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March 15, 2013

John Funghi
Program Director
SFMTA
Central Subway Project
821 Howard Street, 2nd Floor
San Francisco, CA 94103

Attn: Albert Hoe, Deputy Program Manager

Reference: Contract No. CS-155.1 – Central Subway Final Design Package #1 – Tunneling and Utilities

Subject: Proposal to Prepare Detailed Design to Accommodate TBM Retrieval at Pagoda Theater

Dear John:

As a follow-up to our discussions with Ross Edwards and Albert Hoe over the course of the past week and a half, attached please find our proposal to prepare final design documents for extending the tunnel alignment within the public right of way and retrieving the tunnel boring machines (TBMs) from a temporary shaft to be constructed at the site of the Pagoda Theater (1731-1741 Powell Street). The Pagoda Theater will be demolished by others prior to construction of the temporary retrieval shaft.

We understand that the primary objective of this alternative alignment and retrieval shaft location is to lessen surface disruption along Columbus Avenue without directly impacting other properties.

We understand that the schedule is the critical driver of the design, closely followed by cost considerations. Specifically, SFMTA intends to procure construction of the temporary retrieval shaft (and associated site work and building protection) under a separate contract. Construction of the temporary retrieval shaft must be completed by March 2014, so as not to delay tunnel construction and TBM retrieval under Contract 1252. In order to meet this aggressive schedule, SFMTA has established two critical milestones for the design effort:

Deliverable	Milestone
Temporary retrieval shaft design, substantially complete, for DBI review	1 month from NTP
Signed and sealed drawings and technical specifications for temporary retrieval shaft and associated building protection (for separate procurement package)	2.5 months from NTP

The estimated cost to prepare final design documents for the tunnel extension and temporary TBM retrieval shaft to meet these milestone dates is $391,975. Attached are a detailed scope, schedule, cost breakdown, and preliminary list of drawings and technical specifications.

Please note that the schedule has been compressed to 2.5 months for the separate procurement package, based on the assumption that up to 10 hours of authorized overtime per week for some individuals, in order meet the critical milestone dates noted above. If overtime is not authorized, the schedule will stretch to 3 months.

This design effort will be led by David Abrahams, with design oversight from myself and management oversight from Aileen Read.

We understand the urgency of the need for this design package and are prepared to begin work immediately upon receipt of written Notice to Proceed (NTP). We understand that the process of amending the contract and certifying additional funding will commence following issuance of NTP. If you have any questions, please contact me at 415-243-4694.

Sincerely,
PB Telamon

Matthew Fowler
JV Project Manager

encl.

cc: Mennor Chan, Telamon Engineering Consultants, Inc.

Scope of Services

1. Tunnel Alignment. The extension of the TBM tunnel section will be a continuation of the Contract 1252 segmental lining over the length of the extended alignment. The design of the final tunnel alignment will take into account the following design considerations:

   - Drain towards Chinatown Station
   - Minimum TBM turning radius of 450 feet
   - Maximum grade not to exceed 6.7%; ideal grade of 3% or less
   - Tunnel profile (depth of cover at breakout) sufficient to reduce settlement impacts to buildings/utilities
   - Ideal tunnel profile to accommodate temporary retrieval shaft construction; to the extent possible, tunnel curvatures and minimum tunnel separation should match what was used for the current tunnel alignment and retrieval shaft design
   - The extension of the TBM tunnel section, as it deviates from the current design, is temporary in nature and, as such, does not require and invert slab or sidewalk.

   Deliverable: Signed and sealed tunnel alignment drawings for construction under Contract 1252

2. Temporary Retrieval Shaft, Cover, and Bulkheads. The temporary retrieval shaft will be located within the boundary of the 1731-1741 Powell Street property. Due to the time-critical nature of this project, the current design of the permanent retrieval shaft will be reused to the maximum extent practical; specifically, it is anticipated that the configuration and construction (secant piles with jet grout) of the shaft will generally be the same (perhaps up to 6 feet wider). However, since the proposed shaft will be temporary, it is anticipated that the design of the secant pile reinforcement and base slab will be modified to suit. In addition, the temporary bracing arrangement and design loads/criteria will be shown.

   The time-critical nature of the project also requires the design of the temporary retrieval shaft to advance prior to completion of geotechnical investigations and concurrent with building investigations and settlement analysis. The initial design (for DBI review) will be based on the geotechnical design parameters used for the current (permanent) retrieval shaft design; adjustments to the design may be required, if warranted, by the results of subsequent geotechnical investigations.

   The temporary shaft cover will be designed for typical roof loading, with no provision for traffic loading. The cover is anticipated to be of semi-modular construction, to accommodate removal and restoration by BIH for TBM retrieval.

   It is anticipated that four bulkheads (two per tunnel) will be designed for construction under Contract 1252, to isolate the temporary (off-alignment) tunnels from the running tunnels at completion of Contract 1252 construction. The bulkheads will be designed to retain the full ground and water loads. The design shall include waterproofing details to protect the running tunnels from water infiltration. One set of bulkheads will be located within public right of way in front of 1731-1741 Powell Street; the other set of bulkheads willd be located at the transition between the "temporary" and running tunnels.

   Deliverables:

   - *Signed and sealed drawings and technical specifications for temporary retrieval shaft and cover, for a separate construction contract. Drawings shall include suggested construction sequence.*
   - *Signed and sealed drawings for bulkheads for construction under Contract 1252.*

3. Geotechnical Investigations. We understand that information pertaining to one 30-foot deep

boring is available from the owner of the property at 1731-1741 Powell Street. We propose to drill one boring immediately in front of the 1731-1741 Powell site, within public right of way. We propose to drill to a depth of 90 feet below the ground surface. In addition to collecting samples at 5-foot intervals for laboratory testing, we propose to perform an electric/natural gamma geophysical log in the hole, to allow further definition of the subsurface stratigraphy to support the interpretations developed from samples and logging of the drilling.

This scope of services assumes that contaminated soils are not present along the tunnel alignment or within the soils at the 1731-1741 Powell Street site; as such, design and mitigation measures for handling and disposal of contaminated water or soils is excluded from this scope of services.

Deliverables:

- *Signed and sealed drawings – subsurface investigation plan and profile of depicting soil classification information from the new boring and previous investigations (CS-19NB(P), CPT-15NB, and CS-18NB). This information will be provided to the Contractor for baseline purposes, in lieu of a Geotechnical Baseline Report.*
- *Signed and sealed drawings and technical specifications – shoring design criteria, excavation support and protection, dewatering.*

4. Building Protection. Development of building protection drawings involves three discrete activities:

- Building Assessments. With assistance from SFMTA, we will obtain record drawings of the adjacent buildings from the Department of Building Inspection. In addition, with assistance from SFMTA to gain access, we will perform site visits of the adjacent buildings, to confirm that the available record drawings generally reflect the construction of the buildings and to identify potential locations for building monitoring points. Six properties are proposed to be assessed:
  - Block 0101, Lot 005
  - Block 0101, Lot 005A
  - Block 0101, Lot 006
  - Block 0101, Lot 007
  - Block 0101, Lot 031
  - Block 0101, Lot 045
- Settlement Analyses. We will perform analyses to evaluate the ground movement and assess the settlement impacts on adjacent buildings and utilities due to the construction of the extended tunnel and temporary retrieval shaft. A set of calculations of the *unmitigated* settlement will be prepared for each of the six properties, for SFMTA's use in obtaining license agreements for compensation grouting, if needed.
- Settlement Mitigation and Monitoring. We will prepare drawings and technical specifications for instrumentation, monitoring, and settlement mitigation. To the extent feasible, the instrumentation types and reading methods will be selected to work with the methods and systems already in use for Contract 1252.

Deliverables:

- *Record drawings, sketches and/or photographs of the six properties to be assessed*
- *Estimates of the unmitigated settlement impacts to the six properties due to tunnel and retrieval shaft construction*

- *Signed and sealed drawings and technical specifications for instrumentation, monitoring, and settlement mitigation measures, for inclusion in the bid documents for construction of the temporary retrieval shaft. It is assumed that the instrumentation, monitoring, and settlement mitigation would be turned over to Contract 1252 upon completion of construction of the temporary retrieval shaft.*

5. Site Work and Drainage. We will prepare a site plan depicting anticipated existing conditions at the time of construction of the retrieval shaft. It is assumed that SFMTA will obtain CAD files of the demolition plans for the Pagoda Theater, for use in developing the site plan.

   In addition, we will prepare drawings to provide for temporary drainage of the retrieval shaft and tunnel extension via a drainage pipe extending through the bulkheads and along the invert of one of the running tunnels.

General Assumptions

- General Provisions, Special Provisions and Division 1 specifications will be prepared by SFMTA and/or PMCM.
- Quantities and construction cost estimates will be prepared by the Project Controls Team.
- Traffic control plans and specifications will be prepared by SFMTA. PB Telamon will provide input regarding requirements for construction laydown area, access, and suggested construction sequence.
- Plans and specifications for OCS pole / traffic signal relocation, if required will be prepared by SFMTA.
- Permits for tree pruning/removal, if needed, will be obtained by SFMTA and/or PMCM.
- License agreements for compensation grouting, if needed, will be obtained by SFMTA and/or PMCM.
- Portions of the tunnels between the bulkheads will be left open (unfilled).
- Public outreach will be performed by SFMTA and/or PMCM
- Contaminated soils are not present at the site of the Pagoda Theater.
- SW- drawings, if required, will be prepared by SFDPW
- Revisions to existing Contract 1252 drawings (e.g., revisions to utilities drawings) is not included in this proposal

Additional Services. PB Telamon is prepared to provide the following additional services for additional compensation, if needed.

- Participate in meetings and/or provide additional information in support of obtaining license agreements with property owners to perform compensation grouting
- Provide design support during construction of the temporary retrieval shaft.
- Perform utility coordination and prepare utility relocation drawings (e.g., relocation of fire hydrant, slip lining of sewer line along Powell Street, between Columbus and Union Streets)

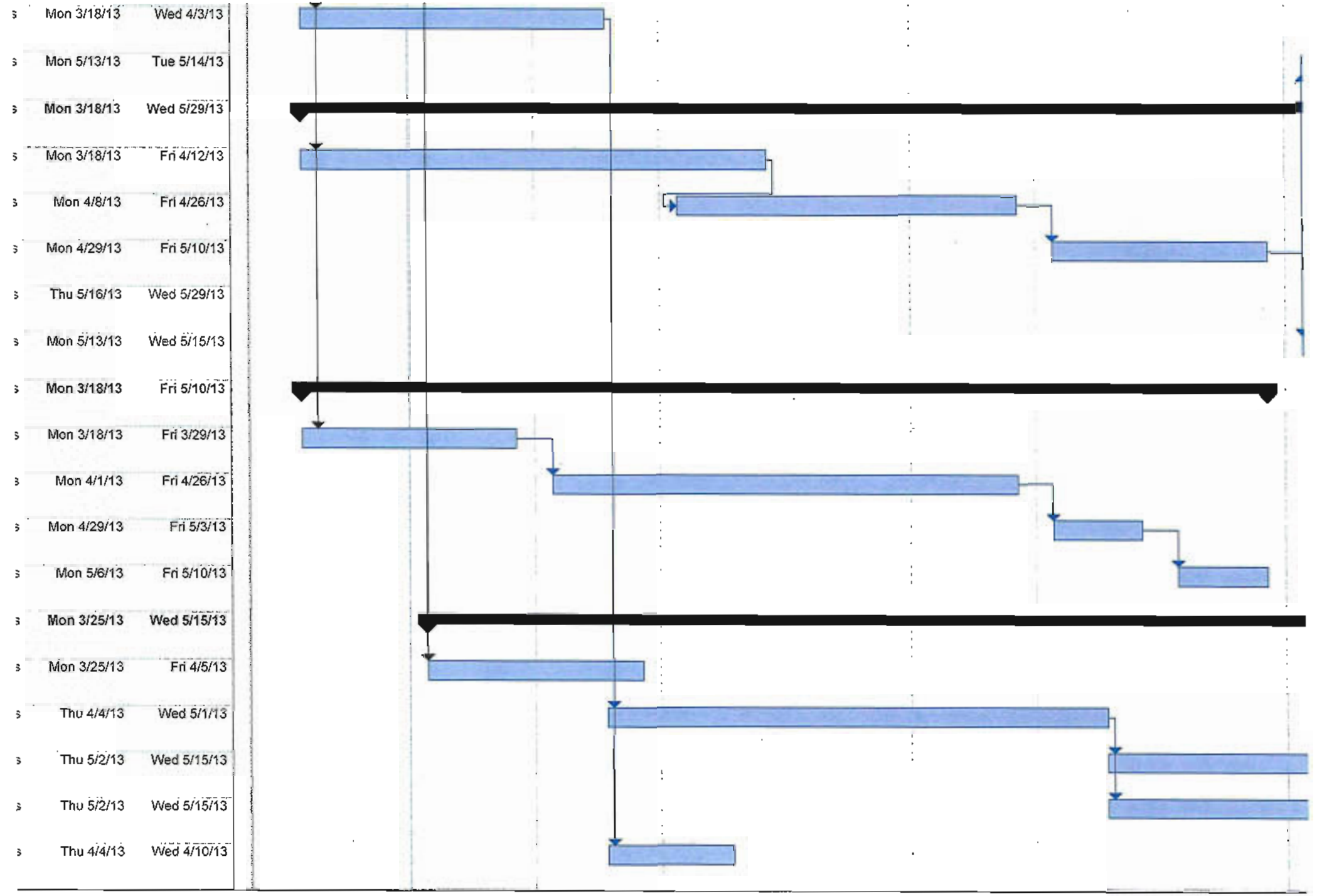
CENTRAL SUBWAY - TEMPORARY TBM RETRIEVAL SHAFT AT 1731-1741 POWELL STREET					
SHT.	CTRL NO.	DWG NO.	REV.	DRAWING TITLE	RESPONSIBLE INDIVIDUAL (PE)
GENERAL DRAWINGS					
1		GE-001	0	TITLE SHEET	D. Abrahams
2		GE-011	0	INDEX OF DRAWINGS	D. Abrahams
3		GE-101	0	GENERAL NOTES	D. Abrahams
TEMPORARY TRAFFIC ROUTING					
4		TR-101	0	POWELL ST (B/W FILBERT ST AND UNION ST)	SFMTA
OVERHEAD CONTACT SYSTEM POLE RELOCATION					
5		OV-101	0	POLE REMOVAL	SFMTA
6		OV-102	0	POLE RESTORATION	SFMTA
CIVIL					
7		CV-101	0	SITE PLAN	C. Sunthudkarn
EXCAVATION AND GROUND SUPPORT					
8		ES-011		SHORING DESIGN CRITERIA - 1 OF 3	S. Kim
9		ES-012		SHORING DESIGN CRITERIA - 2 OF 3	S. Kim
10		ES-013		SHORING DESIGN CRITERIA - 3 OF 3	S. Kim
STRUCTURAL					
11		ST-001	0	GENERAL NOTES	D. Abrahams
12		ST-101	0	RETRIEVAL SHAFT LAYOUT	D. Abrahams
13		ST-102	0	BASE SLAB PLAN	D. Abrahams
14		ST-103	0	SECTIONS - SHEET 1 OF 2	D. Abrahams
15		ST-104	0	SECTIONS - SHEET 2 OF 2	D. Abrahams
16		ST-105	0	ASSUMED CONSTRUCTION SEQUENCE	D. Abrahams
17		ST-201	0	PILE REINFORCEMENT SCHEDULE AND DETAILS	D. Abrahams
18		ST-202	0	FRAMING SCHEDULE AND DETAILS	D. Abrahams
19		ST-203	0	BASE SLAB DETAILS	D. Abrahams
20		ST-204	0	ROOF SLAB DETAILS	D. Abrahams
BUILDING PROTECTION					
21		BP-001	0	GENERAL NOTES	S. Kim
22		BP-101	0	OVERALL INSTRUMENTATION PLAN	S. Kim
23		BP-102	0	BUILDING SETTLEMENT MONITORING - PLAN	S. Kim
24		BP-103	0	BUILDING SETTLEMENT MONITORING - SECTIONS	S. Kim
25		BP-201	0	BUILDING SETTLEMENT MITIGATION - PLAN	S. Kim
26		BP-202	0	BUILDING SETTLEMENT MITIGATION - SECTIONS	S. Kim
27		BP-301	0	INSTRUMENTATION SCHEDULE	S. Kim
28		BP-302	0	INSTRUMENTATION TYPICAL DETAILS	S. Kim
GEOTECHNICAL					
29		GT-101	0	EXPLORATION LOCATIONS CTL 76+00 TO 84+00	S. Kim
30		GT-121	0	SUBSURFACE INVESTIGATION CROSS SECTION CTL 76+00 TO 84+00	S. Kim
31		GT-131	0	DEWATERING PLAN	S. Kim
CONTRACT 1252 DRAWINGS					
EXCAVATION AND GROUND SUPPORT					
	CL-18138	ES-101	1	SOUTHBOUND TUNNEL PLAN AND PROFILE - SHEET 1 OF 13	C. Sunthudkarn
	CL-18151	ES-121	1	NORTHBOUND TUNNEL PLAN AND PROFILE - SHEET 1 OF 13	C. Sunthudkarn
STRUCTURAL					
		ST-801	0	BULKHEAD DETAILS	D. Abrahams

	Direct Hourly Rate	Total Hours	Total Direct Labor	Applicable OH rate (based on total hours & tasks)	Total Indirect Labor (OH)	Total (DL + OH)	Applicable Fee	Total Fee	Total Burdened Labor (Esc Direct, OH, Fee)	Non-Travel Expenses	E
ND CONSTRUCTION		2220	$117,231		$186,279	$303,510		$33,386	$336,896	$0	
	$48.04	500	$24,020	158.9%	$38,168	$62,188	11%	$6,841	$69,028	$0	
	$85.74	160	$13,718	158.9%	$21,798	$35,516	11%	$3,907	$39,423	$0	
	$40.19	60	$2,411	158.9%	$3,831	$6,242	11%	$687	$6,929	$0	
	$92.75	120	$11,130	158.9%	$17,686	$28,816	11%	$3,170	$31,986	$0	
	$41.08	400	$16,433	158.9%	$26,112	$42,546	11%	$4,680	$47,226	$0	
	$81.41	40	$3,256	158.9%	$5,174	$8,431	11%	$927	$9,358	$0	
	$49.00	160	$7,840	158.9%	$12,458	$20,298	11%	$2,233	$22,531	$0	
	$106.83	40	$4,273	158.9%	$6,790	$11,063	11%	$1,217	$12,280	$0	
	$46.73	500	$23,364	158.9%	$37,125	$60,489	11%	$6,654	$67,143	$0	
	$46.62	120	$5,595	158.9%	$8,890	$14,485	11%	$1,593	$16,078	$0	
	$43.25	120	$5,190	158.9%	$8,247	$13,436	11%	$1,478	$14,914	$0	

		FO/PO	N/A	HO	149.2%	Fixed Fee - DP	11.0%				
	Direct Hourly Rate	Total Hours	Total Direct Labor	Applicable OH rate (based on total hours & tasks)	Total Indirect Labor (OH)	Total (DL + OH)	Applicable Fee	Total Fee	Total Burdened Labor (Esc Direct, OH, Fee)	Non-Travel Expenses	E
ND CONSTRUCTION		180	$6,536		$9,751	$16,287		$1,792	$18,079	$0	
	$50.48	35	$1,767	149.2%	$2,636	$4,403	11%	$484	$4,887	$0	
	$32.89	145	$4,769	149.2%	$7,115	$11,884	11%	$1,307	$13,192	$0	

TOTAL:	2400	$ 123,766	-	$ 196,031	$ 319,797	-	$ 35,178	$ 354,975	$ -	$

subject to availability; personnel of equivalent skills and experience will be used when named personnel are not available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