

Risk Mitigation Meeting Minutes #72

DATE: July 30, 2015

MEETING DATE: **July 9, 2015**

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

TIME: 2:00pm

ATTENDEES: John Funghi, Eric Stassevitch, Beverly Ward, Bill Byrne

COPIES TO: Attendees: Roger Nguyen, Alex Clifford, Albert Hoe, Mark Latch, John Lackey, Jane Wang, Sanford Pong, Luis Zurinaga, Jeffrey Davis
File: M544.1.5.0820

REFERENCE: Project No. M544.1, Contract No. 149 Task 1-4.01
Program/Construction Management

SUBJECT: **Risk Management – Risk Mitigation Meeting
Risk Mitigation Report No. 72**

RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	Report on Red Risk and – (Risk rating ≥ 6)	
	<p>Risk 222: ARGUS Monitoring Software - Sharing Instrumentation for CN1252 and CN1300 <u>Discussion:</u> Work continues towards gathering the related CN1252 submittal documentation to be forwarded to the 1300 Contractor. Risk Rating 6</p> <p>Risk 226: 4th and King Street - Potential time for planned work shutdown - Contractor not able to perform the work in the manner prescribed <u>Discussion:</u> A meeting was held with SFMTA Operations on 07/09/15, to discuss the specific requirements of the 1st weekend shutdown. The meeting yielded several actions items to include as follows:</p> <ol style="list-style-type: none"> 1) Need to install a temporary platform north of the double crossover on King Street. 2) The need to identify that the existing switches will operate in reverse the mode from 4th Street onto King to accommodate for the pull out of trains from MME. 3) The need to have one inspector each, located at the temporary platform and the N-Judah platform to control the single tracking between the double crossover and the N-Judah platform. 4) Also to include an identical street inspection operation at the 4th and Berry station and the channel single crossover as required to provide T-Line service on 	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>southern end.</p> <p>5) A PowerPoint presentation showing the operations of N-Judah line, the T-Line pullout, and then the diesel bus service along Embarcadero station, because the T-Line will not be served from 4th and Berry to the Embarcadero station.</p> <p>6) A PowerPoint slide presentation on the pedestrian movements.</p> <p>The Chief concerns for SFMTA Operations is the pulling out the T- Line from the barn. A request has been made for the Contractor to provide an status update to Operations twice a week, and as the date gets closer to Labor day a update should be provided each day. Risk Rating 9</p> <p>Risk 225: Ellis Street Utilities (unknown underground utilities) <u>Discussion:</u> Excavation work has just started. Risk will remain open until invert slab is in place. Risk Rating 5</p> <p>Risk 232: Behind Schedule - Unable to Recover from Delay to 1300 Contract <u>Discussion:</u> A schedule analysis continues to be developed and outlined structure establish to ascertain the number of days the Contractor is behind schedule. Risk Rating 12</p> <p>Risk 233: Acceptance of Shotcrete Substitution - leads to final product being inferior in performance <u>Discussion:</u> The Contractor is working towards submittal plan to demonstrate the requested design parameters performance base for concrete in using the shotcrete method instead. Risk Rating 9</p> <p>Risk 234: Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence <u>Discussion:</u> Contractor submittal is still pending. No response was received to the Designer of Record suggested geometry change. Risk Rating 7</p>	
2 -	<p>Report on Remaining Requirement Risks (Risk rating ≤ 6)</p>	
	<p>Risk 79: Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected - Risk Rating 1</p> <p>Risk 104: CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows - Risk Rating 5</p> <p>No new information was reported on the two remaining requirement risk. Visibility of these risks will continue to be present on future agendas until they have been completely mitigated.</p>	
3-	<p>Active Construction Risk</p>	
	<p>Risk 72: Interface new Signaling and Train Control system to existing at Fourth and King <u>Discussion:</u> SFMTA has retracted approval of the Contractor's proposed use of H& K train switch machine. Offering TPC the opportunity to use the enhance Irwin switch for the signaling and train control system at 4th and King. A PCC was issued to the Contractor for a price quote to procure the four track switches required. Risk Rating 5</p> <p>Risk 204: Relocation of AT&T Vault and other utilities delays Work south of Bryant <u>Discussion:</u> Post Meeting Note: The RE reports all cable materials have arrived. AT&T's crew is anticipated to mobilize the week of 07/13/2015. Risk Rating 3</p>	


ITEM #	DISCUSSION	ACTION BY DUE DATE
	<p>Risk 211: Differing site conditions encountered during ground freezing of Cross Passage results in increased costs <u>Discussion:</u> The Contractor has yet to submit a change order request for this work. Risk Rating 4</p> <p>Risk 216: Olivet building potential construction impact <u>Discussion:</u> Demolition work is still pending. Coordination discussions with the Developer and Sustainable Streets regarding timing of sidewalk handover is taking place. Risk Rating 2</p> <p>Risk 235: Sewer work running up and down Stockton Street <u>Discussion:</u> The Construction team needs to perform an investigation in this area to understanding the current risk remaining to the Program. Risk Rating 2</p>	
4 -	Risk Mitigation/Assessment NEW RISK	
	<p>Risk 237: Non-Conforming work is not identified by TPC's Quality Control Program <u>Discussion:</u> This risk title has been revised. During the July Partnering meeting the need for a Quality Assurance Task Force meeting was discussed. This meeting will be implemented and is to occur every other week. Risk Rating TBD</p> <p>Risk 238: Quality Program is ineffective in processing the nonconformance items causing schedule impacts <u>Discussion:</u> The Contractor is still having trouble documenting their work performed in a timely fashion. SFMTA suggest as a potential mitigation strategy be added. To open up in CM13 a module allowing the Contractor to track noncompliance for nonconformance reports. Risk Rating TBD</p>	
	No new risk was added to this month Risk Register.	

ACTION ITEMS –

ITEM #	MTG DATE	DESCRIPTION	BIC	DUE DATE	STATUS
4	12/13/12	Risk 72 – 4th & King (SSWP)	S. Pong C. Morganson	08/06/15	Open
3	05/07/15	Risk 72 – 4th & King - Develop a test plan checklist for recertifying	S. Pong	08/06/15	Open
3	05/07/15	Risk 72 – 4th & King - TPC needs to fill the position of a system integrator	TPC	08/06/15	Open

Meeting adjourned at 3:45pm

These meeting minutes have been prepared by B. Ward and reviewed by A. Hoe, 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: 10/24/15 [Date review completed.]

Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 72
July 09, 2015
2:00pm– 4:00pm
 Central Subway Project Office
 821 Howard St. 2nd Floor
 Main Conference Room

Attendees:

William Byrne		Mark Latch		Beverly Ward	
John Funghi		Roger Nguyen		Luis Zurinaga	
Albert Hoe		Eric Stassevitch			

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

- Construction Risks (222, 226, **232**, 233, 234)

2. Remaining Requirement and Design Risks

- Requirement Risks (79, 104)

3. Active Risks

- Construction Risks (72, 204, 211, 225, 216, 235)

4. New Risk - Requiring Mitigation Strategy and Assessment

- 237 - Quality Control Program is not effective in identifying nonconformance work
- 238 - Quality Program is ineffective in processing the nonconformance items causing schedule impacts
- 239 - Revenue Service Delay

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. 72

July 09, 2015




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
Bill Byrne	DEA/PMOC	720-225-4669	BByrne@deainc.com	BZ
Jeffrey Davis	FTA	415-744-2594	Jeffrey.s.davis@dot.gov	
John Funghi	SFMTA	415-701-4299	John.funghi@sfmta.com	
Albert Hoe	SFMTA	415-701-4289	Albert.hoe@sfmta.com	
John Lackey	DEA/PMOC	503-499-0596	jal@deainc.com	
Mark Latch	CSP	415-701-5294	Mark.latch@sfmta.com	
Roger Nguyen	SFMTA	415-701-4312	Roger.Nguyen@sfmta.com	
Eric Stassevitch	CSP	415-660-5407	Eric.stassevitch@sfmta.com	ES
Beverly Ward	CSP	415-701-5291	Beverly.ward@sfmta.com	
Luis Zurinaga	SFCTA	415-716-6956	luis@sfcta.org	
REDACTED				

Risk Mitigation Status
Risk Reference: 72

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

Initial Assessment: 2, 3, 5

Risk Owner: S. Pong

Current Assessment: Risk Rating 5 – Design Risk

Status Log:

October 2011 Meeting:

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

November 2011:

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

January 2012 Meeting:

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

February 2012:

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

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

1. Technical specifications now approved.

Risk Mitigation Status
Risk Reference: 72

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

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

December 2012 Meeting:

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

July 2013 Meeting:

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

October 2014:

1. Review of the designs constructability needs additional evaluation.
2. A swat team to include Program Management, RE and ARE will be created to address the interface issues between trackwork, signaling and train control system.

February 2015:

1. S. Pong to setup a meeting with the Designer (HNTB) to respond to outstanding questions related to signal and train control.

March 2015:

1. The meeting with HNTB (DP3) has yet to take place. S. Pong is still working on coordination.

April 2015:

1. Meeting took place between SFMTA and HNTB (DP3). A solution is still pending. The Designer needs to demonstrate their signaling phasing design similar to the track design.

May 2015:

1. The Contractor will submit a master plan to address the question of how they plan to recertify the 4th and Street intersection for revenue service.
2. TPC needs to fill the liaisons positions of a System Integrator.

June 2015:

1. SFMTA received contractor's master workplan on 5/18 and is under review.

Risk Mitigation Status

Risk Reference: 72

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

July 2015:

1. Approval of the H&K track switch machine submittal has been rescinded. See SFMTA Ltr 0765, dated June 17, 2015.
2. SFMTA has offered an alternative, to use the enhanced Irwin switch for train control. PCC 060 was issued to the Contractor to obtain a price quote to procure four track switches.

Risk Mitigation Status
Risk Reference: 204

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none"> 1. Continue negotiations/ coordination with utility owners. 2. Contract 1300 is required to coordinate with utility companies for relocations 3. SWAT team established to address utilities south of Bryant Street 4. Initiate utility coordination meetings 5. Proactively schedule AT&T resources

Initial Assessment: 2, 2, 4
Current Assessment: Risk Rating 3 – Construction Risk

Risk Owner: M. Acosta

Status Log:

December 2012:

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

January 2013:

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

February 2013:

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

March 2013:

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

April 2013:

1. Utility relocations may require a joint trench under the Contract 1300 design build scope.
2. If a joint trench is required under the contract the 1300 contractor would manage the implementation of the joint trench, SFMTA would manage the Form B process for reimbursement of the joint trench costs.

Risk Mitigation Status
Risk Reference: 204

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none"> 1. Continue negotiations/ coordination with utility owners. 2. Contract 1300 is required to coordinate with utility companies for relocations 3. SWAT team established to address utilities south of Bryant Street 4. Initiate utility coordination meetings 5. Proactively schedule AT&T resources

3. Mitigation strategy added that the 1300 contractor is required to coordinate with private utility companies.
4. A SWAT team has been established comprising DP-3 and the Design Oversight manager who are meeting weekly to address utilities south of Bryant. DP3 are preparing Notice of Intent letters for utilities to relocate.

May 2013:

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

July 2013:

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

October 2013:

1. DP-3 Tech memo being finalized
2. Relocation design and construction schedule to be developed

November 2013:

1. Coordination meetings with utility owners to occur on a regular basis, Tutor Perini are to be invited
 - a. AT&T plan for resource allocation, confirmation of assets and scheduling of work is to be confirmed as AT&T have very few resources who can complete cutover work
2. SFMTA are currently working with AT&T to establish a feasible location to relocate Vault 2081
3. The importance of this work is to be discussed at the next executive partnering meeting with Tutor

December 2013:

1. Letter was sent notifying the contractor of the criticality of this work and requesting a completion schedule
2. Potential vault location has been identified with AT&T. Feasibility is being confirmed via potholing

January 2014:

1. Potholing to confirm locations of utilities to commence the week of January 20th
2. AT&T are to be put on notice of the expected installation and cut over dates.

Risk Mitigation Status
Risk Reference: 204

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none"> 1. Continue negotiations/ coordination with utility owners. 2. Contract 1300 is required to coordinate with utility companies for relocations 3. SWAT team established to address utilities south of Bryant Street 4. Initiate utility coordination meetings 5. Proactively schedule AT&T resources

3. Proactively requesting and scheduling AT&T resources added to mitigation strategy.

February 2014:

1. Potholing of utilities has commenced.
2. At the last executive partnering meeting Tutor Perini were tasked with commencing utility coordination meetings.
3. 1/31/14 Letter (CN 1300 Misc. Letter No. 0023) a letter was sent to AT&T notifying them of key dates from Tutor Perini's baseline schedule and requesting AT&T schedule it's resources to meet Tutor Perini's dates.

March 2014:

1. Potholing of utilities is 99% complete. Potholing work at 4th and Townsend remains.
2. Current AT&T ductbank relocation design is constructible but will include relocation of a 20' segment of 12" waterline and shifting of existing AT&T cables.
3. Tutor Perini is projected to start installation of AT&T ductbank by early April 2014 pending completion of soil profile work.

April 2014:

1. Potholing of utilities is 100% complete.
2. There seem to be enough space for a new AT&T manhole and a 36" sewer force main without having to relocate a 20' segment of 12" waterline. Shifting of existing AT&T cables is still necessary at 4th/Bryant; the project team including AT&T Engineer have finalized the workplan to safely accomplish this task.
3. Tutor Perini's subcontractor, Abbett Electric started installation of AT&T ductbank. Abbett decided to temporarily stockpile excavated soils to its yard to be re-used as backfill. Surplus materials to be off hauled pending completion of soil profiling.
4. Risk probability has been reduced to a 1.

May 2014:

1. Installation of AT&T ductbank work continues. Surplus materials to be off hauled pending completion of soil profiling.
2. Expected completion of ductbank and vault installation is July 2014.

June 2014:

1. Installation of AT&T ductbank work continues. Surplus materials to be off hauled pending completion of soil profiling.
2. Expected completion of ductbank and vault installation is September 2014.

Risk Mitigation Status
Risk Reference: 204

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none"> 1. Continue negotiations/ coordination with utility owners. 2. Contract 1300 is required to coordinate with utility companies for relocations 3. SWAT team established to address utilities south of Bryant Street 4. Initiate utility coordination meetings 5. Proactively schedule AT&T resources

October 2014:

1. Installation of AT&T ductbank work continues. Surplus materials to be off hauled pending completion of soil profiling.
2. Expected completion of ductbank and vault installation is October 31, 2014 for the main trunk. At this time, AT&T can start cut-over process. Note that AT&T had recently requested to install six 4" conduits across Bryant Street. This request does not delay the cut-over start or extend the cut-over duration.

November 2014:

1. Installation of AT&T ductbank work continues. Surplus materials to be off hauled pending completion of soil profiling.
2. Expected completion of ductbank and vault installation is November 26, 2014 for the main trunk.
3. RE sent Miscellaneous City Letter #37 to put AT&T on notice of completion of main ductbank and start of cut-over work. AT&T had requested to install six 4" conduits across Bryant Street; PCC 23 was issued to Tutor. This request does not delay the cut-over start or extend the cut-over duration.

December 2014:

1. Installation of AT&T ductbank work continues. Surplus materials to be off hauled pending completion of soil profiling.
2. Expected completion of ductbank and vault installation is January 30, 2015 for the main trunk.
3. RE sent Miscellaneous City Letter #37 to put AT&T on notice of completion of main ductbank and start of cut-over work. AT&T had requested to install six 4" conduits across Bryant Street; PCC 23 was issued to Tutor. This request does not delay the cut-over start or extend the cut-over duration. RE has not received Tutor's cost proposal

January 2015:

1. No new update from December's report out.

February 2015:

1. Provide a price for BKF Design
2. Set up meeting with PUC

March 2015:

1. Completion of the ductbank work is almost done.
2. Discussions are taking place with AT&T requesting them to meet the original cut-over date. 12months form the date which was prior to any contract changes.

Risk Mitigation Status**Risk Reference: 204**

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	<ol style="list-style-type: none">1. Continue negotiations/ coordination with utility owners.2. Contract 1300 is required to coordinate with utility companies for relocations3. SWAT team established to address utilities south of Bryant Street4. Initiate utility coordination meetings5. Proactively schedule AT&T resources

April 2015:

1. Completion of the ductbank work by April 10, 2015.
2. Discussions are taking place with AT&T requesting them to meet the original cut-over date. 12months from the date which was prior to any contract changes.

May 2015:

1. Duct bank and vault work by the Contractor is now complete. AT&T has taken possession of the site.

June 2015:

1. Ductbank was signed over by TPC. Substantial completion of AT&T ductbank work occurred on April 16, 2015. This is the date in which the final mandrel report was made.
2. AT&T is in the process of ordering the cable.

July 2015:

1. All cable materials have arrived. AT&T cutover crew will mobilize as early as the week of 7/13/2015 and no later than the week of 7/20/15.

Risk Mitigation Status
Risk Reference: 211

Risk	Mitigation Strategy
Differing site conditions encountered during ground freezing of Cross Passage results in increased costs	<ol style="list-style-type: none"> 1. Contractor has submitted a 'no cost, no schedule' PCC for ground freezing 2. Need early review of work plan, and identification of entity that will perform the work 3. Review Plans 4. Monitor work at CP5 - to ensure no addl cost are incurred by Program

Initial Assessment: 2 (1, 2, 2) **Risk Owner:** A. Clifford/ E. Stassevitch
Current Assessment: Risk Rating 4 - Construction Risk

Status Log:

- February 2013:
1. Identified as a potential risk
 2. Majority of risk is carried by the 1252 Contractor
- March 2013:
1. Discuss and confirm risk description, mitigations and owner
 2. Contractor has submitted a no cost, no schedule PCC for ground freezing.
 3. **Recommended risk rating 2 (1, 2, 1)**
 - a. Probability (1), <50%, differing ground conditions are considered unlikely
 - b. Cost impact (2), \$250k to \$1m, additional costs would be limited to additional ground freezing work
 - c. Schedule impacts (1), <1 month, impact of additional work (if required) is expected to be minor
- May 2013:
1. Risk heading revised to include clarification "during ground freezing".
- October 2013:
1. Additional mitigation strategy added – Early review of work plan, and identification of entity that will perform the work.
- July 2014:
1. Ground freeze pipe installation began in June, and ground condition appears to be consistent in those anticipated.
- October 2014:
1. Freeze pipe installation is complete. Freeze plant has been installed and ground freeze has commenced.
 2. Contractor experienced difficulty and delay installing the freeze pipes.
 3. No notifications have been received for delay or differing site condition from the contractor.

Risk Mitigation Status**Risk Reference: 211**

Risk	Mitigation Strategy
Differing site conditions encountered during ground freezing of Cross Passage results in increased costs	<ol style="list-style-type: none"> 1. Contractor has submitted a 'no cost, no schedule' PCC for ground freezing 2. Need early review of work plan, and identification of entity that will perform the work 3. Review Plans 4. Monitor work at CP5 - to ensure no addl cost are incurred by Program

Initial Assessment: 2 (1, 2, 2)**Risk Owner:** A. Clifford/ E. Stassevitch**Current Assessment:** Risk Rating 4 - Construction Risk

November 2014:

1. Ground freezing commenced October 8, 2014. The latest approved schedule allows 42 days for ground freezing which would have ground freezing complete November 19th, 2014.
2. The Contractor is currently forecasting completion of the ground freeze November 30th which is 26 days later than the approved August schedule update date of November 4th.
3. No notifications have been received for delay or differing site condition from the contractor.

December 2014:

1. Excavation of Cross Passage 5 is almost complete (approximately 1' of sump remaining to be excavated as at 12/15/14)
2. No notifications have been received for delay or differing site condition from the contractor.
3. Risk retired by majority consent of the Risk Assessment Committee on 12/16/14

January 2015:

1. Due to the recent ground loss at CP5 with the ground freezing resulting in surface impacts on 4th Street on December 27th, this risk will be reopened.
2. A letter will be sent to Soil Freeze reminding them that any liability concerning this matter is the responsibility of BIH.

February 2015:

1. Awaiting Root Cause analysis from Contractor.
2. Repairs of surface voids and voids in crown of tunnels repairs underway.

March 2015:

1. Still awaiting Root Cause Analysis from Contractor.
2. Cross Passage 5 has been re-excavated, initial liner and waterproofing installation is complete.
3. Final liner is expected to be complete within two weeks.
4. Letter drafted to respond to last BIHJV letter received (No. 269, dated February 4th, 2015).

Risk Mitigation Status**Risk Reference: 211**

Risk	Mitigation Strategy
Differing site conditions encountered during ground freezing of Cross Passage results in increased costs	<ol style="list-style-type: none"> 1. Contractor has submitted a 'no cost, no schedule' PCC for ground freezing 2. Need early review of work plan, and identification of entity that will perform the work 3. Review Plans 4. Monitor work at CP5 - to ensure no addl cost are incurred by Program

Initial Assessment: 2 (1, 2, 2)**Risk Owner:** A. Clifford/ E. Stassevitch**Current Assessment:** Risk Rating 4 - Construction Risk

May 2015:

1. Work is complete. Project was provided substantial completion on April 15th.
2. No Change in the status of this risk.
3. Still awaiting Root Cause Analysis from Contractor.

June 2015:

1. Instrumentation in the area of CP5 are stable, no further risk of ground loss.
2. Root Cause Analysis still pending.

July 2015:

1. The Contractor's Change order request remains unsubmitted for the work at CP5.

Risk Mitigation Status
Risk Reference: 216

Risk	Mitigation Strategy
Olivet building potential construction impact	<ol style="list-style-type: none"> 1. 1. Reach out to building owner and keep him abreast of CS construction activities.

Initial Assessment: 2 (1, 1, 2)
Current Assessment: Risk Rating 2 - Construction Risk

Risk Owner: M. Vilcheck

Status Log:

May 2013:

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

July 2013:

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

October 2013:

1. Discuss increasing cost impact to rating (2) \$250k to \$1m due to potential impact on building protection and compensation grouting program
2. Staff are working with the City Attorney's office, Planning, and Department of Building Inspection to confirm the Cities rights in this situation
3. Permitting status of development to be confirmed
4. TPC to submit street space permits as soon as possible
5. Communication protocol with developer to be established

November 2013:

1. 10/23/13 conference call held with developer.
 - a. The developer is preparing a pile foundation design to minimize impact on Station Structure
 - b. This will be forward to Central Subway to allow its designers to assess the impact of the design on the station
 - c. Central Subways consultant time will be reimbursed by the developer (agreement currently with developer for review)
 - d. Tutor Perini have established Phase 1 Traffic Management which occupies part of Clementina Street and the West side of 4th street

January 2014:

1. Central Subway are still waiting for the Owner of the development to return the signed cost reimbursement agreement to reimburse Central Subway staff and consultant time spent reviewing any 250 Fourth Street Development information

Risk Mitigation Status
Risk Reference: 216

Risk	Mitigation Strategy
Olivet building potential construction impact	<ol style="list-style-type: none"> 1. Reach out to building owner and keep him abreast of CS construction activities.

June 2014:

1. Demolition Permit issued 4/21/14
2. No change to this risk rating
3. Compensation grouting bid item has been eliminated
4. Risk owner has transferred from A. Clifford to M. Vilcheck

July 2014:

1. Latest communication from developer is demolition is planned to begin ~07/15/14.

October 2014:

1. Developer has been non-responsive to requests for information. Demolition pending.
2. Suggest putting the Developer in contact with TPC, to see if an agreement could be reached. The Contractor could demo the building in exchange for use of the site as a temporary laydown area.

December 2014:

1. The building remains standing. There is no change to this risk.

January 2015:

1. The building remains standing. Attempts to contact the developer have been unsuccessful. There is no change to this risk.

April 2015:

1. A meeting to discuss coordination with the property developer for 250 4th St has been scheduled for 04/02/15.

May 2015:

1. Demolition not yet begun. Coordinating with developer regarding sidewalk design accuracy and timing of CSP/developer restoration.

June 2015:

1. Demolition not yet begun. Coordinating with developer regarding timing of sidewalk/Clementina handover.

July 2015:

1. Demolition not yet begun, but planned to begin mid-August per latest communication with developer. Coordinating regarding timing of sidewalk/Clementina handover.

Risk Mitigation Status
Risk Reference: 222

Risk	Mitigation Strategy
ARGUS Monitoring Software - Sharing Instrumentation for CN1252 and CN1300	1. Outline responsibilities for each contractor (1252 & 1300)

Initial Assessment: 3 (3,1,2)

Risk Owner: E. Stassevitch

Current Assessment: Risk Rating 6 - Construction Risk

Status Log:

February 2014:

1. A delineation of responsibility needs to be established for each Contractor to avoid a potential liability issue.

March 2014:

1. Risk has been assessed. Current risk rating is at a 6.

October 2014:

1. Contract responsibility of instrumentation sharing has been established.
2. Recommendation to retire risk.
3. A letter will be sent to the Contractor, outlining TPC's responsibility for the monitoring software. Risk will remain active until pending action is resolved.

November 2014:

1. CN1300 RFI #807 response identifies for the Contractor the areas of instrumentation required to be monitoring, instrumentation which will be removed, instrumentation installed within public property that will remain in place and instrumentation installed within public property which shall remain in place.

December 2014:

1. A letter will be sent to Tutor Perini by 12/19/14 summarizing the instruments being handed over to CN1300 from CN1252, and the dates that CN1300 work commenced in zones that were still being actively monitored under the 1252 Contract.
2. No change to the status of this risk.

May 2015:

1. Transfer of 1252 Monitoring to TPC (Contract 1300), Letter No. 347 was sent on 12/23/14. Identifying which instruments are to be transferred to TPC.
2. The next-step will be to determine how TPC is to physically receive the instrumentation information since they do not have access to the 1252 version of CM13.

Risk Mitigation Status**Risk Reference: 222**

Risk	Mitigation Strategy
ARGUS Monitoring Software - Sharing Instrumentation for CN1252 and CN1300	1. Outline responsibilities for each contractor (1252 & 1300)

June 2015:

1. Instrumentation information will be transferred to TPC by way of downloading all relevant Contract Number 1252 submittals from CM13, compiled via a CD/DVD/Flash Drive and transmit to TPC via a letter or a transmittal.
2. Document Control is in the process of downloading/compiling these nearly 200 submittals, which is expected to be wrapped up by 06/12, referencing SFMTA Letter #347.

July 2015:

1. Continuing to work on gathering all Contract 1252 related submittals for transmission to Contract 1300

Risk Mitigation Status
Risk Reference: 225

Risk	Mitigation Strategy
Ellis Street Utilities (unknown underground utilities)	<ol style="list-style-type: none"> 1. Proactive investigation into identify the issue 2. Engineers should review and make a recommendation 3. Early review of potholing information for potential conflicts 4. Put utilities on red alert

Initial Assessment: 5 (2, 2, 2)

Current Assessment: 5

Risk Owner: A. Hoe/E. Stassevitch

Status Log:

July 2014:

1. The Contractor has verbally mentioned some utility issue on Ellis Street, but has not submitted any documentation concerning the issue.
2. The Engineering team will review the issue and make a determination.

October 2014:

1. Contractor has notified SFMTA of DSC however, no official letter notification has been submitted.
2. Additional mitigation strategies were added to this risk.
 - a. Review Contractor's potholing plan for inconsistently
 - b. Determine what TPC issues are
 - c. Investigate the Contractor DSC claims, what have they found

November 2014:

1. Contractor has not submitted any information concerning their DSC claim.

December 2014:

1. No further notice has been received from the Contractor on any issues.
2. Ellis Street has been closed to help the Contractor mitigate the risk area.
3. A. Hoe will take the lead in focusing on the investigation of the utilities in the area.

January 2015:

1. There was an issue with a vault which could possibly impact sheeting. The issue has now gone away.

February 2015:

1. A. Hoe contacted DPW requesting information, none was provided. Additionally A. Hoe met with Utility representatives for PG&E and AT&T. No information was obtained regarding the unknown underground utilities.
2. This risk item will remain open until the Contractor has reached the bottom.

March 2015:

1. Contractor is now in the process of jack hammering the shaft.

Risk Mitigation Status**Risk Reference: 225**

Risk	Mitigation Strategy
Ellis Street Utilities (unknown underground utilities)	<ol style="list-style-type: none">1. Proactive investigation into identify the issue2. Engineers should review and make a recommendation3. Early review of potholing information for potential conflicts4. Put utilities on red alert

April 2015:

1. Contactor just encountered a differing site condition 04/02/15, that could potentially contain asbestos. Mitigation measures are in place to address this DSC.
2. This risk will remain open until work is finished in this area.
3. Risk rating has been reduced to a 5.

May 2015:

1. The Contractor has now reached the invert. He should not expect to encounter any utilities.

June 2015:

1. The Contractor has another 12ft to go before the bottom is reached.

July 2015:

1. Excavation has only just begun, risk needs to remain open until the invert slab is placed.

Risk Mitigation Status
Risk Reference: 226

Risk	Mitigation Strategy
4th and King Street - Potential time for planned work shutdown - Contractor not able to perform the work in the manner prescribed	<ol style="list-style-type: none"> 1. Identify schedule of potential time for planned work shutdown 2. Identify better traffic patterns 3. Pursue 4th & King option to achieve additional 3-6mos on the schedule 4. Review Giants and Warriors schedule for home games

Initial Assessment: 3, 3, 3
Current Assessment: Risk Rating 9 – Construction Risk

Risk Owner: M. Acosta

Status Log:

November 2014:

1. Contractor has yet to submit a proposal for the 4th and King planned shutdown.

December 2014:

1. Contractor has yet to submit a complete proposal for the traffic system. SFMTA Operations is willing to discuss (internally) alternative shutdown periods.
2. A dedicated team needs to be establish to focus on this 8wk sequence of shutdown activity.
3. Item to be elevated for discussion at Partnering session.

January 2015:

1. Letter will be sent to the Contractor rejecting their incomplete proposal.

February 2015:

1. The RE reported the Contractor has already planned the 8-week shutdown in the schedule. However, the Contractor has yet to provide a master work plan. The RE will a send a letter to the Contractor requesting information:
 - a. Provide the status of the site specific work plans for the proposed 10-day shutdown.
 - b. Per spec sect requirement 34 11 00 3.04. Contractor is required to provide a detail of the schedule showing activities with a planned duration.
 - c. Identify the location for where the portable cross-over will go.
 - d. Provide the name (contact person) of the Contractor's System Integration Manger.

March 2015:

1. The Contractor schedule demonstrates they are already behind in activities involving the three full weekend shutdowns.
2. A letter was sent to TPC reminding them they are required by contract to provide SFMTA their schedule 90 days in advance of the work.

April 2015:

1. In latest correspondence, TPC proposed 2 shutdowns in May 2015 (a 3 day and a 6 day shutdowns).
2. The May 2015 proposed shutdown does not meet contract requirements, including the 90 day advance notice, therefore, will be rejected.

Risk Mitigation Status**Risk Reference: 226**

Risk	Mitigation Strategy
4th and King Street - Potential time for planned work shutdown - Contractor not able to perform the work in the manner prescribed	<ol style="list-style-type: none"> 1. Identify schedule of potential time for planned work shutdown 2. Identify better traffic patterns 3. Pursue 4th & King option to achieve additional 3-6mos on the schedule 4. Review Giants and Warriors schedule for home games

May 2015:

1. The Contractor's pending 4th and King Streets Master Plan should address the impact of the freeway off ramp closure, and the propose shutdown days.

June 2015:

1. Contractor's Master Work Plan for 4th and King Streets was received. A review will be done with SFMTA Operations on 05/29. After which a meeting will be scheduled with SFMTA and the Contractor to review the comments made by Operations.
2. The Program's key concerns are to ensure operability to maintain revenue service.

July 2015:

1. A meeting was held with SFMTA Operations on 07/09/15, to discuss the specific requirements of the 1st weekend shutdown
 - Need to install a temporary platform north of the double crossover on King Street.
 - The need to identify that the existing switches will operate in reverse the mode from 4th Street onto King to accommodate for the pull out of trains from MME.
 - The need to have one inspector each, located at the temporary platform and the N-Judah platform to control the single tracking between the double crossover and the N-Judah platform.
 - Also to include an identical street inspection operation at the 4th and Berry station and the channel single crossover as required to provide T-Line service on southern end.
 - A PowerPoint presentation showing the operations of N-Judah line, the T-Line pullout, and then the diesel bus service along Embarcadero station, because the T-Line will not be served from 4th and Berry to the Embarcadero station.
 - A PowerPoint slide presentation on the pedestrian movements
2. Operations requested the Contractor provided and status update twice a week and as we get closer to the Labor day shutdown a update should be provided each day.

Risk Mitigation Status
Risk Reference: 232

Risk	Mitigation Strategy
Behind Schedule - Unable to Recover from Delay to 1300 Contract	<ol style="list-style-type: none"> 1. Contractor implemented Schedule Recovery 2. Acceleration 3. Scope Reduction

Initial Assessment: 4, 3, 3

Risk Owner: E. Stassevitch

Current Assessment: Risk Rating 12 – Construction Risk

Status Log:

January 2015:

1. Contractor’s schedule update has not been submitted.

February 2015:

1. Contractor has submitted their schedule update on February 04, 2015. The update shows an approximate six month delay. A time impact analysis has not been submitted to justify this claim.
2. To pick up time, the Contractor should be put on notice that activities on the schedule which the Contractor can work two shifts, they should do so.
3. SFMTA needs to perform an in-house analysis on the schedule.

March 2015:

1. SFMTA will perform an in-house analysis of the Contractor’s time impacts submitted to validate the actual durations.
2. SFMTA will meet with the PMOC to discuss activities on the Contractor’s schedule for ways to gain recovery.

April 2015:

1. A draft analysis was done to compare the Contractor’s baseline activities against actual work which occurred in January update.
2. Additional analyses will be ran to demonstrate a side by side comparison for each delay the Contractor is claiming.
3. A standardize document will be created for reporting the Contractor’s work progress versus what is shown in the baseline schedule activity.

May 2015

1. The Program will initiate a schedule containment workshop, to better define the risk to the project, and address issues and ways to mitigate potential delays.

June 2015:

1. A schedule analysis being generated to determine the number of days the contractor is behind schedule.

July 2015:

1. Schedule analysis continues to be generated to determine precise number of days the contractor is behind
2. Partnering workshop held – mini milestones identified to increase confidence that team can attain schedule recovery.

Risk Mitigation Status
Risk Reference: 233

Risk	Mitigation Strategy
Acceptance of Shotcrete Substitution - leads to final product being inferior in performance	1. Meet and discuss with TPC's senior management what the issues are and the status for clarification.

Initial Assessment: 3, 3, 3
Current Assessment: Risk Rating 9 -

Risk Owner: M. Kobler

Status Log:

December 2014:

1. SFMTA and TPC have a different interpretation of the contract specification language for where shotcrete may be used for the final lining of the Cross Cut, Platform and Crossover Covers at CTS in the tunnel lining.

January 2015:

1. The Program received a resubmittal of the shotcrete plan. The new submittal deletes the phrase "in lieu of". Allowing the content of the submittal to be reviewed as a mix design for shotcrete.

February 2015:

1. CSDG has been authorize to review the shotcrete resubmittal.

March 2015:

1. Receipt of the Contractor's response to SFMTA letter CS CN 1300 No. 0556 requesting the Contractor demonstrate in his submittal how the performance specifications will be met for concrete by using the shotcrete is still pending.

April 2015:

1. The Contractor has yet to respond to SFMTA's request to demonstrate performance criteria will be met.

May 2015

1. The contractor has yet to respond .

June 2015

1. Contractor has yet to submit.
2. Risk title was reevaluated for accuracy of the risk. The Risk Committee agreed the title should be changed during the June 2015 meeting.

July 2015:

1. TPC announced at the Partnering meeting they are working on the submittal demonstrating the performance requirement.

Risk Mitigation Status
Risk Reference: 234

Risk	Mitigation Strategy
Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence	<ol style="list-style-type: none"> 1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward

Initial Assessment: 2, 4, 3
Current Assessment: Risk Rating 7 – Construction Risk

Risk Owner: M. Kobler

Status Log:

January 2015:

1. The Program is awaiting the Contractor's SEM re-submittal. Anticipating their response to SFMTA's letter providing them with 4 options to choose from to perform the work.

February 2015:

1. No new update on this risk.

March 2015:

1. Contractor has yet to submit a response to SFMTA letter providing them with alternatives for the excavation sequences.

April 2015:

1. Contractor has not responded to SFMTA's letter with alternatives
2. The Designer of record will be contracted to review the Contractor's submittal for (scope and delivery) to determine if the proposed is viable.

May 2015:

1. The designer has proposed 4 different sequences for the contractor to evaluate. Contractor is evaluating.
2. DOR was compensated to review the SEM Geometry change and offered suggestions for TPC's evaluation.

June 2015:

1. Contractor has yet to submit.
2. Risk title was reevaluated for accuracy of the risk. The Risk Committee agreed the title should be changed during the June 2015 meeting.

July 2015:

1. Contractor has yet to submit.

Risk Mitigation Status**Risk Reference: 235**

Risk	Mitigation Strategy
Sewer work running up and down Stockton Street	1.

Initial Assessment: X, X,X**Risk Owner:** M. Kobler**Current Assessment:** Construction Risk Rating X**Status Log:**

December 2014:

1. Risk #13 related to *Slip Line 3'x5' brick sewer before TBM reaches CTS*, was closed in December. This new risk was developed related to sewer work after lowering of tunnel at CTS.
2. M. Kobler will put together proposal of plan of action to address 3X5 sewer at CTS.

June 2015:

1. Brick sewer slip lined north of Washington. Slip lining south to be completed before crosscut excavation.
2. Risk title was reevaluated for accuracy of the risk. The Risk Committee agreed the title should be changed during the June 2015 meeting.

July 2015:

1. No update provided this month. An investigation is required to understanding the current risk remaining to the Program.

Risk Mitigation Status**Risk Reference: 237**

Risk	Mitigation Strategy
Non-Conforming work is not identified by TPC's Quality Control Program	<ol style="list-style-type: none"> 1. Correction Action Plan from Contractor 2. Stand down meeting with Contractor 3. Augmentation of Management Staff 4. Higher Cross Check Standards 5. QA (greater surveillances) 6. Bring on additional personnel within the Smith-Emery organization

Initial Assessment: X, X,X**Risk Owner:** M. Latch**Current Assessment:** Construction Risk Rating X**Status Log:**

May 2015:

1. When Work is found to be non-conforming the Contractor generates a Contractor Non Conformance Report (CNCR). To date, the Contractor has logged 58 CNCRs. The Contractor is required to complete each Block 14 "Proposed Action(s)" of the Contractor's CNCR Form. USE-AS-IS and REPAIR dispositioned CNCRs must be approved by the Resident Engineer (RE) – the approval of the RE includes acceptance of Block 14.
2. The Contractor has been asked to resume the bi-weekly Quality Task Force Meetings (after the 5May2015 C1300 Progress Meeting) which should be the proper forum, or will result in additional meetings to assure that the Work is performed to the Contract Documents and that Work is inspected as required by the approved QCP.
3. Currently the Contractor has provided personnel as required except at CTS where the QCM is also the acting AQCM. TPC QC is in the process of adding personnel, the exact date is to TBD. . In addition, the reinforcing F & I Subcontractor has recently added a Quality Control Engineer (QCE) to assure, and sign-off on the preplacement card, that the rebar has been installed to the latest approved shop drawings or Engineer approved changes to the Design Drawings (the QCE also helps facilitate the generation of RFIs when rebar Design Drawings require clarification).
4. TPC QC has made Smith Emery (SE) Reinforced Concrete Inspectors aware Design Drawing details that have been the subject of CNCRs at YBM roof placements. Additionally, the SE Inspectors have been told to use Design Drawings and approved rebar shop drawings to inspect/accept the installation of reinforcing steel in all concrete placement.
5. TBD
6. TPC QC is now having an additional SE Inspector present to allow for an dedicated inspection of placed rebar prior to each concrete placement.

June 2015:

1. No new information to report.
2. Risk title was reevaluated for accuracy of the risk. The Risk Committee agreed the title should be changed during the June 2015 meeting.

Risk Mitigation Status**Risk Reference: 237**

Risk	Mitigation Strategy
Non-Conforming work is not identified by TPC's Quality Control Program	<ol style="list-style-type: none">1. Correction Action Plan from Contractor2. Stand down meeting with Contractor3. Augmentation of Management Staff4. Higher Cross Check Standards5. QA (greater surveillances)6. Bring on additional personnel within the Smith-Emery organization

July 2015:

1. Only change is Contractor has now written 72 CNCRs
2. At the 8Jul2015 C1300 Partnering Meeting, the need for this meeting was discussed and is to occur every other week.
3. There is now an Assistant CQM for each of the Contract Packages. The organization is somewhat in flux regarding the potential replacement of the current CQM due to health reasons.
4. No change
5. SFMTA QA completed Quality Assurance Audit 025 and Quality Assurance Surveillances 063-066 of TPC's implementation of their Contractor Quality Program (CQP).
6. No change
7. Risk title has been updated once more during the July 2015 meeting, to read "Non-Conforming work is not identified by TPC's Quality Control Program".

Risk Mitigation Status

Risk Reference: 238

Risk	Mitigation Strategy
Quality Program is ineffective in processing the nonconformance items causing schedule impacts	1.

Initial Assessment: X, X,X

Risk Owner: M. Latch

Current Assessment: Construction Risk Rating X

Status Log:

July 2015:

1. Discussion required regarding condemning the "Quality Program" VS TPC/TPC QC's inability to; accurately log and or expedite the determination of the disposition of a CNCR, provide timely suggested repair procedures, determine root cause, provide acceptable steps to prevent recurrence, correctly close or accurately update the CNCR Log .
2. TPC QC has begun using the CM13 module for Noncompliance Notices for CNCRs. This should provide for timely submittal of CNCRs and timely/accurate updates of the CNCR Log. More to follow.

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S
PROJECT RISK REGISTER Central Subway Project San Francisco REV : 45 DATE ISSUED: 07/09/15		Risk Profile		Severity Score					Probability Cost Impact Schedule Impact	Low (1) Medium (2) High (3) Very High (4) Significant (5)	Legend <3 Low 3-9 Medium >10 High	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)							
		Likelihood Score	1	2	3	4	5												
		5	Yellow	Red	Red	Red	Red												
		4	Yellow	Yellow	Red	Red	Red												
		3	Green	Yellow	Yellow	Red	Red												
2	Green	Green	Yellow	Yellow	Red														
1	Green	Green	Green	Yellow	Yellow														
Final Risk ID	Risk Description	Mitigation Description			Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date					
12	Underground Tunnel																		
45	115 Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently quality of end walls.	1. In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated. 2. Alternatively, place an allowance in the station contracts for end wall leakage repair.			C	3	1	1	1	50%	3		5/26/15 UMS1295						
52	Track Embedded																		
55	Track: Special																		
58	MOS Station																		
60	21 Incomplete cutoff of groundwater at MOS	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates.			C	1	1	-	1	10%	1	1	Mitigation measure to be made part of the contract documents	4/28/15 MOS1150					
63	22 Public complaints result in unanticipated restrictions on construction at UMS	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 5. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 6. Quickly process and resolve damage and accident claims from the Public. 7. Assumed this work in cost & schedule estimates.			C	1	1	-	1	10%	1	1	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	9/16/16 MOS1230					
67	F Underground obstructions Stations (MOS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.			C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	4/28/15 MOS1150					

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S
1 PROJECT RISK REGISTER		Risk Profile			Severity Score					2	Probability	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) 2	
		Likelihood Score	1	2	3	4	5												
		5	Yellow	Red	Red	Red	Red												
		4	Yellow	Yellow	Red	Red	Red												
		3	Green	Yellow	Yellow	Red	Red												
3 REV : 45		2			1					3	Cost Impact	< \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	>\$10M	3-9 Medium	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)	
4 DATE ISSUED: 07/09/15		1			1														
5	Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date						
98	F	Underground obstructions Stations (UMS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	8/12/15 UMS 1320						
99	28	Incomplete cutoff of groundwater at UMS	1. If needed, perform grouting to mitigate the intrusion of groundwater. 2. Include in cost & schedule estimates.	C	1	2	1	2	10%	2	3	Mitigation measures in the form of consolidation grouting to be included in contract documents	8/12/15 UMS1320						
107	33	Damage to utilities at UMS causes delay to construction and/or consequential cost. (very close to walls adjacent to relocated utility trenches)	1. Intensive utility coordination and investigation. 2. Relocate utilities out of the way of construction wherever possible. 3. Show utilities on reference plans. 4. Have utility contact information and procedure on plans. 5. Have contingency repair/restoration plans. 6. Include probable impacts to schedule & cost in estimates.	C	2	1	1	1	35%	2	4	Although mitigation measure have been fully implemented, Increased probability due to proximity of new pile design to existing relocated utilities.	7/19/16 UMS1410						
108	34	Loss of business results in unanticipated restrictions on construction at UMS	1. Public outreach. 2. Work closely with Merchant's Association. 3. Maintain regular and open communications so Merchants know construction plans and progress at all times. 4. Advertise that Stockton Street Merchants are Open for Business. 5. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. 6. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 7. Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 8. Include this work in cost & schedule estimates.	C	2	3	2	3	35%	5	10	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	9/7/16 UMS1430						
111	35	Ground support structure causes groundwater table to rise which results in leakage into adjacent structures.(new structure might create a dam that results into leaks into new and existing structures)	1. Perform detailed hydrogeologic modeling and analysis. 2. Monitor groundwater table at multiple locations and passive measures as necessary to mitigate. 3. Reference the Tech memo in contract documents. 4. Include probable costs in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures incorporated in design based on updated Hydrogeologic analysis and report	9/7/16 UMS1430						
112	36	Damage to buildings or utilities as a result of heave from jet grouting at UMS.	Utilize tangent piles combined with surface jet grouting.	C	1	1	-	1	10%	1	1	Mitigation measures implemented in contract documents to reduce risk	4/14/15 UMS1310						
113	37	Damage to adjacent buildings at UMS due to surface construction activities.	1. Require protective barriers. 2. Have an emergency and rapid response customer focused task force to fix damaged facilities. 3. Quickly repair and reimburse resulting costs. 4. Include probable cost in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures implemented in contract documents to reduce risk	9/7/16 UMS1430						

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S
PROJECT RISK REGISTER Central Subway Project San Francisco REV : 45 DATE ISSUED: 07/09/15		Risk Profile		Severity Score					Probability Cost Impact Schedule Impact	Low (1) Medium (2) High (3) Very High (4) Significant (5)	Legend <3 Low 3-9 Medium >10 High	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)							
		Likelihood Score	1	2	3	4	5												
		5																	
		4																	
		3																	
2																			
1																			
Final Risk ID	Risk Description	Mitigation Description			Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date					
Q	As-built drawings and UMS construction drawings do not contain enough information to produce shop drawings without significant surveying effort delaying construction north entrance.	1. Investigate if electronic files of design can be given to the contractor. 2. Clearly define shop drawing criteria in the technical specifications. 3. Make as-built drawings available as reference drawings to the contractor			C	3	1	1	1	50%	3	6	Specifications require contractor to survey USG in order to develop shop drawings for structural steel.	3/24/12 UMS1280					
46	Public complaints result in unanticipated restrictions on construction at CTS. (schedule and estimate for underground work assumes 6 day work week and 2 shifts per day)	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 6. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 7. Quickly process and resolve damage and accident claims from the Public. 8. Include this work in cost & schedule estimates.			C	2	5	1	3	35%	6	12	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	10/9/17 CTS1500					
48	Incomplete drawdown of groundwater. (inside of box and inside of caverns)	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. 3. Include allowance for dewatering within cavern during construction.			C	2	2	1	2	35%	3	6	Mitigation measures have been included in contract documents	5/1/16 CTS1140					

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S
PROJECT RISK REGISTER Central Subway Project San Francisco REV : 45 DATE ISSUED: 07/09/15		Risk Profile		Severity Score					Probability Cost Impact Schedule Impact	Low (1) < 10% < \$250K < 1 Month	Medium (2) <> \$250K - \$1M <> 1 - 3 Months	High (3) > 50% <> \$1M - \$3M <> 3-6 Months	Very High (4) <> 75% & 90% <> \$3M - \$10M <> 6 - 12 Months	Significant (5) >90% >\$10M > 12 Months	Legend <3 Low 3-9 Medium >10 High	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)			
		Likelihood Score	1	2	3	4	5												
		5	Yellow	Red	Red	Red	Red												
		4	Yellow	Yellow	Red	Red	Red												
		3	Green	Yellow	Yellow	Red	Red												
2	Green	Green	Yellow	Yellow	Red														
1	Green	Green	Green	Yellow	Yellow														
Final Risk ID	Risk Description	Mitigation Description			Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date					
52	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	1. Evaluate effect of potential settlement on utilities. 2. Slip-line sewer by TBM contractor. 3. Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed. 4. Have contingency repair/restoration plan. 5. Utility contact information and procedure will be on plans. 6. Develop an allowance for utility repair. 7. Include probable cost in estimate. 8. Need to identify the new SFPUC contact			C	3	3	1	2	50%	6	12	Project configuration change, lowered station 25 ft. reducing the probability of this risk. Risk rating lowered.	4/22/16 N-CTS9730					
F	Underground obstructions stations (CTS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings			C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	10/9/17 CTS1500					
U	Proximity at junction of head house boundary wall and school yard may result in relocation of school yard during wall construction				C	1	1	1	1	10%	1	2	Project configuration changed to eliminate encroachment. Risk converted to Construction risk from Risk 55.	8/16/13 CTS1010					
216 General																			
218 Demolition, Clearing , Earthwork																			
220 Site Utilities, Utility relocations																			
230 Hazmat, Contaminated Material																			
234 Environmental Mitigations																			
66	Archeological/Cultural findings during construction increases schedule and/or cost.(Moscone) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.			C	3	1	1	1	50%	3	6	Mitigated - Current exposure only to those amount above those currently identified	4/28/15 TUN1150					
67	Archeological/Cultural findings during construction increases schedule and/or cost. (UMS)...LESS THAN 1%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.			C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	8/12/15 UMS1320					
68	Archeological/Cultural findings during construction increases schedule and/or cost. (CHINA TOWN) ...AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.			C	3	1	2	2	50%	5	9	Mitigation measures to be implemented in contract documents	10/9/17 CTS1500					
240 Site Structure incl. sound walls																			
242 Auto/bus/van access ways, roads																			
247 Train Control and Signals																			
72	Interface new Signaling and Train Control system to existing at Fourth and King	Connect new system in parallel with existing system until the new system has been tested and safety certified for operation.			C	2	2	3	3	35%	5	10	Awaiting approval of contract plans by Muni Operations.	3/4/16 STS1045					
PR78	Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC	1. Monitor other projects' developments. 2. Develop contingency plans as needed to avoid 1256 delay of revenue service.			C	2	1	1	1	35%	2	4		7/27/12 FDS 1940					
258																			
260 Traffic signals & Crossing Protn.																			
262 Fare Collections Systems																			

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S	
1 PROJECT RISK REGISTER		Risk Profile			Severity Score					2	Probability	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) 2 SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
		Likelihood Score	1	2	3	4	5	< 10%	<> 10-50%			> 50%	<> 75% & 90%	>90%	<3 Low					
		5	Yellow	Red	Red	Red	Red	< \$250K	<> \$250K - \$1M			<> \$1M - \$3M	<> \$3M - \$10M	>\$10M	3-9 Medium					
		4	Yellow	Yellow	Yellow	Red	Red	< 1 Month	<> 1 - 3 Months			<> 3-6 Months	<> 6 - 12 Months	> 12 Months	>10 High					
		3	Green	Yellow	Yellow	Yellow	Red													
3	Green	Green	Green	Yellow	Yellow															
2	Green	Green	Green	Yellow	Yellow															
1	Green	Green	Green	Yellow	Yellow															
2 Central Subway Project San Francisco																				
3 REV : 45																				
4 DATE ISSUED: 07/09/15																				
5 Final Risk ID	Risk Description			Mitigation Description					Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date		
265 Purchase or lease of Real Estate																				
79	Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected			1. Engage Owners in negotiations as soon as possible. 2. PM/CM to provide real estate specialists to facilitate.					R	1	1	-	1	10%	1	1	Right of possession obtained on all three parcels. Cost agreement reached with 1455 Stockton & 801 Market.		9/7/2012	
266																				
273 Reloc. of Household or Business																				
275 Vehicles																				
278 Preliminary Engineering																				
95	Contractor default during construction impacts schedule. (key sub-contractor)			Assist Bonding company in transition and to maintain schedule.					C	1	2	2	2	10%	2	4			11/17/17 STS 1500	
99	Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.			1. Executive partnering and alternate dispute resolution. 2. Provide incentives in construction contracts in addition to penalties					C	2	4	1	3	35%	5	10	Mitigation measures being implemented		7/27/12 FDS 1940	
100	Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)			1. Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement. 2. Monitor procurement of critical items.					C	1	2	2	2	10%	2	4	Not considered a project risk.		11/17/17 STS 1500	
PR37	Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment			1. Identify temporary power requirements for station construction. 2. Investigate the timing of the permanent feed.					C	2	1	2	2	35%	3	6	Cost for First and Redundant electrical services need to be included in Cost Estimate.		5/3/18 STS1080	
305																				
306 Insurance, permits etc.																				
103	Difficulty in getting required permits.			1. Coordinate with permit officials and request permits as early as possible. 2. Obtain assistance obtaining permits from PM/CM & FD Consultants.					C	1	2	1	2	10%	2	3			12/18/12 FDS 1275	
104	CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows			1. Obtain Grade Crossing approvals at final CPUC inspection at the completion of construction. 2. Coordinate closely with CPUC until approval is received.					R	2	3	2	3	35%	5	10	CPUC Resolution (TED-253) for extension of our at grade crossing was granted.		7/27/12 FDS 1940	
105	Electrical service delays startup and testing.			1. Submit applications for new service as early as possible. 2. Coordinate closely with PG&E to ensure timely delivery of electrical service.					C	1	2	1	2	10%	2	3	Applications for new service have been submitted to PG&E.		11/17/17 STS 1500	
106	Risk of Labor dispute delaying the work.			Enforce designated gate for employees of the contract in dispute so that the rest of the work is not delayed.					C	2	1	1	1	35%	2	4			11/17/17 STS 1500	
312 Unallocated Contingency																				
111	Major Earthquake stops work			Include Force Majeure clause in contracts.					C	1	5	3	4	10%	4	8	Force Majeure clause included in contracts.		12/30/20 MS 0010	
317																				

Risk Register

A		H			I					J	K	L	M	N	O	P	Q	R	S
1 PROJECT RISK REGISTER		Risk Profile		Severity Score					J	K	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT) 2 SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)		
		Likelihood Score	1	2	3	4	5	Probability			< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low			
2 Central Subway Project San Francisco	5						4	Cost Impact	< \$250K	<> \$250K - \$1M	<> \$1M - \$3M	<> \$3M - \$10M	>\$10M	3-9 Medium					
3 REV : 45	4						3	Schedule Impact	< 1 Month	<> 1 - 3 Months	<> 3-6 Months	<> 6 - 12 Months	> 12 Months	>10 High					
4 DATE ISSUED: 07/09/15	3						2												
	4						1												
5	Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date						
318	112	Major safety event halts work	1. Require contractor Safety plan to address this risk. 2. CM inspections to ensure that safety plan and procedures are implemented.	C	1	5	3	4	10%	4	8	Health and Safety provisions included in contracts. CS Program provides full-time Safety Manager.	12/30/20 MS 0010						
320	196	The process of acquiring station licenses: acquisition/condemnation could significantly delay schedule and cost more than that presently planned.	1. Continue to negotiate with building owners 2. Required Notices and Appraisals to be completed 3. Commence condemnation process with City Attorneys	C	1	1	1	1	10%	4	2								
329	204	AT&T Vault - New Sewer Work south of Bryant	1. Continue negotiations/coordination with utility owners. 2. Schedule analysis to confirm coordination	C	1	2	4	3	10%	3	6								
330	205	Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	1. CMod Task Force - 5 Areas of Improvement 2. Implement 3. Delegation of Authority	C	3	1	1	1	50%	3	6								
336	211	Differing site conditions encountered during ground freezing of Cross Passage 5 results in increased costs.	1. Contractor has submitted a 'no cost, no schedule' PCC for ground freezing 2. Need early review of work plan, and identification of entity that will perform the work 3. Review Plans 4. Monitor work at CP5 - to ensure no addl cost are incurred by SFMTA 5. Review plans for overcoming incident	C	1	5	3	4	10%	4	8		Retired 12/16/14 Reopened 01/13/15						
339	214	Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	1. Provide micro-pile as-built information to contractor 2. Realign tube-a-manchettes clear of micro-piles	C	3	1	1	1	50%	3	6								
341	216	Olivet building potential construction impact	1. Reach out to building owner and keep him abreast of CS construction activities.	C	1	1	2	2	10%	2	3								
342	217	Delays or complications construction by others – SF Dept. Of Technology, 3rd party utilities	1. Early engagement and coordination for agreements and plan development to avoid construction delays.	C	2	1	1	1	35%	2	4	DTIS MOU has been signed.							
347	222	ARGUS Monitoring Software - Sharing Instrumentation for CN1252 and CN1300	1. Outline responsibilities for each contractor (1252 & 1300)	C	3	3	1	2	50%	6	12								
348	223	Contamination during dewatering (CTS)	1. Review contract requirements .	C	2	3	1	2	35%	4	8								
349	224	CTS AWSS/Ductbank Interface - AWSS system is old and requires replacement	1. Look at alternatives to address 2. Turn off system while CSP work is being done, and then turn on later (find a bypass).	C	5	1	2	2	90%	8	15								

