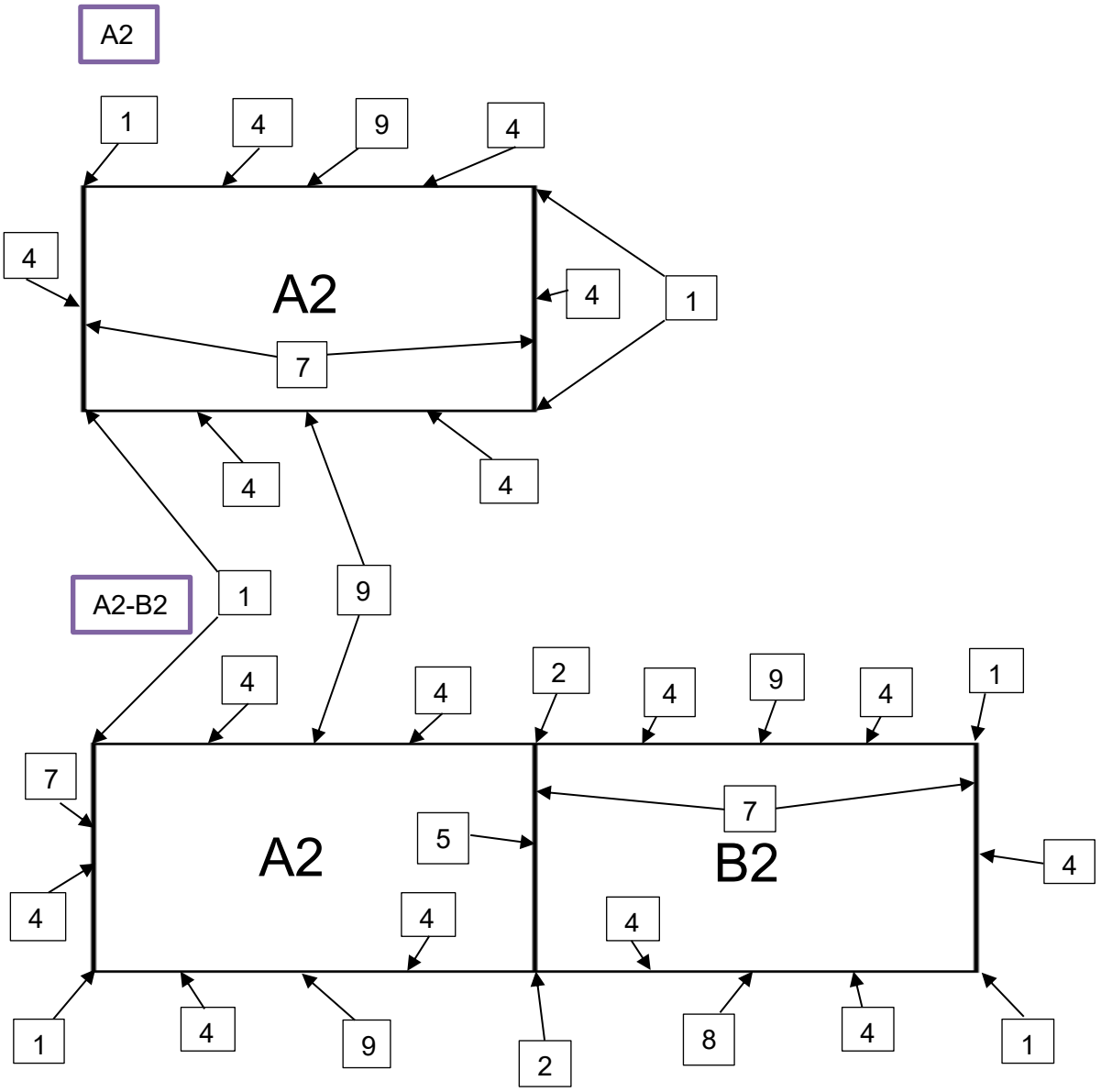
In the following example, 2 support feets are used on the 4m side.

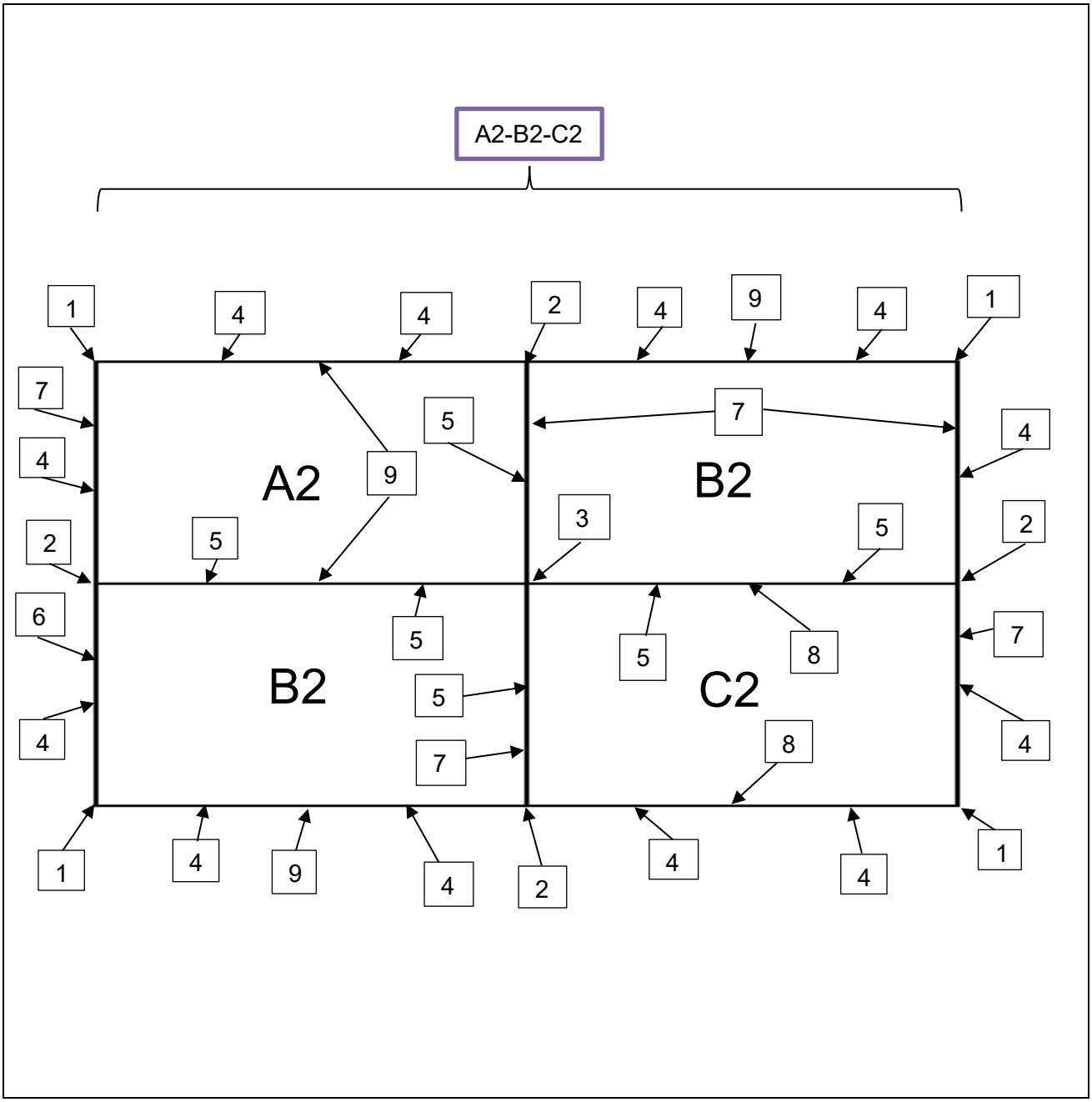
Installation options A, A-B, A-B-C (Vertical)



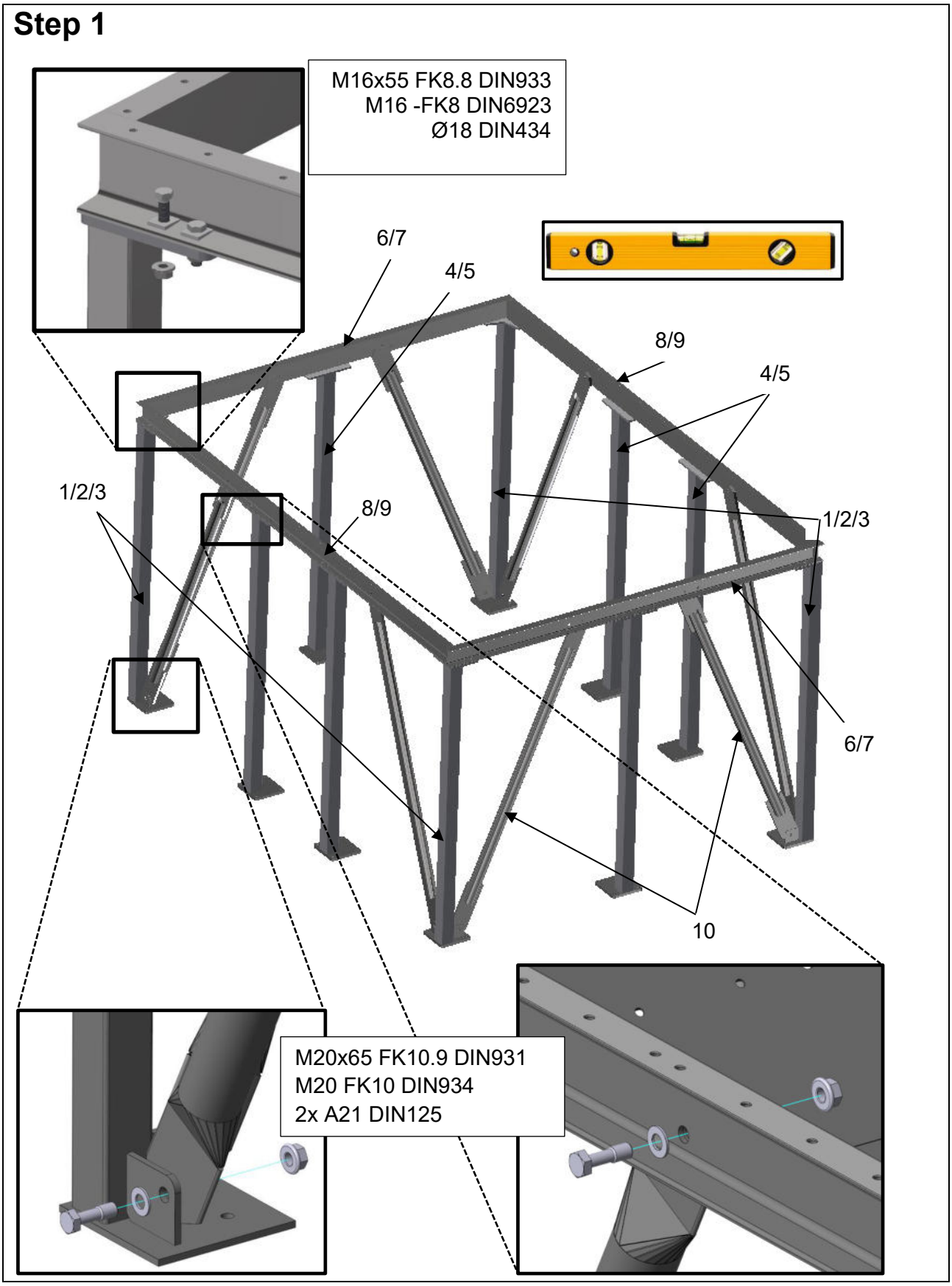

A1-B1-C1
7
1
4
2
4
1
4
5
4
9
9
A1
B1
4
4
5
2
7
3
6
2
4
5
5
5
4
9
8
B1
C1
4
4
5
1
7
4
2
4
6
1

Installation options A, A-B, A-B-C (Horizontal)



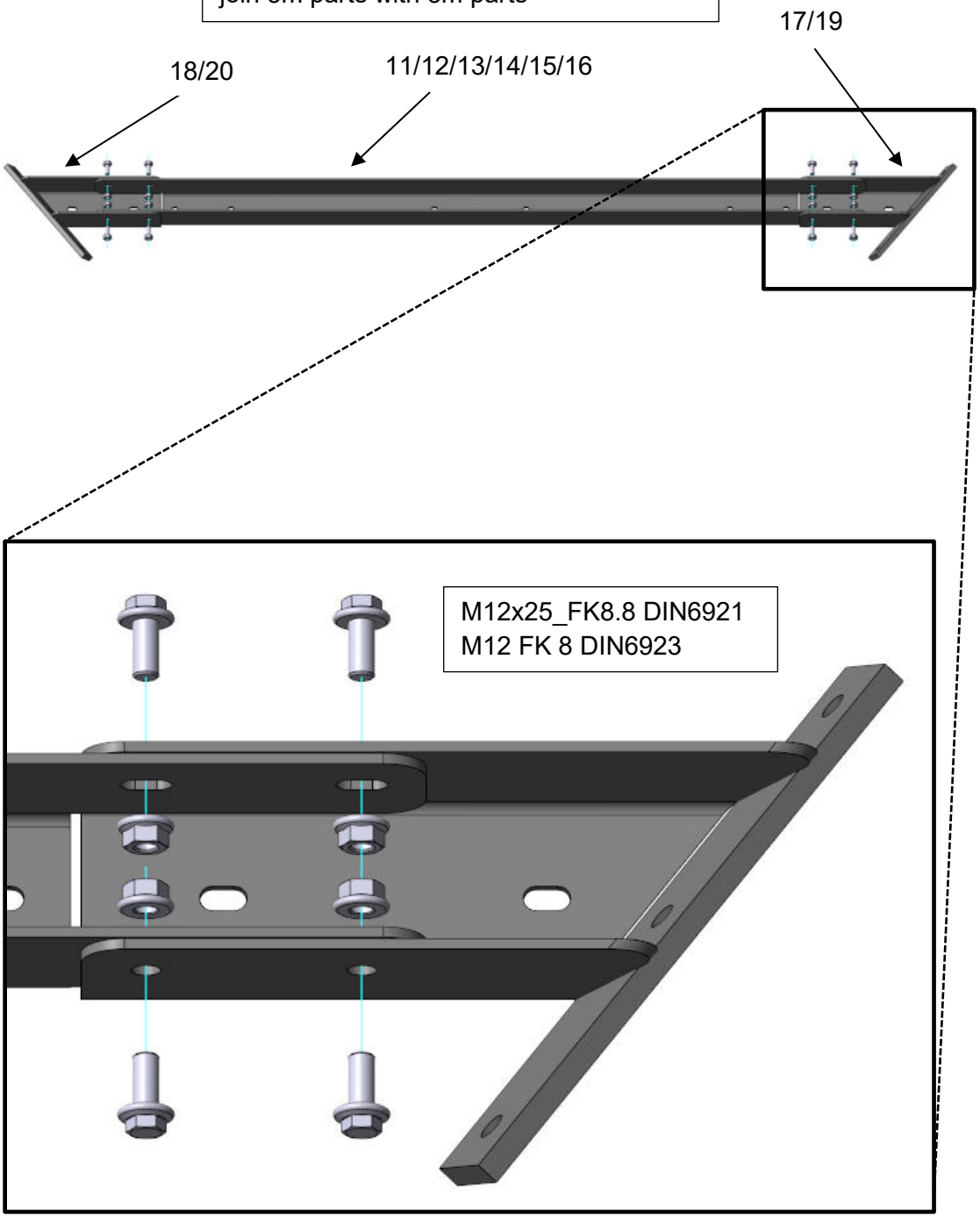

A2-B2-C2
A2
B2
B2
C2

5.5.2 Assembly funnel 4x3

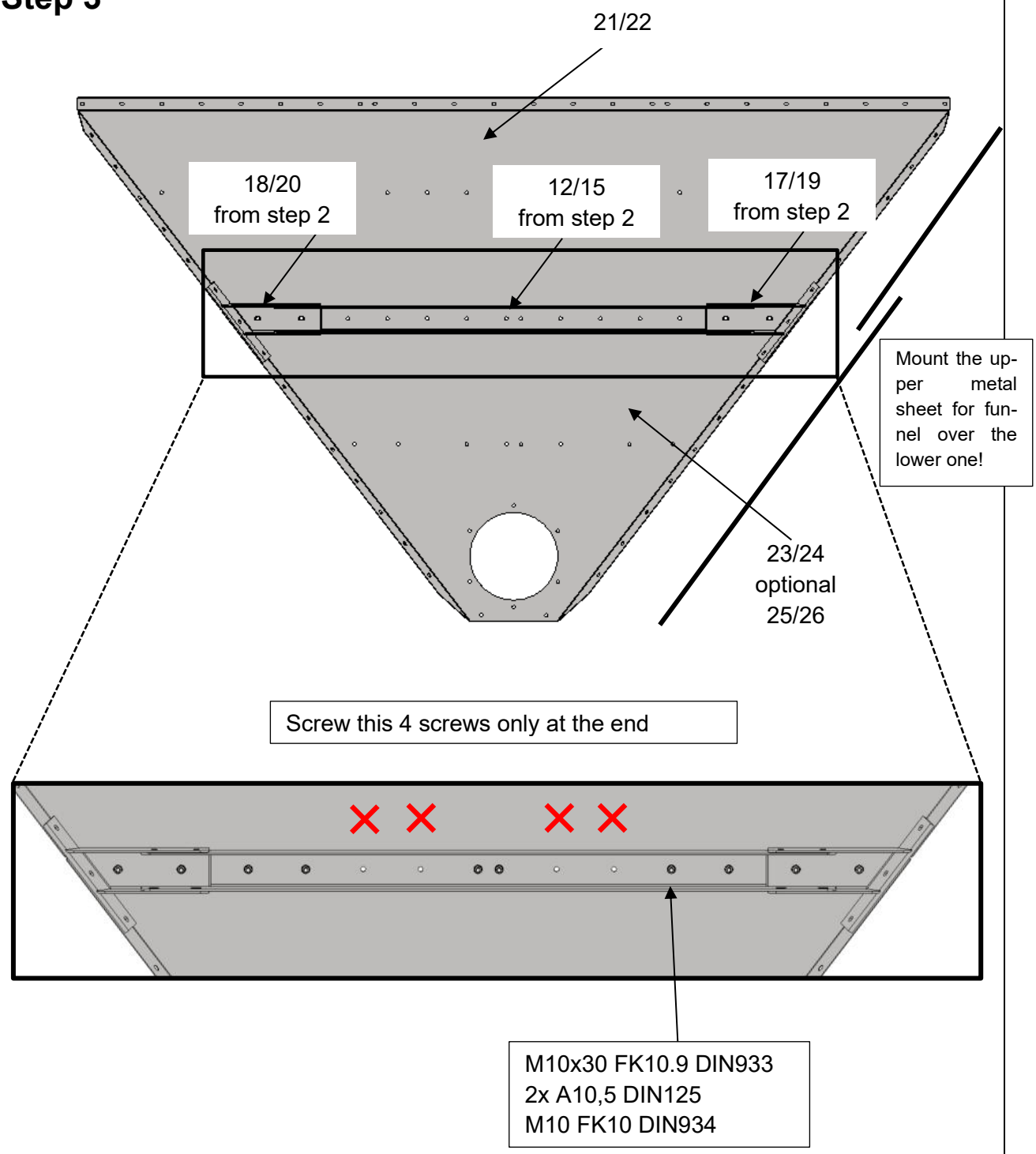


Step 2

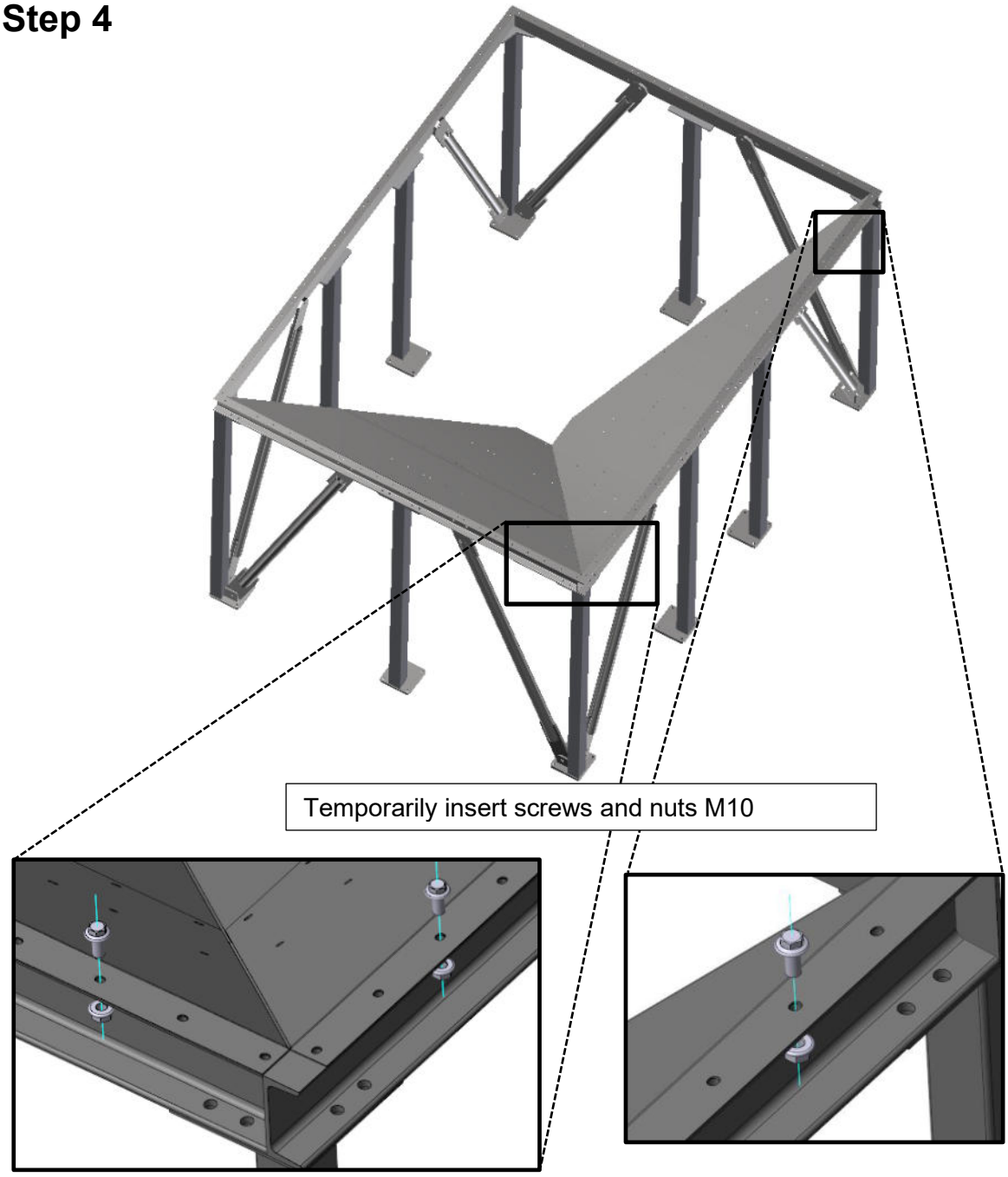
Only join 2m parts with 2m parts and only join 3m parts with 3m parts



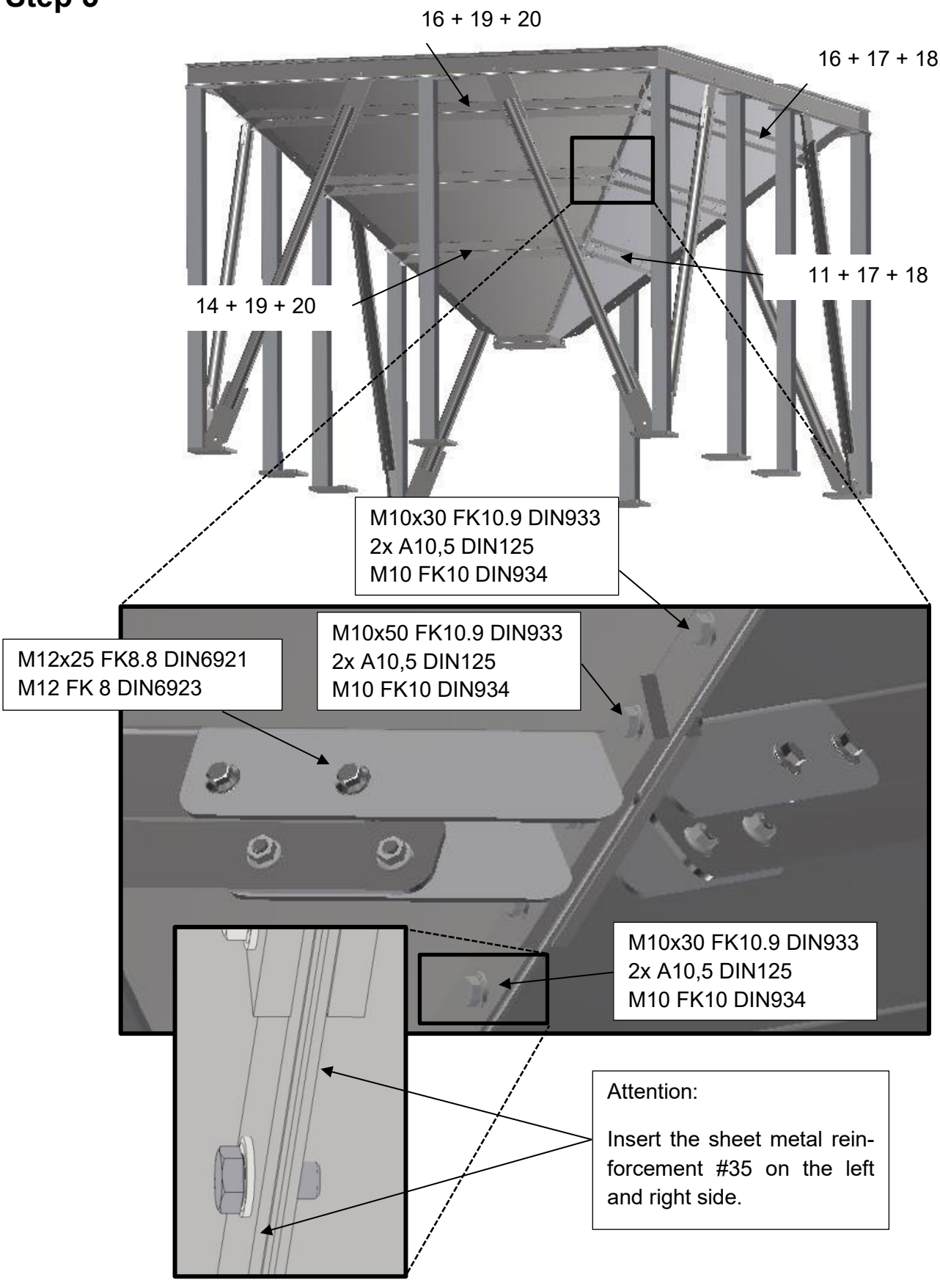
Step 3

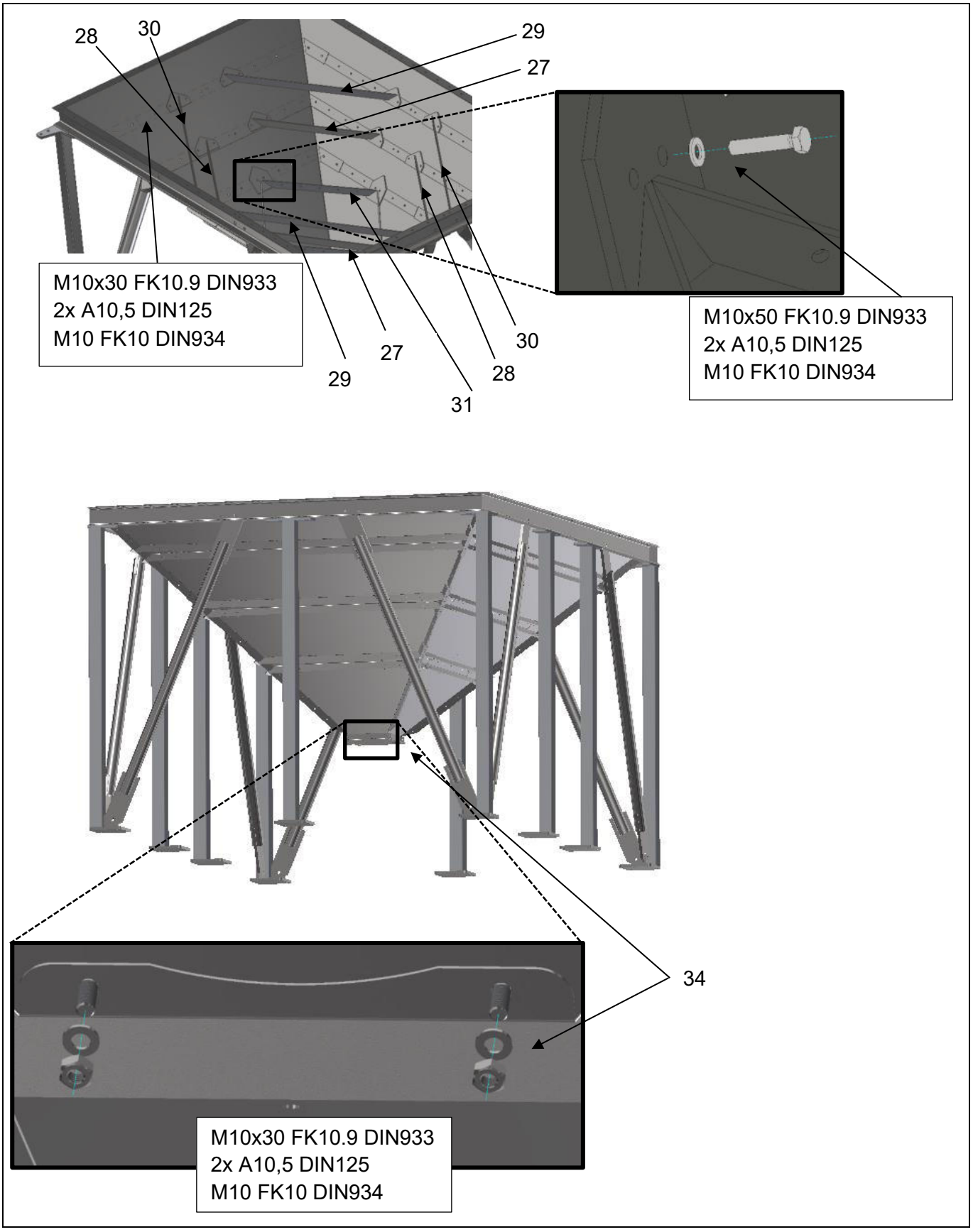

21/22
18/20
from step 2
12/15
from step 2
17/19
from step 2
Mount the upper metal sheet for funnel over the lower one!
23/24
optional
25/26
Screw this 4 screws only at the end
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 4

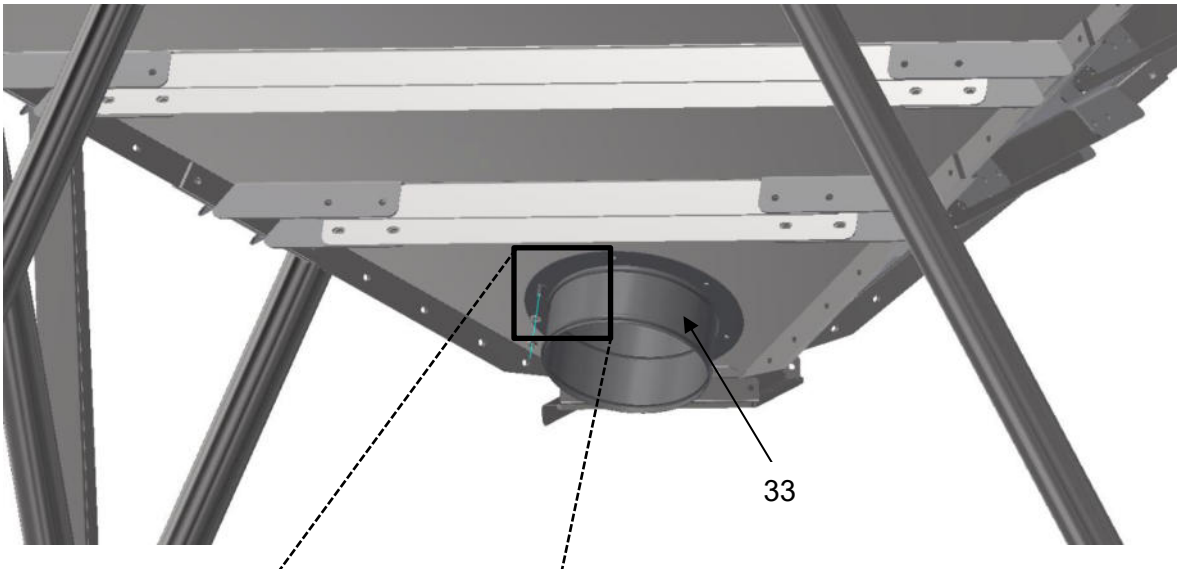


Step 5

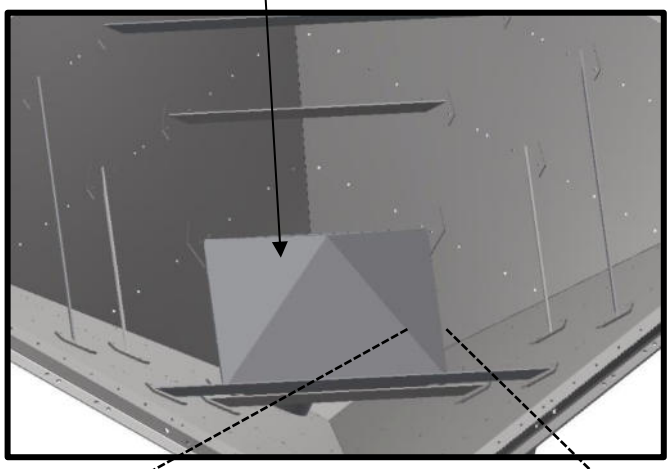

16 + 19 + 20
16 + 17 + 18
11 + 17 + 18
14 + 19 + 20
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
Attention:
Insert the sheet metal reinforcement #35 on the left and right side.


28
30
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
31
28
30
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
34
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

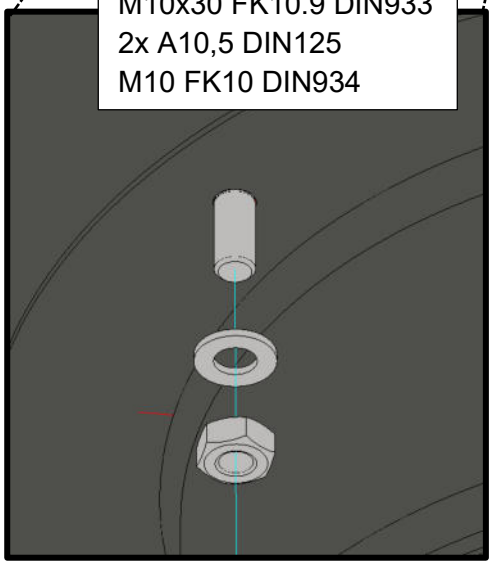
Step 7 Optional

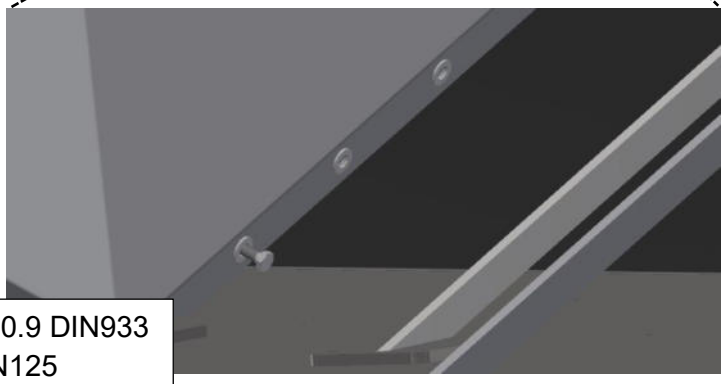


32



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934



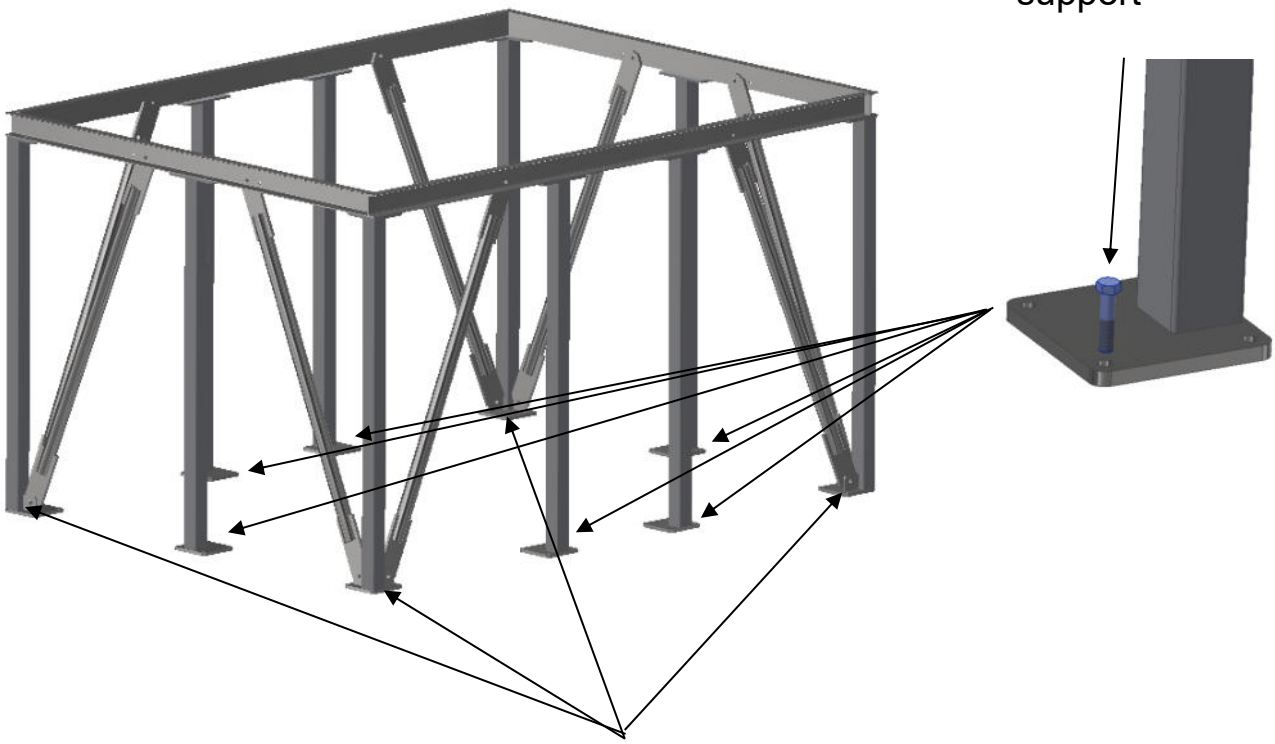


M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

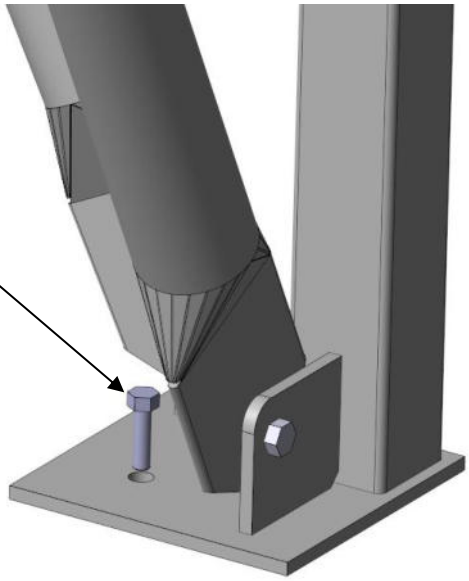
Step 8

Pay attention to a vertical alignment and right-angeled mounting

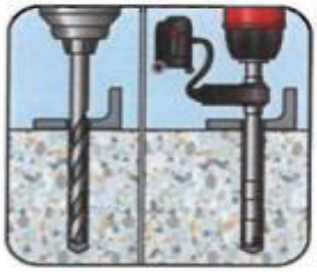
2x screws for concrete each support



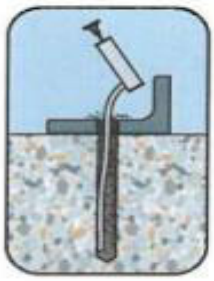
2x screws for concrete each support



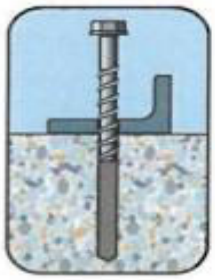
.Installations Instructions



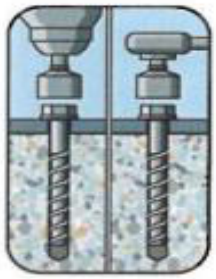
Create hammer drilled or hollow drilled borehole.



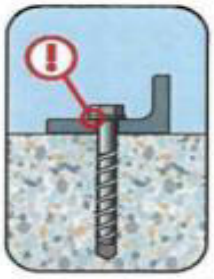
Clean the borehole. If using a hollow drill an additional cleaning of the borehole is not necessary.



Set the screw



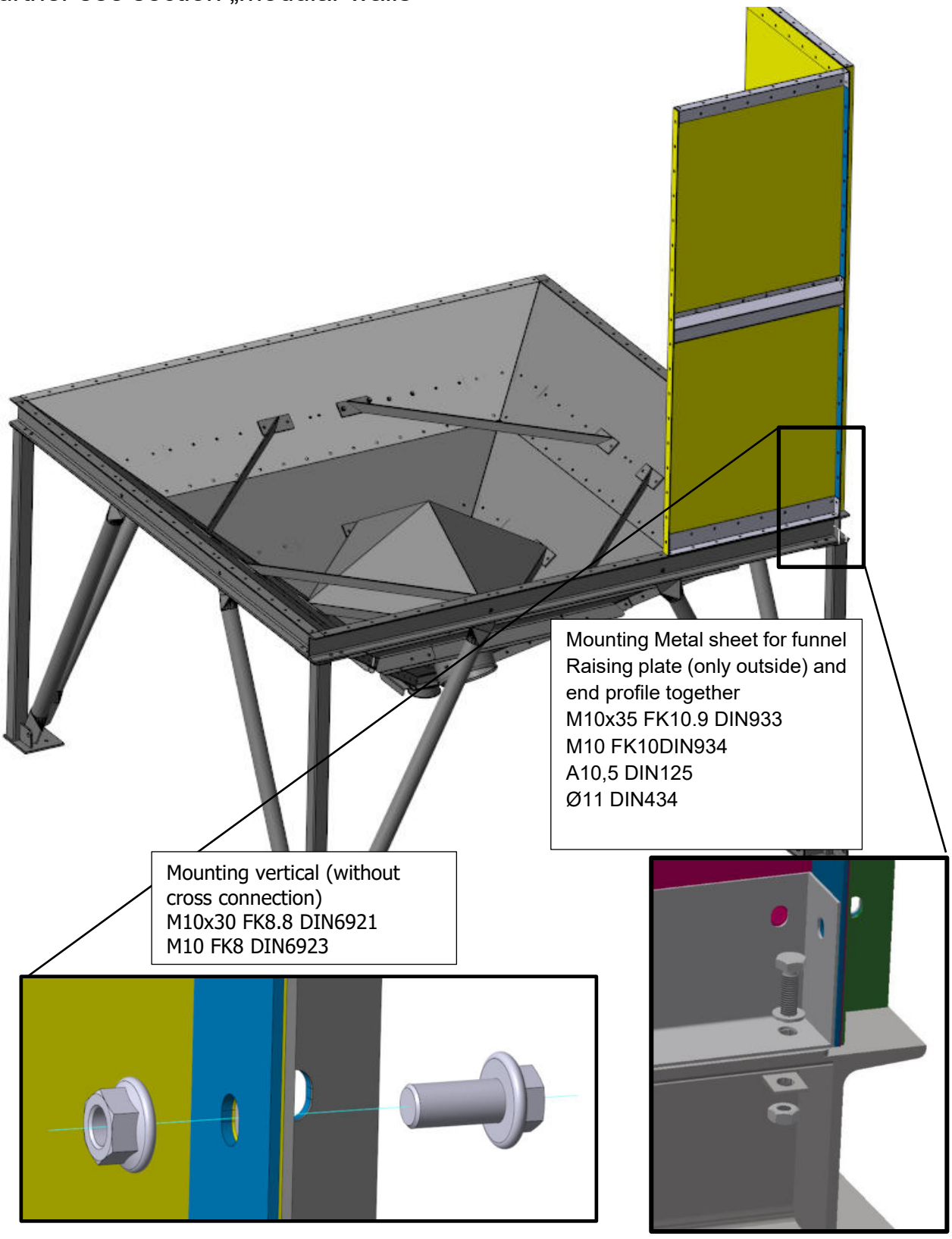
Install the screw by hand or using a impact screw driver. Consider $T_{imp,max}$ und T_{inst}



Installation was successful when the head of the anchor is fully supported and in contact to the fixture without damaging it.

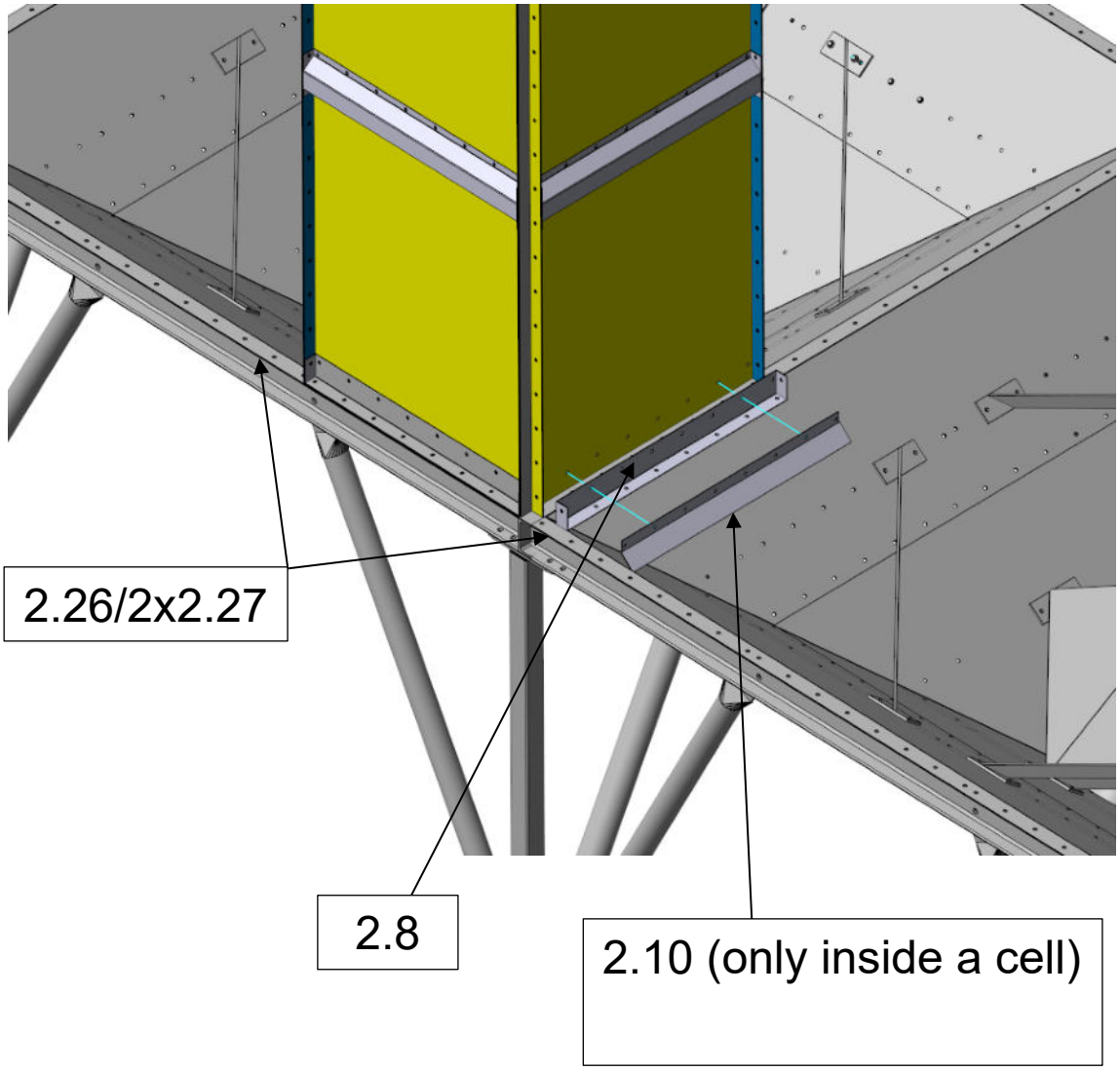
Step 9 (Optional, for the construction of a square cell)

Further see section „modular walls“



there are several funnel substructures

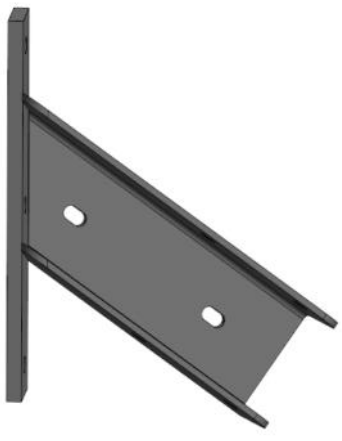
- If the grain is to be stored next to each other, additional bevelling plates must be used on the lower end profile of the partition walls so that the grain can run off cleanly.
- - At points where two funnel plates are on top of each other, the superstructure height is slightly increased -> to compensate for this, additional raising plates (2.26) must be fitted at the other points.

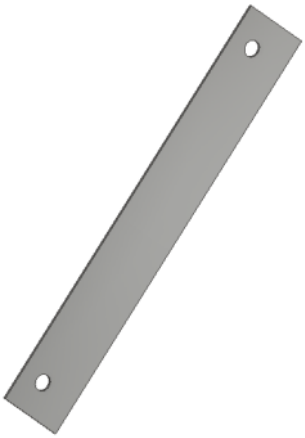
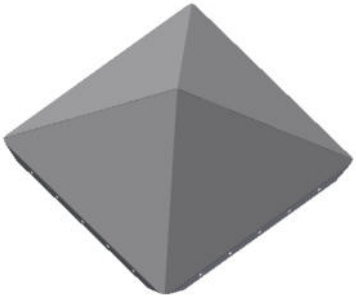
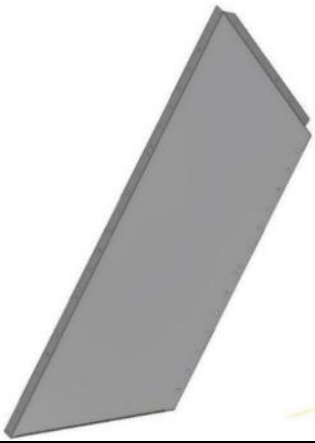


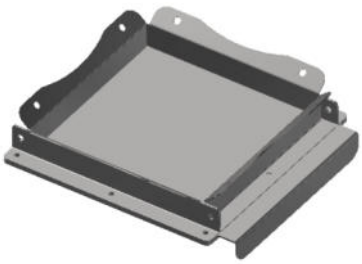
5.6 Optional funnel 4x4

5.6.1 Scope of delivery

#1 Support L for 4x4 & 4x3 Art.No.:4009092015817 	#2 Support T for 4x4 & 4x3 Art.No.:4009092015818 	#3 Support X for 4x4 & 4x3 Art.No.: 4009092015819
#4 Support I outside for 4x4 & 4x3 Art.No.: 4009092015815 	#5 Support I inside for 4x4 & 4x3 Art.No.: 4009092015816 	#6 U140 - l=3997,5 Art.No.: 4009092015808 L=3997,5 mm

#7 U140 - l=4057,5 Art.No.: 4009092015809 L=4057.5mm 	#8 Strut 88,9x4 for support 3x3+2x3 Art.No.:4009092015811 	#9 External reinforcement 3x3m & 4x4m below Art.No.: 4009092015840
#10 External reinforcement 3x3m & 4x4m middle Art.No.: 4009092015841 	#11 External reinforcement 3x3m & 4x4m top Art.No.: 4009092015842 	#12 External reinforcement 4x4m ganz top Art.No.: 4009092015843
#13 External reinforcement console right 40° Art.No.: 4009092015824 	#14 External reinforcement console left 40° Art.No.: 4009092015823 	#15 Inner corner reinforcement top 4x4m 40° Art.No.: 4009092015887

#16 Inner corner reinforcement top 3x3m & 4x4m 40° Art.No.: 4009092015886 	#17 Inner corner reinforcement middle 3x3m & 4x4m 40° Art.No.: 4009092015885 	#18 Inner corner reinforcement below 3x3m & 4x4m 40° Art.No.:4009092015879
#19 Rod support Art.No.: 4009092015907 	#20 Spacer plate rod support Art.No.: 4009027016318 	#21 (Optional) Ventilation cover 3x3 & 4x4m 40° Funnel Art.No.: 4009092015914 
#23 (Optional) Ventilation pipe NW300 f. Ventilation device Art.No.: 4009003016990 	#24 Metal sheet for funnel 4x4m 40° top Art.No.: 4009092015866 	#25 Metal sheet for funnel 3x3xm & 4x4m 40° below Art.No.: 4009092015863

#26 (optional, only if #21 is installed) Metal sheet for funnel 3x3m & 4x4m 40° Belüftung Art.No.: 4009092015864 	#27 Reinforcement of metal sheet for 4x4m 40° Funnel Art.No.: 4009092015854 	#28 Outlet with slide valve 300x300 Art.No.: 4009092015820 Transition to 150,200,250 4009023015782, 783, 784 

Options for intermediate supports

At least one additional support foot must be screwed in per side (Figure 1). For example, if you have a conveyor system that runs centrally under the silos, two support feets (Figure 2) can also be screwed in

Figure 1

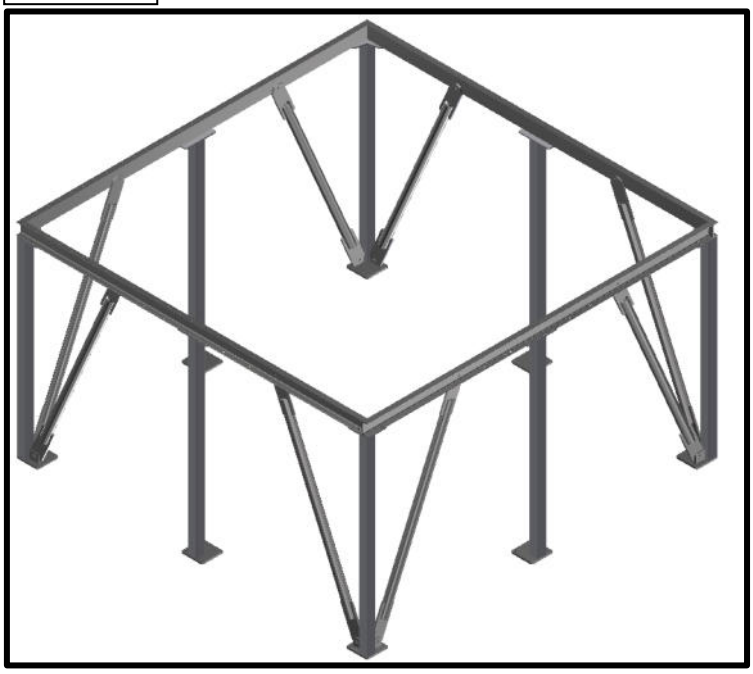
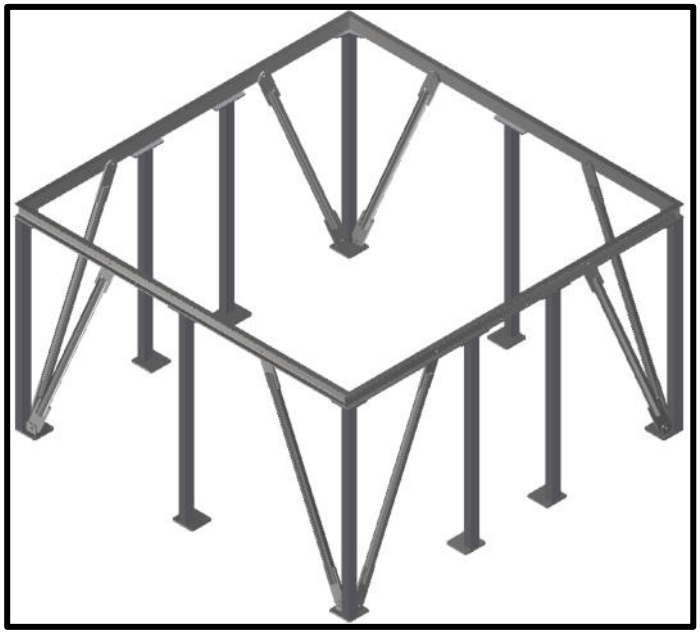


Figure 2

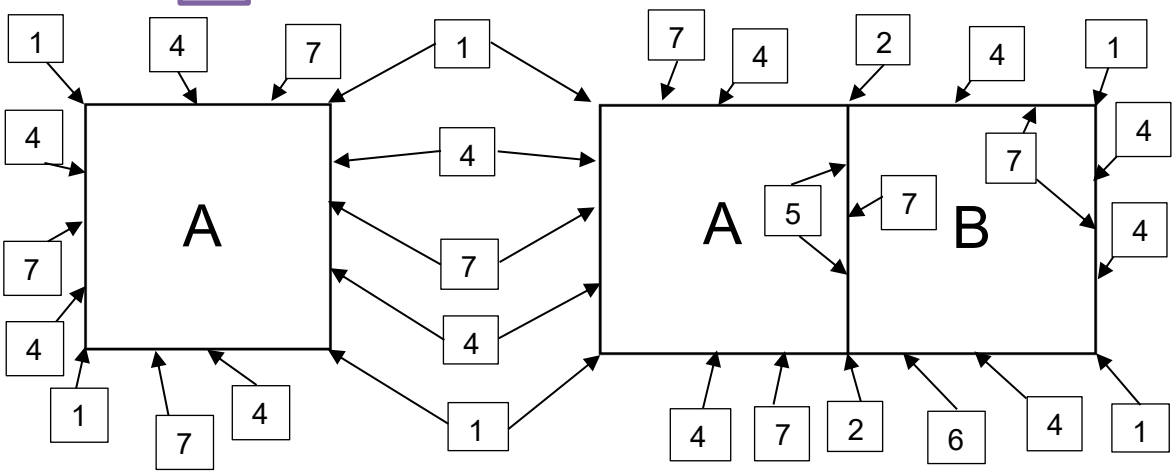


In the following example, 2 support feets are used.

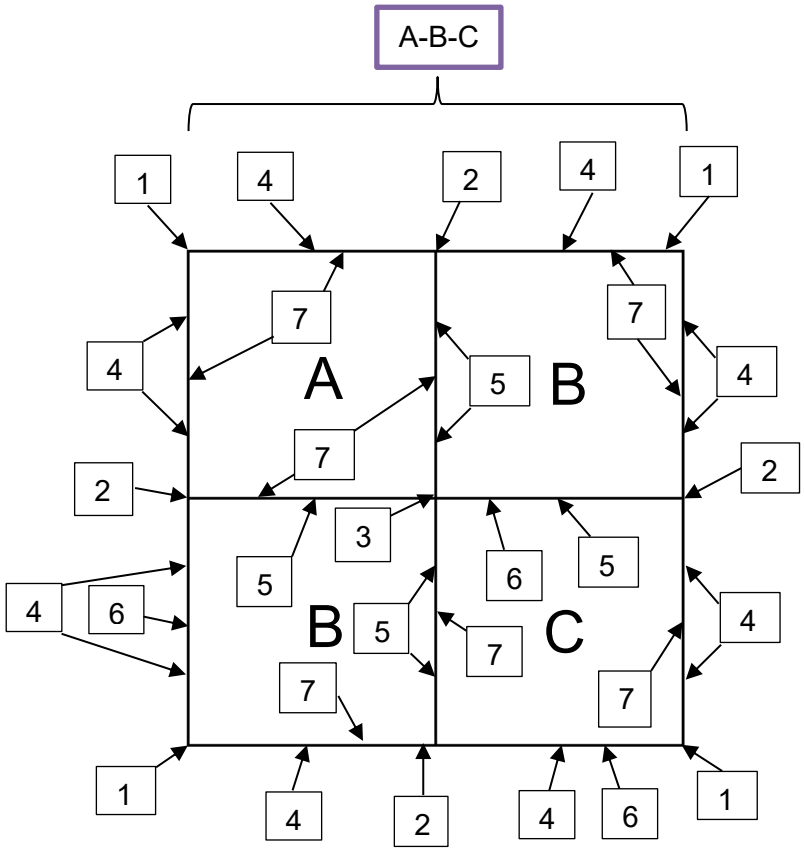
Installation options A, A-B, A-B-C

A

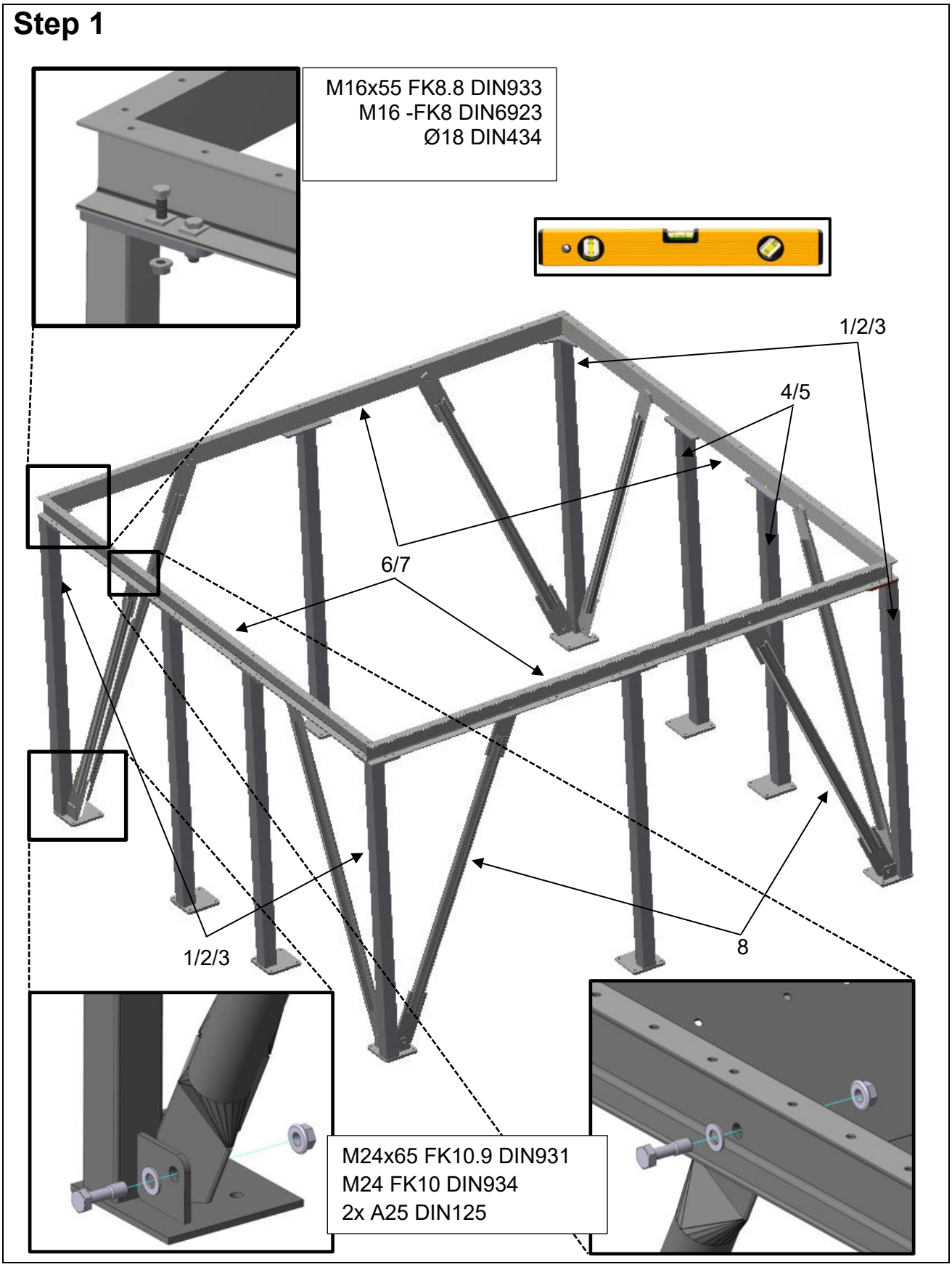
A-B



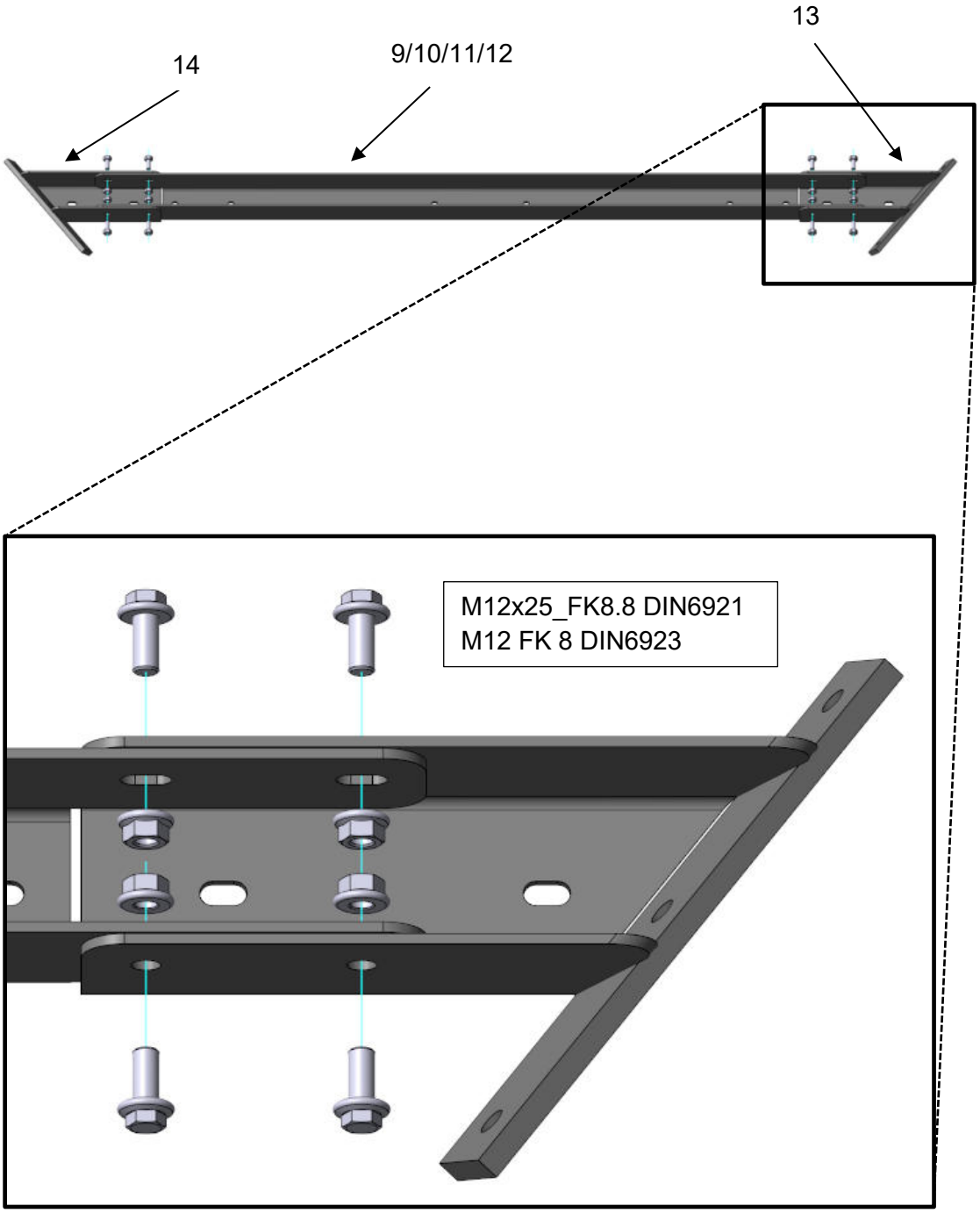
A-B-C



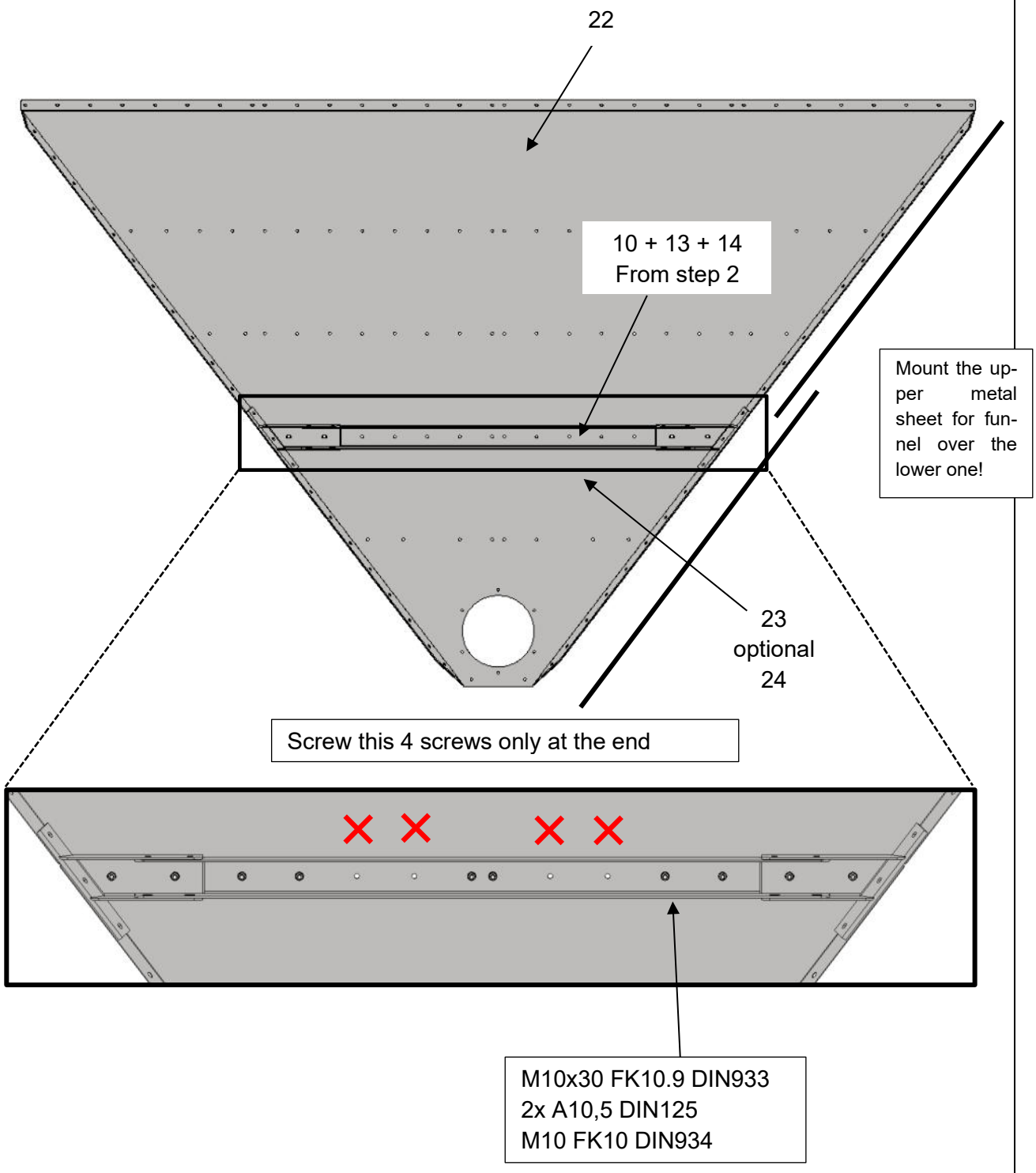
5.6.2 Assembly funnel 4x4



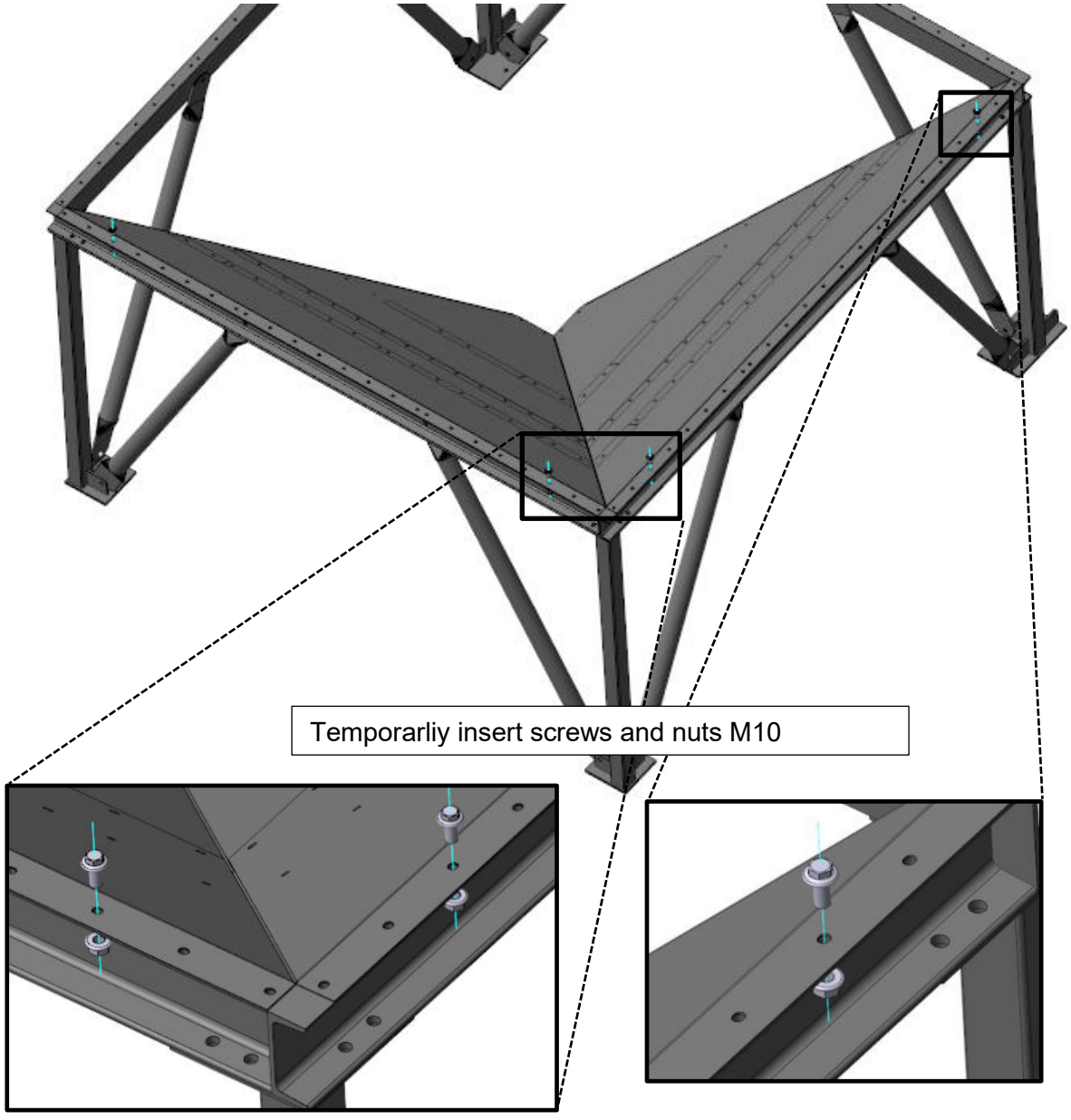
Step 2



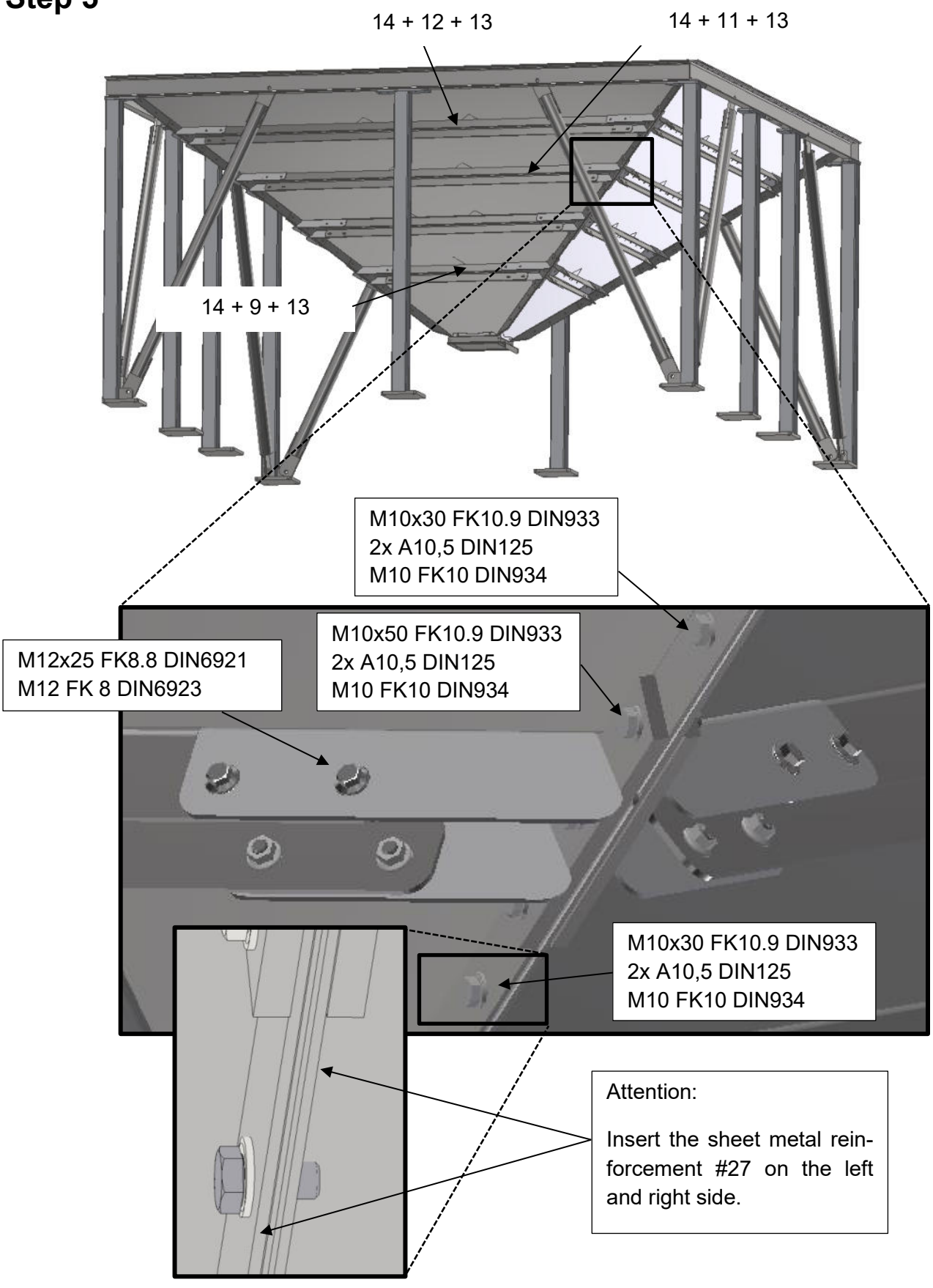
Step 3

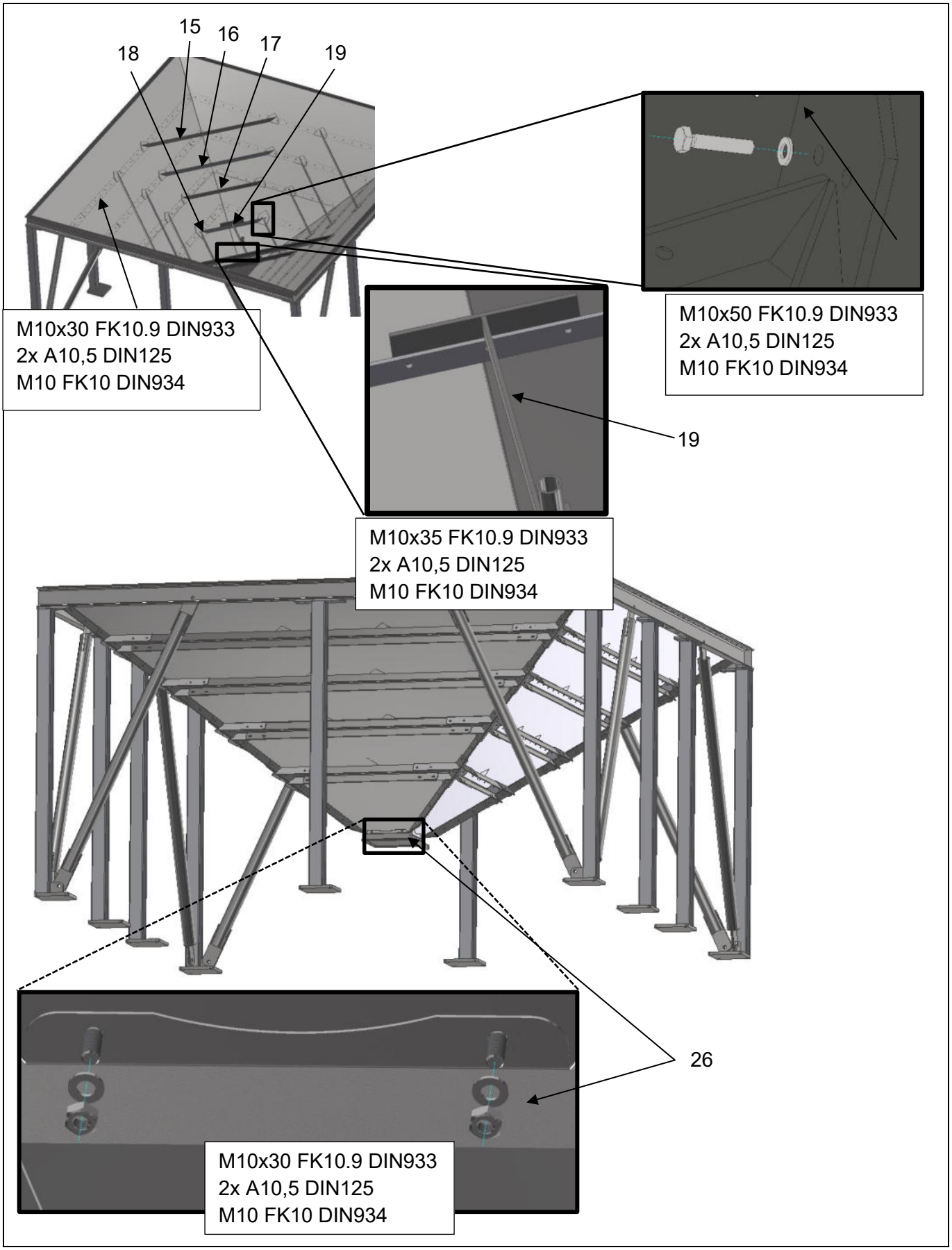

22
10 + 13 + 14
From step 2
Mount the upper metal sheet for funnel over the lower one!
23
optional
24
Screw this 4 screws only at the end
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 4

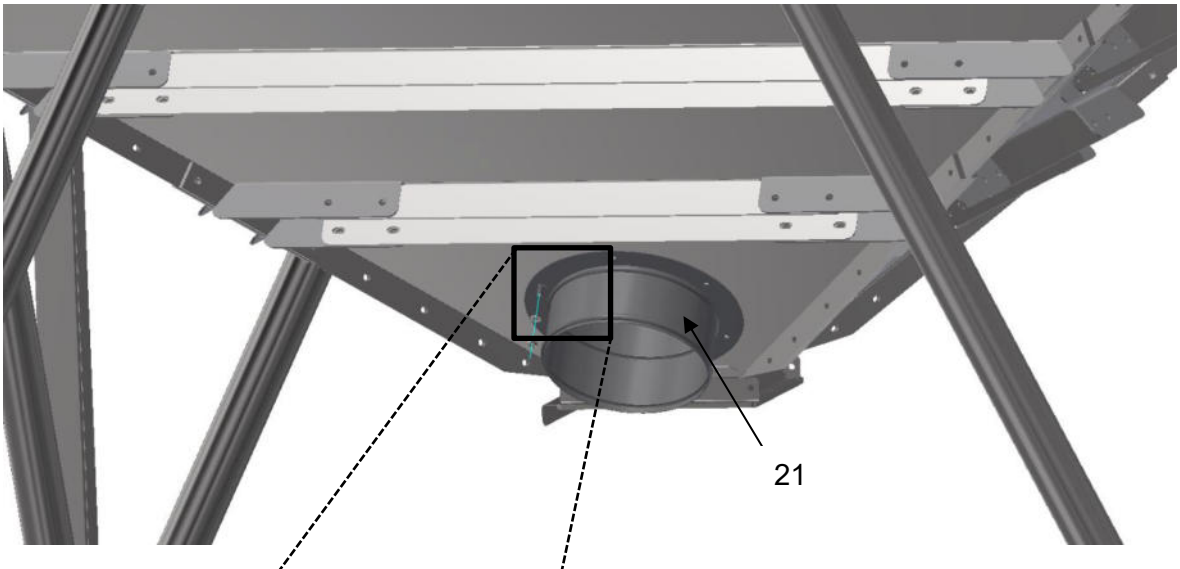


Step 5

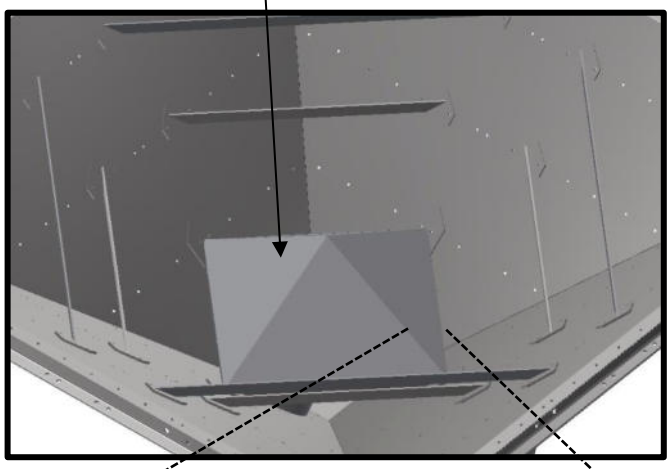

14 + 12 + 13
14 + 11 + 13
14 + 9 + 13
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
Attention:
Insert the sheet metal reinforcement #27 on the left and right side.


15
16
17
18
19
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
19
M10x35 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
26
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

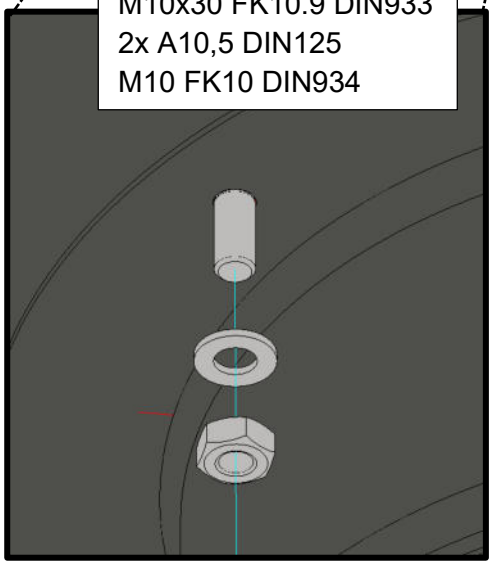
Step 7 Optional

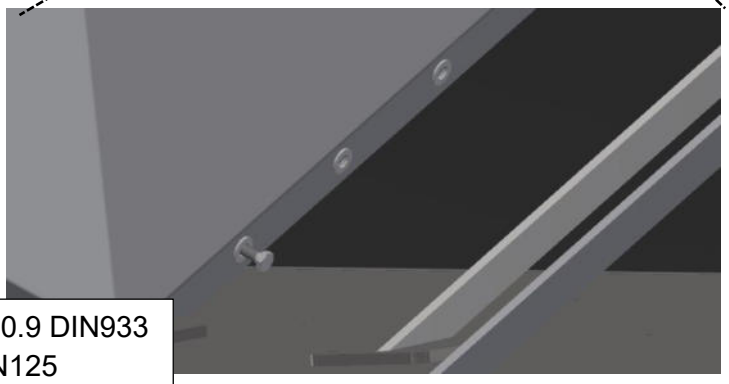


20



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934



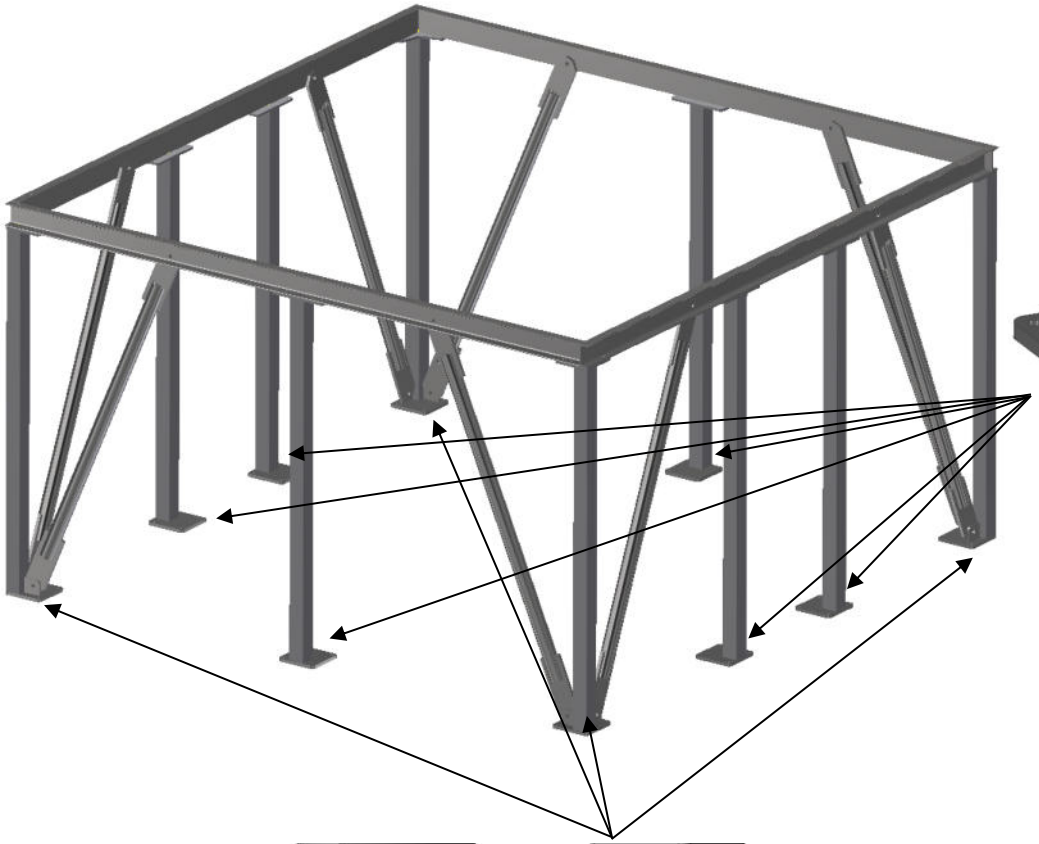


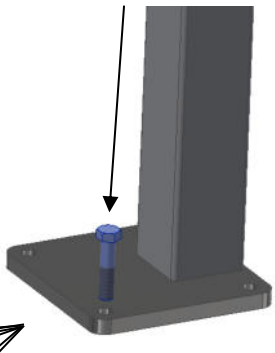
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Step 8

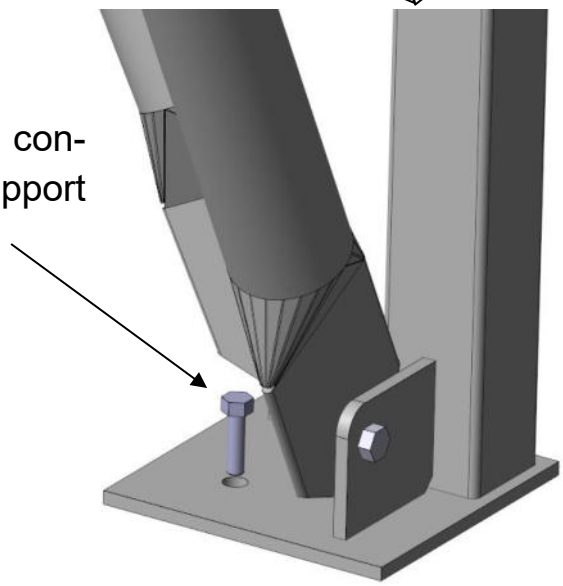
Pay attention to a vertical alignment and right-angelde mounting

2x Screw for concrete each support

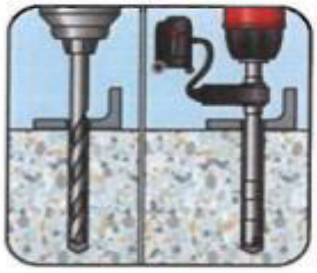




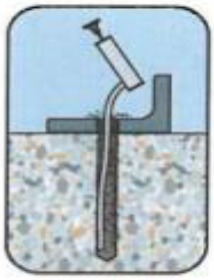
2x Screw for concrete each support



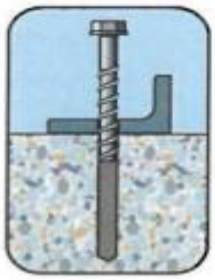
.Installations Instructions



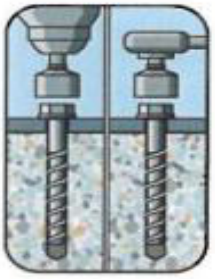
Create hammer drilled or hollow drilled borehole.



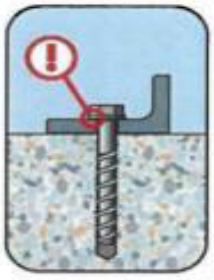
Clean the borehole. If using a hollow drill an additional cleaning of the borehole is not necessary.



Set the screw



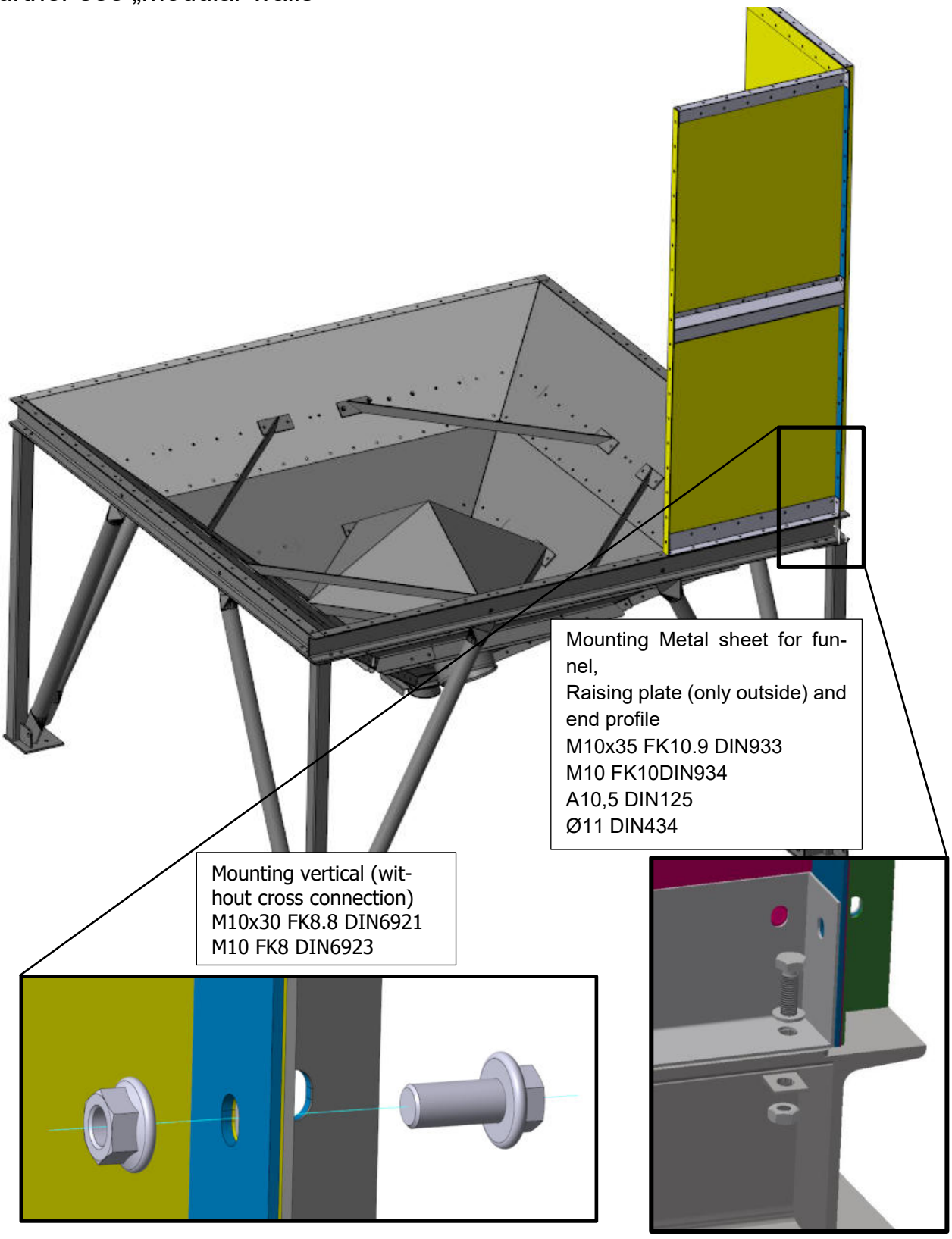
Install the screw by hand or using a impact screw driver. Consider $T_{imp,max}$ und T_{inst}



Installation was successful when the head of the anchor is fully supported and in contact to the fixture without damaging it.

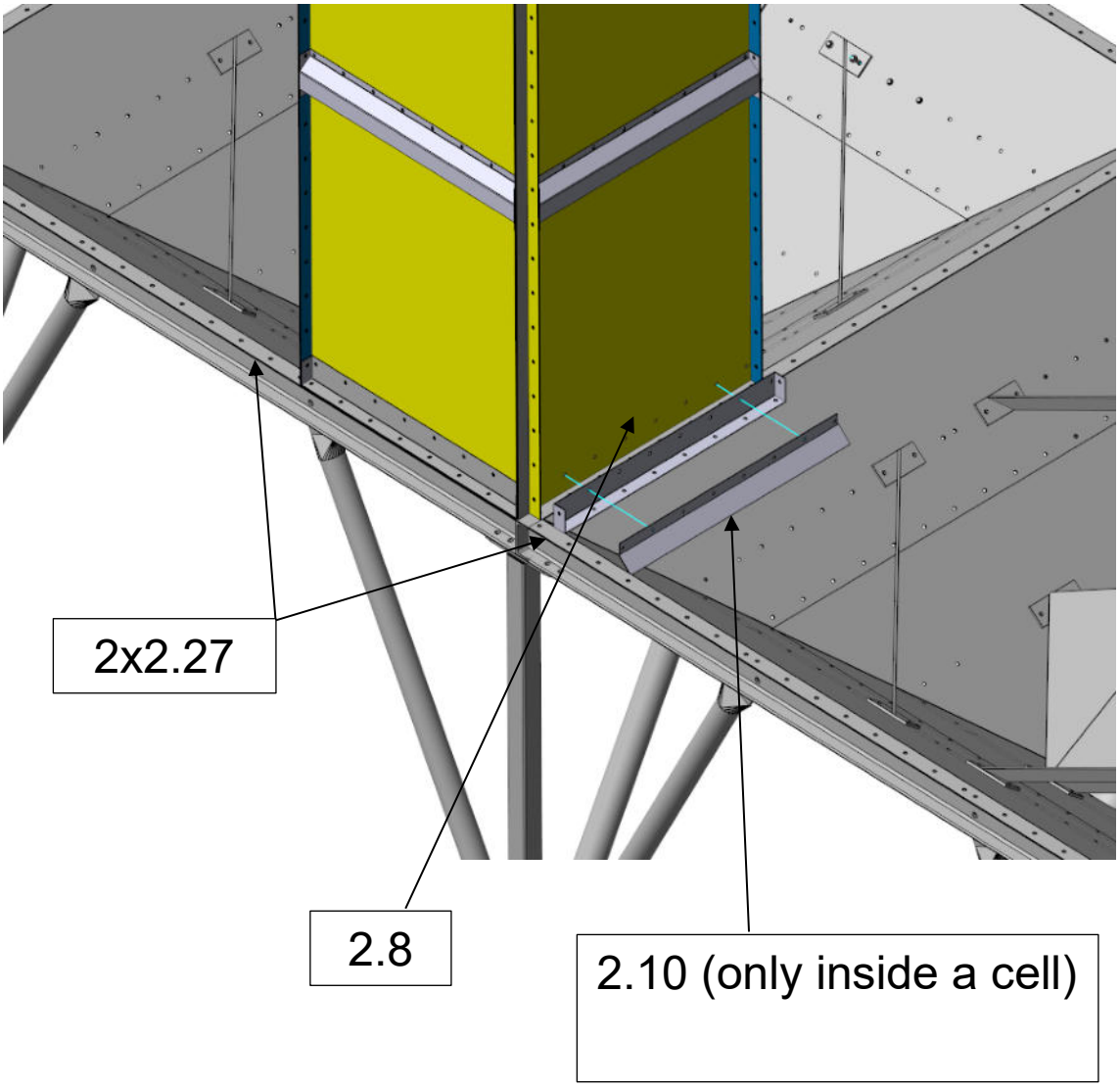
Step 9 (Optional, for the construction of a square cell)

Further see „modular walls“



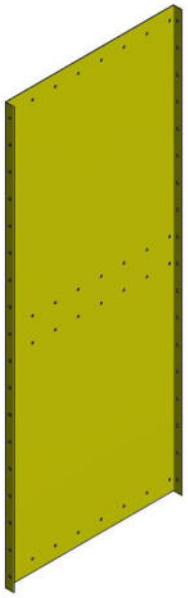
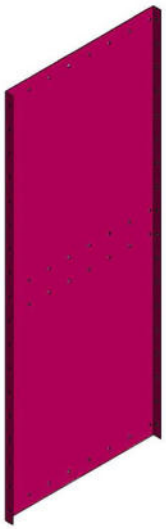
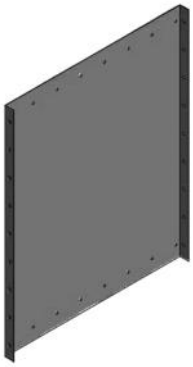
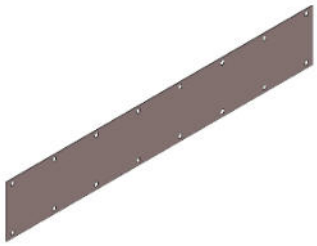
there are several funnel substructures

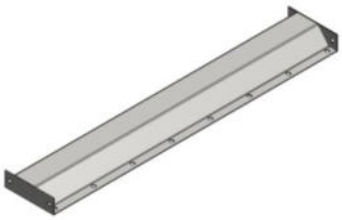
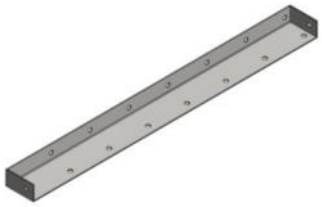
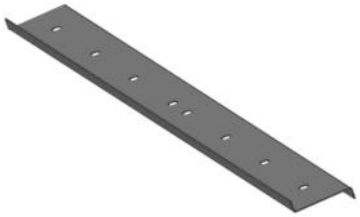
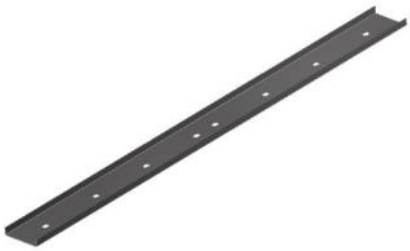
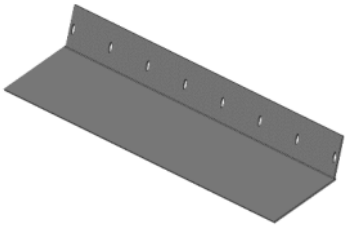
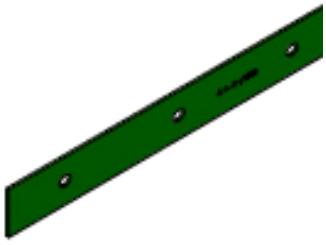
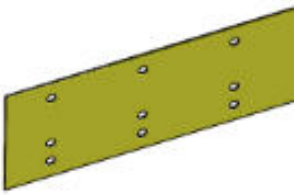
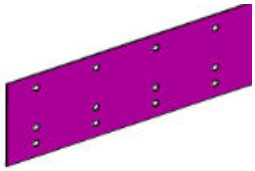
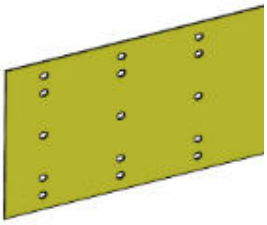
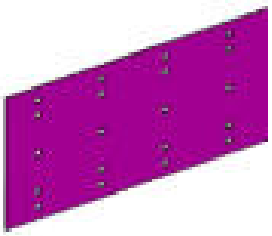
- If the grain is to be stored next to each other, additional bevelling plates must be used on the lower end profile of the partition walls so that the grain can run off cleanly.
- - At points where two funnel plates are on top of each other, the superstructure height is slightly increased -> to compensate for this, additional raising plates (2.26) must be fitted at the other points.

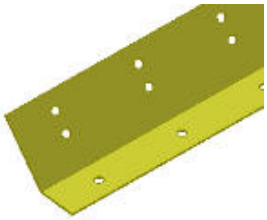
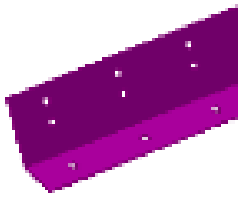
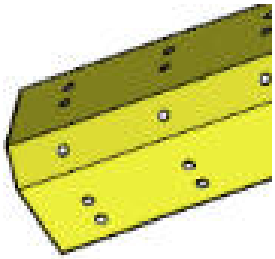
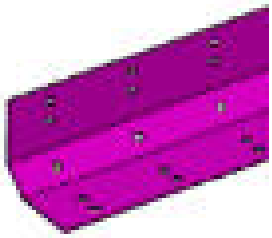
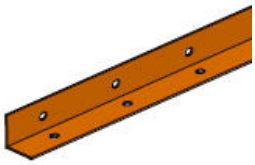
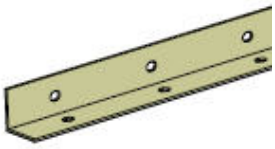
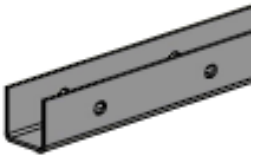
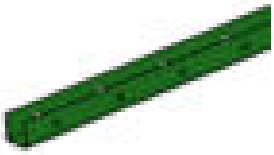


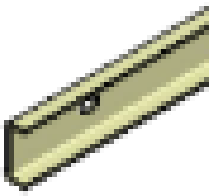
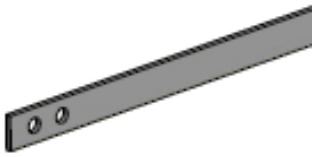
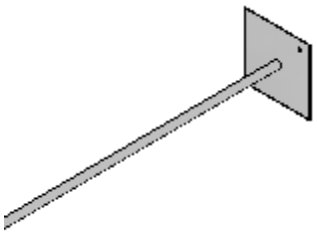
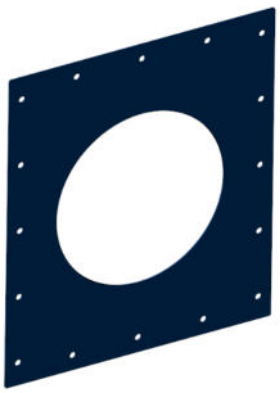
5.7 Modular walls

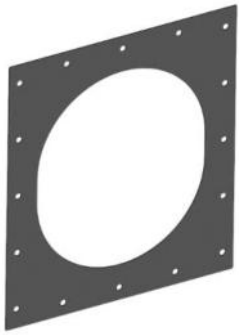
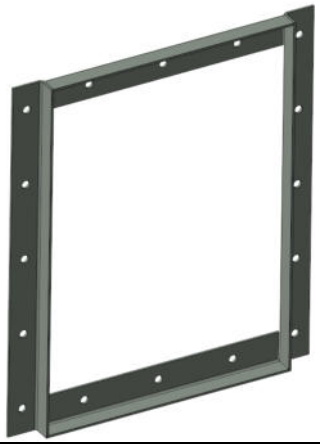
5.7.1 Scope of delivery

#2.1 (s=1,25mm H=2,50m) Metal sheet “green” Art.No.: 4009099015712 For entry Art.No.: 4009099016041 	#2.2 (s=1,25mm H=2,50m) Metal sheet “Blue” Art.No.: 4009099015696 For entry Art.No.: 4009099016040 	#2.3 (s=1,0mm H=2,50m) Metal sheet “Yellow” Art.No.: 4009099015680 For entry Art.No.: 4009099016039 
#2.4 (s=0,75mm H=2,50m) Metal sheet “REd” Art.No.: 4009099015664 For entry Art.No.: 4009099016038 	#2.5 (s=0,75mm H=1,25m) Metal sheet „Black“ Art.No.: 4009099015728 For entry Art.No.: 4009099016043 	#2.6 Cover plate Art.No.: 4009099015748 

#2.7 Stile profile Art.No.: 4009099015744 	#2.8 Statement profile Art.No.: 4009099015745 	#2.9 L1 = 1,0 m Angle plate for upper edge Art.No.: 4009099015767 
#2.9a Angel plate U für upper edge Art.No.: 4009099016045 	#2.10 Sloping sheet Art.No.: 4009099015988 	
#2.11 Angle stiffener Art.No.: 4009099015750 L=1250 	#2.12 Angle stiffener Art.No.: 4009099015749 L=2500 	#2.13 Intermediate sheet straight Art.No.: 4009099015754 L=1250 
#2.14 Intermediate sheet straight Art.No.: 4009099015753 L=2500 	#2.15 Intermediate sheet straight Art.No.: 4009099015758 L=1250 	#2.16 Intermediate sheet straight Art.No.: 4009099015757 L=2500 

#2.17 Intermediate sheet 1x45° Art.No.: 4009099015752 L=1250 	#2.18 Intermediate sheet 1x45° Art.No.:4009099015751 L=2500 	#2.19 Intermediate sheet 2x45° Art.No.:4009099015756 L=1250 
#2.20 Intermediate sheet 2x45° Art.No.: 4009099015755 L=2500 	#2.21 Corner profile Art.No.: 4009099015760 L=1250 	#2.22 Corner profile Art.No.: 4009099015759 L=2500 
#2.23 U-Profile Art.No.:4009099015762 L=1250 	#2.24 U-Profile Art.No.:4009099015761 L=2500 	#2.25 U-Profile cross connection Art.No.: 4009099015764 L=1250
#2.26 Raising plate 3m for funnel Art.No.: 4009027016133 	#2.27 Raising plate 2m for funnel Art.No.: 4009027016132 	

#2.28 U-Profile cross connection Art.No.:4009099015763 L=2500 	#2.29 Entry door Frame Art.No.:4009099015881 Door Art.No.:4009099015879 Seal ArtNr: 1081004000128 	#2.30 Corner strut Art.No.:4009099015768 
#2.31 L1= 969mm Art.No.:400909915769 #2.32 L2=1976mm Art.No.:4009099015770 #2.33 L3=2978mm Art.No.:4009099015771 #2.34 L4=3982mm Art.No.: 400909915772 #2.35 L5=4987mm Art.No.:4009099015773	#2.31 - #2.35 Pullbar 	2.37 Support tension rod (various lengths) 1,25m – 7,5m Art.No.: 4009099016046-51 
#2.38 Support tension rod for ventilation cover (various lenght) Art.No.: 4009099016052-57 	#2.39 Support tension rod for funnel without ventilation cover Art.No.:4009027016058-63 	#2.40 Rubber screw extraction Art.No.: 4009099015853 

#2.41 Sealing plate Art.No.:4009027016029 	#2.42 Frame for screw extraction Art.No.: 4009099015863 	

5.7.2 Metal sheets thicknesses

Consider the safety instructions (point 4) during the assembly. The modular wall cells will be delivered in individual parts on pallets. You can start with the assembly as soon as the individual parts are unpacked. Different thicknesses of the metal sheets are possible if higher silos are being set up. Because of that the metal sheets are marked with different colors. As the first step the thickest metal sheets have to be used, meaning at the bottom.

Metal sheet:	Height:	Thickness:	Acronym:
Green (two rows)	2,5m	1,25mm	GR
Blue (one row)	2,5m	1,25mm	BL
Yellow	2,5m	1,00mm	GE
Red	2,5m	0,75mm	RO
Black	1,25m	0,75mm	SW

Table 2: wall sheets under consideration of the silo height and the transverse section (left= bottom sheet, right= top sheet)

Silo-Type	Height	Height	Height	Height	Height	Height
	1,25 m	2,50 m	3,75 m	5,00 m	6,25 m	7,50 m
1,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x4,10m	SW	RO	GE SW	GE RO	GR GE SW	GR BL RO
4,10x5,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO
5,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x4,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO

5.7.3 Determination of the amount of corner struts an pull bars

Table 3: Quantitiy of corner struts and pull bars

Widt/Height in m	2,50	3,75	5,00	6,25	7,50
1x2	2	3	5	7	9
1x3	2	3	5	7	9
1x4	2	3	5	7	9
1x5	2	3	5	7	9
1x6	2	3	5	7	9
2x2	2	3	5	7	9
2x3	2	3	5	7	9
2x4	2	3	5	7	9
2x5	2	3	5	7	9
2x6	2	3	5	7	9
3x3	2	3	5	7	9
3x4	3	3	6	8	9
3x5	3	4	6	8	9
3x6	3	4	6	8	9
4x4	3	4	6	8	9
4x5	3	4	6	8	9
4x6	3	4	6	8	9

5.7.4 Mounting height of the corner struts and the pull bars

Table 4: Mounting height of the corner struts and pull bars

Cell height in m above the funnel								
2,50		3,75		5,00		6,25		7,50
Vertical quantitiy of struts								
2	3	3	4	5	6	7	8	9
Position, height in m								
1; 1,18 2; 2,43	1; 0,76 2; 1,60 3; 2,43	1; 1,18 2; 2,43 3; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68 5; 4,93	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,68 6; 4,93	1; 0,62 2; 1,18 3; 2,02 4; 2,85 5; 3,68 6; 4,93 7; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18 9; 7,43

If a funnel base is used an additional corner strut and pull bar needs to be mounted at position 0 in 0,07 m height.

5.7.5 Example

You would like to install a cell with 3x3m incl. funnel. This cell has a height of 5 m above the funnel.

Table 2 shows that the red wall sheet has to be mounted on top of the yellow wall sheet in the bottom metal sheet row.

Table 3 shows that each cell needs to be reinforced with 5 corner struts which have to be equally distributed over the height of 5 m.

The Table 4 shows, that the corner struts need to be screwed together in the following hole lines from beneath.

0,76m 1,60m 2,43m 3,68m 4,93m

Because of the funnel you need to install a corner strut for each corner in the bottom hole line in 0,07 m.

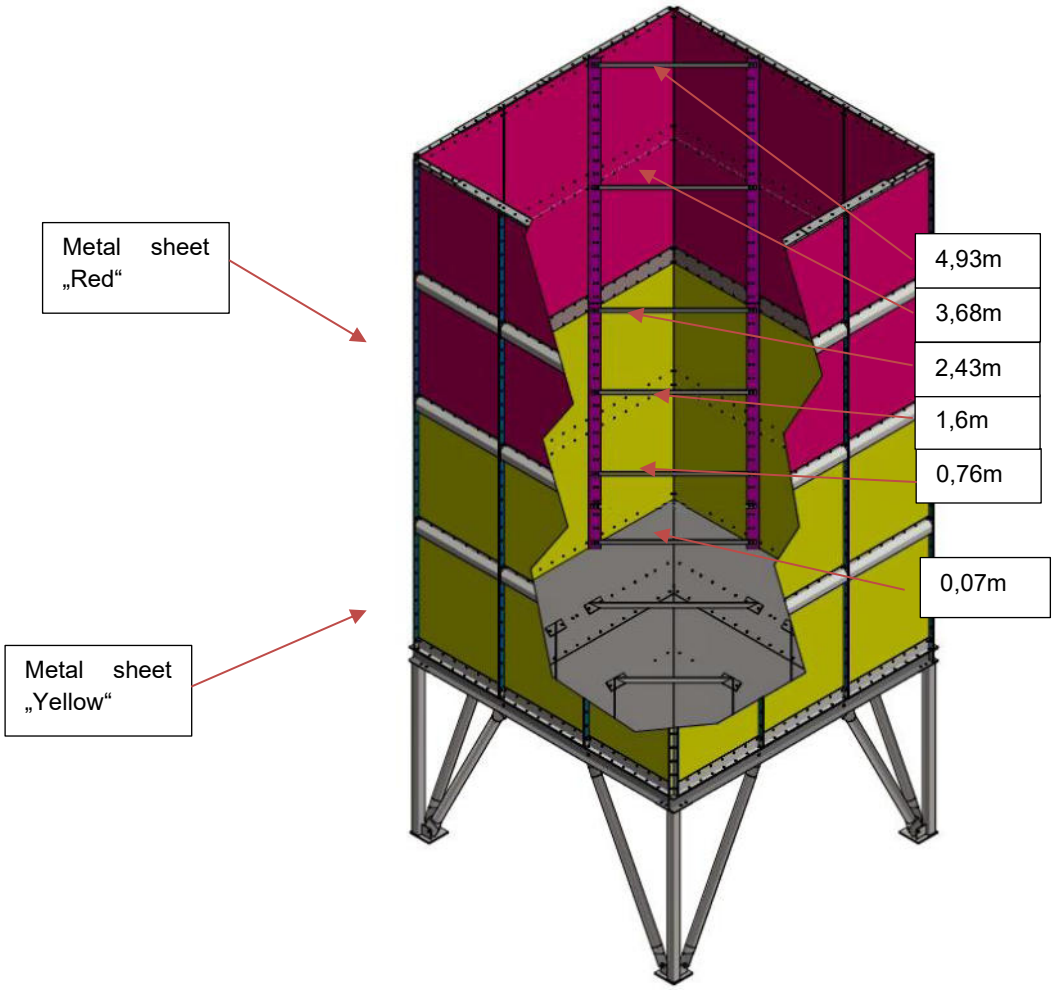
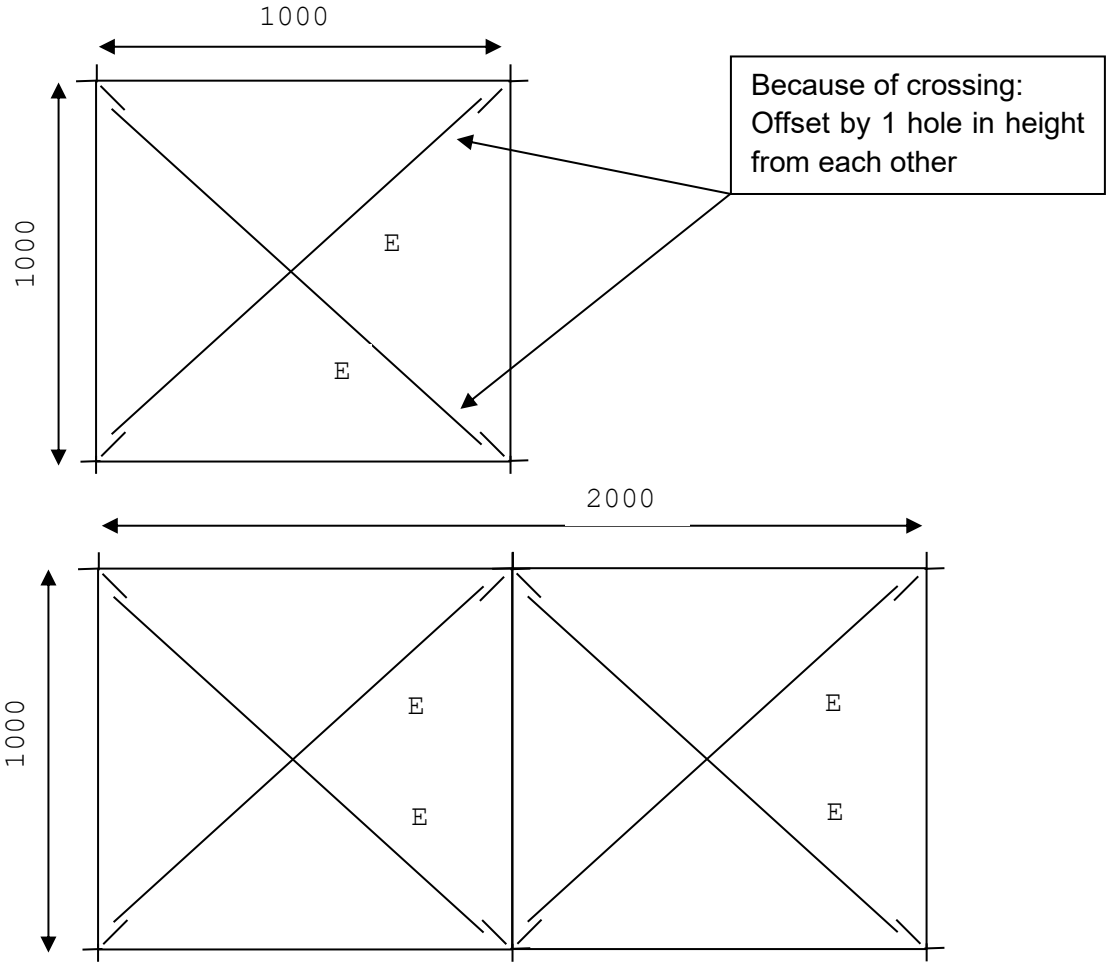


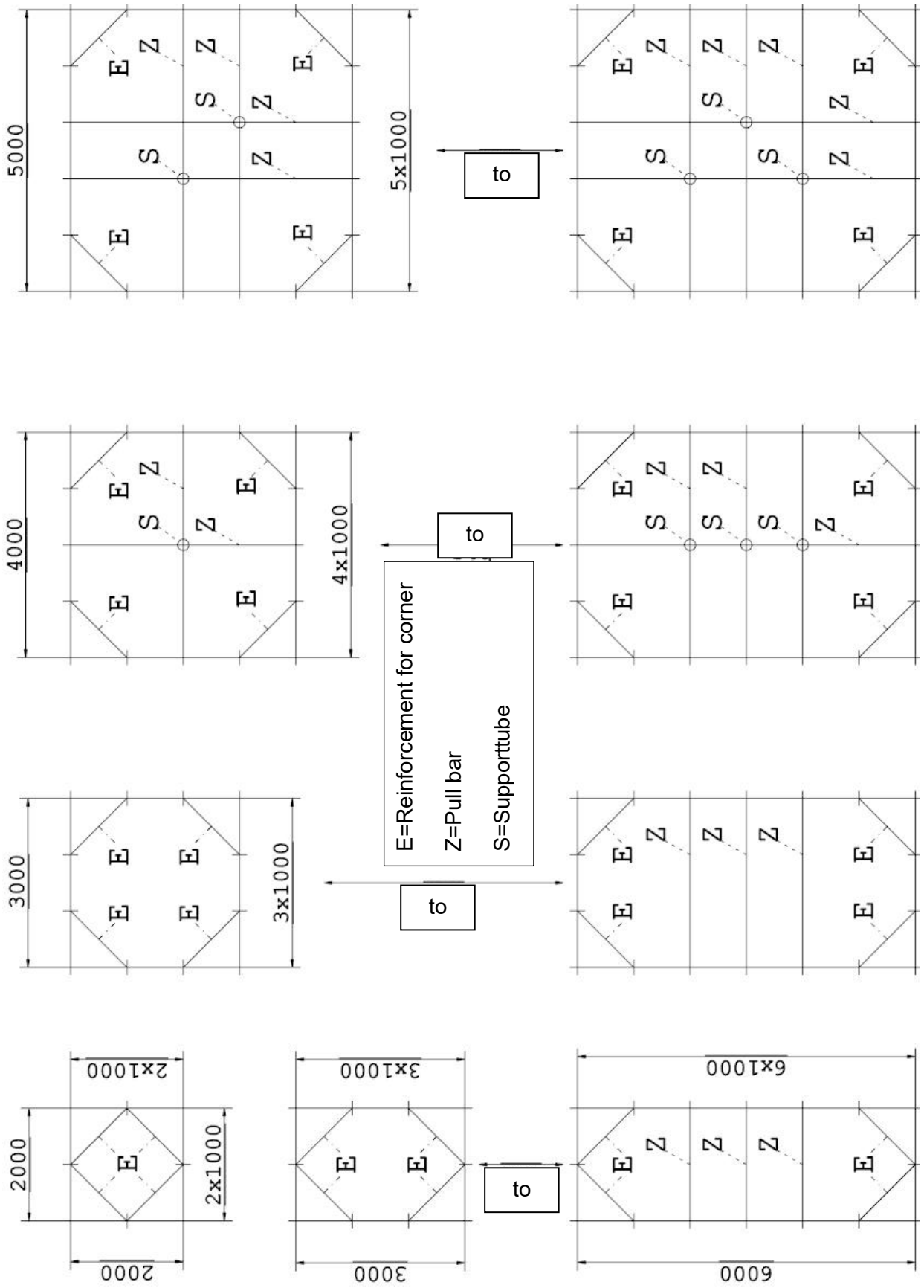
Figure 2: Example cell with funnel

Pull bars are used additional to the corner struts if the cell is bigger than 3 m in one or more directions. The Pull bars have to be placed just like the corner struts.

To prevent the pull bars from sagging because of a wider span supports are used in the middle.

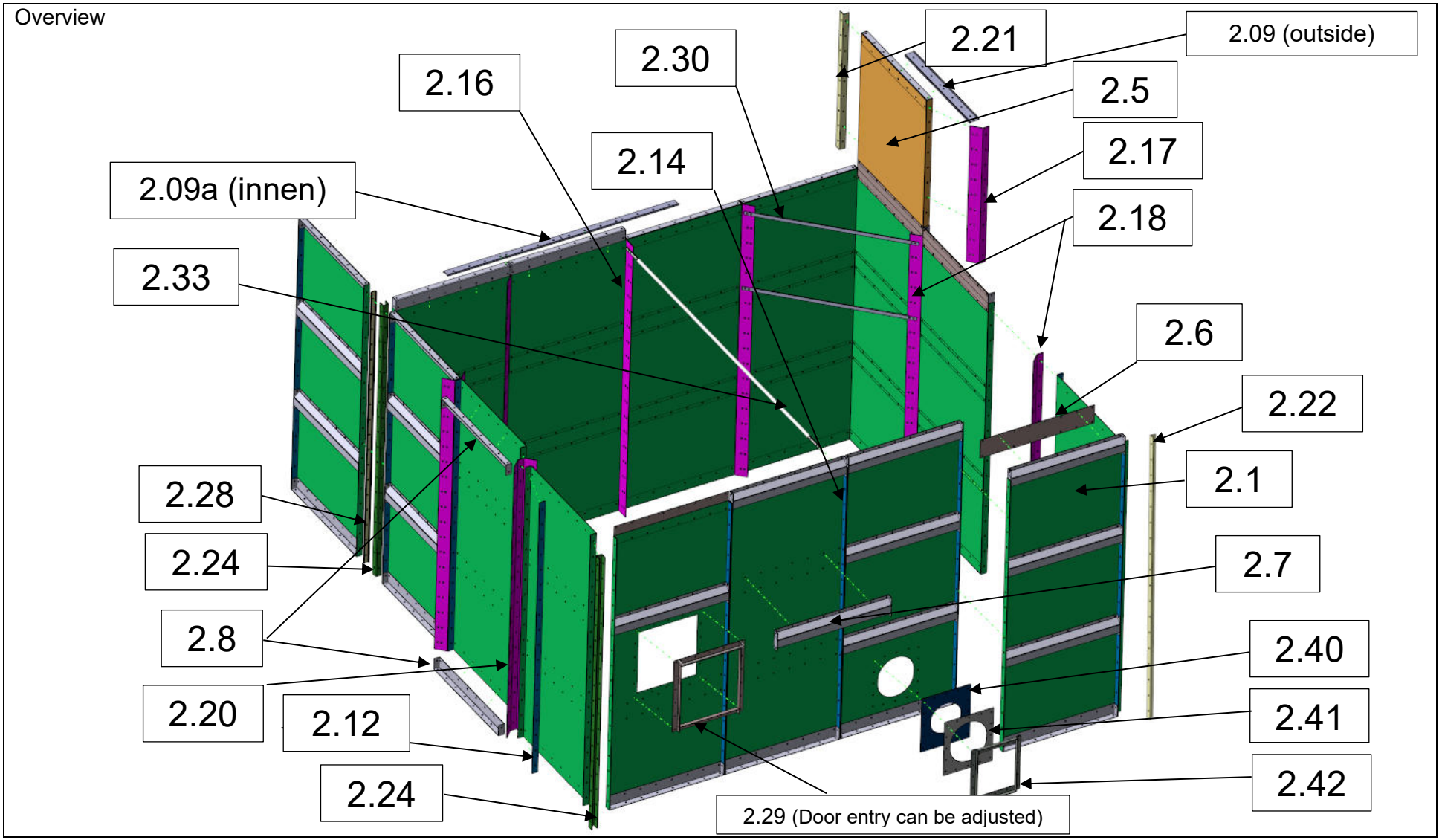
5.7.6 Corner-reinforcements and pull bars

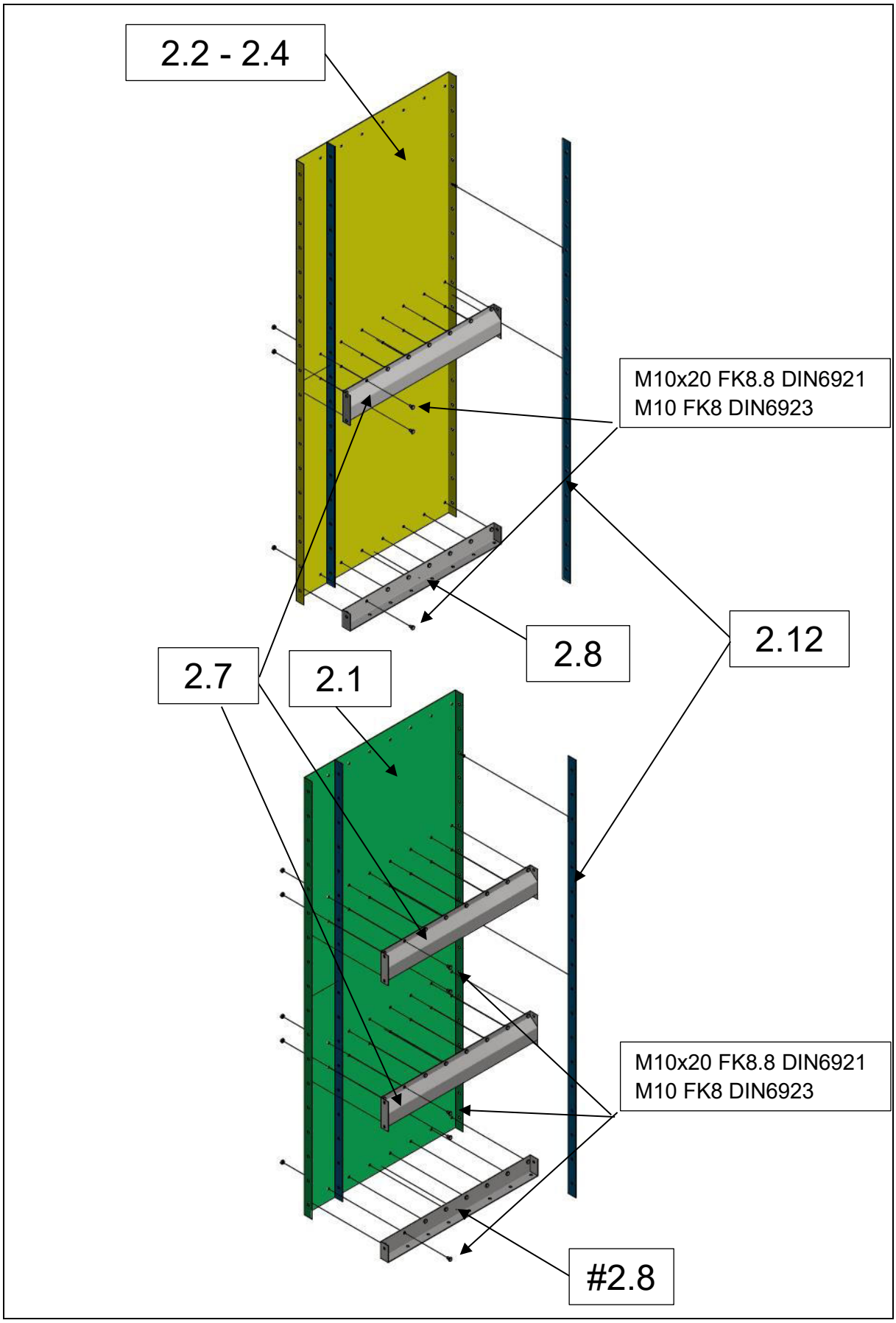



5000
5x1000
to
4000
4x1000
to
E=Reinforcement for corner
Z=Pull bar
S=Supporttube
3000
3x1000
to
2000
2x1000
3000
3x1000
6000
6x1000
to

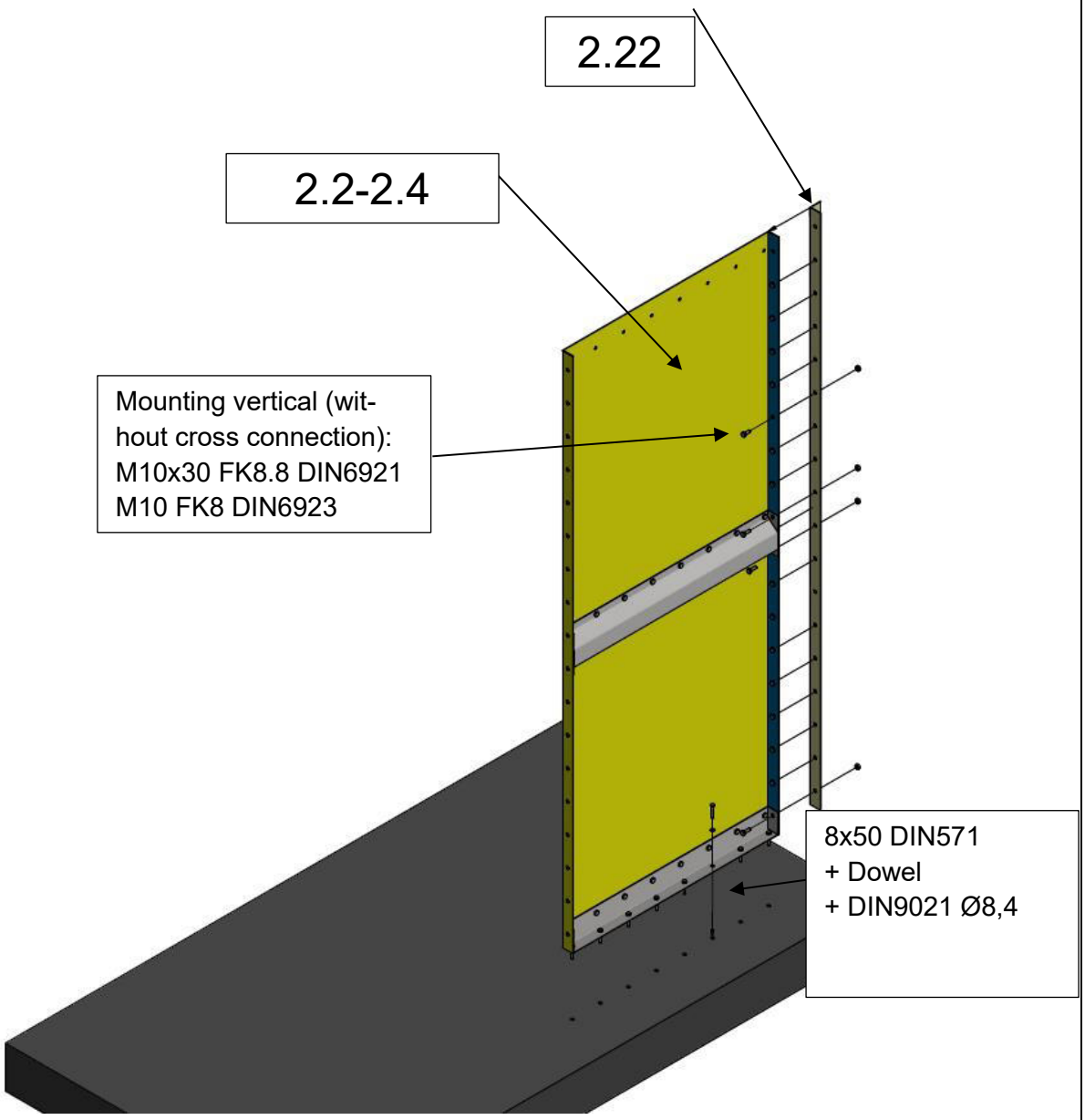
5.7.7 Mounting walls

Overview

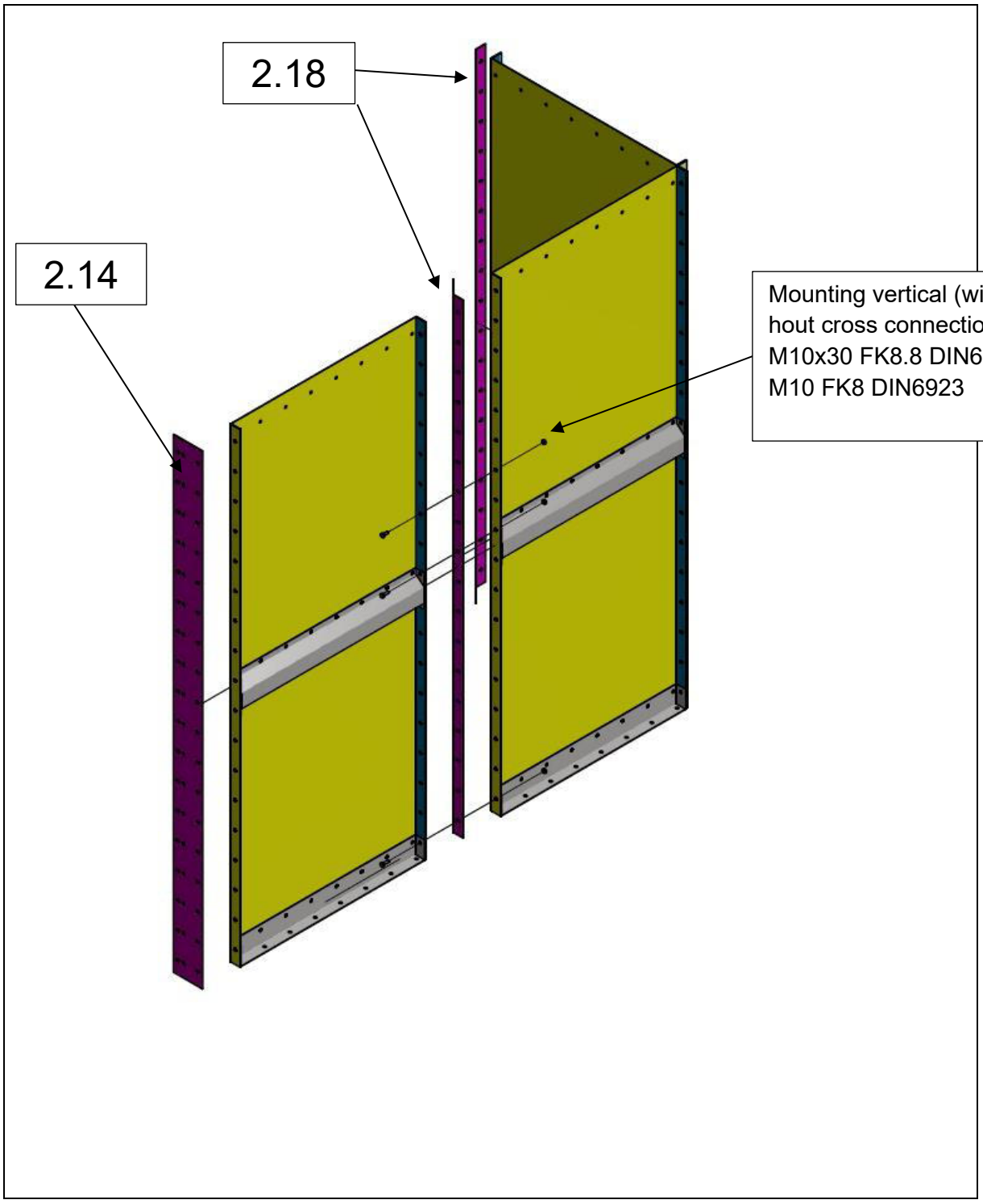

2.21
2.09 (outside)
2.30
2.16
2.5
2.14
2.17
2.09a (innen)
2.18
2.33
2.6
2.22
2.28
2.1
2.24
2.7
2.8
2.40
2.20
2.12
2.41
2.24
2.42
2.29 (Door entry can be adjusted)


2.2 - 2.4
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
2.8
2.12
2.7
2.1
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
#2.8

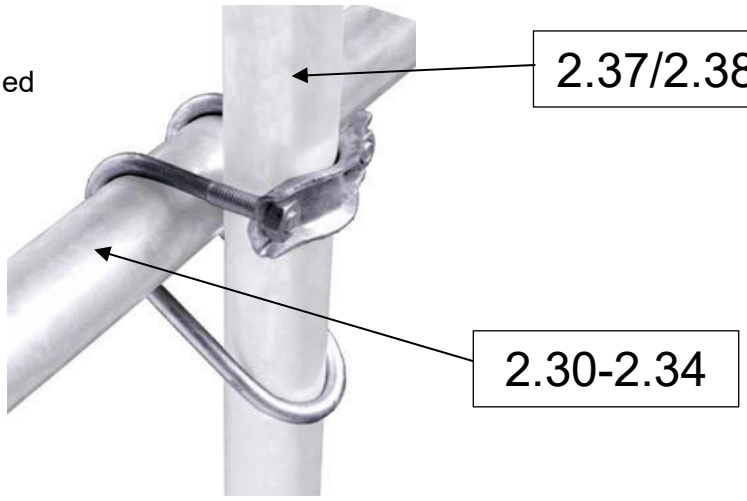
Example: Mounting without a funnel !

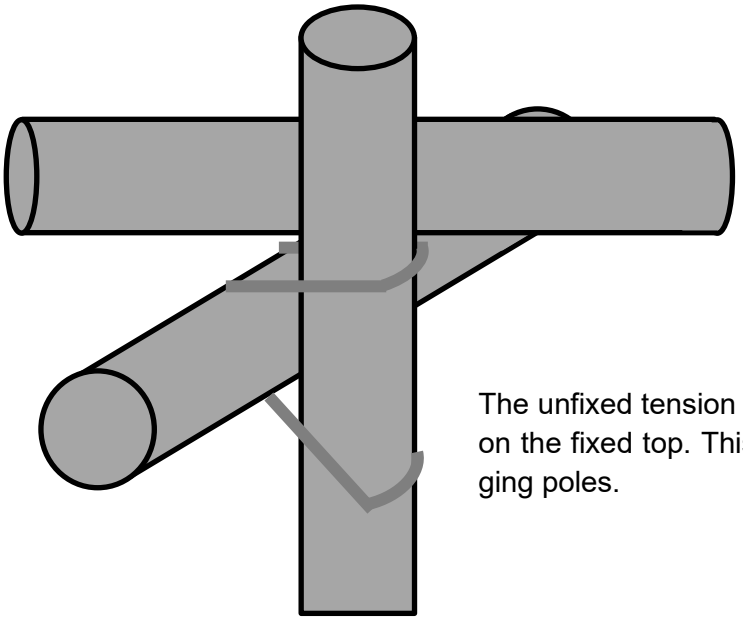


Pay attention to a vertical alignment and right-angle mounting

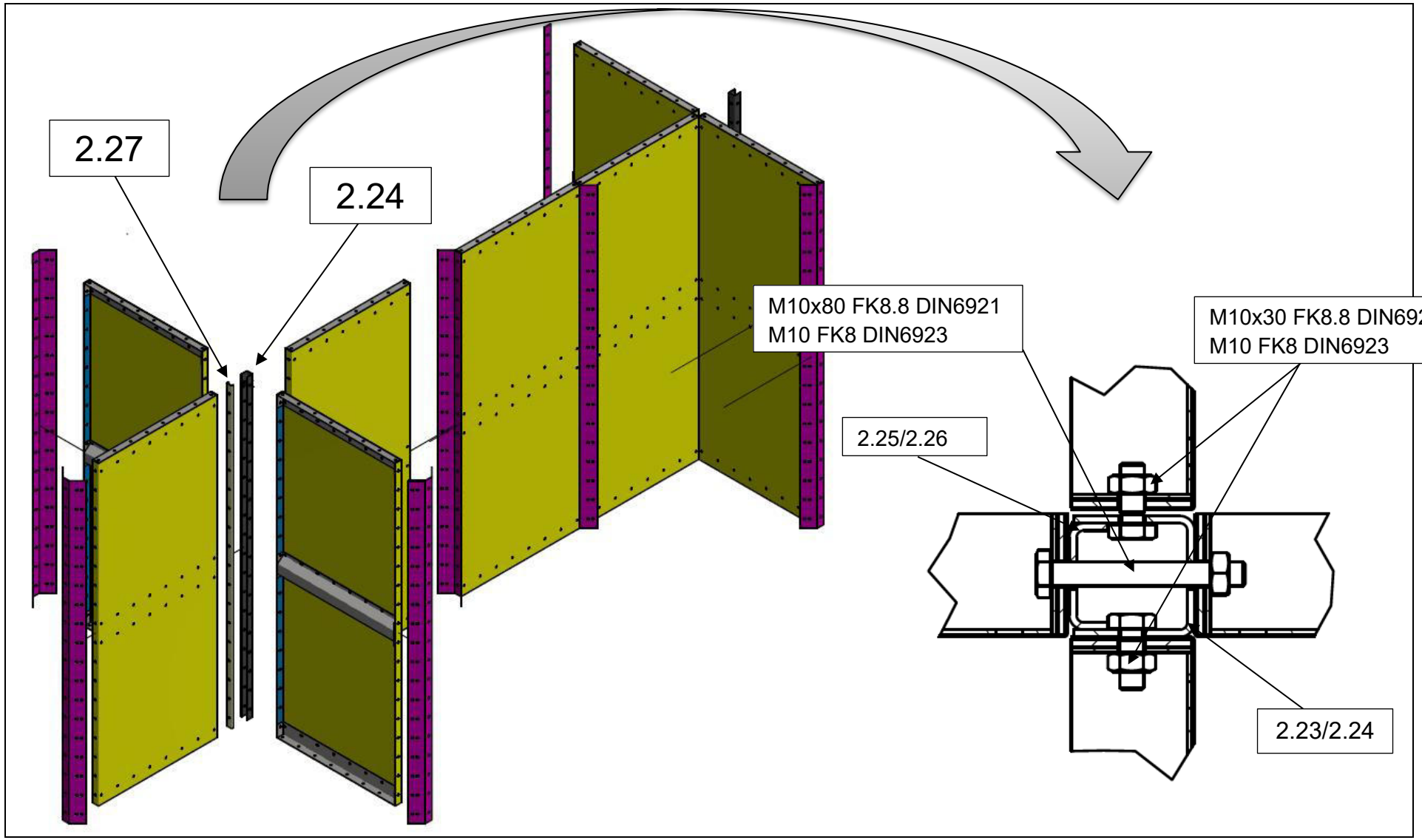

2.18
2.14
Mounting vertical (wit-
hout cross connection):
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923

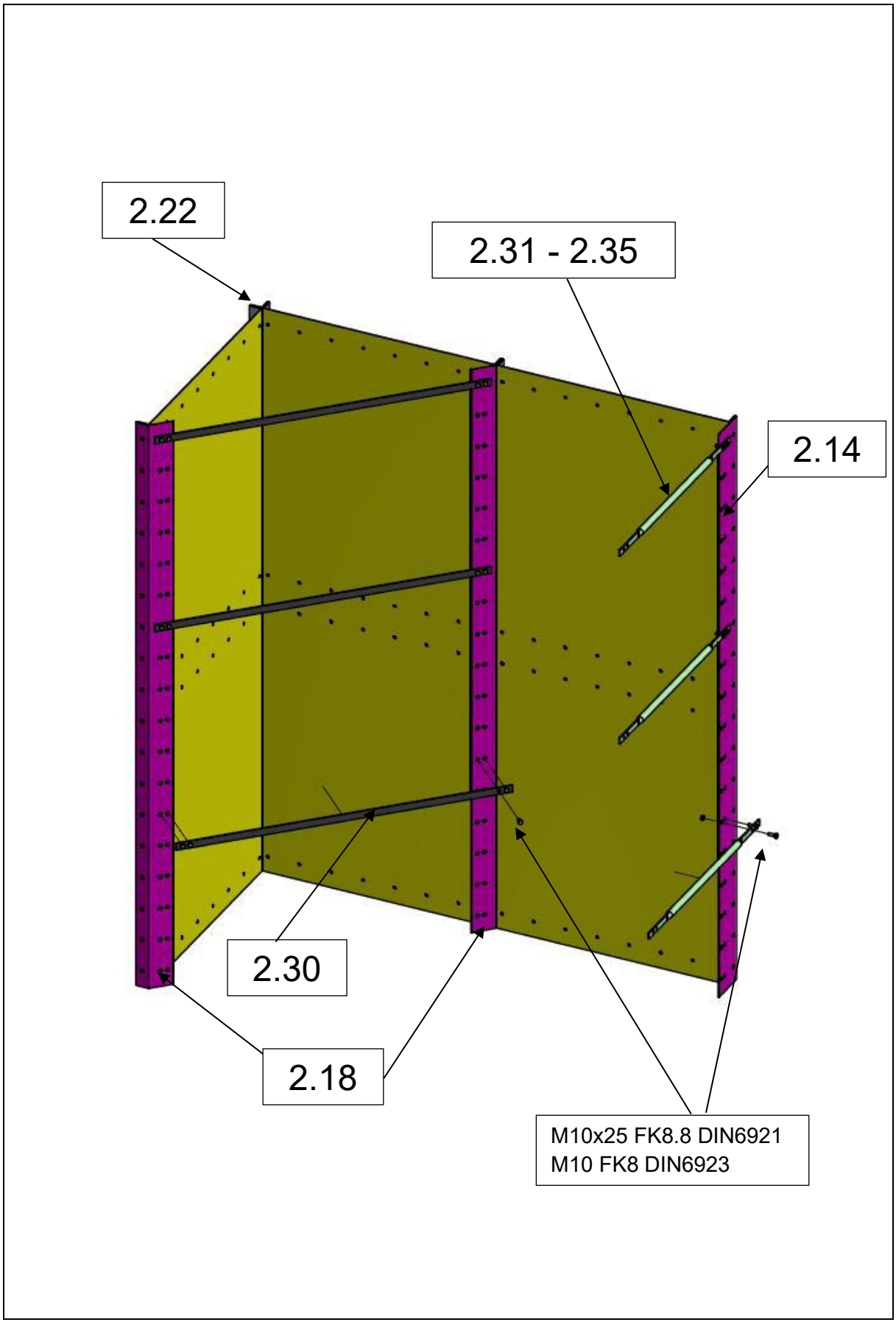
>= 4 m
Connect the tie rods
Support with one included clamp
with the tension rods

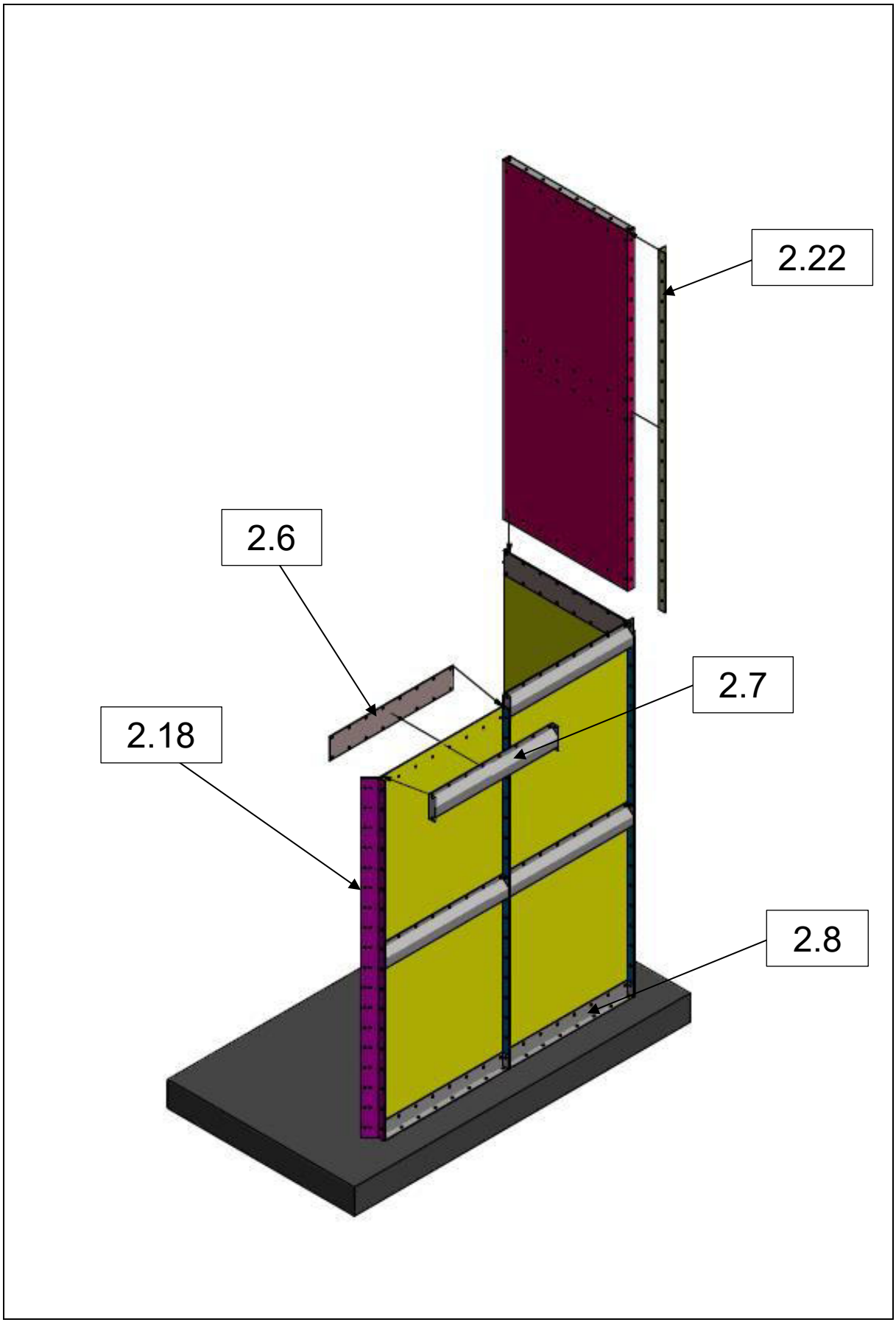




The unfixed tension rod must rest on the fixed top. This avoids sagging poles.


2.27
2.24
M10x80 FK8.8 DIN6921
M10 FK8 DIN6923
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923
2.25/2.26
2.23/2.24


2.22
2.31 - 2.35
2.14
2.30
2.18
M10x25 FK8.8 DIN6921
M10 FK8 DIN6923


2.22
2.6
2.7
2.18
2.8

5.8 Notes on the commissioning and training of the operating staff

These instructions have to be read bevor the first commissioning. Please contact your retailer in case you have any further questions regarding the commissioning.

The operating personnel has to be able to get these instructions at all times. The operating personnel also should be familiar with the general accident prevention regulations.

5.9 Operation

Make sure no one executes maintenance, repair work or cleaning work in direct proximity of hazard locations (risk of secondary accident). Also make sure the entry door is sealed from the outside after the maintenance or cleaning work is completed (safety regulations).

The filling and emptying of the modular wall cells always needs to be centric. Otherwise the silo could be damaged.

During the filling of the silo the wall sheets will be deformed, so-called buckling. This is not a reason for a complaint. The deformation will partly vanish after the emptying of the silo.

In case a joint screw is used and the cell consists of a various number of hoppers, please consider that it's not advised to let out the material from only one hopper. Instead every slider should be opened separately. Otherwise the emptying wouldn't be centric. It's not enough if all slides are open. Once the screw is filled the following funnel outlets are not able to give off material. That means an asymmetrical emptying is forbidden.

6 Maintenance and repair

Generally speaking maintenance or repair works are only possible if the silo is not being filled in that moment and if there's sufficient ventilation.

The silo can't be used in case of heavy corrosion or other flaws which could limit the intended use. The worn out parts have to be replaced.

Generally, the safety instructions have to be considered.

Only use original parts of the manufacturer.

seit 1913
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WIR MEISTERN METALL

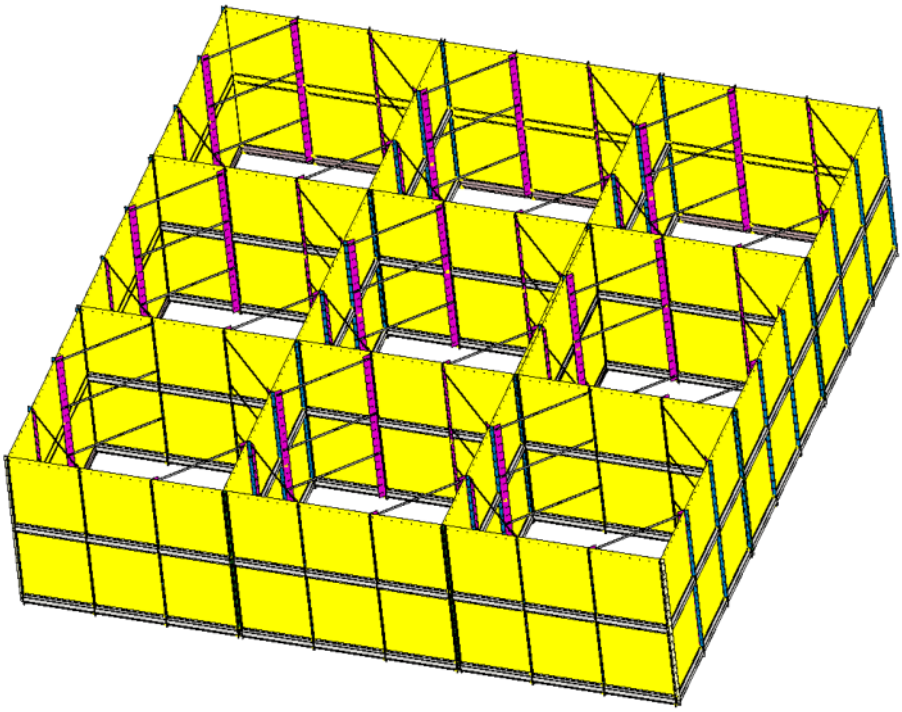
Manuel d´utilisation

Notice originale

Cellules carrées

Stockage à plat ou avec trémie

Sous réserve de modifications techniques



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Avant la mise en service,

veuillez lire attentivement ce manuel d´utilisation et prendre les compte les recommandations

1 Généralités

1.1 Préface

Ce manuel d´utilisation a été élaboré en tenant compte de la directive européenne relative aux machines en Europe (06/42/EG) afin de faciliter la mise en service. Ce manuel d´utilisation contient des remarques importantes pour utiliser le produit correctement et en toute sécurité.

Le manuel d´utilisation doit toujours se trouver près du produit concerné.

Le manuel d´utilisation doit pouvoir être lu et utilisé par toute personne responsable du fonctionnement et de la manutention (maintenance, inspection, réparation).

Le manuel d´utilisation doit toujours être transmis au propriétaire ou utilisateur suivant.

En plus du matériel d´utilisation et des règles associées pour prévention des accidents comme « les prescriptions en matière de santé et de sécurité des syndicats professionnels agricoles », il est également nécessaire de porter attention aux règles techniques spécialisées pour la sécurité et à la précision technique du travail.

Ce manuel d´utilisation reste la propriété intellectuelle de la Société Schmelzer et ne doit aucunement être copié ou multiplié sans une autorisation écrite.

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1.2 Signification des symboles

	Chaussures de sécurité obligatoires
	Lunettes de protection obligatoires
	Porter des protections auditives
	Respecter les consignes d´utilisation
	Casque de protection obligatoire
	Signalisation d´un danger
	Danger matières toxiques
	Danger objet très pointu
	Danger obstacles au niveau de la tête
	Risque de glissade

2 Description de l´installation

2.1 Désignation

Les cellules carrées permettent le stockage de céréales (blé, seigle, orge, avoine, mais) dans des bâtiments couverts. Il est également possible de monter, en option, un système de ventilation afin de ventiler la matière.

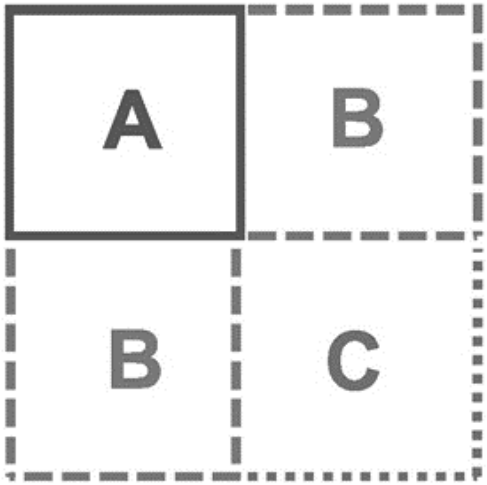
2.2 Description générale

Les cellules carrées sont conçues exclusivement pour une installation à l´intérieur d´un bâtiment et doivent être protégées contre l´infiltration d´humidité extérieure et le vent. Il est également nécessaire de vérifier la charge admissible des sols ; dans le cas où elle ne serait pas suffisante il serait nécessaire de prendre les mesures préventives en conséquence, afin d´assurer une stabilité suffisante des silos. Il est également nécessaire de vérifier que l´installation est placée de façon précise et perpendiculaire. Les cellules sont livrables individuellement et peuvent être adaptées aux éléments existants, étant donné qu´il s´agit d´un système modulaire. Par conséquent chaque place disponible peut être utilisée de façon optimale dans un bâtiment. La plus petite cellule mesure 1,10 m x 1,10 m. La cellule peut mesurer jusque 5,10 m x 6,10 m par tranches de 1m. Les châssis standards disponibles mesurent 2,10 m x 2,10 m, 2,10 m x 3,10 m, 3,10 m x 3,10 m. Des dimensions spécifiques sont possibles sur demande. Les hauteurs de construction possibles sont de 1,25 m à 7,50 m par tranches de 1,25 m. (en option tranches réductibles de 139 mm).

Les cellules silos sont composées de plaques en tôle qui sont assemblées pour former les murs. En fonction de la taille des cellules, des renforts supplémentaires seront nécessaires, voir les explications de montage ci-dessous. Les murs des silos peuvent être disposés directement sur le sol béton ou bien montés sur un châssis avec socle (optionnel).

Les murs en tôle ne sont pas rigides, c´est à dire qu´ils peuvent se déformer légèrement lors du remplissage et de la vidange.

Il est possible d´aligner plusieurs cellules côte à côte, c´est pourquoi il existe des cellules type A-, B- et C- (voir représentation 1). Une cellule A a 4 parois, une cellule B a 3 parois et une cellule C n´a plus que 2 parois. Les parties des murs extérieurs deviennent ainsi des murs intérieurs. Dans le cas d´installations avec châssis il existe le même type de groupes de construction.



Représentation 1

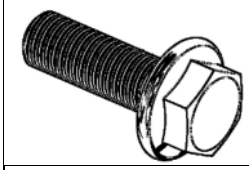
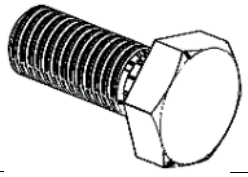
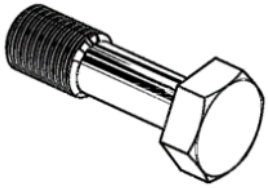
2.3 Données techniques

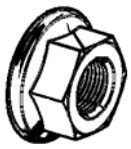
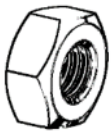
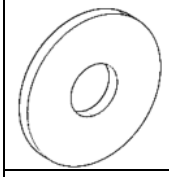
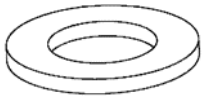
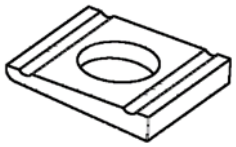
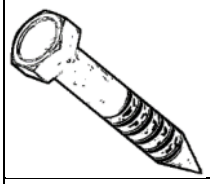
2.3.1 Livraison

Les pièces doivent être vérifiées **avec la liste des pièces jointe**, afin de pouvoir planifier et organiser la construction et d´éviter les réclamations futures.

Ci-joint, vous trouverez un aperçu général des vis et des accessoires utilisés.

Tableau 1: Aperçu des éléments de fixation

Exemple d'illustration	Norme
	Vis avec rondelle intégrée- DIN 6921
	Vis à tête hexagonale DIN 933
	Vis à tête hexagonale avec tige DIN 931

	Écrou hexagonal avec rondelle intégrée DIN 6923
	Écrou hexagonal DIN 934
	Rondelle 3x diamètre extérieur DIN 9021
	Rondelle DIN 125
	Rondelle de calage DIN 434 (Article 3019055)
	Vis à béton (Article 3022058)
	Vis DIN 571

2.3.2 Conditions environnementales

Stocker dans un endroit sec et non agressif ou corrosif. Ne pas empiler ni superposer les palettes.

Conditions de fonctionnement : Température : -20…50°C

Pression : pression atmosphérique habituelle

3 Utilisation adéquate

3.1 Utilisation conforme

Les cellules carrées servent au stockage des céréales et des produits en vrac secs qui peuvent s´écouler et qui ont tous les mêmes propriétés : Densité apparente maximale = 7,5 $\frac{kN}{m^3}$ ou masse volumique maximale 750 $\frac{kg}{m^3}$ et angle de talutage = 30 °. Les masses volumiques différentes et les hauteurs de construction et sections qui en résultent doivent faire l'objet d'une étude séparée.

Les cellules carrées sont uniquement concues pour être disposées à l´intérieur d´un batiment et doivent être suffisamment protégées de l´humidité , de la neige, de glace et du vent.

Toute autre utilisation est considérée comme non conforme. Dans ce cas, le fabricant n´aurait aucune responsabilité dans le cas de dommages éventuels. L´utilisateur en prend le risque.

Les produits en vrac cohésifs et ayant tendance à former des ponts ne doivent pas être stockés.

Ce silo de stockage est uniquement conçu pour le remplissage et la vidange centrée.

Pour les convoyeurs de prélèvement et de remplissage installés, il convient de respecter les instructions d'utilisation de ces convoyeurs.

La fixation des piliers au sol doit être effectuée en respectant les données de la société ayant coulé les fondations/de la dalle de plancher.

Les silos peuvent facilement être endommagés à cause d´une action mécanique extérieure. Dans le cas où les silos seraient construits en bordure de voie d´accès, il est nécessaire de prévoir une protection anti-collision conséquente.

Il est interdit de rentrer dans des silos complètement ou partiellement remplis. Si le silo est vide, des mesures de protection adaptées doivent être respectées, ainsi que pour assurer un remplissage suffisant. Voir les recommandations de sécurité et mesures de protection de la santé des organismes professionnels.

Les transformations sur le produit ne sont pas autorisées.

3.2 Messages d´avertissement lors d´une mauvaise utilisation.

Lors du nettoyage il faut veiller à une ventilation suffisante avant de pénétrer dans une cellule vide. Risque de suffocation.

Il est toujours nécessaire de respecter les mesures de sécurité afin d´éviter les blessures et coupures.

Lors de la maintenance en dessous des cellules ou à l´intérieur, faire attention aux obstacles au niveau de la tête.

A l´intérieur des cellules, il existe toujours un risque de glissade élevé, c´est pourquoi il est toujours nécessaire de porter des chaussures de sécurité adaptées.

4 Consignes de sécurité

4.1 Stabilité

Lorsque la cellule est complètement montée, la stabilité est assurée. Lors du montage il faut particulièrement s´assurer que les pièces ne peuvent se décrocher et tomber. Le sol ne doit comporter ni bosse ou surface inégale, ni aucune pente. Cela pourrait engendrer une déformation ou même un écroulement des silos. Si le

sol n´est pas droit, il est absolument nécessaire de corriger les écarts avec des calles/plaques adaptées ou avec un matériel de calage approprié similaire.

Comme le fonctionnement de l´installation nécessite une prise de charge dans le sol, il est nécessaire d´avoir une construction suffisante en béton armé, c´est à dire que la résistance du béton, l´épaisseur de la dalle et l´armature doivent être dimensionnées en conséquence. Si vous ne disposez pas de ces informations, celles-ci sont à votre disposition chez le fabricant.

Les vis et boulons doivent être complètement vissés et verrouillé à l´aide des moyens de fixation mis à votre disposition. Utilisez si nécessaire des rondelles pour compenser les inégalités du sol.

Nous vous recommandons fermement de consacrer suffisamment de temps à la préparation du sol. Les conséquences d´une mauvaise préparation du sol et d´un plancher avec des inégalités pourraient entrainer une inclination du silo et déformer les parois en tôle.

4.2 Les mesures de sécurité à respecter

Le port de chaussures de sécurité et de gants de protection est particulièrement nécessaire lors du montage de l´installation. Lors de de l´élévation des pièces au-dessus du niveau de la tête, le port d´un casque adapté est absolument nécessaire.

Par ailleurs, il est absolument nécessaire de porter des lunettes et protections oculaires adaptées en raison de la poussière et du bruit occasionné lors du montage.

4.3 Remarques de sécurité relatives au transport, au déplacement et au stockage

Pour toutes les opérations de transport, levage et de poussage il est nécessaire de respecter les mesures de sécurité adéquates. A cela s´ajoute le fait que seuls les engins de levage certifiés et adaptés peuvent être utilisés.

- Il est généralement interdit de rester sous une charge en suspens.
- Utiliser des engins de levage qui ont suffisamment de capacité de levage
- Le cas échéant contracter une assurance pour le transport.
- S´assurer contre le risque de glissement
- Respecter les directives en matière de protection des accidents.

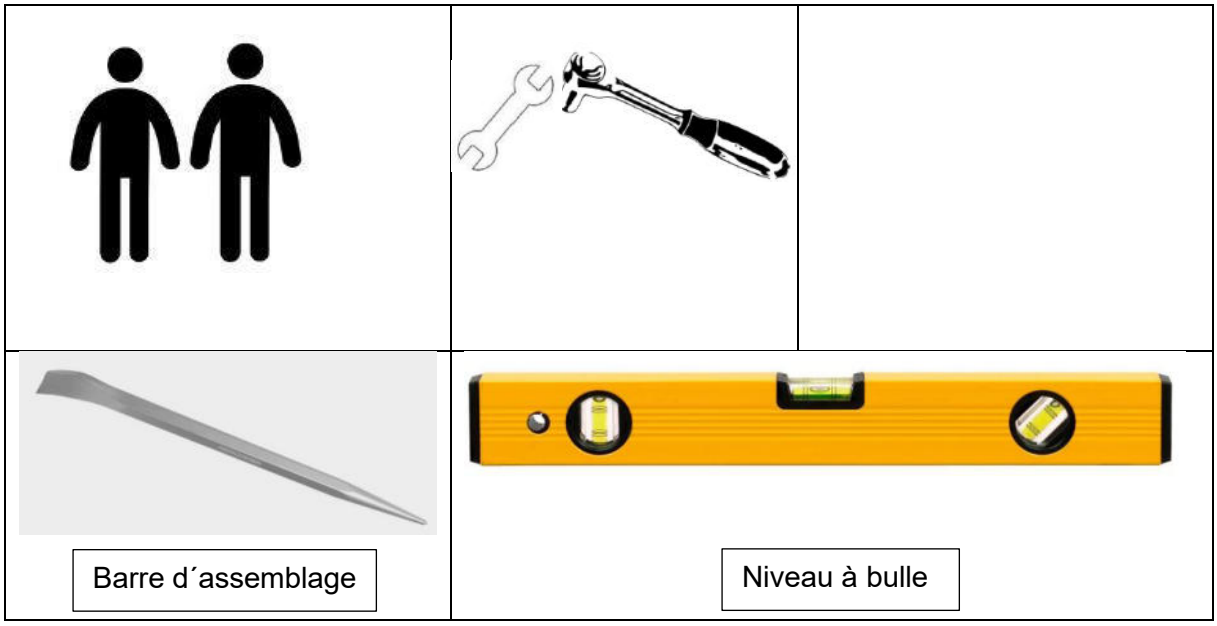
En raison du risque de chute des personnes, les mesures de sécurité comme les ceintures ou les plateformes élévatrices doivent être utilisées et les directives et règles particulières doivent être respectées

4.4 Prévention des troubles et accidents

Lors d´anomalies et de dérangements, il faut immédiatement arrêter le travail.

Dans les cas indiqués précédemment, remédier si possible au dérangement ou au défaut ou le cas échéant contacter le responsable / spécialiste de l´entreprise.

5 Montage



	Toutes les vis doivent être resserrées fermement « à la main » après le montage. Ceci est une obligation. Extrait selon DIN EN1090-2 8.3: „Avec le terme „à la main“ il faut comprendre qu´une personne avec un tournevis de taille normale sans rallonge doit pouvoir y parvenir. Il peut également être le point de fonctionnement avant que la visseuse ne commence à marteler.“

5.1 Le niveau du sol

Les cellules carrées doivent être montées perpendiculairement. Vous pouvez contrôler le niveau à l´aide d´un fil à plomb ou d´un tout autre moyen adapté (niveau, laser lignes croisées, niveau à eau).

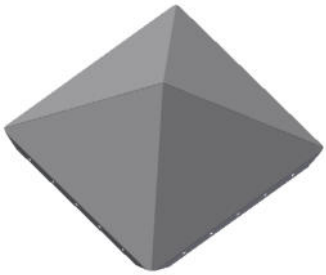
Le plan de disposition correspondant sera toujours transmis avec le type de silo livré. Si vous avez des doutes, n´hésitez pas à contacter votre fournisseur.

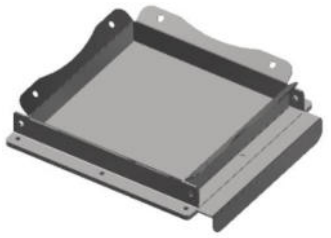
Si vous devez égaliser le niveau du sol, veuillez utiliser des rondelles appropriées.

5.2 Chassis optionnel 2x2

5.2.1 Liste des pièces

#1 Pieds L pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 Nouvel art. 2007775 Pieds en L réduits 1,5m Art.Nr.:4009092015908 Nouvel art. 4000466 	#2 Pieds T pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 Nouvel art. 2007778 Pieds en T réduits 1,5m Art.Nr.:4009092015909 Nouvel art. 4000467 	#3 Pieds X pour 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814 Nouvel art. 4000520 Pieds en X réduits 1,5m Art.Nr.:4009092015910 Nouvel art. 4000468
#4 U140 - l=1995 ArtNr.: 4009092015804 Nouvel art. 4000511 L=1995 	#5 U140 - l=2055 ArtNr.: 4009092015805 Nouvel art. 2007773 L=2055 mm 	#6 Contrefort 60,3x4 pour chassis 2x2+3x3 ArtNr.:4009092015810 Nouvel art. 1001827 Contrefort réduit pour pied 1,5m ArtNr.:4009092015911 Nouvel art. 1001695

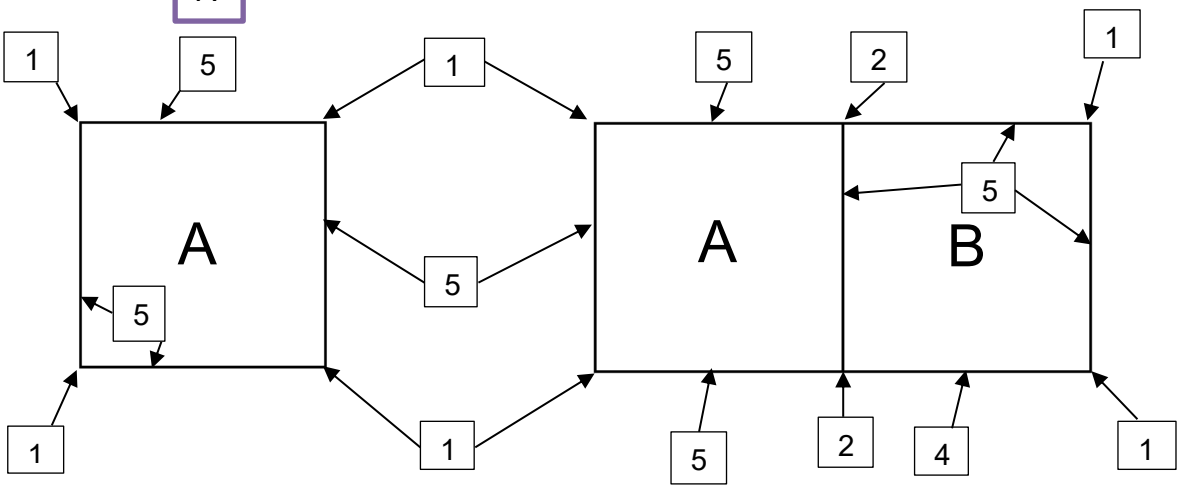
#7 Renforcement extérieur 2x2m 40° ArtNr.: 4009092015833 Nouvel art. 1001656 	#8 Renforcement extérieur gauche 40° ArtNr.: 4009092015823 Nouvel art. 1001646 	#9 Renforcement extérieur droit 40° ArtNr.: 4009092015824 Nouvel art. 1001647
#10 Renforcement intérieur pour 2x2m 40° ArtNr.:4009092015877 Nouvel art. 2007745 	#11 (Optionnel) Hotte de ventilation pour chassis 2x2 40° ArtNr.: 4009092015912 Nouvel art. 1001696 	#12 (Optionnel) Tube de ventilation diamètre 300 ArtNr.: 4009003016990 Nouvel art. 1002175
#13 Tôle du châssis 2x2m 40° ArtNr.: 4009092015855 Nouvel art. 1001676 	#14 (option, seulement si #12 installé) Tôle du châssis 2x2m 40° ventilation ArtNr.: 4009092015856 Nouvel art. 1001677 	#15 Renfort en tôle pour le châssis 2x2m 40° ArtNr.: 4009092015850 Nouvel art. 1001671

#16 Sortie avec vanne 300x300 Art.Nr.: 4009092015820 Nouvel art. 1001828 Transitions sur 150,200,250 4009023015782, 783, 784 		

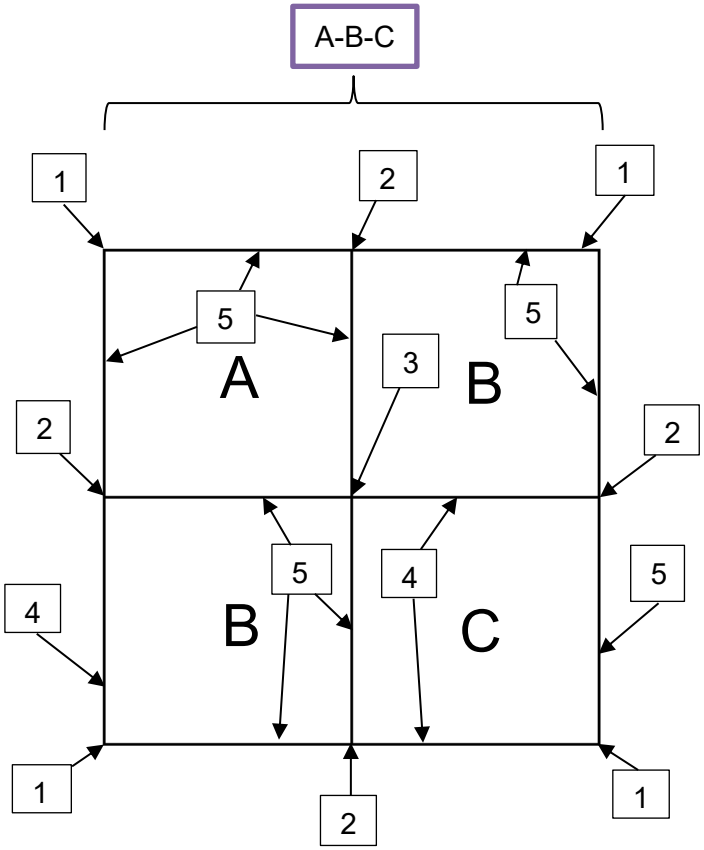
Variantes de disposition A, A-B, A-B-C

A

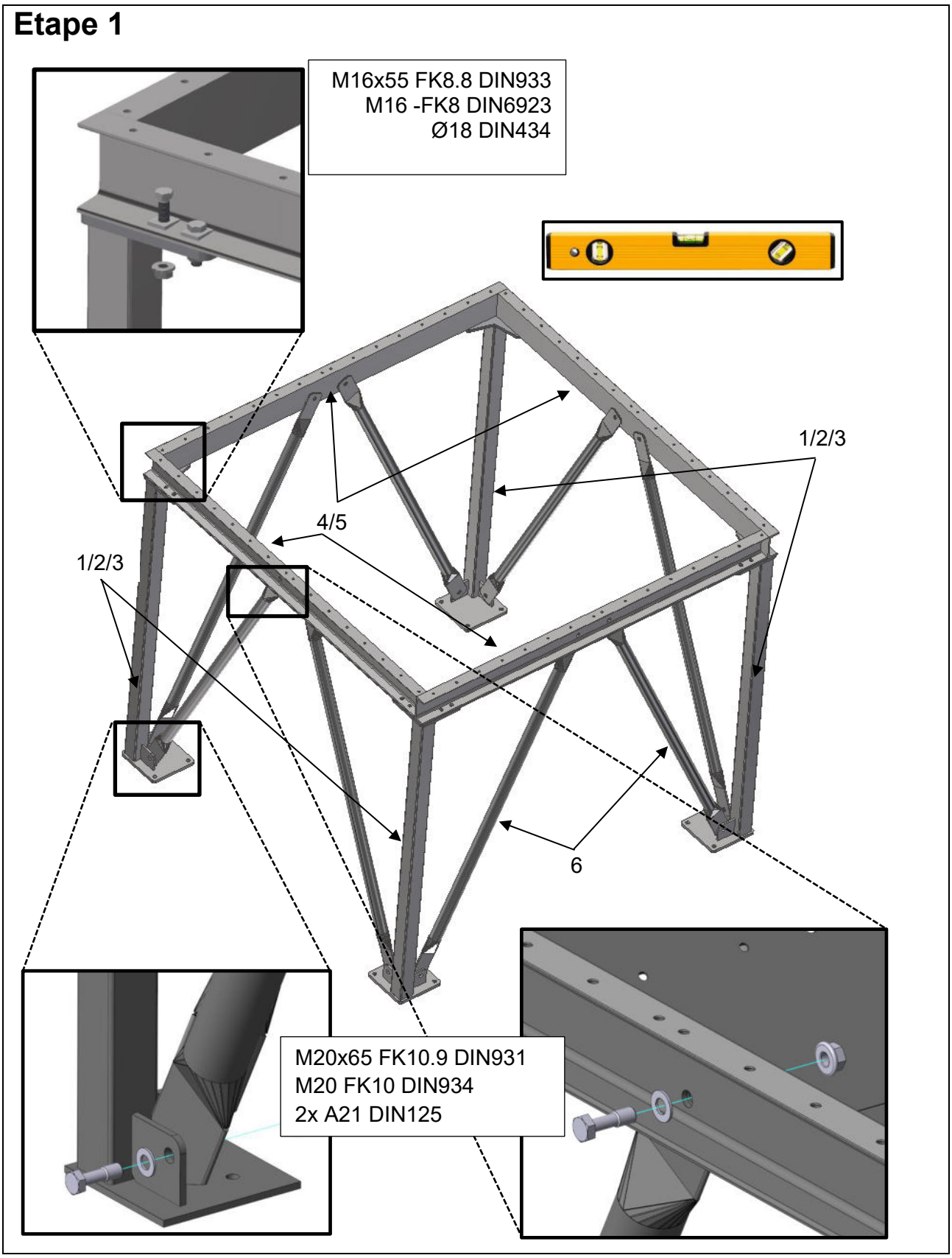
A-B



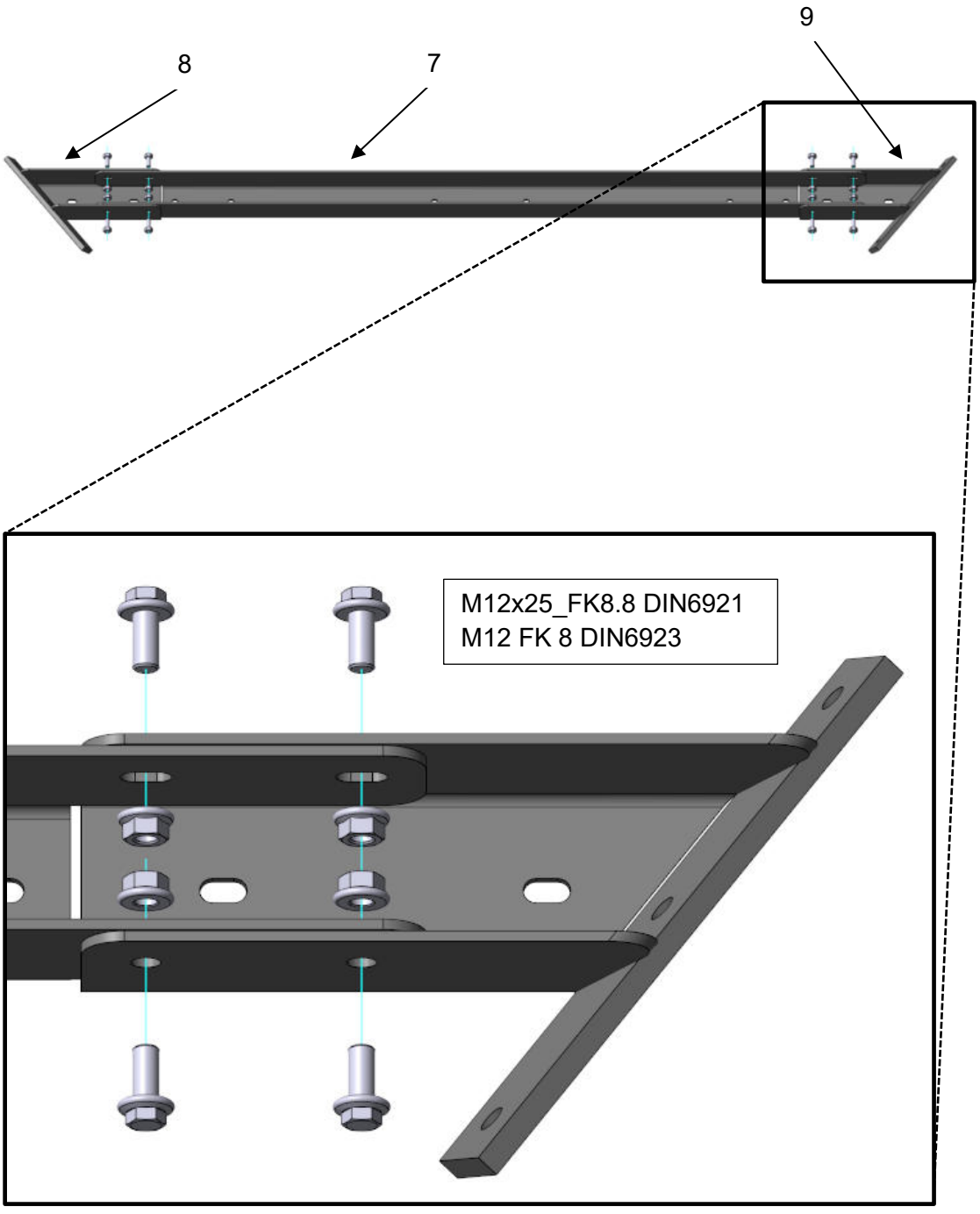
A-B-C



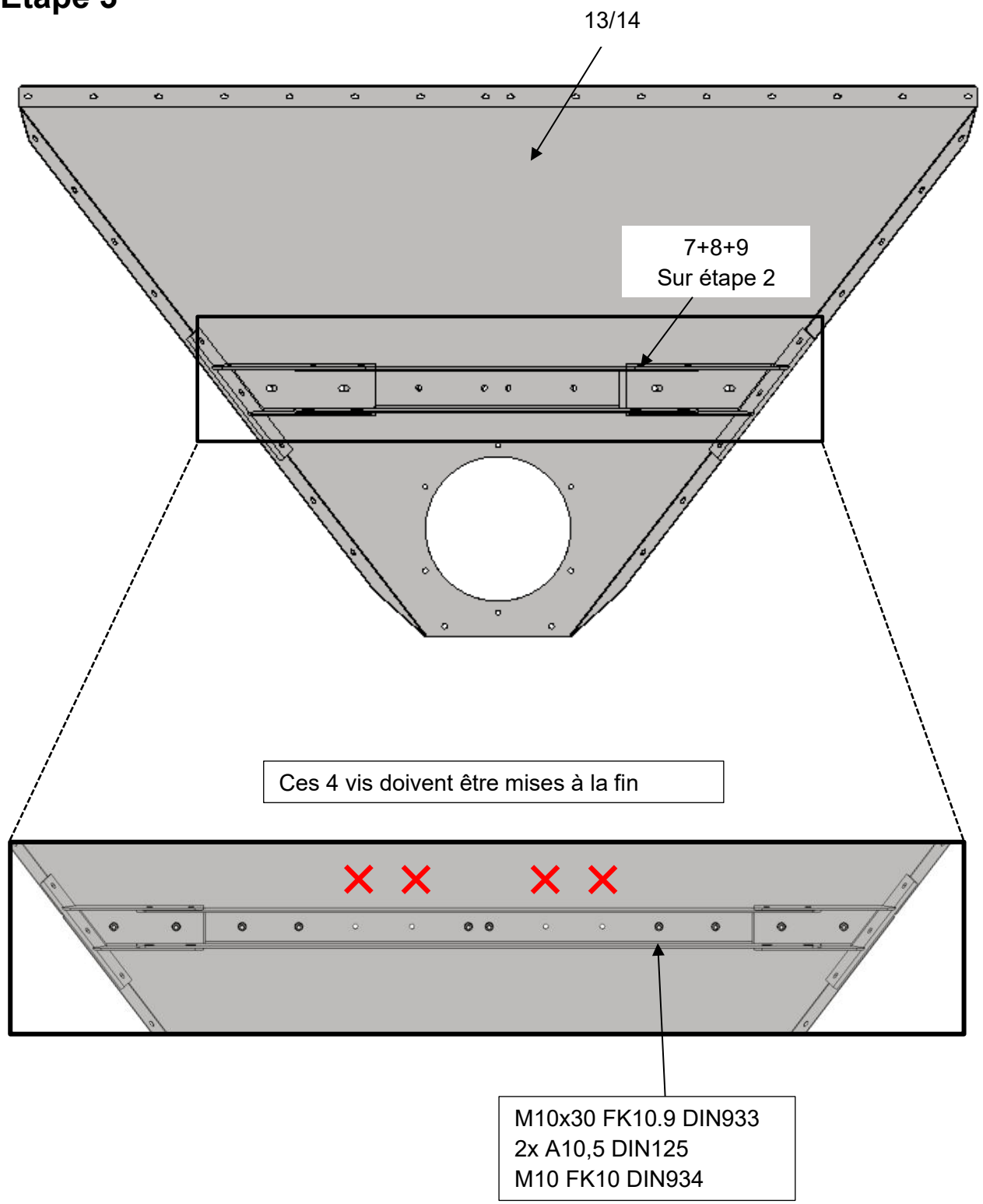
5.2.2 Montage du chassis 2x2



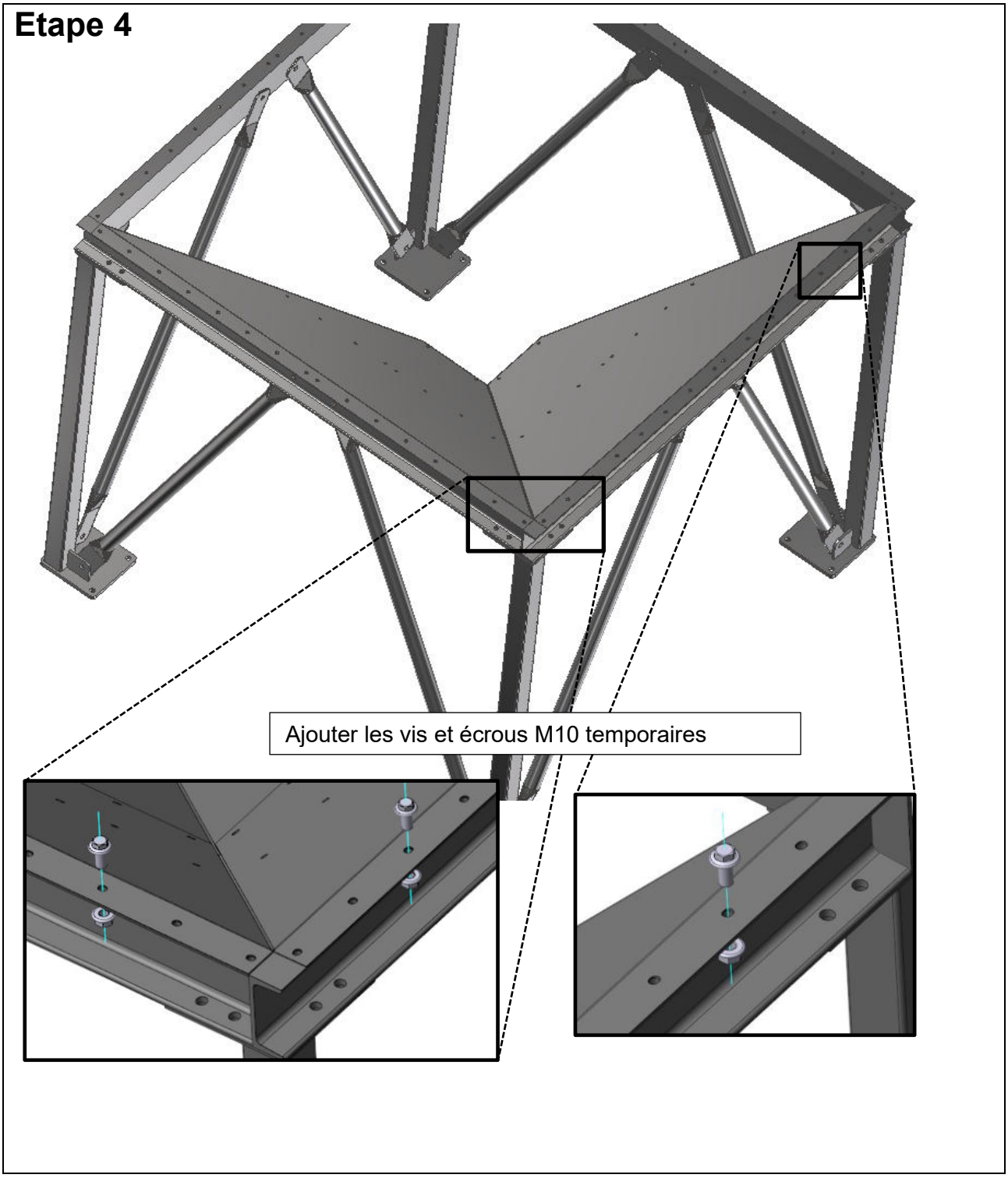
Etape 2



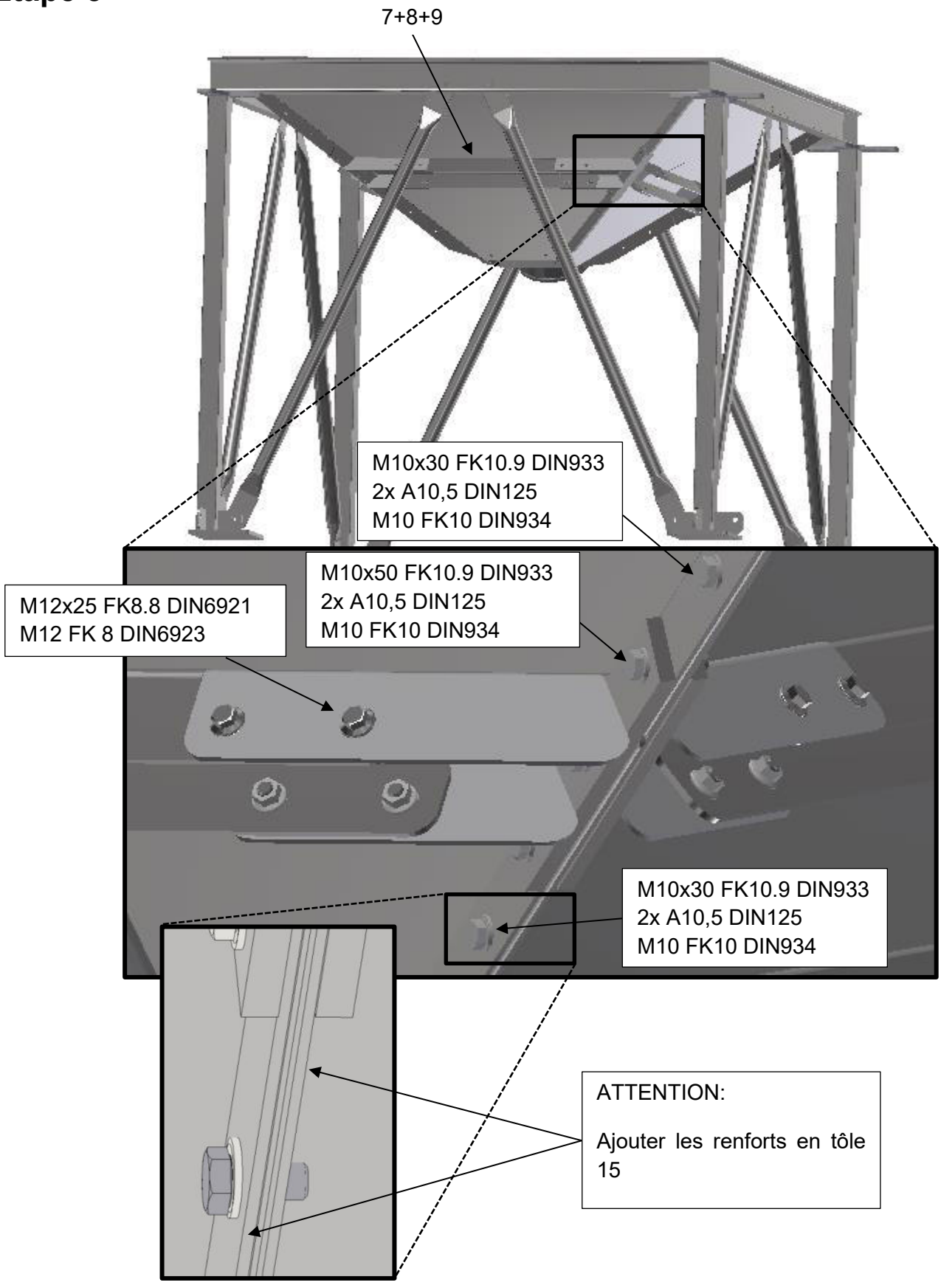
Etape 3

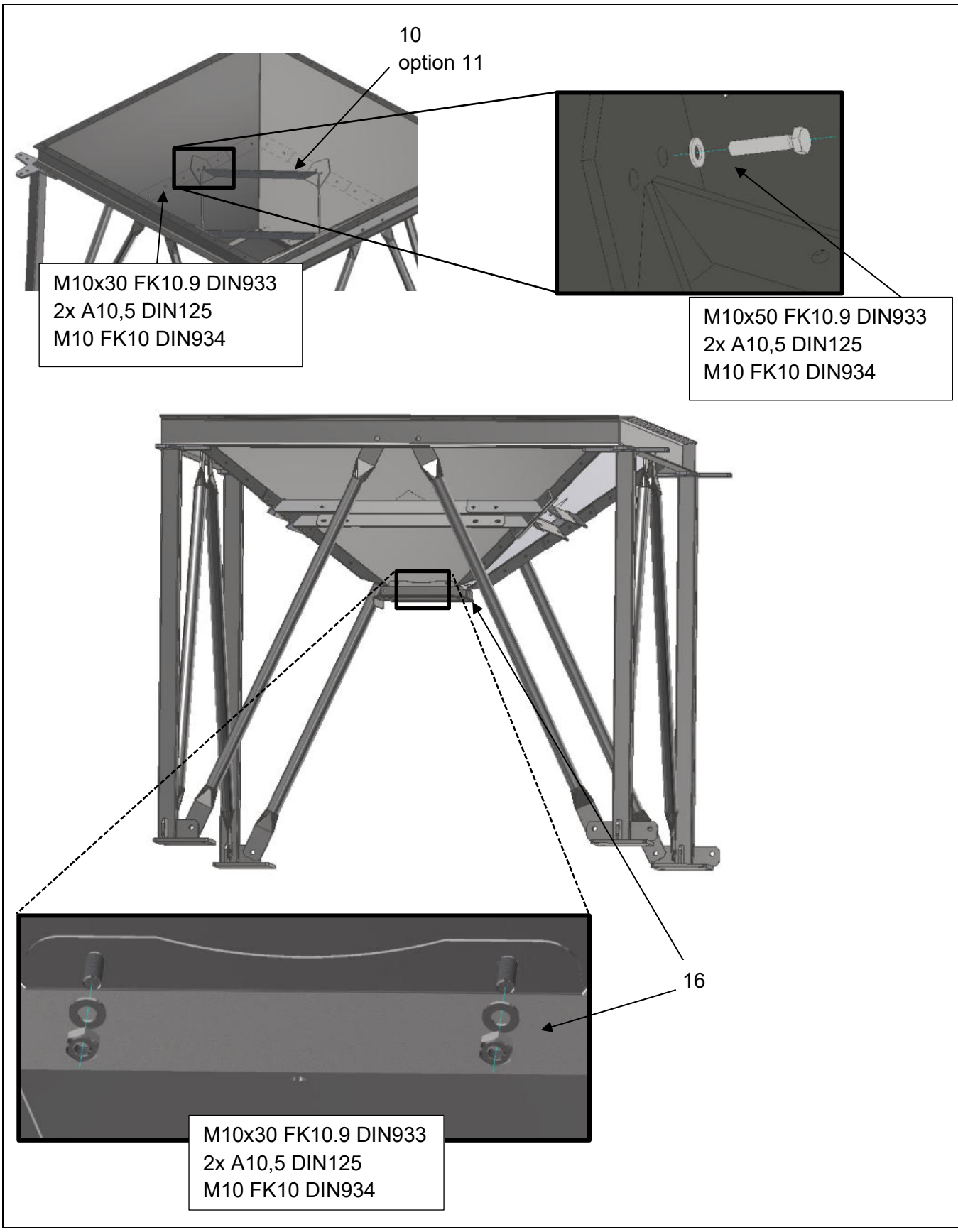

13/14
7+8+9
Sur étape 2
Ces 4 vis doivent être mises à la fin
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 4

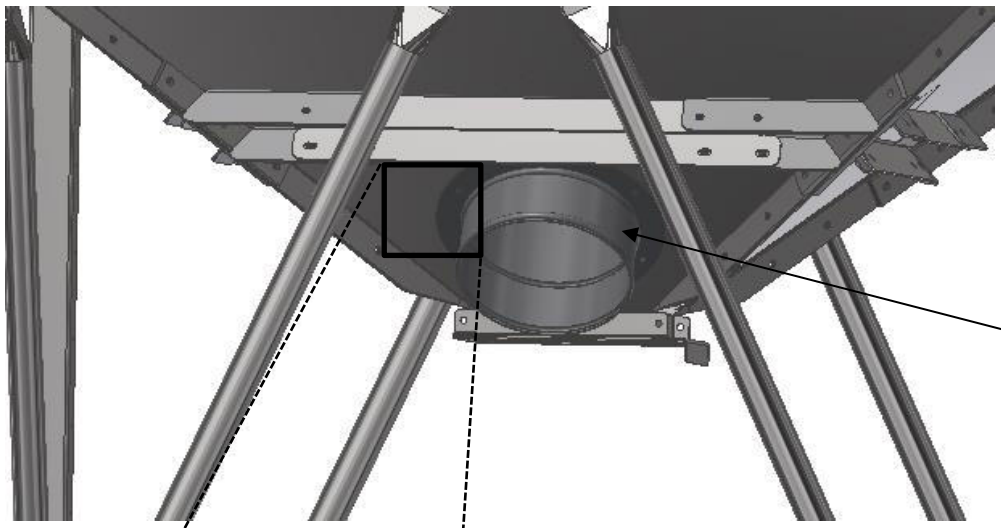


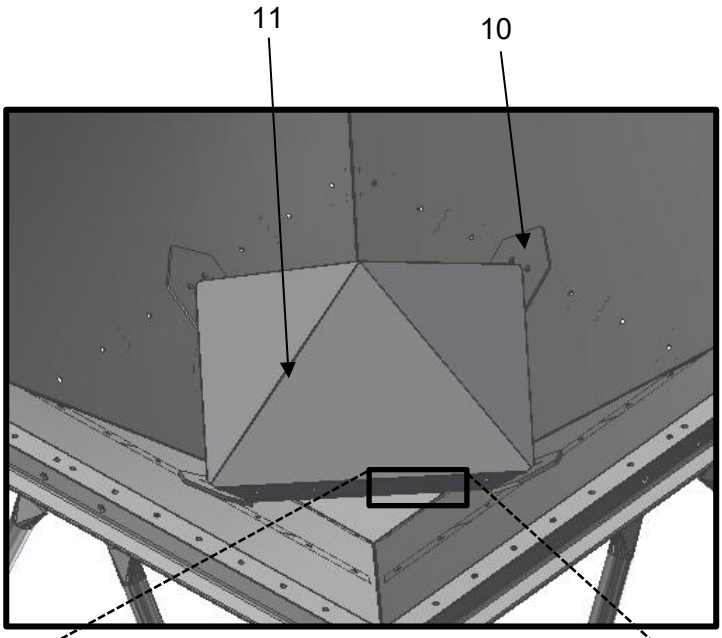
Etape 5

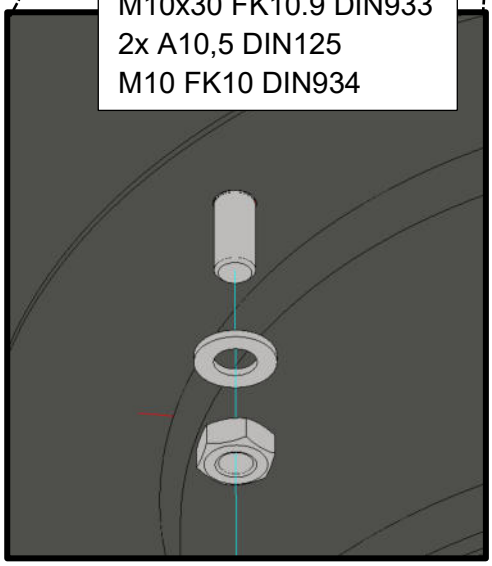

7+8+9
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ATTENTION:
Ajouter les renforts en tôle 15

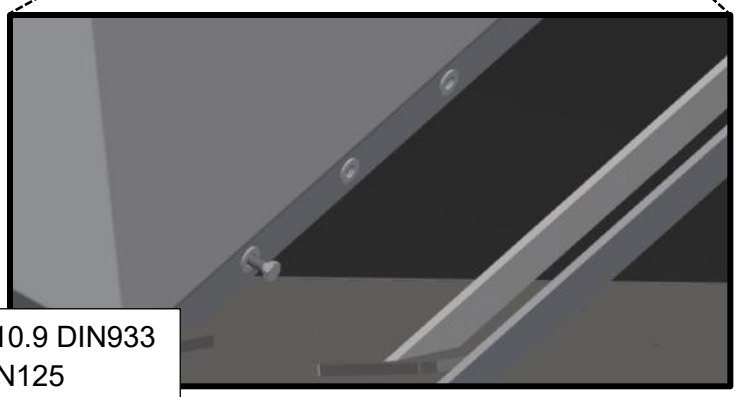

10
option 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
16
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 7 Option



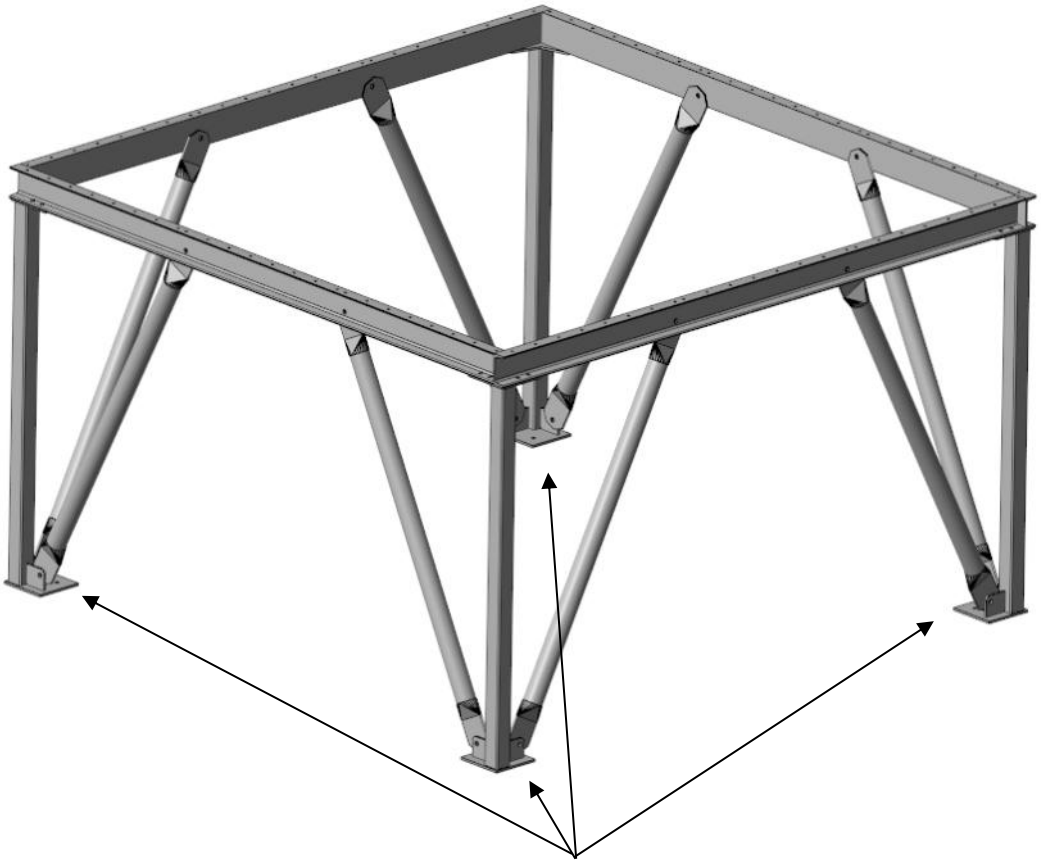


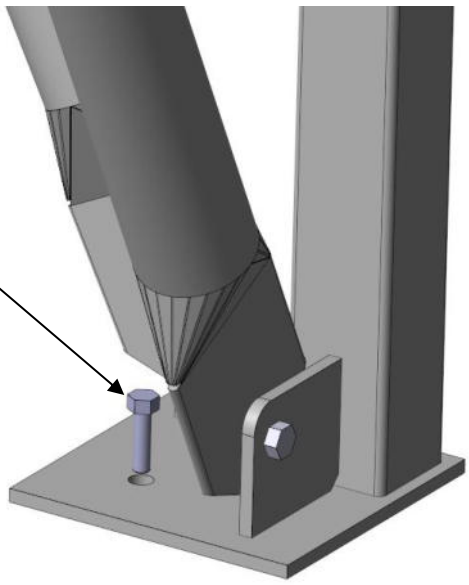




Etape 8

Effectuer un montage perpendiculaire et à angle droit

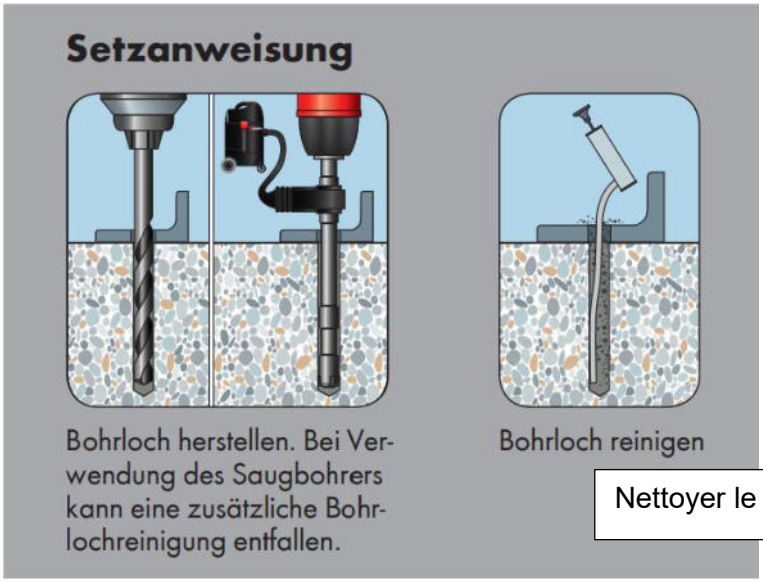




Vis à béton 2x par pied

Mise en oeuvre

Faire un trou. Si-vous utilisez une perceuse aspirante un nettoyage du trou n´est pas nécessaire

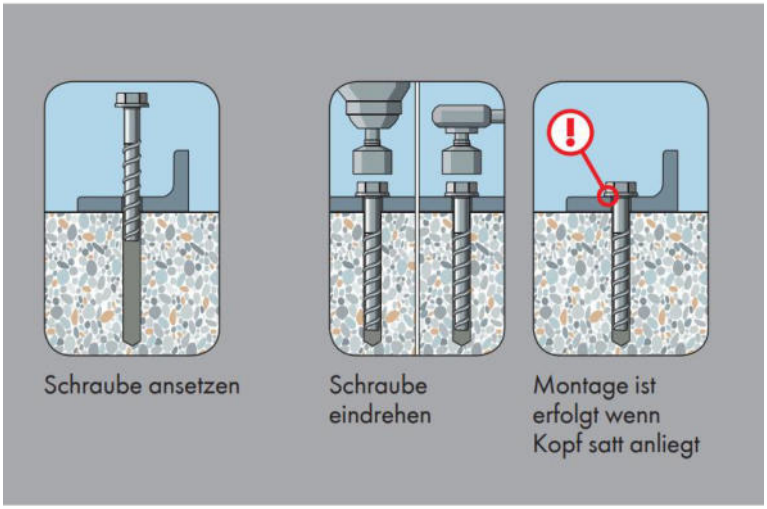


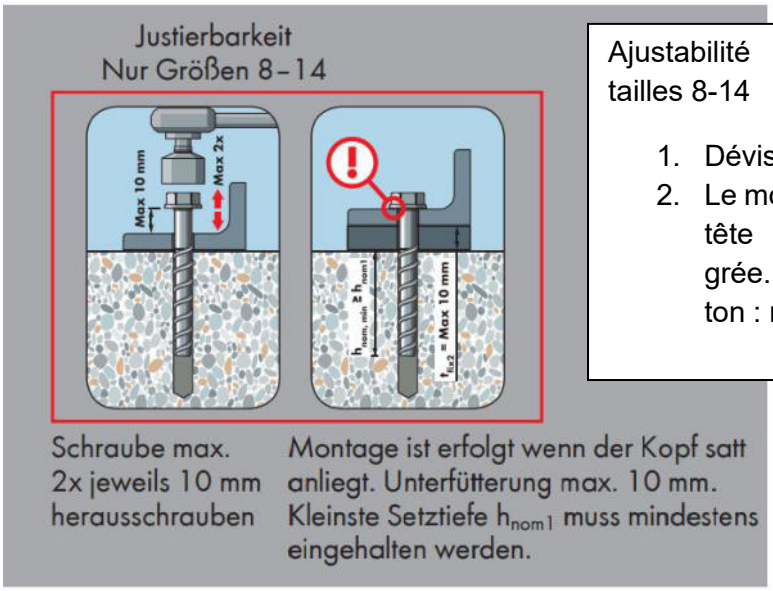
Nettoyer le trou

1 Placer la vis

2 Tourner la vis

3 Le montage est terminé lorsque la tête est complètement intégrée





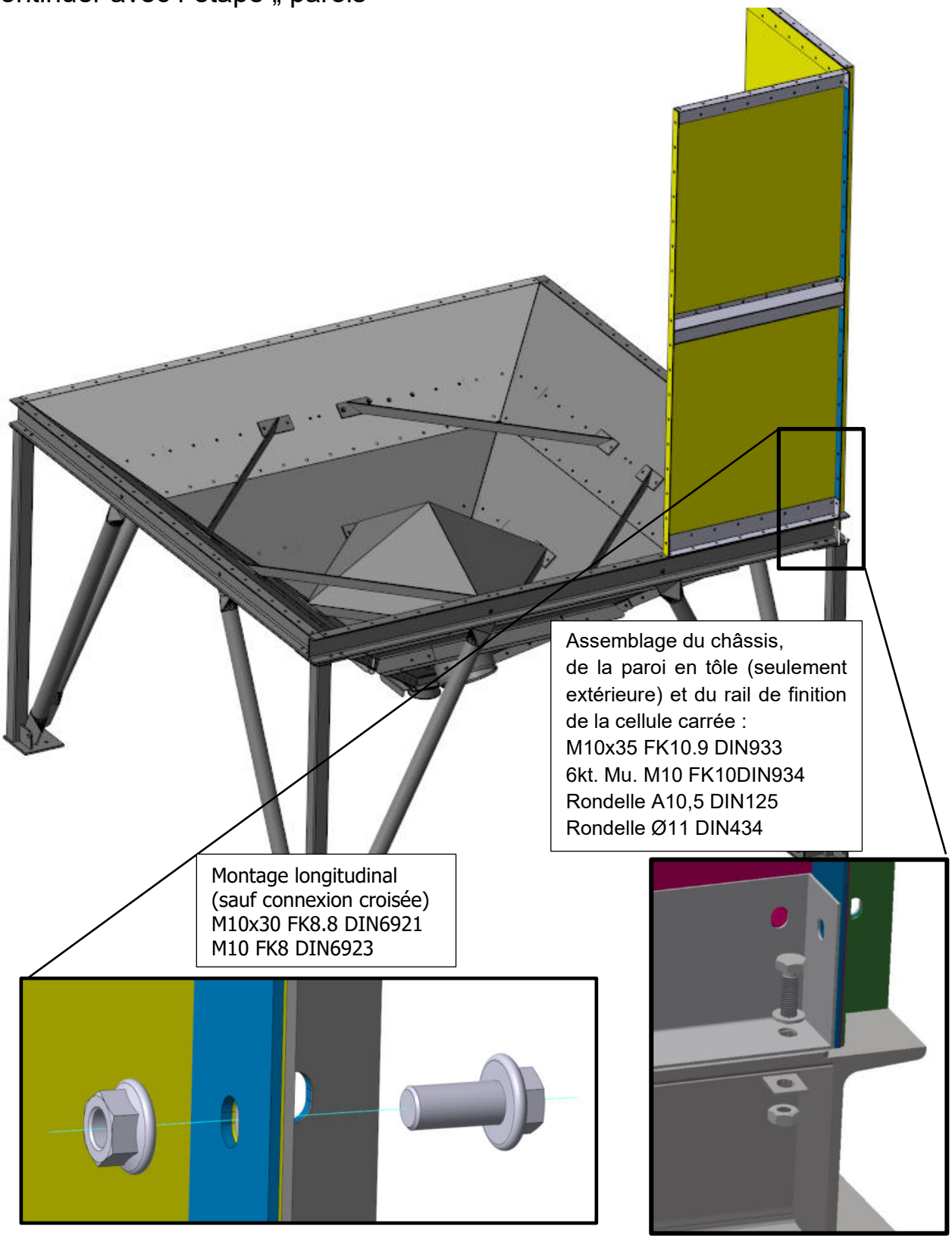
Ajustabilité - Uniquement pour les tailles 8-14

1. Dévisser les vis max 2x 10mm
2. Le montage est réussi quand la tête est complètement intégrée. Entre la pièce et le béton : max 10mm

Informations complémentaires : Würth Vis à bétons W-BS Typ S Tête hexagonale DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

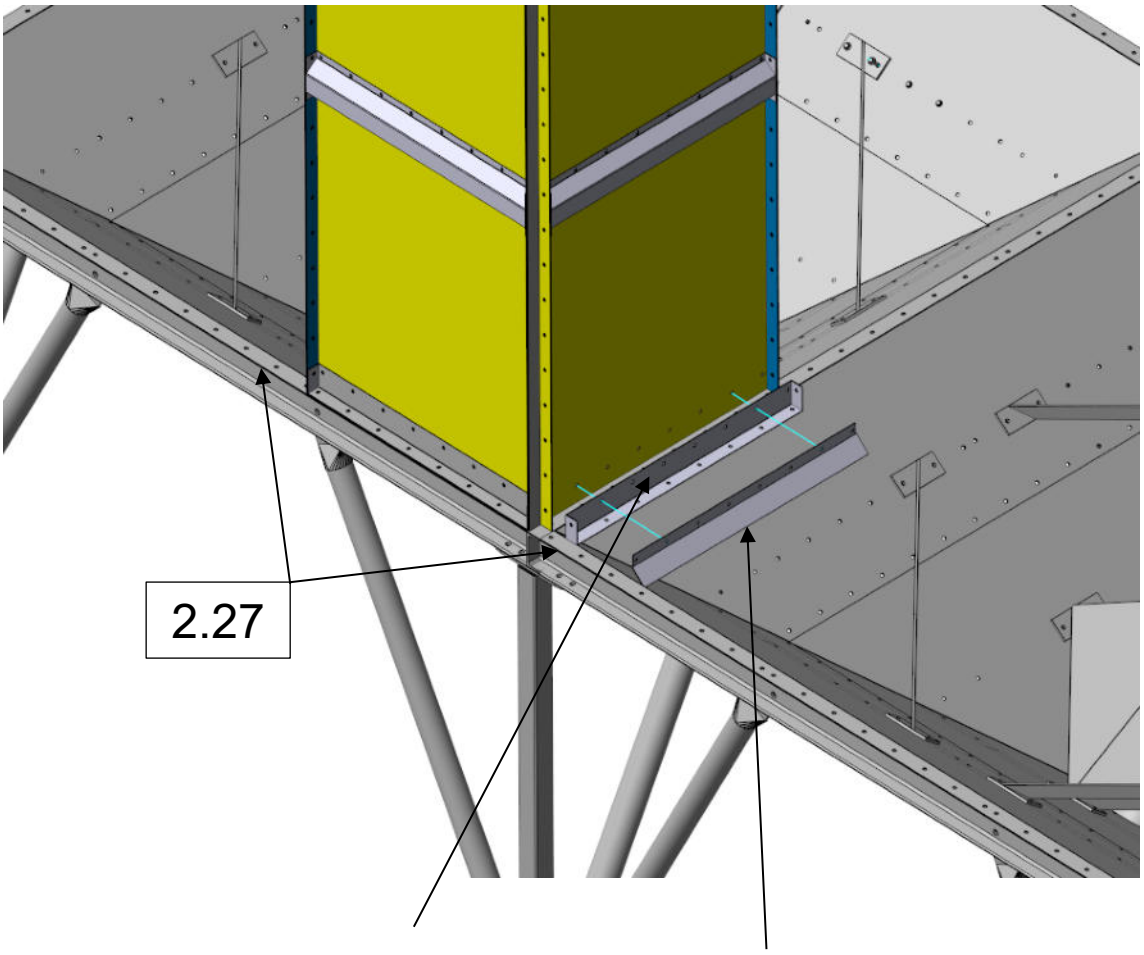
Etape 9 (Option, Construction d´une cellule de stockage)

Continuer avec l´étape „ parois“



Si plusieurs chassis doivent être assemblés l´un à coté de l´autre,

- des toles inclinées repliées doivent être posées entre les parois intermédiaires sur le rail final afin que les céréales puissent s´écouler parfaitement.
- Aux endroits où deux tôles de trémie sont superposées, la hauteur de construction est légèrement plus élevée -> pour compenser, il faut monter des tôles de rehaussement (2.26) supplémentaires aux autres endroits.

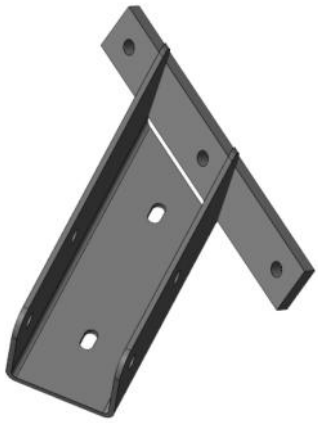


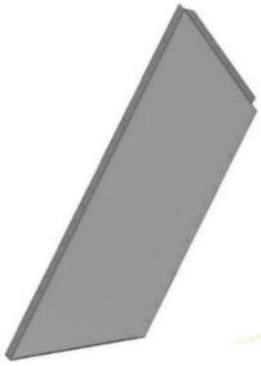
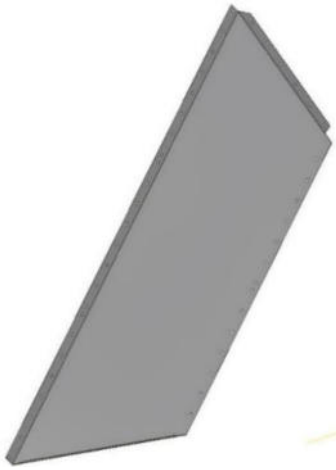
5.3 Chassis 3x2

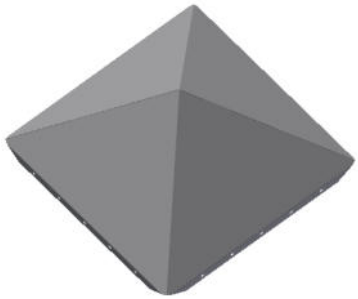
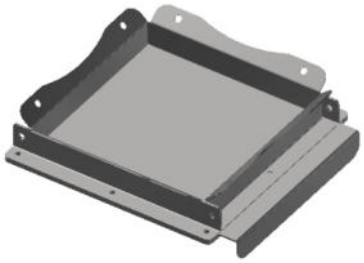
5.3.1 Liste des pièces

#1 Pied en L pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 Nouvel art. 2007775 	#2 Pied en T pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 Nouvel art. 200778 	#3 Pied en X pour 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814 Nouvel art. 4000520
#4 U140 - l=1995 ArtNr.: 4009092015804 Nouvel art. 4000511 L=1995 m 	#5 U140 - l=2055 ArtNr.: 4009092015805 Nouvel art. 2007773 L=2055 mm 	#6 Entretoise 60,3x4 pour chassis 2x2+3x3 ArtNr.:4009092015810 Nouvel art. 1001827

#7 U140 - l=2995 ArtNr.: 4009092015806 Nouvel art. 4000513 L=2995 m 	#8 U140 - l=3055 ArtNr.: 4009092015807 Nouvel art. 2007774 L=3055 mm 	#9 Entretoise 88,9x4 pour chassis 3x3+2x3 ArtNr.:4009092015738 Nouvel art. 2004402
#10 Renfort extérieur inférieur 2x3m – 3m unten ArtNr.: 4009092015839 Nouvel art. 1001662 	#11 Renfort extérieur 2x3m – 3m milieu ArtNr.: 4009092015838 Nouvel art. 1001661 	#12 Renfort extérieur 2x3m – 3m supérieur ArtNr.: 4009092015837 Nouvel art. 1001660

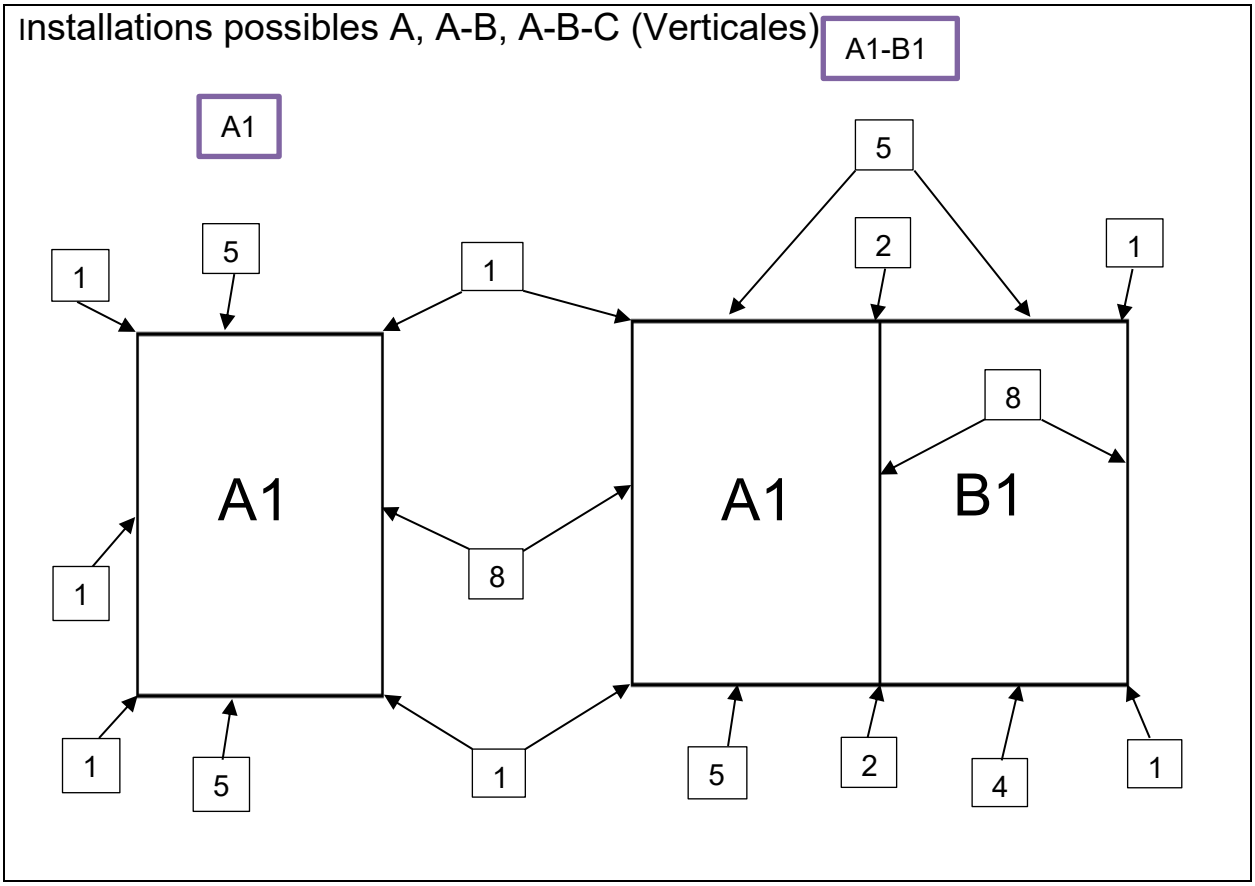
#13 Renfort extérieur 2x3m – 2m inférieur ArtNr.: 4009092015836 Nouvel art. 1001659 	#14 Renfort extérieur 2x3m – 2m milieu ArtNr.: 4009092015835 Nouvel art. 1001658 	#15 Renfort extérieur 2x3m – 2m supérieur ArtNr.: 4009092015834 Nouvel art. 1001657
#16 Renfort extérieur droite 40° 2x3m – 3m ArtNr.: 4009092015828 Nouvel art. 1001651 	#17 Renfort extérieur gauche 40° 3x2m – 3m ArtNr.: 4009092015827 Nouvel art. 1001650 	#18 Renfort extérieur droite 40° 2x3m – 2m ArtNr.: 4009092015826 Nouvel art. 1001649 

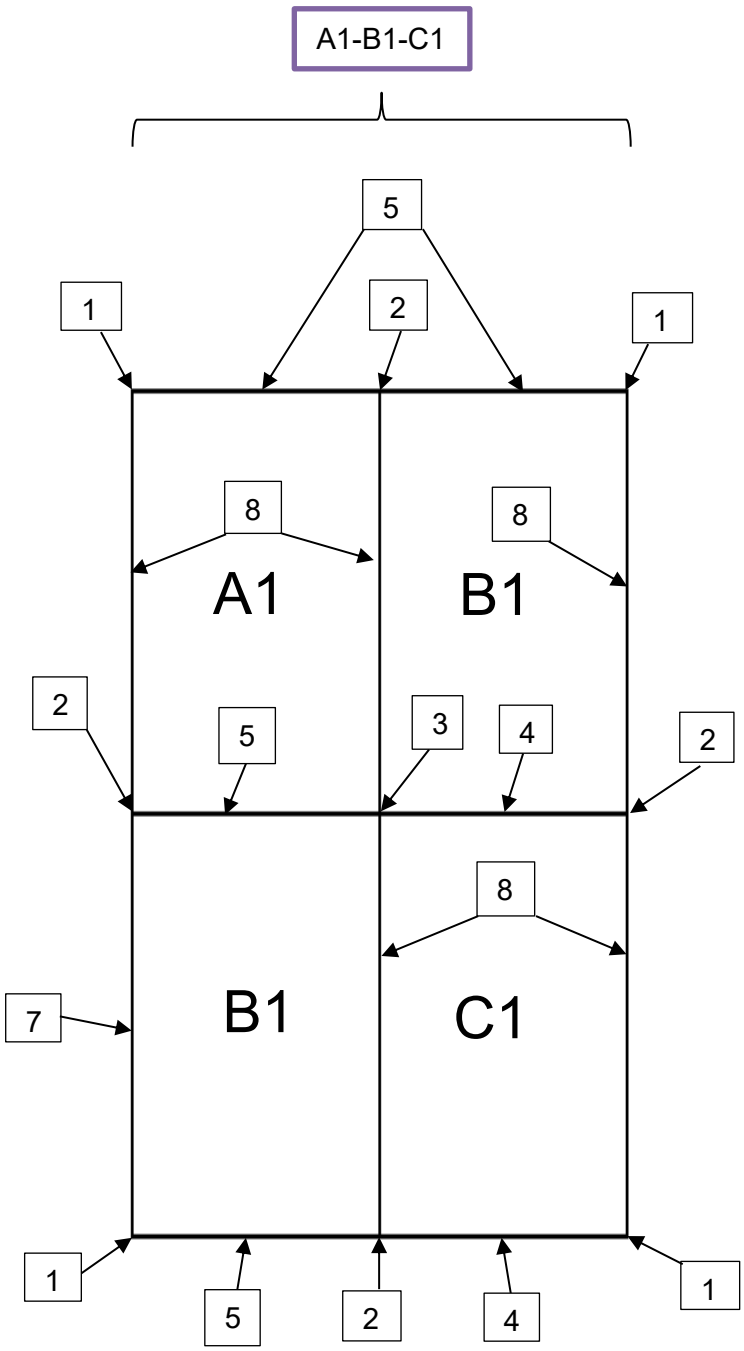
#19 Renfort extérieur gauche 40° 2x3m – 2m ArtNr.: 4009092015825 Nouvel art. 1001648 	#20 Tole supérieure pour chassis 2x3m 40° - 2m ArtNr.: 4009092015858 Nouvel art. 1001679 	#21 Tole supérieure pour chassis 2x3m 40° - 3m ArtNr.: 4009092015857 Nouvel art. 1001678 
#22 Tole inférieure pour chassis 2x3m 40° - 2m ArtNr.: 4009092015860 Nouvel art. 1001681 	#23 Tole inférieure pour chassis 2x3m 40° - 3m ArtNr.: 4009092015859 Nouvel art. 1001680 	#24 (option, seulement si #32 est construit avec) Tole du chassis inférieure pour ventilation 2x3m 40° – 2m ArtNr.: 4009092015862 Nouvel art. 1001683

#25 (option, seulement si #32 est construit avec) Tôle du châssis inférieure 2x3m 40° - 3m pour ventilation ArtNr.: 4009092015861 Nouvel art. 1001682 	#26 Renfort d´angle intérieur milieu 1 2x3m 40° ArtNr.: 4009092015883 Nouvel art. 2007753 	#27 Renfort d´angle intérieur milieu 2 2x3m 40° ArtNr.: 4009092015884 Nouvel art. 2007754
#28 Renfort d´angle intérieur supérieur milieu 2x3m 40° ArtNr.: 4009092015881 Nouvel art. 2007755 	#29 Renfort d´angle intérieur supérieur 2x3m 40° ArtNr.: 4009092015882 Nouvel art. 2007772 	#30 Entretoise intérieure inférieur 2x3m 40° ArtNr.:4009092015878 Nouvel art. 2007752
#31 (Option) Hotte de ventilation pour chassis 2x3m 40° Trichter ArtNr.: 4009092015913 Nouvel art. 1001697 	#32 (Option) Tube de ventilation Diamètre 300 pour châssis 3mx3m ArtNr.: 4009003016990 Nouvel art. 1002175 	#33 Sortie avec vanne 300x300 2x3m Art.Nr.: 4009092015821 Nouvel art. 1001644 Transitions sur 150,200,250 4009023015782, 783, 784 

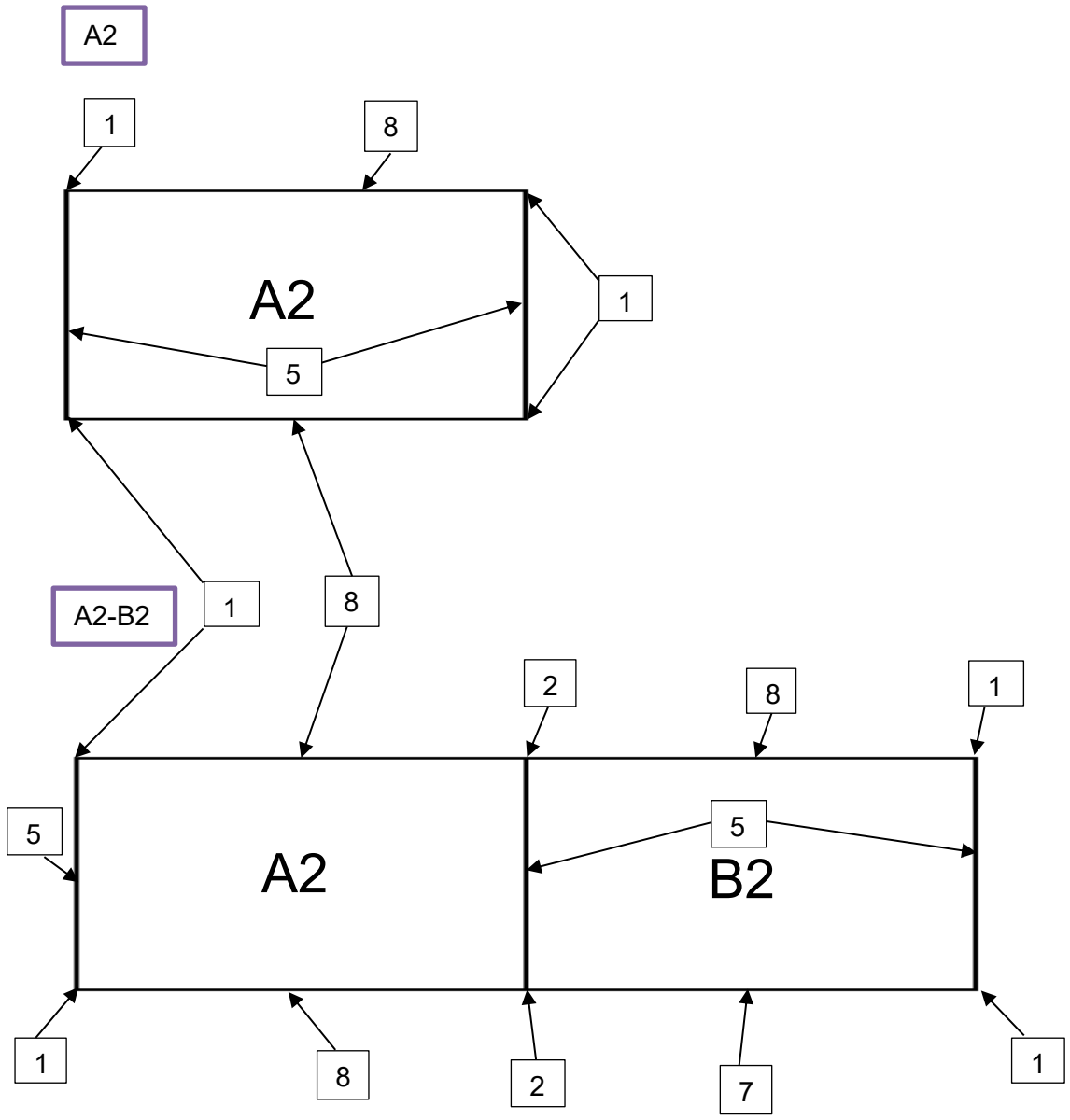
#34 Plaque de renfort pour châssis 2x3m 40° ArtNr.: 4009092015851 Nouvel art. 1001672 		

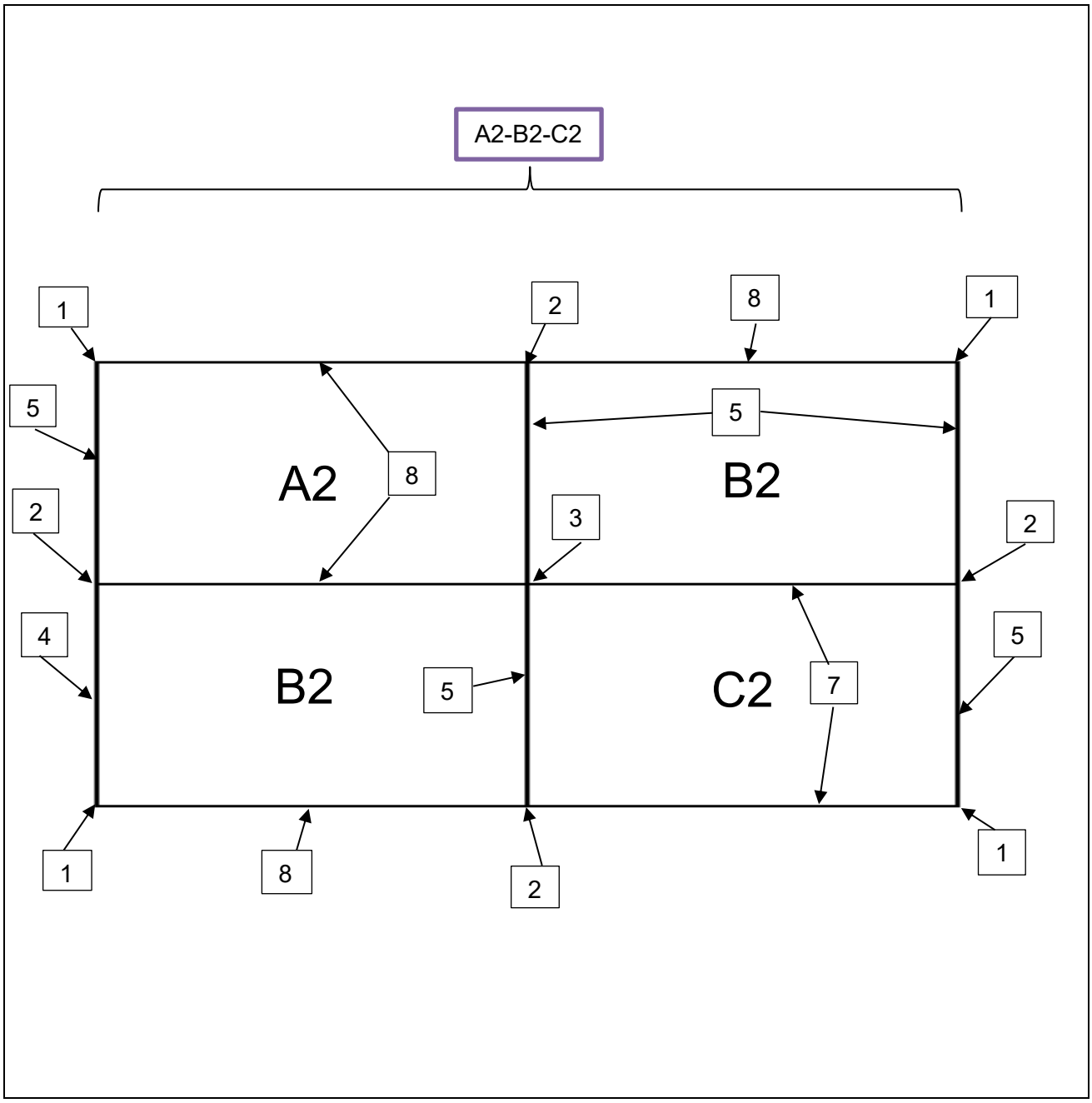
Installations possibles A, A-B, A-B-C (Verticales)




A1-B1-C1
5
1
2
1
8
8
A1
B1
2
5
3
4
2
8
B1
C1
7
1
5
2
4
1

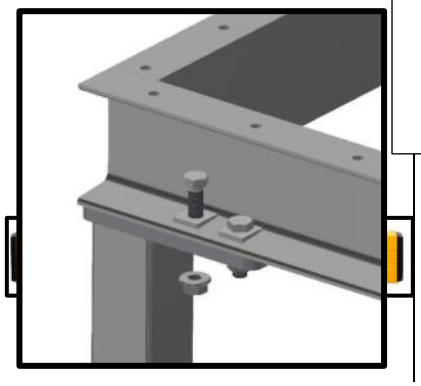
Installations possibles A, A-B, A-B-C (Horizontales)




A2-B2-C2
1
2
8
1
5
5
A2
8
B2
2
3
2
4
B2
5
C2
7
5
1
8
2
1

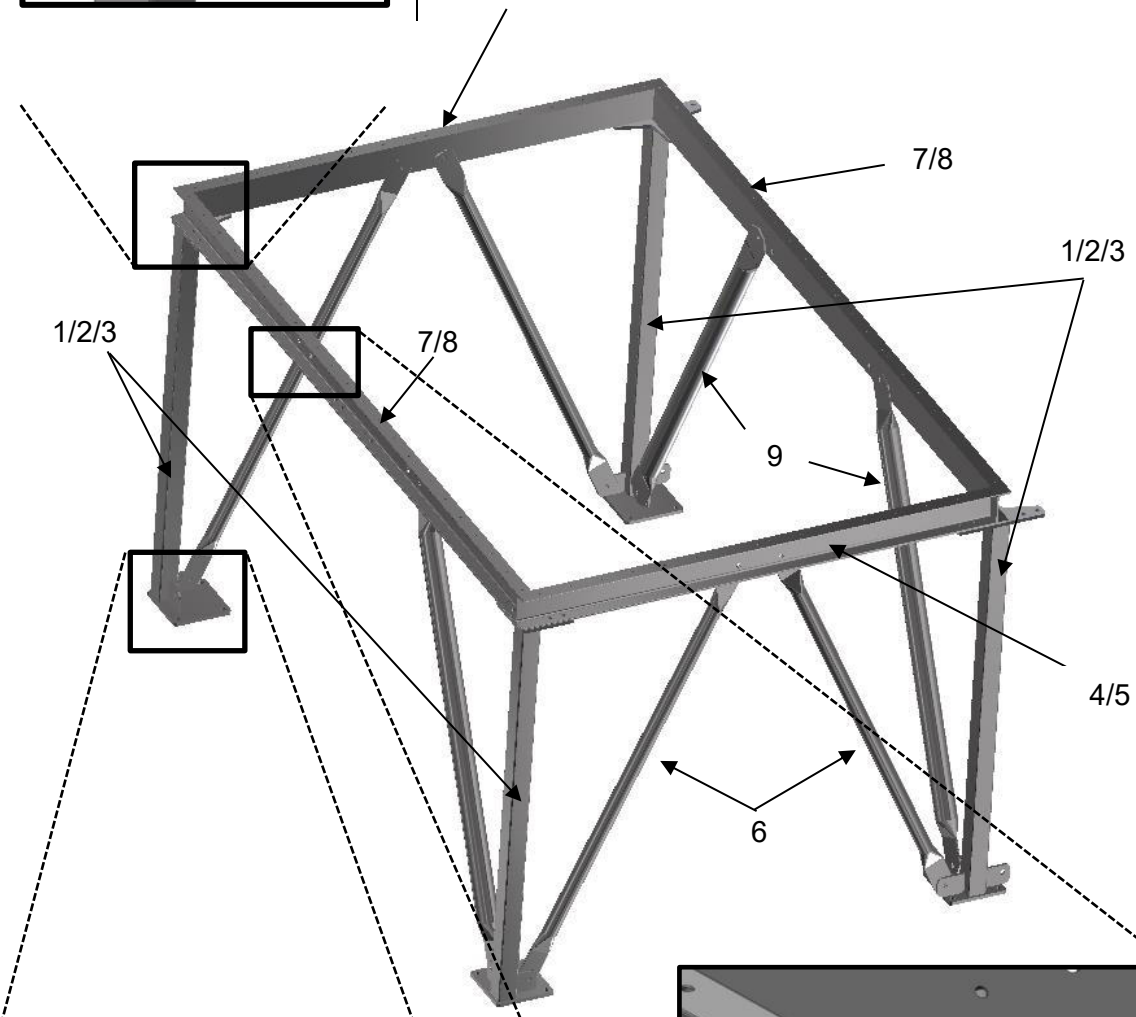
5.3.2 Montage chassis 3x2

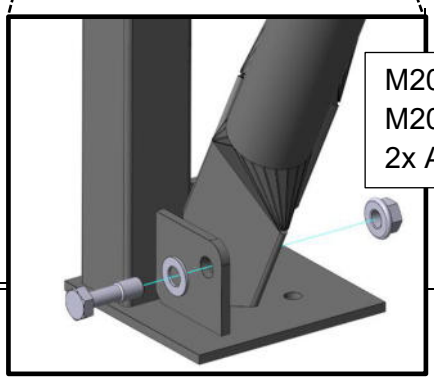
Etape 1



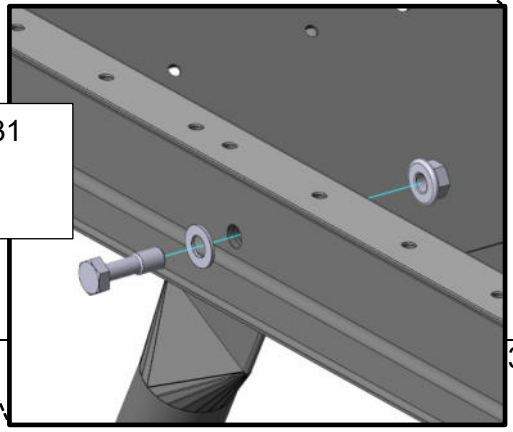
M16x55 FK8.8 DIN933
M16 -FK8 DIN6923
Ø18 DIN434

4/5



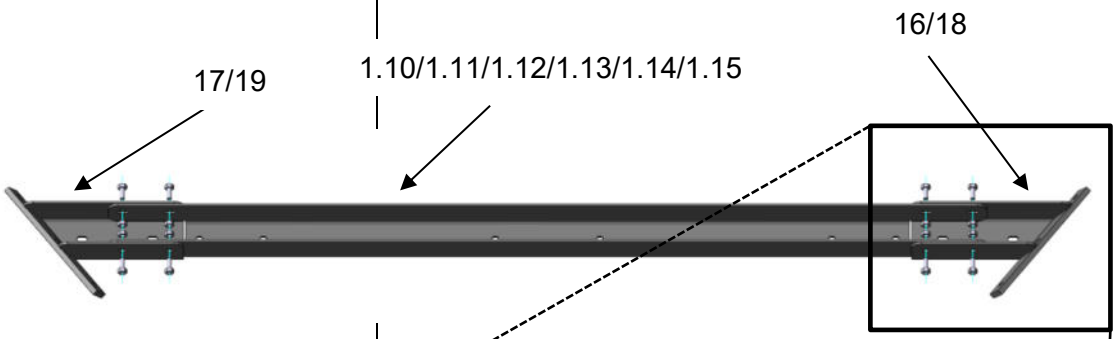


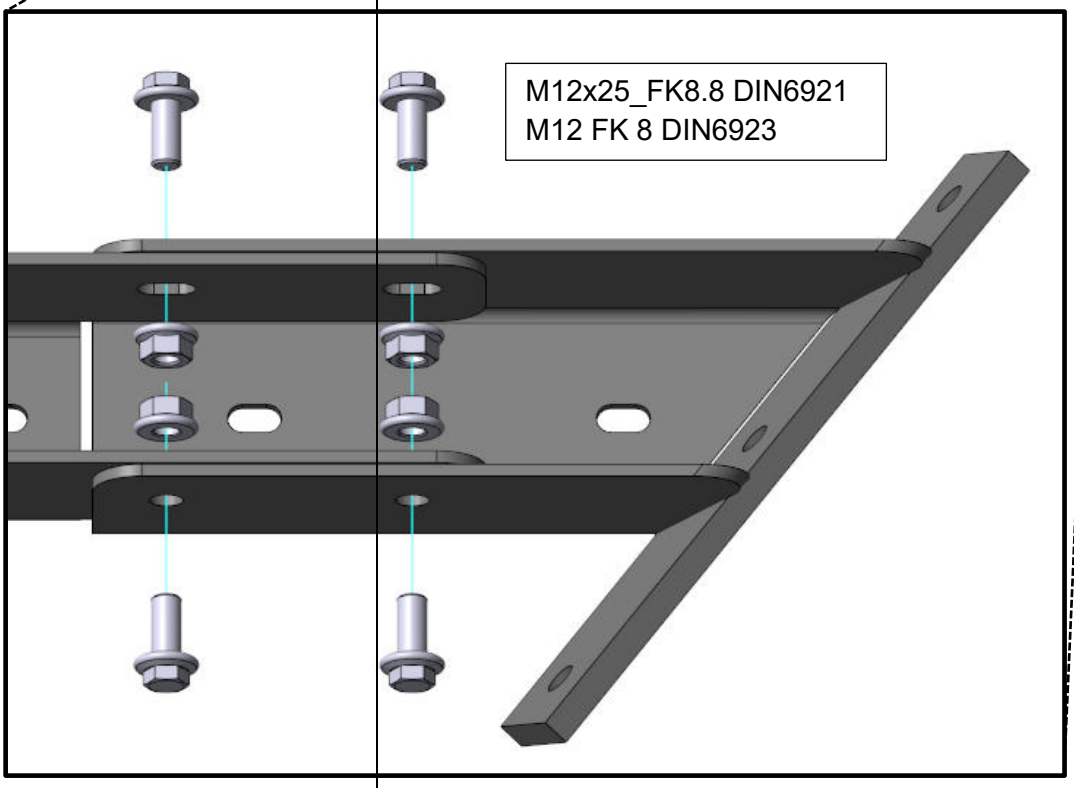
M20x65 FK10.9 DIN931
M20 FK10 DIN934
2x A21 DIN125



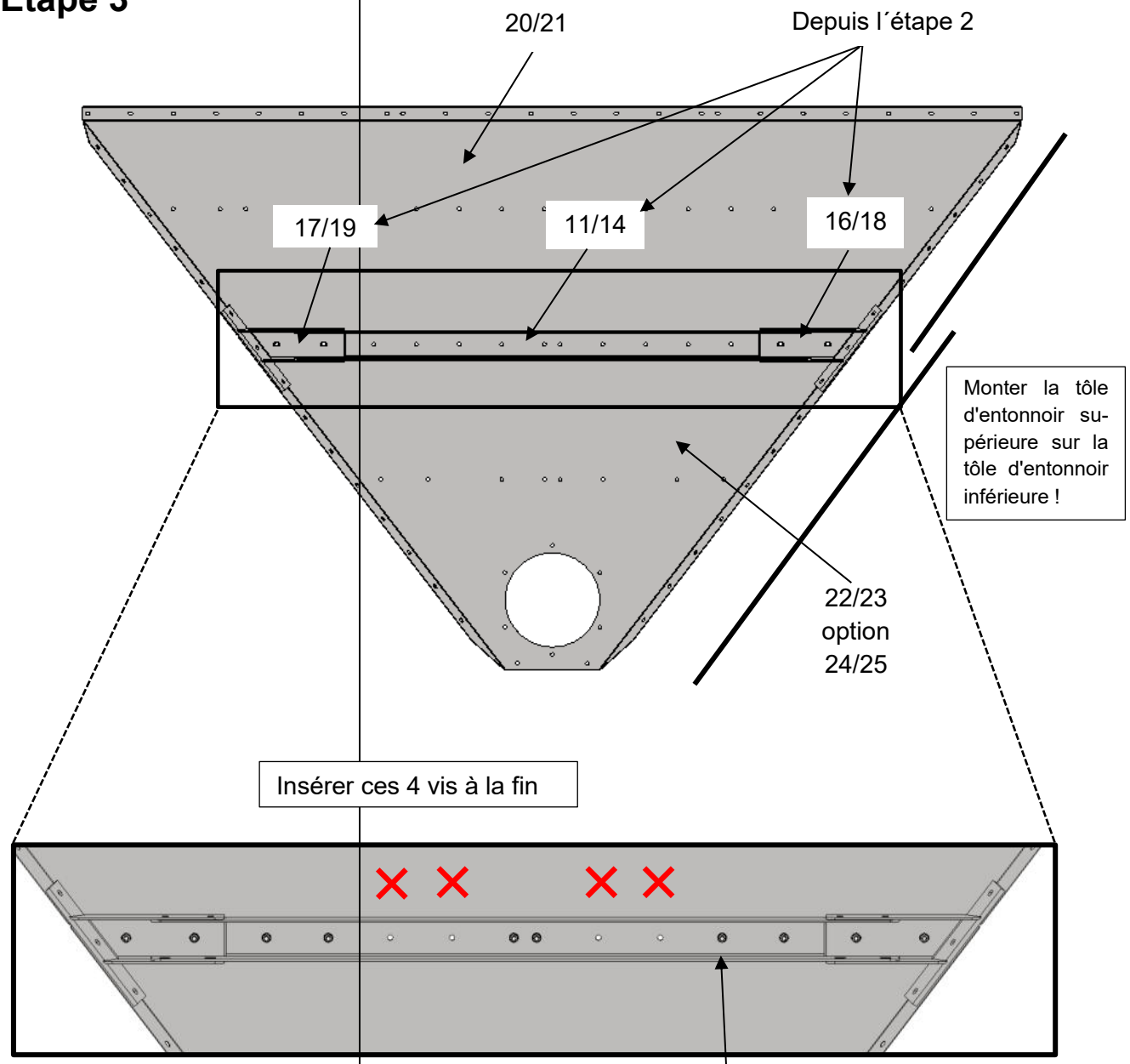
Etape 2

Assembler uniquement des pièces de 2 m avec des pièces de 2 m et uniquement des pièces de 3 m avec des pièces de 3 m





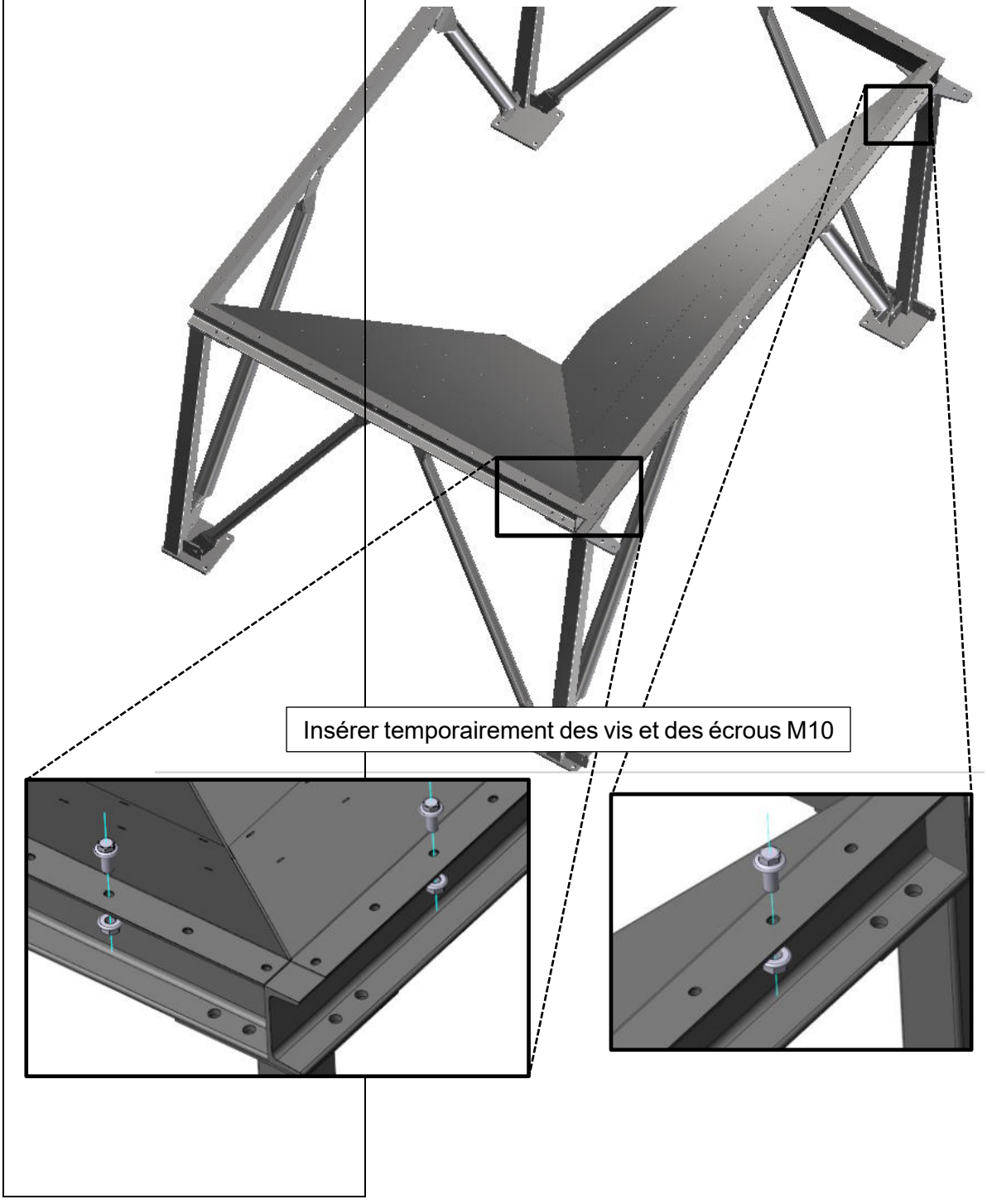
Etape 3



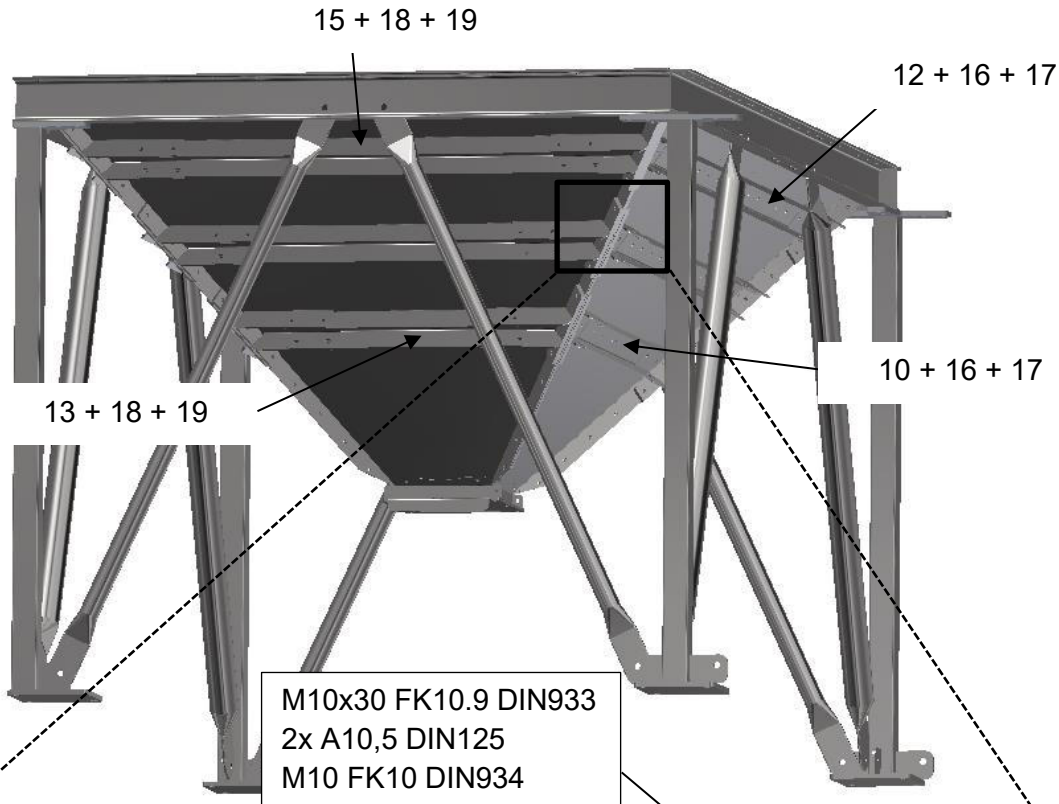
Insérer ces 4 vis à la fin

M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 4



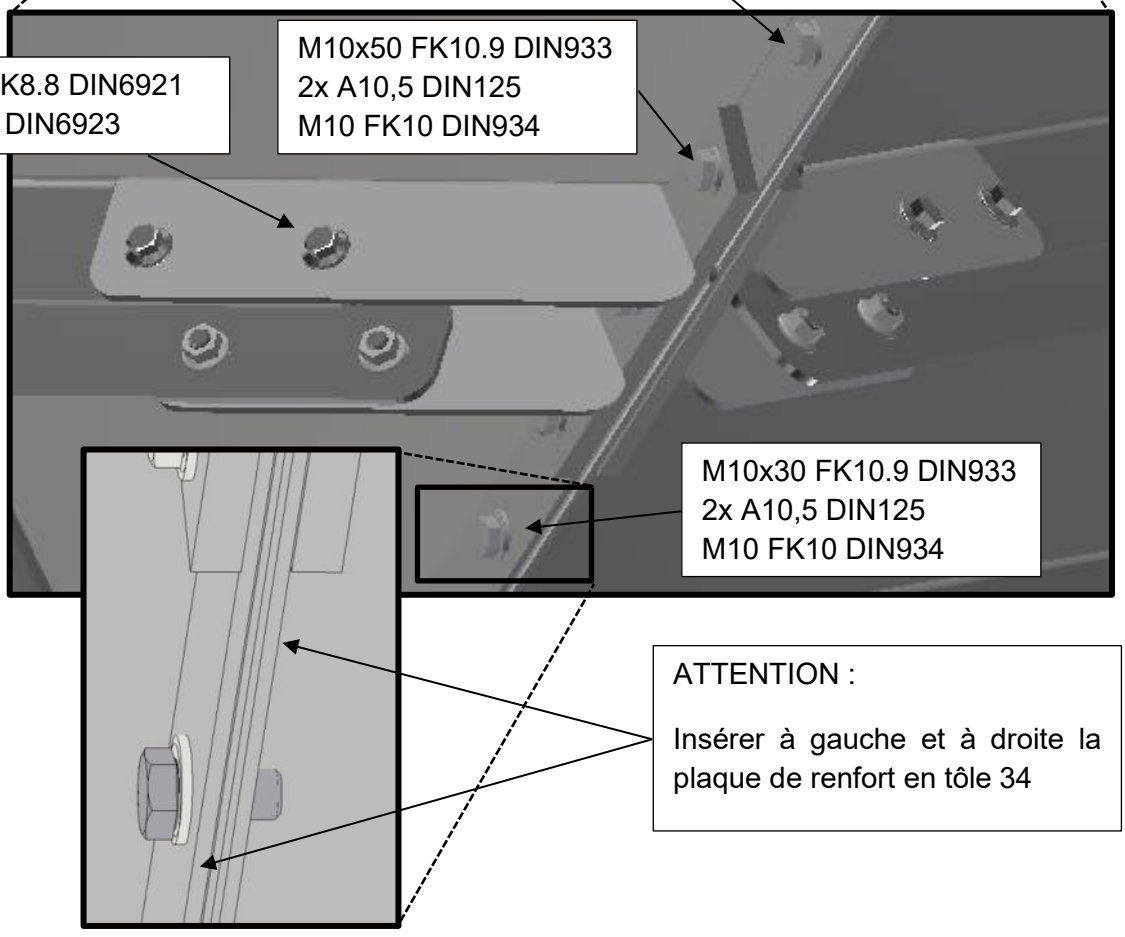
Etape 5



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

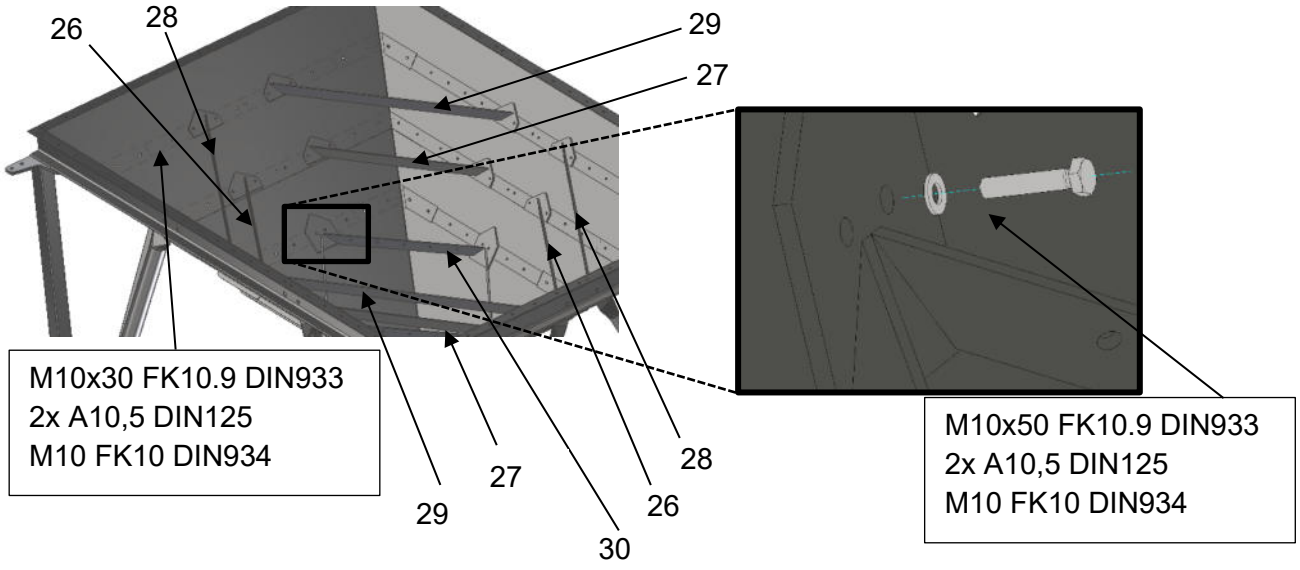
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923

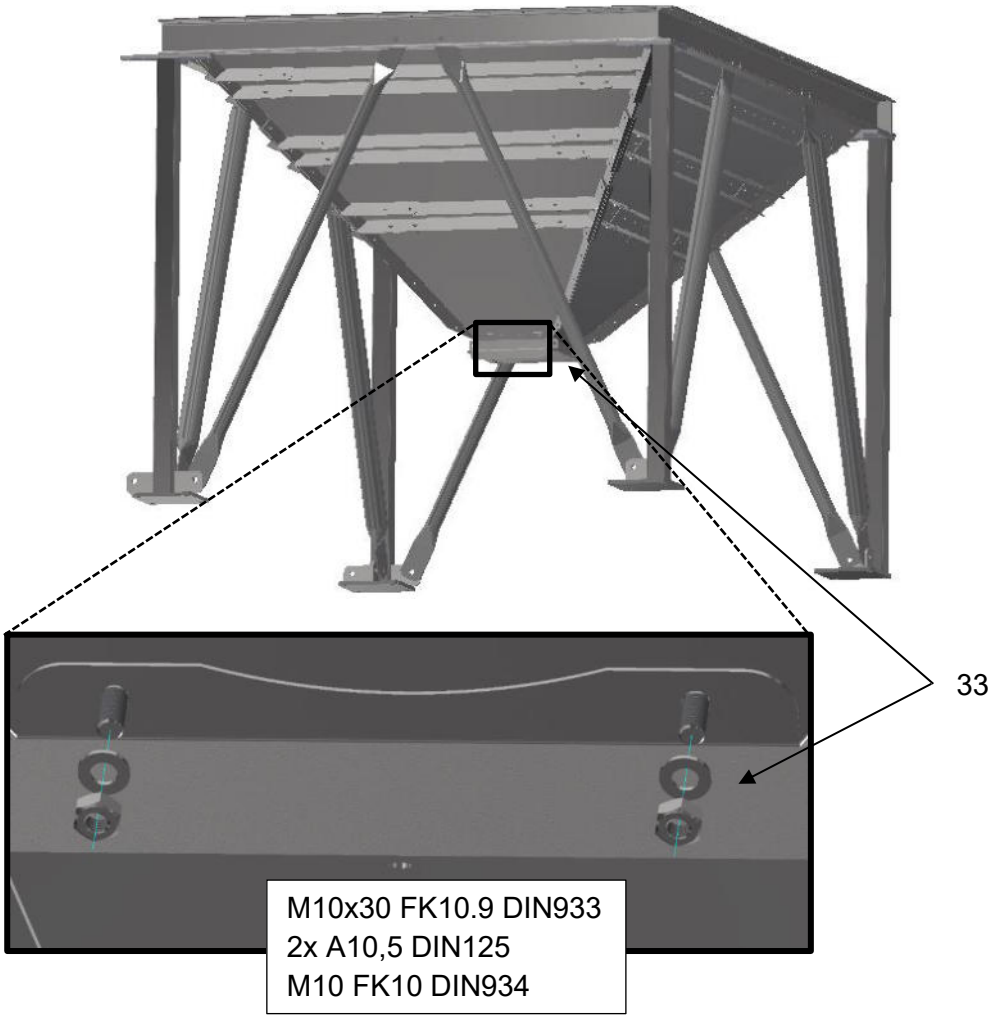


M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

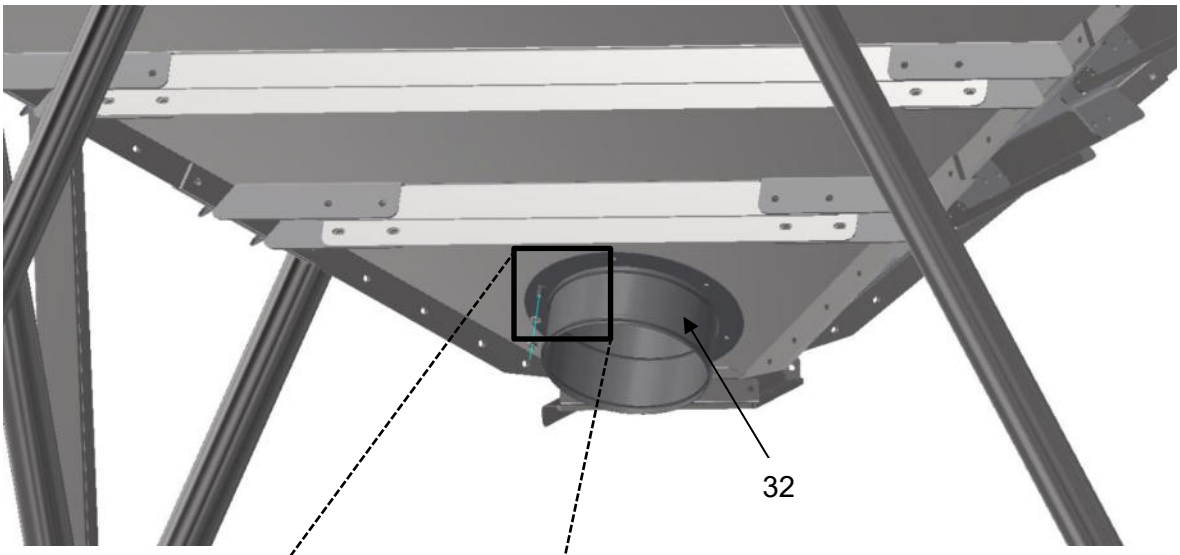
ATTENTION :

Insérer à gauche et à droite la plaque de renfort en tôle 34

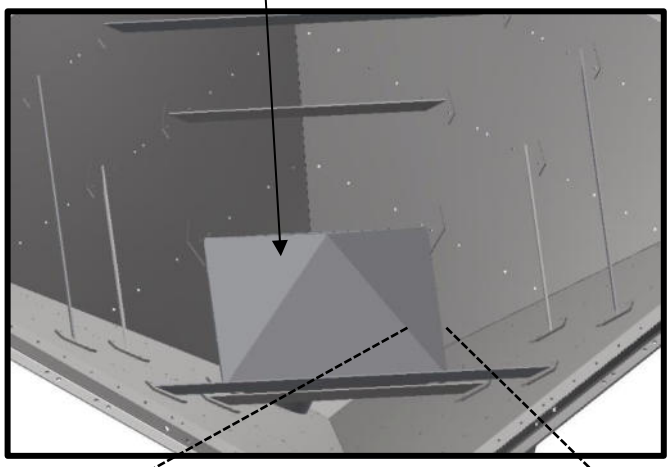

26
28
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
30
26
28
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934


33
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

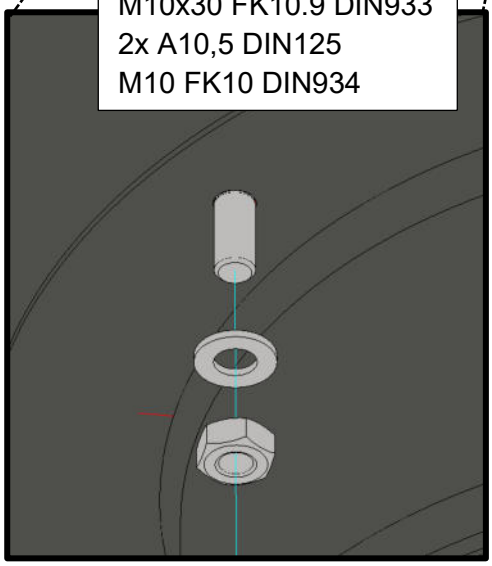
Etape 7 Option

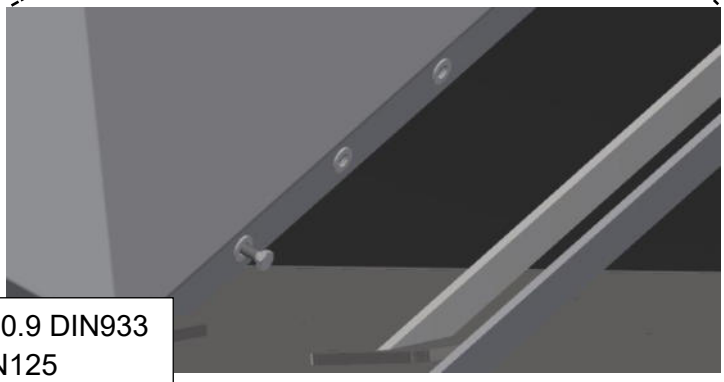


31



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

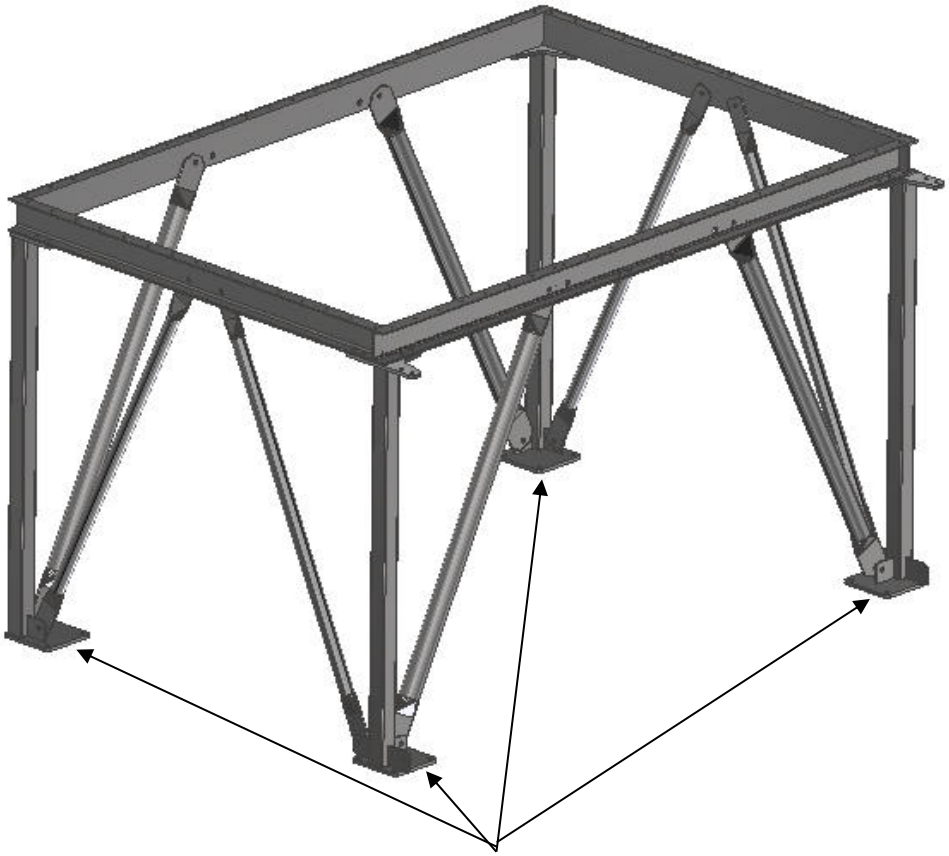




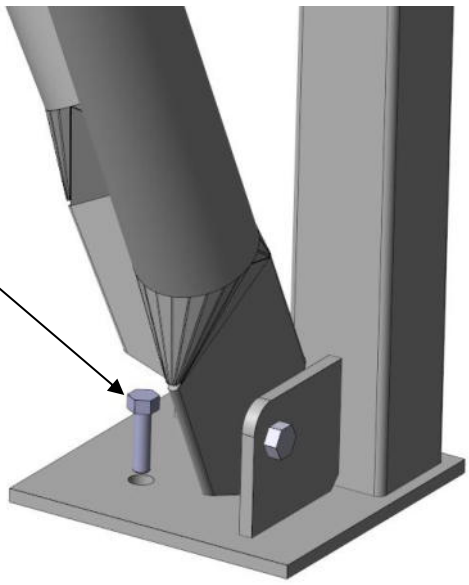
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 8

Veiller à un montage perpendiculaire et à angle droit

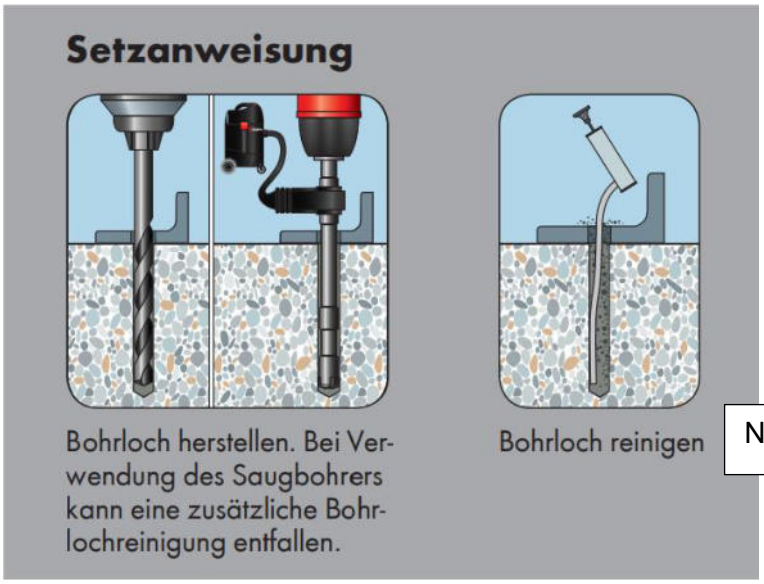


2x vis à béton par pied



Mise en oeuvre

Faire un trou. Si-vous utilisez une perceuse aspirante un nettoyage du trou n´est pas nécessaire

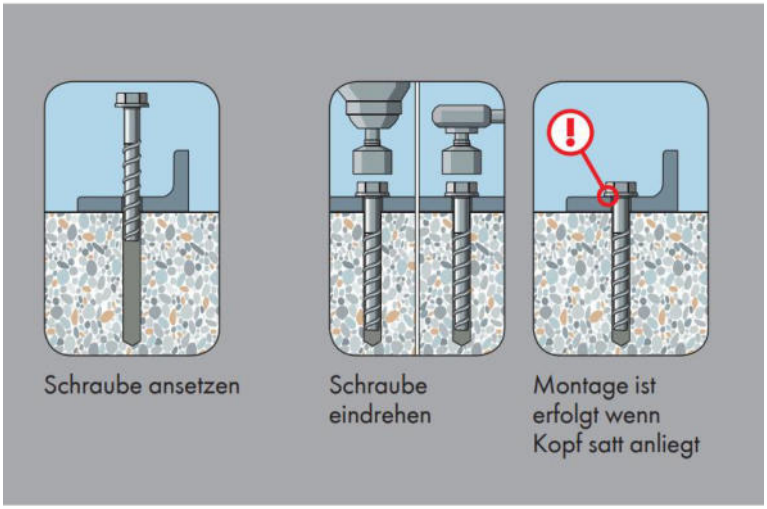


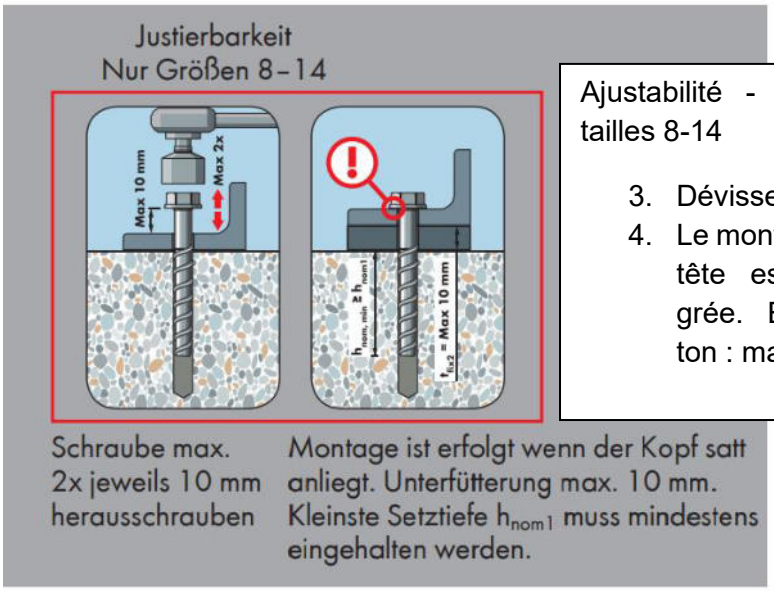
Nettoyer le trou

1 Placer la vis

2 Tourner la vis

3 Le montage est terminé lorsque la tête est complètement intégrée





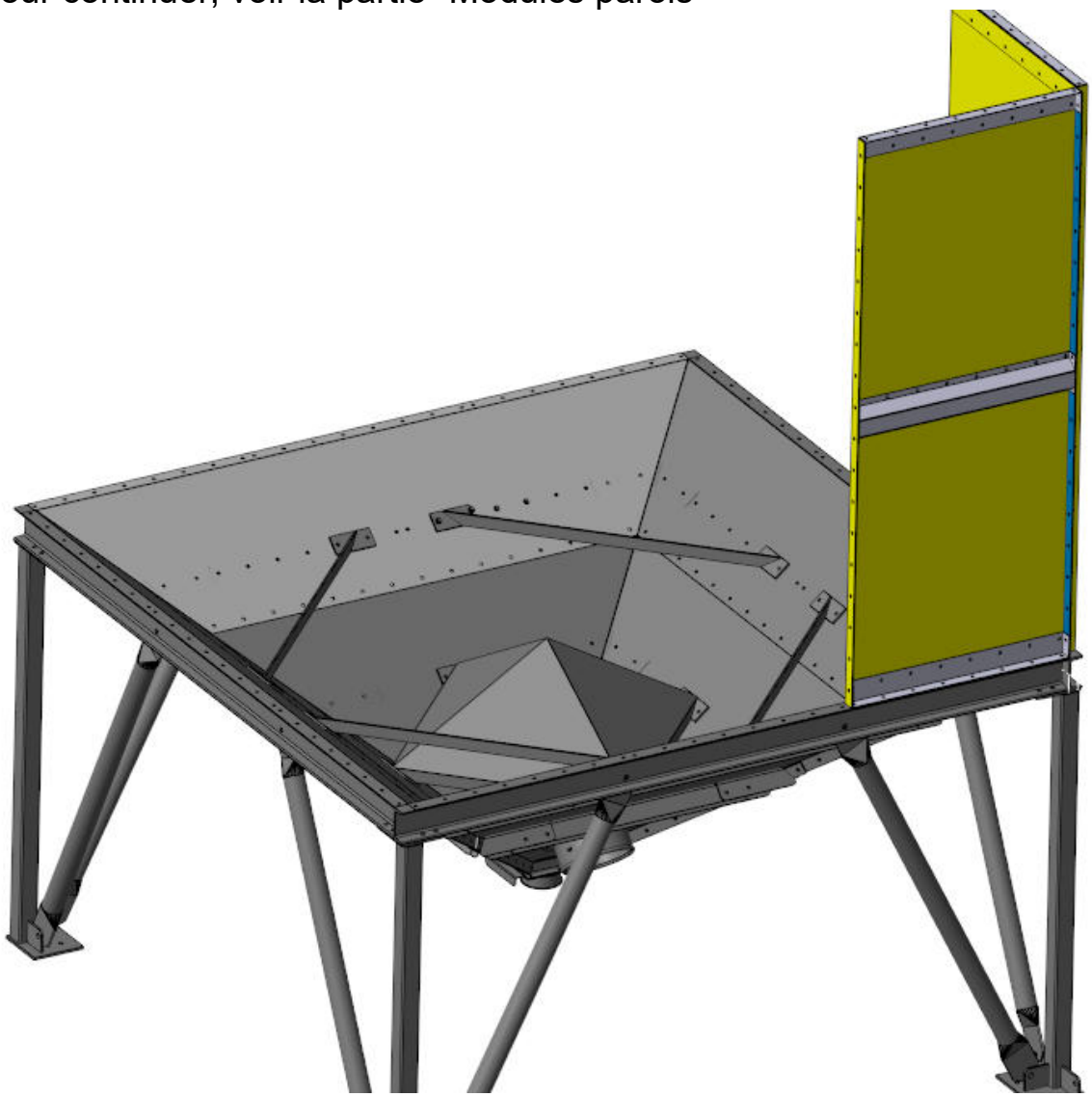
Ajustabilité - Uniquement pour les tailles 8-14

3. Dévisser les vis max 2x 10mm
4. Le montage est réussi quand la tête est complètement intégrée. Entre la pièce et le béton : max 10mm

Informations complémentaires : Würth Vis à bétons W-BS Typ S Tête hexagonale DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

Etape 9 (Option, construction d´une cellule)

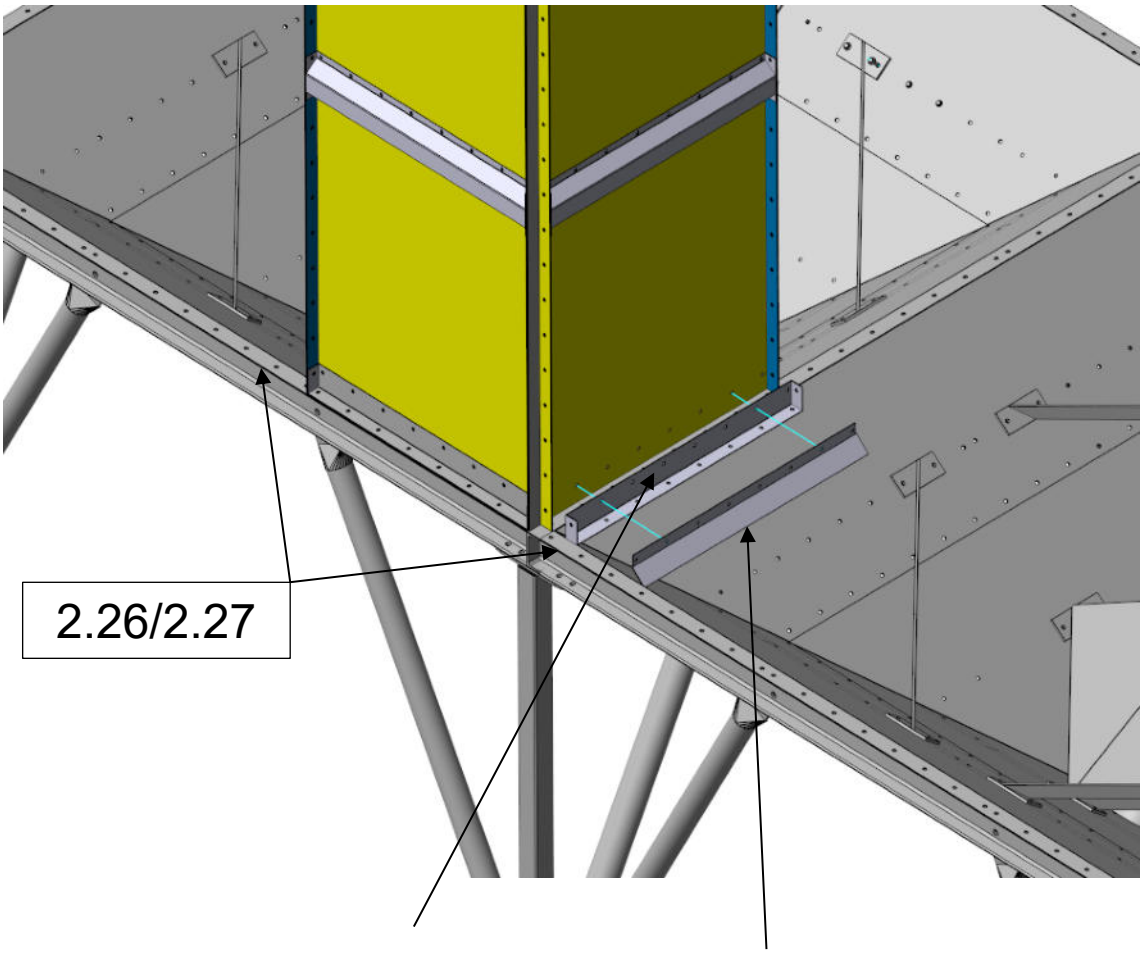
Pour continuer, voir la partie "Modules parois“



Si plusieurs chassis doivent être montés l´un à coté de l´autre:

- des toles repliées doivent être posées entre les parois intermédiaires sur le rail final afin que les céréales puissent s´écouler parfaitement.

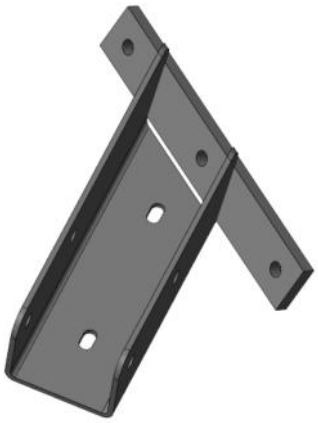
- Aux endroits où deux tôles de trémie sont superposées, la hauteur de la structure est légèrement plus élevée -> pour compenser, il faut monter des tôles de rehaussement supplémentaires (2.26) aux autres endroits.

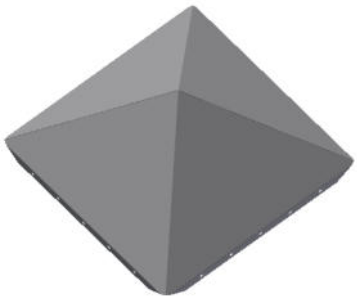
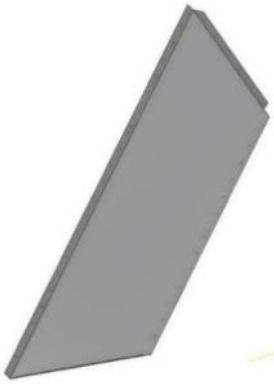
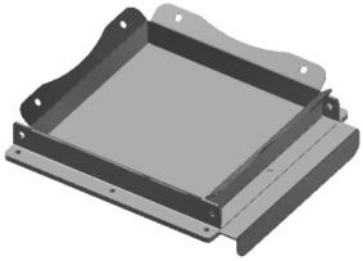


5.4 Chassis 3x3

5.4.1 Liste des pièces

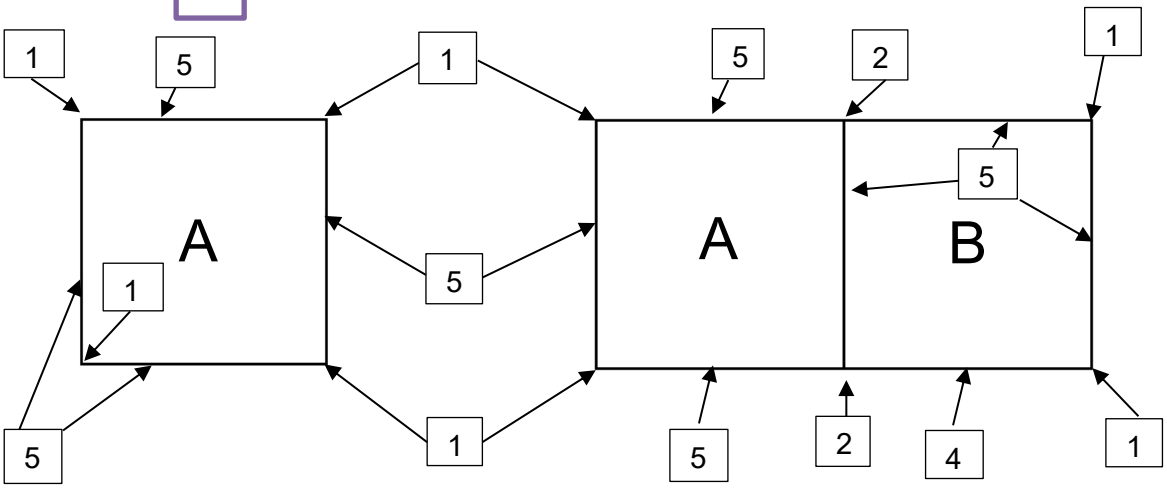
#1 Pied en L pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015812 Nouvel art. 2007775 	#2 Pied en T pour 2x2 & 2x3 & 3x3 Art.Nr.:4009092015813 Nouvel art. 2007778 	#3 Pied en X pour 2x2 & 2x3 & 3x3 ArtNr.: 4009092015814 Nouvel art. 4000520
#4 U140 - l=2995 ArtNr.: 4009092015806 Nouvel art. 4000513 L=2995 m 	#5 U140 - l=3055 ArtNr.: 4009092015807 Nouvel art. 2007774 L=3055 mm 	#6 Entretoise 88,9x4 pour chassis 3x3+2x3 ArtNr.:4009092015738 Nouvel art. 2004402

#7 Renforcement extérieur inférieur pour 3x3m & 4x4m ArtNr.: 4009092015840 Nouvel art. 1001663 	#8 Renforcement extérieur milieu pour 3x3m & 4x4m ArtNr.: 4009092015841 Nouvel art. 1001664 	#9 Renforcement extérieur supérieur pour 3x3m & 4x4m ArtNr.: 4009092015842 Nouvel art. 1001665
#10 Renforcement extérieur gauche 40° ArtNr.: 4009092015823 Nouvel art. 1001646 	#11 Renforcement extérieur droite 40° ArtNr.: 4009092015824 Nouvel art. 1001647 	#12 Contrefort d´angle interne supérieur pour châssis 3mx3m ArtNr.: 4009092015886 Nouvel art. 2007743

#13 Contrefort d´angle milieu supérieur 3x3m & 4x4m 40° ArtNr.: 4009092015885 Nouvel art. 2007742 	#14 Renforcement intérieur inférieur pour 3x3m & 4x4m 40° ArtNr.:4009092015879 Nouvel art. 2007744 	#15 (Option) Hotte de ventilation pour chassis 3x3 & 4x4m 40° ArtNr.: 4009092015914 Nouvel art. 1001698 
#16 (Optionl) Tube de ventilation Diamètre 300 pour dispositif de ventil. ArtNr.: 4009003016990 Nouvel art. 1002175 	#17 Tole supérieure pour chassis 3x3m 40° ArtNr.: 4009092015865 Nouvel art. 1001686 	#18 Tole inférieure du chassis 3x3xm & 4x4m 40° ArtNr.: 4009092015863 Nouvel art. 1001684
#19 (option, seulement avec construction du #16) Tole inférieure avec découpe pour le tube de ventilation du chassis 3x3m & 4x4m 40° ArtNr.: 4009092015864 Nouvel art. 1001685 	#20 Renfort en tole pour le chassis 3x3m 40° ArtNr.: 4009092015852 Nouvel art. 1001673 	#21 Sortie avec vanne 300x300 Art.Nr.: 4009092015820 Nouvel art. 1001828 Transitions sur 150,200,250 4009023015782, 783, 784 

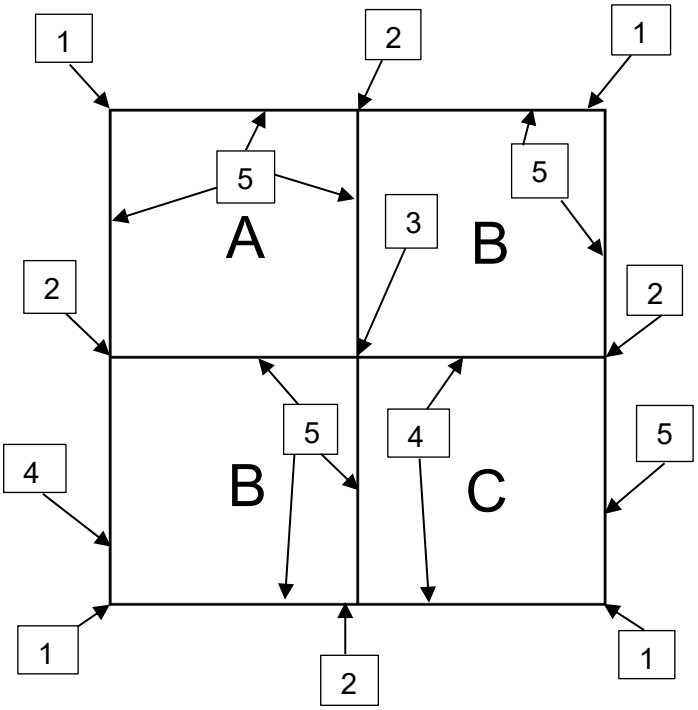
Différentes dispositions possibles A, A-B, A-B-C

A

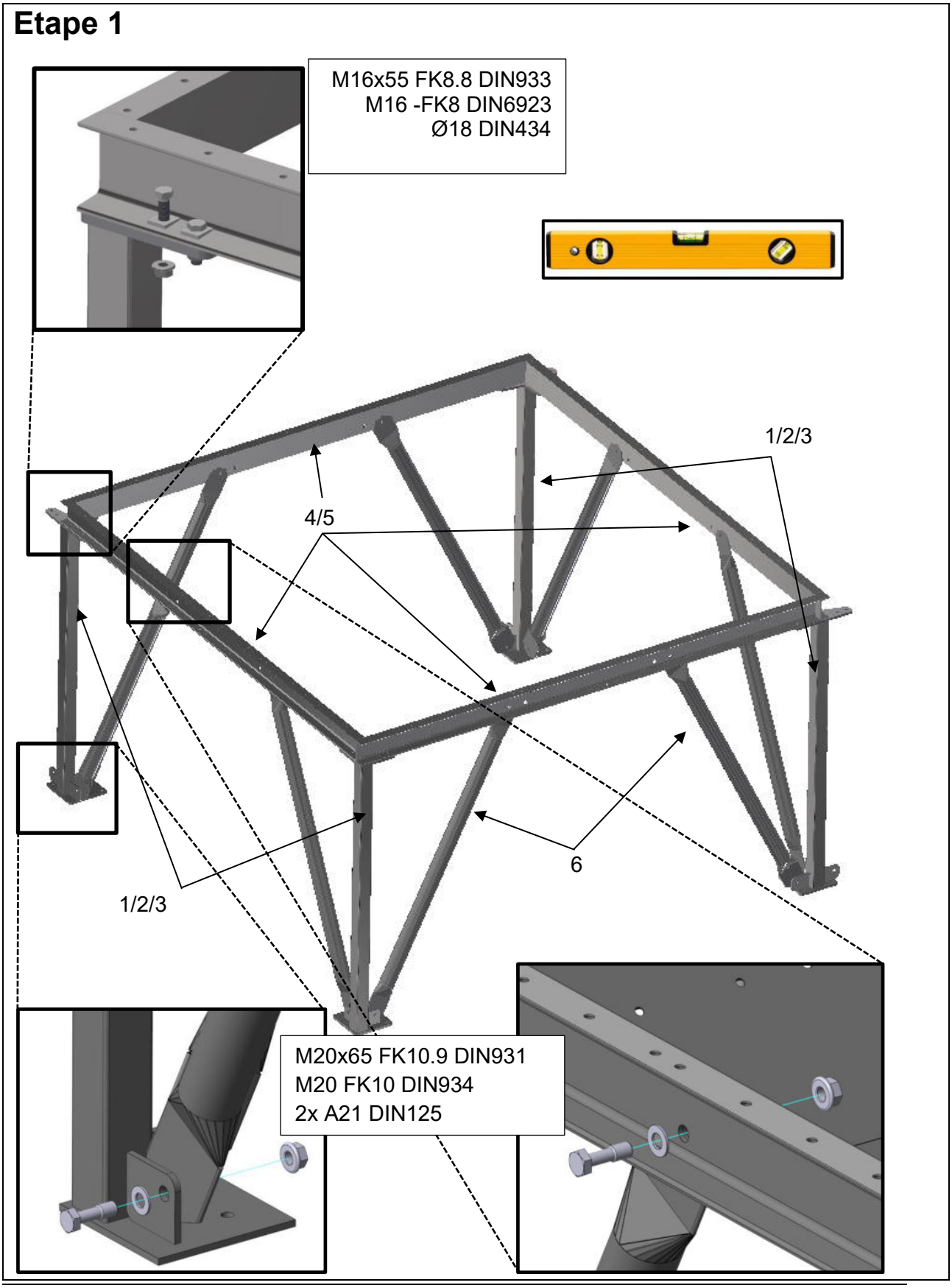


A-B

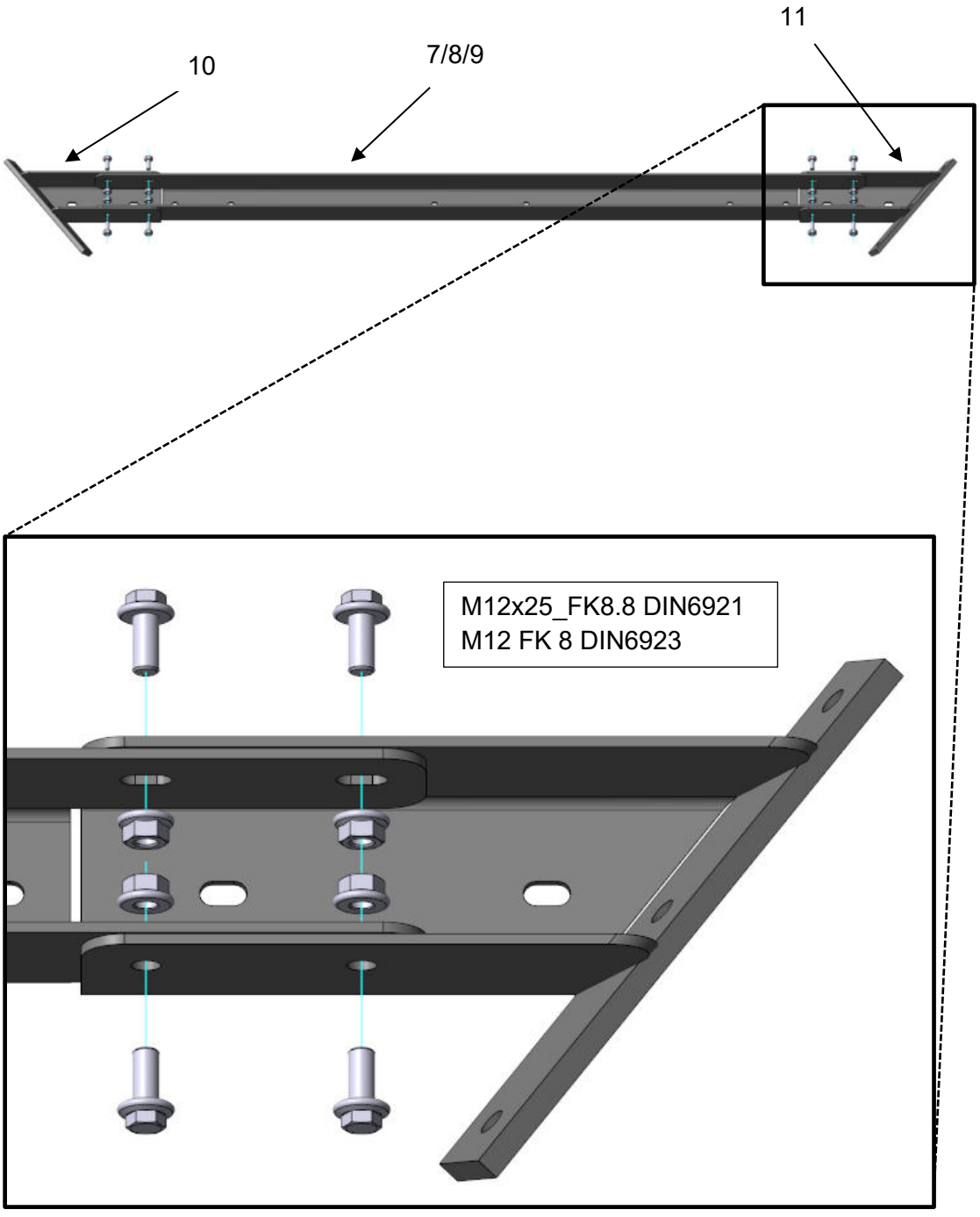
A-B-C



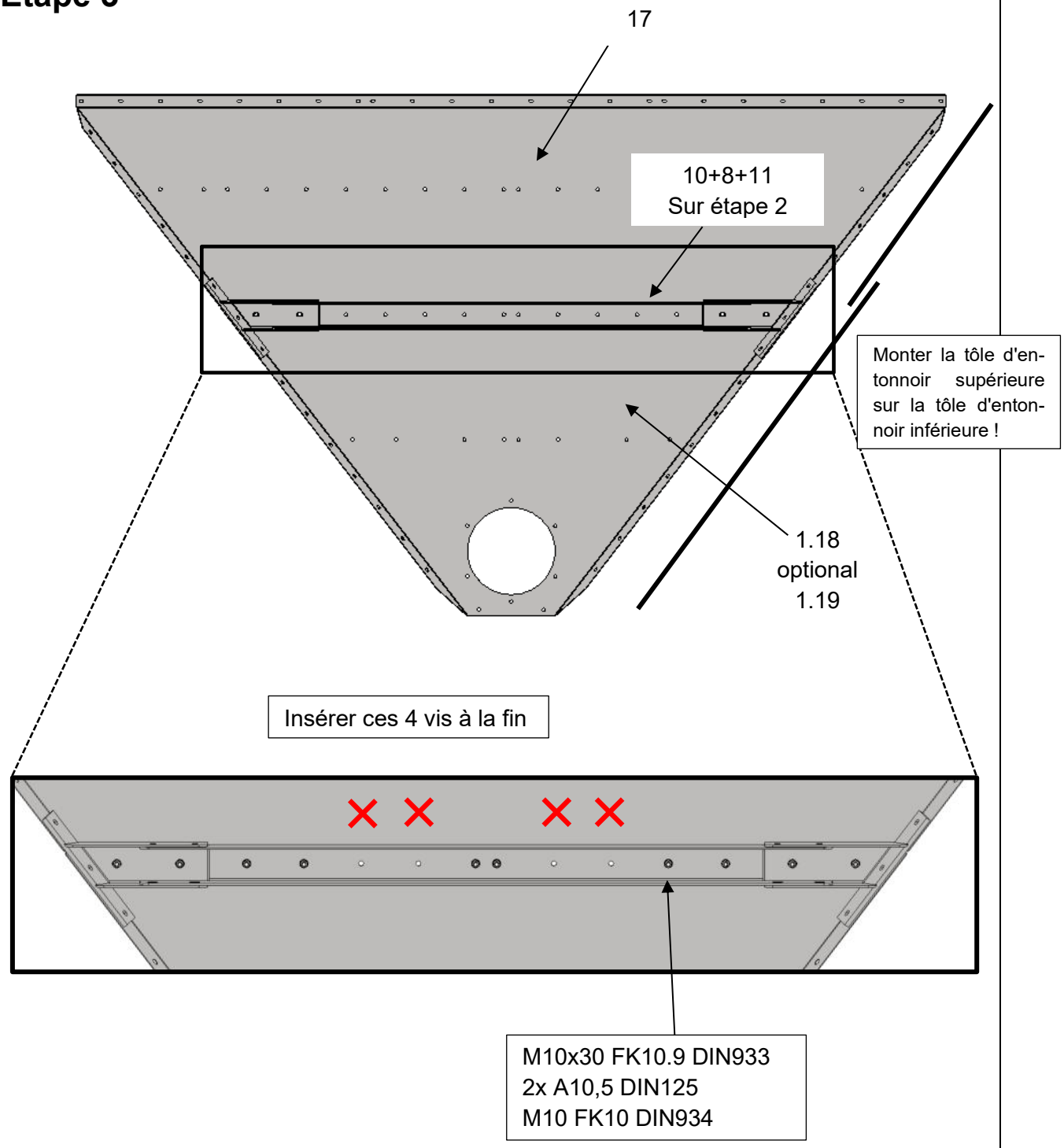
5.4.2 Montage du chassis 3x3



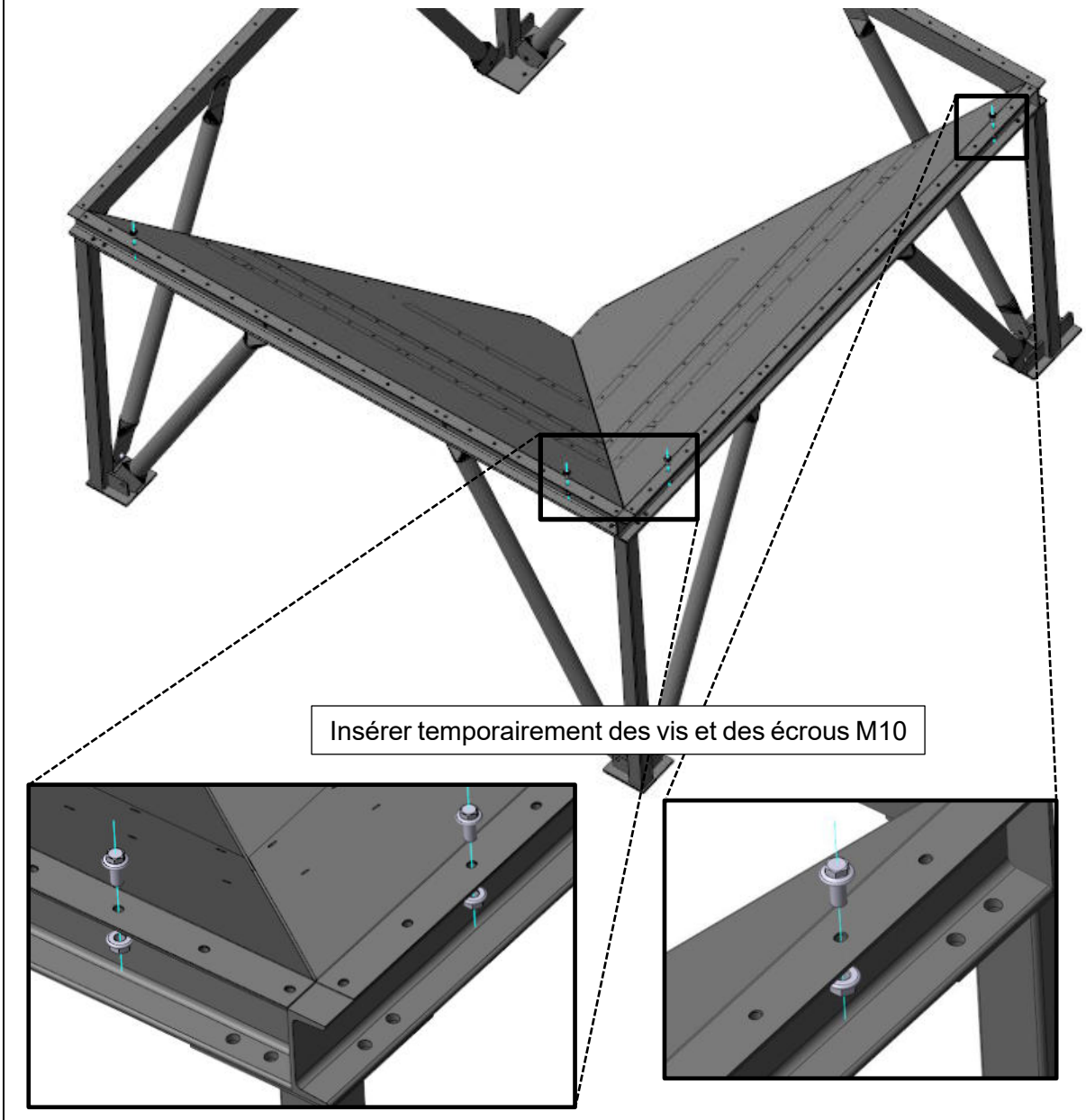
Etape 2



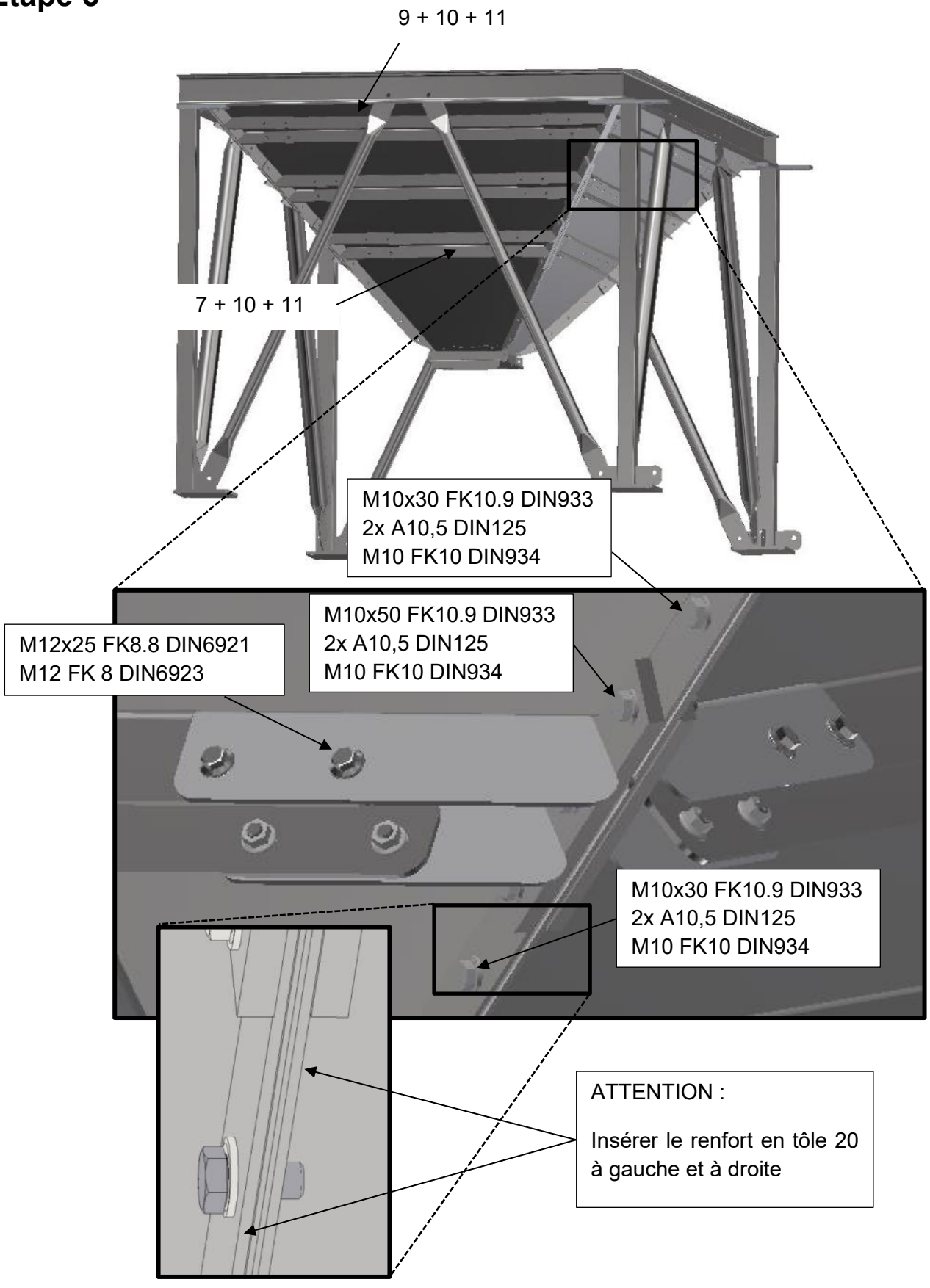
Etape 3

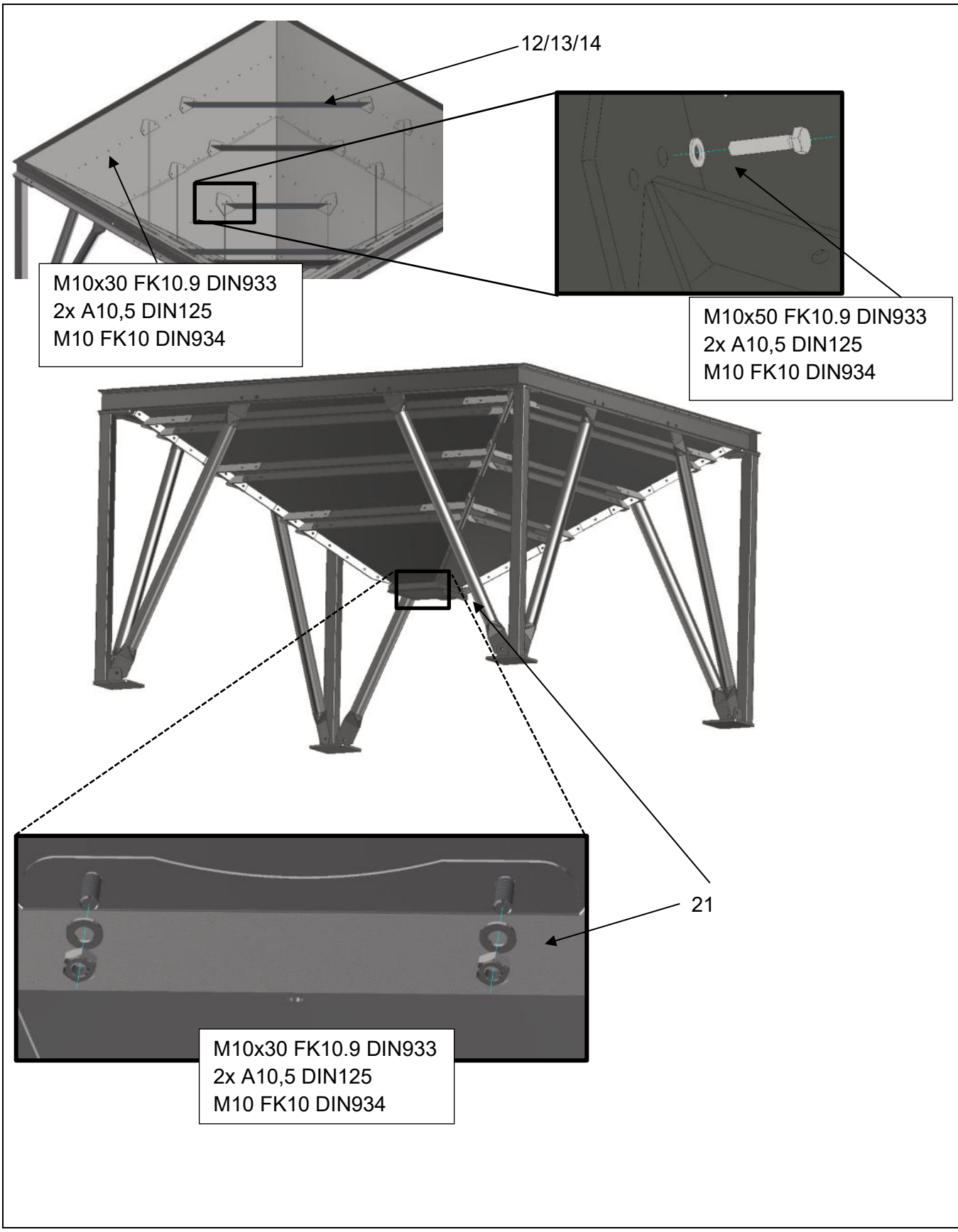

17
10+8+11
Sur étape 2
Monter la tôle d'entonnoir supérieure sur la tôle d'entonnoir inférieure !
1.18
optional
1.19
Insérer ces 4 vis à la fin
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 4

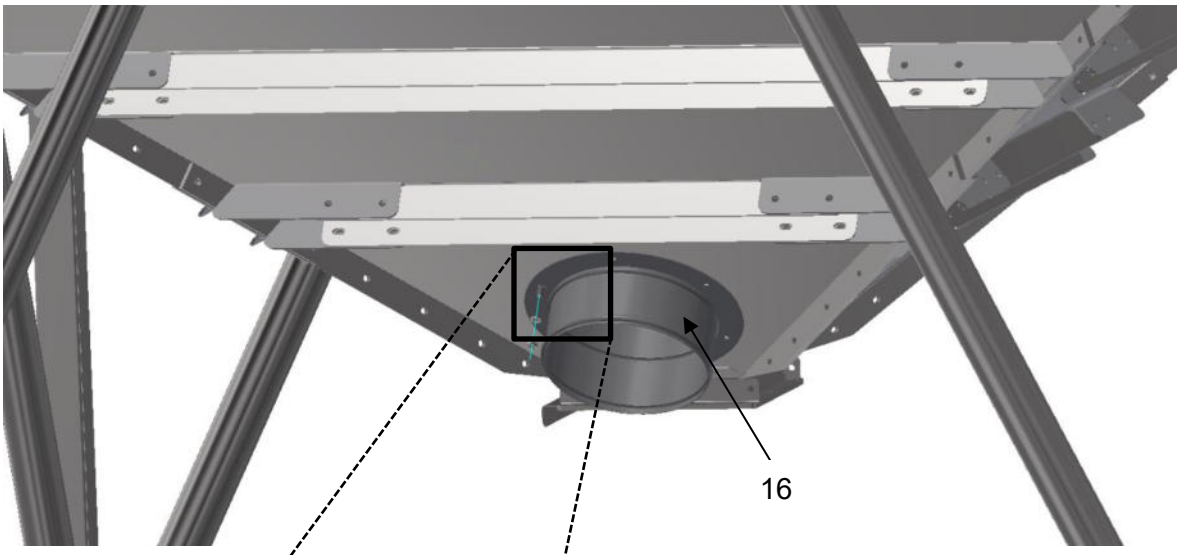


Etape 5

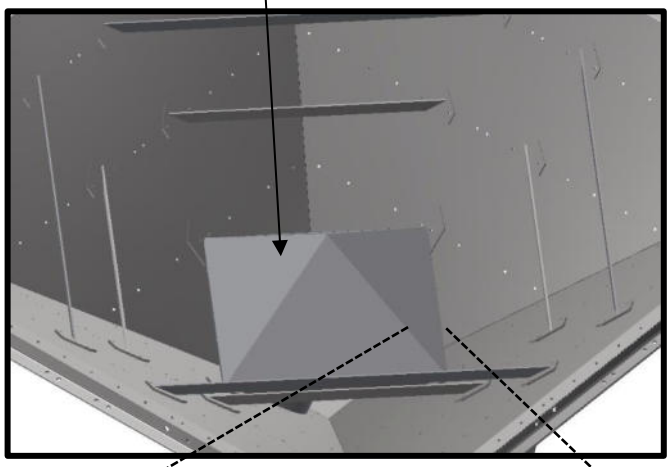

9 + 10 + 11
7 + 10 + 11
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ATTENTION :
Insérer le renfort en tôle 20
à gauche et à droite


12/13/14
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
21
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

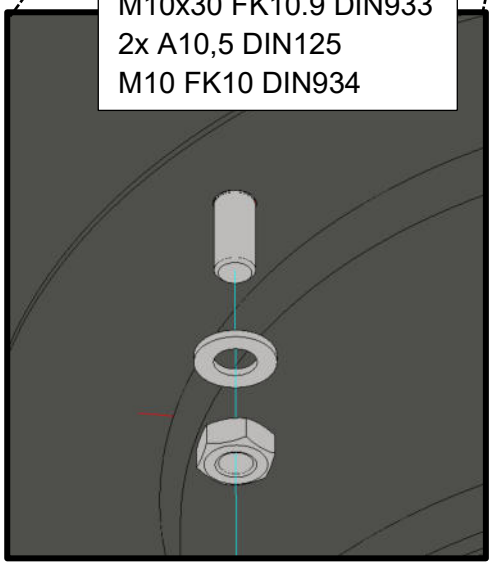
Etape 7 Option

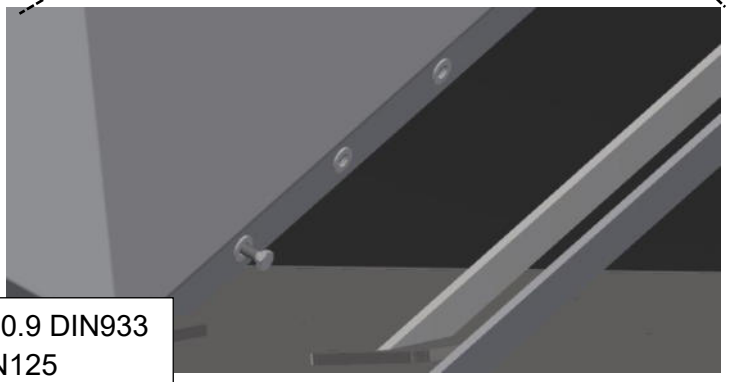


15



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

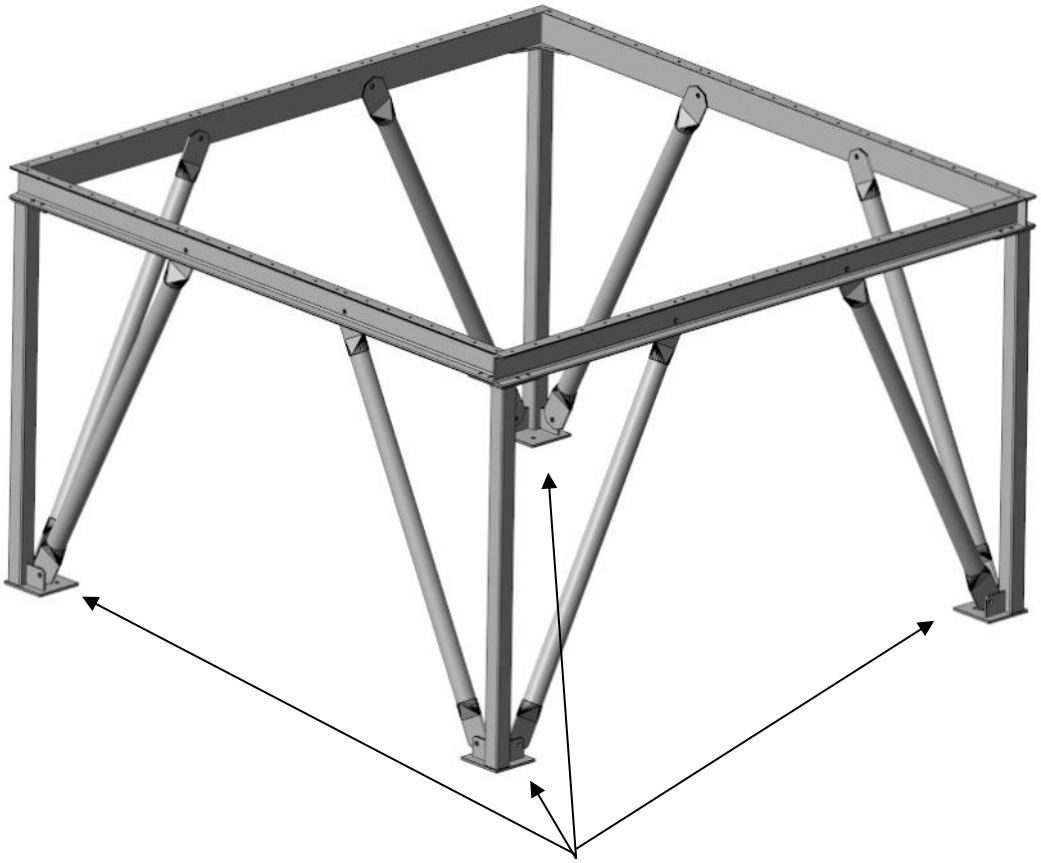




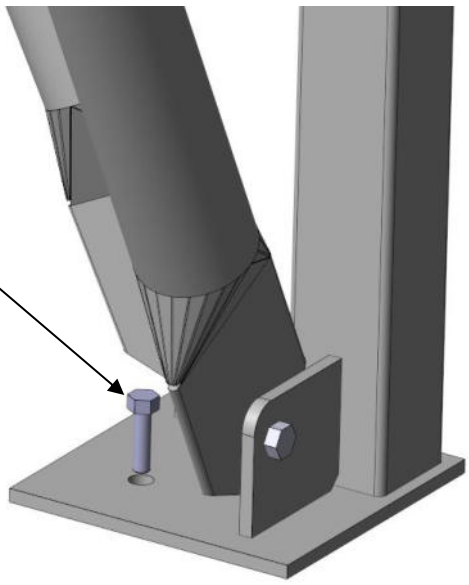
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 8

Veiller à un montage perpendiculaire et à angle droit

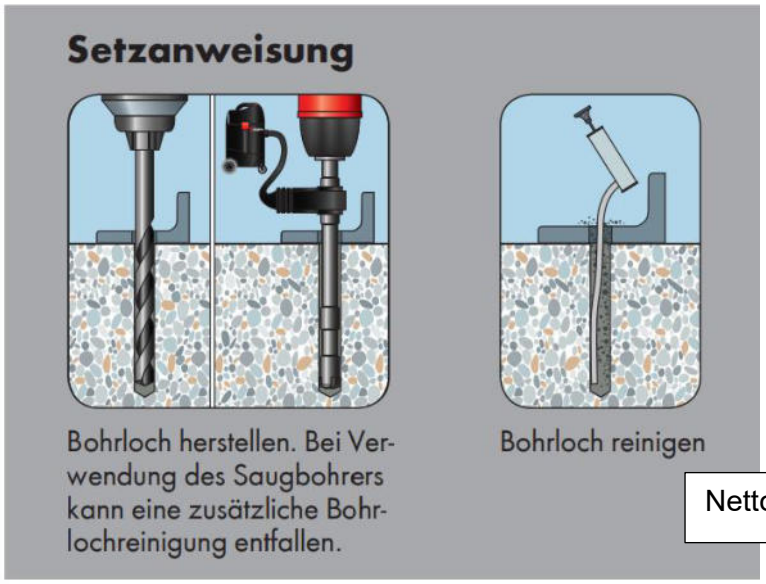


2x Vis à béton par socle



Mise en oeuvre

Faire un trou. Si-vous utilisez une perceuse aspirante un nettoyage du trou n´est pas nécessaire

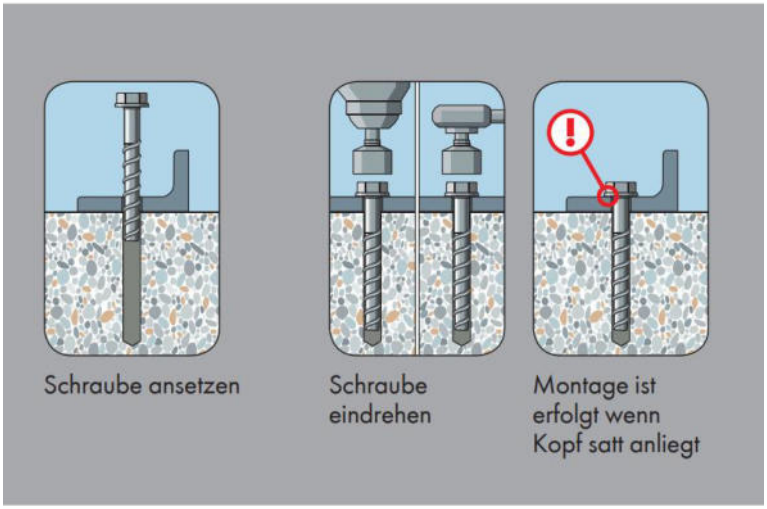


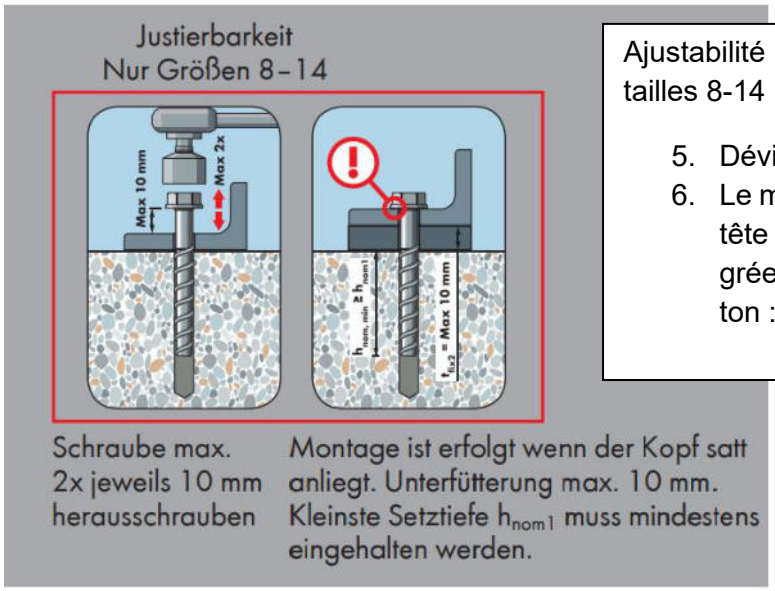
Nettoyer le trou

1 Placer la vis

2 Tourner la vis

3 Le montage est terminé lorsque la tête est complètement intégrée





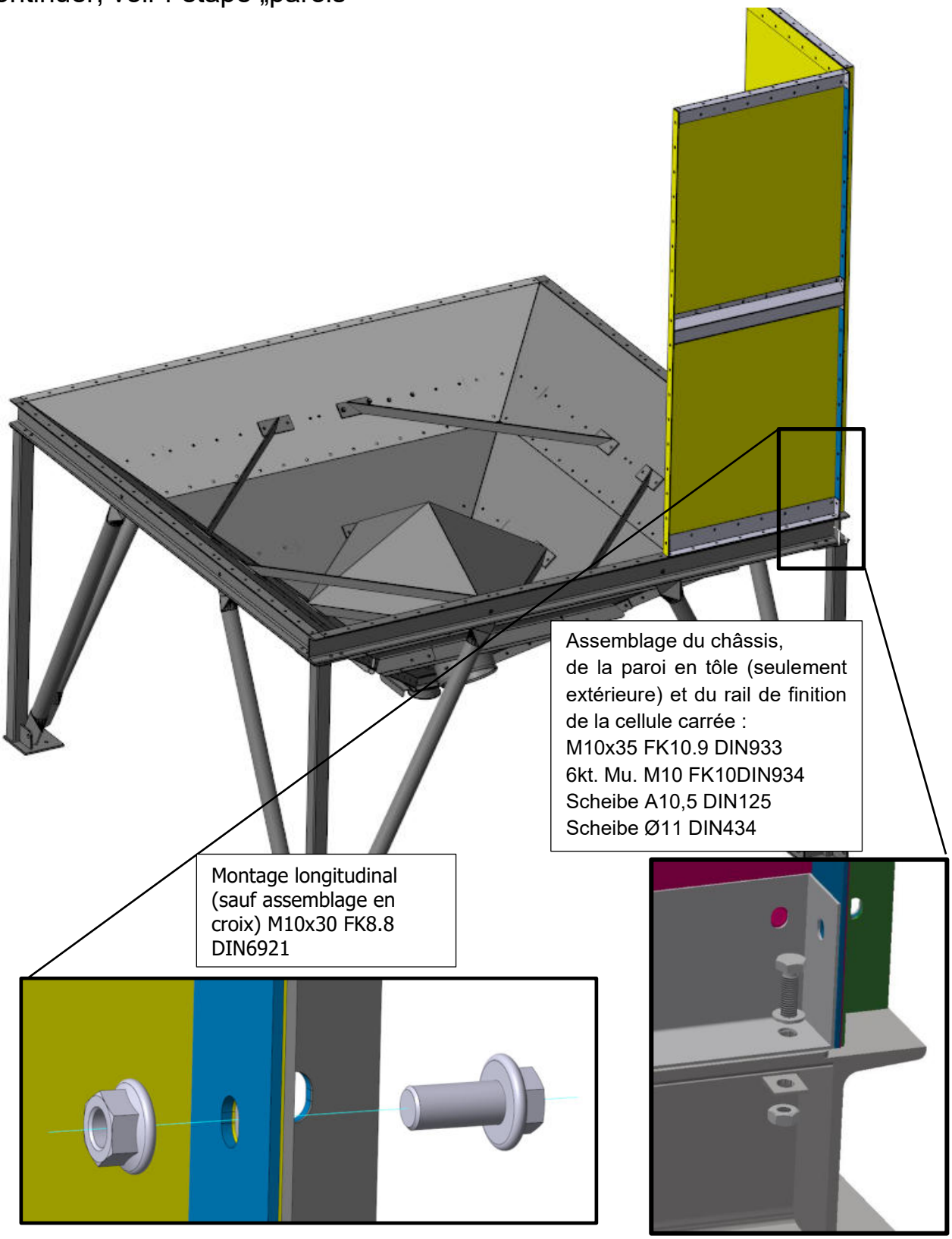
Ajustabilité - Uniquement pour les tailles 8-14

5. Dévisser les vis max 2x 10mm
6. Le montage est réussi quand la tête est complètement intégrée. Entre la pièce et le béton : max 10mm

Informations complémentaires : Würth Vis à bétons W-BS Typ S Tête hexagonale DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

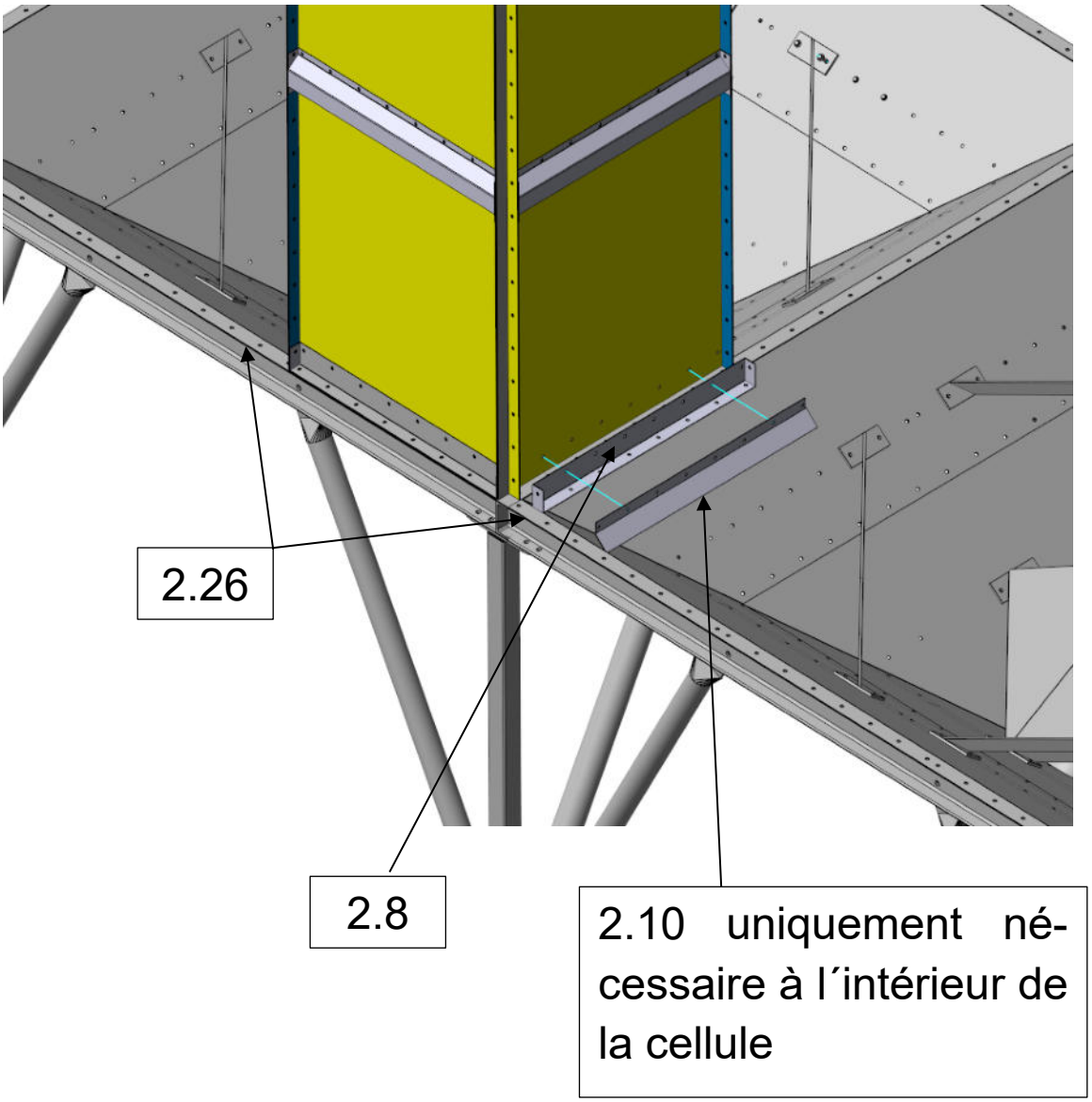
Etape 9 (Option, pour la construction d´un silo)

continuer, voir l´étape „parois“



Si plusieurs chassis doivent être assemblés l´un à coté de l´autre,

- des toles inclinées repliées doivent être posées entre les parois intermédiaires sur le rail final afin que les céréales puissent s´écouler parfaitement.
- Aux endroits où deux tôles de trémie sont superposées, la hauteur de construction est légèrement plus élevée -> pour compenser, il faut monter des tôles de rehaussement (2.26) supplémentaires aux autres endroits.



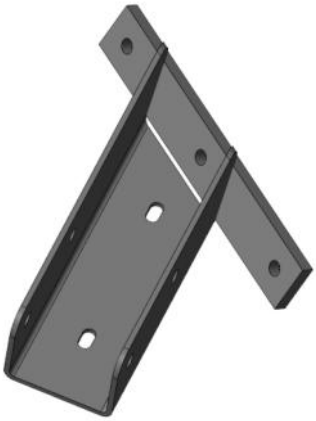
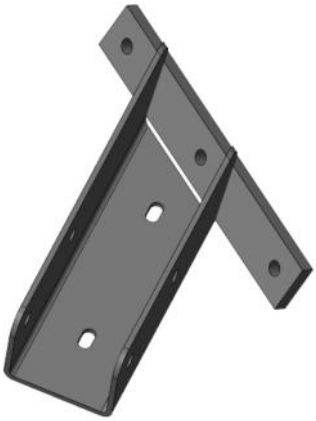
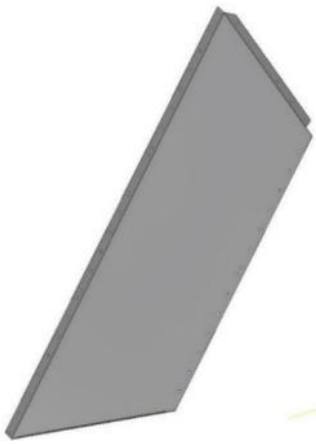
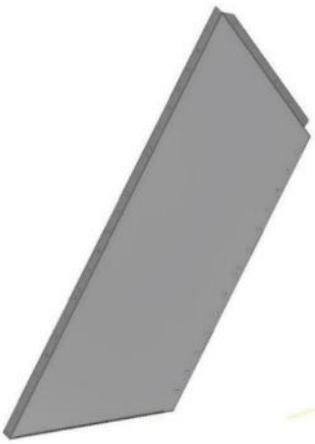
5.5 Chassis 4x3

5.5.1 Liste des pièces

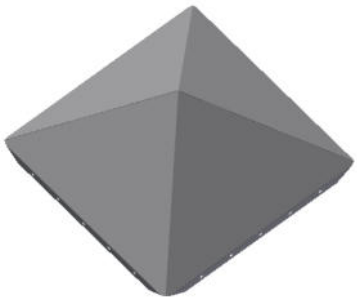
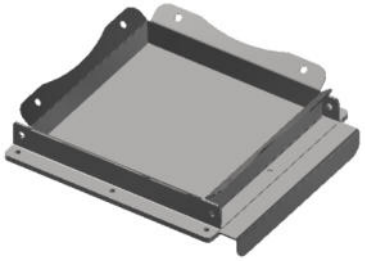
#1 Pied en L pour 4x4 & 4x3 Art.Nr.:4009092015817 Nouvel art. 4000523 	#2 Pied en T pour 4x4 & 4x3 Art.Nr.:4009092015818 Nouvel art. 4000524 	#3 Pied en X pour 4x4 & 4x3 ArtNr.: 4009092015819 Nouvel art. 4000525
#4 Pied I extérieur pour 4x4 & 4x3 ArtNr.: 4009092015815 Nouvel art. 4000521 	#5 Pied I intérieur pour 4x4 & 4x3 ArtNr.: 4009092015816 Nouvel art. 4000522 	#6 U140 - l=2995 ArtNr.: 4009092015806 Nouvel art. 4000513 L=2995 m

#7 U140 - l=3055 ArtNr.: 4009092015807 Nouvel art. 2007774 L=3055 mm 	#8 U140 - l=3997,5 ArtNr.: 4009092015808 Nouvel art. 4000515 L=3997.5 m 	#9 U140 - l=4057,5 ArtNr.: 4009092015809 Nouvel art. 4000516 L=4057.5m
#10 Entretoise 88,9x4 pour chassis 4x4+4x3 ArtNr.:4009092015811 Nouvel art. 4000517 		

#11 Renforcement extérieur inférieur pour 3x4m – 4m ArtNr.: 4009092015846 Nouvel art. 1001667 	#12 Renforcement extérieur milieu pour 3x4m – 4m ArtNr.: 4009092015845 Nouvel art. 1001666 	#13 Renforcement extérieur supérieur 3x4m – 4m ArtNr.: 4009092015844 Nouvel art. 4000446
#14 Renforcement extérieur inférieur 3x4m – 3m ArtNr.: 4009092015849 Nouvel art. 1001670 	#15 Renforcement extérieur milieu 3x4m – 3m ArtNr.: 4009092015848 Nouvel art.1001669 	#16 Renforcement extérieur supérieur 3x4m – 3m ArtNr.: 4009092015847 Nouvel art. 1001668

#17 Renforcement extérieur droite 40° 3x4m - 4m ArtNr.: 4009092015830 Nouvel art. 1001653 	#18 Renforcement extérieur gauche 40° 3x4m – 4m ArtNr.: 4009092015829 Nouvel art. 1001652 	#19 Renforcement extérieur droite 40° 3x4m – 3m ArtNr.: 4009092015832 Nouvel art. 1001655 
#20 Renforcement extérieur gauche 40° 3x4m – 3m ArtNr.: 4009092015831 Nouvel art. 1001654 	#21 Tole supérieure du chassis 3x4m 40° - 3m ArtNr.: 4009092015868 Nouvel art. 4000449 	#22 Tole supérieure du chassis 3x4m 40° - 4m ArtNr.: 4009092015867 Nouvel art. 4000448 

#23 Tôle inférieure du châssis 3x4m 40° - 3m ArtNr.: 4009092015870 Nouvel art. 1001688 	#24 Tôle inférieure du châssis 3x4m 40° - 4m ArtNr.: 4009092015869 Nouvel art. 1001687 	#25 (option, seulement si construit avec #33) Tôle pour ventilation du châssis 3x4m 40° – 3m ArtNr.: 4009092015872 Nouvel art. 1001690
#26 (option, seulement si construit avec #33) Tôle pour ventilation du châssis 3x4m 40° - 4m ArtNr.: 4009092015871 Nouvel art. 1001689 	#27 Renfort d´angle interne milieu 3x4m 40° ArtNr.: 4009092015890 Nouvel art. 4000463 	#28 Renfort d´angle milieu 2 3x4m 40° ArtNr.: 4009092015891 Nouvel art. 4000464

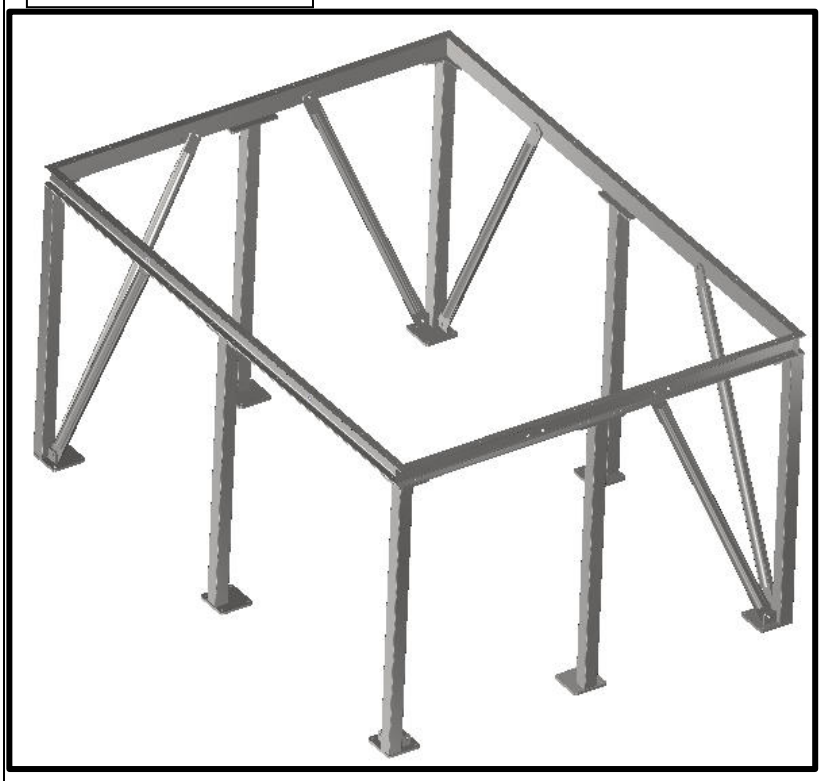
#29 Renfort d´angle intérieur supérieur 1 3x4m 40° ArtNr.: 4009092015888 Nouvel art. 4000461 	#30 Renfort d´angle intérieur supérieur 2 3x4m 40° ArtNr.: 4009092015889 Nouvel art. 4000462 	#31 Renfort intérieur inférieur des angles 3x4m 40° ArtNr.:4009092015880 Nouvel art. 2007770
#32 (Option) Hotte de ventilation pour chassis 3x4m 40° ArtNr.: 4009092015915 Nouvel art. 1001699 	#33 (Option) Tube de ventilation Diamètre 300 ArtNr.: 4009003016990 Nouvel art. 1002175 	#34 Sortie avec vanne 300x300 3x4m Art.Nr.: 4009092015822 Nouvel art. 1001645 Transitions sur 150,200,250 4009023015782, 783, 784 

#35 Renfort pour châssis 3x4m 40° ArtNr.: 4009092015853 Nouvel art. 1001674 		

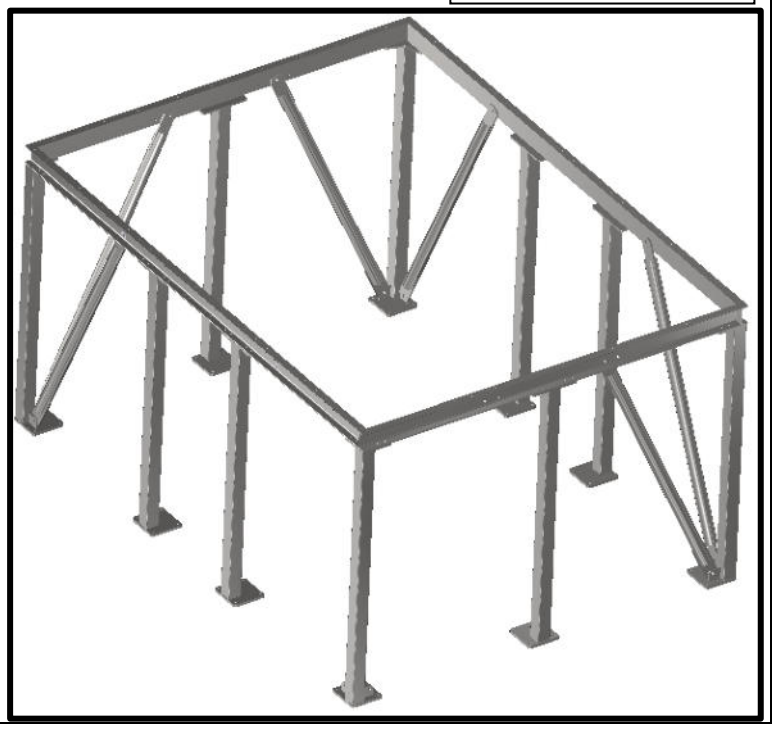
Possibilités pour les supports intermédiaires

Pour chaque côté il faut au minimim visser un pied support supplémentaire (photo 1). Si vous disposez par exemple d'un convoyeur qui passe au milieu des silos, il est également possible de visser deux pieds support (image 2).

Représentation 1

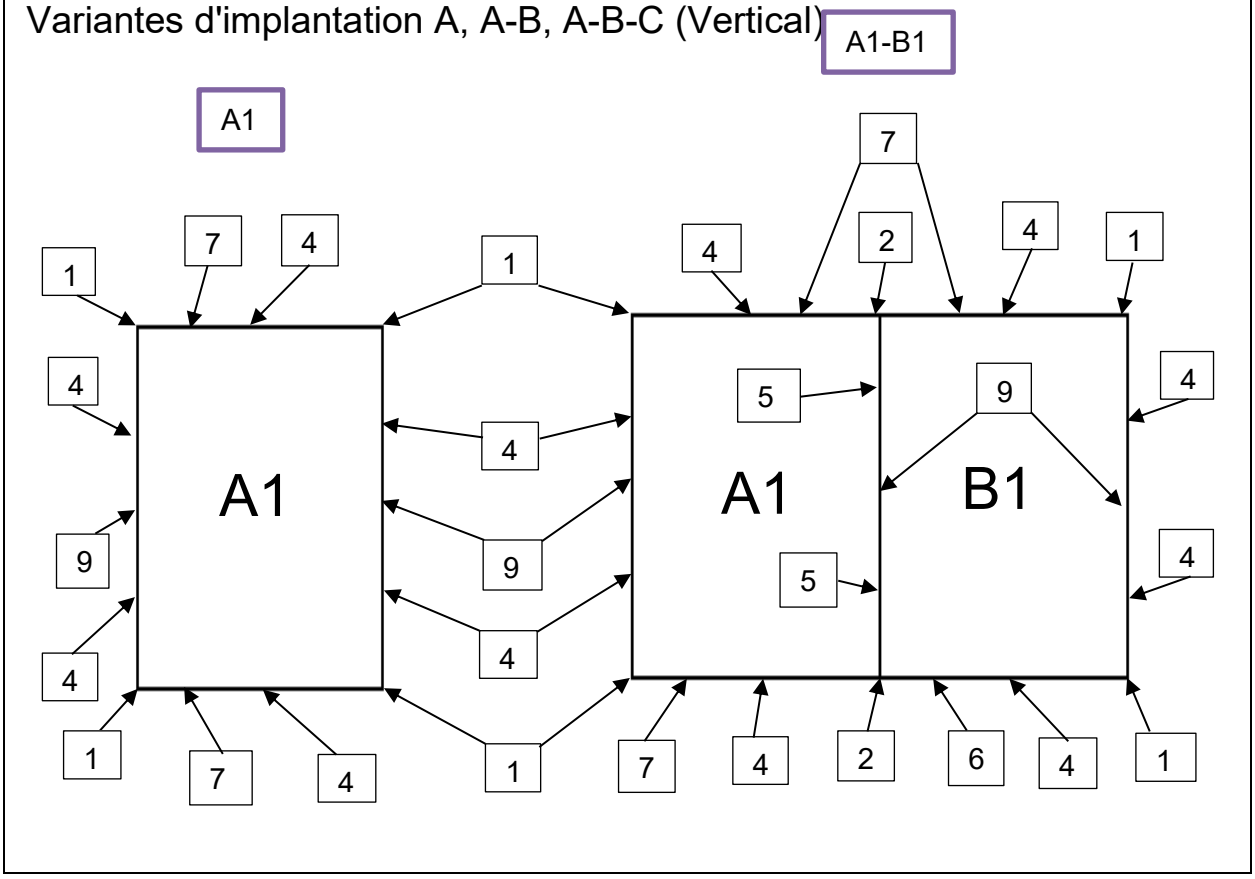


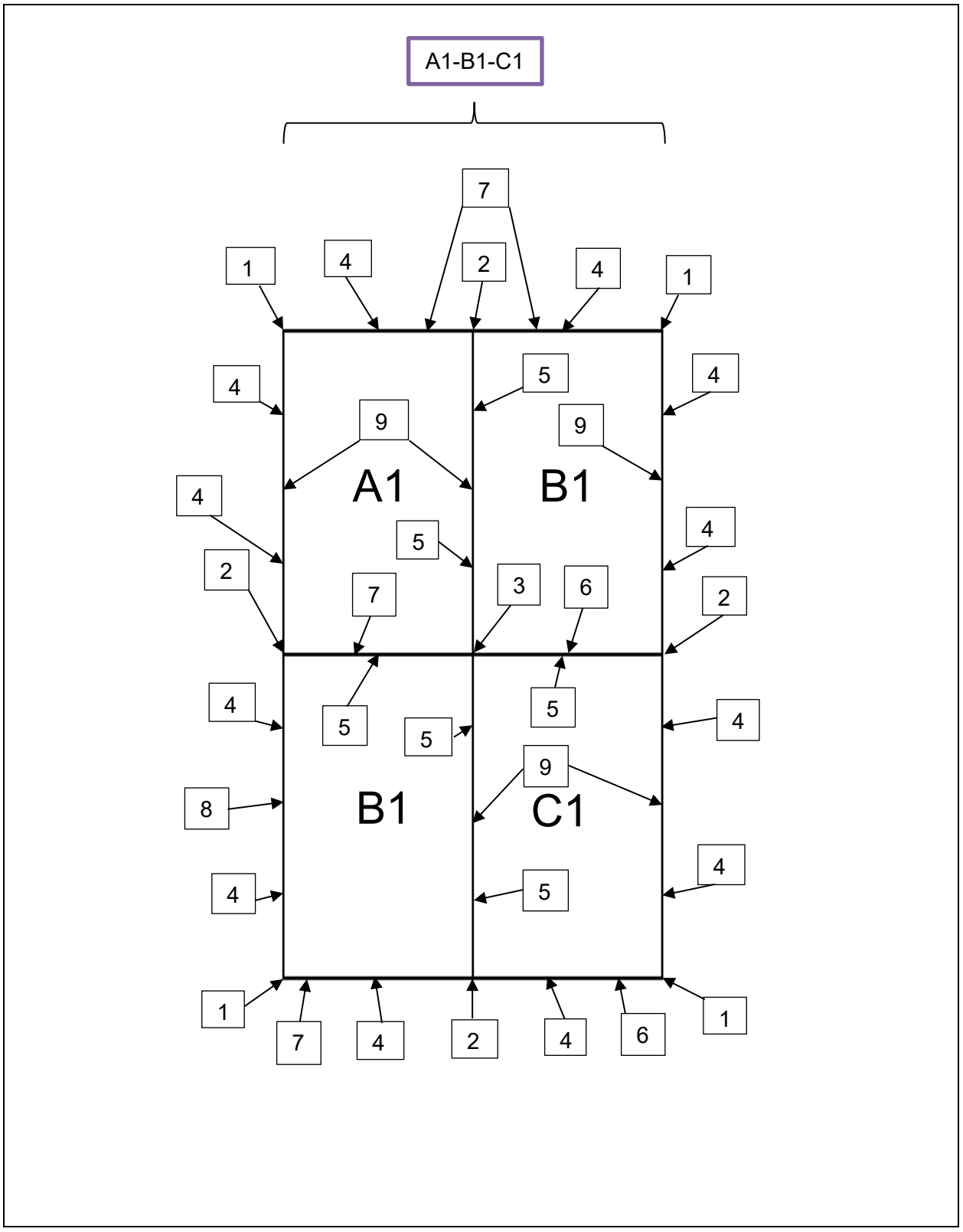
Représentation 2



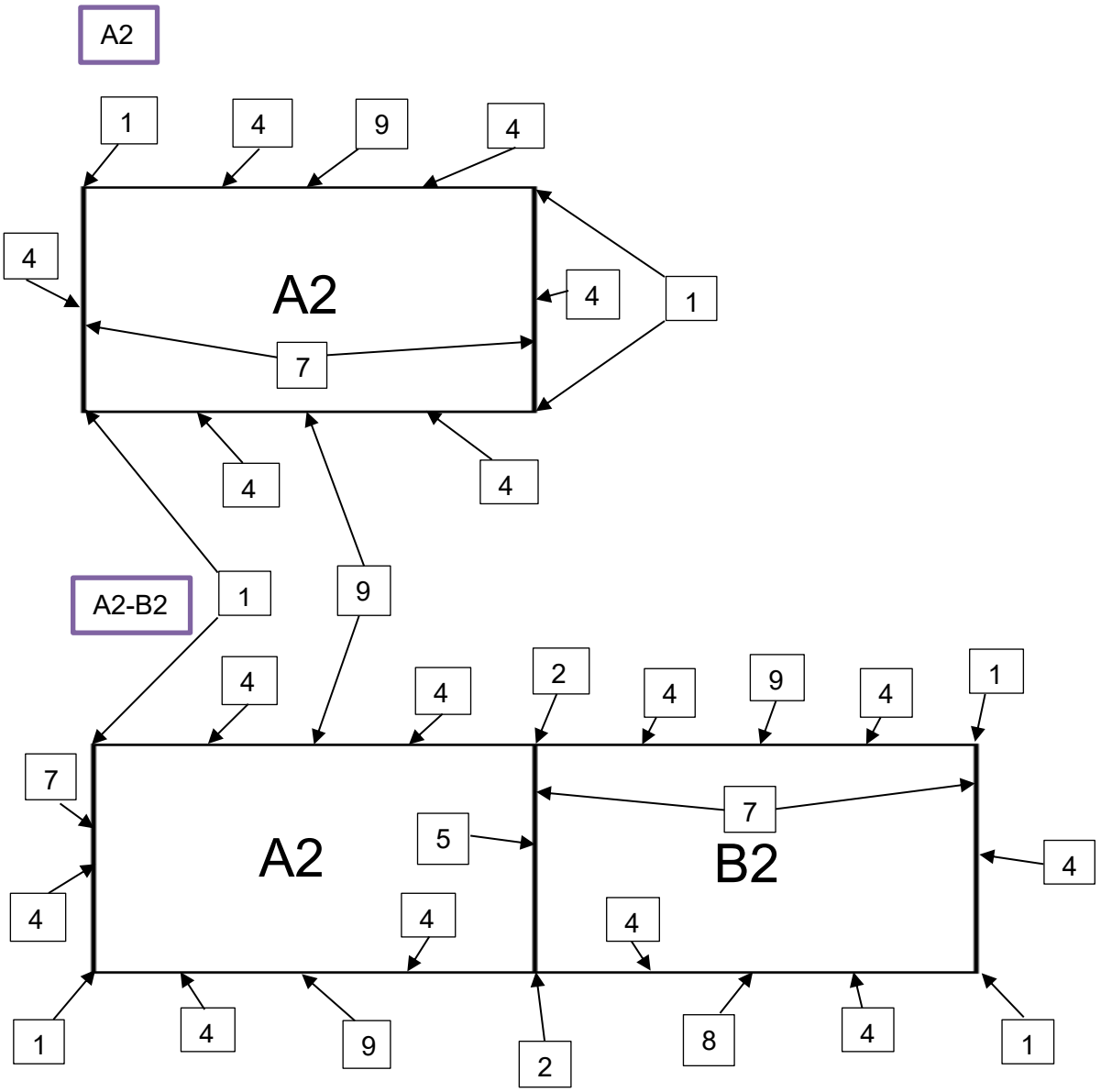
Dans l'exemple suivant, 2 pieds de support sont utilisés sur le côté 4m

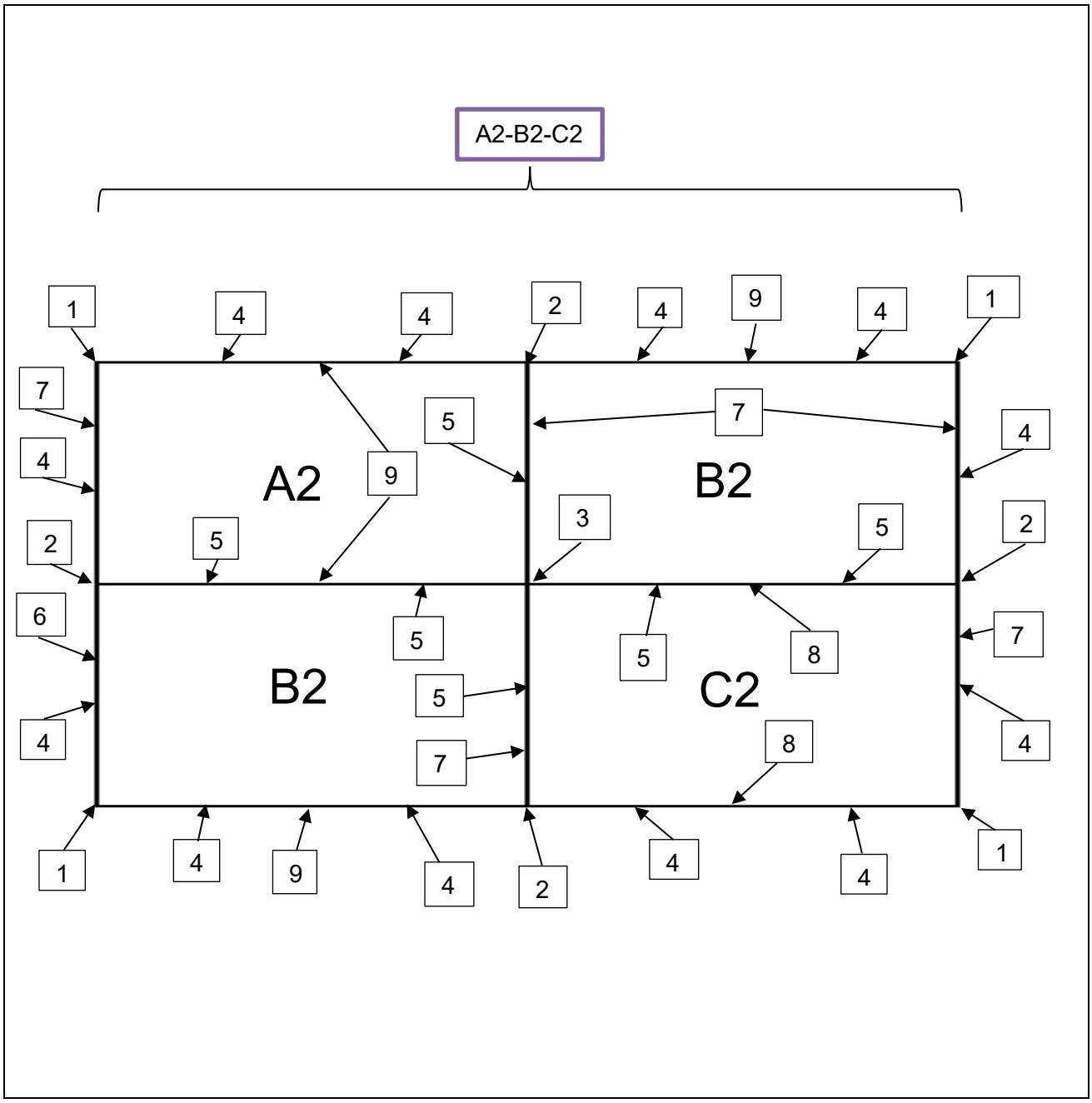
Variantes d'implantation A, A-B, A-B-C (Vertical)



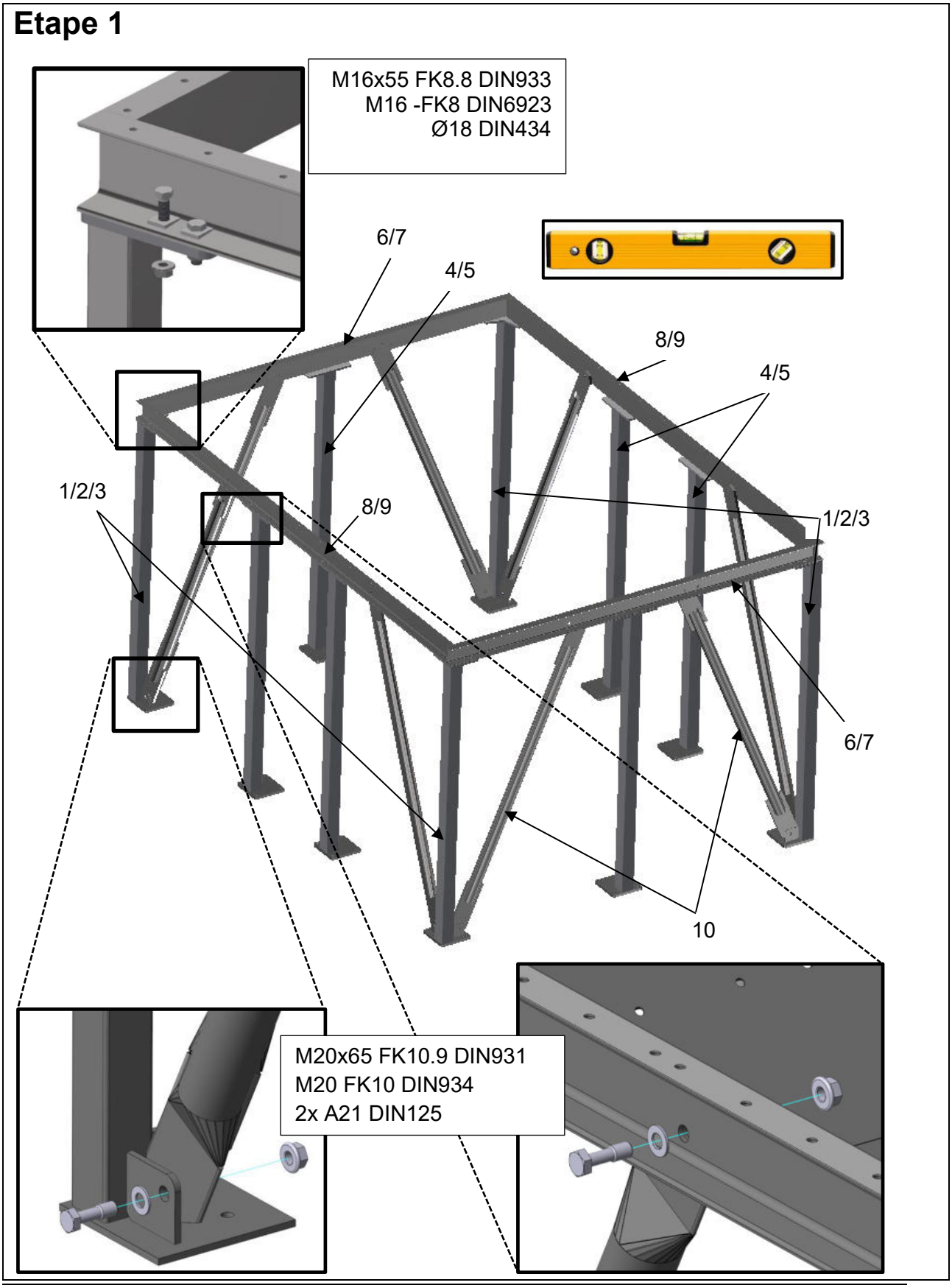

A1-B1-C1
A1
B1
B1
C1

Variantes d'implantation A, A-B, A-B-C (Horizontale)



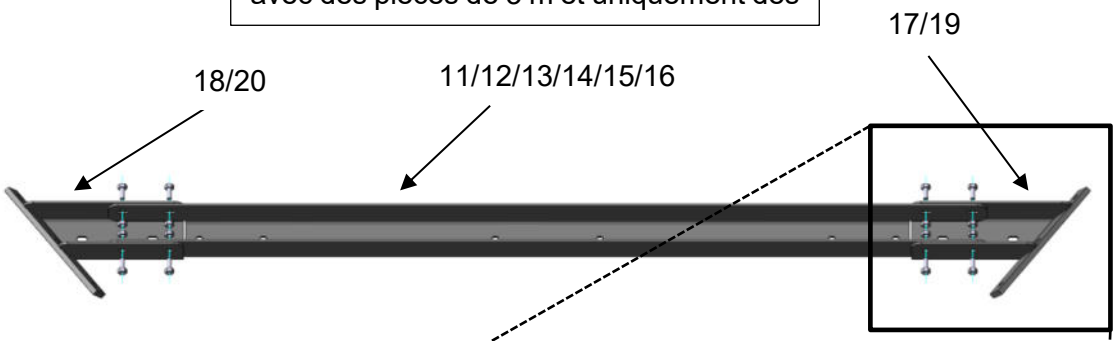

A2-B2-C2
A2
B2
B2
C2

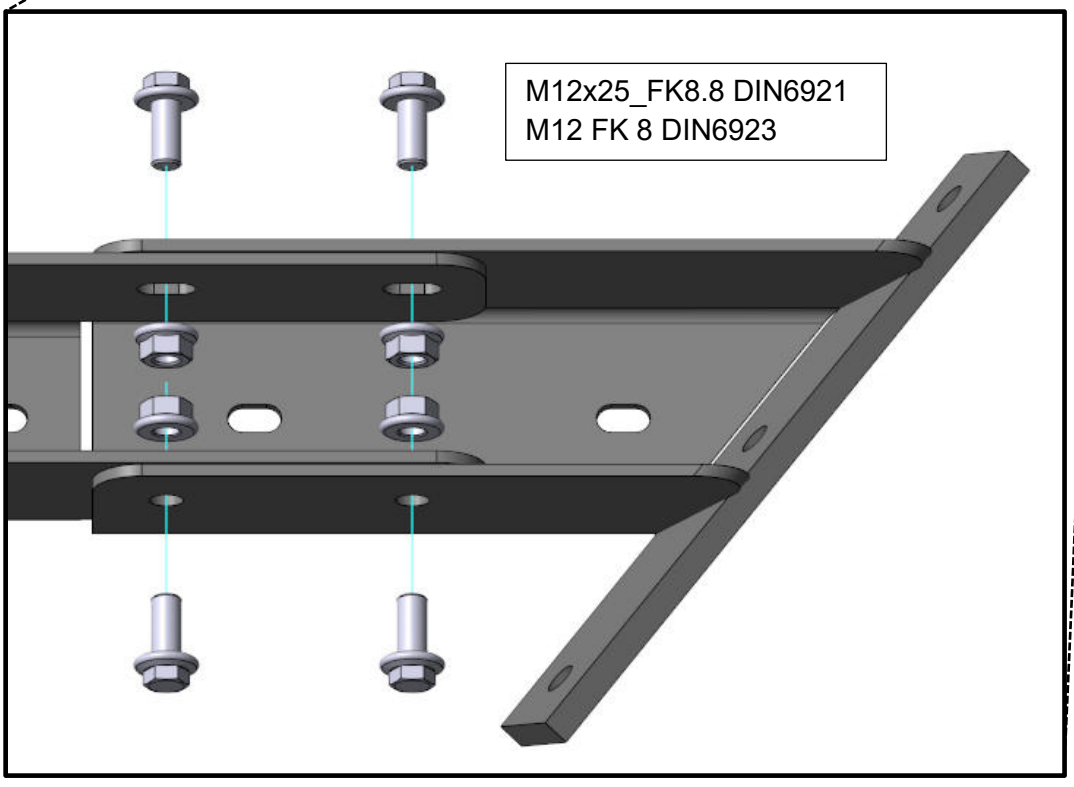
5.5.2 Assemblage du chassis 4x3



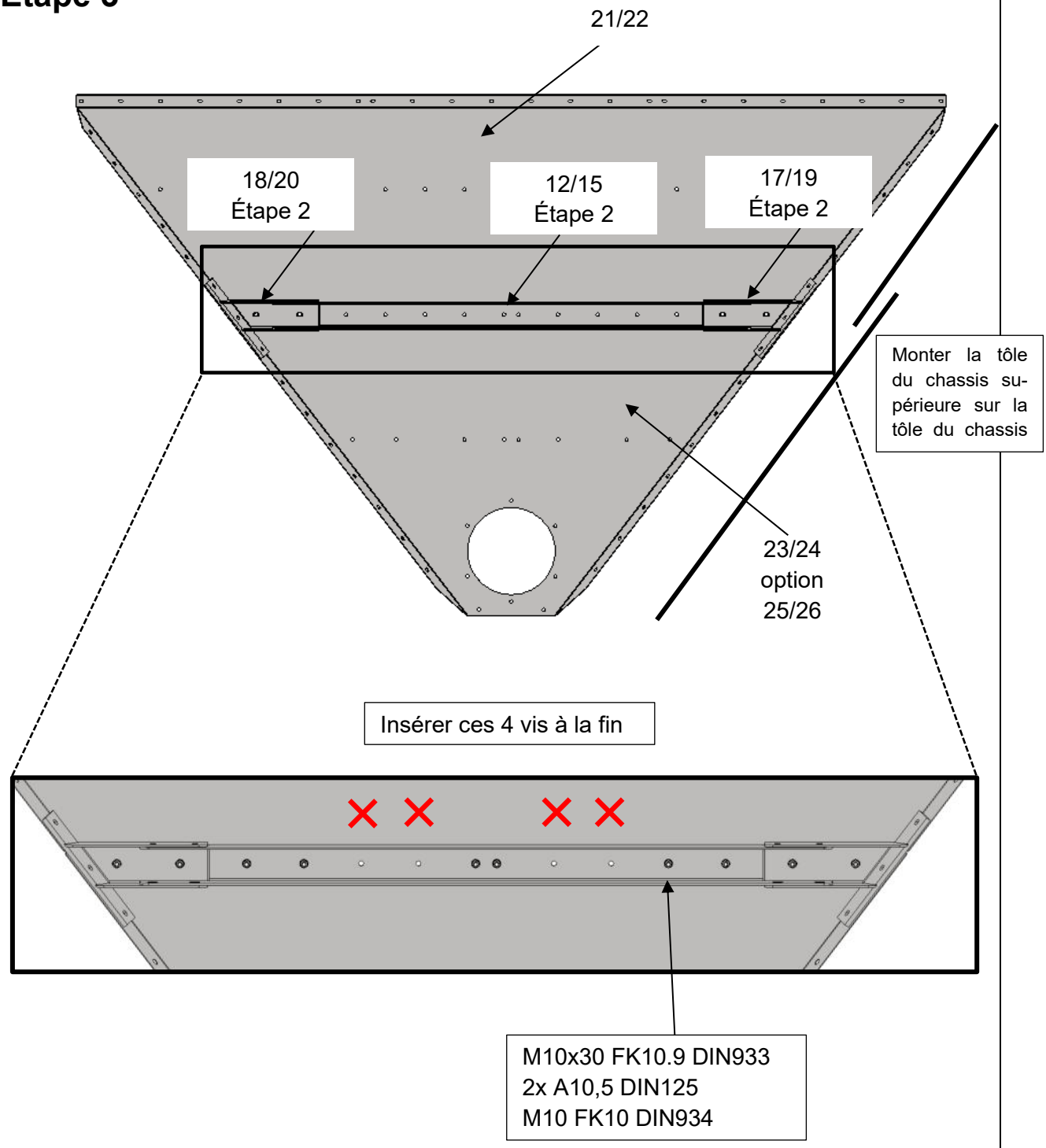
Etape 2

Assembler uniquement des pièces de 3 m avec des pièces de 3 m et uniquement des

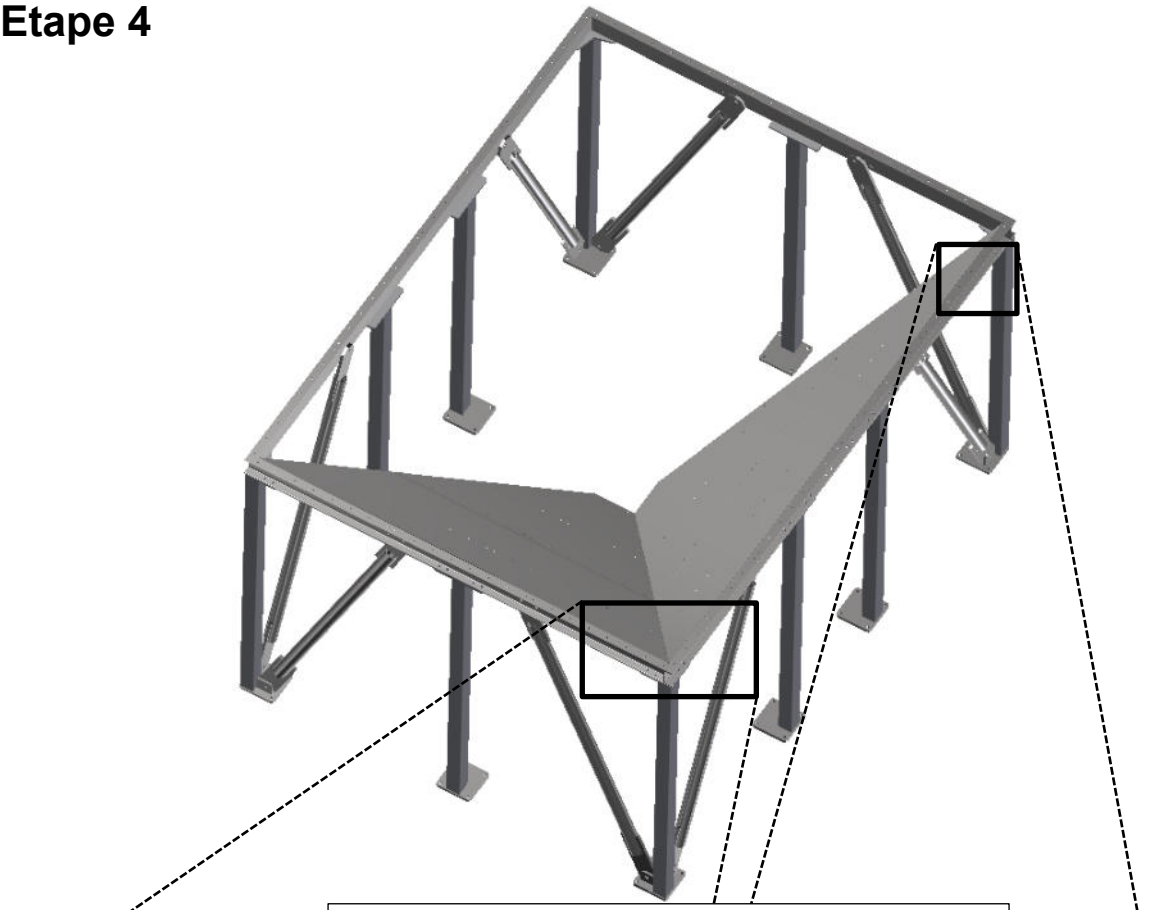




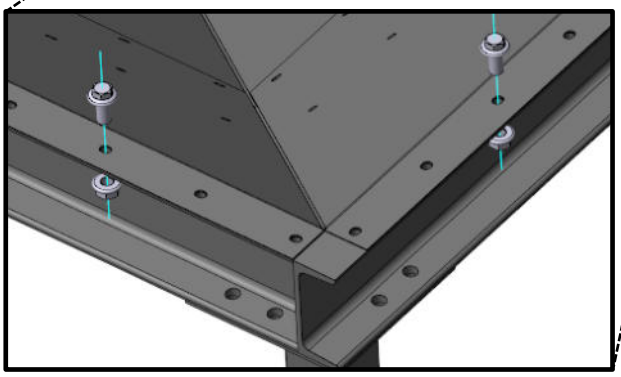
Etape 3

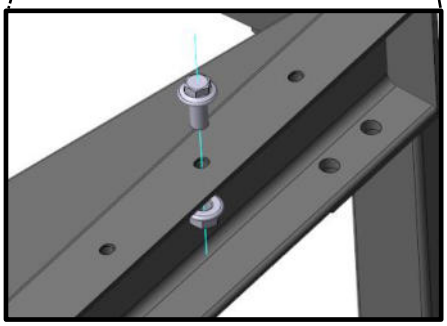

21/22
18/20
Étape 2
12/15
Étape 2
17/19
Étape 2
Monter la tôle du chassis supérieure sur la tôle du chassis
23/24
option
25/26
Insérer ces 4 vis à la fin
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 4

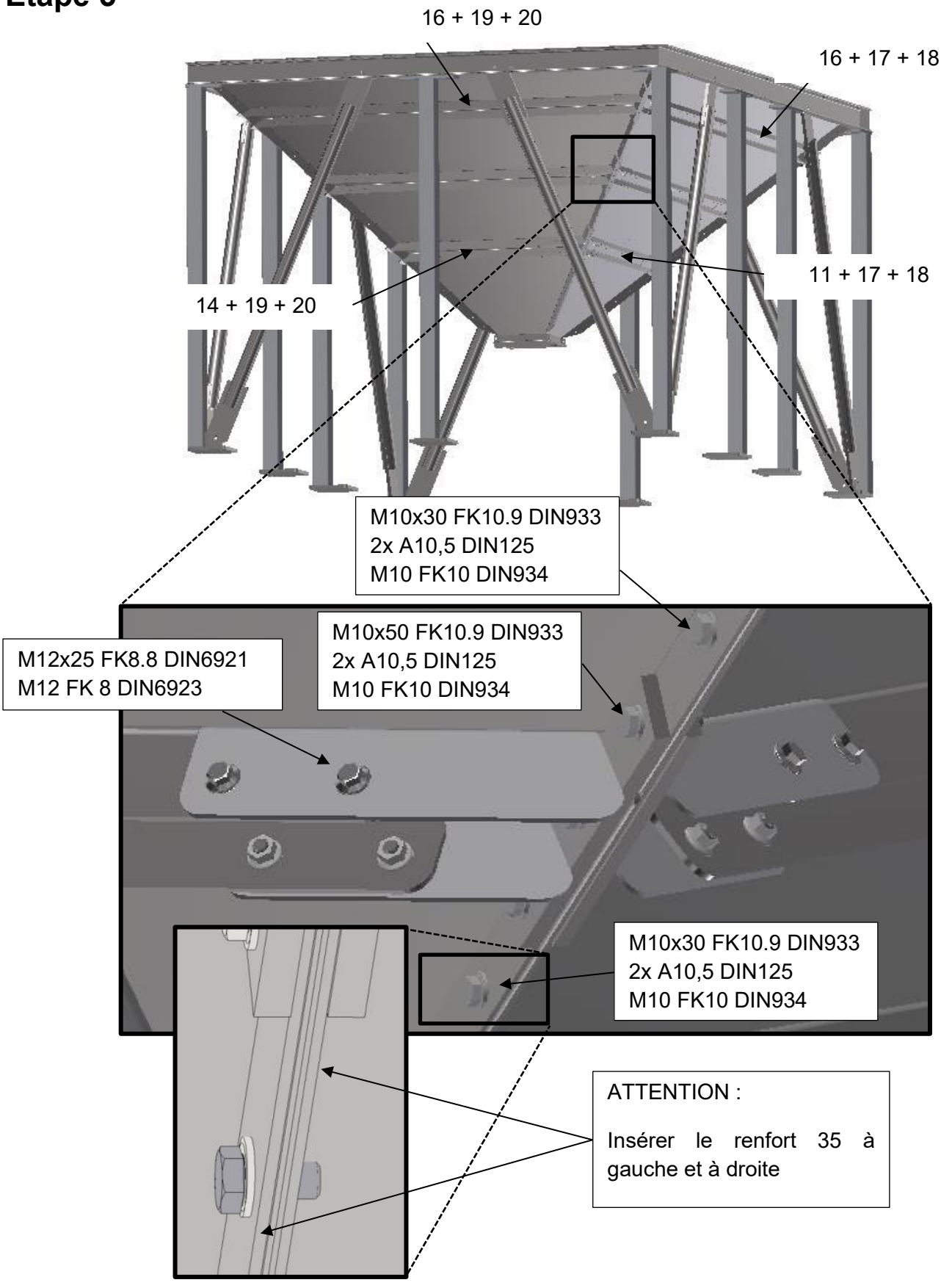


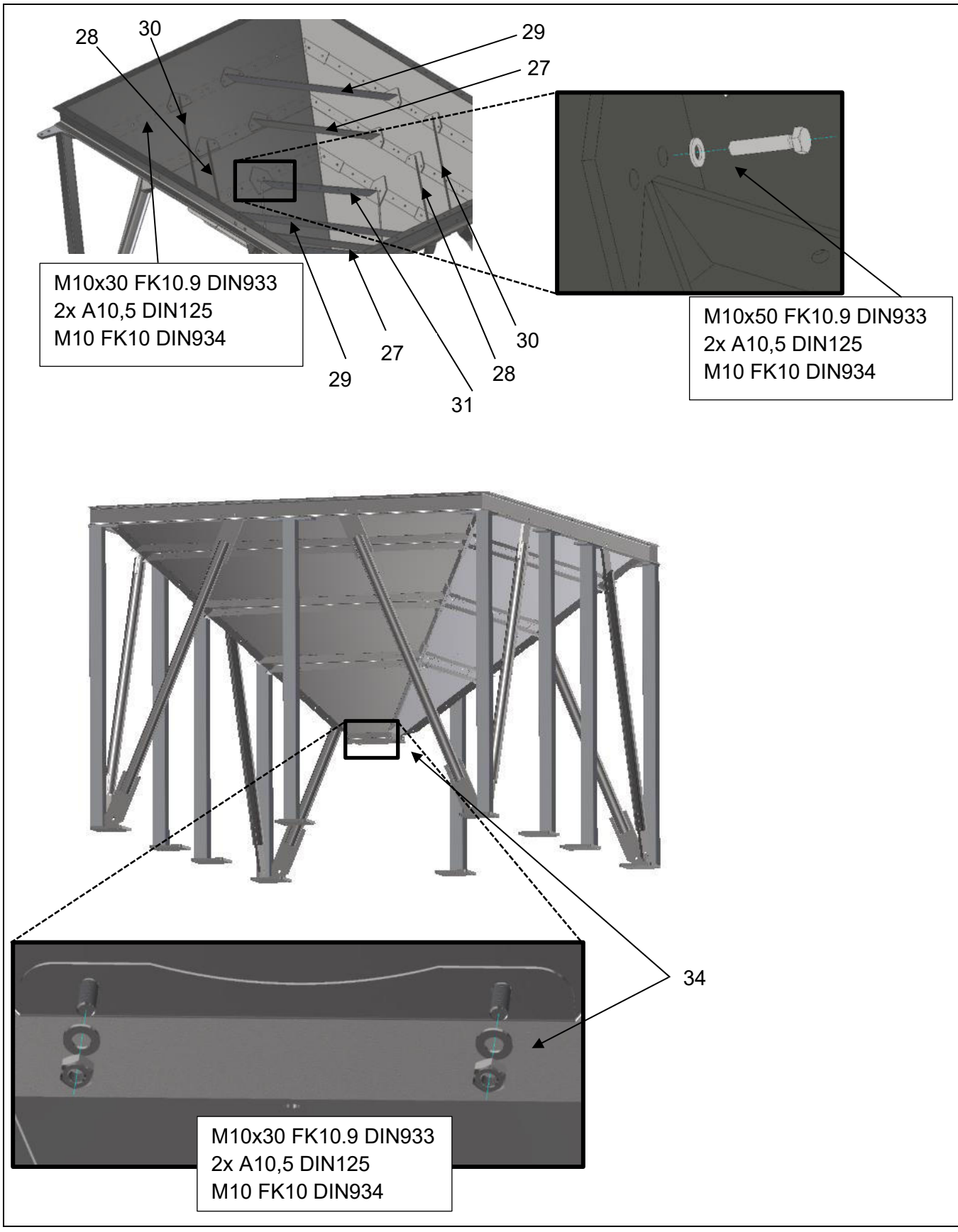
Insérer temporairement des vis et des écrous M10



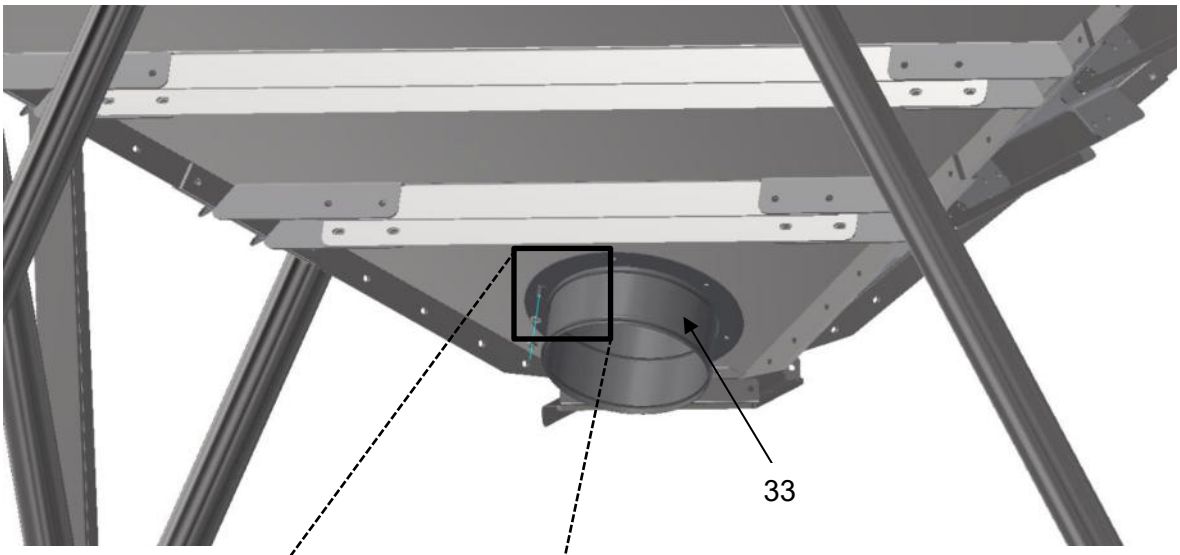


Etape 5

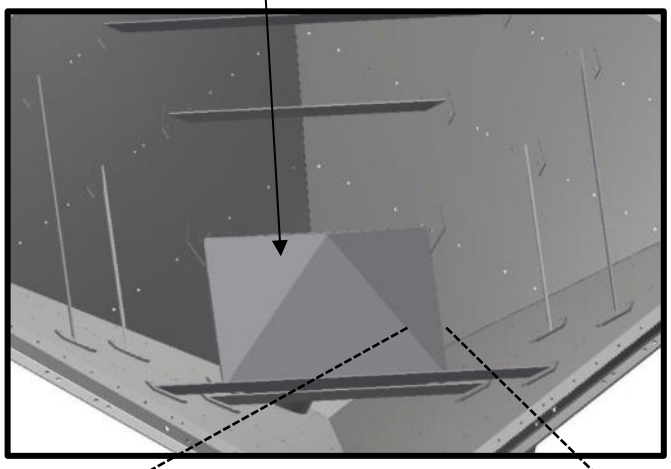

16 + 19 + 20
16 + 17 + 18
11 + 17 + 18
14 + 19 + 20
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
ATTENTION :
Insérer le renfort 35 à gauche et à droite


28
30
29
27
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
29
27
31
28
30
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
34
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

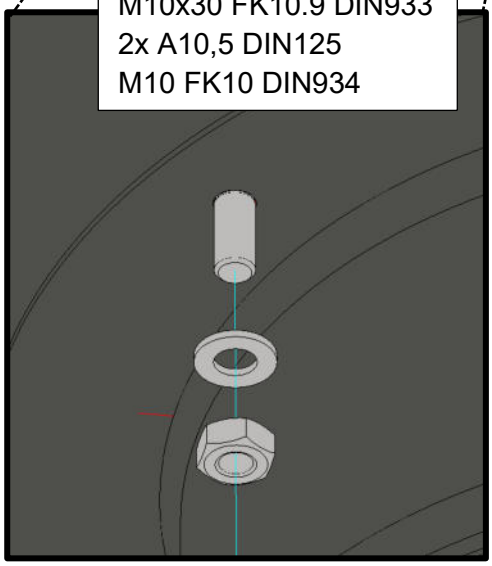
Etape 7 Option

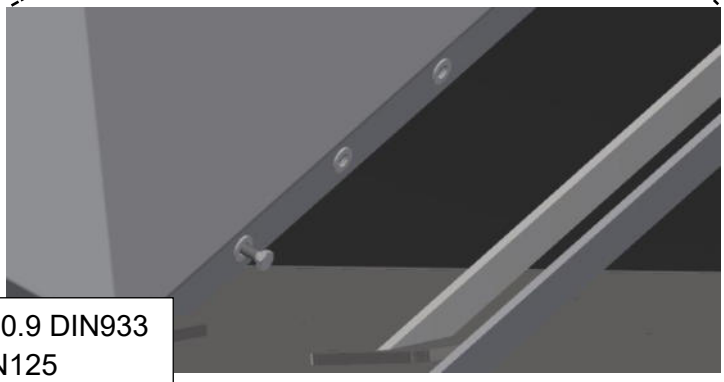


32



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934



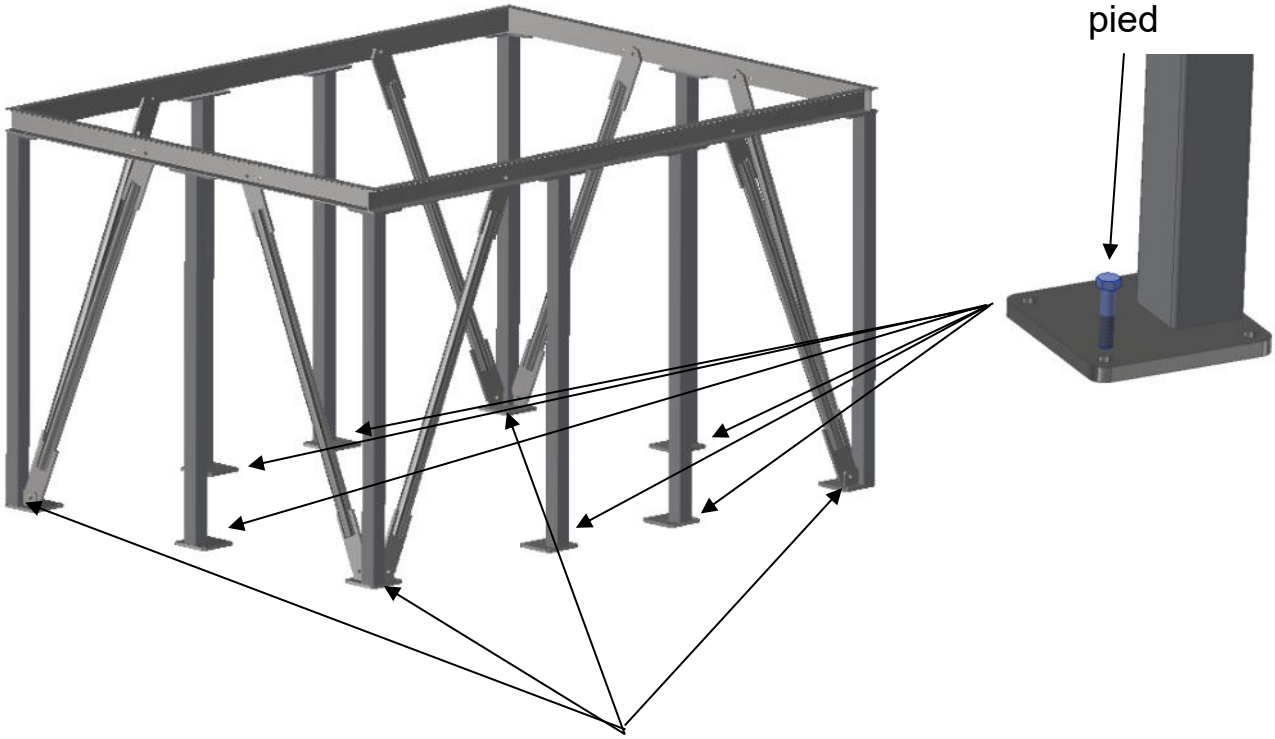


M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

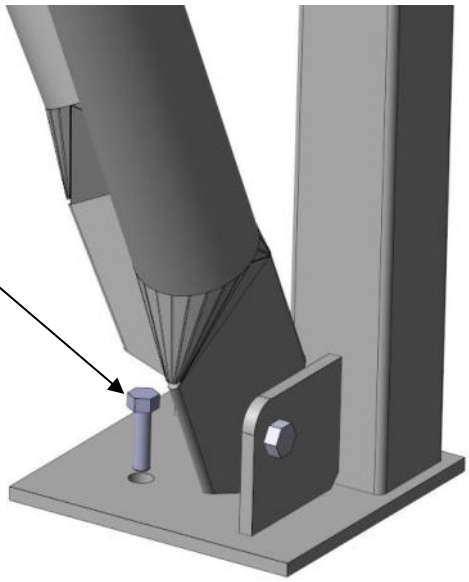
Etape 8

Effectuer un montage perpendiculaire et à angle droit

2x Vis à Betons par pied

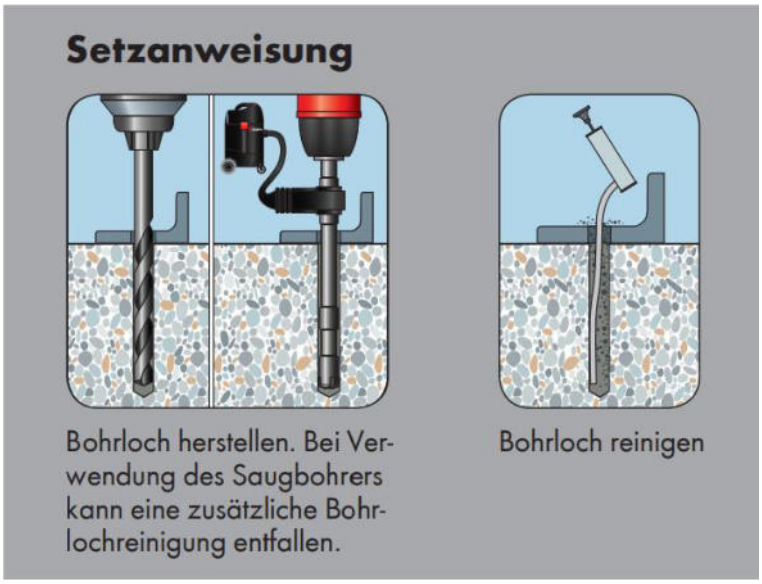


2x Vis à béton par pieds



Mise en oeuvre

Faire un trou. Si-vous utilisez une perceuse aspirante un nettoyage du trou n´est pas nécessaire

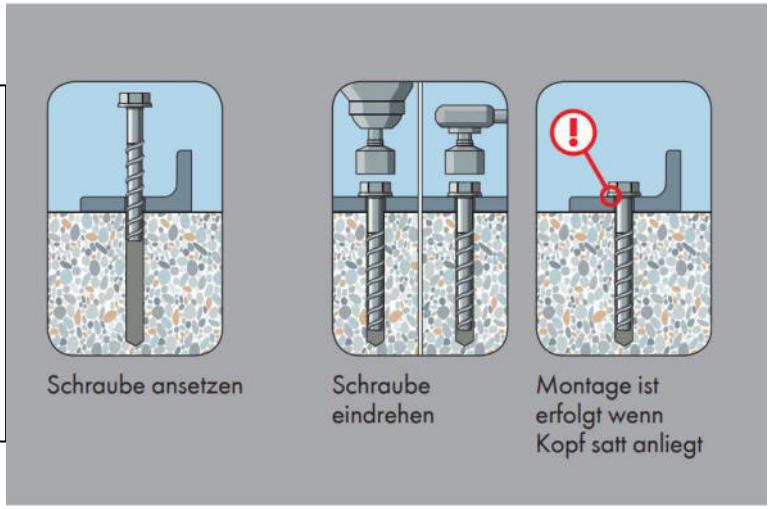


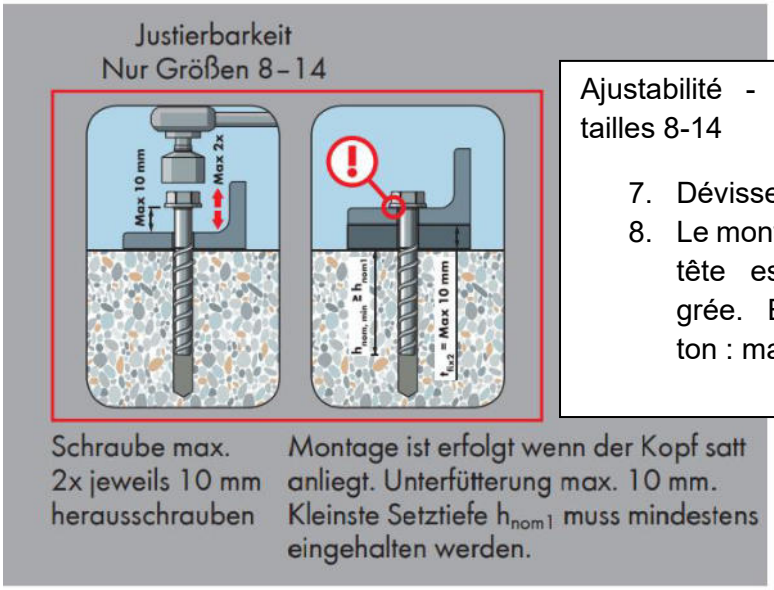
Nettoyer le trou

1 Placer la vis

2 Tourner la vis

3 Le montage est terminé lorsque la tête est complètement intégrée





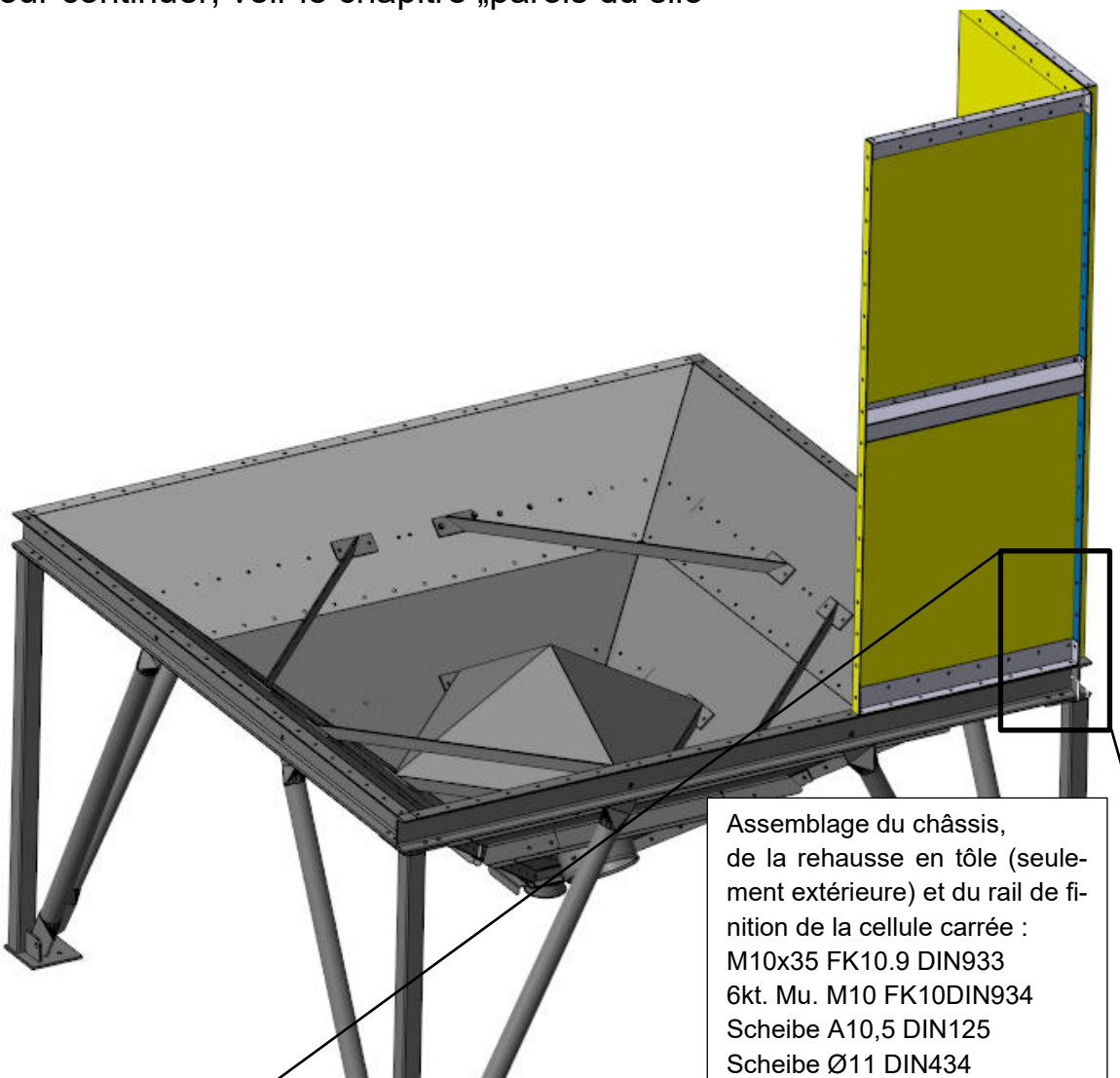
Ajustabilité - Uniquement pour les tailles 8-14

7. Dévisser les vis max 2x 10mm
8. Le montage est réussi quand la tête est complètement intégrée. Entre la pièce et le béton : max 10mm

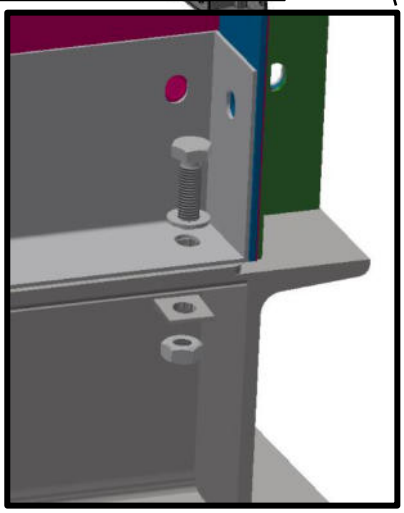
Informations complémentaires : Würth Vis à bétons W-BS Typ S Tête hexagonale DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

Etape 9 (Option, pour la construction d´un silo)

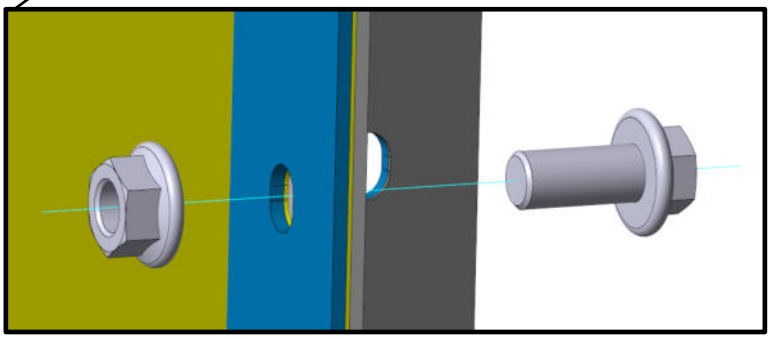
Pour continuer, voir le chapitre „parois du silo“



Assemblage du châssis,
de la rehausse en tôle (seulement extérieure) et du rail de finition de la cellule carrée :
M10x35 FK10.9 DIN933
6kt. Mu. M10 FK10DIN934
Scheibe A10,5 DIN125
Scheibe Ø11 DIN434

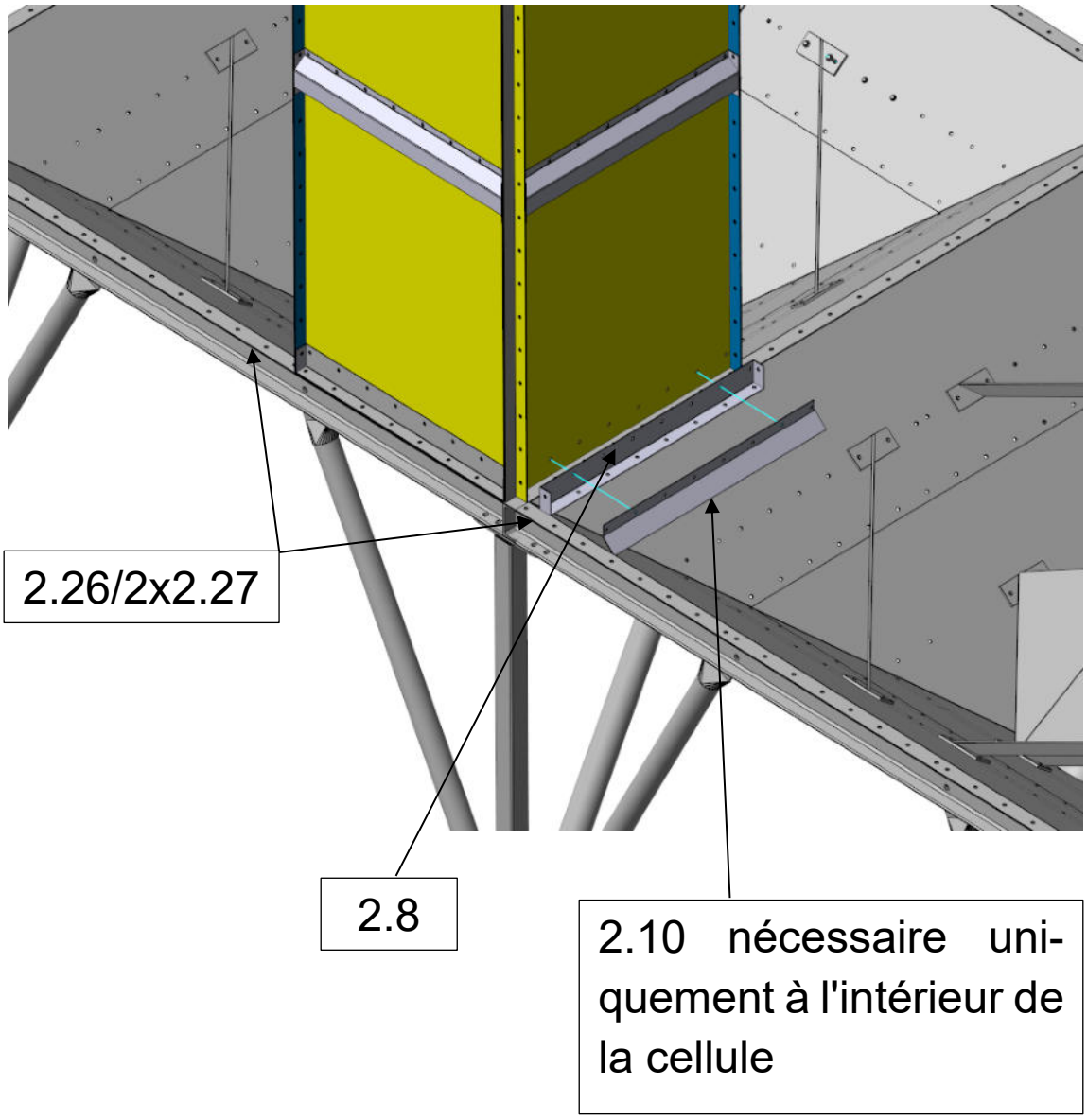


Montage longitudinal
(sauf connexion croisée)
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923



Si plusieurs chassis doivent être assemblés l´un à coté de l´autre,

- des toles inclinées repliées doivent être posées entre les parois intermédiaires sur le rail final afin que les céréales puissent s´écouler parfaitement.
- Aux endroits où deux tôles de trémie sont superposées, la hauteur de construction est légèrement plus élevée -> pour compenser, il faut monter des tôles de rehaussement (2.26) supplémentaires aux autres endroits.

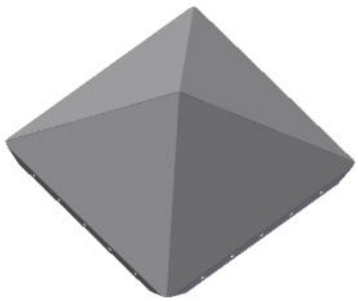


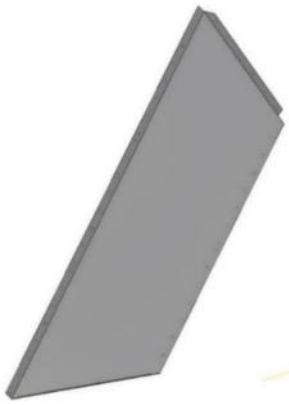
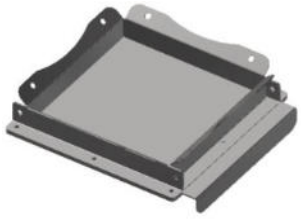
5.6 Option châssis 4x4

5.6.1 Liste de pièces

#1 Pied L pour 4x4 & 4x3 Ancien Art.:4009092015817- Nouvel art. 4000523 	#2 Pied T pour 4x4 & 4x3 Ancien Art. : 4009092015818 Nouvel art.4000524 	#3 Pied X pour 4x4 & 4x3 ArtNr.: 4009092015819 Nouvel art. 4000525
#4 Pied I ext pour 4x4 & 4x3 ArtNr.: 4009092015815 Nouvel art. 4000521 	#5 Pied I int. pour 4x4 & 4x3 ArtNr.: 4009092015816 Nouvel art. 4000522 	#6 Rail U140 - l=3997,5 ArtNr.: 4009092015808 Nouvel art. 4000515 L=3997,5

#7 Rail U140 - l=4057,5 ArtNr.: 4009092015809 Nouvel art. 4000516 L=4057.5mm 	#8 Barre 88,9x4 pour armature du chassis 3x3+2x3 ArtNr.:4009092015811 Nouvel art. 4000517 	#9 Renforcement ext. 3x3m & 4x4m inférieur ArtNr.: 4009092015840 Nouvel art. 1001663
#10 Renforcement ext. 3x3m & 4x4m milieu ArtNr.: 4009092015841 Nouvel art. 1001664 	#11 Renforcement ext. supérieur 3x3m & 4x4m oben ArtNr.: 4009092015842 Nouvel art. 1001665 	#12 Renforcement ext. 4x4m tout en haut ArtNr.: 4009092015843 Nouvel art. 4000445

#13 Renforcement ext. droit 40° ArtNr.: 4009092015824 Nouvel art. 1001647 	#14 Console renforcement gauche 40° ArtNr.: 4009092015823 Nouvel art.1001646 	#15 Renforcement angle sup. Tout en haut 4x4m 40° ArtNr.: 4009092015887 Nouvel art. 4000460
#16 Renforcement angle sup 3x3m & 4x4m 40° ArtNr.: 4009092015886 Nouvel art. 2007743 	#17 Renforcement angle milieu 3x3m & 4x4m 40° ArtNr.: 4009092015885 Nouvel art. 2007742 	#18 Renforcement intérieur inférieur 3x3m & 4x4m 40° ArtNr.:4009092015879 Nouvel art. 2007744
#19 Maintien pour les barres de support ArtNr.: 4009092015907 Nouvel art. 4000465 	#20 Plaque d'écartement pour les barres de support ArtNr.: 4009027016318 Nouvel art. 1001988 	#21 (Option) Hotte de ventilation pour chassis 3x3 & 4x4m 40° ArtNr.: 4009092015914 Nouvel art. 1001698 

#23 (Option) Raccord pour tube de ventilation Diamètre 300 ArtNr.: 4009003016990 Nouvel art. 1002175 	#24 Tole sup. pour chassis 4x4m 40° ArtNr.: 4009092015866 Nouvel art. 4000447 	#25 Tole inf. du chassis 3x3xm & 4x4m 40° ArtNr.: 4009092015863 Nouvel art. 1001684
#26 (option, seulement avec #21) Tole du chassis pour ventilation 3x3m & 4x4m 40° ArtNr.: 4009092015864 Nouvel art. 1001685 	#27 Renfort en tole pour le chassis 4x4m 40° ArtNr.: 4009092015854 Nouvel art. 1001675 	#28 Sortie avec vanne 300x300 Art.Nr.: 4009092015820 Transition sur 150,200,250 4009023015782, 783, 784 Nouvel art. 1001828 

Possibilités pour les supports intermédiaires

Pour chaque côté il faut au minimim visser un pied support supplémentaire (photo 1). Si vous disposez par exemple d'un convoyeur qui passe au milieu des silos, il est également possible de visser deux pieds support (image 2).

Image 1

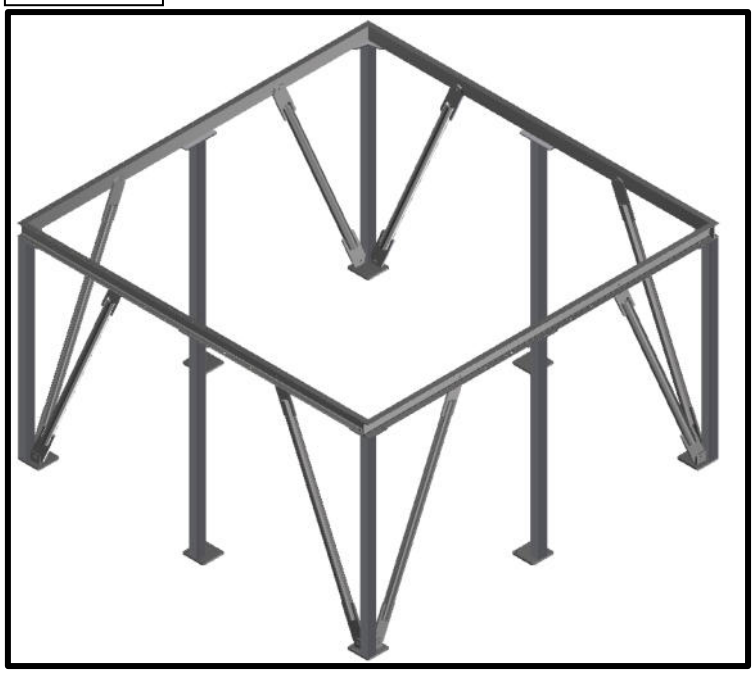
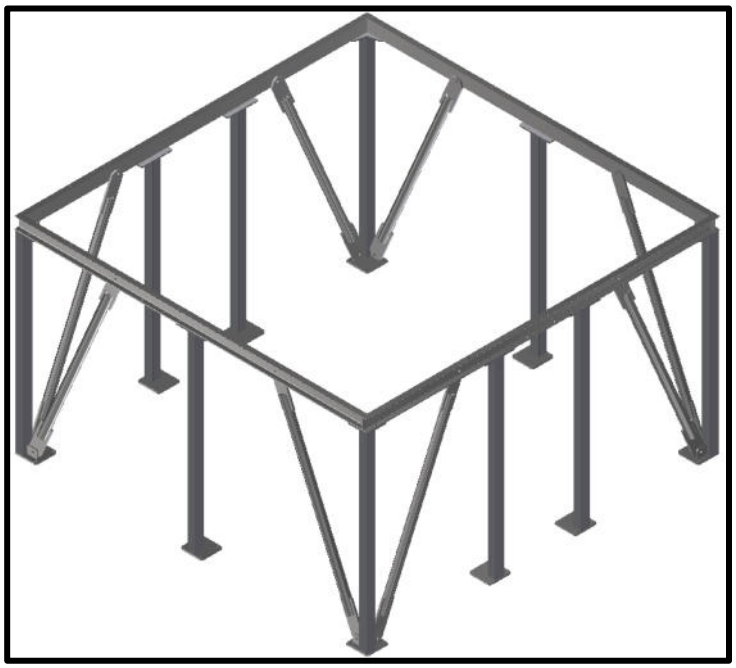


Image 2

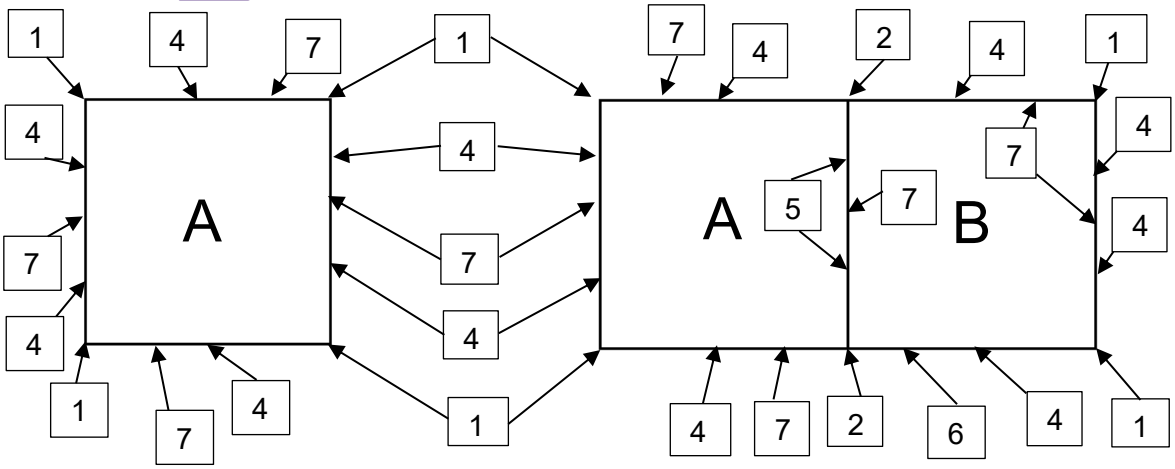


Dans l'exemple suivant, 2 pieds de support sont utilisés sur le côté 4m

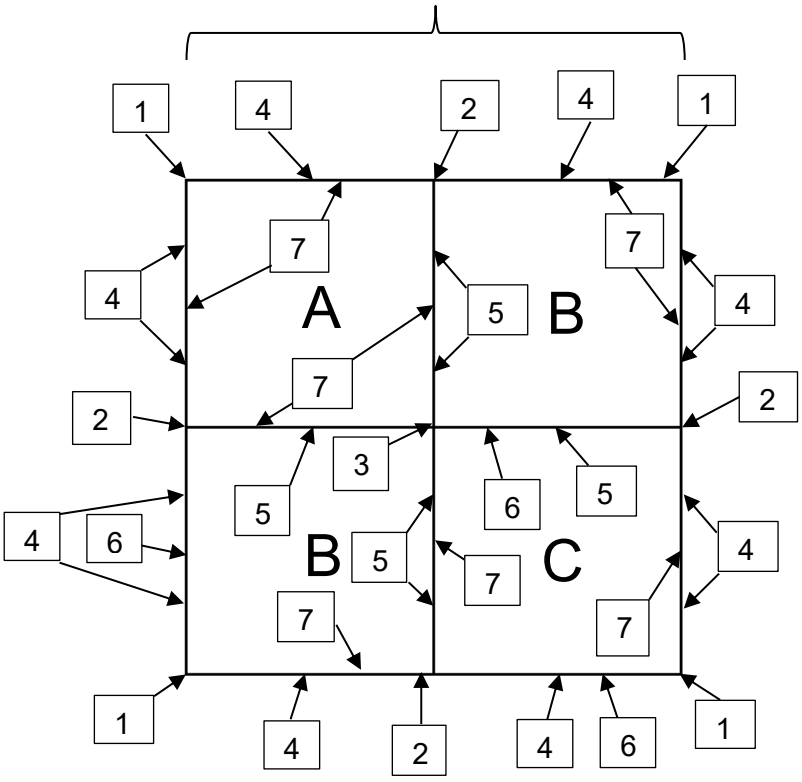
Dispositions possibles : A, A-B, A-B-C

A

A-B

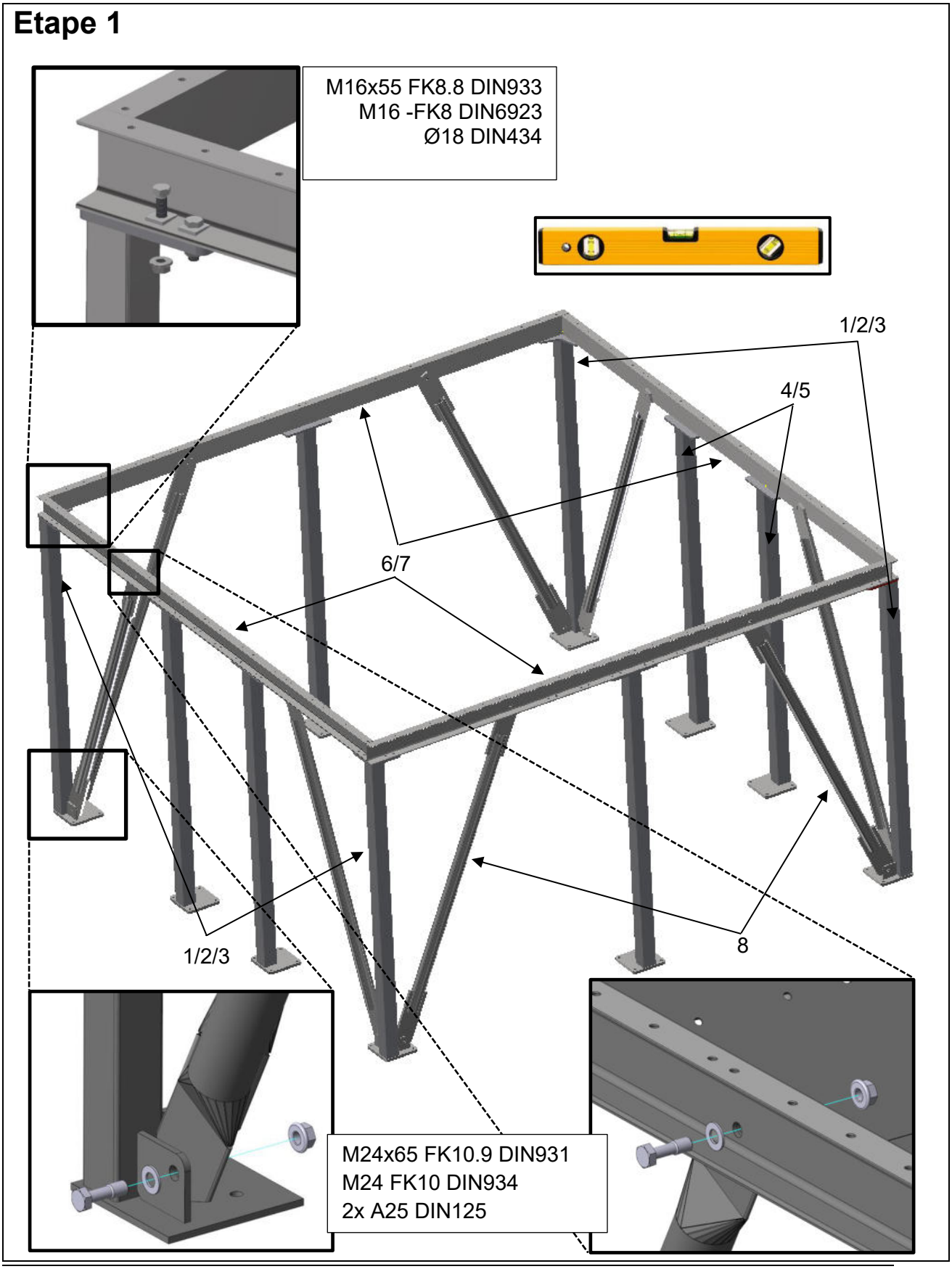


A-B-C

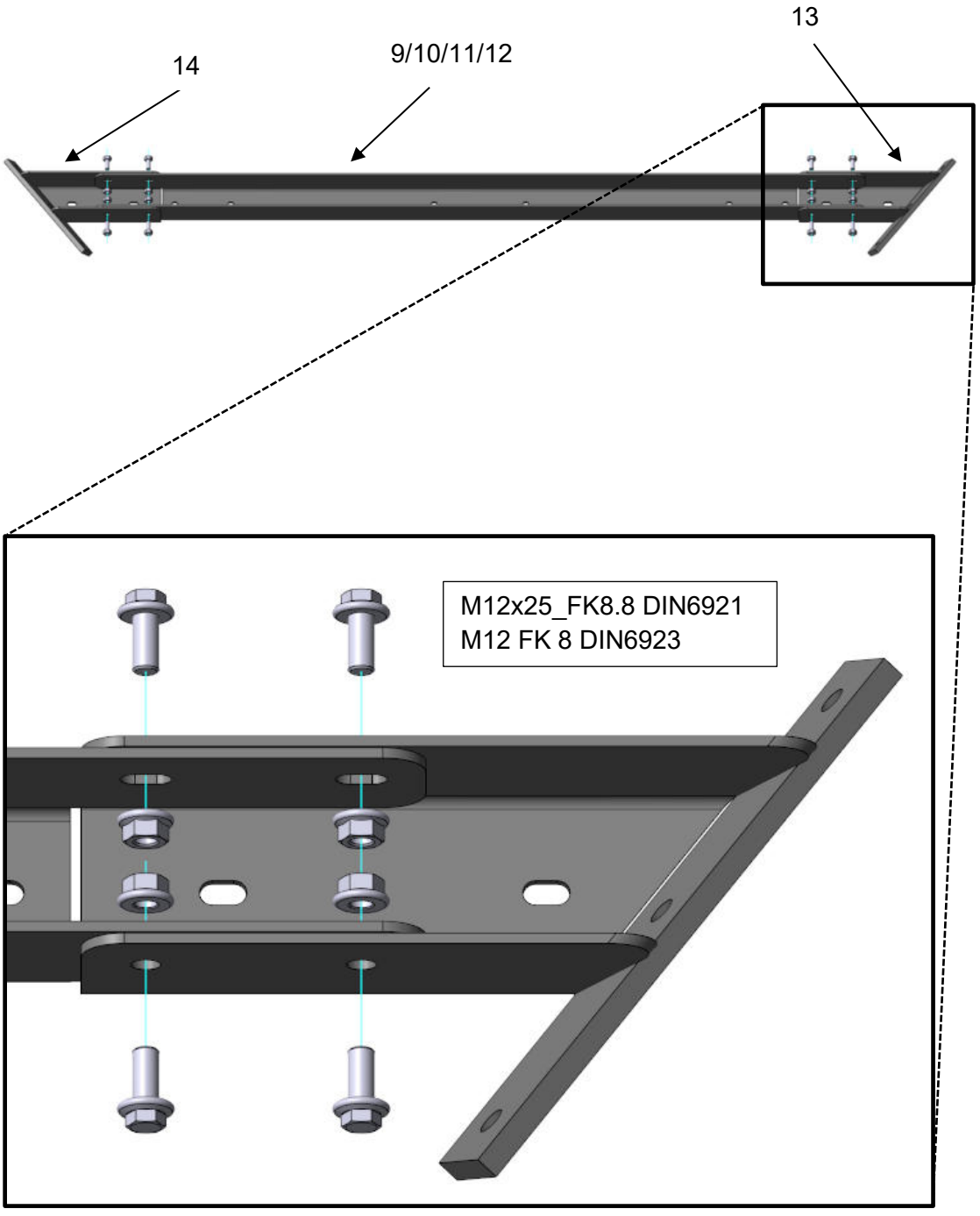


5.6.2 Construction du châssis 4x4

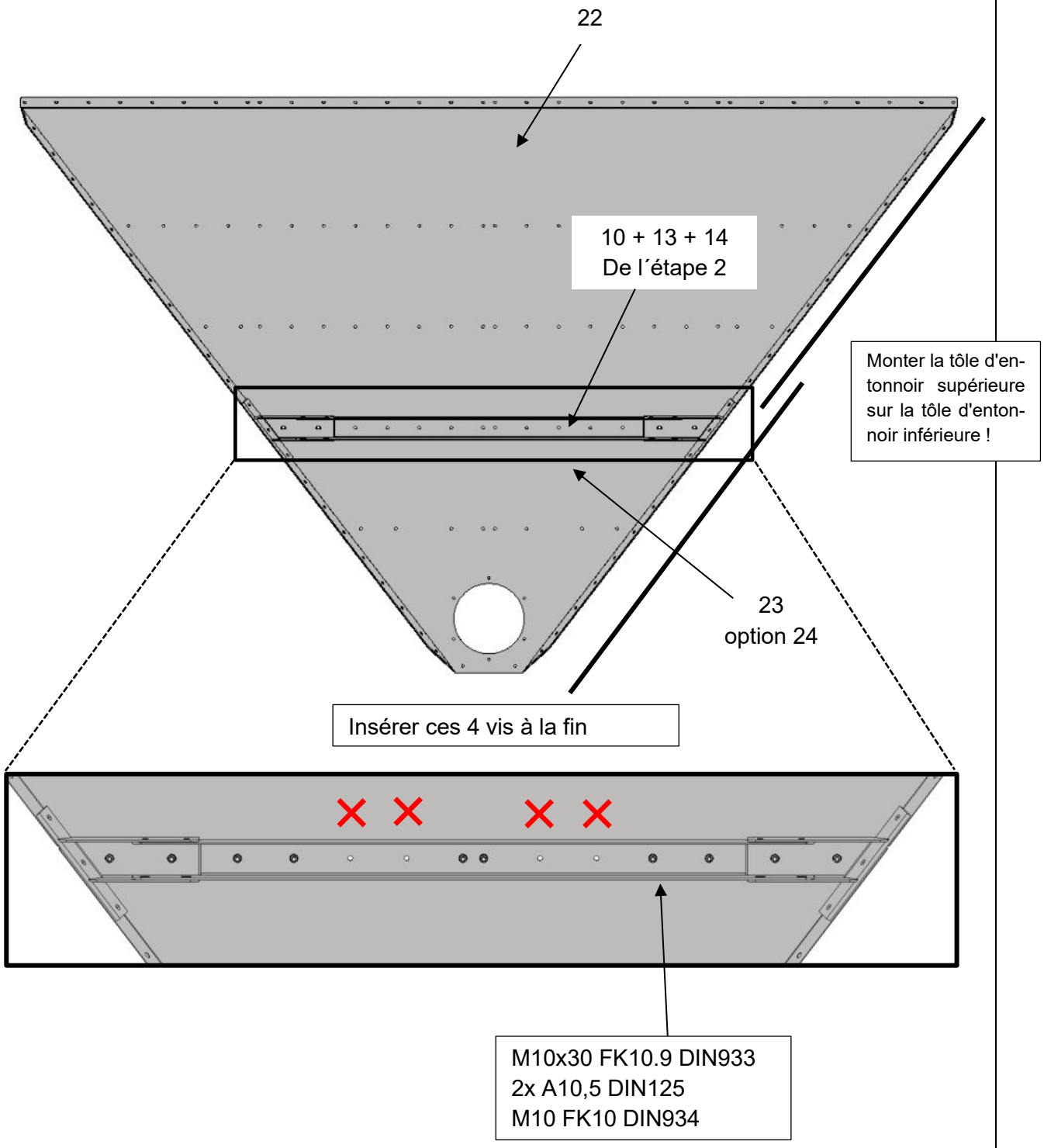
Etape 1



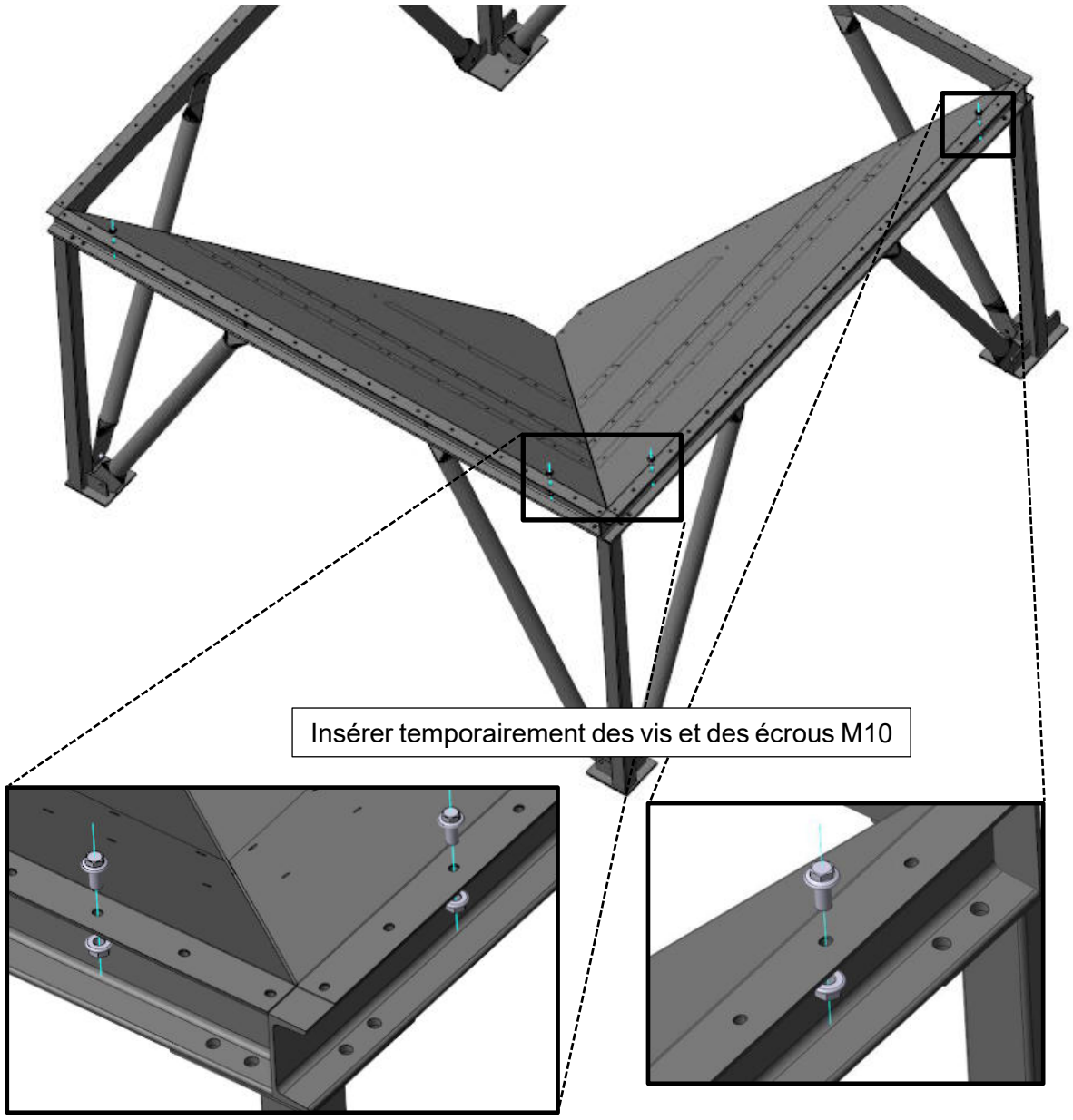
Etape 2



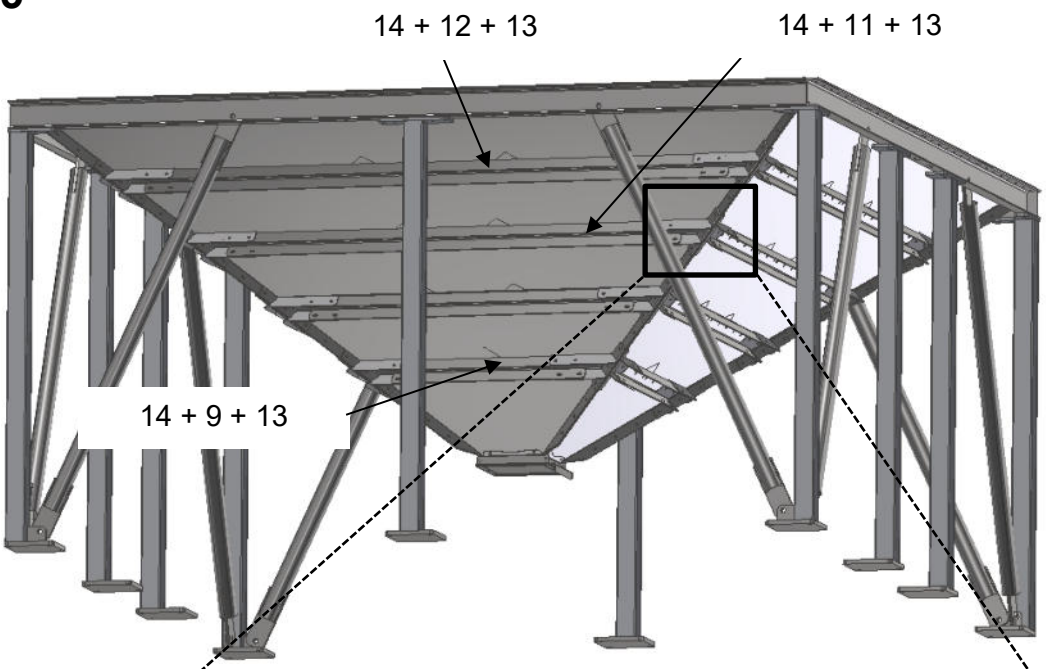
Etape 3


22
10 + 13 + 14
De l´étape 2
Monter la tôle d'entonnoir supérieure sur la tôle d'entonnoir inférieure !
23
option 24
Insérer ces 4 vis à la fin
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 4



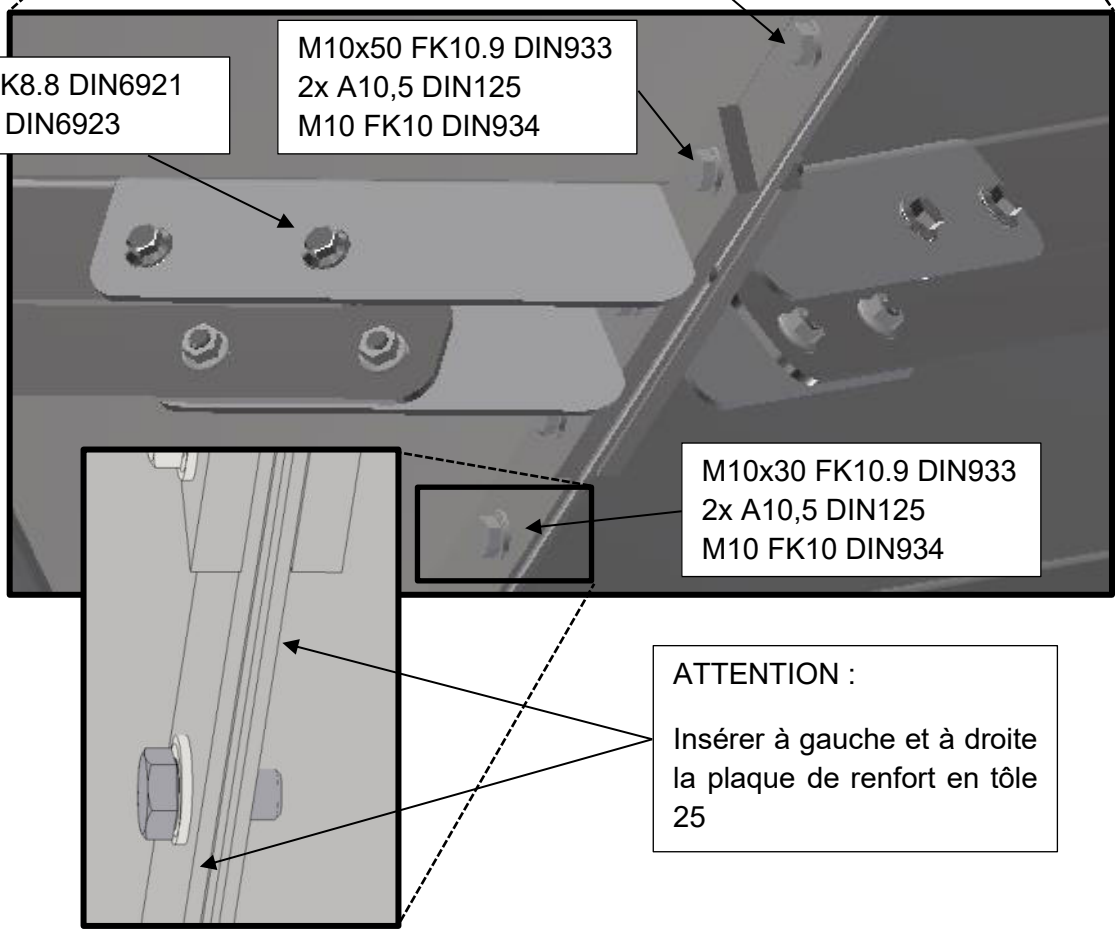
Etape 5



M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

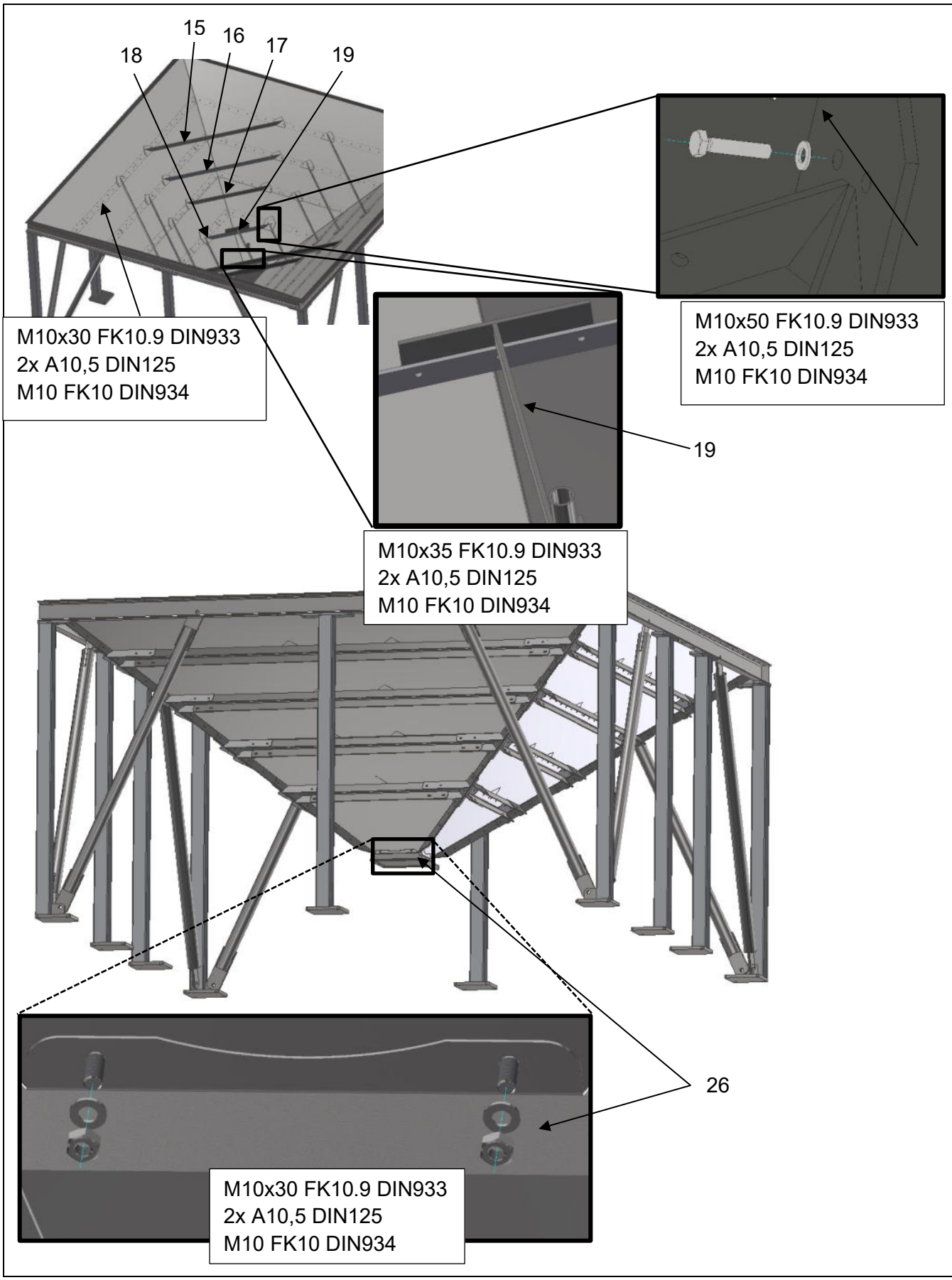
M12x25 FK8.8 DIN6921
M12 FK 8 DIN6923



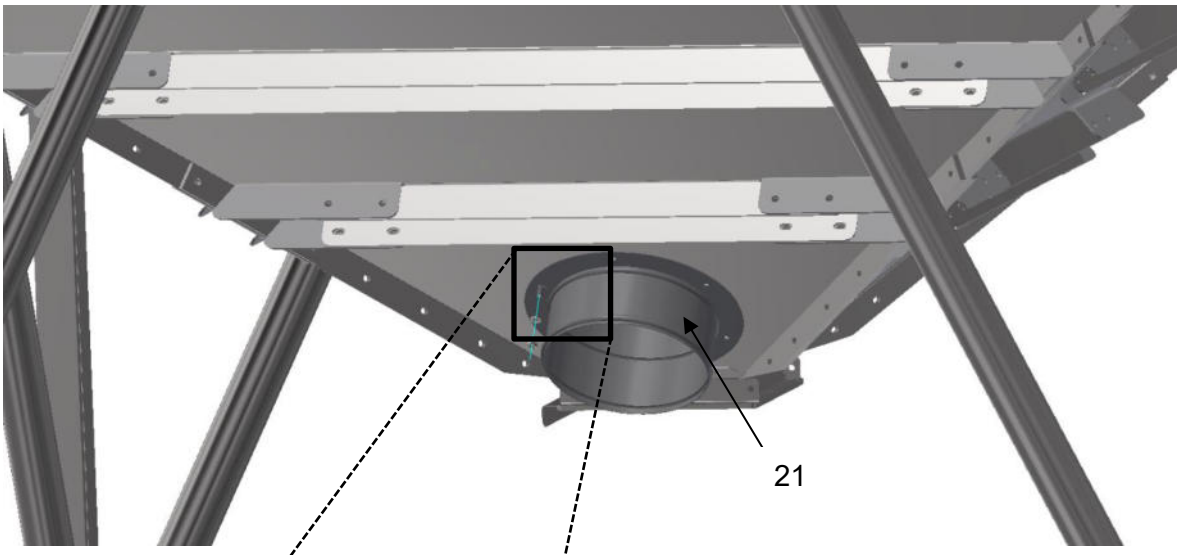
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

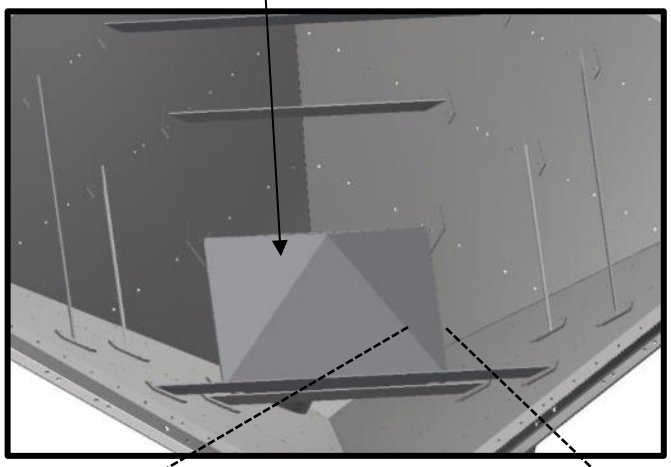
ATTENTION :

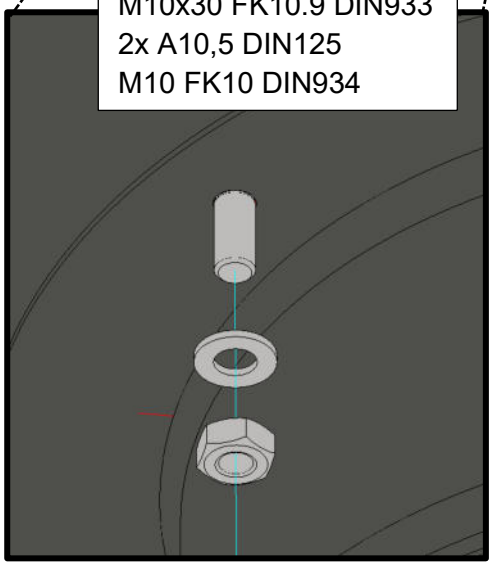
Insérer à gauche et à droite la plaque de renfort en tôle 25

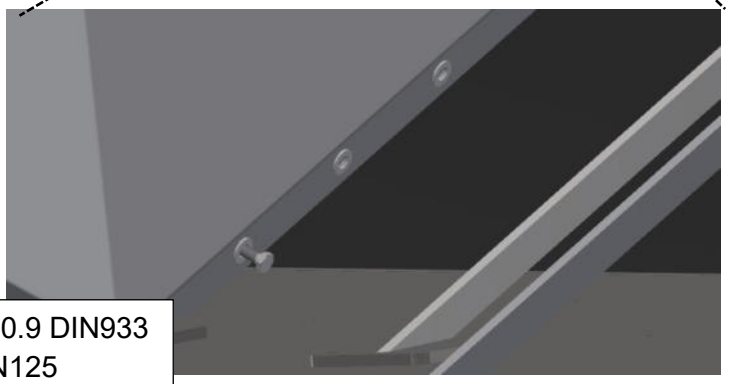

15
16
17
18
19
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
M10x50 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
19
M10x35 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934
26
M10x30 FK10.9 DIN933
2x A10,5 DIN125
M10 FK10 DIN934

Etape 7 optionnelle



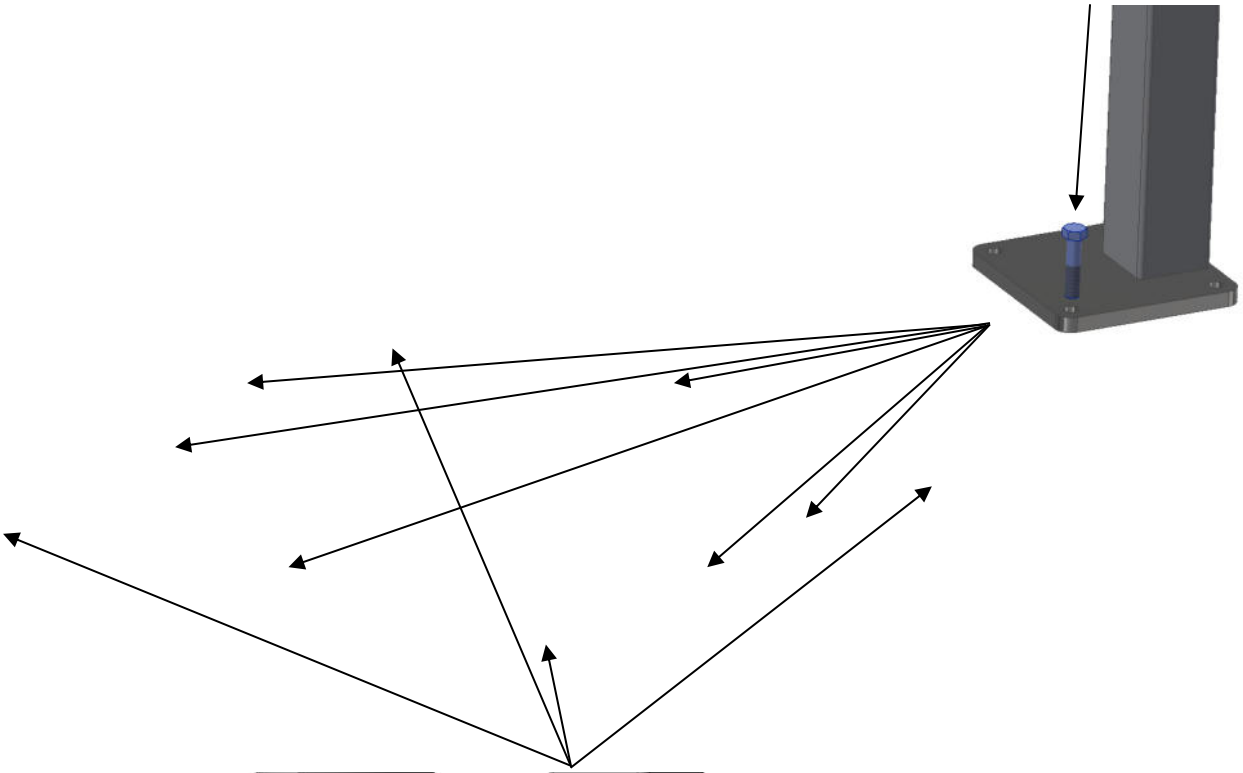




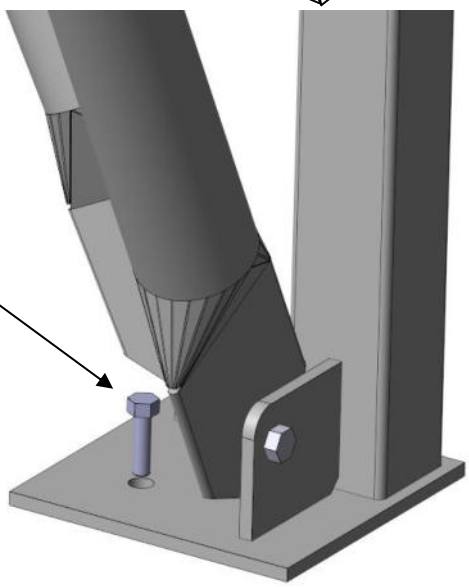


Etape 8

Veiller à un montage perpendiculaire et à angle droit

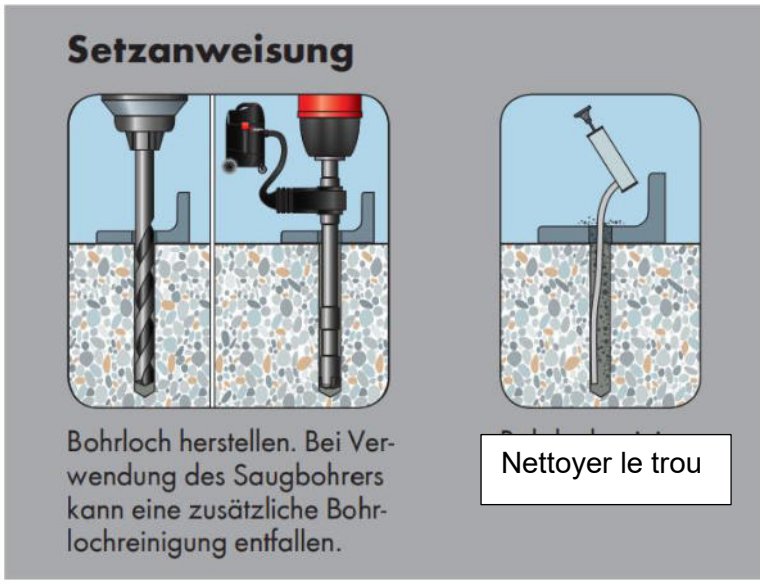


2x vis à béton par pied



Mise en oeuvre

Faire un trou. Si-vous utilisez une perceuse aspirante un nettoyage du trou n´est pas né-cessaire

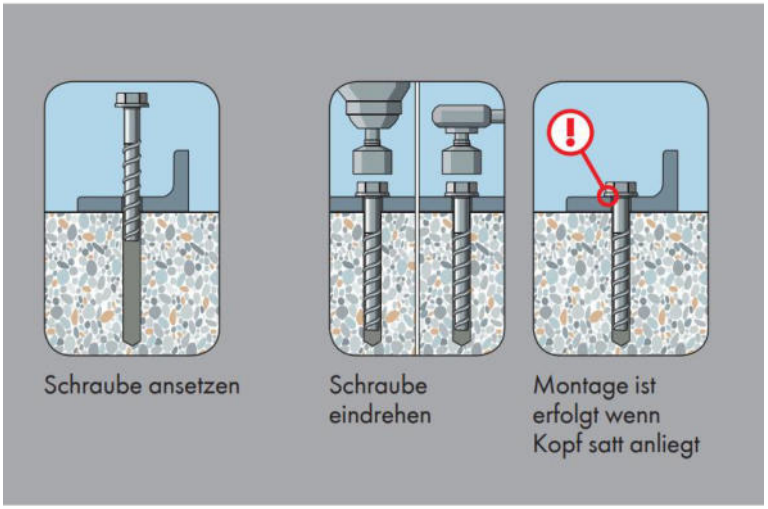


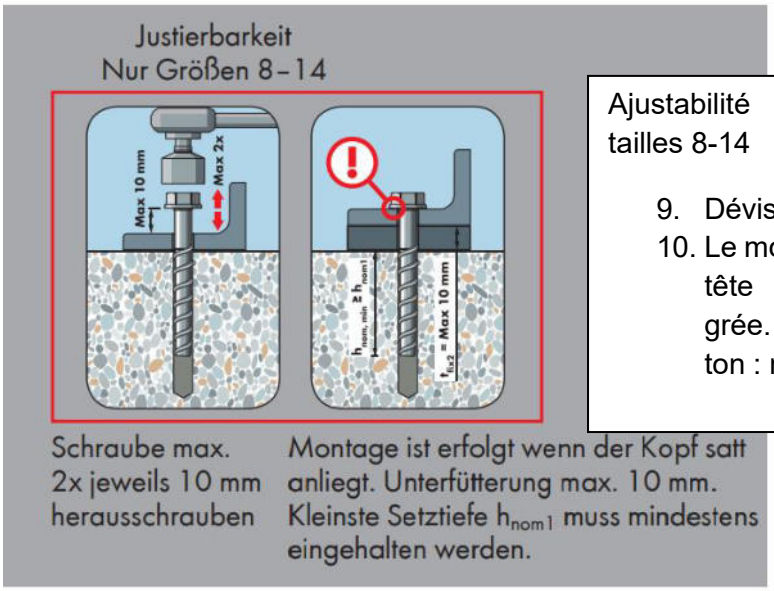
Nettoyer le trou

1 Placer la vis

2 Tourner la vis

3 Le montage est terminé lorsque la tête est complète-ment intégrée





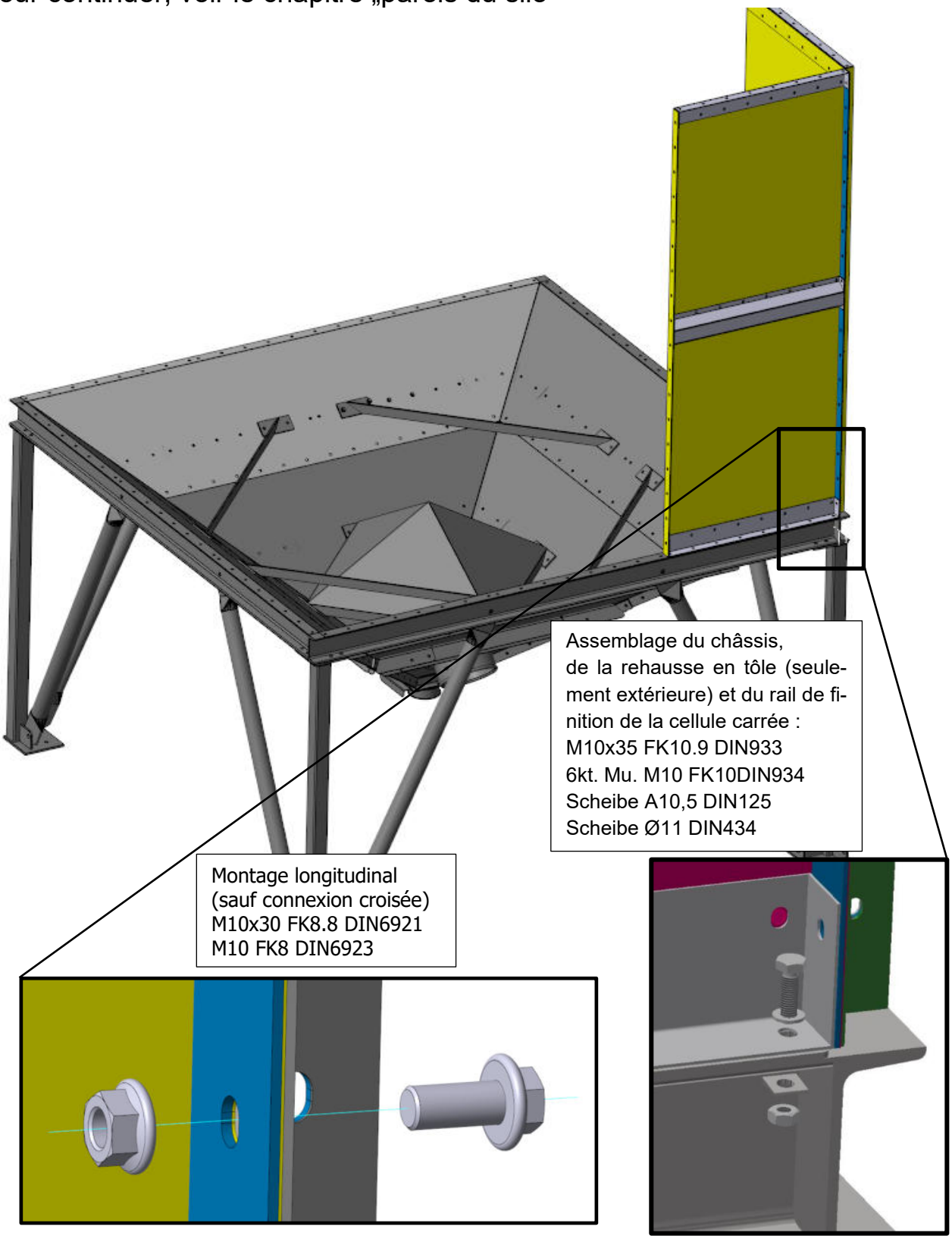
Ajustabilité - Uniquement pour les tailles 8-14

9. Dévisser les vis max 2x 10mm
10. Le montage est réussi quand la tête est complètement inté-grée. Entre la pièce et le bé-ton : max 10mm

Informations complémentaires : Würth Vis à bétons W-BS Typ S Tête hexagonale DBL-(W-BS/S)-(A2K)-SW21-10-35-14X110

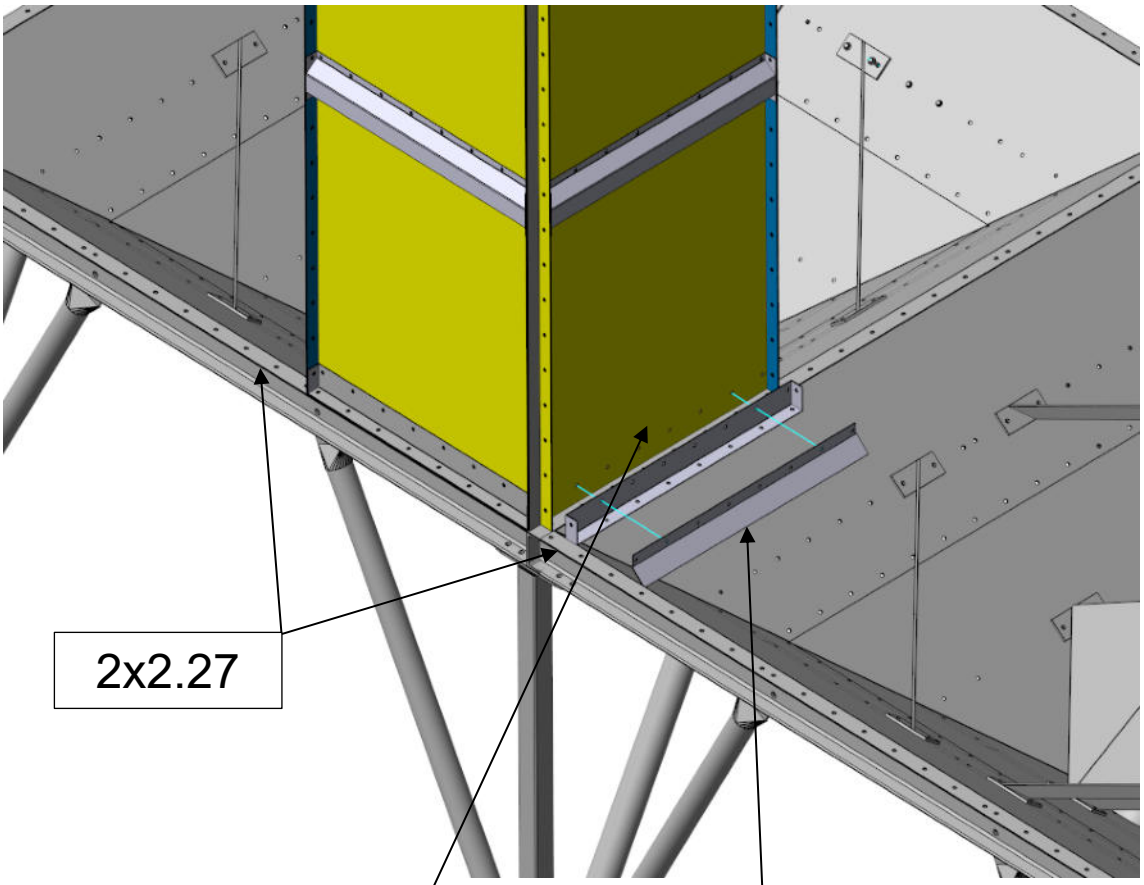
Etape 9 (Optionnelle, si construction d´une cellule de stockage)

Pour continuer, voir le chapitre „parois du silo“



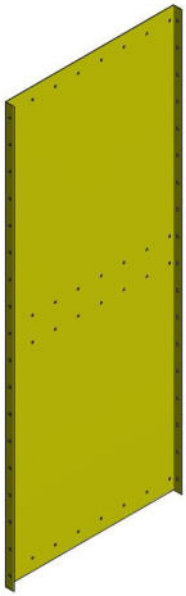
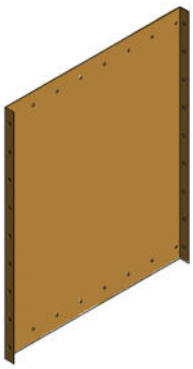
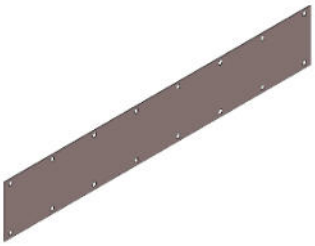
Si plusieurs chassis doivent être assemblés l´un à coté de l´autre,

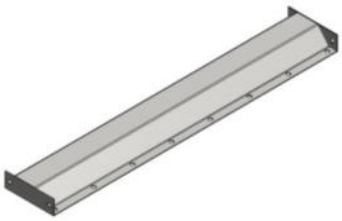
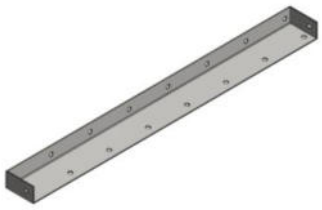
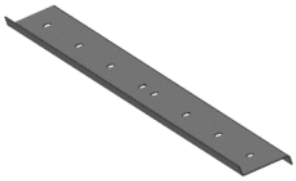
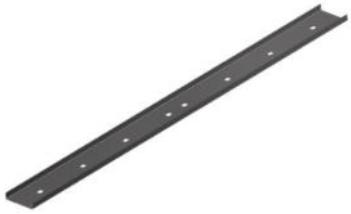
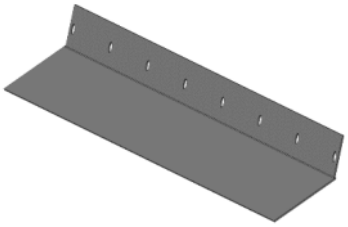
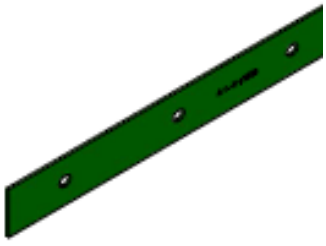
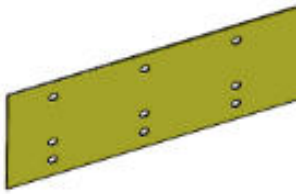
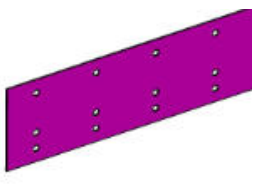
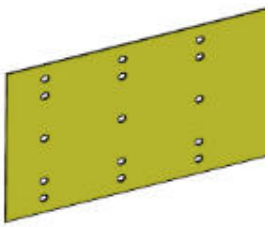
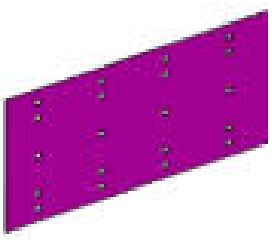
- des toles inclinées repliées doivent être posées entre les parois intermédiaires sur le rail final afin que les céréales puissent s´écouler parfaitement.
  Aux endroits où deux tôles de trémie sont superposées, la hauteur de construction est légèrement plus élevée -> pour compenser, il faut monter des tôles de rehaussement (2.26) supplémentaires aux autres endroits.

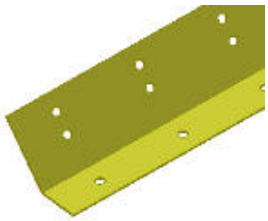
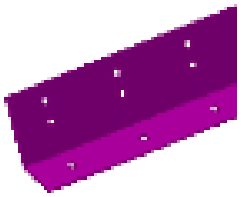
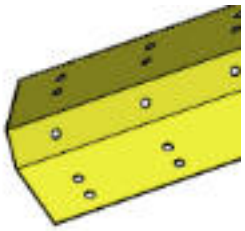
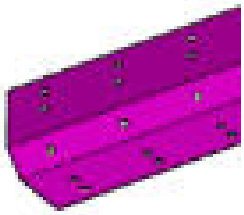
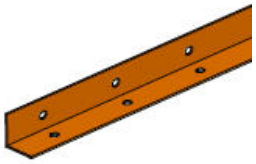
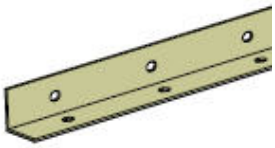
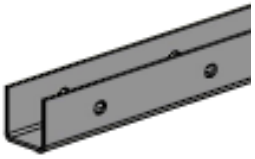
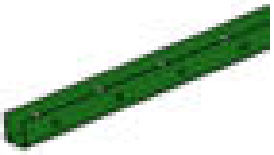
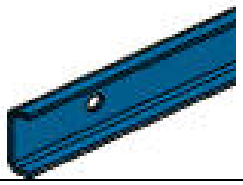


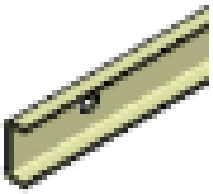
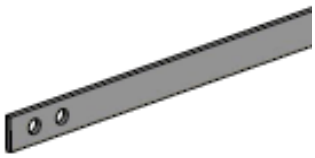
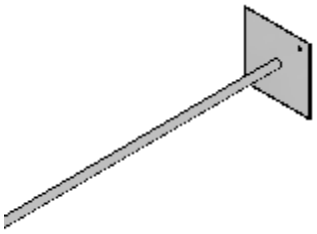
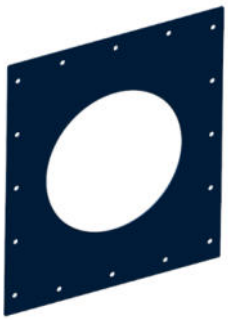
5.7 Les parois

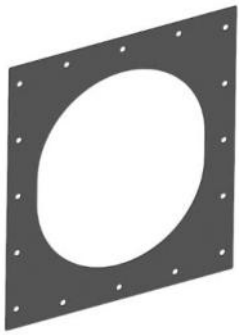
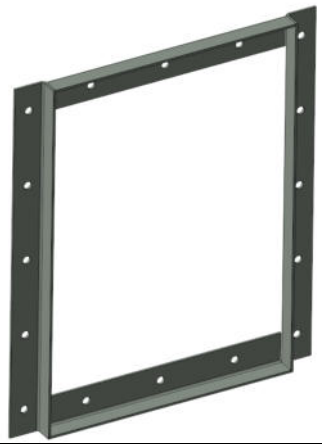
5.7.1 Liste de pièces

#2.1 (s=1,25mm H=2,50m) Paroi “verte” ArtNr.: 4009099015712 Nouvel art. 1001550 Avec découpe pour les portes ArtNr.: 4009099016041 	#2.2 (s=1,25mm H=2,50m) Paroi “Bleue” ArtNr.: 4009099015696 Nouvel art. 1001548 Avec découpe pour les portes ArtNr.: 400909901604 	#2.3 (s=1,0mm H=2,50m) Paroi “jaune” ArtNr.: 4009099015680 Nouvel art. 1001546 Avec découpe pour les portes ArtNr.: 4009099016039 
#2.4 (s=0,75mm H=2,50m) Paroi “Rouge” ArtNr.: 4009099015664 Nouvel art. 1001544 Avec découpe pour les portes ArtNr.: 4009099016038 	#2.5 (s=0,75mm H=1,25m) Paroi „noire“ ArtNr.: 4009099015728 Nouvel art. 1001553 Avec découpe pour les portes  ArtNr.: 4009099016043	#2.6 Tôle de recouvrement ArtNr.: 4009099015748 Nouvel art. 1001555 

#2.7 Profil de renfort ArtNr.: 4009099015744 Nouvel art. 2004211 	#2.8 Rail de finition ArtNr.: 4009099015745 Nouvel art. 2004212 	#2.9 L1 = 1,0 m ArtNr.: 4009099015767 Tôle angulaire pour le bord supérieur Nouvel art. 1001572 
#2.9a Tôle angulaire en U pour bord supérieur ArtNr.: 4009099016045 Nouvel art. 1001625 	#2.10 Tôle angulaire ArtNr.: 4009099015988 Nouvel art. 1001595 	
#2.11 Renfort angulaire en tôle ArtNr.: 4009099015750 L=1250 Nouvel art. 1001557 	#2.12 Renfort angulaire en tôle ArtNr.: 4009099015749 L=2500 Nouvel art. 1001556 	#2.13 Plaque intermédiaire droite ArtNr.: 4009099015754 L=1250 Nouvel art. 1001561 
#2.14 Plaque intermédiaire droite ArtNr.: 4009099015753 L=2500 Nouvel art. 1001560 	#2.15 Plaque intermédiaire droite ArtNr.: 4009099015758 L=1250 Nouvel art. 1001565 	#2.16 Plaque intermédiaire droite ArtNr.: 4009099015757 L=2500 Nouvel art. 1001564 

#2.17 Plaque intermédiaire 1x45° ArtNr.: 4009099015752 L=1250 Nouvel art. 1001559 	#2.18 Plaque intermédiaire 1x45° ArtNr.:4009099015751 L=2500 Nouvel art. 1001558 	#2.19 Plaque intermédiaire 2x45° ArtNr.:4009099015756 L=1250 Nouvel art. 1001563 
#2.20 Plaque intermédiaire 2x45° ArtNr.: 4009099015755 L=2500 Nouvel art. 1001562 	#2.21 Rail angulaire ArtNr.: 4009099015760 L=1250 Nouvel art. 1001567 	#2.22 Rail angulaire ArtNr.: 4009099015759 L=2500 Nouvel art. 1001566 
#2.23 Rail en U ArtNr.:4009099015762 L=1250 Nouvel art. 1001569 	#2.24 Rail en U ArtNr.:4009099015761 L=2500 Nouvel art. 1001568 	#2.25 Rail en U – Raccord en X ArtNr.: 4009099015764 L=1250 Nouvel art. 1001571 
#2.26 Tôle de réhausse 3m pour compensation de la trémie ArtNr.: 4009027016133 Nouvel art. 1001992 	#2.27 Tôle de réhausse 2m pour compensation de la trémie ArtNr.: 4009027016132 Nouvel art. 1001991 	

#2.28 Rail en U – Raccord croisement ArtNr.:4009099015763 L=2500 Nouvel art. 1001570 	#2.29 Cadre pour les portes ArtNr.:4009099015881 Porte Nouvel art. 1001585 ArtNr.:4009099015879 Étanchéité Nouvel art. 1001583 ArtNr: 1081004000128 	#2.30 Plaque angulaire ArtNr.:4009099015768 Nouvel art. 1001573 
#2.31 L1= 969mm ArtNr.:400909915769 1001574 #2.32 L2=1976mm ArtNr.:4009099015770 1001575 #2.33 L3=2978mm ArtNr.:4009099015771 1001576 #2.34 L4=3982mm ArtNr.: 400909915772 1001577 #2.35 L5=4987mm ArtNr.:4009099015773	#2.31 - #2.35 Barre de tension 	2.37 Support pour barre de tension avec plaque de base (diverses longueurs) 1,25m – 7,5m ArtNr.: 4009099016046-51 Nouvel art. 1001626 
#2.38 Support pour barre de tension sur la hotte de ventilation (diverses longueurs) ArtNr.: 4009099016052-57 Nouvel art. 1001634 	#2.39 Support pour barre de tension pour les chassis sans hotte de ventilation ArtNr.:4009027016058-63 Nouvel art. 	#2.40 Caoutchouc pour vis d´extraction ArtNr.: 4009099015853 Nouvel art. 1001580 

#2.41 Tôle d´étanchéité ArtNr.:4009027016029 Nouvel art. 2004984 	#2.42 Cadre pour les vis des silos ArtNr.: 4009099015863 Nouvel art. 1001581 	

5.7.2 Epaisseurs de tole

Pendant le montage, veuillez respecter les mesures de sécurité du point 0 Les cellules carrées sont livrées en pièces détachées, toutes ensembles sur des palettes. Après le déballage des pièces, le montage peut commencer. Pour les silos les plus grands, il est possible d´avoir plusieurs épaisseurs de tôle. Pour cette raison, nous avons effectué une identification par couleur que vous devez respecter. Les tôles de la plus grande épaisseur doivent toujours être utilisées en premier, c´est à dire montées tout en bas.

Tole :	Hauteur :	Epaisseur :	Abbréviation :
Vert (2 rangs)	2,5m	1,25mm	GR
Bleu (1 rang)	2,5m	1,25mm	BL
Jaune	2,5m	1,00mm	GE
Rouge	2,5m	0,75mm	RO
Noir	1,25m	0,75mm	SW

Tableau 2: Parois en tôle en fonction de la hauteur du silo et de la coupe transversale (Gauche= au plus bas, droite=tôle la plus haute)

Type de silo	Hauteur du Silo	Hauteur du Silo	Hauteur du Silo	Hauteur du Silo	Hauteur du Silo	Hauteur du Silo
	1,25 m	2,50 m	3,75 m	5,00 m	6,25 m	7,50 m
1,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
1,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
2,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x4,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
3,10x5,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
4,10x4,10m	SW	RO	GE SW	GE RO	GR GE SW	GR BL RO
4,10x5,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO
5,10x1,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x2,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x3,10m	SW	RO	RO SW	GE RO	GR GE SW	GR GE RO
5,10x4,10m	SW	RO	GE SW	GR RO	GR GE SW	GR BL RO

5.8 Nombre de rails angulaires et tirants

Tableau 3: nombre de rails angulaires nécessaires

Cellule/Hauteur en m	2,50	3,75	5,00	6,25	7,50
1x2	2	3	5	7	9
1x3	2	3	5	7	9
1x4	2	3	5	7	9
1x5	2	3	5	7	9
1x6	2	3	5	7	9
2x2	2	3	5	7	9
2x3	2	3	5	7	9
2x4	2	3	5	7	9
2x5	2	3	5	7	9
2x6	2	3	5	7	9
3x3	2	3	5	7	9
3x4	3	3	6	8	9
3x5	3	4	6	8	9
3x6	3	4	6	8	9
4x4	3	4	6	8	9
4x5	3	4	6	8	9
4x6	3	4	6	8	9

5.9 Hauteur de construction des rails angulaires et câbles de tension

Tableau 4: Hauteur des rails angulaires

Hauteur de la cellule en m								
2,50		3,75		5,00		6,25		7,50
Nombre de rails verticaux ou cables de tension								
2	3	3	4	5	6	7	8	9
Position; Höhe in m								
1; 1,18 2; 2,43	1; 0,76 2; 1,60 3; 2,43	1; 1,18 2; 2,43 3; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68	1; 0,76 2; 1,60 3; 2,43 4; 3,68 5; 4,93	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,68 6; 4,93	1; 0,62 2; 1,18 3; 2,02 4; 2,85 5; 3,68 6; 4,93 7; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18	1; 0,62 2; 1,18 3; 1,88 4; 2,43 5; 3,27 6; 4,10 7; 4,93 8; 6,18 9; 7,43

Dans le cas ou un châssis serait nécessaire, un rail angulaire ou câble de tension supplémentaire doit être mis position 0 à 0,07 m de hauteur.

5.9.1 Exemple

Vous souhaitez construire une cellule 3x3m avec châssis. Cette cellule est de 5m de haut au-dessus du châssis

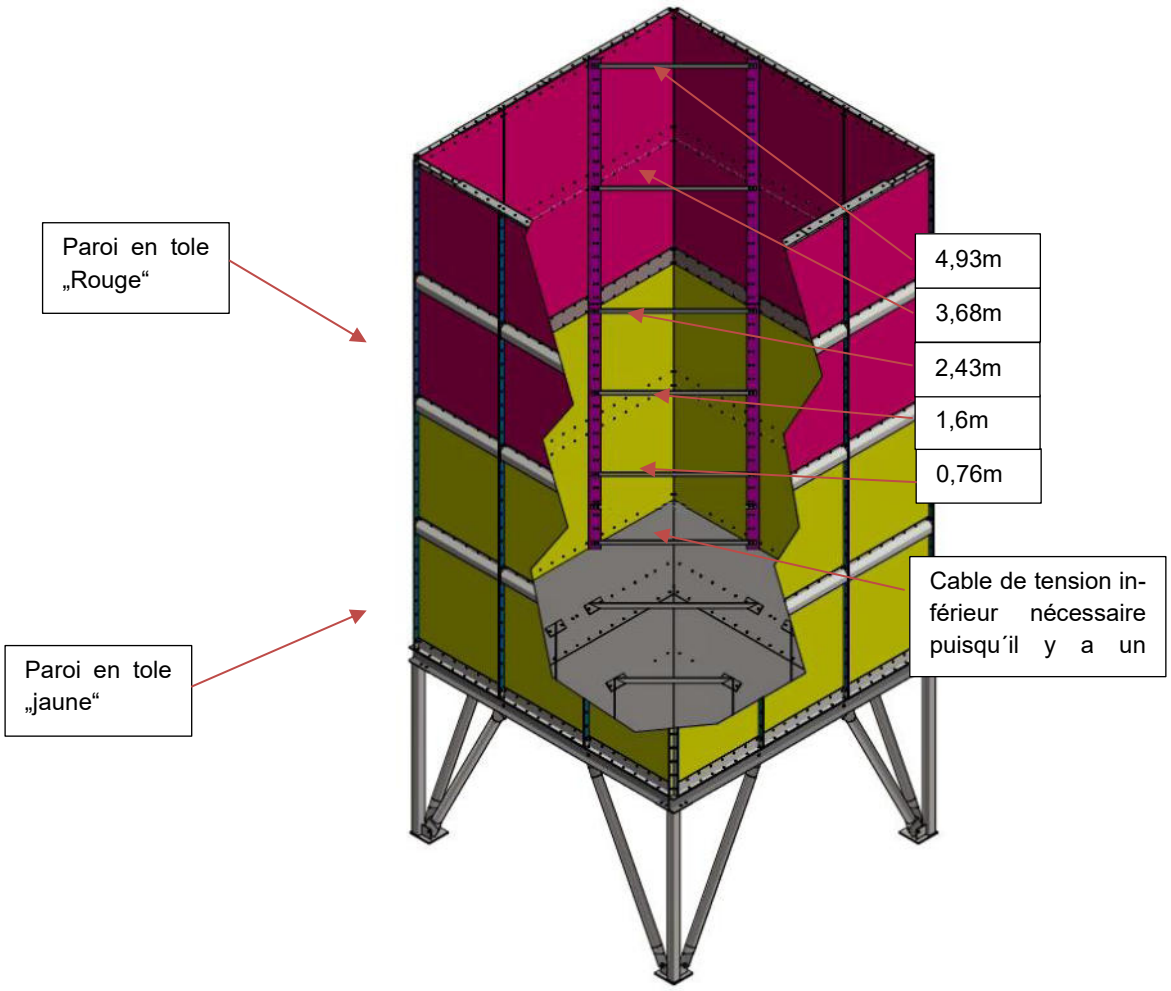
Comme indiqué dans le tableau 2, vous devez utiliser les rangs de tôle inférieurs avec tout d´abord le jaune et ensuite la tôle rouge.

Comme indiqué dans le tableau 3, vous devez renforcer chaque cellule avec 5 câbles de tension par angle sur 5 m de hauteur.

Comme indiqué dans le tableau 4 vous devez visser ces câbles de tension angulaire dans les rangées de trous suivantes :

0,76m	1,60m	2,43m	3,68m	4,93m

Comme vous avez un chassis, vous devez dans ce cas également mettre un cable de tension par angle dans les rangées de trous inférieures à 0,07m :

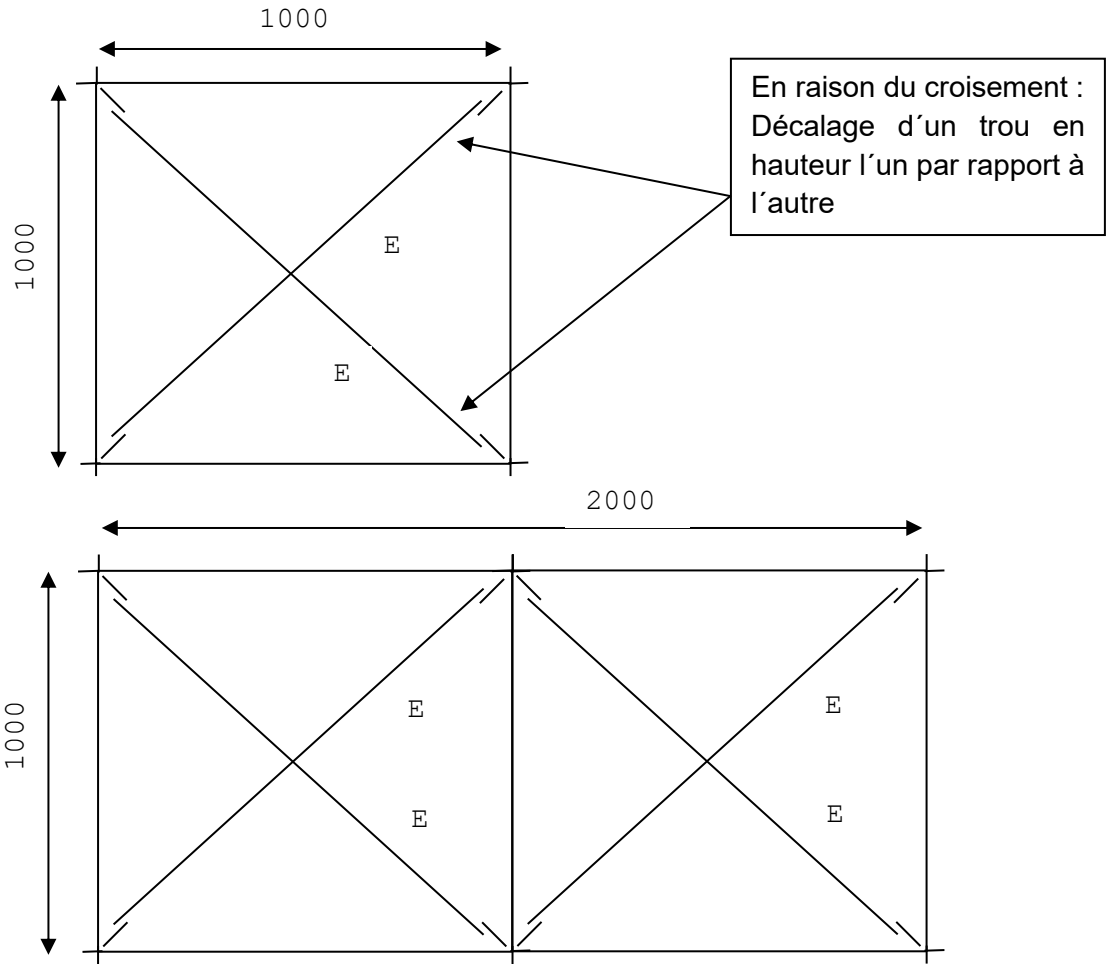


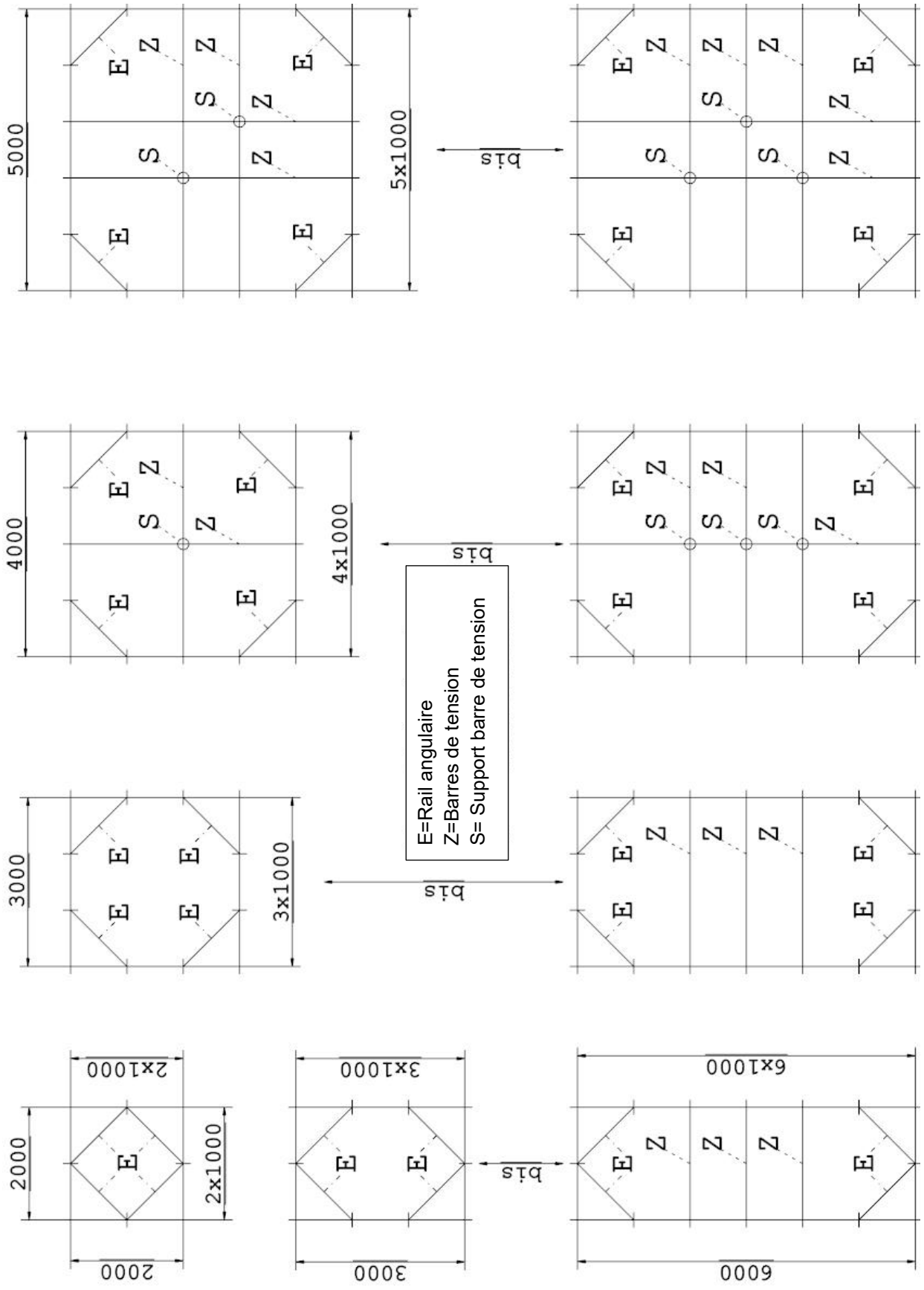
Représentation 2 : Construction d´une cellule

Pour les cellules supérieures à 3m de long ou de large, des câbles de tension de traction devront être utilisés en plus des rails angulaires. L´emplacement de ces câbles de tensions est similaire à celui des rails angulaires.

Pour des câbles de tension de grande longueur, des piliers de soutien seront utilisés afin d´éviter leur affaissement.

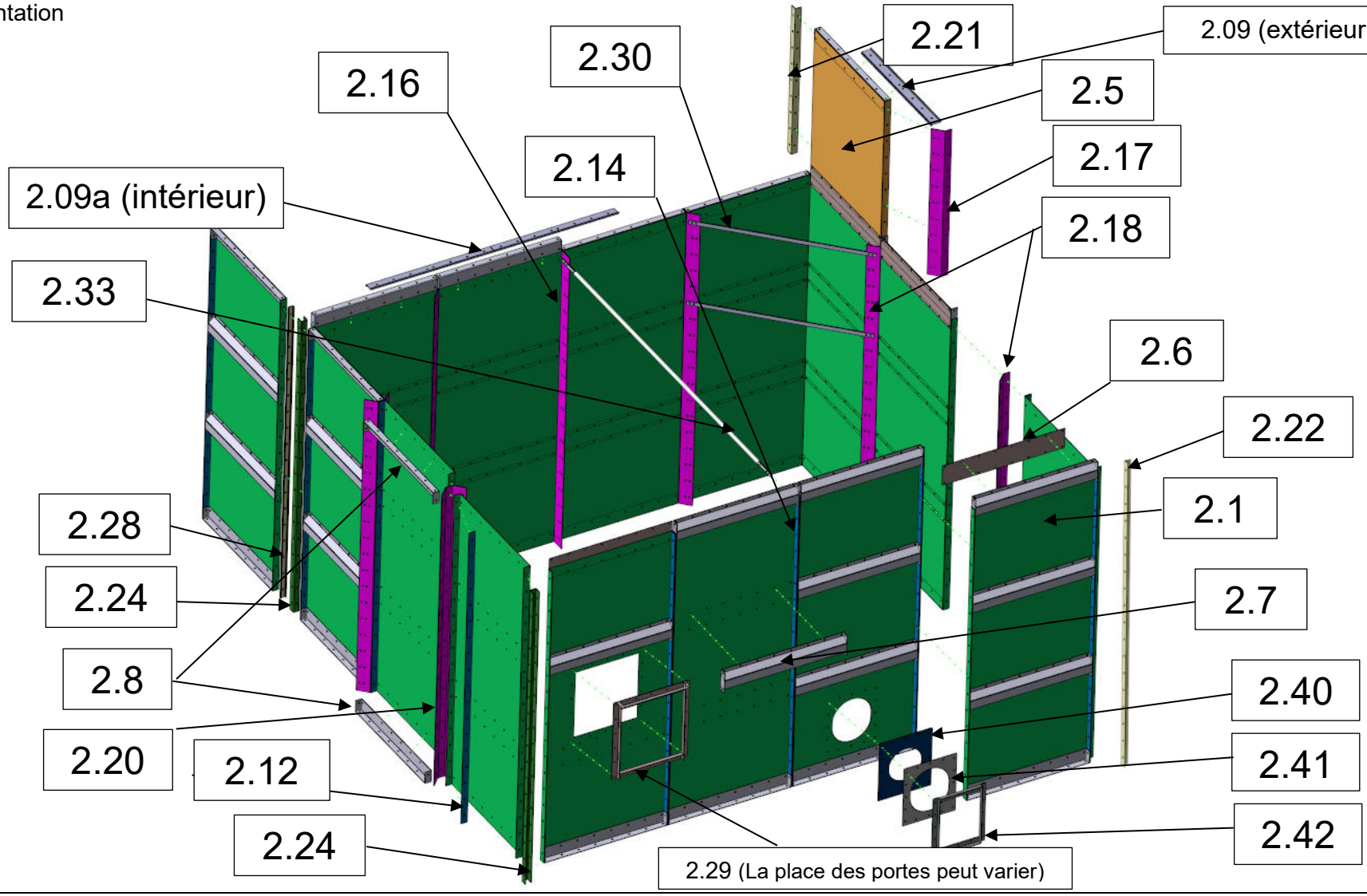
5.9.2 Rails angulaires, barres de tension et montants

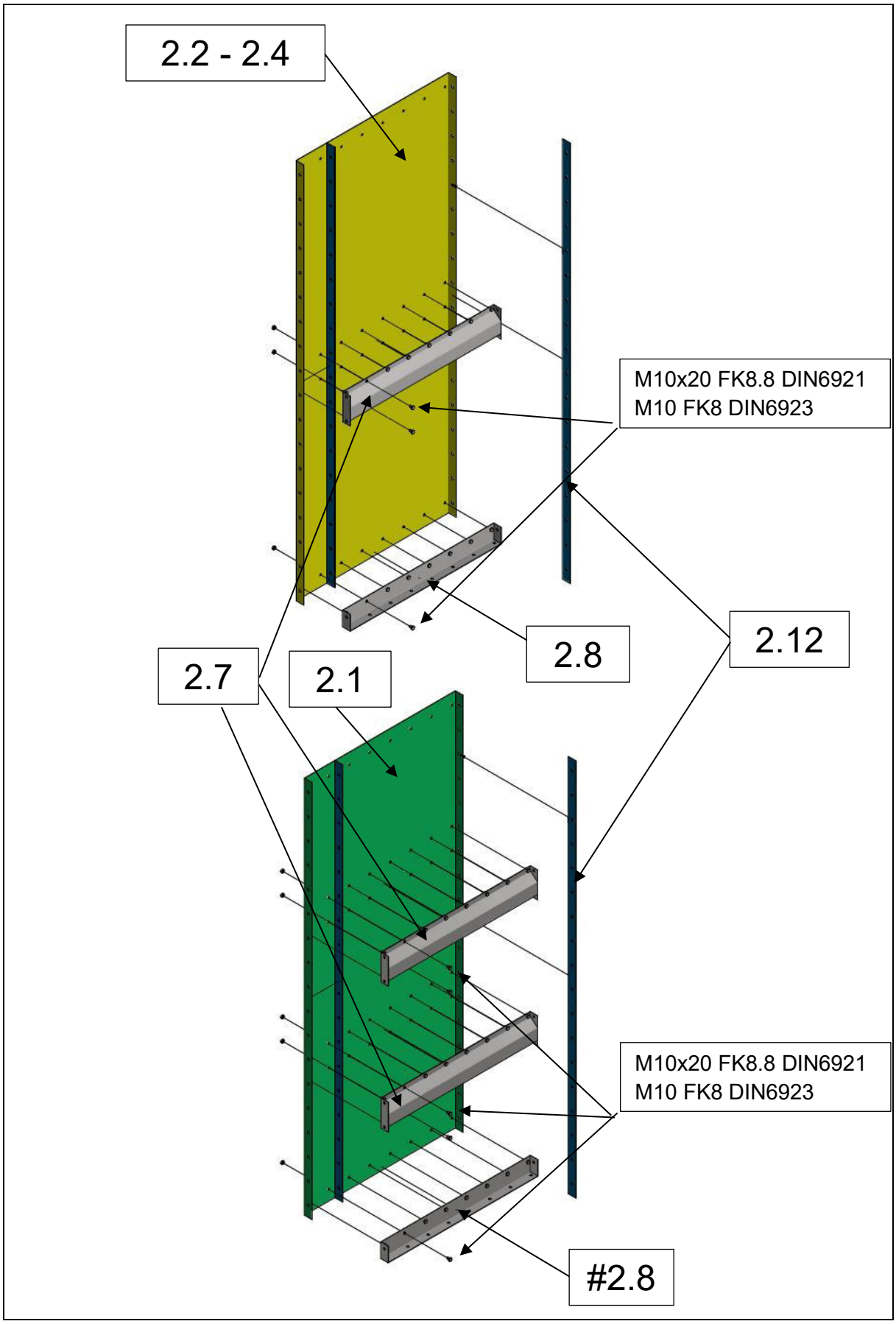



5000
5x1000
bis
4000
4x1000
bis
3000
3x1000
bis
2000
2x1000
2000
2x1000
3000
3x1000
bis
6000
6x1000
E=Rail angulaire
Z=Barres de tension
S= Support barre de tension

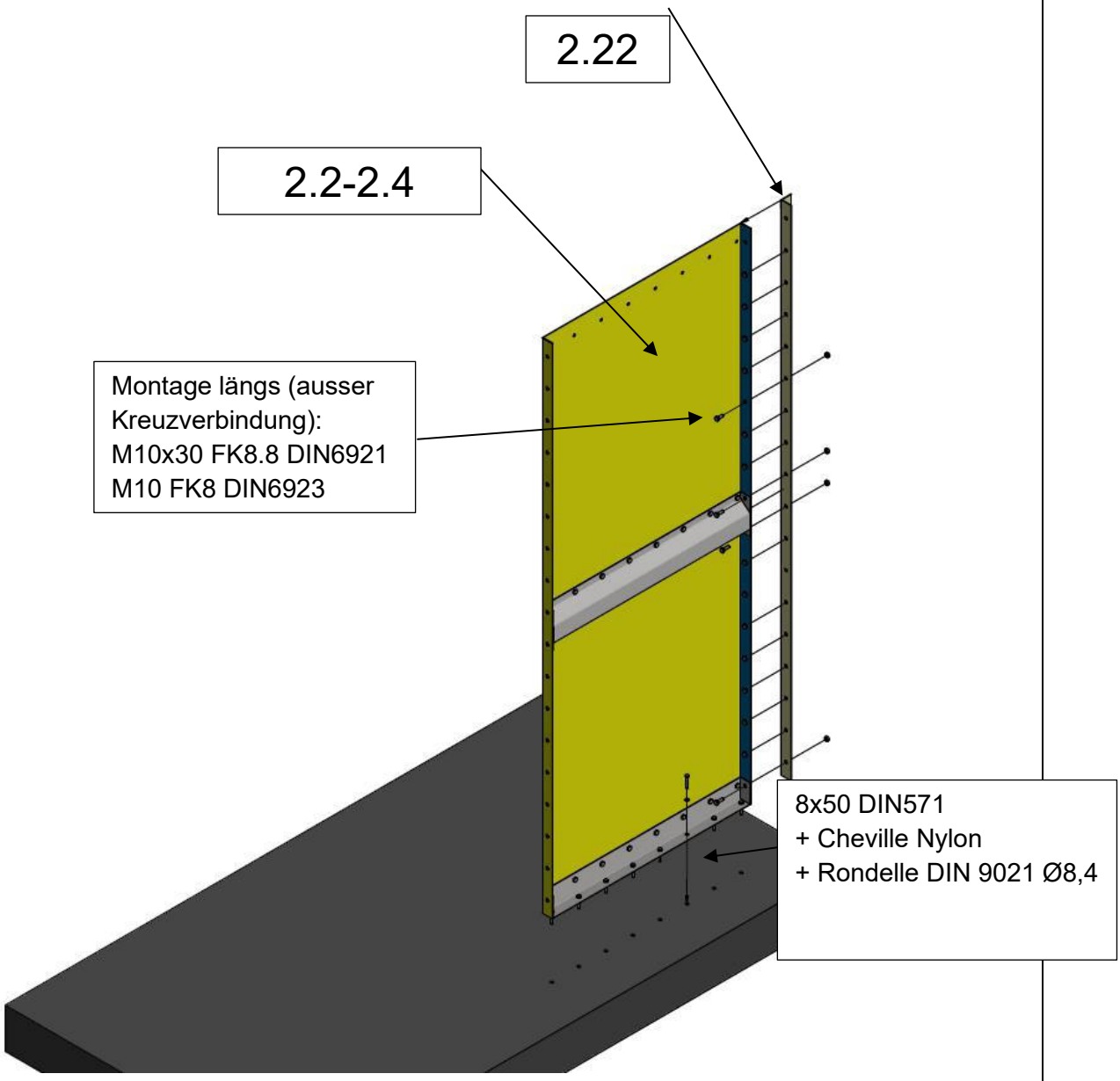
5.9.3 Montage des parois

Représentation

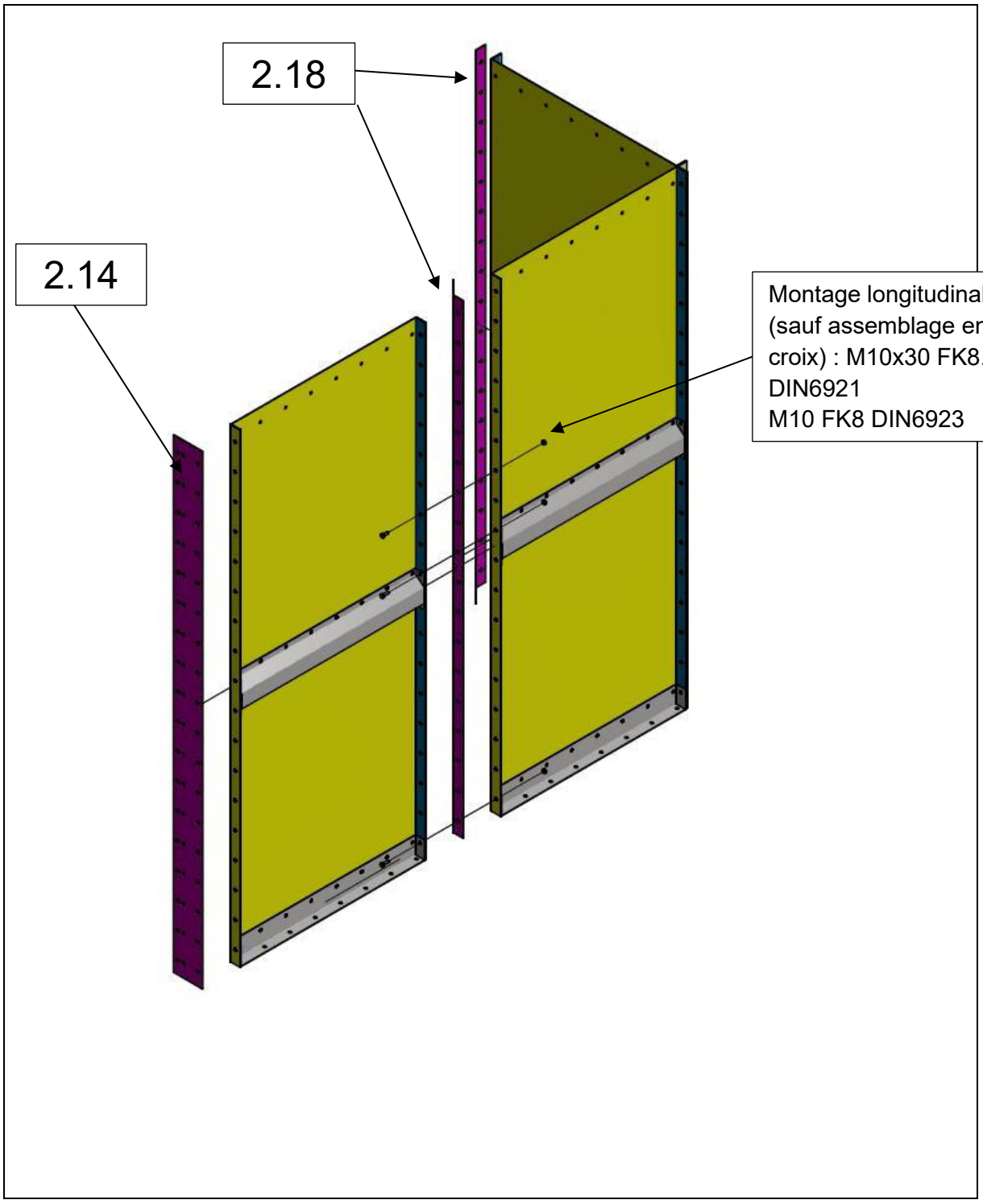



2.2 - 2.4
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
2.8
2.12
2.7
2.1
M10x20 FK8.8 DIN6921
M10 FK8 DIN6923
#2.8

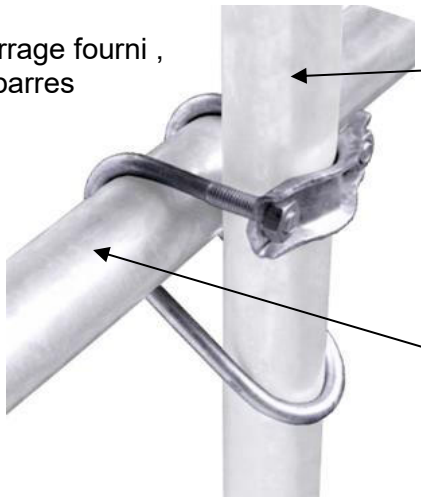
Exemple : assemblage au sol, sans chassis !

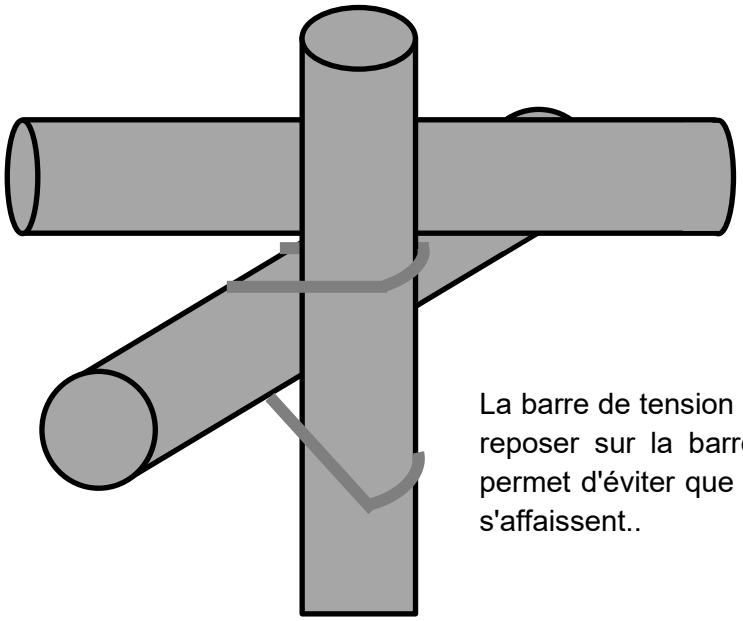


Veiller à un montage perpendiculaire et à angle droit

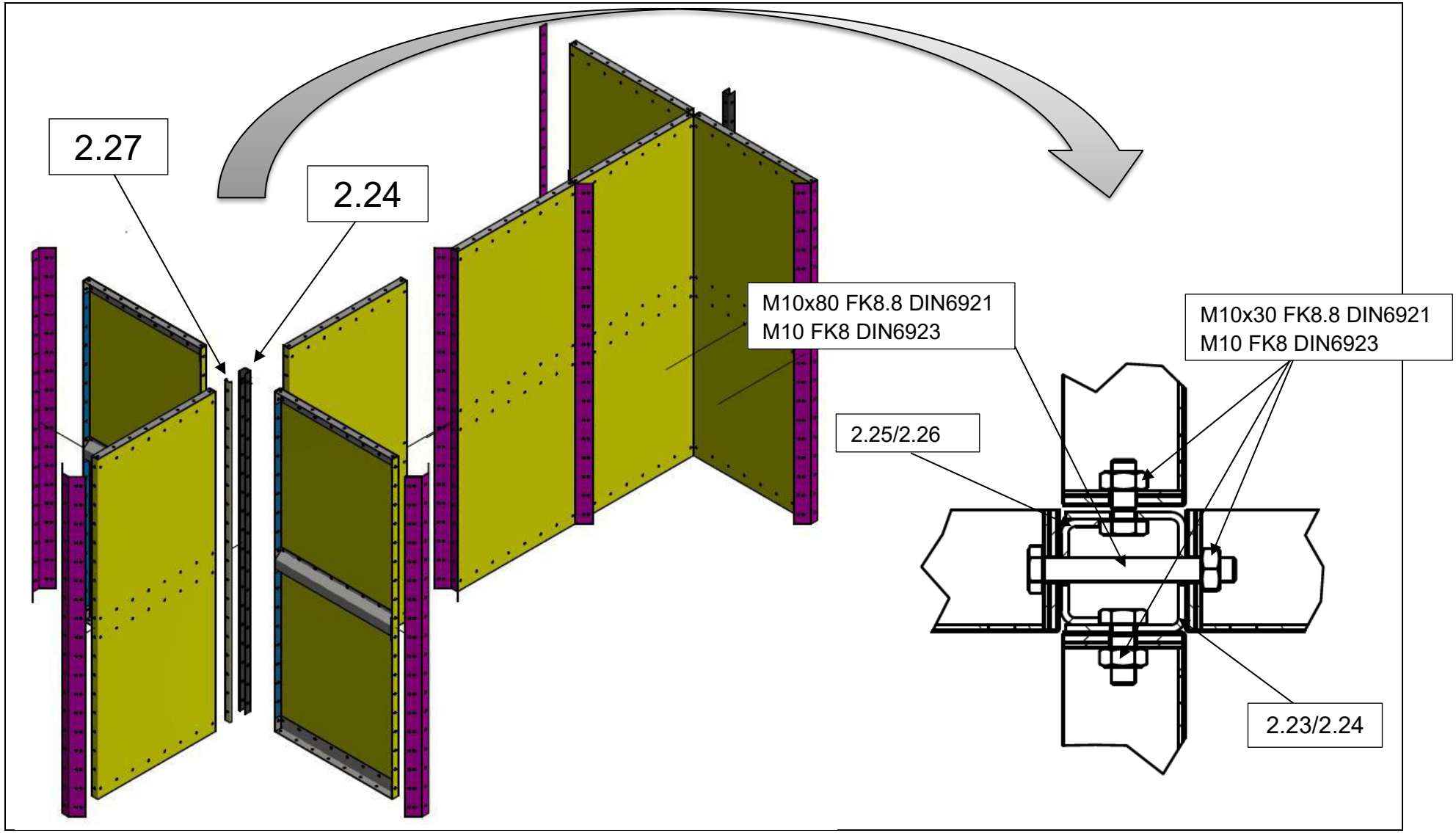

2.18
2.14
Montage longitudinal (sauf assemblage en croix) : M10x30 FK8.8 DIN6921
M10 FK8 DIN6923

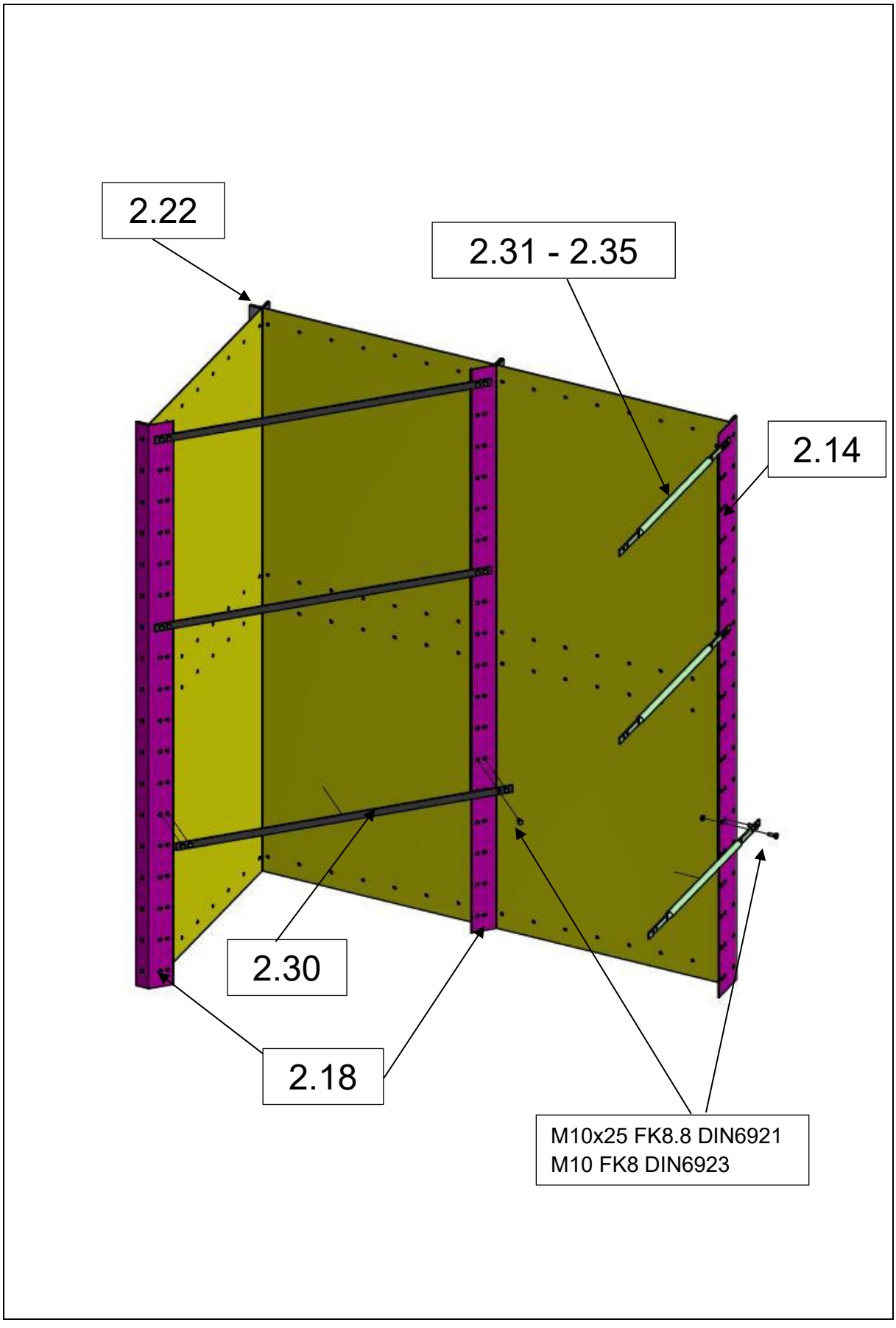
A partir de 4 m
A l'aide du collier de serrage fourni , relier les supports des barres de tension.

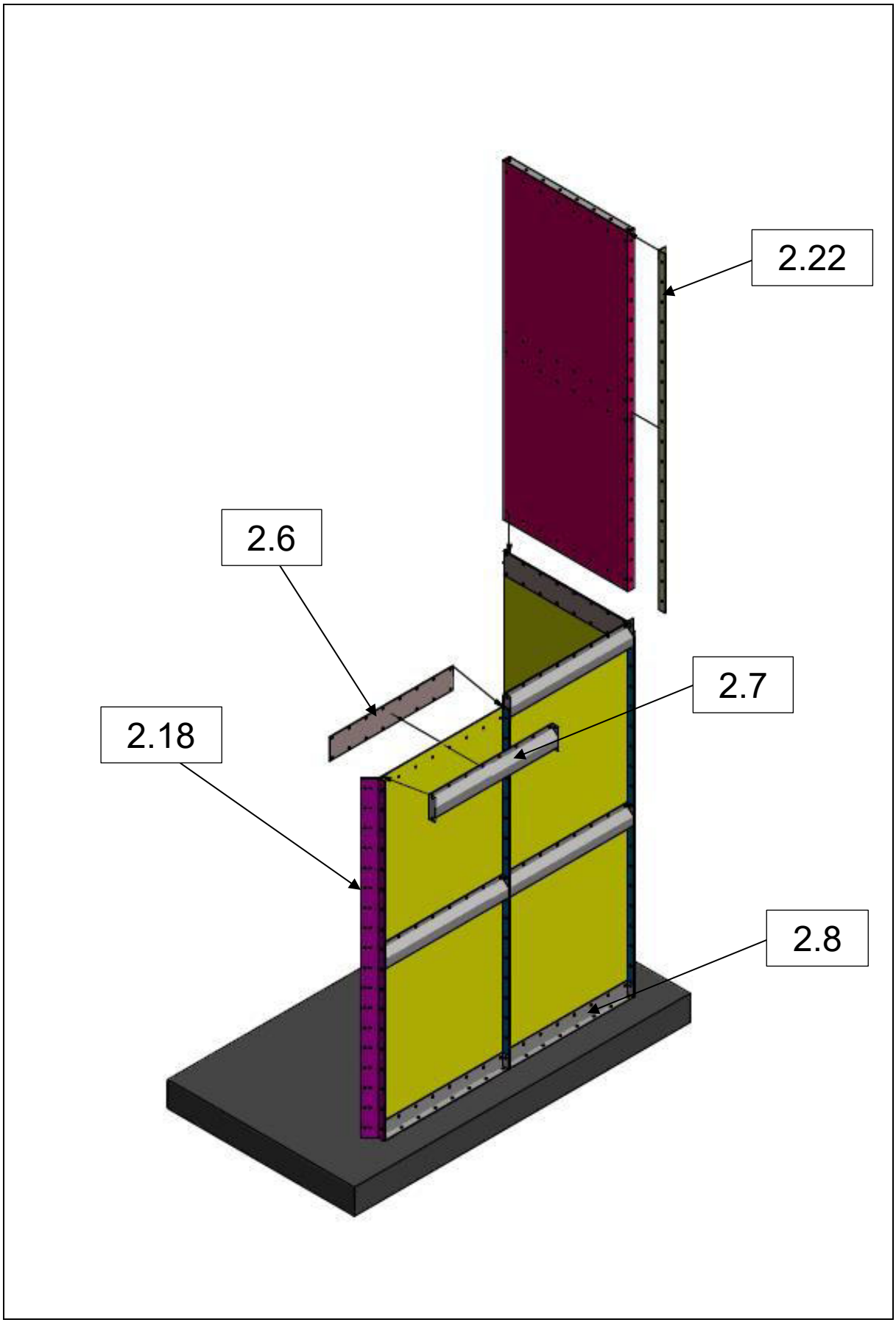




La barre de tension non fixée doit reposer sur la barre fixée. Cela permet d'éviter que les barres ne s'affaissent..


2.27
2.24
M10x80 FK8.8 DIN6921
M10 FK8 DIN6923
M10x30 FK8.8 DIN6921
M10 FK8 DIN6923
2.25/2.26
2.23/2.24


2.22
2.31 - 2.35
2.14
2.30
2.18
M10x25 FK8.8 DIN6921
M10 FK8 DIN6923


2.22
2.6
2.7
2.18
2.8

5.10 Remarques sur la mise en service et la formation du personnel

Vor Inbetriebnahme muss diese Anleitung gelesen und verstanden werden. Bei weiteren Fragen wenden Sie sich vor Inbetriebnahme an Ihren Fachhändler.

Die Anleitung ist jederzeit insbesondere dem Bedienpersonal zugänglich aufzubewahren. Das Betriebspersonal sollte mit den allgemeinen Unfallverhütungsvorschriften vertraut sein.

5.11 Fonctionnement

Assurez-vous que personne n´effectue des travaux de maintenance, de réparation ou de nettoyage à proximité des zones de danger pendant le fonctionnement. Assurez-vous ensuite que les portes d´entrée ont été fermées de l´extérieur après les opérations de maintenance et de nettoyage (veuillez respecter les normes de sécurité).

Le remplissage et la vidange des cellules carrées doivent être toujours effectuées centrées, dans le cas contraire cela pourrait endommager le silo.

Lors du remplissage du silo, les parois en tôle se déforment et forment des bosses. Cela n´est pas une cause de réclamation car la forme de la cellule reprendra partiellement sa forme d´origine lors de la vidange de la cellule.

Si une vis d´alimentation est commune à plusieurs cellules et qu´une cellule a plusieurs châssis, il est nécessaire de vérifier que le matériel sera ouvert, non pas seulement d´un châssis mais de chaque vanne. Cela est important, sinon aucune opération de vidange ne peut s´effectuer de façon centrée. Il n´est pas suffisant de laisser toutes les vannes ouvertes, en effet la vis une fois remplie, les autres sorties de châssis ne pourraient plus livrer de matière et une vidange asymétrique serait ainsi programmée. (ainsi le chassis qui est à la fin de la vis sera vidé en premier avant que les autres ne puissent remettre le matériel).

6 Maintenance et réparation

En règle générale : effectuer la maintenance ou réparation uniquement quand le silo est vide et qu´il y a une ventilation suffisante.

En cas de forte corrosion ou autres défauts qui pourraient entrainer un dysfonctionnement, le silo ne doit plus être utilisé. Les pièces usées peuvent être remplacées conformément aux règles.

En règle générale, les consignes de sécurité indiquées dans le point 0 doivent être respectées Utiliser uniquement les pièces originales du fabricant.