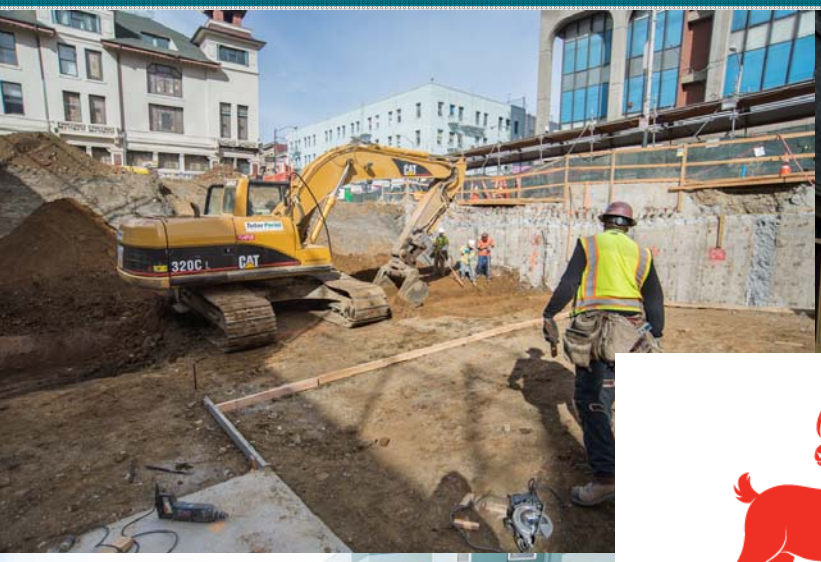
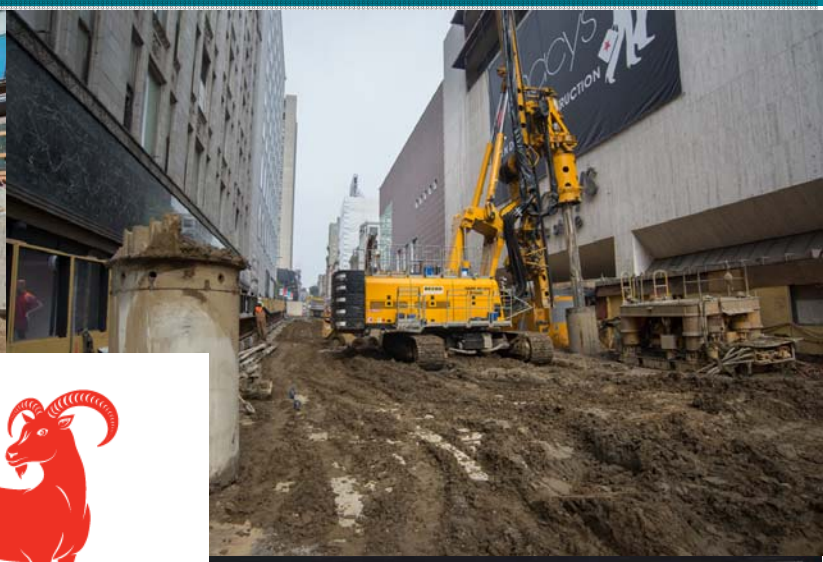
central T subway

Stations Begin to take Shape

Roof slab, excavation, and foundation work at all sites

羊年奮進，地鐵拓通途





Progress Report

February 2015

SFMTA
Municipal
Transportation
Agency

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Table of Contents

See Table of Content page that follows for Cover Photo captions.

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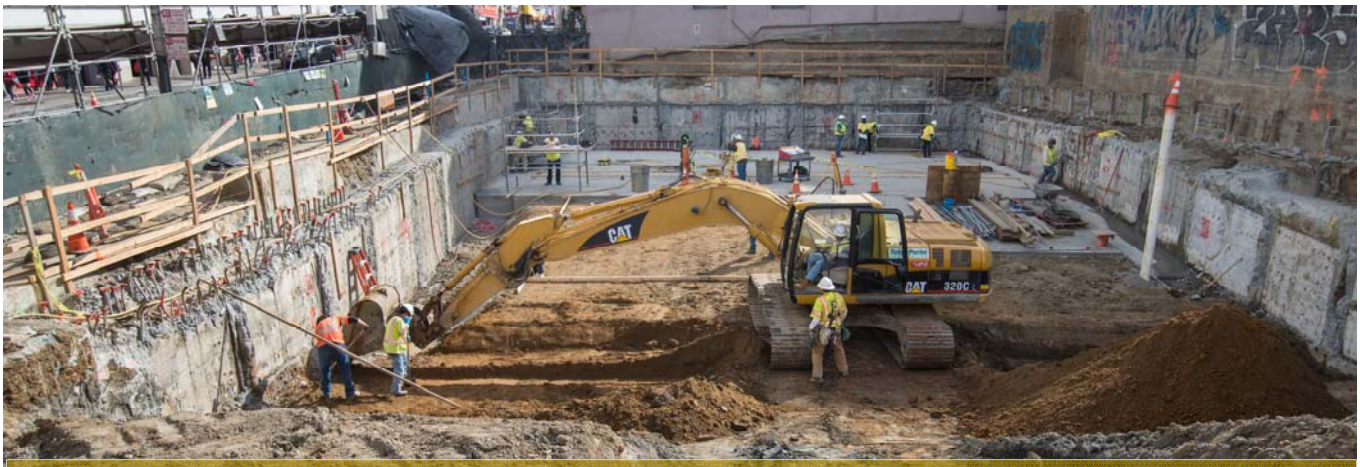
Appendices

Cover photo: ***Clockwise from upper left: Forms for a temporary base slab are laid out at the Chinatown Station site, a rotary drill rig pauses operation with few piles left to excavate at the Union Square/Market Street Station site, tunnel portal walls are nearly complete at 4th and Bryant, and rebar is being put down for the roof slab at the Yerba Buena/Moscone Station site. More photos of this construction can be found on page 36.***

Translation of Chinese Characters: *"Continuous endeavor to move forward in the Year of the Ram, Central Subway creates new thoroughfares."*

Above photos: As part of a phased re-opening of 4th Street between Harrison and Bryant, where the tunnel portal is currently being constructed, the contractor has opened the roadway between Harrison and Perry Alley to facilitate access for Golden Gate Transit buses to their storage yard.

See the Appendix E final page for CS websites hyperlinks and public outreach on line resources. The Project main web site is at: http://www.centralsubwaysf.com/



An excavator carefully removes dirt at the Chinatown Station site to create a trench which will contain a form for a future cross beam yet to be constructed.

Executive Summary

Excavation inside the subway station box areas began in earnest. The initial excavations now underway at YBM, UMS and CTS are opening space for installing the concrete roof of the future stations. See cover photos.

Chinatown Station - the south slurry walls were prepared for the surface level slab while excavation progressed over two-thirds of the headhouse in preparation for the first surface level slab pour. Slip line of the brick sewer from Jackson to Washington was completed.

Union Square/Market Street Station - excavation proceeded to the roof deck level on Stockton Street between Maiden Lane and on Geary Street. The jet grout test program began on the west side of Stockton Street that will enhance the water proof barriers around the station cavity. The temporary HVAC for Union Square Garage was installed.

Yerba Buena/Moscone Station - the west side roof slab will be constructed in three segments, each 113 feet long. On Segment 1, from north headwall to just north of Clementina, concrete is poured, and waterproofing installed while excavation has begun on segments 2 and 3. Soil removal at the headhouse resumed and the archaeological investigation at 4th and Clementina Streets was completed.

Surface, Track and Systems 4th Street station platform, 42 of 45 cast-in-place drilled piles were completed to support the platform, an increase in 38 over last month. A Muni ductbank installation was started while utility enhancements continue toward completion.

Tunnel - Cross Passage 5 waterproofing began and restoration of utilities at 4th and Jessie continued following completion of the compaction grouting. The remaining portal structure walls were poured and work to install utility lines within the portal structure began. One thru traffic lane between Harrison and Perry was restored.

Total project costs to date are $762.45 million, an increase of $14.80 million over last month. The total cost to date equals 48.31% of the total project budget of $1.578 billion. The Master Project Schedule continues to forecast the Revenue Service Date of December 26, 2018.

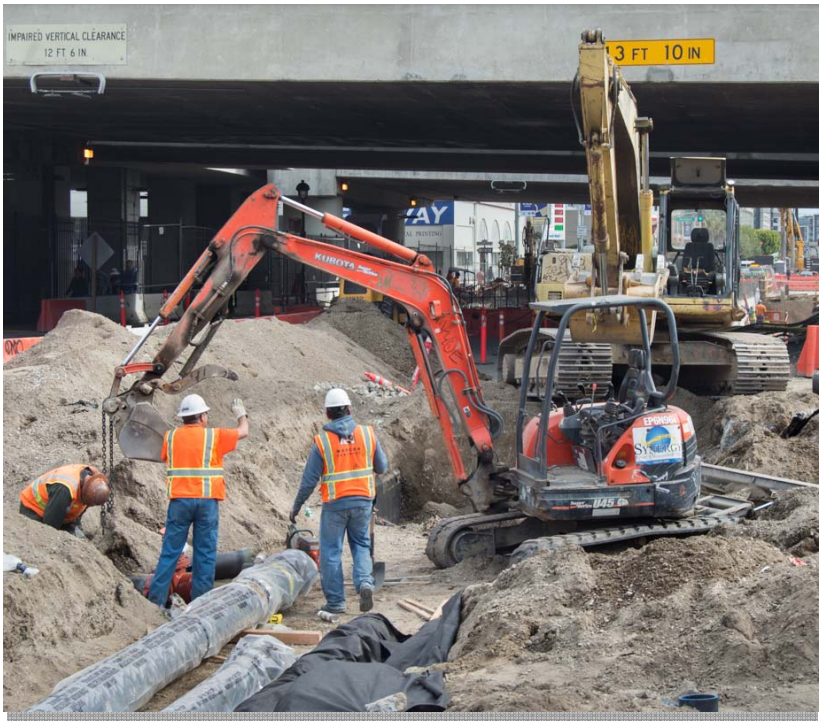
The Tunnel and Stations Contractors' Safety Reports show no recordable accidents took place this month and the rates of work site accident incidents by the man hours worked continue to be below industry standards - see tables on pages 32 and 33.

Key Milestones

Reopening 4th Street between Harrison and Perry Alley

1 Exterior walls and other structural elements of the tunnel portal are constructed

MILESTONE	DATE EXPECTED
General	
Revenue Service	December 2018
Contract 1252 Tunnels	
Substantial Completion	April 15, 2015
Contract 1300 Stations, Surface, Track, Systems	
Notice to Proceed (NTP 1)	June 17, 2013 (A)
Notice to Proceed (NTP 2)	January 12, 2014 (A)
Substantial Completion	February10, 2018



2 Backfilling and utilities are installed

3 The concrete slab is poured and the roadway is reopened in phases

Costs and Schedule

Costs (See Appendix A for Details)

The Current Cost Estimate (CCE) for the Central Subway Project is $1.578 billion in year of expenditure dollars ($YOE) and is the basis of the total project cost as listed in Report 7.1 Program Project Budget. This capital cost projection incorporates allocated and unallocated contingencies to cover the various risks associated with completion of the project.

Total project costs to date are $762.45 million, an $14.80 million increase over last month. The cost to date figure reflects expenditures through FAMIS 786 Report ($711.24 million) plus the utilities joint trench Form B Reimbursement payment ($10.03 million), invoices currently being processed ($24.02 million) and estimates of outstanding pay requests ($17.16 million). This incurred amount equals 48.31% of the total project budget of $1.578 billion.

The current funding level to date is $1,029.79 million. This represents 65% of the total project budget.

Earned Value Analysis

For February the Earned Value Analysis below reports the Planned Value, Earned Value, Percent Complete and resulting indexes as follows.

Overall Budgeted Cost:	$ 1,578,300,000
Planned Value:	$ 802,910,533
Earned Value:	$ 757,722,130
Actual Cost:	$ 762,451,695
Schedule Performance Index (SPI):	0.94
Cost Performance Index (CPI):	0.99
% Complete:	47.87%

Over all, the program is 47.87% complete, on schedule (with an SPI of 0.94) and on budget (CPI 0.99). The Earned Value Cash Flow is shown in Report 7.2 below.

Schedule Highlights (See Appendix B for Details)

The Master Project Schedule, showing progress through February 28, 2014, continues to forecast Revenue Service beginning December 26, 2018.

The controlling critical (longest) path of the MPS runs through CTS followed by Commissioning and Pre-Revenue Activities to the Baseline Finish and Revenue Service Date. See Appendix B – Longest Path.

The Schedule Contingency is 4.8 months on the critical path of the MPS, which is below the Minimum Schedule Contingency level of 8 months. Revisions to the Schedule Contingency minimum levels have been developed and reviewed by FTA. Revisions to schedule contingency minimum levels have been reevaluated utilizing the approved Contract 1300 baseline schedule and found to be consistent with previous results. A re-evaluation is now required utilizing the updated Contract 1300 Schedule to justify any revisions to current minimums. See Appendix B.

The 1300 Contractor submitted the second Schedule Update (thru January 2015), indicating the same 6 month late finish as shown in the December 2014 Update. Both updates have been rejected and require resubmission. The 1300 Contractor continues to address key critical activities to recover lost time and improve schedule performance. Review of schedule update as well as identifying recovery options is ongoing.

Looking southeast from the crest of the tunnel portal roof, work below to construct the exterior walls is well under way.

Schedule Highlights - Continued

Contract 1252 Tunnels:

The critical path shows the construction of the Tunnel Portal Structure followed by demobilization and punch list activities. The Portal Structure activities on the critical path are expected to complete on time. The excavation of Cross Passage 5 is complete and will be followed by the installation of the final concrete liner.

Contract Milestones	Required Finish	FEB 2015 Finish	JAN Finish	Ahead/ Behind Requirement
Contract 1252 Tunnel Substantial Completion	15-Apr-15	15-Apr-15	15-Apr-15	(0) CD

Contract 1252 performed the following work this period:

- Tunnel cleaning and repairs - on going.
- Complete excavation of Cross Passage 5. Began installation of the water proofing at Cross Passage 5.
- Complete compaction grouting at 4th and Jessie. Begin restoration of utilities at 4th and Jessie.
- Poured the remaining Portal Structure walls.
- Restored one traffic lane between Harrison and Perry.
- Continue installation of AWSS and waterlines at intersection of 4th and Harrison. Began installation of the utility lines within the portal structure.
- Continue installation of the seismic frames at the portal structure.

Contract 1300 Stations, Surface, Track and Systems

Contract 1300 schedule currently shows a summary version of Tutor Perini Corporation's (TPC) preliminary Baseline and Bid Schedule. This summary 1300 schedule will be replaced and updated with Tutor's Baseline Schedule once properly updated. The Contract 1300 Update Schedule is currently under SFMTA review.

Contract 1300 has several interface points with Contract 1252. The timing of these interface points correlate to when the NTP was issued for Contract 1300. The table below represents the current status of these interface points with respect to the Contract 1252 update. Tunnel access is not expected to impact Contract 1300. The current completion date of the Contract 1252 is also shown in the table below.

Interface Points	CN1300 Requirement	CN 1252 Jan 2015 Update	Variance	
Tunnel Portal Completion	24-Sep-15	15-May-15	132	CD

Work Package P-1253 UMS performed the following work this month:

- Excavated to roof level on Ellis Street and between Maiden Lane and Geary Street.
- Completed all piles.
- Began Jet Grout Test Program on West Side of Stockton Street.
- Completed Temporary HVAC for Union Street Garage.

Schedule Highlights - Continued

Work Package P-1254R CTS performed the following work this month:

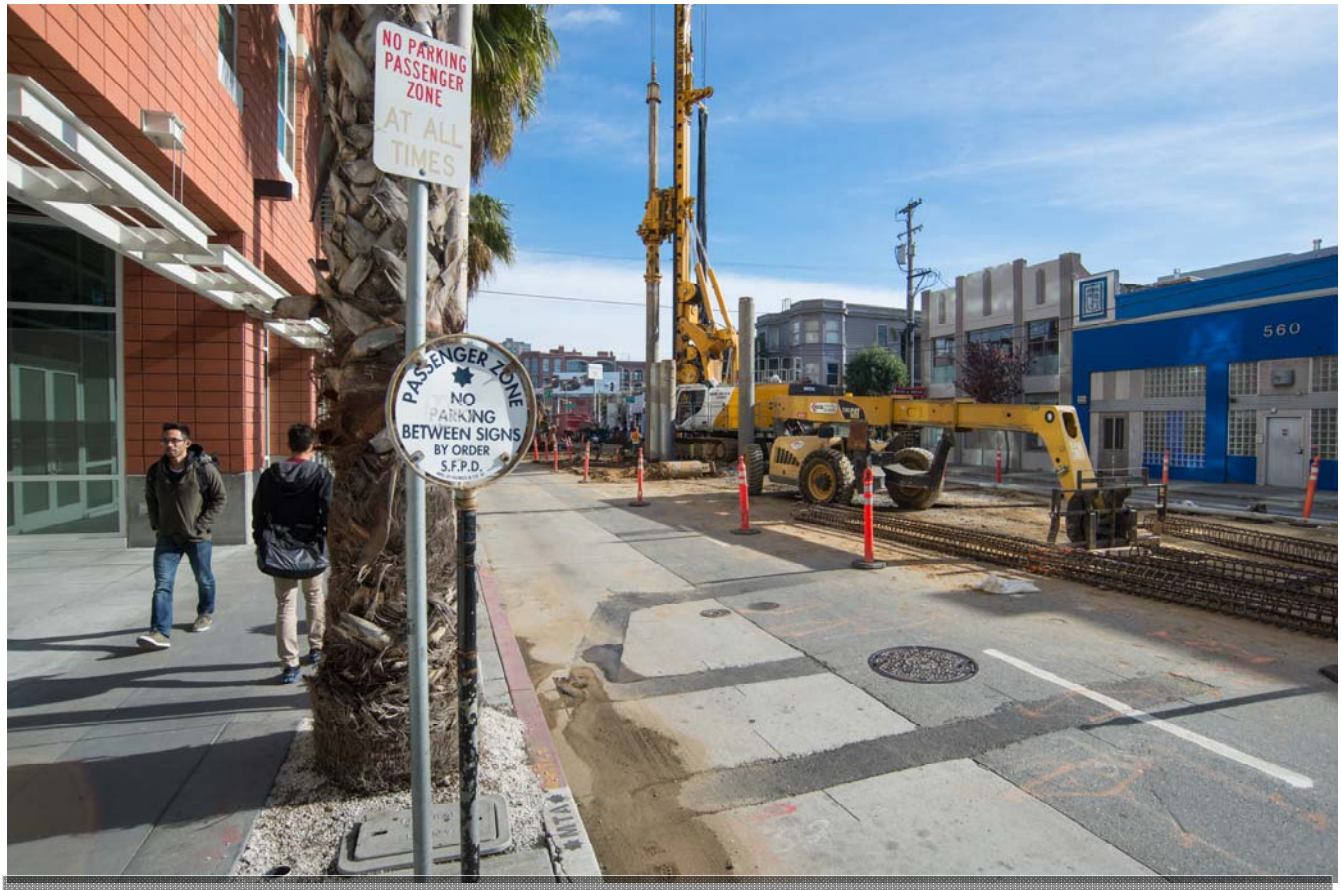
- Excavated 2/3rds headhouse for Surface Level Slab Pour #1
- Demo brick basement in headhouse
- Completed Slip line of the brick sewer Jackson to Washington
- Prep south slurry walls for Surface Level Slab.

Work Package P-1255 YBM performed the following work this month:

- Completion of west side roof Segments 2 & 3.
- Completion of Class I contaminated soil removal from former gas station.
- Preparation for roof slab placement within Clementina footprint.
- Archaeological Monitoring of excavation. .

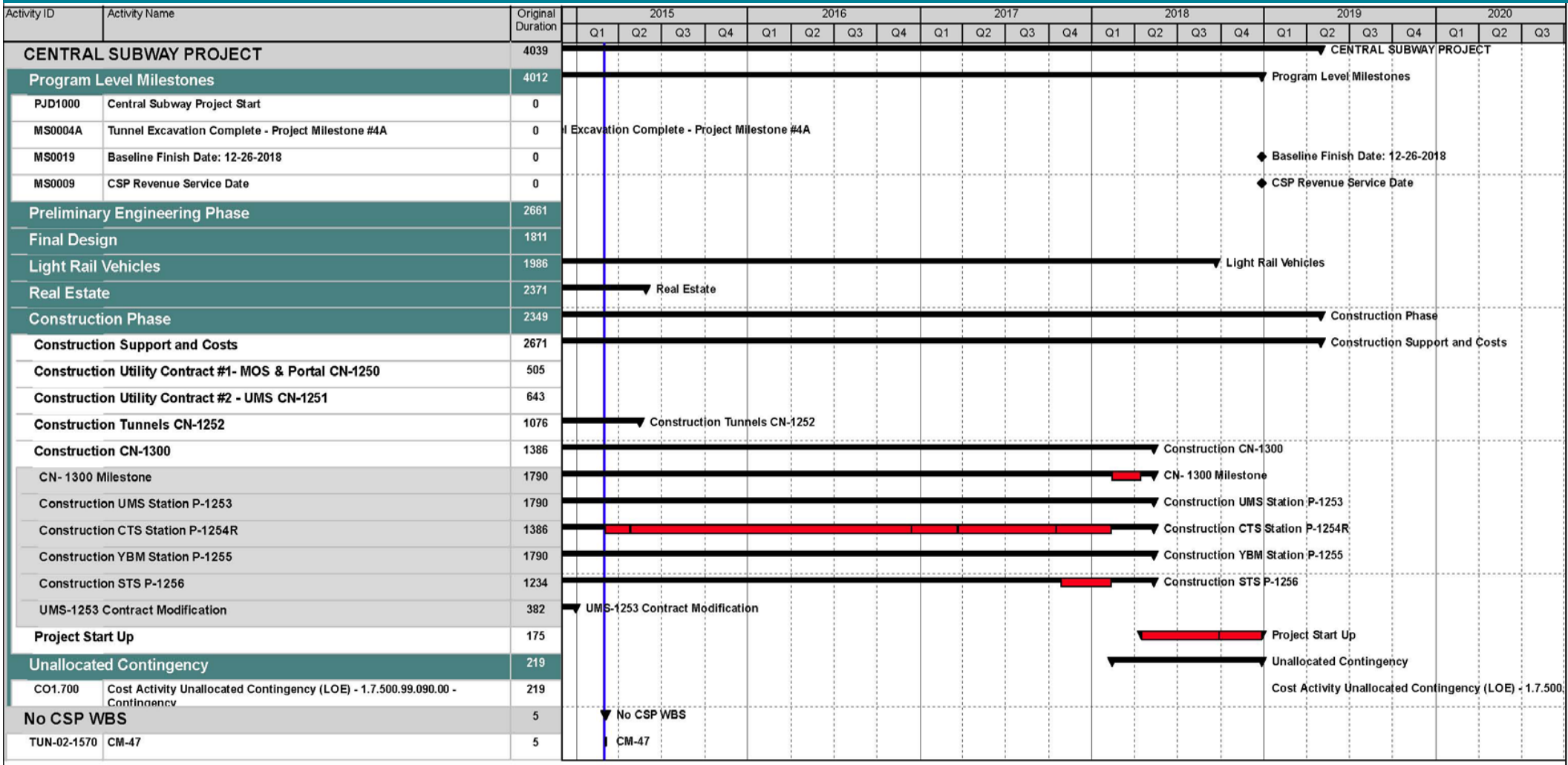
Work Package P-1256 STS performed the following work this month:

- Continue AT&T ductbank installation
- Contractor submitted 100% design of Design-Build 78” sewer
- Contractor progressing toward 100% design of 48” sewer and 36” sewer force main
- Continue sewer installation
- Continue cast-in-place drilled piles for 4th/Brannan Station
- Start Muni ductbank installation



Installation of piles to support the future 4th and Brannan surface station is underway north of Brannan - see 4th Street Surface Station Platform Pile Progress on page 26.

Master Project Schedule



Activity ID	Activity Name	Original Duration
CENTRAL SUBWAY PROJECT		4039
Program Level Milestones		4012
PJD1000	Central Subway Project Start	0
MS0004A	Tunnel Excavation Complete - Project Milestone #4A	0
MS0019	Baseline Finish Date: 12-26-2018	0
MS0009	CSP Revenue Service Date	0
Preliminary Engineering Phase		2661
Final Design		1811
Light Rail Vehicles		1986
Real Estate		2371
Construction Phase		2349
Construction Support and Costs		2671
Construction Utility Contract #1- MOS & Portal CN-1250		505
Construction Utility Contract #2 - UMS CN-1251		643
Construction Tunnels CN-1252		1076
Construction CN-1300		1386
CN- 1300 Milestone		1790
Construction UMS Station P-1253		1790
Construction CTS Station P-1254R		1386
Construction YBM Station P-1255		1790
Construction STS P-1256		1234
UMS-1253 Contract Modification		382
Project Start Up		175
Unallocated Contingency		219
CO1.700	Cost Activity Unallocated Contingency (LOE) - 1.7.500.99.090.00 - Contingency	219
No CSP WBS		5
TUN-02-1570	CM-47	5

Few exterior wall piles remain to be constructed at the Union Square/Market Street Station site. This work will be wrapped up in the coming weeks.

Contracts & Construction

Construction Contracts In Progress

Contract 1252: Central Subway Tunneling

- Contractor: Barnard Impregilo Healy (BIH) JV
- Amount: $241.29 million
- Contract Status: 98.24% complete construction

Contract 1300: Combined Work Packages 1253, 1254, 1255, 1256

- Contractor: Tutor - Perini Corporation
- Amount: $838.09 million
- Contract Status: 28.11% complete construction

Contracts Completed

See Appendix D

Contract 1250: Moscone Station and Portal Utilities Relocation

Contract 1251: Union Square/Market Street Station Utility Relocation

Contract 1277: Pagoda Theater Site Demolition (Funded separately from the CS Project budget)

Contract SBE Participation (Updated Quarterly)

See Appendix E

Central Subway Tunneling

Contract 1252 Contractor: Barnard Impregilo Healy Joint Venture

Description of Work

1.5-mile twin bore tunnels from Hwy I-80 to North Beach using two tunnel boring machines (TBMs).

Contractor procurement and installation of the TBMs; construction of the TBM launch box and retrieval shaft excavation support; Yerba Buena/Moscone Station and Union Square/Market Street Station end walls; tunnel excavation and installation of precast segmental lining, the 4th Street portal transition to the surface and cross passages. Throughout, settlement monitoring and protection of existing utilities, buildings and BART tunnels.

Three Month Look Ahead

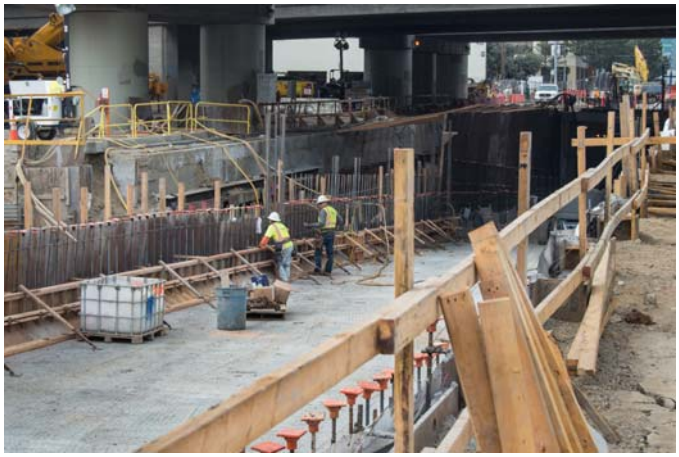
- Complete tunnel cleaning and repairs, and remove remaining tunnel utilities.
- Complete construction of the portal structure.
- Reopen 4th street between Harrison and Bryant.
- Complete utility repair and begin roadway restoration at 4th and Jessie.

Current Status

- Tunnel cleaning and repairs, TBM support equipment demobilizing from the launch box.
- Complete excavation of Cross Passage 5. Began installation of the water proofing at Cross Passage 5.
- Complete compaction grouting at 4th and Jessie. Begin restoration of utilities at 4th and Jessie.
- Poured the remaining Portal Structure walls.
- Restored one traffic lane between Harrison and Perry.
- Continue installation of AWSS and waterlines at intersection of 4th and Harrison. Began installation of the utility lines within the portal structure.
- Continue installation of the seismic frames at the portal structure.

Work Expected Next Month

- Continue final tunnel cleaning and repairs and demobilization of tunnel facilities.
- Install final concrete liner at Cross Passage 5. Began removal of the freeze system after concrete liner is poured.
- Continue restoration of utilities at 4th and Jessie.
- Continue construction of the portal structure. Complete the installation of the barrier walls. Reopen one traffic lane between Harrison to Bryant.
- Complete installation of the seismic frames at the headwalls. Pour the headwalls at the north portal structure.
- Continue installation of the utility lines within the portal structure.
- Complete pedestrian improvements on Columbus Avenue.

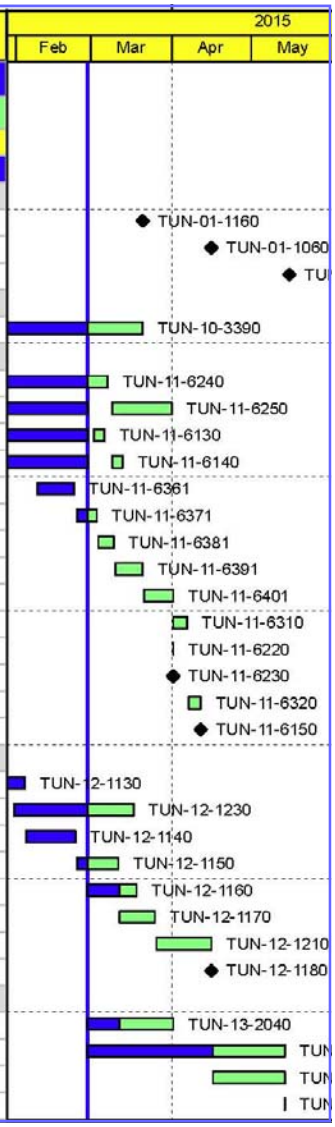


Contract Details	
Contract Awarded:	**June 28, 2011**
Notice to Proceed 1:	**January 27, 2012**
Notice to Proceed 2:	**March 14, 2012**
Partial NTP 3:	**April 12, 2012**
Notice to Proceed 3:	**October 15, 2012**
Substantial Completion:	**April 15, 2015**
Contract Award Value:	**$233,584,015**
Modifications to Date:	**$7,595,315**
Current Contract Value:	**$241,179,330**

Budget/Expenditures	
Category	Amount
Current Budget	**$251,068,971**
Other Project Budget	**$5,150,000**
Other Offset Credits	**$1,023,508**
Expenditures to Date	**$230,878,495**

Three Month Schedule

Mty ID	Activity Name	Start	Finish
CENTRAL SUBWAY PROJECT		15-Dec-14 A	15-May-15
Construction Phase		15-Dec-14 A	15-May-15
Construction Tunnels CN-1252		15-Dec-14 A	15-May-15
1252 Tunnel Contract BIH		15-Dec-14 A	15-May-15
Contract Milestones		20-Mar-15	15-May-15
TUN-01-1160	Milestone 3 - Complete Retrieval Shaft (req'd Jan 6, 2015)		20-Mar-15*
TUN-01-1060	Substantial Completion (req'd Apr 15, 2015) - 1174days		15-Apr-15*
TUN-01-1070	Final Completion (req'd May 15, 2015) - 1204 days		15-May-15
Retrieval Shaft		15-Dec-14 A	20-Mar-15
TUN-10-3390	Retrieval Shaft - Site Restoration	15-Dec-14 A	20-Mar-15
Cross Passage 1-5		18-Dec-14 A	11-Apr-15
TUN-11-6240	Cross Passage 5 - Construct Final Liner (Invert)	18-Dec-14 A	07-Mar-15
TUN-11-6250	Cross Passage 5 - Construct Final Liner (Arch)	24-Dec-14 A	31-Mar-15
TUN-11-6130	Cross Passage 5 Ground Improvements - Install Sewer Manhole	05-Jan-15 A	06-Mar-15
TUN-11-6140	Cross Passage 5 Ground Improvements - Restore Site	12-Jan-15 A	13-Mar-15
TUN-11-6361	Cross Passage 5 Ground Freeze - Excavate remdial work	09-Feb-15 A	23-Feb-15 A
TUN-11-6371	Cross Passage 5 Ground Freeze - Water Proofing remedial work	24-Feb-15 A	03-Mar-15
TUN-11-6381	Cross Passage 5 Ground Freeze - Form/Pour remedial work	04-Mar-15	09-Mar-15
TUN-11-6391	Cross Passage 5 Ground Freeze - Strip for remedial work	10-Mar-15	20-Mar-15
TUN-11-6401	Cross Passage 5 Ground Freeze - Abandon grount holes	21-Mar-15	01-Apr-15
TUN-11-6310	Cross Passage 5 Ground Freeze - Remove Freeze Plant & Equipment	01-Apr-15	06-Apr-15
TUN-11-6220	Cross Passage 5 - Install Misc Metals	01-Apr-15	01-Apr-15
TUN-11-6230	Cross Passage 5 Complete		01-Apr-15
TUN-11-6320	Cross Passage 5 Ground Freeze - Abandon Pipes & Repair Segments	07-Apr-15	11-Apr-15
TUN-11-6150	Cross Passage 5 Ground Freeze Complete		11-Apr-15
Portal Structure		28-Jan-15 A	15-Apr-15
TUN-12-1130	Portal Structure - Construct Base Slab South of Launch Box (East)	28-Jan-15 A	04-Feb-15 A
TUN-12-1230	Portal Structure - East Final Restoration (North of Perry)	31-Jan-15 A	17-Mar-15
TUN-12-1140	Portal Structure - F/R/P Upper Wall (East)	05-Feb-15 A	23-Feb-15 A
TUN-12-1150	Portal Structure - F/R/P Remaining Roof Slab	24-Feb-15 A	11-Mar-15
TUN-12-1160	Portal Structure - Backfill Launch Box and Remove Bracing	28-Feb-15 A	18-Mar-15
TUN-12-1170	Portal Structure - East Final Restoration (South of Perry)	12-Mar-15	25-Mar-15
TUN-12-1210	Portal Structure - West Final Restoration	26-Mar-15	15-Apr-15
TUN-12-1180	Portal Structure - Portal Structure Complete		15-Apr-15
Contract Close Out		28-Feb-15 A	13-May-15
TUN-13-2040	Demobilization - Remove Temporary Utilities	28-Feb-15 A	01-Apr-15
TUN-13-2050	Demobilization - Remove Contractor & Owner's Offices	28-Feb-15 A	13-May-15
TUN-13-2060	Demobilization - Punchlist Activities	16-Apr-15	13-May-15
TUN-13-2080	Demobilization - Transfer Site to Subsequent Contractor(s)	13-May-15	13-May-15



Stations, Surface, Track and Systems

Contract 1300 Contractor: Tutor-Perini Corporation

Description of Work

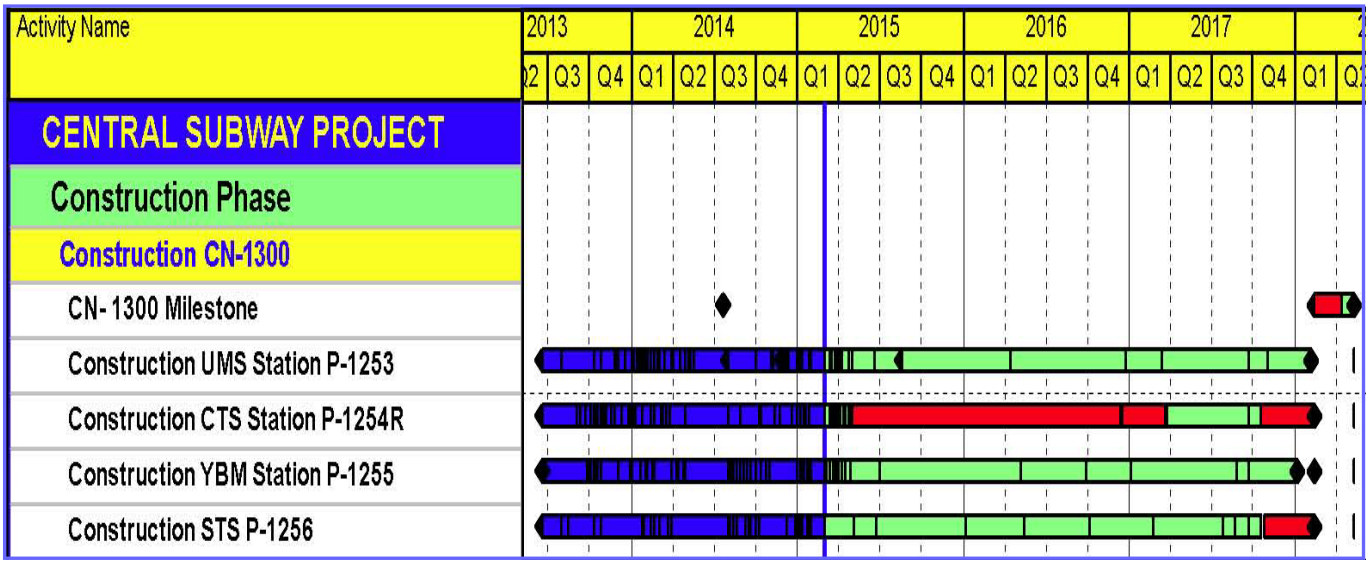
The Contract 1300 scope is to construct the Central Subway's four stations, construct the 2,000 feet of surface track, and install track and operating systems throughout the new alignment. The separate station and systems work packages are presented in the following pages.

Work includes station finishes, AC substations elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, Cutter Soil Mixing, secant pile bottom up and Sequential Excavation Method construction, settlement monitoring, building protection, connecting to and modifying the BART Powell Street Station, PA, CCTV, signage, installation of fare collection equipment and station start-up and commissioning.

Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$839,676,400**
Modifications to Date: (1-5)	**($1,432,743)**
Current Contract Value :	**$838,243,657**

Budget/Expenditures▲	
Current Budget	**$859,676,400**
Expenditures to Date	**$235,614,773**

1300 Summary Schedule



Union Square/Market Street Station

Contract 1300 Work Package1253

Description of Work

Station work site development includes archaeologic investigation and utility relocation. Station structure work includes inclined tangent piles, secant pile top-down compensation grouting, parking garage demolition, cut and over construction and structural concrete, settlement monitoring, building protection.

Systems work includes AC substations, elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, PA, CCTV, signage, installation of fare collection equipment and station start-up and commissioning.

Interior work includes station finishes, connecting to and modifying the BART Powell Street Station.

Three Month Look Ahead

- Close Stockton Street between Ellis and Post Streets.
- Progress I-beam, roof deck and waterproofing installation for roof deck construction.
- Continue demolition operations at Ellis Street on existing BART structure.
- Install new roof on Ellis for BART Station entrance to UMS station.
- Begin Union Square Garage (USG) demolition for North concourse entrance.
- Continue working on Union Square Garage, tieback installation, micro-pile installation and demolition.
- Continue jet-grouting operations on Stockton Street between Geary and O'Farrell Streets.
- Install new roof on Station between Maiden Lane and Geary Street.

Current Status This Month

- Excavated to roof level between Maiden Lane and Geary Street.
- Pile Status to date: Completed all piles.
- Excavated to roof level on Ellis Street.
- Began Jet Grout Test Program on West Side of Stockton Street.
- Completed Temporary HVAC for Union Square Garage.

Work to resume installing underground wall piles is under way.

Work Expected Next Month

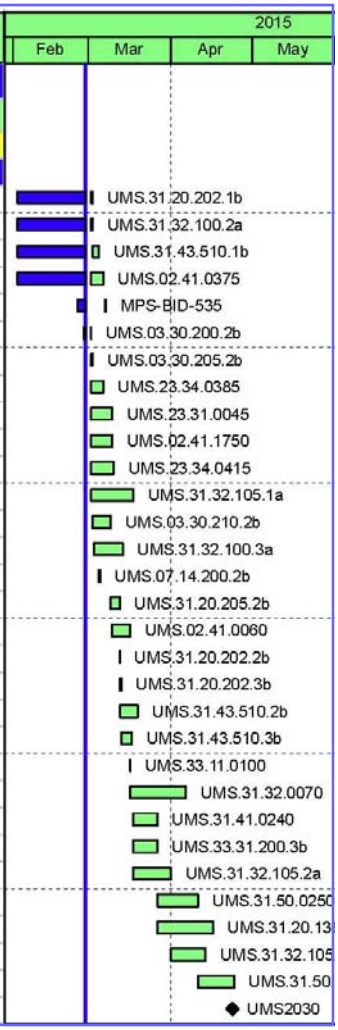
- Street closures: Stockton Street between Ellis and Post and Ellis halfway, Stockton to Powell.
- Union Square Garage – tieback installation, micro-pile installation and demolition.
- Begin jet grouting operations on East side of Stockton Street between Geary and O'Farrell Streets.
- Install I beams for roof installation between Maiden Lane and Geary Street
- Excavation and demolition operations at Ellis Street, concurrent with excavation of enlarged areas for roof deck.

Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$294,030,590**
Modifications to Date:	**$90,000**
Current Contract Value:	**$294,120,590**

Budget/Expenditures ▲	
Current Budget	$299,030,590
Expenditures to Date	**$102,476,776**

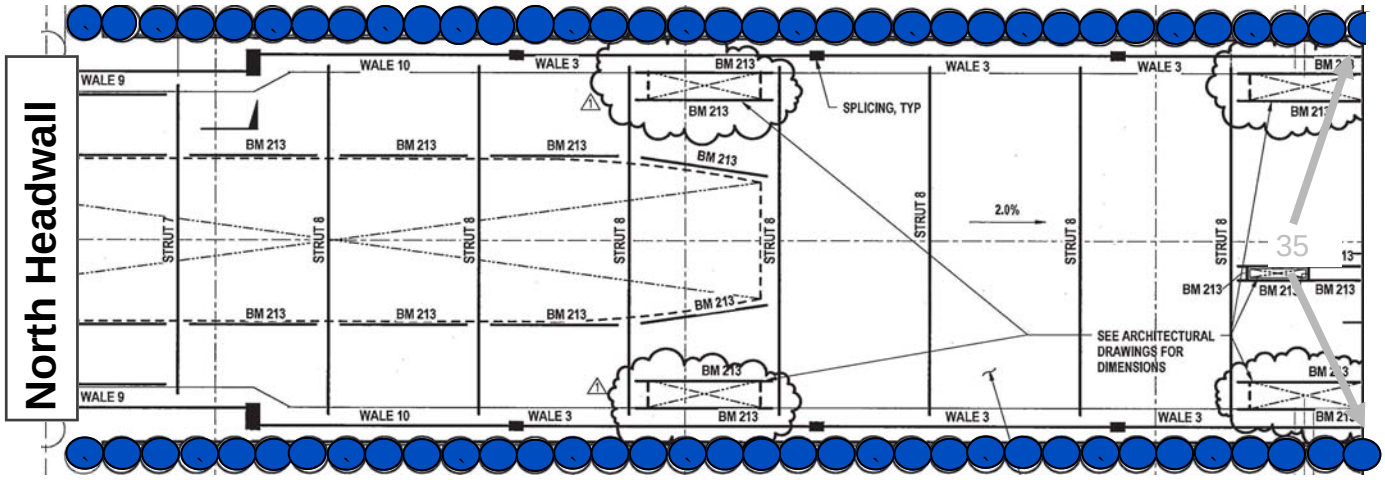
UMS Three Month Schedule

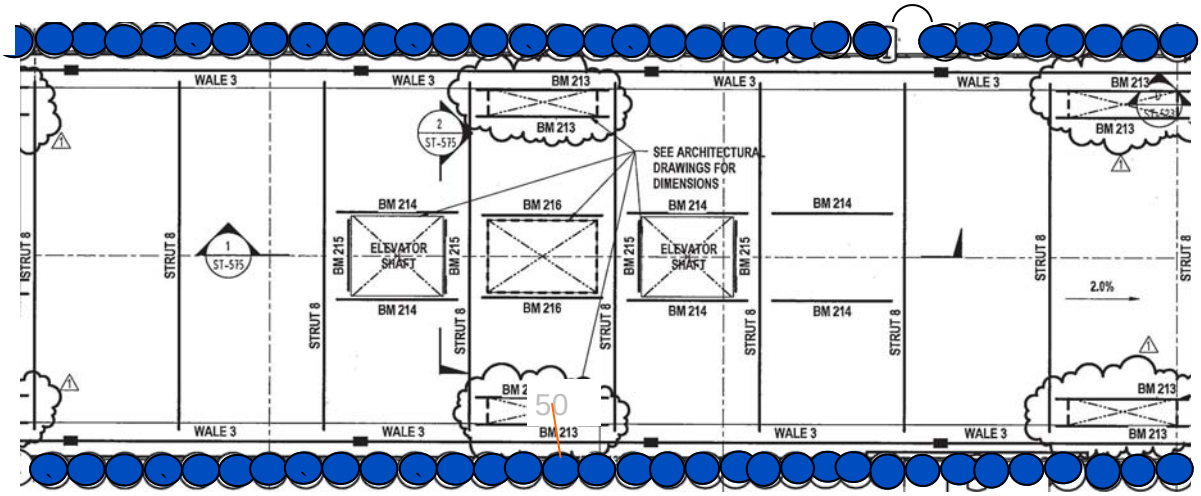
ctivity ID	Activity Name
CENTRAL SUBWAY PROJECT	
Construction Phase	
Construction CN-1300	
Construction UMS Station P-1253	
UMS.31.20.202.1b	UMS_Excavate To Compensation Grout Level - Sta 135+92 To Sta 136+28
UMS.31.32.100.2a	UMS_Jet Grout Stockton St East/West Side for Water Seal Rig#2 Pour 2A
UMS.31.43.510.1b	UMS_ Install Compensation Grouting Tubes - Armani Sta 135+92 to 136+28
UMS.02.41.0375	UMS_Demo Sub-Basement Walls, Beams & Lagging - Stockton St - Maiden To Geary (West Side)
MPS-BID-535	Drill/Pour B-Piles -O'Farrell Intersection (3 QTY)
UMS.03.30.200.2b	UMS_UMS_Formwork/Rebar Roof Deck and Pile Cap - Sta 136+28 to Sta 136+64
UMS.03.30.205.2b	UMS_Place Concrete - Roof Deck and Pile Cap - Sta 136+28 to Sta 136+64
UMS.23.34.0385	UMS_CN_Install HVAC Air Duct Risers to Conc Duct Below (In Union Square Garage Lvl 4)
UMS.23.31.0045	UMS_ Install Temporary Ventilation & Utilities
UMS.02.41.1750	UMS_ Install Temporary Vehicular Circulation at Union Garage
UMS.23.34.0415	UMS_CN_Install Temporary HVAC Exhaust Duct (In Union Square Garage Lvl 4)
UMS.31.32.105.1a	UMS_Jet Grout Piles Stockton St East/West Side for Water Seal Rig#1 Pour 1A
UMS.03.30.210.2b	UMS_Cure Concrete - Roof Deck and Pile Cap - Sta 136+28 to Sta 136+64
UMS.31.32.100.3a	UMS_Jet Grout Stockton St East/West Side for Water Seal Rig#1 Pour 3A
UMS.07.14.200.2b	UMS_Install Waterproofing System/Grout Cover - Roof Deck and Pile Cap - Sta 136+28 to Sta 136+64
UMS.31.20.205.2b	UMS_Backfill Roof Section To Subgrade & Move Skid - Sta 136+28 to Sta 136+64
UMS.02.41.0060	UMS_Demo Garage Roof Slab
UMS.31.20.202.2b	UMS_Excavate To Compensation Grout Level - Sta 136+28 To Sta 136+64
UMS.31.20.202.3b	UMS_Excavate To Compensation Grout Level - Sta 136+64 To Sta 137+00
UMS.31.43.510.2b	UMS_ Install Compensation Grouting Tubes - Apple Store, Armani Sta 136+28 to 136+64
UMS.31.43.510.3b	UMS_ Install Compensation Grouting Tubes - Apple Store Sta 136+64 to 137+00
UMS.33.11.0100	UMS_ Install New 8" Water Main - South Side Ellis St
UMS.31.32.0070	UMS_Jet Grout Under South Wall Footings - USG
UMS.31.41.0240	UMS_Install Sheet Piles @ Access Shaft #2 (O'Farrell)*
UMS.33.31.200.3b	UMS_Install Utilities, OCS Pier #3, & Backfill Street - Sta 136+64 to Sta 137+00
UMS.31.32.105.2a	UMS_Jet Grout Stockton St West/East Side for Water Seal Rig#2 Pour 2A
UMS.31.50.0250	UMS_Excavate. Lag & Support @ Access Shaft #2 (O'Farrell)
UMS.31.20.1365	UMS_Shore Tunnel and ready for break in- Sta 132+50 To North Headwall
UMS.31.32.105.3a	UMS_Jet Grout Stockton St East/West Side for Water Seal Rig#1 Pour 3A
UMS.31.50.0260	UMS_Install Temporary Lid @ Access Shaft #2 (O'Farrell)
UMS2030	UMS Tunnel Interface Finish Cross Passages 3 & 4 (Req'd Feb 26, 2015)

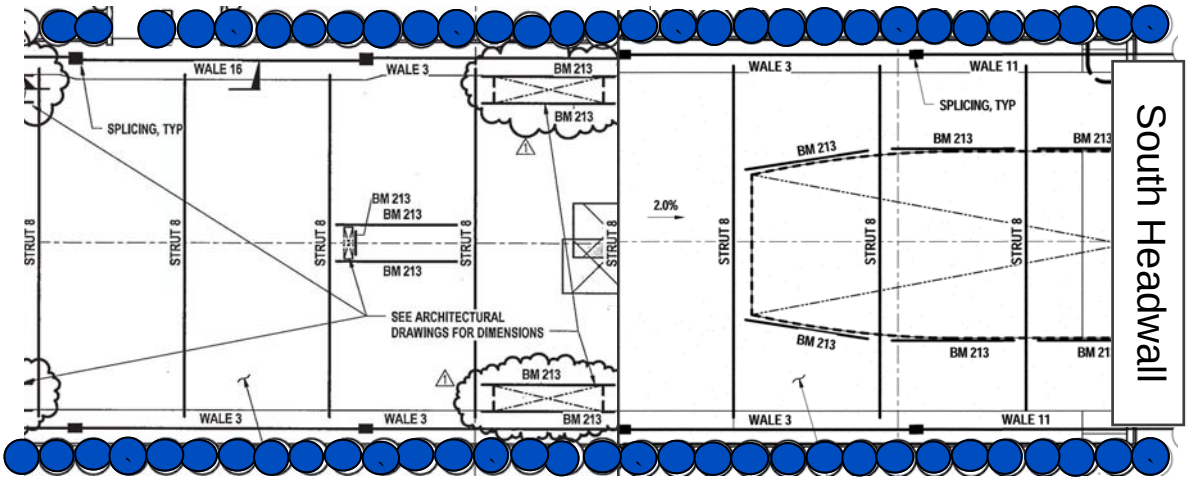


UMS Pile Progress Station Box Area

Tangent Piles (B Type) 198 of 198 Completed - - an increase of 14 over last month







Chinatown Station

Contract 1300 - Work Package 1254R

Description of Work

Station finishes, AC and DC traction power sub-stations, elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, slurry or secant pile and SEM excavation, settlement monitoring, building protection, PA, CCTV, signage, installation of fare collection equipment, station start-up and commissioning.

Three Month Look Ahead

- Excavate, form and pour Surface Level Slab
- Excavate to El 70, install compensation grout tubes, pre grout
- Slip line brick sewer on Stockton Street
- Drill dewatering wells on Stockton Street
- Install inclinometer on Stockton Street

Current Work Status

- Excavated 2/3rds headhouse for Surface Level Slab Pour #1
- Demo brick basement in headhouse
- Completed Slip line of the brick sewer Jackson to Washington
- Prep south slurry walls for Surface Level Slab.

These plywood boards cover exposed rebar, which will be attached to the future roof slab.

Work Expected Next Month

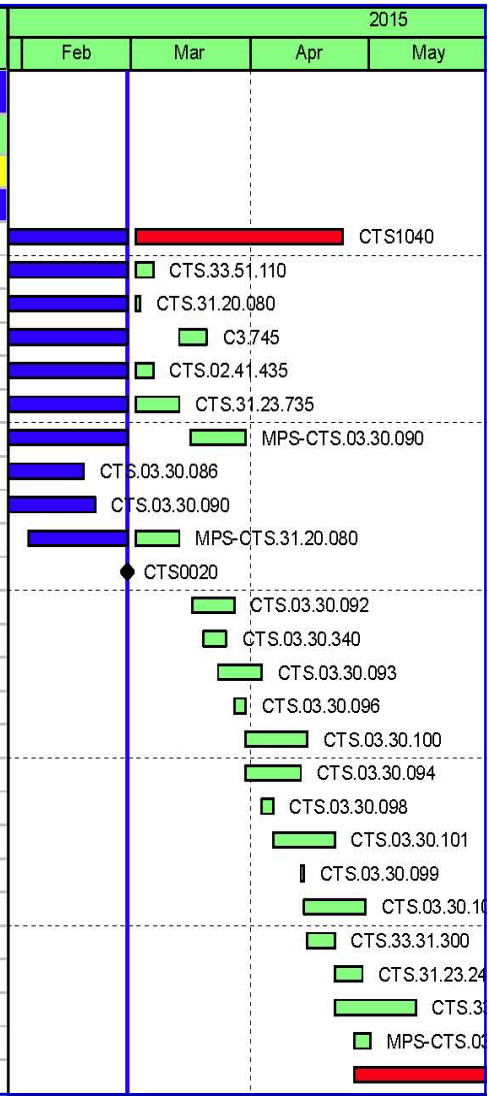
- Install Dewatering wells on Stockton St
- Install settlement instrumentation on Stockton St
- Pour for surface level slab and beams, Pours 1 and 2 .

Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$247,567,810**
Modifications to Date:	**$230,956**
Current Contract Value:	**$247,798,766**

Budget/Expenditures	
Current Budget	**$252,567,810**
Expenditures to Date	**$53,780,357**

CTS Three Month Schedule

tivity ID	Activity Name
CENTRAL SUBWAY PROJECT	
Construction Phase	
Construction CN-1300	
Construction CTS Station P-1254R	
CTS1040	CTS Excavate Headhouse & Bracing
CTS.33.51.110	CTS_Perform: Utilities: Gas Line Washington/Stockton
CTS.31.20.080	Excavate For Surface Level Deck
C3.745	CTS_SU Drill & Install Dewatering Wells - In Stockton St - 24 ea
CTS.02.41.435	Structural Demolition -Basement (With Excavation)
CTS.31.23.735	CTS_UM Drill & Install Dewatering Wells - In Headhouse - 4 ea
MPS-CTS.03.30.090	Form/Rebar/Pour Surface Level Deck
CTS.03.30.086	Install Base Support For Surface Level Deck Falsework
CTS.03.30.090	Install Falsework/Soffit - Surface Level Deck
MPS-CTS.31.20.080	Excavate For Surface Level Deck
CTS0020	CTS Tunnel Interface Finish Cross Passages 1 & 2 (Req'd Sept 9, 2014)
CTS.03.30.092	Form/Rebar Surface Level Deck - Pour #1
CTS.03.30.340	CTS_SU Exterior - Form\Rebar\Pour Concrete for Maintenance Hatch below Wa
CTS.03.30.093	Form/Rebar Surface Level Deck - Pour #2
CTS.03.30.096	Place Concrete Surface Level Deck - Pour #1
CTS.03.30.100	Cure & Strip Falsework for Surface Level Deck - Pour #1
CTS.03.30.094	Form/Rebar Surface Level Deck - Pour #3
CTS.03.30.098	Place Concrete Surface Level Deck - Pour #2
CTS.03.30.101	Cure & Strip Falsework for Surface Level Deck - Pour #2
CTS.03.30.099	Place Concrete Surface Level Deck - Pour #3
CTS.03.30.102	Cure & Strip Falsework for Surface Level Deck - Pour #3
CTS.33.31.300	CTS_Backfill & Complete Permanent Sewer Work In Washington St.
CTS.31.23.240	Complete Backfill Deck @ Washington Street
CTS.33.31.280	Install Sewer System Slip Lining - Washington/Stockton
MPS-CTS.03.30.092	Install Base Support For Surface Level Deck Falsework
CTS1050	CTS SEM & Install Supports



Yerba Buena/Moscone Station

Contract 1300 - Work Package 1255

Description of Work

Station finishes, AC and DC Traction Power substations elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, slurry wall top-down construction, settlement monitoring, building protection, PA, CCTV, signage, installation of fare collection equipment and station start-up and commissioning.

Three Month Look Ahead

- Complete west side roof slab construction
- Perform Archaeological Monitoring
- Complete utility installation above west-side roof
- Restore west side roadway section on 4th Street and switch over to east side.

Current Status

- West side roof slab construction in three segments, each 113’ long. Segment 1 (from north headwall to just north of Clementina), concrete placed, waterproofing installed. Segment 2 & 3, utility removal and excavation begun.
- Began removal of Class I contaminated soil from former gas station (top ~6’ containing lead)
- Archaeological investigation at 4th and Clementina Streets was completed.

A concrete truck backs into the site, to deliver material used to build part of the roof slab.

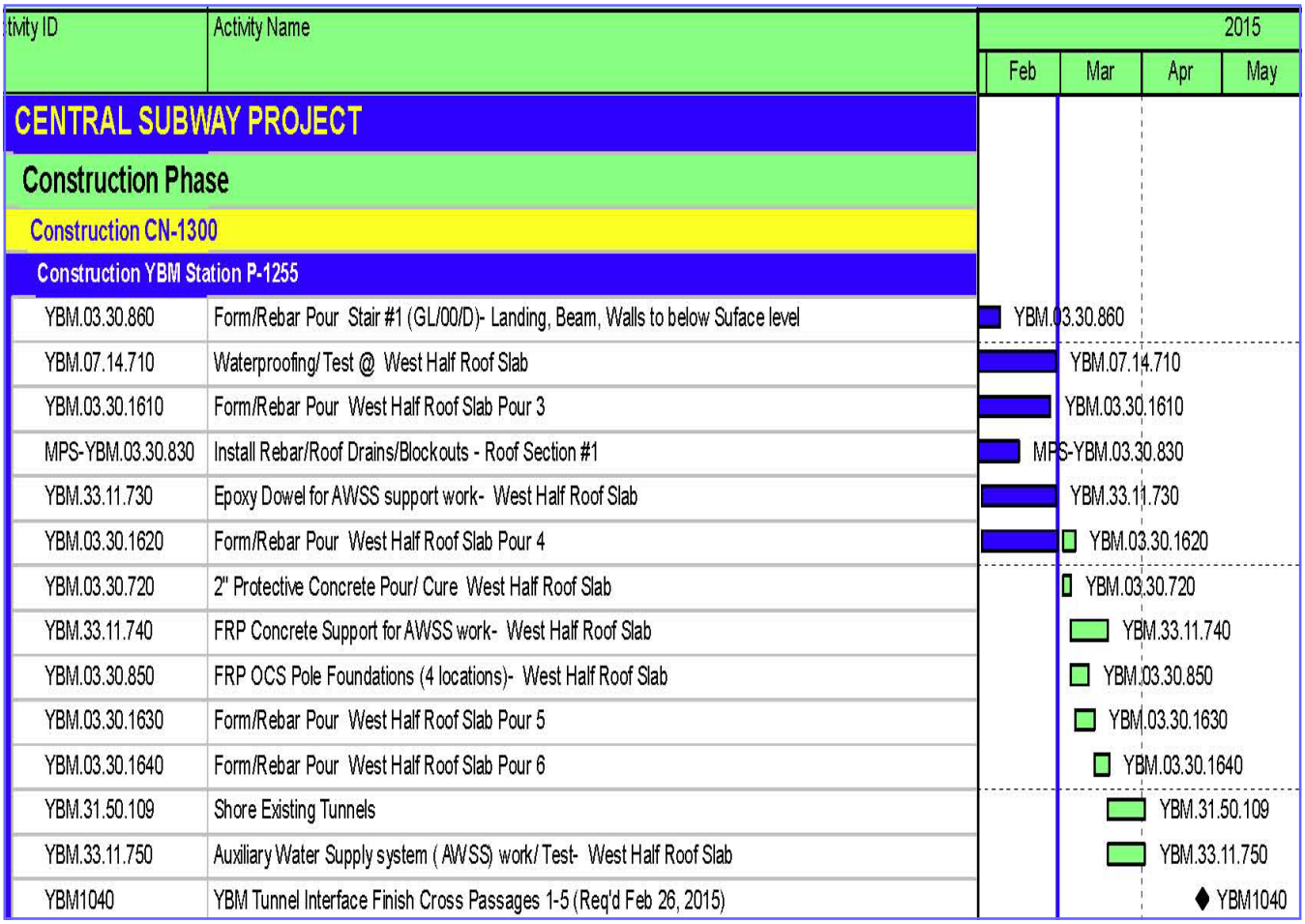
Work Expected Next Month

- Completion of west side roof Segments 2 & 3.
- Completion of Class I contaminated soil removal from former gas station.
- Preparation for roof slab placement within Clementina footprint.
- Archaeological Monitoring of excavation.

Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$158,089,000**
Modifications to Date:	**($1,833,869)**
Current Contract Value:	**$156,255,131**

Budget/Expenditures ▲	
Current Budget	**$163,089,000**
Expenditures to Date	**$59,266,549**

YBM Three Month Schedule



Systems, Trackwork, & Surface Station

Contract 1300 - Work Package 1256

Description of Work

The Work under package 1256 for the construction of Surface, Track and Systems (STS) includes light rail track and systems, track invert, track safety walkways, constructed in guideway tunnels, emergency cross-passages, and three subway stations; light rail track and systems constructed on the 2,000 foot surface for the alignment from the tunnel portal, south to the tie-in to the existing Muni T-Line at Fourth and King Streets; and the surface Fourth and Brannan Street (FBS) Station.

Three Month Look Ahead

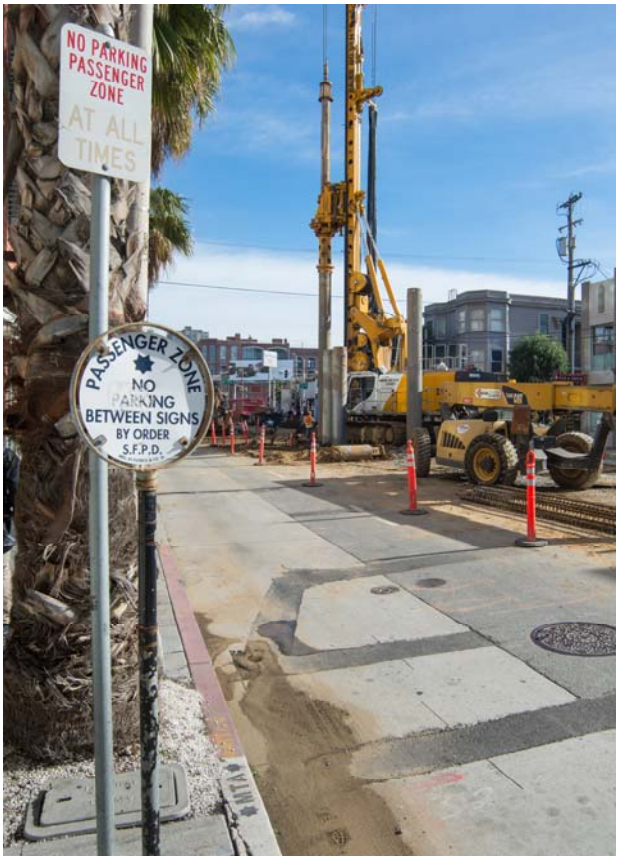
- AT&T Ductbank installation
- Sewer installation
- Streetlight conduit installation
- Waterline installation
- AWSS installation
- Muni ductbank installation
- Cast-In-Place Drilled Piles

Current Status

- Continue AT&T ductbank installation
- Contractor submitted 100% design of Design-Build 78” sewer
- Contractor progressing toward 100% design of 48” sewer and 36” sewer force main
- Continue sewer installation
- Continue cast-in-place drilled piles for 4th/Brannan Station
- Start Muni ductbank installation

Work Expected Next Month

- Complete AT&T ductbank installation on 4th between Bryant and Bluxome
- Install sewer, waterline and Muni ductbank
- Complete Drill Piles for 4th/Brannan Station
- Start rehabilitation of 78” sewer

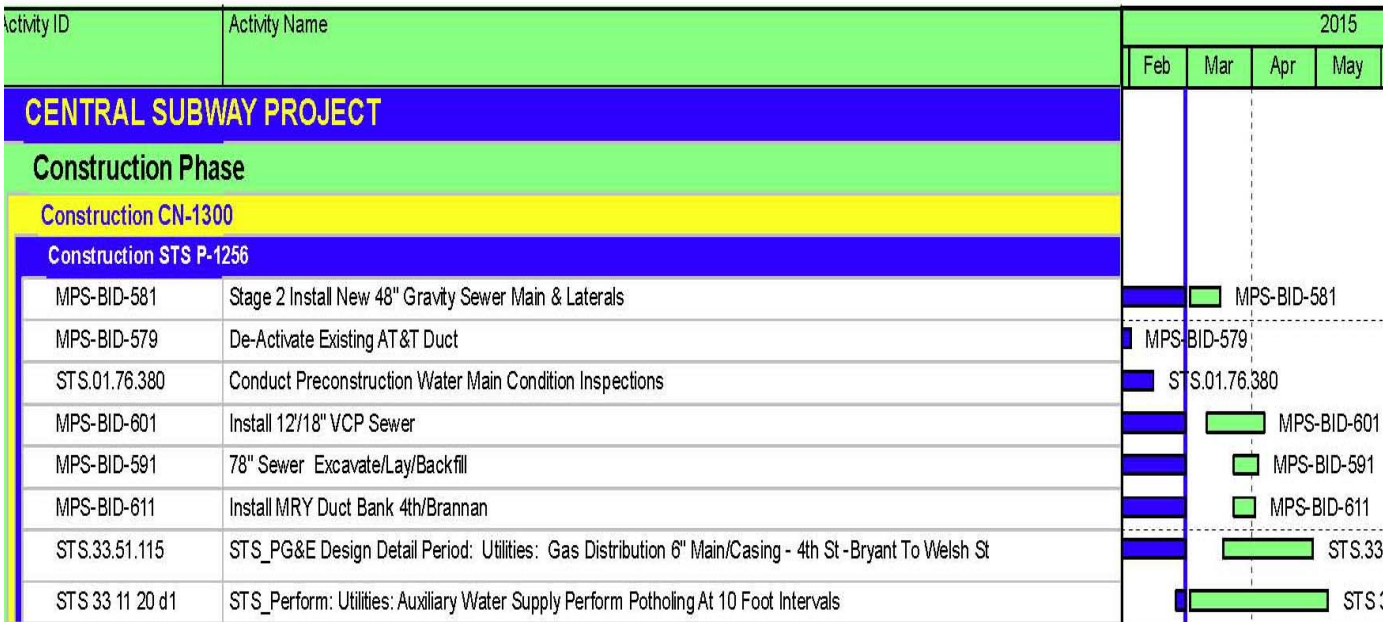


Parking has been removed from 4th Street adjacent to foundation and utility work.

Contract Details	
Contract Awarded:	May 21, 2013
Notice to Proceed:	June 17, 2013
Substantial Completion:	February 10, 2018
Contract Award Value:	$139,989,000
Modifications to Date:	$80,170
Current Contract Value:	$140,069,170

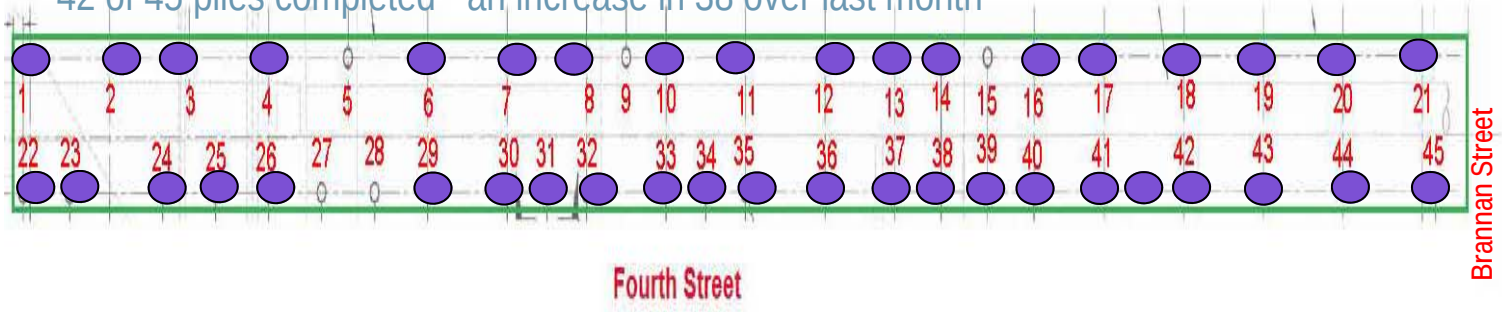
Budget/Expenditures	
Current Budget	$144,989,000
Expenditures to Date	$20,091,091

Systems, Track and Surface Station Three Month Schedule



4th Street Surface Station Platform Pile Progress

42 of 45 piles completed - an increase in 38 over last month



Program Components

Community Outreach

Outreach public information, events and presentations for February 2015 include:

- The Registry February 3, 2015
- ACECSI February 17, 2015
- Union Square BID February 19, 2015
- CAG Meeting February 19, 2015

A construction update presentation was given to Union Square area merchants with over 20 attendees.

The Project office hosted the quarterly Community Advisory Group meeting with more than 10 attendees.

A letter to Ritch Street neighbors was sent out in to inform of the conversion of Ritch street between Brannan and Townsend

Outreach in Support of Mitigation and Monitoring

Team members participated in weekly progress meetings related to Stations, Tracks and System construction and address neighborhood concerns

Outreach and communication efforts continue in Chinatown, Union Square, and SoMa.

Weekly construction update emails sent to list of approximately 600 residents and stakeholders. Distributed monthly construction update to STS and CTS neighborhood, CTS flier are bi-lingual

Media Coverage

Central Subway Media Coverage			
Date	Title (with link to story)	Source	Reporter/Writer
02/01/15	Julie Christensen is designer of change at SF City Hall	SF Examiner	Joel P. Engardio
02/18/15	Know Your Street Art: Ellipses in the Key of Blue	SF Weekly	Jonathan Curiel
02/22/15	Removing A Tunnelling Machine From The Ground Is Difficult	Gizmodo	Chris Mills

Quality Assurance

Quality Assurance monthly activity of oversight, surveillance, audits, proactive feedback and QA records actively involves the Project construction management staff, the resident engineers, the two prime construction contractors and their subcontractors.

Stations and Systems Contract CN1300 Quality Assurance Monitoring – On Going

1. UMS Pile Subcontractor, continuing battered piles – BECHO. This is now complete – all battered piles were installed without encroachment into the tunnel precast segments.
2. UMS roof beam to pile WF installation – TPC. No activity during this month.
3. UMS Water Proofing Subcontractor – Waterproofing Experts. No activity during this month.
4. UMS Jet Grout Subcontractor, continuation of Jet Grout qualification testing on the West side of Stockton.
   - Due to TPC not following established testing protocols, the test columns were relocated North of the original test area. - Layne
5. CTS Slurry Wall Panels
   - Subcontractor Layne: all panel excavation and concrete placement complete.
   - Preparation of slab mechanical couplers
6. YBM Slurry Wall Panels
   - Subcontractor, all panel excavation and concrete placement complete – Layne
   - Panels to roof slab and subsequent interior slabs
7. YBM Water Proofing Subcontractor – Waterproofing Experts
8. Daily Inspection Reports
9. Smith Emery inspections (TPC's laboratory / Inspection Services) including Special Inspections.
10. Preparatory and Initial Phase Meetings as required by Specification Section 01 45 00.*

    Participation in these vital meetings is approximately 50 percent of PQM's schedule.
7. Quality Task Force Meetings primarily to assist and support the Contractor's QC effort
8. Weekly Instrumentation/Monitoring and Construction Management Task Force (CMTF) Meeting
9. Progress Meetings for C1300, STS, YBM, UMS and CTS.

<u>QA Document comment and reviews</u>:

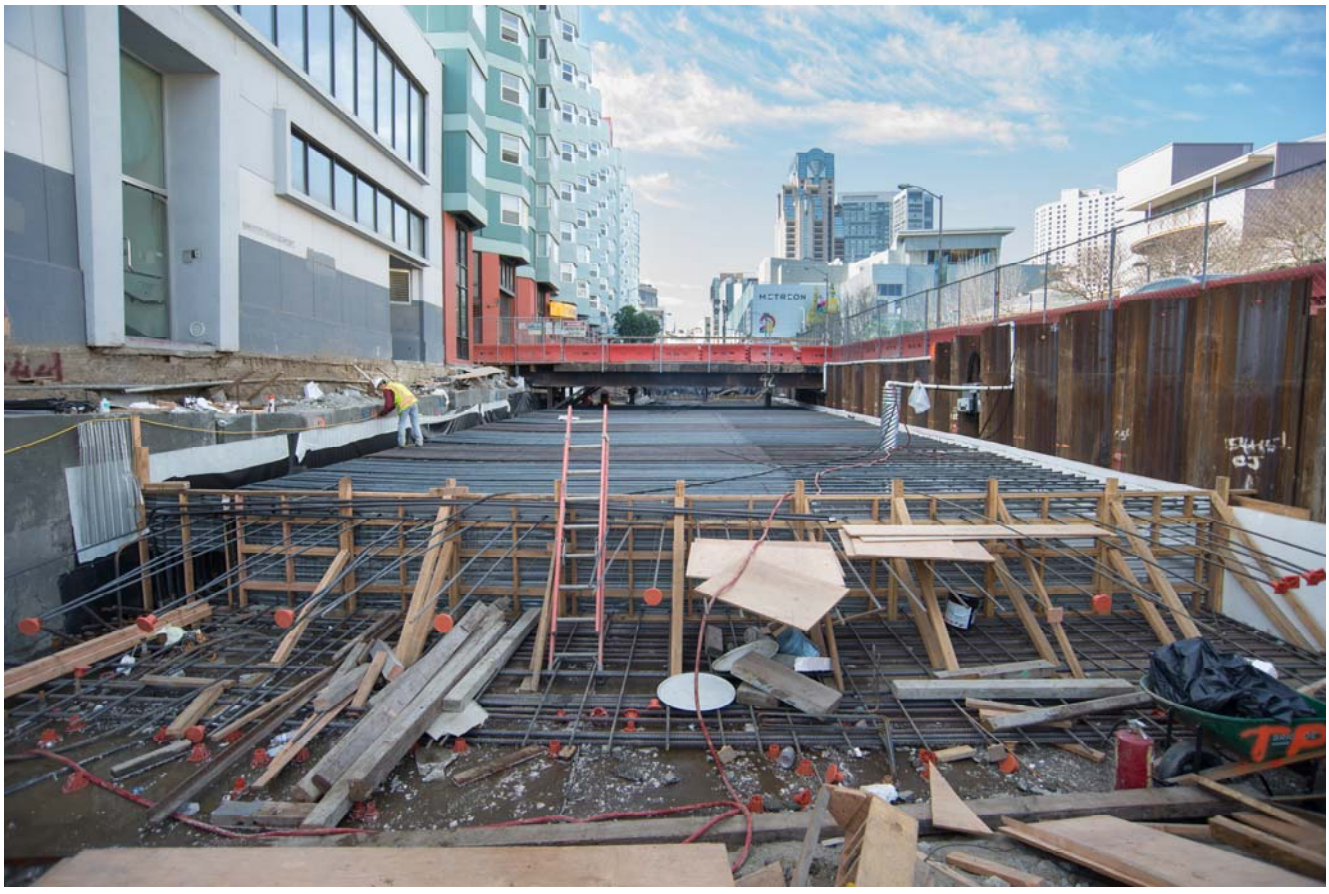
- Contractor's submittals, e.g., review of welding, concrete and other Quality related submittals/ comments as requested to support the RE's and CM, and RFIs related to quality.
- Random/spot checks of the 1300 Contractor's Field Testing lab results; items requiring further action/investigation (missing or inconsistent data, compressive strength results that appear to have a very broad range of values and such) are brought to the attention of the Contractor.
- CNCR logs and CNCRs that provide guidance to REs regarding content, accuracy of the disposition and confirmation close-out is correct – TPC QC is to i) make the descriptions, status more accurate and concise and, ii) to add a comments section to the CNCR log

* Contractor shall not start work until such time that all prerequisite requirements have been met. This facilitates work being done to the strict requirements of the Contract Documents, the "first time".

Quality Assurance - Continued

QA Issues:

- TPC QC continues to work closely with TPC's Subcontractors to obtain complete QC documentation in a timely manner to minimize the overall turnaround time. QA issues related to the Subcontractors are:
  1. TPC QC obtaining complete and accurate QC documentation
  2. The quality of TPC QC's review of the QC documentation
  3. The turnaround time of TPC's QC review is slower than desired.
- The goal is to obtain complete and accurate documentation as quickly as possible but in a time realistic. TPC QC continues to make available to RE's Staff at the 530 Bush Offices, hard copies of QC Documentation provided by Layne or BECHO, that may require minor corrections, attesting to the fact that work has been performed as required; with the complete QC Documentation packages ("pour packs") to be transmitted to the REs, as soon as the required corrections are made and provided to TPC QC.
- The quality and timeliness of Documentation associated with each CMC (TPC's rebar fabrication Sub Contractor) furnished rebar cage continues to improve due to both the RE and TPC QC's reviews. Hold Points established by TPC QC and RE's remain in place to assure that the installation of each cage is not performed until the required documentation is determined to be as required.



Quality Assurance - Continued

QA Concerns:

- TPC's management and administration of their Sub Contractors. TPC's Project Engineers in particular still appear to be not involved with the actual on-going work as well as not scrutinizing and evaluating the adequacy of Sub Contractor's submittals. It is not uncommon for TPC production personnel to not be present at Preparatory and Initial Phase Meetings; only TPC's Subcontractors and TPC QC are always present.
- TPC's Project Manager, Project Engineer's and Field Supervision's support of the implementation of TPC's Quality Control Program (see above regarding Preparatory and Initial Phase Meetings).
- The implementation of the approved waterproofing, waterstop and construction joint details for the pile caps for the all Stations Roofs.
- Test Column results and subsequent performance of UMS Jet Grouting
- TPC's honoring of RE Hold Points; in particular, TPC's Electrical Subcontractor has failed to honor TPC and SFMTA Hold Points – corrective action determination is ongoing.

Tunnel Contract CN1252 Quality Assurance Monitoring – On Going

Current QA Monitoring of the Implementation of the Contractors Quality Control Program:

1. Repair of precast segment tunnel liners
2. Installation of the tunnel cross-overs
3. Determination/and execution of the repair of the CP 5 localized failure – which includes assurance that sufficient instrumentation is in place and monitored/reported to prevent another localized freeze failure.
4. Construction of the Tunnel Portal structure
5. Monitoring and evaluation of instrumentation and resulting data.
6. Turn-over of Quality Documentation

Document comment and review:

- QA Staff continues random/spot checks of the 1252 Contractor's Field Testing lab results; items requiring further action/investigation are brought to the attention of the Contractor.
- Review of CNCR logs and CNCRs for closeout and on-going work

QA Issues:

Documentation associated with the repair of non-conforming conditions associated with installation of tunnel segments in which the removal of the segment is not practical.

- Contractor CNCRs associated with the installation of tunnel liner segments are being evaluated/ revised to facilitate proper processing, Engineer's review and subsequent closing.

Quality Assurance - Continued

- Working with BIH JV to complete the index of QA documentation that is required to be completed for close out of contract.

QA Concerns:

Repairs made to tunnel liner segments and preparation for revising instrumentation and ground freezing piping, densification of soil and restoration of the street above Cross-Passage 5.

- Contractor's Field repairs of tunnel liner segments per approved procedures.
- Open CNCRs that await closing as a function of required liner repairs.
- Turn-over of final Barnard Impregilo Healy Quality Documentation as contract completion approaches.

Other Program QA Practices Implemented

- Close-out of Corrective Action Requests: Close outs continued from Quality Assurance staff's Audits, Surveillances and PMOC Quarterly Reviews. The status is tracked in the Corrective Action Log that is provided to the project team and the FTA PMOC.
- On-going indoctrination to the CSP Quality Program continues on a one-to-one basis as new personnel are added to the PM/CM Staff.

Risk Management

Risk Mitigation Management Meeting No. 67 was held on February 10, 2015. The Risk Assessment Committee reviewed and discussed Risks that include Construction Risks with ratings above 6; Remaining Requirement and Design Risks; and, any New Risk Assessment and Mitigations identified to date.

Program Safety & Security

The San Francisco Municipal Transportation Agency is committed to the highest practical level of safety and security standards and practices in the public transit industry. The Safety and Security

Workers keep a close eye on the movement of machinery and coordinate their work accordingly.

Program Safety & Security - continued

Management Plan (SSMP) components are reported on below as appropriate including, Safety and Security Committee, the Fire Life Safety and Security Committee the Construction Conformance Verification and Documentation and Contractor Safety and Security.

Safety Summary for Stations Systems Track Construction

Table 1300 on the next page summarizes the Month to Date and Project to Date for the Stations, Systems and Track Construction contractor and subcontractors. Table 1300 shows that no recordable accidents took place in February.

Table 1300 STS Construction Safety Record

Through Month End - February 28, 2015

SAFETY GOALS
OSHA Recordable Accidents, <3.4 Lost Time Cases, <1.6

JOB TO DATE	Tutor	Subs	Total Project	Rate*
OSHA Recordable Accidents	0	0	**0**	0.00
Job Transfer or Restricted Duty Cases	0	0	**0**	0.00
Lost Time Cases	0	0	**0**	0.00
Total Project Incidents	0	0	**0**	0.00
Man Hours Worked Through M/E	165,059	292,981	**458,039**	

YEAR TO DATE	Tutor	Subs	Total Project	Rate*
OSHA Recordable Accidents	0	0	**0**	0.00
Job Transfer or Restricted Duty Cases	0	0	**0**	0.00
Lost Time Cases	0	0	**0**	0.00
Total Project Incidents	0	0	**0**	0.00
Man Hours Worked Through M/E	29,288	36,764	**66,052**	

++ An injury is recordable by OSHA or the US Department of Labor if it results in days away from work, restricted work or transfer to another job, medical treatment beyond first aid, loss of consciousness or death.

* Rate is calculated based on number of incidents divided by total number of man hours worked multiplied by 200,000 man hours. OSHA Recordable Accidents - 2008 Construction Industry Rate for Highway, Street, and Bridge Construction

Program Safety & Security - continued

Safety Summary for Tunnels Construction

Table 1252 below summarizes the Job to Date and Year to Date Tunneling Contractor's Safety Record based on field work reporting of incident per man hours worked. There were no recordable accidents this month.*

Table 1252 Tunnel & Portal Construction Safety Record

SAFETY GOALS

Through Month End - February 28, 2015

OSHA Recordable Accidents, <3.4 Lost Time Cases, <1.6

JOB TO DATE	BIH	Subs	Total Project	Rate*
OSHA Recordable Accidents	6	4	**10**	2.44
Job Transfer or Restricted Duty Cases	7	0	**7**	1.71
Lost Time Cases	0	1	**1**	0.24
Total Project Incidents	13	5	**18**	4.39
Man Hours Worked Through M/E	487,007	333,372	**820,379**	

YEAR TO DATE	BIH	Subs	Total Project	Rate*
OSHA Recordable Accidents	0	0	**0**	0.00
Job Transfer or Restricted Duty Cases	0	0	**0**	0.00
Lost Time Cases	0	0	**0**	0.00
Total Project Incidents	0	0	**0**	0.00
Man Hours Worked Through M/E	15,351	6,481	**21,832**	

++ An injury is recordable by OSHA or the US Department of Labor if it results in days away from work, restricted work or transfer to another job, medical treatment beyond first aid, loss of consciousness or death.

* Rate is calculated based on number of incidents divided by total number of man hours worked multiplied by 200,000 man hours. OSHA Recordable Accidents - 2008 Construction Industry Rate for Highway, Street, and Bridge Construction = 3.9.

Technical Capacity

The candidate selected for the Cost Control Analyst position is scheduled to start in mid March. No Project positions are currently open or unfilled.

Staffing

The Central Subway Staffing Table shows Planned and Actual full-time equivalent staff (FTEs) working on the Program by organizational function and responsibility.

Central Subway Staffing Table	Dec-2014		Jan-2015		Feb-2015	
Locations	Planned	Actual	Planned	Actual	Planned	Actual
Project Management						
Program Management	7.00	7.43	7.00	7.43	7.00	7.43
Quality Assurance	2.25	2.60	2.25	2.60	2.25	2.60
Contract Administration	1.40	1.40	1.40	1.40	1.40	1.40
Community Outreach	5.50	5.50	5.50	5.50	5.50	5.50
Finance	1.90	1.90	1.90	1.90	1.90	1.90
Project Controls	6.60	5.23	6.60	5.23	6.60	5.23
Subtotal	24.65	24.06	24.65	24.06	24.65	24.06
Construction Management						
CM - CN 1252	7.23	8.85	7.23	8.85	7.23	8.85
CM - CN 1300	26.98	26.40	26.98	26.40	26.98	26.40
Design Support - CN 1252	1.19	0.50	0.50	0.40	0.50	0.50
Design Support - CN 1300	14.18	5.20	6.43	6.00	6.43	5.80
Subtotal	49.57	40.95	41.13	41.65	41.13	41.55
Start Up						
Start Up / Safety & Security	2.00	2.10	2.00	2.10	2.00	2.10
Subtotal	2.00	2.10	2.00	2.10	2.00	2.10
Total	**76.21**	**67.11**	**67.77**	**67.81**	**67.77**	**67.71**

Third-Party Agreements

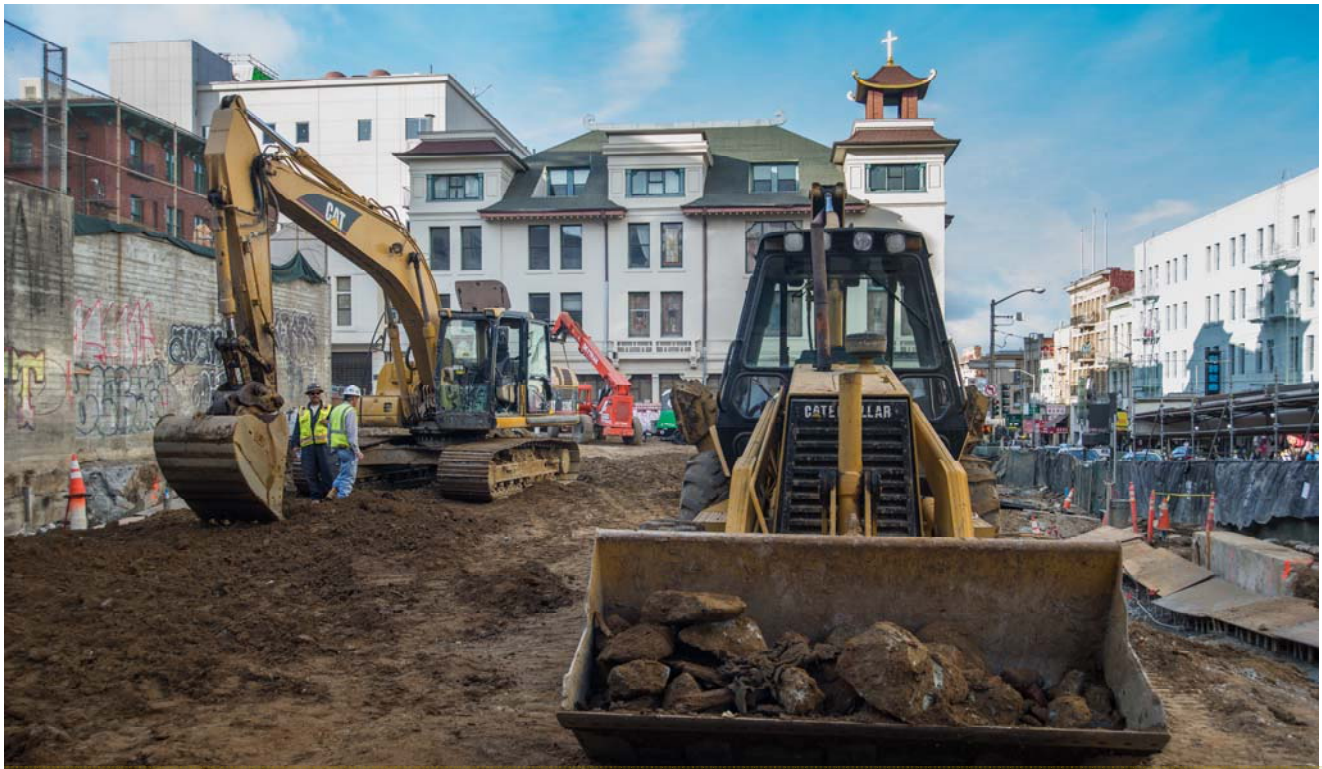
In January 2015, the court issued a decision on the amount payable to the property for the single outstanding access license, for compensation grouting, at 19 Stockton Street, adjacent to the Union Square / Market Street Station. The City Attorney's Office is reviewing the decision and assessing its options for appeal.

Project staff continue to work with the property owner to begin installation of monitoring instruments within the building

LRV Procurement

The SFMTA light rail vehicle procurement continues to schedule the 24 LRVs that will be part of the Central Subway start up to be ready for service testing and training by mid 2018 in order to begin use at the start of Central Subway service in December 2018.

The SFMTA Board authorized award of the contract on July 15, 2014 to Siemens for up to 260 cars, which includes a base contract of 175 cars for a total of $648 million, with an option to acquire up to 85 more, bringing the overall total to 260 cars. On September 19, 2014 Mayor Edwin Lee approved the contract.



Removal of concrete guide walls and exposing rebar at the tops of the underground, exterior wall sections proceeds the construction of further structural elements.

central T subway

Current Construction Activity

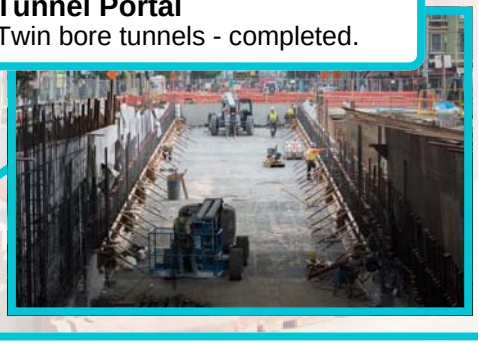
Chinatown

Union Square/Market Street (UMS)

Yerba Buena/Moscone (YBM)

Tunnel Portal

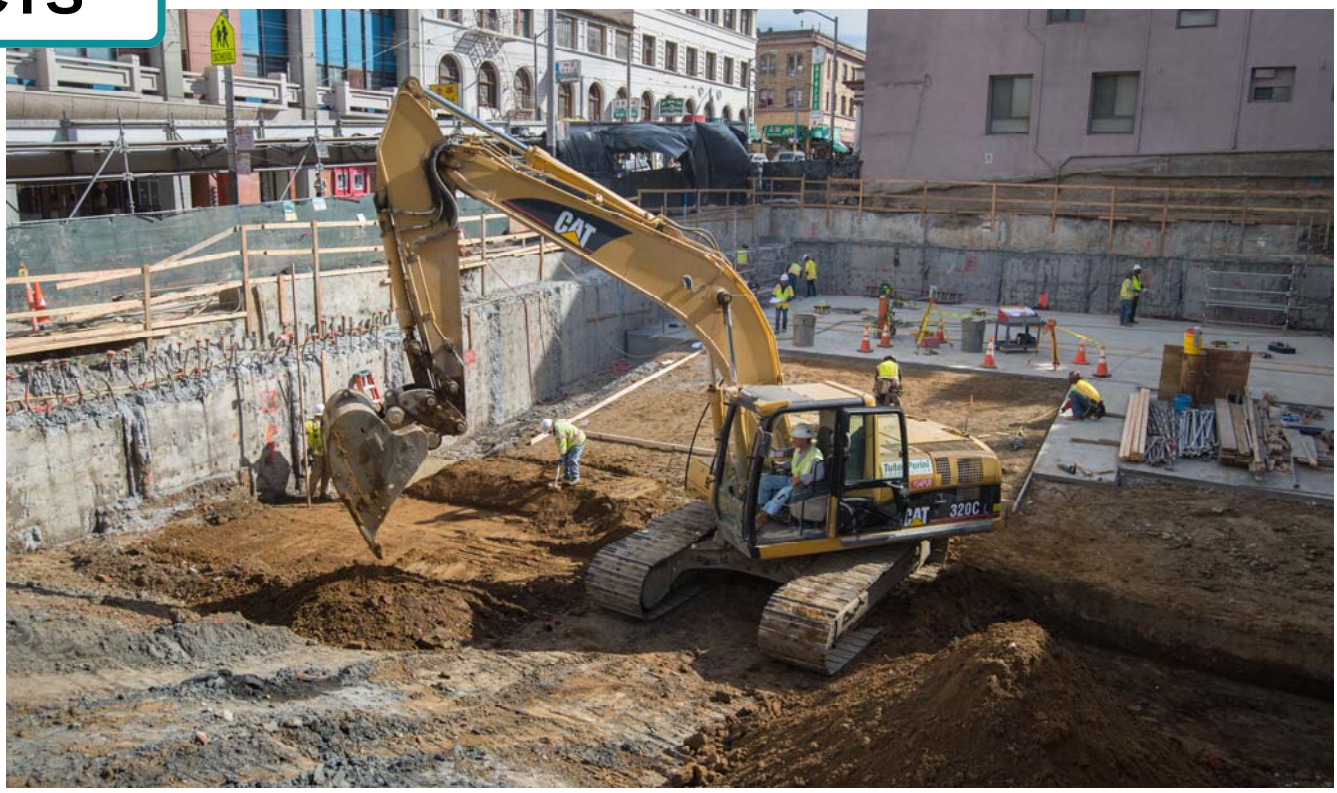
Twin bore tunnels - completed.



4th St. Surface Track, Systems (STS)

- 8,500 feet of tunnel alignment completed June 2014.
- 2,000 feet of surface alignment to be completed.

CTS



A temporary "rat slab" is being constructed as the bottom of a form which will he used to build the future roof slab of the station.

Workers use pneumatic jackhammers to exposed rebar, which will be tied in with rebar used in the future roof slab.

CTS - continued

Work to install a new sewer is underway on Stockton between Washington and Jackson.

This auxiliary fire hydrant was added to the northeast corner of Stockton and Washington.

Looking north from Market Street and Stockton, the entire Union Square/Market Street Station site can be viewed.

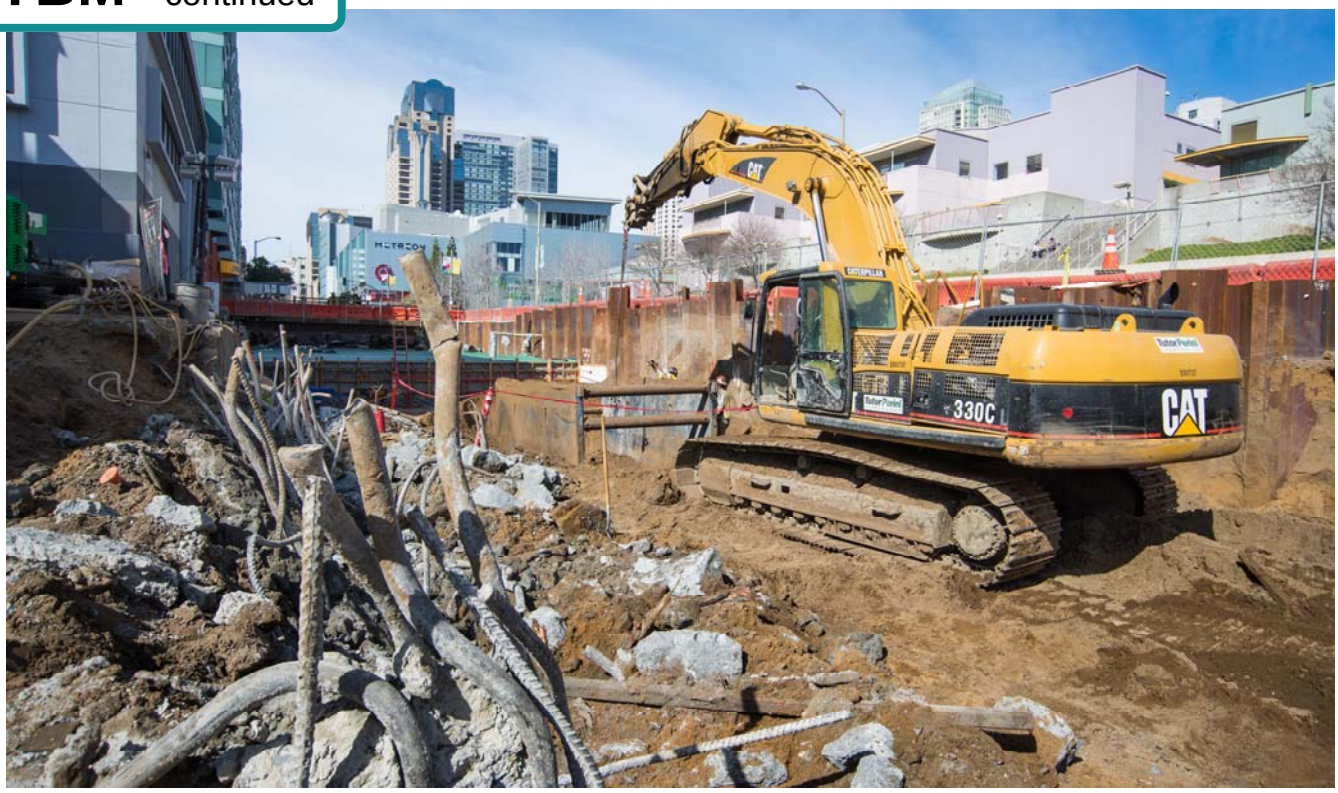
UMS - continued

North of Geary on Stockton, workers are methodically reinforcing and hanging active utilities from a truss suspended above the roadway, while excavating soil from below.

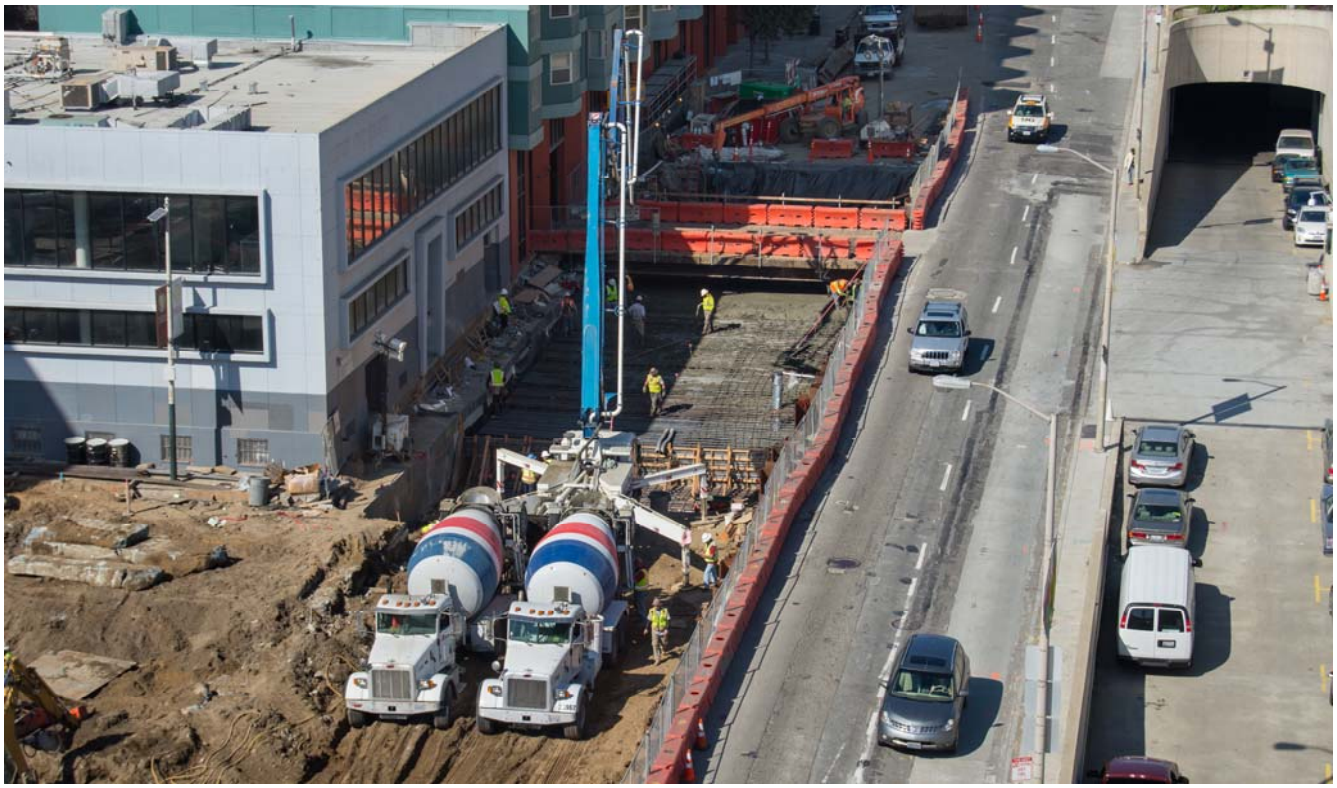
YBM

Work to remove underground obstacles to further construction is ongoing at Yerba Buena/ Moscone. Basement walls of former buildings were discovered and removed.

YBM - continued

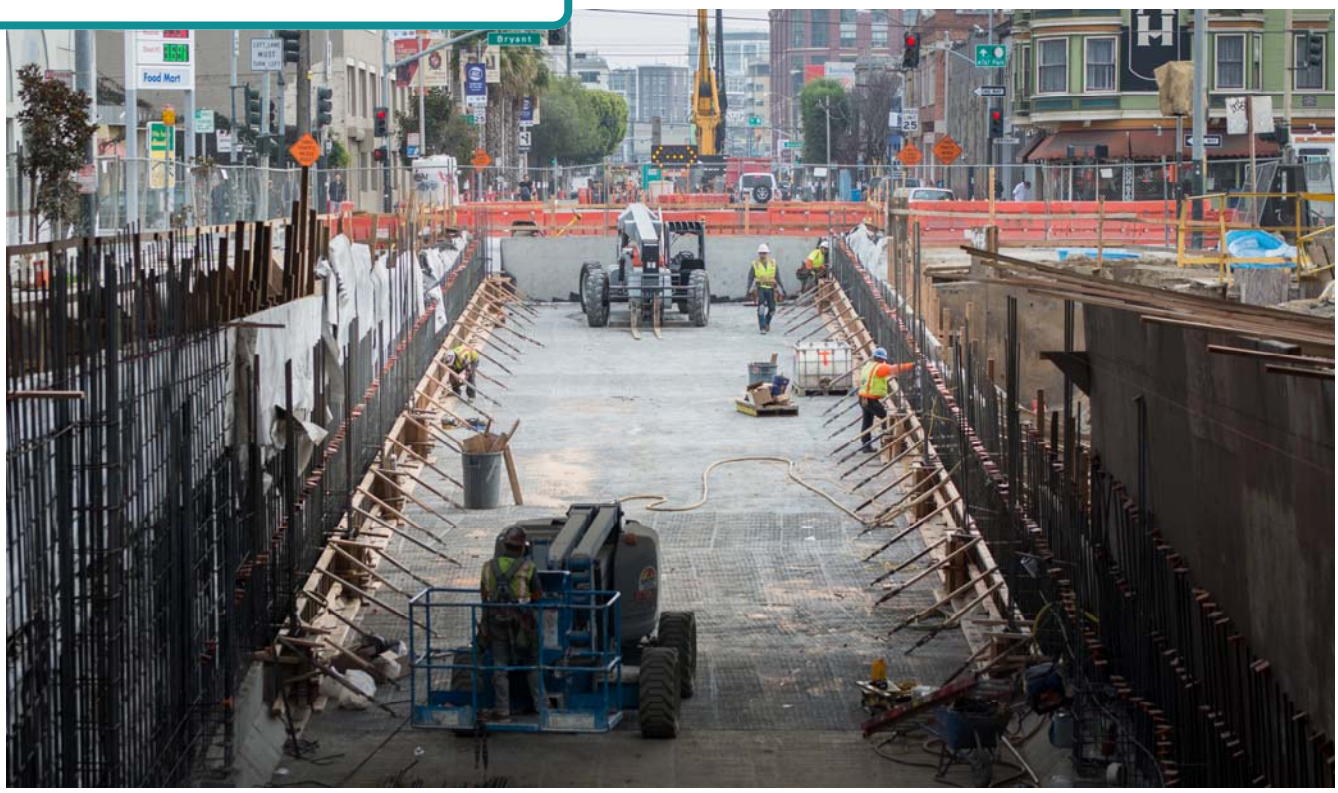


Exposed rebar seen here will be tied into rebar installed for the future roof slab. The roof slab will be constructed in sections, and will be made of reinforced concrete.

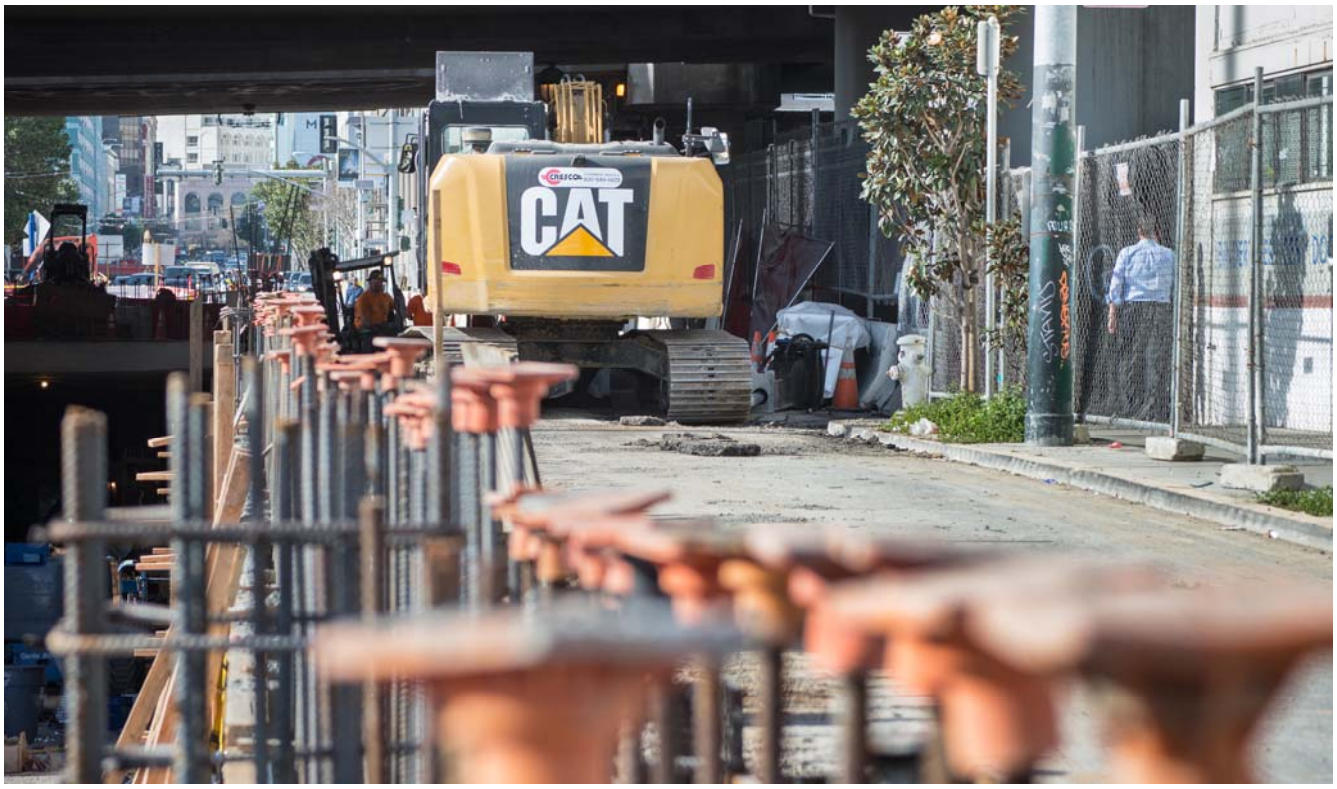


Dual concrete trucks pour material used in the construction of the first section of roof slab. An articulated boom pumps this material wherever it is needed.

Tunnel and Portal

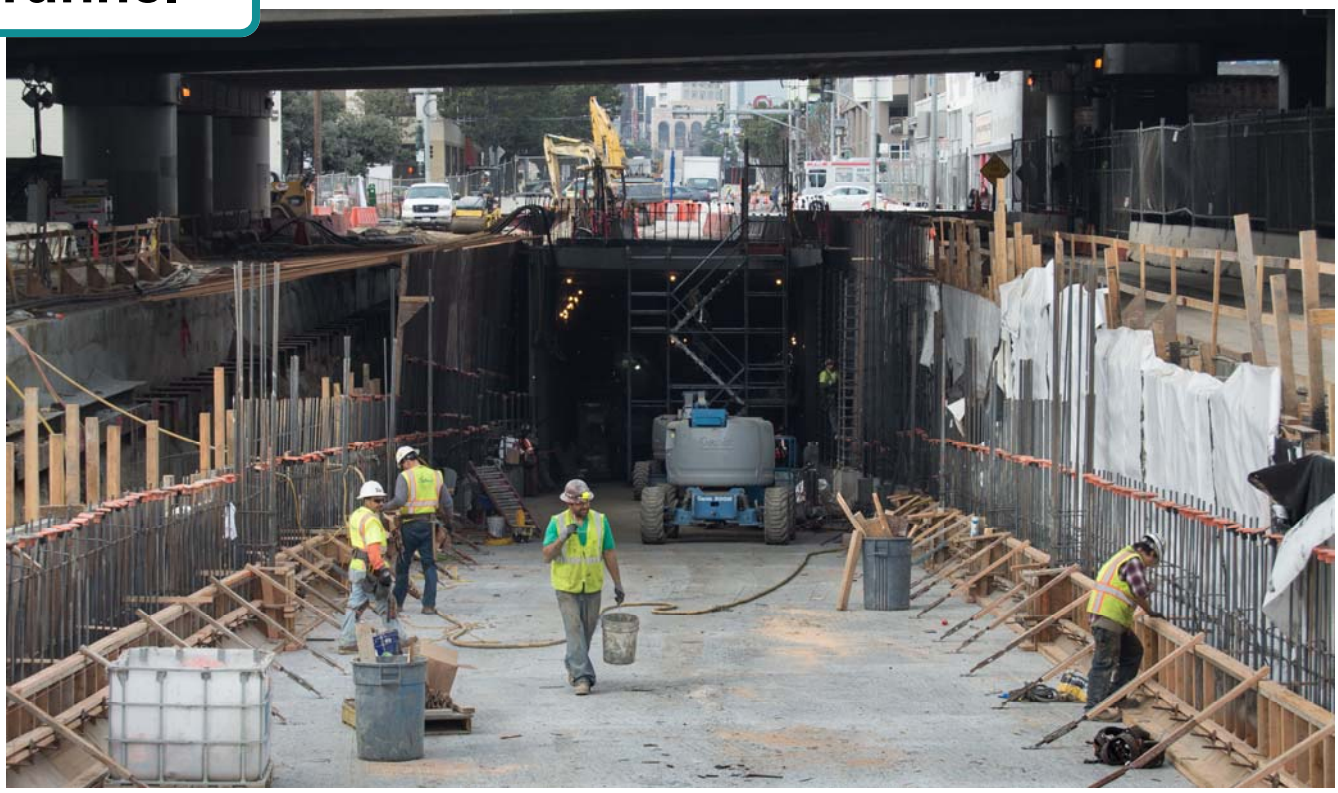


Forms can be seen being erected to build the final exterior walls of the tunnel portal, located on 4th Street underneath the Interstate 80 overpass.



Capped rebar marks where the future railing wall will be located, separating auto traffic from trains entering the tunnels.

Tunnel



Looking northwest up 4th Street, and into the mouth of the future tunnel portal, workers first install waterproofing barriers before rebar and concrete forms.

At the northern end of the tunnel portal site, the already-completed roof has been back-filled. New utilities are being installed here, which will eventually extend to Bryant.

STS

These steel shafts are drilled into the ground and used to hold back soil while an auger removes it inside. Later, rebar is lowered into each shaft and concrete is poured.

Workers can be seen here moving piping used to pump concrete to the bottom of these foundation pile shafts.

STS - continued

A crew uncovers the arched brick top to a 48-inch sewer just south of Brannan on 4th Street. This sewer will be rebuilt to sustain the weight of trains passing overhead.

A mini excavator sits waiting to be used for utility excavation the next day.