CalMod

Peninsula Corridor Electrification Project (PCEP)

Q2 Quarterly Update #13
October 1 – December 31, 2017

JPB Board Meeting
February 1, 2018
Agenda Item # 8b

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Electrification - Infrastructure

- Progression of design:
  - Overhead Catenary System (OCS):
    - Complete design for Segment 2 Work Area 4
    - Continued design for other Segments 2 and 4
  - Signal System:
    - Continued submission and review of 65% signal design for Segments 2 and 4
    - Continued technical coordination with Union Pacific Railroad (UPRR) for system wide signal system design
    - Met with UPRR regarding proposed solution for Consistent Warning Time (CWT)
  - Traction Power System:
    - Completed review of 95% Traction Power Facilities design for Segment 4
    - Continued submission of 95% Traction Power Facilities design system wide
    - Completed Pacific Gas and Electric (PG&E) interconnection feasibility study for Segments 2 and 4 and reviewed preferred options with project team
  - Communication System:
    - Continued work on 65% system wide communication system design

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Electrification - Infrastructure

Foundation Drilling Equipment

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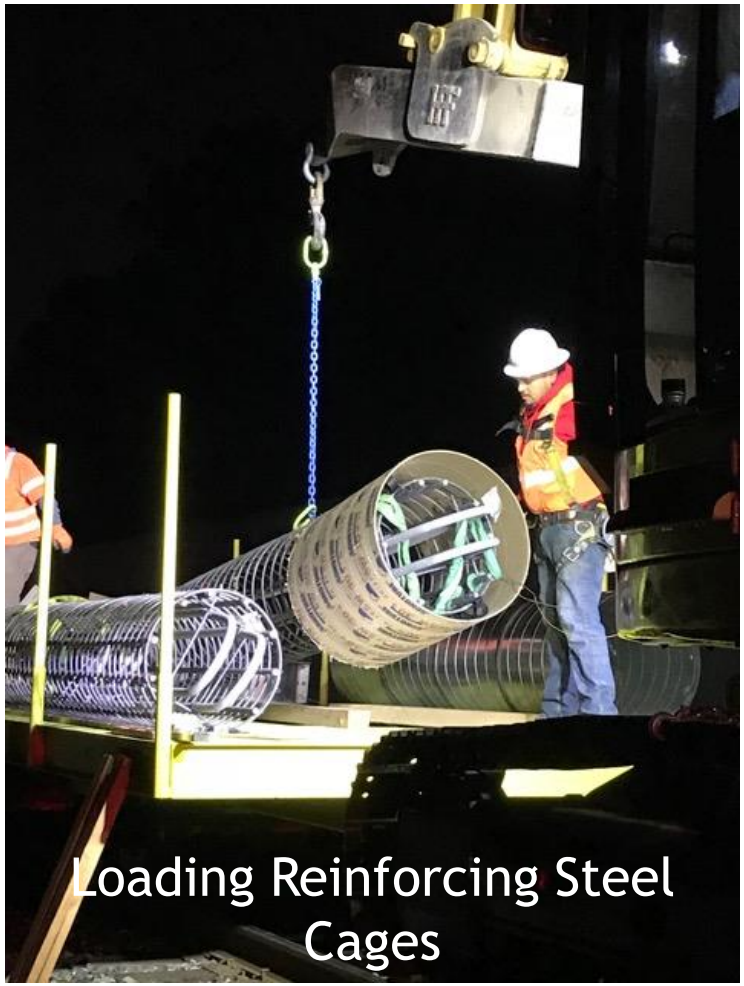
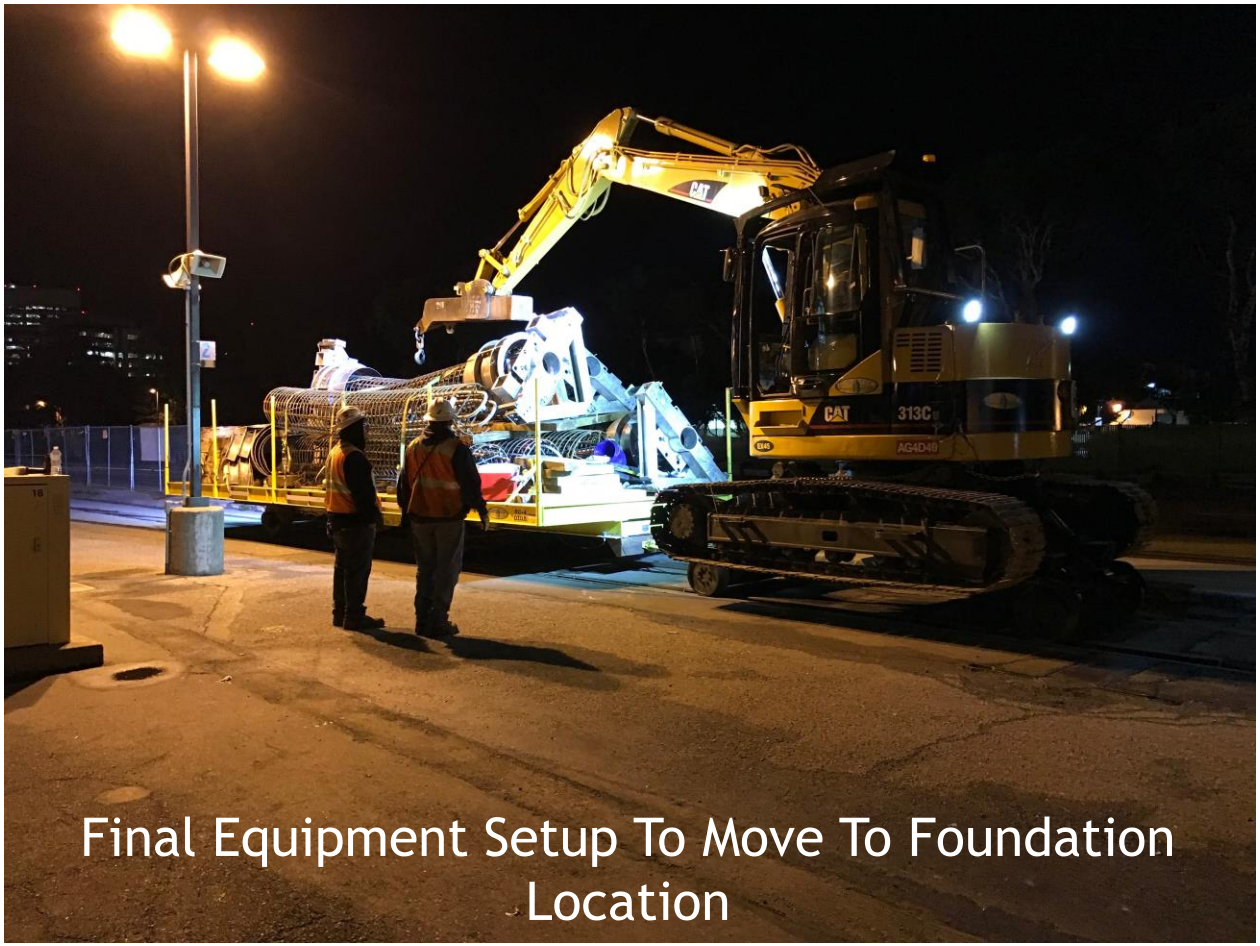
Electrification - Infrastructure



Loading Reinforcing Steel Cages

Electrification - Infrastructure



Final Equipment Setup To Move To Foundation Location

Electrification - Infrastructure

Foundation Work Train

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Drilling of Foundations

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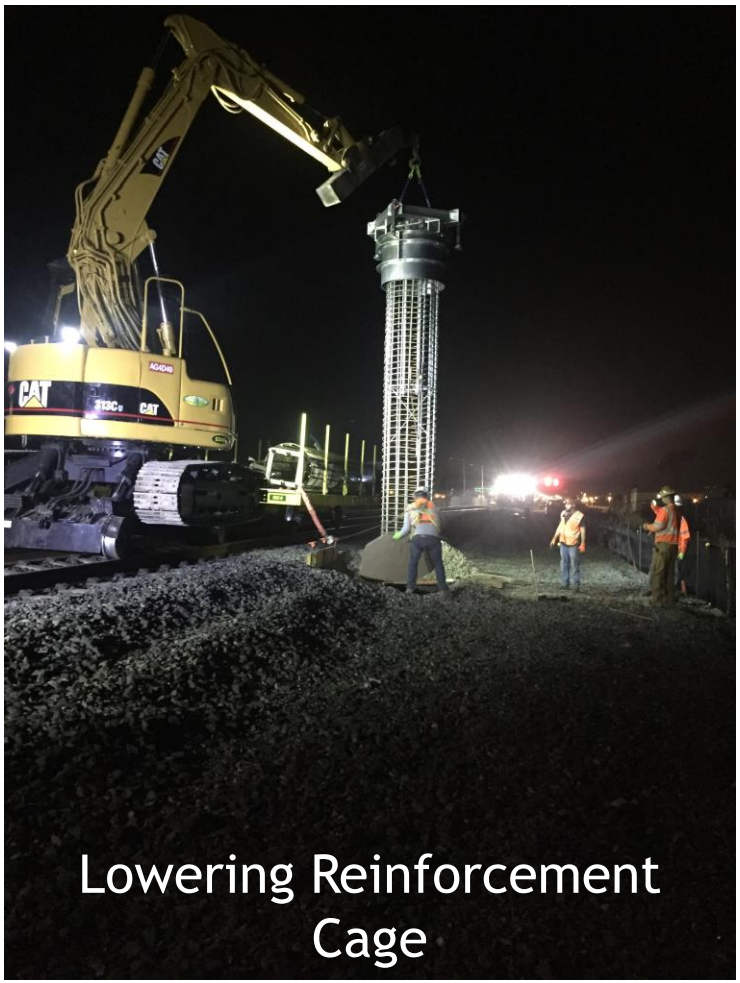
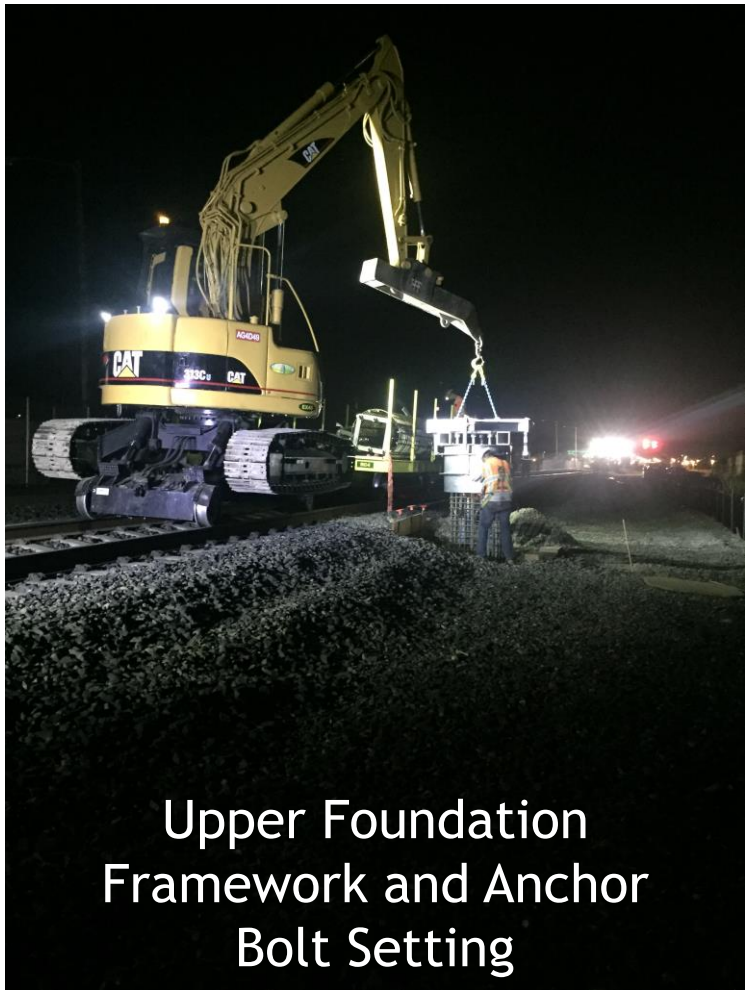
Electrification - Infrastructure



Lowering Reinforcement Cage

Electrification - Infrastructure



Upper Foundation Framework and Anchor Bolt Setting

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Final Alignment of Anchor Bolts

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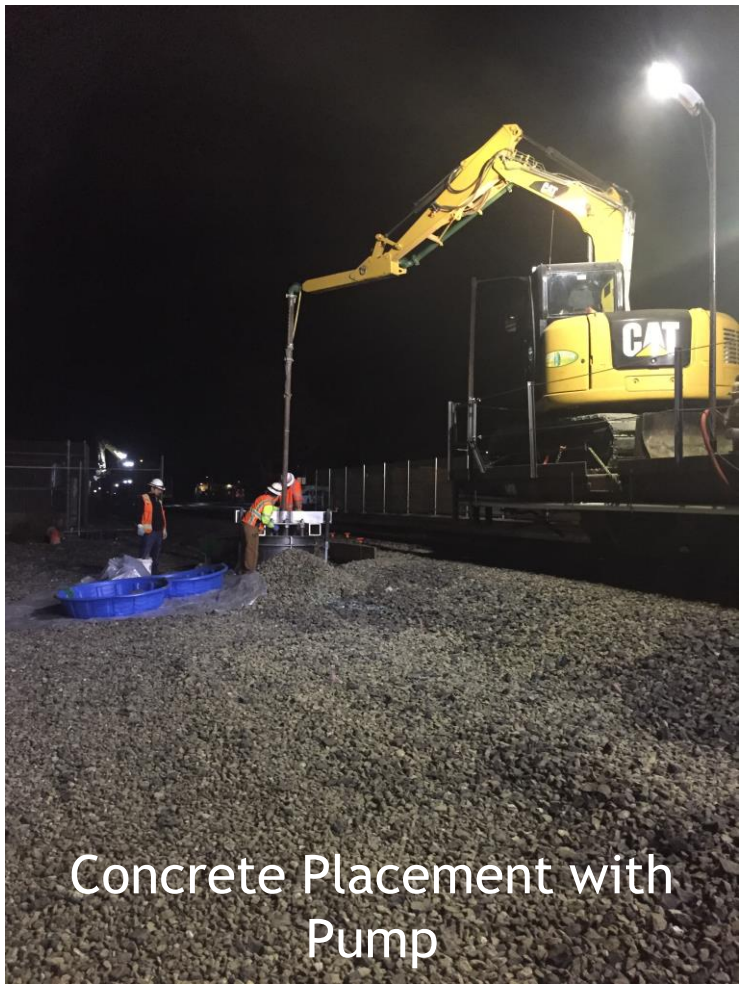
Electrification - Infrastructure



Concrete Placement with Pump

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Close-up on Concrete Placement

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Concrete for Guy Wire Foundation in Place

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Finished Concrete for
Top of Foundation

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Foundation Concrete Quality Testing

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Final Finishing of Exposed Concrete Foundations

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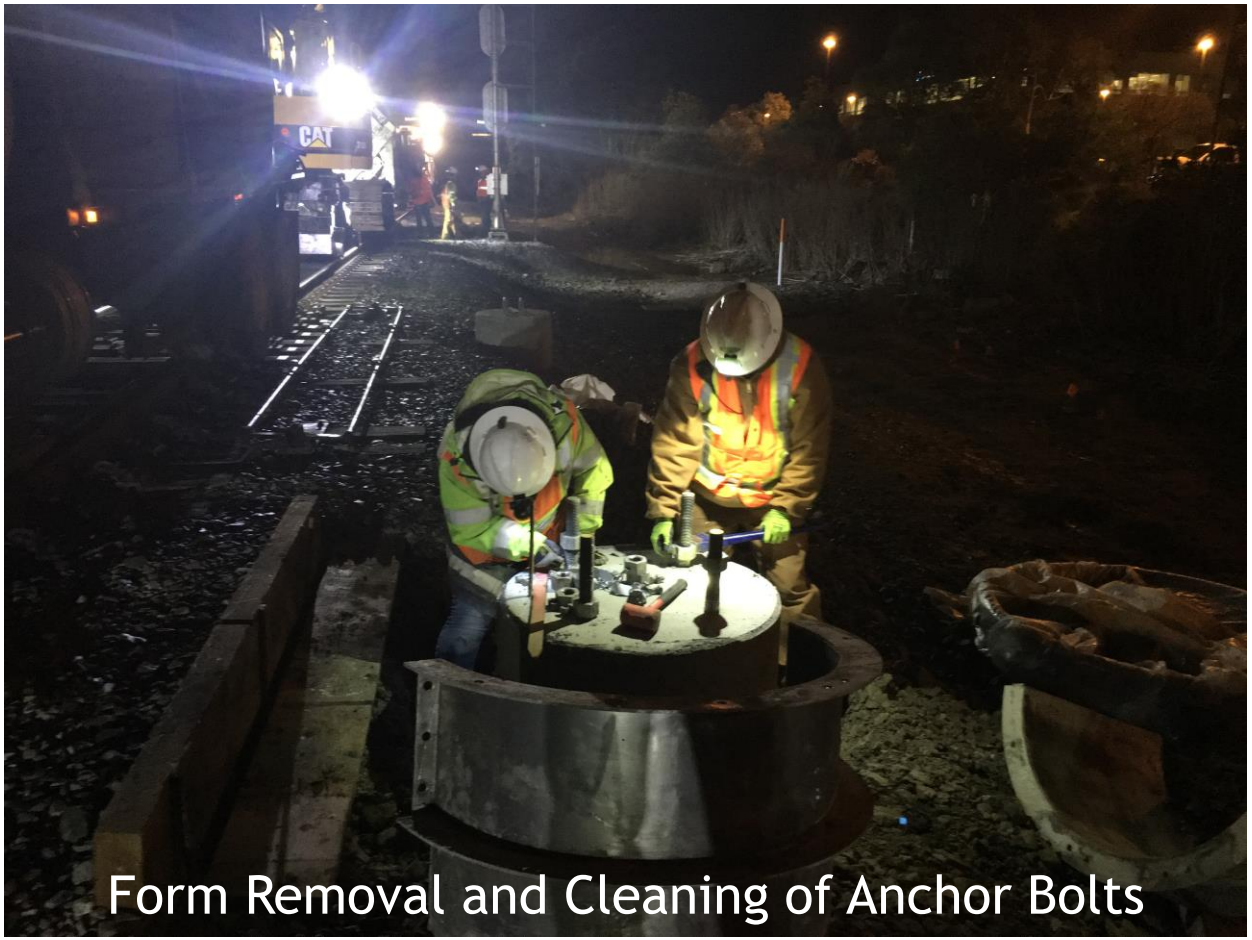

Form Removal and Cleaning of Anchor Bolts

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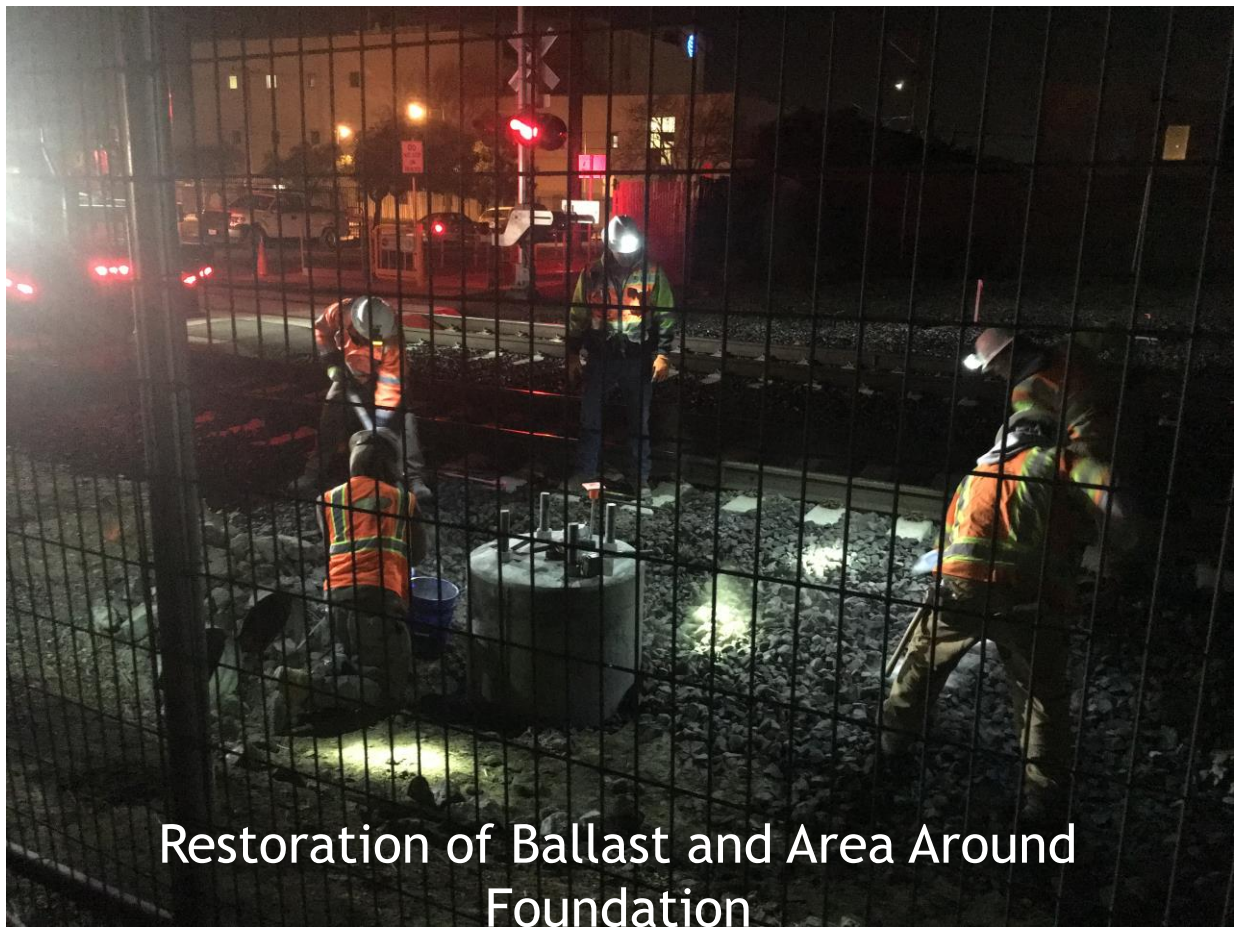
Electrification - Infrastructure



Restoration of Ballast and Area Around Foundation

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Electrification - Infrastructure

- Supervisory Control and Data Acquisition (SCADA) Contract (ARINC Inc.)
  - Issued Noticed to Proceed and held kickoff meeting in October
  - Signal System
- Tunnel Modifications
  - 100% Plans and Specifications reviewed
- Centralized Equipment Maintenance and Operations Facility (CEMOF)
  - 60% Design underway
- PG&E
  - Progress on power quality studies with PG&E
  - Completed interconnection option study
  - Continued coordination for substation improvements
- Utility Relocation and Coordination
  - Relocation required at locations of overhead power and communication lines
  - Completed PG&E relocation in Segment 2 Work Area 5

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EMUs

- Stadler
  - Preliminary Designs Reviews (PDRs) for all major systems conducted being finalized for Caltrain approval
  - Carshell extrusions in production
  - Aluminum carbody subassemblies being fabricated
  - Carshell structures being welded
  - Subassemblies being completed and staged for final assembly
  - Manufacturing and Final Assembly Facility beginning construction in Salt Lake City area

EMUs

EMUs

Carshell Sidewall Extrusions

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EMUs

Carshell Miscellaneous Extrusions

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EMUs

EMUs


Representative Carshell Floor Structure
in Welding Fixture

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EMUs

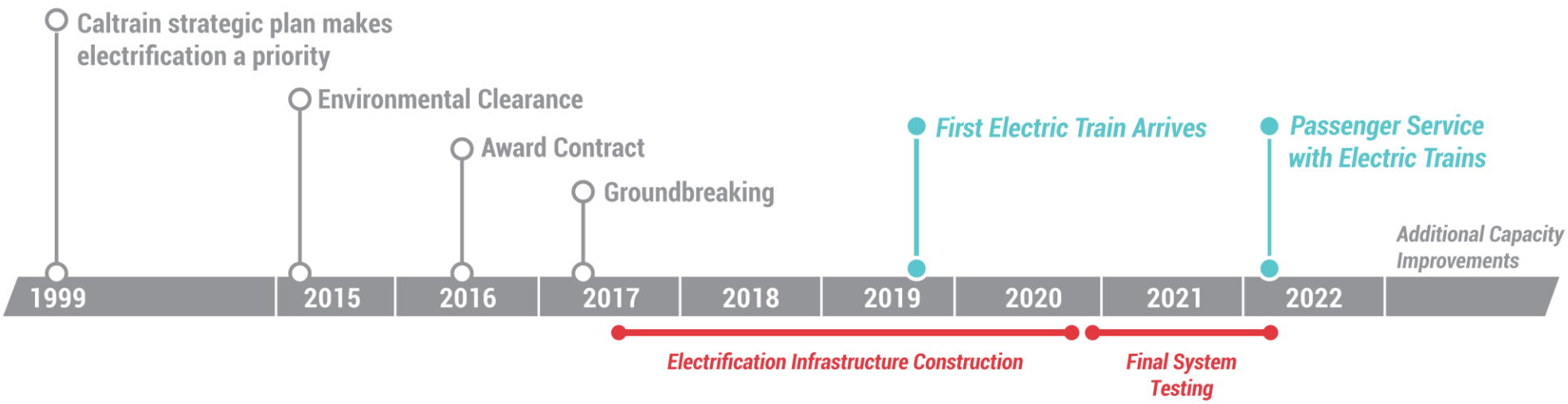

Carshell Sub Assembly Lay-down Area
with Represeantative Side Walls & Roofs

EMUs

EMUs

Schedule

MILESTONES



*Please keep in mind that testing and construction will overlap as each Segment will be tested individually, prior to final system testing.

Note: Schedule Subject to Change

Risk Management

- Review Cost and Schedule Impacts of Risk Register
- Top Risk: Contractor may be unable to develop grade crossing modifications that meet operational requirements prior to scheduled sub-system testing of the grade crossings
- 277 risks; 90 active; 187 retired

Budget & Expenditures (in millions)

	Budget	Current Budget*	Q2 Costs	Costs to Date	Estimate at Completion
Electrification	$696.6	$696.7	$26.7	$183.9	$696.7
SCADA	$0.0	$3.4	$0.0	$0.0	$3.4
EMU	$550.9	$551.8	$17.1	$60.7	$551.8
Separate Contract & Support Costs	$417.2	$417.2	$20.5	$143.9	$417.2
Contingency	$315.5	$311.1	$0.0	$0.0	$269.6
Anticipated Changes	$0.0	$0.0	$0.0	$0.0	$41.5
PCEP Total	$1,980.3	$1,980.3	$64.4	$388.5	$1,980.3

* Includes executed change orders and awarded contracts
** Refer to Contingency Drawdown Table on next slide for details

Note: Budget / Expenditures as of December 31, 2017

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Contingency Drawdown

Contracts	Amount	Contingency
Beginning Contingency		$ 315,533,611
Drawdown		
Executed Change Orders	$ 960,972	
SCADA Contract	$ 3,446,917	
Total	$ 4,407,889	
Remaining Contingency		$ 311,125,722

Note: As of December 31, 2017

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Anticipated Contingency Drawdown

Contracts	Amount	Contingency
Remaining Contingency		$ 311,125,722
Anticipated Contingency Drawdown		
Negotiated Change Orders	$ 10,294,819	
PG&E Supplemental Agreement #4	$ 31,263,082	
Total	$ 41,557,901	
Anticipated Remaining Contingency		$ 269,567,821

Note: As of December 31, 2017

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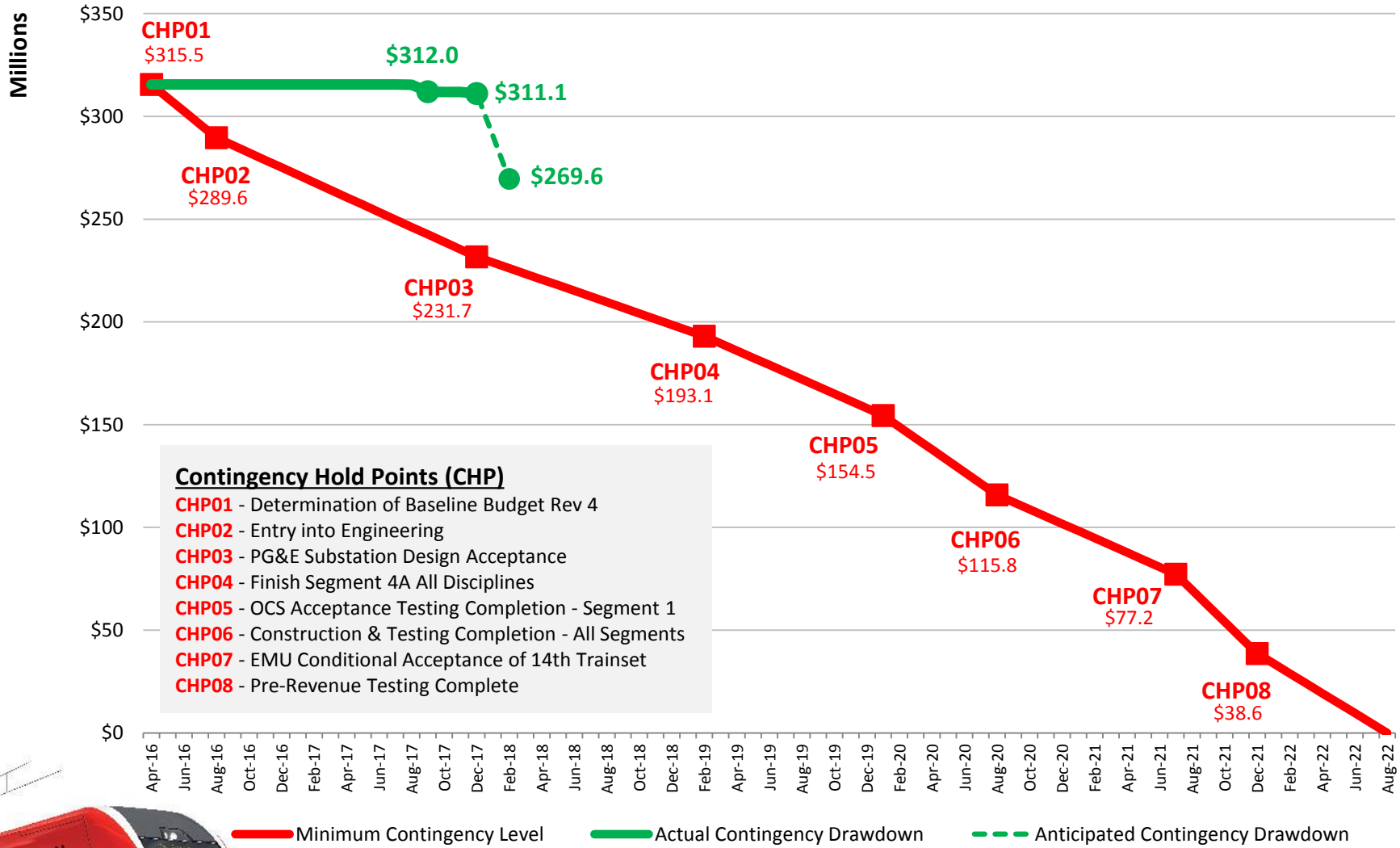
Contingency Drawdown Curve

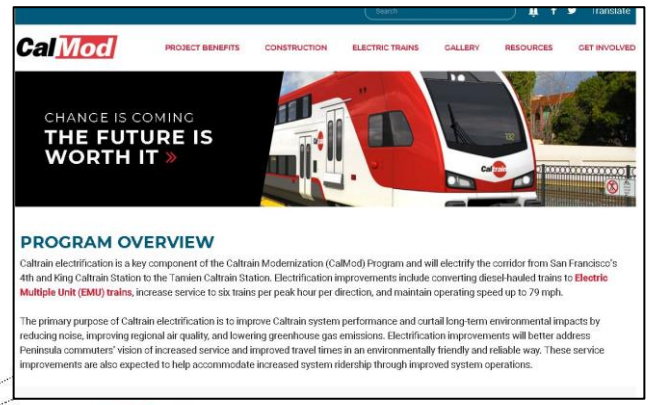


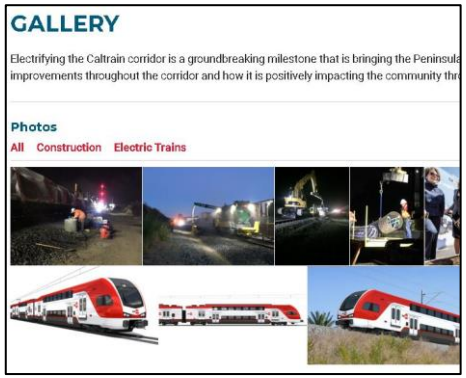
Contingency Hold Points (CHP)

- **CHP01** - Determination of Baseline Budget Rev 4
- **CHP02** - Entry into Engineering
- **CHP03** - PG&E Substation Design Acceptance
- **CHP04** - Finish Segment 4A All Disciplines
- **CHP05** - OCS Acceptance Testing Completion - Segment 1
- **CHP06** - Construction & Testing Completion - All Segments
- **CHP07** - EMU Conditional Acceptance of 14th Trainset
- **CHP08** - Pre-Revenue Testing Complete

Infrastructure Outreach

- 3 Community Meetings re: Construction
  - (San Jose/Santa Clara, Redwood City/North Fair Oaks, Belmont/San Carlos)
- 15,670 Direct Mailers
- New Website: calmod.org





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Electric Trains

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Procurement History

Date	Key Milestones
May 2014	Request for Information (6 Car Builders participated)
August 2015	Request for Proposal Released **(Includes Board Decisions, Customized Vehicle)**
July 2016	Stadler, Sole Proposer, Awarded Contract
September 2016	Limited Notice to Proceed
May 2017	Award Full Notice to Proceed Contract **(FFGA Requirement: "At least 10 percent increase in seated capacity")**

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Capacity Decision (Summer 2015)

- JPB Discussion & Action
  - Tradeoffs between seats, standing space, bikes, restrooms (fixed space in the vehicle)
  - Dual Doors “not to preclude” future HSR options

Board Decision	Outreach
8:1 Ratio Seats to Bikes (staff originally proposed 9:1)	- Special Board Workshop - 20 public meetings - Over 10,000 comments from the different venues - Multiple Surveys - Top 10 Station Outreach AM/PM - Traditional / Social Media
1 Restroom per train (staff originally proposed 0 restrooms)	
Dual doors “not to preclude” future HSR boarding decisions. Customized vehicle. Seats in front of the doors.	

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Stadler Design (2017)

- Layout largely fixed to meet bike / seat ratio, FFGA seat requirements, ADA Restroom, dual doors, etc.

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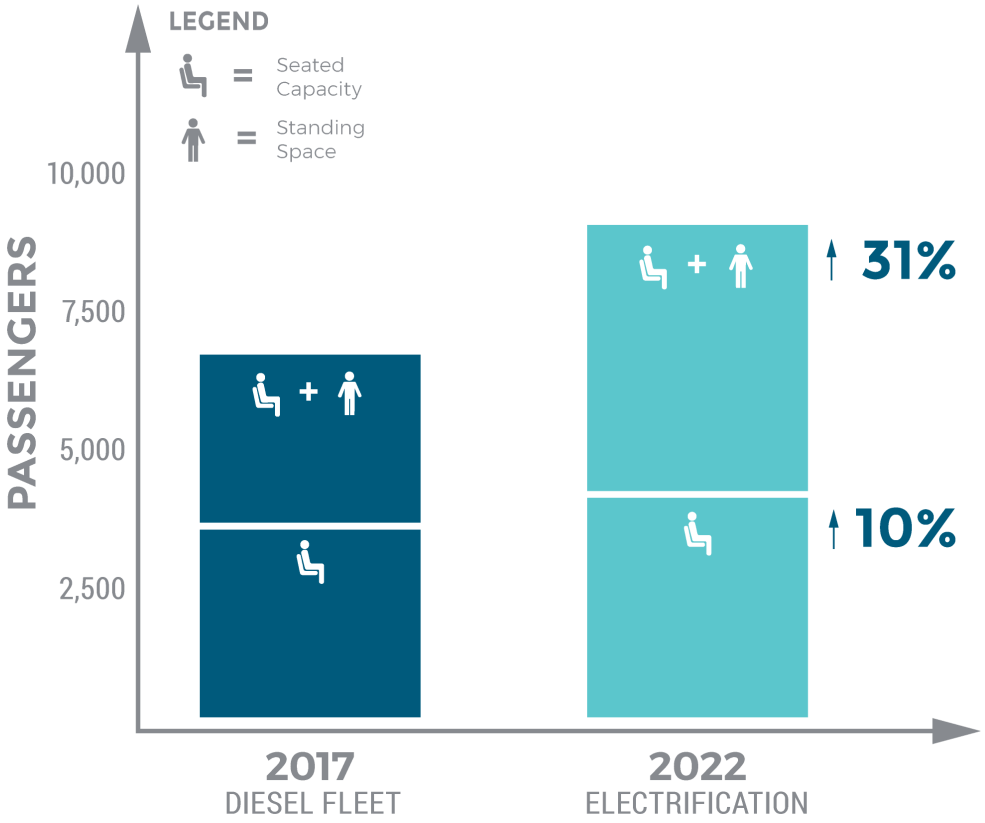
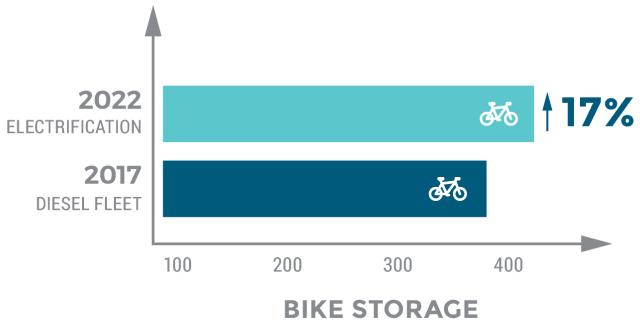
Capacity





The CalMod program lays the foundation for continued capacity growth on the corridor. Unlike diesel trains, electric trains can maintain performance while expanding the number of train cars.

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

Per Peak, Per Direction

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Capacity Continued

CURRENT DIESEL FLEET

(Mix Of Bombardier and Gallery Cars | 5- and 6-car Train Sets)

Average Per Train				Trains Per Peak Hour In Each Direction		Average Per Peak Hour, Per Peak Direction		
637.0 Standing	741.0 Seats	73.6 Bikes	x	5	=	3,185 Standing	3,705 Seats	368 Bikes

2022 ELECTRIFICATION

(Mix of 7-car Diesel Train Sets and 6-car Electric Train Sets)

Average Per Train				Trains Per Peak Hour In Each Direction		Average Per Peak Hour, Per Peak Direction		
821.3 Standing	681.3 Seats	72.0 Bikes	x	6	=	4,928 Standing	4,088 Seats	432* Bikes

The CalMod program lays the foundation for continued capacity growth on the corridor. Unlike diesel trains, electric trains can maintain performance while expanding the number of train cars.

*Figures and percentages subject to changes as EMU design elements and new service schedules are finalized. *Electric trains will meet a 1:8 bike to seat ratio.*

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Design Refinements (2017/2018)

Topic	Outreach
Exterior Train Design (Red and White)	- Surveys - 10 Station and Outreach Meetings - Restroom Mockup and walkthrough for ADA Community - 56 Meetings - Sample Seats & Bike Storage at Project Office - Social / Traditional Media - Calmodtrains.org website
Interior Seats Color (Grey, red stripe)	
Restroom ADA (Incorporated many changes: button, handle location etc.)	
Bike Storage Options (Stacking option selected to maximize capacity)	
Interior Wheelchair Lift (to be used when HSR on the corridor with common platforms)	
Upper Doors (to be used when HSR on the corridor with common platforms)	

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Design Refinements Continued

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Bike Security

- Bike Security Review (Onboard and Wayside)
  - What could we be doing better now, potential options and best practices with new electric trains
  - Response to concerns raised by bike community
- Collaboration with Key Stakeholders
  - Bicycle Advisory Committee
  - SF Bicycle Coalition and Silicon Valley Bicycle Coalition
  - Broader Bike Community
  - Internal Taskforce (Ops, Planning, Marketing, Transit Police)

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Electric Train Amenities

PLENTIFUL POWER SOURCES

BETTER LOCATION & DESTINATION INFO

QUIETER, SMOOTHER RIDES

INCREASED FREQUENCY & REDUCED TRAVEL TIME

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Questions

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