

## Risk Mitigation Meeting Minutes #47

DATE: July 10, 2013  
 MEETING DATE: **July 09, 2013**  
 LOCATION: 821 Howard Street, 2<sup>nd</sup> Floor – Main Conference Room  
 TIME: 2:00pm  
 ATTENDEES: Richard Redmond, Jane Wang, Eric Stassevitch, Alex Clifford, Mark Benson, Beverly Ward, Roger Nguyen, Luis Zurinaga. Brad Lebovitz  
 COPIES TO: Attendees: John Funghi, Albert Hoe, Mark Latch, Quon Chin, Sanford Pong, Vivian Chow Aileen Read, Chuck Morganson, James Sampson, , 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. 47**

### RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	<b>Report on Red Risk and – (Risk rating ≥ 6)</b>	
	<p><b>Risk 83:</b> Cost of vehicles may be more than estimated due to sole source and small order  <u>Discussion:</u> <i>Post meeting note:</i> RFP requires SFMTA Board approval prior to being issued, now scheduled for August. No change to rating. <b>Risk Rating 8</b></p> <p><b>Risk 203:</b> Headwalls interface delay 1300 Contractor  <u>Discussion:</u> Headwall completion date continues to slip, now early October. Implementation of recovery schedule began yesterday with second rig mobilization. Current productivity rates to be proactively monitored and compared to recovery schedule and reported weekly. Early identification of planned CN 1300 activities required to implement mitigation strategies. <b>Risk Rating 8</b></p> <p><b>Risk 204:</b> Relocation of AT&amp;T Vault and other utilities delays Work south of Bryant  <u>Discussion:</u> Review Tutor Perini (TP) baseline schedule for utilities. Schedule utility coordination meeting. Status sheet to be updated to include broader scope of all utilities south of Bryant. <b>Risk Rating 6</b></p> <p><b>Risk 208:</b> Additional cost to retrieve TBMs at the Pagoda Theatre site exceeds current budget  <u>Discussion:</u> Efforts continue to maintain budget, negotiations not yet finalized.  <b>Risk Rating 8</b></p>	

ITEM #	DISCUSSION	ACTION BY DUE DATE
2 -	<b>Report on Remaining Requirement &amp; Design Risks (Risk rating ≤ 6)</b>	
	<p><b>Risk A:</b> Timely resolution of sewer lines south of portal  <u>Discussion:</u> MOU finalized, being routed for signature.  <b>Risk Rating 0. Risk retired.</b></p> <p><b>Risk 104:</b> CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows  <u>Discussion:</u> Schedule Extension granted, design issues have been resolved, remaining activities associated with construction sign off at substantial completion. CPUC grade crossing approval process only allows three year period, another extension will be required in 2016. <b>Risk Rating 5</b></p> <p><b>Risk T:</b> Delay to final design submittal due to delay of emergency ventilation approval by SFFD.  <u>Discussion:</u> Approval of SES report by SFFD obtained. Internal approval completed. Risk to remain open until all design review comments have been verified and closed. <b>Risk Rating 5</b></p> <p>Design Risks with a rating below 6, which are actively being tracked, were included on the agenda for information, but were not discussed at this meeting. Updated Risk Mitigation Status report is included with these meeting minutes.</p>	
3-	<b>Active Risks</b>	
	<p><b>Risk 100:</b> Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)  <u>Discussion:</u> Review of CN 1300 baseline schedule to identify inclusion of or need for procurement items. <b>Risk Rating 2</b></p> <p><b>Risk 107:</b> Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get performance bonding)  <u>Discussion:</u> The contract has received NTP, bonding requirements met.  <b>Risk Rating 0. Risk retired.</b></p>	
	<p>Construction Risk with a rating below 6 which are actively been tracked were included on the agenda for information, but were not discussed at this meeting. Updates to those risk status sheet are included in this meeting package for distribution.</p> <p><b>Risk 112:</b> Major safety event halts work  <u>Discussion:</u> A full time Safety Manager is on-board. Daily reports are being prepared, formal weekly and monthly safety walks, document safety concerns and are transmitted to Contractor to address.  <b>Risk Rating 4</b></p> <p><b>Risk 116:</b> TBM procurement, delivery and assembly take longer than assumed in schedule.  <u>Discussion:</u> Notification sent to Contractor of time concerns. Another notice will be sent addressing SFMTA's time expectation. The CM Team will do a schedule analysis as a way to demonstrate the Contractor can meet the 7-week schedule for TBM #2 assembly and commissioning as proposed in their recovery schedule</p>	



ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>and to demonstrate to ourselves we are still ok time wise with 1300 Contract. <b>Risk Rating 4</b></p> <p><b>Risk 212:</b> UMS Inclined piles – 8” clearance between piles and tunnel results in damage or safety issues within the tunnel <u>Discussion:</u> Within so many feet the Contractor will stop and view were they are. <b>Risk Rating 4</b></p> <p><b>Risk 72</b> Interface new Signaling and Train Control system to existing at Fourth and King <u>Discussion:</u> Risk is still open, 1256 Designer still owe a presentation to demonstrate the details of their site-specific work plan (SSWP). SFMTA will start discussion with 1300 Contractor to start developing the site plan. <b>Risk Rating 5</b></p>	
4-	<b>New Risks (Assessment and mitigation strategy)</b>	
	<p>New risk was prematurely added to Risk Register and assigned a number prior to being properly vetted.</p> <p><b>Risk 218</b> – Condemnation for Mandarin Tower and 19 Stockton Street <u>Discussion:</u> This risk duplicates existing risk #196. <b>Risk to be voided.</b></p>	
5-	<b>Other Business – New Risks Items: Tunnel Program, Headwalls &amp; CN1300</b>	
	<p><b>New Risk</b> – Resource Constraints of critical Instrumentation Subcontractor. Resource availability in question to support to both contract 1252 and 1300. <u>Discussion:</u> Risk Rating TBD Mitigation Description: 1. Conduct an early meeting with Wang Technology to let them know what is acceptable in the submittal process 2. Review Contractor’s work plan to prioritize instrumentation installation plan and schedule</p> <p><b>New Risk</b> – Delay in Demolition of Pagoda Theater <u>Discussion:</u> Contract Administration and Resident Engineer working directly with Contractor to address needed documentation for start of work. Risk Rating TBD</p>	

**ACTION ITEMS –**

ITEM #	MTG DATE	Task #	DESCRIPTION	BIC	DUE DATE	STATUS
1	12/13/12		<b>Risk 7</b> – Cost for significant settlement grout	J. Wang	08/14/13	Open
4	12/13/12		<b>Risk 72</b> – 4 <sup>th</sup> & King (SSWP)	S. Pong C. Morganson	08/14/13	Open

Meeting adjourned at 4:00pm

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:  [Date review completed.]

## Meeting Agenda

**Project No. M544.1, Contract No. CS-149**  
**Program/Construction Management**  
**Risk Mitigation Management Meeting No. 47**  
**July 9, 2013**  
**2:00pm – 4:00pm**  
 Central Subway Project Office  
 821 Howard St. 2<sup>nd</sup> Floor  
 Main Conference Room

**Attendees:**

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

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

- Requirement Risks (**83**)
- Construction Risks (**203, 204, 208**)

**2. Report on Remaining Requirement and Design Risks**

- Requirement Risks (**A, 104, T**)
- Design Risks (**V, 89**)

**3. Active Risks**

- Market Risk (**100, 107**)
- Construction Risks (**32, PR78, 112, 116, 196, 209, 214, 216**)

**4. New Risks (Assessment and mitigation strategy)**

- Construction Risks (**218, 219**)

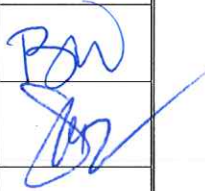
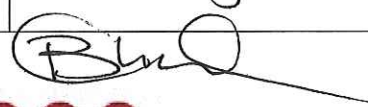
**5. New Risk items** – Identify new Risk associated with Tunnel Program, Headwalls and Contract 1300

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. 47**  
**July 09, 2013**  
**2:00 p.m. – 4:00 p.m.**  
 Central Subway Project Office  
 821 Howard Street, 2<sup>nd</sup> Floor  
 Main Conference Room

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

NAME	AFFILIATION	PHONE	E-MAIL (for minutes)	INITIALS
Mark Benson	CSP	415-701-5295	<a href="mailto:Mark.Benson@sfmta.com">Mark.Benson@sfmta.com</a>	MCB
Vivian Chow	SFMTA	415 701-5264	<a href="mailto:Vivian.chow.@sfmta.com">Vivian.chow.@sfmta.com</a>	
Alex Clifford	CSP	415 701- 5275	<a href="mailto:Alex.clifford@sfmta.com">Alex.clifford@sfmta.com</a>	A
John Funghi	SFMTA	415-701-4299	<a href="mailto:john.funghi@sfmta.com">john.funghi@sfmta.com</a>	
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David Kuehn	STV/PMOC	510-464-8053	<a href="mailto:david.kuehn@stvinc.com">david.kuehn@stvinc.com</a>	
Mark Latch	CSP	415-701-5294	<a href="mailto:mark.latch@sfmta.com">mark.latch@sfmta.com</a>	
Brad Lebovitz	STV/PMOC	510-464-8052	<a href="mailto:Bradley.lebovitz@stvinc.com">Bradley.lebovitz@stvinc.com</a>	BR
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Eric Stassevitch	CSP	415-701-4426	<a href="mailto:Eric.stassevitch@sfmta.com">Eric.stassevitch@sfmta.com</a>	
Beverly Ward	CSP	415-701-5291	<a href="mailto:Beverly.ward@sfmta.com">Beverly.ward@sfmta.com</a>	BW
Luis Zurinaga	SFCTA	415-716-6956	<a href="mailto:luis@sfcta.org">luis@sfcta.org</a>	
Jane Wang and Roger Nguyen were in attendance but did not sign the attendance sheet.				
				

<b>Risk Mitigation Status</b>
<b>Risk Reference: 32</b>

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

**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.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 32</b>
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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 19<sup>th</sup> 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.

July 2013:

1. BIH have been issued a force account instruction to complete the civil work for the new connection at Macys Mens.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 32</b>
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2. The budget has been approved for the water department to carry out the cutover.
3. A coordination meeting will be held between the contractor and water department week commencing July 8<sup>th</sup>.
4. Target completion of cutover by end of August.



<b>Risk Mitigation Status</b>
<b>Risk Reference: 72</b>

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

**Initial Assessment:** 2, 3, 5  
**Current Assessment:** Risk Rating 5 – Design Risk  
**Risk Owner:** S. Pong

**Status Log:**

October 2011 Meeting:

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

November 2011:

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

January 2012 Meeting:

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

February 2012:

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

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

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

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 72</b>
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December 2012 Meeting:

1. Clarification system will not be parallel
2. System train control will not be done during track and OCS construction
3. New switch machine have similar controls as the old machine.
4. Expansion of the Site Specific Work Plan will be established for review by the Risk Committee.

July 2013 Meeting:

1. AFMTA to begin discussions with CN 1300 Contractor – Tutor Perini to develop site specific work plans and identify weekend work windows.

<b>Risk Mitigation Status</b>
<b>Risk Reference: 83</b>

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

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 83</b>
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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

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 83</b>
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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

July 2013

1. RFP now scheduled for SFMTA Board approval in August prior to release.
2. Currently routing and vetting internal approvals for submission to Board

<b>Risk Mitigation Status</b>
<b>Risk Reference: 89</b>

<b>Risk</b>	<b>Mitigation Strategy</b>
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 3<sup>rd</sup> 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 3<sup>rd</sup> party comment. Priority was given to 3<sup>rd</sup> party reviewers with permit approval authority such as SFFD, SFPUC and DBI. Note that the design phase has been closed.

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

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

December 2012 Meeting:

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

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 89</b>
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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.

July 2013:

1. DBI approved the design of all three stations.
2. Verification of 90% comments from reviewers still being closed out.

**Risk Mitigation Status****Risk Reference: 100**

Risk	Mitigation Strategy
Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)	<ol style="list-style-type: none"> <li>1. Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement.</li> <li>2. Monitor procurement of critical items.</li> </ol>

**Initial Assessment:** 2, 2, 2**Current Assessment:** Risk Rating 2 – Construction Risk**Risk Owner:** R. Redmond**Status Log:**

February 2012:

1. Contract provisions SP-13 include provisions for storage of materials in bonded warehouse.
2. Contract milestones include adequate time to procure long lead time materials.

May 2013:

1. The first TBM has been delivered to site. Testing of the second TBM was complete May 3<sup>rd</sup>.
2. Payment for long lead items shown in GP's or SP's
3. Recommend transferring this risk to Construction Risk to monitor procurement or critical items

July 2013:

1. Risk changed from Market Risk to Construction Risk.
2. Risk owner changed from R. Edwards to R. Redmond.
3. CN 1300 Contractor - Tutor Perini has been requested to include long lead items in baseline schedule.
4. Revisit following review of baseline schedule submittal (expected mid July).



<b>Risk Mitigation Status</b>
<b>Risk Reference: 104</b>

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	<ol style="list-style-type: none"> <li>Grade Crossing approvals are not received until final CPUC inspection at the completion of construction.</li> <li>Close coordination with CPUC will continue until approval is received.</li> </ol>

**Initial Assessment:** 2, 3.5, 7  
**Current Assessment:** Risk Rating 5 – Construction Risk

**Risk Owner:** S. Pong

**Status Log:**

September 2011:

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

January 2012 Meeting:

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

April 2012 Meeting:

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

May 2012 Meeting:

No update.

July 2012 Meeting:

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

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 104</b>
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August 2012 Meeting:

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

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

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

December 2012:

1. Approval by the CPUC is given for a specific window of time, and if need another approval will need to be requested.
2. Follow up on letter sent to CPUC for concurrence

January 2013 Meeting:

1. A request for a continuance from CPUC will be sent.

February 2013 Meeting:

1. A letter requesting an extension (continuance) was sent to CPUC February 8<sup>th</sup> 2013 and is now being processed.
2. The letter was vetted with CPUC for comments prior to being sent.

March 2013:

1. Extension of the timeframe to complete the construction of at grade crossings by 3 years was received from CPUC March 6<sup>th</sup> 2013
2. Discuss transferring this risk to CM team

April 2013:

1. Construction, testing, and safety requirements need to be met to enable CPUC signoff at completion.
2. Another request for extension will need to be submitted if construction and approval is not received by January 1<sup>st</sup> 2016.

May 2013:

1. Discuss transferring to Construction Risk and maintain current risk owner.
2. Risk has been transferred to a Construction category, Risk owner remains as Sanford Pong
3. Final form approval from CPUC will be given after construction completion.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 104</b>
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July 2013

1. Confirmed design issues have been resolved and agreed to with CPUC, schedule extension granted. Schedule Extensions are for a maximum of three years, another request will need to be generated in 2016.

**Risk Mitigation Status****Risk Reference: 107**

Risk	Mitigation Strategy
Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get performance bonding)	1. Structure bonding appropriately for Contract 1300

**Initial Assessment:** 3, 2.5, 8**Current Assessment:** Risk Rating 0 – Market Risk**Risk Owner:** A. Wong**Status Log:**

September 2011:

1. Seven construction contracts are planned for the program.
2. Three contracts have been awarded.
3. The four remaining contracts are anticipated to be less than the tunnel contract, which was awarded for \$235 million.

August 2012:

1. All estimates still under \$250million
2. Does not seem to be a problem for UMS or CTS

April 2013:

1. Risk updated to specify that risk is referring to performance bonding.
2. Obtaining performance bonding for the \$750m contract 1300 is not a problem for the market.
3. Issues have been raised in relation to performance bond coverage over the various and extensive warranty periods nominated in the various project specifications.
4. Contract 1300 specification has been revised to structure bonding appropriately for the 1300 contract.
5. Sureties obligations have been limited to 5 years after substantial completion, and up to 10% of construction costs.
6. Mitigation strategy revised from 'Structure construction contracts not to exceed \$250 million' to 'structure bonding appropriately for Contract 1300'.

July 2013:

1. Tutor Perini given Notice to Proceed June 17<sup>th</sup> 2013 having satisfied bonding requirements
2. Recommend retiring this risk.
3. Risk retired by unanimous consent of Risk Assessment Committee 7/09/13.

**Risk Mitigation Status****Risk Reference: 112**

<b>Risk</b>	<b>Mitigation Strategy</b>
Major safety event halts work	1. Require contractor to provide for a full-time Safety Manager.

**Initial Assessment:** 5, 3, 4**Current Assessment:** Risk Rating 4 – Construction Risk**Risk Owner:** M. Benson**Status Log:**

February 2012:

1. Contract Technical Specifications Section 01 35 29.10 – Health and Safety includes procedures and contractor requirements to prevent accidents.
2. Contracts require contractor to provide a full-time Safety Manager.
3. Central Subway Program retains a full-time Safety Manager.

July 2013:

1. Safety inspections being carried out monthly.
2. Safety inspection observations are being communicated to the contractor as required.
3. Cal OSHA mining inspections held every 2 months.
4. Executive safety meetings being held quarterly.

<b>Risk Mitigation Status</b>
<b>Risk Reference: 116</b>

Risk	Mitigation Strategy
TBM procurement, delivery and assembly takes longer than assumed in schedule.	<ol style="list-style-type: none"> <li>1. Allow adequate time to allow procurement of TBM in MPS.</li> <li>2. Provide Notice to Contractor on time concerns</li> </ol>

**Initial Assessment:** 3, 1, 3  
**Current Assessment:** Risk Rating 4 – Construction Risk

**Risk Owner:** M. Benson

**Status Log:**

February 2012:

1. Mitigation strategy #1 “The most likely delay to TBM procurement and delivery, on the order of 2 or 3 months, could be accommodated with current float shown on the construction schedule” was removed.
2. Mitigation strategy #2 “Include milestones in contract for procurement of TBM” was not used.
3. Contract includes substantial completion requirements including liquidated damages for delay in completion by milestone date.
4. NTP 1 for TBM procurement was issued on 1/27/12.
5. Contractor has estimated 10 months to procure and deliver TBM to site.
6. LOPN2 was approved by FTA to build launch box and MOS headwalls.
7. Recommend to reduce this risk rating.

April 2012:

1. BIH has entered into a contract with Robbins to procure two TBMs; one to be delivered no later than January 2013 and one no later than February 2013.

April 2013:

1. The 1<sup>st</sup> TBM is arriving this month, the 2<sup>nd</sup> TBM is due to arrive in June this year.
2. BIH are procuring a gantry crane for the TBM assembly, if the gantry crane is not approved for use adjacent to the I-80 bridge an alternate crane would need to be sourced. The delay due to this is expected to be less than 1 month.
3. **Recommend reducing this risk rating to 3 (2, 2, 1)** (reduced schedule impact associated with sourcing another crane)
  - a. Current probability (2), 10 - 50%, maintain probability rating
  - b. Current cost impact (2), \$250k - \$1m, maintain cost impact
  - c. Current schedule impacts (2), 1 -3 months, recommend reducing schedule impact to (1), <1month

June 2013:

1. BIH received approval from Caltrans to use their proposed gantry crane.
2. TBM # 1 arrived April 25<sup>th</sup>, 2013 and assembly has been completed. Assembly of TBM 1 was planned to take 6 weeks, with an actual assembly time of approximately 8 weeks. Contractor is working additional shifts to minimize delay resulting in little impact to the schedule.
3. TBM #1 is scheduled to be launched June 24<sup>th</sup>, TBM # 2 is schedule to arrive July 2<sup>nd</sup>.

July 2013

1. Assembly of TBM #1 was originally scheduled to take 35 days and has taken approximately 45 days to date.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 116</b>
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2. The recovery schedule submitted by BIH this shows 35 days for assembly and commissioning of TBM 2.
3. BIH have advised that the timeframe for assembly and commissioning of TBM 2 is achievable as delays affecting the assembly of TBM 1 (late tail shield, delay in gantry crane erection) will not be experienced in the assembly of TBM 2. Also, preparation of TBM 2 was further advanced in the factory prior to delivery, and lessons learned from assembly of TBM 1 will be incorporated into assembly of TBM 2.

<b>Risk Mitigation Status</b>
<b>Risk Reference: 196</b>

Risk	Mitigation Strategy
<p>The process of acquiring station licenses: acquisition/condemnation could significantly delay schedule and cost more than that presently planned.</p>	<ol style="list-style-type: none"> <li>1. Continue to negotiate with building owners</li> <li>2. Required Notices and Appraisals to be completed</li> <li>3. Commence condemnation process with City Attorneys</li> </ol>

**Initial Assessment:** new risk

**Risk Owner:** A. Clifford

**Current Assessment:** Risk Rating 4 – Construction Risk

**Status Log:**

September 2012 Meeting:

1. Risk 57 retired August 2012. New Risk 196 opened.
2. To date 9/27 required Station Licenses have been signed by the respective property owners.
3. 5/27 have reached verbal agreement or have been sent to the owner for signature.
4. 13/27 Licenses are outstanding
  - a. 7 of the 13 outstanding Licenses are progressing toward agreement
  - b. The Program team is currently preparing for condemnation on the following 6 Licenses should
    - 1 Stockton (Apple) & 212 Stockton (Bulgari) (same property manager)
    - 216 Stockton (Dior)
    - 39 Stockton (Disney)
    - 19 Stockton (Armani) – unresponsive owner
    - 250 Fourth Street (Olivet University)
5. Targeting Board of Supervisors 10/23/12
  - a. remaining Notice of Intent to Appraise mailed 8/30/12
  - b. finalize list of condemnation properties by 9/14/12
  - c. remaining appraisals to be completed by 9/20/12
  - d. meeting with board clerk 9/21/12
  - e. government code offer letters to be sent by 9/27/12

November 2012 Meeting:

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



<b>Risk Mitigation Status</b>
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<b>Risk Reference: 196</b>
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- c. 12/27 Station licenses remain outstanding, 3 of which are being negotiated with the a single property owner (Macy's) and are expected to reach agreement.
2. 9/27 Remaining station licenses + 2 remaining tunnel easements (Central Subway has possession of the two tunnel easements) have been calendared for the December 11<sup>th</sup> Board of Supervisors Hearing.
  - a. Central Subway project team and the City Attorney's office submitted draft Resolutions of Necessity to the Clerk of the Boards office November 5<sup>th</sup>.
  - b. The Central Subway Project team continues to negotiate with the property owners.
  - c. The required access for compensation grouting and building monitoring is expected approximately May 10<sup>th</sup> 2013 should this need to be obtained through the eminent domain process.

April 2013:

1. Outstanding Tunnel & Station Group A licenses: (a, b and c do not have the condemnation option available at this time)
  - a. **Macy's 3 properties** – licenses for the remaining 3 properties to be sent to Macy's 4/11/13 (233 Geary, 120 Stockton, 101 Stockton)
  - b. **1013-1015 Stockton Street** – the final agreement was hand delivered to the owners representative for signature 4/10/13. Signature of the 3 owners is expected by 4/19
  - c. **3 Pagoda properties** (725 Filbert, 659 Columbus, 1717 Powell) – details and offer letters have been sent to owners
  - d. 950 Stockton Street – Central Subway continues to negotiate with the HOA and land owner while working with the City attorney to commence condemnation if agreement cannot be reached by 4/19
  - e. 216 Stockton – resolving final issues with owner (condemnation to commence 4/19 if agreement cannot be reached)
  - f. 1 Stockton and 212 Stockton – final agreement sent to owner for signature 4/9/13
  - g. 1455 Stockton Street – condemnation suit filed 4/9/13, possession estimated mid August 2013
  - h. 19 Stockton Street – condemnation suit filed 2/13/13, possession estimated 7/6/13

July 2013:

1. 4 Licenses to be obtained by SFMTA are outstanding
  - a. 659 Columbus Ave (1252 Contract)
    - License has been verbally agreed and sent to the owner for signature (expecting signed agreement by 7/15).
    - The Program has not prepared to condemn this license.
  - b. 1455 Stockton (1252 Contract)
    - The pre-judgment possession hearing scheduled for 7/9/13 has been continued to 7/23/13. Estimated possession date is now 8/26/13.
    - The project team continues to seek resolution of the license through negotiation with BofA and the owner.
  - c. 950 Stockton (1300 Contract)
    - Condemnation action filed 7/8/13. Possession of the license is estimated to be late November 2013.
    - The project team continues to work with the Mandarin Tower Homeowners Association (HOA) and the owner to reach agreement. Currently the Project team is requesting the HOA to sign the agreement with a condition that compensation grouting work cannot proceed until agreement from the landowner is received.
  - d. 19 Stockton (1300 Contract)
    - Condemnation suit filed 2/13/13.
    - The owner has engaged trial condemnation attorneys and is challenging the City's 'right to take' this license.
    - The pre-judgment possession hearing originally scheduled for 6/7/13 and was continued by the court.
    - City attorney availability pushed pre-judgment possession hearing date to early August 2013.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 196</b>
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- Owner attorney availability pushed pre-judgment possession hearing date September 9<sup>th</sup> 2013. If the motion for pre-judgment possession is successful, possession of the license would be obtained approximately October 11<sup>th</sup> 2013.

**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 3<sup>rd</sup> (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 15<sup>th</sup> (south headwall) and September 25<sup>th</sup> (north headwall).
2. 1300 Contractor has access 90 days following NTP (approximately September 7<sup>th</sup> – 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 14<sup>th</sup> 2013 compared to Contract 1252 May Preliminary Schedule completion dates;

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

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.

July 2013:

1. NTP issued to 1300 Contractor Tutor Perini Corporation June 17<sup>th</sup>, 2013
2. Revisit following receipt of baseline schedule from Tutor (expected by July 17<sup>th</sup>).

**Risk Mitigation Status****Risk Reference: 204**

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none"> <li>1. Continue negotiations/ coordination with utility owners.</li> <li>2. Contract 1300 is required to coordinate with utility companies for relocations</li> <li>3. SWAT team established to address utilities south of Bryant Street</li> <li>4. Initiate utility coordination meetings</li> </ol>

**Initial Assessment:** 2, 2, 4**Current Assessment:** Risk Rating 6 – Construction Risk**Risk Owner:** R. Edwards /M. Benson**Status Log:**

December 2012:

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

January 2013:

1. Need to setup a meeting with AT&T and a representative from the Design side to walk them through what will be done in the 1300 contract.

February 2013:

1. Risk description refined.
2. AT&T were made aware of the potential need for relocation of the vault and duct bank in November 2012.
3. A meeting has been arranged between CSP and AT&T for Tuesday 2/19/13 to follow up on the November meeting and confirm that the vault and duct bank will need to be relocated.
4. Relocation of the vault has been included in the D&B element of the 1300 contract and is the responsibility of the contractor.
5. The 1300 contract requires the contractor to allow 12 months for AT&T to cut over new services from the existing duct bank into a new duct bank proposed within the eastern sidewalk of 4<sup>th</sup> Street between Bryant and Brannan Streets.

March 2013:

1. Increase scope of this risk to include other utilities; Level 3, PG&E, MRY, ASB, SFWD, SFDT, Comcast.
2. Contractual execution of the trench installation to be discussed.
3. AT&T have not been contacted during 1300 bid.
4. It was discussed that the schedule impact of this risk rating should be increased to 4 (6-12 months), this increased the risk rating to 6

April 2013:

1. Utility relocations may require a joint trench under the Contract 1300 design build scope.
2. If a joint trench is required under the contract the 1300 contractor would manage the implementation of the joint trench, SFMTA would manage the Form B process for reimbursement of the joint trench costs.
3. Mitigation strategy added that the 1300 contractor is required to coordinate with private utility companies.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 204</b>
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4. A SWAT team has been established comprising DP-3 and the Design Oversight manager who are meeting weekly to address utilities south of Bryant. DP3 are preparing Notice of Intent letters for utilities to relocate.

May 2013:

1. Final Notice of Intent letters were sent to private utilities Friday 5/3/13.
2. Final Notice of Intent letters will be sent to AT&T and PG&E the week commencing 5/6/13.

July 2013:

1. Revisit following Tutor baseline submittal.
2. It is noted that the Tutor schedule submitted 5 days following bid closure allowed a 12 month period to cutover to the new AT&T duct but did not appear to allow adequate time for construction of the AT&T duct along 4<sup>th</sup> Street.
3. Utility coordination meeting will be held to ensure the contract requirements are understood by the contractor.

**Risk Mitigation Status****Risk Reference: 208**

Risk		Mitigation Strategy
Additional cost to retrieve TBMs at the Pagoda Theatre site exceeds current budget	<ul style="list-style-type: none"> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> <li>√</li> </ul>	<ul style="list-style-type: none"> <li>1. Develop Scope with designers currently under contract</li> <li>2. Agree to alignment and details of new shaft location</li> <li>3. Issue PCC to Contractor</li> <li>4. Initial site works and borings if necessary</li> <li>5. Obtain appropriate permits</li> <li>6. Investigate alternate procurement methods</li> </ul>

**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.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: 208</b>
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4. PCC 10 should be closed by June 14, or during the week commencing 6/17/13.
5. Overall budget will be maintained.

July 2013

1. Final negotiations have not yet concluded. Currently still on Budget



**Risk Mitigation Status****Risk Reference: 209**

Risk	Mitigation Strategy
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

**Initial Assessment:** 1, 1, 3**Current Assessment:** Risk Rating 3 – Construction Risk**Risk Owner:** R. Edwards**Status Log:**

## February 2013 Meeting:

1. Central Subway has engaged SF Planning and outlined the required actions.
2. CEQA Documents are under review, feedback is expected by the end of February 2013.
3. NEPA feedback is expected March 2013.
4. Updated Area of Potential Effects (APE) to be sent to SHPO week commencing 2/18/13

## March 2013:

1. CEQA clearance has been received
2. 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.

## April 2013:

1. Technical Memo for Archaeological Monitoring, Testing, and Treatment plan for the Pagoda Option sent to SHPO and the FTA 2/19/13 (incorporating Area of Potential Affects).
2. Correction to March 2013 report. Item 2 has been carried over from risk 207.
3. Contracts have been issued for completion of noise and vibration studies which are expected to be completed by the end of April.
4. NEPA feedback is expected by the end of April.

## May 2013

1. NEPA clearance received from FTA – May 10<sup>th</sup>.

## July 2013

1. Environmental Clearance obtained and contract awarded.
2. Risk to be retired
3. This risk was retired by unanimous consent by the Risk Assessment Committee on 07/09/13.

<b>Risk Mitigation Status</b>
<b>Risk Reference: 214</b>

Risk		Mitigation Strategy
Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	√	<ol style="list-style-type: none"> <li>1. Provide micro-pile as-built information to contractor</li> <li>2. Ensure tube-a-manchettes are realigned to be installed clear of micro-piles</li> </ol>

**Initial Assessment:** 1, 1, 3  
**Current Assessment:** Risk Rating 3 - Construction Risk

**Risk Owner:** M. Benson

**Status Log:**

February 2013:

1. Identified as a risk

March 2013:

1. Discuss risk description, mitigation strategy and risk rating
2. Central Subway has responded to Contractors RFI and provided as-built information for the micropiles
3. Contractor will work to install tube-a-manchettes to avoid micropiles
4. **Recommended risk rating 3 (3, 1, 1)**
  - a. Probability (3), >50%
  - b. Cost impact (1), <\$250
  - c. Schedule impacts (1), <1 month

April 2013:

1. Contractor is reviewing the micropile as-built information
2. An additional mitigation was added to ensure the tube-a-manchettes are realigned to be installed clear of the micro-piles
  - a. A workshop will be held between the PB and BIH to resolve the required geometry to install the tube-a-manchettes clear of the micro-piles
  - b. The contractor will submit a revised installation alignment plan for the tube-a-manchette installation

May 2013:

1. A workshop was held between PB and BIH in April to establish the required installation geometry
2. The contractor will install the compensation grouting tubes using a diamond drill in the event that the micro piles cannot be avoided

July 2013:

1. As of Monday 7/8/13, 9 tube-a-manchettes have been installed at the Ellis Street shaft. 1 of 9 has encountered a micropile.
2. 1252 Contractor will install tubes as per the current plan. Additional tubes will be installed as required.
3. A 3-D model of the micropiles will be provided to Tutor Perini. A workshop will also be held between PB and Tutor (similar to that held with BIH) to minimize the risk of interference with 1300 compensation grouting tubes.

**Risk Mitigation Status****Risk Reference: 216**

<b>Risk</b>	<b>Mitigation Strategy</b>
Olivet building potential construction impact	1. 1. Reach out to building owner and keep him abreast of CS construction activities.

**Initial Assessment:** 2 (1, 1, 2)**Current Assessment:** Risk Rating 2 - Construction Risk**Risk Owner:** A. Clifford**Status Log:**

May 2013:

1. Maintain communication with DPT to make sure that they aren't approving work which will affect our project.

July 2013:

1. A meeting was held with the owner and engineering consultants of the 250 Fourth Street Development.
  - a. Overview and extent of YBM station structure and construction staging was explained.
  - b. Demolition of existing Olivet University building expected early 2014
  - c. 250 Fourth Development advised that Clementina (via 5<sup>th</sup> Street) is likely to be the only access available to their site.

**Risk Mitigation Status****Risk Reference: A**

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

**Initial Assessment:** 4, 1, 10**Risk Owner:** S. Pong**Current Assessment:** Risk Rating 0 – Design Risk**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.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: A</b>
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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.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: A</b>
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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 4<sup>th</sup> Street continues no impact to 1256 schedule.

September 2012 Meeting:

1. Sewer design for 4<sup>th</sup> 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.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: A</b>
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3. PUC has committed to provide funds by the end of 2013.

July 2013

1. MOU finalized, routing for signature. R&R provision removed will be dealt with on a City Wide basis.
2. Risk Assessment Committee agreed to retire risk.
3. Risk retired by unanimous consent of Risk Assessment Committee 7/09/13.

RETIRED

<b>Risk Mitigation Status</b>
<b>Risk Reference: T</b>

Risk	Mitigation Strategy
Delay to final design submittal due to delay of emergency ventilation approval by SFFD.	<ol style="list-style-type: none"> <li>1. Work with SFFD to develop a plan acceptable to each party.</li> <li>2. Incorporate SFFD comments into the construction documents.</li> </ol>

**Initial Assessment:** 2, 2, 4  
**Current Assessment:** Risk Rating 5 – Requirement Risk

**Risk Owner:** R. Edwards

**Status Log:**

December 2011:

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

March 2012 Meeting:

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

May 2012 Meeting:

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

June 2012 Meeting:

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

September 2012 Meeting:

1. SES review comments addressed, revised report submitted.

October 2012 Meeting:

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

1. November 2012 Meeting:

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

December 2012 Meeting:

1. Comments received by SFFD, submittal will be revised.



<b>Risk Mitigation Status</b>
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<b>Risk Reference: T</b>
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January 2013:

1. SES will be forwarded to Fire Life Safety Committee for approval.

February 2013 Meeting:

1. The Tunnel Ventilation SES resubmittal was sent for verification 1/18/13 (verification is expected early March 2013).

March 2013:

1. No new update to this risk.

April 2013:

2. A conference call was held between HNTB and SFFD on 3/21/13 to review open comments.
3. SFFD were satisfied with the responses given.
4. HNTB are preparing a revised Tech Memo for verification prior to formal submission.

May 2013:

1. Concurrence was received from SFFD for the revision 2 of the SES technical memo
2. The tech memo will be routed internally for signature prior to sending to FLSC (Fire Life Safety Committee) for signoff.
3. The completed and signed tech memo is expected to be completed and signed by the FLSC by the end of May 2013.

July 2013:

1. SES report has been approved by SFFD, being routed internally for signature.
2. Review comments to be addressed prior to retirement of risk,

**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"> <li>1. Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use.</li> <li>2. Integrate work with SFMTA Real Estate into CSP</li> </ol>

**Initial Assessment:** 3, 2, 6**Current Assessment:** Risk Rating 3 – Design Risk**Risk Owner:** R. Edwards**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

<b>Risk Mitigation Status</b>
<b>Risk Reference: V</b>

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

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 4<sup>th</sup> 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 4<sup>th</sup> 2012 is still outstanding.

<b>Risk Mitigation Status</b>
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<b>Risk Reference: V</b>
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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 there is no issue for YBM.
3. Risk cost impact has been reduced to a 1. Overall Risk assessment rating is currently at a 3.

July 2013

1. Nothing new to report, No change in rating.

<b>Risk Mitigation Status</b>
<b>Risk Reference: PR78</b>

Risk	Mitigation Strategy
Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC, ATCS	1. Monitor other projects' developments and develop contingency plans as needed to avoid 1256 delay of revenue service.

**Initial Assessment:** 1, 1, 2

**Risk Owner:** R. Redmond

**Current Assessment:** Risk Rating 2 – Construction Risk

**Status Log:**

May 2012 Meeting:

1. Thales is expected to provide the CSP advanced train control system under a sole source contract requiring FTA approval.
2. An RFP has been prepared for Thales services, equipment and contract preparation
3. Thales will review the CSP Project specifications, drawings and related documents
4. Thales will provide commentary and revise CSP design documents
5. Thales will list proprietary software, hardware, systems, equipment and components including a Bill of Materials
6. Thales will submit a cost proposal as part of the RFP.
7. Thales will assist in Contract Preparation
8. SFMTA Radio Project has been delayed. Equipment requirements from this project may be needed for the Systems contract. Fiber backbone upgrades in Market Street subway may be needed for implementation of Systems contract.
9. Capacity on the existing backbone within the Muni Metro tunnel will become available. CSP to investigate if this new capacity can be utilized for the project.
10. SFDT has suggested that a route to TMC at 1455 Market is available through existing ductbanks within the city streets.
11. The schedule for completion the C3 project at the TMC has it completed several years in advance of the time that CSP will need to tie into the TMC.

June 2012 Meeting:

1. Design has been completed with SFMTA projects integrated into contract documents.
2. Recommend to retire this risk and open new construction risk on this subject.

July 2013:

1. This risk has been re-adjusted to a construction risk. Risk owner was changed from C. Campillo to R. Redmond.

Risk Register

PROJECT RISK REGISTER												Risk Profile					Legend							
Central Subway Project San Francisco												Severity Score					RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)							
REV : 23												Likelihood Score	1	2	3	4	5	Probability	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	<3 Low
DATE ISSUED: 07/09/13												5	4	3	2	1	Cost Impact	< \$250K	< \$250K - \$1M	< \$1M - \$3M	< \$3M - \$10M	> \$10M	3 - 9 Medium	
												2	1	1	1	1	Schedule Impact	< 1 Month	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> 12 Months	>10 High	
												SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)					2							
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												

Risk Register

PROJECT RISK REGISTER		Risk Profile					Severity Score					Legend		RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
Central Subway Project San Francisco		Likelihood Score	1	2	3	4	5	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	<3 Low	3 - 9 Medium	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
REV : 23		5						< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%				
DATE ISSUED: 07/09/13		4						< \$250K	< \$250K - \$1M	> \$1M - \$3M	< \$3M - \$10M	> \$10M				
		3						< 1 Month	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> 12 Months				
		2														
		1														
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				
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				
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				
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	16	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				

Risk Register

PROJECT RISK REGISTER		Risk Profile					Severity Score					Legend		RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
Central Subway Project San Francisco		Likelihood Score	1	2	3	4	5	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	<3 Low	3 - 9 Medium	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
REV : 23		5						< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%				2
DATE ISSUED: 07/09/13		4						< \$250K	< \$250K - \$1M	< \$1M - \$3M	< \$3M - \$10M	> \$10M				
		3						< 1 Month	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> 12 Months				
		2														
		1														
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				
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				
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	6	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				







Risk Register

PROJECT RISK REGISTER												Risk Profile		Severity Score		Low (1)		Medium (2)		High (3)		Very High (4)		Significant (5)		Legend			
Central Subway Project San Francisco												Likelihood Score		1		2		3		4		5		Probability		RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)			
REV : 23												5		4		3		2		1		Probability		< 10%		< 3 Low			
DATE ISSUED: 07/09/13												3		2		1		1		1		1		Cost Impact		< \$250K		3 - 9 Medium	
												2		1		1		1		1		1		Schedule Impact		< 1 Month		> 10 High	
												1		1		1		1		1		1		Score		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																	
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.	C	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																	
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																	
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	6		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																	
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	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																			

Risk Register

PROJECT RISK REGISTER		Risk Profile										Legend		
Central Subway Project San Francisco REV : 23 DATE ISSUED: 07/09/13		Severity Score					Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
		Likelihood Score	1	2	3	4	< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%			
		5												< 3 Low
		4												3 - 9 Medium
		3												> 10 High
2														
1														
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		
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				
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				
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				
217	Delays or complications construction by others – SF Dept. Of Technology, 3rd party utilities	1. Early engagement and coordination for agreements and plan development to avoid construction delays.	C	2	1	1	1	35%	2	4	DTIS MOU has been signed.			