EXHIBIT 14
CUP16-02

SECTION 14 – FRONTAGE IMPROVEMENTS ALTERNATE DESIGN MEMO

MEMO

ROBERTSON ENGINEERING, PC
610 Esther Street, Suite 102, Vancouver, WA 98660
(360) 975-4995 | www.robertsonengineering.us

To: **Development Review Staff & Hearings Examiner**
City of Camas

From: Jeremy Fick, PE
Robertson Engineering, PC

Date: November 10, 2016

Re: **Lacamas Heights E.S. Replacement – Road Frontage Improvements Alternate Design**

Introduction

Camas School District and the Camas community are committed to providing a high-quality education to our children. In the coming years, much of the future growth in Camas will occur on the north shore of Lacamas Lake within the City's North Urban Growth Area (NUGA). With this next wave of growth in mind, Camas School District purchased a 40-acre site north of Lacamas Lake located at NE 232nd Ave and NE 9th Street. This rural site is in a generally undeveloped area and is home to six wetlands, two creeks, meadows and wooded acres containing mature white oak trees, in addition to extensive archaeological resource areas. These site attributes afford numerous opportunities for students to learn about the surrounding natural environment. However, it has been challenging to locate the footprint of the new elementary school and its associated improvements while minimizing encroachment into any of the existing eco-systems.

The Lacamas Heights Elementary School Replacement project includes proposed public road improvements as an alternate solution for more traditional frontage improvements. A Traffic Impact Study was performed for the development and no off-site improvements are required to facilitate the proposal as shown.

City of Camas Municipal Code Section 17.19.040(B)(10)(d) allows the City to permit a deviation from frontage improvement standards based upon the recommendation of the City Engineer. This memo compares the proposed solution to more traditional frontage improvements and identifies how the project meets the intent of the code, is a more desirable design, is approximately the same proportionate investment, and does not shift undue burden to the City.

Roadway Frontage Improvements Scope

Section 17.19.040(B) of the City's code describes the required half-street improvements for development projects and the City's Design Standards Manual requires half-street improvements on all frontages. The Camas Transportation Comprehensive Plan Map indicates that NE 232nd Avenue is an "Existing 2 or 3 Lane Arterial" and NE 9th Street is a "Proposed 2 or 3 Lane Arterial" (see attached graphic). City Staff have indicated that both NE 232nd Avenue and NE 9th Street are classified as 3-Lane Arterials, as defined by City of Camas Standard Detail ST5 (see attached).

For the subject site, the base assumption is that any development activity would require roadway improvements to the current classification from centerline of right-of-way (ROW) along both frontages.

For NE 232nd Avenue, the existing roadway is in good condition and generally complies with arterial geometry. Typical frontage improvements on this frontage would consist of widening approximately 12 feet of asphalt pavement plus curbs, street trees, street lights, and sidewalks. There is also a fish bearing stream that crosses 232nd Avenue via an existing culvert. Any widening at this location would trigger the culvert be upgraded to a 3-sided box culvert and associated streambed enhancements.

For NE 9th Street, the existing roadway is not in good condition does not meet geometrical roadway standards for urban arterials. The existing roadway would need to be completely removed and major earthwork performed to provide an appropriate arterial roadway profile. Typical frontage improvements along 9th Street would require a full half-street improvement including 23 feet of asphalt pavement, curbs, street trees, street lights, and sidewalks.

The proposed alternate design includes half-street improvements that curve through the subject site. The overall length of the proposed improvements is less than the total of the existing two frontages, but provides a wider section and dedicates additional ROW. For the length of the proposed improvements, additional ROW would be dedicated to accommodate the future widening. Additionally, ROW is proposed to be dedicated south of this roadway that may be used for future trailhead, stormwater facilities, or critical area protection/enhancement areas.

Camas Municipal Code Compliance & Proposal Benefits

Section 17.19.040(B)(6) requires street improvements be extended to the boundaries of the plat for the purpose of ensuring access to neighboring properties. In this proposal, all existing lots already have access to the existing road network. The only parcel needing to take access off of the proposed roadway is the school in the interim condition. The future alignment beyond our development to the east has yet to be determined by City long-range planning. Sections 17.19.040(B)(3)(a) and 17.19.040(B)(3)(d) justify not constructing improvements further east than proposed.

Section 17.19.040(B)(10) requires street layouts to be strategic for circulation and safety purposes. The Comprehensive Plan identifies the primary arterial route through the NUGA as NE 232nd Avenue turning onto NE 9th Street. The existing roadway south of the intersection of 232nd and 9th that becomes Leadbetter Road will eventually change to a local access road or trail. *This project has a unique opportunity to dedicate sufficient right-of-way to allow the ultimate alignment to contain a horizontal curve rather than a 90 degree intersection.* This will greatly enhance the traffic flow through this area in the ultimate condition. In addition to the traffic benefit, this proposed street layout impacts significantly less wetlands than widening along the existing roadway alignments (even in the future widened condition).

Proportionality Considerations

In order to compare the value of the proposal to that of more typical frontage improvements, a side-by-side comparison of costs has been prepared and is attached. The spreadsheet is designed to show the total value to the City and general public of each scenario by combining the construction costs and the value of the right-of-way dedication area (in lieu of land acquisition costs). Case 1 represents the typical frontage improvements described above for NE 232nd Avenue and NE 9th

Street. Case 2 represents the proposed alternate design. Because the proposed land dedication beyond the 74 foot standard ROW width has less value, it was removed in the Case 2A scenario to show a range in value for the proposal (second case). As the spreadsheet illustrates, the proposal is providing an approximate equivalent value to the City and general public as expected frontage improvements.

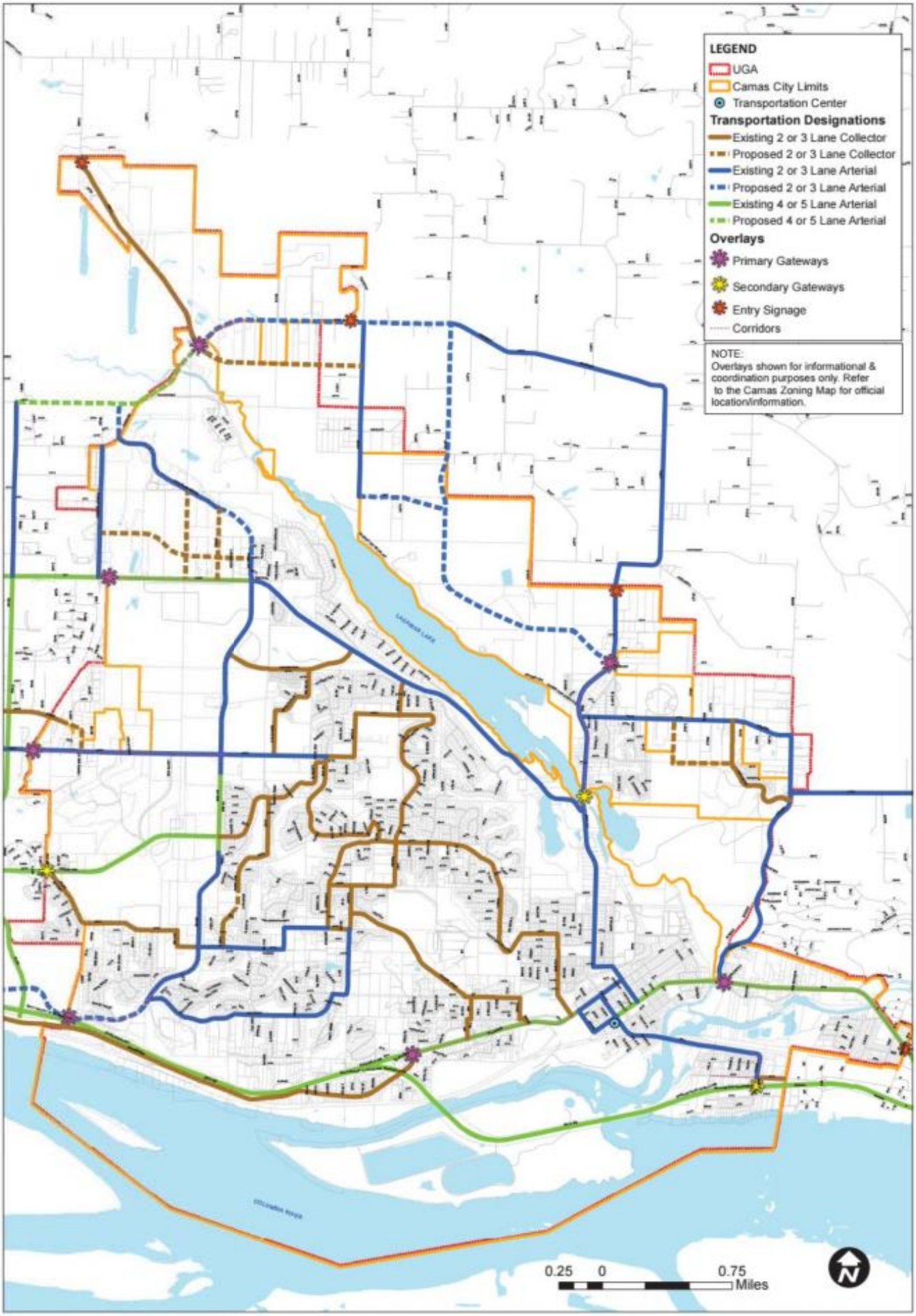
Any frontage improvement along this property will be a partial improvement, and relies on the fact that someone in the future will improve the other half of the roadway. In this case, the other party is likely the City of Camas for two main reasons. First, the City desires to alter the historical traffic patterns at this juncture by making NE 232nd Avenue south of NE 9th Street a local access road or trail only. This requires a transition in the transportation infrastructure at this location, including potential parking/trailhead improvements. Secondly, the parcels on the other side of the roadway are largely encumbered with wetlands, streams, and steep slopes, making them unattractive pieces of land for development. Therefore the City is assumed to have a role in any future expansion of this roadway, likely as a capital road project. Included with that role is the assumption that there will be environmental permits associated with that project.

The approval of this alternate roadway design shifts burdens both ways between the current developer (School District) and the future developer (assumed the City). Future City tasks would include the widening of the school's remaining frontages along 232nd Avenue and 9th Street, the demolition or modification of the existing NE 9th Street, and the upgrade of the existing stream crossing on NE 232nd Avenue. However, the proposal is also granting additional benefits to the City that would not normally be required, such as additional pavement width along the proposal (26' vs. an average of 17.5'), additional ROW dedication for the full ROW along the proposal (74' vs. average of 19'), and additional ROW dedication beyond the roadway for other purposes as previously stated. Although burdens are being shifted back and forth, the attached spreadsheet demonstrates how those shifts are roughly equivalent. The City will have a future capital project with environmental permitting in any case, and this proposal does not change those conditions. It simply shifts who is doing what and when it is being done, while not shifting the overall total financial burden of any party.

The shifts in scope also better align the appropriate responsible parties. The future arterial alignment east of the school site is not yet determined, making a future improvement by a future party (when more information is known) more appropriate. The fish bearing stream crossing north of our proposal is not a direct impact by the school project, and will likely require improvements beyond the ROW centerline, making a capital road project the more appropriate venue.

Conclusion

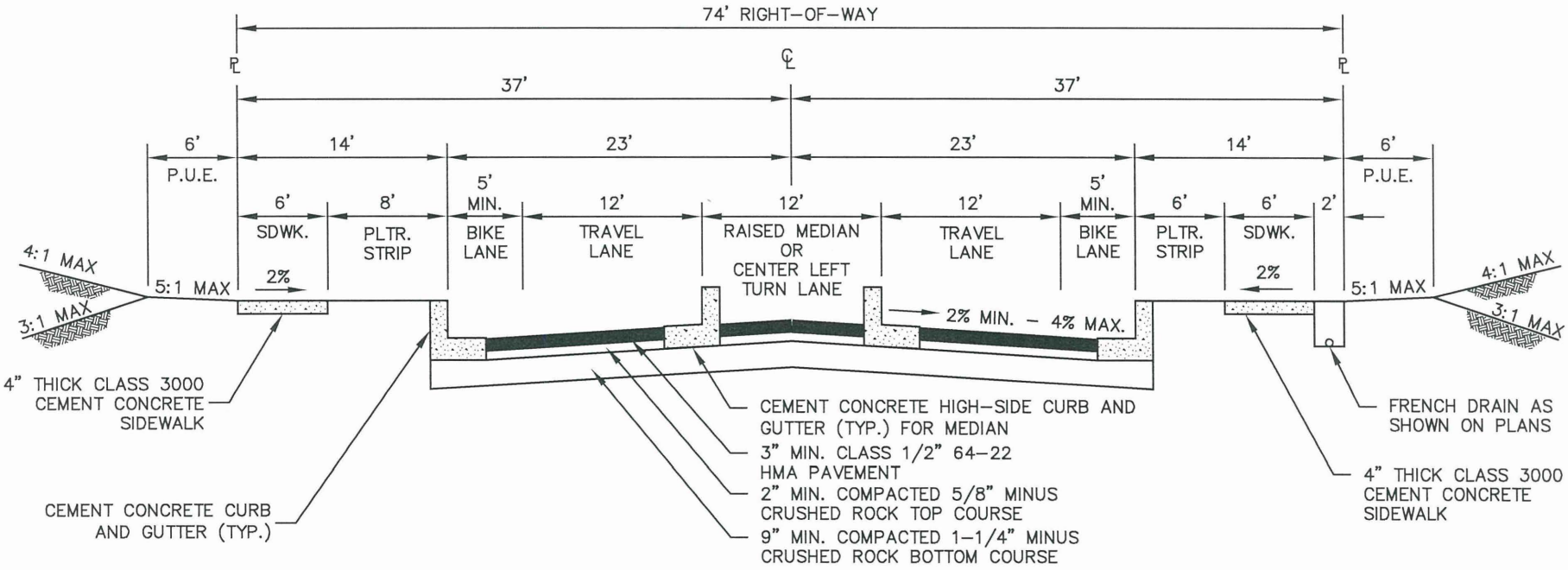
The proposed alternate public road improvements afford the School District the opportunity to meet its mission using cost effective public dollars while meeting the intent of the City Code and providing an overall more desirable transportation solution for the community.



CAMAS TRANSPORTATION COMPREHENSIVE PLAN MAP

CAMAS, WA I Ordinance 16-010 Adopted June 2016

2035 Camas
Your voice, Your vision, Your future



NOTES:

1. STREET SECTION DEPTHS SHOWN ARE ABSOLUTE MINIMUMS. ALL STREET SECTION DIMENSIONS TO BE CALCULATED BASED ON THE SITE SOIL CONDITIONS BY A LICENSED STATE OF WASHINGTON ENGINEER.
2. CROSS-SLOPE APPLIES TO CROWN OR SHED STREETS.
3. MIMIUM CURB RETURN RADIUS SHALL BE 35'.

REV. NO.	DATE	BY	APPR.
1	5/1/07	SCD	JC
2	9/18/07	SCD	JC
3	1/1/11	SCD	JC
4	10/21/14	SCD	JC

CITY OF CAMAS ~ STREET DETAIL

3 LANE COLLECTOR/ARTERIAL (74' R.O.W.)

John C. Cattelton 10-21-14

DETAIL APPROVED BY DATE

NOT TO SCALE

DETAIL NO. ST5

ST-SECTIONS.DWG

Lacamas Height Elementary School Off-Site Roadway
Comparison of Frontage Improvement Alternatives

ROBERTSON ENGINEERING, PC

Prepared by Robertson Engineering, PC
November 10, 2016

Road Frontage Comparison Descriptions
The following describes the approximate value to the City and general public for different road frontage improvement scenarios for the purpose of considering whether the proposed improvements are an equivalent or better alternative to the "typical" expected road frontages.

			CASE 1							CASE 2			CASE 2A		
			"Typical" Frontage Improvements for NE 232nd Avenue			"Typical" Frontage Improvements for NE 9th Street			Total "Typical"	"Proposed" Frontage Improvements			"Modified Proposed" Frontage Improvements		
Item No.	Description	Unit	Qty	Unit Price	Total	Qty	Unit Price	Total	Total	Qty	Unit Price	Total	Qty	Unit Price	Total
1	Mobilization (assume 7%)	L.S.	1	$ 41,300	$ 41,300	1	$ 35,400	$ 35,400	$ 76,700	1	$ 41,900	$ 41,900	1	$ 41,900	$ 41,900
2	Construction Entrance	Each	1	$ 1,500	$ 1,500	1	$ 1,500	$ 1,500	$ 3,000	1	$ 1,500	$ 1,500	1	$ 1,500	$ 1,500
3	Silt Fencing	L.F.	1,294	$ 2	$ 2,588	1,281	$ 2	$ 2,562	$ 5,150	2,400	$ 2	$ 4,800	2,400	$ 2	$ 4,800
4	Clear and Grub	S.Y.	3,836	$ 2	$ 7,673	4,430	$ 2	$ 8,861	$ 16,534	8,798	$ 2	$ 17,597	8,798	$ 2	$ 17,597
5	Tree Removal	Each	15	$ 250	$ 3,750	18	$ 250	$ 4,500	$ 8,250	60	$ 250	$ 15,000	60	$ 250	$ 15,000
6	Stripping & Haul (assume 6" depth)	C.Y.	639	$ 20	$ 12,788	738	$ 20	$ 14,768	$ 27,556	1,466	$ 20	$ 29,328	1,466	$ 20	$ 29,328
7	Sawcutting	L.F.	1,326	$ 5	$ 6,630	115	$ 5	$ 575	$ 7,205	50	$ 5	$ 250	50	$ 5	$ 250
8	Pavement Removal (including haul)	S.Y.	147	$ 15	$ 2,207	904	$ 15	$ 13,563	$ 15,770	963	$ 15	$ 14,447	963	$ 15	$ 14,447
9	Earthwork - Cut	C.Y.	1,660	$ 6	$ 9,961	2,903	$ 6	$ 17,418	$ 27,379	3,750	$ 6	$ 22,500	3,750	$ 6	$ 22,500
10	Earthwork - Fill	C.Y.	1,295	$ 8	$ 10,360	2,264	$ 8	$ 18,114	$ 28,474	2,925	$ 8	$ 23,400	2,925	$ 8	$ 23,400
11	Earthwork - Haul Off-site	C.Y.	365	$ 25	$ 9,131	639	$ 25	$ 15,966	$ 25,097	825	$ 25	$ 20,625	825	$ 25	$ 20,625
12	Concrete Curb & Gutter	L.F.	1,304	$ 20	$ 26,080	1,290	$ 20	$ 25,800	$ 51,880	1,100	$ 20	$ 22,000	1,100	$ 20	$ 22,000
13	Concrete Sidewalk	S.Y.	874	$ 45	$ 39,330	865	$ 45	$ 38,915	$ 78,245	694	$ 45	$ 31,225	694	$ 45	$ 31,225
14	Asphalt Pavement - (assume 4" depth)	Ton	386	$ 90	$ 34,771	676	$ 90	$ 60,798	$ 95,568	873	$ 90	$ 78,538	873	$ 90	$ 78,538
15	Crushed Rock (C.S.T.C. & C.S.B.C.)	C.Y.	558	$ 45	$ 25,117	976	$ 45	$ 43,918	$ 69,034	1,310	$ 45	$ 58,950	1,310	$ 45	$ 58,950
16	Signage and Striping	L.S.	1	$ 6,000	$ 6,000	1	$ 6,000	$ 6,000	$ 12,000	1	$ 12,000	$ 12,000	1	$ 12,000	$ 12,000
17	Catch Basins	Each	4	$ 1,200	$ 4,800	4	$ 1,200	$ 4,800	$ 9,600	6	$ 1,200	$ 7,200	6	$ 1,200	$ 7,200
18	Manholes	Each	4	$ 3,000	$ 12,000	4	$ 3,000	$ 12,000	$ 24,000	6	$ 3,000	$ 18,000	6	$ 3,000	$ 18,000
19	Storm Pipe	L.F.	1,600	$ 60	$ 96,000	1,600	$ 60	$ 96,000	$ 192,000	1,360	$ 60	$ 81,600	1,360	$ 60	$ 81,600
20	Stormwater Treatment Facility	S.F.	182	$ 12	$ 2,178	317	$ 12	$ 3,809	$ 5,987	410	$ 12	$ 4,920	410	$ 12	$ 4,920
21	Flow Control Manhole	Each	1	$ 15,000	$ 15,000		$ 15,000	$ -	$ 15,000	1	$ 15,000	$ 15,000	1	$ 15,000	$ 15,000
22	Underground Detention	L.S.	1	$ 12,396	$ 12,396	1	$ 21,675	$ 21,675	$ 34,071	1	$ 28,000	$ 28,000	1	$ 28,000	$ 28,000
23	Box Culvert	L.S.	1	$ 150,000	$ 150,000		$ 300	$ -	$ 150,000		$ 300	$ -		$ 300	$ -
24	Street Trees	Each	37	$ 300	$ 11,100	37	$ 300	$ 11,100	$ 22,200	15	$ 300	$ 4,500	15	$ 300	$ 4,500
25	Landscaping	L.S.	1	$ 2,500	$ 2,500	1	$ 2,500	$ 2,500	$ 5,000	1	$ 5,000	$ 5,000	1	$ 5,000	$ 5,000
26	Street Lights	Each	9	$ 5,000	$ 45,000	9	$ 5,000	$ 45,000	$ 90,000	8	$ 5,000	$ 40,000	8	$ 5,000	$ 40,000
27	Right-of-Way Dedicated	S.F.	22,215	$ 7	$ 155,505	27,097	$ 7	$ 189,679	$ 345,184	221,571	$ 7	$ 1,550,997	111,879	$ 7	$ 783,153
				Total	$ 745,664		Total	$ 695,221	**$ 1,440,884**		**Total**	**$ 2,149,277**		**Total**	**$ 1,381,433**

Notes:
1. Does not include city fees (TIF's), permit fees, sales tax or design fees.
2. Does not include off-site water or sanitary sewer improvements. These are assumed to be included in the on-site estimate.