

Risk Mitigation Meeting Minutes #50

DATE: October 04, 2013

MEETING DATE: **September 10, 2013**

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

TIME: 10:00am

ATTENDEES: John Funghi, Albert Hoe, Eric Stassevitch, Alex Clifford, Vivian Chow, Beverly Ward, Luis Zurinaga, Bradley Lebovitz,

COPIES TO: Attendees: Richard Redmond, Roger Nguyen, Mark Benson, Jane Wang, Mark Latch, Sanford Pong, Aileen Read, Chuck Morganson, , James Sampson, David Kuehn, Jeffrey Davis
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. 50**

RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	Risk Refresh 2013 – Update The Risk Manager provided a recap of the two Risk Refresh presentations. Which focused on the schedule assessment, in an attempt to demonstrate the Program has an adequate contingency level in schedule of 4.8 months left to complete the project based on the fact that the Program risk profile has changed since the initial contingency level was established in 2009. The Risk committee is in agreement with the analysis presented. A final report will be generated to make a case with the funding partners recommending the new contingency drawdown level.	
2 -	<p>Review of Risk Summary Sheet – Risk Ratings</p> <p>The Risk Committee performed an additional review of the current Risk items in summary form to ensure that the risk ratings of the remaining risks utilized in the schedule assessment analysis were appropriate. To determine if the risk description’s risk ratings accurately represent the current level of potential impacts now that we are in the Construction phase. A list of Risk items which were discussed at the meeting are as follows:</p> <p>Risk 104: CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows <u>Resolution:</u> This risk is still current and will remain open. One comment regarding the Crossbuck” remains open for resolution. Risk Rating 5</p> <p>Risk 16: TBM loss and / or damaged in Transit <u>Resolution:</u> This risk has been mitigated. The only item awaiting delivery is the conveyor Risk Rating 0. This risk is retired.</p>	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>Risk 214: Micro Piles at UMS interfere with Tube-a-machete installation (60' deep micropiles) <u>Resolution:</u> This risk is becoming a larger issue. Have we thoroughly mitigated this risk? More mitigation measures need to be identified and implemented. Risk Rating 3</p> <p>Risk J: Macy's entrance conflict with new piles <u>Resolution:</u> Attempts to open a dialogue with Macy to get their assumption. This risk will be revisited to better understand the risk itself. Risk Rating 3</p> <p>Risk 32: Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2) <u>Resolution:</u> Macy's backflow is complete. Risk has been mitigated. Risk Rating 0. This risk is retired.</p> <p>Risk 71: Power supply interruptions to TBM's (no dual power feed currently planned) <u>Resolution:</u> The Committee does not feel the PG&E power being supplied is robust enough. PG&E has the potential to restore power quickly but replacing power takes a couple of months. Risk Rating 1</p> <p>Risk 83: Cost of vehicles may be more than estimated due to sole source and small order <u>Resolution:</u> The Risk Description should be revised to reflect the current status of the vehicle procurement, it is not sole source. Risk Rating 8</p>	
3 -	Other Business – New Risks Items: Tunnel Program, Headwalls & CN1300	
	<p>New Risk – Power Pole Not de-energized at 930 Stockton Street Risk Rating TBD Mitigation Description: 1. Work with PG&E to accelerate the relocation</p> <p>New Risk – Property Development 250 4th Street (New Construction) <u>Discussion:</u> If a permit has not been issued by DBI they cannot begin the work. A review of the EIR documents should be done to see if it references the coordination with Central Subway. Risk Rating TBD</p>	

ACTION ITEMS –

ITEM #	MTG DATE	Task #	DESCRIPTION	BIC	DUE DATE	STATUS
1	12/13/12		Risk 7 – Cost for significant settlement grout	J. Wang	09/12/13	Open
4	12/13/12		Risk 72 – 4 th & King (SSWP)	S. Pong C. Morganson	09/12/13	Open
1	08/13/13		Expand/Confirm CN1300 Startup activities	PM/CM	08/27/13	CLOSED
1	08/13/13		Examine additional schedule activities	PCC	08/27/13	CLOSED
1	08/13/13		Schedule duration that are in the Master Schedule	PCC	08/27/13	CLOSED

Meeting adjourned at 3:00pm

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: 04/24/13 [Date review completed.]

Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 50
September 10, 2013
2:00pm – 4:00pm
Central Subway Project Office
821 Howard St. 2nd Floor
Main Conference Room

Attendees:

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

- 1. Risk Refresh 2013 – Update**
- 2. Review of Risk Summary Sheet**
- 3. Other Business** – Identify New Risk items associated with Tunnel Program, Headwalls and Contract 1300

Meeting Attendance Sheet

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Management Meeting No. 50
September 10, 2013
2:00 p.m. – 3:00 p.m.
 Central Subway Project Office
 821 Howard Street, 2nd Floor
 Main Conference Room

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

NAME	AFFILIATION	PHONE	E-MAIL (for minutes)	INITIALS
Mark Benson	CSP	415-701-5295	Mark.Benson@sfmta.com	
Vivian Chow	SFMTA	415 701-5264	Vivian.chow.@sfmta.com	<i>vchow</i>
Jeffrey Davis	FTA	415 744-2594	Jeffrey.s.davis@dot.gov	
Alex Clifford	CSP	415 701- 5275	Alex.clifford@sfmta.com	<i>A</i>
John Funghi	SFMTA	415-701-4299	john.funghi@sfmta.com	<i>JF</i>
Albert Hoe	SFMTA	415-701-4289	albert.hoe@sfmta.com	<i>AH</i>
Mark Latch	CSP	415-701-5294	mark.latch@sfmta.com	
Brad Lebovitz	STV/PMOC	510-464-8052	Bradley.lebovitz@stvinc.com	<i>BR</i>
Richard Redmond	CSP	415-701-4288	Richard.redmond@sfmta.com	
Eric Stassevitch	CSP	415-701-4426	Eric.stassevitch@sfmta.com	<i>ES</i>
Beverly Ward	CSP	415-701-5291	Beverly.ward@sfmta.com	<i>BW</i>
Luis Zurinaga	SFCTA	415-716-6956	luis@sfcta.org	<i>LZ</i>

Risk Mitigation Status
Risk Reference: 16

Risk		Mitigation Strategy
TBM loss and / or damaged in Transit	<ul style="list-style-type: none"> √ √ 	<ul style="list-style-type: none"> 1. Provide provisions for insurance for TBM in transit to jobsite. 2. Include insurance costs in contract cost.

Initial Assessment: 0, 0, 0
Current Assessment: Risk Rating 5 – Construction Risk

Risk Owner: M. Benson

Status Log:

February 2012:

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

September 2012:

- 1. Contractor has ordered spare parts
- 2. 2nd TBM will be used to mitigate loss
- 3. Contingency plan to be developed – investigate market for 2nd hand TBM’s

October 2012:

- 1. Market for 2nd hand TBM’s still to be investigated

November 2012 Meeting:

- 1. Market for 2nd hand TBM’s will not be investigated.
- 2. Recommend retiring, will revisit in December 2012 Risk meeting.

April 2013:

- 1. The 1st TBM is due to arrive this month. The second 2nd TBM is due to arrive in June of this year.
- 2. Revisit this risk following arrival of the 2nd TBM.

September 2013:

- 1. The conveyor is the one item awaiting delivery.
- 2. Recommended to retire.
- 3. This risk was retired by unanimous consent by the Risk Assessment Committee on 09/10/13.

Risk Mitigation Status**Risk Reference: 32**

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

Initial Assessment: 1, 1, 1**Current Assessment:** Risk Rating 1 – Requirement Risk**Risk Owner:** M. Benson**Status Log:**

September 2011:

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

January 2012 Meeting:

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

March 2012:

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

April 2012

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

May 2012

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

June 2012

1. No status update

July 2012

1. No Status update

November 2012 Meeting:

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

Risk Mitigation Status

Risk Reference: 32

December 2012:

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

February 2013:

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

March 2013:

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

April 2013:

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

May 2013:

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

June 2013:

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

July 2013:

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

Risk Mitigation Status

Risk Reference: 32

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 8th.
4. Target completion of cutover by end of August.

September 2013:

1. Backflow work at Macy's has been completed. Risk has been mitigated.
2. Risk retired by unanimous consent of Risk Assessment Committee 09/10/13.

RETIRED

Risk Mitigation Status**Risk Reference: 71**

Risk	Mitigation Strategy
Power supply interruptions to TBM's (no dual power feed currently planned)	Chance of power outage is miniscule.

Initial Assessment: 1, 1, 1**Current Assessment:** Risk Rating 1 – Construction Risk**Risk Owner:** S. Wilson**Status Log:**

November 2012 Meeting:

1. Recommend retiring, will revisit in December 2012 Risk meeting.

September 2013 Meeting:

1. Power supplied to the TBM does not seem adequate. If power is lost, PG&E has the ability to restore power quickly, but replacing power takes a couple of months.

Risk Mitigation Status
Risk Reference: 83

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

Initial Assessment: 1, 1.5, 2
Current Assessment: Risk Rating 8 – Requirement Risk

Risk Owner: L. Ames

Status Log:

April 2012 Meeting:

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

May 2012 Meeting:

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

June 2012 Meeting:

1. No status update.

September 2012 Meeting:

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

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

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

October 2012 Meeting:

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

Risk Mitigation Status

Risk Reference: 83

4. SFMTA Transit Division issued a revised procurement plan to the FTA in October identifying the following actions in the near term;
 - a. Provide ROM Cost, funding schedule and cashflow drawdown November 2012
 - b. LRV Concept report December 2012
 - c. Service Demand Modeling Updates December 2012
 - d. Central Subway Service Plan Model Revisions December 2012
 - e. Finalize Fleet Strategy including Base Order Qty December 2012
 - f. Complete Acquisition Plan December 2012
 - g. Release updated Fleet Management Plan to FTA February 2013
 - h. Release updated Central Subway Service Plan to FTA February 2013
 - i. Release updated LRV Procurement Plan to FTA February 2013

November 2012 Meeting:

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

December 2012:

1. Item 4a items received Nov. 20 from SFMTA LRV Procurement PM include draft schedule, scope and budget.
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 budget.
6. The SFMTA LRV Procurement staff is currently expending funds in anticipation of receiving funds for retroactive costs.

January 2013:

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

February 2013 Meeting:

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

Risk Mitigation Status

Risk Reference: 83

March 2013:

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

April 2013:

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

May 2013:

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

June 2013:

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

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

September 2013

1. Due to the purchase of the vehicles no long being a sole source order the risk description will be revised to reflect the current purchase status.

Risk Mitigation Status
Risk Reference: 104

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

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 4th/Bryant and 4th/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.

Risk Mitigation Status

Risk Reference: 104

August 2012 Meeting:

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

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

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

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 8th 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 6th 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 1st 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.

Risk Mitigation Status

Risk Reference: 104

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.

September 2013:

1. One comment remains open regarding the 'crossbuck" on. Resolution is still pending.

Risk Mitigation Status
Risk Reference: 214

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

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: 214

September 2013:

1. Risk is becoming a greater concern. Additional mitigation measures need to be identified and implemented.

Risk Mitigation Status**Risk Reference: J**

Risk	Mitigation Strategy
Macy's entrance conflict with new piles.	<ol style="list-style-type: none"> 1. Show known obstructions on as-built drawings on contract drawings, 2. Make as-built drawings available to contractor as reference drawings. 3. Include allowance for differing site conditions. 4. Recover costs for removal of Macy's entrance from Macy's if it is in conflict with station construction.

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

February 2012:

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

November 2012:

1. Recommend retiring, will revisit in December 2012 Risk meeting.

September 2013:

1. An open dialogue with Macy's needs to take place.
2. The Committee needs to revisit the Risk to achieve a better understanding of the risk and what mitigation strategy are being implemented..

Risk Register

PROJECT RISK REGISTER												Risk Profile					Legend							
Central Subway Project San Francisco												Severity Score					RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)							
REV : 24												Likelihood Score	1	2	3	4	5	Probability	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	<3 Low
DATE ISSUED: 09/10/13												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												
115	Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently quality 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 : 24		5						< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%	2			
DATE ISSUED: 09/10/13		4						< \$250K	< \$250K - \$1M	> \$1M - \$3M	< \$3M - \$10M	> \$10M	2			
		3						< 1 Month	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> 12 Months	2			
		2											2			
		1											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				
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 Central Subway Project San Francisco REV : 24 DATE ISSUED: 09/10/13		Risk Profile					Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
		Likelihood Score	Severity Score										
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	
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					Legend		RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
Central Subway Project San Francisco		Likelihood Score	1	2	3	4	5	Probability	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	<3 Low	2	
REV : 24		5	Yellow	Orange	Red	Red	Red	< 10%	< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%	3 - 9 Medium	2	
DATE ISSUED: 09/10/13		4	Green	Yellow	Orange	Red	Red	< \$250K	< 1 Month	< \$250K - \$1M	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> \$10M	> 12 Months	> 10 High
		3	Green	Green	Yellow	Orange	Orange	< \$250K	< 1 Month	< \$250K - \$1M	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> \$10M	> 12 Months	> 10 High
		2	Green	Green	Green	Yellow	Yellow	< \$250K	< 1 Month	< \$250K - \$1M	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> \$10M	> 12 Months	> 10 High
		1	Green	Green	Green	Green	Green	< \$250K	< 1 Month	< \$250K - \$1M	< 1 - 3 Months	< 3 - 6 Months	< 6 - 12 Months	> \$10M	> 12 Months	> 10 High
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				
Hazmat, Contaminated Material																
Environmental Mitigations																
65	Archeological/Cultural findings during construction increases schedule and/or cost. (Portal) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	1	2	1	2	10%	2	3	Additional boring taken in vicinity of portal indicated no evidence of Archeological/Cultural resources.	10/24/12 TUN1080				
66	Archeological/Cultural findings during construction increases schedule and/or cost.(Moscone) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	1	1	50%	3	6	Mitigated - Current exposure only to those amount above those currently identified	4/28/15 TUN1150				
67	Archeological/Cultural findings during construction increases schedule and/or cost. (UMS)...LESS THAN 1%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	8/12/15 UMS1320				
68	Archeological/Cultural findings during construction increases schedule and/or cost. (CHINA TOWN) ...AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	10/9/17 CTS1500				
Auto/bus/van access ways, roads																
70	Change in traffic control requirements after bid.	1. Provide unit bid items to reimburse contractor for traffic management costs outside their control. 2. Include allowance in construction contracts for PCOs.	C	3	4	1	3	50%	8	15	Mitigation measures implemented.	5/22/17 STS1020				
71	Power supply interruptions to TBM's (no dual power feed currently planned)	Obtain TBM power directly from PG&E substation.	C	1	2	-	1	10%	1	2		2/5/14 TUN1124				
Train Control and Signals																
72	Interface new Signaling and Train Control system to existing at Fourth and King	Connect new system in parallel with existing system until the new system has been tested and safety certified for operation.	C	2	2	3	3	35%	5	10	Awaiting approval of contract plans by Muni Operations.	3/4/16 STS1045				
PR78	Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC	1. Monitor other projects' developments. 2. Develop contingency plans as needed to avoid 1256 delay of revenue service.	C	2	1	1	1	35%	2	4		7/27/12 FDS 1940				
Traffic signals & Crossing Protn.																
Purchase or lease of Real Estate																
79	Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	1. Engage Owners in negotiations as soon as possible. 2. PM/CM to provide real estate specialists to facilitate.	R	1	1	-	1	10%	1	1	Right of possession obtained on all three parcels. Cost agreement reached with 1455 Stockton & 801 Market.	9/7/2012				
PR80	ROW costs higher than anticipated.	Provide adequate contingency for potential higher costs	M	1	3	-	2	10%	2	3	Similar to Risk 81.	7/1/12 FDS 1240				
Reloc. of Household or Business																
Vehicles																
83	Cost of vehicles may be more than estimated due to sole source and small order	Time the procurement of the vehicles to be part of the procurement of the existing Breda LRVs.	R	3	4	1	3	50%	8	15	CSP vehicles to be included in overall SFMTA vehicle procurement contract.	11/17/17 STS 1500				
Preliminary Engineering																
89	3rd Party reviews of Design documents delays completion of Final Design.	Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work.	D	1	2	2	2	10%	2	4	3rd Party coordination meeting ongoing.	5/23/12 FDS 1930				
Project Management for Design and Construction																
95	Contractor default during construction impacts schedule. (key sub-contractor)	Assist Bonding company in transition and to maintain schedule.	C	1	2	2	2	10%	2	4		11/17/17 STS 1500				
99	Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.	1. Executive partnering and alternate dispute resolution. 2. Provide incentives in construction contracts in addition to penalties	C	2	5	3	4	35%	8	16	Mitigation measures being implemented	7/27/12 FDS 1940				

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	2
REV : 24												5						< 10%	< 10% - 50%	> 50%	< 75% - 90%	> 90%	3 - 9 Medium	
DATE ISSUED: 09/10/13												4						< \$250K	< \$250K - \$1M	< \$1M - \$3M	< \$3M - \$10M	> \$10M	>10 High	
												3												
												2												
												1												
												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												
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	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 Central Subway Project San Francisco REV : 24 DATE ISSUED: 09/10/13		Risk Profile					Risk Category	Probability	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
		Likelihood Score	Severity Score													
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%		4	DTIS MOU has been signed.					