central T subway

Pouring at the Portal

Concrete forms have been installed to pour the remaining portion of the Tunnel Portal invert and track plinths

Progress Report

March 2017

SFMTA
Municipal
Transportation
Agency

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Table of Contents

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

Table of Contents - continued

Appendices

Cover photo: ***At the bottom of the tunnel portal ramp, the northbound and southbound tracks transition to the twin subway tunnels, curving outward slightly before running parallel to the Yerba Buena/Moscone Station just a block away.*** *Workers have installed concrete forms to construct the remaining elements of the tunnel portal invert, and track foundations called plinths.* ***More photos can be found starting on page 36.***

Above photos: ***Crews have re-excavated the full height of the egg-shaped cross-cut cavern to be able to access the inverts of the side drifts for the next phase of excavation.*** *New ventilation systems have been installed, and the next phase of excavation is well on its way.*

See the Appendix E final page for CS websites hyperlinks and public outreach on

Light streams in the south end of the station box, where the initial "rat slab" for the remaining unconstructed portions of the platform level invert has been poured.

Executive Summary

Continued excavation at YBM, UMS and CTS Stations as we advance to the respective station inverts. STS continues tunnel invert drain pipe and catch basins installations in the Southbound and Northbound tunnels.

Chinatown Station - Headhouse excavated to 16' below Temp Level 5.0 walers and struts. Complete excavation of the Platform Caverns (North and South) of Right Side Drift and Left Side Drift Top Headings and Temp Invert for both headings. Incidental street work (minor), ongoing monitoring and surveying. Mockup for Final Waterproofing and Lining underway for the North Emergency Egress (NEE) Shaft and Tunnel.

Union Square/Market Street Station - North Concourse: Install utilities. Worked on PG&E #7 installation on Geary in front of the Union Square Garage. Platform Station: Completed Temp Level wales & struts; progressed to Mezzanine Level except for 3 struts blocked by ramp and began Platform Strut Level.. Ellis Annex: Worked on PG&E gas line, water line installations, AT&T work, traffic signal and traffic controller box installations and completed OCS pole and write installation Sequence 2. UMS North Entrance: Continued structural streel and fan level trench excavation, both approximately 80% complete.

Yerba Buena/Moscone Station - Sidewalk restoration in progress on west side of 4th Street south of Howard Street intersection. Excavation to Invert level beneath Temporary Strut Level 6 is complete to south headwall in Station Box. Placement of waterproofing and 3rd of 3 mud slabs within station box at Invert Level is complete. Installation of metal stairs at Stair 1 and Stair 4 are in progress. Placement of mechanical equipment curbs on Mezzanine Level is in progress.

Surface, Track and Systems– Continued 36" sewer rehabilitation. Continued 48" sewer installation. Continued MRY ductbank installation. Continued AWSS installation. Continued pavement renovation. Continued invert slab construction.

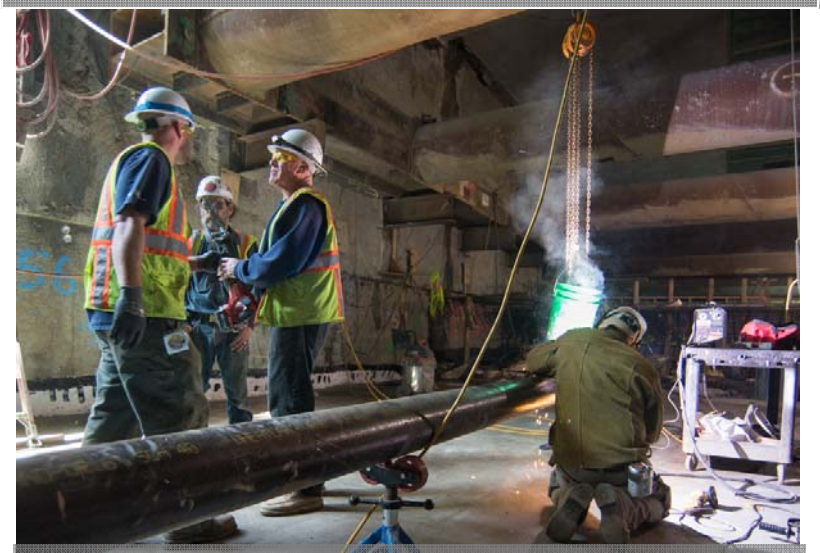
Tunnel - Contract administrative closeout is ongoing.

Total project costs to date are $1,045.65 million, an increase of $9.61 million over last month. The total cost to date equals 66.25% of the total project budget of $1.578 billion. The Master Project Schedule forecasts a Revenue Service Date of November 2019.

The Stations Contractors' Safety Reports shows that one recordable accident took place this month. The rates of work site accident incidents by the man-hours worked, continue to be below industry standards - see tables on page 34.

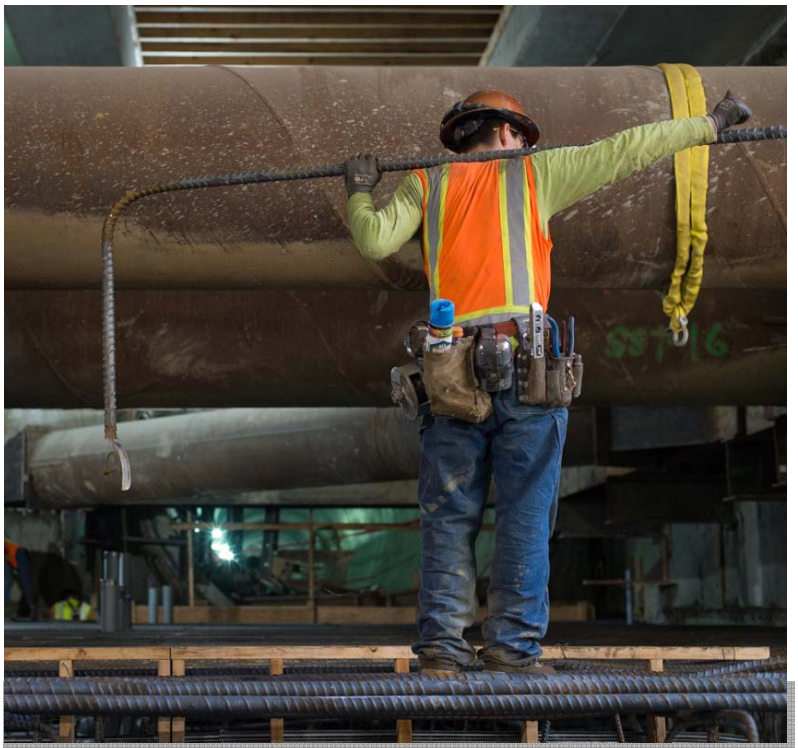
Key Milestones

Constructing the remaining sections of station box invert at YBM

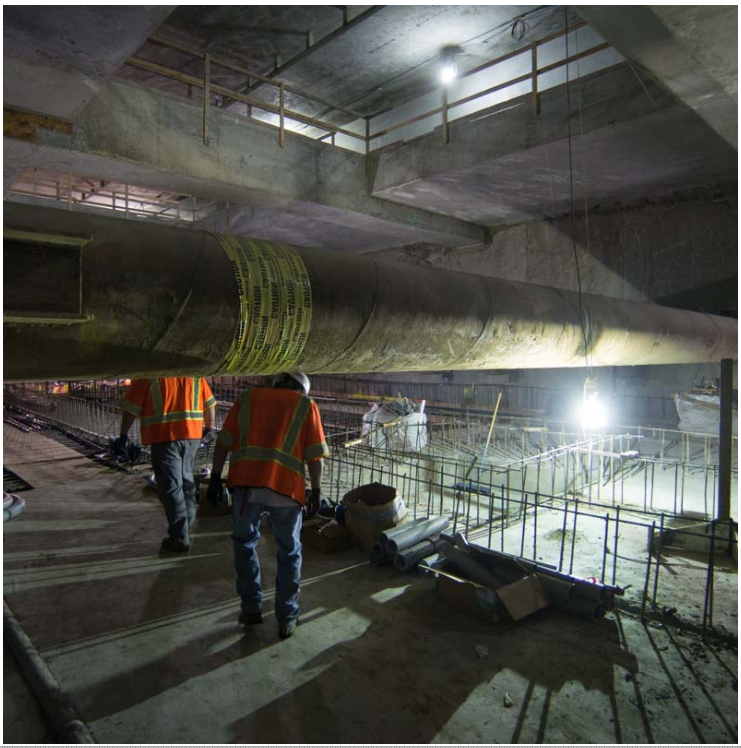


1 Workers install concrete forms and utilities

MILESTONE	DATE EXPECTED
General	
Revenue Service	November 2019
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	February 10, 2018



2 Rebar is installed to construct large sections of the invert slab



3 Concrete is poured and the next phase of construction begins

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). This total project cost is shown at the top of Report 7.1, Program Project Budget. This capital cost projection incorporates allocated and unallocated contingencies to cover the risks associated with the project completion.

Total net incurred costs for the project are $1,045.65million, a $9.61 million increase over last month. The cost to date figure reflects expenditures through FAMIS 786 Report ($1,009.70 million) plus the utilities joint trench Form B Reimbursement payment ($11.20 million), invoices currently being processed ($20.81 million) and estimates of outstanding pay requests ($4.00 million). This incurred amount equals 66.25% of the total project budget of $1.578 billion.

The current funding level to date is $1,329.79 million. This represents 84% of the total project budget.

Earned Value Analysis

In March 2017 Report, the Preliminary Earned Value Analysis reports is based on the SFMTA March Schedule Update. The Planned Value, Earned Value, Actual Cost, Percent Complete and resulting indexes as follows:

Preliminary March Earned Value

Overall Budgeted Cost:	$1,578,300,000
Planned Value:	$1,351,937,374
Earned Value:	$1,031,886,602
Actual Cost:	$1,045,653,328
Schedule Performance Index (SPI):	0.76
Cost Performance Index (CPI):	0.99
Percent Complete:	65.3%

Schedule Highlights

The Master Project Schedule (MPS) below includes progress through March 2017. The March 2017 Schedule Update submittal from Contract 1300 Contractor was not submitted due previous update corrections that needed to be completed before TPC provide the March update. The Contract 1300 schedule represented in this report is based on the SFMTA March 2017 Schedule Update.

The MPS shows a forecast Revenue Service Date of November 2019.

The controlling critical (longest) path of the MPS runs through CTS Excavation succeeded by STS Startup & Testing, Commissioning and Pre-Revenue Activities to the Baseline Finish and Revenue Service Date. See Appendix B – Longest Path. The latest schedule shows the longest path running through the Chinatown Station (CTS). Contractor is required to implement a Recovery Schedule to put the Project back on schedule.

Schedule Contingency is fully utilized on the critical path of the MPS, which is below the Minimum Schedule Contingency level of 6 months. A schedule re-evaluation will be performed, utilizing the updated Contract 1300 Schedule. Recovery options are being implemented in key areas as work proceeds. SFMTA continues to meet with Contractor to discuss all schedule concerns and comments. Excavation and Support of the Top Right Heading & Bench was completed with lower than expected levels of production and the contractor is now working on Excavation and Support Top Right and Left Step 3 Invert of the South Platform Cavern. Despite expected ground conditions as described in the GBR, TPC's mining productivity has not been as planned. TPC has continued the mitigation effort to institute two-twelve hours shifts or six days per week, in an effort to recover some lost time. Contract 1300 Schedule shows 24 days of delay in March with a new forecasted Revenue Service Date of 14 November 2019

Contract 1300 Contractor submitted twenty-eight (28) Schedule Updates from December 2014 to March 2017. SFMTA rejected fifteen (15) Schedule Updates from December 2015 to April 2016 and June 2016 to March 2017. SFMTA approved as noted the September 2015, October 2015, November 2015 and May 2016 Schedule Updates. Contractor has been directed to develop a Recovery Schedule as required by Contract and correct out-of-sequence and Retained Logic driving many of the forecast dates. Review of schedule updates as well as identifying recovery options is ongoing.

Contract 1300 - WP1253 UMS / WP1254R CTS / WP1255 YBM / WP1256 STS:

The Contractor, Tutor Perini Corporation's (TPC) baseline schedule is incorporated into the master program schedule. The preliminary SFMTA Contract 1300 March 2017 schedule is used within the March Report. The SFMTA Contract 1300 March 2017 schedule is based on the approved baseline schedule logic with adjustments made for fixing retained logic and lags. The SFMTA will continue to use the SFMTA Contract 1300 schedule update as a forecasting tool going forward until the Contract 1300 Contractor submits an acceptable schedule that addresses all of SFMTA scheduling concerns.

Workers wrangle and position a large steel I-beam just lowered into the station box from the surface.

Schedule Highlights - Continued

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

- Headhouse excavated to 16' below Temp Level 5.0 walers and struts
- Complete excavation of the Platform Caverns (North and South) of Right Side Drift and Left Side Drift Top Headings and Temp Invert for both headings
- Platform Caverns (North and South) – begin excavation of Left and Right Side Drifts invert
- Incidental street work (minor), ongoing monitoring and surveying
- Mockup for Final Waterproofing and Lining underway for the North Emergency Egress (NEE) Shaft and Tunnel

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

- North Concourse: Worked on PG&E #7 box installation on Geary in front of the Union Square Garage
- Platform Station: Completed Temp Level wales & struts; progressed Mezzanine Level except for 3 struts blocked by ramp and began Platform Strut Level
- Ellis Annex: Worked on PG&E gas line, water line installations, AT&T work, traffic signal and traffic controller box installations, and completed OCS pole and wire installation Sequence 2
- UMS North Entrance: Continued structural steel and fan level trench excavation, both approx. 80% complete

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

Sidewalk restoration in progress on west side of 4th Street south of Howard Street intersection

- Excavation to Invert level beneath Temporary Strut Level 6 is complete to south headwall in Station Box
- Placement of waterproofing and 3rd of 3 mud slabs within Station Box at Invert Level is complete
- Placement of concrete in Invert Level sections 1, 2, 3, and 6 of 6 is completed in the Station Box
- Preparation for Invert concrete placements 4 and 5 of 6 in Station Box is in progress
- Installation of metal stairs at Stair 1 and Stair 4 are in progress
- Placement of mechanical equipment curbs on Mezzanine is complete

Schedule Highlights - Continued

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

Continued 36” sewer installation at 4th/Brannan intersection

Continued MRY ductbank at 4th/Townsend intersection

Continued pavement renovation on 4th Street between King and Welsh

Continued AWSS lateral installation on 4th Street between Welsh and Freelon

Completed AWSS main installation at 4th/Bryant

Continued water line installation at 4th/Townsend

Completed 36” sewer installation at 4th/Welsh intersection

Completed 48” sewer installation at 4th/Welsh intersection

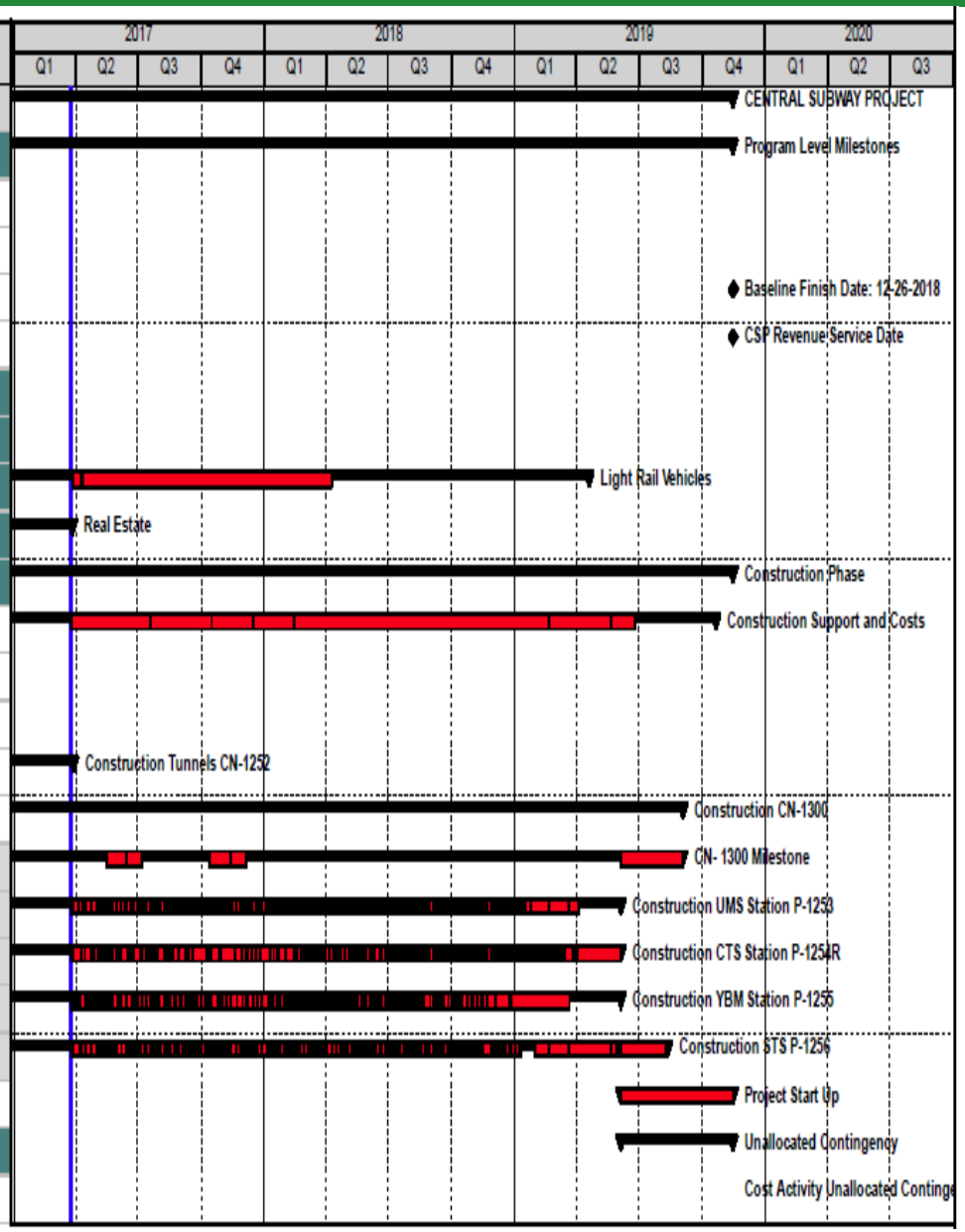
Continued invert slab construction at tunnel portal

Started track installation at tunnel portal

Started track pavement and plinth construction at tunnel portal

Master Project Schedule

Activity ID	Activity Name	Original Duration	Start	Finish
CENTRAL SUBWAY PROJECT		4323	03-Jun-03 A	14-Nov-19
Program Level Milestones		4335	03-Jun-03 A	14-Nov-19
PJD1000	Central Subway Project Start	0	03-Jun-03 A	
MS0004A	Tunnel Excavation Complete - Project Milestone #4A	0		05-Sep-14 A
MS0019	Baseline Finish Date: 12-26-2018	0		14-Nov-19*
MS0009	CSP Revenue Service Date	0		14-Nov-19*
Preliminary Engineering Phase		2661	03-Jun-03 A	07-Jan-10 A
Final Design		1811	08-Jan-10 A	17-Jun-13 A
Light Rail Vehicles		2196	15-Apr-13 A	19-Apr-19
Real Estate		3130	01-Aug-08 A	27-Mar-17
Construction Phase		2604	04-Jan-10 A	14-Nov-19
Construction Support and Costs		2843	04-Jan-10 A	21-Oct-19
Construction Utility Contract #1- MOS & Portal CN-1250		505	04-Jan-10 A	23-May-11 A
Construction Utility Contract #2 - UMS CN-1251		643	12-Jan-11 A	15-Oct-12 A
Construction Tunnels CN-1252		1470	08-Jun-11 A	28-Mar-17
Construction CN-1300		1704	03-Jun-13 A	02-Sep-19
CN- 1300 Milestone		1619	17-Jun-13 A	02-Sep-19
Construction UMS Station P-1253		1704	17-Jun-13 A	05-Jun-19
Construction CTS Station P-1254R		1556	17-Jun-13 A	05-Jun-19
Construction YBM Station P-1255		1651	10-Jun-13 A	05-Jun-19
Construction STS P-1256		1604	03-Jun-13 A	12-Aug-19
Project Start Up		163	04-Jun-19	14-Nov-19
Unallocated Contingency		115	04-Jun-19	14-Nov-19
CO1.700	Cost Activity Unallocated Contingency (LOE) - 1.7.500.99.090.00 - Contingency	115	04-Jun-19	14-Nov-19



A worker checks the air pressure on a hose inside the left side drift of the north platform cavern, while a large excavator fitted with a grinding wheel works away nearby.

Contracts & Construction

Construction Contracts In Progress

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

- Contractor: Tutor - Perini Corporation
- Amount: $846.76 million
- Contract Status: 54.73% 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 1252: Central Subway Tunneling

Contract SBE Participation (Updated Quarterly)

See Appendix E

Stations, Surface, Track and Systems

Contract 1300 Contractor: Tutor-Perini Corporation

Description of Work

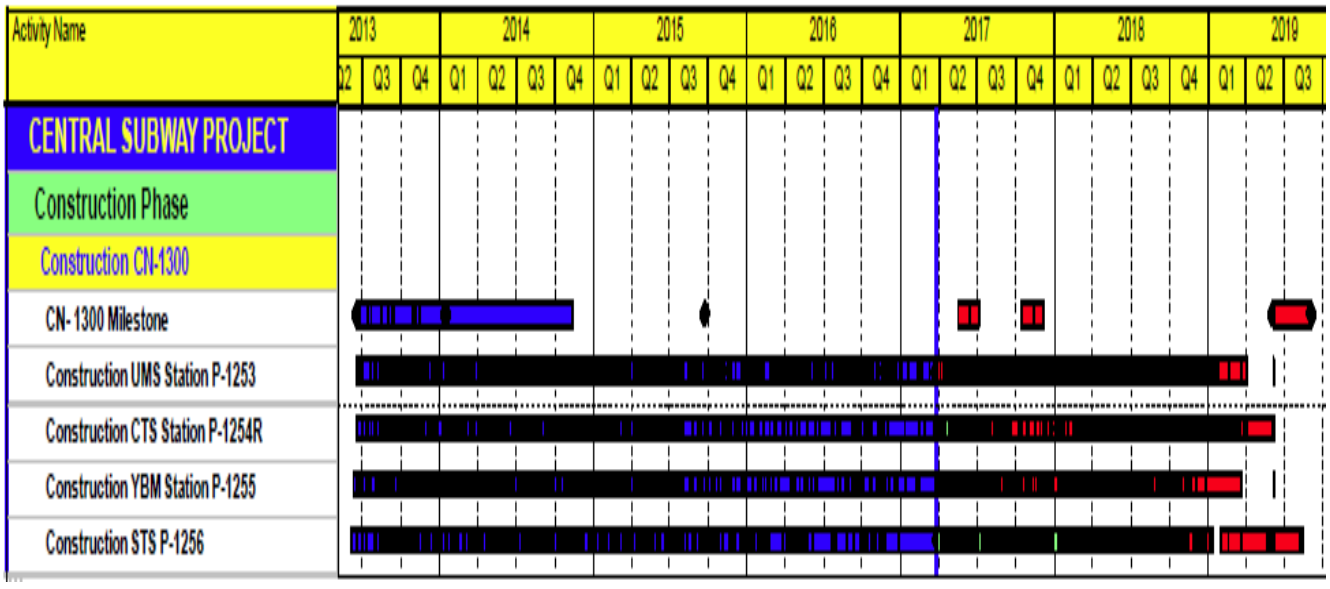
The Contract 1300 scope is to construct the Central Subway's three subway stations, one surface station, construct the 2,000 feet of surface track, and install track and operating systems throughout the new alignment. The separate station and systems work packages are presented in the following pages.

Work includes station finishes, AC and DC 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:	**$7,085,814**
Current Contract Value :	**$846,762,214**

Budget/Expenditures▲	
Current Budget	**$879,676,400**
Other Project Offset Credits	**$3,123,097**
Expenditures to Date	**$472,931,531**

1300 Summary Schedule



Chinatown Station

Contract 1300 - Work Package 1254R

Current Work Status

- Head house- excavated to 16’ below Temp Level 5.0 walers and struts
- Complete excavation of the Platform Caverns (North and South) of Right Side Drift and Left Side Drift Top Headings and Temp Invert for both headings
- Platform Caverns (North and South) – begin excavation of Left and Right Side Drifts invert
- Incidental street work (minor), ongoing monitoring and surveying
- Mockup for Final Waterproofing and Lining underway for the North Emergency Egress (NEE) Shaft and Tunnel

Work Expected Next Month

- Platform Caverns (North and South) – continue with Left and Right Side Drift inverts
- 4’ – wide walkway along Chinese United Methodist Church on Washington Street to be completed

Description of Work

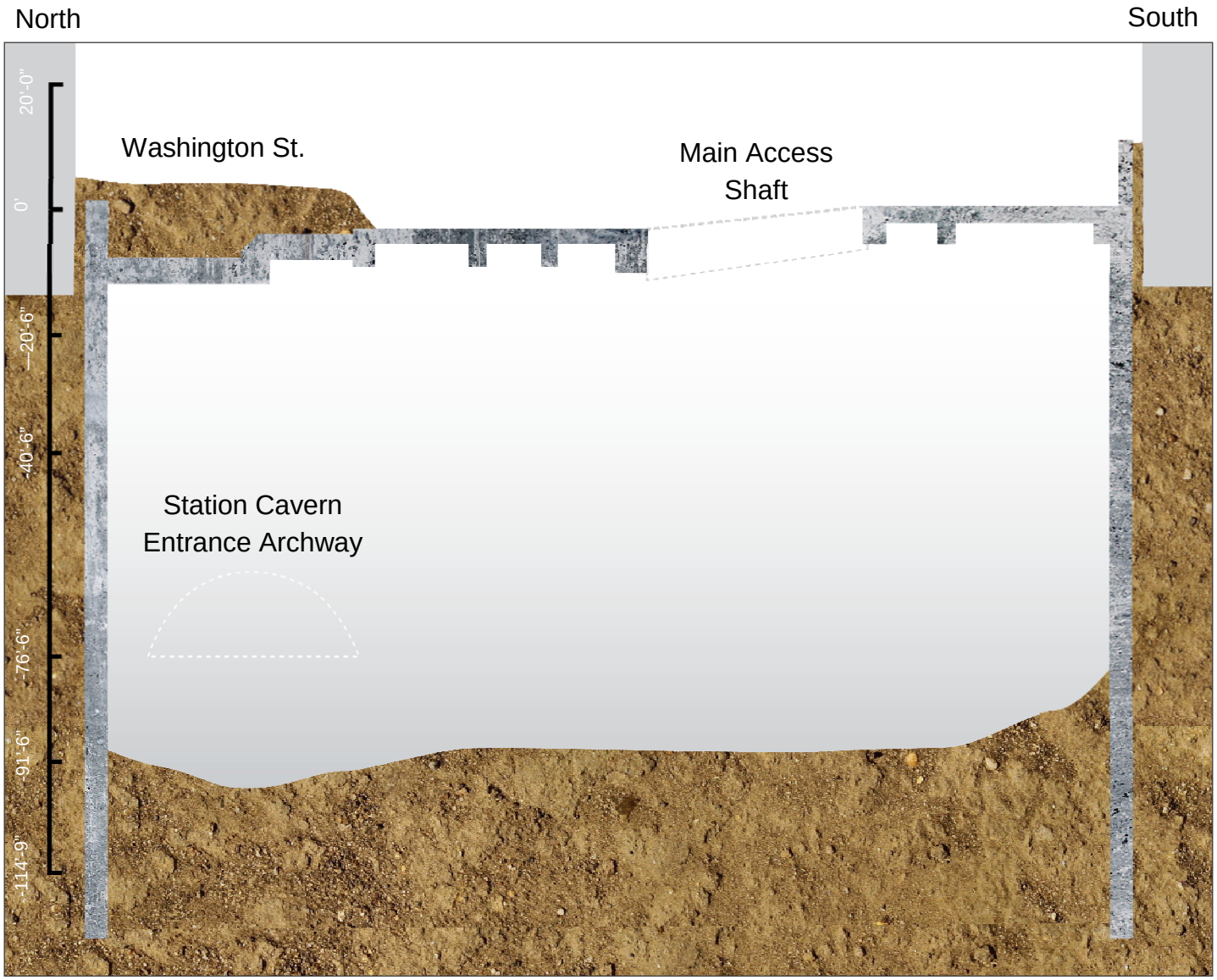
This Work Package is to construct one subway station. Includes station finishes, AC and DC Traction Power substations elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, slurry wall top-down construction, settlement monitoring, building protection, PA,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

Three Month Look Ahead

- Head house: Provide logistic support area for tunnel excavation
- North and South Platform Cavern excavation will be ongoing

CTS—continued

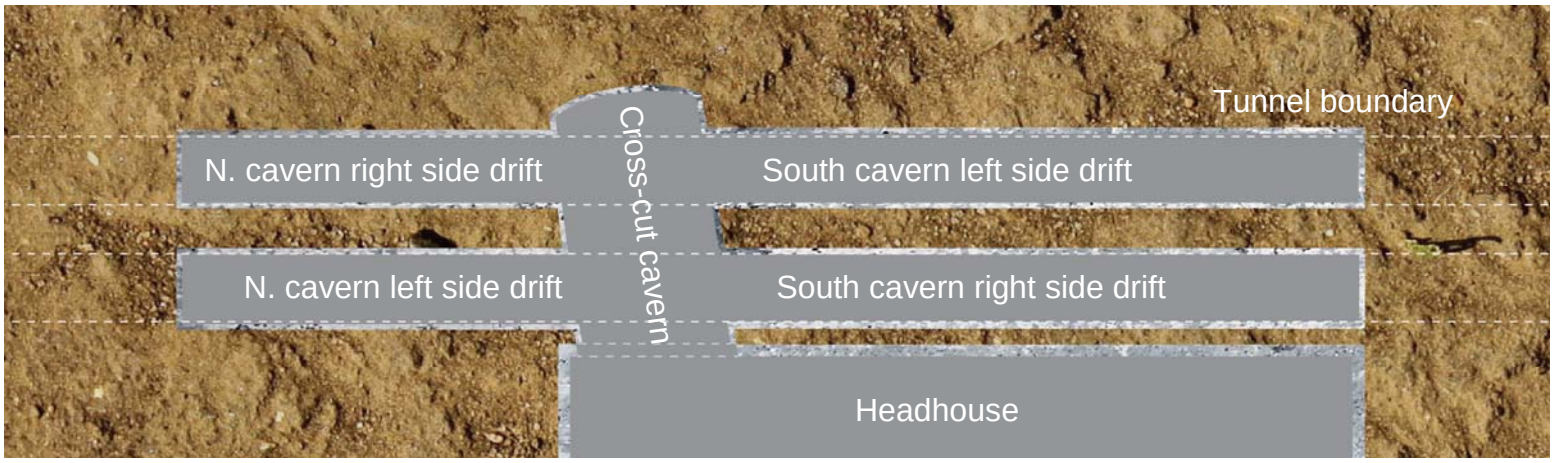
Station Excavation and Construction Progress Section

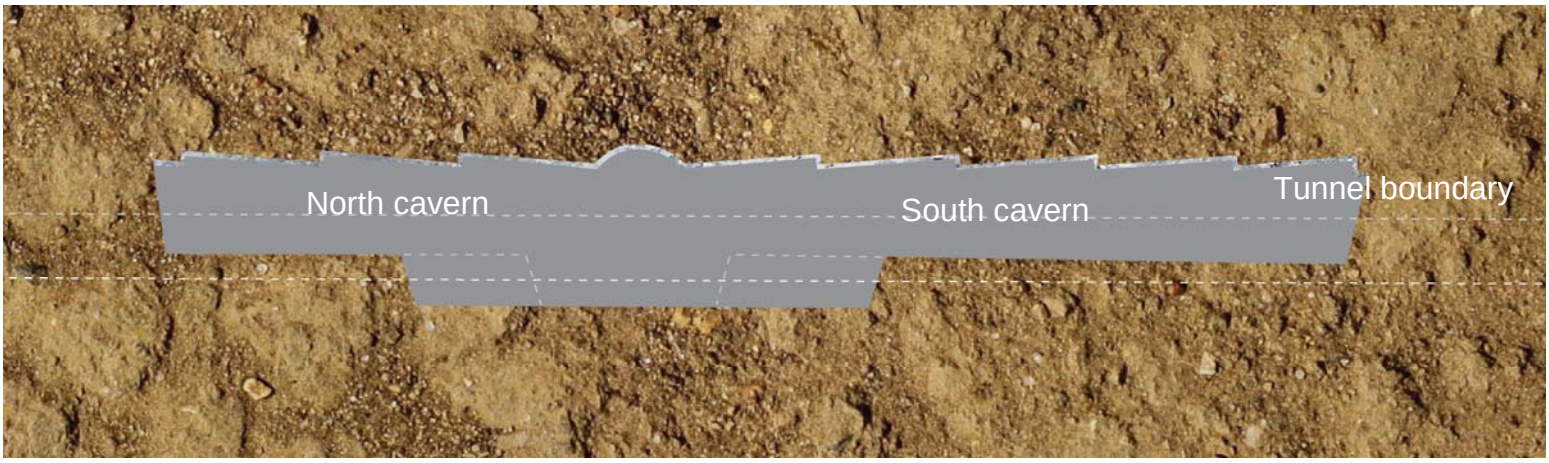


CTS—continued

Station Cavern Excavation Progress Plan and Section

North South

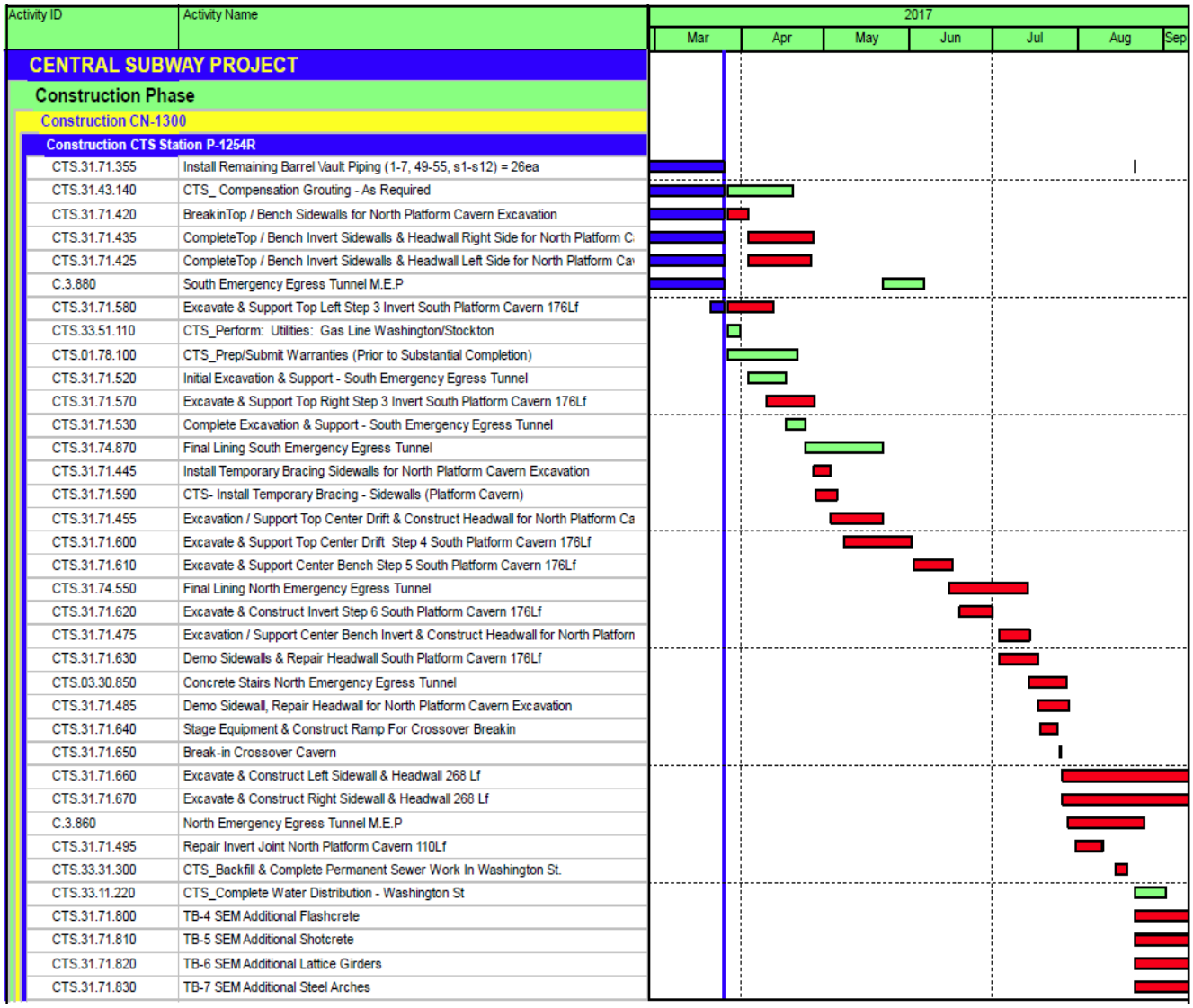




Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$247,567,810**
Modifications to Date:	**$2,964,460**
Current Contract Value:	**$250,532,270**

Budget/Expenditures	
Current Budget	**$257,567,810**
Other Project Offset Credits	**$75,000**
Expenditures to Date	**$131,221,079**

CTS Three Month Schedule



Schedule: Contract 1300 March 2017 Update

Union Square/Market Street Station

Contract 1300 Work Package1253

Description of Work

This Work Package is to construct one subway station. Includes 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.

Current Status This Month

- North Concourse: Worked on PG&E #7 box installation on Geary in front of the Union Square Garage
- Platform Station: Completed Temp Level wales & struts; progressed Mezzanine Level except for 3 struts blocked by ramp and began Platform Strut Level.
- Ellis Annex: Worked on PG&E gas line, water line installations, AT&T work, traffic signal and traffic controller box installations, and completed OCS pole and wire installation Sequence 2.
- UMS North Entrance: Continued structural steel and fan level trench excavation, both approximately 80% complete.

Work Expected Next Month

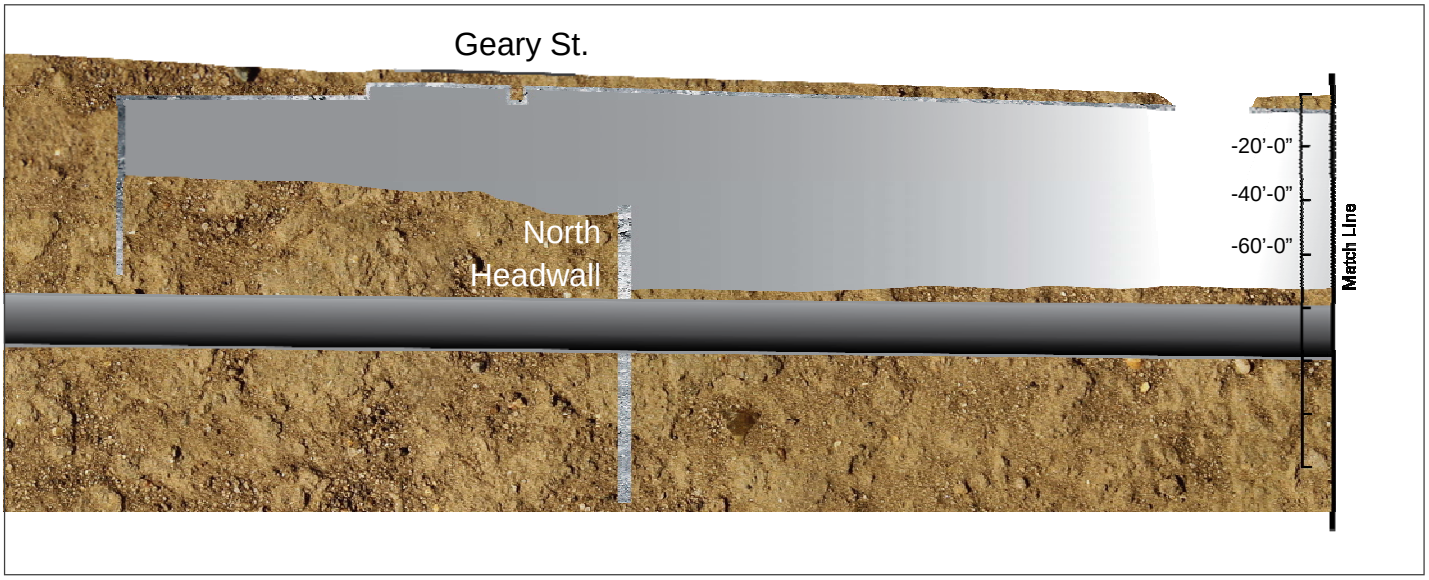
- Nighttime lane closures expected for utility work. Ellis Street expected to have nighttime intermittent closures
- North Concourse: Continue to install utilities. Excavation and structural steel deliveries. Installation of soil nail walls continues
- Platform Station: Continue to excavate and install structural & temporary steel support system
- South Concourse: Platform Station: Continue to excavate and install structural & temporary steel support system
- Ellis Annex: Complete backfilling and restoration of Ellis Street and utility installation. Begin permanent roadway restoration
- UMS North Entrance – Complete fan level trench support of excavation

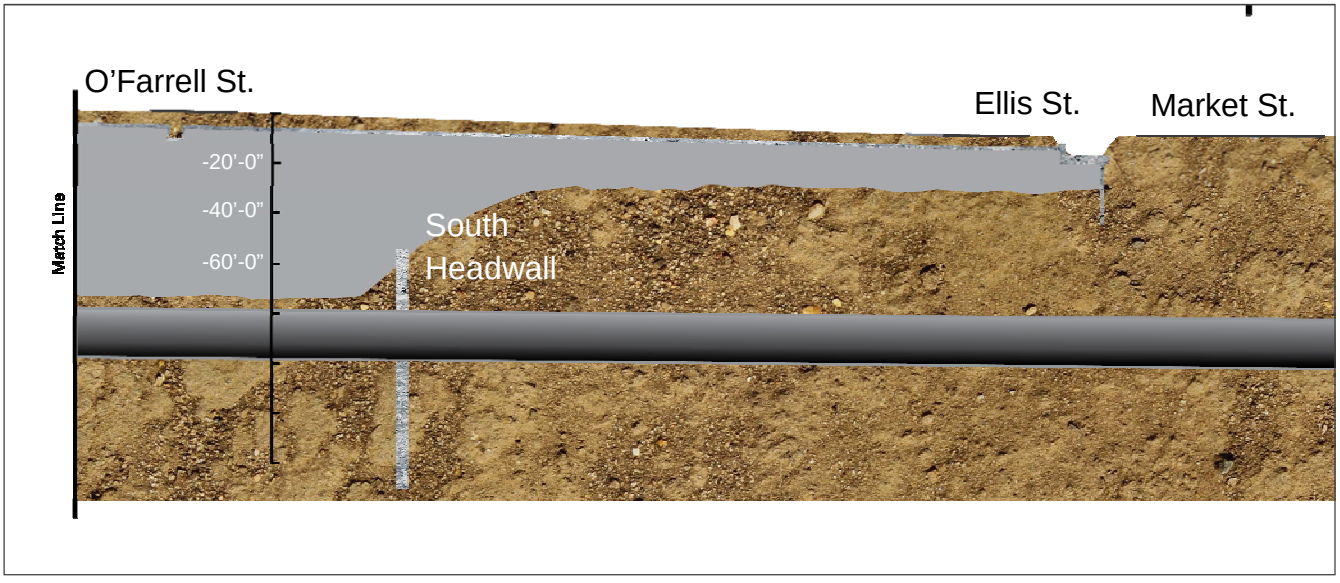
Three Month Look Ahead

- Platform Station: Continue to install utilities and restore street; dewatering; install permanent& temporary struts and wales; excavate bench; install studs, mesh, drain pipe & shotcrete pile walls
- Access Shaft: bottom out access shaft excavation. Install invert slab
- Access Shaft: bottom out access shaft excavation. Install invert slab
- Union Square Garage – Complete testing and commissioning of new fire and life safety devices within garage and open new ramp for public use

Station Excavation and Construction Progress Section

North South

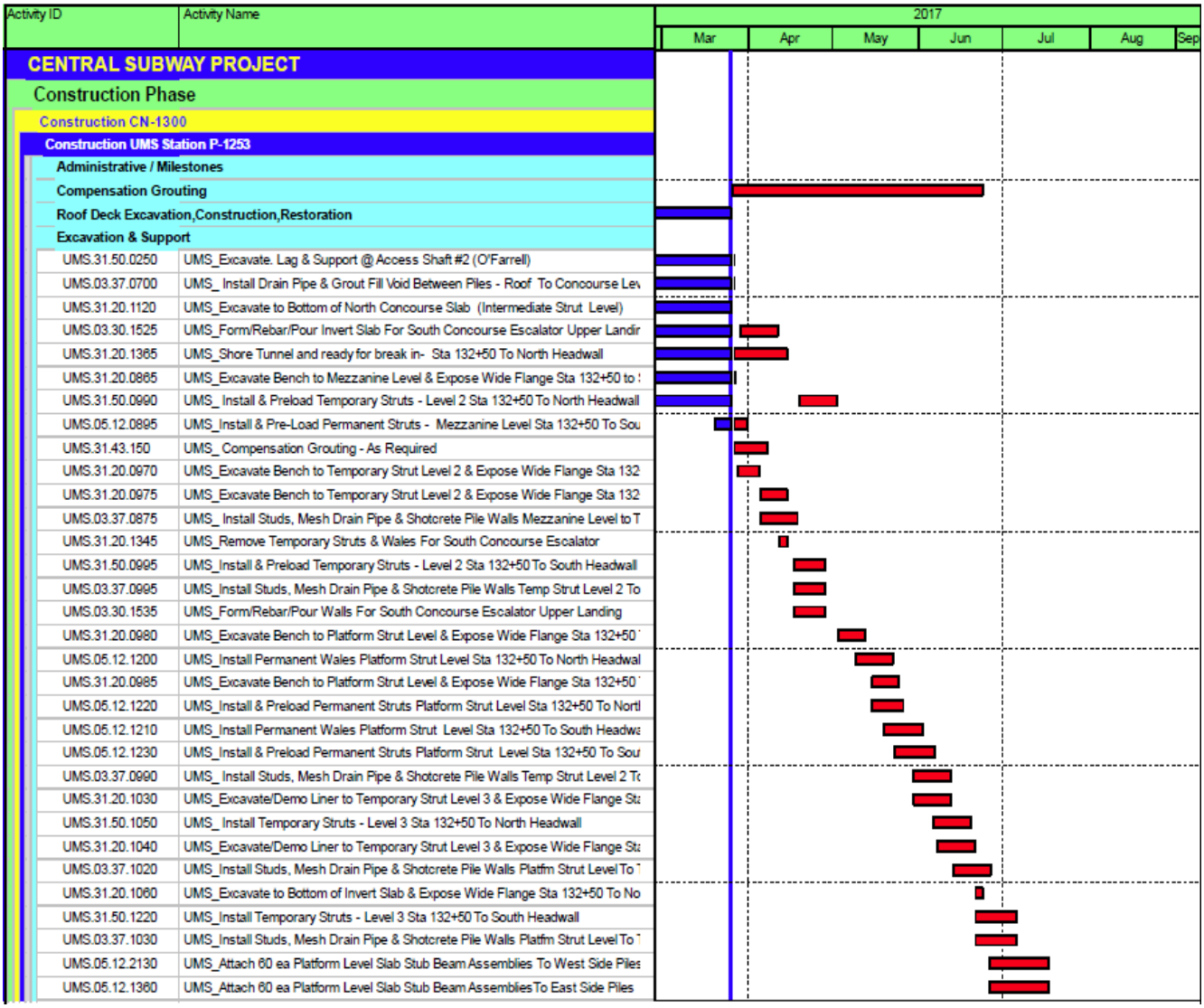




Contract Details	
Contract Awarded:	**May 21, 2013**
Notice to Proceed:	**June 17, 2013**
Substantial Completion:	**February 10, 2018**
Contract Award Value:	**$294,030,590**
Modifications to Date:	**$2,188,335**
Current Contract Value:	**$296,218,925**

Budget/Expenditures ▲	
Current Budget	**$314,030,590**
Expenditures to Date	**$189,582,582**

UMS Three Month Schedule



Schedule: Contract 1300 March 2017 Update

Yerba Buena/Moscone Station

Contract 1300 - Work Package 1255

Description of Work

This Work Package is to construct one subway station. Includes 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.

Current Status

- Sidewalk restoration in progress on west side of 4th Street south of Howard Street intersection
- Excavation to Invert level beneath Temporary Strut Level 6 is complete to south headwall in Station Box
- Placement of waterproofing and 3rd of 3 mud slabs within Station Box at Invert Level is complete
- Placement of concrete in Invert Level sections 1, 2, 3, and 6 of 6 is completed in the Station Box
- Preparation for Invert concrete placements 4 and 5 of 6 in Station Box is in progress
- Installation of metal stairs at Stair 1 and Stair 4 are in progress
- Placement of mechanical equipment curbs on Mezzanine is complete

Work Expected Next Month

- Continue interior finishes on Mezzanine & Concourse Levels
- Complete excavation to Invert Level beneath Level 6 Temporary Struts in Headhouse
- Continue installation of mud slab, waterproofing, and protective concrete for Invert slab sections 7 through 9 within Headhouse
- Continue placement of Invert Level concrete slab sections within Station Box
- Begin shoring for installation of Stair 4 hatchway on adjacent to Folsom Street at south end of Headhouse
- Complete sidewalk restoration on west side of 4th Street south of Howard Street intersection
- Switch traffic and begin mobilizing for 36" force main sewer installation within intersection of 4th at Howard

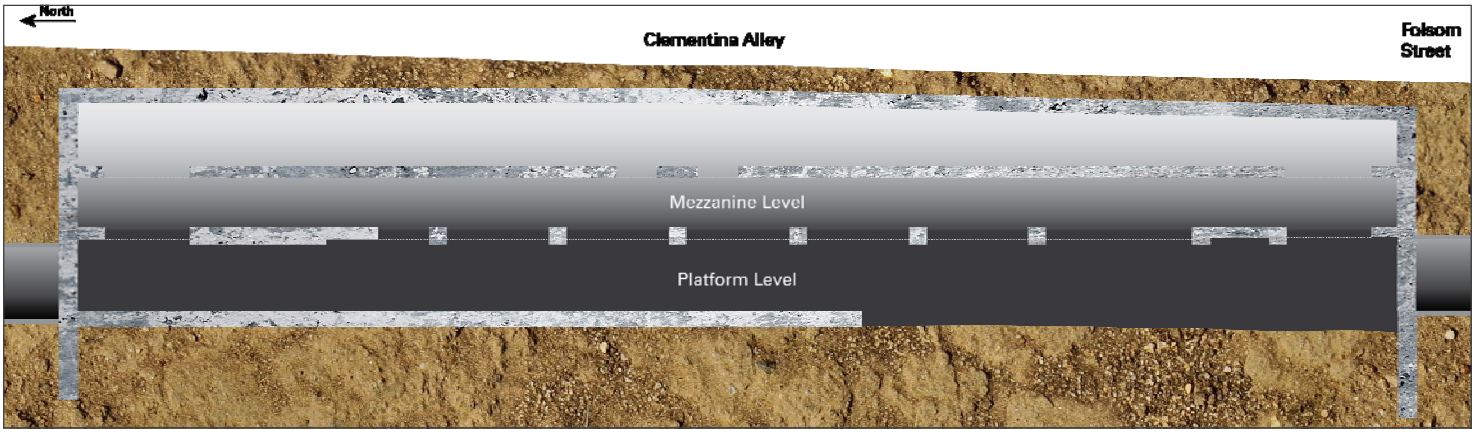
Three Month Look Ahead

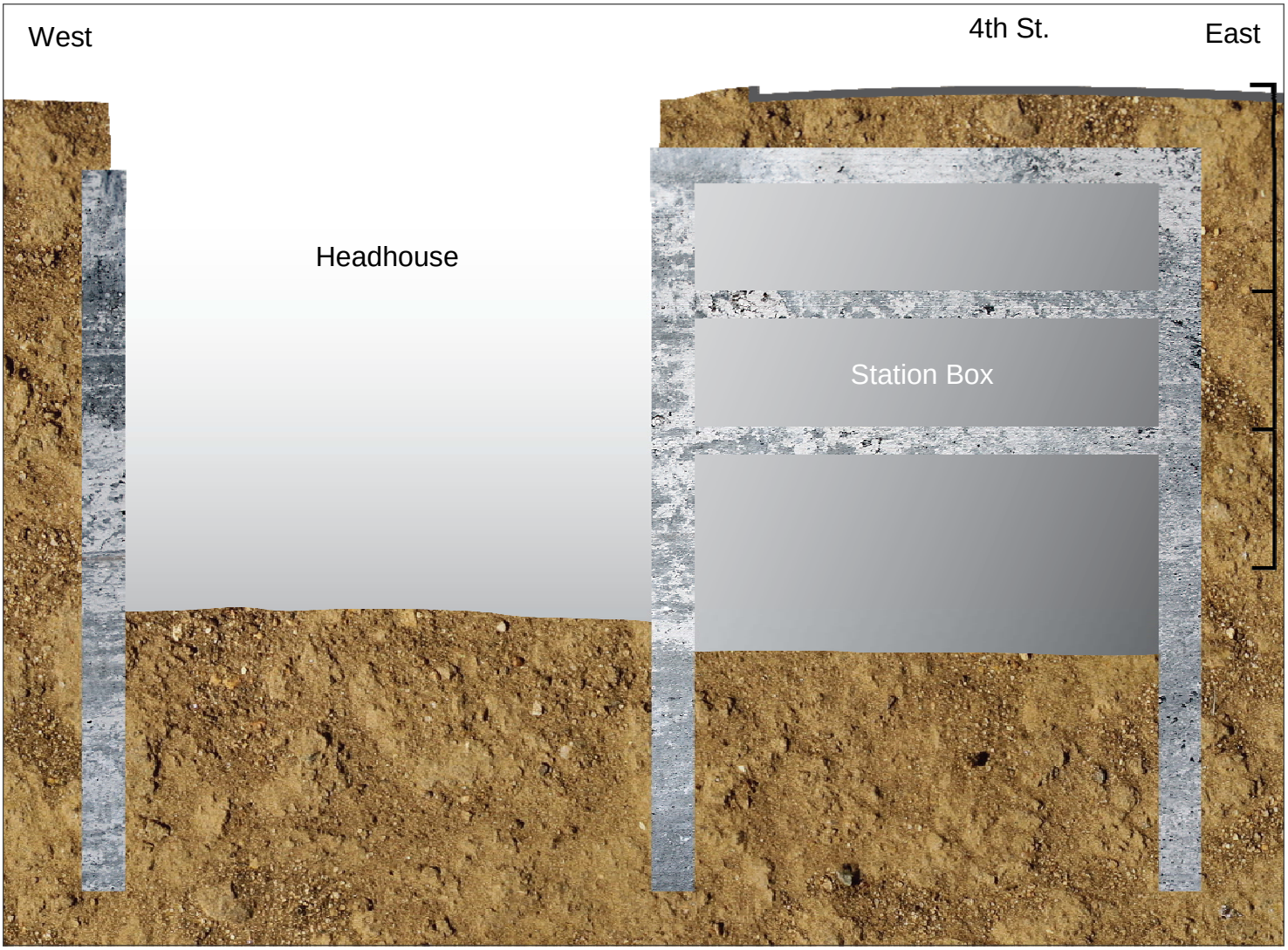
- Continue to place Invert slab rebar and concrete within Station and Headhouse and prepare to construct Concourse and Mezzanine slabs from bottom up within Headhouse
- Continue interior finishes on Mezzanine & Concourse Levels within Station Box
- Continue placement of stairs within Station and Headhouse
- Begin installation of station power electrical vaults on Folsom Street
- Switch traffic handling and resume installation of 36" force main sewer within 4th Street and Howard Street intersection

YBM - continued

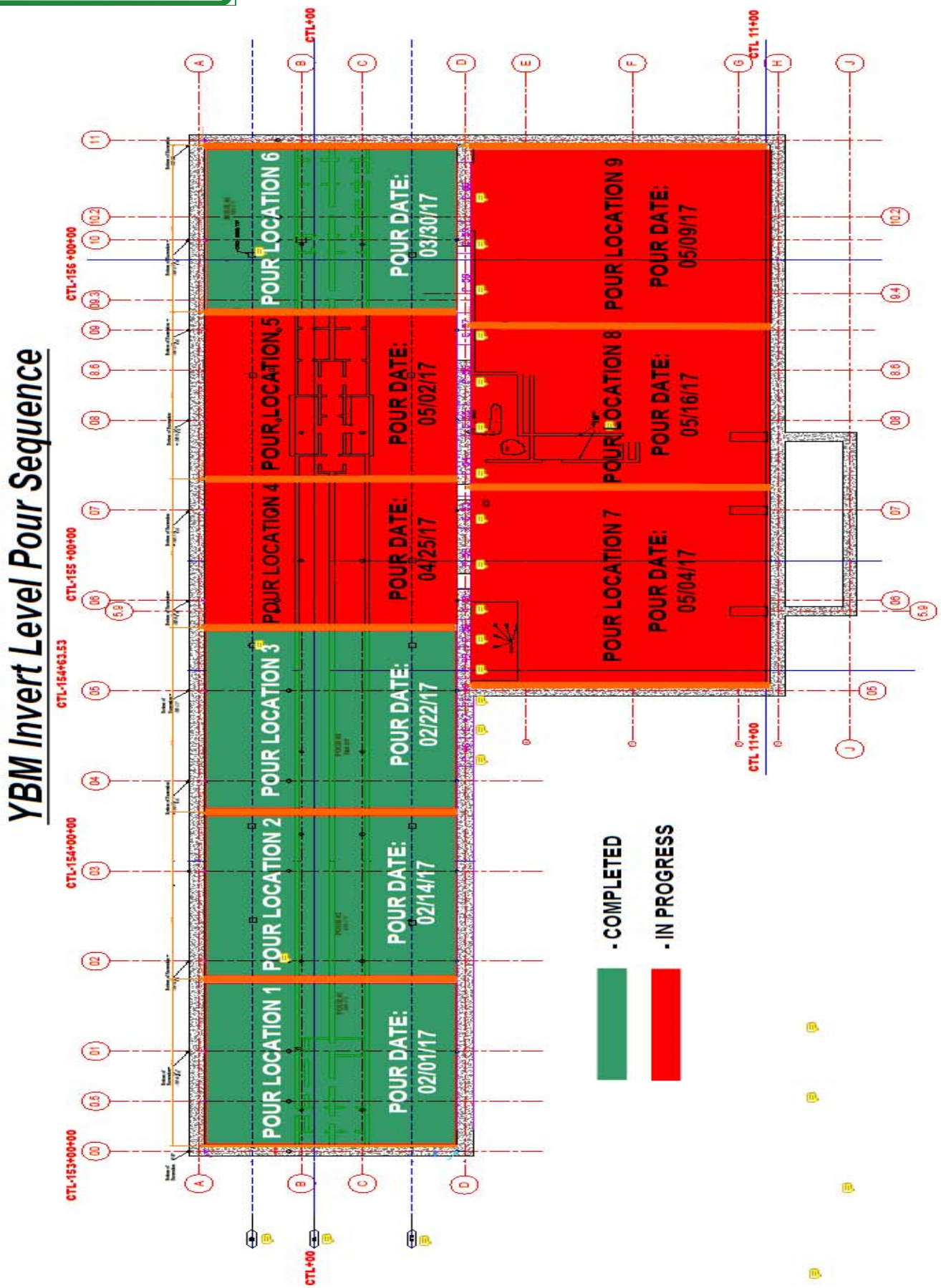
Station Excavation and Construction Progress Section

North South





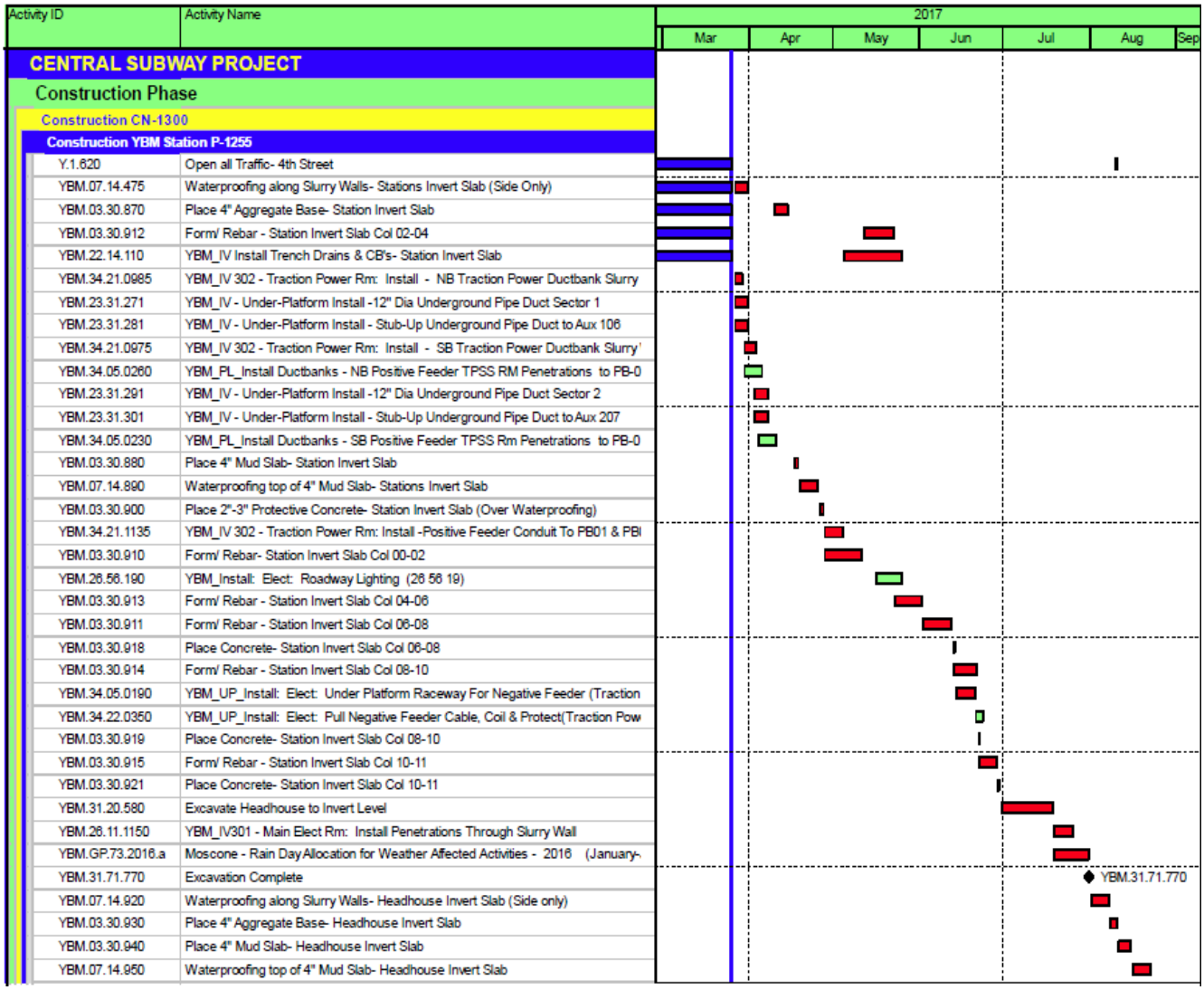
YBM - continued



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:	$57,052
Current Contract Value:	$158,146,052

Budget/Expenditures ▲	
Current Budget	$163,089,000
Other Project Offset Credits	$415,331
Expenditures to Date	$97,937,943

YBM Three Month Schedule



Schedule: Contract 1300 March 2017 Update

Systems, Trackwork, & Surface Station

Contract 1300 - Work Package 1256

Description of Work

This Work Package is to construct one Surface Station. Includes light rail track and systems, track invert, track safety walkways; 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.

Current Status

- Continued 36” sewer installation at 4th/ Brannan intersection
- Continued MRY ductbank at 4th/Townsend intersection
- Continued pavement renovation on 4th Street between King and Welsh
- Continued AWSS lateral installation on 4th Street between Welsh and Freelon
- Completed AWSS main installation at 4th/ Bryant
- Continued water line installation at 4th/ Townsend
- Completed 36” sewer installation at 4th/Welsh intersection
- Completed 48” sewer installation at 4th/Welsh intersection
- Continued invert slab construction at tunnel portal
- Started track installation at tunnel portal
- Started track pavement and plinth construction at tunnel portal

Work Expected Next Month

- Continued 48” sewer installation
- Continued 36” sewer installation
- Continued MRY ductbank installation
- Continued AWSS installation
- Continued water line installation
- Continued pavement renovation
- Continued invert slab construction at tunnel portal

- Continued installation at tunnel portal
- Continued pavement and plinth construction at tunnel portal

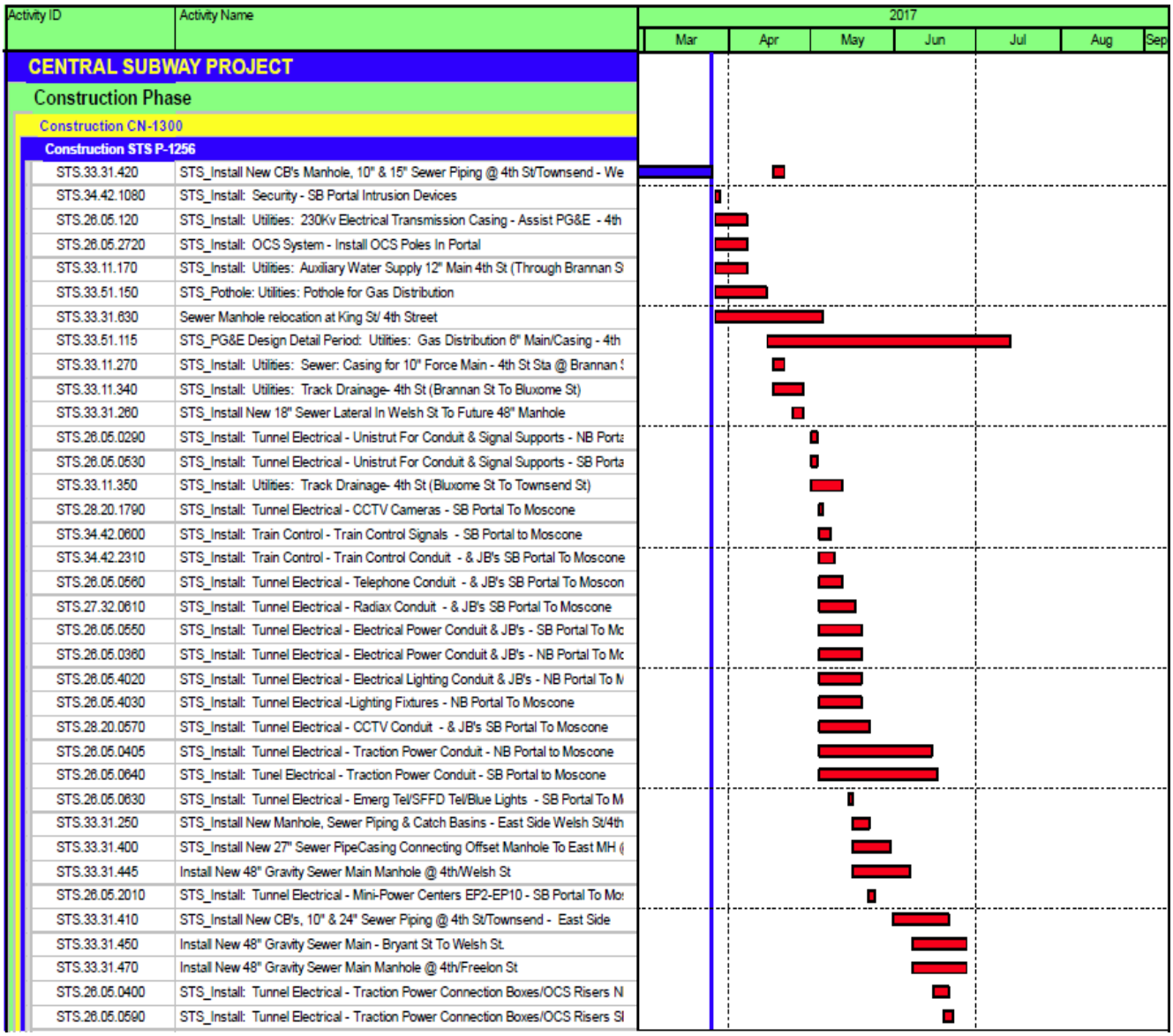
Three Month Look Ahead

- Continued waterline installation
- Continued AWSS installation
- Continued MRY ductbank installation
- Continued 36” sewer force main installation
- Continued 48” sewer force main installation
- Continued OCS pole installation
- Continued invert slab construction at tunnel portal
- Continued permanent pavement renovation
- Continued track installation
- Continued track pavement and plinth construction at tunnel portal

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:	**$1,875,966**
Current Contract Value:	**$141,864,966**

Budget/Expenditures	
Current Budget	**$144,989,000**
Other Project Offset Credits	**$2,632,766**
Expenditures to Date	**$51,141,830**

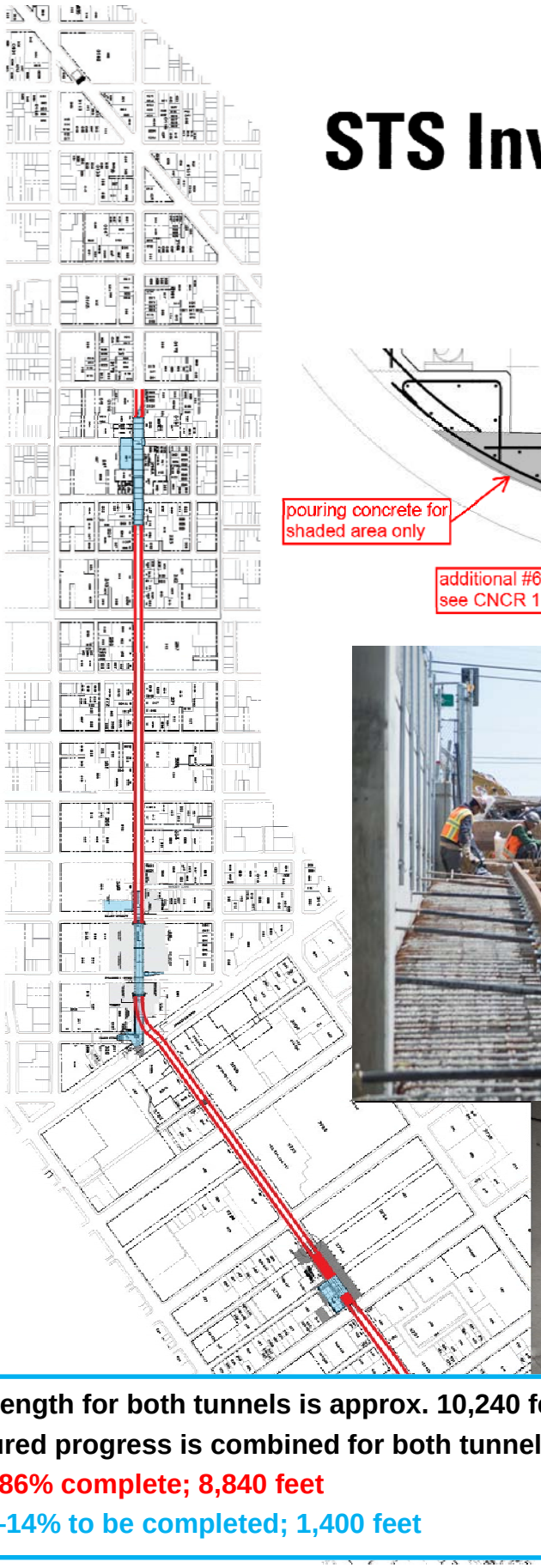
Systems, Track and Surface Station Three Month Schedule

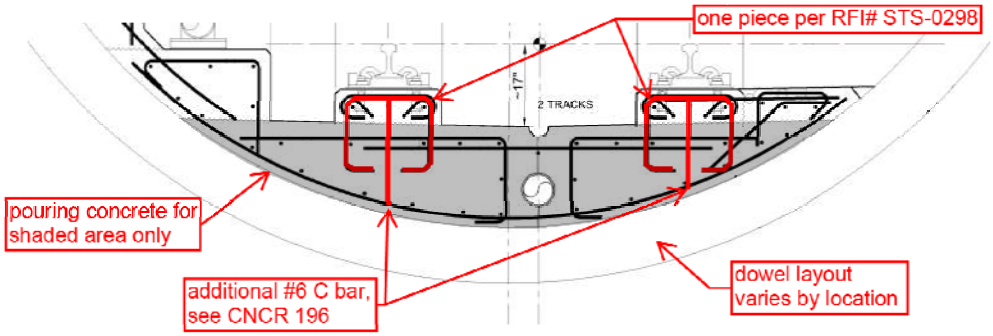


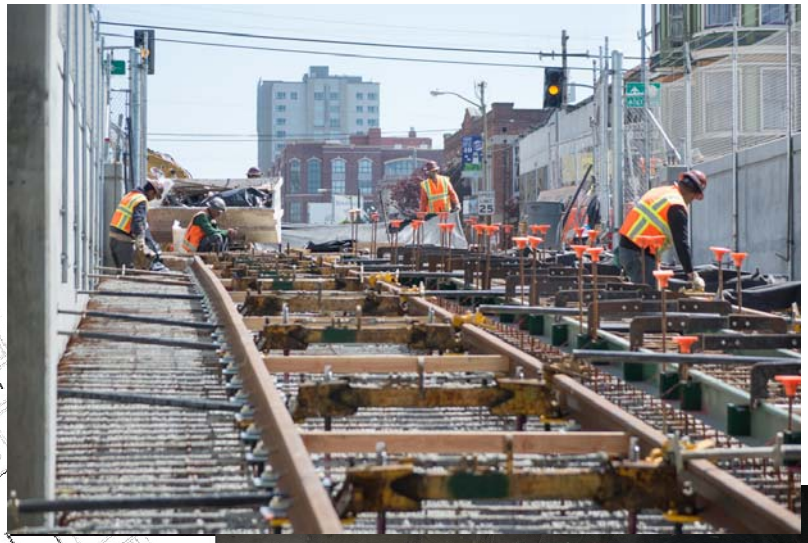
Schedule: Contract 1300 March 2017 Update

STS—continued

STS Invert Slab Progress







Total length for both tunnels is approx. 10,240 feet.
Measured progress is combined for both tunnels.
Red—86% complete; 8,840 feet
Blue—14% to be completed; 1,400 feet

Program Components

Community Outreach

Outreach public information, events and presentations for March 2017 include:

- Continued noise mitigation meetings with Tutor Perini and community stakeholders
- Ongoing outreach to merchants and residents
- Conducted meetings and face-to-face visits with various merchant stakeholders along the alignment
- Preparation and dissemination of construction notices
- Produced quarterly construction update video and other multimedia content
- Responded to constituent complaints

Outreach in Support of Mitigation and Monitoring

Team members participated in weekly progress to address neighborhood concerns

Outreach and communication efforts continue in Chinatown, Union Square, and SOMA

Weekly photo documentation of project work and editing

Weekly construction update emails sent to list of approximately 700 residents and stake-holders

Media Coverage

Central Subway Media Coverage			
Date	Title (with link to story)	Source	Reporter/Writer
3/16/2017	Last Legal Obstacle for Streetcar Loop in SF's Dogpatch Falls	SFGate	Bob Egelko
3/17/2017	With State Supreme Court Decision, Dogpatch Streetcar Loop Clears Last Legal Hurdle	hoodline	Shane Downing
3/22/2017	Dogpatch Muni Legal Battle Over	San Francisco News	William Sandlund

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 prime construction contractor and their subcontractors.

Stations and Systems Contract CN1300 Quality Assurance Monitoring – On Going/As Reported Previously

- UMS structural steel installation – Continued Inspection/acceptance/documentation by Smith Emery CWI's of all welds associated with the ongoing Installation of some structural and mostly excavation support steel
- TPC QC Daily Inspection Reports posted to CM13 which includes TPC's Specialty Subcontractor's QC checklists and associated documentation and Smith Emery Inspection Reports; TPC's Subcontractor that provides laboratory and Inspection Services – including Special Inspections required for the City of San Francisco's Department of Building Inspection (DBI) for all permitted work
- Preparatory and Initial Phase Meetings continue as scheduled. Additional Initial Phase Meetings are conducted at the request of the SFMTA or TPC QC as circumstances demand or as unanticipated issues occur
- Sequential Excavation Method (SEM) Meetings (daily at 8:00 am at the CTS site) and Instrumentation/Monitoring and Construction Management Task Force (CMTF) Meetings (Tuesdays and Fridays; changed from Thursday to better align with SEM convergence and pressure cell readings that are taken Monday and Thursday) at 9:00 am
- Bi-Weekly Quality Task Force (QTF) Meetings – ongoing dialog regarding; planning for upcoming Work, identification and mitigation of in-process potentially unsatisfactory work, generation of CNCRs, welding inspection documentation and other items related to TPC's QC efforts in implementing TPC's approved Quality Control Program (QCP)
- Weekly Work Package Progress Meetings for STS, YBM, UMS and CTS
- Monthly Project Risk Mitigation, Safety and Security, MEP Progress and weekly CMB Meetings as scheduling constraints allow

<u>Document comment and review</u>:

- Contractor's submittals, e.g., review of welding, concrete (including shotcrete) and other Quality related submittals/comments as requested to support the RE's and CM, and RFIs related to quality and welding

QA Staff continues random/spot checks of the 1300 Contractor's Field Testing lab results; the now few items requiring further action/investigation (missing or inconsistent data, compressive strength results that appear to have a very broad range of values, failure to adequately identify the location where tests/specimens are taken, non-identified low test results and such) are brought to the attention of the Contractor. Discussions continue regarding flexural specimen VS compressive strength specimens for on-gong production shotcrete panels at CTS

- Numerous meetings associated with how TPC at UMS is documenting on-going work and acceptance of work (primarily as a result of the RE's processing of pay requests predicated upon TPC QC's SE CWI's Daily Inspection Reports (DIRs) have resulted in the continuing challenging task of the development of a welding inspection log that will eventually clearly indicated exactly

what welds/connection have been included in the Monthly Pay Application as well as documenting that all welds have been performed to and accepted as required by our Contract Documents and the Welding Code (D1.1). The aforementioned continues

- Also associated with UMS steel installation is the on-going issue of TPC QC providing complete CWI DIRs in a timely manner to CM13. Currently, TPC QC is in the process of improving upon the approximately now 1 week lag of CWI DIRs being posted to CM13
- Contractor Non Conformance Reports (CNCR) Status as indicated in the TPC QC CNCR Log:
    - ◊ 9 (-11 from last month) CNCRs are currently posted to the CNCR Log as INITIAL entries (C1300 is required to generate a CNCR within 24 hours of becoming aware of what appears to be non-conforming work).
    - ◊ 10 (-16 from last month) CNCRs are currently posted to the CNCR Log as DISPOSITIONED and are being reviewed by associated SFMTA RE to verify that the Contractor's proposed disposition is appropriate.)
    - ◊ 35 (+23 from last month) CNCRs are currently posted to the CNCR Log as DISPOSITIONED (NOT ACCEPTABLE) and have been returned to the Contractor because the RE's review of the Contractor's proposed disposition determined that the proposed disposition is not appropriate and must be revised).
    - ◊ 22 (-4 from last month) CNCRs are currently posted to the CNCR Log as APPROVED because the suggested REPAIR dispositions have been approved and the CNCRs will remain open until the approved REPAIR procedure is performed.
    - ◊ 163 (+ 14 from last month) CNCRs are currently posted to the CNCR Log as CLOSED.
    - ◊ 37 (+1 from last month) CNCRs are currently posted to the CNCR Log as VOIDED (subsequent evaluation of the INITIAL CNCRs determined that a CNCR is not warranted)
    - ◊ 290 (+7 from last month) CNCRs are currently posted to the CNCR Log

QA Issues:

- None to report for this period

QA Concerns:

- As is typical to similar Projects, work performed prior to receipt of approval status of required submittals/RIFs with/without knowledge of QC remains a potential item(s) of concern
- TPC's Record Document (as-built) effort refinement, to include CNCRs and a timely recording of work performed that is different than what is required by the latest approved Conformed Design Drawings. Follow-up Quality Assurance Surveillance QAS076 was conducted; posted to CM13 and provided to TPC for their action. This follow-up Surveillance documents, as had previously been identified in QAS072 (provided to TPC for their corrective action - January of 2016) some lack of conformance to the requirements of the *Record Document* Specification Section 01 78 39 (As-Builts)
- Revision of and adherence to approved Required Excavation Support System (RESS) sheets at CTS, as expressed by the RE/DSP's Senior Engineers, at the daily SEM Meetings. Note that the required changes to and approval thereof of RESS sheets, prior to the start of effected Work, continues to be implemented in a most acceptable manner

- The effort associated with the UMS RE and RE Staff ensuring that only acceptable work is included in the RE's approval of the Contractor's monthly invoice. The primary issue being TPC's reluctance to provide associated documentation of TPC's QC acceptance of the work included in each monthly payment invoice

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
- TPC's response to Quality Assurance Audit Report QAA 026, Implementation of TPC's Quality Control Program (QCP) was received and as resources allow, is currently under review with some additional documentation/information required prior to audit closeout; specifically associated with documentation related to mechanical couplers. This audit will be closed-out as resources allow
- Conversation with SFDBI Electrical Inspection Department has begun to develop the understanding of their role for CSP. All electrical subcontractors to the C1300 General Contractor (TPC) will be required to keep a "book" that will provide the media for the DBI Electrical Inspector to document their visits and the results of their inspections. SFDBI Electrical will be involved with electrical Work physically outside of the permitted area when the Work is "connected" to the Work on private property. TPC's Superintendent at UMS is to coordinate DBI permitted Work at YBM – in particular concrete placements for invert placements 7-9

New sections of the roadway are being restored on the east side of 4th between Brannan and Bluxome.

Risk Management

Risk Mitigation Management Meeting No. 92 was held on March 2, 2017. The Risk Assessment Committee reviewed and discussed the Projects Construction Risks with ratings above 6; and Active Construction Risks rated below 6.

During this month's meeting, one (1) new risk which was introduced at February's meeting received a risk rating. In addition, the Committee also established strategies for mitigating the potential of unforeseen issues and conditions.

Currently the Program is tracking thirty-five (35) remaining construction risks and one (1) remaining requirement risk on the Project's Risk Register. With the use of an individual risk mitigation status sheet, monthly updates are provided by the Risk owner to demonstrate the assigned mitigation strategy is being implemented or suggest recommendations to alleviate issues caused by unforeseen conditions. The status of these risk items will continue to be closely monitored by the Program.

Top Ten Risk

Risk #	Risk Description	Risk Owner	Risk Rating	Contract
232	Behind Schedule - Unable to Recover from Delay to 1300 Contract	ES	20	STA
240	Unresolved Assignment of Schedule Delay Responsibility (may lead to increase cost)	ES	8	STA
234	Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence	DJ	7	CTS
233	Acceptance of Shotcrete Substitution - leads to final product being inferior in performance and availability of shotcrete needed for the permanent liner.	DJ	6	STA
52	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	DJ	6	CTS
238	Quality Program is ineffective in processing the nonconformance items causing schedule impacts	ML	6	STA
205	Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	ES	6	STA
229	CN1300 System Acceptance Testing	AH	6	GEN
230	SFMTA Commissioning Coordination (inaccurate time for coordination or participation from Muni Ops)	AH	6	GEN
237	Non-Conforming work is not identified by TPC's Quality Control Program	ML	6	STA

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 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.

Project Management/Construction Management (PMCM) Team

Safety bulletin boards have subjects covering the complacency and daily job briefings.

Safety Summary for the 1300 Stations Systems Track Construction Package

During the month of March, TPC had two first aid or lost time incidents.

Table 1300 Stations Construction Safety Record

Table 1300 below summarizes the Month to Date and Project to Date for the Stations, Systems and Track Construction contractor and subcontractors.

Next Month Look Ahead

1300 Contract

1. The CTS station now has very good air flow which is monitored at beginning of shift and half way through the shift. We will be checking documentation during the month.

2. At the UMS station, work continues underground with excavation. TPC is planning on breaking through the segments and into the tunnels at this site. We will monitor this activity along with how the ventilation system will be set up.

3. At the YBM station, invert pours have been completed inside of the station. We will now be watching the head house work.

4. At the STS station, work continues on the utility relocations. We will be closely watching the welding process being performed at the portal opening.

Program Safety & Security - continued

Project Safety Record - Contract 1300

Through Month End -Mar 2017

SAFETY GOALS

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

JOB TO DATE	Tutor	Subs	Total Project	Rate*
OSHA Recordable Accidents	5	1	**6**	0.58
Job Transfer or Restricted Duty Cases	0	0	**0**	0.00
Lost Time Cases	1	0	**1**	0.10
Total Project Incidents	6	1	**7**	0.68
Man Hours Worked Through M/E Mar 2017	891,267	1,177,589	**2,068,856**	

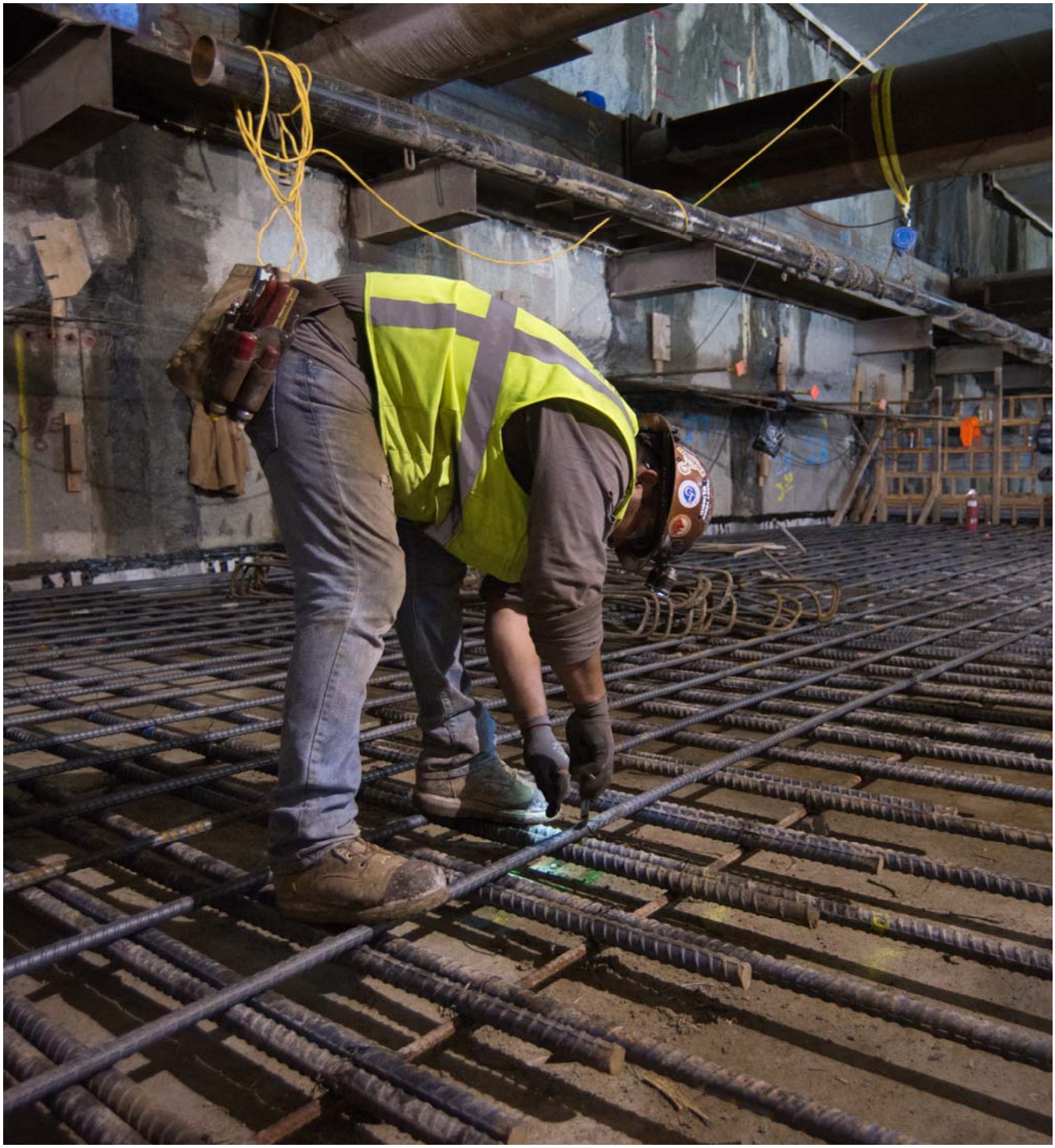
YEAR TO DATE (Month ,Day, Year to Month, Day, Year)	Tutor	Subs	Total Project	Rate*
OSHA Recordable Accidents	0	0	**0**	0.00
Job Transfer or Restricted Duty Cases	0	0	**0**	0.00
Lost Time Cases	0	0	**0**	0.00
Total Project Incidents	0	0	**0**	0.00
Man Hours Worked Through M/E Mar 2017	79,086	84,970	**164,056**	

* 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

*Classifications change at a later date due to additional information becoming available, thereby, changing the numbers on the chart. For example, what was once classified as an accident can become a first aid which leads it to no longer being recordable.

Technical Capacity

No Project positions are currently open or unfilled.



A worker affixes strands of rebar to each other where they join, using lengths of wire and a pair of plyers.

Staffing

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

	Jan-2017		Feb-2017		Mar-2017	
	Planned	Actual	Planned	Actual	Planned	Actual
Project Management						
Program Management	6.60	6.00	6.60	6.00	6.60	6.00
Quality Assurance	1.80	2.30	1.80	2.30	1.80	2.30
Contract Administration	1.40	1.40	1.40	1.40	1.40	1.40
Community Outreach	5.50	4.00	5.50	3.00	5.50	3.00
Finance	2.00	2.00	2.00	2.00	2.00	2.00
Project Controls	4.80	6.30	4.80	6.30	4.80	6.30
Subtotal	22.10	22.00	22.10	21.00	22.10	21.00
Construction Management						
CM - CN 1252	0.00	0.00	0.00	0.00	0.00	0.00
CM - CN 1300	29.98	30.98	29.98	30.98	29.98	30.98
Design Support - CN 1252	0.00	0.00	0.00	0.00	0.00	0.00
Design Support - CN 1300	12.40	12.40	12.40	12.40	12.40	12.40
Subtotal	42.38	43.38	42.38	43.38	42.38	43.38
Start Up						
Start Up / Safety & Security	3.00	2.10	2.00	2.10	2.00	2.10
Subtotal	3.00	2.10	2.00	2.10	2.00	2.10
Total	**67.48**	**67.48**	**66.48**	**66.48**	**66.48**	**66.48**

Third-Party Agreements

No activity in this reporting month.

LRV Procurement

SFMTA has initiated a new light rail vehicle procurement to acquire up to 260 vehicles over the next 15 years. The scope includes the design, manufacture, delivery and testing of up to 260 light rail vehicles together with associated services, spare parts, special tools, training and documentation. This includes an initial delivery of 24 cars, scheduled for delivery from 2017 - 2018 to supplement the fleet when the SFMTA's Third Street Phase 2 - Central Subway Project extension opens.

Production of the first 12 cars continues. The third car 2003 was delivered to SFMTA March 30th, 2017, ahead of schedule. Mainline testing including load qualification testing is underway with Car 2001. Static testing continues for Car 2002. Final assembly and testing of Car 2004 is in process and is scheduled for delivery in April.

A bobcat dumps soil excavated from inside the station headhouse into a large steel bucket used to lift material to the surface for transport offsite.

central subway

Current Construction Activity

Chinatown (CTS)

Union Square/Market Street (UMS)

Yerba Buena/Moscone (YBM)

4th St. Surface Track, Systems (STS)

The faint outline of remaining tunnel segment pieces can be seen as it is removed during excavation of the left side drift for the north platform cavern.

Demolition jaws are moved into place to see how effective they are at removing reinforced shotcrete during excavation inside the cross-cut cavern area.

As material excavated below is brought to the surface of the headhouse, a loader collects it and distributes the load evenly in trucks for transport offsite.

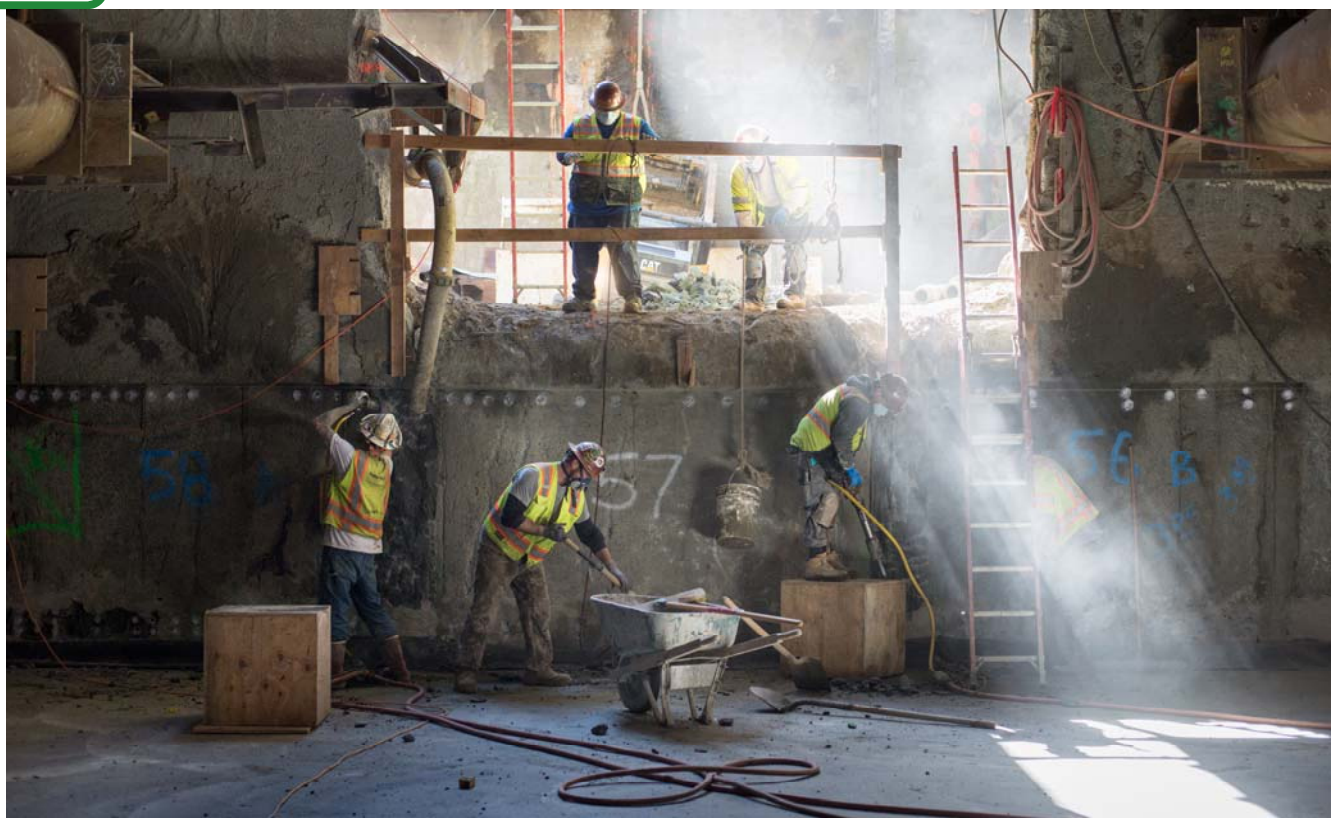
A bulldozer brings excavated material from inside the station cavern to a collection area at the south end of the headhouse. Here, the driver waits for the large steel bucket that brings material to the surface to be lowered.

A small crew applies patching to shotcrete on the west wall of the station box, while excavation and shotcrete installation work occur below.

A bobcat fitted with a jackhammer is used to remove excess concrete from exterior tangent piles, comprising the station's outer walls. In this area on the east side of the station box at O'Farrell, workers are excavating a future emergency egress stairwell.

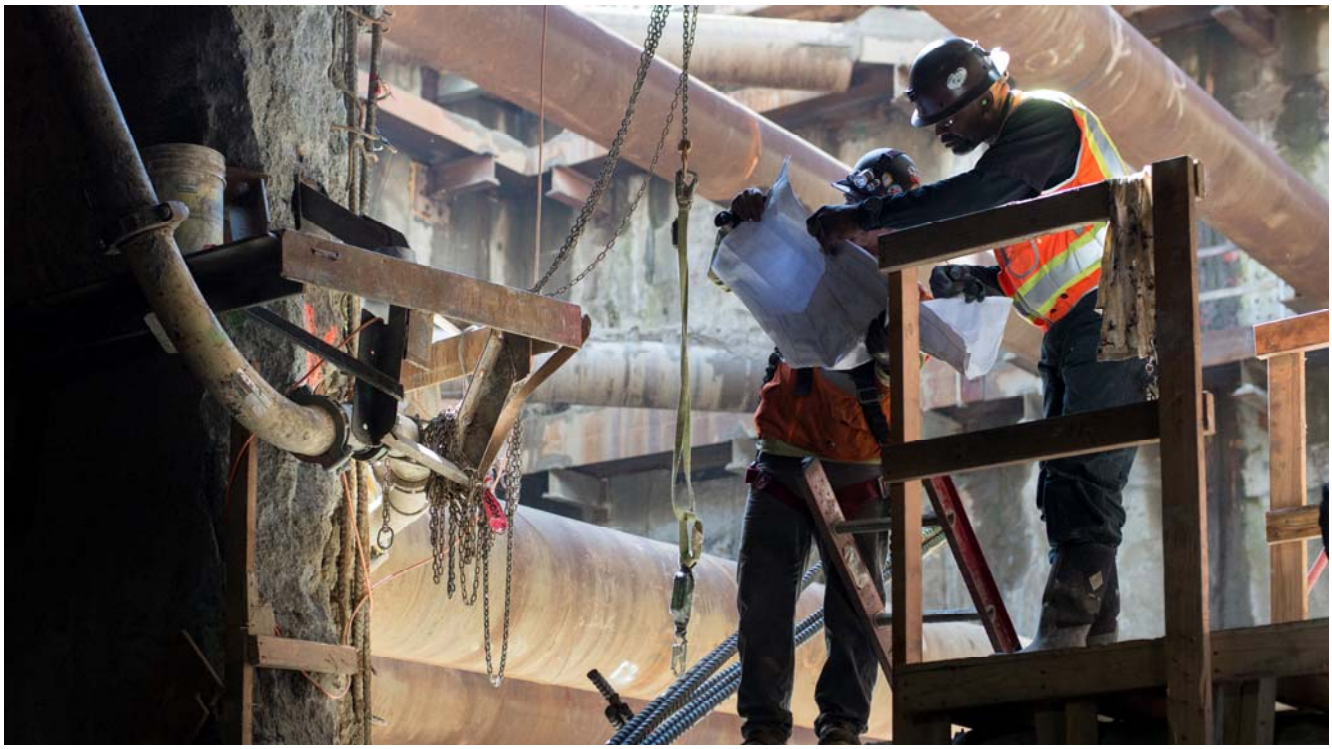
A metalworker cleans up the ends of a large steel I-beam for welding, which will be used as a bracket at the south headwall, near O'Farrell.

A bundle of utility conduits lay in a trench in a backfilled area on the south side of Ellis at Stockton and Market, where backfill and roadway restoration work are underway.

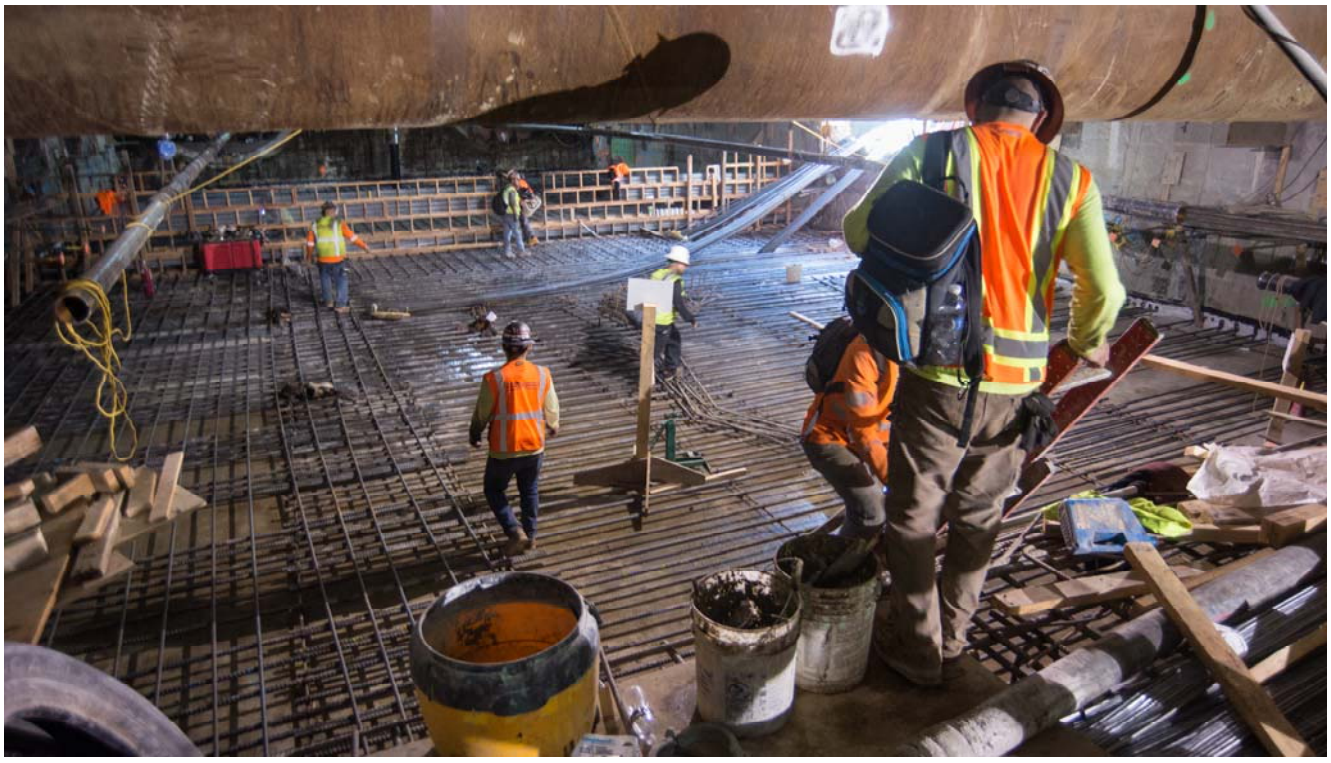


Workers chip away at the bottom of the access portal to the station box from the head-house, prior to constructing the station box platform level invert in this section.

Workers install rebar at the south end of the station box's platform level, where it meets subway tunnels leading to and from the tunnel portal, only a block away.

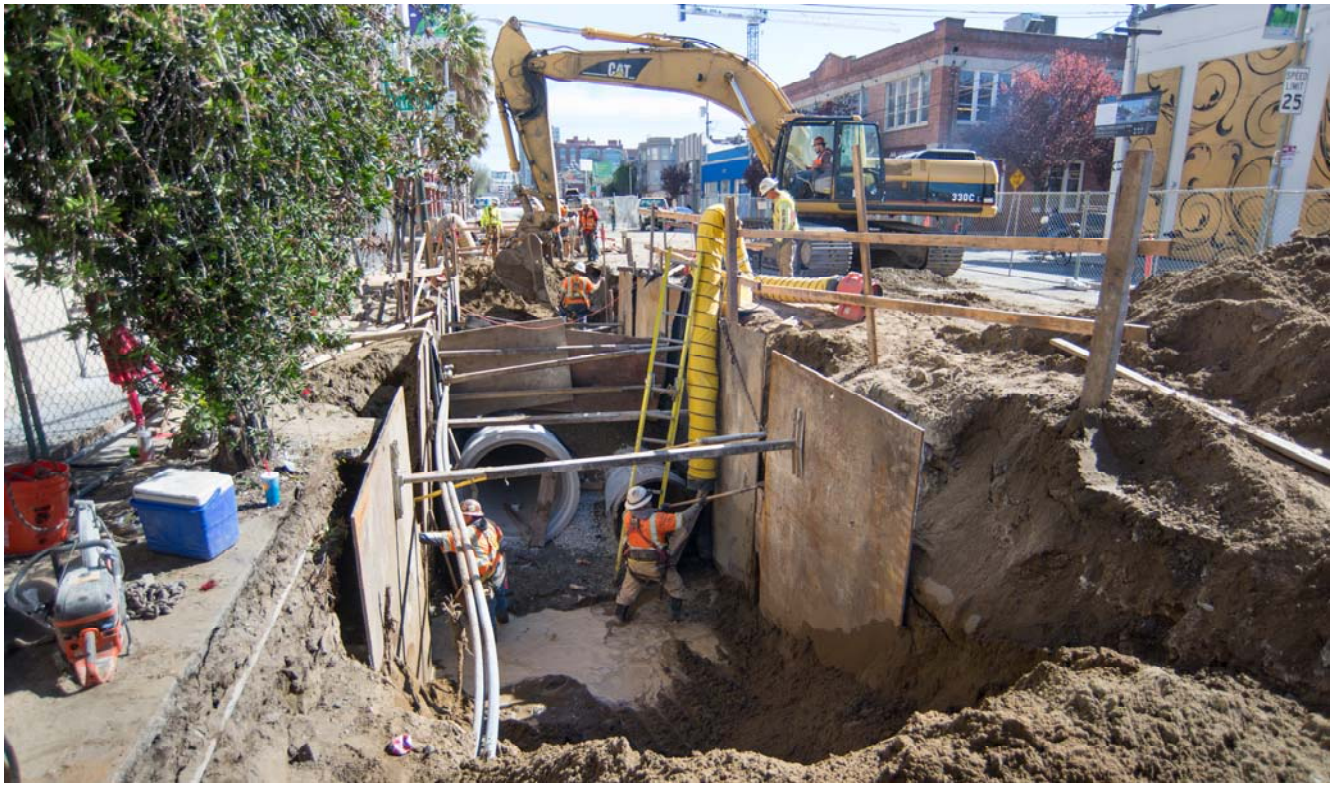


Two men review blueprints at the access portal between the station box and headhouse during invert rebar cage assembly.



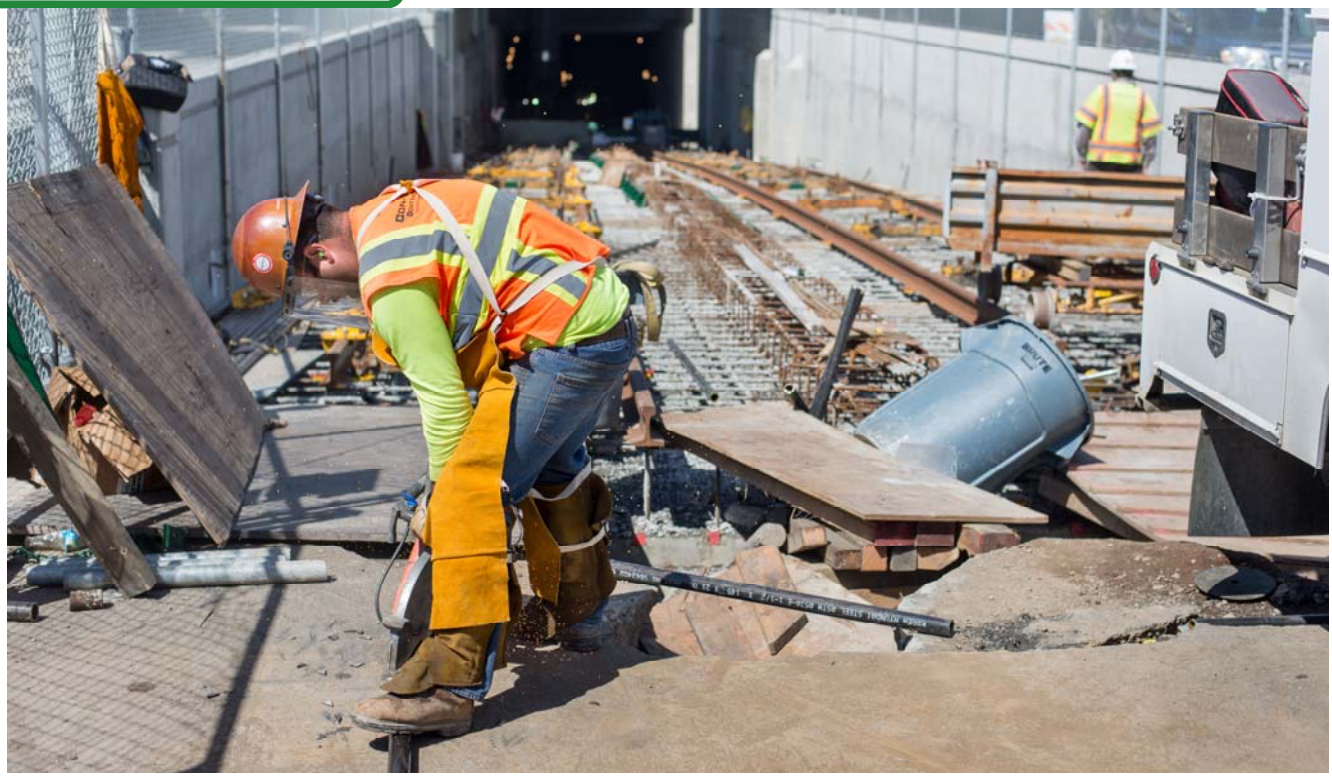
Workers arrive back at the south end of the platform level after returning from lunch, where the next two sections of the station's invert slab rebar cage are being constructed.

A backhoe brings a bucket of soil to bury newly-installed sewer pipes between Welsh and Bryant, on the east side of 4th.



Two new sewer lines are visible on the east side of 4th south of Bryant, as workers continue to move up the street one section of pipe at a time.

STS—Continued



Sections of small steel pipe are cut as part of the final push to construct the remaining elements of the invert slab for the tunnel portal.

A new concrete road foundation slab is being poured at the southwest corner of 4th and Bluxome.