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Risk Mitigation Meeting Minutes #81

DATE:	May 04, 2016
MEETING DATE:	**April 07, 2016**
LOCATION:	821 Howard Street, 2nd Floor – Main Conference Room
TIME:	2:00pm
ATTENDEES:	John Funghi, Mark Latch, Beverly Ward, Bill Byrne
COPIES TO:	Attendees: Albert Hoe, Roger Nguyen, Jane Wang, John Lackey, Eric Stassevitch, Luis Zurinaga, Jeffrey Davis File: M544.1.5.0820
REFERENCE	Program/Construction Management
SUBJECT:	**Risk Management – Risk Mitigation Meeting** **Risk Mitigation Report No. 81**

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RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	**Report on Red Risk and – (Risk rating ≥ 6)**	
	Risk 232: Behind Schedule - Unable to Recover from Delay to 1300 Contract Discussion: Both TPC and SFMTA are focusing on reconciling the progress schedule. The primary focus of SFMTA is to get back on schedule and not to fall any farther behind. Four mini milestones were established to accomplish this goal. **Risk Rating 9** **Risk 233**: Acceptance of Shotcrete Substitution - leads to final product being inferior in performance Discussion: SFMTA along with the Contractor expects to be a day or so away from inspecting the shotcrete test panels, which were shot above ground at the YBM station. The four test panels shot represent the worse conditions, which could be found. A decision on the cavern concrete is still pending. **Risk Rating 9** **Risk 234**: Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence Discussion: The Contractor did not follow through with their initial substitution request to change the sequence of the excavation method at CTS. With this in mind, the Engineer of record Franz Langer, Dr. Sauer Group is now on board to ensure TPC is following the prescribe design method of operation. **Risk Rating 7** **Risk 237**: Non-Conforming work is not identified by TPC's Quality Control Program Discussion: TPC and CSP are still focused on documenting issues as dictated by TPC quality program. **Risk Rating 7**	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	Risk 238: Quality Program is ineffective in processing the nonconformance items causing schedule impacts Discussion: CNCR are being addressed in a timely manner. There are a one or two CNCR's which haven't been resolved yet. General several meetings will take place to resolve the issues. These items are not holding up work. The CNCR log is being distributed at the weekly construction progress meetings and if warranted the log is discussed. **Risk Rating 6**	
2 -	**Report on Remaining Requirement Risks (Risk rating ≤ 6)**	
	Risk 104: CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows Discussion: CPUC forwarded on April 08, 2016, an email acknowledging CSP's request for an extension. The email states the request was granted and an official approval letter is forthcoming. **Risk Rating 5** **Risk 99:** Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule. Discussion: Collaboration meetings with TPC and CSP's management are being conducted every Thursday. CSP's Resident Engineers also attend a weekly progress meeting each Tuesday and Wednesday with a number of TPC's management staff as well. **Risk rating 5** **Risk 204**: Relocation of AT&T Vault and other utilities delays Work south of Bryant Discussion: AT&T subleases are expected to be out of the area by April 18, 2016. TPC was given permission to begin the ductbank removal on April 15, 2016. **Risk Rating 3** **Risk 115**: Jet grouted station end walls are installed by tunnel Contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently quality of end walls. Discussion: The N. Headwalls at YBM showed sign of moisture. If there is, an issue found the 1300 Contractor is contractually responsible to rectify the issue. There are no signs of any issues occurring at the concourse area. **Risk Rating 3** **Risk 205**: Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor Discussion: The change order process is being examined. CSP has brought on additional help to establish merit determination for the numerous COR's at the UMS Union Square Garage location. **Risk Rating 3** **Risk 214**: Micro Piles at UMS interfere with Tube-a-manchette installation (60' deep micropiles) Discussion: At the north concourse no interface with the micropiles have been seen as of yet. **Risk Rating 3** **Risk 245**: Relocation of Resident Engineer's Construction Management Operations Discussion: SFMTA requested, per the contract the TPC provide a 60-foot construction trailer for CSP construction management team managing the operations for YBM and STS contract. The trailer will be located at 5th and Bryant Streets. All other staff from 821 Howard Street will relocate to the 530 Bush Street office. **Risk Rating TBD**	

ITEM #	DISCUSSION	ACTION BY DUE DATE
3-	**New Risk:**	
	Risk 246: Design changes not being captured in as-builts Discussion: **Risk Rating TBD** Mitigation Strategy: 1. Insure Contractor is capturing Designers Proposed Contact Change (PCC) design changes onto the as-builts.	

ACTION ITEMS –

ITEM #	MTG DATE	DESCRIPTION	BIC	DUE DATE	STATUS
3	05/07/15	**Risk 72** – 4th & King - Develop a test plan checklist for recertifying	S. Pong	5/05/16	Open

Meeting adjourned at 3:20pm

These meeting minutes have been prepared by B. Ward, 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 [initials of preparer] **Date:** 5/6/16 [Date completed].

Ward, Beverly

From: Mozaffari, Siavash <Siavash.Mozaffari@cpuc.ca.gov>
Sent: Tuesday, April 05, 2016 11:08 AM
To: Pong, Sanford
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Hi Stanford

We had a small miscommunication internally. Nothing to worry about. The time extension will pass it will just take a little more time for it to get signed off. Thank you for your patience and participation.

Regards
Sia Mozaffari, Utilities Engineer
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
(415)703-1815 Office
(415)471-4129 Cell Phone
siavash.mozaffari@cpuc.ca.gov

CPUC Rail Crossings Engineering Section
http://www.cpuc.ca.gov/crossings/

From: Pong, Sanford [mailto:Sanford.Pong@sfmta.com]
Sent: Friday, April 01, 2016 11:10 AM
To: Mozaffari, Siavash
Cc: Pong, Sanford
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Hi Sia,

I have yet to receive the approved renewal letter/email. Would you kindly check when it went out and who it was addressed to? I may need to track it down on our side if the letter wasn't circulated here.

Thanks,
Sanford

415-701-4265
Sanford.Pong@sfmta.com

From: Mozaffari, Siavash [mailto:Siavash.Mozaffari@cpuc.ca.gov]
Sent: Thursday, March 17, 2016 12:06 PM
To: Pong, Sanford
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Looks like it's been approved. Let me know if you receive a letter in the mail or email.

Regards
Sia Mozaffari, Utilities Engineer
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
(415)703-1815 Office
(415)471-4129 Cell Phone
siavash.mozaffari@cpuc.ca.gov

CPUC Rail Crossings Engineering Section
http://www.cpuc.ca.gov/crossings/

From: Pong, Sanford [mailto:Sanford.Pong@sfmta.com]
Sent: Tuesday, March 08, 2016 1:07 PM
To: Mozaffari, Siavash
Cc: Pong, Sanford
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Hi Sia,

Thanks for the update. Looking forward to the approval.

Sanford

From: Mozaffari, Siavash [mailto:Siavash.Mozaffari@cpuc.ca.gov]
Sent: Tuesday, March 08, 2016 11:26 AM
To: Gilbert, Daren S.; Pong, Sanford; Robertson, Michael; Garabetian, Antranig G.
Cc: Robertson, Michael; Garabetian, Antranig G.; Artus, Stephen; Espinal, Steven; Xia, Jimmy; Schumacher, Kevin; Hoe, Albert; Wang, Jane; Stassevitch, Eric; Hansen, Robert
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Hi Stanford

I have received your letter and drafted an approval response I believe it needs just two or three more signatures before it is approved. I will notify you personally when I hear back.

Regards
Sia Mozaffari, Utilities Engineer
California Public Utilities Commission
505 Van Ness Avenue
San Francisco, CA 94102
(415)703-1815 Office
(415)471-4129 Cell Phone
siavash.mozaffari@cpuc.ca.gov

CPUC Rail Crossings Engineering Section

http://www.cpuc.ca.gov/crossings/

From: Gilbert, Daren S.
Sent: Tuesday, March 08, 2016 10:40 AM
To: Pong, Sanford
Cc: Mozaffari, Siavash; Robertson, Michael; Garabetian, Antranig G.; Artus, Stephen; Espinal, Steven; Xia, Jimmy; Schumacher, Kevin; Hoe, Albert; Wang, Jane; Stassevitch, Eric; Hansen, Robert
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Good morning Sanford:

I received your request to extend further the authority granted by the Commission for the at-grade crossings that are part of the extension of the current system to the new subway portal as part of the Central Subway project of SF Muni.

FYI, the Rail Transit and Crossings Branch at CPUC has been split into two separate Branches --- the Rail Transit Safety Branch, with me as Branch Manager, and the Rail Crossings and Engineering Branch (RCEB), which is Managed by Mike Robertson. I have forwarded your request letter to Mike and the RCEB supervisor, Anton Garabetian. Sia Mozaffari is still your main CPUC contact for San Francisco rail crossings, and so further inquiries should probably go to Sia.

I have copied all three so that one of them can provide you a status update.

Daren Gilbert, Manager
Rail Transit Safety Branch
Safety and Enforcement Division
California Public Utilities Commission
180 Promenade Circle, Suite 115
Sacramento, CA 95834

Office Ph 916-928-6858

From: Pong, Sanford [mailto:Sanford.Pong@sfmta.com]
Sent: Tuesday, March 08, 2016 8:07 AM
To: Gilbert, Daren S.
Cc: Artus, Stephen; Espinal, Steven; Xia, Jimmy; Schumacher, Kevin; Mozaffari, Siavash; Hoe, Albert; Wang, Jane; Pong, Sanford; Stassevitch, Eric
Subject: RE: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Morning Daren,

I'm following up our letter sent on February 9, 2016 requesting an extension to construct grade crossing for the Central Subway Project. The current application is scheduled to expire on March 11, 2016 and we would like to get the status of our request of a new expiration date.

Please let us know if you have questions regarding our request.

Thanks,
Sanford

Sanford Pong, P.E.
SFMTA | Municipal Transportation Agency
Central Subway
821 Howard Street
San Francisco, CA 94103

415-701-4265
Sanford.Pong@sfmta.com

From: Nacion, Joery
Sent: Tuesday, February 09, 2016 1:30 PM
To: daren.gilbert@cpuc.ca.gov
Cc: stephen.artus@cpuc.ca.gov; sde@cpuc.ca.gov; jx7@cpuc.ca.gov; shk@cpuc.ca.gov; siavash.mozaffari@cpuc.ca.gov; Hoe, Albert; Stassevitch, Eric; Wang, Jane; Pong, Sanford; Morganson, Chuck; Chuck Morganson <CMorganson@HNTB.com> (CMorganson@HNTB.com); Funghi, John
Subject: Letter No. 2549 - Extension to Construct Central Subway Project Grade Crossings - Feb. 8, 2016

Dear Mr. Gilbert,

Attached please find SFMTA's letter regarding the Extension to Construct Central Subway Project Grade Crossings. (original will follow)

Thank you.
Joery Nacion
SFMTA – Central Subway Project
415-701-4249

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Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 81
April 07, 2016
2:00pm– 4:00pm
Central Subway Project Office
821 Howard St. 2nd Floor
Main Conference Room

1. **Attendees:**

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

1. **Report on Red Risks (Risk Rating 6 and above)**
   - **Construction Risks** (**232**, 233, 234, 237, 238, 240)
2. **Remaining Requirement and Design Risks**
   - **Requirement Risks** (104)
3. **Active Risks**
   - **Construction Risks** (99, 204, 115, 205, 214)
4. **Requiring Mitigation Strategy and Assessment**
   - 245 – Relocating Program Management Operation

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. 81
April 07, 2016
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	MDL
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	BW
Lyn Wylder	DEA/PMOC	503-499-0273	cdw@deainc.com	
Luis Zurinaga	SFCTA	415-716-6956	luis@sfcta.org	

Risk Mitigation Status
Risk Reference: 99

Risk	Mitigation Strategy
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. Train staff in adherence to issue resolution process

Initial Assessment: 5, 3, 8
Risk Owner: E. Stassevitch
Current Assessment: Risk Rating 5 – Construction Risk

Status Log:

February 2012 Meeting:

1. Mitigation measures being implemented.
2. Incentives not being used due to legal obstacles.
3. Recommend to reduce the risk rating.

December 2012:

1. The combined contract will reduce the number of interfaces between contracts and potential for relationships to become strained
2. The CMOD process is being improved for quicker resolution of change orders
3. Mitigation 2 - 'Provide incentives in construction contracts in addition to penalties' was removed from the mitigation strategy as this is not being used (as noted in the February 2012 update).

March 2013:

1. A breakdown in the relationship has occurred due to untimely resolution of changes and unresolved contract interpretation issues.
2. SFMTA CMod SWAT team dedicated to processing changes has been implemented to improve the performance of change processing.
3. This improvement has been recognized by both parties.
4. An issue resolution process has been formalized to address disputes and avoid claims.

April 2013:

1. The issue resolution process is not being followed consistently. BIH are not responding in a timely manner and are revisiting prior agreements in the issue resolution process.
2. Brian Kelleher is developing observations and training for adherence to issue resolution process.

May 2013:

1. New Issue Resolution Ladder process presented at the CMB

June 2013:

1. The first meeting was held with BIH on May 21st, 2013 utilizing the refined issue resolution process that was presented to the CMB in May with positive results. A follow up meeting is being held June 14th to further refine the process.
2. Staff training in the issue resolution process is ongoing.
3. A similar meeting with Tutor Perini will be held in future.

Risk Mitigation Status
Risk Reference: 99

Risk	Mitigation Strategy
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. Train staff in adherence to issue resolution process

October 2013:

1. Issue resolution ladder is not working as intended and is to be discussed at the next partnering session

November 2013:

1. Issue resolution ladder to be discussed at next partnering meeting to be held 11/18/13.
2. Risk rating reduced as relationship with 1252 Contractor has improved
3. Risk rating reduced to 5. Probability (2) 10-50%, Cost Impact (4) $3m-$10m, Schedule Impact (1) < 1 month.
4.

December 2013:

1. IRL process topic of discussion during Partnering. Contractor has agreed to focus more efforts to resolve issues.

March 2014:

1. Executive Partnering session with Contractor for 1300 (TPC) was held 27JAN14. Follow-up dedicated meeting for the schedule brainstorming was calendared for the 28FEB14 but subsequently cancelled by TPC. Currently not rescheduled
2. Regular quarterly partnering meeting held with 1252 Contractor (BIH). Openly discussed contentious environment between parties and how to improve. Executive management team committed to process moving forward, established follow-up dates to review schedule recovery, retention reduction and release, and timely processing of progress payments.

April 2014:

1. The next Executive partnering meeting is schedule with the Contractor for (1300) Tutor Perini on April 24, 2014
2. An Executive Management meeting was held with between contract 1252 and the PM/CM Sr. Management to resolve outstanding COR's. A follow up meeting to discuss the balance of the issues is scheduled for 04/15.
3. Construction Management team for contract 1300 will be trained in adherence to issue resolution process.

May 2014:

1. SFMTA and Tutor Perini have had 2 Exec partnering sessions.
2. Practices are being implemented to address issues.

December 2014:

1. Quarterly Partnering meetings are taking place to address issues.

August 2015:

1. An executive partnering session meeting is schedule between SFMTA and TPC's upper management on August 27, 2015 at 10am.

Risk Mitigation Status
Risk Reference: 99

Risk	Mitigation Strategy
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. Train staff in adherence to issue resolution process

November 2015:

1. As part of an overall evaluation of the remaining requirement and design risk, as well as the low rated active construction risk. The committee preformed a reassessment of this risk to determine if its current Risk rating is still valid.
2. There was no change made to the risk rating. This construction Risk rating will remain a 5.

April 2016:

1. Meetings are taking place with TPC's management every Thursday at 1:30pm. The RE's also attend a progress meeting each Tuesday and Wednesday's with a number of TPC management.

Risk Mitigation Status
Risk Reference: 104

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Grade Crossing approvals are not received until final CPUC inspection at the completion of construction. 2. Close coordination with CPUC will continue until approval is received. 3. Signal standardization issue will elevated to the appropriate SFMTA Division

Initial Assessment: 2, 3.5, 7 **Risk Owner:** S. Pong
Current Assessment: Risk Rating 5 – Construction Risk

Status Log:

September 2011:

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

January 2012 Meeting:

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

April 2012 Meeting:

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

May 2012 Meeting:

No update.

July 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 104

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Grade Crossing approvals are not received until final CPUC inspection at the completion of construction. 2. Close coordination with CPUC will continue until approval is received. 3. Signal standardization issue will elevated to the appropriate SFMTA Division

August 2012 Meeting:

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

September 2012 Meeting:

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

October 2012 Meeting:

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

November 2012 Meeting:

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

December 2012:

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

January 2013 Meeting:

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

February 2013 Meeting:

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

March 2013:

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

April 2013:

1. Construction, testing, and safety requirements need to be met to enable CPUC signoff at completion.

Risk Mitigation Status
Risk Reference: 104

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Grade Crossing approvals are not received until final CPUC inspection at the completion of construction. 2. Close coordination with CPUC will continue until approval is received. 3. Signal standardization issue will elevated to the appropriate SFMTA Division

2. Another request for extension will need to be submitted if construction and approval is not received by January 1st 2016.

May 2013:

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

July 2013

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

September 2013:

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

November 2013:

1. CPUC Resolution (TED-253) for extension of at grade crossing was granted. Need to reapply for extension in 2016 as well as resolve outstanding comment related to Red Cross Buck.

October 2014:

1. The Red X cross buck issue remains open. This is an agency wide issue which will require resolution between SFMTA and CPUC.

November 2015:

1. A meeting will be setup with CPUC to discuss the outstanding issue of signal design to be used.
2. CSP will request an extension of the CPUC Resolution (TED-253). The current extension will expire on 3/11/16.

January 2016:

1. Extension request letter – Resolution (TED-253) for the construction of the - At grade crossing has been drafted and will be sent to CPUC.

February 2016:

1. A letter requesting an extension (continuance) will go out by the end of the week, February 05, 2016.

Risk Mitigation Status
Risk Reference: 104

Risk	Mitigation Strategy
CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Grade Crossing approvals are not received until final CPUC inspection at the completion of construction. 2. Close coordination with CPUC will continue until approval is received. 3. Signal standardization issue will elevated to the appropriate SFMTA Division

March 2016:

1. Extension request letter was issued to MTC on February 9, 2016. Awaiting extension approval.

April 2016:

1. Email received on CPUC, on April 5, 2016, stating they will pass CSP's time extension request.
2. Still awaiting official approval letter from CPUC.

Risk Mitigation Status
Risk Reference: 115

Risk	Mitigation Strategy
Jet grouted station end walls are installed by tunnel Contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently quality of end walls.	1. In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated. 2. Alternatively, place and allowance in the station contracts for end wall leakage repair. 3. Include "Clawback" provision in tunnel contract to allow station contractor to transfer costs of repair to headwall to the tunnel contractor. 4. Require tunnel contractor to be present to witness station excavation of headwalls.

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

Status Log:

September 2011:

1. Project configuration changes include headwall designs with multiple levels of redundancy.
2. Warranty "clawback" provisions added to tunnel contact language.

December 2012:

1. Risk owner changed from J. Caulfield/J. Wang to S. Wilson
2. Mitigations 1, 2 and 3 have not been implemented.
3. The 1252 contract includes a Warranty Bond of 10% of the contract value for 2 years following final acceptance. Should funds need to be obtained to remediate leakage problems, Central Subway will source these from the bond holder.
4. The forecast completion date for the portal structure is April 2015, current estimate schedule for station excavation (latest of 3 stations) is November 2015. Therefore the excavation of the station caverns and exposure of the end walls will fall within the warranty period of the 1252 contract.

November 2015:

1. As part of an overall evaluation of the remaining requirement and design risk, as well as the low rated active construction risk. The committee preformed a reassessment of this risk to determine if its current Risk rating is still valid.
2. There was no change made to the risk rating. This current construction Risk rating will remain a 3.

December 2015:

1. Excavation of the station boxes at YBM and UMS has commenced and is still expected to be complete within the 1252 Warranty Bond time period. See Item 3 of the December 2012 update.

Risk Mitigation Status
Risk Reference: 115

Risk	Mitigation Strategy
Jet grouted station end walls are installed by tunnel Contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently quality of end walls.	1. In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated. 2. Alternatively, place and allowance in the station contracts for end wall leakage repair. 3. Include “Clawback” provision in tunnel contract to allow station contractor to transfer costs of repair to headwall to the tunnel contractor. 4. Require tunnel contractor to be present to witness station excavation of headwalls.

April 2016:

1. N. Headwalls at UMS showed a little water. If this is an issue TPC is responsible for addressing it.
2. CN1252 includes a warrant bond, if need these will be used to remediate leakage problems.

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.

June 2015:

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

July 2015:

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

August 2015:

1. AT&T crew completed pulling cables. Cut-over crew will mobilize within 2 weeks for splicing. AT&T's goal is to complete cutover by end of 2015.

September 2015:

1. AT&T cutover crew has not started work yet. The utility crew is awaiting receipt of the splicers.
2. AT&T still believes they can put everything in before the end of the year.

October 2015:

1. AT&T crew has yet to begin cutover work. The utility crew is awaiting receipt of the splicers.
2. AT&T has until April 2016 to put everything in.

November 2015

1. AT&T has made a commitment to perform the cutover work by November 19th, 2015.

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

December 2015:

1. The RE is currently trying to get a more reliable schedule. Currently the work that's being performed is pre work and not the fiber connection work. PG&E has made the commitment to be done by the end of the year.

January 2016:

1. RE's perform a task updating the manhours for AT&T to demonstrate the percent complete. The results show AT&T is roughly 65% complete.
2. RE's has requested a meeting with Huan Huynh, AT&T representative to obtain the metric schedule of when their work will be completed.

February 2016:

1. Removal of existing duct bank is an issue. SFMTA direct TPC perform the removal work.
2. RE is working with AT&T to have them pay for the additional work to remove the DB.

March 2016:

1. SFMTA directed TPC in writing to perform the removal work of the existing duct bank.
2. RE is working with AT&T to have them pay for the additional work to remove the DB.

April 2016:

1. AT&T subleases should be out by April 15, 2016. RE sent email out today, 04/07/16 to them citing the urgency to vacate.
2. TPC has been given the ok to start the DB removal on April 18, 2016.

Risk Mitigation Status
Risk Reference: 205

Risk		Mitigation Strategy
Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	√ √	1. CMod Task Force - 5 Areas of Improvement identified 2. Implement areas of improvement 3. Increase Delegation of Authority

Initial Assessment: 1, 1, 3 **Risk Owner:** E. Stassevitch
Current Assessment: Risk Rating 3 – Construction Risk

Status Log:

December Meeting 2012:

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

January 2013:
1. CMod Task force continues to demonstrate the process is working.
2. Task force process has slowed down submission of changes from Contractor

February 2013 Meeting:
1. Initial risk rating established
2. CMod task force improvements are working
3. The combined 1300 contract has effectively resulted in a $5m Board threshold for the entire 1300 contract (previously $5m threshold for each of the 4 contracts) – Central Subway to investigate increasing the CMod authority above $5m.

March 2013:
1. Process to increase delegation of authority to be discussed

April 2013:
1. Risk owner changed from M. Benson to R. Redmond
2. A formal recommendation to increase the delegation of authority will be prepared and presented to the CMB on 4/17.
3. A detailed White Paper will be developed for the Project Director outlining the rationale for increasing the delegation of authority.

May 2013:
1. A request to the SFMTA board to increase the Director of Transportation authority to approve changes orders of up to $5 million for each of the Contract 1300 packages (a total of $20 million) has been included in the calendar item requesting the SFMTA board to award Contract 1300.
2. The target SFMTA board meeting for this calendar item is May 21st 2013.

October 2013:
1. SFMTA board approved increase in Directors authority with award of Contract 1300 in May 2013.

Risk Mitigation Status
Risk Reference: 205

Risk		Mitigation Strategy
Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	√ √	1. CMod Task Force - 5 Areas of Improvement identified 2. Implement areas of improvement 3. Increase Delegation of Authority

May 2014:

1. Progress in the CMod process are continuing to be made.

July 2014:

1. Contract 1300 Partnering efforts have expanded to include the RE level, Designers, Utility companies and Department of Traffic.

December 2014:

1. No change to the status of this risk.

September 2015:

1. Executive partnering meeting on August 27, 2015 established goal to lower number of outstanding merited changes. Focused attention on completing outstanding merit evaluations, and effectively utilizing the regular weekly meeting to move changes thru the process. Program Manager and Contractor Project Manager to attend weekly change meeting to prioritize work and to meet more often if required expediting processing of changes. Progress to be monitored weekly to measure effectiveness and implement mitigations as required.

October 2015:

1. Weekly Change Management meetings are beginning to produce results; agreed to list of changes, prioritization of items to be addressed, and scheduling of change negotiations. Progress is still extremely slow in the processing of agreed to changes, but moving forward.
2. Outstanding merit determination items are being reduced.

November 2015:

1. Progress continues to be extremely slow, but still moving forward.

December 2015:

1. Three Cmod’s have been signed this month, that contained multiple COR’s.

January 2016:

1. 6 more Cmod’s have been processed since the last update, all contain multiple CORs.

February 2016:

2. Four CMods for the stations contract and Two CMods for the tunnel contract have been process since last month’s update.

Risk Mitigation Status
Risk Reference: 205

Risk		Mitigation Strategy
Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	√ √	1. CMod Task Force - 5 Areas of Improvement identified 2. Implement areas of improvement 3. Increase Delegation of Authority

April 2016:

1. The change order process is being examined. The Program has brought on additional help to address the issue of assessing merit determination at UMS – Union Square Garage settlements.

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.

June 2015:

1. Tube-a- manchette for the micropiles for compensation grouting at the Barney's still need to be put in.

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

August 2015:

1. Tube-a-manchette installation has relocated to Chinatown until approx. October.
2. No change to the status of this risk.

November 2015:

1. As part of an overall evaluation of the remaining requirement and design risk, as well as the low rated active construction risk. The committee preformed a reassessment of this risk to determine if its current Risk rating is still valid.
2. There was no change made to the risk rating. This current construction Risk rating will remain a 3.
3. Compensation grouting north of the headwalls work still remains.

December 2015:

1. No Change to the status of this risk.
2. Recommend revisiting early 2016 when TAM installation recommences at UMS.

April 2016:

1. The Contractor had completed everything beyond Geary Street. Tube-a-manchette have been installed at the North concourse. There hasn't been any interface as of yet. Micopiles were not installed pass Geary Street.

Risk Mitigation Status
Risk Reference: 232

Risk		Mitigation Strategy
Behind Schedule - Unable to Recover from Delay to 1300 Contract		1. Contractor implemented Schedule Recovery 2. Acceleration 3. Scope Reduction

Initial Assessment: 4, 3, 3 **Risk Owner:** E. Stassevitch
Current Assessment: Risk Rating 12 – Construction Risk

Status Log:

January 2015:
1. Contractor's schedule update has not been submitted.

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

March 2015:
1. SFMTA will perform an in-house analysis of the Contractor's time impacts submitted to validate the actual durations.
2. SFMTA will meet with the PMOC to discuss activities on the Contractor's schedule for ways to gain recovery.

April 2015:
1. A draft analysis was done to compare the Contractor's baseline activities against actual work which occurred in January update.
2. Additional analyses will be ran to demonstrate a side by side comparison for each delay the Contractor is claiming.
3. A standardize document will be created for reporting the Contractor's work progress versus what is shown in the baseline schedule activity.

May 2015
1. The Program will initiate a schedule containment workshop, to better define the risk to the project, and address issues and ways to mitigate potential delays.

June 2015:
1. A schedule analysis being generated to determine the number of days the contractor is behind schedule.

July 2015:
1. Schedule analysis continues to be generated to determine precise number of days the contractor is behind
2. Partnering workshop held – mini milestones identified to increase confidence that team can attain schedule recovery.

Risk Mitigation Status
Risk Reference: 232

Risk		Mitigation Strategy
Behind Schedule - Unable to Recover from Delay to 1300 Contract		1. Contractor implemented Schedule Recovery 2. Acceleration 3. Scope Reduction

August 2015:

1. Schedule updates are being received from the Contractor. Once all updates are received and approved, the Program can proceed with making a determination of the amount of time the Contractor is behind schedule and begin to work on ways to mitigate the delay.

September 2015:

1. Executive Partnering meeting held August 27, 2015, established initial recovery efforts to double shift roof placement activities at UMS to recover lost time from jet grouting operations; also identify any and all work to could be performed now, and implement plan to proceed with that work. Initial ideas identified work in the tunnel. Tunnel walk thru by Contractor took place on September 2, 2015, with effected subcontractors, to develop plan for placing as much tunnel invert as possible prior to break-ins.

October 2015:

1. Work is proceeding with the extended shifts for the roof placements; goal is to complete all but two of them by the moratorium.
2. Work in the tunnel is progressing with removal of the fan line (ducts) and preparation for invert placement. Goal is to complete all invert and rail placement by April 2016 working from North to South.

November 2015:

1. Continuing with efforts to complete roof placements, will not achieve goal of all but two. Need to develop plan for after moratorium to make up lost time on roof placement efforts.
2. Work in the tunnels continues, all fan line removed. Still on track to complete goal by April 2016. Response required for shrinkage crack RFI

December 2015:

1. A schedule workshop meeting took place on 11/18 and 11/19 to see where there was opportunity to recovery.
2. A Senior Management meeting will take place to discuss ways to implement some of the schedule recovery elements.

January 2016:

1. Sr. Mgmt meeting took place Dec 4th, identified CTS as critical path and reviewed areas to potentially recover time or at a minimum not to lose more time. Identified 5 mini milestones to track to ensure progress is maintained or improved. Focus is on having all barrel vaults installed by 23rd of Feb and CDF in tunnels in place ready for break in of Cross cavern.

February 2016:

1. Modification of the mini milestones identified at CTS was done. The Contractor is still working towards the new dates.

Risk Mitigation Status
Risk Reference: 232

Risk		Mitigation Strategy
Behind Schedule - Unable to Recover from Delay to 1300 Contract		1. Contractor implemented Schedule Recovery 2. Acceleration 3. Scope Reduction

April 2016:

1. TPC Management is very focus on insuring that the schedule is recovered to the best of everyone's ability and identify components of work that will allow the contract to recovery time. The primary focus currently is on the Chinatown stations. As an example the audacious goals were established for all four work sites during partnering. CTS goal is to complete the cross cut cavern by June 15th, 2016. This would be a month to 1-1/2 months ahead of schedule.
2. Additionally, short-term milestones are also being tracked.

Risk Mitigation Status
Risk Reference: 233

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

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

Risk Owner: W. Lee

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 authorized to review the shotcrete resubmittal.

March 2015:

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

April 2015:

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

May 2015

1. The contractor has yet to respond .

June 2015

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

July 2015:

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

Risk Mitigation Status
Risk Reference: 233

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

August 2015:

1. No submittal received, TPC has informed us that they will submit two separate submittals. One for the head house and one for the underground station, crossover and cross cut. The use of shotcrete as a final lining is over a year off

September 2015:

1. Nothing submitted yet.
2. The Contractor indicated during the Partnering meeting on 08/27/15, they are working on it.

October 2015:

1. We have not received the submittal. The issue is thought to be concerning the Contractor proposing sacrificing the waterproofing membrane in front.

November 2015:

1. The Program has expressed concern with the Contractor wanting to piecemeal approach of submitting information related to shotcreting work, which gives the false impression the Program is accepting their proposal of shotecrete in lieu of. SFMTA will send a letter to the Contractor rejecting their submittals ideals (Shotcrete in lieu of). Requesting a more comprehensive submittal package demonstrating they are meeting all of the performance requirements.

December 2015:

1. TPC submitted Letter -1166 with 5 exhibits responding to SFMTA letters 556 and 1039. The letter is under review. Shotcrete mix design has been approved and test panels are scheduled to be shot.

January 2016:

1. SFMTA has yet to respond to TPC letter No. 1166. SFMTA is in the process of responding. The letter will address the issue of deficiency. Citing directly from the contract technical specifications.

February 2016:

1. SFMTA has met with CSDG to resolve if a redesign of the final lining is required, awaiting a response from CSDG. Met with TPC and their shotcrete subcontractor Superior regarding response to Letter 556, it became clear that the 556 deals only with vertical walls in the stations. The CTS caverns will be dealt with later. Working on response.

March 2016:

1. SFMTA, Designer, Contractor and Specialty Contractor have all agreed on the configuration for vertical shotcrete of what the test panels will consist of. The panels will replicate the most congested condition which could be found on the jobsite.

Risk Mitigation Status
Risk Reference: 233

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

2. The cavern concrete issue has not been decided yet.

April 2016:

1. The four test panels were shot will soon be examine to determine if approval may be given. The panel shot is a god representation of the worse conditions that may be found.
2. CSP suggested that TPC put in writing that they are agreeable to shooting another test panel if a worse condition is presented.

Risk Mitigation Status
Risk Reference: 234

Risk		Mitigation Strategy
Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence		1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward

Initial Assessment: 2, 4, 3 **Risk Owner:** M. Kobler
Current Assessment: Risk Rating 7 – Construction Risk

Status Log:

January 2015:
1. The Program is awaiting the Contractor's SEM re-submittal. Anticipating their response to SFMTA's letter providing them with 4 options to choose from to perform the work.

February 2015:
1. No new update on this risk.

March 2015:
1. Contractor has yet to submit a response to SFMTA letter providing them with alternatives for the excavation sequences.

April 2015:
1. Contractor has not responded to SFMTA's letter with alternatives
2. The Designer of record will be contracted to review the Contractor's submittal for (scope and delivery) to determine if the proposed is viable.

May 2015:
1. The designer has proposed 4 different sequences for the contractor to evaluate. Contractor is evaluating.
2. DOR was compensated to review the SEM Geometry change and offered suggestions for TPC's evaluation.

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

July 2015:
1. Contractor has yet to submit.

Risk Mitigation Status
Risk Reference: 234

Risk		Mitigation Strategy
Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence		1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward

August 2015:

1. Contractor has yet to submit.

September 2015:

1. The Contractor has submitted the proposed method. The submittal was forwarded to the designer of record on July 29 and is now being reviewed by CSDG.

October 2015:

1. The submittal was returned revise and resubmit. The designer did not have an issue with the proposed sequences but wanted to see the stamped calculations.

November 2015:

1. The Contractor is performing the work in the approved prescribed sequence. Stamp calculations have yet to be submitted.

December 2015:

A contractor is performing the prep work in the approved prescribed sequence. Calculations were not required for the sequence. Calculations were required for slurrywall support between the two side drifts.

January 2016:

1. The Contractor is performing the prep work as prescribed.
2. The risk to the Program is can they perform the work in a quality manner.

February 2016:

1. TPC is performing the work as specified.

April 2016:

1. The Contractor is in the process of installing barrel vault pipes.
2. The SEM designer of record Engineer Franz Langer, is now on site to ensure the contract design is being followed.

Risk Mitigation Status
Risk Reference: 237

Risk		Mitigation Strategy
Non-Conforming work is not identified by TPC's Quality Control Program		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: 3, 2, 2 **Risk Owner:** M. Latch
Current Assessment: Construction Risk Rating 6

Status Log:

May 2015:

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

June 2015:

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

July 2015:

1. Only change is Contractor has now written 72 CNCRs
2. At the 8Jul2015 C1300 Partnering Meeting, the need for this meeting was discussed and is to occur every other week.

Risk Mitigation Status
Risk Reference: 237

Risk		Mitigation Strategy
Non-Conforming work is not identified by TPC's Quality Control Program		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

3. There is now an Assistant CQM for each of the Contract Packages. The organization is somewhat in flux regarding the potential replacement of the current CQM due to health reasons.
4. No change
5. SFMTA QA completed Quality Assurance Audit 025 and Quality Assurance Surveillances 063-066 of TPC's implementation of their Contractor Quality Program (CQP).
6. No change
7. Risk title has been updated once more during the July 2015 meeting, to read "Non-Conforming work is not identified by TPC's Quality Control Program".

August 2015:

1. TPC has assigned a new Quality Control Manager.
2. Assessment of the risk was done and values were assigned.
3. **Recommended risk rating 6 (3 2 2)**
    a. Probability (3), >50%
    b. Cost impact (2), <>$250K - $1M
    c. Schedule impacts (2), <> 1 - 3 Months

September 2015:

1. The corrective action reports (CAR) are being received.
2. The Contractor's Quality Control Plan submittal was resubmitted after SFMTA comments were addressed.
3. Reorganization of TPC Quality Control personnel was done; TPC has hired additional personnel.

October 2015:

1. TPC QC is initiating CNCRs usually within the required 24 hours upon becoming cognizant (which at times is provided by RE Staff) of the non-conforming condition.
2. CNCRs with a Use-As-Is and Repair dispositions are being approved by SFMTA prior to repairs being performed or subsequent work being allowed to proceed.
3. TPC's CNCR Form, once again, and as originally approved, includes the CQM's approval of the disposition, root cause and steps to prevent recurrence.
4. Concrete Placement Cards now include provision for assuring that all open CNCRs are closed prior to concrete placement.
5. REs have generated no NCNs (RE requesting TPC to generate a CNCR) since mid-August.

Risk Mitigation Status
Risk Reference: 237

Risk		Mitigation Strategy
Non-Conforming work is not identified by TPC's Quality Control Program		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

December 2015:

1. Bi weekly quality meeting are ongoing, attended by Chuck Ralston, TPC and Mark. Latch, SFMTA.

January 2016:

1. Bi weekly quality meeting continue to take place.
2. Quality issues related to welding have reached a resolution.
3. Spot surveillance related to quality issues findings require resolution.

February 2016:

1. The Quality Task Force (QTF) Meetings are conducted on a bi-weekly schedule with meeting minutes published usually within the following week. These meetings frequently include, as agenda items or ad-hoc items, discussion and suggested mitigation measures related to SFMTA's identification of potential field issues as observed by SFMTA's QA Inspectors.
2. TPC QC, with some participation by SFMTA QA, have verified that Smith Emery's CWIs have documented their acceptance of all structural steel welds performed at UMS prior to June 2015, to approved shop and design drawings and Welding Code (AWS D1.2) requirements.
3. Follow-up joint surveillance (SFMTA QA/TPC QC) of Project Record Documentation (As-Builts) indicates that repair dispositioned CNCRs are now being reflected on the Documentation

March 2016:

1. Generally, the Contractor's QP is being implemented through a collaborative effort; including RE Staff's timely participation, prior to (Preparatory and Initial Phase Meetings and SFMTA HOLD Points) and during the performance of Work, to ensure that the Contract Document requirements have been met. CNCR's are generated, also at times through the aforementioned collaborative effort, when non-conforming work is inadvertently performed/occur. Through ongoing discussions/interactions with SFMTA and TPC QC, TPC QC does not clandestinely accept Work that will require a CNCR.

April 2016:

1. Nothing new to report.

Risk Mitigation Status
Risk Reference: 238

Risk		Mitigation Strategy
Quality Program is ineffective in processing the nonconformance items causing schedule impacts		1. Review CNCR log on a biweekly basis. 2. Greater clarity in the Log on what CNCR's are open

Initial Assessment: 3, 2,2 **Risk Owner:** M. Latch
Current Assessment: Construction Risk Rating 6

Status Log:

July 2015:

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

August 2015:

1. Assessment of the risk was done and values were assigned.
2. **Recommended risk rating 6 (3 2 2)**
    a. Probability (3), >50%
    b. Cost impact (2), <>$250K - $1M
    c. Schedule impacts (2), <> 1 - 3 Months

September 2015:

1. SFMTA Construction team diligently working to make sure the CNCR log is accurate and nonconformance items are being clearly addressed

October 2015:

1. As mentioned in the 6Oct2015 C1300 Progress Meeting - TPC QC has made significant progress in providing a more complete, accurate and timely CNCR Log.
2. New mitigation item added.

November 2015:

1. TPC QC, with support from TPC's Project Executive, is no longer allowing commercial issues to impede the generation of CNCRs.
    a. Additionally, at the bi-weekly Quality Task Force Meeting it was agreed that TPC's CQM and the CSP PQM will discuss CNCRs that are of a particularly contemptuous or controversial nature and in particular to make sure that each CNCR is timely and accurate and describes non-conforming work; not contractual matters. CNCRs are now identified on the CNCR Log and at each Additional Initial Phase Concrete Pre-Placement Meeting, to preclude work that is the subject of a CNCR from being inadvertently

Risk Mitigation Status
Risk Reference: 238

Risk		Mitigation Strategy
Quality Program is ineffective in processing the nonconformance items causing schedule impacts		1. Review CNCR log on a biweekly basis. 2. Greater clarity in the Log on what CNCR's are open

incorporated in to the work. TPC in general, is providing a timelier but still in need of improvement (including ensuring that sufficient information is provided to the Engineer to allow an efficient review of each CNCR) disposition of CNCRs. TPC QCM is now signing off on each CNCR form, prior to the submittal to the Engineer, attesting to the fact that the CNCR contains a reasonable/plausible root cause, suggested repair, reason for accepting a USE-AS-IS dispositioned CNCR and steps to preclude recurrence.

b. Posting all CNCRs to CM13 eliminates issues associated with the lack of CNCR file naming convention or human error. Through the use of CM13, the Initial issuances and subsequent processing of CNCRs are now timelier and much easier to retrieve for review/approval/informational purposes. Each of the four stages/phases of each CNCR are documented by posting (attaching) a separate file for (1) Initial, (2) Dispositioned, (3) Approved by SFMTA (REPAIR and USE-AS-IS dispositions) and (4) Closed CNCRs, to the associated CNCR number within CM13.

January 2016:

1. The posting of nonconformance items by the Contractor has shown notable improvements as it relates to the four stages/phases within CM13.

February 2016:

1. Timely issuance/updating of TPC's CNCR log and issuance of initial phase CNCRs has significantly improved.

March 2016:

1. Nothing new to report other than the CNCR Log is distributed, and discussed as warranted, at the weekly Contract Package Progress Meetings. And, SFMTA Quality Assurance Audit QAS 026, currently being conducted, includes CNCR Log attributes.)

April 2016:

1. Nothing new to report.

Risk Mitigation Status
Risk Reference: 240

Risk		Mitigation Strategy
Unresolved Assignment of Schedule Delay Responsibility (may lead to increase cost for the Program)		1. Ask for TIA's 2. As Built Schedule (Program Analysis) 3. Perform a more refined analysis

Initial Assessment: 2, 4, 4 **Risk Owner:** E. Stassevitch
Current Assessment: Risk Rating 8 – Construction Risk

Status Log:

October 2015:

1. Risk was assessed, risk rating was applied and mitigation strategy added.
2. SFMTA requested the Contractor to submit a recover schedule to demonstrate the method to which they intend to capture the time loss. If the Contractor elects not to produce a recovery schedule. The Program should formally document the Contractor is not adhering to the contract.

November 2015:

1. SFMTA is working with Contractor to produce recovery Schedule.
2. SFMTA together with FTA PMOC have planned a schedule workshop for mid Nov. to focus on identifying recovery plans and addressing several issues with the schedule update process.

December 2015:

1. Working with TPC to provide monthly schedule progress updates to minimize impact.

January 2016:

1. Schedule letter in preparation to address issues surrounding schedule updates, need for schedule recovery plan, and other deficiencies related to contract required schedule deliverables.

February 2016:

1. SFMTA is preparing a letter to be sent out on February 5, 2016. The will address various issues:
    a. TPC's claim of TIA's, which have yet to be received by SFMTA.
    b. List of achievable goals where SFMTA can help them with.

April 2016:

1. Partnering with TPC continues. Both parties have agreed to sit down and discuss schedule comments.
2. Limiting the rhetoric, comments are required to come from management in terms of how to address the schedule mitigation.
3. The work is not being by the unresolved schedule comments. The focus now is to improve the contract operation future and to reconcile the past.
4. Two additional resources on the SFMTA's scheduling side have been brought on board help with resolutions.

Risk Mitigation Status
Risk Reference: 245

Risk		Mitigation Strategy
Relocation of Resident Engineer's Construction Management Operations		1. Interface with Utility, DT and City agency to establish temporary residency.

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

Risk Owner: E. Stassevitch

Status Log:

April 2016:

1. To accommodate CSP staff move to 530 Bush, the Program is negotiating with the Contractor to secure a 60-foot trailer to be housed on Bryant Street for YBM and STS construction staff.

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 (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

	A	H	I	J	K	L	M	N	O	P	Q	R	S
1	**PROJECT RISK REGISTER**					Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend		
2	Central Subway Project San Francisco				Probability	< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low	RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE I	
3	REV : 54				Cost Impact	< $250K	<>$250K - $1M	<> $1M - $3M	<> $3M - $10M	>$10M	3-9 Medium	2	
4	DATE ISSUED: 04/07/16				Schedule Impact	< 1 Month	<> 1 - 3 Months	<> 3-6 Months	<> 6 - 12 Months	> 12 Months	>10 High	SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPAC	
5	**Final Risk ID**	**Risk Description**	**Mitigation Description**	**Risk Category**	**Probability %**	**Cost Impact**	**Schedule Impact**	**Calc Impact**	**Calc %**	**Risk Rating**	**Score**	**Status**	**Must Complete by Date**
108	34	Loss of business results in unanticipated restrictions on construction at UMS	1. Public outreach. 2. Work closely with Merchant's Association. 3. Maintain regular and open communications so Merchants know construction plans and progress at all times. 4. Advertise that Stockton Street Merchants are Open for Business. 5. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. 6. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 7. Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 8. Include this work in cost & schedule estimates.	**C**	2	3	2	3	35%	5	10	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	9/7/16 UMS1430
111	35	Ground support structure causes groundwater table to rise which results in leakage into adjacent structures.(new structure might create a dam that results into leaks into new and existing structures)	1. Perform detailed hydrogeologic modeling and analysis. 2. Monitor groundwater table at multiple locations and passive measures as necessary to mitigate. 3. Reference the Tech memo in contract documents. 4. Include probable costs in estimate.	**C**	1	2	-	1	10%	1	2	Mitigation measures incorporated in design based on updated Hydrogeologic analysis and report	9/7/16 UMS1430
112	36	Damage to buildings or utilities as a result of heave from jet grouting at UMS.	Utilize tangent piles combined with surface jet grouting.	**C**	5	1	1	1	90%	5	10	Mitigation measures implemented in contract documents to reduce risk	4/14/15 UMS1310
113	37	Damage to adjacent buildings at UMS due to surface construction activities.	1. Require protective barriers. 2. Have an emergency and rapid response customer focused task force to fix damaged facilities. 3. Quickly repair and reimburse resulting costs. 4. Include probable cost in estimate.	**C**	1	2	-	1	10%	1	2	Mitigation measures implemented in contract documents to reduce risk	9/7/16 UMS1430
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												

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	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
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RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE I
2

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPAC

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
46	Public complaints result in unanticipated restrictions on construction at CTS. (schedule and estimate for underground work assumes 6 day work week and 2 shifts per day)	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 6. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 7. Quickly process and resolve damage and accident claims from the Public. 8. Include this work in cost & schedule estimates.	C	2	5	1	3	35%	6	12	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	10/9/17 CTS1500
48	Incomplete drawdown of groundwater. (inside of box and inside of caverns)	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. 3. Include allowance for dewatering within cavern during construction.	C	2	2	1	2	35%	3	6	Mitigation measures have been included in contract documents	5/1/16 CTS1140
52	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	1. Evaluate effect of potential settlement on utilities. 2. Slip-line sewer by TBM contractor. 3. Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed. 4. Have contingency repair/restoration plan. 5. Utility contact information and procedure will be on plans. 6. Develop an allowance for utility repair. 7. Include probable cost in estimate. 8. Need to identify the new SFPUC contact	C	3	3	1	2	50%	6	12	Project configuration change, lowered station 25 ft. reducing the probability of this risk. Risk rating lowered.	4/22/16 N-CTS9730
F	Underground obstructions stations (CTS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings	C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	10/9/17 CTS1500
General												
Demolition, Clearing , Earthwork												
Site Utilities, Utility relocations												
Hazmat, Contaminated Material												
Environmental Mitigations												

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DATE ISSUED: 04/07/16

	Low (1)	Medium (2)	High (3)	Very High (4)	Significant (5)	Legend
Probability	< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low
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RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE I
2

SCORE = PROBABILITY X (COST IMPACT + SCHEDULE IMPAC

	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	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												
273	Reloc. of Household or Business												
275	Vehicles												
278	Preliminary Engineering												
291	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
297	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
299	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
305	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
306	Insurance, permits etc.												
307	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

PROJECT RISK REGISTER

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DATE ISSUED: 04/07/16

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Probability	< 10%	<> 10-50%	> 50%	<> 75% & 90%	>90%	<3 Low
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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
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 contr	12/30/20 MS 0010
112	Major safety event halts work	1. Require contractor Safety plan to address this risk. 2. CM inspections to ensure that safety plan and procedures are implemented.	C	1	5	3	4	10%	4	8	Health and Safety provisions included in contracts. CS Program provides full-time Safety Manager.	12/30/20 MS 0010
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		
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		
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.	
223	Contamination during dewatering (CTS)	1. Review contract requirements .	C	2	3	1	2	35%	4	8		
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		
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		
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		
229	Pre Revenue Testing		C									
230	Post Revenue Testing		C									

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 54

DATE ISSUED: 04/07/16

	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
232	Behind Schedule - Unable to Recover from Delay to 1300 Contract	1. Schedule analysis of number of days behind 2.	C	4	3	3	3	80%	12	24		
233	Shotcrete Substitution - Final Finish Concrete Lining is Inferior	1. Meet and discuss with TPC's senior management what the issues are and the status for clarification.	C	3	3	3	3	50%	9	18		
234	Sequential Excavation Method at CTS - Contractor's propose method will induce subsidence	1. Designers concurrence on variation of options 2. Presented four options to the Contractor for going forward	C	2	4	3	4	35%	7	14		
235	Sewer work running up and down Stockton Street		C	1	3	1	2	10%	2	4		
237	Non-Conforming work is not identified by TPC's 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	2	3	2	3	35%	5	10		
238	Quality Program is ineffective in processing the nonconformance items causing schedule impacts	1. Review the CNCR log on a biweekly basis at the joint TPC /SFMTA meeting. 2. Greater Clarity in the Log on what CNCR's are open	C	3	2	2	2	50%	6	12		
239	Revenue Service Delay		C				-	0%	-	-		
240	Unresolved Assignment of Schedule Delay Responsibility (may lead to increase cost)	1. Ask the Contractor for TIA's 2. As built schedule (Program analysis) 3. Perform a more refined analysis	C	2	4	4	4	35%	8	16		
241	Potential Winter Impacts (Preparation for El Niño)	1. Allowing planning for future activities during rainy days 2. Have a large capacity pump on standby	C	3	2	2	2	50%	6	12		
243	Contractor becomes complacent in third party insurance claims - could increase cost to the project		C	5	2	1	2	90%	8	15		
244	Olivet building - potential coordination issues	1. Maintain contact with the Developer 2. Facilitate completion of TPC work overlapping with developer access	C	2	1	1	1	35%	2	4		
245	Relocation of RE's CM Operation		C					0%	-	-		
246	Design changes not being capture in As-Builts		C					0%	-	-		