

central subway

Connecting people. Connecting communities.

TBM Launch Box In Progress

Under 4th Street at Hwy 80 Looking North to Harrison Street



Progress Report

March 2013



SFMTA
Municipal Transportation Agency

Table of Contents

Executive Summary	3
Progress Photos and Overview	4
Costs	5
Summary of Costs Table	6
Cash Flow Curve	7
Project Funding and Expenditure Summary Table	8
Schedule	9
Schedule Highlights	10
Master Project Schedule	11
Program Components	12
Program and Final Design Support During Construction	12
Real Estate	15
Relocation	15
Third-Party Agreements and Licenses	15
Risk Management	16
Quality Assurance	16
Technical Capacity	17
Community Outreach	18
Staffing	20
Safety and Security	22
Contracts & Construction	23
Construction Contracts at a Glance	24
CN 1250: Moscone Station and Portal Utility Relocation	25
CN 1251: Union Square/Market Street Station Utility Relocation	26
CN 1252: Central Subway Tunneling	27
CN 1300 WP 1253: Union Square/Market Street Station	28
CN 1300 WP 1254: Chinatown Station	29
CN 1300 WP 1255: Yerba Buena/Moscone Station	30
CN 1300 WP 1256: Trackwork, Systems and 4th and Brannan Surface Station	31
Monthly Progress Construction Photos	32
Appendices	
Appendix A: Cost Report	A1
Appendix B: Schedule Report	B1
Appendix C: Program Overview	C1

Cover: View looking north inside the tunnel boring machine launch box, on 4th Street under the I-80 Freeway overpass between Harrison and Bryant. After the tunnel is completed, this area will become the ramp between the subway and the street level operations. For additional up to date construction location information, see the Central Subway Blog at this hyperlink, <http://www.centuralsubwayblog.com/blog/>.



Clockwise from upper left: Chinatown Station entrance at Washington and Stockton, Union Square Station entrance on Geary Street, 4th and Brannan Station surface platform, and Yerba Buena/Moscone Station entrance on Clementina.

Executive Summary

Work continues to be on hold at the Retrieval Shaft on Columbus Ave in North Beach while staff implements the option of changing the Retrieval Shaft location to the Pagoda Palace Theater site which was approved at the February Board Meeting.

CN 1252-Tunnel Contract construction continues with the Launch Box excavation activities and installing base slab. Headwall construction for Yerba Buena/Moscone Station (YBM) on 4th Street between Howard and Folsom was on hold most of the month while relocation of two large water mains continued. Headwall construction for Union Square Market Street Station (UMS) continues together with Ellis Street shaft work and Jet Grouting activities.

Contract 1300 - Continued the bid process, responding to bidders inquiries. The bid date was moved to April 18, 2013.

Current Cost estimate for the program remains unchanged and on target at \$1.578 billion. Costs to date are approximately \$317.28 million with total committed funding of \$643.6 million. Total cost contingency is at \$184.9 million, a favorable level above the current minimum required of \$160 million.

Schedule for Revenue Service Date remains unchanged and on target for December 26, 2018. Buffer Float decreased to 4.7 months, an unfavorable level below the current minimum of 10 months. Schedule Contingency recovery efforts are being evaluated and developed for review and approval by FTA.

The Program's Safety and Security activities includes Project 1252 Safety statistics thru March 2013.

Final punch list work and administrative closeout activities continue for Final Completion of CN 1251—Union Square Utility Relocation Construction contract.

Progress Photos



Excavating the vertical shaft at Ellis and Stockton in early March (above) and late March (below).



A worker inspecting the depth of secant pile excavation for the Union Square/Market Street headwalls.

Upcoming Milestones

MILESTONE	DATE EXPECTED
General	
Revenue Service	December 2018
Contract 1252 (Tunnel)	
TBM Launch	June 2013
Milestone 1—Complete Cross Passages 1 & 2	May 27, 2014
Milestone 2—Complete Cross Passages 3 & 4	July 30, 2014
Substantial Completion	April 6, 2015
CN 1300 - WP 1253 (UMS)	
Bid Opening	April 18, 2013
Notice to Proceed	June 2013
Substantial Completion	October 2017
CN 1300 - WP 1254 (CTS)	
Bid Opening	April 18, 2013
Notice to Proceed	June 2013
Substantial Completion	October 2017
CN 1300 - WP 12535(YBM)	
Bid Opening	April 18, 2013
Notice to Proceed	June 2013
Substantial Completion	July 2017
CN 1300 - WP 1256 (STS)	
Bid Opening	April 18, 2013
Notice to Proceed	June 2013
Substantial Completion	January 2018

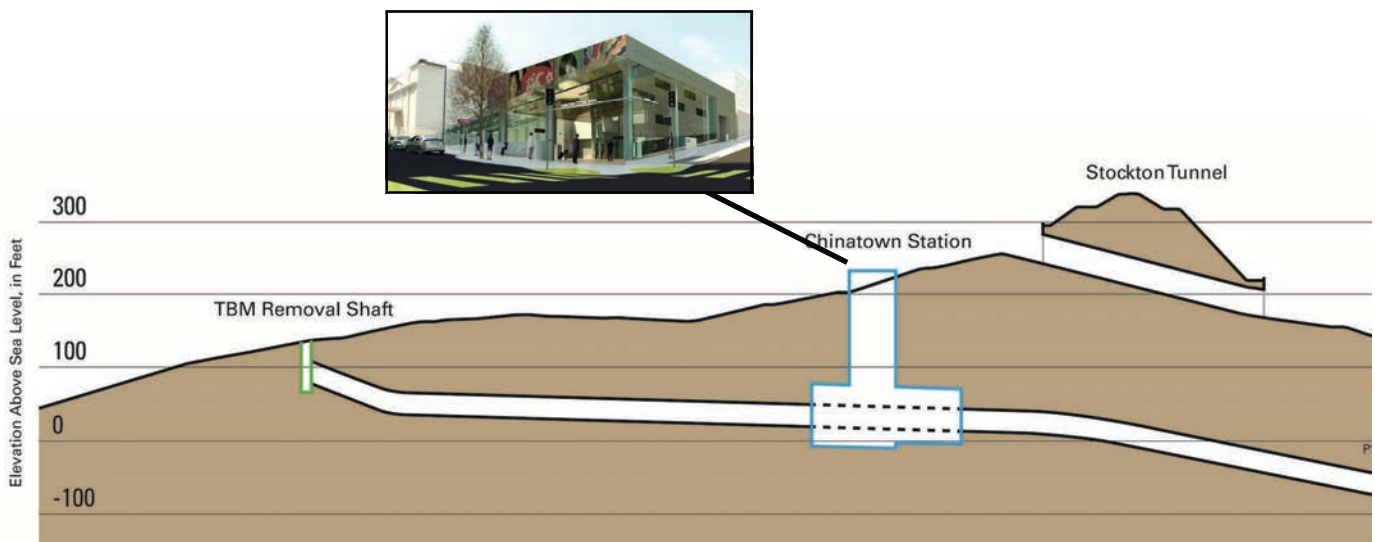
Costs (See Appendix A for Details)

The Current Cost Estimate (CCE) for the Central Subway Project is **\$1.5783 billion** in year of expenditure dollars (\$YOE) and is the basis of the total project cost as presented in the 2011 New Starts Report submittal. This capital cost projection incorporates allocated and unallocated contingencies to cover the various risks associated with completion of the project.

Total net incurred costs for the project are \$317.28 million. This figure reflects expenditures through FAMIS 786 Report (\$298.02 million) plus the pay requests approved and currently being processed (\$2.133 million) and estimates of outstanding pay requests (\$17.129 million). This incurred amount equals 20.11% of the total project budget of \$1.5783 billion.

The current funding level to date is \$643,635 million. This represents 41% of the total project budget. The funding increased from the previous month with the receipt of funds.

The current Total Project Contingency is **\$184.95 million**, which is a \$24.95 million favorable balance against the current Minimum Contingency level of \$160 million. This month represents no change to the total project contingency. The Cost Contingency Drawdown Curve is attached in the Summary Cost Reports and Graphics section in Appendix A of this report to illustrate the full scope of the contingency drawdown over the life of the project.



Summary Cost Report Table

(\$ in millions)

Category	SCC Codes	Current Cost Estimate ¹ Previous Month vs Current Month			Commitments ²		Incurred (Expenditures + Approved for Payment)		Current Forecast	
		Previous Month	Transfer/Changes	Mar. 2013	To Date	Mar. 2013	To Date	Mar. 2013	Current	Change from Last Period
Construction	10 - 50	\$1,080.6	-0-	\$1,080.6	\$271.8	-0-	\$132.4	+8.97	\$1,080.6	-0-
Real Estate	60	\$37.4	-0-	\$37.4	\$36.4	-0-	\$16.51	+0.03	\$37.4	-0-
Vehicles	70	\$26.4	-0-	\$26.4	\$0.0	-0-	\$0.0	-0-	\$26.4	-0-
Professional Services³										
Preliminary Engineering	80.01	\$46.2	-0-	\$46.2	\$46.2	-0-	\$46.2	-0-	\$46.2	-0-
Final Design	80.02	\$83.7	-0-	\$82.0	\$83.4	-0-	\$61.5	+0.42	\$82.0	-0-
Project Management	80.03-80.04	\$206.4	-0-	\$208.6	\$74.7	-0-	\$52.13	+1.26	\$208.6	-0-
Other ⁴	80.05-80.08	\$22.9	-0-	\$22.9	\$11.3	-0-	\$8.53	+0.11	\$22.9	-0-
Finance Charges	100	\$0.0	-0-	\$0.0	\$0.0	-0-	\$0.0	-0-	\$0.0	-0-
Unallocated Contingency	90	\$74.7	-0-	\$74.2	\$0.0	—			\$74.2	-0-
Grand Totals		\$1,578.3	-0-	\$1,578.3	\$523.7	0.0	\$317.28	+10.79	\$1,578.3	-0-

1 - Current Cost Estimate (CCE): These columns reflect the project budget based on the approved transfers/changes from the previous month.

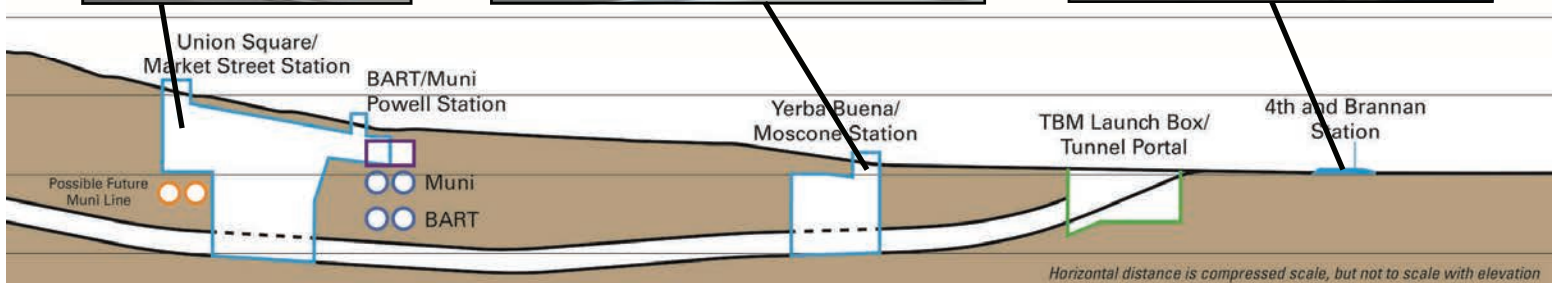
2 - Commitments: This includes awarded contract/MOU values, programmed real estate values and programmed agency/labor other direct costs (ODCs).

3 - Professional Services includes SFMTA, City/County, consultant charges and associated ODCs.

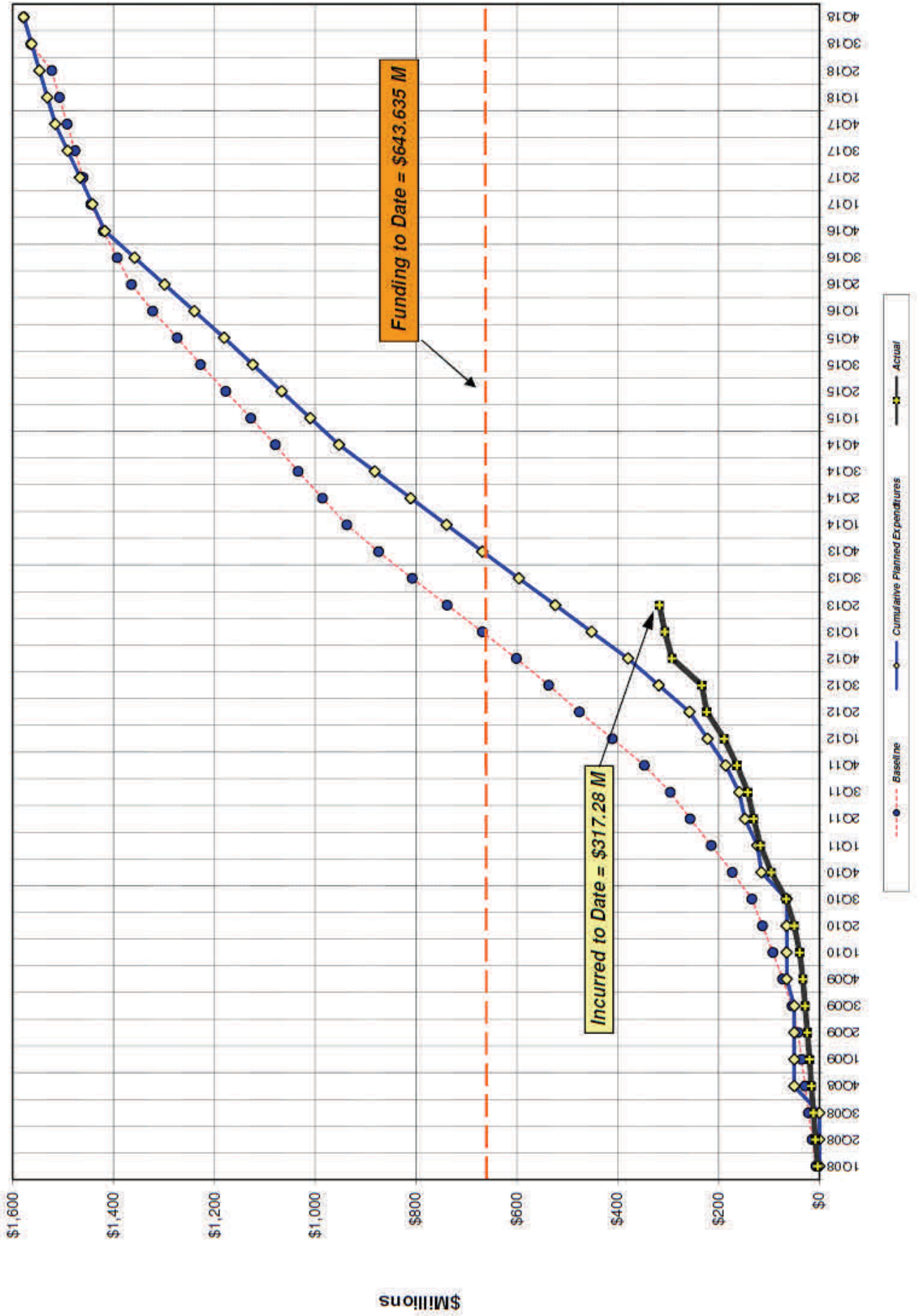
4 - Other includes legal, permits, review fees by other agencies, surveys, testing, investigation, inspection and startup.

Note: This chart is generated from the Summary - Grouped by Project, SCC Summary and SCC Code Report. See **Appendix A** for more information.

Incurred costs and commitments for construction include Form B amounts.



CENTRAL SUBWAY PROJECT Cash Flow Curve



Funding, Expenditures & Available Cash

The Funding/Expenditure Summary Table below, organized by federal, state, and regional/local funding sources, reports the grant funds received and expended and the cash balance by source. Appendix C details the sources and amounts now committed to implement the Project.

Total funds available in March, now booked in project accounts and available for current billing, is **\$130,562** million (Column F). The total cash now available and not yet booked to specific cost accounts, is **\$195.7** million, unchanged from February.

Total cash and funding levels are projected to be sufficient for the scheduled contract partial certifications, and other Program costs during the next 90 days.

A	Funding		Expenditures		Available Cash on Hand		
	Committed Funding Sources	Total Awarded Funds to Date	Encumbrances to Date	Expenditures Billed to Date	Available for Billing Budgeted Expenses	Percent of Awarded Funds Allocated	Available for 2013 Additional Expenditures
A	B	C	D	E	F	G	H
<i>This row provides explanations and source of values</i>	<i>CS/Grants Inputs Baseline Budget</i>	<i>CS/Grants Inputs from Grants Records</i>	<i>Amounts in the Project's Approved Expenditures Authorizations/Budget Revisions</i>	<i>Monthly SFMTA Accounting</i>	<i>D - E</i>	<i>D / C</i>	<i>C - D</i>
Federal							
Sect. 5309-NS	942,200	177,415	\$128,453	\$111,699	\$16,754	72.40%	\$48,963
CMAQ	\$41,025	\$41,025	\$41,025	\$41,025	\$0	100.00%	\$0
Federal Subtotal	\$983,225	\$218,440	\$169,478	\$152,724	\$16,754	\$0.00	\$48,963
State							
TCRP	\$14,000	\$14,000	\$14,000	\$14,000	\$0	100.00%	\$0
State RIP	\$88,000	\$0	\$0	\$0	\$0	\$0.00	\$0
Prop. 1B (I-Bond) PTIMSE	\$307,792	\$225,912	\$100,809	\$51,625	\$49,184	44.62%	\$125,103
Prop. 1A (HSR-Bond)	\$61,308	\$61,308	\$61,308	\$0	\$61,308	\$0.00	\$0
State Subtotal	\$471,100	\$301,220	\$176,117	\$65,625	\$110,492	\$0.00	\$125,103
Local							
Prop. K	\$123,975	\$123,975	\$102,248	\$98,931	\$3,316	82.47%	\$21,727
Local Subtotal	\$123,975	\$123,975	\$102,248	\$98,931	\$3,316	\$0.00	\$21,727
Project Total	\$1,578,300	\$643,635	\$447,842	\$317,281	\$130,562	69.58%	\$195,793

Schedule

The summary Master Project Schedule (MPS) shown on page 12 includes progress through March 31, 2013. The expected dates of future major project milestones are shown in the chart on page 4. See Appendix B for schedule detail.

Schedule Revisions

The March 2013 Update of the Master Project Schedule (MPS) continues to forecast the Revenue Service Date (RSD) of December 26, 2018.

The controlling critical (longest) path currently starts with the Procurement Phase of CN 1300, to the UMS piles, through Excavation and Construction of UMS, to UMS Commissioning, to STS CS Commissioning and Pre-Revenue Activities to the Baseline Finish and RSD.

The CTS station is only one day off the critical path.

Bid Opening for Contract 1300 was changed twice in the month of March. Addendum 5 was executed on March 4, 2013 which moved Bid Opening from April 2, 2013 to April 4, 2013 and then to April 18, 2013 with Addendum 7 executed on March 29, 2013.

The Schedule Contingency decreased this month from 5.2 to 4.7 months on the critical path of the MPS, which is below the Minimum Schedule Contingency level of 10 months. The decrease in Schedule Contingency this month was due to the delay in the Bid Opening for Contract 1300. The Minimum Schedule Contingency Hold Points were updated this month to reflect the dates in the MPS (See Appendix B - Schedule Contingency Drawdown).

Schedule contingency has been below the minimum level since September 2012 when changes to the procurement of the remaining four contracts was incorporated into the MPS. Incorporating Contract 1300, which combined the stations and systems contracts, reduced schedule contingency levels from 14.4 to 5.2 months. Schedule changes to Contract 1300 in November 2012 resulted in an increase of schedule contingency from 5.2 to 5.8. However, in February 2013 it decreased from 5.8 to 5.2 followed by a reduction to 4.7 this month due to the slip in the bid opening of Contract 1300.

The primary reasons for Schedule Contingency falling below minimum levels is attributed to NTP dates pushed out important construction progress and removed interfaces associated with buffer float off the critical path. CTS and UMS had been planned to NTP in the summer and fall of 2012 respectively but were changed with the combination of Contract 1300 to NTP on May 1, 2013. Since then, Contract 1300 NTP has moved to its current date of June 21, 2013. A portion of this nine month differential is expected to be regained with Contractors Bid Days being less than the contract duration called for in the Contract 1300 documents.

Tunnels (1252):

On February 19, 2013 the SFMTA Board approved measures to proceed with construction of the Retrieval Shaft at the Pagoda Palace Theater Site location. The originally intended Columbus Street Retrieval Shaft location has been suspended indefinitely.

March 2013 Update includes a new sequence and activities for moving the retrieval to the Pagoda Palace Theater location. Two tunneling activities have also been added to the schedule

Tunnels (1252) - continued

as place holders for the extra time it could take to tunnel to the new location. This timing adds a total of two weeks to the critical path of Project 1252. Once approved if any extra tunneling time is required the milestone will be adjusted accordingly. Therefore, in the interim the Substantial and Completion Milestones of 1252 have been adjusted for these place holders.

BIH's Contract Milestones Progress.	Required Finish	February Finish	March Finish	Ahead/ Behind
Milestone 1 - Complete Cross Passages 1&2 (CTS)	27-May-14	30-May-14	10-Jun-14	-14 Day
Milestone 2 - Complete Cross Passages 3&4 (UMS)	30-Jul-14	1-Aug-14	12-Aug-14	-13Days
CN 1252 Tunnel Substantial Completion	12-April-15*	10-Apr-15	29-Apr-15*	-17 Days*

* Includes time for tunneling to Pagoda Palace Theater location.

BIH ran into multiple issues in March with the secant pile installation operation at UMS due to equipment breakdowns and to the inability to achieve the verticality required by the contract. This lack of progress has put the UMS Headwalls on the critical path of 1252. Furthermore production rates for the piles in the schedule have been determined as unattainable. BIH is currently working on a recovery schedule. This is an important interface with Contract 1300 and the completion date will continue to be closely monitored.

BIH's milestones slipped this month due lack of progress at the UMS Headwalls which shows up on the March critical path of 1252. BIH is currently working on a recovery schedule. As mentioned above the required Substantial Completion date has temporarily been adjusted two weeks to account for the extra time it may take to tunnel to the Pagoda Place Theater location. In the interim the corresponding tunnel buffer float to station activities have been adjusted accordingly.

The southbound TBM shipped in March on two separate vessels. The southbound TBM shield is expected to arrive on-site April 22, 2013 and the trailing gear is expected on May 10, 2013. The Factory Acceptance Test of the northbound TBM is scheduled for April 22, 2013 and is expect to arrive on-site June 6, 2103.

Stations and Systems Design and Procurement

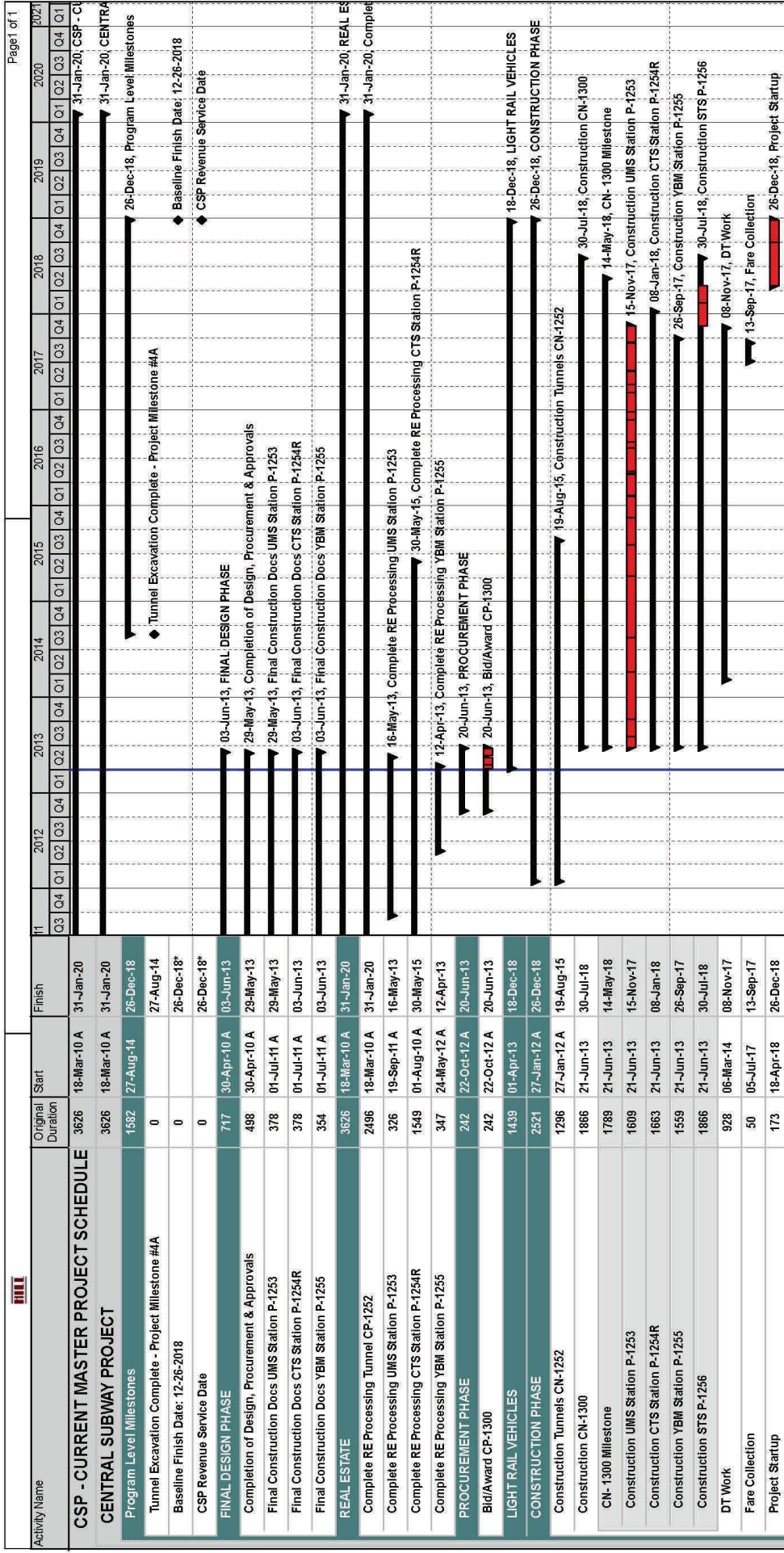
Work Packages 1253, 1254, 1255 & 1256

Addendum 5 was executed on March 4, 2013 which moved Contract 1300 Bid Opening from April 2, 2013 to April 4, 2013. On March 29, 2013 Addendum 7 was executed which moved Contract 1300 Bid Opening again from April 4, 2013 to April 18, 2013.

The specification for Contract 1300 state that the Contractor shall schedule its Work based on the assumption that the UMS headwalls will be complete 90 calendar days after NTP.

Although the UMS headwall completion date has slipped in the tunnel contract schedule this interface is still in compliance for Contract 1300.

Master Project Schedule



Program Components

Program and Design Support During Construction

·Program Management/Construction Management CS-149

- Monthly meeting with PMOC - March 5
- Conducted CMB meetings - March 6, 13, 20, 27 & · Risk Meeting—March 14th
- Contract 1300 Addendum 5 – 3/5, 6 – 3/8, 7 – 3/28
- Thales Negotiations/Contract 3/7, 12, 13, 20
- Monitored SYSTRA work in progress on Rail Simulation of 2018 and 2030 Service Plan
- Continued PM/CM and Design Overhead Rate Desk Reviews

Contract No.	CS-149 Central Subway Partnership	
Contract Description:	Project management and construction management.	
Status:	On-going.	
As of 3/31/13	Base Contract Value	\$85,139,092
	Approved Change Orders	-0-
	Current Contract Value	\$85,139,092
	Expended to Date (est.)	\$32,347,697
	% Expended	37.99%
	DBE Participation	32%

Project Controls Contract CS-156

- **Reporting:** Provided cost and schedule data for Monthly Report; input data and provided analysis within Monthly Report. Prepare Monthly Report and supporting Appendix A & B material.
- **Support:** Provided document control support for all contracts, utilizing EDMS and contract manager. Provide Estimating support for Construction Change orders
- **Cost/schedule support:** PCC10—Pagoda Theater Option—Prepare detailed estimate and hold scoping and negotiation meetings with 1252 Contractor.
- Contract No. 1252 change orders, schedule and submittal review; contract modification task force meeting; specialty estimates and schedule impacts; Small Business Enterprise participation.

Contract No.	CS 156 Project Controls To Date	
Contract Description:	Project Controls Consultant.	
Status:	Project Control Support for Central Subway—Ongoing	
As of 3/31/13	Base Contract Value	\$17,112,873
	Approved Change Orders	-0-
	Current Contract Value	\$17,112,873
	Expended to Date (est.)	\$5,236,011
	% Expended	30.6%
	DBE Participation	22.15%

Program and Design Support During Construction (Cont.)

Tunnel Design CS-155-1. Design support this month focuses on the following tunnel activity:

- Received 17 RFI's from the Contractor; RFI's 00152.1, 00186.1, and 00231-00245 mostly related to Instrumentation, TBM construction, UMS Headwall construction, Compensation Grout installation, and Launch Box construction
- Responded to 16 RFI's; 10 RFI's are in review.
- Received 32 Submittals from the Contractor with an emphasis on Instrumentation, TBM construction, Jet Grout, Compensation Grout, UMS Headwalls, and Launch Box construction.
- Responded to 14 Submittals, and a total of 33 Submittals are in review.

Contract No.	CS-155-1 PB/ Telemon (Unexercised options not included in figures)	
Contract Description:	Design Package 1 for contracts 1250, 1251 and 1252.	
Status:	Design is complete. Construction support ongoing	
As of 3/31/13	Base Contract Value	\$5,795,000 (includes exercised options)
	Approved Change Orders (5)	\$ 642,886
	Current Contract Value	\$6,967,838
	Expended to Date (est.)	\$6,734,426
	% Expended	96.65%
	DBE Participation	32.75%

Subway Station Design CS-155-2: The current focus is design support with project integration, permits and bidding during construction.

- Participated in meetings with DBI and SFFD
- Finalized Title 24 documentation for each of the stations
- Revised drawings and specifications to reflect existing conditions at UMS and YBM based on issues encountered during construction of CN 1251 and CN 1252
- Prepared responses to Bidders' Questions
- Prepared signed and sealed revised drawings for YBM and UMS for issue to DBI
- Prepared response to RFI Nos. 00186.1, 00235, 00236, and 00238
- Reviewed submittals related to UMS Headwalls Submittal No. 31 62 13.15-010

Contract No.	CS-155-2 Central Subway Design Group (Unexercised options not included in figures)	
Contract Description:	Design Package 2 for 1253 UMS, 1254 CTS, 1255 YBM Stations.	
Status:	Design contract complete. Bid support for Contract 1300 is underway.	
As of 3/31/13	Base Contract Value	\$35,059,252 (includes exercised options)
	Approved Change Orders (1)	\$ 1,010,600
	Current Contract Value	\$36,069,852
	Expended to Date (est.)	\$26,255,497
	% Expended	72.8%
	DBE Participation	41.8%

Program and Design Support During Construction (Cont.)

Surface, Trackwork and Systems Design CS-155-3 Final Design and the overall design integration and quality control is 92.0 percent complete.

- Prepared Addendum 6 and 7 responses to bidder's questions.
- Revised and submitted details for structural attachments for PDS in stations.
- Provided support for SFMTA to finalize utility relocation for private utilities.
- Provided Bid Support to SFMTA to develop requirements for the sole source contract with Thales.
- Submitted Utility Tech Memo

Contract No.	CS-155-3 HNTB-B&C (Unexercised options not included in figures)	
Contract Description:	Design Package 3 for Systems, Track work, and Surface station.	
Status:	Design is complete. Bid support in progress.	
As of 3/31/13	Base Contract Value	\$16,822,238
	Approved Change Orders (4)	\$ 312,814
	Current Contract Value	\$17,135,052
	Expended to Date (est.)	\$11,343,568
	% Expended	66.2%
	SBE Participation	30.2%

Real Estate and Relocation

The Project possesses all fee acquisitions and subsurface easements required to construct the stations and tunnels.

The Memorandum of Understanding between the MTA and the Recreation and Parks Department for partial acquisition of the Union Square Garage is being finalized for approval by the MTA Board of Directors in April and the Recreation and Parks Commission in May.

The Project continued to gather documents to satisfy a pre-trial discovery request from the former owner of 266 4th Street. While the Project has possession of this property, a hearing date has been scheduled for May 2013 to determine the final purchase price.

All project commercial and residential relocations are complete. The project continues to manage the remaining relocation and goodwill payments.

Third-Party Agreements

Negotiations continue for all outstanding temporary licenses required for the tunnel, the Chinatown, Union Square/Market Street and the Yerba Buena/Moscone stations. These temporary license agreements will allow the MTA to install compensation grouting tubes and settlement monitoring equipment at sensitive buildings adjacent to the project.

The Project team has concluded negotiations and obtained signed temporary construction license agreements for 16 of the required 27 properties affected by construction of the Central Subway Stations. The team continues to negotiate with the property owners to obtain the remaining licenses.

In anticipation that timely agreement would not be reached with a small number of property owners, the Project team requested and received approval from the San Francisco Board of Supervisors for Resolutions of Necessity on December 11, 2012. If agreement is not reached in a timely manner, the Resolutions of Necessity allow the Project to condemn the remaining licenses through the courts in order to maintain the project schedule.

The Project filed for condemnation of the temporary license at 17-19 Stockton on the 13th of February 2013, a hearing date has been set for 6th June 2013.

The Project team, with the City Attorney's office is preparing condemnation documentation for seven properties along Stockton and 4th Streets should agreement not be reached by April 19th.



Above - A worker uses a grinder while fabricating temporary supports that will be used to shore up the launch box before the floor slab is poured.

Below - A close-up of the clamshell bucket excavator used to dig the secant pile shafts used in the southern Union Square/Market Street Station headwalls.



Risk Management

Risk Mitigation Meeting No. 43 was conducted on March 14, 2013. Discussions focused on new risks associated with tunnel construction and updating risks associated with changing the location of the Retrieval shaft and for the contracting strategy for one large contract. Risk Register Rev 19 was published, incorporating actions taken during the preceding month.

The next Risk Mitigation Meeting (No.44) is scheduled for April 11, 2013. The Risk Assessment Committee focuses on mitigation of all outstanding risks, as well as identify and mitigate new risks associated with current construction activities..

Quality Assurance

The Quality Assurance team is providing oversight, surveillance, proactive feedback and QA records by working closely with the construction management, resident engineers, contractors and subcontractors on the following contracts and program efforts.

Yerba Buena/ Moscone Station and Portal Utilities Relocation Contract CN1250 Close Out

Quality Assurance staff is reviewing and monitoring the close out process underway since July 2012 when the Resident Engineer submitted the last Completeness Determination Forms with the final punch list to the PUC for review. In August through October, to advance the close out process, the Designer, Contractor's Superintendent and the Resident Engineer continued with correcting/completing the CADD versions of the final as-builts. The last requests for clarification of as-built information previously provided to the designers of the AWSS and Sewer have been provided which will allow the completion of all CADD work for these as-builts. The Utility Contractor and Resident Engineer will then perform a final review and the as-builts will then be signed off. These items will also be submitted to the PUC for distribution.

When the final punch list and as-builts are combined with the last Completeness Determination Forms, the PUC will review the set and sign off. The sign off will confirm the PUC's acceptance of the utility installations.

UMS Utilities Relocation Contract CN1251 – Near Close Out

The punch lists required by the 01 45 00 Specification Section are virtually complete – the Contractor's dedicated "close-out" crews have completed all but some very minor items (SFMTA and Sewer) to complete which includes the final walk-throughs with the associated Utility inspectors/engineers. The final Punch list documentation should be complete by April/May.

The remaining issues are the RE's review, with assistance by QA Staff and acceptance of the Contractor's Quality Documentation and the completion of as-built CADD work and review and sign-off by the Contractor and RE.

The Contractor completed the process of attaching all associated test and inspection test reports to the associated Daily Inspection Report (DIR) which includes items such as pull tests and mandrel reports from their Subcontractor. Remaining as-built work includes final review by the RE of the Contractor's as-builts of the most recently completed Field Work, Utilities will then complete their CADD work, the Contractor and RE will then perform their final reviews for sign-off of the completed as-builts. As-builts are expected to be completed by the end of May/June 2013.

Quality Assurance - Cont.

Tunnel Contract CN1252 – On Going

Quality Assurance staff is assisting implementation of the Contractor's Quality Control Program for Jet and Compensation Grouting, Launch Box and MOS Slurry Walls and Excavation Support, Ellis Street Shaft, UMS Secant Piles and precast segment tunnel liners.

QA staff continues to proactively participate in Weekly Progress Meetings, Preparatory and Initial Phase Meetings and Instrumentation Meetings as well as provide review comments for Contractor submittals and RFIs related to items such as concrete mixes, welding procedures, welder qualifications, Superintendent qualifications, material test reports, laboratory test reports and Quality Control Plans.

QA Staff and the C1252 Contractor's Quality Control Manager continue to visit the tunnel liner precast manufacturer, Precast Management Corporation (PMC) prior to the initial shipment of the precast liner segments. Issues have been identified by PMC's Quality Staff regarding the acceptance of the segment liners associated with production issues concerning gaskets, spalling of concrete adjacent to the gasket and defects at some corners of the segments. PMC is currently developing resolution of the production issues with both the gasket and form suppliers. Additionally, PMC is developing repair procedures and generating Non Conformance Reports that must be approved by PMC's Designer, BIH and SFMTA's Engineer.

Emphasis will continue regarding the review of the RE's Daily Inspection Reports, verification of location/position of installed members and assurance that installations are performed to the requirements of the Contract Documents.

Other Program QA Practices Implemented

Quality Assurance staff's continued to expedite the close-out of Corrective Action Requests 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.

QA support this month focused on:

Training Session 37, Indoctrination to the CSP Quality Program for CM/PM personnel was conducted 22Mar2013.

Oversight and Design Managers for the 1300-Union Market Street Station, Chinatown Station, Moscone Station and Surface, Track and Systems contracts.

QA staff completed the conduct and held the Exit Meeting for Quality Assurance Audit QAA024. This audit consists of the verification of the 1252 Resident Engineer's compliance with Construction Management Procedures associated with changes to the contract. The QAA024 Audit Report is anticipated to be published in April with the subsequent closure of two associated Corrective Action Requests (CAR) by the end of April 2013.

Technical Capacity

The Program welcomed Jeff Kraus, as Program Safety Manager to replace Dale Matlock who retired; Lisa Lew as a First Source Hire Field Monitor; and Brian Kelleher as Contract's Manager. Efforts continue to search for project controls staff, estimating and field staff to fill Resident Engineers, Assistance Resident Engineers and Office Engineers.

Community Outreach

Events/Public Activities/Presentations

601 4th Street Follow Up Meeting	March 12, 2013
Construction Coordination: Chinese Hospital	March 21, 2013
Chamber of Commerce: Leadership SF	March 21, 2013

Outreach team efforts continued to businesses, residents and community groups. A follow up meeting was held with SoMa residents about upcoming construction and concerns with traffic and building access.

Notices were handed out to businesses along Stockton to inform them of upcoming SF Water Department activity across Union Square.

The Outreach team produced and translated into the Winter edition of the Central Subway community newsletter, Connection, and notices for SFAC Central Subway Chinatown Station art programs.

In collaboration with the Chinatown Community Development Center, members of the team met with the construction team of the Chinese Hospital to discuss coordination of construction and mitigation of impacts while the Central Subway and Hospital work proceed concurrently over the next several years.

On-going to previous Monthly Progress Reports, the 10 photos for this MPR were taken and produced by the Outreach multimedia team as part of the Project photo history record.



Crews have begun bringing in rebar that will be used to reinforce the floor slab of the launch box.

Outreach - Continued.

Outreach in Support of Mitigation and Monitoring

Weekly construction emails and frequent social media updates continued. The email list receiving these updates has grown to over 500 email addresses, ensuring construction impact information is reaching a significant number of people and organizations along the project alignment.

The outreach team continues to assist the Tunnel Contractor in obtaining permission for installation of the monitoring devices.

Team member and the Tunnel Contractor outreach to businesses regarding construction of the covered walk-way.

Media Coverage

Date	Title with link to story	Source	Reporter/Writer
3/7/2013	S.F.'s new plan for spending \$25 billion	SF Chronicle	Andrew Ross
3/11/2013	Mom Chung and Big Alma to bore SFMTA Central Subway tunnels	RT&S (Railway Track and	None
3/12/2013	ULISF Gets the Scoop on the Central Subway	Urban Land Institute	Carla Collins Mixon



A close-up of piping and rebar that will reinforce the launch box floor slab.

Staffing

The table below shows Planned and Actual full-time equivalent staff (FTEs) working on the Project by location and organization. Updated Staffing plans generated this month to reflect the new contracting strategy and timing of construction provide explanation for the drop in planned staffing levels.

Central Subway Staffing

Locations	January 2013 FTEs		February 2013 FTEs		March 2013 FTEs	
	Planned	Actual	Planned	Actual	Planned	Actual
Project Office 821 Howard						
SFMTA (Admin/PM)	9.8	10.0	11.8	5	5.85	9.5
PMCM (CS149)	29.45	16.85	17.08	17	17.08	17.41
PCC (CS156)	7.21	6.71	7.00	5.25	7.00	5.25
DPW (CM)	2.0	2.0	2	2	2	2
Subtotal	54.6	35.56	37.9	29.3	37.9	34.2
1252 Construction Field Office						
SFMTA (PM/Design)	0.0	0.0	5.85	1	7.85	1
PMCM (CS149)	9.0	9.12	9.00	9.63	9.00	9.06
PCC (CS156)	1.0	1.0	2.00	2.00	2.00	2.00
PBT (CS155-1)	0.0	0.0	0.0	0.0	0.0	0.0
CSDG (CS155-2)	0.0	0.0	0.0	0.0	0.0	0.0
HNTB-B&C (CS155-3)	0.0	0.0	0.0	0.0	0.0	0.0
Subtotal	10.0	10.12	16.9	12.6	18.9	12.1
Other						
SFMTA (R.E, Contracts, Admin)	1.0	1.0	1.0	1.0	1.0	1.0
SFMTA + DPT (Design)	0.83	1.0	0.78	1.0	0.78	1.0
CC of San Francisco	0.0	0.0	0.0	0.0	0.0	0.0
PMCM (CS149)	6.75	5.82	6.75	8.39	8.75	8.00
DPW (Design)	2.0	1.2	2.0	1.74	2.0	1.74
PBT (CS155-1)	1.3	1.5	3.50	1.50	1.30	1.50
CSDG (CS155-2)	3.5	5.7	3.82	5.70	3.00	2.0
HNTB-B&C (CS155-3)	3.82	4.6	4.00	4.20	3.82	3.0
Subtotal	19.2	20.8	21.9	23.2	20.7	18.2
Total	85.1	65.6	76.6	65.1	77.4	64.5

Safety & Security

The San Francisco Municipal Transportation Agency (SFMTA) is committed to the highest practical level of safety and security standards and practices in the public transit industry and has developed a Safety and Security Management Plan (SSMP) expressly for the purpose of carrying out the FTA intentions for the Central Subway Project. This commitment is consistent with the SFMTA's:

- Mission
- Rail System Safety Program Plan
- System Security Program Plan
- Emergency Preparedness Program
- Central Subway Project Management Plan
- C P U C Approved Safety Certification of Third Street Light Rail Phase 1 Operation and Metro Maintenance facility in 2007-2008.

The project-specific SSMP, prepared by an SFMTA Project team in concert with the FTA, is the road map to integrate safety and security into the Phase 2 Project, achieve SFMTA's safety and security commitment and implement all FTA and California Public Utilities Commission (CPUC) requirements. Several of the important components of the plan are reported on below. More information and details will be provided as appropriate for the particular phase of the project.

Safety and Security Committee

The Central Subway Project SSCC monitors and reports the status of, and implement on a timely basis the Project Safety and Security Certification Plan (SSCP).

Fire Life Safety and Security Committee

The Project Fire/Life Safety and Security Committee (FLSSC), a subcommittee of the S S C C , will be on-going through the design phase and continue through the other phases of the project. The Fire/Life Safety and Security Committee focuses on fire/life safety and security issues.

Construction Conformance Verification and Documentation

The construction specification conformance process consists of preparation and verification of Specification Conformance Checklist for each certifiable project element. The purpose of the checklist is to provide a method to track and verify that the project elements provided under construction, procurement, and installation contracts conform to the specified safety and security requirements of technical specifications, drawings and contract documents.

Checklists for all contract packages have been completed and approved for incorporation into the SSMP and utilization by the CM team.

Contractor Safety and Security

The purpose of the construction safety and security program will be to outline the minimum health, safety and security requirements to which all participating SFMTA employees and Central Subway Project construction contractors and subcontractors shall adhere to for preventing job-related injuries, illnesses, and providing protection during construction activities at the Project. The table below measures the current safety rate for construction vs. the OSHA based comparable construction industry rate.

Project Safety Record - Contract 1252		SAFETY RATES			
		OSHA Recordable Accidents, 3.8 Lost Time Cases, 1.3			
Through Month End - March 2013					
JOB TO DATE		BIH	Subs	Total Project	Rate*
OSHA Recordable Accidents		1	2	3	2.68
Job Transfer or Restricted Duty Cases		0	0	0	0.00
Lost Time Cases		0	1	1	0.89
Total Project Incidents		1	3	4	3.57
Man Hours Worked Through M/E - March 31, 2013		73,649	150,371	224,021	
YEAR TO DATE (Month, Day, Year to Month, Day, Year)		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	1	1	2.80
Total Project Incidents		0	1	1	2.80
Man Hours Worked Through M/E - March 31, 2013		30,713	40,727	71,440	

* Rate calculation: Number of incidents divided by total number of labor hours worked multiplied by 200,000 labor hours.
The 2008 OSHA Recordable Accidents Construction Industry Rate for Highway, Street, and Bridge Construction is 3.9.

Workers welding and cutting steel I-beams at the Union Square/Market Street headwall site.





View looking north at the tunnel boring machine launch box site, showing temporary supports in place.

Contracts & Construction

Current Status

Contract 1250 - Moscone Station and Portal Utilities Relocation:

- Continue administrative closeout

Contract 1251 - Union Square/Market Street Station Utility Relocation:

- Final Completion October 15, 2012
- Prepare for project final acceptance by the SFMTA Board of Directors
- Continue punch list work

Contract 1252 - Central Subway Tunneling:

- Shipped the first TBM
- Finished excavation and installation of bracing at the Launch Box.
- Finished jet grouting the outermost columns at the north headwall at UMS.

Contract 1300 - Work Package 1253 - Union Square/Market Street Station:

- Bid date is April 18, 2013

Contract 1300 - Work Package 1254 - Chinatown Station:

- Bid date is April 18, 2013

Contract 1300 - Work Package 1255 - Yerba Buena/Moscone Station:

- Bid date is April 18, 2013

Contract 1300 - Work Package 1256 - Systems, Trackwork and Surface Station:

- Bid date is April 18, 2013

Construction Contracts at a Glance

Awarded Contracts

Contract 1250: Moscone Station and Portal Utilities Relocation

- Contractor: Synergy Project Management
- Amount: \$11.97 million
- Contract Status: Completed

Contract 1251: Union Square/Market Street Sta- tion Utility Relocation

- Contractor: Synergy Project Management
- Amount: \$20.79 million
- Contract Status: Completed

Contract 1252: Central Subway Tunneling

- Contractor: Barnard Impregilo Healy JV
- Amount: \$233.58 million
- Contract Status: In progress

Upcoming Contract

Contract 1300 - Combined WPs 1253, 1254, 1255, 1256

- Advertise Date: October 22, 2012
- Estimated Cost: \$720—\$750 million
- Notice to Proceed: 2nd quarter 2013

Work Package 1253: Union Square/Market Street Station

Work Package 1254: Chinatown Station

Work Package 1255: Yerba Buena/Moscone Station

Work Package 1256: Systems, Trackwork and Station



Moscone Station and Portal Utility Relocation

Contract 1250

Contractor: Synergy Project Management, Inc.

PROJECT COMPLETE—UNDER BUDGET

Contract Details	
Contract Awarded:	November 17, 2009
Notice to Proceed:	January 4, 2010
Substantial Completion:	June 23, 2011
Contract Award Value:	\$ 9,273,939
Modifications Final :	\$ 2,694,211
Final Contract Value:	\$11,968,150

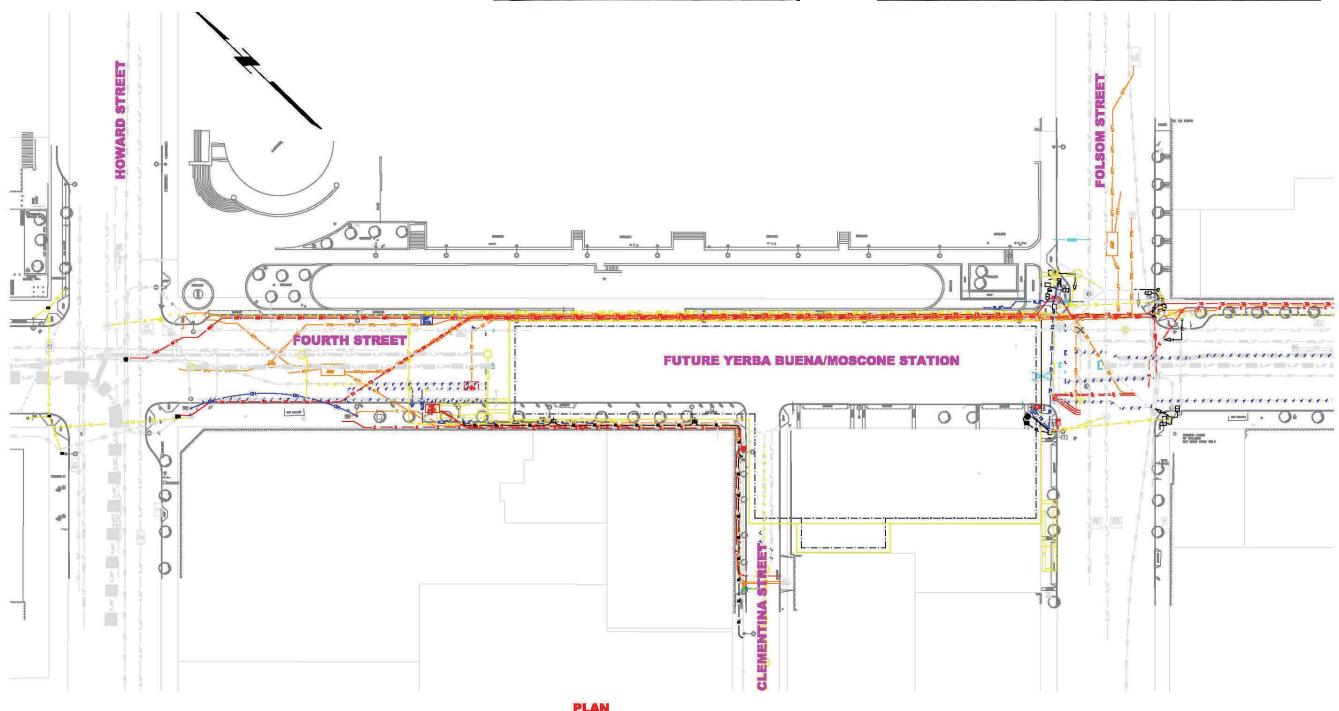
Description

This project relocates utilities within the footprint of the proposed Yerba Buena/Moscone Station and the 4th Street Portal where the tunnel boring machines will descend underground. Also included is installation of building protections and monitoring of buildings adjacent to utility trenches.

Status

- Work complete
- Project closeout administration and documentation
- Final Completion Date: June 23, 2011

Budget/Expenditures	
Category	Amount
Original Budget	\$11,227,316
Expenditures Final	\$11,968,150
Utility Reimbursements	(\$2,275,419)
Final Program Cost	\$9,692,731
Budget Impact (Underrun)	(\$1,534,585)



Union Square/Market Street Station Utility Relocation

Contract 1251

Contractor: Synergy Project Management, Inc.
PROJECT COMPLETE - UNDER BUDGET

Contract Details	
Contract Awarded:	December 7, 2010
Notice to Proceed:	January 12, 2011
Substantial Completion:	August 16, 2012
Contract Award Value:	\$16,832,550
Modifications Final:	\$ 3,962,031
Final Contract Value:	\$20,794,581

Budget/Expenditures	
Category	Amount
Original Budget	\$22,199,847
Expenditures Final	\$20,794,581
Utility Reimbursements	\$7,618,412
Final Program Costs	\$13,176,169
Budget Impact (Underrun)	\$9,023,678

Description

This project relocates utilities for the Union Square/Market Street Station and temporarily reroutes existing trolley coach lines around the construction.

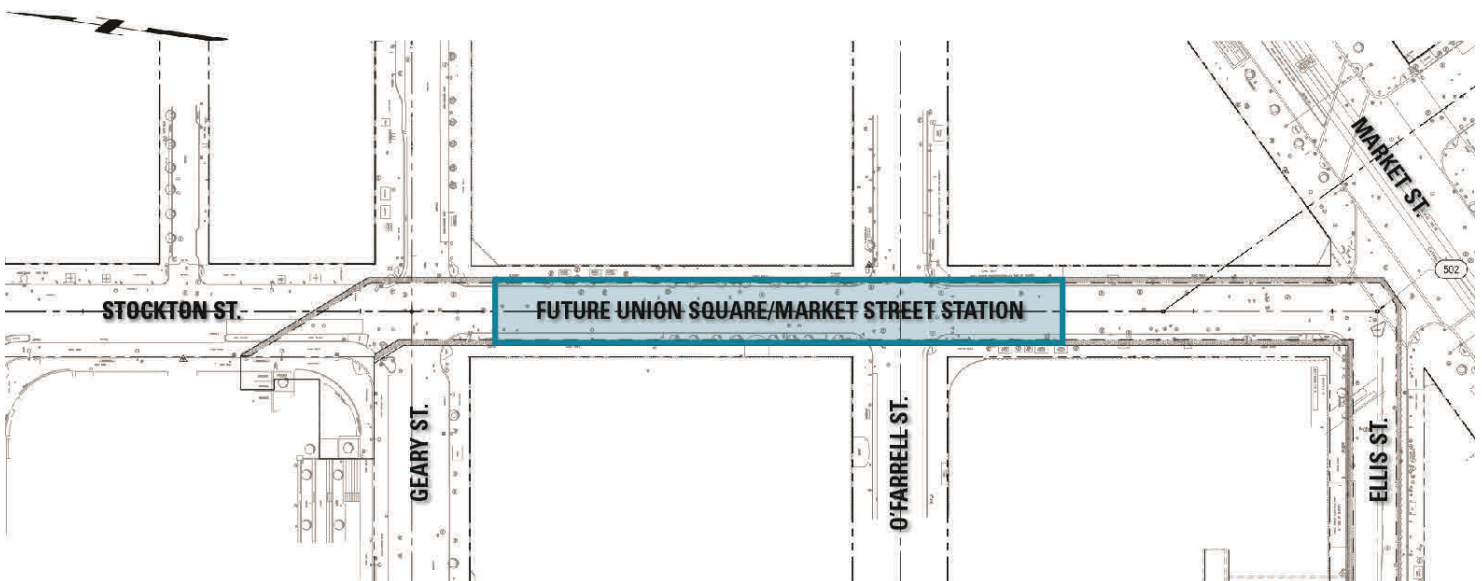
Status

Project is substantially complete.

- Final completion date is October 15, 2012.
- Continue punch list work

Work Expected Next Month

- Prepare for Project Final Acceptance by the SFMTA Board of Directors
- Complete punch list work



Central Subway Tunneling

Contract 1252

Contractor: Barnard Impregilo Healy Joint Venture

Contract Details

Contract Awarded: August 8, 2011
Notice to Proceed 1: January 27, 2012
Notice to Proceed 2: March 14, 2012
Partial NTP 3: April 13, 2012
Notice to Proceed 3: October 15, 2012
Substantial Completion: March 29, 2015
Total Contract Days = 1,150
Contract Award Value: \$233,584,015
Modifications to Date: (\$2,897,915.90)
Current Contract Value: \$230,686,099

Budget/Expenditures

Category	Amount
Current Budget	\$267,242,479
Expenditures to Date	\$93,774,273

Description

1.7-mile twin bore tunnels from Hwy I-80 to North Beach using two tunnel boring machines (TBMs) simultaneously; advanced procurement of TBMs by Contractor; settlement monitoring and protection of existing utilities, buildings and BART tunnels; TBM launch box and retrieval shaft excavation support; Yerba Buena/Moscone Station and Union Square/Market Street Station end walls; tunnel excavation and lining (one-pass precast segmental lining), 4th Street portal and cross passage.

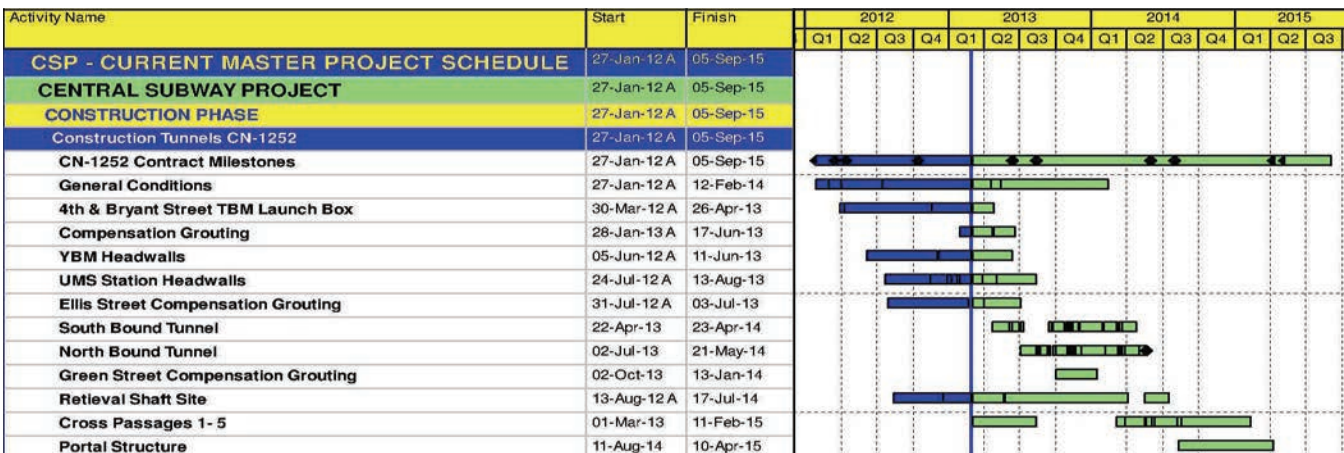
Status

- TBM - Shipped the first TBM
- Launch Box—Finished excavation and installation of bracing. Started construction of the base slab. Continued pre-grout for compensation grouting at 4th Street and Harrison.
- Moscone— Continued installation of utilities and tie-ins.
- UMS— Finished jet grouting the outermost columns at the north headwall. Continued installing piles at the south headwall
- Ellis Shaft—Started excavation of the shaft.

Work Expected Next Month

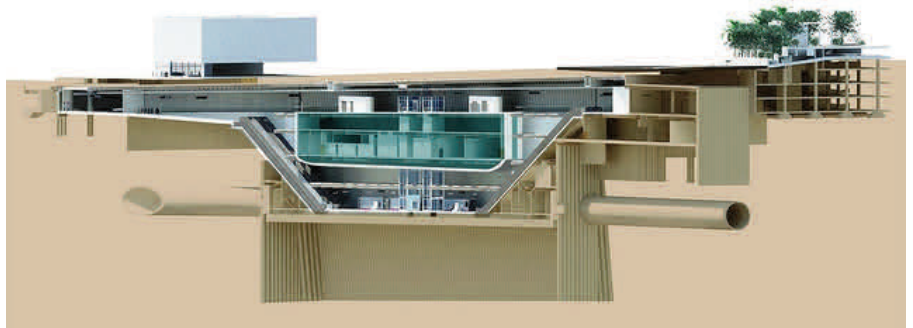
- TBM—Arrival of the first TBM shield on site. The factory commissioning of the second TBM.
- Launch Box— Completion of the base slab, access ramp, and installation of the gantry crane, Start lowering and assembly of the first TBM shield. Finish pre-grout for compensation grouting at 4th Street and Harrison.
- Moscone- Finish installation of utilities and tie-ins. Finish north guide walls and the slurry panel on the east/north side of 4th Street.
- 4th & Market—Start installation of pre-grouting for compensation grouting
- UMS— Continue installing piles at the south headwall
- Ellis Shaft— Finish excavation of the shaft.

Schedule



Union Square/Market Street Station

Contract 1300- Work Package 1253



Contract Details	
Advertise Date:	October 22, 2012
Scheduled NTP:	2nd quarter 2013
Duration:	56 months
Length:	210 feet
Depth:	100 feet
Estimated Cost:	\$210,000,000

Description

Station finishes, AC substations elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, Cutter Soil Mixing, secant pile top-down 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.

Budget/Expenditures	
Category	Amount
Current Budget	\$226,446,637
Expenditures to Date	\$0

Status

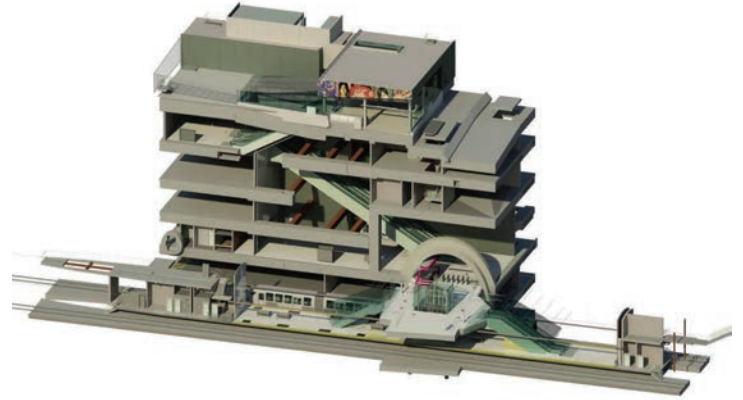
Work package included in Combined Contract 1300 advertised October 22, 2012. The bid opening is April 18, 2013.

Schedule

Activity Name	Start	Finish	2013			2014			2015			2016			2017		
			Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
CSP - CURRENT MASTER PROJECT SCHEDULE	07-Jun-13	01-Nov-17															
CENTRAL SUBWAY PROJECT	07-Jun-13	01-Nov-17															
CONSTRUCTION PHASE	07-Jun-13	01-Nov-17															
Construction CN-1300	07-Jun-13	01-Nov-17															
Construction UMS Station P-1253	07-Jun-13	01-Nov-17															
UMS Milestones	07-Jun-13	01-Nov-17	◆	◆					◆			◆			◆		◆
Ellis Streets	07-Jun-13	06-Jul-17	■			■	■	■								■	■
O'Farrell Street	25-Sep-13	02-Apr-14		■	■												
Stockton Street	22-Jul-13	11-Apr-17															
South Concourse	23-Oct-13	15-Nov-14															
Station Box	25-Sep-13	11-Apr-17															
North Concourse	22-Jul-13	15-Apr-15	■	■				■									
UMS Garage	07-Jun-13	12-Jun-17	■			■	■	■			■	■	■				■
Concourse Level	17-Nov-14	01-Nov-17															■
Intermediate Strut Level	16-Aug-16	14-Mar-17															■
Mezzanine Level	29-Apr-16	21-Jun-17															■
Platform Level	22-Jul-15	01-Jul-16															■

Chinatown Station

Contract 1300 - Work Package 1254



Contract Details	
Advertise Date:	October 22,2012
Scheduled NTP:	2nd Quarter 2013
Duration:	52 months
Length:	200 feet
Extended Cavern:	340 feet
Depth:	115 feet
Estimated Cost:	\$235,000,000

Description

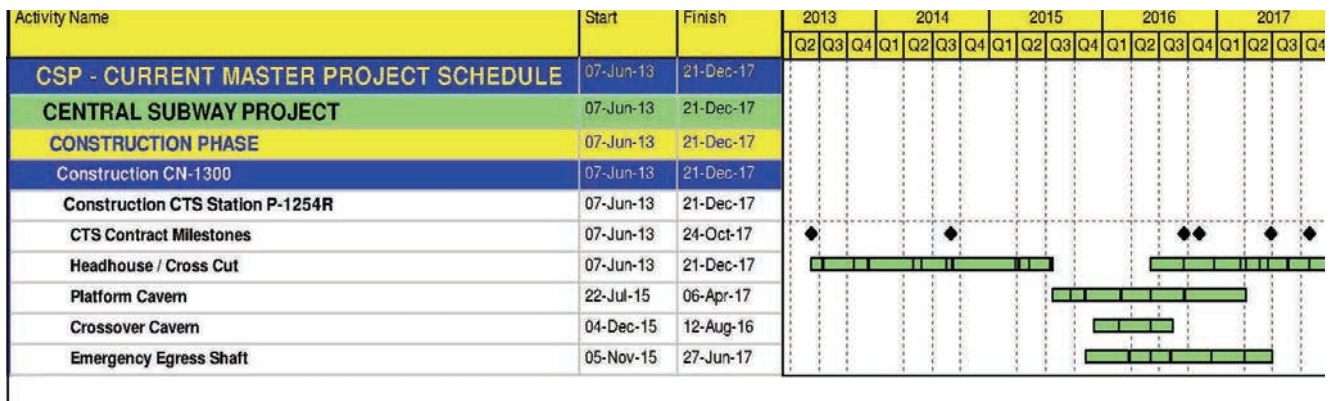
Station finishes, AC and DC traction power substations, elevators, escalators, lighting, emergency ventilation fans, HVAC fire alarm/ suppression/ protection, slurry or secant pile and SEM excavation, settlement monitoring, building protection, PA, CCTV, signage, installation of fare collection equipment,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

Budget/Expenditures	
Category	Amount
Current Budget	\$251,115,794
Expenditures to Date	\$0

Status

Work package included in Combined Contract 1300 advertised October 22, 2012. The bid opening moved to April 18, 2013.

Schedule



Yerba Buena/Moscone Station

Contract 1300 - Work Package 1255



Contract Details	
Advertise Date:	October 22, 2012
Scheduled NTP:	2nd quarter 2013
Duration:	50 months
Length:	200 feet
Depth:	50 feet
Estimated Cost:	\$132,000,000

Budget/Expenditures	
Category	Amount
Current Budget	\$136,754,973
Expenditures to Date	\$0

Description

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.

Status

Work package included in Combined Contract 1300 advertised October 22, 2012. The bid opening moved to April 18, 2013.

Schedule

Activity Name	Start	Finish	2013		2014			2015			2016			2017				
			Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	
CSP - CURRENT MASTER PROJECT SCHEDULE	07-Jun-13	08-Aug-17																
CENTRAL SUBWAY PROJECT	07-Jun-13	08-Aug-17																
CONSTRUCTION PHASE	07-Jun-13	08-Aug-17																
Construction CN-1300	07-Jun-13	08-Aug-17																
Construction YBM Station P-1255	07-Jun-13	08-Aug-17																
YBM Milestones	07-Jun-13	08-Aug-17	◆				◆				◆					◆		◆
Surface Level	07-Jun-13	08-Aug-17	■	■	■	■												
Mezzanine Level	17-Nov-14	14-Apr-17					■	■				■	■	■	■	■	■	■
Concourse Level	17-Feb-15	31-Mar-17							■	■		■	■	■	■	■	■	■
Platform Level	04-Jun-15	09-Feb-17									■	■	■	■	■	■	■	■

Systems, Trackwork, & Station

Contract 1300 - Work Package 1256



Contract Details	
Advertise Date:	October 22, 2012
Scheduled NTP:	2nd quarter 2013
Duration:	63 months
Estimated Cost:	\$143,000,000

Description

Testing, safety and security project certification and enabling the SFMTA to satisfactorily operate and maintain the project, including but not limited to construction of tunnel invert concrete, track emergency walkways, lighting, wet standpipes, undercar deluge, radio repeater stations and antennae, overhead contact system, traction power feeders and detection system, switch machines, CCTV, SCADA, communications system, ticket vending machines, advanced train control system, train destination audible and visual announcement displays and other passenger information systems, systems monitoring/control centers and signage.

Budget/Expenditures	
Category	Amount
Current Budget	\$154,999,985
Expenditures to Date	\$0

Status

Work package included in Combined Contract 1300 advertised October 22, 2012. The bid opening moved to April 18, 2013.

Schedule

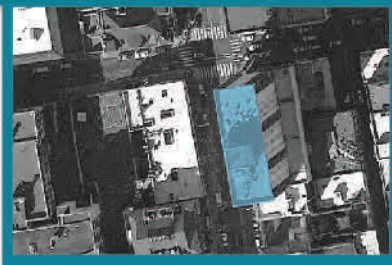
Activity Name	Start	Finish	2013		2014		2015		2016		2017		2018					
			Q2	Q4	Q	Q	Q	Q3	Q	Q1	Q	Q	Q4	Q	Q3	Q	Q	Q2
CSP - CURRENT MASTER PROJECT SCHEDULE	07-Jun-13	16-Jul-18																
CENTRAL SUBWAY PROJECT	07-Jun-13	16-Jul-18																
CONSTRUCTION PHASE	07-Jun-13	16-Jul-18																
Construction CN-1300	07-Jun-13	16-Jul-18																
Construction STS P-1256	07-Jun-13	16-Jul-18																
STS Milestones	07-Jun-13	30-Apr-18																
General	07-Jun-13	16-Jul-18																
4th & King Street	05-Aug-13	20-Sep-16																
Surface	05-Aug-13	11-Jul-14																
NB & SB Tunnel	15-Sep-15	30-Oct-17																
YBM	17-Apr-17	08-Aug-17																
UMS	22-Jun-17	13-Oct-17																
CTS	23-Jun-17	30-Oct-17																

central **T** subway

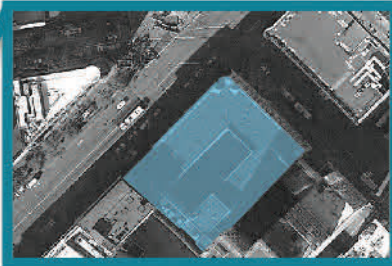
Monthly Progress Construction Activity

1

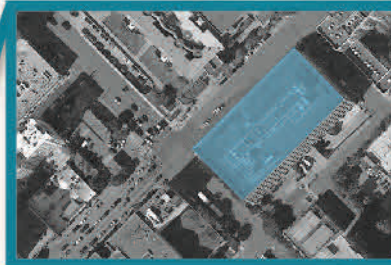
Chinatown Station



Union Square/Market Street Station



Yerba Buena/Moscone Station



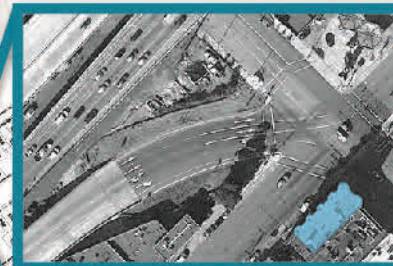
Tunnel Launch Box North



3

Tunnel Launch Box South

4a



4b

1N

2



Looking south down Stockton Street from above the entrance to the Stockton Street Tunnel, toward the Union Square/Market Street construction site between Geary and Ellis, where station headwall construction is underway.

2



4th Street between Market and Stevenson, where preparation for compensation grouting will soon begin.

3



Headwall construction at the Yerba Buena/Moscone Station site has paused temporarily for workers to relocate a large-diameter water line.

4a



View looking northwest in the tunnel boring machine launch box, located on 4th Street between Harrison and Bryant. The walls are temporarily supported during excavation by large steel pipes called “walers”.

4b



Installing forms for a concrete slab on the south end of the launch box site where the future location of two cooling towers for the TBM’s electrical system will be .

central **T** subway

Central Subway Project Office
821 Howard Street
San Francisco, CA 94103
Phone: 415.701.4371
Fax: 415.701.5222
Email: central.subway@sfmta.com



www.centalsubwaysf.com



www.twitter.com/central_subway



www.facebook.com/centralsubway



www.centalsubwayblog.com



www.youtube.com/municentralsubwaysf



www.flickr.com/municentralsubway

This document is published by the SFMTA and the City and County of San Francisco as a service to individuals and agencies interested in the Central Subway Project. Funding for the Central Subway is made possible through funds provided by the Federal Transit Administration, the State of California, the Metropolitan Transportation Commission and the San Francisco County Transportation Authority.



SFMTA
Municipal Transportation Agency



Workers performing drilling operations head of building the large vertical shaft at the corner of Ellis and Stockton.



Looking north in the TBM launch box, with temporary supports above, and rebar for the future floor slab below.