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# Memorandum

CS Memorandum No. 1292

То:	Distribution
From:	Susan MacKenzie, Document Control Manager M 6
Date:	November 19, 2012
Reference:	Project No. M544.1, Contract No. CS-149 Task No. 1-4, Risk Management
Subject:	Risk Mitigation Report No. 39

Attached please find Risk Mitigation Report No. 39 for meeting held on November 8, 2012. Please click on the "Bookmark" tab on the left side of Adobe file to navigate to report sections.

Attachments:

Risk Mitigation Report No. 39 with attachments

Cc: James Sampson, STV (w/attachments) james.sampson@stvinc.com David Kuehn, STV (w/attachments) david.kuehn@stvinc.com Luis Zurinaga, SFCTA (w/attachments) luis.zurinaga@sfcta.org Matt Lee, SFCTA (matt@sfcta.org) Albert Hoe, SFMTA (w/attachments) Arthur Wong, SFMTA (w/attachments) Richard Redmond, CSP (w/attachments) Mark Latch, CSP (w/attachments) Jane Wang, SFMTA (w/attachments) Quon Chin, CSP (w/attachments) Chuck Morganson, HNTB/B&C (w/attachments) Aileen Read, CSDG (w/attachments) CS File No. M544.1.5.0820

# **Distribution**:

Brad Lebovitz, STV <u>bradley.lebovitz@stvinc.com</u> John Funghi, SFMTA Ross Edwards, CSP Eric Stassevitch, CSP Mark Benson, CSP Carlos Campillo, CSP Alex Clifford, CSP Beverly Ward, CSP Tom Tolentino, HNTB/B&C David Coury, HNTB/B&C



Municipal Transportation Agency



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# **Risk Mitigation Meeting Minutes #39**

DATE:	November 10, 2012
MEETING DATE:	November 08, 2012
LOCATION:	821 Howard Street, 2 <sup>nd</sup> Floor – Main Conference Room
TIME:	2:00pm
ATTENDEES:	John Funghi, Ross Edwards, Mark Benson, Eric Stassevitch, Alex Clifford, Beverly Ward, Tom Tolentino, David Curry, Carlos Campillo, Brad Lebovitz
COPIES TO:	Attendees: Albert Hoe, Arthur Wong, Richard Redmond, Mark Latch, Jane Wang, Quon Chin, Carlos Campillo, Chuck Morganson, Aileen Read, James Sampson, Luis Zurinaga Matt Lee, , David Kuehn File: M544.1.5.0820
REFERENCE	Project No. M544.1, Contract No. 149 Task 1-4.01 Program/Construction Management
SUBJECT:	Risk Management – Risk Mitigation Meeting Risk Mitigation Report No. 39

# **RECORD OF MEETING**

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	Report on Red Risk and – (Risk rating ≥ 6)	
	<ul> <li>Risk 83: Cost of vehicles may be more than estimated due to sole source and small order</li> <li><u>Discussion:</u> No new update to report, further information is being pursued. An update the schedule for future submittals is listed on the summary status sheet for this risk. Risk Rating 4, 4, 16</li> <li>Risk 7: Potential for excessive settlement of BART tunnels - Significant Compensation Grout Required over Estimate Allowances.</li> <li><u>Discussion:</u> Work is still being done and coordination with BART. Reporting requirements to the Risk Committee should be heighten.</li> <li>Risk Rating 3, 2.5, 7.5</li> </ul>	
2 -	Report on Requirement & Design Risks (Risk rating ≤ 6)	
	A list of Requirement Risks and Design Risks with a rating below 6 which are actively been tracked were included on the agenda for information, but were not discussed at this meeting, however an updated Risk Mitigation Status report is included with these meeting minutes. Risks which were discussed are listed below:	



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ITEM #	DISCUSSION	ACTION BY DUE DATE
	<b>Risk 74</b> : Insufficient time in schedule for testing and commissioning S&C <u>Discussion</u> There is enough time for commissioning activities; 60 plus 44 days of float between Commissioning and pre Revenue. A copy of the exhibit of the combined CN1300 September schedule was presented showing the amount of time for commissioning and testing. Risk Rating 0, 0, 0. <b>This Risk will be retired.</b>	R. Edwards
	<b>Risk 72</b> : Interface new Signaling and Train Control system to existing at Fourth and King <u>Discussion</u> : As a requested by the Risk Assessment Committee, Tom Tolentino, DP3 Design Package Manager for Systems clarified the design has taken into account the existing connection to the new controls. Spec section 34 11 01 which is part of the CN1300 (see attached) partially addresses this issue and they have demonstrated to themselves they can do this. A meeting will be held on 11/16/12 with Operations to refresh and get their sign off. Material will be provided to show evidence of the sequence of the shutdown along with a future demonstration to the Risk Committee for closure of the Risk. Risk Rating 2, 2, 5	
	<b>Risk 32</b> : Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2) <u>Discussion</u> : This Risk will not be retired as originally recommended. A notation will be made on the status log to refer to Retired Risk #60 which is similar in mitigation measures to this Risk.	
3-	Report on Market and Construction Risks (Risk rating ≤6)	
	A list of Active Market and Construction Risks which are being tracked were included on the agenda for information, but were not discussed at this meeting, however an updated Risk Mitigation Status report for each risk is included with these meeting minutes.	
	In addition there were several Risks on the agenda for retirement and, after further review from the Risk Committee it was agreed these Risks will not be retired this month, and will be revisited in December for additional evaluation that the Risk item has been thoroughly mitigated. Market and Construction Risk which will be retired this month from the Risk Register are <b>Risk PR79 and Risk 23</b> . Status logs for each risk are included with these meeting minutes.	
4-	Other Business –	
	<b>Risk Management Brief –</b> E. Stassevitch presented a review of the Risk Management efforts of the Program since inception in March 2009; illustrating where we are at this point by providing a brief overview of the status for the current remaining risks by category in the October 2012 Risk Register, Rev.14,; and putting it in context with where efforts began in March 2009 with the first Risk Register being developed out of the FTA sponsored Risk Workshop #1 thru #4. Contingency management for both cost and schedule have been revised as a part of the mitigation efforts as defined in the Risk and Contingency Management Plan which is the basis for CSP's Risk Management Program.	
	<b>Contingency Management Plan –</b> E. Stassevitch reviewed the Contingency Management Plan showing cost & schedule charts of the contingency drawdown as of September 2012.	



ITEM #	DISCUSSION	ACTION BY DUE DATE
	New Risks Items associated with New Contracting Strategy - The following list represents potential new Risks which were identified at the Risk meeting:	
	<ol> <li>Outreach efforts to get more bidders</li> <li>Lack of response from potential bidders who attended "meet and greet"</li> <li>Potential delays in dealing with larger contracting groups</li> <li>Possible Bid Protest</li> <li>Ship America requirement</li> <li>Headwalls interface with new 1300 Contract</li> <li>AT&amp;T Vault – new sewer work</li> <li>Prolong period of CMods causes "bad blood" between RE and Contractor</li> </ol>	
	Risk Mitigation Status sheets will be developed for each of the above identified risks, an owner will be assigned and mitigation measures identified for discussion at the next Risk Meeting.	

# **ACTION ITEMS -**

ITEM #	MTG DATE	Task #	DESCRIPTION	BIC	DUE DATE	STATUS	
2	09/13/12		Risk PR 73 – Status of the MOU memo	R. Edwards	10/11/12	Open	
2	10/18/12		<b>Risk 72</b> – Demonstration from the Designer/Risk Owner of signaling logic plan	C. Campillo	11/08/12	Closed	

Meeting adjourned at 3:45pm

These meeting minutes have been prepared by B. Ward and reviewed by E. Stassevitch, and are the preparer's interpretation of discussions that took place. If the reader's interpretation differs, please contact the author in writing within four (4) days of receipt of these minutes.

Signed:



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# **Meeting Agenda**

Project No. M544.1, Contract No. CS-149 Program/Construction Management Risk Mitigation Management Meeting No. 39 November 8, 2012 2:00pm – 4:00pm Central Subway Project Office 821 Howard St. 2<sup>nd</sup> Floor Main Conference Room

# Attendees:

Mark Benson	David Kuehn	Beverly Ward	
Alex Clifford	Mark Latch	Art Wong	
Ross Edwards	Brad Lebovitz	Luis Zurinaga	
John Funghi	Richard Redmond		
Albert Hoe	Eric Stassevitch		

# 1. Report on Red Risks (Risk Rating 6 and above)

- Requirement Risks (83)
- Design Risks (All outstanding Design None)
- Market Risks (All outstanding Market None)
- Construction Risks (7)
- 2. Report on Remaining Requirement and Design Risks
  - Requirement Risks (32, 74, 79, 104, 196, T)
  - **Design Risks** (72, 89, PR73, V)
- 3. Active Risks New risks to be discussed
  - Market Risks (56, PR79, 94)
  - Construction Risks (16, 23, 38, 65, 71, 75, 111, J)
- 4. Other Business Identify New risk items associated with New Contracting Strategy

Note: **Bolded** numerals indicate that risk is recommended to be retired.



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# **Meeting Attendance Sheet**

Project No. M544.1, Contract No. CS-149 Program/Construction Management Risk Management Meeting No. 39 November 8, 2012 2:00 p.m. – 4:00 p.m. Central Subway Project Office 821 Howard Street, 2<sup>nd</sup> Floor Main Conference Room

Deliver Meeting Attendance Sheet with original signatures/initials to Document Control.

NAME	AFFILIATION	PHONE	E-MAIL (for minutes)	INITIALS
Mark Benson	CSP	415-701-5295	Mark.Benson@sfmta.com	Meg
Alex Clifford	CSP	415 701- 5275	Alex.clifford@sfmta.com	A
Ross Edwards	CSP	415-581-5165	ross.edwards@sfmta.com	THE
John Funghi	SFMTA	415-701-4299	john.funghi@sfmta.com	(B)
Albert Hoe	SFMTA	415-701-4289	albert.hoe@sfmta.com	
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Mark Latch	CSP	415-701-5294	mark.latch@sfmta.com	
Brad Lebovitz	STV/PMOC	510-464-8052	Bradley.lebovitz@stvinc.com	BL
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Richard Redmond	CSP	415-701-4288	Richard.redmond@sfmta.com	
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Beverly Ward	CSP	415-701-5291	Beverly.ward@sfmta.com	800
Arthur Wong	SFMTA	415-701-4305	arthur.wong@sfmta.com	
Luis Zurinaga	SFCTA	415-716-6956	luis@sfcta.org	







NAME	AFFILIATION	PHONE	E-MAIL (for minutes)	INITIALS
Tom Tolentina	CSP-DP3	(110) 4-315- 4822	Holent@ comcast, net	131.
Pavid Coury Carlos Canfill	CSP. DP3	(707) 7046912	deouvy @bnctransit, com molos. campo Destara. com	N
Carle Canfle	Pmc-m	(786)556-3224	Molos. Cample Destata. Com	

# **Risk Register**

PROJEC		REGISTEI	2		lisk Profile Jeelihood Severity Score			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
		t San Francis		-	Score 1 2 3 4 5		Probabili	ty <10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X ( <u>COST IMPACT + SCHEDULE IMPACT)</u>	
REV : 15	way i rojeci	Contration		-	6   High     4   Image: Constraint of the second		Cost Impa	ct < \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9	2	
DATE ISSUE	ED : 11/08/	(12					Schedule Impa	Ct < 1 Month	<> 1 - 3 Months	<> 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	Medium >10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
Final Risk ID	Contract I.D	Muni Risk REF. I.D	Туре	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
Underground Tun	nel														
1	TUN	10.07.1	Guideway Tunnels	Additional night shift work required at portal launch box due to bus storage facility relocation delay	Work with TJPA to coordinate construction schedules and GGB to coordinate Traffic Routing.	С	2	1	-	1	35%	1	2	No longer considered a risk. GGB not scheduled to be utilizing site until 2014	3/20/15 TUN1160
2a	TUN	10.07.2	Guideway Tunnels	42"/48" sewer line relocated as part Utility 1 package is damaged by subsequent construction of the launch box.	<ol> <li>Make follow-on contractor responsible for repairs to any existing utility lines.</li> <li>Properly as built actual location as part of Utility 1 package and provide to Contract 3 Contractor</li> </ol>	С	1	1	2	2	10%	2	3	Sewer Installation complete, awaiting as built drawing. Sewer installed according to contract drawings. Contract 1252 provisions for protection of existing utilities puts all cost and schedule risk on Contractor.	10/24/12 TUN1080
5	TUN	10.07.13	Guideway Tunnels	Possibility that lowest level of tie-backs extending out from Moscone Center could be within the tunnel alignment.	<ol> <li>Lower tunnel alignment 5' below the lowest expected tieback.</li> <li>Include obstruction clause and allowance in contract documents.</li> </ol>	С	1	1	1	1	10%	1	2	Contract Documents issued for bid, contain location of tiebacks from as built drawings, do not intersect tunnel alignment.	7/2/13 TUN1118
7	TUN	10.07.14	Guideway Tunnels	Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE ALLOWANCES	<ol> <li>Early and extensive co-ordination with BART.</li> <li>Survey BART tunnels to determine exact locations.</li> <li>Checking effect of maximum expected settlement on tunnels.</li> <li>Require EPBM TBM, Contractor to demonstrate effective control of ground settlements and correction of settlements by compensation grouting, and pre-installation of compensation grout piping under BART tunnels prior to tunneling reaching Market St. Require repair/adjustment plan.</li> <li>Develop contingency plan to provide bus bridge, if needed.</li> <li>Require non-stop weekend excavation beneath BART tunnels.</li> <li>Monitor movement of BART tunnels in real-time.</li> <li>Repair/adjust as needed.</li> <li>Include probable cost in estimate.</li> </ol>	С	3	4	1	2.5	50%	7.5	15	Risk is considered active, with mitigation measures fully developed with the exception of Bus Bridge. Adjusted cost impact lower resulting in Risk rating increasing to 2 but still remains a low risk.	8/28/13 TUN1120
8	TUN	10.07.15	Guideway Tunnels	Flowing groundwater in vicinity of UMS Station could make adequate annulus grouting difficult.	<ol> <li>Use appropriate additives such as accelerators in primary annulus backfill grouting, if needed.</li> <li>Use secondary grouting as needed.</li> </ol>	С	1	1	1	1	10%	1	2	Plans issued for bid contain mitigation measures	8/28/13 TUN1120
E	TUN		Guideway Tunnels	Underground obstructions tunnel and retrieval shaft	Include differing site conditions in GPs as well as DRB to adjudicate conflicts and minimize costs	С	2	2	3	3	35%	5	10	Mitigation measures have been implemented. Maintain adequate contingency throughout tunnel construction	2/5/14 TUN1124
PR1	TUN		Guideway Tunnels	Actual TBM production rate may be slower than forecasted.	Assign significant liquidated damages for not meeting specific schedule dates.	С	1	1	3	2	10%	2	4	Considered Risk inherent in the work and reflected in the Current Cost Estimate. Risk will be reflected in Contractor's Bid. LDs included in contract.	2/5/14 TUN1124
13	TUN		Guideway Tunnels	Damage / settlement 3x 5' to old brick sewer running parallel to tunnel alignment	Slip Line 3'x5' brick sewer before TBM reaches CTS.	С	1	1	-	1	10%	1	1	Tunnel profile has been lowered 25 ft and plans developed for replacement of at risk utilities in advance of tunnel drive.	TUN1121
15	TUN		Guideway Tunnels	Major TBM machine failure	Closely monitor condition and maintenance of the machines.	С	1	2	2	2	10%	2	4	Contractor has indicated that they plan to use a newly manufactured TBM for this project.	2/5/14 TUN1124
16	TUN		Guideway Tunnels	TBM loss and / or damaged in Transit	Provide provisions for insurance for TBM in transit to jobsite	С	1	5	4	5	10%	5	9	Costs covered by Contractor's insurance.	5/20/13 TUN1095
114	TUN		Guideway Tunnel	Grout pipes for BART underpinning are too long and cannot be installed accurately from small shaft.	<ol> <li>"Belling out" the bottom of the grout shaft on Ellis Street so that a larger directional drill rig can be utilized to more accurately install these grout pipes.</li> <li>In addition, investigate the possibility of using the basement of the old Virgin Records Store (Block 328 Lot 002) for installation of grout pipes.</li> <li>Investigate possibility of grouting from BART tunnel.</li> </ol>	С	-	2	2	2	0%	-	-	Test program to be conducted by tunnel contractor. Investigation of grouting program on previous contracts to be conducted by tunnel contractor.	8/28/13 TUN1120
115	TUN		Guideway Tunnel	Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently qualify of end walls.	<ol> <li>In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated.</li> <li>Alternatively, place an allowance in the station contracts for end wall leakage repair.</li> </ol>	С	3	1	1	1	50%	3	6	Project configuration changes include headwall designs with multiple levels of redundancy. Warranty provisions added to contact language.	<sup>S</sup> 5/26/15 UMS1295
116	TUN		Guideway Tunnel	TBM procurement, delivery and assembly takes longer than assumed in schedule.	Accommodate delay to TBM procurement and delivery, on the order of 2 or 3 months, with current float shown on the construction schedule.	С	2	2	2	2	35%	4	8	Mitigation measures are being implemented	5/20/13 TUN1095
В	TUN		Guideway Tunnel	Storage and testing of excavated soils from tunnel limits advance rate of tunneling.	<ol> <li>Provide adequate storage and handling facility to accommodate testing activity.</li> <li>Work with SAR to develop acceptance criteria, to minimize or eliminate testing requirements.</li> <li>Require the contractor to provide a detailed workplan for testing, sorting and stockpile prior to hauling.</li> </ol>	С	2	3	3	3	35%	6	9	Contractor is attempting to obtain the use of additional Caltrans parcel between Fourth & Fifth and Harrison & Bryant to help facilitate this work and provide additional storage area	

PROJEC	T RISK F	REGISTE	R	Risk Profile Likelihood Severity Score Score 1 2 3 4 5			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
Central Subv	way Project	San Franci	SCO	5 <b>H</b>		Probabili	<mark>ty</mark> < 10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X ( <u>COST IMPACT + SCHEDULE IMPACT</u> )	
REV : 15						Cost Impa	ct < \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium	2	
DATE ISSUI	DATE ISSUED : 11/08/12					Schedule Impa	Ct < 1 Month	< 1 Month 🗢 1 - 3 Months	Ionths <> 3 - 6 Months	⇔ 6 - 12 Months	s > 12 Months	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
Final Risk ID	Contract I.D	Muni Risk REF I.D	. Type Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
21	MOS	20.03.01.2	Moscone Station Incomplete cutoff of groundwater at MO	<ol> <li>Require additional grouting to limit leakage to permissible level.</li> <li>Include probable grouting work in cost &amp; schedule estimates.</li> </ol>	С	1	1	-	1	10%	1	1	1 Mitigation measure to be made part of the contract documents	4/28/15 MOS1150
22	MOS	20.03.01.5	Moscone Station Public complaints result in unanticipated restrictions on construction at MOS.	<ol> <li>Public outreach.</li> <li>Maintain regular and open communications so Public knows construction plans and progress at all times.</li> <li>Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths.</li> <li>Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed.</li> <li>Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements.</li> <li>Quickly process and resolve damage and accident claims from the Public.</li> <li>Assumed this work in cost &amp; schedule estimates.</li> </ol>	С	1	1	-	1	10%	1	1	Implementation of mitigation measures part of 1 Communication/Outreach plan and certain aspects to be included in the contract documents.	9/16/16 MOS1230
F	MOS		Moscone Station Underground obstructions Stations (MO	<ol> <li>Provide adequate allowance for differing site conditions to address unknown underground obstructions.</li> <li>Show field verified obstructions discovered during previous contracts on contract drawings.</li> <li>Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.</li> </ol>	с	4	2	2	2	80%	8	10	6 Mitigation measures have been implemented.	4/28/15 MOS1150
27	MOS		Moscone Station Loss of business results in unanticipated restrictions on construction at MOS.	<ol> <li>Public outreach.</li> <li>Maintain regular and open communications so Merchants know construction plans and progress at all times.</li> <li>Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths.</li> <li>Require barriers to protect pedestrians and shield them from noise and dirt from construction.</li> <li>Work with MOEWD to increase cleanup of the area and assist pedestrians across streets.</li> <li>Include this work in cost &amp; schedule estimates.</li> </ol>	С	1	2	1	2	10%	2	3	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	4/28/15 MOS1150
UMS Station	1													
F	UMS		Union Square market Street Station	<ol> <li>Provide adequate allowance for differing site conditions to address unknown underground obstructions.</li> <li>Show field verified obstructions discovered during previous contracts on contract drawings.</li> <li>Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.</li> </ol>	с	4	2	2	2	80%	8		Mitigation measures have been implemented.	8/12/15 UMS 1320
28	UMS	20.03.02.2	Union Square market Street Incomplete cutoff of groundwater at UM Station	<ol> <li>If needed, perform grouting to mitigate the intrusion of groundwater.</li> <li>Include in cost &amp; schedule estimates.</li> </ol>	С	8	2	1	2	0%	12	24	4 Mitigation measures in the form of consolidation grouting to be included in contract documents	8/12/15 UMS1320
32	UMS	20.03.02.9	Union Square Delay in advanced utility relocation dela Market Street ground treatment and start of construction Station 2)		R	1	1	1	1	10%	1	2	Advance utility relocation contract (1251) is underway with a projected completion date in advance of advertising UMS construction contract, reducing this risk of cost and schedule impacts	7/31/12 N-ATT00100
33	UMS	20.03.02.10	Union Square market Street Station Damage to utilities at UMS causes dela construction and/or consequential cost. close to walls adjacent to relocated utili trenches)	very 3. Show utilities on reference plans.	С	2	1	1	1	35%	2		Although mitigation measure have been fully 4 implemented, Increased probability due to proximity of new pile design to existing relocated utilities.	7/19/16 UMS1410

PROJEC	T RISK	REGISTE	R	Li	sk Profile Severity Score			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
Central Subv	way Projec	t San Francis	SCO	-	Score         1         2         3         4         5           5		Probability	y <10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X ( <u>COST IMPACT + SCHEDULE IMPACT)</u>	
REV : 15	, ,			_	5     J       4     J       3     J		Cost Impac	t < \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium	2	
	DATE ISSUED : 11/08/12			-			Schedule Impac	t < 1 Month	<> 1 - 3 Months	<> 3 - 6 Months	<> 6 - 12 Months	> 12 Months	>10	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
DATE 13301													High		
Final Risk ID	Contract I.D	Muni Risk REF. I.D	Туре	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
34	UMS	20.03.02.11	Union Square market Street Station	Loss of business results in unanticipated restrictions on construction at UMS.	<ol> <li>Public outreach.</li> <li>Work closely with Merchant's Association.</li> <li>Maintain regular and open communications so Merchants know construction plans and progress at all times.</li> <li>Advertise that Stockton Street Merchants are Open for Business.</li> <li>Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths.</li> <li>Require barriers to protect pedestrians and shield them from noise and dirt from construction.</li> <li>Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets.</li> <li>Include this work in cost &amp; schedule estimates.</li> </ol>	С	2	3	2	3	35%	5	10	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	9/7/16 UMS1430
35	UMS	20.03.02.14	Union Square Market Street Station	Ground support structure causes groundwater table to rise which results in leakage into adjacent structures.( new structure might create a dam that results into leaks into new and existing structures)	<ol> <li>Perform detailed hydrogeologic modeling and analysis.</li> <li>Monitor groundwater table at multiple locations and passive measures as necessary to mitigate.</li> <li>Reference the Tech memo in contract documents.</li> <li>Include probable costs in estimate.</li> </ol>	с	1	2	-	1	10%	1	2	Mitigation measures incorporated in design based on updated Hydrogeologic analysis and report	9/7/16 UMS1430
36	UMS	20.03.02.15	Union Square Market Street Station	Damage to buildings or utilities as a result of heave from jet grouting at UMS.	Utilize tangent piles combined with surface jet grouting.	С	1	1	-	1	10%	1	1	Mitigation measures implemented in contract documents to reduce risk	4/14/15 UMS1310
37	UMS	20.03.02.16	Union Square market Street Station	Damage to adjacent buildings at UMS due to surface construction activities.	<ol> <li>Require protective barriers.</li> <li>Have an emergency and rapid response customer focused task force to fix damaged facilities.</li> <li>Quickly repair and reimburse resulting costs.</li> <li>Include probable cost in estimate.</li> </ol>	С	1	2	-	1	10%	1	2	Mitigation measures implemented in contract documents to reduce risk	9/7/16 UMS1430
38	UMS	20.03.02.17	Union Square market Street Station	Tiebacks in Stockton Street mislocated (in path of walls and would have to be dug out within 20ft of surface level)	<ol> <li>Direct contractor to dig out the tiebacks on the plans.</li> <li>Include allowance and differing site conditions clause in contract.</li> <li>Include this work in the cost and schedule estimates.</li> </ol>	с	2	2	1	2	35%	3		Mitigation measures fully implemented, Advance utility relocation contract (1251) confirmed location of tiebacks. Risk rating has been reduced due to a lowering of the probability of event occurring	5/6/14 UMS1170
J	UMS		ROW	Macy's entrance conflict with new piles	<ol> <li>Show known obstructions shown on as-built drawings on contract drawings.</li> <li>Make as-built drawings available to contractor as reference drawings.</li> <li>Have contractor field verify obstruction shown on as-built drawings and contract drawings</li> </ol>	с	3	1	1	1	50%	3	6	Known obstructions are shown on the ES drawings. Allowance for differing site conditions added to UMS Station contract.	1/23/14 UMS1060
Q	UMS		Union Square market Street Station	As-built drawings and UMS construction drawings do not contain enough information to produce shop drawings without significant surveying effort delaying construction north entrance.	<ol> <li>Investigate if electronic files of design can be given to the contractor.</li> <li>Clearly define shop drawing criteria in the technical specifications.</li> <li>Make as-built drawings available as reference drawings to the contractor</li> </ol>	С	3	1	1	1	50%	3		Specifications require contractor to survey USG in order to develop shop drawings for structural steel.	3/24/12 UMS1280
CTS Station 46					1. Public outreach.										
	CTS	20.03.03.2	Chinatown Station and crossover cavern	Public complaints result in unanticipated restrictions on construction at CTS. (schedule and estimate for underground work assumes 6 day work week and 2 shifts per day)	<ol> <li>Nonicouriedan.</li> <li>Maintain regular and open communications so Public knows construction plans and progress at all times.</li> <li>Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths.</li> <li>Require barriers to protect pedestrians and shield them from noise and dirt from construction.</li> <li>Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed.</li> <li>Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements.</li> <li>Quickly process and resolve damage and accident claims from the Public.</li> <li>Include this work in cost &amp; schedule estimates.</li> </ol>	с	2	5	1	3	35%	6	12	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	10/9/17 CTS1500

# **Risk Register**

PROJECT	RISK	REGISTE	R		isk Profile ikelihood Severity Score Score 1 2 3 4 5			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
Central Subw	vay Projec	t San Francis	sco	-			Probabili	ty < 10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
REV : 15				-			Cost Impa	сt < \$250К	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium	2	
DATE ISSUE	ED : 11/08/	/12		-			Schedule Impa	Ct < 1 Month	<> 1 - 3 Months	<> 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
Final Risk ID	Contract I.D	Muni Risk REF. I.D	Туре	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complet by Date
7	CTS	20.03.03.5	Chinatown Station and crossover cavern	Revisions to the SEM sequence during construction at CTS, which differ from the plan, could lead to significant delays if not sufficiently pre-planned.	<ol> <li>Revisit sequence strategy during FD.</li> <li>Address change through flexible bid schedule.</li> <li>Utilize contractor pre-qualification:</li> <li>Require experienced SEM Contractor, approved SEM procedures, and continuous SEM inspection.</li> <li>Provide attractive T + C's (e.g. differing site conditions) Conduct peer review for FD</li> <li>Provide performance incentives including crew incentives for production.</li> <li>Require shotcrete, as needed. Include shotcrete &amp; inspection costs in estimate.</li> <li>Include language on drawing or in specification that allocates all risk to the contractor for change in sequence.</li> </ol>	D	-	5	3	4	0%	-	-	Language to transfer risk to contractor in case of proposed changes to sequence have been included in the updated contract specifications to 01 25 00 Substitution, 1.02C. This risk to be retired.	4/22/16 N-CTS973(
8	CTS	20.03.03.6	Chinatown Station and crossover cavern	Incomplete drawdown of groundwater. (inside of box and inside of caverns)	<ol> <li>Require additional grouting to limit leakage to permissible level.</li> <li>Include probable grouting work in cost &amp; schedule estimates.</li> <li>Include allowance for dewatering within cavern during construction.</li> </ol>	С	2	2	1	2	35%	3	6	Mitigation measures have been included in contract documents	5/1/16 CTS1140
0	CTS	20.03.03.11	Chinatown Station and crossover cavern	CTS station contractor delayed by tunnel contractor since station platform construction cannot start until tunnels have been finished.	<ol> <li>Include provisions in CTS contract identifying the potential waiting period for tunnel contractor.</li> <li>Actively monitor progress towards schedule milestones</li> </ol>	С	2	1	2	2	35%	3	6	Constraints on CTS contractor added to specification "Work Sequence and Constraints"	12/16/13 TUN1122
2	CTS	20.03.03.12	Chinatown Station and crossover cavern	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	<ol> <li>Evaluate effect of potential settlement on utilities.</li> <li>Slip-line sewer by TBM contractor.</li> <li>Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed.</li> <li>Have contingency repair/restoration plan.</li> <li>Utility contact information and procedure will be on plans.</li> <li>Develop an allowance for utility repair.</li> <li>Include probable cost in estimate.</li> </ol>	С	3	3	1	2	50%	6	12	Project configuration change, lowered station 25 ft. reducing the probability of this risk. Risk rating lowered.	4/22/16 N-CTS973
	CTS		Chinatown Station and crossover cavern	Underground obstructions stations (CTS)	<ol> <li>Provide adequate allowance for differing site conditions to address unknown underground obstructions.</li> <li>Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings</li> </ol>	С	4	2	2	2	80%	8		Mitigation measures have been implemented.	10/9/17 CTS1500
	CTS		Chinatown Station and crossover cavern	Proximity at junction of head house boundary wall and school yard may result in relocation of school yard during wall construction		С	1	1	1	1	10%	1	2	Project configuration changed to eliminate encroachment. Risk converted to Construction risk from Risk 55.	8/16/13 CTS1010
eneral	GEN	40.00.1	Unallocated Contingency	Escalation more / less than expected (Increase in bid prices to hedge possible increases in cost of volatile commodities.)	<ol> <li>In the current economic environment, escalation is just as likely to be less as more than anticipated.</li> <li>For volatile materials and equipment, provide substantial payment for stored materials and equipment to encourage early procurement and an escalation clause for volatile commodities in contracts.</li> </ol>	Μ	2	3	-	2	35%	3	6	Current projected escalation rates remain below those reflected in Program budget.	1/10/18 STS1042
molition, Clearing te Utilities, Utility		:													
	UTL	40.02.6	Utilities	Utility companies do not complete relocations in timely manner. (UTY 1 and UTY 2)	<ol> <li>Continue negotiations with utility owners.</li> <li>PM/CM will assist utilities with access and to schedule their work.</li> <li>Require Utility Relocation contractor to provide assistance to utilities.</li> <li>Include in contract allowance for Contractor to assist Utilities and incentive for early completion.</li> <li>Enforce franchise requirements.</li> </ol>	С	2	1	1	2	35%	4		Work is complete on one advanced contract and underway on the other.	6/31/12 N-ATT0010
	UTL	40.02.7	Utilities	Utility relocation is delayed due to non-standard materials not being available. (UTY 1 and UTY 2) AWSS special material ?	Work with utilities and contractor to identify and acquire non-standard materials well in advance of time that they are needed.	С	1	1	3	2	10%	2	4	Mitigations measures being implemented to manage risk	6/7/12 PC 00-020
	STS		Utilities	Timely resolution of Sewer lines south of portal.	<ol> <li>Develop alternatives that do not require creation of a new sewer line.</li> <li>Work together with SFPUC to find mutually beneficial solutions</li> <li>Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies.</li> <li>Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS.</li> </ol>	R	1	2	1	2	10%	2	3	\$ 2.1 million in budget. Could be as high as \$8 million. Continuing to work with SFPUC to find solution.	5/13/12 PDS 1870

PROJEC1	RISK I	REGISTER	2		isk Profile Severity Score			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
		t San Francis			Score 1 2 3 4 5		Probability	< 10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X ( <u>COST IMPACT + SCHEDULE IMPACT)</u>	
REV : 15	, ,			-	5 S S S S S S S S S S S S S S S S S S S		Cost Impact	< \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium	2	
OATE ISSUE	ED : 11/08/	/12					Schedule Impact	< 1 Month	⇔ 1 - 3 Months	<> 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
Final Risk ID	Contract I.D	Muni Risk REF. I.D	Туре	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Compl by Date
nvironmental Miti	igations	<u> </u>													
5	TUN	40.04.1	Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (Portal) AROUND 10%	<ol> <li>Provide on-call Archeologist.</li> <li>Provide allowance and procedure in contract for Archeological/Cultural discoveries.</li> </ol>	С	1	2	1	2	10%	2	3	Additional boring taken in vicinity of portal indicated no evidence of Archeological/Cultural resources.	10/24/12 TUN1080
5	MOS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost.(Moscone) AROUND 10%	Provide on-call Archeologist.     Provide allowance and procedure in contract for Archeological/Cultural discoveries.	С	3	2	1	2	50%	5	9	Mitigated - Current exposure only to those amount above those currently identified	4/28/15 TUN1150
1	UMS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (UMS)LESS THAN 1%	Provide on-call Archeologist.     Provide allowance and procedure in contract for Archeological/Cultural discoveries.	С	3	2	2	2	50%	6	12	Mitigation measures to be implemented in contract documents	8/12/15 UMS1320
3	CTS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (CHINA TOWN)AROUND 10%	<ol> <li>Provide on-call Archeologist.</li> <li>Provide allowance and procedure in contract for Archeological/Cultural discoveries.</li> </ol>	С	3	2	2	2	50%	6	12	Mitigation measures to be implemented in contract documents	10/9/17 CTS1500
ito/bus/van acce	ss ways, road	S													1
	GEN	40.08.1	Vehicle access	Change in traffic control requirements after bid.	<ol> <li>Provide unit bid items to reimburse contractor for traffic management costs outside their control.</li> <li>Include allowance in construction contracts for PCOs.</li> </ol>	С	3	4	1	3	50%	8	15	Mitigation measures implemented.	5/22/1 STS1020
ain Control and s	TUN	40.08.2	Vehicle access	Power supply interruptions to TBM's (no dual power feed currently planned)	Obtain TBM power directly from PG&E substation.	С	1	2	-	1	10%	1	2		2/5/14 TUN112
an control and	STS		Train Control and Signals	Interface new Signaling and Train Control system to existing at Fourth and King	Connect new system in parallel with existing system until the new system has been tested and safety certified for operation.	С	2	2	3	3	35%	5	10	Awaiting approval of contract plans by Muni Operations.	3/4/10 STS104
	STS	50.01.1	Train Control and Signals	Signals and Comms equipment may need to be stored off site	Require contractor to store equipment offsite or at the factory until it is needed.	С	3	1	-	1	50%	2	3	Special Provisions address offsite storage.	11/6/1 STS107
.73	STS	50.01.1	Train Control and Signals	Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities	Early engagement and coordination for agreements and plan development to avoid construction delays.	D	2	1	1	1	35%	2	4		5/30/1 DP3C53
274	STS	50.01.1	Train Control and Signals	Incomplete design by City staff – not prioritized to complete 1256 work on time	Monitor development of design and recommend exercise of contract options to supplement City staff.	D	3	1	1	1	50%	3	6	Options have been exercised to avoid impacts.	5/30/1 DP3C53
278	STS		Train Control and Signals	Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC	<ol> <li>Monitor other projects' developments.</li> <li>Develop contingency plans as needed to avoid 1256 delay of revenue service.</li> </ol>	С	2	1	1	1		2	4		7/27/1 FDS 194
affic signals & C	rossing Protn.	I I				r									
	GEN	50.05.2	Traffic Signals & Crossing Protection	CS system may need re-design to new system (not yet identified - Coordinating with SFMTA Accessible Services on the wayfinding system for the visually impaired.)	Include new Landmarking/Wayfinding system requirements into stations.	D	1	2	-	1	10%	1	2	DP3 preparing proposal to implement "Landmarking/Wayfinding" system	7/27/1 FDS 194
rchase or lease	of Real Estate	3				1									Ì
	TUN	60.01.1	ROW	Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	<ol> <li>Engage Owners in negotiations as soon as possible.</li> <li>PM/CM to provide real estate specialists to facilitate.</li> </ol>	R	1	1	-	1	10%	1	1	Right of possession obtained on all three parcels. Cost agreement reached with 1455 Stockton & 801 Market.	9/7/201
	MOS	60.01.2	ROW	Delay in obtaining access to Moscone station sites (goes to condemnation).	<ol> <li>Assure that adequate float is contained in the Moscone schedule for condemnation.</li> <li>Engage Owners in negotiations as soon as possible.</li> <li>PM/CM to provide real estate specialists to facilitate.</li> </ol>	R	1	3	3	3	10%	3	6	Continuing to negotiate cost with owner in parallel with condemnation proceedings.	7/1/12 FDS 124
hicles						1									ľ
	GEN	70.00.01	Vehicles	Cost of vehicles may be more than estimated due to sole source and small order	Time the procurement of the vehicles to be part of the procurement of the existing Breda LRVs.	R	4	4	4	4	80%	16	32	CSP vehicles to be included in overall SFMTA vehicle procurement contract.	11/17/1 STS 150
	GEN	80.02.2	Final Design	3rd Party reviews of Design documents delays completion of Final Design.	Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work.	D	1	2	2	2	10%	2	4	3rd Party coordination meeting ongoing.	5/23/1 FDS 193
0	GEN	80.01.3	Final Design	Multiple outside design consultants & mix of SFMTA / City could result in delays and additional costs due to complexities in design coordination	Conduct regular coordination meeting, integration meetings, interdiscipline meeting, design oversight reviews and partnering to encourage and promote a positive work environment.	D	2	2	2	2	35%	4	8	Consultant Design Manager and Design Oversight personnel are responsible for design coordination.	5/23/12 FDS 193

PROJEC		REGISTE	R		isk Profile Severity Score			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
Central Subv					Score 1 2 3 4 5		Probabili		<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
REV : 15	nay i rojoo	Courrient		-	5   Image: second sec		Cost Impa	ct < \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3-9	2	
		40		-	2 CON UN		Schedule Impa	ct < 1 Month	⇔ 1 - 3 Months	<> 3 - 6 Months	<> 6 - 12 Months	> 12 Months	Medium >10	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
DATE ISSUI	ED : 11/08/												High		
Final Risk ID	Contract I.D	Muni Risk REF I.D	Туре	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
94	GEN	80.04.3	Project Management	Bid protests delay award and NTP for construction contracts	Strictly adhere to Procurement Best Practices and Protest Procedures.	М	1	2	2	2	10%	2	4	Mitigation measures being implemented	2/19/13 FDS 1900
95	GEN	80.04.4	Project Management	Contractor default during construction impacts schedule. (key sub-contractor)	Assist Bonding company in transition and to maintain schedule.	С	1	2	2	2	10%	2	4		11/17/17 STS 1500
97	GEN	80.04.6	Project Management	Conflicts arising from Contractors working concurrently in the same work space results in delays and claims for additional costs (systems / civil interface)	Limit the number of contractors working in the same workspace by scheduling contracts appropriately and demobilizing contractors upon substantial completion.	С	2	3	2	3	35%	5	10	Mitigation measures being implemented	11/17/17 STS 1500
PR82	GEN		General	Confined work spaces along alignment can impact productivity and result in significant cost and schedule impacts.	Account for cost and schedule impacts in estimate and schedule for contract packages	С	1	1	1	1	10%	1	2		11/17/17 STS 1500
99	GEN	80.04.8	Project Management	Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.	<ol> <li>Executive partnering and alternate dispute resolution.</li> <li>Provide incentives in construction contracts in addition to penalties</li> </ol>	С	2	5	3	4	35%	8	16	Mitigation measures being implemented	7/27/12 FDS 1940
100	GEN	80.04.9	Project Management	Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)	<ol> <li>Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement.</li> <li>Monitor procurement of critical items.</li> </ol>	М	1	2	2	2	10%	2	4	Not considered a project risk.	11/17/17 STS 1500
102	GEN	80.04.11	Project Management	Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs	<ol> <li>Actively manage contracts and include incentive provisions for early completion in critical contracts.</li> <li>Add buffer float to critical path to actively manage schedule contingency</li> </ol>	С	2	1	2	2	35%	3	6	LONP 1 & 2 initiated to reduce this risk. See Risk 86. The mitigation of risks associated with early contracts will address this risk. Risk rating reduced due to mitigation measures implemented	12/30/20 MS 0010
107	GEN	80.04.12	Testing and startup	Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get bonding)	Structure construction contracts not to exceed \$250 million	М	2	5	-	3	35%	5	10	All contracts expected not to exceed \$250 million	7/27/12 FDS 1940
Γ	GEN	80.04.12	Testing and startup	Delay on station emergency ventilation approval	<ol> <li>Work with SFFD to develop a plan acceptable to each party.</li> <li>Incorporate SFFD requirements into construction documents.</li> </ol>	R	2	5	-	2	35%	4	10	SFFD agreed to the proposed plan by SFMTA	7/27/12 FDS 1940
V	GEN		MOS & CTS Stations	Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	<ol> <li>Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use.</li> <li>Integrate work with SFMTA Real Estate into CSP.</li> </ol>	D	3	2	2	2	50%	6			12/13/16 N-CTS1225
PR37	GEN		Testing and startup	Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment	<ol> <li>Identify temporary power requirements for station construction.</li> <li>Investigate the timing of the permanent feed.</li> </ol>	С	2	1	2	2		3	6	Cost for First and Redundant electrical services need to be included in Cost Estimate.	5/3/18 STS1080
Insurance, permit	s etc														
	GEN	80.06.1	Permits	Difficulty in getting required permits.	<ol> <li>Coordinate with permit officials and request permits as early as possible.</li> <li>Obtain assistance obtaining permits from PM/CM &amp; FD Consultants.</li> </ol>	С	1	2	1	2	10%	2	3		12/18/12 FDS 1275
104	STS	80.06.2	Approvals	CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	<ol> <li>Obtain Grade Crossing approvals at final CPUC inspection at the completion of construction.</li> <li>Coordinate closely with CPUC until approval is received.</li> </ol>	R	2	3	2	3	35%	5	10	Providing preview of 90% submittal to CPUC and will resolve comments/issues from PE before finalizing design documents	7/27/12 FDS 1940
105	GEN	80.06.3	Testing and startup	Electrical service delays startup and testing.	<ol> <li>Submit applications for new service as early as possible.</li> <li>Coordinate closely with PG&amp;E to ensure timely delivery of electrical service.</li> </ol>	С	1	2	1	2	10%	2	3	Applications for new service have been submitted to PG&E.	11/17/17 STS 1500
106	GEN	80.06.4	Labor relations	Risk of Labor dispute delaying the work.	Enforce designated gate for employees of the contract in dispute so that the rest of the work is not delayed.	С	3	3	2	3	50%	8	15		11/17/17 STS 1500
Unallocated Cont 111	ingency GEN		Unallocated Contingency	Major Earthquake stops work	Include Force Majeure clause in contracts.	С	1	5	3	4	10%	4	8	Force Majeure clause included in contracts.	12/30/20 MS 0010

PROJEC	T RISK I	REGISTER		isk Profile ikelihood Severity Score Score 1 2 3 4 5			Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
Central Sub	way Project	t San Francisco				Probability	y <10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
REV : 15			-	3		Cost Impac	t < \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium	2	
DATE ISSU	JED : 11/08/	12	-			Schedule Impac	t < 1 Month	⇔ 1 - 3 Months	<> 3 - 6 Months	<> 6 - 12 Months	> 12 Months	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
Final Risk ID	Contract I.D	Muni Risk REF. I.D Type	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
112	GEN	Unallocated Contingency	Major safety event halts work	<ol> <li>Require contractor Safety plan to address this risk.</li> <li>CM inspections to ensure that safety plan and proced implemented.</li> </ol>	dures are <b>C</b>	1	5	3	4	10%	4	8	Health and Safety provisions included in contracts. CS Program provides full-time Safety Manager.	12/30/20 MS 0010

# **Risk Reference: 83**

Risk	Mitigation Strategy
Cost of vehicles may be more than estimated due to sole source and small order	<ol> <li>Time the procurement of the vehicles to be part of the procurement of the SFMTA LRV procurement contract.</li> </ol>

**Initial Assessment:** 1, 1.5, 2 **Current Assessment:** 1, 2, 2 – Requirement Risk

# Status Log:

April 2012 Meeting:

- 1. Fleet procurement plan needs to be checked with Fleet agency.
- 2. Lewis Ames is working at a program level with Operations to look at alternatives and options for procurement.

# May 2012 Meeting:

- 1 An RFP is being developed by CH2M Hill for high-floor vehicles.
- 2 SFMTA will attempt to attach the procurement of the four CS vehicles to a procurement contract of another transit property that is currently pursuing procurement of vehicles.

June 2012 Meeting:

1 No status update.

# September 2012 Meeting:

- 1. CH2M Hill is now preparing an update of the LRV Procurement Plan. CH2M Hill is working under for SFMTA Transit and led by John Haley's staff under an on-call contract to support the update and help integrate the RFP vehicle specification process led by Elson Hao
- 2. Julie Kirschbaum, Manager of Service Planning/TEP is leading an effort to produce a new city-wide travel forecast as the means to support the capacity need for LRV fleet plan requirements in 2025.

The Plan is expected to be circulated, presented, approved; in 2012 etc. specific next steps in the 3rd and 4th quarters of 2012 will be provided in the next report.

3. The Procurement Plan is expected to include assessing the feasibility for SFMTA to attach the procurement of the four CS vehicles to a procurement contract of another transit property that is pursuing procurement of vehicles.

October 2012 Meeting:

- 1. Risk increased from (1,2, 2) to risk rating (4,4,16)
- 2. There is a possibility that the cost of the LRV significantly exceed the budget
- 3. Risk to be reviewed next meeting, status of LRV procurement plan to be advised

Risk Owner: L. Ames

- SFMTA Transit Division issued a revised procurement plan to the FTA in October identifying the following actions in the near term;
   a. Provide ROM Cost, funding schedule and cashflow drawdown November 2012

b.	LRV Concept report	December 2012
c.	Service Demand Modeling Updates	December 2012
d.	Central Subway Service Plan Model Revisions	December 2012
e.	Finalize Fleet Strategy including Base Order Qty	December 2012
f.	Complete Acquisition Plan	December 2012
g.	Release updated Fleet Management Plan to FTA	February 2013
h.	Release updated Central Subway Service Plan to FTA	February 2013
i.	Release updated LRV Procurement Plan to FTA	February 2013

November 2012 Meeting:

1.

# **Risk Reference: 7**

Risk	Mitigation Strategy
Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE	<ol> <li>Early and extensive co-ordination with BART.</li> <li>Survey BART tunnels to determine exact locations.</li> </ol>
ALLOWANCES).	<ol> <li>Checking effect of maximum expected settlement on tunnels.</li> <li>Requiring EPBM TBM,</li> </ol>
	<ol> <li>Contractor to demonstrate effective control of ground settlements and correction of settlements by compensation grouting, and pre-installation of compensation grout piping under BART tunnels prior to tunneling reaching Market St.</li> </ol>
	<ol><li>Require repair/adjustment plan.</li></ol>
	7. Develop contingency plan to provide bus bridge, if needed.
	<ol> <li>Requiring non-stop weekend excavation beneath BART tunnels.</li> </ol>
	<ol><li>Monitor movement of BART tunnels in real-time.</li></ol>
	10. Repair/adjust as needed.
	11. Included probable cost in estimate.
Initial Assessment: 1, 1.5, 2	Risk Owner: S. Wilson

**Initial Assessment:** 1, 1.5, 2 **Current Assessment:** 3, 2.5, 7.5 – Construction Risk

# Status Log:

# February 2012:

- 1. Coordination with BART has been ongoing.
- 2. The BART tunnels have been surveyed.
- 3. An assessment of the effect of maximum anticipated settlement has been done.
- 4. Tunnel contract specifications require compensation grouting.
- 5. Tunnel contract specifications require the contractor to measure settlements in real time.
- 6. Tunnel contract specification require contractor to provide Action Level Plans that details measures to be taken if observed settlements and/or distortions exceed specified values.
- 7. Tunnel bid documents included bid items for Building Protection, including the BART tunnels.
- 8. EPBM TBM required for tunnel contract.
- 9. Coordinated with BART and Independent Review Panel (IRP) on specific check points for assessing effectiveness of control of the EPBM tunneling operations and related ground movements.
- 10. BART analysis of bus bridging concept reveals that it is not feasible due to lack of capacity in the system to handle the bridging.
- 11. Recommend to reduce this risk rating.

June 2012 Meeting:

1. Contractor and construction manager have gone through BART background check and security training that will allow the contractor to perform the settlement monitoring.

November 2012 Meeting: 1. Coordination with BART and IRP ongoing

# **Risk Reference: 32**

Risk	Mitigation Strategy
Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2)	<ol> <li>Intensive coordination with and commitment from utility owners.</li> <li>Early completion incentive for utility relocation contract.</li> <li>Enforce franchise agreements.</li> </ol>

Risk Owner: M. Benson

Initial Assessment: 1, 1, 1

**Current Assessment:** 1, 1, 1 – Requirement Risk

# Status Log:

# September 2011:

Advance utility relocation contract (1251) is underway with a projected completion date in advance of advertising UMS construction contract.

# January 2012 Meeting:

- 1. CN1251 is 77% complete as of end of December.
- 2. Utility companies are beginning cutovers to new joint trench facilities.

# March 2012:

1. PG&E and AT&T coordination is ongoing. AT&T has brought on additional resources to keep schedule.

# April 2012

1. PG&E and AT&T coordination is ongoing.

# May 2012

- 1. PG&E and AT&T coordination is ongoing.
- 2. AT&T has brought on further additional resources to keep schedule.
- 3. AT&T schedule has slipped based on their current staffing levels.
- 4. SFMTA will request that AT&T begin night work to finish their cutover work ASAP.

# June 2012

1 No status update

# July 2012

1. No Status update

- 1. Completion and close out of AT&T work to be tracked under this risk.
- 2. Currently expecting completion by end of November 2012.

**Risk Reference: 74** 

Risk	Mitigation Strategy
Insufficient time in schedule for testing and commissioning S&C	<ol> <li>Increase duration for this task in the master schedule.</li> <li>Add Division 1 Testing and Commissioning Specification including requirements for Plan, personnel and Committee.</li> </ol>
Initial Assessment: 4, 2.5, 10 Current Assessment: 0, 0, 0 – Requirement Risk	Risk Owner: C. Campillo

# Status Log:

December 8, 2009 Meeting:

- 1. R. Nguyen was identified as the risk owner.
- 2. Risk Mitigation Strategy needs to be rewritten.
- 3. This risk is part of DP3 contract
- 4. R. Nguyen to include in the rewritten risk mitigation strategy: a Start-Up Plan, identification of a Start-Up Manager; identification of a Start-Up Committee.

# January 21, 2010 Meeting:

- 1. R. Nguyen indicated that he interprets this risk as "systems testing." He presented the schedule activities associated with this risk and the related durations and float changes that have occurred over the period from August 2008 to October 2009. It was agreed that more detail is needed in the schedule to define the testing.
- 2. R. Edwards will identify an individual to provide more detail on start up and testing requirements. Whatever the result of obtaining this input, it appears that more time will be needed to accomplish this work.
- 3. It may be necessary to use some Buffer Float to account for any additional time to conduct the testing. The Project can use "some" of this float now that it has permission to perform final design.
- 4. R. Nguyen rewrote the mitigation strategy per his action at the last risk meeting; however, as a result of comments at the meeting, he needs to revise the strategy to include "testing of train controls and signals. R. Nguyen will establish the scope of this risk and a more detailed schedule of activities and durations for presentation at the next risk mitigation meeting.

# February 18, 2010 Meeting:

1. R. Edwards indicated that there is a need to evaluate the schedule to determine the full impact of this risk. He says that the Project shows 80 days for start up and testing-the LA Gold Line had greater than this. R. Edwards will break down the start up and testing into more activities, mainly to identify predecessor activities so that milestones can be set for these activities. R. Edwards will work with R. Whitwell to assist in addressing this risk.

# March 11, 2010 Meeting:

- 1. R. Whitwell developed the schedule activities for the S&C per the action at the last risk mitigation meeting. He is working on assigning durations to these activities and will meet with Project Controls on 3/18/10 for this purpose.
- 2. R. Edwards will work with R. Whitwell to determine options that are reasonable, but aggressive, for starting S&C activities earlier in order to minimize or negate impact on project completion and Revenue Service.
- 3. R. Edwards will report on the above two activities at the next risk mitigation meeting. It was stated that S&C includes implementing the Safety Certification Checklist.

# April 27, 2010 Meeting:

1. There was not much progress made this last month on this risk mitigation. R. Whitwell is working on assigning durations to the S&C activities that have been identified and has meet with Project Controls for this purpose. R. Edwards will work with R. Whitwell to determine options that are reasonable, but aggressive, for starting S&C activities earlier in order to minimize or negate impact on project completion and Revenue Service. R. Edwards stated that four months is not enough time for the S&C task, however, identification of early work could make this happen. R. Edwards will report on this activity at the next risk mitigation meeting.

#### June 2, 2010 Meeting:

1. R. Edwards, R. Whitwell and meeting attendees concur that the four months presently in the schedule for the testing and commission work is insufficient. Without a different approach, this would take about 12 months to complete. R. Edwards is proposing to identify systems work that can be performed early so that portions of the start up and testing can be accelerated thus relieving the tight schedule. R. Whitwell is working to identify more detail in the schedule so that these early work items can be inserted in the schedule for Project review for viability. For example, work could start at Moscone while the CTS mining is continuing. It is anticipated that all systems work could be done up to the CTS before the CTS is completed. While this approach divides the system installation, it allows for an earlier start. Systems acceptance, of course, is based on the whole system.

2. R. Edwards will provide a preliminary schedule of accelerated systems activities at the next meeting that commence defining the approach he has identified to accelerate the systems work. In addition, he will provide a list, with pros and cons, of the above items that were suggested at the meeting to facilitate accelerating the work.

#### July 22, 2010 Meeting:

There has not been significant progress made on mitigation actions for this risk. R. Edwards is presently working with the designer to develop more detail in the schedule so that portions of the start up and testing activities can be identified for acceleration thus relieving the tight schedule. Progress in this regard will be reported at the next risk meeting tentatively set for August 26, 2010.

# October 28, 2010 Meeting:

R. Whitwell is working with the designer to develop more detail in the schedule so that portions of the start up and testing activities can be identified for acceleration thus relieving the tight schedule. Progress in this regard will be reported at the next risk meeting.

# January 2012 Meeting:

- 1. Recommend six additional months be added for testing and commissioning.
- 2. Mitigation strategy added: "Add Division 1 Testing and Commissioning Specification including requirements for Plan, personnel and Committee".

#### June 2012 Meeting:

No status update.

# July 2012 Meeting:

1. Division 1 Section 01 80 00 Systems Testing, Integration, Start Up, and Commissioning updated and included in Section Index approval due 7/16/12

# **Risk Reference: 74**

August 2012 Meeting:

1. Draft RFP prepared for Sole Source Thales Advanced Train Control Contract. Schedule will be updated as scope of work is further defined.

September 2012 Meeting:

- 1. The current schedule includes 6 months for startup activities, preceded by 2 months of buffer float, schedule to be reviewed next meeting.
- 2. RFP issued proposals due 24<sup>th</sup> October 2012.

October 2012 Meeting:

- 1. Candidate to retire
- 2. There is approximately 6 months in the schedule for startup, 2 months of buffer float prior.
- 3. Review updated schedule for combined contract next meeting

- 1. 1300 combined contract schedule reviewed demonstrating adequate times for testing and commissioning two sets of commission for each startup are in STS prior to pre revenue service.
- 2. This risk was retired by unanimous consent of the Risk Assessment Committee on 11/08/12.

Risk	Mitigation Strategy
Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	<ol> <li>Engage Owners in negotiations as soon as possible.</li> <li>PM/CM will provide real estate specialists to facilitate.</li> </ol>

Initial Assessment: 2, 3, 6

**Current Assessment:** 1, 1, 1 – Requirement Risk

# Status Log:

# October 2011 Meeting:

- 1. All Tunnel easements have been acquired.
- 2. Recommend to retire this risk from the project.
- 3. This risk will be revisited next month since not all easements have been obtained

# November 2011 Meeting:

- 1. Right of entry received for properties requiring easement.
- 2. Costs have been identified through appraisals of properties.
- 3. Actual value of easements needs to be negotiated with property owners.
- 4. Added mention of battered piles at UMS headwalls to the risk description as they will cross property lines.

# December 2011:

1. Right of possession for each of the three required parcels has been obtained.

# January 2012 Meeting:

- 1. City Attorney's Office is finalizing final easement deed language and price for all three easements.
- 2. To date owners of 801 Market and 1455 Stockton have agreed to purchase price of easement.
- 3. Awaiting cost agreement with 790 Market.
- 4. Recommend to reduce the risk rating.
- 5. Risk rating reduced to 1, 1, 1.

# February 2012 Meeting:

1. SFMTA is working with City Attorneys Office to finalized easement deed indemnity language for the 790 Market easement.

# March 2012 Meeting:

 SFMTA has provided the City Attorney's Office with additional information regarding tunnel and station related settlement at 790 Market. This information will be shared with the property owner at 790 Market in order to address their concerns of settlement and requests to include certain indemnity language in the tunnel easement. Current draft of the tunnel and station grouting licenses contain the requested indemnity language; CCSF Risk Manager, SFMTA and City Attorney do not feel owner's request for indemnity is appropriate in the easement deed.

Risk Owner: G. Hollins

# **Risk Reference: 79**

# April 2012 Meeting:

1. No update from the March report-out.

# May 2012 Meeting:

1. No update from the March report-out.

# June 2012 Meeting:

1. No update from the March report-out.

# July 2012 Meeting:

1. No update from the March report-out.

# August 2012 Meeting:

1. The SFMTA has agreed to a final purchase price for the 801 Market and 1455 Stockton easements. 801 Market will transfer title (of the easement) through a purchase and sale agreement and 1455 Stockton will transfer title through a stipulated agreement. Final purchase price negotiations for easement under 790 Market are ongoing.

# September 2012 Meeting:

- 1. Central subway has pre-possession for all 3 easements.
- 2. Negotiations continue on terms and conditions for 801 Market and 1455 Stockton.
- 3. Negotiations continue on final purchase price for 790 Market easement.

# October 2012 Meeting:

- 1. Central subway has pre-possession for all 3 easements.
- 2. The SFMTA has executed a final stipulation agreement for possession of the easement under 1455 Stockton and all remaining funds have been transferred to the property owner.
- 3. Negotiations continue on terms and conditions for 801 Market.
- 4. Negotiations continue on final purchase price for 790 Market easement.

- 1. Central subway has pre-possession for all 3 easements.
- 2. The SFMTA has executed a final stipulation agreement for possession of the easement under 1455 Stockton, final transfer of funds is pending signature of the easement deed from the property owner.
- 3. Negotiations continue on terms and conditions for 801 and 790 Market.

# **Risk Reference: 104**

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	<ol> <li>Grade Crossing approvals are not received until final CPUC inspection at the completion of construction.</li> <li>Close coordination with CPUC will continue until approval is received.</li> </ol>
Initial Assessment: 2, 3.5, 7	Risk Owner: C. Campillo

**Current Assessment:** 2, 3, 5 – Requirement Risk

# Status Log:

September 2011:

1. Providing preview of 90% submittal to CPUC and will resolve comments/issues from PE before finalizing design documents.

January 2012 Meeting:

- 1. Design team conducted informal review meeting with CPUC on 12/6/11 in preparation for 1256 pre-final submittal. CPUC provided 5 comments at the meeting that will be incorporated by the designers:
  - Evaluate curb extension at Portal
  - Evaluate curb tapering or end treatments
  - Evaluate train coming sign at 4<sup>th</sup>/Bryant and 4<sup>th</sup>/Brannan
  - Evaluate black out/no left turn sign
  - Evaluate guide stripping
- 2. CPUC issued Resolution SX-92 granting SFMTA approval to construct the new and modified grade crossings in March 11, 2010. This approval is good for 3 years.
- 3. SFMTA will need to file for an extension of SX-92 at least 30 days before March 11, 2013.
- 4. SFMTA will need to file CPUC Form G within 30 days after the completion of construction.
- 5. Recommend to reduce this risk rating.
- 6. Risk rating reduced to 2, 2.5, 5.

April 2012 Meeting:

1. CPUC review comments are being incorporated into the 100% contract documents.

May 2012 Meeting:

No update.

July 2012 Meeting:

 CPUC reviewed and approved 11 of 12 comments noted on RCF-066. RCF-66 Comment 49 remains open with no CPUC concurrence or Verification. Comment 49 states the Muni standard Red X "Crossbuck" signal is not consistent with MUTCD standards and is strongly discouraged by the CPUC for new construction. Comment 49 will be resolved with CPUC to assure successful application of SX-92 for new and modified grade crossings due February 11, 2013.

# Risk Reference: 104

August 2012 Meeting:

- 1. Mitigation measures to be discussed with CPUC at the August 16, 2012 Safety and Security Meeting.
- 2. State PUC to review documents, validate and sign off.

# September 2012 Meeting:

- 1. Meeting held with CPUC.
- 2. Document review ongoing.

# October 2012 Meeting:

- 1. Requirements have been incorporated into the design documents
- 2. Letter to be sent to CPUC for concurrence

# November 2012 Meeting:

1. Confirmation of concurrence is being sought from PUC and is expected to be received by February 2013

Risk	Mitigation Strategy
The process of acquiring station licenses: acquisition/condemnation	1. Continue to negotiate with building owners
could significantly delay schedule and cost more than that presently	2. Required Notices and Appraisals to be completed
planned.	3. Commence condemnation process with City Attorneys
Initial Assessment: new risk	Risk Owner: A.Clifford

**Current Assessment:** 1, 4, 4 – Requirement Risk

Status Log:

September 2012 Meeting:

- 1. Risk 57 retired August 2012. New Risk 196 opened.
- 2. To date 9/27 required Station Licenses have been signed by the respective property owners.
- 3. 5/27 have reached verbal agreement or have been sent to the owner for signature.
- 4. 13/27 Licenses are outstanding
  - a. 7 of the 13 outstanding Licenses are progressing toward agreement
  - b. The Program team is currently preparing for condemnation on the following 6 Licenses should 1 Stockton (Apple) & 212 Stockton (Bvlgari) (same property manager)

216 Stockton (Dior)

39 Stockton (Disney)

19 Stockton (Armani) - unresponsive owner

250 Fourth Street (Olivet University)

- 5. Targeting Board of Supervisors 10/23/12
  - a. remaining Notice of Intent to Appraise mailed 8/30/12
  - b. finalize list of condemnation properties by 9/14/12
  - c. remaining appraisals to be completed by 9/20/12
  - d. meeting with board clerk 9/21/12
  - e. government code offer letters to be sent by 9/27/12

- 1. To date;
  - a. 11/27 required station licenses have been signed by the respective property owners.
  - b. 4/27 have reached verbal agreement or final drafts have been sent to the owner to sign.

# c. 12/27 Station licenses remain outstanding, 3 of which are being negotiated with the a single property owner (Macy's) and are expected to reach agreement.

- 2. 9/27 Remaining station licenses + 2 remaining tunnel easements (Central Subway has possession of the two tunnel easements) have been calendared for the December 11<sup>th</sup> Board of Supervisors Hearing.
  - a. Central Subway project team and the City Attorney's office submitted draft Resolutions of Necessity to the Clerk of the Boards office November 5<sup>th</sup>.
  - b. The Central Subway Project team continues to negotiate with the property owners.
  - c. The required access for compensation grouting and building monitoring is expected approximately May 10<sup>th</sup> 2013 should this need to be obtained through the eminent domain process.

# **Risk Reference: T**

Risk	Mitigation Strategy
Delay to final design submittal due to delay of emergency ventilation approval by SFFD.	<ol> <li>Work with SFFD to develop a plan acceptable to each party.</li> <li>Incorporate SFFD comments into the construction documents.</li> </ol>

Initial Assessment: 2, 2, 4 Current Assessment: 2, 2, 4 – Requirement Risk

#### Status Log:

# December 2011:

1. A meeting was held on 12/15/11 with SFFD and SFMTA to discuss emergency ventilation. SFFD agreed to the proposed plan by SFMTA as long as additional signage and lighting were provided in the stations to increase the safety of emergency responders in event of an emergency.

March 2012 Meeting:

- 1. Required emergency ventilation requirements will be incorporated into the construction documents.
- 2. Recommend to retire this risk from the risk register.
- 3. This risk is not retired. Final approval by SFFD on 100% construction documents still needed.

# May 2012 Meeting:

- 1. SFFD requirements are being implemented in the construction documents.
- 2. A variance for the under stair requirement will be sought from SFFD.

June 2012 Meeting:

- 1. SFFD has conditionally approved the 3-fan configuration in the stations.
- 2. SFFD has conditionally approved the CFD analysis for each station based on the approval of one-hour tenability using illuminated platform edge, and access/egress route signage/demarcation.
- 3. Final approval by SFFD will occur during the DBI pre-application review for each station.

# September 2012 Meeting:

1. SES review comments addressed, revised report submitted.

October 2012 Meeting:

1. Follow up required with SES to close out remaining comments and confirm concurrence

# November 2012 Meeting:

1. Central Subway continue to work with SFFD to close out the remaining comments

Risk Owner: R. Edwards

# **Risk Reference: 72**

Risk	Mitigation Strategy
Interface new Signaling and Train Control system to existing at Fourth and King	New system will be connected in parallel with existing system until the new system has been tested and safety certified for operation.

Initial Assessment: 2, 3, 5 Current Assessment: 2, 3, 5 – Design Risk

Status Log:

#### October 2011 Meeting:

- 1. Recommend to retire this risk from the project.
- 2. Risk not retired. Systems contract drawings need approval of Muni Operations.

# November 2011:

- 1. Functional requirements for the interface have been approved by Muni Operations.
- 2. 90% design drawings for Systems contract will be forwarded to Muni Operations for their review and comment.

# January 2012 Meeting:

- 1. Concept design with SFMTA Operations recommended safety enhancements have been approved.
- 2. ECP for recommended safety enhancements prepared and will be submitted to CMB for approval.

# February 2012:

- 1. CMB approved ECP for Operational & Safety Upgrades.
- 2. SFMTA Muni Operations signed off on ECP.
- 3. ECP being implemented by design team.
- 4. Recommend to reduce this risk rating.

# September 2012 Meeting:

- 1. Update to be provided next meeting.
- 2. New plan to be advised, mitigation strategy to be revised.

# October 2012 Meeting:

- 1. Central Subway have sent a letter to Ops including contract specifications, temporary and permanent requirements seeking concurrence
- 2. Ross/Carlos to provide a briefing next meeting regarding how signaling interface design has ensured functionality at the end of each weekend shutdown.

# November 2012 Meeting:

- 1. Technical specifications now approved.
- 2. A presentation is to be given at the December Risk meeting to demonstrate that the signaling design has confirmed functionality can be maintained where required, and reinstated following the 6 weekend shutdowns.

# Risk Owner: C. Campillo

# **Risk Reference: 89**

Risk	Mitigation Strategy
3rd Party reviews of Design documents delays completion of Final Design.	Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work.
2 oolgin	

Initial Assessment: 1, 2, 2 Current Assessment: 1, 2, 2 – Design Risk Risk Owner: R. Edwards

#### Status Log:

January 2012 Meeting:

- 1. Meetings with Third Party reviewers have been and continue to be held with Muni Operations, DBI, SFFD, BART, etc.
- 2. Late review comments will be handled as addendum.

# May 2012 Meeting:

- 1. A peer review panel was convened to assist in DBI reviews.
- 2. SFFD has been paid to assist in review and approval of Central Subway contract documents.
- 3. Meetings with other third party reviewers are ongoing.

# June 2012 Meeting:

1. Coordination with 3rd Party reviewers continues.

# August 2012 Meeting:

 Majority of third party reviews have been closed. Remaining reviews are in process of going through closure phase (requiring concurrence and verification of comments). Responses have been provided to each 3<sup>rd</sup> party comment. Priority was given to 3<sup>rd</sup> party reviewers with permit approval authority such as SFFD, SFPUC and DBI. Note that the design phase has been closed.

# September 2012 Meeting:

- 1. Process of closing out PUC and DBI comments is ongoing.
- 2. PUC requirements as per draft MOU scope are being incorporated into 1256 by addendum.

# October 2012 Meeting:

- 1. Process of closing out PUC and DBI comments is ongoing.
- 2. PUC requirements as per draft MOU have been incorporated into combined contract.

# November 2012 Meeting:

1. Central Subway continue to work with PUC and DBI to close out remaining comments

# **Risk Reference: PR73**

Risk	Mitigation Strategy
Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities	Early engagement and coordination for agreements and plan development to avoid construction delays.
Initial Assessment: 2, 1, 2	Risk Owner: R. Edwards

**Current Assessment**: 2, 1, 2 – Design Risk

# Status Log:

March 2012 Meeting:

1. Project team continues to coordinate with 3<sup>rd</sup> party utility agencies (AT&T, PG&E, SFDT) to complete construction and cutover of facilities designed under CN1250 & CN1251.

May 2012 Meeting:

1. Met with SFDT to confirm the scope of work that they will perform for the Systems contract.

June 2012 Meeting:

1. Agreements on scope of work with SFDT are being sought.

August 2012 Meeting:

1. MOU written to DTIS to define scope. Awaiting concurrence. SFFD reviewing 90-100% design no comments received to date.

# September 2012 Meeting:

1. Central subway following up DTIS

# October 2012 Meeting:

- 1. Follow up with DTIS still required, verbal concurrence received
- 2. 3<sup>rd</sup> Party Utilities
  - a. 1300 Utility relocations status to be advised next meeting
  - b. 1256 utility relocations confirmation and schedule required follow up next meeting

- 1. Follow up with DTIS still required
- 2. 3<sup>rd</sup> Party Utility
  - a. 1300 Utility relocations High level timeframes to be obtained from utility owners
- 3. 1256 Utility relocations
  - a. Confirmation and schedule to be sought from affected utilities.
  - b. AT&T to advise high level time frames should relocation of the duct bank (east side of 4<sup>th</sup> street, south of Bryant) be required.

# **Risk Reference: V**

Risk	Mitigation Strategy
Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	<ol> <li>Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use.</li> <li>Integrate work with SFMTA Real Estate into CSP</li> </ol>
Initial Assessment: 3, 2, 6	Risk Owner: R. Edwards
Current Assessment: 3, 2, 6 – Design Risk	

# Status Log:

March 2012 Meeting:

- 1. SFMTA entered into agreement with development firm to maximize use of existing SFMTA real estate inventory.
- 2. Initial task is to develop proposed best use for the top three properties of which two of the properties are CTS and MOS headhouse locations.
- 3. Need to identify Program contact person to stay in touch and provide input of CSP constraints to SFMTA Real Estate.

May 2012 Meeting:

1. The Planning Department has included development criteria in the recently approved Conditional Use Permit.

June 2012 Meeting:

No status update.

August 2012 Meeting:

- 1. **MOS TOD** set-aside TOD zone complied to & is based on current zoning criteria. SF Planning has plans to up-size the zoning in SOMA/Central Corridor. Potential conflict and discord with SF Planning on the IFB documents. FD has been completed.
- CTS TOD set-aside TOD zone or absence of TOD cleared SF Planning environmental (& historical) review & MMRP mitigation. Next step is obtaining Conditional Use Authorization thru Sept 6, 2012 Commission contract with incorporation of Planning Dept recommendations. Note: Obtaining the Conditional Use Authorization and incorporating the Planning Departments recommendations is not related to this risk

September 2012 Meeting:

1. Conditional Use permit received for CTS.

# October 2012 Meeting:

1. Status of communication to SFMTA Real Estate to be provided next meeting

November 2012 Meeting:

1. Chinatown Station is compliant with current building codes and zoning requirements in effect. SFMTA Real Estate has a separate project outside of Central Subway to specifically address transit oriented development (TOD) at the site. Central Subway is not directly involved

# **Risk Reference: V**

or has ability for involvement on the TOD scope. There have been no requests received from SFMTA Real Estate in relation to changing the CTS design. Note that the design is complete, and contract is out to bid as Contract 1300.

- 2. Yerba Buena / Moscone Station is compliant with current building codes and zoning requirements in effect. and does not preclude future TOD in accordance to present zoning CSP received a letter from SF Planning on May 4<sup>th</sup> 2012 stating the YBM design is in general conformance with the City's General Plan. In the same letter, SF Planning raised concerns in relation to the development potential of the site in relation to 1) future zoning criteria 2) development over the YBM headhouse portion of the site. Central Subway is circulating a response to this letter.
- 3. SFMTA Real Estate has a separate project outside of Central Subway to specifically address TOD on the site. Central Subway is not directly involved or has the ability for involvement on the TOD scope. There have been no requests received from SFMTA Real Estate in relation to changing the YBM design.
- 4. Note: a correction has been made to the August update.

# Risk Reference: 56

Risk	Mitigation Strategy
Escalation more / less than expected (Increase in bid prices to hedge possible increases in cost of volatile commodities).	<ol> <li>In the current economic environment, escalation is just as likely to be less as more than anticipated.</li> <li>For volatile materials and equipment, provide substantial payment for stored materials and equipment to encourage early procurement</li> <li>Include an escalation clause for volatile commodities in contracts.</li> </ol>
Initial Accomments 5, 2,5, 12	Pick Owner A Wong

**Initial Assessment:** 5, 2.5, 13 **Current Assessment:** 2, 3, 6 – Market Risk Risk Owner: A. Wong

## Status Log:

September 24, 2009 Meeting:

- 1. Escalation varies over the duration of a project. It is favorable to the Project now, but could be a concern in the near future.
- 2. This risk needs to be monitored, but little can be done about it at this time.

February 2012:

- 1. Escalation clause will not be included in contracts because current market projections do not warrant escalation provisions.
- 2. Current cost estimate includes a 3.3% escalation.
- 3. Bid costs will be based on commodity prices at the time of bidding.
- 4. Contractors are likely to include potential escalation of commodities in contracts based on forecasted escalation at the time of bidding.
- 5. Risk rating reduced to 2, 3, 6

# November 2012:

1. Various market factors have changed but overall risk remains unchanged.

# Risk Reference: PR79

Risk	Mitigation Strategy
Parking Garage appraised higher than anticipated.	1. Provide adequate contingency for potential higher costs
Initial Assessment: 1, 1, 1	Risk Owner: R. Edwards
Current Assessment: 0, 0, 0 – Market Risk	
Status Log:	

June 2012 Meeting:

1. An independent review of parking garage appraisal is being conducted by Walker.

- 1. Walker Parking have developed an operational plan for the parking garage during and after construction.
- 2. David Tattersall has completed a fair market value appraisal of the acquisition and impact on the garage during construction.
- 3. The appraisal has been forwarded to the FTA seeking concurrence.
- 4. The appraised value of the UMS Garage acquisition is significantly below the RAMP allowance
- 5. Recommend this risk be retired
- 6. This risk was retired by unanimous consent of the Risk Assessment Committee on 11/08/12.

Risk	Mitigation Strategy						
Bid protests delay award and NTP for construction contracts	Strictly adhere to Procurement Best Practices and Protest Procedures.						
Initial Assessment: 1, 2, 2 Current Assessment: 1, 2, 2	Risk Owner: A. Wong						
Status Log: September 2011:							

Mitigation measures being implemented.

November 2012:

1. Combined contract out to bid, revisit following bid opening

Risk Reference: 16

Risk	Mitigation Strategy
TBM loss and / or damaged in Transit	<ol> <li>Provide provisions for insurance for TBM in transit to jobsite.</li> <li>Include insurance costs in contract cost.</li> </ol>

Risk Owner: M. Benson

**Initial Assessment:** 1, 5, 5 **Current Assessment:** 1, 5, 5 – Construction Risk

#### Status Log:

February 2012:

- 1. Costs covered by Contractor's insurance.
- 2. Payment for delivery of TBM is staged in Mobilization bid item based on performance milestones.
- 3. Recommend to reduce risk to 1, 3, 3

#### September 2012:

- 1. Contractor has ordered spare parts
- 2. 2<sup>nd</sup> TBM will be used to mitigate loss
- 3. Contingency plan to be developed investigate market for 2<sup>nd</sup> hand TBM's

#### October 2012:

1. Market for 2<sup>nd</sup> hand TBM's still to be investigated

#### November 2012 Meeting:

- 1. Market for 2<sup>nd</sup> hand TBM's will not be investigated.
- 2. Recommend retiring, will revisit in December 2012 Risk meeting.

### Risk Reference: 23

Risk	Mitigation Strategy
Time to relocate existing utilities at Moscone Station (fiber optics - uty 1, large water main - uty 2),	<ol> <li>Intensive utility coordination and investigation.</li> <li>Relocate utilities out of the way of construction wherever possible.</li> <li>Show utilities on reference plans.</li> <li>Have utility contact information and procedure on plans.</li> <li>Have contingency repair/restoration plans.</li> <li>Assumed probable impacts to schedule &amp; cost in estimates.</li> </ol>
Initial Assessment: 1, 1, 1	Risk Owner: M. Benson

**Current Assessment:** 0, 0, 0 – Construction Risk

Status Log:

September 2011:

1. Advance utility relocation contract (1250) is nearly complete, reducing this risk of cost and schedule impacts.

November 2012 Meeting:

- 1. 1250 Utility relocations complete
- 2. This risk was retired by unanimous consent of the Risk Assessment Committee on 11/08/12.

#### Risk Reference: 38

Risk	Mitigation Strategy
Tiebacks in Stockton Street miss located (in path of walls and would have to be dug out within 20ft of surface level)'	<ol> <li>Contractor has been directed on the plans to dig out the tiebacks.</li> <li>Include allowance for differing site conditions to contract.</li> <li>Assume this work in the cost and schedule estimates.</li> </ol>
Initial Assessment: 3, 1.5, 5 Current Assessment: 2, 2, 3 – Construction Risk	Risk Owner: M. Benson

#### Status Log:

February 2012:

- 1. Advanced utility relocation contract (1251) confirmed location of tiebacks.
- 2. Tiebacks are shown in contract drawings.
- 3. Note on ES-001 directs contractor to remove tiebacks.
- 4. Allowance for differing site conditions has been included in the contract.

September 2012:

1. Update to be provided next meeting

October 2012:

1. Allowance for differing site conditions has not been included into the contract. PM/CM Design Manager to review bid items for inclusion into the contract documents.

November 2012 Meeting:

1. Confirm allowance for differing site conditions has been included as bid item in 1300 contract

**Current Assessment:** 1, 2, 2

Risk	Mitigation Strategy
Archeological/Cultural findings during construction increases schedule and/or cost. (Portal) AROUND 10%	<ol> <li>Provide on-call Archeologist.</li> <li>Provide allowance and procedure in contract for Archeological/Cultural discoveries.</li> </ol>
Initial Assessment: 1, 1.5, 2	Risk Owner: D. Greenaway

Status Log: September 2011:

Additional boring taken in vicinity of portal indicated no evidence of Archeological/Cultural resources.

November 2012:

Risk	Mitigation Strategy
Power supply interruptions to TBM's (no dual power feed currently planned)	Chance of power outage is miniscule.
<b>Initial Assessment:</b> 1, 1, 1 <b>Current Assessment:</b> 1, 1, 1 – Construction Risk	Risk Owner: S. Wilson
Status Log:	

September 2011:

November 2012 Meeting:

Risk	Mitigation Strategy
Signals and Comms equipment may need to be stored off site.	1. It is normal for the contractor to store equipment offsite or at the factory until it is needed.
Initial Assessment: 3, 0.5, 2	Risk Owner: C. Campillo
Current Assessment: 3, 1, 2 – Construction Risk	
Status Log:	

December 2011:

1. This risk would only apply to Agency-Furnished Equipment or Materials.

November 2012 Meeting:

Risk Reference: 111

Mitigation Strategy
1. Include "Force Majeure" clause in contracts.

**Initial Assessment:** 1, 4, 4 **Current Assessment:** 1, 4, 4 – Construction Risk Risk Owner: A. Wong

### Status Log:

February 2012:

1. General Provisions Section 702, B.1 allows for non-compensable time extension to a contract in the case of an earthquake.

#### August 2012 Meeting:

1. Mitigation plan to be prepared to deal with the event of an earthquake occurring

#### September 2012 Meeting:

1. Mitigation plan/emergency response plan to be prepared

#### October 2012 Meeting:

- 1. Requirements for Central Subway mitigation/emergency response plan to be discussed next meeting
- 2. 'Force Majeure' inclusion in contracts to be reviewed next meeting

#### November 2012 Meeting:

- 1. Requirements for Central Subway mitigation/emergency response plan to be discussed next meeting
- 2. Outline scope of plan to be developed if required.

Risk Reference: J

Macy's entrance conflict with new piles.	<ol> <li>Show known obstructions on as-built drawings on contract drawings,</li> <li>Make as-built drawings available to contractor as reference drawings.</li> <li>Include allowance for differing site conditions.</li> <li>Recover costs for removal of Macy's entrance from Macy's if it is in conflict with station construction.</li> </ol>

Initial Assessment: 3, 1, 3 Current Assessment: 3, 0, 0 – Construction Risk Risk Owner: J. Wang

#### Status Log:

February 2012:

- 1. Known obstructions are shown on the ES drawings.
- 2. As-built Macy's drawings will be made available to the station contractor.
- 3. An allowance for differing site conditions has been added to the contract.

#### November 2012:

Program Phase	Document	TOTAL	<b>Requirement</b>	naining Ris	<b>Warket</b> ks by Cate	<b>Construction</b>	Tunnels	Moscone Station	Union Square Station	Chinatown Station	General	Demolition	Utilities	Hazmat Bisk	δq Environmental	Transit and Access	Train Control & Signals	Traffic Signals & Crossings	Fare Collection Systems	Real Estate	Vehicles	Preliminary Engineering	Final Design	Project Management	Insurance Permits	Unallocated Contingency
Preliminary	March 2009 Risk Register Rev 1	113					19	8	18	10	1	1	4	3	5	2	4	1	2	4	2	3	4	11	5	6
Engineering	July 2009 Risk Management Project Execution Plan, Rev 0																									
	April 2011 Risk Register Rev 4a	176					19	13	47	34	1	1	4	3	5	2	4	1	2	4	2	3	4	12	4	11
Final Design	April 2011 Risk Management Risk & Contingency Management Plan, Rev 1																									
Fillal Design	September 2011 Risk Register Rev 4	165					28	11	30	26	1	1	5	3	5	2	10	1	2	7	2	3	4	14	4	6
	<b>October 2011</b> Risk Management Risk & Contingency Management Plan, Rev 2																									
Construction	October 2012 Risk Register Rev 14	77	8	7	5	57	14	5	11	7	1	0	3		4	2	6	1		3	1		2	11	4	2
	<b>December 2012</b> Risk Management Risk & Contingency Management Plan, Rev 3																									

To date, Contingency Management has been structured on baseline documents developed from the FTA Risk Assessment performed in March 2009 prior to entry into Final Design. A FTA Risk Refresh was performed in May 2011 in preparation for entering into a FFGA. At the time, several significant changes had occurred on the Program; however, no changes were made to the Contingency Drawdown Curves for both cost and schedule. Minimum cost contingency levels established by the baseline documents in early 2009 require updating at this phase of the project to reflect current project status. The Program is advocating the need for changes to the baseline documents' milestones, hold points and minimum contingency levels for reasons stated within.

Contributing factors necessitating the need for reexamining the original milestones hold points and drawdown curves are: Changes to project configurations, delays to design submittals, re-sequencing of contract package procurement, delay to FFGA, and improved risk profiles for tunnel and station contracts.

Table 1 exhibits the existing agreed to Milestones and Hold point that are an integral part of the Program's Risk and Contingency Management Plan (RCMP), the timing of the milestone (QTR) reflects the 2012 update of the RCMP. Proposed changes are shown by in italicized Red Text and new column for proposed minimum levels.

	Hold Points	QTR	Minimum Contingency Level (\$Millions)	Proposed Minimum Contingency Level (\$Millions)
1a	Tunnels 100% Designed	1Q11	\$280	\$280
1b	UMS CTS100% Designed	4Q11	\$250	\$240
1c	FFGA Award and NTP Tunnels October 2011b 40% Bid (Tunnel and CTS)	2Q12	\$225	\$200
1d	FFGA Award	3Q12	-	\$180
2	CTS/UMS Commence October 2012	4Q12	\$160	\$160
3	Demobilize Tunnels January 2014	2Q14	\$140	\$140
4	Complete Station to Platform Levels <i>January</i> 2017 (CTS/MOS)	1Q17	\$60	\$60
5	Complete CTS/Tunnels Systems Installation July 2018	3Q18	\$25	\$25
	Revenue Service	4Q18	0	0

#### Table 1: Minimum Cost Contingency

Close examination of Contingency levels and rational utilized for minimum levels reveals that the original plan has a minimum of \$225M at the time of FFGA. Expectations would have been that the tunnel bid was known and the only physical work completed or in progress would be the Advance Utility Relocations contracts. As can be seen from excerpts of the March 31, 2009 Risk Assessment Report (see below) prepared in advance of recommending entering the Final Design Phase, this rational was based on the assumption that the Tunnel bid would represent 40% of the total bid for all projects, thus addressing a significant level of risks.

Although the station designs would have been complete, the actual bid numbers would not have been known, only 100% estimates. Presumably this minimum value (\$225M) addressed two points, maintaining the recommended 15% level of contingency at the time of FFGA and having ample contingency to address market risks associated with the underground station work in the City of San Francisco.

The next Hold point is the commencement of CTS and UMS, which would indicate that the bids are in for these two high risk underground station constructions. What can be seen is an expectation for a significant use of contingency as the minimum level drops precipitously to \$160M. With the exception of some advance work being started on the TBM launch box (a low risk item) no other physical work was anticipated. This would imply an anticipated use of contingency to address the actual bid values for the two significant underground stations that were deemed extremely risky due to the use of SEM construction, the physical location of both stations, the many constraints imposed, the concern that there would be a limited number of bona fide bidders and most Contractors would be leery of doing business in the City of San Francisco because of perception of onerous requirements in City contracts and most importantly the potential for catastrophic impacts to surrounding buildings and businesses.

Implementation of the recommended changes to milestones and hold points, the program will be at the exact same minimum contingency level as shown in the table above for the same given point in time, commencement of the two underground stations. The program sees the need to adjust the hold points and minimum levels in approaching this strategic point in time due to contributing factors noted above. Specifically, the delay in design submittals, and FFGA, combined with the re- sequencing of the contract procurement; has not only changed the order in which previously identified key strategic events occur, but has necessitated the reevaluation and heightened importance of hold points as they relate specifically to contingency draw down. Examining these against the backdrop of rational utilized to establish the minimum levels as outlined above provides the necessary justification to rationalize the change in contingency draw down, milestones and hold points.

Contributing factor to adjust milestones	Resulting justification for use of contingency
Delays to design submittals	Constrains use of contingency for intended purpose
Re-sequencing of contract package procurement	Advances confirmation of high risk cost items
Delay to FFGA	Allows use of contingency for intended purpose
Improved risk profiles for tunnel and station	Allows use of contingency for intended purpose
contracts	

Changing the definition of Hold point #1b is significant in bringing forth a revised definition of the 40% of Bid. This should include the Tunnel Contract and CTS contract. Representing nearly 50% of the work, having known values, significant risk has been addressed, justifies changing this hold point definition. In addition, market risk has been incorporated in the estimates of the Stations and combined with the knowledge of the CTS bid, use of Contingency to make up the increased estimates for market risk is consistent with the original intent but comes at a different point in time. Concerns are itemized below combined with the program mitigation

Concerns that would contribute to Market Risk	Program Mitigation Measure to Address Risks
Use of SEM construction	Changes to project configurations – Lower CTS and
	eliminate bulb at UMS
The physical location of both stations	Special Provisions to address limitations;
	Additional cost included in estimates
The many constraints imposed	Included additional costs for constraints
Limited number of bona fide bidders	Successful Outreach efforts – Good Market
	Conditions – Large Interested Turnouts
Contractors would be leery of doing business in	Overhaul of General Provisions specific for Central
the City of San Francisco because of perception of	Subway; – 15 Major Contractors combined for
onerous requirements in City contracts	Tunnel bid – Good indication of interest
The potential for catastrophic impacts to	Extensive Building Instrumentation and Monitoring
surrounding buildings and businesses.	as well as compensation grouting to address
	potential settlement issues included in costs

The justification for these changes can be augmented by examining the rational for the establishment of the original milestones and hold points and then addressing the contributing factors above and how they preserve the integrity of the original contingency management objects for addressing those risks, but justifiably can be refined to better address the current project circumstances and status.

Muni Central Subway Project, San Francisco Page 15 of 87 Risk and Contingency Analysis and Recommendations March 31, 2009 – Annotations address how proposed change preserves intent

Milestone #3 - 40% through Bid and Award

- The group agreed to delete the links from station contract awards because they are not a requirement for this milestone to occur. *At the time 40% bid was presumed to be the tunnel contract.*
- The only activity directly related to this activity is the award of the tunnels contract. *Current projections are that the combination of Tunnel and CTS will represent more than 40% of Bid.*
- The changes brought this milestone date back almost a year, to September 13, 2011. *The inclusion of CTS in contracts considered part of the 40% moves this milestone later in time by nine months.*
- Milestone #2 (FFGA) and #3 (40% Bid) occur at the same time. This is because SFMTA intends to award the tunnels contract to allow the procurement of the tunnel boring machines (TBM's)

under an LONP prior to an FFGA. The occurrence of the two milestones still is occurring at nearly the same time, and the rational for procuring the TBMs remains, but not as part of an LONP. Milestone #3 (40% Bid) however now occurs prior in time to Milestone #2 (FFGA) necessitating a change in numbering and minimum contingency value.

- The tunnels contract would require a "break clause" and require identification of "compensation" in the bid to protect SFMTA in the event that FFGA is not awarded, Funds could not be sourced locally and the contract had to be terminated. *Incorporated as part of the contract documents*
- It was noted that there have been projects in the recent past that have been cancelled prior to FFGA. *Still applicable has the same effect on both existing and proposed changes.*
- It would be likely that compensation for cancellation of the contract would be significant as costs would include the TBM's themselves, overheads expended and loss of profit expected from the contract works. *Still applicable has the same effect on both existing and proposed changes*
- The RFP would also likely have to include a "costs for delay" in anticipation of delivery of the TBM's being held up awaiting construction of the launch box linked to a late award of the construction contract following the FFGA award. *Launch Box is subject of an approved LONP and scope of work associated with NTP 2, issued March 14, 2012 prior to FFGA award negating the impact of this perceived risk and "cost of delay". This issue has been altered and work associated with NTP 3 now becomes the risk, should FFGA be delayed to a point that the MPS would be impacted.*

#### Milestone#4 20% Construction

- Agreed date of October 24, 2012 January 2013 (utilizing rational noted below)
- Project milestones are reflective of expected cash flow. At this stage the TBM's have been delivered, a good proportion of utility relocations have been undertaken and there has been a significant draw down on design costs with PM/CM staffing costs weighing in on cash flow expenditure. *TBMs expected to be delivered in December 2012, advance utility relocations will be complete, Final Design costs will be known and PM/CM staffing cost are currently well below plan.*

Milestone #5 50% Construction

- Agreed date of December 31, 2013.
- The reason there is only just over one year between 50% and 75% construction is because in this period tunnel excavation through to disassembling the TBM's is completed and the construction of all the station structures comprising mining, cavern construction and station platforms is well advanced with CTS progressed to head house excavation.

Milestone #6 75% Construction

• Agreed date of January 20, 2016.

Milestone #7 90% Construction

• Agreed date of May 4, 2017.

#### 4.4.2 FTA Hold Points

"Hold" points are defined as points in time, which may be the same as project milestones but are more likely to be associated with strategic events where significant risk exposure is reduced. At "Hold" points minimum contingency amounts for project cost contingency and project float contingency are established and form ceilings below which the implementation of mitigation is believed unavoidable if the project is to be completed to the budget and agreed Revenue Operations Date.

Below are the agreed upon hold points:

1a.Tunnels 100% Design May 2010

- 1b. UMS Station 100% Design June 2011
- 1c. FFGA Award and NTP Tunnels October 2011
- 2. CTS/UMS stations commence works on site October 2012
- 3. Demobilize Tunnels October 2013
- 4. Complete Station to platform levels (CTS/MOS) October 2015
- 5. Complete CTS/Tunnels Systems Installation June 2017

The following discussions at Workshop #4 were pertinent to the agreement of the "Hold" points:

• The PMOC proposed at "Hold" point 1, after bid and award of the tunnels contract and following award of the FFGA– Milestone #2 and #3–a minimum level of \$250 million in contingency should be retained

• After lengthy discussion it was agreed that having the first hold point at the award of the FFGA and holding \$250 million in contingency until this time was an excessive amount to hold as a minimum through virtually all of final design and after award of the tunnels package. Two intermediate "Hold" points were agreed to recognize a gradual draw down against contingency during design. *This gradual draw down can be performed utilizing lower minimum levels and still preserve the intent of covering identified risks.* 

• Hold" point 1a was taken to be when tunnel design was complete targeted for May 2010. This "Hold" point was added because there are expected to be no major changes to the design of tunnels from this major design element from this point forwards. The contingency requirement for this hold point was set at \$280 million. *This hold point was met and minimum levels maintained.* 

• "Hold" point 1b was taken to be at the finish of UMS station design. This hold point is at the completion of all station design, after which the risk of major changes in station design is most unlikely. The contingency requirement for this hold point was set at \$250 million. *The risk of major changes is the station designs have been mitigated with the submittal of the 100%. However, significant cost increase not related to scope changes but due to costs that address perceived market risks due to special provisions and physical constraints required a greater use of contingency than originally planned at this point in time. This increase in cost was anticipated but later in time.* 

• Minimum contingency at "Hold" point 1c (FFGA award) was agreed at \$225 million reflecting a gradual draw down throughout final design, preparation of bid documents, and the RFP process. The tunnels contract would also be bid and awarded at this point with the manufacturing of the TBM under way. More information will be known about program costs to justify a lowering of the minimum at this strategic point in time, specifically, nearly 50% of the bid will be known and lower risk profiles of remaining contracts justifies not holding such an excessive amount at this point.

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A Cost Contingency Recovery Workshop was held on May 25, 2012 in accordance with Program Procedures PCP 06 to address that cost contingency had fallen below the minimum level and to develop a plan. The results of the workshop can be found in Figure 1.

The workshop revealed that FFGA guidance does not address the contingency level calculations of programs that have large expenditure prior to FFGA hence requiring holding a higher level of contingency based on Program's budgets, rather that percentage of cost to complete which takes into account the cost of reducing previously identified risks. The analysis indicates that the Program will have a 17% contingency at the time of FFGA as compared to the recommended 15%, when the calculations are made on the "risk" associated with the remaining work to be performed.

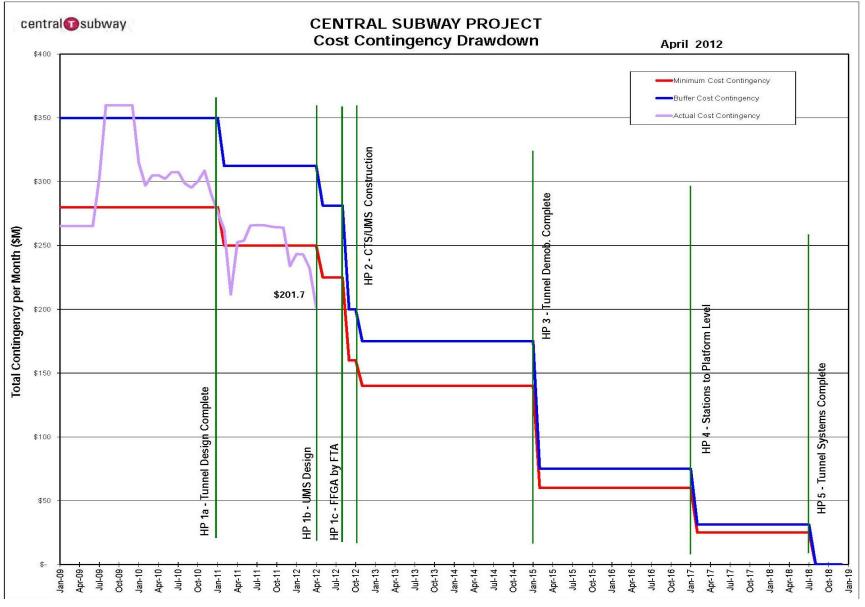
Taken together with the analysis of the milestones and hold points, the workshop resulted in recommending the revised levels of minimum contingency at the refined definitions of milestones and holdpoints. Figure 2 shows the current status of contingency below the established minimums. Figure 3 illustrates the new minimum contingency levels together with the refined definitions.

## FIGURE 1

Analysis of Contingency Levels Based on Total Cost versus Cost to Complete as of the end of April 2012

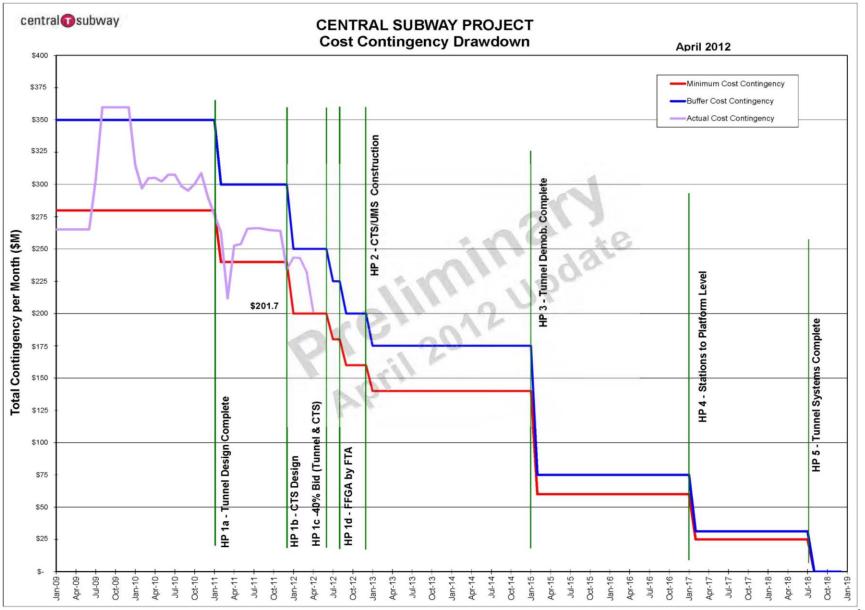
Project Cost Elements	CCE (YOE)	Expenditures to Date	Cost to Complete		PMOC DAK/BL			CENTRAL SUBWA	v
	As of April 2012	In Millions	In Millions	Recommended Contingency %	Total Contingency Dollar Calculated from CCE (YOE)	Total Contingency Dollar Calculated from Cost to Complete	Recommended Contingency %	Total Contingency Dollar Calculated from CCE (YOE)	Total Contingency Dollar Calculated from Cost to Complete
Contract 1250 / UR1	11.4	11.3	0.1	1.0%	0.114	0.114	3.0%	0.342	0.342
Contract 1251 / UR2	19.4	17.1	2.3	2.0%	0.388	0.388	2.0%	0.388	0.388
Contract 1252 / Tunnel	233.5	13.2	220.3	14.0%	32.69	30.842	14.0%	32.69	30.842
Contract 1253 / UMS	210		210	15.0%	31.5	31.5	17.0%	35.7	35.7
Contract 1254 / CTS	235		235	17.0%	39.95	39.95	17.0%	39.95	39.95
Contract 1255 / MOS	129		129	16.0%	20.64	20.64	14.0%	18.06	18.06
Contract 1256 / STS	125		125	14.0%	17.5	17.5	15.0%	18.75	18.75
Other Construction	17	3	14	10.0%	1.7	1.4	10.0%	1.7	1.4
					0	0		0	0
ROW	36	14	22	10.0%	3.6	2.2	8.0%	2.88	1.76
LRV	24		24	10.0%	2.4	2.4	10.0%	2.4	2.4
Preliminary Design	46.2	46.2	0	0.0%	0	0	0.0%	0	0
Final Design	76.3	51.6	24.7	10.0%	7.63	2.47	5.0%	3.815	1.235
Program Management	178.9	34.3	144.6	8.0%	14.312	11.568	8.0%	14.312	11.568
CA/CM	15.5	2.8	12.7	5.0%	0.775	0.635	5.0%	0.775	0.635
Insurance	6.8	5.7	1.1	0.0%	0	0	0.0%	0	C
Legal	6.2	0.7	5.5	20.0%	1.24	1.1	20.0%	1.24	1.1
Survey	0.3	0.2	0.1		0	0		0	C
Start Up	7	0	7	20.0%	1.4	1.4	20.0%	1.4	1.4
Subtotal Base	1377.5	200.1	1177.4		1,377.5	1,177.4		1,377.5	1,177.4
Alloc Cont	122.8				175.8	164.1		174.4	165.5
Unallocated Contingency	78				25.0	36.7		26.4	35.3
Total Current Contingency	200.8		200.8		200.8	200.8		200.8	200.8
					1,578.3	1,378.2		1,578.3	1,378.2

### FIGURE 2

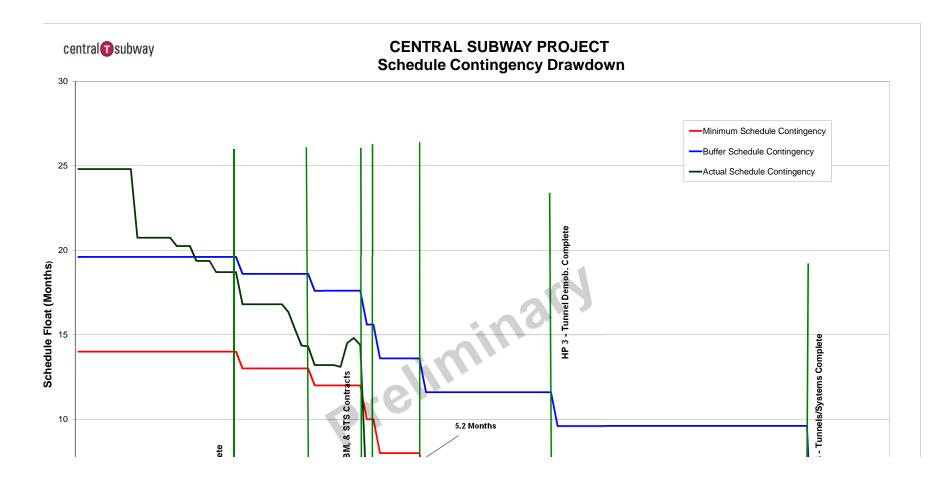


Contingency Management – 2012 Update

### FIGURE 3



Contingency Management – 2012 Update



ity ID	Activity Name	Original	Actual	Start	Finish	Total	2008	2009	2010	2011	2012	201	3 2014	2015	2016	2017	2018	2019	20
		Duration				Float		QQQ											QQQ
REA2304	(APN 3733-093) Finalize "Draft" Relocation Plan	100		06-Nov-09 A						N 3733-093)			ocation Plan						
REA2314	(APN 3733-093) FTA Circulation	20	÷.	26-Apr-10 A					في معاد المحاد ال	APN 3733-09	1								
REA2354	(APN 3733-093) Submit and Review - Relocation Plan	10		27-Jul-10 A						1 I I I I I	11111		iew Relocati	on Plan					
REA2315	(APN 3733-093) Public Circulation	20		27-Jul-10 A						(APN 3733-09		1 1							
REA2604	(APN 3733-093) Relocation Plan - SFMTA Board Approval	1		03-Aug-10 A	-					· · · · ·	1.1 0 0		- SFMTA Boa	11 1 1					
REA2614	(APN 3733-093) Board of Supervisors Approval - Relocation Plan	60		20-Sep-10 A						1 1 1 1			pervisors App		cation Plan				
REA2624	(APN 3733-093) Mayor Approve Ordinance	9	÷	08-Dec-10 A	08-Dec-10 A						1 1 1 1	1 111	ove Ordinanci	9					
REA2634	(APN 3733-093) Ordinance Take Effect	0		08-Dec-10 A						(APN 373)		1 1 1							
REA2344	(APN 3733-093) Commence & Complete Relocation Efforts	259		07-Feb-11 A							1 1 1 1	i i	3-093) Comm	- i i i		i i i			
REA3315	(APN 3733-093) Deliver 90 Day Notice to Tenants to Vacate	90		03-Apr-12 A	03-Jul-12 A						💻 (	i i	3-093) Deliver	1111	- i i i	- i i i	- i i i		
REA9780	(APN 3733-008) Construction License- 250 Fourth Street	58		24-May-12 A		114						1 1 1	3733-008) Cor						
REA9790	(APN 3733-108) Construction License- 801-805 Howard	58	89	24-May-12 A	26-Oct-12	114							3733-108) Cor						
REA10220	(APN 3733-093) Deliver 30 Day Notice to Tenants to Vacate	30	30	04-Jun-12 A	03-Jul-12 A								3-093) Deliver			its to Vacate			
REA3405	Property Cleared for Construction YBM	0	0		26-Oct-12	194						Proper	ty Cleaned for	Constructio	n YBM				
PROCUREMEN	IT PHASE	1307	1122	04-Aug-09 A	01-May-13	2801													
Bid/Award Utilit	ty Contract #1 MOS & Portal CP-1250	123	146	04-Aug-09 A	28-Dec-09 A														
PJD2253	SFMTA Board Approval to Advertise - Portal & MOS Utility Relocation	0	0		04-Aug-09 A			•	SFMTA Boa	ard Approval t	o Advertis	e - Portal	& MOS Utility	Relocation					
PJD2640	Advertise - Portal & MOS Utility Relocation Milestone	0	0	15-Sep-09 A				•	Advertise	Portal & MO	\$ Utility R	elocation	Milestone						ΠT
PJD2257	Advertise - Portal & MOS Utility Relocation	1	1	15-Sep-09 A	15-Sep-09 A			11	Advertise	- Portal & MO	\$ Utility R	elocation							
PJD2256	Prepare Bid - Portal & MOS Utility Relocation	49	28	15-Sep-09 A	22-Oct-09 A			1		Bid - Portal &									
FDS1970	Bid Opening - Portal & MOS Utility Relocation Milestone	0	0		22-Oct-09 A				Bid Open	ing - Portal &	MOS Util	ty Relocat	tian Milestone						
FDS1210	Bid Opening - Portal & MOS Relocation	1	1	22-Oct-09 A	22-Oct-09 A				Bid Open	ing - Portal &	MOS Rei	ocatiqn							
FDS1980	SFMTA Board Award - Portal & MOS Utility Relocation Milestone	0	0		17-Nov-09 A				SFMTA S	Board Award	- Portal &	MOS Utili	ty Relocation	Vilestone					
FDS1215	SFMTA Board Award - Portal & MOS Relocation	1	1	17-Nov-09 A	17-Nov-09 A				I SFMTA	Board Award	- Portal &	MOS Rel	ocation						
FDS1186	Approve/Execute/Certify - Portal & MOS Utility Relocation	40	25	18-Nov-09 A	28-Dec-09 A				Approv	e/Execute/Ce	ertify - Por	tal & MOS	6 Utility Relpca	tion					
Bid/Award Utilit	ty Contract #2 UMS CP-1251	180	119	14-Sep-10 A	11-Jan-11 A														
PJD2280	SFMTA Prepare/SFMTA Approve UMS Utility Reloc #2-Issue for Bid	0	1	14-Sep-10 A	14-Sep-10 A				1				/e UMS Utility	Reloc #2-Is	sue for Bid				
PJD2291	Advertise - UMS Utility Relocation	5	1	15-Sep-10 A	15-Sep-10 A				11111 <u>1</u> 11	Advertise - I	UM\$ Utilit	/ Relocati	on						计个
PJD2650	Advertise - UMS Utility Relocation Milestone	0	0	15-Sep-10 A					•	Advertise - I	UM\$ Utilit	/ Relocati	on Milestone						
PJD2330	Prepare Bid - UMS Utility Relocation	30	29	15-Sep-10 A	26-Oct-10 A				i   i i i	Prepare Bi	d - UMS U	Itility Relo	cation						
FDS1220	Bid Opening - UMS Utility Relocation	1	1	27-Oct-10 A	27-Oct-10 A					I Bid Openin	ng - UMS	Jtility Rela	cation						
FDS1990	Bid Opening - UMS Utility Relocation Milestone	0	0		27-Oct-10 A					Bid Openir	ng - UMS	Jtility Rela	cation Mileste	ne					
FDS1250	Bid Review - UMS Utility Relocation	20	9	28-Oct-10 A	10-Nov-10 A					Bid Review	N - UMS U	Itility Relo	cation						1-1-1
FDS1225	SFMTA Board Award - UMS Utility Relocation	1	2	10-Nov-10 A	07-Dec-10 A					SFMTA B	oard Awar	rd UMS	Utility Relocati	on					
FDS2000	SFMTA Board Award - UMS Utility Relocation Milestone	0	0		07-Dec-10 A					SEMITA B	oard Awar	rd UMS	Utility Relocati	on Milestori	e				
FDS1286	Approve/Execute/Certify - UMS Utility Relocation	40	22	08-Dec-10 A	11-Jan-11 A					Approve	Execute/	Certify - L	JMS Utility Re	ocation					
Bid/Award Tunn	nel CP-1252	199	345	15-Feb-11 A	26-Jan-12 A														
PJD2273	SFMTA Board Memo for Advertise - Tunnel	1	0	15-Feb-11 A	15-Feb-11 A					I SEMTA	Board M	emo for Ac	dvertise - Tuni	nel					
PJD2340	Advertise - Tunnel	5	4	28-Feb-11 A	04-Mar-11 A					I Advert	ise - Tunn	el							
PJD2660	Advertise - Tunnel Milestone	0	0	28-Feb-11 A						<ul> <li>Adverti</li> </ul>		1 1 1	me						
FDS1387	Prepare Bid - Tunnel	60	65	07-Mar-11 A	07-Jun-11 A					🔲 Pre	pare Bid	Tunnel							
	a antral aubuvay	CSP-CN	1PS		,	CITA	ITA Central	Subree	Project							tart On: 08-Ja	an 08		
	central cubway						Master Proje							1			an-08 Date: 26-Dec	c-18	
	and the state of t						All Acti									ata Date: 30-5			

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ctivity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total Float	2008	2009		2010	2011 2012	2013 2014 2015		018 2019	
FDS1230	Bid Opening - Tunnel	1	1 08-Jun-11 A	08-Jun-11 A						I Bid Opening	QQQQQQQQQQQQ Tunnel			QQC
FDS2010	Bid Opening - Tunnel Milestone	0	0	08-Jun-11 A						Bid Opening	Tunnel Milestone			<u>i</u>
FDS1280	Bid Review - Tunnel	17	40 09-Jun-11 A							Bid Review	Tunnet			
FDS1235	SEMTA Board Award - Tunnel	1	0 08-Aug-11 A								rd Award - Tunnel			
FDS2020	SEMTA Board Award - Tunnel Milestone	0		08-Aug-11 A							rd Award - Tunnel Milestone			
FDS1388	Approve/Execute/Certify - Tunnel Contract	50		0							/e/Execute/Certify - Tunnel Contrac			
	S Station CP-1253	76				+						·	+	·
PJD2293	SEMTA Board Notification to Advertise - UMS	1	· ·	-						I SF	ITA Board Notification to Advertise	- UMS		
FDS1682	Advertise/Prepare Bid - UMS (Addendum No. 9)	60	· · · · · · · · · · · · · · · · · · ·								Advertise/Prepare Bid - WMS (Add			
PJD2620	Advertise Milestone- UMS	0	· ·	017/0g 127/						. Ad	ertise Milestone- UMS			
	S Station CP-1254	113		24-Aug-12 A						↓ ∩u	enuse milestone- onno,			
PJD2303	SFMTA Board Notification to Advertise - CTS	1		v						I SEM	A Board Notification to Advertise - (	~+e		
FDS1795	Prepare Bid - CTS	55									epare Bid - CTS	515		
	•			04-Jun-12 A										
FDS1930	Advertise Milestone- CTS	0									rtise Milestone- CTS			
FDS1260	Bid Opening - CTS	1	0 12-Jun-12 A								d Opening - CTS			
FDS2030	Bid Opening - CTS Milestone	0	0	12-Jun-12 A						• B	d Opening - CTS Milestore Bid Review and Rejected- CTS			j
FDS1300	Bid Review and Rejected- CTS	20		0							Bid Review and Rejected- CTS			
	S Station CP-1255	1	0 30-Aug-12 A											
PJD2283	SFMTA Board Notification to Advertise - MOS	1									SFMTA Board Notification to Advert	ise - MOS		
Bid/Award CP-		195		01-May-13	0									
PJD2770	SFMTA Board Notification to Advertise - UMS, CTS, YBM, & STS	1		18-Oct-12	8						SFMTA Board Notification to Adve			
FDS2270	Advertise/Prepare Bid- UMS, CTS, YBM, & STS (Calendar Days)	93		22-Jan-13	9						Advertise/Prepare Bid- UNIS, (		Days)	
FDS2290	Advertise Milestone- UMS, CTS, YBM, & STS	0			7						Advertise Milestone UMS, CTS,			
FDS2250	Bid Opening- UMS, CTS, YBM, & STS	1	0 23-Jan-13	23-Jan-13	7						I Bid Opening- UMS, CTS, YBM			
FDS2300	Bid Opening Milestone- UMS, CTS, YBM, & STS	0	0	23-Jan-13	7						<ul> <li>Bid Opening Milestone- UMS.</li> </ul>			
FDS2280	Bid Review- UMS, CTS, YBM, & STS	20	0 24-Jan-13	21-Feb-13	7						Bid Review- UMS, CTS, YBM	, & STS		
FDS2240	SFMTA Board Award- UMS, CTS, YBM, & STS	1	0 05-Mar-13	05-Mar-13	0						I SFMTA Board Award- UMS,	CTS, YBM, & STS		
FDS2310	SFMTA Board Award Milestone- UMS, CTS, YBM, & STS	0	0	05-Mar-13	0						SFMTA Board Award Mileston	ne- UMS, CTS, YBM, & STS		
FDS2260	Approve/Execute/Certify- UMS, CTS, YBM, & STS	40	0 06-Mar-13	30-Apr-13	0						Approve/Execute/Certify- L	INIS, CTS, YBM, & STS		
FDS2320	NTP CN 1300- UMS, CTS, YBM, & STS	0	0 01-May-13		0						NTP CN 1300- UMS, CTS,	YBM, & STS		
LIGHT RAIL VE	EHICLES	1501	0 02-Jan-13	18-Dec-18	4									
COST8017	Vehicle Seed Money	501	0 02-Jan-13*	30-Dec-14	1003						Vehicle	Seed Money		
COST004	Cost Activity- Light Rail Vehicle (LOE)	668	0 27-Apr-16	18-Dec-18	4								Cost Ac	ctivity- L
N-LRV1290	Vehicle Delivery Inspection at Factory	1	0 27-Apr-16*	27-Apr-16	4							I Vehicle Delivery Inspe	ction at Factory	(
N-LRV1300	First Pilot Cars 1 & 2 Tested	130	0 06-Jun-16	08-Dec-16	4							First Pitot Cars	1 & 2 Tested	
N-LRV1310	First Vehicles Testing / Commissioning	110	0 09-Dec-16	16-May-17	4							First Vehi	cles Testing / Co	ommissi
N-LRV1320	SFMTA Training to enter Revenue Service	100	0 17-May-17	06-Oct-17	4	++++		1			-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+	SFM	TA Training to ent	ter Rev
N-LRV1330	Produce Operations Simulation to Assist Training	130	0 09-Oct-17	13-Apr-18	4								Produce Operat	1 1 1
N-LRV1340	Final Vehicles Testing/ Central Subway Testing	130	0 16-Apr-18	18-Oct-18	4								Final Vehi	icles Te
N-LRV1350	Pre-Revenue Soft Start	40	0 19-Oct-18	17-Dec-18	4								Pre-Rev	venue
N-LRV1360	First Vehicles Enter Revenue Service	1		18-Dec-18	4								First Vel	
		CSP-CM	PS				1 i i		1 1	Li ci Li i	<u> </u>	<u> </u>		
	central cubway	COI "CIVI					al Subway					Start On: 08-Jan-08		
	oundary				Ν		oject Sched ctivities	iule			F	equired Revenue Service Date: Data Date: 30-Sep-12		
		1						ate			1	Data Date. 50"36p"12		

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Activity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total 2008 200	09 2010 2011 2012 2013	2014 2015 2016 2017 2018 2019 2020
CONSTRUCTIO	N DUAGE	4014	1735 01-Jan-08 A	20 Dec 20		<u>alalalalalalalalalalalalalala</u>	<u>alalalalalalalalalalalalalalalalalalal</u>
Construction St		2978	1735 01-Jan-08 A		1154		
CON1010	Cost Activity- YBM Power Feed/ PG&E cn 1252	50	1197 01-Jan-08 A		1442	Cost	Activity: YBM Power Feed/ PG&E cn 1252
UT1001	Utility CP 1 Cost Activity	352	695 04-Jan-10 A		1505		1 Cost Activity
FRMB100	Cost Activity- Form B Credits for Utility Relo 1 &2 (LOE)	1240	695 04-Jan-10 A		84		ivity: Form B Credits for Utility:Relo 1 &2 (LOE)
COST046	Cost Activity Porm & Credits for Outling Reio 1 &2 (LOE) Cost Activity Misc. Construction Contract Work- Macy's	1240	252 04-Jan-10 A		04		Contract:Work-Macy's
CON1020	Cost Activity- Job Order Contract JOC	1795	329 12-Jan-11 A				b Order Contract JOC
COST082	Cost Activity Utilities Relo #2 CN 1251	720	628 12-Jan-11 A		2186		ivity Utilities Relp #2 CN 1251
COST8027	Cost Activity- Public Agencies- Utility Coordination (LOE)	1795	436 12-Jan-11 A		134		ty- Public Agencies- Utility Coordination (LOE)
COST8057	Cost Activity- 1250 & 1251 Department of Technology (LOE)	1795	344 23-May-11 A		1505		ivity-1250 & 1251 Department of Technology (LOE)
COST211	Cost Activity- Utility Relo # 1&2 Costs ***	0	362 05-Oct-11 A		197		ty- Utility Relo #:182 Costs ***
COST8047	Cost Activity Excessive Liability Insurance (LOE)	1273	140 14-Mar-12 A	30-Apr-13	15	Cqst	Activity Excessive Liability Insurance (LOE)
FRMB120	Cost Activity- Form B Credits for Utility Relo Tunnel(LOE)	333	82 05-Jun-12 A	24-Jul-14	162		Cost Activity Form B Credits for Utility Relo Tunnel(LOE)
CON1060	Cost Activity- STS Power Feed	1	0 02-Jan-13*	02-Jan-13	2009	Cost Act	iivity-STS Power Feed
COST170	Cost Activity Communication Connection (LOE)	200	0 01-May-13	18-Feb-14	317		Cost Activity Communication Connection (LOE)
FRMB110	Cost Activity- Form B Credits for Utility Relo CTS (LOE)	101	0 01-May-13	23-Sep-13	-4		Cost Activity Form B Credits for Utility Relo CT\$ (LOE)
COST021	Cost Activity- Public Art Program (LOE)	1058	0 16-May-13	01-Aug-17	65		Cost Activity- Public Art Program (L
CON1040	Cost Activity- CTS Power Feed	1	0 31-Jul-13*	31-Jul-13	1862		dst Activity- CTS Power Feed
CON1050	Cost Activity- UMS Power Feed	1	0 14-Oct-13*	14-Oct-13	1810		Cost Activity- UM\$ Power Feed
COST192	Cost Activity- ATCS- Central Control	1	0 02-Jan-14*	02-Jan-14	1758		Cost Activity ATCS- Central Control
CON1070	Cost Activity- YBM Permanent Power Credit	1	0 02-Aug-17	02-Aug-17	124		I Cost Activity- YBM Permanent Powe
CON1090	Cost Activity- CTS Permanent Power Credit	1	0 27-Sep-17	27-Sep-17	85		Cost Activity CTS Permanent Pov
CON1080	Cost Activity- UMS Permanent Power Credit	1	0 02-Nov-17	02-Nov-17	59		Cost Activity- UMS Permanent P
Construction U	tility Contract #1- MOS & Portal CN-1250	463	571 04-Jan-10 A	29-Jul-11 A			
	onract - (OCS & Comm Conduit)	455	504 04-Jan-10 A	23-May-11 A			
General Cond		455	504 04-Jan-10 A	23-May-11 A			
FDS1195	CN 1250 NTP- Portal & MOS Utility Relocation	0	0 04-Jan-10 A			CN 1250 NTP- Portal & MOS Utility Relocati	ion
UTL1082	Project Submittals & Permits	60	61 04-Jan-10 A	05-Apr-10 A		Project Submittals & Permits	
UTL1050	Portal & MOS Utility Relocation	319	504 04-Jan-10 A			Portal & MOS Utility Relocat	tion
UTL1232	Authorize Period for Option 2	340	274 04-Jan-10 A	,		Authorize Period for Option 2	
REA1022	CN 1250 NTP- Portal & MOS Utility Relocation	0,40	0 04-Jan-10 A			<ul> <li>CN 1250 NTP- Portal &amp; MOS Utility:Relocation</li> </ul>	
REA1022		0	0 04-Jan-10A			<ul> <li>CN 1250 NTP- Portal &amp; MOS Utility Relocation</li> </ul>	
	CN 1250 NTP- Portal & MOS Utility Relocation					<ul> <li>CN 1250 NTP- Portal &amp; MOS Utility Relocation</li> <li>CN 1250 NTP- Portal &amp; MOS Utility Relocation</li> </ul>	
REA1220	CN 1250 NTP- Portal & MOS Utility Relocation	0	0 04-Jan-10 A				
REA1412	CN 1250 NTP- Portal & MOS Utility Relocation	0	0 04-Jan-10 A			CN 1250 NTP-Portal & MOS Utility Relocati	
UTL1092	Work Start Date	0	0 26-Jan-10 A			♦ Work Start Date	
Welsh Street t		290	323 26-Jan-10 A				
UTL1102	Area1 - East Side Sta. 172+00 to 163+00	269	196 26-Jan-10 A			Area1 - East Side Sta. 172+00 to 163	
UTL1112	Area 1 - West Side Sta.172+00 to 163+00	109	196 26-Jan-10 A	•		Area 1 - West Side Sta 172+00 to 16	
UTL1122	Area 1 - Electrical Sta. 163+00 to 165+50 & OCS Pole	26	69 11-Aug-10 A			Area 1 - Electrical Sta. 163+00 to	165+50 & ΦC\$ Pole
Harrison to Fo	blsom	120	99 02-Jul-10 A	11-Jan-11 A			
UTL1192	AT&T/Third Party Re-route work	120	99 02-Jul-10 A	11-Jan-11 A		AT&T/Third Party Re-route work	
	central subway	CSP-CM	28		SFMTA Central Subwa Master Project Sch All Activities September 2012 Up	edule	Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

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Activity ID	Activity Name	Original Duration	Actual Duration	Start	Finish	Total Float	2008	200	9 2010	) 20	)11	2012	2	2013	201	4	2015	20	016	2017	201	18	2019	2020
UTL1142	Area 2 - AWSS - Fire Lines	14		01-Sep-10 A	17-Dec-10 A	Tioda	alalala	QQQ			Q Q Q a 2 - AM		QQQ						QQ					
Folsom to Ho		171			23-May-11 A																			
UTL1162	Area 3 - East Side Sta. 150+50 to 145+50	134			14-Mar-11 A						rea 3 -	East S	Side Sta	. 150+	50 to 145	5+50								
UTL1182	Clementina	48			12-Sep-10 A						: :													
UTL1152	Area 3 - Moscone Underpinning Sta. 151+00 to 153+00	32			23-Apr-10 A				A	ea 3 - Mo	iscone	Under	pinninα	Sta. 1	51+00 to	153+0	α		<u>+-</u>					
UTL1172	Area 3 - West Side Sta 150+50 to 154+50	106			23-May-11 A										150+50 to									
	Contract Work	375		31-Mar-10 A	-																			
Welsh Street		34		30-Jun-10 A																				
UTL1052	Milestone #1 - Joint Trench (East side)	0		30-Jun-10 A						Milestone	#1 - Jo	oint Tre	ench (E	ast sid	e)									
UTL1062	Milestone #2 - Begin AT&T Cutover Work	0	0	02-Jul-10 A						Milestone							·+-+-+-		÷					+
Harrison to Fe		49	159	31-Mar-10 A	15-Dec-10 A							Ĭ												
UTL1132	Area 2 - Joint Trench	49	159	31-Mar-10 A	15-Dec-10 A					Are	a 2 - Jo	int Trei	nch											
Folsom to Ho	oward	314	394	30-Jun-10 A	29-Jul-11 A																			
UTL1061	3 Days to Start of AT&T Cutover Work	3	2	30-Jun-10 A	02-Jul-10 A					3 Days to	Start	of AT&T	Cutov	er Wo	rk									
UTL1212	Option 2 work (48" sewer)	117	230	05-Oct-10 A	23-May-11 A			·	-1		Option	2 wor	k (48"	sewer)	· † · † · †		· † · † · †		† † † †					t t t
UTL1072	Milestone #3 - Complete Harrison - Bryant	0	0		17-Mar-11 A					• N	lileston	e #3 -	Comple	ete Har	rison - B	ryant								
UTL1202	CN 1250 Substantial Completion - Portal & MOS Utility Relocation w/o Option 2	0	0		23-May-11 A					•	CN 12	50 Sub	bstantia	l Com	oletion - F	Portal	& MÓS L	Jtility Re	elocatio	n w/o O	ption 2			
UTL1222	CN 1250 Substantial Completion - Portal & MOS Utility Relocation w/ Option 2	0	0		23-May-11 A					•	CN 12	50 Sut	bstantia	l Com	oletion - F	Portal a	& MÓS L	Jtility Re	elocatio	on w/ Op	tion 2			
UTL1063	Buffer Float to TUN NTP 2	0	0	29-Jul-11 A	29-Jul-11 A						I Buff	er Floa	at to TU		2									
Construction U	tility Contract #2 - UMS CN-1251	643	628	12-Jan-11 A	15-Oct-12	2998			-1111	*****	h triti		•••••	++	++++++				† † † †					+-+-+-
CN-1251 Contr	ract Milestones	643	628	12-Jan-11 A	15-Oct-12	197																		
GC-00-010	CN 1251 NTP- UMS Utility Relocation	0	0	12-Jan-11 A						♦ CN	1251	NTP-U	JINS Uti	lity Rel	ocation									
3P-STK-BU02	Access Req'd - Basement - 212 Stockton (Bulgari)	0	0		19-May-11 A					•	Acces	s Req	d - Bas	ement	- 212 St	ocktor	n (Bulgari	i)						
3P-STK-BU01	Work Completed - Basement - 212 Stockton (Bulgari)	0	0		27-May-11 A						Work	Compl	leted -	Başem	ent - 212	2 Stock	ton (Bul	gari)						
3P-STK-CB01	Vacated - Basement - 55 Stockton (Crate&Barrel)	0	0		30-May-11 A						Vacate	ed - Ba	semen	t - 55 S	Stockton	(¢rate	&Barrel)		†-†					
3P-STK-CB02	Access Req'd - Basement - 55 Stockton (Crate&Barrel)	0	0		30-May-11 A					•	Acces	s Req	d - Bas	ement	- 55 Stp	ckton	(Crate&I	Barrel)						
3P-STK-AP02	Access Req'd - Basement - 1 Stockton (Apple)	0	0		31-May-11 A					•	Acces	s Req	i'd - Bas	semen	t - 1 Storc	kton (	Apple)							
3P-STK-AP01	Work Completed - Basement - 1 Stockton (Apple)	0	0		31-May-11 A					•	Work	Comp	leted -	Basem	ent - 1 S	tockto	n (Apple	)						
3P-STK-AR01	Work Completed - Basement - 17-19 Stockton (Armani)	0	0		16-Jun-11 A										nent - 17-									
3P-STK-AR02	Access Req'd - Basement - 17-19 Stockton (Armani)	0	0		16-Jun-11 A						Acce	ss Rec	d - Ba	semen	t 17-19	Stock	ton (Arm	nani)	111					
3P-MKT-DL01	Work Completed - Basement - 800 Market (Diesel)	0	0		22-Jun-11 A						Work	Comp	bleted -	Basen	nent - 80	0 Marl	ket (Dies	el)						
3P-MKT-DL02	Access Req'd - Basement - 800 Market (Diesel)	0	0		22-Jun-11 A						Acce	ss Red	d - Ba	semer	it 800 N	/larket	(Diesel)							
PC-00-010	Milestone #1 - Trolley Re-route Complete	0	0		22-Dec-11 A						•	Milest	one #1	- Trolle	ey Re-rou	ute Co	mplete							
PC-00-020	CN 1251 Substantial Completion - UMS Utility Relocation (554 CAL. DAYS)	0	0		16-Aug-12 A							•	CN 1	251 Su	bstantial	Comp	letion - L	JMS Ut	ility Re	ocation	554 CAL	. DAYS)		
PC-00-030	Punchlist	30	45	17-Aug-12 A	15-Oct-12	197							Pur	nchlist					1 I I					
PC-00-040	FINAL COMPLETION- Utility Contract #2 - UMS CP-1251	0	0		15-Oct-12	197							+ FIN	IAL CC	NIPLETI	ION-U	Jtility Con	itract #2	2 - UM	S CP-12	251			
CN-1251 Gene	ral Conditions	27	114	12-Jan-11 A	20-Jun-11 A																			
GC-00-020	ENVIRONMENTAL REVIEW	13	13	12-Jan-11 A	31-Jan-11 A					I EN	VIRON	IMENT	AL RE	VIEW										
GC-00-030	POTHOLES	1	0	01-Feb-11 A	01-Feb-11 A					I PC	тноц	ES												
GC-00-040	SOIL PROFILE	5	4	01-Feb-11 A	07-Feb-11 A			T T T		I SC		OFILE	111		111				ΠŤ					TTT
GC-00-050	17-19 STOCKTON ST. OPTION - UTILITY RELOCATION & CLOSURE WALL	0	0	12-Apr-11 A							17-19 S	то¢к	TON \$	T. OP	ripn - U	τİLITY	RELOC	ATION	& CL	OSURE	WALL			
	central	CSP-CM	PS			1	ITA Central Master Proj All Act September 2	ect Sche ivities	dule								R	Required	i Reven	t On: 08- ue Servic Date: 30	e Date: 26	5-Dec-18		

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ctivity ID	Activity Name	Original Duration	Actual Start	Finish	Total         2008         2009         2010           Float         Clock         Clock<	0 2011 2012 2013	2014 2015 2016	2017 2018 2019	2020
GC-00-060	UTILITY RELOCATION & CLOSURE WALL	15	15 31-May-11 A	20-Jun-11 A					
CN -1251 Subm	ittals	60	102 12-Jan-11 A	03-Jun-11 A					
GC-SUB-00-110	0 Prepare / Submit - SEWER	1	0 12-Jan-11 A	12-Jan-11 A		Prepare / Submit - SEW/ER			
GC-SUB-00-08	0 Prepare / Submit - BASELINE SCHEDULE	1	94 12-Jan-11 A	24-May-11 A		Prepare / Submit - BASELIN	E \$CHEDULE		
GC-SUB-00-07	0 Prepare / Submit - SOV	1	28 12-Jan-11 A	21-Feb-11 A		Prepare / Submit - SOV			
GC-SUB-00-09	0 Prepare / Submit - EHASP	1	0 12-Jan-11 A	12-Jan-11 A		Prepare / Submit EHASP			
GC-SUB-00-10	0 Prepare / Submit - QUALITY CONTROL PROGRAM	1	0 12-Jan-11 A	12-Jan-11 A		I Prepare / Submit QUALITY CO	NTROLPROGRAM		
GC-SUB-00-14	0 Prepare / Submit - PLUMBING	40	85 12-Jan-11 A	11-May-11 A		Prepare / Submit - PLUMBIN	G		
GC-SUB-00-16	0 Prepare / Submit - TRAFFIC CONTROL	1	0 12-Jan-11 A	12-Jan-11 A		Prepare / Submit TRAFFIC CO	NTROL		
GC-SUB-00-15	0 Prepare / Submit - WATER	1	56 12-Jan-11 A	31-Mar-11 A		Prepare / Submit - WATER			
GC-SUB-00-12	0 Prepare / Submit - JOINT TRENCH	1	56 12-Jan-11 A	31-Mar-11 A		Prepare / Submit - JØINT TRE	ENCH		
GC-SUB-00-13	0 Prepare / Submit - ELECTRIC (OH)	1	56 12-Jan-11 A	31-Mar-11 A		Prepare / Submit - ELECTRIC	(QH)		
GC-SUB-00-111	1 Review & Approve - SEWER	20	20 13-Jan-11 A	10-Feb-11 A		Review & Approve SEWER			
GC-SUB-00-09	1 Review & Approve - EHASP	20	12 13-Jan-11 A	31-Jan-11 A		Review & Approve - EHASP			
GC-SUB-00-10	1 Review & Approve - QUALITY CONTROL PROGRAM	20	36 13-Jan-11 A	04-Mar-11 A		Review & Approve - QUALITY	CONTROL PROGRAM		
GC-SUB-00-16	1 Review & Approve - TRAFFIC CONTROL	20	12 13-Jan-11 A	31-Jan-11 A		Review & Approve - TRAFFIC C	ONTROL		
GC-SUB-00-112	2 Fabrication / Materials Lead - SEWER	1	0 11-Feb-11 A	11-Feb-11 A		I Fabrication / Materials Lead - S			
GC-SUB-00-16	2 Fabrication / Materials Lead - TRAFFIC CONTROL	10	0 11-Feb-11 A	11-Feb-11 A		I Fabrication / Materials Lead - T	RAFFIC CONTROL		
GC-SUB-00-07	1 Review & Approve - SOV	20	0 22-Feb-11 A	22-Feb-11 A		I Review & Approve SOV			
GC-SUB-00-15	1 Review & Approve - WATER	20	6 01-Apr-11 A	11-Apr-11 A		Review & Approve - WATER			
GC-SUB-00-12	1 Review & Approve - JOINT TRENCH	20	20 01-Apr-11 A	29-Apr-11 A		Review & Approve - JOINT T	RENCH		
GC-SUB-00-13	1 Review & Approve - ELECTRIC (OH)	20	12 01-Apr-11 A	19-Apr-11 A		Review & Approve - ELECTR	IC (OH)		
GC-SUB-00-15	2 Fabrication / Materials Lead - WATER	10	10 12-Apr-11 A	26-Apr-11 A		Fabrication / Materials Lead			
GC-SUB-00-13	2 Fabrication / Materials Lead - ELECTRIC (OH)	60	27 20-Apr-11 A	27-May-11 A		Fabrication / Materials Lead	- ELECTRIC (OH)		
GC-SUB-00-12	2 Fabrication / Materials Lead - JOINT TRENCH	10	12 02-May-11 A	18-May-11 A		Fabrication / Materials Lead	- JOINT TRENCH		
GC-SUB-00-14	1 Review & Approve - PLUMBING	20	14 12-May-11 A	01-Jun-11 A		Review & Approve - PLUMB	ING		
GC-SUB-00-08	1 Review & Approve - BASELINE SCHEDULE	20	2 25-May-11 A	27-May-11 A		I Review & Approve - BASELI	NE SCHEDULE		
GC-SUB-00-142	2 Fabrication / Materials Lead - PLUMBING	1	1 02-Jun-11 A	03-Jun-11 A		I Fabrication / Materials Lead	- PLUMBING		
Phoenix Subco	ntract Work - (OCS & Comm Conduit)	260	478 12-Jan-11 A	04-May-12 A					
New Poles (Ch	ange Order)	35	182 13-Jul-11 A	04-May-12 A					
OHE-00-TIA6	TIA#6 - Footing delay OCS & DBI	1	70 13-Jul-11 A	20-Oct-11 A		TIA #6 - Footing delay C	CS & DBI		
OHE-00-110A	Change Order to move pole to new location	10	71 13-Jul-11 A	21-Oct-11 A		Change Order to move	pole to new location		
OHE-00-110A2	2 Deliver and Install Poles	10	9 15-Sep-11 A	28-Sep-11 A		Deliver and Install Poles			
OHE-00-110A	5th Street and Folsom Pole and Foundation Work	10	46 01-Mar-12 A	04-May-12 A		📮 5th Street and Fo	Isom Pole and Foundation Work		
Building Inbed	ls	147	330 12-Jan-11 A	08-Dec-11 A					
BIB-00-010A	BDI - Permit Delay (Easement & Drawings)	10	196 12-Jan-11 A	20-Oct-11 A		BDI - Permit Delay (Eas	ement & Drawings)		
BIB-00-040A	Market Street Tie-in Building In-Beds	3	1 28-Oct-11 A	31-Oct-11 A		I Market Street Tie⊦in Bu	ilding In-Beds		
BIB-00-020A	Stockton Tie-in Building In-Beds	3	2 09-Nov-11 A	11-Nov-11 A		I Stpckton Tie-in Building	In-Beds		
BIB-00-060A	Howard to Harrison Building In-Beds	3	3 09-Nov-11 A	14-Nov-11 A		I Howard to Harrison Bu			
BIB-00-030A	Sutter to Eddy Building In-Beds	3	1 22-Nov-11 A	23-Nov-11 A		I Sutter to Eddy Building			
BIB-00-050A	Market to Howard Building In-Beds	3	6 30-Nov-11 A	08-Dec-11 A		I Market to Howard Bui	lding In-Beds		
	central subway	CSP-CMPS			SFMTA Central Subway Project Master Project Schedule All Activities September 2012 Update		Required Revenu	On: 08-Jan-08 e Service Date: 26-Dec-18 Jate: 30-Sep-12	

	HILL					Page24 of S
ctivity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total         2008         2009         2010         2011           Float         Olololololololololololololololololololo	
Stockton to Ed	dv.	260	195 31-May-11 A	12-Dec-11 A		<u> </u>
	STOCKTON TIE-IN NEW POLES	10	9 31-May-11 A			STOCKTON TIE-IN NEW POLES
OHE-00-020	SUTTER TO EDDY: NEW POLES	10	4 14-Jun-11 A			SUTTER TO EDDY: NEW POLES
OHE-00-060	STOCKTON TIE-IN TRAFFIC SIGNAL WORK	3	1 24-Oct-11 A			I STOCKTON TE-IN TRAFFIC SIGNAL WORK
OHE-00-070	SUTTER TO EDDY: TRAFFIC SIGNAL WORK	3	1 26-Oct-11 A			I SUTTER TO EDDY: TRAFFIC SIGNALWORK
OHE-00-160	STOCKTON TIE-IN INSTALL OVERHEAD	15	3 17-Nov-11 A			
	SUTTER TO EDDY: INSTALL OVERHEAD		10 28-Nov-11 A			SUTTER TO EDDY: INSTALLOVERHEAD
Market to Howa		207	178 21-Jun-11 A			
OHE-00-030	MARKET STREET TIE-IN: NEW POLES	10				MARKET;STREET TIE-IN: NEW POLES
OHE-00-040	MARKET TO HOWARD: NEW POLES		4 28-Jun-11 A			MARKET TO HOWARD: NEW POLES
OHE-00-180	MARKET STREET TIE-IN: INSTALL OVERHEAD	5	49 06-Oct-11 A			MARKET STREET TIE-IN: INSTALL OVERHEAD
OHE-00-080	MARKET STREET TIE-IN: TRAFFIC SIGNAL WORK	3	1 28-Oct-11 A			MARKET STREET TIE-IN: TRAFFIC SIGNAL WORK
OHE-00-080	MARKET TO HOWARD: TRAFFIC SIGNAL WORK	3	2 01-Nov-11 A			I MARKET TO HOWARD: TRAFFIC SIGNAL WORK
OHE-00-190	MARKET TO HOWARD: INSTALL OVERHEAD	5	6 08-Dec-11 A			
		183				
Howard to Harr		103	169 06-Jul-11 A			HOWARD TO HARRISON: NEW POLES
OHE-00-050	HOWARD TO HARRISON: NEW POLES	9	11 06-Jul-11 A			HOWARD TO HARRISON: NEW POLES
OHE-00-200	HOWARD TO HARRISON: INSTALL OVERHEAD	2	49 06-Oct-11 A			
OHE-00-100	HOWARD TO HARRISON: TRAFFIC SIGNAL WORK		2 04-Nov-11 A			I HÓWARDTO HARRISON: TRAFFIC SIGNAL WORK
OHE-00-200A		5	1 21-Dec-11 A			I RESTING
Synergy Prime C		521	608 01-Feb-11 A		3011	
Interior Plumbin		40		-		
IPL-00-010	INTERIOR PLUMBING - AREA 1	5	9 13-Jun-11 A			INTERIOR PLUMBING - AREA 1
IPL-00-020	INTERIOR PLUMBING - AREA 2	5	4 27-Jun-11 A			INTERIOR PLUMBING - AREA 2
IPL-00-030	INTERIOR PLUMBING - AREA 3	5	4 05-Jul-11 A			INTERIOR PLUMBING:- AREA 3
IPL-00-040	INTERIOR PLUMBING - AREA 4	5	4 12-Jul-11 A	18-Jul-11 A		INTERIOR PLUMBING - AREA 4
IPL-00-050	INTERIOR PLUMBING - AREA 5	15		25-Jul-11 A		INTERIOR PLUMBING - AREA 5
IPL-00-060	INTERIOR PLUMBING - AREA 6	5	24 26-Jul-11 A	0		I INTÉRIOR PLUMBING - AREA 6
	08+00 thru OFA 11+50	481	550 14-Feb-11 A	°		
Sewer		343	376 14-Feb-11 A			
	SEWER - EAST OF STOCKTON	10				NER - EASTOF STOCKTΦN
OFA-01-020	SEWER - STOCKTON INTERSECTION	5	4 28-Feb-11 A			WER - STOCKTON INTERSECTION
OFA-01-030	SEWER - WEST OF STOCKTON	10	· ·		I SE	EWER WEST DF STOCKTON
	Gas Holes/ Cutover- O'Farrell Street	18	38 01-Jun-12 A			Gas Holes/;Cutover: O'Farrell Street
Water		246	256 11-Apr-11 A	,		
	WATER INSTALLATION EAST	15	14 11-Apr-11 A			/ATER INSTALLATION EAST
	WATER - TIE-IN EAST	5	4 02-May-11 A	-	I W	VATER:- ŤIE <mark>-IN</mark> EÁSŤ
	WATER INSTALLATION WEST	15	4 04-May-12 A	,		I WATER INSTALLATION WEST
	WATER - TIE-IN WEST	5	4 11-May-12 A	-		I WATER - TIEHN WEST
AWSS		151	134 09-May-11 A			
	AWSS - INSTALL EAST	15	10 09-May-11 A			WYSS INSTALLEAST
OFA-01-150A	Change Order for AWSS-EAST-change (follow FH Installation)	1	70 16-May-11 A	24-Aug-11 A		I Change Order for AWSS EAST-change (follow FH Installation)
	central	CSP-CM	PS		SFMTA Central Subway Project Master Project Schedule All Activities September 2012 Update	Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

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tivity ID	Activity Name	Original Duration	Actual Duration	Start	Finish	Total 2008 Float	2009	2010	2011 2012 2013	2014 2015 2016 2017 2018 2019 202
OFA-01-050	AWSS - INSTALL WEST	15		31-May-11 A	24-Aug-11 A					
OFA-01-060	AWSS - TEST EAST	5			31-Aug-11 A				AW\$5 TEST EAST	<u>┥╴┽╴┽╴┽╴╴╴┾╴┽╴┽╴┼╴┾╴┾╴┾╴┽╴┥╴┽╶┽╴┽╶┽╴┽╴┽╴┽╴┽╴┽╴</u>
OFA-01-000		5		•	16-Nov-11 A				I AWSS TEST WEST	
Utility Vaults	AW60-TEST WEST	28			28-Oct-11 A					
	UTILITY VAULTS - East	13			26-Aug-11 A				UTILITY VAULTS - East	
	UTILITY VAULTS - West	15			28-Oct-11 A					
Joint Trench		94			20-Apr-12 A					pt
	JOINT TRENCH - EAST	15			18-Nov-11 A				JOINT TRENCH - EA	ST
	JOINT TRENCH - WEST	15		04-Jan-12 A						
Restoration	JOINT INENGIT- WEST	13			16-Aug-12 A					
	RESTORATION	5		27-Jul-12 A	, , , , , , , , , , , , , , , , , , ,				I RESTORATIO	NN
	0 DEMOBILIZATION	10			16-Aug-12 A					
		478		-	09-Aug-12 A				DEWODICIE	
Sewer	3+05 thru 12+00)	36			09-Aug-12 A 01-Apr-11 A					
		10							SEWER - EAST OF STOCKT	
	SEWER - EAST OF STOCKTON SEWER - STOCKTON INTERSECTION	5			25-Feb-11 A 04-Mar-11 A				SEWER - EASTOR STOCKT	
GEA-02-020		10							SEWER - WEST OF STOCK	
	SEWER - WEST OF STOCKTON				01-Apr-11 A				SEWER WEST OF STOCK	ION
Water		239			31-May-12 A					
	WATER INSTALLATION	15			20-May-11 A				WATER INSTALLATION	
	WATER - TIE-IN	5		-	02-Sep-11 A				I WATER - TIE-IN	
		15			27-Apr-12 A				I WATER INSTALI	
	A WATER - TIE-IN	5			31-May-12 A				WATER - TIE-II	Ŋ : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : : :   : : :   : : :   : : :   : : : :   : : : :   : : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : :   : : : :   : : :   : : :   : : : :   : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : :   : : : : :   : : : : :   : : : : : :   : : : : :   : : : : : : : : : : : : : : : : : : : :
AWSS		368			28-Mar-12 A					
	AWSS - INSTALL EAST	15			22-Apr-11 A				AWS\$ - INSTALLEAST	
	Delay PG&E Conflict & COR to Move PG&E	15			17-Nov-11 A					COR to Move PG&E
GEA-02-060		5			29-Apr-11 A				I AWSS-TEST EAST	
	AWSS - INSTALL WEST	15			09-Mar-12 A				AWSS - INSTALL	
	AWSS - TEST WEST	5			28-Mar-12 A				I AWSS-TEST WI	ST
Utility Vaults		283			02-Aug-12 A					
	UTILITY VAULTS - EAST	15			26-Aug-11 A					
	UTILITY VAULTS - WEST	15			26-Aug-11 A				UTILITY VAULTS - WES	
GEA-02-150	Final Utility and Water Work- Geary	15			02-Aug-12 A				Final Utility an	d Water Work-Geary
Joint Trench		90		-	29-Mar-12 A					
	JOINT TRENCH - EAST	15		•	18-Nov-11 A				JOINT TRENCH - EA	
	JOINT TRENCH - WEST	10			17-Nov-11 A				JOINT TRENCH - WI	
	A PCC #5 Additional Work	10			29-Mar-12 A				PCC #5 Additional	Work;
Restoration		5			09-Aug-12 A					
	RESTORATION	5		-	09-Aug-12 A				I RESTORATIO	PN::::::::::::::::::::::::::::::::::::
	-50 thru 141+00)	288			02-Aug-12 A					
Sewer		288			02-Aug-12 A					
ELL-03-TIA5	Redesign Delay on Ellis Utility Re-Design Delay PCC#5	1	131	14-Feb-11 A	19-Aug-11 A				Redesign Delay on Ellis I	tility Re-Design Delay PCC#5
	central subway	CSP-CM	PS			SFMTA Central Master Proje All Acti September 2	ct Schedule vities	ect		Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

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Activity ID	Activity Name	Original Duration	Actual Start Duration	Finish			2020
ELL-03-150	0A Delay MTA Redesign at Ellis	1	82 14-Feb-11 A	10-Jun-11 A		Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q	
ELL-03-010		10	9 13-Jun-11 A		—	I SEWER - NORTH	
ELL-03-150	0A2 PCC#5 Sewer North	1	33 05-Jul-11 A			PCC#5 Sewer North	
ELL-03-020		10		•		I SEWER-SOUTH	
ELL-03-160		10		•		Final Sewer Work Ellis	
Water		20	177 22-Aug-11 A	0			
ELL-03-030	WATER - NORTH	10				I WATER - NORTH	
ELL-03-040	0 WATER - SOUTH	10	-	-		I WATER - SOUTH	
ELL-03-150	0 AWSS Hydrant, Sewer Work, and Restoration	10	27 30-Apr-12 A			AW\$S'Hydrant, Sewer Work, and Restoration	
Waterproof		5	16 26-Oct-11 A				
ELL-03-070		5	16 26-Oct-11 A				
Vaults		15	18 22-Aug-11 A	16-Sep-11 A			
ELL-03-150	0A Demo ATT Vault	1	4 22-Aug-11 A			Demo ATT Vault	
ELL-03-050		15	-	-		VAULTS & ATT Trench	
Rebar		5	9 10-Oct-11 A				
ELL-03-080	0 INSTALL REBAR	5	9 10-Oct-11 A			I INSTALL REBAR	
	ootings & Walls	5	9 17-Oct-11 A				
ELL-03-090		5				I CONCRETE FOOTINGS & WALLS	
Install Elect	trical In Basement	20					
ELL-03-100	D BASEMENT WORK - NORTH	10	4 14-Nov-11 A	18-Nov-11 A		I BASEMENT WORK - NORTH	
ELL-03-110		10				I BASEMENT WORK - SOUTH	
Joint Trenc		17	43 19-Sep-11 A				
ELL-03-120	JOINT TRENCH - NORTH	15					
ELL-03-130		15	16 26-Oct-11 A			JÓINT TRENCH - SOUTH	
Restoration	1	5	3 18-Nov-11 A	23-Nov-11 A			
	RESTORATION	5	3 18-Nov-11 A	23-Nov-11 A		I RESTORATIÓN	
	eary to O'Farrell) East (CTL130+50 thru 134+00)	51	464 01-Feb-11 A				
	10 BARRICADE MOCKUPS	5	4 01-Feb-11 A				
STK01-01-0	20 DEMO SIDEWALK	3	2 08-Feb-11 A	10-Feb-11 A			
STK01-01-0	30 DEMO BASEMENTS	15	14 11-Feb-11 A	03-Mar-11 A			
STK01-01-0	40 WATERPROOFING	5	4 04-Mar-11 A	10-Mar-11 A			
STK01-01-0	50 UNDERPINNING (Remove by MTA)	1	0 10-Mar-11 A	10-Mar-11 A		I, UNDERPINNING (Remove by MTA)	
STK01-01-0	160 REBAR	5	1 07-Apr-11 A	08-Apr-11 A		J REBAR	
STK01-01-0	70 CONCRETE FOOTING AND WALLS	10	9 14-Apr-11 A	27-Apr-11 A		CONCRETE FOOTING AND WALLS	
	30 JOINT TRENCH	10	11 28-Apr-11 A	13-May-11 A			
STK01-01-1	00 WATER	5	21 13-May-11 A	14-Jun-11 A		WATER	
STK01-01-0	90 SEWER	5	4 31-May-11 A	06-Jun-11 A		I SEWER	
STK01-01-1	10 RESTORATION	5	4 15-Jun-11 A	21-Jun-11 A		I RESTORATION	
STK01-01-1	2( Added PGE Slurry Wall (CPR#58)	10	21 11-Apr-12 A	10-May-12 A		I∎ Aqded P,GE Sjuny Wall (CPR#58)	
Stockton (O	'Farrell to Market) East (CTL 134+00 thru CTL 137+00)	133	131 16-May-11 A	18-Nov-11 A			
STK02-02-0	10 DEMO SIDEWALK	3	2 16-May-11 A	18-May-11 A		I DEMO SIDEWALK	
	central	CSP-CM	IPS .	·	SFMTA Central Subway Project Master Project Schedule All Activities September 2012 Update	Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12	

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ity ID	Activity Name	Original Duration	Actual Start Juration	Finish	Total         2008         2009           Float         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O         O	2010 2011		2020 0.0.0
STK02-02-TIA	SFMTA Re-sequencing Stockton East O'Farrell to Market COR#25	1	86 16-May-11 A	16-Sep-11 A			SFMTA Re-sequencing Stockton East O'Farrell to Market COR#25	
STK02-02-020	DEMO BASEMENTS	15	14 19-May-11 A	09-Jun-11 A		I DE	EMO BÁSEMENTS	
STK02-02-110	Demo Concrete Over Pour	15	1 06-Jun-11 A	07-Jun-11 A		I De	emo Concrete Over Pour	
STK02-02-04(	Initial for MICRO PILES	1	1 09-Jun-11 A	10-Jun-11 A		l Ini	itial for MICRO PILES	
STK02-02-TIA	Micro Pile Delay Stockton East O'Farrell to Market COR #26	1	53 09-Jun-11 A	24-Aug-11 A			Micro Pile Delay Stockton East O'Farrell to Market COR #26	
STK02-02-040	MICRO PILES	10	52 10-Jun-11 A	24-Aug-11 A			MICROPILES	
STK02-02-03(	Waterproofing North End	5	4 20-Jun-11 A	24-Jun-11 A		É W	/aterpropfing North End	
STK02-02-030	WATERPROOFING	5	26 11-Jul-11 A	16-Aug-11 A			WATERPROOFING	
STK02-02-03(	Waterproofing South End	5	6 08-Aug-11 A	16-Aug-11 A			Waterproofing South End	
STK02-02-050	REBAR	5	6 22-Aug-11 A	30-Aug-11 A			REBAR	
STK02-02-060	CONCRETE FOOTING AND WALLS	10	56 22-Aug-11 A	09-Nov-11 A			CONCRETE FOOTING AND WALLS	
STK02-02-05(	Rebar & Footing North End	5	16 22-Aug-11 A	14-Sep-11 A			Rebar & Footing North End	
STK02-02-05(	Rebar & Footing South End	1	6 22-Aug-11 A	30-Aug-11 A			Rebar & Footing South End	
STK02-02-06(	Concrete Footing & Wall South End	1	56 22-Aug-11 A	09-Nov-11 A				
STK02-02-06(	Concrete Footing & Wall North End	1	23 25-Aug-11 A	28-Sep-11 A			Concrete Footing & Wall Nprth End	
STK02-02-050	Rebar & Walls South End	1	49 31-Aug-11 A	09-Nov-11 A			Rebar & Walls South End	
STK02-02-070	JOINT TRENCH	10	9 13-Sep-11 A	26-Sep-11 A			JOINT TRENCH	
STK02-02-07(	JOINT TRENCH South End	1	9 13-Sep-11 A	26-Sep-11 A			JOINT TRENCH South End	
STK02-02-05(	Rebar & Walls North End	1	5 21-Sep-11 A	28-Sep-11 A			Rebar & Walls North End	
STK02-02-07(	JOINT TRENCH North End	1	3 21-Sep-11 A	26-Sep-11 A			JOINT TRENCH North End	
STK02-02-090	0 WATER	5	2 27-Sep-11 A	29-Sep-11 A			WATER	
STK02-02-09(	WATER South End	1	1 27-Sep-11 A	28-Sep-11 A			WATER South End	
STK02-02-09(	WATER North End	1	2 27-Sep-11 A	29-Sep-11 A			WATER North End	
STK02-02-080	SEWER	5	34 29-Sep-11 A	16-Nov-11 A			SÉWER	
STK02-02-08(	SEWER South End	1	34 29-Sep-11 A	16-Nov-11 A			SEWER South End	
STK02-02-100	RESTORATION	10	35 30-Sep-11 A	18-Nov-11 A		: : :   : : <b> </b>	RESTORATIÓN	
STK02-02-100	RESTORATION North End (Barneys)	1	3 30-Sep-11 A	05-Oct-11 A			RESTORATION North End (Barneys)	
STK02-02-100	RESTORATION South End	1	4 14-Nov-11 A	18-Nov-11 A			I RESTORATION South End	
Stockton (Pos	st to Geary) East (CTL 127+00 thru 130+50)	113	118 06-Jun-11 A	21-Nov-11 A				
STK03-02-TIA	A9 TIA9-Revised Utility Layout Stockton East PCC #4	1	19 06-Jun-11 A	01-Jul-11 A		( ) ( <b>(</b> †	IA9-Revised Utility Layput Stockton East PCC #4	
STK03-02-06(	TIA9-Revised Utility Layout Stockton East PCC #4	1	19 06-Jun-11 A	01-Jul-11 A		<b>     </b>	IA9-Revised Ψtility Layput Stockton East PCC #4	
STK03-02-010	D SEWER	10	29 27-Jun-11 A	08-Aug-11 A			sewer	
STK03-02-020	UTILITY VAULTS	5	4 09-Aug-11 A	15-Aug-11 A			UTILITY VAULT\$	
STK03-02-030	JOINT TRENCH - EXCAVATION	10	42 30-Aug-11 A	28-Oct-11 A			I JOINT TRENCH - EXCAVATION	
STK03-02-040	JOINT TRENCH - INSTALL & BACKFILL	10	2 26-Oct-11 A	28-Oct-11 A			I JOINT TRENCH - INSTALL& BACKFILL	11
STK03-02-050	RESTORATION	3	2 17-Nov-11 A	21-Nov-11 A			I RESTORATIÓN	
Stockton (O'F	arrell to Market) West (CTL 134+00 thru CTL 137+00)	191	188 04-Jan-12 A	02-Oct-12	121			
Street work		130	105 04-Jan-12 A	04-Jun-12 A				
STK04-03-01	I DEMO SIDEWALK	2	2 04-Jan-12 A	05-Jan-12 A			I DEMO SIDEWALK	
STK04-03-TI	17-19: Remove Material from Basement and Demo Sidewalk by Hand	2	2 05-Jan-12 A	06-Jan-12 A			17-19: Remove Material from Basement and Demp Sidewalk by Hand	
STK04-03-02	20 DEMO BASEMENTS	10	11 09-Jan-12 A	24-Jan-12 A			DEMO BASEMENTS	
	central	CSP-CMPS			SFMTA Central Subway Project Master Project Schedule All Activities September 2012 Update	:	Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12	

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Activity ID	Activity Name		Actual Start uration	Finish	Total 2008 Float	2009	2010	2011	2012 2013	2014 2015 2016 2017 2018 2	019 2020
STK04-03-TI	17-19: Demo Basement by Hand	20	19 10-Jan-12 A	06-Feb-12 A					17-19: Demo Baser	nent by Hand	
STK04-03-TI	Additional Excavation for Apple Store	5	5 07-Feb-12 A	13-Feb-12 A					I Additional Excavatio	n for Apple Store	
STK04-03-TI	Additional Layout for Micro Piles and Footings	1	1 14-Feb-12 A	14-Feb-12 A					I Additional Layout for	Micro Piles and Footings	
STK04-03-110	DEMO BALANCE OF BLOCK	10	9 14-Feb-12 A	27-Feb-12 A		+			DEMO BALANCE	DF;BLOCK	
STK04-03-140	0 MOBILIZE	2	2 15-Feb-12 A	16-Feb-12 A							
STK04-03-TI	17-19: Reconfigure Micro Piles Design due to Utility Conflict	4	3 16-Feb-12 A	21-Feb-12 A					I 17-19: Reconfigure	Micro Piles Design due to Utility Conflict	
STK04-03-TI	Additional Micro Piles for Apple Store	8	7 22-Feb-12 A	05-Mar-12 A					Additional Micro Pile	es for Apple Store	
STK04-03-TI	17-19: Install Protection around Existing Utilities	1	1 22-Feb-12 A	22-Feb-12 A					I 17-19: Install Protec	tion around Existing Utilities	
STK04-03-TI	Micro Pile 27c Stuck Auger Delay	1	1 27-Feb-12 A	27-Feb-12 A					I Micro Pile 27¢ Stud	k Auger Delay	
STK04-03-120	DEMO BALANCE OF BASEMENT AND WALLS	10	9 28-Feb-12 A	12-Mar-12 A					I DENIO BALANCE	DF BASEMENT AND WALLS	
STK04-03-TI	17-19: Micro Pile Drilling Delay due to Utility Conflict	2	1 06-Mar-12 A	07-Mar-12 A					I 17-19: Micro Pile D	rilling Delay due to Utility Conflict	
STK04-03-040	0 MICRO PILES	12	11 08-Mar-12 A	23-Mar-12 A					MICRO PILES		
STK04-03-130	WATERPROOFING	5	4 13-Mar-12 A	19-Mar-12 A					I WATERPROOFIN	G	
STK04-03-170	JOINT TRENCH (55-39 STOCKTON)	10	17 20-Mar-12 A	12-Apr-12 A					JONT TRENCH	(55-39 STOCKTON)	
STK04-03-TI	Additional Cleanup for Added Micro Piles and Soil	2	1 26-Mar-12 A	27-Mar-12 A					Additional Cleanup	for Added Micro Piles and Soil	
STK04-03-150	0 SUBGRADE PREP 95% COMPACT AND 10% ABOVE MOISTURE	3	3 27-Mar-12 A	30-Mar-12 A					SUBGRADE PREF	95% COMPACT AND 10% ABOVE MOISTURE	
STK04-03-TI	Additional Subgrade Prep and Testing for Footing	1	0 28-Mar-12 A	28-Mar-12 A					Additional Subgrad	le Prep and Testing for Fopting	
STK04-03-160	TESTING	3	2 28-Mar-12 A	30-Mar-12 A					I TESTING		
STK04-03-TI	Additional Rebar for Apple Store	5	4 02-Apr-12 A	06-Apr-12 A					Additional Rebar fo	or Apple Store	
STK04-03-050	0 REBAR	5	4 02-Apr-12 A	06-Apr-12 A					I REBAR		
STK04-03-TI	Additional Formwork for Apple Wall	4	3 05-Apr-12 A	10-Apr-12 A					Additional Formwo	ork for Apple Wall	
STK04-03-060	CONCRETE FOOTING AND WALLS	10	9 09-Apr-12 A	20-Apr-12 A					I CONCRETE FOC	DTING AND WALLS	
STK04-03-TI	17-19: Additional Rebar and Inefficiency to Install under Electric Wall	2	1 10-Apr-12 A	11-Apr-12 A					I 17-19 Additional R	Rebar and Inefficiency to Install under Electric Wall	
STK04-03-TI	17-19: Form Wall and Shotcreet	2	1 13-Apr-12 A	16-Apr-12 A					17-19: Form Wall	and Shotcreet	
STK04-03-TI	Additional Work at Step in Footing	1	0 17-Apr-12 A	17-Apr-12 A					I Additional Work a	t Step in Footing	
STK04-03-TI	Additional Form Striping	1	0 18-Apr-12 A	18-Apr-12 A					I Additional Form S	triping	
STK04-03-TI	Additional Shotcreet for Apple Store Wall	1	0 19-Apr-12 A	19-Apr-12 A					I Additional Shotcre	et for Apple Store Wall	
STK04-03-TI	Additional Cleanup for Shotcreet Overspray	1	0 20-Apr-12 A	20-Apr-12 A					I Additional Cleanup	o for Shotcreet Overspray	
STK04-03-030	WATERPROOFING BALANCE OF BLOCK	5	4 23-Apr-12 A	27-Apr-12 A					I WATERPROOFI	NG BALANCE OF BLOCK	
STK04-03-070	JOINT TRENCH (17-19 & 1 STOCKTON)	10	9 30-Apr-12 A	11-May-12 A					I JOINT TRENCH	(17-19 & 1 STOCKTON)	
STK04-03-TI	17-19: Install Utilities	1	0 14-May-12A	14-May-12 A					I 17-19: Install Util	ties	
STK04-03-080	0 SEWER	5	4 15-May-12A	21-May-12 A					I SEWER		
STK04-03-090	0 WATER	5	4 22-May-12 A	29-May-12 A					I WATER		
STK04-03-100	RESTORATION	5	5 25-May-12 A	04-Jun-12 A					I RESTORATION		
STK04-03-TI	Additional Waterproofing at Top of New Apple Wall	1	0 30-May-12 A	30-May-12 A					I Additional Water	proofing at Top of New Apple Wall	
Tie-Ins		87	88 28-May-12 A	02-Oct-12	121						
STK04-03-180	Tie-ins- Water Line 1- Stockton (Post to Geary)	10	5 28-May-12 A	04-Jun-12 A						ine 1- Stockton (Post to Geary)	
STK04-03-210	0 Tie-ins- Water Line 2- Stockton (Geary to Ellis) East	10	34 30-May-12 A	18-Jul-12 A					🛑 Tie-ins- Water	Line 2- Stockton (Geary to Ellis) East	
STK04-03-220	0 Tie-ins- Water Line 3- Stockton (Geary to Ellis) West	28	78 05-Jun-12 A	25-Sep-12 A					i i   i i i i	er Line 3- Stockton (Geary to Ellis) West	
STK04-03-260	0 Back Fill, Demo, and Pave	3	1 28-Sep-12 A	02-Oct-12	121				Back Fill, De	mo, and Pave	
Stockton (Post	t to Geary) West (CTL 127+00 thru CTL 130+50))	181	197 26-Sep-11 A	08-Aug-12 A							
	central	CSP-CMPS			All Ac	ject Schedule				Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12	

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r ID	Activity Name	Original Duration	Actual Start	Finish	Total 2008		2011 2012					_
STK05-03-010	SEWED	10		11-Nov-11 A								
	ATT Vault PCC #4	10	· ·				ATT Vau					
	JOINT TRENCH - EXCAVATION	10						TRENCH - EXCA		{ <b>    </b>		
	JOINT TRENCH - EXCAVATION	10							INSTALL & BACKFILL			
								C 5 COR				
STK05-03-05(	Final Trench and ATT Work Stockton	30							ATT Work Stockton			
	RESTORATION	3		-				RESTORATION				
	ry to O'Farrell) West (CTL 130+50 to CTL 134+00)	85										
	Move Flower Stand	1	. 22 0411 11 11				I Move Flower					
	Setup Pedestrian Control	1	. 22 0411 11 11				I Setup Pedes					
	DEMO SIDEWALK	3					I DEMO SIDE					
	SFMTA Re-sequencing Stockton West Geary to O'Farrell COR #32	1							ockton West Geary to O Farre	#I COR #32		
	DEMO BASEMENT	5		28-Jun-11 A			I DEMO BASI					
STK06-04-030	DEMO BASEMENT - 1ST FLOOR	15	1 27-Jun-11 A	28-Jun-11 A				EMENT - 1ST FL				1   I
STK06-04-040	DEMO BASEMENT - 2ND FLOOR	15	39 29-Jun-11 A	24-Aug-11 A				SEMENT - 2ND				1
STK06-04-110	Macys Delay (Macys Contractor Work) "NIC 1251"	1	9 29-Jun-11 A	13-Jul-11 A			Macys Dela	y (Macys Contra	ctor Work) "NIC 1251"			
STK06-04-050	DEMO BASEMENT - WALLS	15	54 14-Jul-11 A	29-Sep-11 A				ASEMENT - WAL				
STK06-04-110	Install Vibration Monitoring Equipment	1	90 14-Jul-11 A	18-Nov-11 A			Install V	Ibration Monitorin	ng Equipment			
STK06-04-110	Demo Basement Walls/Additional Conc. Left by Sub	1	29 14-Jul-11 A	24-Aug-11 A			🔲 Demo Bas	ement Walls/Add	litional Conc. Left by Sub			
STK06-04-110	Waterproofing 2nd Floor	1	14 18-Jul-11 A	05-Aug-11 A			Waterproof	fing 2nd Floor				
STK06-04-110	Waterproofing 1st Floor	1	9 18-Jul-11 A	29-Jul-11 A			Waterproof	fing 1st Floor				
STK06-04-110	Sawcut 2nd Floor	1	19 25-Aug-11 A	22-Sep-11 A			Sawcut 2	nd Floor				
STK06-04-110	Sawcut 1st Floor	1	10 30-Sep-11 A	14-Oct-11 A			Sawcut 1	st Floor	*	{		(*****
STK06-04-110	CDF 2nd Floor	1	2 05-Oct-11 A	07-Oct-11 A			CDF 2nd	Floor				
STK06-04-080	WATER	5					WATER					
STK06-04-060	JOINT TRENCH	10	3 17-Nov-11 A	22-Nov-11 A			I JOINT	TRENCH				
STK06-04-110	CDF 1st Floor	1	1 18-Nov-11 A	21-Nov-11 A			I CDF 1s	t Floor				
	RESTORATION	5	2 21-Nov-11 A	23-Nov-11 A			I RESTO	RATION	*-*-*			i-h-h-
AT&T Cutover - S		130			182							
N-ATT00100	AT&T Cutover - Stockton Street	130			182			AT&T Cutove	er - Stockton Street			
PG&E Cutover - 3		85			TOL							
	PG&E Cutover - Stockton Street	85		-				PC&E Cutovo	- Stockton Street			
SFMTA Re-Route		10								{ <b>   </b>		
	SFMTA Operations Testing of New OCS Overhead	10					9EMT		ting of New OCS Overhead			
	SFMTA Operations Testing of New OCS Overhead SFMTA Operations Training/ Notify Public/ Open Trolley Reroute	5							aning/ Notify Public/ Open Tro	Dereste		
Construction Tu		-			1960		∎ SFMI	A uperations I ra	anning nouny Public/ Upen tro	tey neroute		
TUN0900		1297		-					Charges			
	CN 1252 Tunnel Construction (LOE)	1148			-26					el Construction (LOE	·	<u>{</u> <u></u>
TUN9700	CN 1252 Tunnel Contingency Cost Activity (LOE)	1074			-21				CN 1252 Tun	nel Contingency Cost	Activity (LOE)	
CN-1252 Contra		1297	248 27-Jan-12 A	19-Aug-15	21							
TUN1000	CN 1252 NTP- TBM Procurement (NTP 1)	0					• CN 12	252 NTP- TBM P	rocurement (NTP 1)			
TUN1185	CN 1252 Requirement - CP-1 & CP-2 Completion (850 CD -> NTP1)	850	248 27-Jan-12 A	26-May-14*	0				CN 1252 Requirement -	CP-1 & CP-2 Comple	tion (850 CD -	> NTP1
	central subway	CSP-CN	IPS			Subway Project ect Schedule ivities			Required R	Start On: 08-Jan-08 evenue Service Date: 20 Data Date: 30-Sep-12	5-Dec-18	

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Activity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total 2008	3 2009	2010	2011	2012 2013	2014 2015 2016	
TUN1265	CN 1252 Requirement- CP-3 & CP-4 Completion (910 CD -> NTP1)	910	248 27-Jan-12 A	25-Jul-14*	0					CN 1252 Requirement-	QQQQQQQQQQQQQQ CP-3&CP-4 Completion (910 CD -> N
TUN9890	CN 1252 Requirement- Substantial Completion - Tunnels (1150 CD -> NTP1)	1150	248 27-Jan-12 A	22-Mar-15*	0	+				CN 1252 Requi	ement- Substantial Completion - Tunnels
TUN9900	CN 1252 Requirement- CLOSEOUT COMPLETE - Tunnels (1180 CD -> NTP1)	1180	248 27-Jan-12 A	21-Apr-15*	0					CN 1252 Requ	irement- CLOSEOUT COMPLETE - Tur
TUN1025	CN 1252 NTP- TBM Launch Box & Site Preparation (NTP 2)	0	0 14-Mar-12 A						♦ CN 1252 NTP- TB	M Launch Box & Site Preparatio	n (NTP 2)
TUN9720	CN 1252 Early Release of Partial NTP3	0	0 13-Apr-12 A						CN 1252 Early Re		
TUN9840	CN 1252 Early Release of Partial NTP3 Part 2	0	0 01-Oct-12		264					ly Release of Partial NTP3 Part	2
TUN1050	CN 1252 NTP- Tunnel Excavation (NTP 3)	0	0 12-Oct-12		186	+	+		CN 1252 NT	P-Tunnel Excavation (NTP 3)	
TUN9830	CN 1252 YBM Headwalls Complete	0	0	13-Jun-13	45					252 YBM Headwalls Complete	
TUN9850	CN 1252 UMS Headwalls Complete	0	0	31-Jul-13	35				• CN	1252 UMS Headwalls Complet	e
TUN1195	CN 1252 - Tunnel CP-1 & CP-2 Complete (850 CD -> NTP1, reg'd May 26, 2014)	0	0	05-Jun-14*	-10					CN 1252 - Tunnel CP-1 8	CP-2 Complete (850 CD -> NTP1, reg
TUN1225	CN 1252 - Tunnel CP-3 & CP-4 Complete (910 CD -> NTP1, reg'd July 25, 2014)	0	0	07-Aug-14*	-13					CN 1252 - Tunnel CP-3	& CP-4 Complete (910 CD -> NTP1, re
TUN1180	CN 1252 Substantial Completion - TUN (1150 CD -> NTP1, reg'd March 22, 20	0	0	17-Apr-15*	-26	+					antial Completion - TUN (1150 CD -> N
TUN9820	TUN Contract Close Out and Demobilization	28	0 18-Apr-15	15-May-15	-24						Close Out and Demobilization
TUN1190	CN 1252 Closeout Complete - TUN (1180 CD -> NTP1, req'd April 21, 2015)	0		15-May-15*	-24						eout Complete - TUN (1180 CD -> NTP
BUF008	TUN Buffer Float No. 8 Portal to STS (120 Calendar Days)	96	0 16-May-15	19-Aug-15	21						Float Np. 8 Portal to STS (120 Calenda
General Cond		639	248 27-Jan-12 A		-28						
Submittals 8		13			-27	+					
TUN9860	TUN Submittals, Permits & Design	13	171 30-Jan-12 A		-27				TUN Sub	nittals, Permits & Design	
	Procurement	639	248 27-Jan-12 A		-14						
TUN9730	TUN TBM Procurement South	330	248 27-Jan-12 A		36				TUNTB	/ Propurement Sputh	
TUN1070	TUN TBM Procurement North	360	248 27-Jan-12 A		77					M Procurement North	
TUN9800	TUN Tunnel Segment Procurement	337	77 12-Jun-12 A		-10	+				TUN Tunnel Segment Procure	ment
TUN9750	TUN Deliver TBM South to sight	30	0 25-Jan-13	23-Feb-13	36					liver TBM South to sight	incin.
TUN9760	TUN Deliver TBM North to sight	30	0 23-5an-13 0 24-Feb-13	25-Mar-13	77					eliver TBM North to sight	
	Mobilization	187	149 01-Mar-12 A		25						
TUN9810	TUN Initial Mobilization and Site Set Up	40	149 01-Mar-12 A		20					obilization and Site Set Up	
TUN9870		40									
	TUN Launch Box Facilities Site Set Up		120 01-Apr-12 A		05					Box Facilities Site Set Up	
TUN9880	TUN Tunnel Facilities Site Set Up	103	54 16-Jul-12 A		25					nnel Pacilities Site Set Up	
Protection &		60	118 13-Apr-12 A		-20						
TUN1100	Protection - Monitor Instrumentation (LOE)	60	118 13-Apr-12 A		-20					Protection - Mic	nitor Instrumentation (LOE)
	Street TBM Launch Box	361	185 30-Mar-12 A		83						
TUN1151	TUN Launch Box Remove Utilities	15	59 30-Mar-12 A							x Remove Utilities	
TUN1080	TUN Launch Box Guide Walls, Jet Grout, Slurry Walls	130	145 11-Apr-12 A		-24					ch Box Guide Walls, Jet Grout,	
TUN9710	TUN Launch Box Excavation, Support, and Equipment Installation	104	0 27-Nov-12		-20					aunch Box Excavation, Suppor	
TUN1120	TUN Compensation Grouting 4th and Harrison- Install & Pregrout CG Pipes	45	0 04-Feb-13	08-Apr-13	71				L TUN C	ompensation Grouting 4th and I	Harrision+ Install & Pregrout CG Pipes
YBM Headwal		247	98 05-Jun-12 A		37						
TUN1035	TUN Headwalls Remove Utilities and Guide Walls @ YBM	54	98 05-Jun-12 A		37					valls Remove Utilities and Guide	
TUN1065	TUN Headwalls (Slurry) and Jet Grout @ YBM	133	0 07-Jan-13	13-Jun-13	37				TUN	Headwalls (Slurry) and Jet Gro	ut@YBM
UMS Station I		217	48 24-Jul-12 A		24						
TUNCM501	TUN UMS Headwalls (North) Remove Utilities and Demo Tie Backs & Soldier pi	28	48 24-Jul-12 A	15-Oct-12	24						es and Demo Tie Backs & Soldier piles
TUNCM511	TUN UMS Headwalls (South) Remove Utilities and Demo Tie Backs & Soldier pi	28	48 24-Jul-12 A	23-Oct-12	74					leadwalls (South) Remove Utilit	es and Demo Tie Backs & Soldier piles
	central cubway	CSP-CM	PS			tral Subway Pro Project Schedule	ject				Start On: 08-Jan-08 venue Service Date: 26-Dec-18
						Activities				E	ata Date: 30-Sep-12
L					Septemb	er 2012 Update					

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ivity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total 200 Float	8 2009 2010	2011 201	12         2013         2014         2015         2016         2017         2018         2019           0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	20
TUNCM512	TUN UMS Headwall (North) and Jet Grout	113	0 16-Oct-12	17-May-13	24			TUN UNIS Headwall (North) and Jet Grout	
TUNCM513	TUN UMS Headwall (South) and Jet Grout	108	0 28-Feb-13	31-Jul-13	24			TUN UMS Headwall (South) and Jet Grout	
	ppensation Grouting	240	62 31-Jul-12 A		167				
TUNCM801	TUN Jet Grout at UMS & Ellis Shaft	57	43 31-Jul-12 A		157			TUN Jet Grout at UMS & Ellis Shaft	
TUN9780	TUN Grout at 4th and Market- Install & Pregrout CG Pipes	27	0 01-Nov-12	01-Feb-13	178			TUN Grout;at 4th and Market- Install & Pregrout CG Pipes	
TUNCM802	TUN Install & Pregrout CG Pipes At Ellis	20	0 09-Apr-13	01-May-13	105			1] TUN Install & Pregrout CG Pipes At Ellis	
South Bound T	unnel	252	0 29-Apr-13	29-Apr-14	56				
TUN-07-1000	Tunneling - Assemble Southbound TBM & Launch Frame	30	0 29-Apr-13	10-Jun-13	-20			Tunneling - Assemble Southbound TBM & Launch Frame	
TUN-07-1010	Tunneling - Test and Commission Southbound TBM	5	0 11-Jun-13	17-Jun-13	-20			I: Tunheling: Test and Commission Southbound TBM	
TUN-07-1020	Tunneling - Launch Southbound TBM (163+52 - 160+00)	15	0 18-Jun-13	09-Jul-13	-20			Tunneling - Launch Southbound TBM (163+52 + 160+00)	
TUN-07-1040	Tunneling - Install Conveyors & Facilities for Southbound TBM	5	0 10-Jul-13	16-Jul-13	26			1 Tunneling - Install/Conveyors & Facilities for, Southbound T/BM	
TUN-07-1050	Tunneling - Tunnel Southbound (160+00 - 156+50)	6	0 20-Sep-13	27-Sep-13	-20			Tunneling - Tunnel Southbound (160+00 - 156+50)	
TUN-07-1060	Tunneling - Tunnel Southbound (156+50 - 142+30)	23	0 30-Sep-13	30-Oct-13	-7			Tunneling - Tunnel Southbound (156+50 - 142+30)	
TUN-07-1070	Tunneling - Tunnel Southbound (142+30 - 140+50)	3	0 01-Nov-13	05-Nov-13	-8			I Tunneling - Tunnel Southbound (142+30 - 140+50)	
TUN-07-1080	Tunneling - Tunnel Southbound (140+50 - 135+00)	9	0 06-Nov-13	18-Nov-13	-8			I Tunneling Tunnel Southbound (140+50 - 135+00)	
TUN-07-1190	Tunneling - Tunnel Under Existing Bart Tunnels	0	0 12-Nov-13		-8			Tunneling - Tunnel Under: Existing Bart Tunnels	÷
TUN-07-1160	Tunneling - Tunnel Southbound (135+00 - 128+00)	11	0 19-Nov-13	05-Dec-13	-8			I Tunneling - Tunnel Southbound (135+00 - 128+00);	
TUN-07-1170	Tunneling - Tunnel Southbound (128+00 - 103+00)	39	0 06-Dec-13	04-Feb-14	-8			Tunneling - Tunnel Southbound (128+00- 103+00)	
TUN-07-1180	Tunneling - Tunnel Southbound (103+00 - 89+00)	23	0 05-Feb-14	10-Mar-14	-8			Tunneling - Tunnel Southbound (103+00 - 89+00)	
TUN-07-1100	Tunneling - Tunnel Southbound (89+00 - 85+50)	4	0 11-Mar-14	14-Mar-14	56			I, Tunneling - Tunnel Southbound (89+00 - 85+50)	
TUN-07-1110	Tunneling - Tunnel Southbound (85+50 - 81+20)	7	0 17-Mar-14	25-Mar-14	56			t Tunneling - Tunnel Southbaund (85+50 - 81+20)	
TUN-07-1120	Tunneling - Disassemble Southbound TBM & Extract Trailing Gear	25	0 26-Mar-14	29-Apr-14	56			Tunneling - Disassemble Southbound TBM & Extract Trailing Ge	ar
TUN-07-1130	Tunneling - Clean Southbound Tunnel & Remove Utilities	25	0 26-Mar-14	29-Apr-14	56			Tunneling - ;Clear Southbound Tunnel; & Remove ;Utilities	
North Bound Tu	-	324	0 10-Jul-13	29-May-14	2407				
TUN-06-1000	Tunneling - Assemble Northbound TBM & Launch Frame	30	0 10-Jul-13	20-Aug-13	-20			Tunneling - Assemble Northbound TBM & Launch Frame	
TUN-06-1010	Tunneling - Test and Commission Northbound TBM	5	0 21-Aug-13	27-Aug-13	-20	-+		I Tunneling - Test and Commission Northbound TBM	
TUN-06-1020	Tunneling - Launch Northbound TBM (163+52 - 160+00)	15	0 28-Aug-13	18-Sep-13	-20			0; Tunneling;- Launch Northbourid T/BM (163+52 - 160+00);	
TUN-07-1030	Tunneling - Install Tunnel Ventilation Ducts	1	0 19-Sep-13	19-Sep-13	-20			I, Tunneling - Install Tunnel Ventilation Ducts	
TUN-06-1030	Tunneling - Install Conveyors & Facilities for Northbound TBM	5	0 19-Sep-13	25-Sep-13	-18			t Tunneting - Install Conveyors & Facilities for Northbound TBM	
TUN-06-1040	Tunneling - Tunnel Northbound (160+00 - 156+50)	6	0 30-Sep-13	07-Oct-13	-20			Tunneling - Tunnel Northbound (160+00 - 156+50)	
TUN-06-1050	Tunneling - Tunnel Northbound (156+50 - 142+30)	23	0 08-Oct-13	07-Nov-13	-20	-++-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-		Tunneling - Tunnel Northbound (156+50)- 142+30)	
TUN-06-1060	Tunneling - Tunnel Northbound (142+30 - 140+50)	3	0 08-Nov-13	12-Nov-13	-20			I Tunneling Tunnel Northbound (142+30 - 140+50)	
TUN-06-1070	Tunneling - Tunnel Northbound (140+50 - 135+00)	9	0 13-Nov-13	25-Nov-13	-20			I Tunneling Tunnel Northbound (140+50 - 135+00)	
TUN-06-1080	Tunneling - Tunnel Under Existing Bart Tunnels	0	0 19-Nov-13		-20			Tunneling Tunnel Under Existing Bart Tunnels	
TUN-06-1130	Tunneling - Tunnel Northbound (135+00 - 128+00)	11	0 26-Nov-13	12-Dec-13	-20			I Tunneling - Tunnel Northbound (135+00 - 128+00)	
TUN-06-1150	Tunneling - Tunnel Northbound (128+00 - 103+00)	39	0 13-Dec-13	11-Feb-14	-20			Tunneling - Tunnel Northbound (128+00 - 103+00)	
TUN-06-1140	Tunneling - Tunnel Northbound (103+00 - 88+00)	23	0 12-Feb-14	17-Mar-14	-20			🔲 Tunneling; - Tunnel Northbound (103+00 - 88+00)	
TUN-06-1090	Tunneling - Tunnel Northbound (88+00 - 85+50)	5	0 18-Mar-14	24-Mar-14	-20			It Tunneling - Tunnel Northbound (88+00 - 85+50)	
TUN-06-1100	Tunneling - Tunnel Northbound (85+50 - 81+20)	7	0 25-Mar-14	02-Apr-14	-20			Turineling - Turinel Northbound (85+50 - 81+20)	
TUN-06-1110	Tunneling - Disassemble Northbound TBM & Extract Trailing Gear	35	0 03-Apr-14	21-May-14	40			🔲 : Tunneling + Disassemble Northbound TBM & Extract Trading G	eat
TUN-06-1120	Tunneling - Clean Northbound Tunnel & Remove Utilities	25	0 03-Apr-14	07-May-14	50	<u></u>		Tunneling - Clean Northbound Tunnel & Remove Utilities	
	central subway	CSP-CMP:	3		Master All	ntral Subway Project Project Schedule Activities per 2012 Update		Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12	

	HILL							Page32 of S
tivity ID	Activity Name		Actual Start	Finish	Total 200 Float	3 2009	2010 2011	<u>11 2012 2013 2014 2015 2016 2017 2018 2019 2020</u>
TUN-07-1140	Unneling - Remove Tunneling Support Facilities at Launch Box	15	0 08-May-14	29-May-14	1655			Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q         Q
TUN-07-1150	Tunneling - Tunnels Complete	15	0 08-10129-14	29-May-14 21-May-14	60			In runneling - Remove runneling Support Facilities at Lauren Box
		•	-					
	ompensation Grouting	60	0 02-May-13	26-Jul-13 26-Jul-13	100			
TUN9740	TUN Grout at Green Street- Install & Pregrout CG Pipes	60	0 02-May-13		100			TUN Grout;at Green Street-Install;& Pregrout;CG Pipes
Retieval Shaft S		411	34 13-Aug-12 A		134			
TUN1235	TUN Remove and install Utilities and Sewer TBM Retrieval Shaft	81	34 13-Aug-12 A		35			TUN Remove and Install Utilities and Sewer TBM Retrieval Shaft
TUN1150	TUN Construct TBM Retrieval Shaft	186	0 26-Feb-13	15-Nov-13	35			TUN Construct TBM Retrieval Shaft
TUN1245	TUN Final Restoration- TBM Retrieval Shaft	44	0 22-May-14	24-Jul-14	134			🗇 TUN Final Restoration- TBM Retrieval Shaft
Cross Passages		745	0 07-Jan-13	21-Jan-15	159			
Cross Passage		217	0 11-Mar-14	21-Jan-15	111			
TUN1154	TUN Excavate/Support/Line - X-Passage #1 (CTS)	62	0 11-Mar-14	05-Jun-14	-8			TUN Excavate/\$upport/Line - X-Passage #1 (CTS)
TUN1205	TUN Excavate/Support/Line - X-Passage #2 (CTS)	37	0 03-Apr-14	23-May-14	-20			□ TUN Excavate/Support/Line - X-Passage #2 (CTS)
TUN1215	TUN Excavate/Support/Line - X-Passage #4 (UMS)	52	0 27-May-14	07-Aug-14	-20			TUN Excavate/Support/Line - X-Passage #4 (UNIS)
TUN1144	TUN Excavate/Support/Line - X-Passage #3 (UMS)	37	0 06-Jun-14	29-Jul-14	-7			📋 TUN Ex¢avate/Support/Line - X-Passage #3 (UWS)
BUF1027	TUN Buffer Float No. 7.5 to Stations CTS (120)	112	0 06-Jun-14	12-Nov-14	47			TUN Buffer Float No. 7.5 to Stations CTS (120)
BUF0007	TUN Buffer Float No. 7 to Stations UMS (120)	110	0 08-Aug-14	20-Jan-15	112			TUN Buffer Float No. 7 to Stations UMS (120)
BUF1047	TUN Buffer Float No. 7.75 to Stations YBM (120)	100	0 25-Aug-14	21-Jan-15	38			TUN Buffer Float No. 7:75 to Stations YBM (120)
Cross Passage	es 5	586	0 07-Jan-13	15-Aug-14	-28			
TUN9770	TUN Ground Improvements/ Jet Grouting X-Passage #5	146	0 07-Jan-13	01-Aug-13	-8			TUN Ground Improvements/ Jet Grouting X-Passage #5
TUN1125	TUN Excavate/Support/Line - X-Passage #5	43	0 17-Jun-14	15-Aug-14	-20	+		□ ,TΨN;Excayate/Support/Line;- X-Passage #5
Portal Structure	8	166	0 18-Aug-14	17-Apr-15	-20			
TUN1160	TUN Tunnel Portal Structure	166	0 18-Aug-14	17-Apr-15	-20			TUN Tunnet Portal Structure
Construction CN		1903	0 01-May-13	16-Jul-18	163			
CN- 1300 Milest		1736	0 01-May-13	30-Jan-18	0			
UMS2090	CN 1300- UMS Reg'd - Headwall Complete (92 CD from NTP)	92	0 01-May-13	31-Jul-13	35	$\cdot$		CN 1300- UMS Reg/d - Headwall Complete (92 CD from NTP)
UMS2100	CN 1300- UMS Reg'd- Tunnel Interface Complete (630 CD from NTP)	630	0 01-May-13	20-Jan-15	160			CN 1300- UM\$ Regid- Tunnel Interface Complete (630 CD from
CTS2120	CN 1300- CTS Reg'd -Tunnel Interface Complete (561 CD from NTP)	561	0 01-May-13	12-Nov-14	76			CN 1300- CTS Regid -Tunnel Interface Complete (561 CD from N
YBM2010	CN 1300- YBM Reg'd Headwalls Complete (49 CD from NTP)	49	0 01-May-13	18-Jun-13	40			CN 1300-YBM Rep'd Headwalls Complete (49 CD from NTP)
YBM2020	CN 1300- YBM Reg'd Tunnel Interface (CP 1-5) Complete (631 CD from NTP)	631	0 01-May-13	21-Jan-15	55			CN 1300- YBM Reg d Treadwars Complete (#9 CD Ironni v (*))
FDS2330	CN 1300- UMS, CTS, YBM, & STSReg'd Substantial Completion (1736 CD fro	1736	0 01-May-13	30-Jan-18		····		CN 1300- UMS, CTS, YBM,
STS10020		841			21			CN 1300- ST\$ Regd Tunnel Portal Completion (841 CD 1
	CN 1300- STS Req'd Tunnel Portal Completion (841 CD from NTP)		0 01-May-13	19-Aug-15	21			
	IMS Station P-1253	1646	0 01-May-13	01-Nov-17	0			
UMS Milestone		1646	0 01-May-13	01-Nov-17	0			
FDS1700	UMS Start	0	0 01-May-13		0			♦ UMS Start
UMS9700	UMS Contingency Cost Activity (LOE)	1009	0 01-May-13	01-Nov-17	0			UMS Contingency Cost Activity
N-UMS1110	UMS Tunnel Interface Finish UMS Head Walls	0	0	31-Jul-13	35			
UMS9890	UMS Tunnel Interface Finish Cross Passages 3 & 4	0	0	20-Jan-15	160			UMS Turnel Interface Finish Cross Passages 3 & 4
N-UMS10200	UMS Access through tunnels Interface to STS	0	0	13-Nov-15	90			◆ UIMS Access through tunnels Interface to STS
N-UMS9770	UMS Track Interface to STS	0	0	25-Jul-16	93			♦ UMS Track Interface to STS
N-UMS10090	UMS Interface for Access to Station Rooms for STS Contractor	0	0	21-Jun-17	20			♦ UM\$ Interface for Access to Station
UMS1500	UMS P-1253 Commissioning Completion	0	0	01-Nov-17	0			UMS P-1253 Commissioning C
	central subway	CSP-CMPS			Master All	tral Subway Proje Project Schedule Activities er 2012 Update	ct	Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

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ivity ID	Activity Name	Original	Actual Start	Finish	Tota	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 2
		Duration	Duration		Float					QQQ		QQQQ					
Ellis Streets		1528	0 01-May-13		54												
N-UMS1000	UMS Submittals and Mobilize	30	0 01-May-13		/							M\$ Submitta	- i i i	- i i i			
UMS9910	UMS Install 60 Piles on Ellis Street	40	0 18-Feb-14	14-Apr-14	42									iles on Ellis			
UMS1250	UMS Excavate Ellis St Annex	65	0 15-Apr-14	16-Jul-14	42									te Ellis St An truct Ellis St			
UMS1270	UMS Construct Ellis St Annex	50	0 17-Jul-14	25-Sep-14	42								UMS Cons	truct Ellis St	1 1 1 1		
N-UMS9750	UMS Install Vertical Circulation Elements (VCE) BART #5 & Elevator	45	0 22-Feb-17	25-Apr-17	53												al Circulation El Roof Slab Ellis
UMS1400	UMS Complete Roof Slab Ellis St/Stockton St (#1)	35	0 17-May-17	06-Jul-17	38										UN UN	S Complete	Roof Slab Ellis
O'Farrell Stree		100	0 19-Aug-13		713												
N-UMS1100	UMS Install 34 Plies for O'Farrell Emergency Exit	35	0 19-Aug-13	07-Oct-13	713						1.1.1	I UMS Insta	1 1 1 1		1. 1. 1.	xit	
UMS1390	UMS O'Farrell St Emergency Exit	65	0 08-Oct-13	25-Feb-14	713							ums Ums	O Farrell St	Emergency	Exit		
Stockton Stree	et	1399	0 13-Jun-13	11-Apr-17	176												
South Conco	ourse	280	0 19-Sep-13	06-Oct-14	42												
N-UMS1009		85	0 19-Sep-13	14-Feb-14	8						1	UMS					
N-UMS9960	UMS 107 Piles Stockton (West) - South Concourse	85	0 15-Feb-14	27-May-14	28							UN 🛑		Stockton (V	1 1 1 1 1	1 1 1 1	
N-UMS1017	UMS Excavate/Roof/Pave South Concourse (134+82 to 137+20)	90	0 20-Jun-14	06-Oct-14	42								UMS Exca	vate/Roof/P	ave South C	oncourse (1	134+82 to 137+2
Station Box		1334	0 17-Aug-13	11-Apr-17	176												
N-UMS9900	UMS 99 Piles Stockton (East) - Station Box (2 Drills)	105	0 17-Aug-13	06-Feb-14	15							UMS 9	9 Piles Stoc	kton (East)	Station Box	(2 Drills)	
N-UMS1003	UMS 99 Piles Stockton (West) Station Box (2 Drills)	105	0 15-Feb-14	19-Jun-14	8							u 📥	/IS 99 Piles	Stockton (W	est) Station	Box (2 Drills	s)
N-UMS1016	UMS Excavate/Jet Grout/ Roof/ Pave Box Station Box	150	0 20-Jun-14	03-Feb-15	8									xcavate/Jet	Grout/ Roof	Pave Box	Station Box
UMS9780	UMS Complete Roof Slab Geary St/Stockton St (#3)	35	0 22-Feb-17	11-Apr-17	123										UM/S	Complete Ro	oof Slab Geary S
North Concor	urse	670	0 13-Jun-13	13-Apr-15	0												
N-UMS9880	UMS 106 Piles (East)- North Concourse	68	0 13-Jun-13	18-Sep-13	7						-	UM\$ 106 F	iles (East)-	North Conc	ourse		
N-UMS1001	UMS 61 Piles (West) - North Concourse	46	0 13-Jun-13	16-Aug-13	12						i 🛑	UMS 61 PI	es (West) -	North Conico	ourse		
N-UMS1013	UMS Excavate/Roof/Pave North Concourse (128+91 to 130+82)	85	0 14-Nov-14	13-Apr-15	0								ums	Excavate/F	oof/Pave N	rth Conçou	rse (128+91 to
UMS Garage		1504	0 01-May-13	12-Jun-17	142												
N-UMS1067	UMS Garage Design, Submittals, and Reviews	20	0 01-May-13	29-May-13	0						U	MS Garage I	Design, Sub	mittals, and I	Reviews		
N-UMS10000	UMS Garage Install Temp Shoring, Bracing, and Utilities	40	0 30-May-13	25-Jul-13	0						- i 📫	UNS Garage	Install Tem	p Shoring, B	racing; and	Utilities	
N-UMS10010	UMS Garage Demo and Install Structural Elements to Garage Permanent Oper	175	0 26-Jul-13	19-May-14	0								S Garage D	emo and ins	tall Structur	al Elements	to Garage Pern
N-UMS9990	UMS Garage Turn Over Garage	0	0	19-May-14	0			1-1-1-1-				♦ UN	S Garage T	urn Över Ga	arage		
N-UMS10060	UMS Garage Floor/Column Demo and Column/Roof Support and Seismic Braci	125	0 20-May-14	13-Nov-14	0								UMS Gar	age Floor/C	olumn Demo	and Colum	n/Roof Support
N-UMS10070	UMS Garage Break through Concourse Level East Wall and complete Jet Gro	25	0 30-Jun-15	04-Aug-15	339									JMS Garage	Break throu	gh Cancpur	se Level East V
N-UMS10100	UMS Garage Install Slabs and Internal Walls	45	0 05-Aug-15	07-Oct-15	339									UMS Gara	ge Install \$la	bs and Inter	nal Walls
N-UMS10050	UMS Garage Vertical Circulation Elements (VCE) 1&2 and 2 Elevator	70	0 08-Oct-15	08-Mar-16	339									UMS C			on Elements (VC
UMS1430	UMS Finish Union Square Garage Station Entrance	20	0 15-May-17	12-Jun-17	100		1111	+-+-+						+++++++	UM:	s Finish Uni	on Square Gara
Concourse Le	vel	1122	0 07-Oct-14	01-Nov-17	0												
UMS1140	UMS Excavate & Install Permanent Struts South Concourse	23	0 07-Oct-14	06-Nov-14	63								UMS Exc	avate & Inst	all Permaner	t Struts Sou	th Concourse
N-UMS1160	UMS Excavate & Install Permanent Struts Platform Box Concourse to Mezzani	115	0 13-Feb-15	29-Jun-15	0								1 1 1 1				uts Platform Bp
UMS1170	UMS Excavate Install Permanent Struts North Concourse	65	0 14-Apr-15	29-Jun-15	0												s North Concou
UMS1180	UMS Place Concourse Level Deck & Encase Wales	50	0 09-Dec-16		0		• • • • • • • • • • • •	+					177	+			rse Level Deck
UMS1210	UMS Internal Walls Concourse Level	25	0 22-Feb-17	22-Mar-17	0										1.1.1.1		s Concourse Le
N-UMS9940	UMS Install Vertical Circulation Elements (VCE) 3 & 4 and Elevators	60	0 22-Feb-17	16-May-17	38										1 1 1	i i i i	cal Circulation E
		CSP-CM	PS	1	1												
	central cubway				SF		l Subway Pro	5					-		art On: 08-Jar		10
	oundary					Master Pro All Ac	ject Schedule tivities						R	equired Reve Dat	nue Service I a Date: 30-Se		-18
							2012 Update							Dat			

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ctivity ID	Activity Name	Original	Actual Start Duration	Finish	Total	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018 2019	2020
111101000		Duration		40.14	Float												
UMS1230 UMS1440	UMS Rough-In M/E/P/A Concourse Level	45	0 23-Mar-17	13-May-17	0											ugh-In M/E/P/AC Finish M/E/P/A	
	UMS Finish M/E/P/A Concourse and Inter Strut Levels	90	0 15-May-17	29-Aug-17	0												h
UMS1450	UMS Commissioning	45	0 30-Aug-17 0 16-Aug-16	01-Nov-17 14-Mar-17	43											S Commissionin	g
UMS1200	UMS Install Intermediate Strut Level Deck & Encase Wales	60	0 16-Aug-16	08-Nov-16	43											ermediate Strut	
UMS1200	UMS Internal Walls Intermediate Strut Level	25	0 09-Nov-16	15-Dec-16	12											Walls Intermedia	
					13												
N-UMS1040	UMS Install Intermediate Strut Level Parameter Walls	20	0 09-Nov-16	08-Dec-16	43											termediate Strut I Emergency Ve	
	UMS Install Emergency Ventilation Equipment		0 16-Dec-16	14-Mar-17	83											In M/E/P/A Inter	
N-UMS9760	UMS Rough-In M/E/P/A Intermediate Strut Level	20	0 16-Dec-16													In M/E/P/A Inter	mediate Strut
Mezzanine Le		291	0 28-Apr-16	21-Jun-17	13												
N-UMS1222	UMS Install Mezzanine Level Deck & Encase Wales	61	0 28-Apr-16	25-Jul-16	0											inine Level Decl alls Mezzanine I	
N-UMS1223	UMS Internal Walls Mezzanine Level	50	0 26-Jul-16	04-Oct-16	18												i
N-UMS10030		15	0 26-Jul-16	15-Aug-16	0									1 1 1 1		anine Level Par	
UMS1240	UMS Rough-In M/E/P/A Mezzanine Level	45	0 12-Oct-16	15-Dec-16	13										1 I I I I I I	n M/E/P/A Mezz	i   i i i
UMS1380	UMS Finish M/E/P/A Platform and Mezzanine Levels	130	0 16-Dec-16	21-Jun-17	13										UM\$ F	nish M/E/P/A Pla	tform and Me
Platform Leve		367	0 30-Jun-15	30-Jun-16	189												
N-UMS1295	UMS Excavate & Install Permanent Struts Mezzanine Level to Platform	115	0 30-Jun-15	13-Nov-15	0											ermanent Struts	Mezzanine Le
UMS1330	UMS Place Invert	62	0 31-Oct-15	21-Jan-16	0									1 1 1 1	ice Invert		
UMS1315	UMS Install Platform Level Parameter Walls & Encase Wales	71	0 22-Jan-16	14-Apr-16	0											evel Parameter	Walls & Enca
UMS1340	UMS Construct Platform Structure	11	0 15-Apr-16	27-Apr-16	0										Construct Platf		
UMS1360	UMS Rough-In M/E/P/A Platform Level	45	0 28-Apr-16	30-Jun-16	129									ıń 🔲 🛛	IS Rough-In M/	/P/A Platform Le	vel
Construction (	CTS Station P-1254R	1660	0 01-May-13	15-Nov-17	76												
CTS9700	CTS Contingency Cost Activity (LOE)	1024	0 01-May-13	15-Nov-17	25											S Contingency C	Cost Activity (L
CTS Contract		1610	0 01-May-13	26-Sep-17	36												
FDS1800	CTS Start	0	0 01-May-13		2						♦ C1	S Start					
N-CTS1000	CTS Tunnel Interface Finish Cross Passages 1 & 2	0	0	12-Nov-14	76								CTS Tunn		Finish Cross Pa		
N-CTS9770	CTS Access through tunnels Interface to STS	0	0	12-Aug-16	40									♦ 0	TS Access thre	ugh tunnels Inte	rface to \$T\$
N-CTS1010	CTS Track Interface to STS	0	0	29-Sep-16	27									•	CT\$ Track Inter	face to STS	
N-CTS9760	CTS Interface for Access to Station Rooms for STS Contractor	0	0	23-Jun-17	3											erface for Acces	
CTS1500	CTS P-1254R Commissioning Completion	0	0	26-Sep-17	36										🔶 СТ\$	P-1254R Comn	hissioning Con
Headhouse / (	Cross Cut	1660	0 01-May-13	15-Nov-17	76												
Headhouse E	Exc / Structural	1380	0 01-May-13	08-Feb-17	258												
N-CTS0900	CTS Relocate Sidewalk / OCS / Install Sound Wall	25	0 01-May-13	05-Jun-13	2						i i i	TS Relocate	i i i	1 1 1 1			
N-CTS0950	CTS AT&T Cutover; Relocate Utilities (PG&E, MUNI, Water, Sewer)	70	0 06-Jun-13	13-Sep-13	2							CTS AT&T	Cutover; Rel	ocate Utiliti	s (PG&E, MUN	, Water, Sewer)	
CTS1000	CTS Building Demolition	30	0 16-Sep-13	28-Oct-13	2								ing Demolitic	1 1 1 1			
CTS1010	CTS Install Slurry Walls	110	0 29-Oct-13	21-Apr-14	2								Install Slurr				
N-CTS1015	CTS Install Dewatering System	90	0 29-Oct-13	24-Mar-14	22							ф ¢т\$	Install Dewa	ering \$yste	m		
CTS1005	CTS Site Setup/Form / Pour Surface Deck Slab & Support Walls	55	0 22-Apr-14	09-Jul-14	2										ur Surface Dec	Slab & Support	Walls
N-CTS1020	CTS Install Gantry Crane	15	0 10-Jul-14	30-Jul-14	2							0 (	TS Install G	1 6 1 1			
CTS1020	CTS Excavate Headhouse & Bracing to El. +18 for Cross Cut Breakout	130	0 31-Jul-14	10-Feb-15	2								CTS E>	cavate He	dhouse & Brac	ng to El. +18 fpr	Cross Cut Bro
N-CTS1022	CTS Backfill tunnels with CDF	19	0 13-Nov-14	11-Dec-14	47								OTS Bac	fill tunnels	with CDF		
	central	CSP-CM	PS			Master Pro All Ad	al Subway Pro ject Schedule tivities 2012 Update						R	equired Rev	rt On: 08-Jan-08 nue Service Date a Date: 30-Sep-1		

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Activity ID	)	Activity Name	Original Duration	Actual Start Duration	Finish	Total Float	2008	2009	2010	2011	2012	2013	2014	2015 2016		2018 201	9 2020
	N-CTS1052	CTS Cross Cut Breakout Side Drifts and Top Heading from Headhouse	10	0 11-Feb-15	01-Mar-15	2								CTS Cross Cut	QQQQQQ Breakout Side D	rifts and Top Hea	ading from Head
	CTS1070	CTS Cross Cut Excavate Top Heading Bench/Invert Side Drifts and Center Drif	35	0 02-Mar-15	05-Apr-15	2								CTS Cross Cu		4 6 6 6 4 4 -	
	CTS1080	CTS Cross Cut Excavate & Bracing to El10 (64)	65	0 06-Apr-15	10-Jun-15	2								CTS Cross			
	CTS1090	CTS Cross Cut Excavate Center Drifts Bench/Invert	5	0 11-Jun-15	15-Jun-15	2									ut Excavate Ce		
	CTS1180	CTS Headhouse Structural Concrete / Remove Bracing	130	0 28-Apr-16	29-Sep-16	2										se Structural Co	
	CTS1190	CTS Cross Cut Cavern Install Permanent Lining	190	0 28-Apr-16	08-Feb-17	179										s Cut Cavern Ins	
	Headhouse A		310	0 15-Aug-16	15-Nov-17	49			+								
	N-CTS1230	CTS Headhouse M/E/P Rough-in	130	0 15-Aug-16	02-Mar-17	1									CTS Hea	house M/E/P R	ough-in
	CTS1200	CTS Headhouse Install Vertical Circulation Elements (VCE)	130	0 16-Nov-16	02-Jun-17	60									стян	eadhouse Instal	Vertical Circula
	N-CTS1800	CTS Cross Cut Cavern Architectural Finishes	45	0 09-Feb-17	13-Apr-17	179										ss Cut Cavern	
	CTS1230	CTS Headhouse M/E/P Finishes	80	0 03-Mar-17	23-Jun-17	1										leadhouse M/E/	
	N-CTS1225	CTS Headhouse Architectural	180	0 03-Mar-17	15-Nov-17	49			+							TS Headhouse /	Architectural
	N-CTS1240	CTS Install Traction Power in Station	100	0 03-Mar-17	24-Jul-17	1										Install Traction F	
	N-CTS1260	CTS Install Emergency Fan Equipment in Station	100	0 03-Mar-17	24-Jul-17	1										Install Emergend	
	N-CTS1235	CTS Headhouse / Platform Artwork	20	0 14-Apr-17	11-May-17	179										adhouse / Platfo	
	CTS1260	CTS Commissioning	45	0 25-Jul-17	26-Sep-17	25										\$ Commissionin	
	Platform Caver		626	0 16-Jun-15	02-Mar-17	302			+-+-+-								9
		ern Exc / Structural	626	0 16-Jun-15	02-Mar-17	302											
	CTS1160	CTS South Platform Breakout/Advance Side Drifts from Cross Cut Cavern	60	0 16-Jun-15	15-Aug-15	2								CTS Sout	Platform Breakc	ut/Advance Side	Drifts from Cro
	N-CTS2260	CTS North Platform Breakout/Advance Side Drifts from Cross Cut Cavern & N	60	0 16-Jun-15	15-Aug-15	27									Platform Break		
	CTS1170	CTS South Platform Breakout/Advance Center Drift	70	0 16-Aug-15	25-Oct-15	21									th Platform Brea		
	N-CTS2280	CTS North Platform Breakout/Advance Center Drift	45	0 16-Aug-15	30-Sep-15	27			+-+-+						h Platform Break	1	
	N-CTS2280	CTS North Platform Install Permanent Lining/ Structural	70	0 01-Oct-15	12-Jan-16	170									Iorth Platform In:		
	N-CTS2220	CTS North Platform Architectural	85	0 13-Jan-16	20-May-16	397									S North Platforr		ining/ an ucrura
	N-CTS2200	CTS South Platform Install Permanent Lining/ Structural	75	0 28-Apr-16	12-Aug-16	27									CTS South Platf		amont Lining/ Str
	N-CTS9750	CTS South Platform Architectural	130	0 15-Aug-16	02-Mar-17	209										h Platform Archit	
	Crossover Cav		235	0 26-Oct-15	02-Wal-17	108											
	CTS1120	CTS Crossover Cavern Advance Side Drifts & South Headwall	65	0 26-Oct-15	07-Jan-16	100								сть	rossover Caver	n Arturnon Oida	
	CTS1120	CTS Crossover Cavern Auvance Side Dhits & South Headwaii CTS Crossover Cavern Center Drifts	100	0 08-Jan-16	27-Apr-16	2									S Crossover Caver		- i - i - i - i - i - i - i i i i
	CTS1130	CTS Crossover Cavern Install Permanent Lining/ Structural	70	0 28-Apr-16	08-Jul-16	108									CTS Crossover (	1 1 1 1 1 1	- i - i - i - i - i - i - i - i - i - i
		, , , , , , , , , , , , , , , , , , ,	400	0 01-Oct-15	22-May-17	172										aveni instan i	ininanenit Lininjg/
	Emergency Eg CTS1210	CTS North Emergency Exit Excavate Tunnel & Shaft	90	0 01-Oct-15	19-Feb-16	172									North Emergenc		
	CTS1210 CTS1220	CTS North Emergency Exit Excavate Tunnel & Shan	180	0 01-Oct-15 0 22-Feb-16	03-Nov-16	172										nergency Exit Li	
_	N-CTS9730	CTS South Emergency Exit Line Shart	45	0 22-Peb-16	30-Jun-16	234									TS South Emer		
	N-CTS9730	CTS South Emergency Exit Excavate Tunnel CTS South Emergency Exit Line Tunnel	45 90	0 28-Apr-16	08-Nov-16	234										mergency Exit L	
	N-CTS1224	CTS North Emergency Exit Line Tunner CTS North Emergency Exit Final Structure Architectural	130	0 01-Jul-16	22-May-17	172										arth Emergency	
	N-CTS2290	CTS South Emergency Exit Final Structure Architectural	65	0 09-Nov-16	22-Iviay-17 23-Feb-17	234										h Emergency Ex	
		BM Station P-1255	1554			234										n Ethergency Ex	n rina suucure
	ONSTRUCTION Y		1554	0 01-May-13 0 01-May-13	01-Aug-17 01-Aug-17	92											
	YBM1600	YBM Start	0		01-Aug-17	92						♦ YB					
	YBM1600 YBM9700	YBM Start YBM Contingency Cost Activity (LOE)	1069	0 01-May-13 0 01-May-13	01-Aug-17	65							n blart		терени уви	Contingency Co	st Activity (LQE
•••••					÷			1:11	1 i i i			1 1 1 1					
			CSP-CMI	PS				l Subway Pro	ject						Start On: 08-Jan-0		
							Master Pro All Ac	ject Schedule							venue Service Da ata Date: 30-Sep-		
								tivities 2012 Update						1	ata Date: 30-Sep-	12	
							r in the or i	= = rame									

	PITLL										Page
ivity ID	Activity Name	Original Duration	Actual Start Duration	Finish	Total Float	2008	2009	2010	2011	2012	
N-YBM10110	YBM Tunnel Interface Finish YBM Head Walls	0	0	18-Jun-13	40						Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q
N-YBM9910	YBM Tunnel Interface Finish Cross Passages 1-5	0	0	21-Jan-15	55						YBM Turnel Interface Finish Cross Passages 1-5
N-YBM10190	YBM Access through tunnels Interface to STS	0	0	30-Oct-15	30						YBM Access through tunnels Interface to STS
N-YBM10120		0	0	03-May-16	48						◆ YBM Track Interface to STS
N-YBM10130	YBM Interface for Access to Station Rooms for STS Contractor	0	0	07-Apr-17	95						♦ YBM Interface for Access to Sta
YBM1500	YBM P-1255 Commissioning Completion	0	0	01-Aug-17	92					• • • • • • • • •	♦ YBM P-1255 Commissioning
Surface Level		1554	0 01-May-13	01-Aug-17	92						
N-YBM1250	YBM Get needed Permits & Submittals	30	-	12-Jun-13	6						YBM Get needed Permits & Submittals
YBM1010	YBM Demolish 76 Gas Station	25	0 13-Jun-13	18-Jul-13	6						YBM Demolish 76 Gas Station
YBM1020	YBM Mobilize & Establish Headhouse Worksite	5	0 19-Jul-13	25-Jul-13	6						VBM Mobilize & Establish Headhouse Worksite
YBM1030	YBM Install Slurry Wall West Side & Headhouse	120	0 26-Jul-13	03-Mar-14	6						YBM Install Slurty Wall West Side; & Headhouse;
YBM9730	YBM Construct Roof Slab for West Side & Restore Street	55	0 04-Mar-14	19-May-14	6						I YBM Construct Roof Slab for West Side & Restore Street
YBM9710	YBM Install Slurry Wall East Side (6 Day Calendar)	120	0 20-May-14	10-Oct-14	7						YBM Install Slurry Wall East Side (6 Day Calendar)
YBM1050	YBM Construct Roof Slab East Side & Restore Street	20	0 13-Oct-14	07-Nov-14	5						YBM Construct Roof Slab East Side & Restore Strept
N-YBM10170	YBM Install Subsurface Headhouse & Ventilation Plenums	15	0 03-Oct-16	21-Oct-16	120						B YBM Install Subsurface Headhouse
N-YBM9050	YBM Install Vertical Circulation Elements (VCE)	100	0 06-Jan-17	26-May-17	65	111					TBM Install Vertical Circulation
N-YBM10180	YBM Install Surface Level Framing	10	0 17-Feb-17	03-Mar-17	90						I YBM Install Surface Level Frami
YBM1230	YBM Surface Level M/E/A/P	35	0 27-Mar-17	12-May-17	75						TBM Surface Level M/E/A/P
YBM1245	YBM Commissioning	45	0 30-May-17	01-Aug-17	65						🖨 YBM Commissioning
Mezzanine Lev	vel	604	0 10-Nov-14	07-Apr-17	65						
YBM1060	YBM Excavate & Install Temp Struts for Mez Level Slab	44	0 10-Nov-14	19-Jan-15	18		1-1-1				YBM Excavate & Install Temp Struts for Mez Level Slab
YBM1080	YBM Construct Mez Slab at Station Box	20	0 20-Jan-15	17-Feb-15	18						YBM Construct Mez Slab at Station Box
N-YBM9750	YBM Construct Headhouse Mez Level Slab & Remove Temp Struts	20	0 08-Jul-16	04-Aug-16	65						YBM Construct Headhpuse Mez Level
N-YBM10160	YBM Install Station Mez Level Walls & Headhouse Columns & Perimeter Walls	40	0 05-Aug-16	30-Sep-16	65						TBM Install Station Mez Level Walls 8
YBM1090	YBM Install Internal Walls at Mez Level Station & Headhouse	20	0 17-Oct-16	11-Nov-16	65						YBM Install Internal Walls at Mez Le
N-YBM1190	YBM Rough-In M/E/P/A at Mez Level	35	0 14-Nov-16	05-Jan-17	65						YBM Rough-In M/E/P/A at Mez Lev
YBM1190	YBM Finish M/E/P/A at Mez Level	55	0 06-Jan-17	24-Mar-17	75						🔲 YBM Finish M/E/P/A at Mez Lev
N-YBM1230	YBM - Emergency Ventilation Equipment	60	0 13-Jan-17	07-Apr-17	65						YBM - Emergency Ventilation Ed
Concourse Le	vel	548	0 22-Jan-15	24-Mar-17	75						
N-MOS9740	YBM Shore/Fill Existing Tunnel for Stability	28	0 22-Jan-15	03-Mar-15	38						YBM Shore/Fill Existing Tunnel for Stability
MOS1130	YBM Excavate & Install Temp Struts to Level 4	30	0 18-Feb-15	31-Mar-15	18						YBM Excavate & Install Temp Struts to Level 4
N-MOS10150	YBM Excavate to bottom of Concourse Slab	15	0 01-Apr-15	21-Apr-15	18						YBM Excavate to bottom of Concourse \$lab
MOS1140	YBM Construct Station Concourse Level Slab & Remove Temp Struts at Station	25	0 22-Apr-15	27-May-15	18						YBM Construct Station Concourse Level Slab & Rem
N-MOS9745	YBM Construct Headhouse Concourse Level Slab & Remove Temp Struts	50	0 24-Feb-16	03-May-16	33						PBM Construct Headhpuse Concourse Le
N-MOS9920	YBM Install Station & Headhouse Concourse LvI . Columns & Perimeter Walls	45	0 04-May-16	07-Jul-16	65						YBM Install Station & Headhouse Conco
MOS1170	YBM Install Intl Walls at Concourse LvI Station & Headhouse	15	0 17-Oct-16	04-Nov-16	75						I YBM Install Intl Walls at Concourse I
N-MOS10140	YBM Rough-In M/E/P/A Concourse Level	35	0 07-Nov-16	28-Dec-16	75						VBM Rough+In M/E/P/A Concourse
MOS1200	YBM Finish M/E/P/A at Concourse Level	60	0 29-Dec-16	24-Mar-17	75						BM Finish M/E/P/A at Concour
Platform Level	4	425	0 28-May-15	02-Feb-17	110						
MOS1110	YBM Excavate & Install Temp Struts to Station Invert	85	0 28-May-15	25-Sep-15	18						YBN Excavate & Install Temp Struts to Station In
MOS1160	YBM Construct Station Invert Slab & Remove Struts to level 6	25	0 28-Sep-15	30-Oct-15	18						YBM Construct Station Invert Stab & Remove St
	central subway	CSP-CM	IPS		Ν	Master Pro All Ac	Subway P ect Schedu ivities 012 Update	le			Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

	BIULL																	Page3
ity ID	Activity Name		Actual Start uration	Finish	Total Float	2008	2009	2010 00000	2011 00000		20	13 2014 00000		2016	2017	2018	2019	_
MOS1180	YBM Construct Station Platform	25	0 02-Nov	15 08-Dec-15	33									YBM Cons	truct Statio	n Platform		
N-MOS1180	YBM Install Station Platform LvI Columns & Perimter Walls	50	0 09-Dec	15 23-Feb-16	33									YBM In			1 1 1	ns & Pe
N- MOS9740	YBM Install Intl Walls at Platform Level Station & Headhouse	10	0 03-Oct-	16 14-Oct-16	65									6	YBM Install	Inti Walls	at Platfor	m Leve)
N-MOS9900	YBM Rough-In M/E/P/A Platform Level	35	0 17-Oct-	16 06-Dec-16	110										YBM Roug	gh-In M/E/	P/A Plato	orm Lev
MOS9740	YBM Finish M/E/P/A at Platform Level	40	0 07-Dec	16 02-Feb-17	110										YBM Fin	nish M/E/P	/A at Platf	form Le
Construction S	TS P-1256	1903	0 01-May	13 16-Jul-18	163													
STS9700	STS Contingency Cost Activity (LOE)	1309	0 01-May	13 16-Jul-18	112											s s	TS Contii	ngency
STS Milestones	S .	1826	0 01-May	13 30-Apr-18	240													
FDS1892	STS Start	0	0 01-May	13	21						•	STS Start						
STS9980	STS Tunnel Portal Completion Interface	0	0	19-Aug-15	21								♦ S	TS Tunnel P	ortal Compl	etion Inter	face	111
STS1480	STS Access through YBM Interface	0	0	30-Oct-15	30								•	STS Acces	s through Y	BM Interta	ice	
STS1490	STS Access through UMS Interface	0	0	13-Nov-15	90									STS Acces	s through U	JM\$ Interf	ace	
STS9720	STS Track YBM Interface	0	0	03-May-16	48										Track YBM			
STS9740	STS Track UMS Interface	0	0	25-Jul-16	93									♦ ST	S Track UN	S Interfac	e	
STS10010	STS Access through CTS Interface	0	0	12-Aug-16	40									♦ S1	S Access t	hraugh C	rs Interfa	icle
STS9760	STS Track CTS Interface	0	0	29-Sep-16	27										TS Track C	T\$ Interfa	ace	
STS9730	STS Access to YBM Station Rooms Interface	0	0	07-Apr-17	95										🔶 STSA	ccess to	YBM Stati	ion Roa
STS9750	STS Access to UMS Station Rooms Interface	0	0	21-Jun-17	20										🔶 STS	Access t	o UŅS SI	tation R
STS9770	STS Access to CTS Station Rooms Interface	0	0	23-Jun-17	3										🔶 STS	Access t	o CT S \$t	ation R
STS1500	CN 1300 Substantial Completion	0	0	30-Jan-18	0					1			+			CN 13	00 Substa	antial Cr
STS1510	CN 1300 Checklist and Closeout	90	0 31-Jan-	18 30-Apr-18	240											🔲 CN	1300 Che	ecklist a
STS1520	CN 1300 Final Completion	0	0	30-Apr-18	240											♦ CN	1300 Fina	al Comr
General		1309	0 01-May	13 16-Jul-18	44													
STS9950	STS Submittals and Permits	40	0 01-May	13 26-Jun-13	259								als and Permi					
STS1050	STS Procure Train Control	1	0 27-Jun-	13 27-Jun-13	1033							\$T\$ Procur	e Train Contro	+				+-++
STS10000	STS Install Control Centers	60	0 06-Sep	16 30-Nov-16	234									i i	STS Instal	Control C	Centers	
STS9990	STS CS Commissioning	60	0 02-Nov	17 30-Jan-18	0										-	STS C	S Cammi	ssionint
BUF1017	STS Buffer Float- (44)	44	0 31-Jan-	18 03-Apr-18	0											📕 sts	Buffer Flo	oat- (44
STS9850	STS Support for S&S Certification / Pre-Revenue Activities	115	0 31-Jan-	18 16-Jul-18	44											📥 s	TS Suppo	ort før S
4th & King Stre	bet the set	785	0 27-Jun-	13 12-Aug-16	259													
STS2202	STS Procure / Deliver Special Trackwork at Fourth and King (18 - 36 months)	755	0 27-Jun-	13 30-Jun-16	259									<b>\$</b> Т:	Procure /	Deliver Sp	ecial Tra	ckwork
STS9710	STS Construct Special Trackwork at Fourth and King (weekends only)	30	0 01-Jul-	6 12-Aug-16	259									🔳 S1	S Construc	t Special	Trackwor	k at Fo
Surface		235	0 27-Jun-	13 04-Jun-14	859													
STS1990	STS Surface Mobilization	10	0 27-Jun-	13 11-Jul-13	317							I STS Surfac	e Mobilization					
STS2000	STS Utility Demo & Installation	85	0 12-Jul-	3 08-Nov-13	317							🔲 STS Uti	ity Demo & Ins	tallation				
STS2010	STS Pavement Restoration (Partial)	15	0 11-Nov	13 03-Dec-13	317	1						STS Pa	vement Resto	ration (Part	al)			
STS2020	STS Construct Surface Station (4th and Brannan)	25	0 04-Dec	13 13-Jan-14	317								onstruct Surf			innan)		
STS2030	STS Install Surface Station MEPA	10	0 14-Jan-	14 27-Jan-14	939							STS	nstall Surface	Station MEF	A			
STS2040	STS Track Installation (Portal to King Street)	25	0 14-Jan-	14 18-Feb-14	317	1							Track Installa					
STS2050	STS Surface Systems Installation (Portal to King Street)	55	0 19-Feb	14 06-May-14	317					1			S Surface Sys			to King S	treet)	Th
STS2060	STS Pavement Restoration (Final)	20	0 07-May	14 04-Jun-14	317							∎ s	TS Pavement	Restoration	(Final)			
	central	CSP-CMPS				ATA Central Master Proj All Act		ject					R	equired Reve	rt On: 08-Jan nue Service I a Date: 30-Se	Date: 26-De	ec-18	

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Activity	ID	Activity Name		Actual Start	Finish	Total Float	1 2008 2009	2010 2011	2012	
	STS2035	STS Surface Testing & Commissioning	10	0 07-May-14	20-May-14	869				2 Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q
	NB & SB Tunr	5 5	542	0 20-Aug-15	12-Oct-17	14				
	STS3000	STS Tunnel Mobilization	10	0 20-Aug-15	02-Sep-15	14				I STS Tunnel Mobilization
	STS3010	STS TUN Port->YBM Construct Invert & Walkway (Includes conduit and embed	45	0 03-Sep-15	02-Sep-15 05-Nov-15	14		<u></u> <u> </u> +-++- +-+-+-+-+-+-+-+-+-+-+-+-+-+-+	÷	STS TUN Port->YBM Construct Invert & Walkway (Inc
	STS3020	STS TUN YBM->UMS Construct Invert & Walkway (Includes conduit and embed	50	0 06-Nov-15	22-Jan-16	14				STS TUN YBM->UMS Construct Invert & Walkway
	STS3025	STS TUN UMS->CTS Construct Invert & Walkway (Includes conduit & embed	60	0 25-Jan-16	18-Apr-16	14				STS TUN UMS->CTS Construct Invert & Walkway
	STS3030	STS TUN Port->CTS Construct Plinths	30	0 19-Apr-16	31-May-16	14				STSTUN Port->CTS Construct Plinths
	STS3040	STS TUN Port->CTS Install MEPA (Lighting, Power, Plumbing)	90	0 01-Jun-16	06-Oct-16	14				STS TUN Port->CTS Install MEPA(Lighting
	STS3050	STS TUN CTS-> End Construct Invert/Walkway (Includes conduit & embedme	25	0 15-Aug-16	19-Sep-16	27	<u>,</u> ┫╌╅╌╅╌╅╌╅╌╅╌╅╌┽╌	+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-	*	STS TUN/CTS-> End Construct Invert/Walk
	STS3070	STS TUN Track Installation	90	0 07-Oct-16	15-Feb-17	14				STS TUN Track Installation
	STS3060	STS TUN CTS-> End Install MEPA (Lighting, Power, Plumbing)	25	0 07-Oct-16	10-Nov-16	59				STS TUN CTS-> End Install MEPA (Lightin
	STS3080	STS TUN Systems Installation	147	0 05-Jan-17	02-Aug-17	14				STS TUN Systems Installetion
	STS3090	STS TUN Certification-Startup & Commissioning	50	0 03-Aug-17	12-Oct-17	14				STS TUN Certification-Startup 8
	YBM		80	0 10-Apr-17	01-Aug-17	65		<u></u> <u> </u>	┊╌┥╌┥╌┥	
	STS9960	STS YBM Room Systems Installation	80	0 10-Apr-17	01-Aug-17 01-Aug-17	65				STS YBM Rodm Systems Installat
		STS TBM Room Systems Installation			-	60				
	UMS		80	0 22-Jun-17	13-Oct-17	13				
	STS9970	STS UMS Room Systems Installation	80 90	0 22-Jun-17	13-Oct-17 31-Oct-17	13				🔲 \$T\$ UM\$ Room \$ystems Instal
	CTS STS1072	STS CTS Room Systems Installation	90	0 26-Jun-17 0 26-Jun-17	31-Oct-17 31-Oct-17		····			STS CTS Room Systems Insta
		STS CTS Room Systems installation				1				
· · · · · ·	DT Work		954	0 14-Jan-14	25-Oct-17	5				
	DT1050	DT Install FBS Phones	40	0 14-Jan-14	11-Mar-14	919				DT Install FBS Phones
	DT1040	DT Install TUN Phones	40	0 19-Feb-14	15-Apr-14	894				DT Install TUN Phones
	DT1000	DT Install Fiber	40	0 20-Sep-16	14-Nov-16	234	]			DT Install Fiber
	DT1030	DT Install YBM Phones	40	0 30-May-17	25-Jul-17					DT Install YBM Phones
	DT1020	DT Install CTS Phones	40	0 25-Jul-17	19-Sep-17	31				DT Install CTS Phones
	DT1010	DT Install UMS Phones	40	0 30-Aug-17	25-Oct-17	5				DT Install UM\$ Phones
<b>.</b>	are Collection		50	0 20-Jun-17	29-Aug-17	45				
	COST191	Install Fare Gates	50	0 20-Jun-17	29-Aug-17	45				Install Fare Gates
	Project Startup		688	0 04-Apr-18	30-Dec-20	0				
	STU1010	S&S Certification / Pre-Revenue Activities	115	0 04-Apr-18	17-Sep-18	0				S&S Certification / Pr
	BUF0018	Muni Float	68	0 18-Sep-18	26-Dec-18	0				Muni Float
	STU1040	After Study	80	0 03-Sep-20	30-Dec-20	0				
		CONTINGENCY	1421	0 01-May-13	26-Dec-18	0	4			
	COST201	Cost Activity Unallocated Contingency (LOE)	1421	0 01-May-13	26-Dec-18	0				Cost Activity;Unall
	COST8067	Cost Activity Unallocated Contingency Start	0	0 01-May-13*		1421				Cast Activity Unallocated Contingency Start
	ROJECT MAN		3073	1253 08-Oct-07 A	02-Jan-20	251	4.000 1.000 1.0			
	COST8037	80 Cost Activities Start	0	0 08-Oct-07 A		Ļ	0 Cost Activities Start			
	COS80.01	80.01 Cost Activity Preliminary Engineering	761	760 08-Oct-07 A		<u> </u>		80.01 C	ast Activity Pr	Preliminary Engineering
	COS80.03	80.03 Cost Activity Project Management	115	695 03-Jan-10 A		481				80;03 C∳stActivi
	COS80.06	80.06 Cost Activity Survey-Permits-Legal Fees	115	695 03-Jan-10 A		503	]			80.06 Cost Activit
	COS80.07	80.07 Cost Activity Survey, Test, Investigate, Inspect	115	695 03-Jan-10 A	27-Dec-12	2011				80.07 Cost Activity Survey, Test, Investigate, Inspect
		central subway	CSP-CMPS				MTA Central Subway Project Master Project Schedule All Activities September 2012 Update	t		Start On: 08-Jan-08 Required Revenue Service Date: 26-Dec-18 Data Date: 30-Sep-12

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Activity ID	Activity Name	Original Duration	Actua Duration	Start	Finish	Tota Floa	2008	2009	2010	20	11	2012	2013	2014	2015	2016	201	7 201	18 2	2019	2020
COS80.04	80.04 Cost Activity Construction	115		03-Jan-10 A	29-Mar-19	441														80.04	Cost Acti
COS80.02	80.02 Cost Activity Final Design	576	691	08-Jan-10 A	29-Mar-19	441	1 1 1 1													80.02	Cost Acti
COS80.05	80.05 Cost Activity Professional Liability/Non Construction Insurance	115	443	03-Jan-11 A	27-Dec-12	2011	1 1 1 1						80.05 C	st Activity	Profession	al Liability/N	on Canstri	uction Insu	ırance		
COS80.08	80.08 Cost Activity	163	443	03-Jan-11 A	02-Jan-20	251	1111														80.08
CON80.02	80.02 Contingency Cost Activity Final Design	500	252	01-Oct-11 A	30-Mar-18	690												8	0.02 Con	tingency	Cost Ac
CON80.06	80.06 Contingency Cost Activity Survey-Permits-Legal Fees	1799	190	03-Jan-12 A	29-Mar-19	441	1													80.06	Continge
CON80.08	80.08 Contingency Cost Activity	1320	0	02-Jan-13*	30-Mar-18	690												8			Cost Ac
CON80.03	80.03 Contingency Cost Activity	1569	C	02-Jan-13*	29-Mar-19	441									1 : : :					80.03	Continge
COST100	80 Cost Activities Complete	0	0		02-Jan-20	251												i   i i			🔶 80 Cos

#### Specific 34 11 01 Construction on Existing Tracks - Requirements include:

Signaling including track circuits and switch and lock movements shall be restored and tested to verify readiness for service. In the event that existing signaling for LRT and vehicular traffic is not restored at the end of the work, the Contractor shall pay SFMTA for the costs of manual traffic control required until such time as the signaling is restored.

Existing Systems Testing. Perform signal testing in accordance with the requirements in Section 34 42 13, SURFACE SIGNALING SYSTEM GENERAL REQUIREMENTS.

Final inspection by SFMTA will be required before train service can resume operations on tracks taken out of service during construction on active tracks. SFMTA will furnish staff to participate in the final inspection required to place track, signaling and OCS in service at the end of Work Windows or when otherwise required. Work shall be planned so as to allow sufficient time for inspection prior to returning track to service.

SFMTA will provide test vehicles on site for testing of the trackwork and OCS work. SFMTA staff will operate the test vehicles. The testing will consist of the passage of the vehicles over the tracks as many times as required to the satisfaction of the Engineer.