JPB CAC

CORRESPONDENCE AS OF

July 18, 2023

From:	Roland Lebrun
To:	city.council@cityofpaloalto.org
Cc:	Board (@caltrain.com); cacsecretary [@caltrain.com]
Subject:	Palo Alto viaduct design
Date:	Wednesday, June 21, 2023 6:14:08 AM
Attachments:	image.png image.png

Dear Palo Alto Rail Committee,

I believe that the primary issue with current viaduct designs in Palo Alto is that (unlike the Diridon viaducts) the consultants did not consider prestressed concrete box girder construction: https://youtu.be/di-KjrM_WEk

Advantages:

- Reduced costs (most utility relocations can be avoided by extending the spans between support foundations as required) https://youtu.be/ohip-tBu_TU?t=8
- Reduced construction impacts (viaduct segments are prefabricated offsite): https://youtu.be/wd1L1sc-kyQ?t=189
- Single row of columns for a two-track viaduct
- No need for electrified shooflies
- No lane closures on Alma
- Improved aesthetics: the thickness of the bridge deck can be reduced between the support columns:

WHAT ARE PSC BOX GIRDERS?

Prestressed concrete (PSC) box girders are concrete sections forming a **boxed shape** (**rectangular or trapezoidal**), which are supported by **prestressed strands**.

These girders are widely used for footbridges, highway bridges, and railway bridges.

They offer significant **reduction in self weight** for longer spans and have **high inherent torsional stiffness**.

Construction of the North-South Commuter Rail (Philippines)

PHOTOS:
NSCR | Department of Transportation – Philippines

I hope you find this information useful.

Sincerely,

Roland Lebrun

CC

Caltrain Board
Caltrain CAC

From:	Roland Lebrun
To:	Board (@caltrain.com)
Cc:	SFCTA Board Secretary; Transbay Info; CHSRA Board; cacsecretary [@caltrain.com]; TJPA CAC; SFCTA CAC; Caltrain, Bac (@caltrain.com)
Subject:	Business case for 4-car Caltrain EMU trainsets
Date:	Monday, July 10, 2023 4:07:08 PM
Attachments:	Business case for 4-car EMU trainsets.pdf

Dear Chair Zmuda,

The intent of the attached letter is to substantiate and elaborate on multiple recommendations by members of the public to reconfigure the entire EMU fleet from 7-car to 4-car trainsets to achieve the following:

ompliance with FFGA requirement for 4,112 seats/hour/direction during peak

0% reduction in O&M **($25M in FY25**)

0% reduction in power consumption (**$6M in FY25**)

0% Battery-electric locomotive range extension sufficient to reach Salinas **($1/2B** saving)

The letter concludes with a specific trainset reconfiguration proposal for referral to the Caltrain CAC and Finance Committee July meetings followed by a recommendation to the August full Board meeting.

Respectfully presented for your consideration

Roland Lebrun

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TJPA Board of Directors

CHSRA Board of Directors

Caltrain CAC

TJPA CAC

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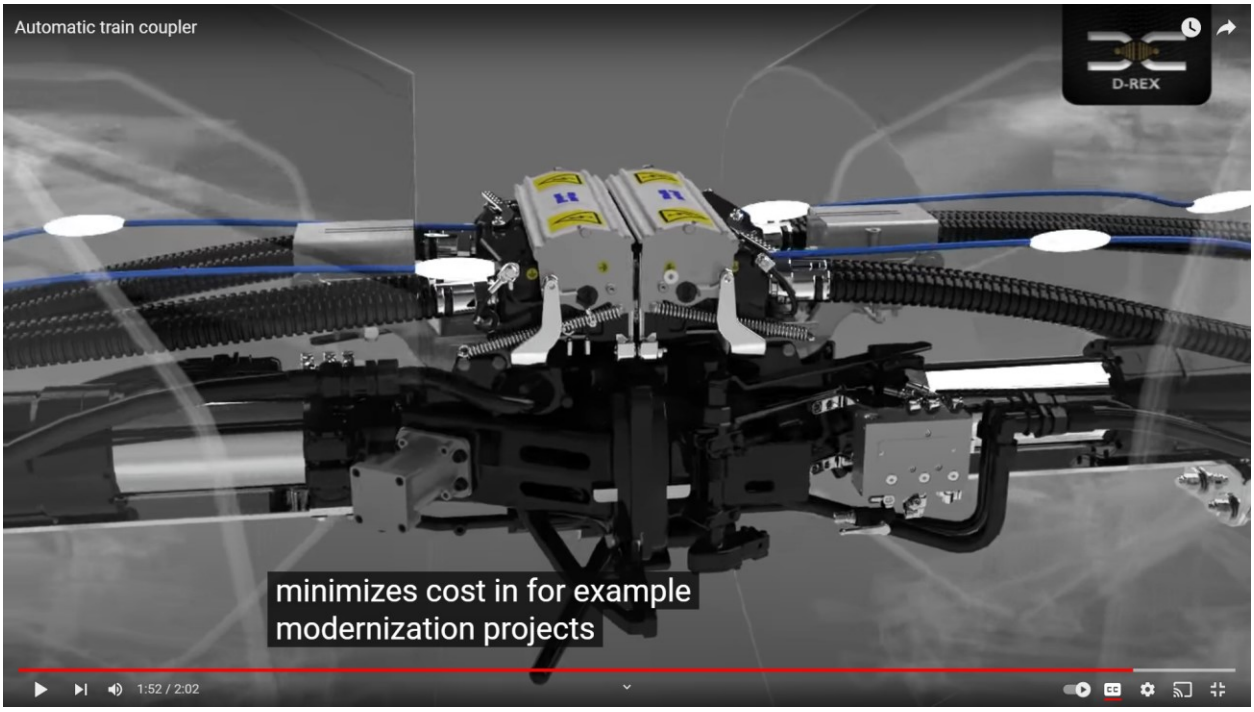
Key Enabling technology

Unlike Caltrain's existing fleet, Stadler Cab ("A" & "B") cars are equipped with automatic couplers capable of connecting trainsets anywhere at a stop on the line **in seconds**.

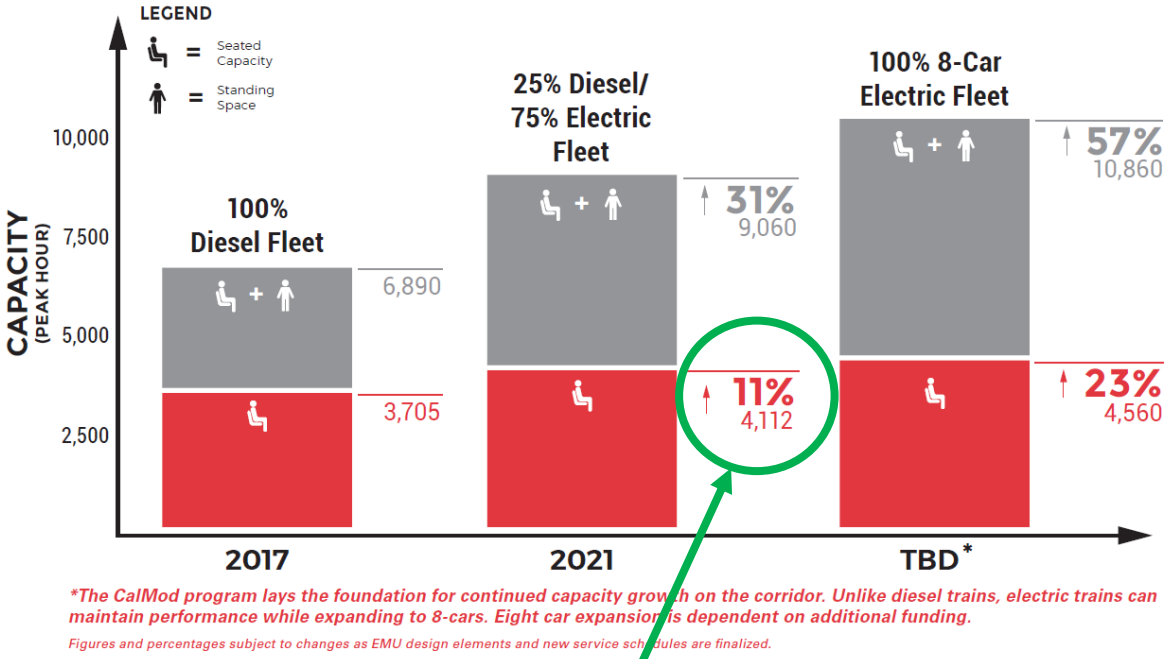


Compliance with FFGA requirement for 4,112 seats/hour/direction during peak

Please refer to the last paragraph in the attached May 9 2017 Seamus Murphy PCEP capacity email which reads as follows:

"*The attached chart demonstrates that with the addition of the Metrolink cars increased current capacity from 3,403 to 3,705 seats/hour and* ***increased post-project capacity from 3,768 to 4,112 seats/hour****.*" ***These capacity numbers exceed the program's minimum 10 percent increase requirement***."

CAPACITY INCREASE



Please refer to the EMU seating capacity chart on the next page and consider the following challenges & opportunities:

- **Staff's current proposal to operate six 656-seat 7-car EMUs during peak cannot possibly meet the requirements of the FFGA (6x656= 3,936).**
- **Current ridership (and associated farebox recovery) cannot possibly sustain the permanent operation of 7-car trainsets**.
- 4-car trainsets can be coupled into 8-car consists during peak and special events.
- **4-car trainsets open an opportunity to negotiate a single conductor per trainset with the unions** (one conductor for a 4-car consist, two conductors for an 8-car consist).
- **Flexible 4-car/8-car operations based on demand can potentially yield:**
    - **a 30% annual saving in O&M ($25M in FY25).**
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4-car EMU configuration proposal

- CAR “A” (100 seats + 2 wheelchairs) CAB car
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Total seating capacities

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- **Six 8-car consists: 4,440 seats (exceeds FFGA seating requirement of 4,112 seats)**

Respectfully presented for your consideration

Roland Lebrun

CC:

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TJPA Board of Directors
CHSRA Board of Directors
Caltrain CAC
TJPA CAC
SFCTA CAC

Attachments:

May 9, 2017 Seamus Murphy PCEP capacity memo
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CAR “C” (82 seats + 2 wheelchairs + 1 bathroom) diagram
CAR “D” (88 seats + 2 wheelchairs + 36 bikes) diagram
CAR “B” (100 seats + 2 wheelchairs) CAB car diagram

Martinez, Martha

From: Martinez, Martha
Sent: Tuesday, May 9, 2017 5:01 PM
Cc: Martinez, Martha; Murphy, Seamus; Hartnett, Jim; McKenna, Nancy
Subject: PCEP Capacity
Attachments: EMU Capacity Graphic PDF.pdf

JPB Board Members,

Attached please find a chart with the capacity numbers we discussed during the Executive Director's report at the last meeting. You'll recall that some members of the public identified that the numbers in the PCEP FFGA application do not reflect the recent addition of the Metrolink railcars to the system.

To be eligible for Core Capacity funds a project must achieve at least a 10 percent seated capacity increase. The Caltrain application identified a 10.7 percent increase in peak hour service, from 3,403 seats/hour to 3,768 seats/hour.

As you know, the Metrolink cars were added after the application was filed to address continuing increases in ridership demand. As represented in the attached chart, the Metrolink cars add capacity to the current service and also add capacity to the post-project capacity when Caltrain will be operating a mixed fleet (EMUs and diesel).

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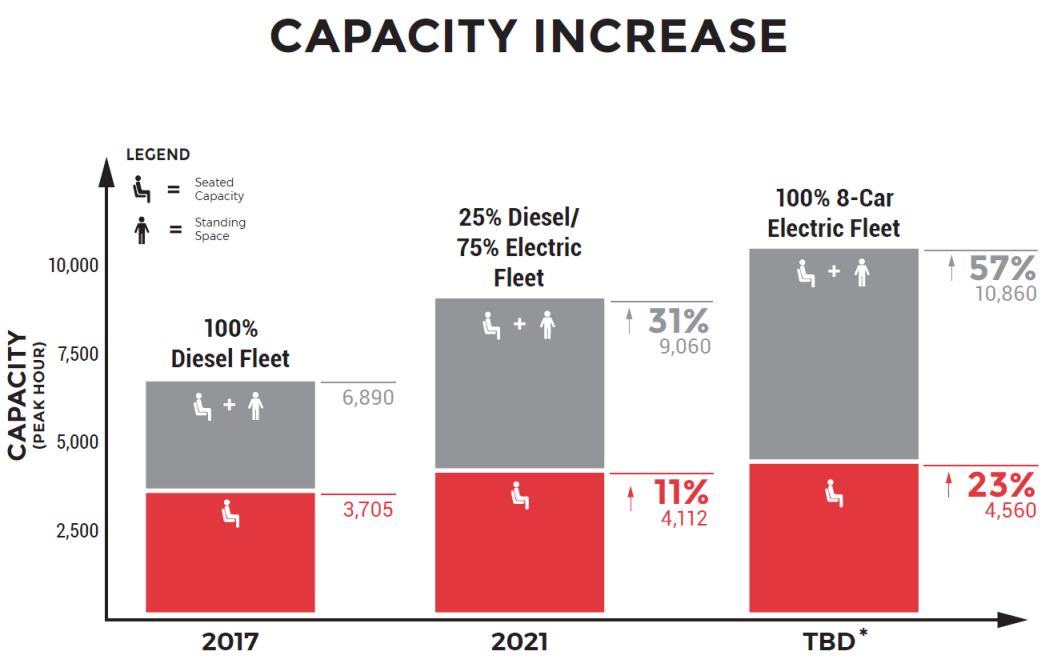
Seamus P. Murphy | Caltrain, SamTrans, SMCTA
Chief Communications Officer
1250 San Carlos Avenue | San Carlos, CA 94070
650.508.6388 | murphys@samtrans.com



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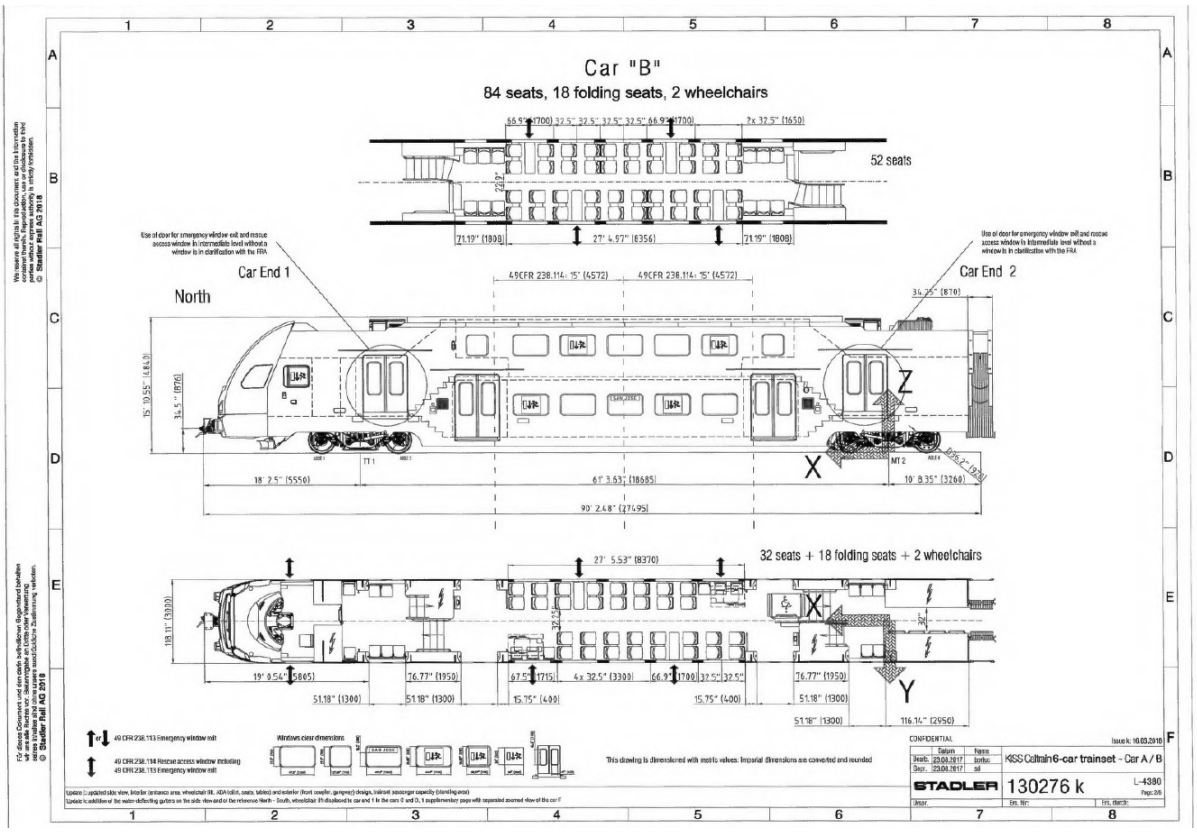
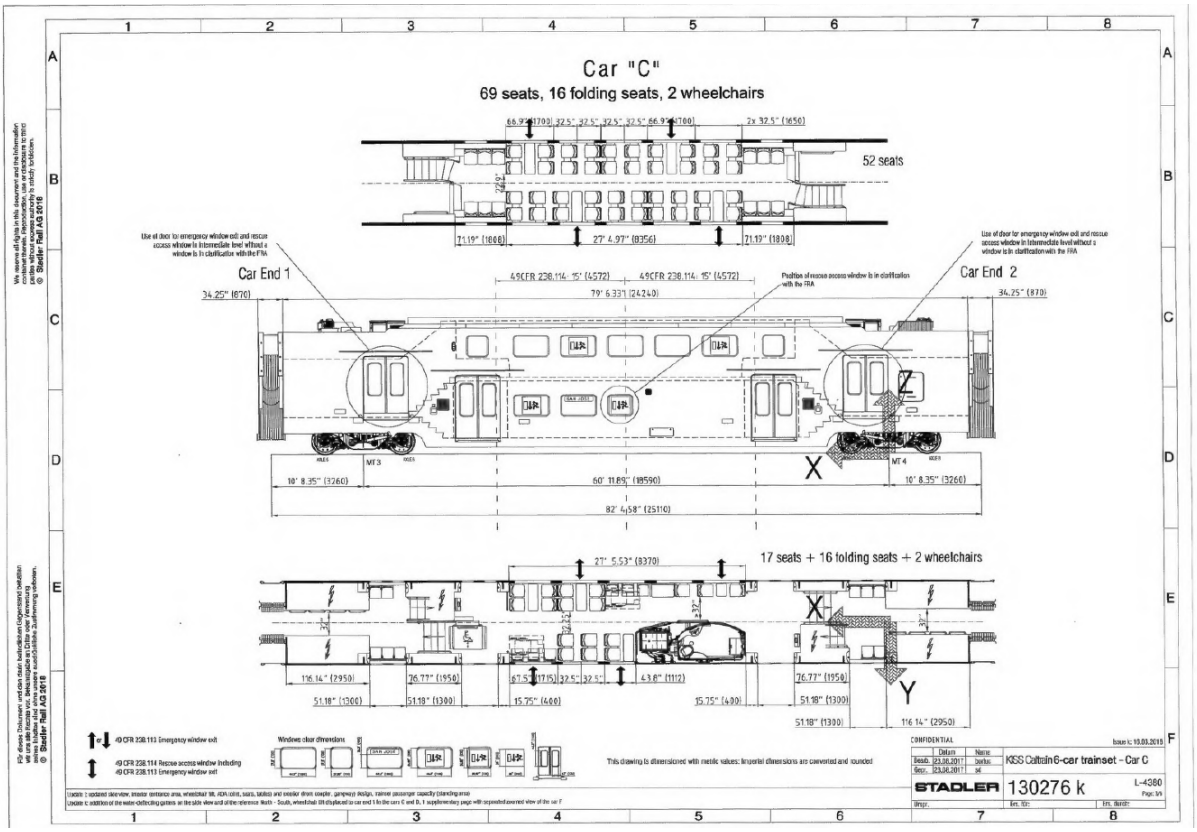
Figures and percentages subject to changes as EMU design elements and new service schedules are finalized.


Car "B"
84 seats, 18 folding seats, 2 wheelchairs
52 seats
Car End 1
North
Car End 2
32 seats + 18 folding seats + 2 wheelchairs
49 CFR 238.113 Emergency window exit
49 CFR 238.114 Rescue access window including
49 CFR 238.113 Emergency window exit
Windows clear dimensions
This drawing is dimensioned with metric values. Imperial dimensions are converted and rounded
CONFIDENTIAL
Issue k: 10.03.2016
Datum Name
Bearb. 23.06.2017 burkec
Gepr. 23.06.2017 sd
KISS Caltrain 6-car trainset - Car A / B
STADLER 130276 k
L-4380


Car "C"
69 seats, 16 folding seats, 2 wheelchairs
52 seats
Car End 1
Car End 2
17 seats + 16 folding seats + 2 wheelchairs
49 CFR 238.113 Emergency window exit
49 CFR 238.114 Rescue access window including
49 CFR 238.113 Emergency window exit
Windows clear dimensions
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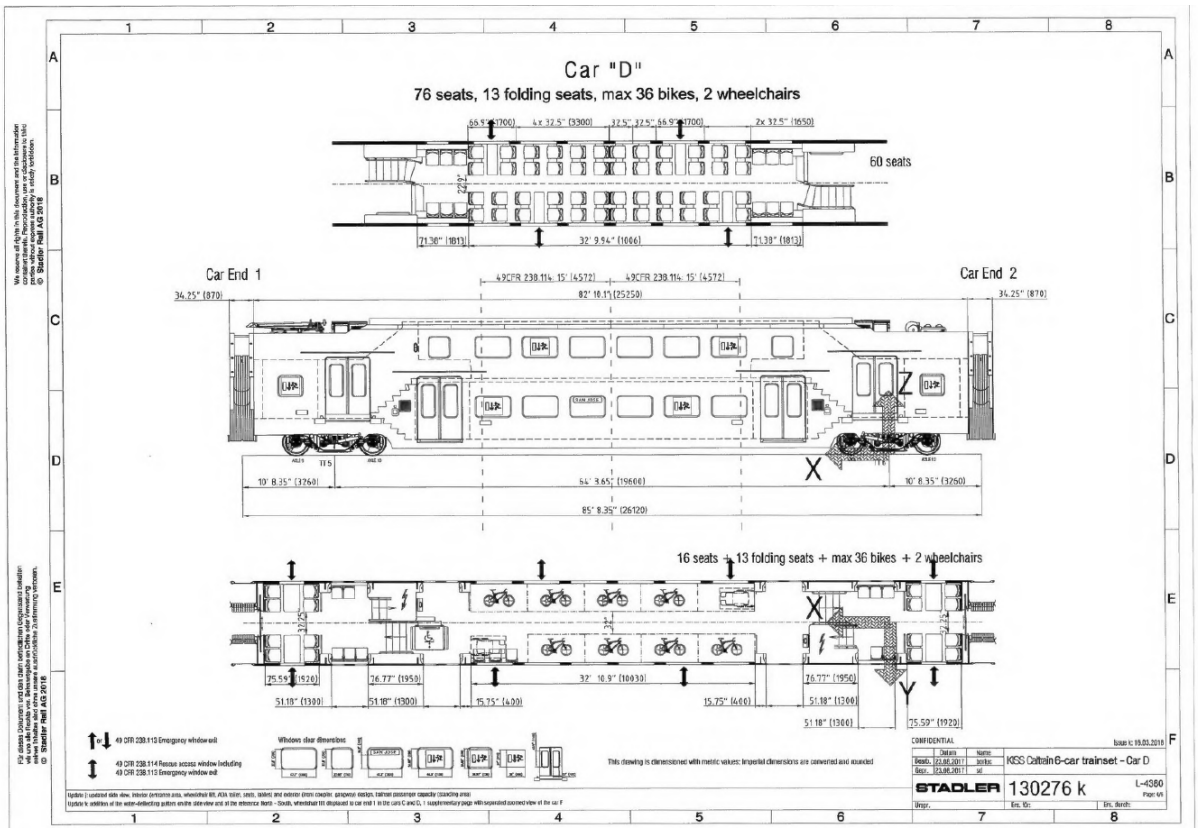
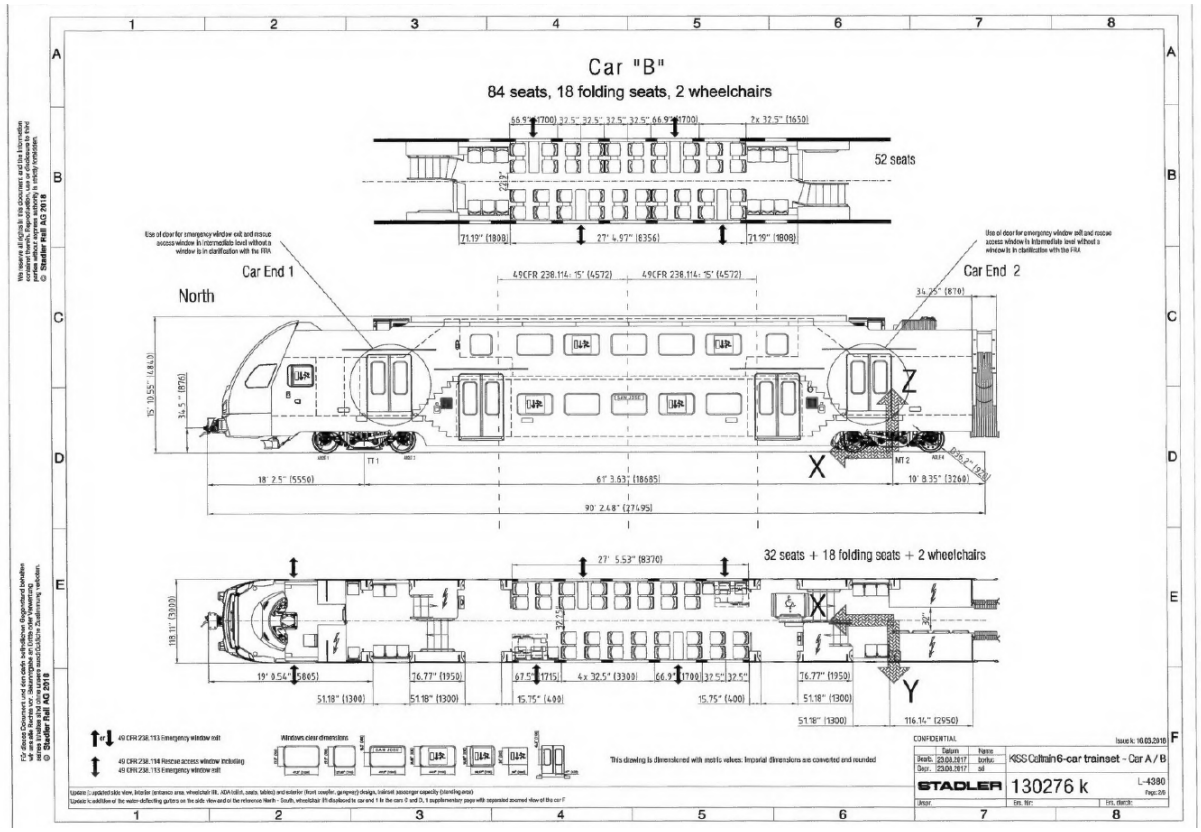
CONFIDENTIAL
Issue c: 10.03.2016
Datum Name
Bearb. 23.06.2017 burkec
Gepr. 23.06.2017 sd
KISS Caltrain 6-car trainset - Car C
STADLER 130276 k
L-4380


Car "D"
76 seats, 13 folding seats, max 36 bikes, 2 wheelchairs
60 seats
Car End 1
Car End 2
16 seats + 13 folding seats + max 36 bikes + 2 wheelchairs
CONFIDENTIAL
KISS Caltrain 6-car trainset - Car D
STADLER
130276 k
L-4380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From:	Roland Lebrun
To:	Board (@caltrain.com)
Cc:	SFCTA Board Secretary; Transbay Info; freight@arb.ca.gov; cacsecretary [@caltrain.com]; TJPA CAC; SFCTA CAC; Caltrain, Bac (@caltrain.com)
Subject:	Business case for Battery-Electric Locomotives (BEL)
Date:	Tuesday, July 18, 2023 6:11:46 AM
Attachments:	Business case for Battery-electric locomotives.pdf Business case for 4-car EMU trainsets.pdf

Dear Chair Zmuda,

Further to my email of June 10th (below), please consider the attached proposal to **replace the entire Caltrain diesel fleet by 2025.**

Key points:

- BEMU prototype reconfiguration to 4 cars (**potential $35-$40M saving**)
- Competitive procurement
- Elimination of battery operations between Tamien and San Francisco
- **Elimination of potential violations of the FFGA caused by a reduction in seating capacity to accommodate 150-200 tons of batteries/trainset.**
- Rigorous testing at the FRA testing facility in Pueblo, NOT SamTrans consultants engaged in Stadler BEMU prototyping
- Evaluation of BELs for the rescue of stranded EMU trainsets
- **Potential $1/2B saving** (6 x BEMU @ $85M each = $510M)

Respectfully presented for your consideration

Roland Lebrun

CC

California Air Resources Board
Caltrain Board
SFCTA Commissioners
TJPA Board of Directors
TAMC Rail Policy Committee
Caltrain CAC
TJPA CAC
SFCTA CAC
Caltrain BAC

From: Roland Lebrun
Sent: Monday, July 10, 2023 4:06 PM
To: Caltrain Board <board@caltrain.com>
Cc: SFCTA Board Secretary <clerk@sfcta.org>; Transbay Info <info@tjpa.org>; CHSRA Board <boardmembers@hsr.ca.gov>; Caltrain CAC Secretary <cacsecretary@caltrain.com>; TJPA CAC <CAC@TJPA.org>; SFCTA CAC <cac@sfcta.org>; Caltrain BAC <bac@caltrain.com>
Subject: Business case for 4-car Caltrain EMU trainsets

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Caltrain BAC

Dear Chair Zmuda,

Further to my earlier recommendation to convert the entire Caltrain EMU fleet to 4-car trainsets and the subsequent **$85M award for a 7-car BEMU** in the state budget signed by Governor Newsom, please consider directing staff as follows at the July 24 Finance Committee:

1) Return to the Finance Committee with a reduced estimate for a **4-car** BEMU prototype
2) Redirect $35-$40M residual funds from the CalSTA BEMU grant to the **competitive** procurement of Battery-Electric Locomotives (BELs) **currently available from Wabtec & Progress Rail for $5M/locomotive** to **replace the entire Caltrain diesel fleet by 2025** **at a saving of $1/2B**

Background

Caltrain have demonstrated that 7-car EMUs can be propelled by locomotives

- Between Salt Lake City and the Pueblo testing facility (650 miles each way)
- Between Salt Lake City and San Jose (770 miles)
- **Between San Jose and San Francisco** (50 miles each way)

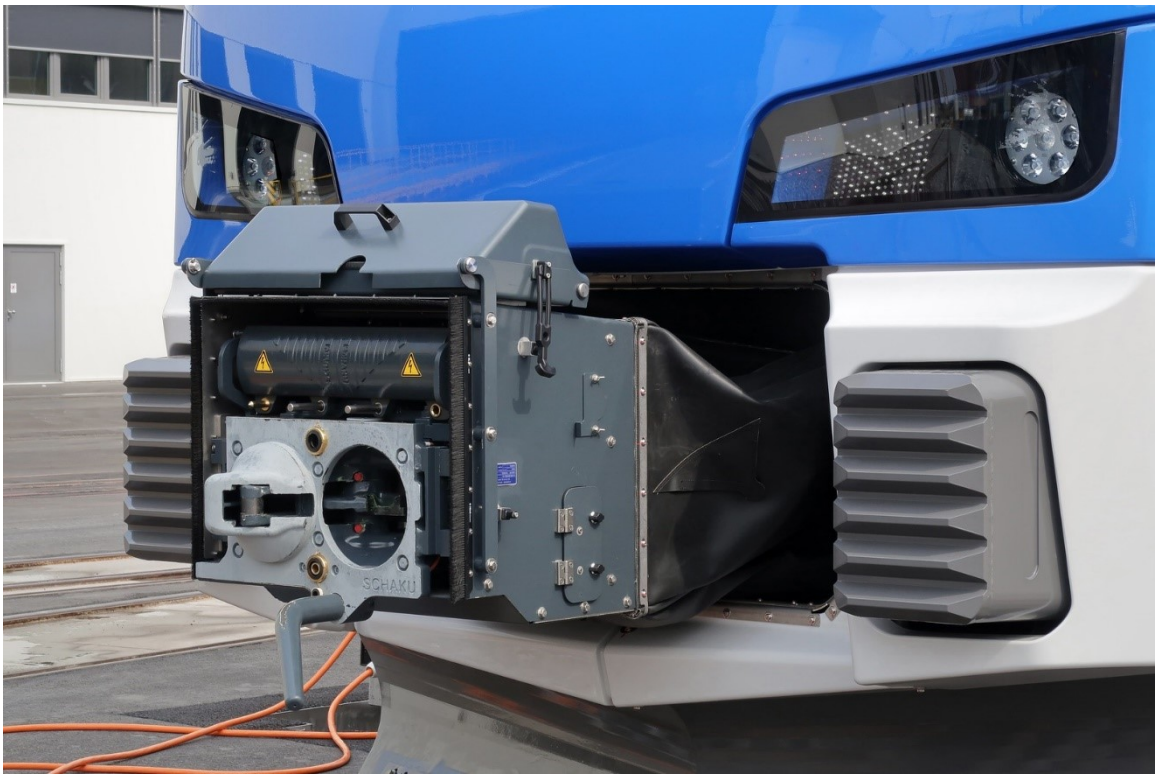
Key enabling technology for passenger service

"The Schwab coupler [nl], made by Schwab Verkehrstechnik AG, Schaffhausen, is used on Stadler Kiss"

"The Schwab coupler is superior in many ways to many other automatic couplers because it makes the pneumatic and electrical connections automatically and is capable of automatic uncoupling.[55]

"As of 2020 Wabtec is working on an automatic coupler based on Schwab"

https://en.wikipedia.org/wiki/Railway_coupling#Schwab_coupler



Potential operating scenarios south of Diridon

1) Southbound
- 8-car EMU consists could decouple at Diridon.
- The southern-most 4-car EMU would continue to Tamien at which point it would couple to a BEL.
- The 4-car EMU + 1 BEL consist would continue to Gilroy (and potentially to Salinas) on a single charge.
- BELs would recharge upon arrival in Gilroy (up to 4 consists) or Salinas (up to 2 additional consists)

2) Northbound
- Upon arrival at Tamien, the BEL would decouple from the EMU consist and recharge while awaiting the next southbound EMU trainset.
- The 4-car EMU would continue northbound under its own power
- The 4-car EMU could couple to another 4-car EMU at Diridon (to form an 8-car consist) or continue north as a 4-car EMU, potentially all the way up to San Francisco.

Testing Regime

The BEL RFP should specify that the selection of the eventual winner of the BEL procurement will be informed by the results of **rigorous testing of the above scenarios at the Pueblo Testing Facility, NOT by SamTrans consultants engaged in Stadler BEMU testing**, including recommendations on sequencing of coupling/decoupling and door opening/closing during passenger service.

"*Joining portions of a passenger train can be done at very low speed (less than 2 mph or 3.2 km/h in the final approach), so that the passengers are not jostled about*"
https://en.wikipedia.org/wiki/Railway_coupling#Scharfenberg_coupler

Testing should also include the evaluation of BEL potentially superior suitability for the rescue of 4 and 8-car stranded Stadler consists: https://youtu.be/WzRUVyDVf0s?t=465

Additional funding for BELs and charging infrastructure
Incentives for Locomotives | California Air Resources Board

Respectfully presented for your consideration

Roland Lebrun

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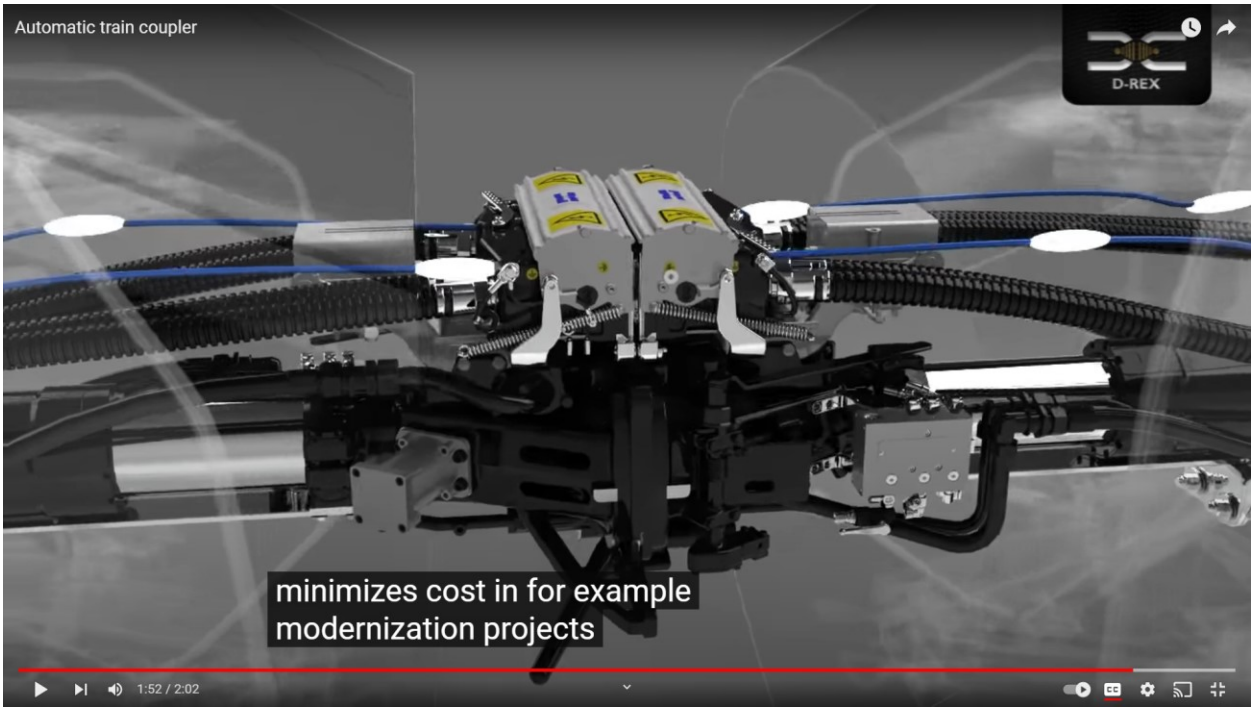

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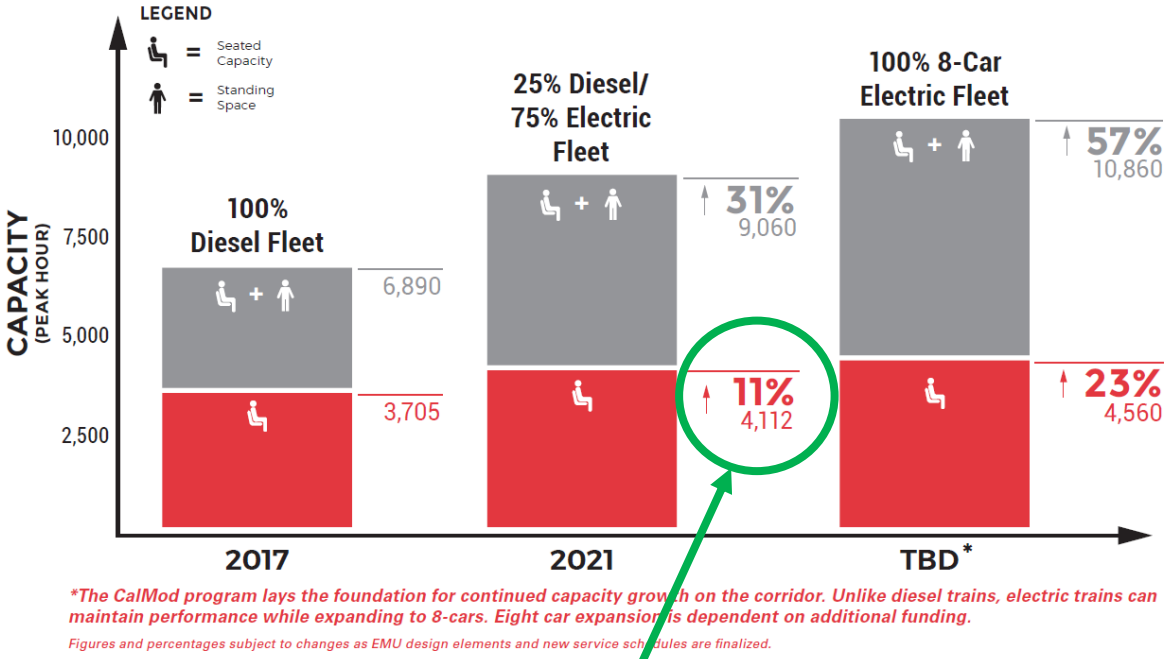

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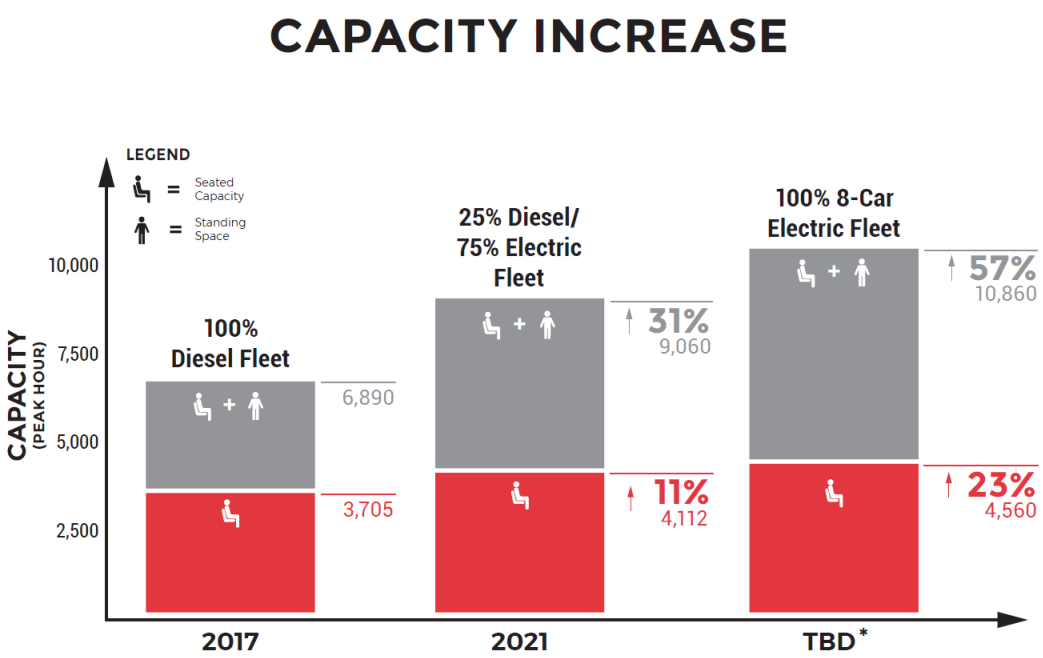

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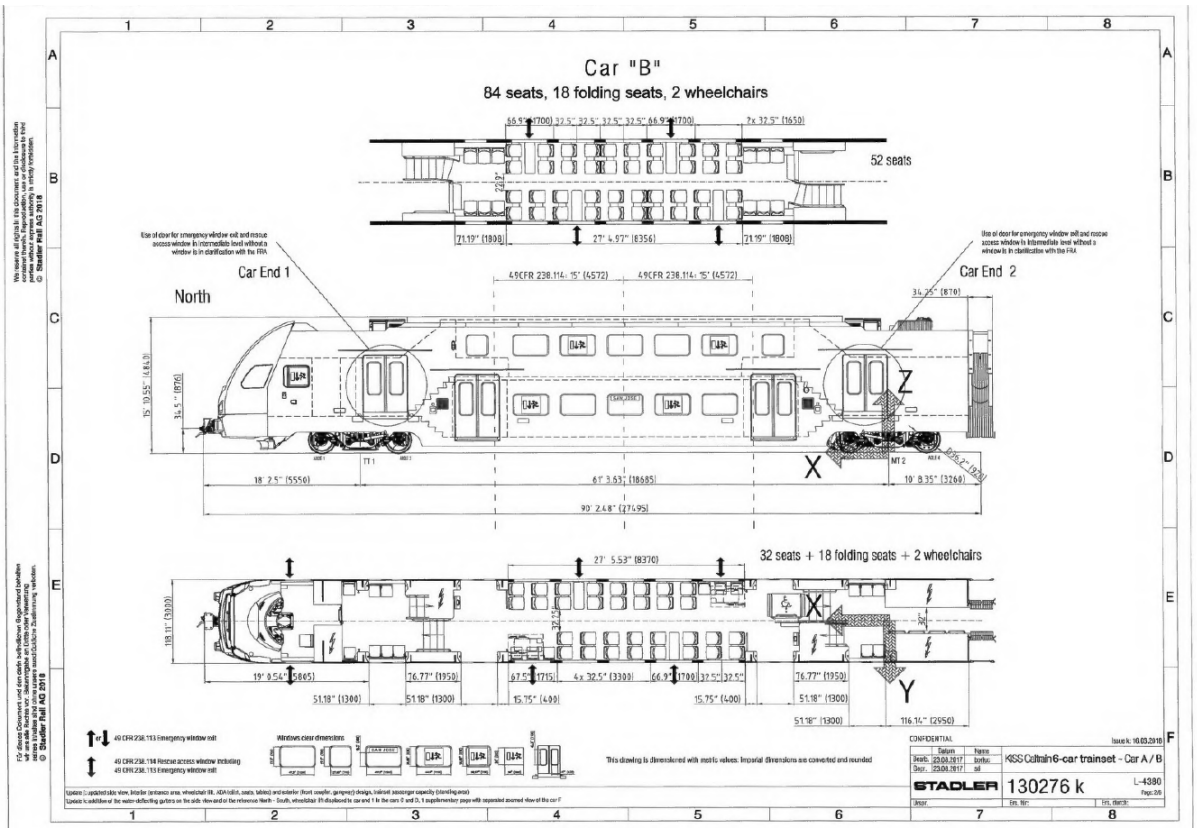
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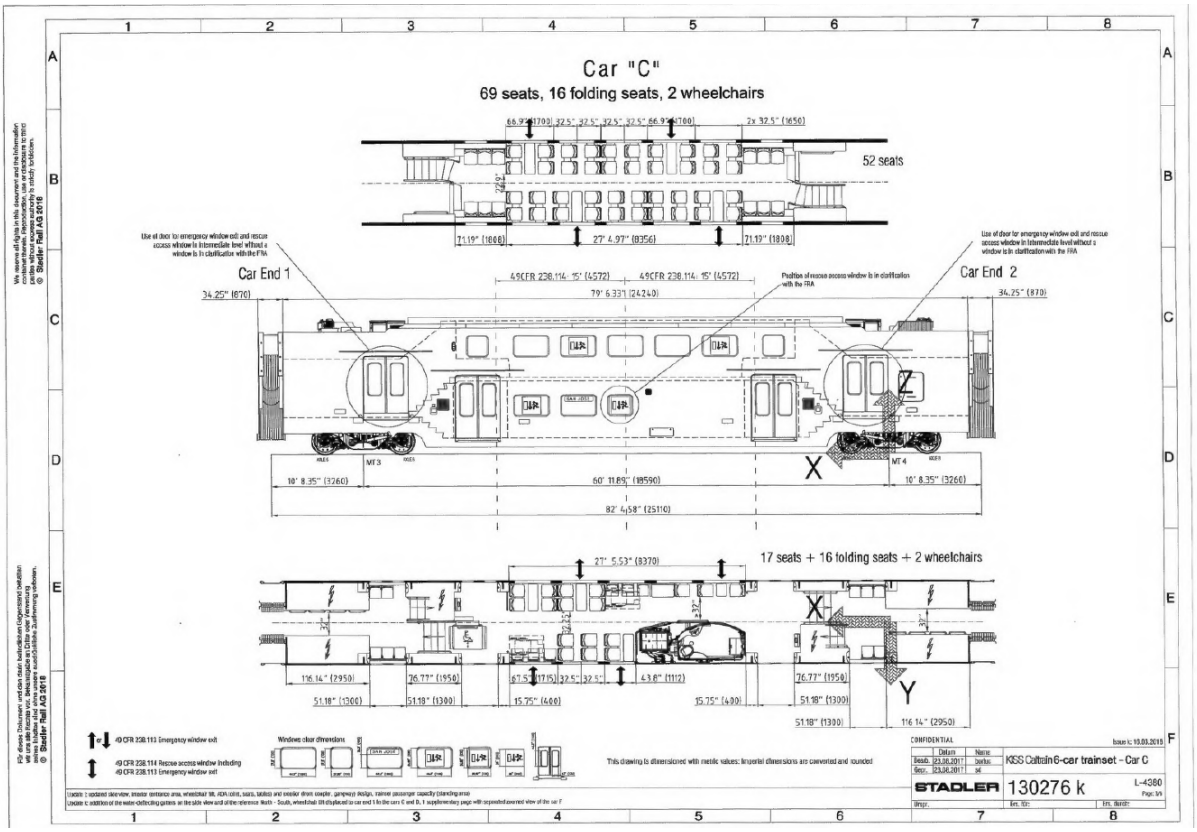
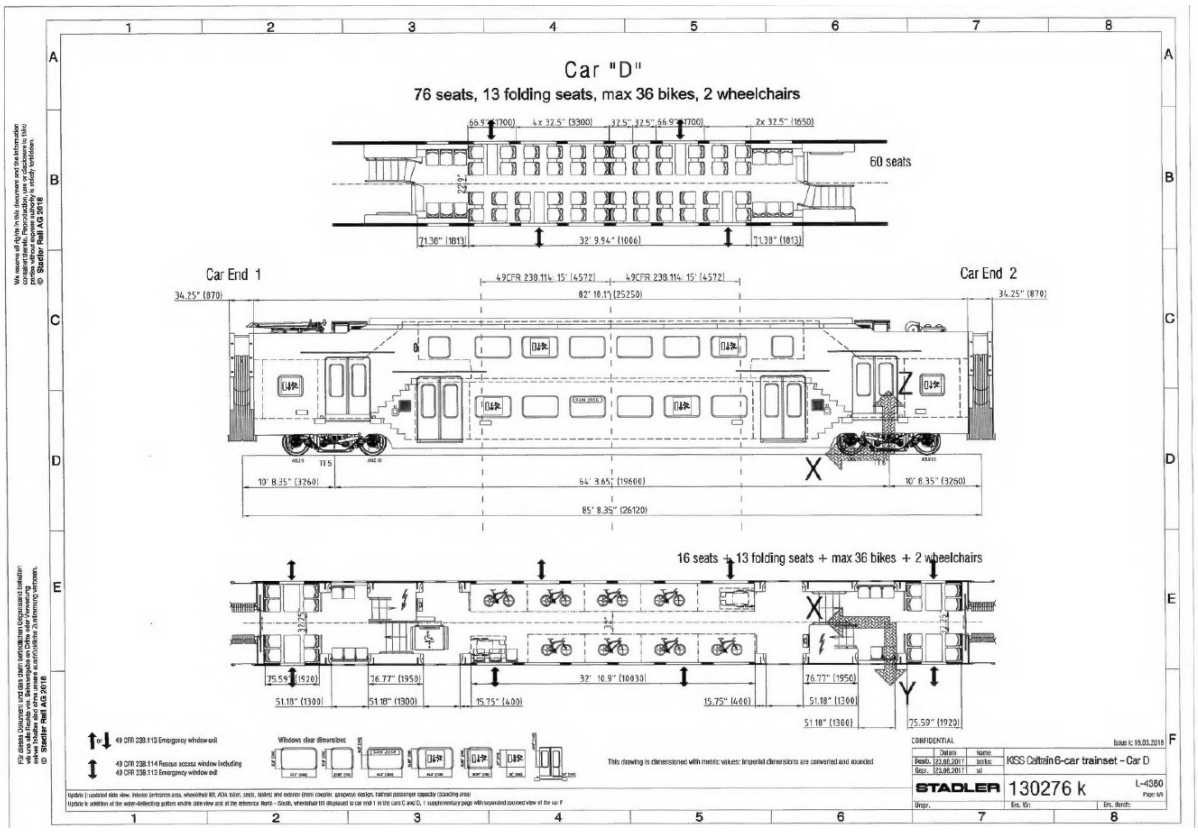
Issue k: 10.03.2016
Datum Name
Bearb. 23.06.2017 burkec
Gepr. 23.06.2017 sd
KISS Caltrain 6-car trainset - Car A / B
STADLER 130276 k
L-4380


Car "C"
69 seats, 16 folding seats, 2 wheelchairs
52 seats
Car End 1
Car End 2
17 seats + 16 folding seats + 2 wheelchairs
49 CFR 238.113 Emergency window exit
49 CFR 238.114 Rescue access window including
49 CFR 238.113 Emergency window exit
Windows clear dimensions
This drawing is dimensioned with metric values. Imperial dimensions are converted and rounded
CONFIDENTIAL
Issue c: 10.03.2016
Datum Name
Bearb. 23.06.2017 burkec
Gepr. 23.06.2017 sd
KISS Caltrain 6-car trainset - Car C
STADLER 130276 k
L-4380


Car "D"
76 seats, 13 folding seats, max 36 bikes, 2 wheelchairs
60 seats
Car End 1
Car End 2
16 seats + 13 folding seats + max 36 bikes + 2 wheelchairs
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KISS Caltrain 6-car trainset - Car D
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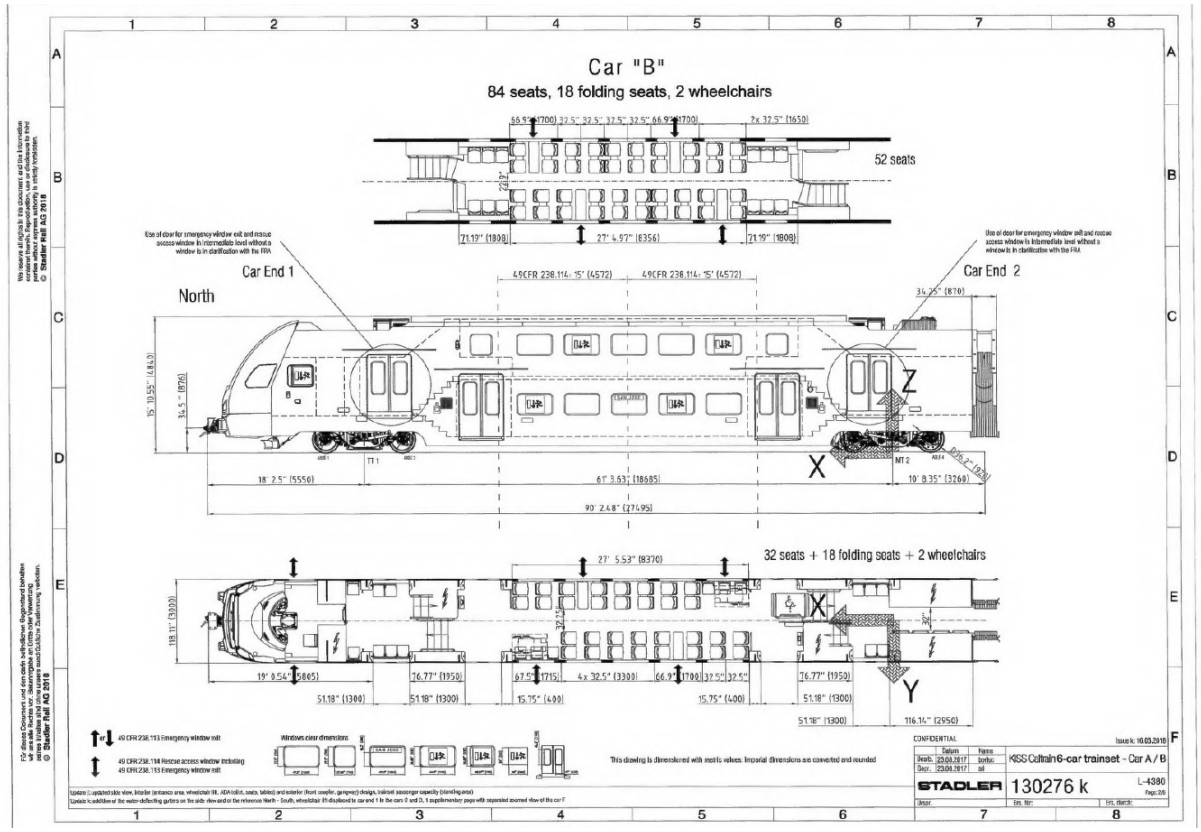
Car "B"
84 seats, 18 folding seats, 2 wheelchairs
52 seats
Car End 1
North
Car End 2
32 seats + 18 folding seats + 2 wheelchairs
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KISS Caltrain 6-car trainset - Car A / B
STADLER
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