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Memorandum

CS Memorandum No. 1341

To: Distribution

From: Susan MacKenzie, Document Control Manager

Date: January 25, 2013

Reference: Project No. M544.1, Contract No. CS-149
Task No. 1-4, Risk Management

Subject: Risk Mitigation Report No. 40

Attached please find Risk Mitigation Report No. 40 for meeting held on December 13, 2012. Please click on the "Bookmark" tab on the left side of Adobe file to navigate to report sections.

Attachments:
Risk Mitigation Report No. 39 with attachments

Cc: James Sampson, STV (w/attachments) james.sampson@stvinc.com
David Kuehn, STV (w/attachments) david.kuehn@stvinc.com
Luis Zurinaga, SFCTA (w/attachments) luis.zurinaga@sfcta.org
Matt Lee, SFCTA (matt@sfcta.org)
John Funghi, SFMTA (w/attachments)
Jane Wang, SFMTA (w/attachments)
Quon Chin, CSP (w/attachments)
Alex Clifford, CSP (w/attachments)
Aileen Read, CSDG (w/attachments)
CS File No. M544.1.5.0820

Distribution:

Brad Lebovitz, STV bradley.lebovitz@stvinc.com
Albert Hoe, SFMTA
Arthur Wong, SFMTA
Ross Edwards, CSP
Richard Redmond, CSP
Eric Stassevitch, CSP
Mark Latch, CSP
Mark Benson, CSP
Beverly Ward, CSP
Chuck Morganson, HNTB/B&C
Tom Tolentino, HNTB/B&C
Mark Bailey, HNTB/B&C mbailey@bnctransit.com

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Risk Mitigation Meeting Minutes #40

DATE:	December 17, 2012
MEETING DATE:	**December 13, 2012**
LOCATION:	821 Howard Street, 2nd Floor – Main Conference Room
TIME:	2:00pm
ATTENDEES:	Ross Edwards, Albert Hoe, Arthur Wong, Richard Redmond, Mark Latch, Mark Benson, Eric Stassevitch, , Beverly Ward, Chuck Morganson, Tom Tolentino, Mark Bailey, Carlos Campillo, Brad Lebovitz
COPIES TO:	Attendees: John Funghi, Jane Wang, Quon Chin, Alex Clifford, Aileen Read, James Sampson, Luis Zurinaga¸ Matt Lee, David Kuehn File: M544.1.5.0820
REFERENCE	Project No. M544.1, Contract No. 149 Task 1-4.01 Program/Construction Management
SUBJECT:	**Risk Management – Risk Mitigation Meeting** **Risk Mitigation Report No. 40**

RECORD OF MEETING

ITEM #	DISCUSSION	ACTION BY DUE DATE
1 -	**Report on Red Risk and – (Risk rating ≥ 6)**	
	Risk 83: Cost of vehicles may be more than estimated due to sole source and small order Discussion: No new update to report, still waiting on vehicle plan. Cost of vehicles will go up. Risk Rating 4, 4, 16 **Risk V**: Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract Discussion: No request has been made to change design. There is still the possibility that up until the time the Contractor pours the invert slab with; a change request could be made. Rating 3, 2, 6 **Risk 7**: Potential for excessive settlement of BART tunnels - Significant Compensation Grout Required over Estimate Allowances. Discussion: Nothing more which can be done. R. Edwards will bring back to next month meeting the cost. Recommendation to reduce the risk to 3**,** 1.5, 4.5 (**agreed**). Risk Rating 3, 1.5, 4.5	
2 -	**Report on Remaining Requirement & Design Risks (Risk rating ≤ 6)**	
	Risk 27: Loss of business results in unanticipated restrictions on construction. Discussion: Construction updates to will be provided to the Yerba Buena Facility Management. Risk Rating 2, 1, 2	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	Risk 32: Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2) Discussion: AT&T will be done in the first week of January. Risk Rating 2, 1, 2 **Risk 79:** Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected Discussion: Confirmation of 1455 Stockton St. condemnation status will be done. Risk Rating 1, 1, 1 **Risk 104:** CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows Discussion: Approval by the CPUC is given for a specific window of time, and if need another approval will need to be requested. R. Edwards will follow up on letter sent to CPUC. Risk Rating 2, 3, 5 **Risk T:** Delay to final design submittal due to delay of emergency ventilation approval by SFFD. Discussion: Comments have been received from SFFD, design submittal will be revised. Risk Rating 2, 2, 4 **Risk 47**: Revisions to the SEM sequence at CTS during construction, which differ from the plan, could lead to significant delays if not sufficiently pre-planned. Discussion: SEM language will be included in Contractor's work plan submittal. **This risk will be retired.** Risk Rating 0, 0, 0 **Risk 89**: 3rd Party reviews of Design documents delays completion of Final Design Discussion: The process of closing out PUC and DBI comments is ongoing. Risk Rating 1, 2, 2 **Risk 90:** Multiple outside design consultants & mix of SFMTA / City could result in delays and additional costs due to complexities in design coordination. Discussion: Central Subway Staffing Plan, Revision 1 was sent and received by the PMOC on 12/11/12. **This risk will be retired.** Risk Rating 0, 0, 0 **Risk A:** Timely resolution of sewer lines south of portal Discussion: Sewer line has been completed. MOU has yet to be received, cost percentage may be revised. Verification cost is accounted for in the contract. Risk Rating 2, 1, 2 **Risk PR73**: Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities Discussion: MOU agreement still needs to be obtained. AT&T could possibly be a problem. Notice to utility owners has been sent. Risk Rating 2, 1, 2 **Risk PR74**: Incomplete design by City staff – not prioritized to complete 1256 work on time Discussion: Risk has been mitigated. **This risk will be retired.** Risk Rating 0, 0, 0	
3-	**Active Risks (New Risks associated with New Contracting Strategy)**	
	The following list represents new Risks Items. Risk owner, mitigation strategies, and initial risk assessment will be added to each new Risk Mitigation Status sheet.	

ITEM #	DISCUSSION	ACTION BY DUE DATE
	Risk 198: Outreach efforts to get more bidders - (SSTS) 1300 Contract Discussion: Pre bid conference and a meet and greet meeting took place to allow the prime contractor to meet with subconsultants. There was about six or seven tables roughly a turnout of 200 people. Extended the bidding period from January to March to address some of the concerns by the existing plan holders list. Risk Rating 2, 2, 5 **Risk 199:** No interests from potential bidders although participated in outreach meet and greet Discussion: Continual efforts will be made to get a Prime to bid who may have been at the meeting, but has elected not to participate. Participation is not required at the meeting, but a Primes outreach efforts with subs consultants is required. Risk Rating 2, 2, 5 **Risk 201:** Bid Protest - 1300 Contract Discussion: Establish and enforce bid qualifications requirements. Risk Rating 2, 2, 5 **Risk 202:** Cargo Preference must solicit U.S. - flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954) Discussion: Letter expected from the Contractor regarding compliance with contract requirement. Risk Rating 2, 1, 3 **Risk 203:** Headwalls interface delay 1300 Contractor Discussion: Allowing them in on the first of January, increasing the production rate. Risk Rating 2, 4, 8 **Risk 204:** AT&T Vault - New Sewer Work south of Bryant Discussion: A meeting with AT&T regarding the design build is necessary. Risk Rating 2, 4, 8 **Risk 205:** Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor Discussion: CMod Task Force created to help improve the process. A draft report will be issued to the PMOC at the weekly CS Management meeting. Risk Rating 2, 2, 5	
4-	Follow up Action	
	Risk 72: Interface new Signaling and Train Control system to existing at Fourth and King Discussion: DP3 Design team presented information regarding the signaling work at 4th and King (see attached). Clarification was given that the system would not be a parallel system as previously reported. Modification of the existing train control system will not be done during track and OCS construction. New switch machines employ similar controls to the old machine. A presentation will be given at next month's Risk meeting to demonstrate how the site - specific work plan (SSWP) will be expanded, which will be included in an addendum. The Risk committee also expressed the need for a backup plan to be developed in case there is an issue, in addition that there be a specific write up in the specs for the amount of time needed for each system site test. Risk Rating 2, 2, 5	

ITEM #	DISCUSSION	ACTION BY DUE DATE
5-	**New Risks Items associated with New Contracting Strategy**	
	The following list represents potential new Risks which were identified at the Risk meeting: Risk 206 - Delay in Decision on Retrieval Shaft Mitigation Description: 1. Establish Task Force to focus on issues 2. Meet Regularly and Act promptly on issues 3. Keep Decision makers informed 4. Keep Community Informed 5. Keep Stakeholders informed Risk 207 - Implementing Pagoda Option for Retrieval Shaft - Delay in Obtaining Property Mitigation Description: 1. Obtain clear understanding of current status of property 2. Meet with Owner and determine best options for SFMTA needs. 3. Establish Special Use District to retain existing development rights, in addition to new land use entitlements. 4. Obtain Appraisal 5. Identify Funding 6. Confirm hazardous abatement Risk 208 - Implementing Pagoda Option - Develop Documents for Design Build Mitigation Description: 1. Develop Scope with designers currently under contract 2. Agree to alignment and details of new shaft location 3. Issue PCC to Contractor 4. Initial site works and borings if necessary 5. Obtain appropriate permits Risk 209 - Implementing Pagoda Option - Obtaining Environmental Clearance Mitigation Description: 1. Engage Planning Dept. to outline required actions 2. Develop necessary CEQA documents in concert with Planning Dept. 3. Meet with FTA and determine NEPA and SHPO requirements Risk 210 - Mission Bay Loop Grant – Needs to be built to allow for train turnarounds (June 13) Mitigation Description: 1. Identify timeline for grant funding Risk Mitigation Status sheets will be developed for each of the above identified risks, and owner will be assigned and mitigation measures identified for discussion at the next Risk Meeting.	

ACTION ITEMS -

ITEM #	MTG DATE	Task #	DESCRIPTION	BIC	DUE DATE	STATUS
2	09/13/12		**Risk PR 73** – Status of the MOU memo	R. Edwards	10/11/12	Open
1	12/13/12		**Risk 7 –** Cost for significant settlement grout	R. Edwards	01/10/13	Open

4	12/13/12		**Risk 72** – 4th & King (SSWP)	R. Edwards/ C. Morganson	01/10/13	Open

Meeting adjourned at 3:40pm

These meeting minutes have been prepared by B. Ward and reviewed by E. Stassevitch, and are the preparer's interpretation of discussions that took place. If the reader's interpretation differs, please contact the author in writing within four (4) days of receipt of these minutes.

Signed: BW EG [initials of preparer & reviewer] **Date:** 24 Jan 13 [Date review completed.]

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Meeting Agenda

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Mitigation Management Meeting No. 40
December 13, 2012
2:00pm – 4:00pm
Central Subway Project Office
821 Howard St. 2nd Floor
Main Conference Room

Attendees:

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

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

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

2. **Report on Remaining Requirement and Design Risks**

   - **Requirement Risks** (27, 32, 79, 104, T)
   - **Design Risks** (47, 89, 90, A, PR73, PR74)

3. **Active Risks** – New risks to be discussed

   - **Market Risks** (198, 199, 201)
   - **Construction Risks** (200, 202, 204, 205)

4. **Follow up Action** – Risk (72) Signaling and Train Control System Presentation

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

Note: **Bolded** numerals indicate that risk is recommended to be retired.
RED numerals indicate new risk added to the Risk Register

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Meeting Attendance Sheet

Project No. M544.1, Contract No. CS-149
Program/Construction Management
Risk Management Meeting No. 40
December 13, 2012
2:00 p.m. – 4:00 p.m.
Central Subway Project Office
821 Howard Street, 2nd Floor
Main Conference Room

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

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

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NAME	AFFILIATION	PHONE	E-MAIL (for minutes)	INITIALS
Carlos Campillo	CSP SYSTEM	786 556-3324	Carlos.Campillo@Stantec.com	
MARK BAILEY	CSP-DP3	510 388 6277	mbailey@bnctransit.com	
Tom Tolentino	CSP-DP3	510 435 4824	Holent@comcast.net	
Chuck Morgan	DP3	(415) 765-9280	Chuck.morgan@stm ta.com	
	Eric Stassevitch was in attendance, but did not sign in.			

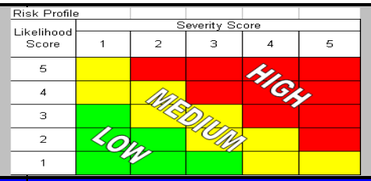
Risk Register

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 16

DATE ISSUED : 12/13/12



	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	Contract I.D	Muni Risk REF. I.D	Type	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
Underground Tunnel															
1	TUN	10.07.1	Guideway Tunnels	Additional night shift work required at portal launch box due to bus storage facility relocation delay	Work with TJPA to coordinate construction schedules and GGB to coordinate Traffic Routing.	C	2	1	-	1	35%	1	2	No longer considered a risk. GGB not scheduled to be utilizing site until 2014	3/20/15 TUN1160
2a	TUN	10.07.2	Guideway Tunnels	42"/48" sewer line relocated as part Utility 1 package is damaged by subsequent construction of the launch box.	1. Make follow-on contractor responsible for repairs to any existing utility lines. 2. Properly as built actual location as part of Utility 1 package and provide to Contract 3 Contractor	C	1	1	2	2	10%	2	3	Sewer Installation complete, awaiting as built drawing. Sewer installed according to contract drawings. Contract 1252 provisions for protection of existing utilities puts all cost and schedule risk on Contractor.	10/24/12 TUN1080
5	TUN	10.07.13	Guideway Tunnels	Possibility that lowest level of tie-backs extending out from Moscone Center could be within the tunnel alignment.	1. Lower tunnel alignment 5' below the lowest expected tieback. 2. Include obstruction clause and allowance in contract documents.	C	1	1	1	1	10%	1	2	Contract Documents issued for bid, contain location of tiebacks from as built drawings, do not intersect tunnel alignment.	7/2/13 TUN1118
7	TUN	10.07.14	Guideway Tunnels	Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE ALLOWANCES	1. Early and extensive co-ordination with BART. 2. Survey BART tunnels to determine exact locations. 3. Checking effect of maximum expected settlement on tunnels. 4. Require EPBM TBM, Contractor to demonstrate effective control of ground settlements and correction of settlements by compensation grouting, and pre-installation of compensation grout piping under BART tunnels prior to tunneling reaching Market St. Require repair/adjustment plan. 5. Develop contingency plan to provide bus bridge, if needed. 6. Require non-stop weekend excavation beneath BART tunnels. 7. Monitor movement of BART tunnels in real-time. 8. Repair/adjust as needed. 9. Include probable cost in estimate.	C	3	4	1	2.5	50%	7.5	15	Risk is considered active, with mitigation measures fully developed with the exception of Bus Bridge. Adjusted cost impact lower resulting in Risk rating increasing to 2 but still remains a low risk.	8/28/13 TUN1120
8	TUN	10.07.15	Guideway Tunnels	Flowing groundwater in vicinity of UMS Station could make adequate annulus grouting difficult.	1. Use appropriate additives such as accelerators in primary annulus backfill grouting, if needed. 2. Use secondary grouting as needed.	C	1	1	1	1	10%	1	2	Plans issued for bid contain mitigation measures	8/28/13 TUN1120
E	TUN		Guideway Tunnels	Underground obstructions tunnel and retrieval shaft	Include differing site conditions in GPs as well as DRB to adjudicate conflicts and minimize costs	C	2	2	3	3	35%	5	10	Mitigation measures have been implemented. Maintain adequate contingency throughout tunnel construction	2/5/14 TUN1124
PR1	TUN		Guideway Tunnels	Actual TBM production rate may be slower than forecasted.	Assign significant liquidated damages for not meeting specific schedule dates.	C	1	1	3	2	10%	2	4	Considered Risk inherent in the work and reflected in the Current Cost Estimate. Risk will be reflected in Contractor's Bid. LDs included in contract.	2/5/14 TUN1124
13	TUN		Guideway Tunnels	Damage / settlement 3x 5' to old brick sewer running parallel to tunnel alignment	Slip Line 3'x5' brick sewer before TBM reaches CTS.	C	1	1	-	1	10%	1	1	Tunnel profile has been lowered 25 ft and plans developed for replacement of at risk utilities in advance of tunnel drive.	12/16/13 TUN1121
15	TUN		Guideway Tunnels	Major TBM machine failure	Closely monitor condition and maintenance of the machines.	C	1	2	2	2	10%	2	4	Contractor has indicated that they plan to use a newly manufactured TBM for this project.	2/5/14 TUN1124
16	TUN		Guideway Tunnels	TBM loss and / or damaged in Transit	Provide provisions for insurance for TBM in transit to jobsite	C	1	5	4	5	10%	5	9	Costs covered by Contractor's insurance.	5/20/13 TUN1095
115	TUN		Guideway Tunnel	Jet grouted station end walls are installed by Tunnel contractor. Station Contractor assumes risk of possibly leakage problems due to insufficiently qualify of end walls.	1. In the 1252 contract, have tunnel contractor set aside a pre-determined amount of money in escrow that can be used to repair any leaks encountered by the station contractors after the in the jet grout end walls are excavated. 2. Alternatively, place an allowance in the station contracts for end wall leakage repair.	C	3	1	1	1	50%	3	6	Project configuration changes include headwall designs with multiple levels of redundancy. Warranty provisions added to contact language.	5/26/15 UMS1295
116	TUN		Guideway Tunnel	TBM procurement, delivery and assembly takes longer than assumed in schedule.	Accommodate delay to TBM procurement and delivery, on the order of 2 or 3 months, with current float shown on the construction schedule.	C	2	2	2	2	35%	4	8	Mitigation measures are being implemented	5/20/13 TUN1095
B	TUN		Guideway Tunnel	Storage and testing of excavated soils from tunnel limits advance rate of tunneling.	1. Provide adequate storage and handling facility to accommodate testing activity. 2. Work with SAR to develop acceptance criteria, to minimize or eliminate testing requirements. 3. Require the contractor to provide a detailed workplan for testing, sorting and stockpile prior to hauling.	C	2	3	3	3	35%	6	9	Contractor is attempting to obtain the use of additional Caltrans parcel between Fourth & Fifth and Harrison & Bryant to help facilitate this work and provide additional storage area. .	2/5/14 TUN1124
MOS Station															
21	MOS	20.03.01.2	Moscone Station	Incomplete cutoff of groundwater at MOS	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates.	C	1	1	-	1	10%	1	1	Mitigation measure to be made part of the contract documents	4/28/15 MOS1150

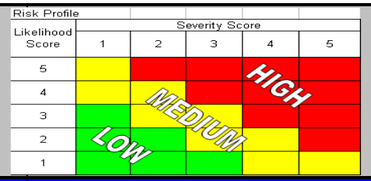
Plot : 1/25/2013 2:14 PM

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 16

DATE ISSUED : 12/13/12



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RISK RATING = PROBABILITY X (COST IMPACT + SCHEDULE IMPACT)
2
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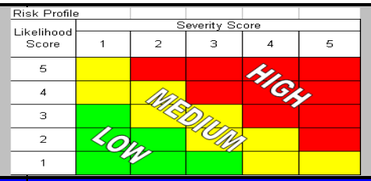
Final Risk ID	Contract I.D	Muni Risk REF. I.D	Type	Risk Description	Mitigation Description	Risk Category	Probability %	Cost Impact	Schedule Impact	Calc Impact	Calc %	Risk Rating	Score	Status	Must Complete by Date
22	MOS	20.03.01.5	Moscone Station	Public complaints result in unanticipated restrictions on construction at MOS.	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 5. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 6. Quickly process and resolve damage and accident claims from the Public. 7. Assumed this work in cost & schedule estimates.	C	1	1	-	1	10%	1	1	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	9/16/16 MOS1230
F	MOS		Moscone Station	Underground obstructions Stations (MOS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8	16	Mitigation measures have been implemented.	4/28/15 MOS1150
27	MOS		Moscone Station	Loss of business results in unanticipated restrictions on construction at MOS.	1. Public outreach. 2. Maintain regular and open communications so Merchants know construction plans and progress at all times. 3. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOEWD to increase cleanup of the area and assist pedestrians across streets. 6. Include this work in cost & schedule estimates.	C	1	2	1	2	10%	2	3	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	4/28/15 MOS1150
UMS Station															
F	UMS		Union Square market Street Station	Underground obstructions Stations (UMS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Show field verified obstructions discovered during previous contracts on contract drawings. 3. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings.	C	4	2	2	2	80%	8		Mitigation measures have been implemented.	8/12/15 UMS 1320
28	UMS	20.03.02.2	Union Square market Street Station	Incomplete cutoff of groundwater at UMS.	1. If needed, perform grouting to mitigate the intrusion of groundwater. 2. Include in cost & schedule estimates.	C	8	2	1	2	0%	12	24	Mitigation measures in the form of consolidation grouting to be included in contract documents	8/12/15 UMS1320
32	UMS	20.03.02.9	Union Square Market Street Station	Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2)	1. Intensive coordination with and commitment from utility owners. 2. Early completion incentive for utility relocation contract. 3. Enforce franchise agreements.	R	1	1	1	1	10%	1	2	Advance utility relocation contract (1251) is underway with a projected completion date in advance of advertising UMS construction contract, reducing this risk of cost and schedule impacts	7/31/12 N-ATT00100
33	UMS	20.03.02.10	Union Square market Street Station	Damage to utilities at UMS causes delay to construction and/or consequential cost. (very close to walls adjacent to relocated utility trenches)	1. Intensive utility coordination and investigation. 2. Relocate utilities out of the way of construction wherever possible. 3. Show utilities on reference plans. 4. Have utility contact information and procedure on plans. 5. Have contingency repair/restoration plans. 6. Include probable impacts to schedule & cost in estimates.	C	2	1	1	1	35%	2	4	Although mitigation measure have been fully implemented, Increased probability due to proximity of new pile design to existing relocated utilities.	7/19/16 UMS1410

PROJECT RISK REGISTER

Central Subway Project San Francisco

REV : 16

DATE ISSUED : 12/13/12



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34	UMS	20.03.02.11	Union Square market Street Station	Loss of business results in unanticipated restrictions on construction at UMS.	1. Public outreach. 2. Work closely with Merchant's Association. 3. Maintain regular and open communications so Merchants know construction plans and progress at all times. 4. Advertise that Stockton Street Merchants are Open for Business. 5. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. 6. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 7. Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. 8. Include this work in cost & schedule estimates.	C	2	3	2	3	35%	5	10	Mitigation measures to be implemented and to the extent possible requirements will be written into contract documents to minimize disruptions to businesses.	9/7/16 UMS1430
35	UMS	20.03.02.14	Union Square Market Street Station	Ground support structure causes groundwater table to rise which results in leakage into adjacent structures.(new structure might create a dam that results into leaks into new and existing structures)	1. Perform detailed hydrogeologic modeling and analysis. 2. Monitor groundwater table at multiple locations and passive measures as necessary to mitigate. 3. Reference the Tech memo in contract documents. 4. Include probable costs in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures incorporated in design based on updated Hydrogeologic analysis and report	9/7/16 UMS1430
36	UMS	20.03.02.15	Union Square Market Street Station	Damage to buildings or utilities as a result of heave from jet grouting at UMS.	Utilize tangent piles combined with surface jet grouting.	C	1	1	-	1	10%	1	1	Mitigation measures implemented in contract documents to reduce risk	4/14/15 UMS1310
37	UMS	20.03.02.16	Union Square market Street Station	Damage to adjacent buildings at UMS due to surface construction activities.	1. Require protective barriers. 2. Have an emergency and rapid response customer focused task force to fix damaged facilities. 3. Quickly repair and reimburse resulting costs. 4. Include probable cost in estimate.	C	1	2	-	1	10%	1	2	Mitigation measures implemented in contract documents to reduce risk	9/7/16 UMS1430
38	UMS	20.03.02.17	Union Square market Street Station	Tiebacks in Stockton Street mislocated (in path of walls and would have to be dug out within 20ft of surface level)'	1. Direct contractor to dig out the tiebacks on the plans. 2. Include allowance and differing site conditions clause in contract. 3. Include this work in the cost and schedule estimates.	C	2	2	1	2	35%	3		Mitigation measures fully implemented, Advance utility relocation contract (1251) confirmed location of tiebacks. Risk rating has been reduced due to a lowering of the probability of event occurring	5/6/14 UMS1170
J	UMS		ROW	Macy's entrance conflict with new piles	1. Show known obstructions shown on as-built drawings on contract drawings. 2. Make as-built drawings available to contractor as reference drawings. 3. Have contractor field verify obstruction shown on as-built drawings and contract drawings	C	3	1	1	1	50%	3	6	Known obstructions are shown on the ES drawings. Allowance for differing site conditions added to UMS Station contract.	1/23/14 UMS1060
Q	UMS		Union Square market Street Station	As-built drawings and UMS construction drawings do not contain enough information to produce shop drawings without significant surveying effort delaying construction north entrance.	1. Investigate if electronic files of design can be given to the contractor. 2. Clearly define shop drawing criteria in the technical specifications. 3. Make as-built drawings available as reference drawings to the contractor	C	3	1	1	1	50%	3	6	Specifications require contractor to survey USG in order to develop shop drawings for structural steel.	3/24/12 UMS1280
CTS Station															
46	CTS	20.03.03.2	Chinatown Station and crossover cavern	Public complaints result in unanticipated restrictions on construction at CTS. (schedule and estimate for underground work assumes 6 day work week and 2 shifts per day)	1. Public outreach. 2. Maintain regular and open communications so Public knows construction plans and progress at all times. 3. Require Contractor to assist Public Outreach efforts, maintain access to businesses and assist with deliveries and pick-ups, control noise and vibration, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, ADA ramps and minimum sidewalk widths. 4. Require barriers to protect pedestrians and shield them from noise and dirt from construction. 5. Work with MOED to increase cleanup of the area and assist pedestrians across streets, as needed. 6. Monitor and enforce noise, vibration, ADA, traffic, and cleanup requirements. 7. Quickly process and resolve damage and accident claims from the Public. 8. Include this work in cost & schedule estimates.	C	2	5	1	3	35%	6	12	Implementation of mitigation measures part of Communication/Outreach plan and certain aspects to be included in the contract documents.	10/9/17 CTS1500

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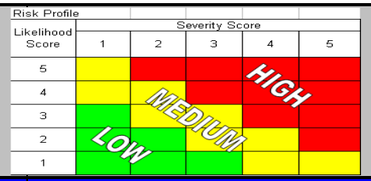

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47	CTS	20.03.03.5	Chinatown Station and crossover cavern	Revisions to the SEM sequence during construction at CTS, which differ from the plan, could lead to significant delays if not sufficiently pre-planned.	1. Revisit sequence strategy during FD. 2. Address change through flexible bid schedule. 3. Utilize contractor pre-qualification: 4. Require experienced SEM Contractor, approved SEM procedures, and continuous SEM inspection. 5. Provide attractive T + C's (e.g. differing site conditions) Conduct peer review for FD 6. Provide performance incentives including crew incentives for production. 7. Require shotcrete, as needed. Include shotcrete & inspection costs in estimate. 8. Include language on drawing or in specification that allocates all risk to the contractor for change in sequence.	D	-	5	3	4	0%	-	-	Language to transfer risk to contractor in case of proposed changes to sequence have been included in the updated contract specifications to 01 25 00 Substitution, 1.02C. This risk to be retired.	4/22/16 N-CTS9730
48	CTS	20.03.03.6	Chinatown Station and crossover cavern	Incomplete drawdown of groundwater. (inside of box and inside of caverns)	1. Require additional grouting to limit leakage to permissible level. 2. Include probable grouting work in cost & schedule estimates. 3. Include allowance for dewatering within cavern during construction.	C	2	2	1	2	35%	3	6	Mitigation measures have been included in contract documents	5/1/16 CTS1140
50	CTS	20.03.03.11	Chinatown Station and crossover cavern	CTS station contractor delayed by tunnel contractor since station platform construction cannot start until tunnels have been finished.	1. Include provisions in CTS contract identifying the potential waiting period for tunnel contractor. 2. Actively monitor progress towards schedule milestones	C	2	1	2	2	35%	3	6	Constraints on CTS contractor added to specification "Work Sequence and Constraints"	12/16/13 TUN1122
52	CTS	20.03.03.12	Chinatown Station and crossover cavern	Unacceptable settlement and impact on major utilities at CTS. (OLD SEWERS AND OTHERS WITHIN 20FT SPACE BETWEEN TOP OF CAVERN AND STREET LEVEL)	1. Evaluate effect of potential settlement on utilities. 2. Slip-line sewer by TBM contractor. 3. Reinforce other utilities as needed, monitored during construction, and repair / replace, as needed. 4. Have contingency repair/restoration plan. 5. Utility contact information and procedure will be on plans. 6. Develop an allowance for utility repair. 7. Include probable cost in estimate.	C	3	3	1	2	50%	6	12	Project configuration change, lowered station 25 ft. reducing the probability of this risk. Risk rating lowered.	4/22/16 N-CTS9730
F	CTS		Chinatown Station and crossover cavern	Underground obstructions stations (CTS)	1. Provide adequate allowance for differing site conditions to address unknown underground obstructions. 2. Make as-built drawings of structures adjacent to the work available to the contractor as reference drawings	C	4	2	2	2	80%	8		Mitigation measures have been implemented.	10/9/17 CTS1500
U	CTS		Chinatown Station and crossover cavern	Proximity at junction of head house boundary wall and school yard may result in relocation of school yard during wall construction		C	1	1	1	1	10%	1	2	Project configuration changed to eliminate encroachment. Risk converted to Construction risk from Risk 55.	8/16/13 CTS1010
General															
56	GEN	40.00.1	Unallocated Contingency	Escalation more / less than expected (Increase in bid prices to hedge possible increases in cost of volatile commodities.)	1. In the current economic environment, escalation is just as likely to be less as more than anticipated. 2. For volatile materials and equipment, provide substantial payment for stored materials and equipment to encourage early procurement and an escalation clause for volatile commodities in contracts.	M	2	3	-	2	35%	3	6	Current projected escalation rates remain below those reflected in Program budget.	1/10/18 STS1042
Demolition, Clearing , Earthwork															
Site Utilities, Utility relocations															
60	UTL	40.02.6	Utilities	Utility companies do not complete relocations in timely manner. (UTY 1 and UTY 2)	1. Continue negotiations with utility owners. 2. PM/CM will assist utilities with access and to schedule their work. 3. Require Utility Relocation contractor to provide assistance to utilities. 4. Include in contract allowance for Contractor to assist Utilities and incentive for early completion. 5. Enforce franchise requirements.	C	2	1	1	2	35%	4	4	Work is complete on one advanced contract and underway on the other.	6/31/12 N-ATT00100
61	UTL	40.02.7	Utilities	Utility relocation is delayed due to non-standard materials not being available. (UTY 1 and UTY 2) AWSS special material ?	Work with utilities and contractor to identify and acquire non-standard materials well in advance of time that they are needed.	C	1	1	3	2	10%	2	4	Mitigations measures being implemented to manage risk	6/7/12 PC 00-020
A	STS		Utilities	Timely resolution of Sewer lines south of portal.	1. Develop alternatives that do not require creation of a new sewer line. 2. Work together with SFPUC to find mutually beneficial solutions. . 3. Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies. 4. Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS.	R	1	2	1	2	10%	2	3	$ 2.1 million in budget. Could be as high as $8 million. Continuing to work with SFPUC to find solution.	5/13/12 PDS 1870

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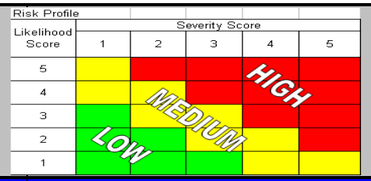

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Environmental Mitigations															
65	TUN	40.04.1	Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (Portal) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	1	2	1	2	10%	2	3	Additional boring taken in vicinity of portal indicated no evidence of Archeological/Cultural resources.	10/24/12 TUN1080
66	MOS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost.(Moscone) AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	2	1	2	50%	5	9	Mitigated - Current exposure only to those amount above those currently identified	4/28/15 TUN1150
67	UMS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (UMS)…LESS THAN 1%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	2	2	2	50%	6	12	Mitigation measures to be implemented in contract documents	8/12/15 UMS1320
68	CTS		Environmental	Archeological/Cultural findings during construction increases schedule and/or cost. (CHINA TOWN) …AROUND 10%	1. Provide on-call Archeologist. 2. Provide allowance and procedure in contract for Archeological/Cultural discoveries.	C	3	2	2	2	50%	6	12	Mitigation measures to be implemented in contract documents	10/9/17 CTS1500
Auto/bus/van access ways, roads															
70	GEN	40.08.1	Vehicle access	Change in traffic control requirements after bid.	1. Provide unit bid items to reimburse contractor for traffic management costs outside their control. 2. Include allowance in construction contracts for PCOs.	C	3	4	1	3	50%	8	15	Mitigation measures implemented.	5/22/17 STS1020
71	TUN	40.08.2	Vehicle access	Power supply interruptions to TBM's (no dual power feed currently planned)	Obtain TBM power directly from PG&E substation.	C	1	2	-	1	10%	1	2		2/5/14 TUN1124
Train Control and Signals															
72	STS	50.01.1	Train Control and Signals	Interface new Signaling and Train Control system to existing at Fourth and King	Connect new system in parallel with existing system until the new system has been tested and safety certified for operation.	C	2	2	3	3	35%	5	10	Awaiting approval of contract plans by Muni Operations.	3/4/16 STS1045
75	STS	50.01.1	Train Control and Signals	Signals and Comms equipment may need to be stored off site	Require contractor to store equipment offsite or at the factory until it is needed.	C	3	1	-	1	50%	2	3	Special Provisions address offsite storage.	11/6/17 STS1070
PR73	STS	50.01.1	Train Control and Signals	Delays or complications of design & construction by others – SF Dept. Of Technology, 3rd party utilities	Early engagement and coordination for agreements and plan development to avoid construction delays.	D	2	1	1	1	35%	2	4		5/30/12 DP3C530
PR74	STS	50.01.1	Train Control and Signals	Incomplete design by City staff – not prioritized to complete 1256 work on time	Monitor development of design and recommend exercise of contract options to supplement City staff.	D	3	1	1	1	50%	3	6	Options have been exercised to avoid impacts.	5/30/12 DP3C530
PR78	STS	50.01.1	Train Control and Signals	Delays or complication by other SFMTA projects delays CSP: radio, fare collection, C3/TMC	1. Monitor other projects' developments. 2. Develop contingency plans as needed to avoid 1256 delay of revenue service.	C	2	1	1	1		2	4		7/27/12 FDS 1940
Traffic signals & Crossing Protn.															
76	GEN	50.05.2	Traffic Signals & Crossing Protection	CS system may need re-design to new system (not yet identified - Coordinating with SFMTA Accessible Services on the wayfinding system for the visually impaired.)	Include new Landmarking/Wayfinding system requirements into stations.	D	1	2	-	1	10%	1	2	DP3 preparing proposal to implement "Landmarking/Wayfinding" system	7/27/12 FDS 1940
Purchase or lease of Real Estate															
79	TUN	60.01.1	ROW	Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	1. Engage Owners in negotiations as soon as possible. 2. PM/CM to provide real estate specialists to facilitate.	R	1	1	-	1	10%	1	1	Right of possession obtained on all three parcels. Cost agreement reached with 1455 Stockton & 801 Market.	9/7/2012
80	MOS	60.01.2	ROW	Delay in obtaining access to Moscone station sites (goes to condemnation).	1. Assure that adequate float is contained in the Moscone schedule for condemnation. 2. Engage Owners in negotiations as soon as possible. 3. PM/CM to provide real estate specialists to facilitate.	R	1	3	3	3	10%	3	6	Continuing to negotiate cost with owner in parallel with condemnation proceedings.	7/1/12 FDS 1240
Vehicles															
83	GEN	70.00.01	Vehicles	Cost of vehicles may be more than estimated due to sole source and small order	Time the procurement of the vehicles to be part of the procurement of the existing Breda LRVs.	R	4	4	4	4	80%	16	32	CSP vehicles to be included in overall SFMTA vehicle procurement contract.	11/17/17 STS 1500
															4
89	GEN	80.02.2	Final Design	3rd Party reviews of Design documents delays completion of Final Design.	Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work.	D	1	2	2	2	10%	2	4	3rd Party coordination meeting ongoing.	5/23/12 FDS 1930
90	GEN	80.01.3	Final Design	Multiple outside design consultants & mix of SFMTA / City could result in delays and additional costs due to complexities in design coordination	Conduct regular coordination meeting, integration meetings, interdiscipline meeting, design oversight reviews and partnering to encourage and promote a positive work environment.	D	2	2	2	2	35%	4	8	Consultant Design Manager and Design Oversight personnel are responsible for design coordination.	5/23/12 FDS 1930
Project Management for Design and Construction															

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Risk Profile

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

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94	GEN	80.04.3	Project Management	Bid protests delay award and NTP for construction contracts	Strictly adhere to Procurement Best Practices and Protest Procedures.	M	1	2	2	2	10%	2	4	Mitigation measures being implemented	2/19/13 FDS 1900
95	GEN	80.04.4	Project Management	Contractor default during construction impacts schedule. (key sub-contractor)	Assist Bonding company in transition and to maintain schedule.	C	1	2	2	2	10%	2	4		11/17/17 STS 1500
97	GEN	80.04.6	Project Management	Conflicts arising from Contractors working concurrently in the same work space results in delays and claims for additional costs (systems / civil interface)	Limit the number of contractors working in the same workspace by scheduling contracts appropriately and demobilizing contractors upon substantial completion.	C	2	3	2	3	35%	5	10	Mitigation measures being implemented	11/17/17 STS 1500
PR82	GEN		General	Confined work spaces along alignment can impact productivity and result in significant cost and schedule impacts.	Account for cost and schedule impacts in estimate and schedule for contract packages	C	1	1	1	1	10%	1	2		11/17/17 STS 1500
99	GEN	80.04.8	Project Management	Breakdown in relationships between SFMTA and Contractors during construction results in increased claims and delays to the overall construction schedule.	1. Executive partnering and alternate dispute resolution. 2. Provide incentives in construction contracts in addition to penalties	C	2	5	3	4	35%	8	16	Mitigation measures being implemented	7/27/12 FDS 1940
100	GEN	80.04.9	Project Management	Procurement of long lead items delays work. (fans, rails and special track work, TPSS, Escalators, elevators, TBM)	1. Include schedule milestones for procurement of and substantial payment for stored long lead items in contract to encourage early procurement. 2. Monitor procurement of critical items.	M	1	2	2	2	10%	2	4	Not considered a project risk.	11/17/17 STS 1500
102	GEN	80.04.11	Project Management	Late finish of early contract delays later contracts and extends PM / CM and incurs additional costs	1. Actively manage contracts and include incentive provisions for early completion in critical contracts. 2. Add buffer float to critical path to actively manage schedule contingency	C	2	1	2	2	35%	3	6	LONP 1 & 2 initiated to reduce this risk. See Risk 86. The mitigation of risks associated with early contracts will address this risk. Risk rating reduced due to mitigation measures implemented	12/30/20 MS 0010
107	GEN	80.04.12	Testing and startup	Market risk in achieving 100% bonding capacity (cost and reduction in contractors able to get bonding)	Structure construction contracts not to exceed $250 million	M	2	5	-	3	35%	5	10	All contracts expected not to exceed $250 million	7/27/12 FDS 1940
T	GEN	80.04.12	Testing and startup	Delay on station emergency ventilation approval	1. Work with SFFD to develop a plan acceptable to each party. 2. Incorporate SFFD requirements into construction documents.	R	2	5	-	2	35%	4	10	SFFD agreed to the proposed plan by SFMTA	7/27/12 FDS 1940
V	GEN		MOS & CTS Stations	Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	1. Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use. 2. Integrate work with SFMTA Real Estate into CSP.	D	3	2	2	2	50%	6			12/13/16 N-CTS1225
PR37	GEN		Testing and startup	Temporary construction power and ability to provide permanent power feed - PGE ability to provide power requirements to the program together with their other commitment	1. Identify temporary power requirements for station construction. 2. Investigate the timing of the permanent feed.	C	2	1	2	2	35%	3	6	Cost for First and Redundant electrical services need to be included in Cost Estimate.	5/3/18 STS1080
Insurance, permits etc															
103	GEN	80.06.1	Permits	Difficulty in getting required permits.	1. Coordinate with permit officials and request permits as early as possible. 2. Obtain assistance obtaining permits from PM/CM & FD Consultants.	C	1	2	1	2	10%	2	3		12/18/12 FDS 1275
104	STS	80.06.2	Approvals	CPUC approval at Grade Crossing for G0164d takes longer to negotiate / obtain than schedule allows	1. Obtain Grade Crossing approvals at final CPUC inspection at the completion of construction. 2. Coordinate closely with CPUC until approval is received.	R	2	3	2	3	35%	5	10	Providing preview of 90% submittal to CPUC and will resolve comments/issues from PE before finalizing design documents	7/27/12 FDS 1940
105	GEN	80.06.3	Testing and startup	Electrical service delays startup and testing.	1. Submit applications for new service as early as possible. 2. Coordinate closely with PG&E to ensure timely delivery of electrical service.	C	1	2	1	2	10%	2	3	Applications for new service have been submitted to PG&E.	11/17/17 STS 1500
106	GEN	80.06.4	Labor relations	Risk of Labor dispute delaying the work.	Enforce designated gate for employees of the contract in dispute so that the rest of the work is not delayed.	C	3	3	2	3	50%	8	15		11/17/17 STS 1500
Unallocated Contingency															
111	GEN		Unallocated Contingency	Major Earthquake stops work	Include Force Majeure clause in contracts.	C	1	5	3	4	10%	4	8	Force Majeure clause included in contracts.	12/30/20 MS 0010

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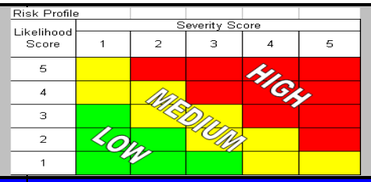

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112	GEN		Unallocated Contingency	Major safety event halts work	1. Require contractor Safety plan to address this risk. 2. CM inspections to ensure that safety plan and procedures are implemented.	C	1	5	3	4	10%	4	8	Health and Safety provisions included in contracts. CS Program provides full-time Safety Manager.	12/30/20 MS 0010
197	GEN		Project Management	The untimely delivery of FFGA funds to the project causes shortfalls in cash flow and the Central Subway will be unable to meet its financial commitments	1. Establish procedure and timeline for receipt of FFGA funds 2. Monitor status of available bridging funds 3. At the start of the 1st quarter of 2013, present the Director of Transportation with a Project cash flow that shows the "what-if" scenario that shows a delay in federal funds in Oct. of 2013	C				-	0%	-	-		
198	GEN		Project Management	Outreach efforts to get more bidders - (SSTS) 1300 Contract	1. Develop a Contractor Outreach Plan: 2. Engage in extensive contractor outreach and promote assurances of being a reasonable contract partner.	M	1	5	2	4	10%	4	7		
199	GEN		Project Management	No interests from potential bidders although participated in outreach meet and greet	1.	M	2	5	2	4	35%	7	14		
200	SSTS		Project Management	Dealing with Larger Contracting Group	1.	C	2	1	1	1	35%	2	4		
201	GEN		Project Management	Bid Protest - (SSTS) 1300 Contract	1. Establish and enforce appropriate qualifications requirement for contractors to be deemed a responsible bidder.	M	1	1	1	1	10%	1	2		
202	SSTS		General	Cargo Preference (Ship America) must solicit U.S.- flag carriers. Civilian Agencies Cargo = at least 50% (governed by Cargo Preference Act of 1954	1. Require Ship America compliance agreement first tier contractors and subcontractors	C	1	1	1	1	10%	1	2		
203	SSTS		Project Management	Headwalls interface delay 1300 Contractor (SSTS)	1. Meet and develop recovery schedule 2. Review possible Adjustment to 1300 interface	C	3	3	2	3	50%	8	15		
204	SSTS		Utilities	AT&T Vault - New Sewer Work south of Bryant	1. Continue negotiations/coordination with utility owners. 2. Schedule analysis to confirm coordination	C	2	2	2	2	35%	4	8		
205	GEN		Project Management	Prolong period of CMod's creates additional cost/causes bad blood between Resident Engineer and Contractor	1. Cmod Task Force - 5 Areas of Improvement 2. Implement 3. Delegation of Authority	C				-	0%	-	-		

Risk Mitigation Status
Risk Reference: 7

Risk	Mitigation Strategy
Potential for excessive settlement of BART tunnels - SIGNIFICANT COMPENSATION GROUT REQUIRED OVER ESTIMATE ALLOWANCES).	1. Early and extensive co-ordination with BART. 2. Survey BART tunnels to determine exact locations. 3. Checking effect of maximum expected settlement on tunnels. 4. Requiring EPBM TBM, 5. Contractor to demonstrate effective control of ground settlements and correction of settlements by compensation grouting, and pre-installation of compensation grout piping under BART tunnels prior to tunneling reaching Market St. 6. Require repair/adjustment plan. 7. Develop contingency plan to provide bus bridge, if needed. 8. Requiring non-stop weekend excavation beneath BART tunnels. 9. Monitor movement of BART tunnels in real-time. 10. Repair/adjust as needed. 11. Included probable cost in estimate.

Initial Assessment: 1, 1.5, 2 **Risk Owner:** S. Wilson
Current Assessment: 3, 2.5, 7.5 – Construction Risk

Status Log:

February 2012:

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

June 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 7

November 2012 Meeting:

1. Coordination with BART and IRP ongoing

December 2012:

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

Risk Mitigation Status
Risk Reference: 27

Risk	Mitigation Strategy
Loss of business results in unanticipated restrictions on construction.	Public outreach. Work closely with Merchant's Association. Maintain regular and open communications so Merchants know construction plans and progress at all times. Advertise that Stockton Street Merchants are Open for Business. Require Contractor to coordinate with merchants, maintain access to businesses and assist with deliveries and pick-ups, continuously cleanup site, and provide pedestrian and vehicle traffic and protection plans, informational signage, and minimum sidewalk widths. Require barriers to protect pedestrians and shield them from noise and dirt from construction. Work with the Union Square BID or MOED to increase cleanup of the area and assist pedestrians across streets. Assumed this work in cost & schedule estimates.

Initial Assessment: 1, 4, 4 **Risk Owner:** A. Wong
Current Assessment: 1, 2, 2 – Requirements Risk

Status Log:

September 2011:

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

December 2012:

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

Risk Mitigation Status
Risk Reference: 32

Risk	Mitigation Strategy
Delay in advanced utility relocation delays ground treatment and start of construction. (Uty 2)	1. Intensive coordination with and commitment from utility owners. 2. Early completion incentive for utility relocation contract. 3. Enforce franchise agreements.

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

Status Log:

September 2011:
Advance utility relocation contract (1251) is underway with a projected completion date in advance of advertising UMS construction contract.

January 2012 Meeting:
1. CN1251 is 77% complete as of end of December.
2. Utility companies are beginning cutovers to new joint trench facilities.

March 2012:
1. PG&E and AT&T coordination is ongoing. AT&T has brought on additional resources to keep schedule.

April 2012
1. PG&E and AT&T coordination is ongoing.

May 2012
1. PG&E and AT&T coordination is ongoing.
2. AT&T has brought on further additional resources to keep schedule.
3. AT&T schedule has slipped based on their current staffing levels.
4. SFMTA will request that AT&T begin night work to finish their cutover work ASAP.

June 2012
1 No status update

July 2012
1. No Status update

November 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 32

December 2012:

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

Risk Mitigation Status
Risk Reference: 47 – CTS Station

Risk	Mitigation Strategy
Revisions to the SEM sequence at CTS during construction, which differ from the plan, could lead to significant delays if not sufficiently pre-planned.	1. Revisit sequence strategy during FD. 2. Address change through flexible bid schedule 3. Utilize contractor pre-qualification: Require experienced SEM Contractor, approved SEM procedures, and continuous SEM inspection. 4. Provide attractive T + C's (e.g. differing site conditions) 5. Conduct peer review for FD 6. Provide performance incentives including crew incentives for production. 7. Require shotcrete, as needed. Include shotcrete & inspection costs in estimate. 8. Include language on drawing or in specification that allocates all risk to the contractor for change in sequence

Initial Assessment: 3, 4, 12 **Risk Owner:** A. Hoe/ Q. Chin
Current Assessment: 0 4, 0– Design Risk
Status Log:

May 28, 2009 Meeting:
1. Revised the Risk and Mitigation statements.
2. Items 1 and 2: Must wait for Final Designer to develop these items
3. Item 3: Check with VTA on pre-quals used there; conduct a survey to generate a list of qualified, available SEM contractors (check with J. Bhore). Conduct some outreach at the upcoming RETC.
4. Item 4: Confer with J. Bhore
5. Item 5: Must wait for Final Designer to develop this item
6. Item 6: Confer with J. Bhore

June 23, 2009 Meeting:
1. A. Hoe identified recent SEM work and found only four locations in the USA where it is being used. The biggest concern is getting qualified personnel to do the work. This calls for an outreach program that will increase chances of obtaining these qualified personnel and contract terms that increase the Project's chances of keeping these personnel on the Project.
2. The SEM process is viable, but project needs to refrain from stipulating Means and Methods.
3. In order to achieve acceptable SEM results, Project needs a good GBR and all instrumentation in place.
4. A means of mitigating possible uncertainties with the SEM work is to perform gradation analysis on EPBM spoils.

August 27, 2009 Meeting:
1. A. Hoe indicated that in his discussions with Caltrans, relative to SEM, they recommended flexibility in any contract with a SEM firm.
2. J. Bhore provided A. Hoe with T&C's as examples of possible incentives that could be used to improve SEM productivity.
3. The objective in improving SEM productivity is to get meaningful money down to the working crew. A. Hoe will also look into using safety incentives as well as training programs through the unions.

RETIRED

4. It is expected that there will be several SEM contracts in the Bay Area at the time CSP is planning to do the CTS. A. Hoe will prepare a time-phase schedule of these projects to determine the degree to which there will be a SEM laborer shortage.
5. It was agreed that the TBM will provide good geotechnical information as it bores through the CTS ahead of the SEM mining operation. It will be necessary to assure that the TBM operation obtains this information.
6. A. Hoe will contact V. Romero to inquire about the incentives that were used on the SFPUC project.
7. A. Hoe will arrange to talk to labor representatives on options to get incentives to crew foremen.

September 24, 2009 Meeting:

1. A. Hoe continues to work the mitigation strategy for this risk, especially in the area of assuring that the Project can attract experienced contractors and retain experienced workers.
2. The possibility of reducing the CTS cavern cross section was suggested. One way to do this would be to make the North and South reaches the same. This would reduce excavation and schedule thereby saving money as well as, hopefully, increasing the factor of safety for the cross section. The increased factor of safety would reduce the concern for excessive settlement. A reduced cross section would also eliminate some of the potential for delay addressed by Risk 47 in that there would be less of the SEM method applied. One problem with reducing the cross section is that the Project architects believe the reduced section would be too restrictive.
3. There was some discussion that reducing the cross section could be presented as a secondary mitigation. This was discounted, however, as the attendees suggested this reduced section be pursued as a primary mitigation as soon as the final designer comes on board. This suggestion will be presented to the Project's Design Oversight Manager.

April 27, 2010 Meeting:

1. A. Hoe indicated that Final Designer will be asked how to address differing site conditions relative to the SEM of the CTS. It was stated that we do not want to repeat Beacon Hill where differing site conditions and unclear measurement for payment led to serious claims.
2. Regarding the issue of obtaining and keeping experienced labor, the use of incentives was again discussed. Overtime can and should be planned for. Bonuses are more of a problem because it is not clear how much of it gets to the workers, which of course, are the ones targeted for incentives.
3. A. Hoe will bring the SEM Final Designer to the next risk mitigation meeting to discuss the SEM process and the measurement and payment issue.

June 2, 2010 Meeting:

1. A. Hoe indicated that he had discussions with the Station Final Designer relative to keeping quality personnel on the job for the SEM work. They suggested that contract language be added to attract supervisors and foremen from outside the region by offering incentives. The designer indicated that an adequate number of experienced laborers are in the area, it is the experienced supervisors that need to be attracted and retained through incentives and bonuses. Project needs to discuss the issue of incentives with the City attorney to see if incentives can be addressed in the General Conditions.
2. The problem with the SEM work is that it needs to be somewhat prescriptive. The degree to which it is prescriptive is difficult to determine. The Project has hired the Preliminary Designer Geotechnical expert for SEM to perform Final Design for the SEM tunneling at CTS and to provide continuous support at the face to adjust means and methods as conditions require.
3. Albert Hoe will request a Final designer accompany him to the next risk mitigation meeting to discuss the issue of measurement and payment as it relates to the SEM at the CTS.

September 16, 2010 Meeting:

RETIRED

Risk Mitigation Status

Risk Reference: 47 – CTS Station

1. Since commencing to address this risk, attendees have recognized that resolution is based on assuring that the Project has a skilled and committed work force for the CTS SEM. Because the crew that will perform the CTS SEM work is historically transitory and will seek the best remuneration available to them, contract arrangements that can get money to the crew are essential to attract and maintain the most skilled labor. Attendees commented that planned incentives for the work force almost always get squelched. An example of this is incentives employing early completion bonuses.
2. It was suggested that the Project might be able to pay for SEM work on a piece rate. European contractors work on a piece rate for SEM work. The possibility of using bonuses for meeting or exceeding scheduled milestones was also discussed. These incentives, however, create problems when delays hinder bonuses or meeting piece work targets. This is especially true with SEM which needs to continuously assess work and adjust for changing conditions.
3. It was agreed that the most direct method of getting incentives to the crew would be through overtime pay. Two 10 hour shifts would accomplish this and fit with a 24 hour operation. Paying the overtime might be enough to incentivize the SEM crew.
4. R. Edwards agreed to be responsible for developing a matrix of the various incentive options for SEM crew. This matrix will be presented at the next risk mitigation meeting with the intent of selecting a viable option(s) to go forward.

October 28, 2010 Meeting

1. The discussion then focused on item 3 of the strategy; utilizing contractor prequalification, require experienced SEM Contractor, approved SEM procedures and continuous SEM inspection. Prequalification would potentially have schedule impacts to the procurement process. It was discussed that to avoid schedule impacts, and not prequalify, changes could be made to enhance the specification to include specific requirements that bidders would have to adhere to. This would in essence attempt to accomplish the same goal of getting qualified contractors to perform the work but not necessarily address the risk. The specification language could at a minimum address sequence changes, if any, could only be made, so as not to cause any delay to the contractor.
2. It was also suggested that incentives to early completion could be investigated as part of the specifications. It was noted that with any incentive, there must be a corresponding disincentive clause to preserve a balanced approach to the use of public funds. It was also suggested that other contracting strategies could also be utilized other than prequalifying; such as best value, a 2 step process similar to what CalTrans uses for their A plus B contracts. This concept utilizes both cost and schedule to evaluate the bid. Further investigation will be required to ensure that the SFMTA has the ability to utilize this procurement strategy.
3. E. Stassevitch agreed to be responsible for obtaining more information on best value for those in attendance that were not familiar with the details of the contracting method. This information together with the matrix will be presented at the future risk mitigation meeting with the intent of selecting a viable option(s) to go forward.

December 16, 2010 Meeting:

1. Continue to evaluate means of mitigating risk prior to bid. Enhancing specification to address issues that would normally be included in a prequalification process was discussed as one method of obtaining experienced contractor's.

January 13, 2011 Meeting:

1. Discussed impact of Risk Mitigation Meeting held on January 7th to specifically address to possibility of lowering CTS by 25 to 30 and what effect this would have on other risks.
2. A comprehensive review of all risks was conducted specifically focused on potential effect to risk definition, likelihood of occurrence of cost and schedule effects.
3. The following risks will need to be reevaluated based on the outcome of the decision to lower CTS. Risk 48, 49, 51, 52, 52a, 53, 54, 55, 57, 80, 81, 82, and possibly 115. Need to confirm the actual Risk description for 115.

PREPARED

Risk Mitigation Status

Risk Reference: 47 – CTS Station

November 2011 Meeting:

1. R. Edwards indicated that many of the mitigation measures have been incorporated during the FD phase. R. Edwards reviewed the progress to date: The sequence of excavation has been reviewed and maintained; prequalification's have been ruled out in favor of including experience and qualifications in the Division 1 specifications; T & C have been improved to include Geotechnical Baseline Report and Dispute Resolution Board provisions to make the contract conditions more attractive to potential contractors; a comprehensive Constructability review workshop was conducted on January 7, 2011 and incorporated in the FD; incentives have been discussed and vetted in previous meeting and found difficult to incorporate in the contract language; Recent meeting have been held to focus on a recommended bid item list to address the various tool box items required of SEM, see (Oct 5, 2011 Memo from A. Reid).
2. A group discussion on the incorporation of specific language on the plans or specification or both that places on the impacts of cost and schedule on the contractor should as alternate approach to sequencing other than that prescribed in the contract documents would allow reduction of this risk rating.

December 2011 Meeting:

1. Follow up action required to provide evidence of language to transfer risk to contractor in case of proposed changes to sequence in the updated contract specifications.

January 2012 Meeting:

1. Language to transfer risk to contractor in case of proposed changes to sequence have been included in the updated contract specifications to 01 25 00 Substitution, 1.02C.
2. Risk retired by unanimous consent of Risk Assessment Committee on 1/12/12.

February 2012 Meeting:

1. The PMOC doesn't believe the language in Division 1 specification section 01 25 00 to place cost and schedule impacts to changes in SEM sequence upon the contractor on the 100% Design Submittal really addresses the SEM sequence. Appropriate specification language to be forwarded to PMOC.
2. Risk status to be changed to active until proper material is presented to indicate contract documents contain the necessary provisions.

March 2012 Meeting:

1. 100% Design contract documents will be distributed to PMOC for verification of implementation of mitigation strategies.

April 2012 Meeting:

1. PMOC to verify implementation of mitigation strategies.

May 2012 Meeting:

1. The Risk Committee is concerned that the language in 01 25 00 does not adequately address the transfer of risk to the contractor for any changes to the SEM construction as outlined in the contract documents.
2. Requests for change to SEM construction will be addressed during the submittal process in construction to ensure that the risks are transferred at that time.

June 2012 Meeting:

No update.

RETIRED

Risk Mitigation Status
Risk Reference: 47 – CTS Station

December 2012:

1. Suggest additional language be included in the specification to require submittals for significant work elements (such as SEM) be submitted well in advance (90days) of the proposed commencement of the relevant activity.
2. SEM construction will be address as part of the submission of Contractors Work Plan submittal.
3. This risk was retired by unanimous consent of the Risk Assessment Committee on 12/13/12.

RETIRED

Risk Mitigation Status
Risk Reference: 72

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

Initial Assessment: 2, 3, 5 **Risk Owner:** C. Campillo
Current Assessment: 2, 3, 5 – Design Risk

Status Log:

October 2011 Meeting:
1. Recommend to retire this risk from the project.
2. Risk not retired. Systems contract drawings need approval of Muni Operations.

November 2011:
1. Functional requirements for the interface have been approved by Muni Operations.
2. 90% design drawings for Systems contract will be forwarded to Muni Operations for their review and comment.

January 2012 Meeting:
1. Concept design with SFMTA Operations recommended safety enhancements have been approved.
2. ECP for recommended safety enhancements prepared and will be submitted to CMB for approval.

February 2012:
1. CMB approved ECP for Operational & Safety Upgrades.
2. SFMTA Muni Operations signed off on ECP.
3. ECP being implemented by design team.
4. Recommend to reduce this risk rating.

September 2012 Meeting:
1. Update to be provided next meeting.
2. New plan to be advised, mitigation strategy to be revised.

October 2012 Meeting:
1. Central Subway have sent a letter to Ops including contract specifications, temporary and permanent requirements seeking concurrence
2. Ross/Carlos to provide a briefing next meeting regarding how signaling interface design has ensured functionality at the end of each weekend shutdown.

November 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 72

December 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 79

Risk	Mitigation Strategy
Delay in obtaining tunnel easements (3 #) (goes to condemnation) - Costs of ROW may cost more than expected	1. Engage Owners in negotiations as soon as possible. 2. PM/CM will provide real estate specialists to facilitate.

Initial Assessment: 2, 3, 6 **Risk Owner:** G. Hollins
Current Assessment: 1, 1, 1 – Requirement Risk

Status Log:

October 2011 Meeting:
1. All Tunnel easements have been acquired.
2. Recommend to retire this risk from the project.
3. This risk will be revisited next month since not all easements have been obtained

November 2011 Meeting:
1. Right of entry received for properties requiring easement.
2. Costs have been identified through appraisals of properties.
3. Actual value of easements needs to be negotiated with property owners.
4. Added mention of battered piles at UMS headwalls to the risk description as they will cross property lines.

December 2011:
1. Right of possession for each of the three required parcels has been obtained.

January 2012 Meeting:
1. City Attorney's Office is finalizing final easement deed language and price for all three easements.
2. To date owners of 801 Market and 1455 Stockton have agreed to purchase price of easement.
3. Awaiting cost agreement with 790 Market.
4. Recommend to reduce the risk rating.
5. Risk rating reduced to 1, 1, 1.

February 2012 Meeting:
1. SFMTA is working with City Attorneys Office to finalized easement deed indemnity language for the 790 Market easement.

March 2012 Meeting:
1. SFMTA has provided the City Attorney's Office with additional information regarding tunnel and station related settlement at 790 Market. This information will be shared with the property owner at 790 Market in order to address their concerns of settlement and requests to include certain indemnity language in the tunnel easement. Current draft of the tunnel and station grouting licenses contain the requested indemnity language; CCSF Risk Manager, SFMTA and City Attorney do not feel owner's request for indemnity is appropriate in the easement deed.

Risk Mitigation Status
Risk Reference: 79

April 2012 Meeting:

1. No update from the March report-out.

May 2012 Meeting:

1. No update from the March report-out.

June 2012 Meeting:

1. No update from the March report-out.

July 2012 Meeting:

1. No update from the March report-out.

August 2012 Meeting:

1. The SFMTA has agreed to a final purchase price for the 801 Market and 1455 Stockton easements. 801 Market will transfer title (of the easement) through a purchase and sale agreement and 1455 Stockton will transfer title through a stipulated agreement. Final purchase price negotiations for easement under 790 Market are ongoing.

September 2012 Meeting:

1. Central subway has pre-possession for all 3 easements.
2. Negotiations continue on terms and conditions for 801 Market and 1455 Stockton.
3. Negotiations continue on final purchase price for 790 Market easement.

October 2012 Meeting:

1. Central subway has pre-possession for all 3 easements.
2. The SFMTA has executed a final stipulation agreement for possession of the easement under 1455 Stockton and all remaining funds have been transferred to the property owner.
3. Negotiations continue on terms and conditions for 801 Market.
4. Negotiations continue on final purchase price for 790 Market easement.

November 2012 Meeting:

1. Central subway has pre-possession for all 3 easements.
2. The SFMTA has executed a final stipulation agreement for possession of the easement under 1455 Stockton, final transfer of funds is pending signature of the easement deed from the property owner.
3. Negotiations continue on terms and conditions for 801 and 790 Market.

December 2012 Meeting:

1. Central subway has pre-possession for all 3 easements.
2. Final transfer of funds for 1455 Stockton easement is pending signature of the easement deed from the property owner.
3. Negotiations continue on final purchase price, terms and conditions for 801 Market and 790 Market Easement Agreements.

Risk Mitigation Status
Risk Reference: 83

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

Initial Assessment: 1, 1.5, 2 **Risk Owner:** L. Ames
Current Assessment: 4,4, 16 – Requirement Risk

Status Log:

April 2012 Meeting:

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

May 2012 Meeting:

1 An RFP is being developed by CH2M Hill for high-floor vehicles.

2 SFMTA will attempt to attach the procurement of the four CS vehicles to a procurement contract of another transit property that is currently pursuing procurement of vehicles.

June 2012 Meeting:

1 No status update.

September 2012 Meeting:

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

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

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

October 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: 83

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

November 2012 Meeting:

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

December 2012:

1. Item 4a items received Nov. 20 from SFMTA LRV Procurement PM include draft schedule, scope and budge.
2. CS team met with SFMTA Finance to initiate a cost control protocol and procedure for release of CS funds for procurement.
3. The draft schedule, scope and budget were submitted to the FTA Nov. 29 for review and comment prior releasing funds.
4. The FTA PMO is expected to provide a report to the SFMTA and CS by Dec. 15.
5. CS team to prepare a Task Order that will incorporate the final schedule, scope and budge.
6. The SFMTA LRV Procurement staff is currently expending funds in anticipation of receiving funds for retroactive costs.

Risk Mitigation Status
Risk Reference: 89

Risk	Mitigation Strategy
3rd Party reviews of Design documents delays completion of Final Design.	Provide assistance to 3rd Parties to facilitate their reviews and obtain concurrent partial approval for underground work.

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

Status Log:

January 2012 Meeting:
1. Meetings with Third Party reviewers have been and continue to be held with Muni Operations, DBI, SFFD, BART, etc.
2. Late review comments will be handled as addendum.

May 2012 Meeting:
1. A peer review panel was convened to assist in DBI reviews.
2. SFFD has been paid to assist in review and approval of Central Subway contract documents.
3. Meetings with other third party reviewers are ongoing.

June 2012 Meeting:
1. Coordination with 3rd Party reviewers continues.

August 2012 Meeting:
1. Majority of third party reviews have been closed. Remaining reviews are in process of going through closure phase (requiring concurrence and verification of comments). Responses have been provided to each 3rd party comment. Priority was given to 3rd party reviewers with permit approval authority such as SFFD, SFPUC and DBI. Note that the design phase has been closed.

September 2012 Meeting:
1. Process of closing out PUC and DBI comments is ongoing.
2. PUC requirements as per draft MOU scope are being incorporated into 1256 by addendum.

October 2012 Meeting:
1. Process of closing out PUC and DBI comments is ongoing.
2. PUC requirements as per draft MOU have been incorporated into combined contract.

November 2012 Meeting:

1. Central Subway continue to work with PUC and DBI to close out remaining comments

December 2012 Meeting:

1. The process of closing out all comments from PUC and DBI to is ongoing.

Risk Mitigation Status
Risk Reference: 90

Risk		Mitigation Strategy
Multiple outside design consultants & mix of SFMTA / City could result in delays and additional costs due to complexities in design coordination.		1. Conduct regular coordination meeting, integration meetings, interdiscipline meeting, design oversight reviews and partnering to encourage and promote a positive work environment. 2. Allocate additional costs to contingency.

Initial Assessment: 3, 3, 9 **Risk Owner:** R. Edwards
Current Assessment: 2, 2, 4 – Design Risk

Status Log:

November 2011 Meeting:
1. Executed options to complete designs for Systems contract.
2. Sufficient costs are in project budget to complete designs.
3. Mitigation strategy will be updated to reflect cost being carried in contingency.

December 2011 Meeting:
1. Delivery schedule of final design packages remains fixed.

February 2012 Meeting:
1. Design coordination within Contract Packages is responsibility of Consultant Design Manager for both consultant and City forces.
2. Design Oversight assists in Design Consultant fulfilling responsibility for coordination.
3. Additional costs for option (consultant design for City-planned work) have been covered by the allocated contingency.
4. No additional costs above allocated contingency are anticipated on the station contracts.
5. Risk rating reduced to 2, 2, 4.

May 2012 Meeting:
1. Cost and schedule for delivery of final design documents is currently not affected by the complexities of design coordination.

June 2012 Meeting:
No status update.

August 2012 Meeting:
1. Agree on complexities in the design coordination. Design contracts including design integration sign-offs are complete for UMS, CTS and MOS station contracts. Design phase has closed and moved onto bid support phase.

September 2012 Meeting:
1. SFMTA and City design elements have been received and incorporated into design documents
2. Staff plan being updated for review early October.

October 2012 Meeting:
1. Staff plan being issued October

RETIRED

Risk Mitigation Status
Risk Reference: 90

December 2012 Meeting:
1. Staffing plan Rev 1, was issued to the PMOC on December 11th.
2. This risk was retired by unanimous consent of the Risk Assessment Committee on 12/13/12

RETIRED

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.

Initial Assessment: 2, 3.5, 7 **Risk Owner:** C. Campillo
Current Assessment: 2, 3, 5 – Requirement 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

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.

Risk Mitigation Status
Risk Reference: 198

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

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

Status Log:

December 2012:

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

Risk Mitigation Status
Risk Reference: 199

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

Initial Assessment: 2, 4, 7 **Risk Owner: A. Wong**
Current Assessment: 2, 4, 7 – Construction Risk

Status Log:

December 2012:

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

Risk Mitigation Status
Risk Reference: 200

Risk		Mitigation Strategy
Dealing with Larger Contractor Group		1.

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

Risk Owner: R. Redmond

Status Log:

DRAFT

Risk Mitigation Status
Risk Reference: 201

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

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

Status Log:

December Meeting 2012:

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

Risk Mitigation Status
Risk Reference: 202

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

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

Status Log:

December 2012:

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

Risk Mitigation Status
Risk Reference: 203

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

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

Status Log:

December Meeting 2012:

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

Risk Mitigation Status
Risk Reference: 204

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

Initial Assessment: 2, 2, 4 **Risk Owner:** R. Edwards **/**M. Benson
Current Assessment: 2, 2, 4 – Construction Risk

Status Log:

December 2012:

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

Risk Mitigation Status
Risk Reference: 205

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

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

Status Log:

December Meeting 2012:

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

Risk Mitigation Status
Risk Reference: A

Risk	Mitigation Strategy
Timely resolution of sewer lines south of portal	1. Develop alternatives that do not require creation of a new sewer line. 2. Work together with SFPUC to find mutually beneficial solutions. 3. Provide evidence of solutions developed for similar situations from existing SFMTA and /or other transit agencies. 4. Develop detailed schedule of activities required for resolution including milestones for go - no go actions which will not impact the overall MPS. 5. Request condition assessment of sewers from SFPUC to determine required repair of sewers under proposed track.

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

Status Log:

November 2011 Meeting:

1. An alternative analysis report dated May 27, 2011 was forwarded to SFPUC for review and comment. Three options were studied by SFMTA for handling the sewers south of the portal:

    A. Leave the sewers in place and construct offset manholes where the track is in conflict with existing manholes,
    B. Replace the existing sewers in their existing locations,
    C. Construct twin sewers.

2. The recommendation from the report was to leave the sewers in place and construct offset manholes.
3. SFPUC provided a letter stating that the recommendations of the May 27 report were unacceptable to SFPUC.
4. New information has confirmed that leaving the sewer manholes in the track way do not violate CPUC, SFPUC or SFMTA safety criteria. A new proposal has been formulated and documented in a letter currently being circulated for signature signoff to SFPUC for approval to leave sewer in place and perform condition assessment at SFPUC cost.
5. Letter is waiting for John Funghi's signature to send to SFPUC.

December 2011 Meeting:

1. SFMTA sent letter December 13 stating that SFMTA will not relocated sewers.
2. Also requested a meeting between SFMTA & SFPUC Directors.
3. Mitigation strategy was added to request condition assessment of sewers under proposed track.

January 2012 Meeting:

1. Meeting between PUC GM and Director of Transportation will be set up by end of month.
2. Condition assessment by SFPUC has been requested by SFMTA in December 13 letter.
3. Risk rating increased to 4, 3, 12.

Risk Mitigation Status
Risk Reference: A

February 2012 Meeting:

1. SFPUC is performing a video survey of sewer lines.
2. Pre-meeting with Director of Transportation will be held prior to meeting with SFPUC. Items to be discussed with Director are:
    a. agreement of bus bridging during sewer construction,
    b. scope of sewer work requested by design team,
    c. structural analysis of existing sewer lines.

April 2012 Meeting:

1. Meeting was held on February 17 between SFMTA and SFPUC to discuss the sewer lines south of the portal.
2. SFMTA presented a proposal to rebuild seven sewer chimneys at manhole locations.
3. SFMTA will provide the LRV train loading conditions to SFPUC.
4. The 30" force main was not discussed.
5. Meeting with SFPUC took place on April 12 to discuss next step on how to move forward. Additional proposal from SFPUC was presented to SFMTA to consider; make 78-inch sewer the main sewer, but run two laterals enabling them to make the house connection without taping the main line. To build two smaller 12-inch sewers on east and west side as a lateral and retrofit the existing with two options: 1) to rebuild the crown for two blocks from Bryant to Townsend, or b) slip line the 78-inch sewer.
6. SFPUC is conducting a condition assessment of the sewers along Fourth Street. The condition assessment will provide the premises of whether or not to rebuild the roof structure of the sewer. SFMTA will not pay for the changes, but would consider cost sharing.
7. A copy of the meeting minutes from the Director's meeting with track change edits from SFMTA was presented.

May 2012 Meeting

1. A meeting with SFPUC was held on 4/12/12.
2. It was discussed that CS would replace the existing brick crowns, replace a force main under the proposed tracks, and protect the sewer laterals. SFPUC would study the potential for their twin sewer arrangement.
3. A senior management meeting was held on 5/18/12 to discuss scope and cost sharing.
    a. The crown and laterals for the existing 78" sewer will be replaced and paid for by SFMTA.
    b. The existing force main under the tracks will be replaced to the east side of the tracks. SFPUC to pay for this work.
    c. A new 48" sewer will be installed on the east side of tracks from Bryant to Brannan. This work will be paid for by SFPUC.
    d. A local sewer will be installed on the west side of the tracks.
    e. Joint trench work to relocate the existing AT&T structures on the east side of the tracks will be required.
    f. Cost estimates for the sewer work are available from DPW.
    g. The design of the sewer work will be achieved using Design/Build contracting strategy.
4. SFPUC completed a video survey of the existing sewers south of Bryant.

June 2012 Meeting:

1. A further Senior Management meeting is required to reach agreement of the cost-sharing of the scope items listed in Item 3 of the May 2012 notes above.
2. An MOU will be drafted upon concurrence of cost sharing between the two parties.
3. Design of the sewer work will still be achieved using Design/build contracting strategy.

Risk Mitigation Status
Risk Reference: A

July 2012 Meeting:

1. Sewer ECP presented to CMB on July 11.
2. Design will include two separate drawings depicting 1) Base work and 2) SFPUC Optional work as a design build.
3. SFPUC Optional work will be done at the sole cost of the PUC.

August 2012 Meeting:

1. Sewer design for 4th Street continues no impact to 1256 schedule.

September 2012 Meeting:

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

October 2012 Meeting:

1. Included as D&B element in combined contract

December 2012 Meeting:

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

Risk Mitigation Status
Risk Reference: T

Risk	Mitigation Strategy
Delay to final design submittal due to delay of emergency ventilation approval by SFFD.	1. Work with SFFD to develop a plan acceptable to each party. 2. Incorporate SFFD comments into the construction documents.

Initial Assessment: 2, 2, 4 **Risk Owner:** R. Edwards
Current Assessment: 2, 2, 4 – Requirement Risk

Status Log:

December 2011:
1. A meeting was held on 12/15/11 with SFFD and SFMTA to discuss emergency ventilation. SFFD agreed to the proposed plan by SFMTA as long as additional signage and lighting were provided in the stations to increase the safety of emergency responders in event of an emergency.

March 2012 Meeting:
1. Required emergency ventilation requirements will be incorporated into the construction documents.
2. Recommend to retire this risk from the risk register.
3. This risk is not retired. Final approval by SFFD on 100% construction documents still needed.

May 2012 Meeting:
1. SFFD requirements are being implemented in the construction documents.
2. A variance for the under stair requirement will be sought from SFFD.

June 2012 Meeting:
1. SFFD has conditionally approved the 3-fan configuration in the stations.
2. SFFD has conditionally approved the CFD analysis for each station based on the approval of one-hour tenability using illuminated platform edge, and access/egress route signage/demarcation.
3. Final approval by SFFD will occur during the DBI pre-application review for each station.

September 2012 Meeting:
1. SES review comments addressed, revised report submitted.

October 2012 Meeting:
1. Follow up required with SES to close out remaining comments and confirm concurrence

November 2012 Meeting:

1. Central Subway continue to work with SFFD to close out the remaining comments

December 2012 Meeting:
1. Comments received by SFFD, submittal will be revised.

Risk Mitigation Status
Risk Reference: V

Risk	Mitigation Strategy
Incorporation of revised Planning Zoning/ development criteria for Moscone Station TOD impact MOS and CTS construction contract.	1. Participate and provide input of CSP constraints to SFMTA Real Estate during process of initial task to define best use. 2. Integrate work with SFMTA Real Estate into CSP

Initial Assessment: 3, 2, 6
Risk Owner: R. Edwards
Current Assessment: 3, 2, 6 – Design Risk

Status Log:

March 2012 Meeting:

1. SFMTA entered into agreement with development firm to maximize use of existing SFMTA real estate inventory.
2. Initial task is to develop proposed best use for the top three properties of which two of the properties are CTS and MOS headhouse locations.
3. Need to identify Program contact person to stay in touch and provide input of CSP constraints to SFMTA Real Estate.

May 2012 Meeting:

1. The Planning Department has included development criteria in the recently approved Conditional Use Permit.

June 2012 Meeting:

No status update.

August 2012 Meeting:

1. **MOS TOD** – set-aside TOD zone complied to & is based on current zoning criteria. SF Planning has plans to up-size the zoning in SOMA/Central Corridor. Potential conflict and discord with SF Planning on the IFB documents. FD has been completed.
2. **CTS TOD** – set-aside TOD zone or absence of TOD cleared SF Planning environmental (& historical) review & MMRP mitigation. ~~Next step is obtaining Conditional Use Authorization thru Sept 6, 2012 Commission contract with incorporation of Planning Dept recommendations.~~ Note: Obtaining the Conditional Use Authorization and incorporating the Planning Departments recommendations is not related to this risk

September 2012 Meeting:

1. Conditional Use permit received for CTS.

October 2012 Meeting:

1. Status of communication to SFMTA Real Estate to be provided next meeting

November 2012 Meeting:

1. Chinatown Station is compliant with current building codes and zoning requirements in effect. SFMTA Real Estate has a separate project outside of Central Subway to specifically address transit oriented development (TOD) at the site. Central Subway is not directly involved

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

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

December 2012:

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

Risk Mitigation Status
Risk Reference: PR73

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

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

Status Log:

March 2012 Meeting:

1. Project team continues to coordinate with 3rd party utility agencies (AT&T, PG&E, SFDT) to complete construction and cutover of facilities designed under CN1250 & CN1251.

May 2012 Meeting:

1. Met with SFDT to confirm the scope of work that they will perform for the Systems contract.

June 2012 Meeting:

1. Agreements on scope of work with SFDT are being sought.

August 2012 Meeting:

1. MOU written to DTIS to define scope. Awaiting concurrence. SFFD reviewing 90-100% design no comments received to date.

September 2012 Meeting:

1. Central subway following up DTIS

October 2012 Meeting:

1. Follow up with DTIS still required, verbal concurrence received
2. 3rd Party Utilities
    a. 1300 Utility relocations – status to be advised next meeting
    b. 1256 utility relocations – confirmation and schedule required – follow up next meeting

November 2012 Meeting:

1. Follow up with DTIS still required
2. 3rd Party Utility
    a. 1300 Utility relocations – High level timeframes to be obtained from utility owners
3. 1256 Utility relocations
    a. Confirmation and schedule to be sought from affected utilities.
    b. AT&T to advise high level time frames should relocation of the duct bank (east side of 4th street, south of Bryant) be required.

Risk Mitigation Status
Risk Reference: PR73

December 2012:

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

Risk Mitigation Status

Risk Reference: PR74

Risk		Mitigation Strategy
Incomplete design by City staff – not prioritized to complete 1256 work on time		Monitor development of design and recommend exercise of contract options to supplement City staff.

Initial Assessment: 3, 1, 3 **Risk Owner:** R. Edwards

Current Assessment: 0, 0, 0 – Design Risk

Status Log:

January 2012:

1. Options have been exercised to avoid impacts.

March 2012 Meeting:

1. Options continue to be exercised in DP3 contract based on a list of work that will not be completed by City staff.

May 2012 Meeting:

1. Option for structural support has been executed.

June 2012 Meeting:

1. All City work will be done prior to “Issue for Bid” date.

December 2012 Meeting:

1. All Mitigation efforts have been addressed.
2. This risk was retired by unanimous consent of the Risk Assessment Committee on 12/13/12.

RETIRED

central T subway

Connecting people. Connecting communities.

Central Subway Presentation

CSP signaling work at 4th and King

HNTB-B&C JOINT VENTURE

PEOPLE | INTEGRATION | DESIGN

December 13 2012

SFMTA | Municipal Transportation Agency

CSP signaling work at 4th and King

- New or modified signaling functionality is not required during track and OCS construction at 4th and King. All final signaling changes are consistent with current design philosophy.
- New switch machines are pre-fitted to the special trackwork in the factory. [34 11 01, 3.07.F]
- New switch machines employ similar controls to the old machine, minimizing the unknowns in the switch replacement work. [34 42 15, 2.02.A]
- New track is factory coated with electrical insulation to ensure that signal track circuits will work when connected with straight forward final adjusting and testing. [34 11 01, 2.01.A]
- The constructability concept work windows for track construction includes time to verify signal cables and operation of (existing) configuration.

CSP signaling work at 4th and King

- Contractor is required to produce detailed site-specific work plan(s) SSWPs that are submitted, reviewed and approved in advance by Engineer. Engineer approval is required to commence site work (per the approved SSWP) when all necessary assets and materials are verified to be available to support construction. [01 35 15, Operating System Interface and 34 11 01, 3.04]
- Contractor is required to provide detailed signaling test procedures that includes; the test objective, prerequisite tests, required test documents, required test equipment, required test personnel, test sequence, pass/fail criteria, test results data sheets and corrective action reports. All site testing work shall be performed in the presence of the Engineer. [34 42 13, 1.03.M]