M.3. Engineering Report

An engineering report must be submitted **if EDA selects the project for further consideration** and must include (at a minimum) the following information:

Project Description:

Background

Dr. J. Patrick Kennedy, CEO and founder of San Leandro's OSIsoft, approached the City in 2011 with a proposal to install a high-speed fiber optic network that will support modern businesses and enable the city to attract next generation enterprises and jobs. The project is being undertaken by San Leandro Dark Fiber and is named **Lit San Leandro**. Businesses wishing to take advantage of the system will be able to lease a strand or more of fiber from San Leandro Dark Fiber enabling access bandwidth levels not offered by the traditional carriers.

The 11-mile loop runs through Downtown San Leandro and a substantial portion of the City's industrial and commercial areas. The first segments of the fiber loop were installed in early 2012 and the system went live in March. Two businesses are currently connected to the system and are enjoying 10 gigabit per second bandwidth. The rest of the 11-mile loop will be completed in 2012.

Please see Section A of the application for additional background on the project.

Proposed Construction

The proposed expansion project is the construction of an additional 39,980 linear feet of two inch conduit, creating five additional loops and strategically bringing service to an additional 1,000 existing businesses. The City explored the feasibility of both open trenching and boring (directional drilling) as a means of installing the conduit, ultimately opting for boring because it provides cost efficiency and minimal disruption. Pull boxes will be installed at distances of no greater than 600 feet apart although they will be installed more frequently in areas where businesses are closely clustered. In addition to providing a mechanism to install the fiber, pull boxes provide an access point for buildings wishing to connect to the system.

All new conduit will be located within existing public rights-of-way and will be owned by the City. Staff estimates that approximately three feet of width is needed to provide working space for the conduit installation. This equates to 11,940 square feet of impacted land area. Given that all installation will be done by boring, the impact is projected to be minimal. All project areas are already paved and functioning as roadways.

If the grant request is successful, design will start in Fall 2012, and bidding would take place in the first months of 2013 and take about three months. Most segments can be completed within the first few months of construction. Segments requiring encroachment permits from railroads or Caltrans will require a delay of several months before initiation. All work is expected to be completed within two years.

1. A statement of project components. Indicate if the proposed project involves the construction of a new facility or facilities or the enlargement, expansion, renovation, or replacement of an existing facility or facilities. Describe the existing facility and proposed project components in terms of dimensions, capacities, quantities, etc.

   The project involves the installation of 39,980 linear feet of new 2 inch conduit and installation of 66 3' by 5' traffic rated, locking pull boxes. Pull boxes will be installed

every 600 feet, at intersections and before and after railroad crossings. All conduit will be installed within existing roadways and will be installed by boring. The project includes resurfacing of bore pits. The City also has approximately 11 miles of existing conduit in other areas that is being used for fiber optic communications. The new conduits contained in the project description will be connected to the existing system at several locations.

The project will result in a 68% increase in the linear footage of the fiber system, extending fiber optic broadband service to approximately 1,000 existing businesses and at least 100 vacant sites.

2. Clear copies of sketches or schematics showing the general layout and location of the project components.

   Specific locations are shown in the Lit San Leandro Expansion Proposal diagram included with this application.

3. A feasibility analysis. Include a review of existing conditions. Discuss any potential problems that might delay construction and affect project components.

   All of the project area is located within existing roadways. One of the subject streets, Doolittle Drive, is California State Highway 61 and an encroachment permit from Caltrans will be required as noted below. Further, permits related to three railroad crossings will be required (see map of expansion segments for crossings). Permitting from outside agencies could result in delays or several months in the worst case.

4. A proposed method of construction. Indicate whether the project will be constructed by competitive bid, single contract, or multiple contracts. Indicate if any portion of the construction work is proposed to be done by design/build, construction management at risk, or by the applicant's own forces.

   The project will be constructed by competitive bid with a single contract. The City’s engineering staff will complete the design in-house before bid.

5. 5. An estimate of useful life of the facility and an explanation of basis on which it is determined.

   The City presently has underground conduit that is over 40 years old and still providing useful service, so the useful life will be several decades, at a minimum. Since the purpose of the project is to provide conduit for fiber optics, it is also important to note the fiber optic technology has a long expected useful lifespan as well. Although bandwidth needs continue to expand, the capacity of fiber is more dependent on the communications switches used rather than the fiber itself. More sophisticated equipment allows data to be transferred across a greater number of frequencies along a given strand of fiber. Future technology cannot be predicted with precision, but there is no faster or more cost-effective technology than fiber on the horizon at this time.

6. A current detailed construction cost estimate for each of project component, showing quantities, unit prices, and total costs.

   Attached

7. A list of all permits required for the proposed project and the status of each permit.

Encroachment permits will be required for:

a. Conduit installation on Doolittle Drive (Caltrans)
b. Railroad crossing on Catalina (RR)
c. Railroad crossing on Farallon (RR)
d. Railroad crossing on Alvarado (RR)

8. 8. An estimate of the number of months for each of the following: (i) design period, (ii) solicitation of bids and awarding of contracts, and (iii) construction period.

Design: 6 months
Bid and award: 3 months
Construction: 4 months (could be longer for segments needing outside permits

BUDGET INFORMATION
Construction Programs
"Additional Detail"

Date: 6/6/2012
Edit by: Jeff Kay
Proj: Lit San Leandro

COST CLASSIFICATIONS (from budget ED-900A)		BREAKDOWN	TOTAL
1. Administrative and Legal Expenses			$ -
A. Travel		$ -	
B. Legal		$ -	
(1) Legal Fees	$ -		
(2) Bond Counsel	$ -		
(3) Printing & Advertising	$ -		
C. Preparation for Bond Sale		$ -	
D. Rental of Vehicles		$ -	
E. Other (Incl Grant Admin., Bonding Expense, Builders, Risk Insurance for Force Account)		$ -	
2. Land, Structures, Rights-of-Way, Appraisals, etc.			$ 1,629,000
A. Land		$ 1,619,000	
B. Structures		$ -	
C. Rights-of-Way		$ -	
D. Appraisals		$ 10,000	
3. Relocation Expenses and Payments*			$ -
A. Tenants, Owners, Business, Farms		$ -	
B. Costs Incidental to Land Acquisition		$ -	
4. Architectural and Engineering Fees [1]			$ 251,000
5. Other Architectural and Engineering Fees			$ -
6. Project Inspection Fees			$ 251,000
A. Audit Costs		$ -	
B. Resident Inspection [1]		$ 251,000	
7. Site Work (Only if Separate Contract)			$ -
8. Demolition and Removal (Only if Separate Contract)			$ -
9. Construction (Must match estimate in Engineers= Report)			$ 1,689,000
10. Equipment (Only if Separate Contract; Provide detailed list)			$ -
11. Miscellaneous (Only use with detailed description for each item)			$ -
12. Subtotal			$ 3,820,000
13. Contingencies (Provide justification, if more than 5% of Subtotal) [2]			$ 422,000
16. Total Project Costs			$ 4,242,000

*** P.L. 91-646 Relocation Assistance (See 49 CFR Part 24, Uniform Relocation Assistance and Real Property Acquisition Regulation for Federal and Federally Assisted Programs for explanation.)**

Rev. 03/17/2009

[1] Design costs estimated at 15% of hard construction cost for all segments except Segment D, which is 10% due to reduced

[2] Contingency estimated at 25% of hard construction cost, or approximately 10% of the subtotal. There are no hard rules, but in general new construction carries less risk of unforeseen conditions than modification to existing work, virgin sites less risk than redevelopment sites, negotiated bids less risk than competitive bids, above ground work less risk than below ground work, and simple or common structures less risk than unique or complicated structures.

San Leandro's experience is that for a project such as the fiber loop conduit installation project that is underground work, in an existing roadway containing utilities that are 60 years old or more, and competitively bid a contingency at bid time should be 25% of the construction cost estimate. It could be that utilities are in our way or that the dirt we need to remove is contaminated.

Segment	Cost	Length	
A	$372,015.50	5,567	
B	$265,825.00	4,050	
C	$101,122.00	1,408	
D	$77,575.00	2,945	
E	$397,187.50	5,975	
F	$382,462.50	5,425	
G	$502,200.00	7,200	
H	$172,980.00	2,520	
I	$342,085.00	4,890	
total (rounded)	$2,613,000.00	39,980	
		7.57	miles

Match

Right-of-Way	$1,619,000.00
R/W Appraisals	$10,000.00
Total Project Cost	$4,242,000.00
Grant = Local Match	$2,121,000.00
Cash Required	$502,000.00

Soft Cost Calculations

Contingencies (25% of hard construction)	$422,000.00	10%
Design (10%/15%)[1]	$251,000.00	
Construction Engineering and Inspection (10%/15%)[1]	$251,000.00	
Hard Construction	$1,689,000.00	

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment A

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$13,000.00	$13,000.00
2	Traffic Control	1	LS	$20,000.00	$20,000.00
3	Bore 2" Conduit, including resurface bore pits	5,567	LF	$30.00	$167,010.00
4	install pull box 3' x 5' traffic rated, locking	10	EA	$4,000.00	$40,000.00

Work includes the following streets
Adams Avenue from Doolittle Drive to McCormick Street
McCormick Street from Adams Avenue to Edison Avenue
Edison Avenue from McCormick Street to Whitney Street
Whitney Street from Edison Avenue to Adams Avenue
Adams Avenue from Whitney Street to Doolittle Drive

SUBTOTAL CONSTRUCTION			$240,010.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	60,002.50
Design.....…….....		15%	36,001.50
Construction Engineering, Inspection & Admin.		15%	36,001.50

TOTAL ESTIMATED PROJECT COST **$372,015.50**

BUDGET INFORMATION
Designated Funds Available:

Account Number (s)	Amount

TOTAL FUNDING **$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment B

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$10,000.00	$10,000.00
2	Traffic Control	1	LS	$20,000.00	$20,000.00
3	Bore 2" Conduit, including resurface bore pits	4,050	LF	$30.00	$121,500.00
4	install pull box 3' x 5' traffic rated, locking	5	EA	$4,000.00	$20,000.00

Work includes the following streets
Doolittle Drive from Davis Street to the Northern City Limit

SUBTOTAL CONSTRUCTION			$171,500.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	42,875.00
Design.....…….....		15%	25,725.00
Construction Engineering, Inspection & Admin.		15%	25,725.00
TOTAL ESTIMATED PROJECT COST			**$265,825.00**

BUDGET INFORMATION	Account Number (s)	Amount
Designated Funds Available:		
TOTAL FUNDING		**$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment C

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$5,000.00	$5,000.00
2	Traffic Control	1	LS	$10,000.00	$10,000.00
3	Bore 2" Conduit, including resurface bore pits	1,408	LF	$30.00	$42,240.00
4	install pull box 3' x 5' traffic rated, locking	2	EA	$4,000.00	$8,000.00

Work includes the following streets
Doolittle Drive from Williams Street to Marina Blvd

SUBTOTAL CONSTRUCTION			$65,240.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	16,310.00
Design.....…….....		15%	9,786.00
Construction Engineering, Inspection & Admin.		15%	9,786.00
TOTAL ESTIMATED PROJECT COST			**$101,122.00**

BUDGET INFORMATION
Designated Funds Available:

Account Number (s)	Amount
TOTAL FUNDING	**$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment D

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$2,500.00	$2,500.00
2	Traffic Control	1	LS	$5,000.00	$5,000.00
3	Install conduit in existing pipe, grout pipe	2,200	LF	$15.00	$33,000.00
4	install pull box 3' x 5' traffic rated, locking	2	EA	$4,000.00	$8,000.00
5	Modify manhole, extend conduit, misc	1	LS	$5,000.00	$5,000.00

Work includes the following streets
Marina Blvd from Dootlittle Drive to Nome Street
Marina Blvd from Nome Street to Neptune Drive

Note that there is existing conduit available on Marina Blvd from Doolittle to Nome
and that there is an unused pipe that may be used to house a condit from Nome to Neptune Drive

SUBTOTAL CONSTRUCTION			$53,500.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	13,375.00
Design.....…….....		10%	5,350.00
Construction Engineering, Inspection & Admin.		10%	5,350.00

TOTAL ESTIMATED PROJECT COST **$77,575.00**

BUDGET INFORMATION
Designated Funds Available:

Account Number (s)	Amount

TOTAL FUNDING **$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment E

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$15,000.00	$15,000.00
2	Traffic Control	1	LS	$30,000.00	$30,000.00
3	Bore 2" Conduit, including resurface bore pits	5,975	LF	$30.00	$179,250.00
4	install pull box 3' x 5' traffic rated, locking	8	EA	$4,000.00	$32,000.00

Work includes the following streets
Monarch Bay Drive from Marina Blvd to Fairway Drive
Fairway Drive from Monarch Bay Drive to Catalina Street

SUBTOTAL CONSTRUCTION			$256,250.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	64,062.50
Design.....…….....		15%	38,437.50
Construction Engineering, Inspection & Admin.		15%	38,437.50

TOTAL ESTIMATED PROJECT COST **$397,187.50**

BUDGET INFORMATION
Designated Funds Available:

Account Number (s)	Amount

TOTAL FUNDING **$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment F

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$13,000.00	$13,000.00
2	Traffic Control	1	LS	$20,000.00	$20,000.00
3	Bore 2" Conduit, including resurface bore pits	5,425	LF	$30.00	$162,750.00
4	install pull box 3' x 5' traffic rated, locking	9	EA	$4,000.00	$36,000.00
5	Added insurance and flagmen at RR	1	LS	$15,000.00	$15,000.00

Work includes the following streets
Catalina Street from Fairway Drive to Farallon Drive
Farallon Drive from Catalina Street to Wicks Blvd

SUBTOTAL CONSTRUCTION			$246,750.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	61,687.50
Design.....…….....		15%	37,012.50
Construction Engineering, Inspection & Admin.		15%	37,012.50
TOTAL ESTIMATED PROJECT COST			**$382,462.50**

BUDGET INFORMATION	Account Number (s)	Amount
Designated Funds Available:		
TOTAL FUNDING		**$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment G

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$15,000.00	$15,000.00
2	Traffic Control	1	LS	$33,000.00	$33,000.00
3	Bore 2" Conduit, including resurface bore pits	7,200	LF	$30.00	$216,000.00
4	install pull box 3' x 5' traffic rated, locking	15	EA	$4,000.00	$60,000.00

Work includes the following streets
Alvarado Street from Marina Blvd to Fremont Ave
Fremont Ave from Alvarado to Chevron Street
Chevron Street from Fremont Ave to public works admin building

SUBTOTAL CONSTRUCTION			$324,000.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	81,000.00
Design.....…….....		15%	48,600.00
Construction Engineering, Inspection & Admin.		15%	48,600.00
TOTAL ESTIMATED PROJECT COST			**$502,200.00**

BUDGET INFORMATION	Account Number (s)	Amount
Designated Funds Available:		
TOTAL FUNDING		**$0.00**

By: Nick Thom
Date Prepared: 22-May-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment H

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$5,000.00	$5,000.00
2	Traffic Control	1	LS	$11,000.00	$11,000.00
3	Bore 2" Conduit, including resurface bore pits	2,520	LF	$30.00	$75,600.00
4	install pull box 3' x 5' traffic rated, locking	5	EA	$4,000.00	$20,000.00

Work includes the following streets
Griffith Street from Farallon Dr to Burroughs Ave
Burroughs Ave from Griffith St to Wicks Blvd

SUBTOTAL CONSTRUCTION			$111,600.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	27,900.00
Design.....…….....		15%	16,740.00
Construction Engineering, Inspection & Admin.		15%	16,740.00
TOTAL ESTIMATED PROJECT COST			**$172,980.00**

BUDGET INFORMATION
Designated Funds Available:

Account Number (s)	Amount
TOTAL FUNDING	**$0.00**

By: Nick Thom
Date Prepared: 1-Jun-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer

ENGINEER'S COST OPINION
FOR
Fiber Expansion 2012
Segment I

ITEM	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	AMOUNT
1	Mobilization	1	EA	$10,000.00	$10,000.00
2	Traffic Control	1	LS	$20,000.00	$20,000.00
3	Bore 2" Conduit, including resurface bore pits	4,890	LF	$30.00	$146,700.00
4	install pull box 3' x 5' traffic rated, locking	11	EA	$4,000.00	$44,000.00

Work includes the following streets
Montague Ave from Alvarado St to Teagarden St
Teagarden St from Montugue Ave to Alvarado St

SUBTOTAL CONSTRUCTION			$220,700.00
Permit Fees, Utility Costs other Misc Fees.....			$0.00
Contingencies.....…	Percentage:	25%	55,175.00
Design.....…….....		15%	33,105.00
Construction Engineering, Inspection & Admin.		15%	33,105.00
TOTAL ESTIMATED PROJECT COST			**$342,085.00**

BUDGET INFORMATION	Account Number (s)	Amount
Designated Funds Available:		
TOTAL FUNDING		**$0.00**

By: Nick Thom Date Prepared: 1-Jun-12
Cost Estimate Purpose: preliminary

Reviewed: _____ Date:_____
Nick Thom, P.E., Senior Engineer

Approved: _____ Date:_____
Kenneth Joseph, P.E., City Engineer