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Risk Mitigation Meeting Minutes #70

DATE: July 6, 2015

MEETING DATE: **May 07, 2015**

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

TIME: 2:00pm

ATTENDEES: John Funghi, Albert Hoe, Mark Latch, Beverly Ward, Bill Byrne

COPIES TO: Attendees: Roger Nguyen, Alex Clifford, Eric Stassevitch, 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. 70

RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	**Report on Red Risk and – (Risk rating ≥ 6)**	
	Risk 225: Ellis Street Utilities (unknown underground utilities) Discussion: The Contractor has reached the invert, there should not be any utilities to encounter at this level. Potential for retirement **Risk Rating 5** **Risk 226**: 4th and King Street - Potential time for planned work shutdown - Contractor not able to perform the work in the manner prescribed Discussion: The Contractor information on the impact of the freeway off ramp closure is still pending. A discussion with the Contractor took place during the Partnering session, that TPC is in the process of preparing a "The 4th and King Master Plan" to submit to the Program, in roughly two weeks, to include a propose shutdown at 4th & King Street during the July 4th weekend. **Risk Rating 9**	
2 -	**Report on Remaining Requirement Risks (Risk rating ≤ 6)**	
	Risk 79: Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected - **Risk Rating 1** **Risk 104**: CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows - **Risk Rating 5** Discussion: 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. **Risk Rating**	

ITEM #	DISCUSSION	ACTION BY DUE DATE
3-	**Active Construction Risk**	
	Risk 50: Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished. Discussion: The Tunnel contract reached substantial completion on 04/15/15. This risk has been mitigated. **This Risk will be retired. Risk Rating 0**	
	Risk 52: Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL) Discussion: The RE's investigation of the 12-inch/100-yr old water line, has led to his recommending that two utility monitoring points be installed at the junction of the old pipe and at Washington Street. The Committee suggests the two options. The RE's could present his recommendation to the Configuration Management Board as a proposed contract change, as soon as possible or he could rearrange the utility monitoring points. As required by the contract the Contractor has been installing soil extensometers. **Risk Rating 6** **Risk 72:** Interface new Signaling and Train Control system to existing at Fourth and King Discussion: The Contractor's pending master plan should answer the question how they plan to recertify the intersection for revenue service A standard test plan checklist needs to develop by the Program. In addition, the Program is looking for the Contractor's resolution to the issue of restoring service at each phase. SFMTA has requested TPC to appoint 4th & King Street liaisons, to hold the position a of System Integrator. **Risk Rating 5** **Risk 211:** Differing site conditions encountered during ground freezing of Cross Passage results in increased costs Discussion: Non-Conformance reports were concerning the ground loss at CP5 was received. **Post-meeting note**: Confirmation was received from the Resident Engineer; the root cause analysis has yet to be received from Soil Freeze through BIH. **Risk Rating 4** **Risk 204:** Relocation of AT&T Vault and other utilities delays Work south of Bryant Discussion: AT&T has taken possession of the work. Work by the Contractor was declared complete in early April. Connection is still pending. Contractor's relocation work of the ductbank and vaults has not been completed. **Risk Rating 3** **Risk 216:** Olivet building potential construction impact Discussion: Demolition work has yet to begin. **Risk Rating 2** **Risk 222:** ARGUS Monitoring Software - Sharing Instrumentation for CN1252 and CN1300 Discussion: Letter sent to the 1300 Contractor identifying which instruments will be transferred from the 1252 contract to 1300. The Program is deciding on how to physically make the turnover of the instrumentation information to TPC without compromising the integrity of CN1252. The only information to be provided relates to contract 1300. At the moment, TPC does not have access to the BIH's version of CM13. **Risk Rating 6**	

ITEM #	DISCUSSION	ACTION BY DUE DATE
4 -	**Risk Mitigation/Assessment**	
	Risk 232: Schedule Mitigation - Ways to mitigate potential delays Discussion: This risk needs to be better defined. During the FTA Quarterly meeting, the Program was requested to put together a schedule containment-meeting workshop. To address schedule issues way of mitigation, acceleration and multiple shifts. **Risk Rating TBD** **Risk 233:** Shotcrete Substitution - in the Stations for final lining Discussion: Contractor's response is still pending SFMTA requested they demonstrate the design parameters performance base for concrete by using the shotcrete method. **Risk Rating TBD** **Risk 234:** Sequential Excavation Method at CTS (SEM) Sequence - Contractor proposes to build the north and south platform simultaneously Discussion: The Designer was ask to look at the Contractor's proposed SEM methodology. **Risk Rating TBD** **Risk 237:** Quality Control Program - work not being installed properly Discussion: Quality Assurance greater surveillances have yet to be determined. Additional inspectors were brought on to provide additional reviews. **Risk Rating TBD**	
5-	**Other Business - Risk for Retirement Potential**	
	Discussion: The following risk were examine for a broader discussion next month with the full Risk Committee, to determine if the risk may be retired due to being mitigate or overtaken by time/events next month. **Risk 102**: Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs Discussion: This is no longer a valid risk; recommend it be retired at the next meeting. **Risk Rating 3** **Risk 214:** Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles) Discussion: This is no longer an issue for the project. The micro piles in front of Barney's were not hit. No more piles pose interference. Recommend this risk be retired at the next meeting. **Risk Rating 3** **Risk 215:** DPW Excavation permit reviews delay contract works Discussion: We have received all of the DPW permits for excavation. Recommend retiring this risk next month. **Risk Rating 2** **Risk 27:** Loss of business results in unanticipated restrictions on construction at YBM Discussion: All construction sites have been opened up. **Risk Rating 2** **Risk 202:** Cargo Preference must solicit U.S. - flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954) Discussion: This risk was initially added to address cargo being shipped under the tunnel contract. Should this risk be closed and new one open to address	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	potential issue under the 1300 contract? **Risk Rating 1** **Risk 21:** Incomplete cutoff of groundwater at Moscone Station Discussion: We have achieved cutoff. Repair strategy is in place. Risk to remain open and risk owner will be change to Resident Engineer Mark Vilcheck. **Risk Rating 1**	
	No new risk items were added to this month's register.	

ACTION ITEMS –

ITEM #	MTG DATE	DESCRIPTION	BIC	DUE DATE	STATUS
4	12/13/12	**Risk 72** – 4th & King (SSWP)	S. Pong C. Morganson	06/04/15	Open
3	05/07/15	**Risk 72** – 4th & King - Develop a test plan checklist for recertifying	S. Pong	06/04/15	Open
3	05/07/15	**Risk 72** – 4th & King - TPC needs to fill the of a system integrator	TPC	06/04/15	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: BW AH [initials of preparer & reviewer] **Date:** 7/6/2015 [Date review completed.

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Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 70
May 07, 2015
02:00pm– 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. **Schedule Time Impact Report (Draft)**

2. **Report on Red Risks (Risk Rating 6 and above)**
   - **Construction Risks** (225, 226)

3. **Report on Remaining Requirement and Design Risks**
   - **Requirement Risks** (79, 104)

4. **Active Risks**
   - **Construction Risks** (**50**, 52, 72, 211, 204, 216, 222)

4. Risk Mitigation/Assessment
- 232 - Schedule Mitigation - Ways to mitigate potential delays
- 233 - Shotcrete Substitution for final lining
- 234 - Sequential Excavation Method at CTS (SEM) - No. & So. simultaneously
- 237 - Quality Control Program -work not being installed

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

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Meeting Attendance Sheet

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Management Meeting No. 70
May 07, 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	BB
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	
Beverly Ward	CSP	415-701-5291	Beverly.ward@sfmta.com	
Luis Zurinaga	SFCTA	415-716-6956	luis@sfcta.org	

Risk Mitigation Status
Risk Reference: 225

Risk	Mitigation Strategy
Ellis Street Utilities (unknown underground utilities)	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) **Risk Owner:** A. Hoe/E. Stassevitch
Current Assessment: 5

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)		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

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.

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		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 **Risk Owner:** M. Acosta
Current Assessment: Risk Rating 9 – Construction Risk

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		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.

Risk Mitigation Status		
Risk Reference: 50		
Risk		**Mitigation Strategy**
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

Initial Assessment: 3, 4, 11 **Risk Owner:** A. Clifford
Current Assessment: Risk Rating 0 – Construction Risk

Status Log:

September 24, 2009 Meeting:
1. Attendees agreed that an LONP is one item that would alleviate this risk.
2. A request for an LONP is presently being prepared. It appears at this time that an LONP has a good chance of being granted.

February 2012:
1. Constraints on CTS contractor added to specification sections Work Sequence and Contract Interface.
2. LONP was granted by FTA for construction of the launch box.

March 2013:
1. Contract 1300 Specification section 01 12 17, 4 a) – tunneling equipment to be removed from CTS 450days following NTP (timeframe approved through CMB and included in CN 1300 addendum 3).

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

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

May 2013:
1. PMCM will continue to monitor the interface between the 1252 and 1300 contracts.
2. No change to report.

Risk Mitigation Status		
Risk Reference: 50		
Risk		**Mitigation Strategy**
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

June 2013:

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

Nov 2013:

1. Contract 1252 milestones were delayed in October because of delays to the Northbound TBM assembly and testing.
2. Concurrent delays to the Retrieval Shaft are also having an impact to 1252 Milestones 1 & 2.
3. Future forecast trend to be developed considering progress to date, and expected progress for the remaining work and geological conditions (i.e. boring through rock)
4. Central Subway team to check that BIH recovery schedule uses reasonable assumptions based on expected progress

	CN1252 Contract Requirement**	CN1252 Oct Finish	CN1300 Requirement	1252 Oct & 1300 Variance	
YBM Headwalls Complete	N/A	20-Sep-14 A	31-Jul-13	(51)	CD
UMS Headwalls Complete	N/A	8-Nov-13	14-Sep-13	(55)	CD
CTS Tunnel Interface Complete 1252 MS 1 - Complete Cross Passages 1&2 (CTS)	10-Jun-14	9-Jul-14	9-Sep-14	62	CD
UMS Tunnel Interface Complete 1252 MS2 - Complete Cross Passages 3&4 (UMS)	13-Aug-14	29-Aug-14	26-Feb-15	181	CD
YBM Tunnel Interface Complete	N/A	30-Sep-14	26-Feb-15	149	CD
1252 Tunnel Substantial Completion	12-Apr-15	11-May-15			
Tunnel Portal Completion 1252 Tunnel Final Completion	12-May-15	8-Jun-15	24-Sep-15	108	CD

** Includes PCC10 & COR8

December 2013:

1. Analysis of expected TBM progress not yet complete
    a. (see analysis chart)
2. Await submittal of Recovery Schedule 5 from contractor

Risk Mitigation Status		
Risk Reference: 50		
Risk		**Mitigation Strategy**
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

January 2014:

1. No current impact at interface points.
2. The Tunnel Contractor's Recovery schedule 5 is still to be assessed against the Station contractors schedule to determine if a conflict between the two contracts is expected.
3. The recovery schedule will not be approved unless the Program believes the dates to be realistic.

February 2014:

1. CN 1252 Recovery schedule 5 (submitted 1/21/14) currently under assessment
2. The monitoring of the two contracts existing float in the schedules is ongoing.

March 2014

1. Approval of CN1252 recovery schedule is pending
2. Milestone 1 & 2 remains 45 days late and 30 days late on substantial completion

April 2014:

1. **See next page**

Risk Mitigation Status		
Risk Reference: 50		
Risk		**Mitigation Strategy**
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

April 2014

1. Recovery schedule discussed with BIH following the last partnering meeting
2. BIH have submitted Recovery Schedule 5b (included in the March 2014 Update)
3. The milestone dates for Recovery Schedule 5b are summarized below

Interface Points	CN1300 Requirement	CN1252 Finish Feb 14	Variance	Recovery 5b Finish MAR14 Recovery 5b	Variance	
YBM Headwalls Complete	31-Jul-13	20-Sep-13	-51.00	20-Sep-13	-51	N/A
UMS Headwalls Complete	14-Sep-13	22-Nov-13	-69.00	22-Nov-13	-69	N/A
CTS Tunnel Interface Complete 1252 MS 1 - Complete Cross Passages 1&2 (CTS)	9-Sep-14	25-Jul-14	46.00	14-Jul-14	57	
UMS Tunnel Interface Complete	26-Feb-15			23-Apr-14	309	CP4
1252 MS2 - Complete Cross Passages 3&4 (UMS)		17-Sep-14	162.00	24-Jun-14	247	CP3
YBM Tunnel Interface Complete	26-Feb-15	16-Oct-14	133.00	17-Nov-14	101	
1252 Tunnel Substantial Completion (12Apr15)		27-May-15	-45.00	10-Apr-15	2	
Tunnel Portal Completion	24-Sep-15	27-May-15	120.00	10-Apr-15	167	

May 2014:

1. January or February are the critical dates to look at.

Risk Mitigation Status		
Risk Reference: 50		
Risk		**Mitigation Strategy**
Station contractor delayed by tunnel contractor since station contractor cannot break in to the tunnels until the tunnels have been finished	√	1. Include Milestone dates in Tunnel Contract when the turnover of tunnels to CTS contractor has to occur. 2. Actively monitor progress towards schedule milestones. 3. Add constraints in CTS contract specification.

June 2014:

1. Schedule slippage of 1 day on Southbound Tunnel excavation and Hole Through activities on May 2014 Update Schedule.
2. Critical Path on Final Invert and Arch for Cross Passage 3 & 4, Portal Structure, and Closeout.
3. May 2014 Update Schedule Substantial Completion shows -1 day of Total Float and Final Completion shows 0 days Total Float.

April 2014 Update Schedule

Interface Points	CN1300 Requirement	CN 1252 April Finish	Variance	
CTS Tunnel Interface Complete 1252 MS 2 - Substantially Complete Cross Passages 1&2 (CTS)	9-Sep-14	9-Aug-14	31	CD
UMS Tunnel Interface Complete 1252 MS1 - Substantially Complete Cross Passages 3&4 (UMS)	26-Feb-15	16-Aug-14	197	CD
YBM Tunnel Interface Complete	26-Feb-15	10-Nov-14	108	CD
Tunnel Portal Completion 1252 Tunnel Final Completion	24-Sep-15	8-May-15	139	CD

October 2014:

1. As at June 2014, Tutor expect to break into CTS tunnel in May 2015.
2. BIH current approved schedule shows portal structure work likely to inhibit access through portal.
3. Discuss status of this risk.

November 2014:

1. As of November, 1300 do not expect Tutor to require access to the tunnel before Substantial Completion of the 1252 Contract.

May 2015:

1. Substantial Completion for the 1252 Contract was achieved on 4/15/15
2. Recommend retirement of this risk
3. Risk retired by unanimous consent of the Risk Assessment Committee 5/07/15

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.

Risk Mitigation Status
Risk Reference: 211

Risk		Mitigation Strategy
Differing site conditions encountered during ground freezing of Cross Passage 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 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		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		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.

Risk Mitigation Status
Risk Reference: 204

Risk	Mitigation Strategy
Relocation of AT&T Vault and other utilities delays Work south of Bryant	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	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	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	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	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

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.

Risk Mitigation Status
Risk Reference: 216

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

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

Risk Owner: 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	1. 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.

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: 232

Risk		Mitigation Strategy
Schedule Mitigation - Ways to mitigate potential delays		1. Track milestone dates month to month 2. Acceleration and multiple shifts

Initial Assessment: X, X,X
Current Assessment: Risk Rating X – Construction Risk

Risk Owner: E. Stassevitch

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 word 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.

Risk Mitigation Status
Risk Reference: 233

Risk	Mitigation Strategy
Shotcrete Substitution - in the Stations for final lining	1. Meet and discuss with TPC's senior management what the issues are and the status for clarification.

Initial Assessment: X, X, X
Current Assessment: Risk Rating X **-**

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 Cavers 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 .

Risk Mitigation Status
Risk Reference: 234

Risk		Mitigation Strategy
Sequential Excavation Method at CTS (SEM) - Sequence and in the - Contractor proposes to build the north and south platform simultaneously		1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward

Initial Assessment: X, X,X
Current Assessment: Risk Rating X – 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.

Risk Mitigation Status
Risk Reference: 237

Risk		Mitigation Strategy
Quality Control Program - - work not being installed		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
Current Assessment: Construction Risk Rating X

Risk Owner: M. Latch

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.

Risk Mitigation Status
Risk Reference: 102

Risk	Mitigation Strategy
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. Buffer float added to critical patch to actively manage schedule contingency

Initial Assessment: 1, 2, 3
Risk Owner: A. Hoe
Current Assessment Risk Rating 3 – Construction Risk

Status Log:
September 2011:

1. LONP 1 & 2 initiated to reduce this risk. See Risk 86.
2. The mitigation of risks associated with early contracts will address this risk.
3. Risk rating reduced due to mitigation measures implemented.

May 2013:

1. The early utilities relocation contracts were completed within an appropriate contract time periods.
    a. Mitigation measures were taken to address issues to accomplish the requirement. Measures taken
        i. Extensive coordination with utility companies
        ii. Acceleration
        iii. Schedule re-sequencing
        iv. Deferment of activities to follow on contracts
2. The follow on contacts are reflective of the early contract impacts, when known in a timely manner.
    a. Follow on contacts include
        i. Updated schedule and milestone
        ii. Updated work scope with included early contract deferred activities
3. The interface between contract 1252 and 1300 is being monitored under Risk #50.
4. Recommend maintaining this risk rating.

May 2015:

1. This is no longer a risk. Recommend retiring at the next monthly meeting.

Risk Mitigation Status
Risk Reference: 214

Risk		Mitigation Strategy
Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	√	1. Provide micro-pile as-built information to contractor 2. Ensure tube-a-manchettes are realigned to be installed clear of micro-piles

Initial Assessment: 1, 1, 3 **Risk Owner:** A. Clifford
Current Assessment: Risk Rating 3 - Construction Risk

Status Log:

February 2013:
1. Identified as a risk

March 2013:
1. Discuss risk description, mitigation strategy and risk rating
2. Central Subway has responded to Contractors RFI and provided as-built information for the micropiles
3. Contractor will work to install tube-a-manchettes to avoid micropiles
4. **Recommended risk rating 3 (3, 1, 1)**
    a. Probability (3), >50%
    b. Cost impact (1), <$250
    c. Schedule impacts (1), <1 month

April 2013:
1. Contractor is reviewing the micropile as-built information
2. An additional mitigation was added to ensure the tube-a-manchettes are realigned to be installed clear of the micro-piles
    a. A workshop will be held between the PB and BIH to resolve the required geometry to install the tube-a-manchettes clear of the micro-piles
    b. The contractor will submit a revised installation alignment plan for the tube-a-manchette installation

May 2013:
1. A workshop was held between PB and BIH in April to establish the required installation geometry
2. The contractor will install the compensation grouting tubes using a diamond drill in the event that the micro piles cannot be avoided

July 2013:
1. As of Monday 7/8/13, 9 tube-a-manchettes have been installed at the Ellis Street shaft. 1 of 9 has encountered a micropile.
2. 1252 Contractor will install tubes as per the current plan. Additional tubes will be installed as required.
3. A 3-D model of the micro piles will be provided to Tutor Perini. A workshop will also be held between PB and Tutor (similar to that held with BIH) to minimize the risk of interference with 1300 compensation grouting tubes.

Risk Mitigation Status
Risk Reference: 214

Risk		Mitigation Strategy
Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	√	1. Provide micro-pile as-built information to contractor 2. Ensure tube-a-manchettes are realigned to be installed clear of micro-piles

September 2013:

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

December 2013:

1. Micropile as-built information was included in 1300 reference documents
2. 1300 Contractor is considering installing TAMs from within station box

June 2014:

1. 5 additional joker holes, 623 extra feet of drilling and pre-condition grouting, lowering of pipes, adjustment to the working platform
2. Contractor claiming $380k, SFMTA current estimate in the order of $210k
3. Discuss updating risk rating.
4. The Program's portion of the cost will be under the estimated $210K.

November 2014:

1. Negotiations for PCC-12 have been completed with BIH. $176k was agreed for Item 5 of PCC-12.
2. Additional costs associated with tube-a-manchette installation were included in PCC-12.
3. The Program will seek reimbursement of these costs from the designer.

December 2014:

1. A letter has been sent to the designed requesting reimbursement of increased costs associated with TAM installation due to the presence of micropiles.

January 2015:

1. Waiting for the comp grout south of headwall, which is the only remaining risk. No impact to the incline piles.

February 2015:

1. No new information from last months update . When TPC drills thru the secant pile wall, they may hit the micropiles.

May 2015:

1. There is no longer a risk for the Program. A potential collision with the piles did not take place.
2. Recommend retiring this risk at the next monthly meeting.

Risk Mitigation Status
Risk Reference: 215

Risk	Mitigation Strategy
DPW Excavation permit reviews delay contract works	1. Obtain a blanket excavation permit from DPW covering the area of work for 1253, 1254, 1255, 1256

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

Risk Owner: A. Clifford

Status Log:

March 2013:

1. Contract documents have been issued to DPW for review
2. Blanket application permits have been submitted for UMS and YBM
3. Meeting scheduled for 3/15/13 to discuss status of documentation review, submittal of CTS and STS general excavation permits, and DPW resourcing for review of excavation permits
4. Contract 1300 currently requires the contractor to obtain excavation permits
5. **Initial risk rating 3 (2, 1, 1)**
    a. Probability (2), 10-50%
    b. Cost impact (1), <$250
    c. Schedule impacts (1), <1 month

October 2013:

1. DPW review of project documents for excavation permit is not affecting the contract works
2. The contractor is required to obtain excavation permits as per the contract
    a. Central Subway staff and TPC met with DPW to assist obtaining interim blanket excavation permits for all work to the end of 2013

January 2014:

1. DPW have completed their review of all documents
2. Concurrence letter from DPW, and issuance of general excavation permits expected week commencing January 13

February 2014:

1. DPW have issued general excavation permits for each of the 4 areas of work under contact 1300 (CTS, UMS, YBM, STS)
2. Central Subway will issue the permits to Tutor Perini via a letter work with conditions commencing 2/10

May 2015:

1. All DPW permits required have been received.
2. This risk is recommended for retirement.

Risk Mitigation Status	
Risk Reference: 27 (YBM)	
Risk	**Mitigation Strategy**
Loss of business results in unanticipated restrictions on construction.	Public outreach. 1. Work closely with Merchant's Association. 2. Maintain regular and open communications so Merchants know construction plans and progress at all times. 3. Advertise that Stockton Street Merchants are Open for Business. 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 the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 6. Assumed this work in cost & schedule estimates.

Initial Assessment: 1, 4, 4 **Risk Owner:** M. Vilcheck/B. Chau
Current Assessment Risk Rating 2 – Construction Risk

Status Log:

September 2011:

Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.

December 2012:

1. Community outreach is being conducted including the Yerba Buena B.I.D., merchants association and childcare center.
2. Additional reach out required prior to commencement of YBM Station.

May 2013:

1. Outreach met with YBM alliance in April and collected email addresses from businesses for notifications and construction updates. Outreach are working with Yerba Buena BID, Yerba Buena Alliance, Moscone Centre
2. Outreach will meet with individual business owners once contractors schedule is obtained to provide an update and Central Subway contact information.
3. Contactor is required to:
    - Send 60day, and 30day notices to surrounding properties.
    - Coordinate with businesses regarding changes to property access and parking.
    - Install appropriate barriers to guide pedestrians around the construction site.
    - Keep areas adjacent to the site clean

Risk Mitigation Status	
Risk Reference: 27 (YBM)	
Risk	**Mitigation Strategy**
Loss of business results in unanticipated restrictions on construction.	Public outreach. 1. Work closely with Merchant's Association. 2. Maintain regular and open communications so Merchants know construction plans and progress at all times. 3. Advertise that Stockton Street Merchants are Open for Business. 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 the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 6. Assumed this work in cost & schedule estimates.

October 2013:

1. Community meetings were held in September (TODCO/Woolf House and other project neighbors) to notify the community that work on the Yerba Buena / Moscone Station would be commencing soon.
2. 30day and 10day construction notices have been mailed

May 2015:

1. All four construction sites have been opened up. There has been no issues with access to the businesses.
2. Recommend retiring this risk at the next risk meeting.

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
Risk Owner: E. Stassevitch
Current Assessment: Risk Rating 1 - Construction Risk

Status Log:

December 2012 Meeting:
1. Identified Risk and refined risk statement together with development of mitigation strategies.

January 2013 Meeting:
1. No indication from Maritime admin what the penalty would be for non-compliance, if the Contractor does not adhere to Cargo Preference requirement.

February 2013 Meeting:
1. It has appeared that MARAD initial ruling is that the TBM must be shipped 50% American vessel, the 1st TBM is planned to be shipped by non-American vessel, expected to ship early march - the 2nd TBM ship date has not yet been confirmed.
2. Contractor has engaged legal advice this issue.

March 2013:
1. 50% of each TBM will be shipped via U.S. flagged carriers
2. Assess Stations and Systems contract following contract 1300 NTP

September 2013:
1. This is a contractor risk, no effect on program.
2. MARAD issued finding of non-compliance to Robbins

October 2013:
1. MARAD are evaluating possible penalties for Robbins
2. Letter sent to BIH September 17, 2013 encouraging future shipments to be transported via United States flagged vessels

June 2014:
1. MARAD has elected to not impose a fine on BIH's subconsultant Robbins.
2. The compliance issue has not come up in CN1300.

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

May 2015:

1. This risk was developed for the cargo being shipped during the tunnel contract. Risk needs to be further evaluated to determine if it's still valid, now that we are no longer expecting oversee shipping cargo.

Risk Mitigation Status
Risk Reference: 21

Risk	Mitigation Strategy
Incomplete cutoff of groundwater at Moscone Station	1. Require additional grouting to limit leakage to permissible level. 2. Assume probable grouting work in cost & schedule estimates.

Initial Assessment: 1, 1, 1
Current Assessment: Risk Rating 1 – Construction Risk

Risk Owner: M. Vilcheck

Status Log:

February 2012:

1. Additional grouting has been made part of the contract documents.
2. Deep slurry walls are designed to cutoff groundwater.

May 2015

1. Cutoff has been achieved. The Program has a repair procedure in place.
2. Risk owner has been changed to Mark Vilcheck.

PROJECT RISK REGISTER

Central Subway Project San Francisco

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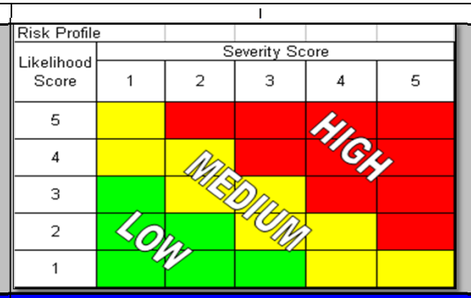

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low
Cost Impact	< $250K	<>$250K - $1M	<> $1M - $3M	<> $3M - $10M	>$10M	3-9 Medium
Schedule Impact	< 1 Month	<> 1 - 3 Months	<> 3-6 Months	<> 6 - 12 Months	> 12 Months	>10 High

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

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
Underground Tunnel												
115	Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently qualify of end walls.	1. In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated. 2. Alternatively, place an allowance in the station contracts for end wall leakage repair.	C	3	1	1	1	50%	3			5/26/15 UMS1295
Track Embedded												
Track: Special												
MOS Station												
21	Incomplete cutoff of groundwater at MOS	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates.	C	1	1	-	1	10%	1	1	Mitigation measure to be made part of the contract documents	4/28/15 MOS1150
22	Public complaints result in unanticipated restrictions on construction at 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
F	Underground obstructions Stations (MOS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	4/28/15 MOS1150
27	Loss of business results in unanticipated restrictions on construction at YBM	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

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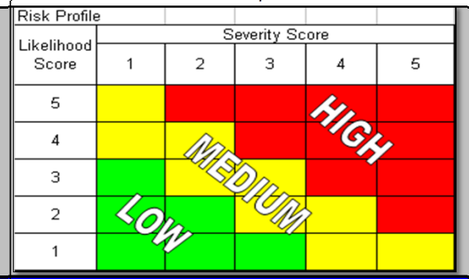

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Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
F	Underground obstructions Stations (UMS)	1. Provide adequate allowance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

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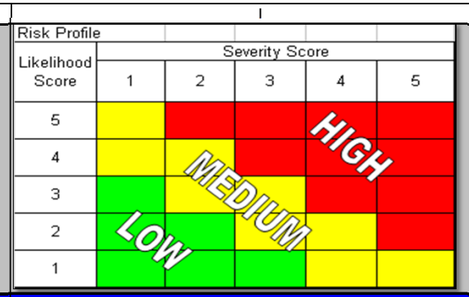

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	Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
160	Q	As-built drawings and UMS construction drawings do not contain enough 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
161	CTS Station												
163	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
167	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

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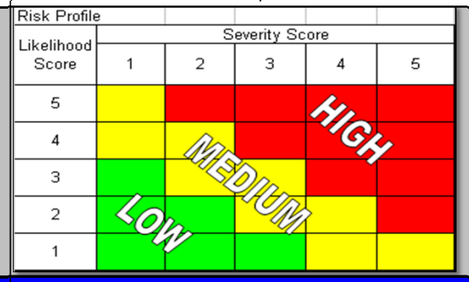

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RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
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SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

	Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
175	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
183	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
214	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												
236	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
237	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
238	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												
249	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
258	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
260	Traffic signals & Crossing Protn.												
262	Fare Collections Systems												
265	Purchase or lease of Real Estate												

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Risk Profile

Likelihood Score	Severity Score 1	2	3	4	5
5				HIGH	
4			MEDIUM		
3					
2	LOW				
1					

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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
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
Reloc. of Household or Business												
Vehicles												
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
102	Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs	1. Actively manage contracts and include incentive provisions for early completion in critical contracts. 2. Add buffer float to critical path to actively manage schedule contingency	C	2	1	2	2	35%	3	6	LONP 1 & 2 initiated to reduce this risk. See Risk 86. The mitigation of risks associated with early contracts will address this risk. Risk rating reduced due to mitigation measures implemented	12/30/20 MS 0010
PR37	Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment	1. Identify temporary power requirements for station construction. 2. Investigate the timing of the permanent feed.	C	2	1	2	2	35%	3	6	Cost for First and Redundant electrical services need to be included in Cost Estimate.	5/3/18 STS1080
Insurance, permits etc.												
103	Difficulty in getting required permits.	1. Coordinate with permit officials and request permits as early as possible. 2. Obtain assistance obtaining permits from PM/CM & FD Consultants.	C	1	2	1	2	10%	2	3		12/18/12 FDS 1275
104	CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Obtain Grade Crossing approvals at final CPUC inspection at the completion of construction. 2. Coordinate closely with CPUC until approval is received.	R	2	3	2	3	35%	5	10	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
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

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112	Major safety event halts work	1. Require contractor Safety plan to address this risk. 2. CM inspections to ensure that safety plan and procedures are implemented.	C	1	5	3	4	10%	4	8	Health and Safety provisions included in contracts. CS Program provides full-time Safety Manager.	12/30/20 MS 0010
196	The process of acquiring station licenses: acquisition/condemnation could significantly delay schedule and cost more than that presently planned.	1. Continue to negotiate with building owners 2. Required Notices and Appraisals to be completed 3. Commence condemnation process with City Attorneys	C	1	1	1	1	10%	4	2		
202	Cargo Preference (Ship America) must solicit U.S.- flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954	1. Require Ship America compliance agreement first tier contractors and subcontractors	C	1	1	1	1	10%	1	2		
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		
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		
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
214	Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles)	1. Provide micro-pile as-built information to contractor 2. Realign tube-a-manchettes clear of micro-piles	C	3	1	1	1	50%	3	6		
215	DPW Excavation permit reviews delay contract works	1. Obtain a blanket excavation permits from DPW covering the area of work for 1253, 1254, 1255, 1256	C	2	1	1	1	35%	2	4		
216	Olivet building potential construction impact	1. Reach out to building owner and keep him abreast of CS construction activities.	C	1	1	2	2	10%	2	3		
217	Delays or complications construction by others – SF Dept. Of Technology, 3rd party utilities	1. Early engagement and coordination for agreements and plan development to avoid construction delays.	C	2	1	1	1	35%	2	4	DTIS MOU has been signed.	
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		
223	Contamination during dewatering (CTS)	1. Review contract requirements .	C	2	3	1	2	35%	4	8		

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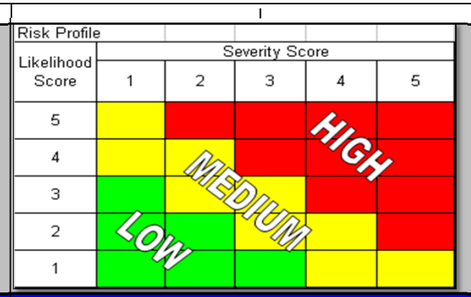

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Probability	< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low
Cost Impact	< $250K	<>$250K - $1M	<> $1M - $3M	<> $3M - $10M	>$10M	3-9 Medium
Schedule Impact	< 1 Month	<> 1 - 3 Months	<> 3-6 Months	<> 6 - 12 Months	> 12 Months	>10 High

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

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

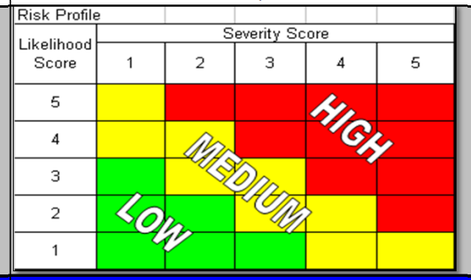
	Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
349	224	CTS AWSS/Ductbank Interface - AWSS system is old and requires replacement	1. Look at alternatives to address 2. Turn off system while CSP work is being done, and then turn on later (find a bypass).	C	5	1	2	2	90%	8	15		
350	225	Ellis Street Utilities (unknown underground utilities)	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 the utilities on red alert	C	3	2	1	2	50%	5	9		
351	226	4th and King Street - Potential time for planned work shutdown - Contractor not able to perform the work in the manner prescribed	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	C	3	3	3	3	50%	9	18		
352	227	LRV Training - having enough trained operators (surplus)	1. Ramp up trained operators a year ahead of time 2. Ensure testing is finished 3. Completion of work at storage track location (Bryant & King)	C	1	2	1	2	10%	2	3		
353	228	Muni union workers - barn signup (preferred runs)	1. Try to get six months advance notice for annual in addition to barn sign up.	C	1	1	1	1	10%	1	2		
354	229	Pre Revenue Testing		C									
355	230	Post Revenue Testing		C									
357	232	Schedule Mitigation - Ways to mitigate potential delays		C				-	0%	-	-		
358	233	Shotcrete Substitution - in the Stations for final lining	1. Meet and discuss with TPC's senior management what the issues are and the status for clarification.	C				-	0%	-	-		
359	234	Sequential Excavation Method at CTS (SEM) Sequence - Contractor proposes to build the north and south platform simultaneously	1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward	C				-	0%	-	-		
360	235	Sewer work after lowering of tunnel - Damage / settlement 3x 5' to old brick sewer running parallel to tunnel alignment		C				-	0%	-	-		
361	236	UMS North Concourse Roof Issues - 12-inch waterline relocation		C				-	0%	-	-		

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 43

DATE ISSUED: 05/07/15



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

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

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)

Final Risk ID	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
237	Quality Control Program	1. Correction Action Plan from Contractor 2. Stand down Meeting with Contractor 3. Augmentation of Management Staff 4. Higher Cross Standards 5. QA (greater surveillances) 6. Bring on additional personnel within the Smith-Emery organization	C				-	0%	-	-		