


Memorandum

CS Memorandum No. 1345

To: Distribution
From: Susan MacKenzie, Document Control Manager 
Date: January 30, 2013
Reference: Project No. M544.1, Contract No. CS-149
Task No. 1-4, Risk Management
Subject: Risk Mitigation Report No. 41

Attached please find Risk Mitigation Report No. 41 for meeting held on January 10, 2013. Please click on the "Bookmark" tab on the left side of Adobe file to navigate to report sections.

Attachments:

Risk Mitigation Report No. 41 with attachments

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

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Mark Latch, CSP
Mark Benson, CSP
Alex Clifford, CSP
Beverly Ward, CSP

Risk Mitigation Meeting Minutes #41

DATE: January 15, 2013
 MEETING DATE: **January 10, 2013**
 LOCATION: 821 Howard Street, 2nd Floor – Main Conference Room
 TIME: 2:00pm
 ATTENDEES: John Funghi, Albert Hoe, Ross Edwards, Richard Redmond, Mark Latch, Mark Benson, Eric Stassevitch, Alex Clifford, Beverly Ward, Matt Lee, Brad Lebovitz
 COPIES TO: Attendees: Arthur Wong, Jane Wang, Quon Chin, Aileen Read, Chuck Morganson, James Sampson, Luis Zurinaga, David Kuehn
 File: M544.1.5.0820
 REFERENCE Project No. M544.1, Contract No. 149 Task 1-4.01
 Program/Construction Management
 SUBJECT: **Risk Management – Risk Mitigation Meeting
 Risk Mitigation Report No. 41**

RECORD OF MEETING

| ITEM # | DISCUSSION | ACTION BY DUE DATE |
|--------|--|-----------------------|
| 1 - | Report on Red Risk and – (Risk rating ≥ 6) | |
| | <p>Risk 83: Cost of vehicles may be more than estimated due to sole source and small order <u>Discussion:</u> No status change from the December update to January that is relevant. Process is ongoing; most of the dates will be advanced by the end of February. PMO report has not been submitted yet. Risk Rating 4, 4, 16</p> <p>Risk V: Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract <u>Discussion:</u> No additional request to report. Possible demolition of Olivet University which is located next to where the project is being built. Environmental documents will be reviewed to discuss the usage. Rating 3, 2, 6</p> <p>Risk 7: Potential for excessive settlement of BART tunnels - Significant Compensation Grout Required over Estimate Allowances. <u>Discussion:</u> An alert level has been established; when trigger is reached than the process will stop. BART is in agreement and on board with the mitigation strategies in place. A recommendation to reduce the risk to 2, 2, 4, was agreed to. Risk Rating 2, 2, 4</p> | |
| 2 - | Report on Remaining Requirement & Design Risks (Risk rating ≤ 6) | |
| | <p>Risk 104: CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows <u>Discussion:</u> Letter is being prepared to request a continuous from the CPUC. Risk Rating 2, 3, 5</p> | |

| ITEM # | DISCUSSION | ACTION BY DUE DATE |
|--------|--|--------------------|
| | <p>Risk T: Delay to final design submittal due to delay of emergency ventilation approval by SFFD. <u>Discussion:</u> One more revision to the SES will be done. Needs to go to the Fire Life Safety Committee as a letter for approval. Risk Rating 2, 2, 4</p> <p>Risk A: Timely resolution of sewer lines south of portal <u>Discussion:</u> Drawings have been included in the CN1300 drawings. MOU has not been finalized; percentage cost has not been received from DPW. Risk Rating 2, 1, 2</p> <p>Risk PR73: Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities <u>Discussion:</u> (Post meeting update) - MOU agreement is still pending. Risk Rating 2, 1, 2</p> | |
| 3- | <p>Active Risks (New Risks associated with New Contracting Strategy)</p> | |
| | <p>The following list represents new Risks Items added to the Register. Risk items #199 and #200 previously listed on the Risk Register Rev.16 were deemed by the Risk Committee to not represent at risk or replicated a risk already established; therefore they were retired from the active Risk Register.</p> | |
| | <p>Risk 198: Outreach efforts to get more bidders - (SSTS) 1300 Contract <u>Discussion:</u> Pre bid conference and a meet and greet meeting took place to allow the prime contractor to meet with subconsultants. There was about viable companies who sponsored tables as the event. Extended the bidding period from January to March to address some of the concerns by the existing plan holders list. Risk Rating 1, 4, 4</p> <p>Risk 201: Bid Protest - 1300 Contract <u>Discussion:</u> Ability to respond to protest is low in probability; specification language is worded in a manner that a response can be given quickly without impact to the schedule. Risk Rating 1, 1, 1</p> <p>Risk 202: Cargo Preference must solicit U.S. - flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954) <u>Discussion:</u> Maritime website doesn't state what the penalty is for not shipping cargo through a U.S. flag carrier. If the Project is penalize by the FTA due to the Contractor not using a U.S. carrier than we could withhold a portion of their payment as well Risk Rating 1, 1, 1</p> <p>Risk 203: Headwalls interface delay CN1300 Contractor <u>Discussion:</u> 1252 Contract states August 15th for the UMS turnover, the current schedule has it listed September 12th, as the date for turnover, roughly six weeks behind schedule. Meeting with BIH will take place to develop a recovery schedule Risk Rating 3, 3, 8</p> <p>Risk 204: AT&T Vault - New Sewer Work south of Bryant <u>Discussion:</u> Agreement with AT&T has not been established as to whether it will be moved or stays where it is. A schedule analysis needs to be done. Moving ahead, a meeting needs to take place with AT&T and the Design Build. Risk Rating 2, 2, 4</p> | |



| ITEM # | DISCUSSION | ACTION BY DUE DATE |
|--------|---|-----------------------|
| | <p>Risk 205: Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor <u>Discussion:</u> CMod Task Force created to help improve the process. A draft report will be issued to the PMOC at the weekly CS Management meeting. Risk Rating (TBD)</p> | |
| | <p>The following new risk #206 thru #210 was introduced at December's meeting as potential new risks. Discussions did not take place at this meeting regarding these risks but were referenced at the meeting for tracking purposes.</p> <p>Risk Mitigation status sheets will be included in the distribution of these meeting minutes.</p> | |
| | <p>Risk 206: Delay in Decision on Retrieval Shaft <u>Discussion:</u> Risk Rating 3, 3, 9</p> <p>Risk 207: Implementing Pagoda Option for Retrieval Shaft - Delay in Obtaining Property <u>Discussion:</u> Risk Rating 3, 3, 9</p> <p>Risk 208: Implementing Pagoda Option - Develop Documents for Design Build <u>Discussion:</u> Risk Rating 3, 3, 8</p> <p>Risk 209: Implementing Pagoda Option - Obtaining Environmental Clearance <u>Discussion:</u> Risk Rating (TBD)</p> <p>Risk 210 Mission Bay Loop Grant – Needs to be built to allow for train turnarounds (June 2013) <u>Discussion:</u> Risk Rating (TBD)</p> | |
| 4- | Other Business - New items associated with New Contracting Strategy | |
| | <p>Potential Risk 1 - Destruction of Olivet University next to CS construction. <u>Discussion:</u> This could possibly be a construction coordination risk. This issue will be revisited after review of the Environmental documents.</p> | |

ACTION ITEMS -

| ITEM # | MTG DATE | Task # | DESCRIPTION | BIC | DUE DATE | STATUS |
|--------|----------|--------|--|-----------------------------|----------|--------|
| 2 | 09/13/12 | | Risk PR 73 -- Status of the MOU memo | R. Edwards | 10/11/12 | Open |
| 1 | 12/13/12 | | Risk 7 -- Cost for significant settlement grout | R. Edwards | 01/10/13 | Open |
| 4 | 12/13/12 | | Risk 72 -- 4 th & King (SSWP) | R. Edwards/ C. Morganson | 01/10/13 | Open |

Meeting adjourned at 3:40pm

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. 41
January 10, 2012
2:00pm – 4:00pm
 Central Subway Project Office
 821 Howard St. 2nd Floor
 Main Conference Room

Attendees:

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

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

- **Requirement Risks** (83)
- **Design Risks** (V)
- **Market Risks** (All outstanding Market - None)
- **Construction Risks** (7)

2. Report on Remaining Requirement and Design Risks

- **Requirement Risks** (104, T)
- **Design Risks** (A, PR73)

3. Active Risks – New risks to be discussed

- **Market Risks** (198, 199, 201)
- **Construction Risks** (202, 203, 204, 205)

4. Other Business – Identify New risk items associated with New Contracting Strategy

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. 41

January 10, 2013

2:00 p.m. – 4:00 p.m.

Central Subway Project Office

821 Howard Street, 2nd Floor

Main Conference Room

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

| NAME | AFFILIATION | PHONE | E-MAIL (for minutes) | INITIALS |
|------------------|-------------|---------------|--|----------|
| Mark Benson | CSP | 415-701-5295 | Mark.Benson@sfmta.com | MCB |
| Alex Clifford | CSP | 415 701- 5275 | Alex.clifford@sfmta.com | A |
| Ross Edwards | CSP | 415-581-5165 | ross.edwards@sfmta.com | RE |
| John Funghi | SFMTA | 415-701-4299 | john.funghi@sfmta.com | CF |
| Albert Hoe | SFMTA | 415-701-4289 | albert.hoe@sfmta.com | AH |
| David Kuehn | STV/PMOC | 510-464-8053 | david.kuehn@stvinc.com | |
| Mark Latch | CSP | 415-701-5294 | mark.latch@sfmta.com | ML |
| Brad Lebovitz | STV/PMOC | 510-464-8052 | Bradley.lebovitz@stvinc.com | BL |
| Matt Lee | SFCTA | 415 522-4813 | matt@sfcta.org | ML |
| Richard Redmond | CSP | 415-701-4288 | Richard.redmond@sfmta.com | RR |
| Eric Stassevitch | CSP | 415-701-4426 | Eric.stassevitch@sfmta.com | ES |
| Beverly Ward | CSP | 415-701-5291 | Beverly.ward@sfmta.com | BW |
| Arthur Wong | SFMTA | 415-701-4305 | arthur.wong@sfmta.com | |
| Luis Zurinaga | SFCTA | 415-716-6956 | luis@sfcta.org | |

| NAME | AFFILIATION | PHONE | E-MAIL (for minutes) | INITIALS |
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Risk Mitigation Status**Risk Reference: 7**

| Risk | Mitigation Strategy |
|--|---|
| <p>Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE ALLOWANCES).</p> | <ol style="list-style-type: none"> 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. Requiring EPBM TBM, 5. 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. 6. Require repair/adjustment plan. 7. Develop contingency plan to provide bus bridge, if needed. 8. Requiring non-stop weekend excavation beneath BART tunnels. 9. Monitor movement of BART tunnels in real-time. 10. Repair/adjust as needed. 11. Included probable cost in estimate. |

Initial Assessment: 1, 1.5, 2**Current Assessment:** 2,2, 4 – Construction Risk**Risk Owner:** S. Wilson**Status Log:**

February 2012:

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

June 2012 Meeting:

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

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| Risk Mitigation Status |
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| Risk Reference: 7 |
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November 2012 Meeting:

1. Coordination with BART and IRP ongoing

December 2012:

1. Installation and pre-charging of the compensation grouting pipes will demonstrate the effectiveness of the system (mitigation 5)
2. **Recommend reducing this risk rating to 3, 1.5, 4.5** (reduced cost impact associated with grout)
 - a. Current probability (3), >50%, maintain probability rating
 - b. Current cost impact (4), \$3m - \$10m, recommend reduce cost impact to (2), \$250k - \$1m (based on expected cost of additional grout only)
 - c. Current schedule impacts (1), <1 month, maintain schedule impact
3. No more can be done.
4. Cost will be brought to the January meet.

January 2013:

Risk probability has been lowered, new Risk rating – 2, 2, 4.

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| 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: 4,4, 16 – 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

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| Risk Mitigation Status |
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| Risk Reference: 83 |
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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.
- Expected December report from the FTA/PMO has not been received.

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| 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: 2, 3, 5 – Requirement Risk

Risk Owner: C. Campillo

Status Log:

September 2011:
 1. Providing preview of 90% submittal to CPUC and will resolve comments/issues from PE before finalizing design documents.

January 2012 Meeting:
 1. Design team conducted informal review meeting with CPUC on 12/6/11 in preparation for 1256 pre-final submittal. CPUC provided 5 comments at the meeting that will be incorporated by the designers:

- Evaluate curb extension at Portal
- Evaluate curb tapering or end treatments
- Evaluate train coming sign at 4th/Bryant and 4th/Brannan
- Evaluate black out/no left turn sign
- Evaluate guide stripping

 2. CPUC issued Resolution SX-92 granting SFMTA approval to construct the new and modified grade crossings in March 11, 2010. This approval is good for 3 years.
 3. SFMTA will need to file for an extension of SX-92 at least 30 days before March 11, 2013.
 4. SFMTA will need to file CPUC Form G within 30 days after the completion of construction.
 5. Recommend to reduce this risk rating.
 6. Risk rating reduced to 2, 2.5, 5.

April 2012 Meeting:
 1. CPUC review comments are being incorporated into the 100% contract documents.

May 2012 Meeting:
 No update.

July 2012 Meeting:
 1. 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.

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| Risk Mitigation Status |
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| Risk Reference: 104 |
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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:

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

Risk Mitigation Status**Risk Reference: 198**

| Risk | Mitigation Strategy |
|--|---|
| Outreach efforts to get more bidders - 1300 Contract | 1. Develop a Contractor Outreach Plan: 2. Engage in extensive contractor outreach and promote assurances of being a reasonable contract partner. |

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

December 2012:

1. Identified Risk and refined risk statement together with development of mitigation strategies.
2. Pre bid conference meeting took place and a meet and greet to allow the Prime Contractor to meet with sub consultants
3. Extended the bidding period an additional 3mos from January to March
4. List of Prime Contractors who attended the conference:
 - a. Kiewit
 - b. Tutor Perini Corp
 - c. R&L Brosamer
 - d. Dragados USA
 - e. S.J. Smoroso Construction Co., Inc. – (Table)
 - f. Reeds Construction
 - g. Sener Engineering & Systems, Inc.
 - h. Quality Engineering Inc.
 - i. Impregilo/S.A.S. Healy – (Table)
 - j. Alfred Williams Consultancy, LLC
 - k. Barnard Construction Company, Inc.
 - l. Skanska, Shimmick

January 2013:

1. No new updates

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| Risk Mitigation Status |
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| Risk Reference: 199 |
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| Risk | Mitigation Strategy |
|---|--|
| No interests from potential bidders although participated in outreach meet and greet. | 1. Continuous efforts with Prime to get them to bid. |

Initial Assessment: 2, 4, 7

Current Assessment: 2, 4, 7 – Construction Risk

Risk Owner: A. Wong

Status Log:

December 2012:

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

January 2013:

1. - Deemed by the Risk Committee to not represent at risk or replicated a risk already established; therefore it will be retired from the active Risk Register.

RETIRED

Risk Mitigation Status

Risk Reference: 200

| Risk | Mitigation Strategy |
|--------------------------------------|---------------------|
| Dealing with Larger Contractor Group | 1. |

Initial Assessment: X, X, X

Current Assessment: X, X, X – Construction Risk

Risk Owner: R. Redmond

Status Log:

January 2013:

1. - Deemed by the Risk Committee to not represent at risk or replicated a risk already established; therefore it will be retired from the active Risk Register.

RETIRED

Risk Mitigation Status**Risk Reference: 201**

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

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

December Meeting 2012:

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

January 2013:

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

Risk Mitigation Status**Risk Reference: 202**

| Risk | Mitigation Strategy |
|---|---|
| Cargo Preference must solicit U.S. - flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954) | 1. Require compliance agreement first tier contractors and subcontractors |

Initial Assessment: 1, 1, 1**Current Assessment:** 1, 1, 1 Construction Risk**Risk Owner:** R. Redmond**Status Log:**

December 2012:

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

January 2013:

1. No indication from Maritime what the penalty would be for non-compliance, if the Contractor does not adhere to Cargo Preference requirement.

Risk Mitigation Status**Risk Reference: 203**

| Risk | Mitigation Strategy |
|---|--|
| Headwalls interface delay 1300 Contractor | 1. Meet and develop recovery schedule 2. Review possible Adjustment to 1300 interface |

Initial Assessment: 3, 3, 8**Current Assessment:** 3, 3, 8 – Construction Risk**Risk Owner:** M. Benson**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.

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| Risk Mitigation Status |
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| Risk Reference: 204 |
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| Risk | Mitigation Strategy |
|---|---|
| AT&T Vault - New Sewer Work south of Bryant | 1. Continue negotiations/ coordination with utility owners. |

Initial Assessment: 2, 2, 4

Current Assessment: 2, 2, 4 – 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.

Risk Mitigation Status**Risk Reference: 205**

| Risk | Mitigation Strategy |
|--|---|
| 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 |

Initial Assessment: X, X, X**Current Assessment:** X, X, X – Construction Risk**Risk Owner:** E. Stassevitch/M. Benson**Status Log:**

December Meeting 2012:

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

January 2013:

1. CMod Task force continues to demonstrate the process is work.
2. Task force process has slowed down submission of changes from Contractor

Risk Mitigation Status

Risk Reference: 206

| Risk | Mitigation Strategy |
|--------------------------------------|---|
| Delay in Decision on Retrieval Shaft | <ol style="list-style-type: none">1. Establish Task Force to focus on issues2. Meet Regularly and Act promptly on issues3. Keep Decision makers informed4. Keep Community Informed5. Keep Stakeholders informed |

Initial Assessment: X, X, X

Current Assessment: X, X, X – Construction Risk

Risk Owner: R. Redmond/ Mark Benson

Status Log:

Risk Mitigation Status**Risk Reference: 207**

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

Initial Assessment: 3, 3, 9**Current Assessment:** 3, 3, 9 – Construction Risk**Risk Owner:** G. Hollins**Status Log:**

Risk Mitigation Status

Risk Reference: 208

| Risk | Mitigation Strategy |
|---|--|
| Additional cost if we change direction in going to the Pagoda | <ol style="list-style-type: none">1. Develop Scope with designers currently under contract2. Agree to alignment and details of new shaft location3. Issue PCC to Contractor4. Initial site works and borings if necessary5. Obtain appropriate permits |

Initial Assessment: 3, 3, 8

Current Assessment: 3, 3, 8 – Construction Risk

Risk Owner: R. Redmond/M. Benson

Status Log:

Risk Mitigation Status

Risk Reference: 209

| Risk | Mitigation Strategy |
|--|---|
| Implementing Pagoda Option - Obtaining Environmental Clearance | <ol style="list-style-type: none">1. Engage Planning Dept. to outline required actions2. Develop necessary CEQA documents in concert with Planning Dept.3. Meet with FTA and determine NEPA and SHPO requirements |

Initial Assessment: X, X, X

Current Assessment: X, X, X – Construction Risk

Risk Owner: R. Edwards

Status Log:

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| Risk Mitigation Status |
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| Risk Reference: 210 |
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| Risk | Mitigation Strategy |
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| Mission Bay Loop Grant – Needs to be built to allow for train turnarounds (June 2013) | 1. Identify timeline for grant funding |

Initial Assessment: X, X, X

Current Assessment: X, X, X – Construction Risk

Risk Owner: R. Edwards

Status Log:

Risk Mitigation Status**Risk Reference: A**

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

Initial Assessment: 4, 1, 10**Current Assessment:** 1, 1, 2 – Design Risk**Risk Owner:** C. Campillo**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.

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| Risk Mitigation Status |
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| Risk Reference: A |
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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.

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| Risk Mitigation Status |
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| Risk Reference: A |
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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 4th Street continues no impact to 1256 schedule.

September 2012 Meeting:

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

October 2012 Meeting:

1. Included as D&B element in combined contract

December 2012 Meeting:

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

January 2013 Meeting:

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

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| Risk Mitigation Status |
| Risk Reference: T |

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

Initial Assessment: 2, 2, 4
Current Assessment: 2, 2, 4 – 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
- 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.

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| Risk Mitigation Status |
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| Risk Reference: T |
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January 2013:

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

Risk Mitigation Status**Risk Reference: V**

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

Initial Assessment: 3, 2, 6**Current Assessment:** 3, 2, 6 – 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.

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

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

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

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

December 2012:

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

January 2013:

1. No additional request to report from SFMTA.

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| Risk Mitigation Status |
| Risk Reference: PR73 |

| Risk | Mitigation Strategy |
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| Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities | Early engagement and coordination for agreements and plan development to avoid construction delays. |

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

Status Log:

- March 2012 Meeting:
1. Project team continues to coordinate with 3rd party utility agencies (AT&T, PG&E, SFDT) to complete construction and cutover of facilities designed under CN1250 & CN1251.
- May 2012 Meeting:
1. Met with SFDT to confirm the scope of work that they will perform for the Systems contract.
- June 2012 Meeting:
1. Agreements on scope of work with SFDT are being sought.
- August 2012 Meeting:
1. MOU written to DTIS to define scope. Awaiting concurrence. SFFD reviewing 90-100% design no comments received to date.
- September 2012 Meeting:
1. Central subway following up DTIS
- October 2012 Meeting:
1. Follow up with DTIS still required, verbal concurrence received
 2. 3rd Party Utilities
 - a. 1300 Utility relocations – status to be advised next meeting
 - b. 1256 utility relocations – confirmation and schedule required – follow up next meeting
- November 2012 Meeting:
1. Follow up with DTIS still required
 2. 3rd Party Utility
 - a. 1300 Utility relocations – High level timeframes to be obtained from utility owners
 3. 1256 Utility relocations
 - a. Confirmation and schedule to be sought from affected utilities.
 - b. AT&T to advise high level time frames should relocation of the duct bank (east side of 4th street, south of Bryant) be required.

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| Risk Mitigation Status |
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| Risk Reference: PR73 |
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December 2012:

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

January 2013:

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

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Central Subway Project San Francisco | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| REV : 17 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="float: right; margin-left: auto;"> <tr> <th colspan="2">Risk Profile</th> <th colspan="5">Severity Score</th> </tr> <tr> <th>Likelihood Score</th> <th></th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> </tr> <tr> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | | | | | | | | | | | Risk Profile | | Severity Score | | | | | Likelihood Score | | 1 | 2 | 3 | 4 | 5 | 5 | | | | | | | 4 | | | | | | | 3 | | | | | | | 2 | | | | | | | 1 | | | | | | |
| Risk Profile | | Severity Score | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Likelihood Score | | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1" style="float: right; margin-left: auto;"> <tr> <th></th> <th>Low (1)</th> <th>Medium (2)</th> <th>High (3)</th> <th>Very High (4)</th> <th>Significant (5)</th> <th>Legend</th> </tr> <tr> <td>Probability</td> <td>< 10%</td> <td>10% - 50%</td> <td>> 50%</td> <td>75% - 90%</td> <td>> 90%</td> <td>< 3 Low</td> </tr> <tr> <td>Cost Impact</td> <td>< \$250K</td> <td>\$250K - \$1M</td> <td>\$1M - \$3M</td> <td>\$3M - \$10M</td> <td>> \$10M</td> <td>3 - 9 Medium</td> </tr> <tr> <td>Schedule Impact</td> <td>< 1 Month</td> <td>1 - 3 Months</td> <td>3 - 6 Months</td> <td>6 - 12 Months</td> <td>> 12 Months</td> <td>> 10 High</td> </tr> </table> | | | | | | | | | | | | | | | | | | Low (1) | Medium (2) | High (3) | Very High (4) | Significant (5) | Legend | Probability | < 10% | 10% - 50% | > 50% | 75% - 90% | > 90% | < 3 Low | Cost Impact | < \$250K | \$250K - \$1M | \$1M - \$3M | \$3M - \$10M | > \$10M | 3 - 9 Medium | Schedule Impact | < 1 Month | 1 - 3 Months | 3 - 6 Months | 6 - 12 Months | > 12 Months | > 10 High | | | | | | | | | | | | | | | | | | | | | |
| | Low (1) | Medium (2) | High (3) | Very High (4) | Significant (5) | Legend | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Probability | < 10% | 10% - 50% | > 50% | 75% - 90% | > 90% | < 3 Low | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cost Impact | < \$250K | \$250K - \$1M | \$1M - \$3M | \$3M - \$10M | > \$10M | 3 - 9 Medium | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schedule Impact | < 1 Month | 1 - 3 Months | 3 - 6 Months | 6 - 12 Months | > 12 Months | > 10 High | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Underground Tunnel | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | TUN | 10.07.1 | Guideway Tunnels | Additional night shift work required at portal launch box due to bus storage facility relocation delay | Work with TJPA to coordinate construction schedules and GGB to coordinate Traffic Routing. | 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 | TUN | 10.07.2 | Guideway Tunnels | 42"/48" sewer line relocated as part Utility 1 package is damaged by subsequent construction of the launch box. | 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 | TUN | 10.07.13 | Guideway Tunnels | 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 | TUN | 10.07.14 | Guideway Tunnels | 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 | 3 | 4 | 1 | 2.5 | 50% | 7.5 | 15 | Risk is considered active, with mitigation measures fully developed with the exception of Bus Bridge. Adjusted cost impact lower resulting in Risk rating increasing to 2 but still remains a low risk. | 8/28/13 TUN1120 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | TUN | 10.07.15 | Guideway Tunnels | Flowing groundwater in vicinity of UMS Station could make adequate annulus grouting difficult. | 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 | TUN | | Guideway Tunnels | Underground obstructions tunnel and retrieval shaft | Include differing site conditions in GPs as well as DRB to adjudicate conflicts and minimize costs | C | 2 | 2 | 3 | 3 | 35% | 5 | 10 | Mitigation measures have been implemented. Maintain adequate contingency throughout tunnel construction | 2/5/14 TUN1124 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PR1 | TUN | | Guideway Tunnels | Actual TBM production rate may be slower than forecasted. | Assign significant liquidated damages for not meeting specific schedule dates. | 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 | TUN | | Guideway Tunnels | Damage / settlement 3x 5' to old brick sewer running parallel to tunnel alignment | Slip Line 3'x5' brick sewer before TBM reaches CTS. | 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 | TUN | | Guideway Tunnels | 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 | TUN | | Guideway Tunnels | 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 | TUN | | Guideway Tunnel | Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently qualify of end walls. | 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 | TUN | | Guideway Tunnel | TBM procurement, delivery and assembly takes longer than assumed in schedule. | Accommodate delay to TBM procurement and delivery, on the order of 2 or 3 months, with current float shown on the construction schedule. | C | 2 | 2 | 2 | 2 | 35% | 4 | 8 | Mitigation measures are being implemented | 5/20/13 TUN1095 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B | TUN | | Guideway Tunnel | 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 | MOS | 20.03.01.2 | Moscone Station | Incomplete cutoff of groundwater at MOS | 1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. | C | 1 | 1 | - | 1 | 10% | 1 | 1 | Mitigation measure to be made part of the contract documents | 4/28/15 MOS1150 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | | Risk Profile | | Legend | | | | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | |
|--------------------------------------|--------------|--------------------|------------------------------------|---|---|---------------|---------------|-------------|-----------------|-------------|--------|-------------|-------|--|---|--------------------|---|---|----------|-----------------|---|----------------|---------|--------------|-------------|-------|-------------|-------|---------|---|
| Central Subway Project San Francisco | | | | | | | | | | | | | | Likelihood Score | | Severity Score | | | | | SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | |
| REV : 17 | | | | | | | | | | | | | | 5 | 4 | 3 | 2 | 1 | 1 | 2 | 3 | 4 | 5 | < 10% | < 10% - 50% | > 50% | < 75% - 90% | > 90% | < 3 Low | 2 |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | | 5 | 4 | 3 | 2 | 1 | < \$250K | < \$250K - \$1M | < \$1M - \$3M | < \$3M - \$10M | > \$10M | 3 - 9 Medium | > 10 High | | | | | |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | | | | | |
| 22 | MOS | 20.03.01.5 | Moscone Station | 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 | 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 | MOS | | Moscone Station | 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 | MOS | | Moscone Station | Loss of business results in unanticipated restrictions on construction at MOS. | 1. Public outreach. 2. Maintain regular and open communications so Merchants know construction plans and progress at all times. 3. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOEWD to increase cleanup of the area and assist pedestrians across streets. 6. Include this work in cost & schedule estimates. | C | 1 | 2 | 1 | 2 | 10% | 2 | 3 | Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses. | 4/28/15 MOS1150 | | | | | | | | | | | | | | | |
| Ums Station | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| F | UMS | | Union Square market Street Station | Underground obstructions Stations (UMS) | 1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings. | C | 4 | 2 | 2 | 2 | 80% | 8 | | Mitigation measures have been implemented. | 8/12/15 UMS 1320 | | | | | | | | | | | | | | | |
| 28 | UMS | 20.03.02.2 | Union Square market Street Station | Incomplete cutoff of groundwater at UMS. | 1. If needed, perform grouting to mitigate the intrusion of groundwater. 2. Include in cost & schedule estimates. | C | 8 | 2 | 1 | 2 | 0% | 12 | 24 | Mitigation measures in the form of consolidation grouting to be included in contract documents | 8/12/15 UMS1320 | | | | | | | | | | | | | | | |
| 32 | UMS | 20.03.02.9 | Union Square Market Street Station | 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 | UMS | 20.03.02.10 | Union Square market Street Station | 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 | UMS | 20.03.02.11 | Union Square market Street Station | 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 | | | | | | | | | | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | | Risk Profile | | Legend | | | | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | |
|--------------------------------------|--------------|--------------------|--|---|--|---------------|---------------|-------------|-----------------|-------------|--------|-------------|-------|--|-----------------------|----------------|---|---|---------|--------------|---|---------------|-----------------|--------|--------------|----------|
| Central Subway Project San Francisco | | | | | | | | | | | | | | Likelihood Score | | Severity Score | | | | | SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | |
| REV : 17 | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | Low (1) | Medium (2) | High (3) | Very High (4) | Significant (5) | <3 Low | 3 - 9 Medium | >10 High |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | | 5 | 4 | 3 | 2 | 1 | < 10% | <= 10% - 50% | > 50% | <= 75% - 90% | > 90% | 2 | 2 | |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | |
| 35 | UMS | 20.03.02.14 | Union Square Market Street Station | Ground support structure causes groundwater table to rise which results in leakage into adjacent structures. (new structure might create a dam that results into leaks into new and existing structures) | 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 | UMS | 20.03.02.15 | Union Square Market Street Station | Damage to buildings or utilities as a result of heave from jet grouting at UMS. | Utilize tangent piles combined with surface jet grouting. | C | 1 | 1 | - | 1 | 10% | 1 | 1 | Mitigation measures implemented in contract documents to reduce risk | 4/14/15 UMS1310 | | | | | | | | | | | |
| 37 | UMS | 20.03.02.16 | Union Square market Street Station | Damage to adjacent buildings at UMS due to surface construction activities. | 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 | UMS | 20.03.02.17 | Union Square market Street Station | Tiebacks in Stockton Street mislocated (in path of walls and would have to be dug out within 20ft of surface level) | 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 | 1 | Mitigation measures fully implemented, Advance utility relocation contract (1251) confirmed location of tiebacks. Risk rating has been reduced due to a lowering of the probability of event occurring | 5/6/14 UMS1170 | | | | | | | | | | | |
| J | UMS | | ROW | Macy's entrance conflict with new piles | 1. Show known obstructions shown on as-built drawings on contract drawings. 2. Make as-built drawings available to contractor as reference drawings. 3. Have contractor field verify obstruction shown on as-built drawings and contract drawings | C | 3 | 1 | 1 | 1 | 50% | 3 | 6 | Known obstructions are shown on the ES drawings. Allowance for differing site conditions added to UMS Station contract. | 1/23/14 UMS1060 | | | | | | | | | | | |
| Q | UMS | | Union Square market Street Station | As-built drawings and UMS construction drawings do not contain enough information to produce shop drawings without significant surveying effort delaying construction north entrance. | 1. Investigate if electronic files of design can be given to the contractor. 2. Clearly define shop drawing criteria in the technical specifications. 3. Make as-built drawings available as reference drawings to the contractor | C | 3 | 1 | 1 | 1 | 50% | 3 | 6 | Specifications require contractor to survey USG in order to develop shop drawings for structural steel. | 3/24/12 UMS1280 | | | | | | | | | | | |
| CTS Station | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 46 | CTS | 20.03.03.2 | Chinatown Station and crossover cavern | Public complaints result in unanticipated restrictions on construction at CTS. (schedule and estimate for underground work assumes 6 day work week and 2 shifts per day) | 1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 6. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 7. Quickly process and resolve damage and accident claims from the Public. 8. Include this work in cost & schedule estimates. | C | 2 | 5 | 1 | 3 | 35% | 6 | 12 | Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents. | 10/9/17 CTS1500 | | | | | | | | | | | |
| 48 | CTS | 20.03.03.6 | Chinatown Station and crossover cavern | Incomplete drawdown of groundwater. (inside of box and inside of caverns) | 1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. 3. Include allowance for dewatering within cavern during construction. | C | 2 | 2 | 1 | 2 | 35% | 3 | 6 | Mitigation measures have been included in contract documents | 5/1/16 CTS1140 | | | | | | | | | | | |
| 50 | CTS | 20.03.03.11 | Chinatown Station and crossover cavern | CTS station contractor delayed by tunnel contractor since station platform construction cannot start until tunnels have been finished. | 1. Include provisions in CTS contract identifying the potential waiting period for tunnel contractor. 2. Actively monitor progress towards schedule milestones | C | 2 | 1 | 2 | 2 | 35% | 3 | 6 | Constraints on CTS contractor added to specification "Work Sequence and Constraints" | 12/16/13 TUN1122 | | | | | | | | | | | |
| 52 | CTS | 20.03.03.12 | Chinatown Station and crossover cavern | Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL) | 1. Evaluate effect of potential settlement on utilities. 2. Slip-line sewer by TBM contractor. 3. Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed. 4. Have contingency repair/restoration plan. 5. Utility contact information and procedure will be on plans. 6. Develop an allowance for utility repair. 7. Include probable cost in estimate. | C | 3 | 3 | 1 | 2 | 50% | 6 | 12 | Project configuration change, lowered station 25 ft. reducing the probability of this risk. Risk rating lowered. | 4/22/16 N-CTS9730 | | | | | | | | | | | |
| F | CTS | | Chinatown Station and crossover cavern | Underground obstructions stations (CTS) | 1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings | C | 4 | 2 | 2 | 2 | 80% | 8 | 1 | Mitigation measures have been implemented. | 10/9/17 CTS1500 | | | | | | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | | Risk Profile | | Legend | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | |
|--------------------------------------|--------------|--------------------|--|--|---|---------------|---------------|-------------|-----------------|-------------|--------|-------------|-------|--|-----------------------|----------------|---|---|---------|------------|-----------|---------------|-----------------|--------------|----------|---|
| Central Subway Project San Francisco | | | | | | | | | | | | | | Likelihood Score | | Severity Score | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | |
| REV : 17 | | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | Low (1) | Medium (2) | High (3) | Very High (4) | Significant (5) | 3 - 9 Medium | >10 High | 2 |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | | 5 | 4 | 3 | 2 | 1 | < 10% | < \$250K | < 1 Month | < 10% | > 90% | 3 - 9 Medium | >10 High | SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | |
| U | CTS | | Chinatown Station and crossover cavern | Proximity at junction of head house boundary wall and school yard may result in relocation of school yard during wall construction | | C | 1 | 1 | 1 | 1 | 10% | 1 | 2 | Project configuration changed to eliminate encroachment. Risk converted to Construction risk from Risk 55. | 8/16/13 CTS1010 | | | | | | | | | | | |
| General | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 56 | GEN | 40.00.1 | Unallocated Contingency | Escalation more / less than expected (Increase in bid prices to hedge possible increases in cost of volatile commodities.) | 1. In the current economic environment, escalation is just as likely to be less as more than anticipated. 2. For volatile materials and equipment, provide substantial payment for stored materials and equipment to encourage early procurement and an escalation clause for volatile commodities in contracts. | M | 2 | 3 | - | 2 | 35% | 3 | 6 | Current projected escalation rates remain below those reflected in Program budget. | 1/10/18 STS1042 | | | | | | | | | | | |
| Demolition, Clearing, Earthwork | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Site Utilities, Utility relocations | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 60 | UTL | 40.02.6 | Utilities | Utility companies do not complete relocations in timely manner. (UTY 1 and UTY 2) | 1. Continue negotiations with utility owners. 2. PM/CM will assist utilities with access and to schedule their work. 3. Require Utility Relocation contractor to provide assistance to utilities. 4. Include in contract allowance for Contractor to assist Utilities and incentive for early completion. 5. Enforce franchise requirements. | C | 2 | 1 | 1 | 2 | 35% | 4 | 4 | Work is complete on one advanced contract and underway on the other. | 6/31/12 N-ATT00100 | | | | | | | | | | | |
| 61 | UTL | 40.02.7 | Utilities | Utility relocation is delayed due to non-standard materials not being available. (UTY 1 and UTY 2) AWSS special material ? | Work with utilities and contractor to identify and acquire non-standard materials well in advance of time that they are needed. | C | 1 | 1 | 3 | 2 | 10% | 2 | 4 | Mitigations measures being implemented to manage risk | 6/7/12 PC 00-020 | | | | | | | | | | | |
| A | STS | | Utilities | Timely resolution of Sewer lines south of portal. | 1. Develop alternatives that do not require creation of a new sewer line. 2. Work together with SFPUC to find mutually beneficial solutions. . 3. Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies. 4. Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS. | R | 1 | 2 | 1 | 2 | 10% | 2 | 3 | \$ 2.1 million in budget. Could be as high as \$8 million. Continuing to work with SFPUC to find solution. | 5/13/12 PDS 1870 | | | | | | | | | | | |
| Environmental Mitigations | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 65 | TUN | 40.04.1 | Environmental | 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 | MOS | | Environmental | 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 | 2 | 1 | 2 | 50% | 5 | 9 | Mitigated - Current exposure only to those amount above those currently identified | 4/28/15 TUN1150 | | | | | | | | | | | |
| 67 | UMS | | Environmental | 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 | 2 | 2 | 2 | 50% | 6 | 12 | Mitigation measures to be implemented in contract documents | 8/12/15 UMS1320 | | | | | | | | | | | |
| 68 | CTS | | Environmental | 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 | 2 | 2 | 2 | 50% | 6 | 12 | Mitigation measures to be implemented in contract documents | 10/9/17 CTS1500 | | | | | | | | | | | |
| Auto/bus/van access ways, roads | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 70 | GEN | 40.08.1 | Vehicle access | 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 | TUN | 40.08.2 | Vehicle access | Power supply interruptions to TBM's (no dual power feed currently planned) | Obtain TBM power directly from PG&E substation. | C | 1 | 2 | - | 1 | 10% | 1 | 2 | | 2/5/14 TUN1124 | | | | | | | | | | | |
| Train Control and Signals | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 72 | STS | 50.01.1 | Train Control and Signals | Interface new Signaling and Train Control system to existing at Fourth and King | Connect new system in parallel with existing system until the new system has been tested and safety certified for operation. | C | 2 | 2 | 3 | 3 | 35% | 5 | 10 | Awaiting approval of contract plans by Muni Operations. | 3/4/16 STS1045 | | | | | | | | | | | |
| 75 | STS | 50.01.1 | Train Control and Signals | Signals and Comms equipment may need to be stored off site | Require contractor to store equipment offsite or at the factory until it is needed. | C | 3 | 1 | - | 1 | 50% | 2 | 3 | Special Provisions address offsite storage. | 11/6/17 STS1070 | | | | | | | | | | | |
| PR73 | STS | 50.01.1 | Train Control and Signals | Delays or complications of design & construction by others - SF Dept. Of Technology, 3rd party utilities | Early engagement and coordination for agreements and plan development to avoid construction delays. | D | 2 | 1 | 1 | 1 | 35% | 2 | 4 | | 5/30/12 DP3C530 | | | | | | | | | | | |
| PR78 | STS | 50.01.1 | Train Control and Signals | 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 | | 2 | 4 | | 7/27/12 FDS 1940 | | | | | | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | Risk Profile | | Legend | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | | | |
|---|--------------|--------------------|---------------------------------------|--|---|---------------|---------------|-------------|-----------------|-------------|--------|-------------|------------------|---|-----------------------|---|---|----------|-----------------|---------------|----------------|---------|-----|--------|------|-----------|-------------|-------|
| Central Subway Project San Francisco | | | | | | | | | | | | | Likelihood Score | | Severity Score | | | | | | | | | | | | | |
| REV : 17 | | | | | | | | | | | | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | Low | Medium | High | Very High | Significant | Score |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | 5 | 4 | 3 | 2 | 1 | < 10% | < 10% - 50% | > 50% | < 75% - 90% | > 90% | < 3 | 3 - 9 | > 10 | < 3 | Low | |
| SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | | | | | | | | | | | 2 | 2 | 2 | 2 | 2 | < \$250K | < \$250K - \$1M | > \$1M - \$3M | < \$3M - \$10M | > \$10M | 2 | 2 | 2 | 2 | 2 | 2 |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | | | |
| Traffic signals & Crossing Protn. | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 76 | GEN | 50.05.2 | Traffic Signals & Crossing Protection | CS system may need re-design to new system (not yet identified - Coordinating with SFMTA Accessible Services on the wayfinding system for the visually impaired.) | Include new Landmarking/Wayfinding system requirements into stations. | D | 1 | 2 | - | 1 | 10% | 1 | 2 | DP3 preparing proposal to implement "Landmarking/Wayfinding" system | 7/27/12 FDS 1940 | | | | | | | | | | | | | |
| Purchase or lease of Real Estate | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 79 | TUN | 60.01.1 | ROW | 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 | | | | | | | | | | | | | |
| 80 | MOS | 60.01.2 | ROW | Delay in obtaining access to Moscone station sites (goes to condemnation). | 1. Assure that adequate float is contained in the Moscone schedule for condemnation. 2. Engage Owners in negotiations as soon as possible. 3. PM/CM to provide real estate specialists to facilitate. | R | 1 | 3 | 3 | 3 | 10% | 3 | 6 | Continuing to negotiate cost with owner in parallel with condemnation proceedings. | 7/1/12 FDS 1240 | | | | | | | | | | | | | |
| Vehicles | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 83 | GEN | 70.00.01 | Vehicles | Cost of vehicles may be more than estimated due to sole source and small order | Time the procurement of the vehicles to be part of the procurement of the existing Breda LRVs. | R | 4 | 4 | 4 | 4 | 80% | 16 | 32 | CSP vehicles to be included in overall SFMTA vehicle procurement contract. | 11/17/17 STS 1500 | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 89 | GEN | 80.02.2 | Final Design | 3rd Party reviews of Design documents delays completion of Final Design. | Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work. | D | 1 | 2 | 2 | 2 | 10% | 2 | 4 | 3rd Party coordination meeting ongoing. | 5/23/12 FDS 1930 | | | | | | | | | | | | | |
| Project Management for Design and Construction | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 94 | GEN | 80.04.3 | Project Management | Bid protests delay award and NTP for construction contracts | Strictly adhere to Procurement Best Practices and Protest Procedures. | M | 1 | 2 | 2 | 2 | 10% | 2 | 4 | Mitigation measures being implemented | 2/19/13 FDS 1900 | | | | | | | | | | | | | |
| 95 | GEN | 80.04.4 | Project Management | Contractor default during construction impacts schedule. (key sub-contractor) | Assist Bonding company in transition and to maintain schedule. | C | 1 | 2 | 2 | 2 | 10% | 2 | 4 | | 11/17/17 STS 1500 | | | | | | | | | | | | | |
| 97 | GEN | 80.04.6 | Project Management | Conflicts arising from Contractors working concurrently in the same work space results in delays and claims for additional costs (systems / civil interface) | Limit the number of contractors working in the same workspace by scheduling contracts appropriately and demobilizing contractors upon substantial completion. | C | 2 | 3 | 2 | 3 | 35% | 5 | 10 | Mitigation measures being implemented | 11/17/17 STS 1500 | | | | | | | | | | | | | |
| PR82 | GEN | | General | Confined work spaces along alignment can impact productivity and result in significant cost and schedule impacts. | Account for cost and schedule impacts in estimate and schedule for contract packages | C | 1 | 1 | 1 | 1 | 10% | 1 | 2 | | 11/17/17 STS 1500 | | | | | | | | | | | | | |
| 99 | GEN | 80.04.8 | Project Management | Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule. | 1. Executive partnering and alternate dispute resolution. 2. Provide incentives in construction contracts in addition to penalties | C | 2 | 5 | 3 | 4 | 35% | 8 | 16 | Mitigation measures being implemented | 7/27/12 FDS 1940 | | | | | | | | | | | | | |
| 100 | GEN | 80.04.9 | Project Management | Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM) | 1. Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement. 2. Monitor procurement of critical items. | M | 1 | 2 | 2 | 2 | 10% | 2 | 4 | Not considered a project risk. | 11/17/17 STS 1500 | | | | | | | | | | | | | |
| 102 | GEN | 80.04.11 | Project Management | Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs | 1. Actively manage contracts and include incentive provisions for early completion in critical contracts. 2. Add buffer float to critical path to actively manage schedule contingency | C | 2 | 1 | 2 | 2 | 35% | 3 | 6 | LONP 1 & 2 initiated to reduce this risk. See Risk 86. The mitigation of risks associated with early contracts will address this risk. Risk rating reduced due to mitigation measures implemented | 12/30/20 MS 0010 | | | | | | | | | | | | | |
| 107 | GEN | 80.04.12 | Testing and startup | Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get bonding) | Structure construction contracts not to exceed \$250 million | M | 2 | 5 | - | 3 | 35% | 5 | 10 | All contracts expected not to exceed \$250 million | 7/27/12 FDS 1940 | | | | | | | | | | | | | |
| T | GEN | 80.04.12 | Testing and startup | 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 | - | 2 | 35% | 4 | 10 | SFFD agreed to the proposed plan by SFMTA | 7/27/12 FDS 1940 | | | | | | | | | | | | | |
| V | GEN | | MOS & CTS Stations | Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract. | 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 | 3 | 2 | 2 | 2 | 50% | 6 | | 12/13/16 N-CTS1225 | | | | | | | | | | | | | | |
| PR37 | GEN | | Testing and startup | Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment | 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 | | | | | | | | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | Risk Profile | | Legend | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | |
|--------------------------------------|--------------|--------------------|-------------------------|---|---|---------------|---------------|-------------|-----------------|-------------|--------|------------------|-------|--|-----------------------|---|---|---|--|
| Central Subway Project San Francisco | | | | | | | | | | | | Likelihood Score | | Severity Score | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | | | |
| REV : 17 | | | | | | | | | | | | 5 | 1 | 2 | 3 | 4 | 5 | 2 | |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | 4 | 1 | 2 | 3 | 4 | 5 | 3 - 9 Medium | |
| | | | | | | | | | | | | 3 | 1 | 2 | 3 | 4 | 5 | >10 High | |
| | | | | | | | | | | | | 2 | 1 | 2 | 3 | 4 | 5 | SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | |
| | | | | | | | | | | | | 1 | 1 | 2 | 3 | 4 | 5 | | |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | |
| Insurance, permits etc | | | | | | | | | | | | | | | | | | | |
| 103 | GEN | 80.06.1 | Permits | 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 | STS | 80.06.2 | Approvals | 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 | GEN | 80.06.3 | Testing and startup | 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 | GEN | 80.06.4 | Labor relations | Risk of Labor dispute delaying the work. | Enforce designated gate for employees of the contract in dispute so that the rest of the work is not delayed. | C | 3 | 3 | 2 | 3 | 50% | 8 | 15 | | 11/17/17 STS 1500 | | | | |
| Unallocated Contingency | | | | | | | | | | | | | | | | | | | |
| 111 | GEN | | Unallocated Contingency | 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 | GEN | | Unallocated Contingency | 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 | | | | |
| 197 | GEN | | Project Management | The untimely delivery of FFGA funds to the project causes shortfalls in cash flow and the Central Subway will be unable to meet its financial commitments | 1. Establish procedure and timeline for receipt of FFGA funds 2. Monitor status of available bridging funds 3. At the start of the 1st quarter of 2013, present the Director of Transportation with a Project cash flow that shows the "what-if" scenario that shows a delay in federal funds in Oct. of 2013 | C | | | | | 0% | - | - | | | | | | |
| 198 | GEN | | Project Management | Outreach efforts to get more bidders - (SSTS) 1300 Contract | 1. Develop a Contractor Outreach Plan: 2. Engage in extensive contractor outreach and promote assurances of being a reasonable contract partner. | M | 1 | 5 | 2 | 4 | 10% | 4 | 7 | | | | | | |
| 199 | GEN | | Project Management | No interests from potential bidders although participated in outreach meet and greet | Deemed by the Risk Committee to not represent at risk or replicated a risk already established. | M | - | - | - | - | 0% | - | - | | | | | | |
| 200 | SSTS | | Project Management | Dealing with Larger Contracting Group | Deemed by the Risk Committee to not represent at risk or replicated a risk already established. | C | - | - | - | - | 0% | - | - | | | | | | |
| 201 | GEN | | Project Management | Bid Protest - (SSTS) 1300 Contract | 1. Establish and enforce appropriate qualifications requirement for contractors to be deemed a responsible bidder. | M | 1 | 1 | 1 | 1 | 10% | 1 | 2 | | | | | | |
| 202 | SSTS | | General | 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 | SSTS | | Project Management | Headwalls interface delay 1300 Contractor (SSTS) | 1. Meet and develop recovery schedule 2. Review possible Adjustment to 1300 interface | C | 3 | 3 | 2 | 3 | 50% | 8 | 15 | | | | | | |
| 204 | SSTS | | Utilities | 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 | 2 | 2 | 35% | 4 | 8 | | | | | | |
| 205 | GEN | | Project Management | 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 | | | | | 0% | - | - | | | | | | |
| 206 | TUN | | Project Management | Delay in Decision on Retrieval Shaft | 1. Establish Task Force to focus on issues 2. Meet Regularly and Act promptly on issues 3. Keep Decision makers informed 4. Keep Community Informed 5. Keep Stakeholders informed | C | 3 | 4 | 2 | 3 | 50% | 9 | 18 | | | | | | |
| 207 | TUN | | Project Management | Implementing Pagoda Option for Retrieval Shaft - Delay in Obtaining Property | 1. Obtain clear understanding of current status of property 2. Meet with Owner and determine best options for SFMTA needs. 3. Establish Special Use District to retain existing development rights, in addition to new land use entitlements. 4. Obtain Appraisal 5. Identify Funding 6. Confirm hazardous abatement | C | 3 | 4 | 2 | 3 | 50% | 9 | 18 | | | | | | |

Risk Register

| PROJECT RISK REGISTER | | | | | | | | | | | | | | Risk Profile | | Legend | | | | | | | | | | | |
|--------------------------------------|--------------|--------------------|--------------------|---|--|---------------|---------------|-------------|-----------------|-------------|--------|-------------|-------|------------------|-----------------------|----------------|--|-------------|--|-----------------|--|-----------------|--|---------------|--|---|--|
| Central Subway Project San Francisco | | | | | | | | | | | | | | Likelihood Score | | Severity Score | | Low (1) | | Medium (2) | | High (3) | | Very High (4) | | Significant (5) | |
| REV : 17 | | | | | | | | | | | | | | 5 | | HIGH | | < 10% | | < \$250K | | < 1 Month | | < 3 | | RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | |
| DATE ISSUED : 01/10/13 | | | | | | | | | | | | | | 4 | | MEDIUM | | < 10% - 50% | | < \$250K - \$1M | | < 1 - 3 Months | | 3 - 9 | | 2 | |
| | | | | | | | | | | | | | | 3 | | LOW | | > 50% | | < \$1M - \$3M | | < 3 - 6 Months | | > 10 | | SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) | |
| | | | | | | | | | | | | | | 2 | | | | < 75% - 90% | | < \$3M - \$10M | | < 6 - 12 Months | | > 10 | | | |
| | | | | | | | | | | | | | | 1 | | | | > 90% | | > \$10M | | > 12 Months | | > 10 | | | |
| | | | | | | | | | | | | | | | | | | > 10 | | High | | | | | | | |
| Final Risk ID | Contract I.D | Muni Risk REF. I.D | Type | Risk Description | Mitigation Description | Risk Category | Probability % | Cost Impact | Schedule Impact | Calc Impact | Calc % | Risk Rating | Score | Status | Must Complete by Date | | | | | | | | | | | | |
| 208 | TUN | | Project Management | Implementing Pagoda Option - Develop Documents for Design Build | 1. Develop Scope with designers currently under contract 2. Agree to alignment and details of new shaft location 3. Issue PCC to Contractor 4. Initial site works and borings if necessary 5. Obtain appropriate permits | C | 3 | 3 | 2 | 3 | 50% | 8 | 15 | | | | | | | | | | | | | | |
| 209 | TUN | | Project Management | Implementing Pagoda Option - Obtaining Environmental Clearance | 1. Engage Planning Dept to outline required actions 2. Develop necessary CEQA documents in concert with Planning Dept. 3. Meet with FTA and determine NEPA and SHPO requirements | C | | | | - | 0% | - | - | | | | | | | | | | | | | | |
| 210 | Gen | | Project Management | Mission Bay Loop Grant – Needs to be built to allow for train turnarounds (June 2013) | 1. Identify timeline for grant funding | C | | | | - | 0% | - | - | | | | | | | | | | | | | | |