


Memorandum

CS Memorandum No. 1501

To: Distribution

From: Beverly Ward, CMB/Risk Management Assistant 

Date: July 03, 2013

Reference: Project No. M544.1, Contract No. CS-149
Task No. 1-4, Risk Management

Subject: Risk Mitigation Report No. 46, Rev. 0

Attached please find Risk Mitigation Report No. 46 for meeting held on June 13, 2013. Please click on the "Bookmark" tab on the left side of Adobe file to navigate to report sections Attachments:

Risk Mitigation Report No. 46, Rev 0 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
John Funghi, SFMTA (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:

Jeffrey Davis, FTA jeffrey.s.davis@dot.gov
Brad Lebovitz, STV bradley.lebovitz@stvinc.com
John Funghi, SFMTA
Albert Hoe, SFMTA
Richard Redmond, CSP
Eric Stassevitch, CSP
Alex Clifford, CSP
Vivian Chow, SFMTA
Mark Benson, CSP
Beverly Ward, CSP

Risk Mitigation Meeting Minutes #46

DATE: June 14, 2013

MEETING DATE: **June 13, 2013**

LOCATION: 821 Howard Street, 2nd Floor – Main Conference Room

TIME: 2:00pm

ATTENDEES: John Funghi, Albert Hoe, Richard Redmond, Eric Stassevitch, Vivian Chow, Alex Clifford, Mark Benson, Beverly Ward, Brad Lebovitz, Jeff Davis, Adrian Quiroz, (FTA Intern)

COPIES TO: Attendees:, Arthur Wong, Mark Latch, Quon Chin, Jane Wang, Aileen Read, Chuck Morganson, James Sampson, Luis Zurinaga, 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. 46**

RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
	Beginning July 2013 the Risk Management Meetings will be held on the second (2nd) Tuesday of each month at 2pm. The next standing Risk meeting will take place on July 9th. An updated meeting invitation will be sent out to all participants.	
1 -	Report on Red Risk and – (Risk rating ≥ 6)	
	<p>Risk 83: Cost of vehicles may be more than estimated due to sole source and small order <u>Discussion</u> A meet and greet with the American Public Transportation Association (APTA) took place earlier in the year. Recent APTA meetings were held to conduct one on one interview with individuals who responded to SFMTA's request for qualifications released in March. Feedback comments were received on the actual specs which are being incorporated into RFP package. The RFP should go out this month; multiple bidders are expected. Schedule impact has been lowered to 1. Risk rating change accordingly. Risk Rating 8</p> <p>Risk V: Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract <u>Discussion:</u> We have incorporated the requirements; a funding source has been established for CTS. The agency has initiated a conceptual design effort and the Mayor's Office has identified some shadow impact funding from the Transbay Center Shadow Impact Mitigation that will be allocated to Central Subway to build out the balance of the property at the CTS location that estimate cost could be around \$9-\$12M. Current delivery plan is to turn over the conceptual design to 1300 Contractor</p>	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>to ask them for a design build price. The SF Planning Director has determined there is no issue for YBM. Risk cost impact has been reduced to a 1. Risk Rating 3</p> <p>Risk 99: Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule. <u>Discussion:</u> Issue Resolution Ladder process is still being worked through. The training of the process with the staff is ongoing. Risk Rating 8</p> <p>Risk 203: Headwalls interface delay CN1300 Contractor <u>Discussion:</u> A letter was received from BIH confirming their commitment to an accelerated efforts in bringing on the additional equipment (rig) and working double shifts. BIH's Recovery schedule is due on 06/14/13. CSP Contract Administrator will draft a NTP for the 1300 Contract on 06/17. Risk Rating 8</p> <p>Risk 207: Implementing Pagoda Option for Retrieval Shaft - Delay in Obtaining Property <u>Discussion:</u> Property has been acquired, leased has been signed. National Environmental Policy Act (NEPA) approval was completed on May 10th. Risk Rating 0. This risk will be Retired.</p> <p>Risk 208: Additional cost if we change direction going to the Pagoda <u>Discussion:</u> SFMTA anticipates PCC 10 being closed by Friday, June 14 or next week sometime. We will remain within budget overall. Risk Rating 8</p>	
2 -	Report on Remaining Requirement & Design Risks (Risk rating ≤ 6)	
	<p>Risk A: Timely resolution of sewer lines south of portal <u>Discussion:</u> MOU has not been signed. PUC is committed to fund this by the end of the year. PUC is thinking about removing the long term obligation of who pays the repair and replacement cost for Muni operation type back charges into a formal MOU with the agency. Funding from PUC is expected by the end of the year. Risk Rating 2</p> <p>Risk 32: Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2) <u>Discussion:</u> A quote is being solicited from BIH. Risk Rating 1</p> <p>Risk 89: 3rd Party reviews of Design documents delays completion of Final Design. <u>Discussion:</u> Permits have been obtained. Verification from the reviewers is ongoing. Risk Rating 2</p> <p>Risk PR73: Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities <u>Discussion:</u> DTIS MOU agreement has been signed. This design risk will be closed and a new construction risk will be opened in its place. Construction risk owner will be Albert Hoe. Risk Rating 0. This risk will be retired.</p>	
3	Active Risks	
	<p>Risk 56: <u>Discussion:</u> Escalation more / less than expected (Increase in bid prices to hedge possible increases in cost of volatile commodities). <u>Discussion:</u> 1300 Contract has been awarded. Risk Rating 0. This risk will be retired.</p>	


ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>Risk 94: Bid protests delay award and NTP for construction contracts <u>Discussion:</u> No protests were received for the 1300 Contractor's bid proposal prior to award and NTP. Risk Rating 0. This risk will be retired.</p> <p>Risk 201: Bid Protest - 1300 Contract <u>Discussion:</u> No bid protests were received. Risk Rating 0. This risk will be retired.</p> <p>Risk PR37: Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment <u>Discussion:</u> Beginning to engage PG&E on temporary power for street lights. They have a general scheme for permanent power feed but are not finished with their full design. Reimbursement from PG&E will be made for turning on the lights but not for redundant power. This remains a risk until we understand what the cost for the redundant fee. New risk owner will be Albert Hoe. Risk Rating 3</p> <p>Risk 50: Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished. <u>Discussion:</u> As reported in the April 2013 update, current 1252 cross passage completion dates and 1300 tunnel break in dates are still holding. Risk Rating 3</p> <p>Risk PR82: Confined work spaces along alignment can impact productivity and result in significant cost and schedule impacts <u>Discussion:</u> Schedule has accounted for all the difficulties. Cost and schedule risk is now up to the Contractor to maintain the 1700 days. Risk Rating 0. This risk will be retired.</p> <p>Risk 116: TBM procurement, delivery and assembly takes longer than assumed in schedule <u>Discussion:</u> Assembly of TBM machine is moving a little slower than expected. Second TBM machine is expected on July 2. The Contractor has not met their schedule dates. Risk Rating 4</p>	
4-	Other Business – New Risks Items: Tunnel Program, Headwalls & CN1300	
	<p>New Risk 218 – Condemnation for Mandarin Tower and 1719 Stockton Street <u>Discussion:</u> Increased cost.</p> <p>New Risk 219 – Political risk from opponents – Impact on productivity <u>Discussion:</u> What's the exposure or cost in responding to the inquiries?</p>	

ACTION ITEMS -

ITEM #	MTG DATE	Task #	DESCRIPTION	BIC	DUE DATE	STATUS
1	12/13/12		Risk 7 – Cost for significant settlement grout	J. Wang	07/09/13	Open
4	12/13/12		Risk 72 – 4 th & King (SSWP)	S. Pong C. Morganson	07/09/13	Open

Meeting adjourned at 3:30pm

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:  [initials of preparer & reviewer] Date: 03 Jul 13 [Date review completed.]

Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 46
June 13, 2013
2:00pm – 4:00pm
 Central Subway Project Office
 821 Howard St. 2nd Floor
 Main Conference Room

Attendees:

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

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

- Requirement Risks (**83**)
- Design Risks (**V**)
- Construction Risks (**99, 203, 207, 208**)

2. Report on Remaining Requirement and Design Risks

- Requirement Risks (**A, 32**)
- Design Risks (**89, PR73**)

3. Active Risks

- Market Risk (**56, 94, 201**)
- Construction Risks (**PR37, 50, PR82, 116**)

4. Other Business – Identify New Risk items associated with Tunnel Program, Headwalls and Contract 1300

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

Meeting Attendance Sheet

Project No. M544.1, Contract No. CS-149

Program/Construction Management

Risk Management Meeting No. 46

June 13, 2013

2:00 p.m. – 4:00 p.m.

Central Subway Project Office

821 Howard Street, 2nd 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	MCB
Vivian Chow	SFMTA	415 701-5264	Vivian.chow.@sfmta.com	vchow
Alex Clifford	CSP	415 701- 5275	Alex.clifford@sfmta.com	A
Ross Edwards	CSP	415-701-5296	ross.edwards@sfmta.com	
John Funghi	SFMTA	415-701-4299	john.funghi@sfmta.com	JF
Albert Hoe	SFMTA	415-701-4289	albert.hoe@sfmta.com	
David Kuehn	STV/PMOC	510-464-8053	david.kuehn@stvinc.com	
Mark Latch	CSP	415-701-5294	mark.latch@sfmta.com	
Brad Lebovitz	STV/PMOC	510-464-8052	Bradley.lebovitz@stvinc.com	BL
Richard Redmond	CSP	415-701-4288	Richard.redmond@sfmta.com	RR
Eric Stassevitch	CSP	415-701-4426	Eric.stassevitch@sfmta.com	
Beverly Ward	CSP	415-701-5291	Beverly.ward@sfmta.com	BW
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
Jeffrey Davis	FTA	415 744 2594	Jeffrey.S.Davis@DOT.gov	JD
Adrian Quiroz	FTA	815-535 5746	adquiroz@berkeley.edu	AQ

Risk Mitigation Status
Risk Reference: 83

Risk	Mitigation Strategy
Cost of vehicles may be more than estimated due to sole source and small order	1. Time the procurement of the vehicles to be part of the procurement of the SFMTA LRV procurement contract.

Initial Assessment: 1, 1.5, 2

Current Assessment: Risk Rating 8 – Requirement Risk

Risk Owner: L. Ames

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 Mitigation Status
Risk Reference: 83

4. 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. Item 4a above – not yet received continue to monitor with LRV Procurement PM.

December 2012:

1. Item 4a items received Nov. 20 from SFMTA LRV Procurement PM include draft schedule, scope and budge.
2. CS team met with SFMTA Finance to initiate a cost control protocol and procedure for release of CS funds for procurement.
3. The draft schedule, scope and budget were submitted to the FTA Nov. 29 for review and comment prior releasing funds.
4. The FTA PMO is expected to provide a report to the SFMTA and CS by Dec. 15.
5. CS team to prepare a Task Order that will incorporate the final schedule, scope and budge.
6. The SFMTA LRV Procurement staff is currently expending funds in anticipation of receiving funds for retroactive costs.

January 2013:

1. Most of the procurement actions will advance by the end of February
2. Ground rules are being developed to control our funds from being syphoned away.
3. Expected December report from the FTA/PMO has not been received.

February 2013 Meeting:

1. Most procurement actions are still tracking for February
2. FTA/PMO report was received early February 2013
3. Central Subway is preparing a memorandum of understanding to track funds, FTA comments are being incorporated into the memorandum

Risk Mitigation Status
Risk Reference: 83

March 2013:

1. Central Subway completed a Memorandum of Agreement with SFMTA transit division to establish the phases, costs, scope and timing of initial LRV procurement activities resulting in an LRV procurement RFP in May 2013, and vendor selection early 2014.

April 2013:

1. The RFP Package due May 2013 is expected to be complete on time.

May 2013:

1. Request for Qualifications for new LRV's was released in March
2. Responses were due April 22
3. The review process is now underway with the results of the review due late June
4. Procurement of 175 cars
5. Award expected in 2014
6. First cars expected in 2016

June 2013:

1. APTA meetings were held. One on one interviews with individuals who responded to the RFQ
2. Feedback comments on specification are being incorporated into the RFP to be released in June
3. Schedule impact has been lowered to a risk rating of (1).
4. Current assessment is an 8

Risk Mitigation Status
Risk Reference: V

Risk	Mitigation Strategy
Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	<ol style="list-style-type: none"> 1. Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use. 2. Integrate work with SFMTA Real Estate into CSP

Initial Assessment: 3, 2, 6

Risk Owner: R. Edwards

Current Assessment: Risk Rating 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.
4/10/13 Note: Central Subway received an email from Scott Sanchez of SF Planning on 9/11/12 confirming that a Conditional Use Authorization is not required as the Planning Code Section 228(c) was recently amended (Ordinance No. 173-12, effective 9/1/12) to exempt service stations on Primary Transit Streets or Citywide Pedestrian Network Streets (as designated in the General Plan) from the conversion requirements of Section 228.

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.
2. **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

Risk Mitigation Status
Risk Reference: V

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 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 4th 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.

December 2012:

1. SFMTA has not requested a change in design, however they could make a request up into the time we pour the invert slab with the actual column base rebar.

January 2013:

1. No additional request to report from SFMTA.

February 2013 Meeting:

1. Central Subway are circulating a response letter to SF Planning letter of May 4th 2012.

March 2013 Meeting:

1. No new update to this risk.

April 2013:

1. Final design documents for YBM are being routed for approval through the SF Planning department.
2. The response to the SF Planning letter of May 4th 2012 is still outstanding.

Risk Mitigation Status
Risk Reference: V

May 2013:

1. CTS:
 - a) Agency has additional funds from Funding Source:- Environmental Mitigation for Open Space
 - b) Gensler Architects to come up with proposals to perform some minor modification to the **surface** portion of Chinatown Station. Community meeting will be held in late May or June to present options. Community feedback will determine how to proceed with surface build-out of CTS.
2. MOS:
 - a) Funding source has not yet been established for MOS. Central Corridor plan is in the EIR development stage.

June 2013:

1. CTS:
 - a) Funding source has been established for CTS. The Agency has initiated a conceptual design effort to build out the balance of the property at the CTS location.
 - b) Design will be given to the 1300 Contractor to request a design build cost. Estimated cost is \$9-12M
2. MOS:
 - a) SF Planning has determined d there is no issue for YBM.
3. Risk cost impact has been reduced to a 1. Risk assessment rating is currently at a 3.

Risk Mitigation Status
Risk Reference: 99

Risk	Mitigation Strategy
Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.	<ol style="list-style-type: none"> 1. Executive partnering and alternate dispute resolution. 2. Train staff in adherence to issue resolution process

Initial Assessment: 5, 3, 8

Risk Owner: M. Benson

Current Assessment: Risk Rating 8 – Construction Risk

Status Log:

February 2012 Meeting:

1. Mitigation measures being implemented.
2. Incentives not being used due to legal obstacles.
3. Recommend to reduce the risk rating.

December 2012:

1. The combined contract will reduce the number of interfaces between contracts and potential for relationships to become strained
2. The CMOD process is being improved for quicker resolution of change orders
3. Mitigation 2 - 'Provide incentives in construction contracts in addition to penalties' was removed from the mitigation strategy as this is not being used (as noted in the February 2012 update).

March 2013:

1. A breakdown in the relationship has occurred due to untimely resolution of changes and unresolved contract interpretation issues.
2. SFMTA CMod SWAT team dedicated to processing changes has been implemented to improve the performance of change processing.
3. This improvement has been recognized by both parties.
4. An issue resolution process has been formalized to address disputes and avoid claims.

April 2013:

1. The issue resolution process is not being followed consistently. BIH are not responding in a timely manner and are revisiting prior agreements in the issue resolution process.
2. Brian Kelleher is developing observations and training for adherence to issue resolution process.

May 2013:

1. New Issue Resolution Ladder process presented at the CMB

June 2013:

1. The first meeting was held with BIH on May 21st, 2013 utilizing the refined issue resolution process that was presented to the CMB in May with positive results. A follow up meeting is being held June 14th to further refine the process.
2. Staff training in the issue resolution process is ongoing.
3. A similar meeting with Tutor Perini will be held in future.

Risk Mitigation Status
Risk Reference: 203

Risk	Mitigation Strategy
Headwalls interface delay 1300 Contractor	1. Meet and develop recovery schedule 2. CM to review possible Adjustment to 1300 interface 3. Ensure contractor is notified (via letter) of their obligations under the contract

Initial Assessment: 3, 2, 8

Risk Owner: M. Benson

Current Assessment: Risk Rating 8 – Construction Risk

Status Log:

December Meeting 2012:

1. Identified Risk and refined risk statement together with development of mitigation strategies.

January 2013:

1. Delay has already begun, roughly six weeks behind schedule.
2. Meeting with BIH will take place to discuss a recovery schedule.

February 2013 Meeting:

1. BIH and their sub CJN JV have re-sequenced the headwall work at Union Square so the completion date is now back on schedule with the CN 1300 milestone interface date with the CN 1252 headwall completion.

March 2013:

1. Contractor has experienced delay installing the first 4 secant piles.
2. Work has been re-sequenced, and BIH are working 2 shifts (5days per week) and a single shift Saturday.
3. Contractor is back on schedule.

April 2013:

1. Contractor is currently working 2 shifts, 6days per week and bringing additional plant to site.
2. Contractor is preparing a revised recovery schedule.
3. The current projected completion date for the headwalls is October 3rd (assumed production of 2 ½ piles per week)
4. A letter is to be prepared and sent to BIH summarizing the history of events contributing to the current delay, reaffirming the applicable liquidated damages under the contract and placing BIH on notice that additional resources and improved planning is required to address this delay.

May 2013:

1. The contractor has re-sequenced the work with a new forecast completion date of August 15th (south headwall) and September 25th (north headwall).
2. 1300 Contractor has access 90 days following NTP (approximately September 7th – subject to NTP date).
3. Tutor preliminary schedule indicates that current completion dates should not impact the 1300 contractor.

Risk Mitigation Status**Risk Reference: 203**

June 2013:

1. Contract 1300 requirements (assuming NTP June 14th 2013 compared to Contract 1252 May Preliminary Schedule completion dates;

CN1300 Requirement		1252 May Update Activities	1252 May Finish	Variance		Notes
Assumed NTP	14-Jun-13					
YBM Headwalls Complete (NTP+45CD)	<u>29-Jul-13</u>	YBM				
		Jet Grout Complete	12-Jul-13	17	CD	timing may improve with recovery schedule
		AWSS & Restoration Complete	2-Aug-13	(4)	CD	
UMS Headwalls Complete (NTP+90CD)	<u>12-Sep-13</u>	UMS				
		South Headwall Complete	21-Aug-13	22	CD	Finish date has 41 days of float in the 1252 schedule
		North Headwall Complete	23-Sep-13	(11)	CD	

2. Letter received from 1252 Contractor confirming their commitment to accelerated efforts by bringing on additional equipment and working double shifts, a recovery schedule will be provided to the CM team for review.
3. CSP Contract Administrator will draft the 1300 NTP letter on June 17, 2013.

Risk Mitigation Status**Risk Reference: 207**

Risk	Mitigation Strategy
Implementing Pagoda Option for Retrieval Shaft – costs and time associated with additional real estate and environmental requirements	<ol style="list-style-type: none">1. Obtain clear understanding of current status of property2. Meet with Owner and determine best options for SFMTA needs.3. Establish Special Use District to retain existing development rights, in addition to new land use entitlements.4. Obtain Appraisal5. Identify Funding6. Confirm hazardous abatement

Initial Assessment: 4, 2, 9**Current Assessment:** Risk Rating 0 – Construction Risk**Risk Owner:** R. Edwards**Status Log:**

February 2013 meeting:

1. Pagoda lease signed 2/13/13.
2. The risk management meeting attendant's agreed to broaden the risk description include requirements other than 'delay in obtaining Property'.

March 2013:

1. Separate contracts will be issued to complete additional noise and vibration studies to satisfy National Environmental Policy Act (NEPA) requirement and will be submitted to the FTA for evaluation.
2. Hazardous material abatement is not expected to be required. The status of hazardous material abatement under PCC 10 is to be confirmed.

April 2013:

1. Risk Owner changed from J. Funghi to R. Edwards
2. The lease for the use of the Pagoda site has been signed
3. New information has been received regarding the presence of hazardous material at the Pagoda site and will be included in PCC-10 and master schedule.
4. Risk description will not expanded as this risk is limited to obtaining the property

May 2013:

1. The Owner has until May to back out of the lease.
2. Maintain this risk rating.
3. NEPA clearance still remains open.

June 2013:

1. SFMTA took possession of the site and commenced the lease of the Pagoda on June 10th 2013
2. The first lease payment and security deposit was paid to the owner 6/7/13.
3. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status
Risk Reference: 208

Risk		Mitigation Strategy
Additional cost to retrieve TBMs at the Pagoda Theatre site exceeds current budget	√ √ √	1. Develop Scope with designers currently under contract 2. Agree to alignment and details of new shaft location 3. Issue PCC to Contractor 4. Initial site works and borings if necessary 5. Obtain appropriate permits 6. Investigate alternate procurement methods

Initial Assessment: 3, 2, 8

Risk Owner: R. Redmond/M. Benson

Current Assessment: Risk Rating 8 – Construction Risk

Status Log:

February 2013 Meeting:

1. This is in the works, PCC 10 has been issued, a rough order of magnitude estimate has been established, BIH has been given a not to exceed of \$ 50,000 to do Pagoda demolition drawings, SFMTA is negotiating with Pagoda Owner for use of the site.

March 2013:

1. Demolition drawings have been submitted to DBI for review.
2. If resolution of costs associated with the Pagoda option is not achieved, the TBMs will be buried to maintain budget requirements

April 2013:

1. Contractors cost estimate currently at \$10.4m net compared to engineers estimate of \$5.6m
2. Agreement has not been reached on PCC-10.
3. Current schedule has the retrieval shaft finishing just in time for arrival of the TBMs in North Beach.
4. Recommend adding an additional mitigation item 6. – investigate alternate procurement methods and strategies.
 - a. Option 1 – agree PCC-10 with contractor – Central Subway and BIH are preparing a joint paper summarizing the areas where agreement has not been reached on the PCC-10 estimates
 - b. Option 2 – utilize a separate design contract and procure via design, bid, build
 - c. Option 3 – bid demolition of the Pagoda theatre as a separate package
5. Central Subway are meeting with BIH 4/12/13 to discuss the joint paper prior to elevating for review by management
6. Recommend maintaining this risk rating.

May 2013:

1. Contract 1277 for the demolition of the Pagoda Theatre site was advertised Saturday 5/4/13.
2. The Central Subway BIH joint paper is still being developed.
3. Current cost issue between SFMTA and Contractor are close to being resolved.

June 2013:

1. PCC-10 is still being negotiated; further details will be provided next meeting.
2. Cutter soil mixing is being proposed to construct the retrieval shaft in lieu of tangent piles (ROM approx. \$600k less than tangent piles).
3. Contract 1277 for demolition of the Pagoda theatre is to be awarded 6/19/13.

Risk Mitigation Status

Risk Reference: 208

4. PCC 10 should be closed by June 14, or during the week commencing 6/17/13.
5. Overall budget will be maintained.

Risk Mitigation Status
Risk Reference: A

Risk	Mitigation Strategy
Timely resolution of sewer lines south of portal	<ol style="list-style-type: none"> 1. Develop alternatives that do not require creation of a new sewer line. 2. Work together with SFPUC to find mutually beneficial solutions. 3. Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies. 4. Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS. 5. Request condition assessment of sewers from SFPUC to determine required repair of sewers under proposed track.

Initial Assessment: 4, 1, 10

Current Assessment: Risk Rating 2 – Design Risk

Risk Owner: S. Pong

Status Log:

November 2011 Meeting:

1. An alternative analysis report dated May 27, 2011 was forwarded to SFPUC for review and comment. Three options were studied by SFMTA for handling the sewers south of the portal:
 - A. Leave the sewers in place and construct offset manholes where the track is in conflict with existing manholes,
 - B. Replace the existing sewers in their existing locations,
 - C. Construct twin sewers.
2. The recommendation from the report was to leave the sewers in place and construct offset manholes.
3. SFPUC provided a letter stating that the recommendations of the May 27 report were unacceptable to SFPUC.
4. New information has confirmed that leaving the sewer manholes in the track way do not violate CPUC, SFPUC or SFMTA safety criteria. A new proposal has been formulated and documented in a letter currently being circulated for signature signoff to SFPUC for approval to leave sewer in place and perform condition assessment at SFPUC cost.
5. Letter is waiting for John Funghi's signature to send to SFPUC.

December 2011 Meeting:

1. SFMTA sent letter December 13 stating that SFMTA will not relocate sewers.
2. Also requested a meeting between SFMTA & SFPUC Directors.
3. Mitigation strategy was added to request condition assessment of sewers under proposed track.

January 2012 Meeting:

1. Meeting between PUC GM and Director of Transportation will be set up by end of month.
2. Condition assessment by SFPUC has been requested by SFMTA in December 13 letter.
3. Risk rating increased to 4, 3, 12.

Risk Mitigation Status
Risk Reference: A

February 2012 Meeting:

1. SFPUC is performing a video survey of sewer lines.
2. Pre-meeting with Director of Transportation will be held prior to meeting with SFPUC. Items to be discussed with Director are:
 - a. agreement of bus bridging during sewer construction,
 - b. scope of sewer work requested by design team,
 - c. structural analysis of existing sewer lines.

April 2012 Meeting:

1. Meeting was held on February 17 between SFMTA and SFPUC to discuss the sewer lines south of the portal.
2. SFMTA presented a proposal to rebuild seven sewer chimneys at manhole locations.
3. SFMTA will provide the LRV train loading conditions to SFPUC.
4. The 30" force main was not discussed.
5. Meeting with SFPUC took place on April 12 to discuss next step on how to move forward. Additional proposal from SFPUC was presented to SFMTA to consider; make 78-inch sewer the main sewer, but run two laterals enabling them to make the house connection without taping the main line. To build two smaller 12-inch sewers on east and west side as a lateral and retrofit the existing with two options: 1) to rebuild the crown for two blocks from Bryant to Townsend, or b) slip line the 78-inch sewer.
6. SFPUC is conducting a condition assessment of the sewers along Fourth Street. The condition assessment will provide the premises of whether or not to rebuild the roof structure of the sewer. SFMTA will not pay for the changes, but would consider cost sharing.
7. A copy of the meeting minutes from the Director's meeting with track change edits from SFMTA was presented.

May 2012 Meeting

1. A meeting with SFPUC was held on 4/12/12.
2. It was discussed that CS would replace the existing brick crowns, replace a force main under the proposed tracks, and protect the sewer laterals. SFPUC would study the potential for their twin sewer arrangement.
3. A senior management meeting was held on 5/18/12 to discuss scope and cost sharing.
 - a. The crown and laterals for the existing 78" sewer will be replaced and paid for by SFMTA.
 - b. The existing force main under the tracks will be replaced to the east side of the tracks. SFPUC to pay for this work.
 - c. A new 48" sewer will be installed on the east side of tracks from Bryant to Brannan. This work will be paid for by SFPUC.
 - d. A local sewer will be installed on the west side of the tracks.
 - e. Joint trench work to relocate the existing AT&T structures on the east side of the tracks will be required.
 - f. Cost estimates for the sewer work are available from DPW.
 - g. The design of the sewer work will be achieved using Design/Build contracting strategy.
4. SFPUC completed a video survey of the existing sewers south of Bryant.

June 2012 Meeting:

1. A further Senior Management meeting is required to reach agreement of the cost-sharing of the scope items listed in Item 3 of the May 2012 notes above.
2. An MOU will be drafted upon concurrence of cost sharing between the two parties.
3. Design of the sewer work will still be achieved using Design/build contracting strategy.

Risk Mitigation Status
Risk Reference: A

July 2012 Meeting:

1. Sewer ECP presented to CMB on July 11.
2. Design will include two separate drawings depicting 1) Base work and 2) SFPUC Optional work as a design build.
3. SFPUC Optional work will be done at the sole cost of the PUC.

August 2012 Meeting:

1. Sewer design for 4th Street continues no impact to 1256 schedule.

September 2012 Meeting:

1. Sewer design for 4th Street expected to be complete 9/28/12

October 2012 Meeting:

1. Included as D&B element in combined contract

December 2012 Meeting:

1. Sewer line completed
2. Receipt of MOU is still pending.
3. Percentage cost may need to be revised.

January 2013 Meeting:

1. MOU has not been finalized, still pending
2. New sewer drawings are included in CN1300 drawings set

February 2013 Meeting:

1. The cost share agreement with PUC is still being finalized
2. Expected costs are in the current budget

March 2013:

1. Meeting to be held 3/20 with PUC to discuss the MOU and cost share percentages

April 2013:

1. Cost share percentages for the MOU were agreed between SFMTA and SFPUC at the meeting 3/20.
2. The draft MOU has been circulated for discussion.

May 2013:

1. Meeting to be held with PUC 5/15
2. The terms and conditions of the MOU are still to be resolved.

June 2013:

1. Meeting held with PUC 6/13/13.
2. The project team will issue responses to all SFPUC comments by 6/14/13 and continues to work with SFPUC to resolve the terms and conditions of the cost share MOU.

Risk Mitigation Status

Risk Reference: A

3. PUC has committed to provide funds by the end of 2013.

Risk Mitigation Status
Risk Reference: 32

Risk	Mitigation Strategy
Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2)	<ol style="list-style-type: none"> 1. Intensive coordination with and commitment from utility owners. 2. Early completion incentive for utility relocation contract. 3. Enforce franchise agreements.

Initial Assessment: 1, 1, 1

Current Assessment: Risk Rating 1 – Requirement Risk

Risk Owner: M. Benson

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

November 2012 Meeting:

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 Mitigation Status
Risk Reference: 32

December 2012:

1. PG&E work is complete
2. AT&T are scheduled to be complete the first week of January.
3. The Maiden Lane water tie in is to be completed prior to commencement of the UMS station work
 - a. A quote from CCSF is being sought to self-perform the work

February 2013:

1. AT&T cutovers were completed at Union Square the first week in January 2013.
2. Maiden Lane water tie-in will be performed by SFWD. Need to establish a budget and index code for SFWD to perform this work.
3. Macy's are required to install a backflow preventer at the Macy's Men's store to allow the fire service to be cut over, and the existing water main to be abandoned. The existing water main is in the UMS station footprint and needs to be abandoned prior to UMS construction.

March 2013:

1. Maiden Lane water tie-in – budget has been approved for SFWD to self perform the work
2. Macy's Men's backflow preventer (120 Stockton Street) – A meeting was held with Macy's management on Friday 3/8/13, Macy's are not taking action to complete this work. Central Subway are preparing a letter advising Macy's that the existing water service to the building will be removed at commencement of the Union Square / Market Street Station construction.
3. Discuss increasing this risk rating and revising the mitigation strategy.

April 2013:

1. Maiden Lane water tie in is due to be completed this month.
2. Macy's Men's backflow preventer – SFMTA are investigating:
 - a. having the SFMTA mechanical engineering division design the backflow installation
 - b. having the installation work completed under the 1252 or 1300 contracts
 - c. seeking reimbursement for the work from Macy's
3. A letter is being prepared to send to Macy's by 4/15.
4. NTP for contract 1300 is expected early June 2013, the backflow prevention device and service cutover will need to be completed by this time.

May 2013:

1. Maiden Lane Water tie in completed Wednesday April 19th 2013.
2. Macy's Backflow
 - a. Central Subway have investigated and found an existing check valve within the public right of way.
 - b. Central Subway have requested an estimate from the SF Water Department to self-perform the installation of a new check valve and complete the connection to the building within the public right of way. No work will be required within the Macy's building.

June 2013:

1. PCC-13 has been issued to BIH to perform excavation, backfill, and restoration work for SFWD.

Risk Mitigation Status
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.

Initial Assessment: 2, 2, 2

Current Assessment: Risk Rating 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:

1. 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 3rd party comment. Priority was given to 3rd 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

December 2012 Meeting:

1. The process of closing out all comments from PUC and DBI to is ongoing.

Risk Mitigation Status
Risk Reference: 89

February 2013 Meeting:

1. Meeting scheduled with PUC early March to address remaining comments
2. Status of close out of DBI electrical and mechanical to be confirmed.

March 2013 Meeting:

1. Not a delay.
2. Verification by reviewers of comment incorporation task is remaining.

April 2013:

1. Verification by reviewers of comment incorporation task is ongoing.

May 2013:

1. The status of close out of the DBI comments is as follows:
 - a. CTS – complete
 - b. UMS – complete
 - c. YBM – 95% complete (only mechanical comments require close out)

June 2013:

1. YBM – 100% complete
2. Verification of 90% comments from reviewers are still being closed out.

Risk Mitigation Status**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: 1, 1, 2**Risk Owner:** R. Edwards**Current Assessment:** Risk Rating 0 – Design Risk**Status Log:**

March 2012 Meeting:

1. Project team continues to coordinate with 3rd 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. 3rd Party Utilities
 - a. 1300 Utility relocations – status to be advised next meeting
 - b. 1256 utility relocations – confirmation and schedule required – follow up next meeting

November 2012 Meeting:

1. Follow up with DTIS still required
2. 3rd 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 4th street, south of Bryant) be required.

Risk Mitigation Status
Risk Reference: PR73

December 2012:

1. Follow up with DTIS still required??? Ross
2. 3rd Party Utility
 - a. 1300 Utility relocations – High level timeframes still to be obtained from utility owners
3. 1256 Utility relocations
 - a. Notice of Intent letters sent to utility owners
4. An MOU agreement between SFMTA and DTIS is still pending.
5. AT&T work on south of Market Street

January 2013:

1. No new updates, MOU agreement is still pending.

February 2013 Meeting:

1. STS 3rd Party private utility relocation scope and schedule has not yet been completed and coordination with utility agencies is ongoing.
2. Where scope and timing has been established, the details have been included in the 1300 contract.
3. Other mitigations have been included in the 1300 contract in anticipation of agreement with 3rd party utilities.
4. The status of the MOU with DTIS will be advised next meeting.

March 2013:

1. STS 3rd Party Utility coordination is ongoing
2. DTIS MOU is agreed, a signed version needs to be obtained from DTIS.

April 2013:

1. Central Subway are still working to obtain a signed version from DTIS

May 2013:

1. DTIS scope concurrence letter signed 4/19/13
2. Recommend creating a new construction risk to coordinate DT's work once contract 1300 schedule has been established.
3. Recommend retiring this risk.

June 2013:

1. DTIS MOU agreement has been signed.
2. Design Risk will be closed and will be re-established as a Construction risk. New risk owner will be Albert Hoe.
3. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status**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 style="list-style-type: none">1. In the current economic environment, escalation is just as likely to be less as more than anticipated.2. For volatile materials and equipment, provide substantial payment for stored materials and equipment to encourage early procurement3. Include an escalation clause for volatile commodities in contracts.

Initial Assessment: 5, 2.5, 13**Current Assessment:** Risk Rating 0 – 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.

May 2013:

1. Contract 1300 bid prices have been received.
2. Risk associated with material pricing is carried by the contractor.
3. Recommend retiring this risk.

June 2013:

1. The 1300 Contract has been awarded.
2. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status**Risk Reference: 94**

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:** Risk Rating 0 – Market Risk**Risk Owner:** A. Wong**Status Log:**

September 2011:

Mitigation measures being implemented.

November 2012:

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

June 2013:

1. No bid protests have been received.
2. Recommend retiring this risk.
3. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status**Risk Reference: 201**

Risk	Mitigation Strategy
Bid Protest - 1300 Contract	1. Establish and enforce appropriate qualifications requirement for contractors to be deemed a responsible bidder.

Initial Assessment: 1, 1, 1**Current Assessment:** Risk Rating 0 – Market Risk**Risk Owner:** A. Hoe**Status Log:**

December Meeting 2012:

1. Identified Risk and refined risk statement together with development of mitigation strategies.

January 2013:

1. Specification language worded to allow for quick response without impact to schedule.

February 2013:

1. No change in the status of this risk

March 2013:

1. No change to the status of this risk

June 2013:

1. No bid protests have been received for contract 1300.
2. Recommend retiring this risk.
3. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status**Risk Reference: PR37**

Risk	Mitigation Strategy
Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment	1. Identify temporary power requirements for station construction. 2. Investigate the timing of the permanent feed.

Initial Assessment: 1, 2, 3**Risk Owner:** A. Hoe / S. Pong**Current Assessment:** Risk Rating 3 – Construction Risk**Status Log:**

March 2013:

1. 1300 Contractor is responsible for temporary construction power
2. Permanent power applications have been submitted to PG&E
3. The PG&E Permanent power supply activities and any additional information required from Central Subway need to be established and included in the project Master Schedule.

June 2013:

1. Risk owner changed from Q. Chin to A. Hoe/S.Pong.
2. Meeting held with PG&E 6/11/13 to commence planning and coordination of streetlight connections.
3. Temporary power requirements will be facilitated through ongoing coordination meetings with PG&E and the 1300 contractor.
4. This risk applies to permanent power only.
5. PG&E has a scheme for permanent power feed. Full design is still in progress.
6. PG&E to provide costs for permanent supply.

Risk Mitigation Status
Risk Reference: 50

Risk		Mitigation Strategy
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished.	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

Initial Assessment: 3, 4, 11

Risk Owner: M. Benson

Current Assessment: Risk Rating 3 – Construction Risk

Status Log:

September 24, 2009 Meeting:

- Attendees agreed that an LONP is one item that would alleviate this risk.
- A request for an LONP is presently being prepared. It appears at this time that an LONP has a good chance of being granted.

February 2012:

- Constraints on CTS contractor added to specification sections Work Sequence and Contract Interface.
- LONP was granted by FTA for construction of the launch box.

March 2013:

- Contract 1300 Specification section 01 12 17, 4 a) – tunneling equipment to be removed from CTS 450days following NTP (timeframe approved through CMB and included in CN 1300 addendum 3).

April 2013:

- Discuss revising this risk description to 'break into tunnel delayed by 1252 contractor' as applicable to the 1300 contract.
- Specification timing for tunneling equipment to be removed from UMS and YBM to be checked
- Current 1252 cross passage completion dates and 1300 tunnel break in dates (if NTP June 20, 2013):

Contract 1252			Contract 1300		
Milestone (complete)	Contract constraint (days following NTP)	Current Milestone date	Milestone	Contract Constraint (days following NTP)	Milestone Date (if NTP June 20, 2013)
CP1	851	6/4/14	Break into tunnel CTS	450	9/13/14
CP2, CP3 & 4	851, 915	6/4/14, 8/6/14	Break into tunnel UMS	620	3/2/15
CP5	Not a milestone	8/8/14	Break into tunnel YBM	620	3/2/15
Tunnel Substantial completion	1157	4/10/15	Tunnel Portal Access	830	9/28/15

May 2013:

- PMCM will continue to monitor the interface between the 1252 and 1300 contracts.
- No change to report.

Risk Mitigation Status

Risk Reference: 50

June 2013:

1. PMCM continue to monitor the interface between the 1252 and 1300 contracts.

Risk Mitigation Status	
Risk Reference: PR82	

Risk	Mitigation Strategy
Confined work spaces along alignment can impact productivity and result in significant cost and schedule impacts.	1. Account for cost and schedule impacts in estimate and schedule for contract packages

Initial Assessment: 1, 2, 2
Current Assessment: Risk Rating 0 – Construction Risk
Risk Owner: R. Redmond/M. Benson

Status Log:

- June 2013:
1. The schedule accounted for the impact on productivity by assuming 6 day working weeks, and multiple shifts, and multiple machines where appropriate.
 2. The estimate for the work was based on the assumptions in the estimate schedule.
 3. Review following the contractors baseline schedule submittal.
 4. Cost and schedule risks now reside with Contractor
 5. This risk was retired by unanimous consent by the Risk Assessment Committee on 06/13/13.

Risk Mitigation Status**Risk Reference: 218**

Risk	Mitigation Strategy
Condemnation for Mandarin Tower and 1719 Stockton Street	1.

Initial Assessment: TBD**Risk Owner:** A. Clifford**Current Assessment:** Risk Rating TBD - Construction Risk**Status Log:**

1.

Risk Mitigation Status**Risk Reference: 219**

Risk	Mitigation Strategy
Political risk from opponents – Impacts productivity	1.

Initial Assessment: TBD**Risk Owner:** A. Clifford**Current Assessment:** Risk Rating TBD - Construction Risk**Status Log:**

1.

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	↔ 10% - 50%	> 50%	↔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	↔ \$250K - \$1M	↔ \$1M - \$3M	↔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	↔ 1 - 3 Months	↔ 3 - 6 Months	↔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

2

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
Underground Tunnel												
1	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.	C	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	42"/48" sewer line relocated as part Utility 1 package is damaged by subsequent construction of the launch box.	1. Make follow-on contractor responsible for repairs to any existing utility lines. 2. Properly as built actual location as part of Utility 1 package and provide to Contract 3 Contractor	C	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	Possibility that lowest level of tie-backs extending out from Moscone Center could be within the tunnel alignment.	1. Lower tunnel alignment 5' below the lowest expected tieback. 2. Include obstruction clause and allowance in contract documents.	C	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	Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE ALLOWANCES	1. Early and extensive co-ordination with BART. 2. Survey BART tunnels to determine exact locations. 3. Checking effect of maximum expected settlement on tunnels. 4. 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. 5. Develop contingency plan to provide bus bridge, if needed. 6. Require non-stop weekend excavation beneath BART tunnels. 7. Monitor movement of BART tunnels in real-time. 8. Repair/adjust as needed. 9. Include probable cost in estimate.	C	2	2	2	2	35%	4	8	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	Flowing groundwater in vicinity of UMS Station could make adequate annulus grouting difficult.	1. Use appropriate additives such as accelerators in primary annulus backfill grouting, if needed. 2. Use secondary grouting as needed.	C	1	1	1	1	10%	1	2	Plans issued for bid contain mitigation measures	8/28/13 TUN1120
E	Underground obstructions tunnel and retrieval shaft	Include differing site conditions in GPs as well as DRB to adjudicate conflicts and minimize costs	C	2	2	3	3	35%	5	10	Mitigation measures have been implemented. Maintain adequate contingency throughout tunnel construction	2/5/14 TUN1124
PR1	Actual TBM production rate may be slower than forecasted.	Assign significant liquidated damages for not meeting specific schedule dates.	C	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	Damage / settlement 3x 5' to old brick sewer running parallel to tunnel alignment	Slip Line 3'x5' brick sewer before TBM reaches CTS.	C	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.	12/16/13 TUN1121
15	Major TBM machine failure	Closely monitor condition and maintenance of the machines.	C	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	TBM loss and / or damaged in Transit	Provide provisions for insurance for TBM in transit to jobsite	C	1	5	4	5	10%	5	9	Costs covered by Contractor's insurance.	5/20/13 TUN1095
115	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.	1. 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. 2. Alternatively, place an allowance in the station contracts for end wall leakage repair.	C	3	1	1	1	50%	3	6	Project configuration changes include headwall designs with multiple levels of redundancy. Warranty provisions added to contact language.	5/26/15 UMS1295
116	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.	C	2	2	2	2	35%	4	8	Mitigation measures are being implemented	5/20/13 TUN1095
B	Storage and testing of excavated soils from tunnel limits advance rate of tunneling.	1. Provide adequate storage and handling facility to accommodate testing activity. 2. Work with SAR to develop acceptance criteria, to minimize or eliminate testing requirements. 3. Require the contractor to provide a detailed workplan for testing, sorting and stockpile prior to hauling.	C	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. .	2/5/14 TUN1124
MOS Station												
21	Incomplete cutoff of groundwater at MOS	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates.	C	1	1	-	1	10%	1	1	Mitigation measure to be made part of the contract documents	4/28/15 MOS1150

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	<> 10% - 50%	> 50%	<> 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	<> 1 - 3 Months	<> 3 - 6 Months	<> 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
2
SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
22	Public complaints result in unanticipated restrictions on construction at MOS.	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. 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. 4. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 5. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 6. Quickly process and resolve damage and accident claims from the Public. 7. Assumed this work in cost & schedule estimates.	C	1	1	-	1	10%	1	1	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	9/16/16 MOS1230
F	Underground obstructions Stations (MOS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	4/28/15 MOS1150
27	Loss of business results in unanticipated restrictions on construction at MOS.	1. Public outreach. 2. Maintain regular and open communications so Merchants know construction plans and progress at all times. 3. 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. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOEWD to increase cleanup of the area and assist pedestrians across streets. 6. Include this work in cost & schedule estimates.	C	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												
F	Underground obstructions Stations (UMS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8		Mitigation measures have been implemented.	8/12/15 UMS 1320
28	Incomplete cutoff of groundwater at UMS	1. If needed, perform grouting to mitigate the intrusion of groundwater. 2. Include in cost & schedule estimates.	C	1	2	1	2	10%	2	3	Mitigation measures in the form of consolidation grouting to be included in contract documents	8/12/15 UMS1320
32	Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2)	1. Intensive coordination with and commitment from utility owners. 2. Early completion incentive for utility relocation contract. 3. Enforce franchise agreements.	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	Damage to utilities at UMS causes delay to construction and/or consequential cost. (very close to walls adjacent to relocated utility trenches)	1. Intensive utility coordination and investigation. 2. Relocate utilities out of the way of construction wherever possible. 3. Show utilities on reference plans. 4. Have utility contact information and procedure on plans. 5. Have contingency repair/restoration plans. 6. Include probable impacts to schedule & cost in estimates.	C	2	1	1	1	35%	2	4	Although mitigation measure have been fully implemented, Increased probability due to proximity of new pile design to existing relocated utilities.	7/19/16 UMS1410

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	⇔ 10% - 50%	> 50%	⇔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	⇔ \$250K - \$1M	⇔ \$1M - \$3M	⇔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	⇔ 1 - 3 Months	⇔ 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
2
SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
34	Loss of business results in unanticipated restrictions on construction at UMS.	1. Public outreach. 2. Work closely with Merchant's Association. 3. Maintain regular and open communications so Merchants know construction plans and progress at all times. 4. Advertise that Stockton Street Merchants are Open for Business. 5. 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. 6. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 7. Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 8. Include this work in cost & schedule estimates.	C	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	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)	1. Perform detailed hydrogeologic modeling and analysis. 2. Monitor groundwater table at multiple locations and passive measures as necessary to mitigate. 3. Reference the Tech memo in contract documents. 4. Include probable costs in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures incorporated in design based on updated Hydrogeologic analysis and report	9/7/16 UMS1430
36	Damage to buildings or utilities as a result of heave from jet grouting at UMS.	Utilize tangent piles combined with surface jet grouting.	C	1	1	-	1	10%	1	1	Mitigation measures implemented in contract documents to reduce risk	4/14/15 UMS1310
37	Damage to adjacent buildings at UMS due to surface construction activities.	1. Require protective barriers. 2. Have an emergency and rapid response customer focused task force to fix damaged facilities. 3. Quickly repair and reimburse resulting costs. 4. Include probable cost in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures implemented in contract documents to reduce risk	9/7/16 UMS1430
38	Tiebacks in Stockton Street misallocated (in path of walls and would have to be dug out within 20ft of surface level)'	1. Direct contractor to dig out the tiebacks on the plans. 2. Include allowance and differing site conditions clause in contract. 3. Include this work in the cost and schedule estimates.	C	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	Macy's entrance conflict with new piles	1. Show known obstructions shown on as-built drawings on contract drawings. 2. Make as-built drawings available to contractor as reference drawings. 3. Have contractor field verify obstruction shown on as-built drawings and contract drawings	C	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	As-built drawings and UMS construction drawings do not contain enough information to produce shop drawings without significant surveying effort delaying construction north entrance.	1. Investigate if electronic files of design can be given to the contractor. 2. Clearly define shop drawing criteria in the technical specifications. 3. Make as-built drawings available as reference drawings to the contractor	C	3	1	1	1	50%	3	6	Specifications require contractor to survey USG in order to develop shop drawings for structural steel.	3/24/12 UMS1280
CTS Station												
46	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)	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. 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. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 6. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 7. Quickly process and resolve damage and accident claims from the Public. 8. Include this work in cost & schedule estimates.	C	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
48	Incomplete drawdown of groundwater. (inside of box and inside of caverns)	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. 3. Include allowance for dewatering within cavern during construction.	C	2	2	1	2	35%	3	6	Mitigation measures have been included in contract documents	5/1/16 CTS1140

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	⇔ 10% - 50%	> 50%	⇔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	⇔ \$250K - \$1M	⇔ \$1M - \$3M	⇔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	⇔ 1 - 3 Months	⇔ 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

2

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
50	CTS station contractor delayed by tunnel contractor since station platform construction cannot start until tunnels have been finished.	1. Include provisions in CTS contract identifying the potential waiting period for tunnel contractor. 2. Actively monitor progress towards schedule milestones	C	2	1	2	2	35%	3	6	Constraints on CTS contractor added to specification "Work Sequence and Constraints"	12/16/13 TUN1122
52	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	1. Evaluate effect of potential settlement on utilities. 2. Slip-line sewer by TBM contractor. 3. Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed. 4. Have contingency repair/restoration plan. 5. Utility contact information and procedure will be on plans. 6. Develop an allowance for utility repair. 7. Include probable cost in estimate.	C	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-CTS9730
F	Underground obstructions stations (CTS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings	C	4	2	2	2	80%	8		Mitigation measures have been implemented.	10/9/17 CTS1500
U	Proximity at junction of head house boundary wall and school yard may result in relocation of school yard during wall construction		C	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
General												
Demolition, Clearing , Earthwork												
Site Utilities, Utility relocations												
A	Timely resolution of Sewer lines south of portal.	1. Develop alternatives that do not require creation of a new sewer line. 2. Work together with SFPUC to find mutually beneficial solutions. . 3. Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies. 4. Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS.	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
Environmental Mitigations												
65	Archeological/Cultural findings during construction increases schedule and/or cost. (Portal) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	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
66	Archeological/Cultural findings during construction increases schedule and/or cost.(Moscone) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	1	1	50%	3	6	Mitigated - Current exposure only to those amount above those currently identified	4/28/15 TUN1150
67	Archeological/Cultural findings during construction increases schedule and/or cost. (UMS)...LESS THAN 1%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	8/12/15 UMS1320
68	Archeological/Cultural findings during construction increases schedule and/or cost. (CHINA TOWN) ...AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	10/9/17 CTS1500
Auto/bus/van access ways, roads												
70	Change in traffic control requirements after bid.	1. Provide unit bid items to reimburse contractor for traffic management costs outside their control. 2. Include allowance in construction contracts for PCOs.	C	3	4	1	3	50%	8	15	Mitigation measures implemented.	5/22/17 STS1020
71	Power supply interruptions to TBM's (no dual power feed currently planned)	Obtain TBM power directly from PG&E substation.	C	1	2	-	1	10%	1	2		2/5/14 TUN1124
Train Control and Signals												
72	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.	C	2	2	3	3	35%	5	10	Awaiting approval of contract plans by Muni Operations.	3/4/16 STS1045
PR78	Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC	1. Monitor other projects' developments. 2. Develop contingency plans as needed to avoid 1256 delay of revenue service.	C	2	1	1	1	35%	2	4		7/27/12 FDS 1940
Traffic signals & Crossing Protn.												
Purchase or lease of Real Estate												
79	Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	1. Engage Owners in negotiations as soon as possible. 2. PM/CM to provide real estate specialists to facilitate.	R	1	1	-	1	10%	1	1	Right of possession obtained on all three parcels. Cost agreement reached with 1455 Stockton & 801 Market.	9/7/2012
PR80	ROW costs higher than anticipated.	Provide adequate contingency for potential higher costs	M	1	3	-	2	10%	2	3	Similar to Risk 81.	7/1/12 FDS 1240

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	⇔ 10% - 50%	> 50%	⇔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	⇔ \$250K - \$1M	⇔ \$1M - \$3M	⇔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	⇔ 1 - 3 Months	⇔ 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
2
SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
---------------	------------------	------------------------	---------------	---------------	-------------	-----------------	-------------	--------	-------------	-------	--------	-----------------------

Reloc. of Household or Business

Vehicles

83	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	3	4	1	3	50%	8	15	CSP vehicles to be included in overall SFMTA vehicle procurement contract.	11/17/17 STS 1500
----	--	--	---	---	---	---	---	-----	---	----	--	----------------------

Preliminary Engineering

85	Delay in achieving ROD delays schedule (ROD planned end October 2008)	ROD received	R	-	-	-	-	0%	-	-		Retired 11/10/11
----	---	--------------	---	---	---	---	---	----	---	---	--	---------------------

86	Obtain FTA approval of a Letter of No Prejudice (LONP) to construct the TBM Launch Box Portal Structure, complete the Temporary Trolley Re-route, and incur associated construction management costs for these items.	1. Validate cost, schedule and budget impacts (Done) 2. Complete and submit request to enter Final Design (FD) and for LONP and supporting documentation (Done). 3. Address any questions that FTA may have with the requests to enter FD and for the LONP (Done). 4. Work with FTA to justify the benefits of the LONP. 5. Keep the SFMTA Board informed of LONP status: <ul style="list-style-type: none">• Brief Board on continuous basis• Brief Board on Letter Requesting LONP• Brief Board after obtaining FTA LONP• Brief Board at time of request to advertise Tunnel contract	D	-	-	-	-	0%	-	-	LONP has been approved by FTA. Risk to be retired.	Retired 2/9/2012
----	---	--	---	---	---	---	---	----	---	---	--	---------------------

87	Insufficient design and processes in place to achieve project readiness to request entry into FD (October 2009)	Only two items remain to be submitted on the Checklist for Entry to Final Design.	R	-	-	-	-	0%	-	-	FTA granted Entry into FD in January 2010.	Retired 11/10/11
----	---	---	---	---	---	---	---	----	---	---	--	---------------------

4

89	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.	5/23/12 FDS 1930
----	--	--	---	---	---	---	---	-----	---	---	---	---------------------

91	Obtain prompt approval of FTA Full Funding Grant Agreement (FFGA).	1. Final Design of 100% Tunneling and 65% Stations contracts. 2. Determine cost, schedule and budget impacts of 65% Final Design of Stations and 100% tunnels contracts. 3. SFMTA approval of FFGA application. 4. Complete and submit request FFGA and supporting documentation. 5. Assist FTA to promptly complete Technical and Financial Capacity Review and Risk Analysis updates. 6. Work with FTA at both the Regional and National levels to address any questions with regard to the FFGA request. 7. Work with Congress to address any questions with regard to the FFGA request.	R	0	5	3	4	0%	-	-	Tunnel contract has been awarded. 65% Final Design packages have been completed for all station contracts and STS contract. Cost, schedule and budget impacts have of 65% Final Design packages has been completed. The FFGA application has been submitted with supporting documentation. Detailed review of PMP will be delivered soon. The Technical and Financial Capacity Review and Risk Analysis update has been completed. SFMTA is continuing to work with partners at regional and national levels to address questions with regard to the FFGA application.	1/23/12 HIdPt1C
----	--	---	---	---	---	---	---	----	---	---	--	--------------------

Project Management for Design and Construction

95	Contractor default during construction impacts schedule. (key sub-contractor)	Assist Bonding company in transition and to maintain schedule.	C	1	2	2	2	10%	2	4		11/17/17 STS 1500
----	---	--	---	---	---	---	---	-----	---	---	--	----------------------

99	Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.	1. Executive partnering and alternate dispute resolution. 2. Provide incentives in construction contracts in addition to penalties	C	2	5	3	4	35%	8	16	Mitigation measures being implemented	7/27/12 FDS 1940
----	---	---	---	---	---	---	---	-----	---	----	---------------------------------------	---------------------

100	Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)	1. Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement. 2. Monitor procurement of critical items.	M	1	2	2	2	10%	2	4	Not considered a project risk.	11/17/17 STS 1500
-----	--	---	---	---	---	---	---	-----	---	---	--------------------------------	----------------------

102	Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs	1. Actively manage contracts and include incentive provisions for early completion in critical contracts. 2. Add buffer float to critical path to actively manage schedule contingency	C	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	Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get bonding)	Structure construction contracts not to exceed \$250 million	M	2	5	-	3	35%	5	10	All contracts expected not to exceed \$250 million	7/27/12 FDS 1940
-----	--	--	---	---	---	---	---	-----	---	----	--	---------------------

T	Delay on station emergency ventilation approval	1. Work with SFFD to develop a plan acceptable to each party. 2. Incorporate SFFD requirements into construction documents.	R	2	5	-	3	35%	5	10	SFFD agreed to the proposed plan by SFMTA	7/27/12 FDS 1940
---	---	--	---	---	---	---	---	-----	---	----	---	---------------------

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile Likelihood Score	Severity Score				
	1	2	3	4	5
5					
4					
3					
2					
1					

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	↔ 10% - 50%	> 50%	↔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	↔ \$250K - \$1M	↔ \$1M - \$3M	↔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	↔ 1 - 3 Months	↔ 3 - 6 Months	↔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

2

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
V	Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	1. Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use. 2. Integrate work with SFMTA Real Estate into CSP.	D	2	1	2	2	35%	3			12/13/16 N-CTS1225
PR37	Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment	1. Identify temporary power requirements for station construction. 2. Investigate the timing of the permanent feed.	C	2	1	2	2	35%	3	6	Cost for First and Redundant electrical services need to be included in Cost Estimate.	5/3/18 STS1080
Insurance, permits etc.												
103	Difficulty in getting required permits.	1. Coordinate with permit officials and request permits as early as possible. 2. Obtain assistance obtaining permits from PM/CM & FD Consultants.	C	1	2	1	2	10%	2	3		12/18/12 FDS 1275
104	CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Obtain Grade Crossing approvals at final CPUC inspection at the completion of construction. 2. Coordinate closely with CPUC until approval is received.	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	Electrical service delays startup and testing.	1. Submit applications for new service as early as possible. 2. Coordinate closely with PG&E to ensure timely delivery of electrical service.	C	1	2	1	2	10%	2	3	Applications for new service have been submitted to PG&E.	11/17/17 STS 1500
106	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.	C	2	1	1	1	35%	2	4		11/17/17 STS 1500
Unallocated Contingency												
111	Major Earthquake stops work	Include Force Majeure clause in contracts.	C	1	5	3	4	10%	4	8	Force Majeure clause included in contracts.	12/30/20 MS 0010
112	Major safety event halts work	1. Require contractor Safety plan to address this risk. 2. CM inspections to ensure that safety plan and procedures are implemented	C	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
113	Finance charges may be required (assumptions on FTA funding at \$150m per annum optimistic) - finance costs would be in order of \$100-150M	Obtain bridge financing from funding partners. Provide realistic finance charges given the project cash flow requirements.	R	-	3	-	2	0%	-	-	Bridge financing agreement are in place with local and regional funding partners. Risk to be retired	Retired 12/15/11
196	The process of acquiring station licenses: acquisition/condemnation could significantly delay schedule and cost more than that presently planned.	1. Continue to negotiate with building owners 2. Required Notices and Appraisals to be completed 3. Commence condemnation process with City Attorneys	C		1	1	1	0%	4	-		
202	Cargo Preference (Ship America) must solicit U.S.- flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954	1. Require Ship America compliance agreement first tier contractors and subcontractors	C	1	1	1	1	10%	1	2		
203	Headwalls interface delay 1300 Contractor (SSTS)	1. Meet and develop recovery schedule 2. Review possible Adjustment to 1300 interface	C	3	3	2	3	50%	8	15		
204	AT&T Vault - New Sewer Work south of Bryant	1. Continue negotiations/coordination with utility owners. 2. Schedule analysis to confirm coordination	C	2	2	4	3	35%	6	12		
205	Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	1. CMod Task Force - 5 Areas of Improvement 2. Implement 3. Delegation of Authority	C	3	1	1	1	50%	3	6		
208	Additional cost if we change direction going to the Pagoda	1. Develop Scope with designers currently under contract 2. Agree to alignment and details of new shaft location 3. Issue PCC to Contractor 4. Initial site works and borings if necessary 5. Obtain appropriate permits	C	3	3	2	3	50%	8	15		
209	Implementing Pagoda Option - Obtaining Environmental Clearance	1. Engage Planning Dept to outline required actions 2. Develop necessary CEQA documents in concert with Planning Dept. 3. Meet with FTA and determine NEPA and SHPO requirements	C	3	1	1	1	50%	3	6		
210	Mission Bay Loop Grant – Needs to be built to allow for train turnarounds (June 2013)	1. Identify timeline for grant funding	C	4	1	1	1	80%	4	8		

Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 22

DATE ISSUED: 06/13/13

Risk Profile		Severity Score				
Likelihood Score		1	2	3	4	5
5						
4						
3						
2						
1						

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	⇔ 10% - 50%	> 50%	⇔ 75% - 90%	> 90%	<3 Low
Cost Impact	< \$250K	⇔ \$250K - \$1M	⇔ \$1M - \$3M	⇔ \$3M - \$10M	> \$10M	3 - 9 Medium
Schedule Impact	< 1 Month	⇔ 1 - 3 Months	⇔ 3 - 6 Months	⇔ 6 - 12 Months	> 12 Months	>10 High

RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
2
SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
211	Differing site conditions encountered during ground freezing of Cross Passage 5 results in increased costs.		C	1	2	2	2	10%	2	4		
212	UMS Inclined piles – 8" clearance between piles and tunnel results in damage or safety issues within the tunnel	1. Establish 1252 and 1300 contract requirements to construct within acceptable tolerances 2. Workshop to be held with BIH to discuss	C	1	5	3	4	10%	4	8		
213	Micro Piles exist within tunnel path at UMS	1. Re-profile and realign tunnel to clear micropiles	C	2	3	1	2	35%	4	8		
214	Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	1. Provide micro-pile as-built information to contractor 2. Realign tube-a-manchettes clear of micro-piles	C	3	1	1	1	50%	3	6		
215	DPW Excavation permit reviews delay contract works	1. Obtain a blanket excavation permits from DPW covering the area of work for 1253, 1254, 1255, 1256	C	2	1	1	1	35%	2	4		
216	Olivet building potential construction impact	1. Reach out to building owner and keep him abreast of CS construction activities.	C	1	1	2	2	10%	2	3	DTIS MOU has been signed.	
217	Delays or complications construction by others – SF Dept. Of Technology, 3rd party utilities	Early engagement and coordination for agreements and plan development to avoid construction delays.	C	2	1	1	1	35%	2			
218	Condemnation for Mandrain Tower and 1719 Stockton Street	1	C				-	0%	-			
219	Political risk from opponents - Impacts productivity	2	C				-	0%	-	4		