CITY OF ISSAQUAH
NEWPORT WAY NW IMPROVEMENTS
VALUE ENGINEERING
JANUARY 14, 2019

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MENG Analysis

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I. EXECUTIVE SUMMARY

Introduction

This value engineering (VE) report is presented to the City of Issaquah and the design team to assist in decision making at the 60% design phase for the Newport Way NW – SR 900 to 54th St. improvement project.

The following criteria were described by stakeholders as important project requirements:

- Neighborhood vehicular access
- Traffic calming
- Corridor character
- Pedestrian safety
- Pedestrian access
- Environmental enhancement
- Construction cost
- Bike provisions
- Constructability

The multi-disciplined team was led by certified value management facilitators, and included: Cost and Construction, Environmental / Wetland, Geotechnical, Structural, Roadway, and Traffic Engineering specialists.

At the initial kick-off meeting, the City of Issaquah and design team presented their project requirements and basis of planning and design. Following a visit to the site, the VE study team worked together using the formal value methodology process. The essential and secondary functions were identified along with their associated costs. Design alternatives were generated, and the most viable alternatives were further developed.

Substantiate Current Design and Project Requirements

In the process of comparing alternative concepts against the current design, the VE team noted the following planning/design components and owner project requirements that merit strong continued support:

- Pedestrian safety improvements
- Multimodal amenities
- General traffic lane configuration
- Environmental enhancements

Value Engineering Proposals

Key proposals include:

- Alternative roadway pavement sections
- Vertical and horizontal roadway alignment adjustments to reduce retaining wall requirements
- Alternative retaining wall structures and facias
- Traffic and pedestrian illumination configuration
- Storm detention measures to reduce cost and impacts of detention structures
- Alternative planting strip configuration and planting types in order to reduce retaining and cut slope impacts
- Alternative pedestrian and bicycle lane configuration for more efficient roadway section
- Constructability measures that support reduced construction phasing and schedule impacts

Summary

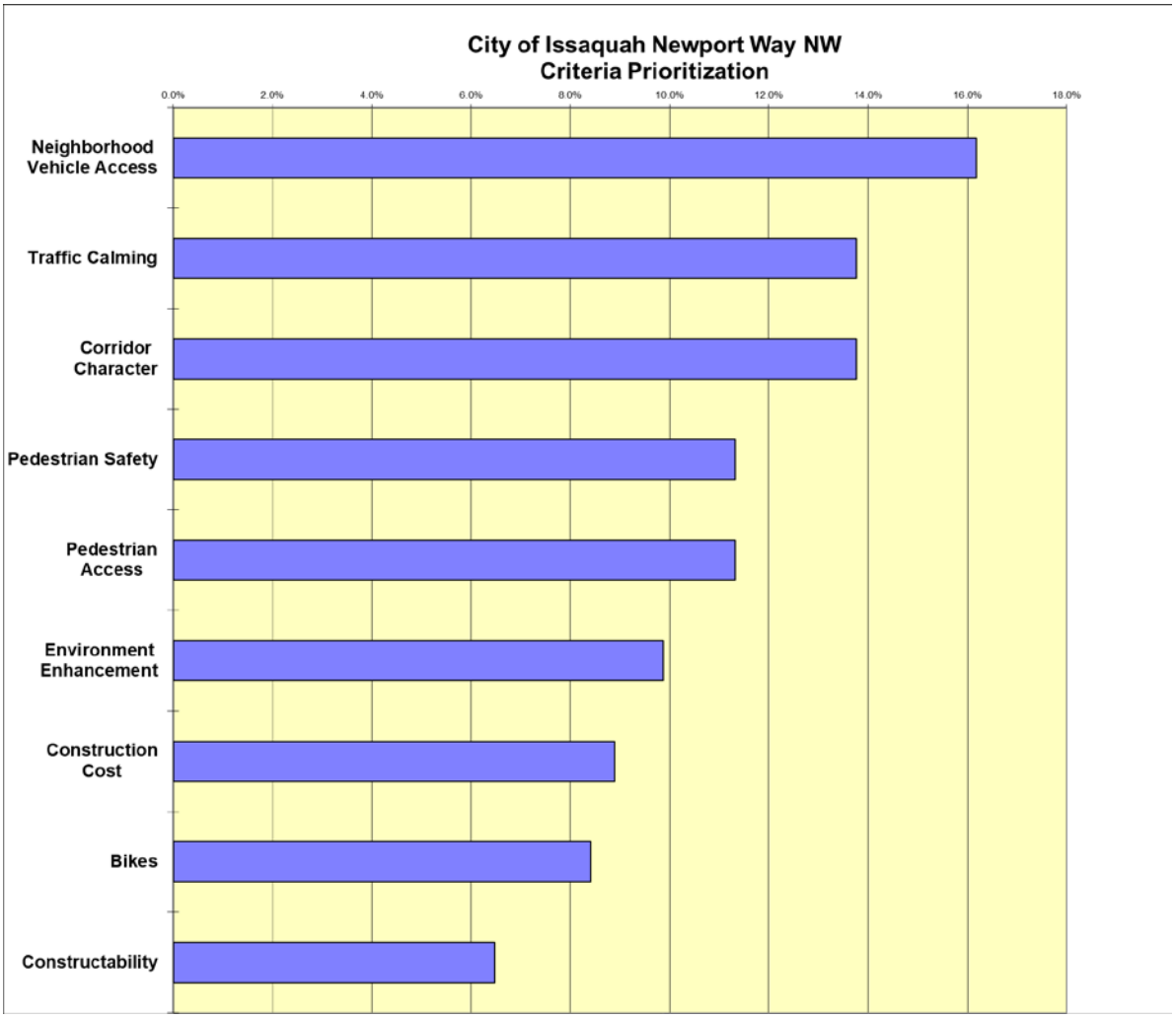
Overall, this project is well developed for the schematic design level. In general, the team though that the current estimate was higher than expected based on the project scope. This project warrants a more detailed bottoms-up estimate by an independent estimator. This will most likely support reductions in the large contingencies currently built into the unit cost estimate.

The highest cost and construction impact elements in this project are the retaining walls for both the cut slopes and fill slopes along the roadway. This study proposes several alternatives for those structures, with the goal of reducing costs while still offering the character enhancements desired for this corridor.

This project was originally designed with the assumption that the east half of this corridor would be developed akin to the current residential development on the west half. Since that time, much of the eastern half has been purchased by the city and designated for park use. Accordingly, many of the vehicular and pedestrian support functions may be different than assumed in the current design. This study offers several alternatives for pedestrian, vehicular, and bicycle lane configuration as well as landscaping and lighting that may allow a narrower overall roadway section, reducing the slope cuts and retaining structures.

Criteria Prioritization Graph

At the VE kickoff meeting, city stakeholders were led through a criteria prioritization exercise. This exercise allows the city to vote on which criteria are most and least important to them. The following criteria prioritization graph shows how the various project criteria were weighted by the stakeholders. The VE team uses this graph when evaluating and developing proposals that support prioritized project goals in addition to cost reduction ideas.



II. PROJECT DESCRIPTION

Project Information

Construction Cost:	**$33,607,115**
Right of Way Costs	**$ 2,100,000**

Total Length: **1.2 miles**
Cost per mile**: $30,000,000 per mile**

Location: Issaquah, Washington

Schedule: Construction estimated at three years (assumed at 500 work days)

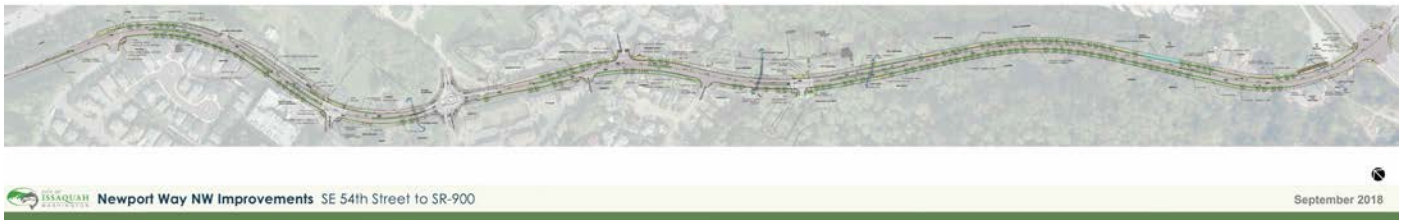
Delivery Method: Design-Bid-Build

Project Description (excerpted from design team information)

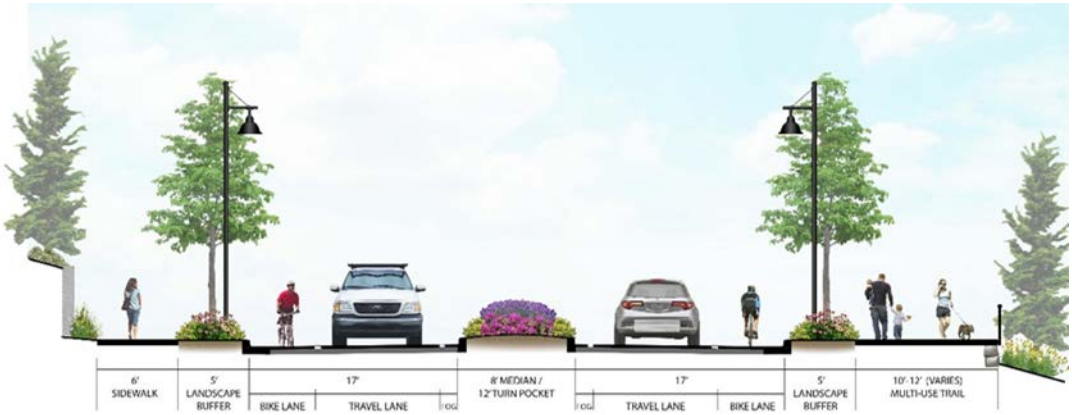
The Newport Way project is an improvement project to an existing stretch of Newport Way between SR 900 and SE 54th St. The project intent is to improve safety, and enhance and promote nonmotorized mobility, and support local and regional population and employment growth.

The project scope includes crossing treatments, intersection operations, corridor aesthetics, and stormwater facilities. The project extends for approximately one mile between SE 54th St and SR 900. Project improvements include bike facilities, sidewalks, a multi-use trail, curb and gutter improvements, pedestrian illumination, and pedestrian crossing treatments, including refuge islands and flashing beacons. The project will also require right-of-way acquisition and replacement or extension of up to six stream crossing structures.

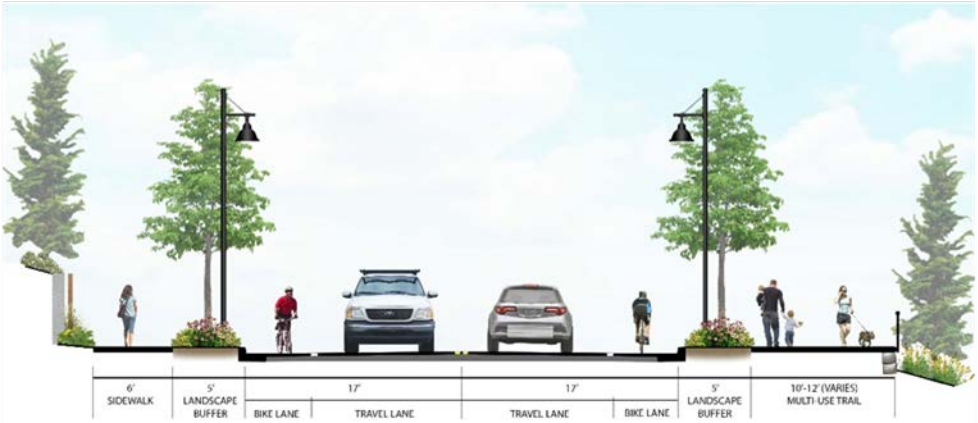
Site Plan



Cross Sections - Concept



SE 54th Street- King County Trailhead Section
Looking Northwest



King County Trailhead-SR 900 Section
Looking Northwest

Proposal Summary

Prop. #	COMPONENTS AND SYSTEMS	CURRENT $	VE PROP $	DIFFERENCE $
Value Proposals				
R1	Pavement Base	3,688,000	2,814,000	874,000
R2	Pavement Section	3,688,000	2,679,000	1,009,000
R3	Roadway Alignment	13,028,000	11,137,000	1,891,000
i1a	Illumination - Location	1,723,000	1,036,000	687,000
i1b	Illumination - Intersections	1,723,000	483,000	1,240,000
i1c	Illumination - Pedestrian - East Project	1,571,000	408,000	1,163,000
i2	Pedestrian Crossings	0	453,000	(453,000)
E1	Storm Treatment - Modular System	544,000	84,000	460,000
E2	Storm Detention - Precast	977,000	415,000	562,000
E3	Environmental Mitigation	239,000	467,000	(228,000)
P1	Planning - Planting Zones	4,046,000	1,111,000	2,935,000
P2	Sidewalks	23,655,000	15,813,000	7,842,000
P3	Road Profile - Cross Section	26,114,000	18,513,000	7,601,000
S1	Retaining Walls - Finish	2,399,000	947,000	1,452,000
S2	Retaining Walls - Structure	6,763,000	2,843,000	3,920,000
S3	Fill Walls - Structure	3,541,000	3,342,000	199,000
S4	Wall Structure - Welded Wire Face Wall	3,541,000	3,388,000	153,000
S5	Fill Wall Structure - Gravity Block	3,541,000	3,388,000	153,000
S6	Retaining Walls - Grade Slope	1,562,000	1,101,000	461,000
S7	Pedestrian Bridge - Corridor Character	651,000	494,000	157,000
S8	Retaining Walls - Planted Slope	7,418,000	4,031,000	3,387,000
S9	Pedestrian Bridge - Tibbetts Creek	651,000	269,000	382,000
C1	Construction - Temporary Access Road	7,820,000	6,645,000	1,175,000
C2	Construction - Phasing	9,961,000	7,081,000	2,880,000

Additonal Cost Reduction Proposals				
X1	Salvage timber (sell timber, and use for stream enhancement at fish passable culverts)	-	143,000	143,000
X2	Use common borrow soils in appropriate locations ILO gravel borrow	165,000	75,000	90,000
X3	Use pervious HMA for the multi-use trail ILO pervious concrete	588,000	176,000	412,000
X4	Maximize native soils, use drought resistant plants, simplify plant list, increase plant spacing, and reduce irrigation.	750,000	400,000	350,000
X5a	Retain a portion of the power and telecom as overhead services	500,000	350,000	150,000
X5b	Retain all of the power and telecom services overhead (none underground)	1,715,000	500,000	1,215,000
X6	Alternative railing materials (steel posts and stainless aircraft cable)	700,000	230,000	470,000
Technical Reports				
T1	Utility - Franchise Move			
T2	Utility - Location			
T3	Slope Stability			

Prioritized Proposal Summary

Each proposal was rated based one the prioritized criteria on a scale of 1-10 where 5 is neutral, 6-10 is improved over the current design, and 4-1 is less responsive than the current design. The following two tables show the weighted results of this rating process, as well as the individual scores for each proposal relative to the prioritized criteria.

Prop. #	COMPONENTS AND SYSTEMS	CURRENT $	VE PROP $	DIFFERENCE $	TOTAL CRITERIA & IMPLEMENT.
Value Proposals					
C1	Construction - Temporary Access Road	7,820,000	6,645,000	1,175,000	4,702
S8	Retaining Walls - Planted Slope	7,418,000	4,031,000	3,387,000	4,516
i1b	Illumination - Intersections	1,723,000	483,000	1,240,000	4,480
i2	Pedestrian Crossings	0	453,000	(453,000)	4,465
S5	Fill Wall Structure - Gravity Block	3,541,000	3,388,000	153,000	4,449
C2	Construction - Phasing	9,961,000	7,081,000	2,880,000	4,420
S3	Fill Walls - Structure	3,541,000	3,342,000	199,000	4,375
S2	Retaining Walls - Structure	6,763,000	2,843,000	3,920,000	4,300
S4	Wall Structure - Welded Wire Face Wall	3,541,000	3,388,000	153,000	4,296
S1	Retaining Walls - Finish	2,399,000	947,000	1,452,000	4,275
S7	Pedestrian Bridge - Corridor Character	651,000	494,000	157,000	4,211
i1c	Illumination - Pedestrian - East Project	1,571,000	408,000	1,163,000	4,169
P3	Road Profile - Cross Section	26,114,000	18,513,000	7,601,000	4,107
E2	Storm Detention - Precast	977,000	415,000	562,000	4,090
P2	Sidewalks	23,655,000	15,813,000	7,842,000	4,015
S9	Pedestrian Bridge - Tibbetts Creek	651,000	269,000	382,000	3,996
i1a	Illumination - Location	1,723,000	1,036,000	687,000	3,975
R1	Pavement Base	3,688,000	2,814,000	874,000	3,961
R2	Pavement Section	3,688,000	2,679,000	1,009,000	3,961
E1	Storm Treatment - Modular System	544,000	84,000	460,000	3,923
E3	Environmental Mitigation	239,000	467,000	(228,000)	3,923
R3	Roadway Alignment	13,028,000	11,137,000	1,891,000	3,861
	CURRENT DESIGN				3,840
S6	Retaining Walls - Grade Slope	1,562,000	1,101,000	461,000	3,824
P1	Planning - Planting Zones	4,046,000	1,111,000	2,935,000	3,725

Prop. #	COMPONENTS AND SYSTEMS	Neighborhood Vehicle Access	Traffic Calming	Corridor Character	Pedestrian Safety	Pedestrian Access	Environment Enhancement	Construction Cost	Bikes	Constructability
Value Proposals		100	85	85	70	70	61	55	52	40
C1	Construction - Temporary Access Road	5	5	8	8	5	7	6	5	8
S8	Retaining Walls - Planted Slope	5	6	7	5	5	6	9	5	6
i1b	Illumination - Intersections	5	7	7	3	5	7	7	4	4
i2	Pedestrian Crossings	5	9	5	10	7	5	4	5	5
S5	Fill Wall Structure - Gravity Block	5	5	7	5	5	5	6	7	7
C2	Construction - Phasing	5	5	5	5	5	5	7	5	8
S3	Fill Walls - Structure	5	5	5	5	5	5	6	5	7
S2	Retaining Walls - Structure	5	5	7	5	5	5	9	5	8
S4	Wall Structure - Welded Wire Face Wall	5	5	5	5	5	6	6	5	6
S1	Retaining Walls - Finish	5	6	7	5	5	5	7	5	8
S7	Pedestrian Bridge - Corridor Character	5	6	7	5	5	6	6	5	5
i1c	Illumination - Pedestrian - East Project	5	5	7	4	5	6	7	4	4
P3	Road Profile - Cross Section	5	5	5	5	5	5	10	6	6
E2	Storm Detention - Precast	5	5	5	5	5	5	7	5	6
P2	Sidewalks	5	5	5	4	4	5	10	5	6
S9	Pedestrian Bridge - Tibbetts Creek	5	5	5	5	5	6	6	5	6
i1a	Illumination - Location	5	5	4	4	5	5	7	5	7
R1	Pavement Base	5	5	5	5	5	6	7	5	5
R2	Pavement Section	5	5	5	5	5	6	7	5	5
E1	Storm Treatment - Modular System	5	4	4	5	5	3	6	5	8
E3	Environmental Mitigation	5	5	6	5	5	8	4	5	3
R3	Roadway Alignment	5	5	5	5	5	6	7	5	5
	CURRENT DESIGN	5	5	5	5	5	5	5	5	5
S6	Retaining Walls - Grade Slope	4	5	5	5	5	4	6	5	6
P1	Planning - Planting Zones	5	4	4	5	5	5	8	5	6

III. VALUE ENGINEERING PROPOSALS

The following section presents the detailed explanation of the preferred proposals from the VE team. Each proposal describes the current concept in the design, then compares it to the VE team concept. Individual rough order of magnitude cost estimates are included for each alternative that compare the current cost to the estimated VE concept cost.

	PROPOSAL	R1
COMPONENT: Pavement Base	**AUTHOR**	MLF

CURRENT CONCEPT:

The existing HMA and cement concrete panel pavements will be removed and disposed off-site.

VE CONCEPT:

Pulverize/rubblize the existing pavements and reuse as base material for the new pavement and other appropriate on-site locations.

FUNCTIONS		
Support traffic	Support sidewalk	Support wall

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 3,688,000	**$** 2,814,000	**$** 874,000

ADVANTAGES:

- Reuse existing material.
- Reduce truck hauling off-site.
- Reduce construction duration.
- Reduce cost.

DISADVANTAGES:

- Recycled materials not meeting Standard Specification requirements.
- Pulverize/rubblize pavements not suitable for base.

DISCUSSION:

The current concept will remove the existing HMA pavement and cement concrete panels and dispose the removed material at a contractor's identified disposal site. The current concept does not have a disposal site within the project limits.

The VE concept is to pulverize or rubblize the existing pavement material and reuse it on-site as base course for the new pavement section or gravel borrow.

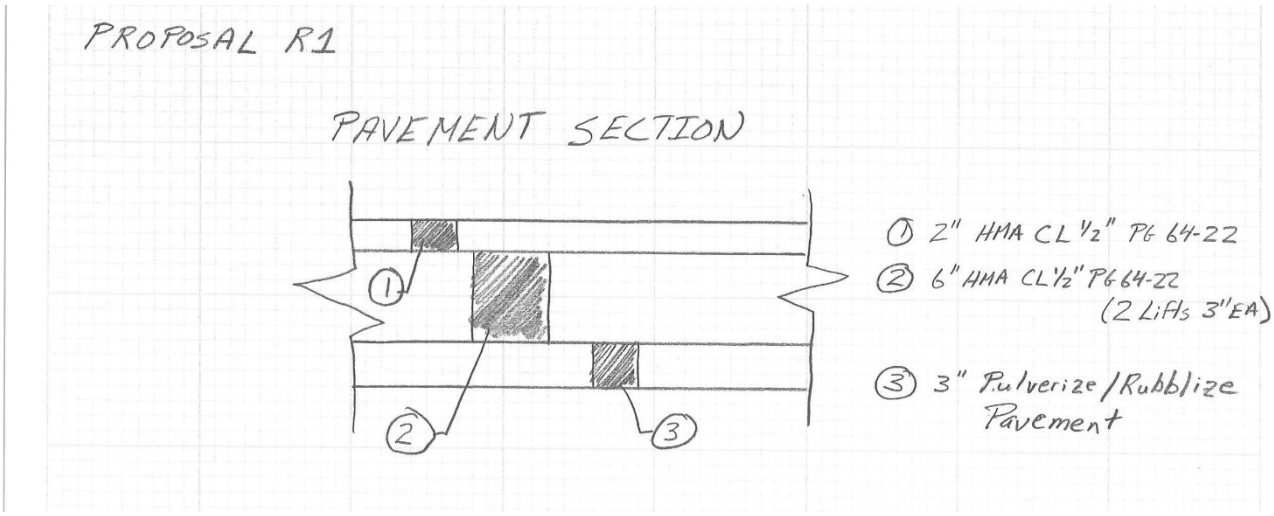
	PROPOSAL	R1
COMPONENT: Pavement Base	**AUTHOR**	MLF

The image below shows a typical HMA pulverizing operation.

The image below shows a typical cement concrete rubblizing operation.

	PROPOSAL	R1
COMPONENT: Pavement Base	**AUTHOR**	MLF

The proposed pavement section using rubblized material is shown below.



The recycled material has been used in the past on several transportation related projects. The Standard Specifications provides the material and gradation requirements for this recycled materials.

The recycled material provides a subtle alternative to crush surfacing base course and crush surfacing top course.

The benefits in using the existing pavement material within the project site are as follows:

- Environmental – minimizes the use of virgin material.
- Disruptions – minimizes the number of haul trucks leaving and entering the site.
- Construction duration – shortens the construction duration.
- Costs – reduction in materials costs.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Pavement Base

R1

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Roadway Excavation Incl. Haul	12,400	CY	32.20	399,280	Roadway Excavation Incl. Haul	7,578	CY	32.20	244,010
Gravel Borrow Incl. Haul	6,610	TON	28.75	190,040	Gravel Borrow Incl. Haul	4,958	TON	11.50	57,020
Crushed Surfacing Top Course	600	TON	43.70	26,220	Crushed Surfacing Top Course	450	TON	11.50	5,180
Crushed Surfacing Base Course	4,090	TON	34.50	141,110	Crushed Surfacing Base Course	3,068	TON	11.50	35,280
HMA Cl. 1/2" PG 64-22	6,560	TON	115.00	754,400	HMA Cl. 1/2" PG 64-22	5,248	TON	115.00	603,520
HMA Cl. 1/2" PG 64-22 for Overlay	3,710	TON	115.00	426,650	HMA Cl. 1/2" PG 64-22 for Overlay	2,968	TON	115.00	341,320
HMA Cl. 1" PG 64-22 for Prelevel	680	TON	103.50	70,380					-
				-					-
Schedule Duration	11	MO	152759.61	1,680,360	Schedule Duration	10	MO	152759.61	1,527,600
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				3,688,440	Subtotal				2,813,930
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				3,688,000	Total to nearest $1000				2,814,000
					Difference				874,000

MENG Analysis

Proposal

R1

	PROPOSAL	R2
COMPONENT: Pavement Section	**AUTHOR**	MLF

CURRENT CONCEPT:

The pavement section has 10” to 14” of HMA over 4” of Crushed Surface Base Course.

VE CONCEPT:

Reduce the pavement section to 8” of HMA over 3” of Crushed Surface Base Course.

FUNCTIONS		
Support traffic	Support bikes	Provide comfort

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 3,688,000	**$** 2,679,000	**$** 1,009,000

ADVANTAGES:

- Reduction in material needs.
- Reduce construction cost.
- Reduce construction duration.
- Provides adequate pavement surface.

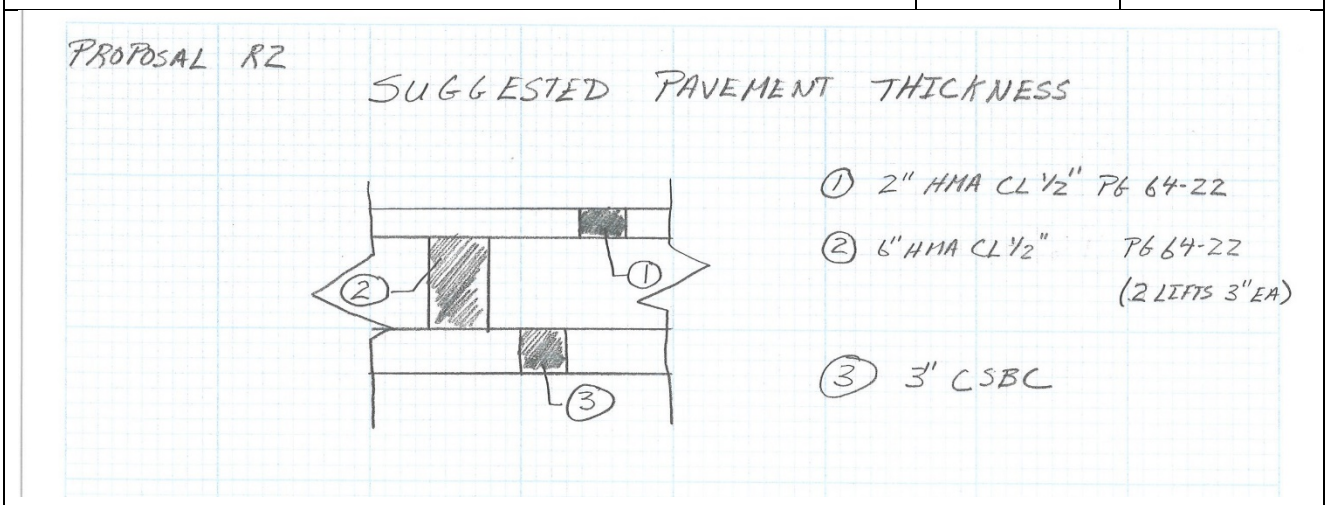
DISADVANTAGES:

- Shorter Life Cycle (minor).
- Durability (minor).
- More frequent maintenance (minor).

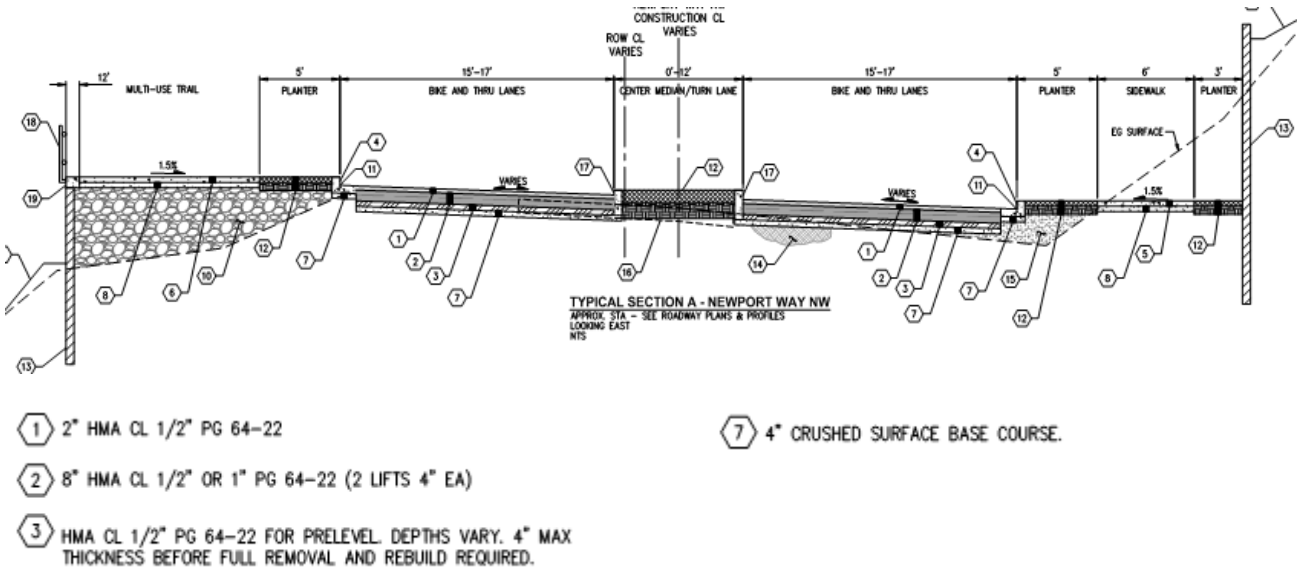
DISCUSSION:

Based on the project documentations provided to the VE team, it appears a pavement design report has not been performed. The VE study proposes to reduce the total pavement section from 18” to 11”. The proposed VE section is shown in the figure below.

	PROPOSAL	R2
COMPONENT: Pavement Section	**AUTHOR**	MLF



For comparison purposes, the following figure is the proposed section as shown in the 60% plans. The plans indicate that the HMA prelevel may be up to 4" thick.



Newport Way is not designated as a truck route. The predominate vehicle using this roadway is passenger vehicle. Due to these reasons, the VE team suggested pavement section should be adequate for this roadway. It is our understanding that King County Metro will provide a future bus service (between 2020 to 2022) along Newport Way with 30-minute headways. It is our expectation this proposed pavement section is adequate for these buses.

	PROPOSAL	R2
COMPONENT: Pavement Section	**AUTHOR**	MLF

A HMA pavement roadway normally requires maintenance approximately 10 to 15 years after installation. This typical maintenance varies from fog seal, chip seal, spot pavement repairs, crack sealing, or pavement grinding and overlaying with HMA. Typically, a thicker HMA pavement section extends the period when maintenance is required. We expect the proposed pavement section will require maintenance about 1 to 3 years earlier than the current pavement section.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Pavement Section

R2

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Roadway Excavation Incl. Haul	12,400	CY	32.20	399,280	Roadway Excavation Incl. Haul	7,578	CY	32.20	244,010
Gravel Borrow Incl. Haul	6,610	TON	28.75	190,040	Gravel Borrow Incl. Haul	4,958	TON	28.75	142,540
Crushed Surfacing Top Course	600	TON	43.70	26,220	Crushed Surfacing Top Course	450	TON	43.70	19,670
Crushed Surfacing Base Course	4,090	TON	34.50	141,110	Crushed Surfacing Base Course	3,068	TON	34.50	105,850
HMA Cl. 1/2" PG 64-22	6,560	TON	115.00	754,400	HMA Cl. 1/2" PG 64-22	5,248	TON	115.00	603,520
HMA Cl. 1/2" PG 64-22 for Overlay	3,710	TON	115.00	426,650	HMA Cl. 1/2" PG 64-22 for Overlay	2,968	TON	115.00	341,320
HMA Cl. 1" PG 64-22 for Prelevel	680	TON	103.50	70,380					-
				-					-
Schedule Duration	11	MO	152759.61	1,680,360	Schedule Duration	8	MO	152759.61	1,222,080
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				3,688,440	Subtotal				2,678,990
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				3,688,000	Total to nearest $1000				2,679,000
					Difference				1,009,000

MENG Analysis

Proposal

R2

	PROPOSAL	R3
COMPONENT: Roadway Alignment	**AUTHOR**	MLF

CURRENT CONCEPT:

The horizontal roadway alignment nearly matches the existing roadway centerline or double yellow stripe. The vertical roadway alignment matches the existing roadway profiles and matches the developers' newly constructed intersections.

VE CONCEPT:

Between stations 42+00 to 45+00 and stations 47+00 to 58+00, the proposed concept will shift the horizontal alignment north approximately 1 to 2 feet and raise the profile approximately 1 to 2 feet.

FUNCTIONS		
Build road	Reduce risk	Directs movement

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 13,028,000	**$** 11,137,000	**$** 1,891,000

ADVANTAGES:

- Reduction in cut wall heights.
- Minimize the risk of unstable slope.
- Reduce right-of-way on south side of roadway.

DISADVANTAGES:

- Increase in fill wall heights.
- Additional right-of-way on north side of roadway.

DISCUSSION:

The project's horizontal and vertical alignments matches the current roadway as closely as possible. In reviewing the project cost estimate, the highest construction cost items correspond to the construction of cut walls. This proposal evaluated options in reducing the heights of the cut walls thus reducing costs.

	PROPOSAL	R3
COMPONENT: Roadway Alignment	**AUTHOR**	MLF

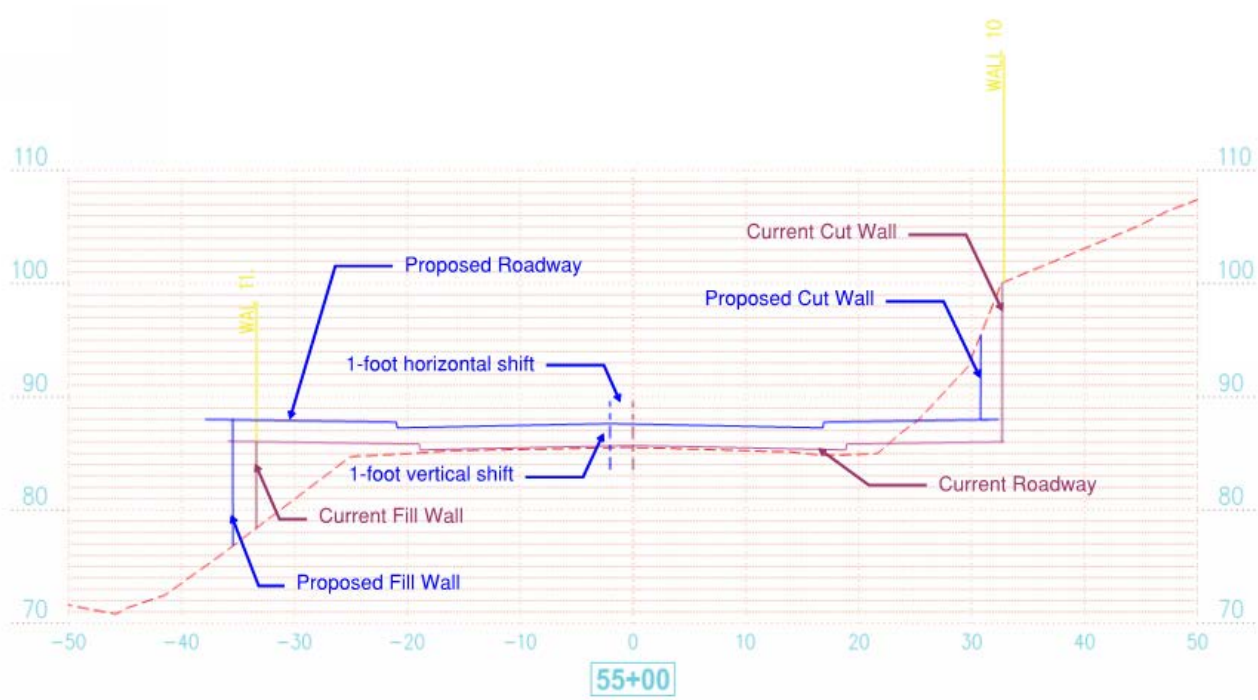
The project plans to construct four cut walls. They are located as follows:

- Wall 9 – Stations 29+10 to 33+50
- Wall 11 – Stations 41+90 to 44+90 (first cut wall section)
- Wall 11 – Stations 46+60 to 49+50 (second cut wall section)
- Wall 11 – Stations 50+30 to 58+40 (third cut wall section)

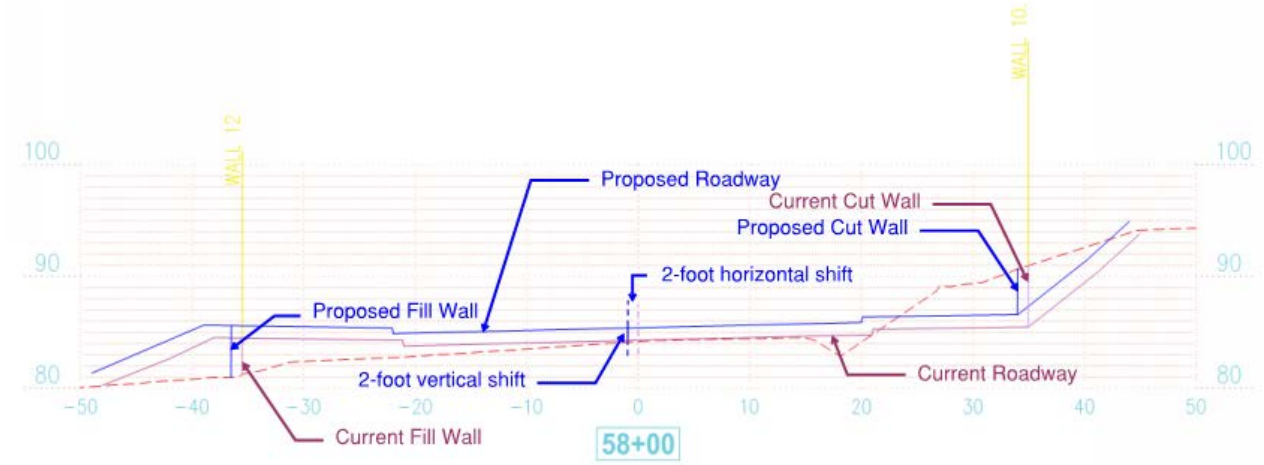
In evaluating the cross sections, the VE team saw opportunities to reduce the height of cut walls by shifting the roadway horizontal alignment northerly from 1 to 2 feet and raising the roadway vertical profile from 1 to 2 feet.

For Wall 9, due to the recently constructed Sammamish Pointe intersection, the VE team did not see an opportunity in shifting alignments without reconstructing this intersection.

For Wall 11, there was opportunity to shift the alignments of the roadway, northerly by 1 to 2 feet and vertically by 1 to 2 feet. The following sections, 55+00 and 58+00, provide representations of these concepts.



	PROPOSAL	R3
COMPONENT: Roadway Alignment	**AUTHOR**	MLF



These sections show that the amount of embankment volume and fill wall heights will increase but the amount of roadway excavation and cut wall heights will reduce. The following tables provide some representative numbers for these sections.

Earthwork Areas

	Cut		Fill	
Station	Current	Proposed	Current	Proposed
55+00	54 sf	16 sf	54 sf	190 sf
58+00	54 sf	16 sf	57 sf	182 sf

Wall Heights

	Cut		Fill	
Station	Current	Proposed	Current	Proposed
55+00	6 feet	4 feet	3 feet	5 feet
58+00	14 feet	8 feet	8 feet	12 feet

	PROPOSAL	R3
COMPONENT: Roadway Alignment	**AUTHOR**	MLF
As shown in tables above, Wall 11 cut wall will be reduced by approximately 40 percent while Wall 10 fill wall will increase approximately 50 percent.		

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Roadway Alignment

R3

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Roadway Excavation Incl. Haul	12,400	CY	32.20	399,280	Roadway Excavation Incl. Haul	7,440	CY	32.20	239,570
Gravel Borrow Incl. Haul	6,610	TON	28.75	190,040	Gravel Borrow Incl. Haul	8,263	TON	28.75	237,550
Gravel Backfill Incl. Haul for Modular Block Walls	5,990	TON	28.75	172,210	Gravel Backfill Incl. Haul for Modular Block Walls	7,488	TON	28.75	215,270
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	79,350	Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	99,190
Shaft - 24 In. Diam.	200	LF	115.00	23,000	Shaft - 24 In. Diam.	120	LF	115.00	13,800
Shaft - 30 In. Diam.	3	EA	1150.00	3,450	Shaft - 30 In. Diam.	2	EA	1150.00	2,070
Shaft - 36 In. Diam.	42	EA	1840.00	77,280	Shaft - 36 In. Diam.	25	EA	1840.00	46,370
Furnishing Soldier Pile - W 14x30 Wide Flange Beams	13	EA	2185.00	28,410	Furnishing Soldier Pile - W 14x30 Wide Flange Beams	8	EA	2185.00	17,040
Furnishing Soldier Pile - W 14x43 Wide Flange Beams	17	EA	2875.00	48,880	Furnishing Soldier Pile - W 14x43 Wide Flange Beams	10	EA	2875.00	29,330
Furnishing Soldier Pile - W 21x44 Wide Flange Beams	12	EA	1150.00	13,800	Furnishing Soldier Pile - W 21x44 Wide Flange Beams	7	EA	1150.00	8,280
Furnishing Soldier Pile - W 21x57 Wide Flange Beams	12	EA	1150.00	13,800	Furnishing Soldier Pile - W 21x57 Wide Flange Beams	7	EA	1150.00	8,280
Furnishing Soldier Pile - W 27x84 Wide Flange Beams	8	EA	1150.00	9,200	Furnishing Soldier Pile - W 27x84 Wide Flange Beams	5	EA	1150.00	5,520
Furnishing Soldier Pile - W 27x127 Wide Flange Beams	1	LS	747500.00	747,500	Furnishing Soldier Pile - W 27x127 Wide Flange Beams	1	LS	747500.00	448,500
Timber Lagging	12	EA	28750.00	345,000	Timber Lagging	7	EA	28750.00	207,000
Concrete Fascia Panel	1	EA	46000.00	46,000	Concrete Fascia Panel	1	EA	46000.00	27,600
Prefabricated Drainage Mat	1	LS	1725000.00	1,725,000	Prefabricated Drainage Mat	1	LS	1725000.00	1,035,000
Cement Concrete Gutter for Soldier Pile Wall	1	LS	569250.00	569,250	Cement Concrete Gutter for Soldier Pile Wall	1	LS	569250.00	341,550
Remove Solider Pile Shaft Obstructions	3,000	CY	63.25	189,750	Remove Solider Pile Shaft Obstructions	1,800	CY	63.25	113,850
Gravel Backfill Incl. Haul for Modular Block Walls	5,990	TON	28.75	172,210	Gravel Backfill Incl. Haul for Modular Block Walls	5,990	TON	28.75	172,210
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	79,350	Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	79,350
Structure Excavation Class A, Incl. Haul for Walls	3,681	CY	32.20	118,530	Structure Excavation Class A, Incl. Haul for Walls	3,681	CY	32.20	118,530
Precast Concrete Modular Block Wall	21,830	SF	57.50	1,255,230	Precast Concrete Modular Block Wall	21,830	SF	57.50	1,255,230
				-					-
Schedule Duration	44	MO	152759.61	6,721,420	Schedule Duration	42	MO	152759.61	6,415,900
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				13,027,940	Subtotal				11,136,990
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				13,028,000	Total to nearest $1000				11,137,000
					Difference				1,891,000

MENG Analysis

Proposal

R3

	PROPOSAL	I1
COMPONENT: Illumination	**AUTHOR**	TB

CURRENT CONCEPT:

For the length of the roadway, existing sidewalk pole lighting is to be removed, and replaced with luminaires mounted on 17' tall poles on each side of the road.

VE CONCEPT:

Three alternative approaches for providing illumination.

FUNCTIONS		
Improve safety	Increase visibility	Illuminate people

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ Op A: 1,723,000	**$** 1,036,000	**$** 687,000
$ Op B: 1,723,000	**$** 483,000	**$** 1,240,000
$ Op C: 1,571,000	**$** 408,000	**$** 1,163,000

ADVANTAGES:

- Option A (descriptions next page):
  - Reduced capital cost and
  - Reduced maintenance cost
- Option B:
  - Reduced capital cost
  - Reduced maintenance cost
  - Reduced energy consumption
  - Reduced light pollution
  - Batt and Owl friendly
- Option C:
  - Reduced capital cost
  - Reuse of system elements
  - Bike / Pedestrian Illumination

DISADVANTAGES:

- Option A:
  - Inconsistent with development
  - Not consistent with Guidelines
- Option B:
  - Only street lighting at intersections
  - No Bike/walk illumination
- Option C:
  - Requires option B also
  - Not all "new"
  - Still requires new bases, etc.
  - May be more hassle than just new.

	PROPOSAL	I1
COMPONENT: Illumination	**AUTHOR**	TB

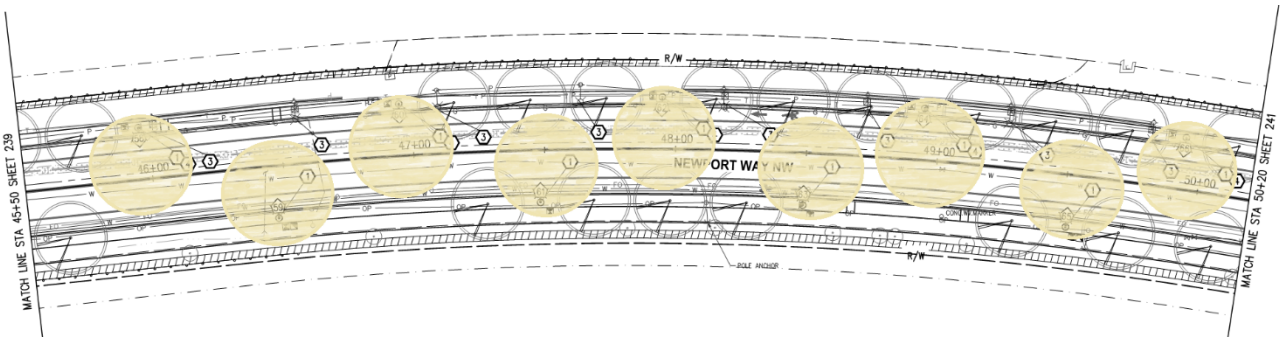
DISCUSSION:

Option A: Illumination – Location:

Instead of providing 17' tall light poles on each side of the street, this proposal reduces the number of new lighting poles by providing illumination for the street, bike, and pedestrians using taller poles on one side of the road, at greater spacing, and adding two per intersection. Additionally, underground infrastructure (power conduit) is eliminated from one side of the street.

(For the sake of this proposal the VE team preliminarily assumes an alternative design comprised of 30' tall poles, typically spaced about 150' apart).

Current Concept



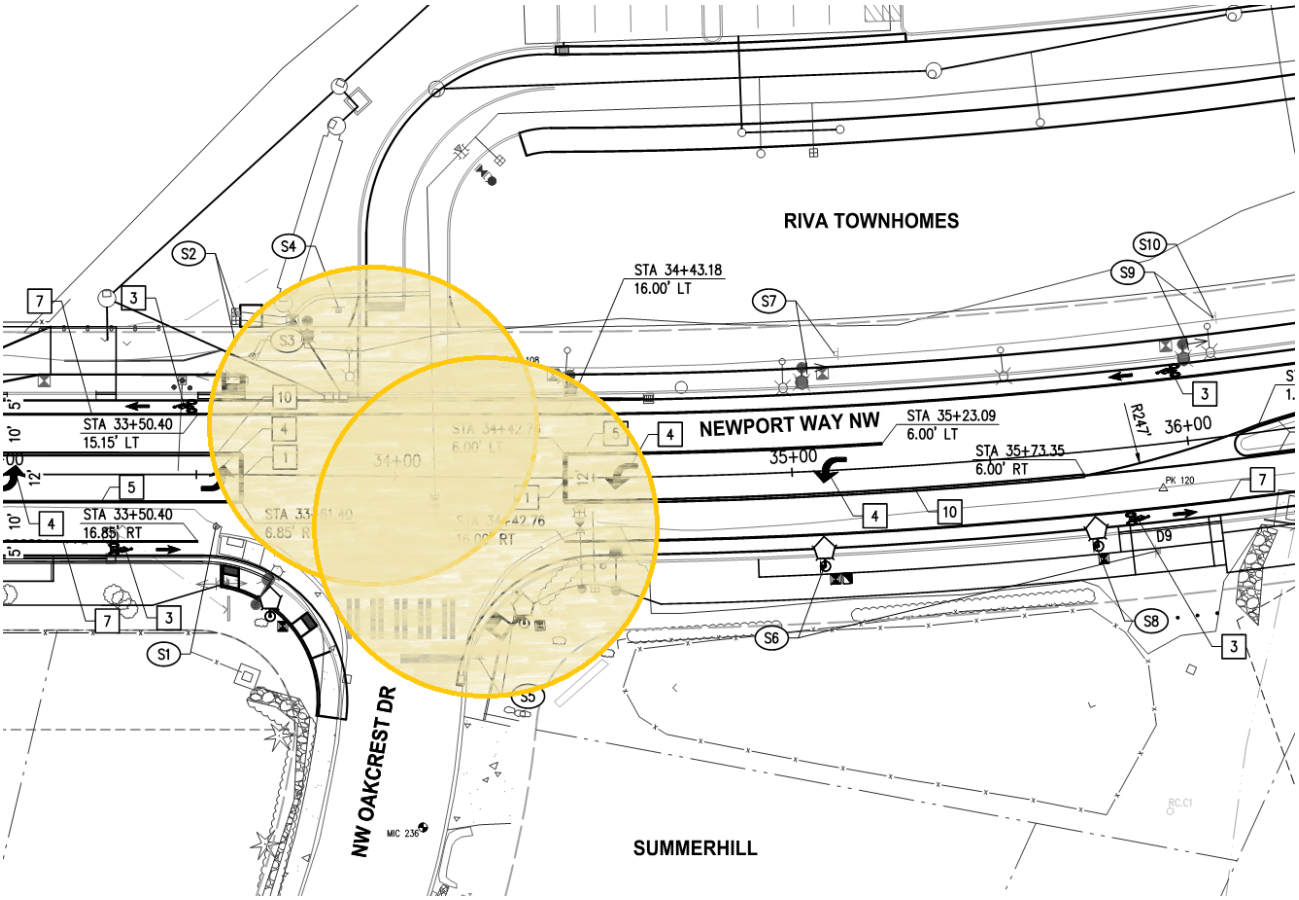
VE proposal

	PROPOSAL	I1
COMPONENT: Illumination	**AUTHOR**	TB

Option B: Illumination – Intersections:

Eliminate street pole lighting for the length of the improvements. Provide instead pole lighting to illuminate intersections and driveways only.

While this proposal does not provide illumination for the full length of bike lanes, multi modal trail and sidewalks, it does direct light to critical crossing and intersection areas, reduces costs, energy use, and maintenance. Additionally, the design is friendlier to habitat (especially nocturnal species such as owls and bats) and is more compliant with "dark skies" concepts.



	PROPOSAL	I1
COMPONENT: Illumination	**AUTHOR**	TB

Option C: Illumination – Pedestrian – East Project:

This option assumes Option B also occurs (Street lighting at the intersections and driveways), and provides the addition of multi-modal trail lighting. Use the existing light poles (salvaged, and protected, cleaned, and re-installed, in addition to some new to match) down the hill (East end) along the multi-modal trail.

While new bases, conduit, and power will still be required, reuse of existing poles also visually demonstrates fiscal responsibility to tax payers by re-using existing resources that are relatively new fixtures.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Illumination - Location

I1A

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Illumination System, Complete	1	LS	1265000	1,265,000	30VF Street Lights	58	EA	10000.00	580,000
				-	1.5" PVC Conduit & Wire	6,000	LF	10.00	60,000
				-	Trenching	6,000	LF	15.00	90,000
				-					-
				-					-
				-					-
				-					-
Schedule Duration	3	MO	152759.61	458,280	Schedule Duration	2	MO	152759.61	305,520
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				1,723,280	Subtotal				1,035,520
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				1,723,000	Total to nearest $1000				1,036,000
					Difference				687,000

MENG Analysis

Proposal

I1A

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Illumination - Intersections

I1B

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Illumination System, Complete	1	LS	1265000	1,265,000	30VF Street Lights	18	EA	10000.00	180,000
				-	1.5" PVC Conduit & Wire	6,000	LF	10.00	60,000
				-	Trenching	6,000	LF	15.00	90,000
				-					-
				-					-
				-					-
				-					-
Schedule Duration	3	MO	152759.61	458,280	Schedule Duration	1	MO	152759.61	152,760
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				1,723,280	Subtotal				482,760
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				1,723,000	Total to nearest $1000				483,000
					Difference				1,240,000

MENG Analysis

Proposal

I1B

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Illumination - Pedestrian - East Project

I1C

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Illumination System, Complete	1	LS	1265000	1,265,000	Reuse Ex. Street Lights (Labor & EQ)	60	EA	3000.00	180,000
				-	1.5" PVC Conduit & Wire	3,000	LF	10.00	30,000
				-	Trenching	3,000	LF	15.00	45,000
				-					-
				-					-
				-					-
				-					-
Schedule Duration	2	MO	152760	305,520	Schedule Duration	1	MO	152760	152,760
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
				-					-
Subtotal				1,570,520	Subtotal				407,760
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				1,571,000	Total to nearest $1000				408,000
					Difference				1,163,000

MENG Analysis

Proposal

I1C

	PROPOSAL	I2
COMPONENT: Pedestrian Crossings	**AUTHOR**	TB

CURRENT CONCEPT:

There is a total of four crosswalks in the current plan providing passage for pedestrians and linking the North and South sides of Newport Way NW for the full 1.2 miles of this project area. Bus stops are designated on each side of the intersection at NW Oakcrest Drive with no pedestrian crossing to get to the bus stop.

VE CONCEPT:

Add an additional crossing with a High Intensity Activated Crosswalk Beacon (HAWK) at NW Oakcrest Drive.

FUNCTIONS		
Accommodate pedestrians	Link sidewalks	Access transit

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 0	**$** 453,000	**$** (453,000)

ADVANTAGES:

- Improves safety.
- Access bus stops.
- Crossing for denser residence area.
- Provide access to multimodal trail.

DISADVANTAGES:

- Increased capital cost.
- Increased maintenance of beacons.
- Beacon does not directly control driveway traffic.
- Sight distance concerns for crosswalk (if no HAWK beacon provided, or in power failure).

DISCUSSION:

In the current design there is no crossing at one of the highest population density areas of the project adjacent to the RIVA Townhomes and Summerhill developments.

In addition to no crossing planned at the NW Oakcrest Drive intersection providing protected pedestrian crossing to the multimodal trail, this location also provides planned bus stops on each side of the street. There are no accommodations for pedestrians to

	PROPOSAL	I2
COMPONENT: Pedestrian Crossings	**AUTHOR**	TB

access the transit stop at the other side of the street within a reasonable walking distance (people will jaywalk to reach the other side of the street).

No crossing was designed here due to concerns about sight distances. This is why this proposal also calls for the installation of a pedestrian hybrid beacon otherwise known as a High Intensity Activated Crosswalk Beacon (HAWK)

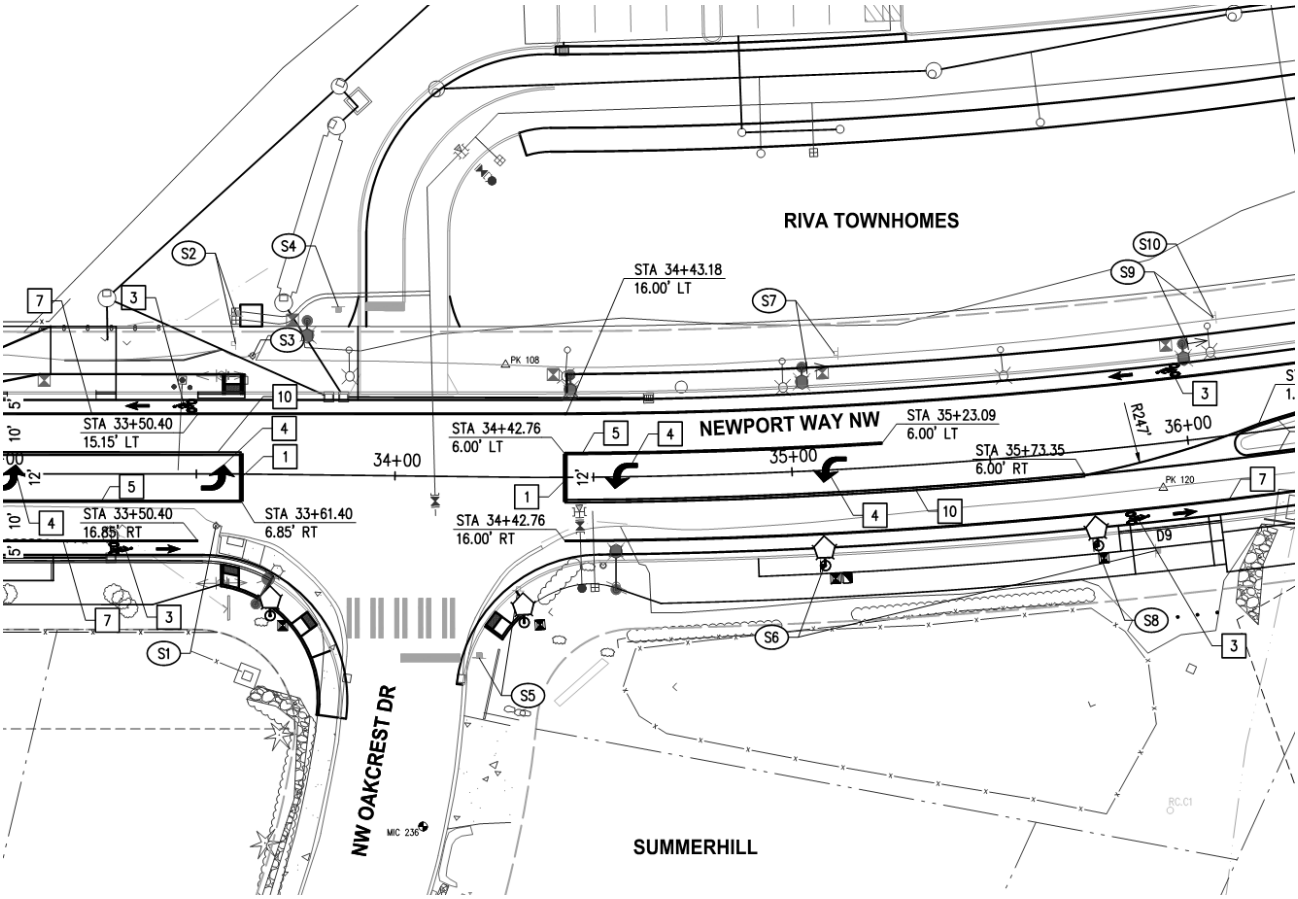
The purpose of a HAWK beacon is to allow protected pedestrian crossings, stopping road traffic only as needed when pedestrians activate the signal (example below).

Alternatively, if there will not be a secured crossing provided at this intersection, the team recommends moving the bus stops to a location adjacent to the crossing provided at the planned King County Trailhead crossing.

VALUE ENGINEERING

	PROPOSAL	I2
COMPONENT: Pedestrian Crossings	**AUTHOR**	TB

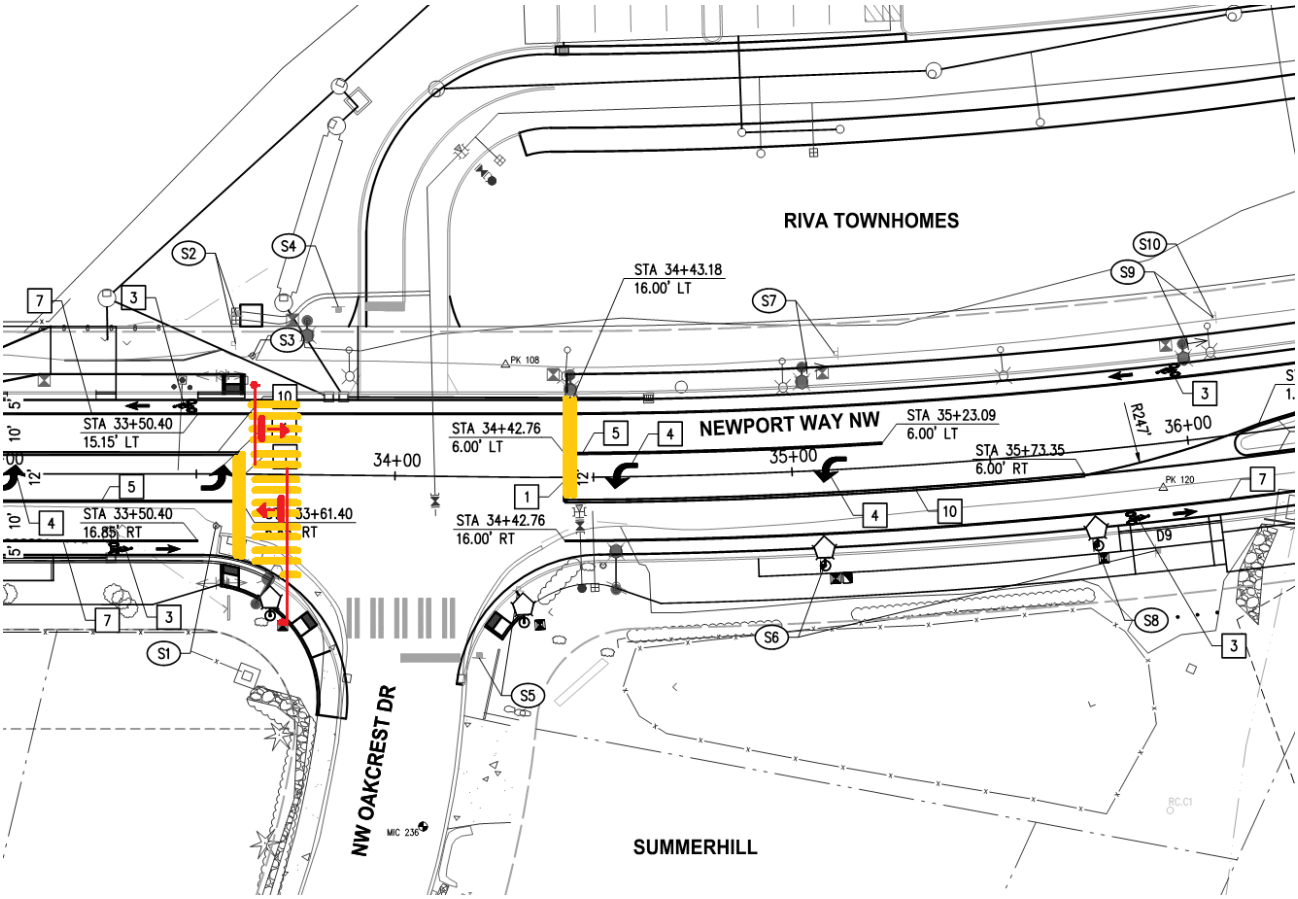
Current Concept:



VALUE ENGINEERING

	PROPOSAL	I2
COMPONENT: Pedestrian Crossings	**AUTHOR**	TB

Proposed Concept:



City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Pedestrian Crossings

I2

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
				-	HAWK Signal at Intersection	1	EA	300000	300,000
				-					-
				-					-
									-
									-
									-
									-
				-	Schedule Duration	1	MO	152760	152,760
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				-	Subtotal				452,760
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				-	Total to nearest $1000				453,000
					Difference				(453,000)

MENG Analysis

Proposal

I2

	PROPOSAL	E1
COMPONENT: Storm Treatment – Modular System	**AUTHOR**	JG

CURRENT CONCEPT:

13 modular wetland units for stormwater treatment of 2.6 acres of pollution generating hard surfaces (PGHS) to position the project for an Ecology stormwater retrofit grant.

VE CONCEPT:

Reduce number of modular wetlands to minimum requirement (treat 0.75-acre PGHS).

FUNCTIONS		
Ecology grant	Protect habitat	Maintain water quality

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 544,000	**$** 84,000	**$** 460,000

ADVANTAGES:

- Compliant with minimum requirements of stormwater manuals.
- Protects habitat and maintains water quality.
- Could reduce project cost from $340k to $40K.

DISADVANTAGES:

- Not eligible for Ecology grant money.
- Treats less area of PGHS.
- Less water quality treatment and habitat protection.
- Less of a project “sell” to public.

DISCUSSION:

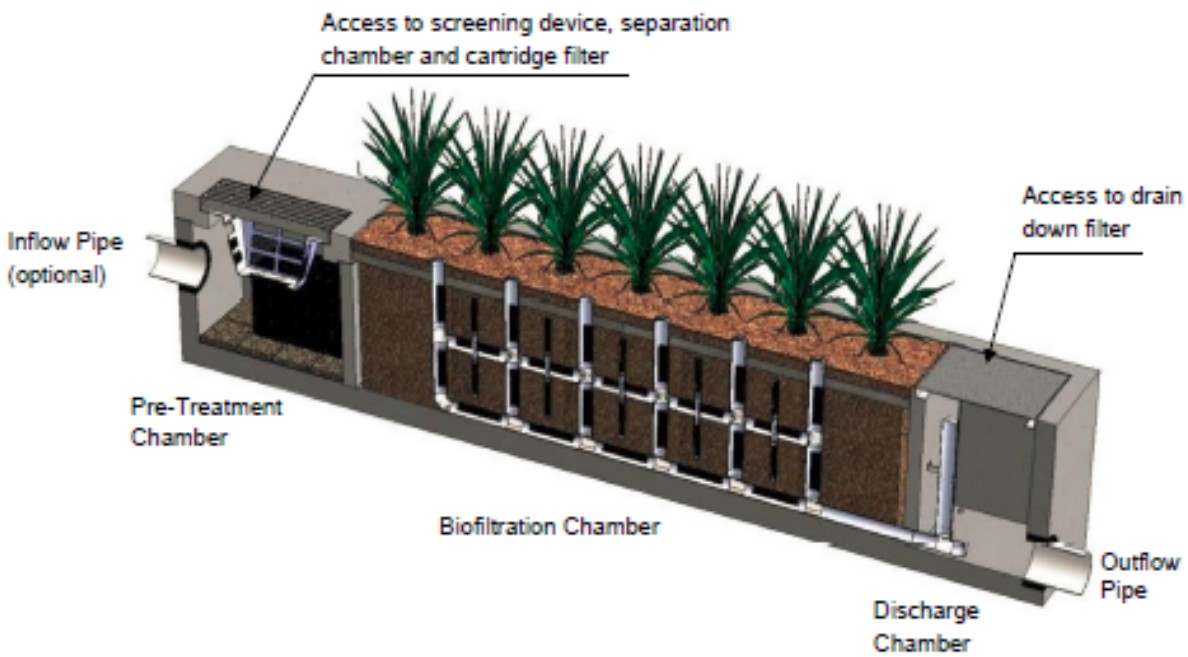
The project currently proposes to treat 2.6 acres of PGHS to position the project for an Ecology stormwater retrofit grant whereas runoff treatment is only required for 0.75 acre of PGHS per the Stormwater Site Plan report. 13 modular wetlands are proposed in place in catch basins along street curbs. A single modular wetland (Item 510) could be utilized to treat 0.84 acre of PGHS to meet the 2012 King County Stormwater Manual (amended 2014) and the 2017 Issaquah Addendum.

The stormwater site plan report indicates that if Ecology grants are not awarded for the proposed stormwater retrofit then the modular wetlands will be removed at 90 percent design. The potential value of the Ecology grant should be tracked relative to the cost of

	PROPOSAL	E1
COMPONENT: Storm Treatment – Modular System	**AUTHOR**	JG

installing additional modular wetland units and design revisions should the Ecology grant not be awarded, available, or compatible with the anticipated construction schedule.

System Diagram



www.modularwetlands.com

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Storm Treatment - Modular System

E1

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Modular Wetland 4' x 4'	12	EA	28750.00	345,000	Modular Wetland 4' x 8'	1	EA	46000.00	46,000
Modular Wetland 4' x 8'	1	EA	46000.00	46,000					-
									-
									-
									-
									-
									-
Schedule Duration	1	MO	152759.61	152,760	Schedule Duration	0.25	MO	152759.61	38,190
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				543,760	Subtotal				84,190
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				544,000	Total to nearest $1000				84,000
					Difference				460,000

MENG Analysis

Proposal

E1

	PROPOSAL	E2
COMPONENT: Storm Detention - Precast	**AUTHOR**	JG

CURRENT CONCEPT:

Install stormwater detention vault (181'L x 18'W x 9.75'H) and dispersion trench for flow control, and let contractor decide cast-in-place or precast form.

VE CONCEPT:

Specify precast vault to lower cost of detention vault.

FUNCTIONS		
Protect habitat	Prevent flooding/erosion	Code compliance

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 977,000	**$** 415,000	**$** 562,000

ADVANTAGES:

- Cost savings.
- Provides same project functions.

DISADVANTAGES:

- Less contractor flexibility during construction.

DISCUSSION:

Specify in contract documents to install pre-cast stormwater vault rather than give the contractor the option to cast-in-place or install a precast vault. Cost savings is estimated at $562,000 by specifying the precast vault.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Storm Detention - Precast

E2

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Detention Vault	1	LS	747500.00	747,500	Detention Vault	1	LS	300000.00	300,000
(Assuming Cast in Place)									-
									-
									-
									-
									-
				-					-
Schedule Duration	1.5	MO	152759.61	229,140	Schedule Duration	0.75	MO	152759.61	114,570
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				976,640	Subtotal				414,570
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				977,000	Total to nearest $1000				415,000
					Difference				562,000

MENG Analysis

Proposal

E2

	PROPOSAL	E3
COMPONENT: Environmental Mitigation	**AUTHOR**	JG

CURRENT CONCEPT:

Restoration of temporary buffer impacts only.

VE CONCEPT:

Additional stream/wetland buffer enhancement (approximately 13,000 SF) at existing staging area near SR 900 adjacent to the PSE access road to recover unaccounted for buffer mitigation needs.

FUNCTIONS		
Improve water quality	Improve habitat	Code compliance

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 239,000	**$** 467,000	**$** (228,000)

ADVANTAGES:

- Provide buffer mitigation on-site along Tibbets Creek.
- Reduce or eliminate off-site mitigation activities.
- On-site location to streamline overall project landscaping/restoration installation.
- Reduces future costs.
- Reduced maintenance.

DISADVANTAGES:

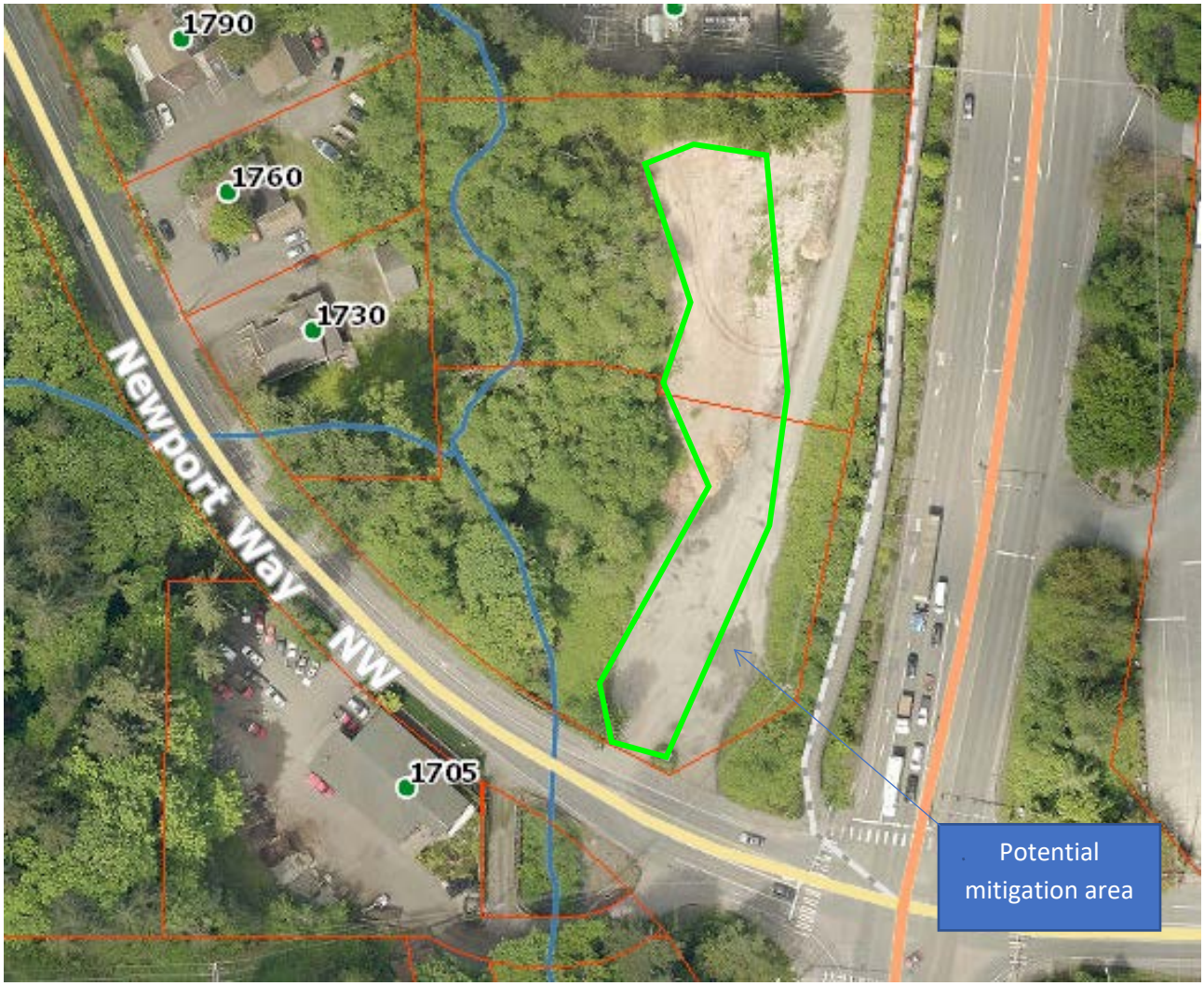
- Eliminates staging area for future projects.
- PSE easement coordination.

DISCUSSION:

Environmental impacts to wetland and stream buffers on the north side of SR 900 have not been quantified. The project appears to result in a straight reduction of forested wetland/stream buffer area along the project corridor from the road expansion. Restoration of temporary impacts is included in the current project design, but buffer loss must be mitigated to achieve a no net loss according to Issaquah City Code Chapter 18.10

	PROPOSAL	E3
COMPONENT: Environmental Mitigation	**AUTHOR**	JG

(Environmental Protection). Maximizing the use of this city-owned property provides an opportunity to mitigate on-site and avoid or reduce additional mitigation activities off-site. Restoration opportunities are dependent on the delineation of wetland boundaries along Tibbets Creek and may be constrained or limited depending on location of the Puget Sound Energy (PSE) easement parallel to SR 900.



City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Environmental Mitigation

E3

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Riparian and Wetland Buffer Restoration	1	LS	86250	86,250	Riparian and Wetland Buffer Restoration	1	LS	86250.00	86,250
					Additional Stream/Wetland Buffer Enhancement	13,000	SF	5.77	75,000
									-
									-
									-
									-
									-
									-
									-
									-
									-
				-					-
Schedule Duration	1.0	MO	152760	152,760	Schedule Duration	2	MO	152760	305,520
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				239,010	Subtotal				466,770
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				239,000	Total to nearest $1000				467,000
					Difference				(228,000)

MENG Analysis

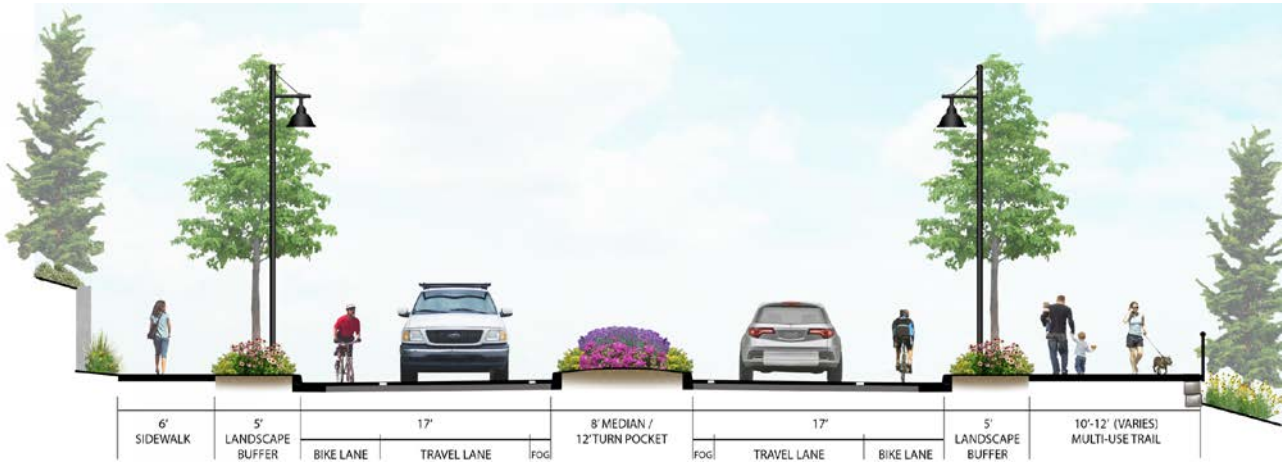
Proposal

E3

	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD

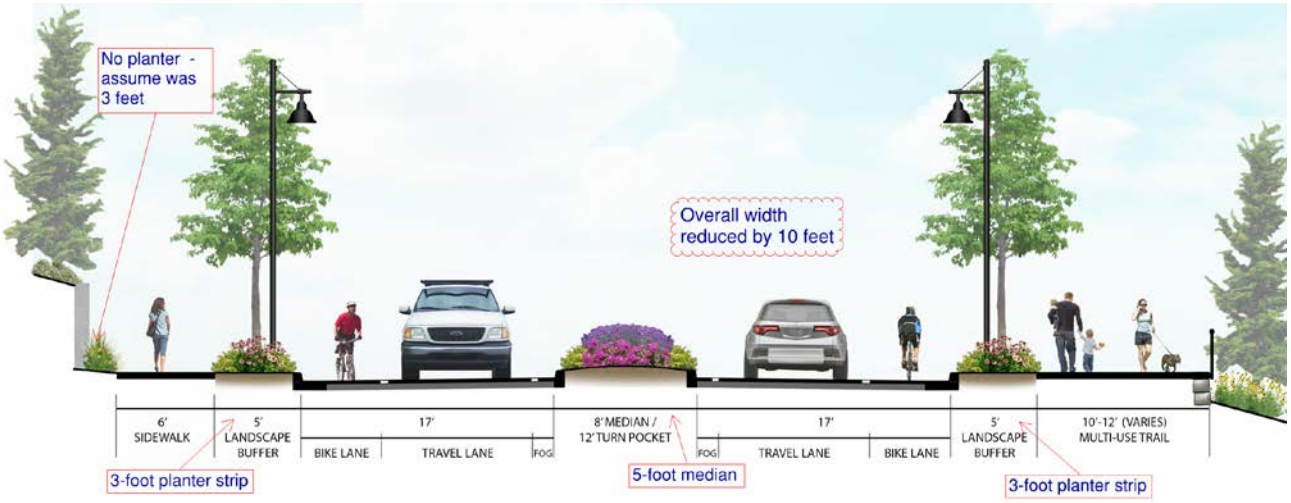
CURRENT CONCEPT:

Current proposal consists of the following typical section:



VE CONCEPT:

Minimize planter strip areas to reduce project footprint in order to minimize walls and needed additional right-of-way.



	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD

FUNCTIONS		
Increase safety	Increase property	Slow traffic

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 4,046,000	**$** 1,111,000	**$** 2,935,000

ADVANTAGES:

- Reduces project footprint.
- Reduces project cost.
- Reduces wall heights.

DISADVANTAGES:

- Reduces separation between corridor users but still meets standards.
- Wall immediately next to sidewalk will be a less comfortable to pedestrians, but still safe.
- Smaller zones for planting may stress plants. Proposed irrigation would help (irrigation has been retained).

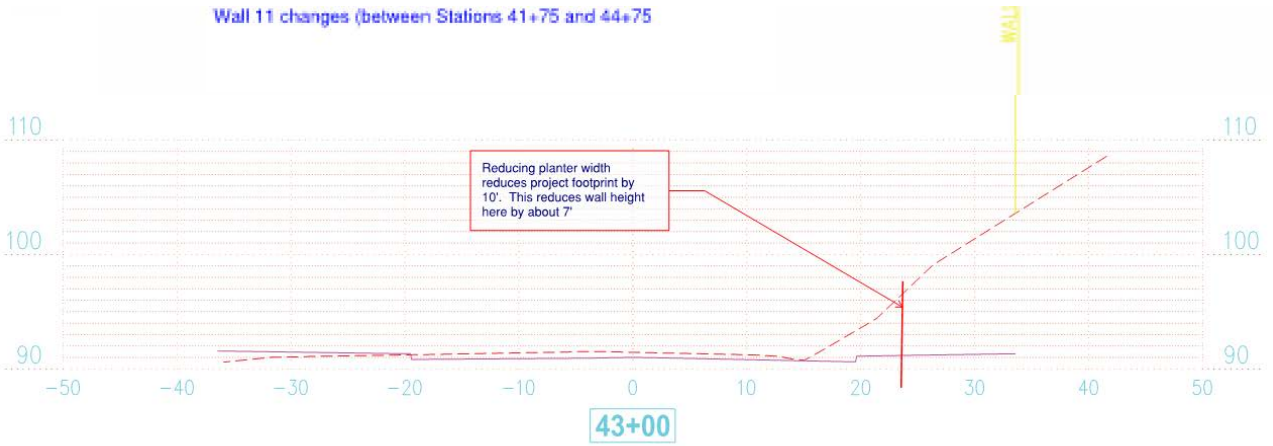
DISCUSSION:

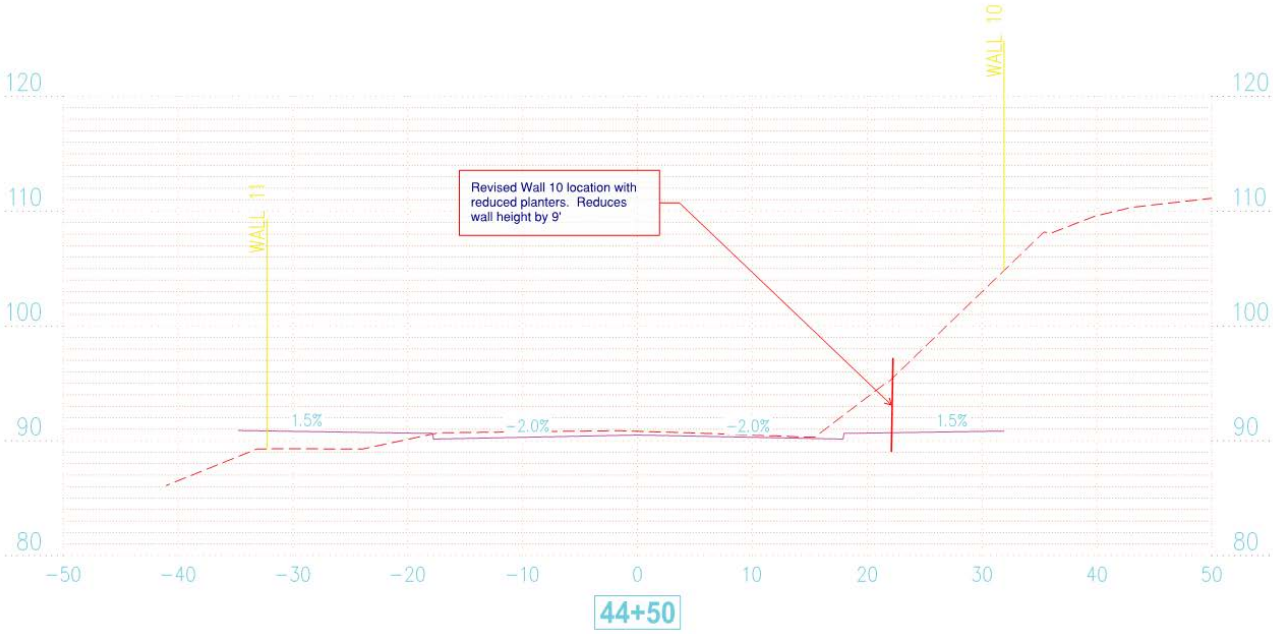
By reducing planter areas, the amount of right-of-way needed can be reduced by 10-feet. Reducing the overall project footprint would reduce wall needs significantly. This approach would reduce the soldier pile walls on the east end significantly. At the end of this proposal, there are some figures illustrating approximate height savings. The amount of potential savings for the soldier pile area is summarized below.

Begin Station	End Station	Length	Average Wall Ht saving	Wall SF savings
4175	4475	300	8	2400
4700	4925	225	6.5	1462.5
5075	5250	175	7.5	1312.5
5400	5675	275	6.5	1787.5
			Total =	**6962.5**
				7000 SF

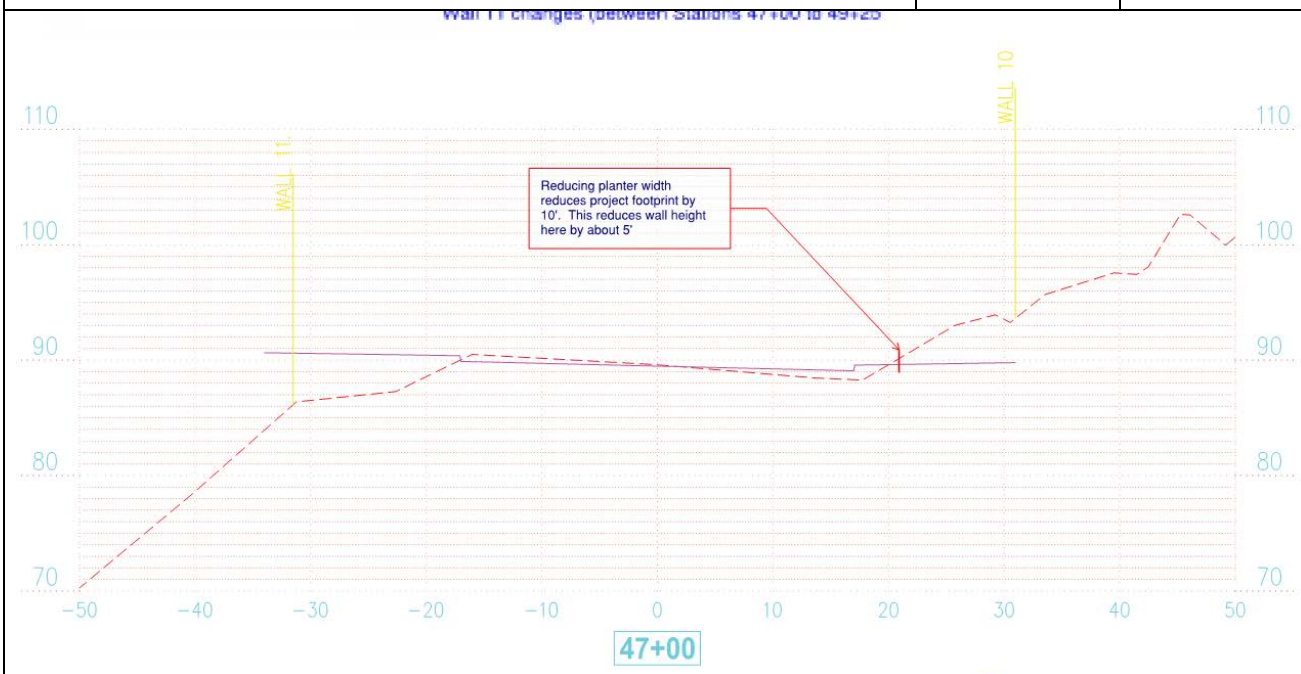
	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD

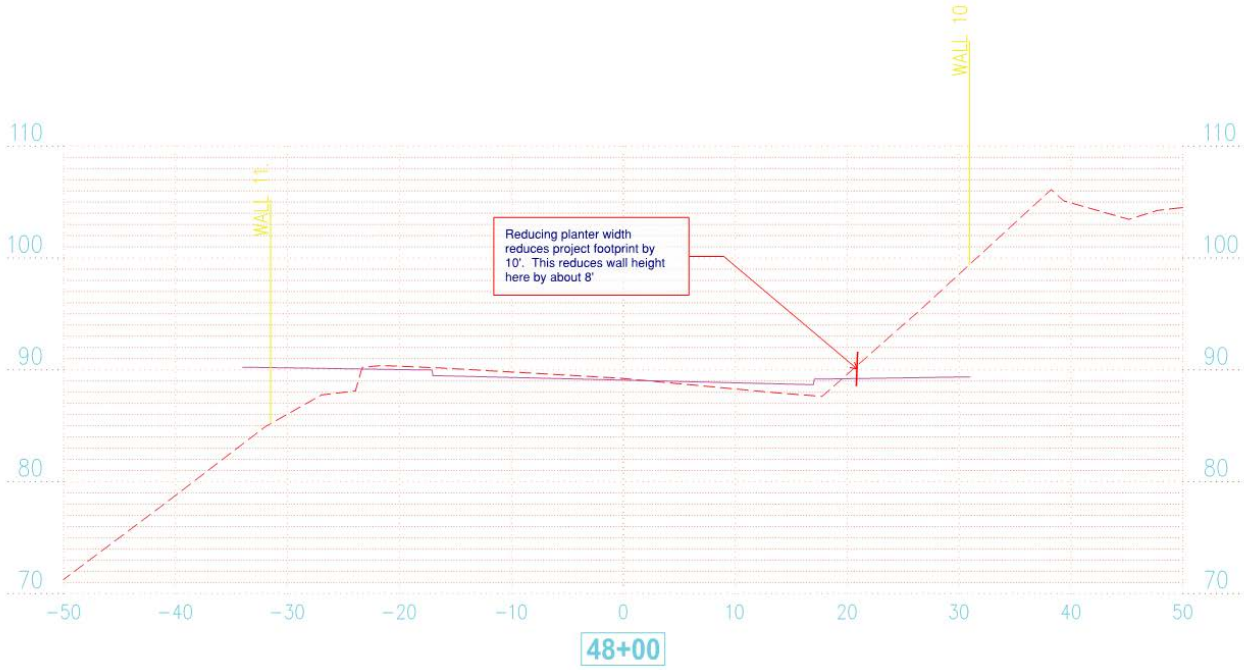
In addition, there would be additional cost savings associated with up to 10-feet less of right-of-way (ROW) needed – where it is being acquired - throughout the project, and 10-feet less of landscaping (a total of 63,000 SF less landscaping). The ROW savings shown is based on an assumed 8-feet less of ROW being acquired on the south side of the roadway between Stations 30+50 and 33+50, and from Station 36+50 to 58+75). Total of 20,200 SF.



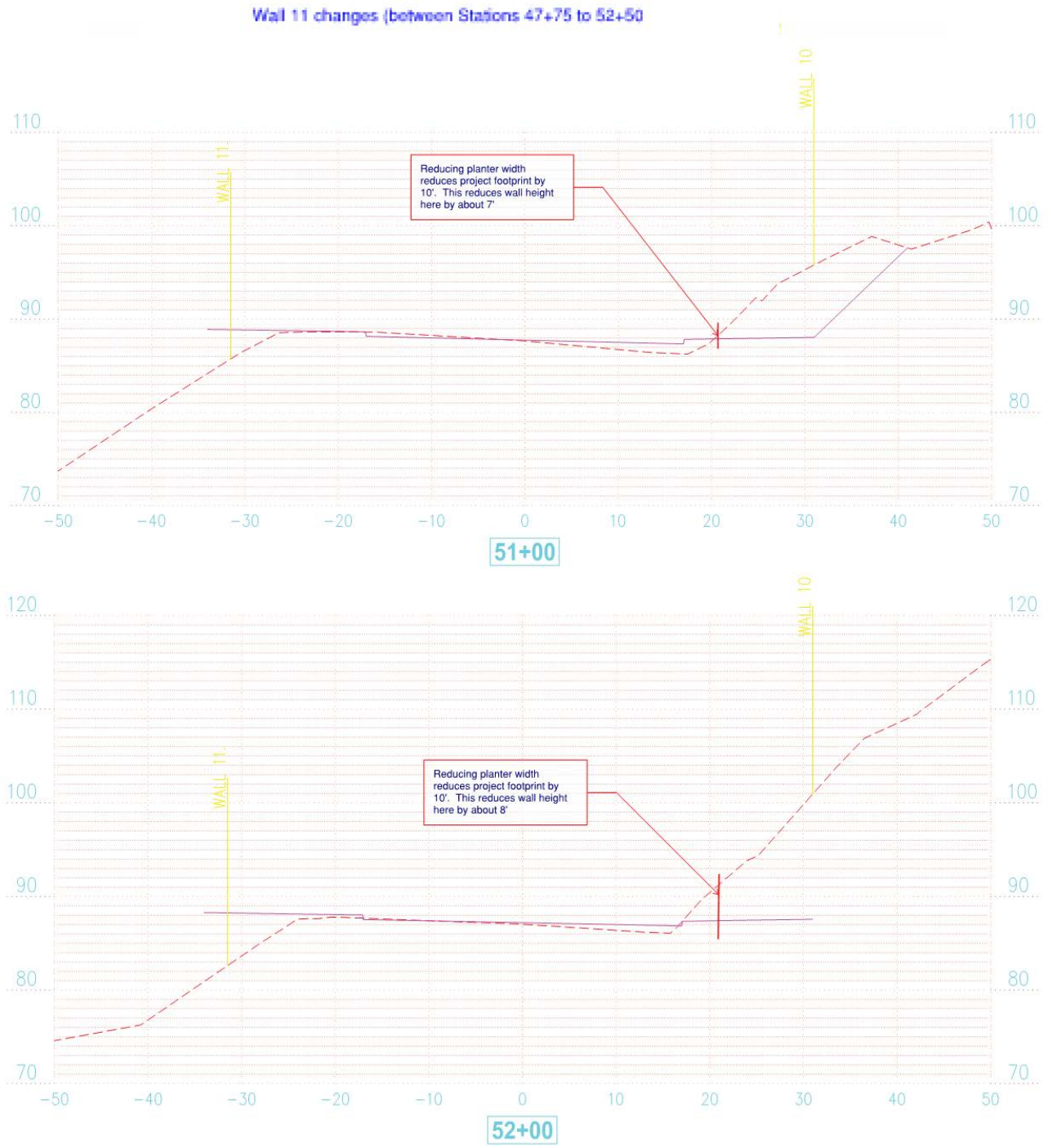


	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD

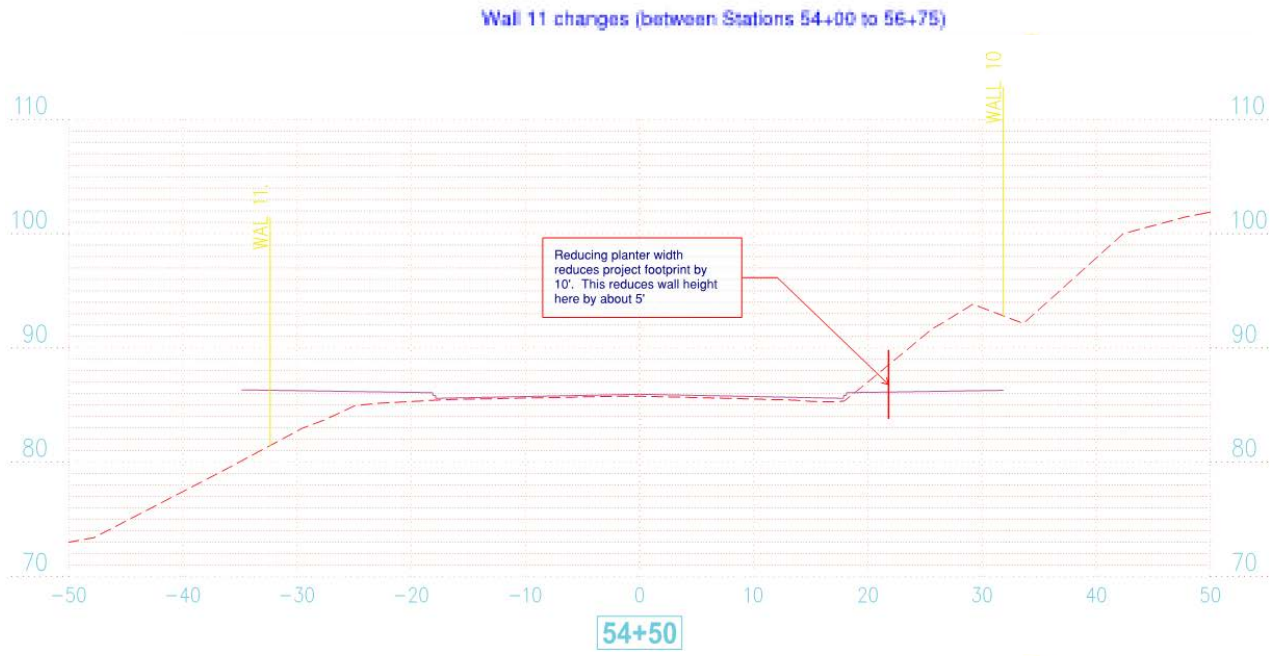


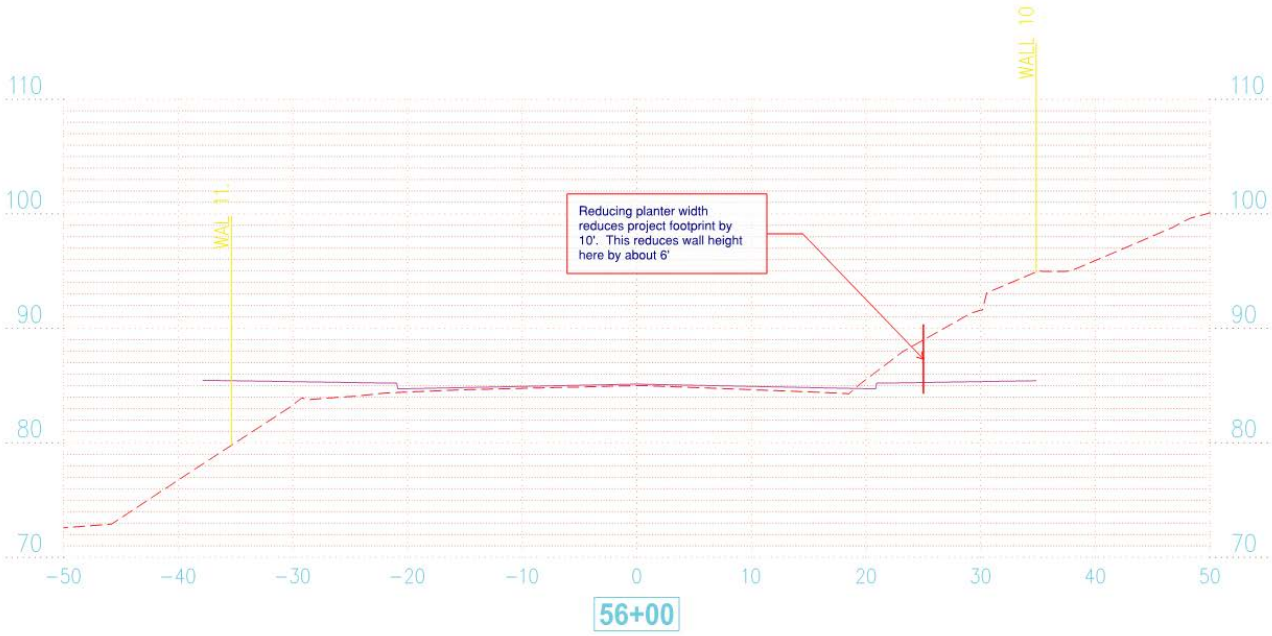


	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD



	PROPOSAL	P1
COMPONENT: Planning – Planting Zones	**AUTHOR**	PGD





City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Planning - Planting Zones

P1

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Topsoil Type A	3,000	CY	63.25	189,750	Topsoil Type A	1,572	CY	63.25	99,430
Bark or Wood Chip Mulch	550	CY	63.25	34,790	Bark or Wood Chip Mulch	289	CY	63.25	18,280
Fine Compost	350	CY	63.25	22,140	Fine Compost	184	CY	63.25	11,640
PSIPE Shrubs, Grasses, and Groundcovers	5,850	SY	92.00	538,200	PSIPE Shrubs, Grasses, and Groundcovers	3,065	SY	92.00	281,980
Root Barrier	2,680	LF	13.80	36,980	Root Barrier	1,404	LF	13.80	19,380
Irrigation System, Complete	1	LS	132250.00	132,250	Irrigation System, Complete	1	LS	132250.00	69,270
Shaft - 36 In. Diam.	1,581	LF	230.00	363,630					-
Furnishing Soldier Pile - W 27x84 Wide Flange Beams	1,085	LF	258.75	280,610					-
Timber Lagging	7,000	SF	23.00	161,000					-
ROW Cost	20,200	SF	30.00	606,000					-
				-					-
Schedule Duration	11	MO	152759.61	1,680,360	Schedule Duration	4	MO	152759.61	611,040
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
Subtotal				4,045,710	Subtotal				1,111,020
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				4,046,000	Total to nearest $1000				1,111,000
					Difference				2,935,000

MENG Analysis

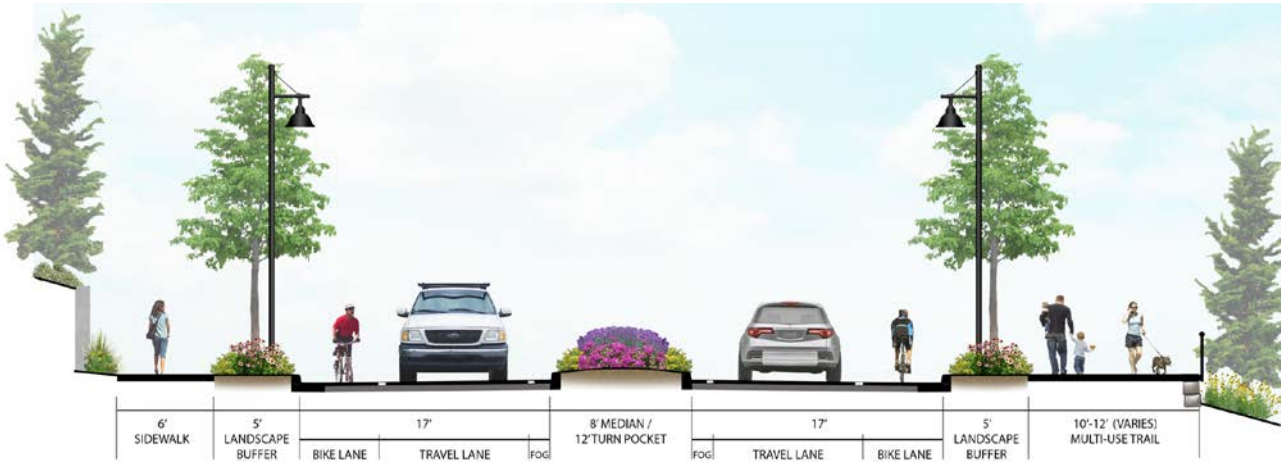
Proposal

P1

	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

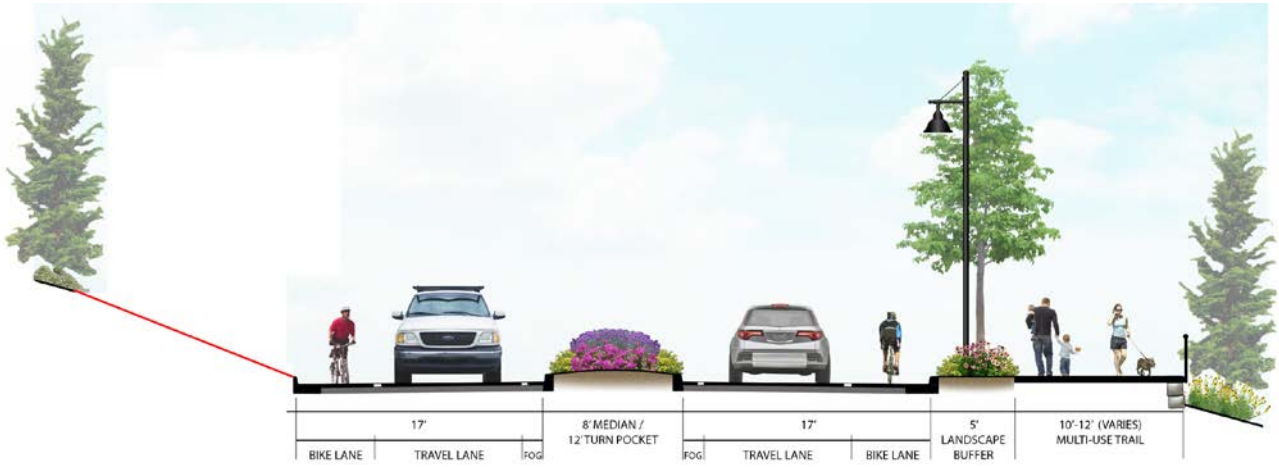
CURRENT CONCEPT:

Current concept has a 6-foot sidewalk separated from the roadway by a 5-foot landscaped buffer along the entire corridor.



VE CONCEPT:

Eliminate sidewalk in front of King County and recently acquired Bergsma property.



FUNCTIONS		
Access pedestrians	Increase safety	Accommodate development

	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 23,655,000	**$** 15,813,000	**$** 7,842,000

ADVANTAGES:

- Would reduce construction cost.
- Results in less long-term maintenance costs.

DISADVANTAGES:

- Does not provide a continuous pedestrian facility on both side of the roadway – need to confirm this is OK with grant agencies.

DISCUSSION:

There are no significant pedestrian origination or destination points in this segment. Eliminating the sidewalk on the south side between approximately Station 39+00 to 60+50 would eliminate the expensive soldier pile walls in this area. The tallest remaining wall in this zone would be about 4 to 5-feet in height which is suggested to be a Gravity Stone or similar modular block wall. Total amount of Gravity Stone or similar modular block wall would be:

Would require some less expensive wall in front of King Co and Bergsma properties. Suggest Gravity Stone or similar				
Begin Station	End Station	Length	Average Wall Ht saving	Wall SF savings
4175	4475	300	4	1200
4700	4925	225	0	0
5075	5250	175	2	350
5400	5675	275	2	550
			Total =	**2100**

There would also be additional cost savings associated with reduced right-of-way needs (assumed to be 8-feet of savings in this segment), and no need for formal landscaping behind the curb. The ROW savings shown is based on an assumed 8-feet less of ROW being acquired on the south side of the roadway between Stations 30+50 and 33+50, and from Station 36+50 to 58+75). Total of 20,200 SF.

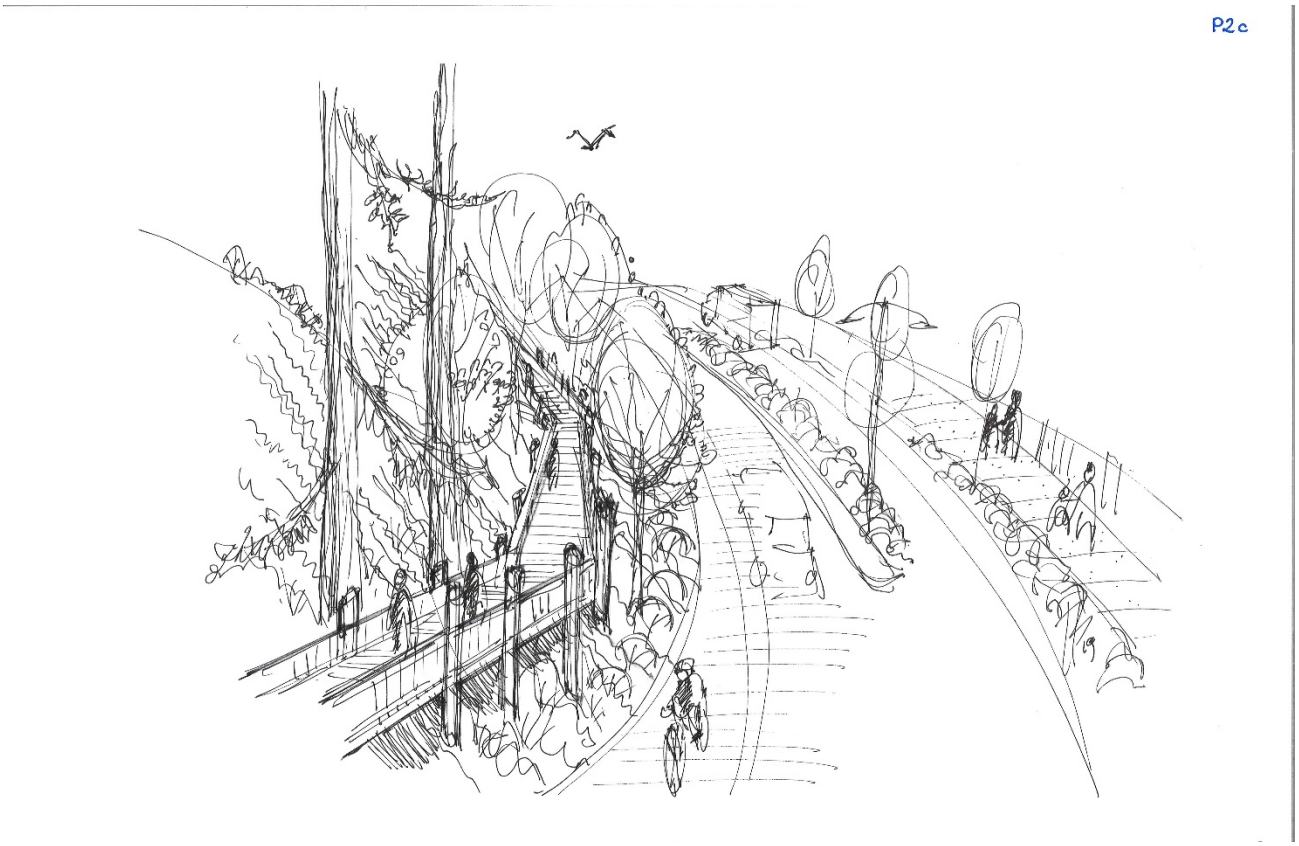
	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

Alternative P2b.

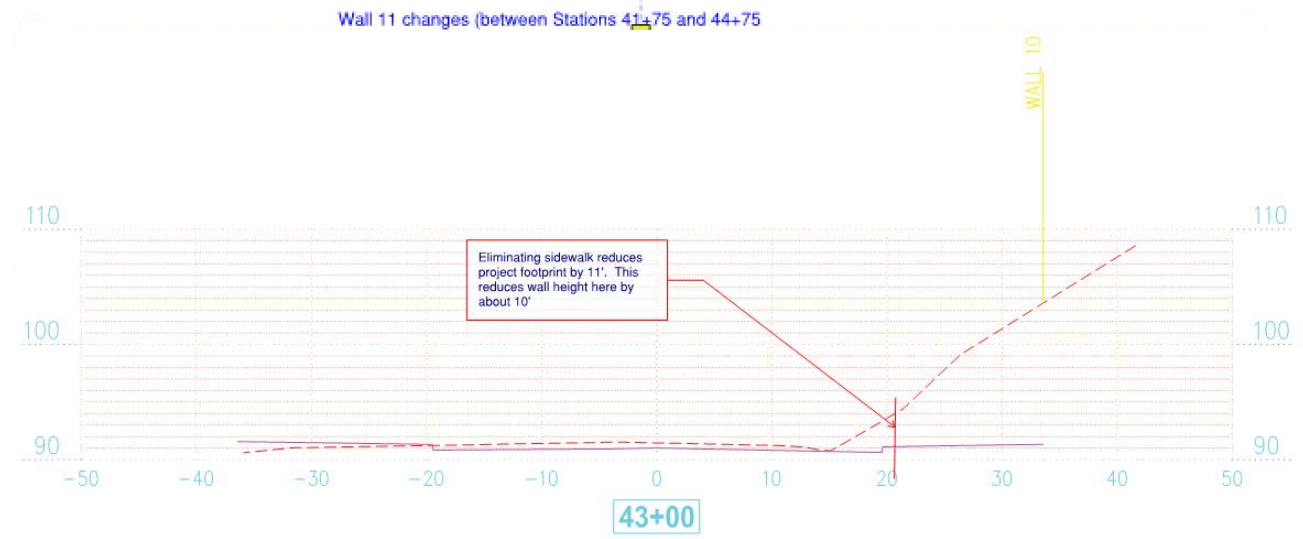
An alternative proposal would be having a trail to meander thru the natural area on the south side of this segment. If this was done, it should be treated as a nature trail to reduce cost that is not paved. This would be a less costly approach than a formal sidewalk.

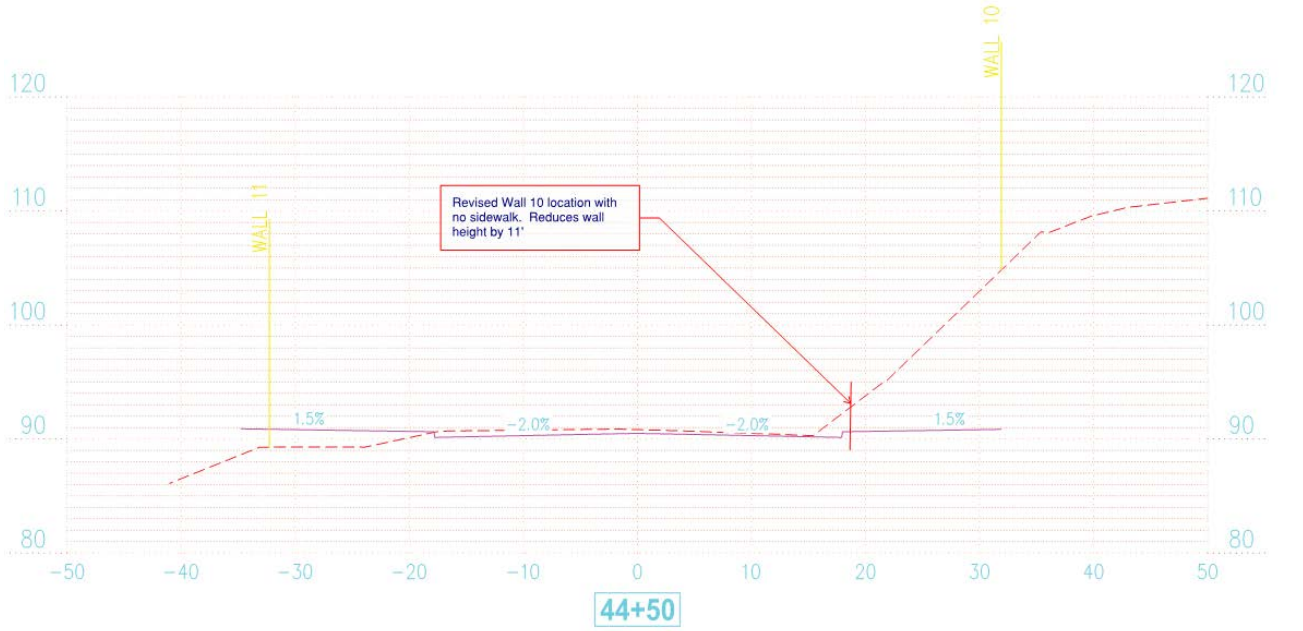
Alternative P2c.

A third alternative would be to instead of using a sidewalk on the south side of this segment is to use a boardwalk perched along the slope to avoid the need for most of the walls. The figure below illustrates the concept.

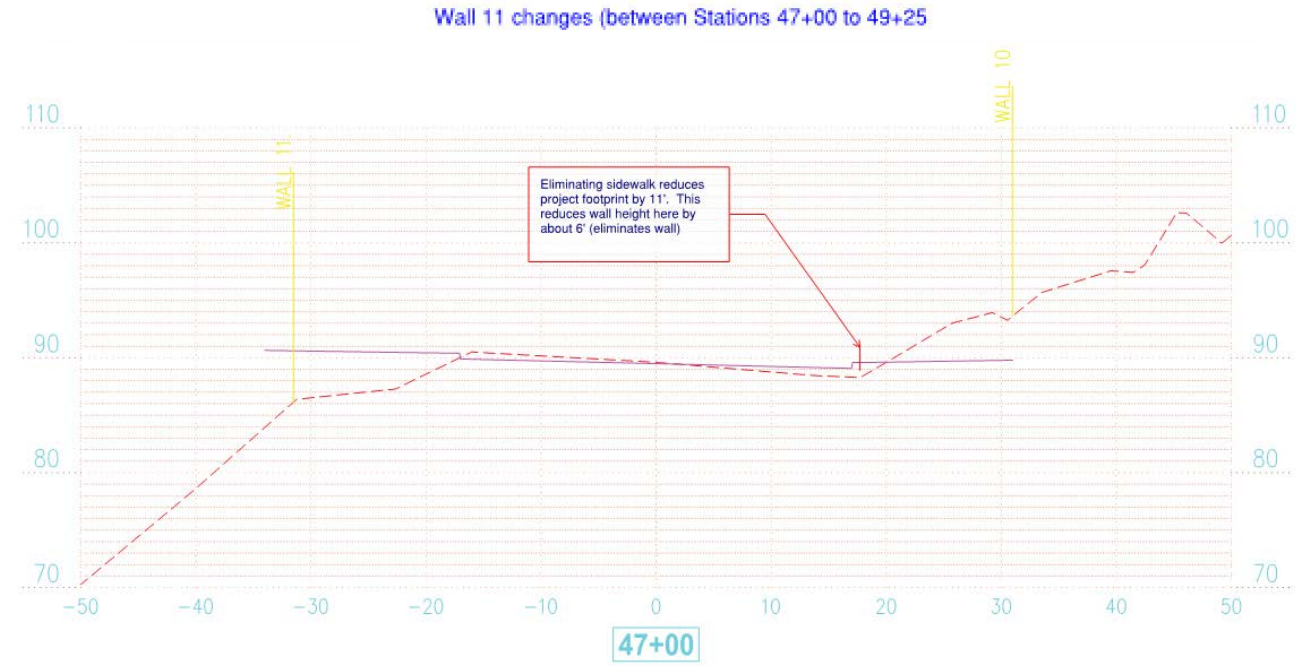


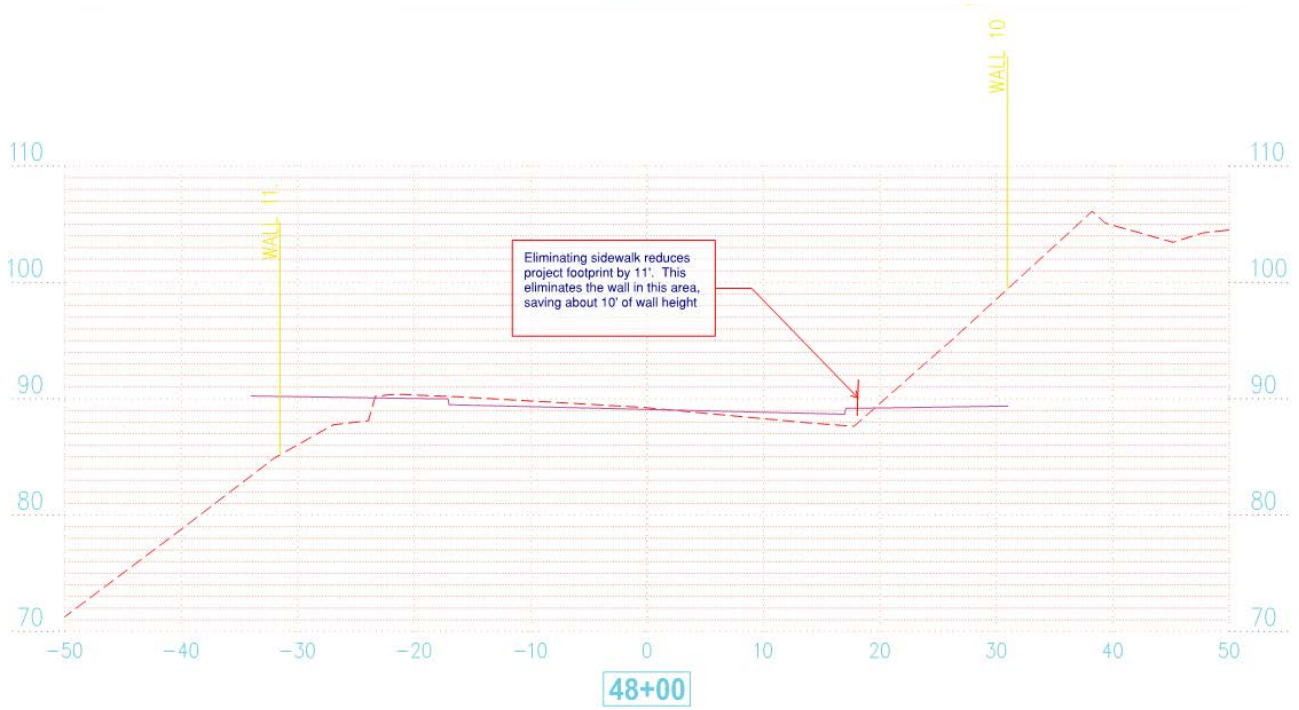
	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD





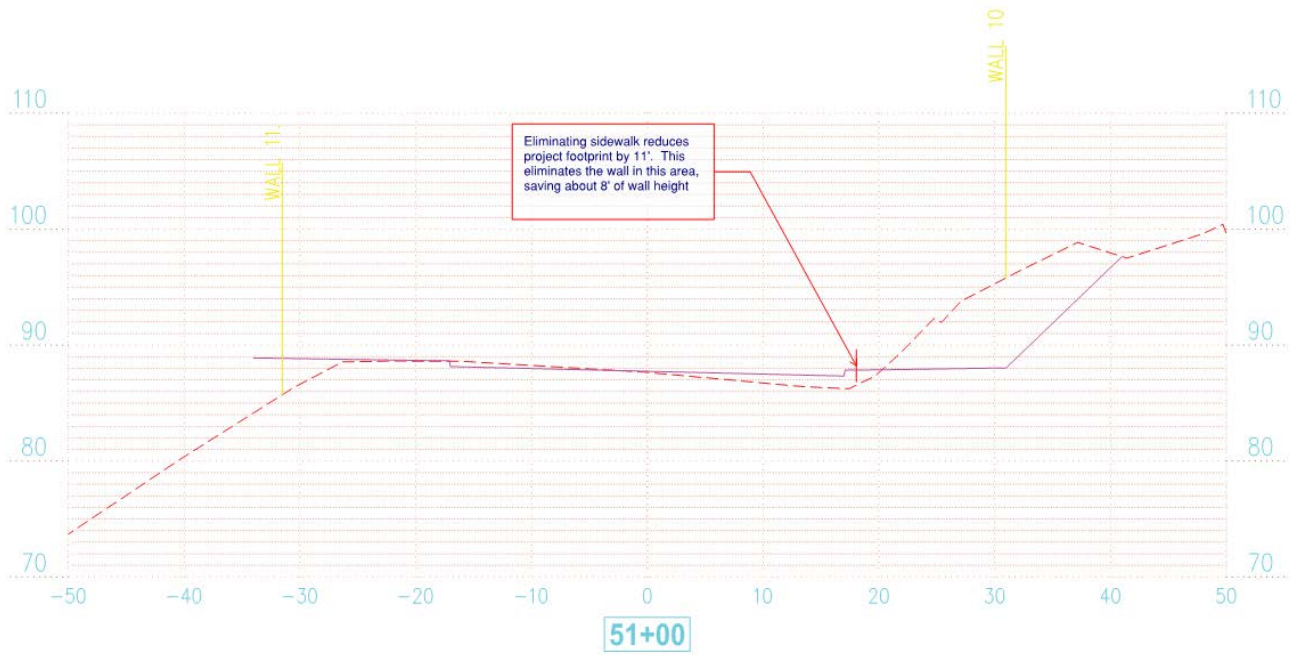
	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

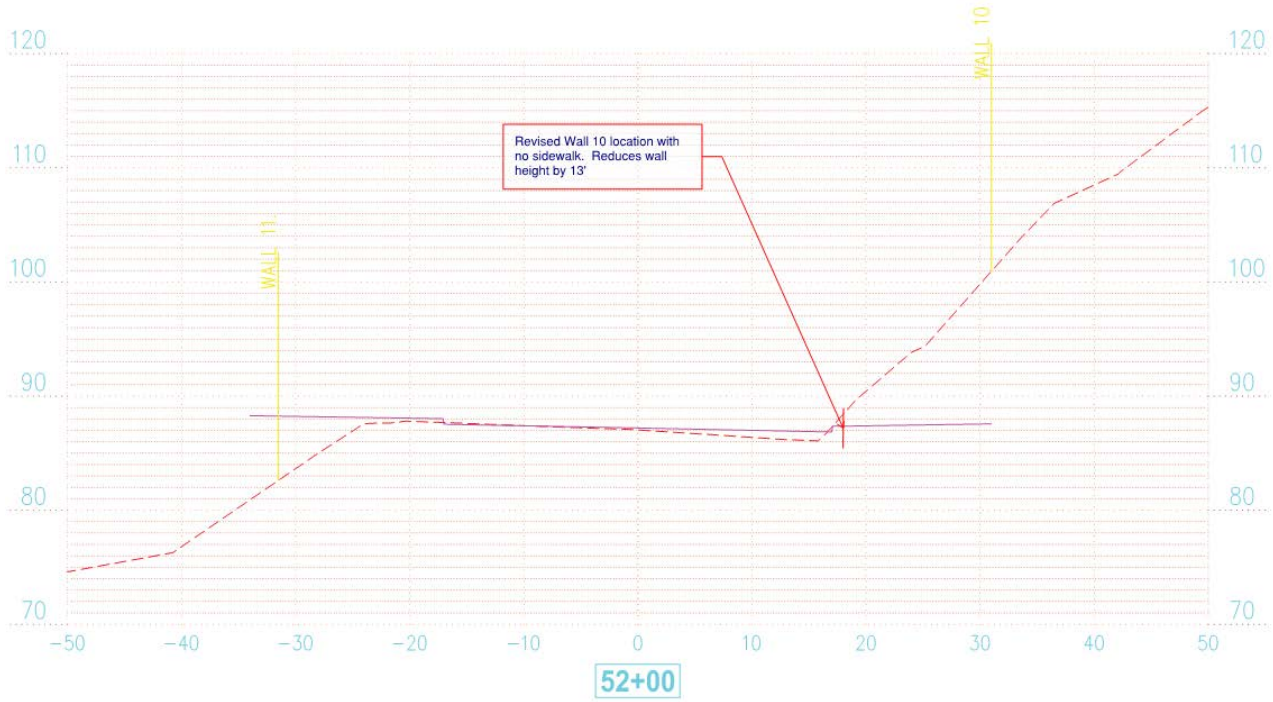




	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

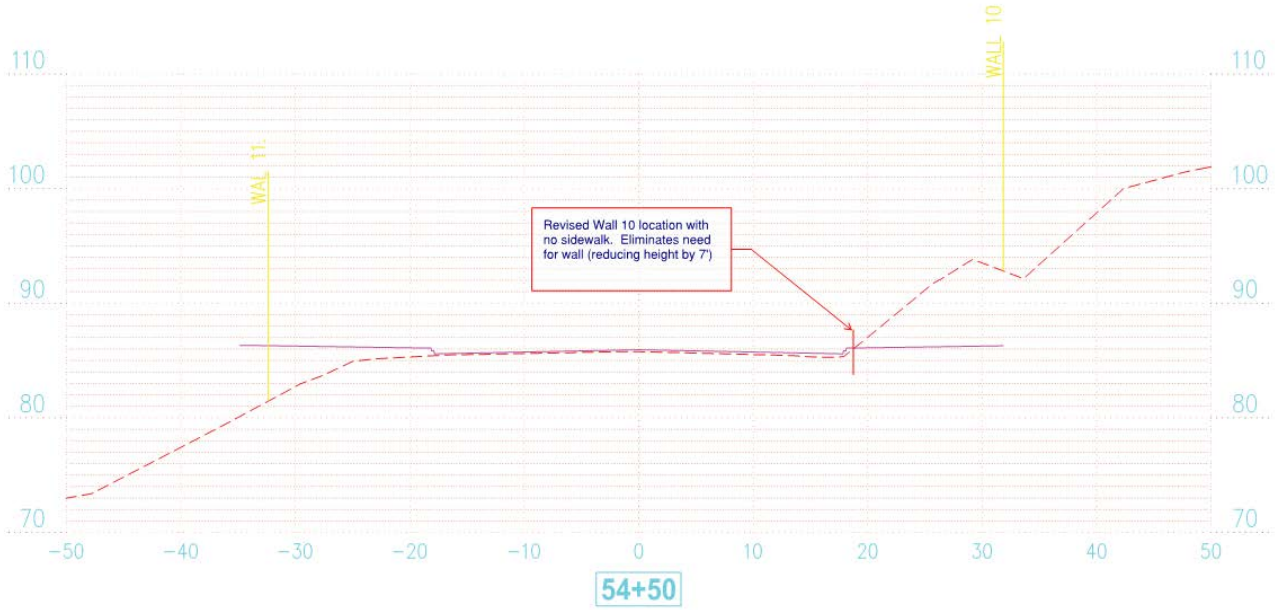
Wall 11 changes (between Stations 50+75 to 52+50

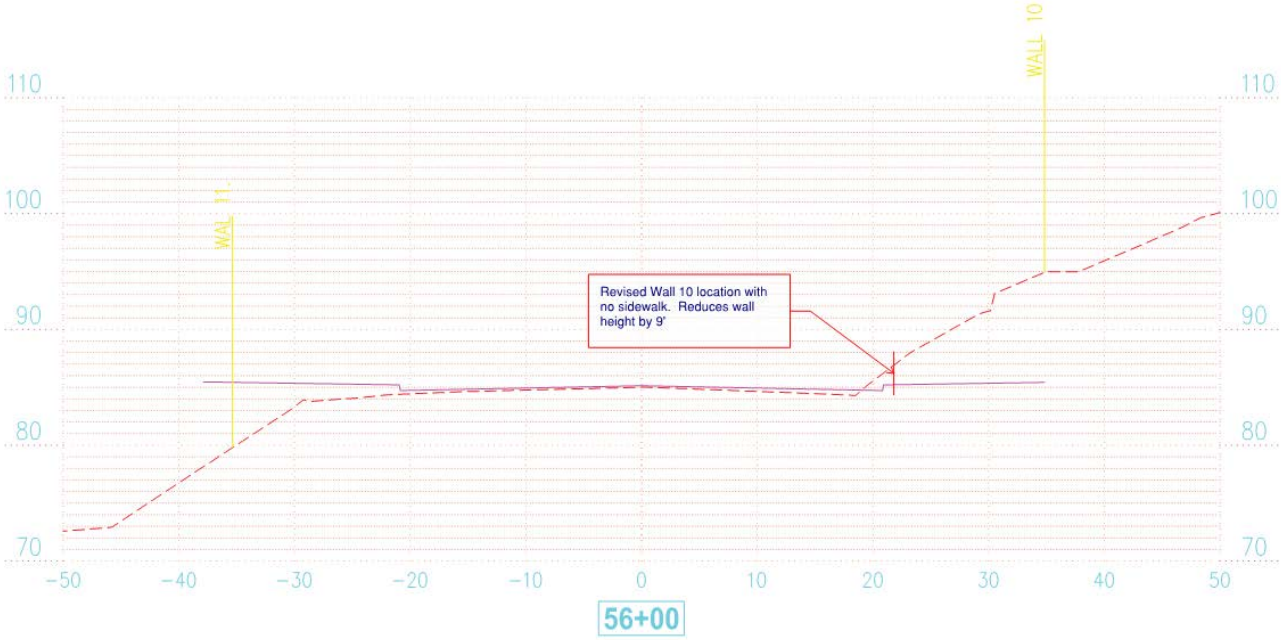




	PROPOSAL	P2
COMPONENT: Sidewalks	**AUTHOR**	PGD

Wall 11 changes (between Stations 54+00 to 56+75)





City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Sidewalks

P2

CURRENT DESIGN					VA PROPOSAL				
ITEM	QTY	UNIT	UNIT COST	TOTAL COST	ITEM	QTY	UNIT	UNIT COST	TOTAL COST
				-					-
Topsoil Type A	3,000	CY	63.25	189,750	Topsoil Type A	2,757	CY	63.25	174,380
Bark or Wood Chip Mulch	550	CY	63.25	34,790	Bark or Wood Chip Mulch	506	CY	63.25	32,000
Fine Compost	350	CY	63.25	22,140	Fine Compost	322	CY	63.25	20,370
PSIPE Shrubs, Grasses, and Groundcovers	5,850	SY	92.00	538,200	PSIPE Shrubs, Grasses, and Groundcovers	5,375	SY	92.00	494,500
Root Barrier	2,680	LF	13.80	36,980	Root Barrier	2,463	LF	13.80	33,990
Irrigation System, Complete	1	LS	132250.00	132,250	Irrigation System, Complete	1	LS	132250.00	119,030
Shaft - 24 In. Diam.	1,236	LF	172.50	213,210	Gravel Backfill Incl. Haul for Modular Block Walls	1,500	TON	28.75	43,130
Shaft - 30 In. Diam.	1,196	LF	172.50	206,310	Shoring or Extra Excavation Class A, Incl. Haul for Walls	0.3	LS	79350.00	19,840
Shaft - 36 In. Diam.	2,108	LF	230.00	484,840	Structure Excavation Class A, Incl. Haul for Walls	1,950	CY	32.20	62,790
Furnishing Soldier Pile - W 14x30 Wide Flange Beams	827	LF	92.00	76,080	Precast Concrete Modular Block Wall	2,100	SF	57.50	120,750
Furnishing Soldier Pile - W 14x43 Wide Flange Beams	445	LF	132.25	58,850	ROW Cost	449,000	SF	30.00	13,470,000
Furnishing Soldier Pile - W 21x44 Wide Flange Beams	495	LF	138.00	68,310					-
Furnishing Soldier Pile - W 21x57 Wide Flange Beams	725	LF	172.50	125,060					-
Furnishing Soldier Pile - W 27x84 Wide Flange Beams	1,446	LF	258.75	374,150					-
Furnishing Soldier Pile - W 27x127 Wide Flange Beams	700	LF	391.00	273,700					-
Timber Lagging	24,240	SF	23.00	557,520					-
Concrete Fascia Panel	20,725	SF	172.50	3,575,060					-
Prefabricated Drainage Mat	866	SY	17.25	14,940					-
Cement Concrete Gutter for Soldier Pile Wall	2,400	LF	46.00	110,400					-
Remove Solider Pile Shaft Obstructions	1	EST	57500.00	57,500					-
Pervious Cem. Conc. Sidewalk	8,520	SY	80.50	685,860					-
ROW Cost	466,200	SF	30.00	13,986,000					-
				-					-
Schedule Duration	12	MO	152759.61	1,833,120	Schedule Duration	8	MO	152759.61	1,222,080
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
Subtotal				23,655,020	Subtotal				15,812,860
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				23,655,000	Total to nearest $1000				15,813,000
					Difference				7,842,000

MENG Analysis

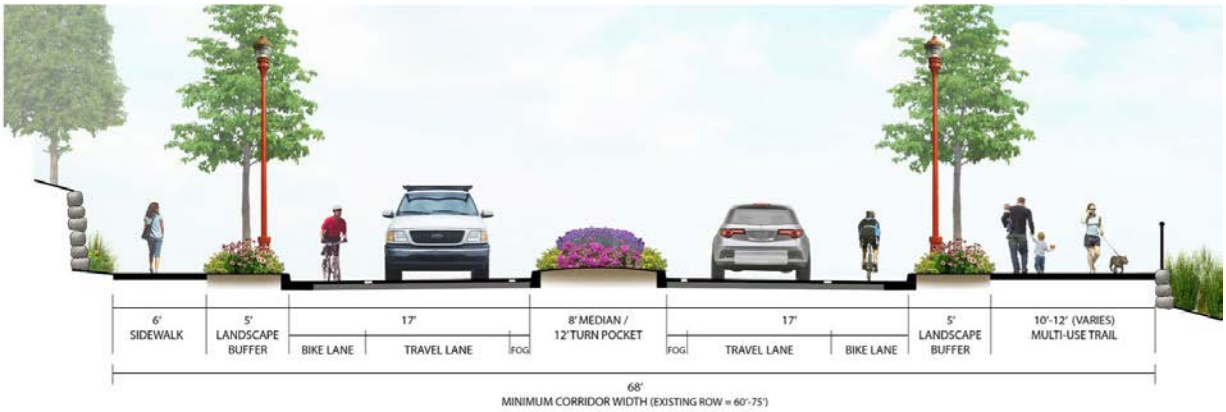
Proposal

P2

	PROPOSAL	P3
COMPONENT: Road Profile – Cross Section	**AUTHOR**	PGD

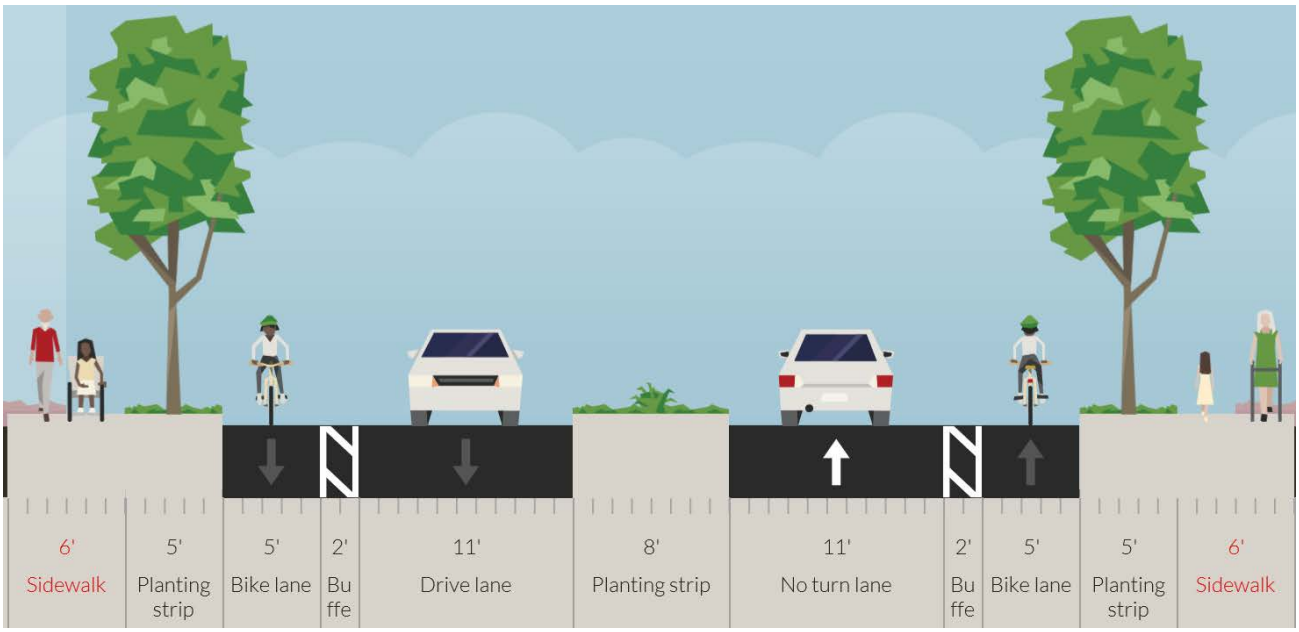
CURRENT CONCEPT:

Current proposal consists of the following typical section:



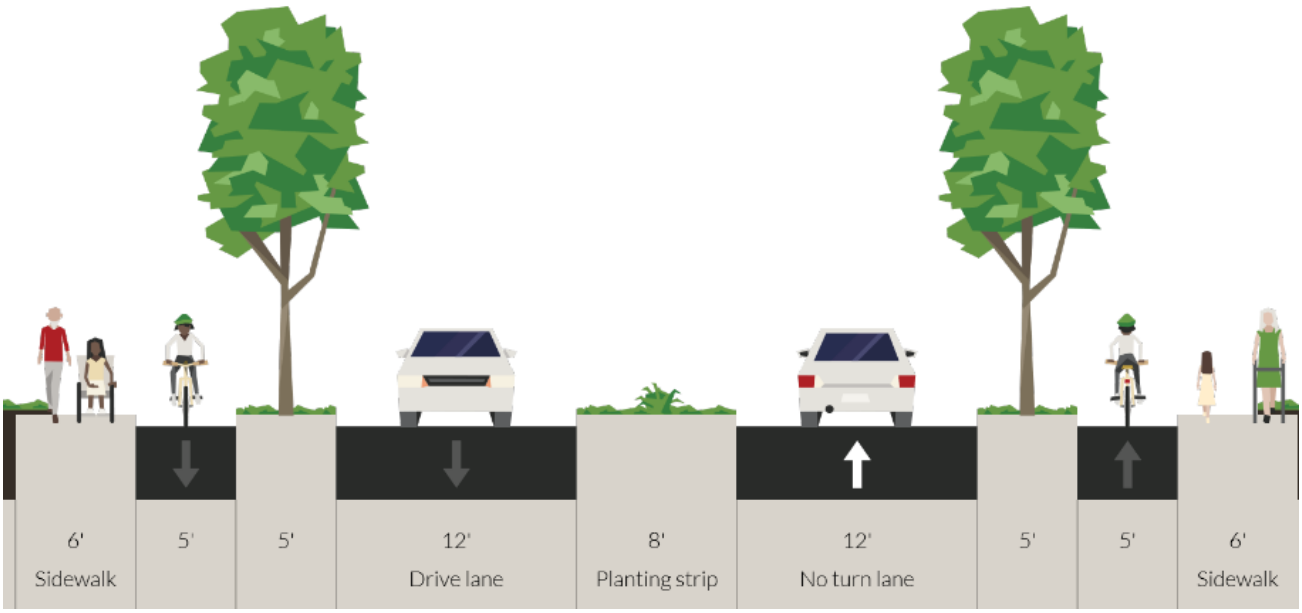
VE CONCEPT:

Modify cross-section to include a protected bike facility on each side, along with a pedestrian sidewalk. Goal is to reduce overall roadway cross-section while maintaining a comfortable experience for all users. The VE proposed concept is illustrated below. It would save 4-feet of width.



	PROPOSAL	P3
COMPONENT: Road Profile – Cross Section	**AUTHOR**	PGD

An alternative section with fully separated bike facilities would save 6-feet of width. The concept is illustrated below:



FUNCTIONS		
Access pedestrians	Accommodate bikes	Increase safety

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 26,114,000	**$** 18,513,000	**$** 7,601,000

	PROPOSAL	P3
COMPONENT: Road Profile – Cross Section	**AUTHOR**	PGD

ADVANTAGES:	**DISADVANTAGES:**
VE Proposed Concept • Reduced wall costs • Reduced right-of-way costs • Provides defined space for all users of the corridor.	VE Proposed Concept • Protected bike facilities are not all that common yet. • There are already some developments in the corridor who are getting ready to build a multi-use trail. If this change is to happen, it needs to be conveyed quickly.
Alternative VE Concept • Reduced wall costs • Reduced right-of-way costs • Reduced impervious area requiring stormwater flow control	Alternative VE Concept • Reduced roadway width would require more median breaks for emergency vehicles to get around vehicles.

DISCUSSION:

Protected bike facilities are becoming a preferred method of accommodating cyclists across the country. A protected bike provides the benefit of having bicyclists visible to the motoring public while also creating buffer spaces for increased safety. The VE proposed concept creates a safe and separated space for all users of the corridor. Each mode travels at different speeds, and the separation provided by the VE proposed concept increases comfort for all users.

The proposed concept would result in a narrow overall roadway section, resulting in lower overall project costs.

Estimate of cost related changes for VE proposed concept:

Save 4-feet of ROW (approximately ½ of total ROW costs).

Save 6-feet of multi-use path (6' x 6300 LF = 37,800 SF)

Save about 40% of the soldier pile wall savings based on the review conducted for P1 (i.e. 2,800 SF).

	PROPOSAL	P3
COMPONENT: Road Profile – Cross Section	**AUTHOR**	PGD

Add 2-feet of roadway paving (2' x 6300 LF = 12,600 SF)

Add 6% of drainage vault cost to account for additional pavement area (2' / 34' = 6%)

Add 6% of water quality (modular wetlands) to account for additional pollution generating pavement area.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Road Profile - Cross Section

P3

CURRENT DESIGN					VA PROPOSAL				
ITEM	QTY	UNIT	UNIT COST	TOTAL COST	ITEM	QTY	UNIT	UNIT COST	TOTAL COST
				-					-
ROW Cost	466,200	SF	30.00	13,986,000	ROW Cost	233,100	SF	30.00	6,993,000
Permeable Ballast Base Course	1,910	TON	57.50	109,830	Permeable Ballast Base Course	966	TON	57.50	55,540
Pervious Cem. Conc. Sidewalk	8,520	SY	80.50	685,860	Pervious Cem. Conc. Sidewalk	4,309	SY	80.50	346,870
Shaft - 24 In. Diam.	1,236	LF	172.50	213,210	Shaft - 24 In. Diam.	1,093	LF	172.50	188,580
Shaft - 30 In. Diam.	1,196	LF	172.50	206,310	Shaft - 30 In. Diam.	1,058	LF	172.50	182,480
Shaft - 36 In. Diam.	2,108	LF	230.00	484,840	Shaft - 36 In. Diam.	1,865	LF	230.00	428,840
Furnishing Soldier Pile - W 14x30 Wide Flange Beams	827	LF	92.00	76,080	Furnishing Soldier Pile - W 14x30 Wide Flange Beams	731	LF	92.00	67,300
Furnishing Soldier Pile - W 14x43 Wide Flange Beams	445	LF	132.25	58,850	Furnishing Soldier Pile - W 14x43 Wide Flange Beams	394	LF	132.25	52,050
Furnishing Soldier Pile - W 21x44 Wide Flange Beams	495	LF	138.00	68,310	Furnishing Soldier Pile - W 21x44 Wide Flange Beams	438	LF	138.00	60,420
Furnishing Soldier Pile - W 21x57 Wide Flange Beams	725	LF	172.50	125,060	Furnishing Soldier Pile - W 21x57 Wide Flange Beams	641	LF	172.50	110,620
Furnishing Soldier Pile - W 27x84 Wide Flange Beams	1,446	LF	258.75	374,150	Furnishing Soldier Pile - W 27x84 Wide Flange Beams	1,279	LF	258.75	330,930
Furnishing Soldier Pile - W 27x127 Wide Flange Beams	700	LF	391.00	273,700	Furnishing Soldier Pile - W 27x127 Wide Flange Beams	619	LF	391.00	242,080
Timber Lagging	24,240	SF	23.00	557,520	Timber Lagging	21,440	SF	23.00	493,120
Concrete Fascia Panel	20,725	SF	172.50	3,575,060	Concrete Fascia Panel	18,331	SF	172.50	3,162,100
Prefabricated Drainage Mat	866	SY	17.25	14,940	Prefabricated Drainage Mat	766	SY	17.25	13,210
Cement Concrete Gutter for Soldier Pile Wall	2,400	LF	46.00	110,400	Cement Concrete Gutter for Soldier Pile Wall	2,123	LF	46.00	97,650
Remove Solider Pile Shaft Obstructions	1	EST	57500.00	57,500	Remove Solider Pile Shaft Obstructions	1	EST	57500.00	50,860
Roadway Excavation Incl. Haul	12,400	CY	32.20	399,280	Roadway Excavation Incl. Haul	13,129	CY	32.20	422,770
Gravel Borrow Incl. Haul	6,610	TON	28.75	190,040	Gravel Borrow Incl. Haul	6,999	TON	28.75	201,220
Crushed Surfacing Top Course	600	TON	43.70	26,220	Crushed Surfacing Top Course	635	TON	43.70	27,760
Crushed Surfacing Base Course	4,090	TON	34.50	141,110	Crushed Surfacing Base Course	4,331	TON	34.50	149,410
HMA Cl. 1/2" PG 64-22	6,560	TON	115.00	754,400	HMA Cl. 1/2" PG 64-22	6,946	TON	115.00	798,780
HMA Cl. 1/2" PG 64-22 for Overlay	3,710	TON	115.00	426,650	HMA Cl. 1/2" PG 64-22 for Overlay	3,928	TON	115.00	451,750
HMA Cl. 1/2" PG 64-22 for Utility Trench	1,360	TON	115.00	156,400	HMA Cl. 1/2" PG 64-22 for Utility Trench	1,440	TON	115.00	165,600
HMA Cl. 1" PG 64-22 for Prelevel	680	TON	103.50	70,380	HMA Cl. 1" PG 64-22 for Prelevel	720	TON	103.50	74,520
Detention Vault	1	LS	747500.00	747,500	Detention Vault	1	LS	747500.00	792,350
Modular Wetland 4' x 4'	12	EA	28750.00	345,000	Modular Wetland 4' x 4'	13	EA	28750.00	365,700
Modular Wetland 4' x 8'	1	EA	46000.00	46,000	Modular Wetland 4' x 8'	1	EA	46000.00	48,760
				-					-
Schedule Duration	12	MO	152759.61	1,833,120	Schedule Duration	14	MO	152759.61	2,138,630
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
Subtotal				26,113,720	Subtotal				18,512,900
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				26,114,000	Total to nearest $1000				18,513,000
					Difference				7,601,000

MENG Analysis

Proposal

P3

	PROPOSAL	S1
COMPONENT: Retaining Walls - Finish	**AUTHOR**	JM/BB

CURRENT CONCEPT:

Soldier pile and soldier pile tieback walls utilize conventional 8” thick cast-in-place concrete fascias.

VE CONCEPT:

Change fascia type to sculpted shotcrete 6” thick.

FUNCTIONS		
Provide space	Stabilize hillside	Minimize ROW

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 2,399,000	**$** 947,000	**$** 1,452,000

ADVANTAGES:

- Substantial cost savings.
- Speed of construction.
- Thinner than cast-in-place.
- Realistic finish to match natural surroundings.
- Aesthetically pleasing.

DISADVANTAGES:

- Different aesthetic.
- Perceived quality and durability.

DISCUSSION:

Traditional CIP fascias can be time consuming to construct, as they require building front forms and generally require thicker sections to facilitate concrete placement. Shotcrete, on the other hand, does not require the use of a front form system. This speeds up construction considerably. Since not a contained form system, shotcrete can also be placed in thinner applications, saving material.

Aesthetic treatments for cast-in-place fascias are achieved by utilizing formliners. The finishes are limited to what is available commercially and tend to produce very repetitive finishes. Alternatively, shotcrete can be sculpted after placement by shotcrete artists and can produce very realistic looking finishes that are not repetitive and don't require purchasing or renting formliners.

INSTALLATION PROCESS:

Shotcrete is defined as “mortar or concrete pneumatically projected at high velocity onto a surface.”

Prior to application of shotcrete to the face of the wall, shear studs will be applied to the piles (or soil nail bearing plates) and the wall fascia rebar is placed. For this project, a concrete mix will be produced and premixed similar to traditional concrete. The concrete is then placed into delivery equipment. The material is forced through a delivery hose to the nozzle where compressed air is injected to increase velocity and is then “shot” or sprayed onto the surface.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Retaining Walls - Finish

S1

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Concrete Fascia Panel	20,725	SF	86.25	1,787,530	6" Sculpted Shotcrete	20,725	SF	30.94	641,140
				-					-
Schedule Duration	4	MO	152759.61	611,040	Schedule Duration	2	MO	152759.61	305,520
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
				-					-
Subtotal				2,398,570	Subtotal				946,660
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				2,399,000	Total to nearest $1000				947,000
					Difference				1,452,000

MENG Analysis

Proposal

S1

	PROPOSAL	S2
COMPONENT: Retaining Walls – Structure	**AUTHOR**	BRB

CURRENT CONCEPT:

Soldier pile walls for cut slopes.

VE CONCEPT:

Soil nail walls for cut slopes.

FUNCTIONS		
Resupport cut slopes	Reduce ROW acquisition	Aesthetic finish

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 6,763,000	**$** 2,843,000	**$** 3,920,000

ADVANTAGES:

- Effective long-term support of near-vertical cut slope.
- Top-down construction (no temporary shoring).
- Less cost.

DISADVANTAGES:

- Requires temporary cuts that are stable up to 5 feet high.
- Requires reasonably competent soils for nail reinforcement.
- No groundwater issues during construction.
- Nails require subsurface easement.

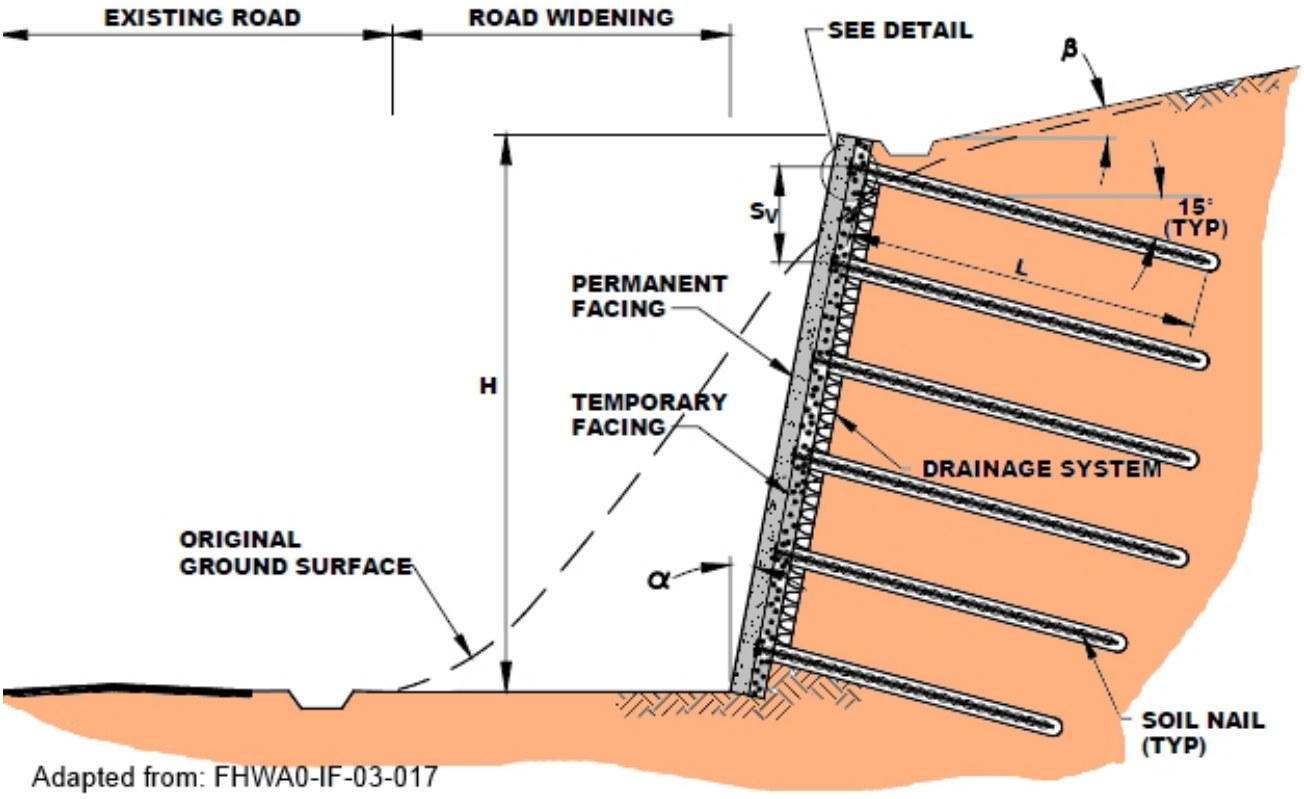
DISCUSSION:

The current concept for slope resupport of soil cuts along the uphill side of Newport Way, primarily at the east part of the alignment, is to use soldier pile walls. In brief, a soldier pile wall involves predrilling large diameter holes at 4- to 8-foot, center-to-center spacing that are pre-installed prior to cut excavation, thus allowing for top-down construction. Cantilever soldier pile walls are typically effective in cut situations for wall heights of less than 12 to 14 feet. Higher soldier pile walls require support along the steel column referred to as “tiebacks” to redistribute the lateral load and require a subsurface easement for the tiebacks. Soldier piles walls are common applications where subsurface soil conditions are

	PROPOSAL	S2
COMPONENT: Retaining Walls – Structure	**AUTHOR**	BRB

less known and may be needed to stabilize a landslide. For this reason, a soldier pile wall installation is more adaptive to varying subsurface soil and groundwater conditions.

Alternatively, a soil nail wall can be considered, which is lower in cost and provides "top-down" construction; similar to a soldier pile wall. A soil nail wall could be used to support near vertical cut slopes up to 20 feet high as proposed for this project. A soil nail wall is constructed by excavating 4- to 5-foot high cut benches where the "soil nails" are installed at an incline into the cut slope soils. The face of the cut is then treated with a structural grout (shotcrete); this process of cut slope/bench, nail installation and shotcreting continues until the full height of the wall is achieved. Primary assumptions for successful soil nail wall installation include competent soils in the backslope area that can have adequate stand-up time (no caving), no groundwater seepage. Detailed investigation of soil and groundwater conditions is necessary to reduce the risk of changes that could affect soil nail wall design. Global stability of the soil nail wall system is imperative because of this type of slope resupport is not effective for stabilizing landslides.



Adapted from: FHWA0-IF-03-017

VALUE ENGINEERING

	PROPOSAL	S2
COMPONENT: Retaining Walls – Structure	**AUTHOR**	BRB

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Retaining Walls - Structure

S2

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Shaft - 24 In. Diam.	1236	LF	150	185,400	25ft Soil Nails	970	EA	1200.00	1,164,000
Shaft - 30 In. Diam.	1196	LF	150	179,400	6" Shotcrete Wall	24,240	SF	30.94	749,880
Shaft - 36 In. Diam.	2108	LF	200	421,600	Prefabricated Drainage Mat	866	SY	15.00	12,990
Furnishing Soldier Pile - W 14x30 Wide Flange Beams	827	LF	80	66,160					-
Furnishing Soldier Pile - W 14x43 Wide Flange Beams	445	LF	115	51,180					-
Furnishing Soldier Pile - W 21x44 Wide Flange Beams	495	LF	120	59,400					-
Furnishing Soldier Pile - W 21x57 Wide Flange Beams	725	LF	150	108,750					-
Furnishing Soldier Pile - W 27x84 Wide Flange Beams	1446	LF	225	325,350					-
Furnishing Soldier Pile - W 27x127 Wide Flange Beams	700	LF	340	238,000					-
Timber Lagging	24240	SF	20	484,800					-
Concrete Fascia Panel	20725	SF	150	3,108,750					-
Prefabricated Drainage Mat	866	SY	15	12,990					-
Pile Wall	2400	LF	40	96,000					-
Remove Solider Pile Shaft Obstructions	1	EST	50000	50,000					-
				-					-
Schedule Duration	9.0	MO	152759.61	1,374,840	Schedule Duration	6	MO	152759.61	916,560
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				6,762,620	Subtotal				2,843,430
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				6,763,000	Total to nearest $1000				2,843,000
					Difference				3,920,000

MENG Analysis

Proposal

S2

	PROPOSAL	S3
COMPONENT: Fill Walls – Structure	**AUTHOR**	BRB

CURRENT CONCEPT:

Structural Earth Walls (SEWs) in fill sections.

VE CONCEPT:

Soldier pile wall in fill sections.

FUNCTIONS		
Structural support of fill	Provide space for utility installation	Avoid existing underground utility conflicts (possible job delays)

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 3,541,000	**$** 3,342,000	**$** 199,000

ADVANTAGES:

- Equally effective (compared to SEWs) for long-term support of fill.
- Provides for standard structural fill placement (no geogrids).
- Provides for unrestricted space for underground utility installation in the fill section.
- Better global stability results.
- Use of standard structural fill (no geogrids).

DISADVANTAGES:

- Higher cost by itself, but may be offset by sharing mobilization costs with other soldier piles being installed.

DISCUSSION:

The current concept for widening the existing the south side of the road uses SEWs. SEWs require geogrid reinforcement within the fill for internal stability of this type of wall system. The geogrid length can vary from 0.7H to 1H (H = wall height). Alterations of the geogrids is not allowed therefore restricting excavations for underground utilities within the reinforced fill zone. SEWs require well-drained fill, of which none is expected in on-site excavations

	PROPOSAL	S3
COMPONENT: Fill Walls – Structure	**AUTHOR**	BRB

within the project site. We expect that all well-drained fill will be imported for the reinforced fill zone for SEWs.

Alternatively, a soldier pile wall can be installed in a fill section that can utilize standard structural fill backfill. This new structural fill prism can be constructed of properly moisture conditioned structural fill (no geogrids) and will provide space for new underground utility installation within the new fill area along the north side of the project. A soldier pile wall will provide better global stability results compared with SEW, Hilfiker or gravity block walls.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Fill Walls - Structure

S3

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Gravel Backfill Incl. Haul for Modular Block Walls	5990	TON	28.75	172,210	Shaft - 36 In. Diam.	2,780	LF	230.00	639,400
Shoring or Extra Excavation Class B, Incl. Haul	1	LS	201250	201,250	Furnishing Soldier Pile - W 27x84 Wide Flange Beams	3,661	LF	258.75	947,280
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350	79,350	Timber Lagging	15,245	SF	23.00	350,640
Precast Concrete Modular Block Wall	21830	SF	57.5	1,255,230	Structure Excavation Class A, Incl. Haul for Walls	926	CY	32.20	29,810
				-					-
				-					-
Schedule Duration	12.0	MO	152759.61	1,833,120	Schedule Duration	9	MO	152759.61	1,374,840
(Contractor overhead cost/month -				-	***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				3,541,160	Subtotal				3,341,970
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				3,541,000	Total to nearest $1000				3,342,000
					Difference				199,000

MENG Analysis

Proposal

S3

	PROPOSAL	S4
COMPONENT: Wall Structure – Welded Wire Face Wall	**AUTHOR**	BRB

CURRENT CONCEPT:

Structural Earth Walls (SEWs) in fill sections.

VE CONCEPT:

Use welded-wire faced walls (Hilfiker Wall) in fill sections.

FUNCTIONS		
Structural support of fill	Provide space for utility installation	Avoid existing underground utility conflicts (possible job delays)

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 3,541,000	**$** 3,388,000	**$** 153,000

ADVANTAGES:

- Equally effective (compared to SEWs) for long-term support of fill.
- Provides for standard structural fill placement.
- Provides for unrestricted space for underground utility installation in the fill section.
- Better similar stability results.
- Use of standard structural fill.
- Reduce cost.

DISADVANTAGES:

- Large size of structure reduces some structural fill space that could be used by new underground utilities.

DISCUSSION:

The current concept for widening the existing the south side of the road uses SEWs. SEWs require geogrid reinforcement within the fill for internal stability of this type of wall system. The geogrid length can vary from 0.7H to 1H (H = wall height). Alterations of the geogrids is not allowed therefore restricting excavations for underground utilities within the reinforced

	PROPOSAL	S4
COMPONENT: Wall Structure – Welded Wire Face Wall	**AUTHOR**	BRB

fill zone. SEWs require well-drained fill, of which none is expected in excavations within the project site. We expect that all well-drained fill will be imported for the reinforced fill zone for SEWs.

Alternatively, a Hilfiker wall system can be installed in a fill section that uses standard structural fill. This new structural fill prism can be constructed of properly moisture conditioned structural fill (no geogrids) and will provide space for new underground utility installation within the new fill area along the north side of the project. A Hilfiker wall system should provide better global stability results than SEWs or gravity block walls.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Wall Structure - Welded Wire Face Wall

S4

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Gravel Backfill Incl. Haul for Modular Block Walls	5990	TON	28.75	172,210	Gravel Backfill Incl. Haul for Modular Block Walls	5,990	TON	28.75	172,210
Shoring or Extra Excavation Class B, Incl. Haul	1	LS	201250	201,250	Shoring or Extra Excavation Class B, Incl. Haul	1	LS	201250.00	201,250
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350	79,350	Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	79,350
Precast Concrete Modular Block Wall	21830	SF	57.5	1,255,230	Welded Wire Fabric Walls	21,830	SF	57.50	1,255,230
				-					-
				-					-
Schedule Duration	12.0	MO	152759.61	1,833,120	Schedule Duration	11	MO	152759.61	1,680,360
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				3,541,160	Subtotal				3,388,400
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				3,541,000	Total to nearest $1000				3,388,000
					Difference				153,000

MENG Analysis

Proposal

S4

	PROPOSAL	S5
COMPONENT: Fill Wall Structure – Gravity Block	**AUTHOR**	BRB

CURRENT CONCEPT:

Structural Earth Walls (SEWs) in Fill Sections.

VE CONCEPT:

Gravity Block Walls (Red-Rock/Ultrablock) in Fill Sections.

FUNCTIONS		
Structural support of fill	Provide space for utility installation	Avoid existing underground utility conflicts (possible job delays)

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 3,541,000	**$** 3,388,000	**$** 153,000

ADVANTAGES:

- Equally effective (compared to SEWs) for long-term support of fill.
- Standard structural fill backfill (no geogrids).
- Provides space for underground utility installation (no geogrids).
- Reduced cost.
- Shorten schedule.

DISADVANTAGES:

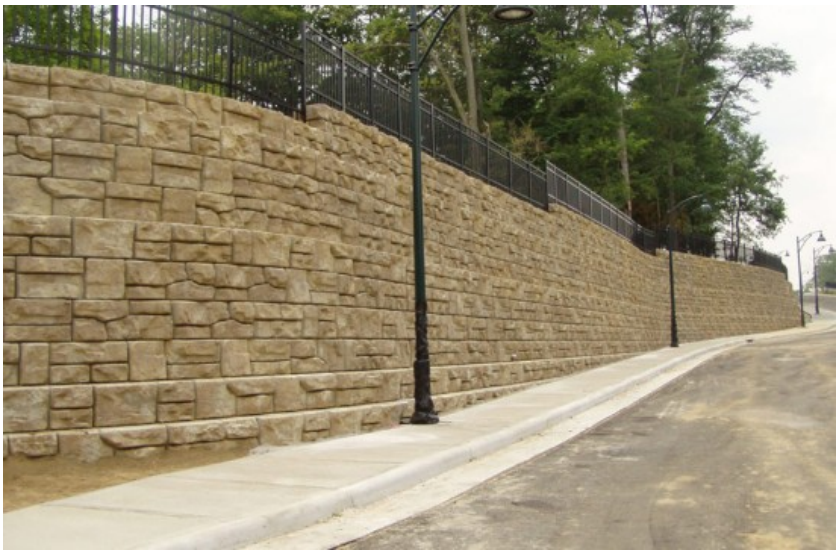
- Similar to that as SEWs.

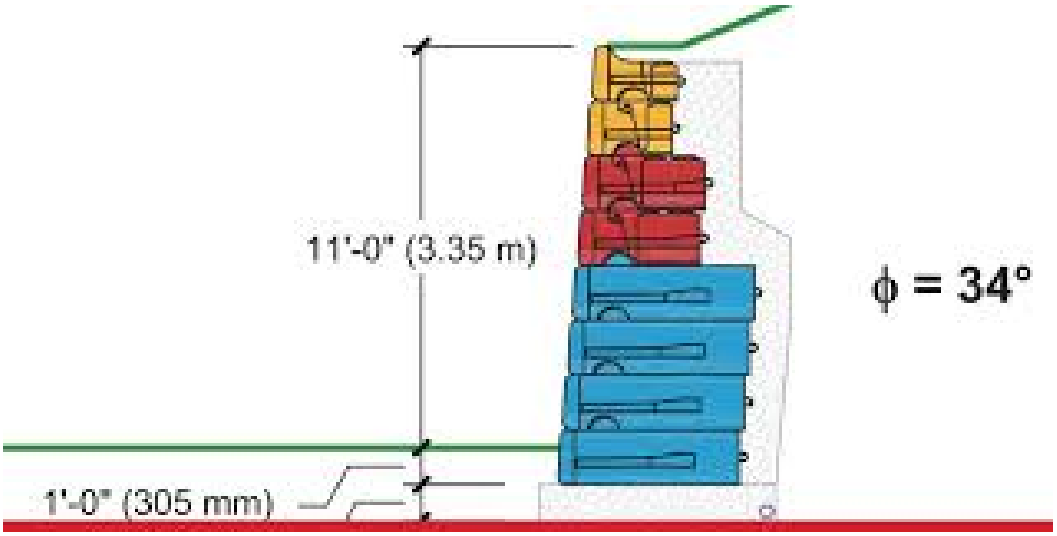
DISCUSSION:

The current concept for widening the existing the south side of the road uses SEWs. SEWs require geogrid reinforcement within the fill for internal stability of this type of wall system. The geogrid length can vary from 0.7H to 1H (H = wall height). Alterations of the geogrids is not allowed therefore restricting excavations for underground utilities within the reinforced fill zone. SEWs require well-drained fill, of which none is expected in excavations within the project site. We expect that all well-drained fill will be imported for the reinforced fill zone for SEWs.

	PROPOSAL	S5
COMPONENT: Fill Wall Structure – Gravity Block	**AUTHOR**	BRB

Alternatively, a gravity block wall can be installed in a fill section that can utilize standard structural fill backfill. This new structural fill prism can be constructed of properly moisture conditioned structural fill (no geogrids) and will provide space for new underground utility installation within the new fill area along the north side of the project. A gravity block wall should provide similar global stability results compared to a SEW or Hilfiker wall.





City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Fill Wall Structure - Gravity Block

S5

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Gravel Backfill Incl. Haul for Modular Block Walls	5990	TON	28.75	172,210	Gravel Backfill Incl. Haul for Modular Block Walls	5,990	TON	28.75	172,210
Shoring or Extra Excavation Class B, Incl. Haul	1	LS	201250	201,250	Shoring or Extra Excavation Class B, Incl. Haul	1	LS	201250.00	201,250
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350	79,350	Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	79,350
Precast Concrete Modular Block Wall	21830	SF	57.5	1,255,230	Welded Wire Fabric Walls	21,830	SF	57.50	1,255,230
				-					-
				-					-
Schedule Duration	12.0	MO	152759.61	1,833,120	Schedule Duration	11	MO	152759.61	1,680,360
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				3,541,160	Subtotal				3,388,400
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				3,541,000	Total to nearest $1000				3,388,000
					Difference				153,000

MENG Analysis

Proposal

S5

	PROPOSAL	S6
COMPONENT: Retaining Walls – Grade Slope	**AUTHOR**	JM/BB

CURRENT CONCEPT:

Based on the existing topography in the vicinity of the Hildreth property, Wall 2 is needed to contain fills within City ROW.

VE CONCEPT:

Since Wall 2 is very tall, work with the property owner to regrade their parcel. This could improve the site for future development as well as reduce or eliminate Wall 2 (6,600 sf).

FUNCTIONS		
Provide space	Stabilize hillside	Support trail

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 1,562,000	**$** 1,101,000	**$** 461,000

ADVANTAGES:

- Reduce cost.
- Benefit to future development of the property.
- Constructability.

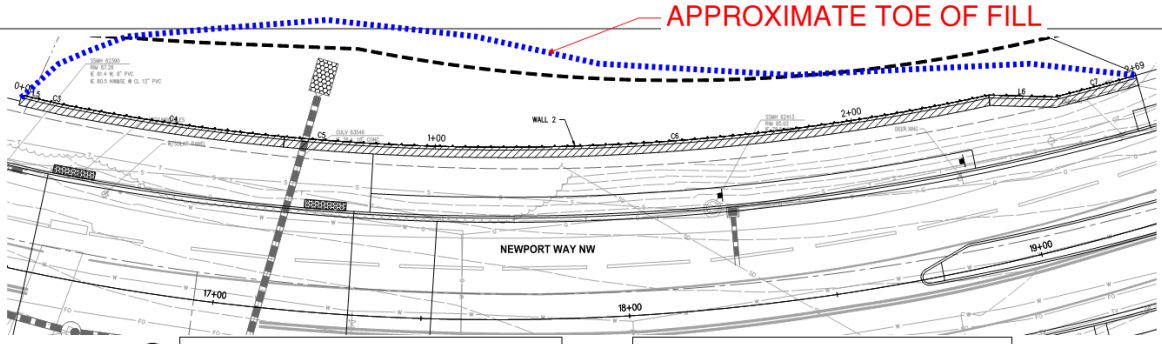
DISADVANTAGES:

- Permission and concurrence from property owner.
- Requires slope easement.

DISCUSSION:

Wall 2 is currently a block faced structural earth wall that is approximately 300 ft. long and up to approximately 20 ft. tall. This proposal would eliminate Wall 2 by placing a fill slope that catches onto the Hildreth Parcel. A slope easement would be required. This could provide a dual benefit to the City and Property owner by leveling out the site and bringing it up to the roadway grade. It would also eliminate a possible pinch point between the temporary roadway and the excavation that would be needed to install soil reinforcing.

	PROPOSAL	S6
COMPONENT: Retaining Walls – Grade Slope	**AUTHOR**	JM/BB

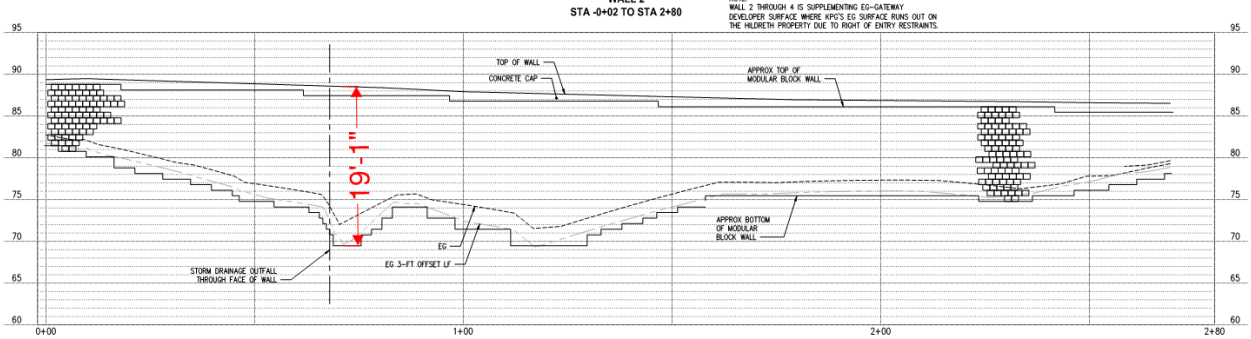


WALL 2								
NUMBER	START STA	NORTHING	EASTING	LENGTH	BRNG/DELTA	RADIUS	PI STA	TAN
L5	0+00.00	203489.59	1333716.10	6.80'	S 9°25'25" E			
C3	0+06.80	203482.88	1333717.21	3.21'	1°08'20"	161.45'	0+08.40	1.60'
C4	0+10.01	203479.72	1333717.77	53.78'	5°36'54"	548.73'	0+36.92	26.91'
C5	0+63.79	203427.62	1333731.01	17.76'	0°02'40"	22855.82'	0+72.67	8.88'

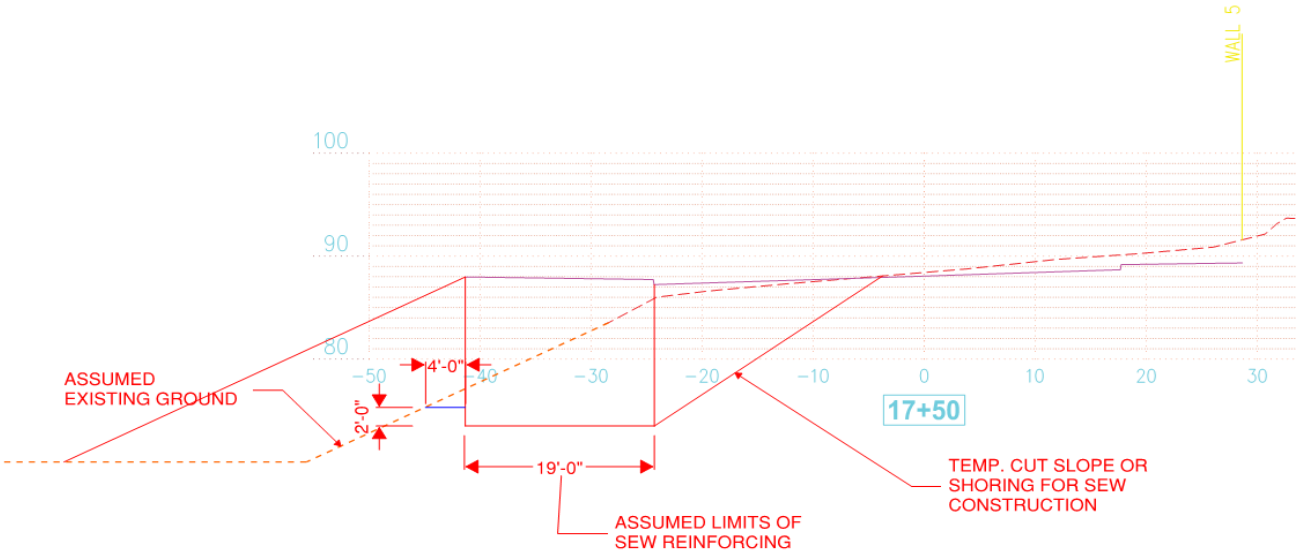
WALL 2								
NUMBER	START STA	NORTHING	EASTING	LENGTH	BRNG/DELTA	RADIUS	PI STA	TAN
C6	0+81.55	203410.73	1333736.49	151.97'	15°51'55"	548.84'	1+58.02	76.48'
L6	2+33.52	203275.57	1333804.92	15.80'	S 20°55'07" E			
C7	2+49.32	203260.81	1333810.56	20.07'	2°04'49"	552.84'	2+59.36	10.04'

WALL 2
STA -0+02 TO STA 2+80

NOTE:
WALL 2 THROUGH 4 IS SUPPLEMENTING EG-GATEWAY DEVELOPER SURFACE WHERE KPC'S EG SURFACE RUNS OUT ON THE HILDRETH PROPERTY DUE TO RIGHT OF ENTRY RESTRAINTS.



PROFILE



WALL 2 CROSS SECTION

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Retaining Walls - Grade Slope

S6

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Precast Concrete Modular Block Wall	7,942	SF	57.50	456,670	Structural Fill	6,735	CY	50.00	336,750
Gravel Backfill Incl. Haul for Modular Block Walls	4,493	TON	28.75	129,160					-
Shoring or Extra Excavation Class A, Incl. Haul for Walls	1	LS	79350.00	59,510					-
				-					-
				-					-
				-					-
				-					-
				-					-
Schedule Duration	6	MO	152759.61	916,560	Schedule Duration	5	MO	152759.61	763,800
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				1,561,900	Subtotal				1,100,550
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				1,562,000	Total to nearest $1000				1,101,000
					Difference				461,000

MENG Analysis

Proposal

S6

	PROPOSAL	S7
COMPONENT: Pedestrian Bridge – Corridor Character	**AUTHOR**	JM/BB

CURRENT CONCEPT:

Pedestrian bridges consist of precast concrete voided slab superstructures supported on deep foundations. The Tibbetts Creek Trail Bridge is currently 12'-0" wide by 40'-0" long.

VE CONCEPT:

Utilize a bridge superstructure type that provides a "Gateway" aesthetic at Tibbetts Creek Pedestrian Crossing (e.g. timber arch, steel truss, etc.) 12'-0" wide by 60'-0" long.

FUNCTIONS		
Avoid stream	Define character	Support trail

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 651,000	**$** 494,000	**$** 157,000

ADVANTAGES:

- Added value through defining corridor character and taking advantage of "gateway" opportunity.
- Prefabricated structure can reduce installation time.
- Can increase span, further protecting sensitive areas.

DISADVANTAGES:

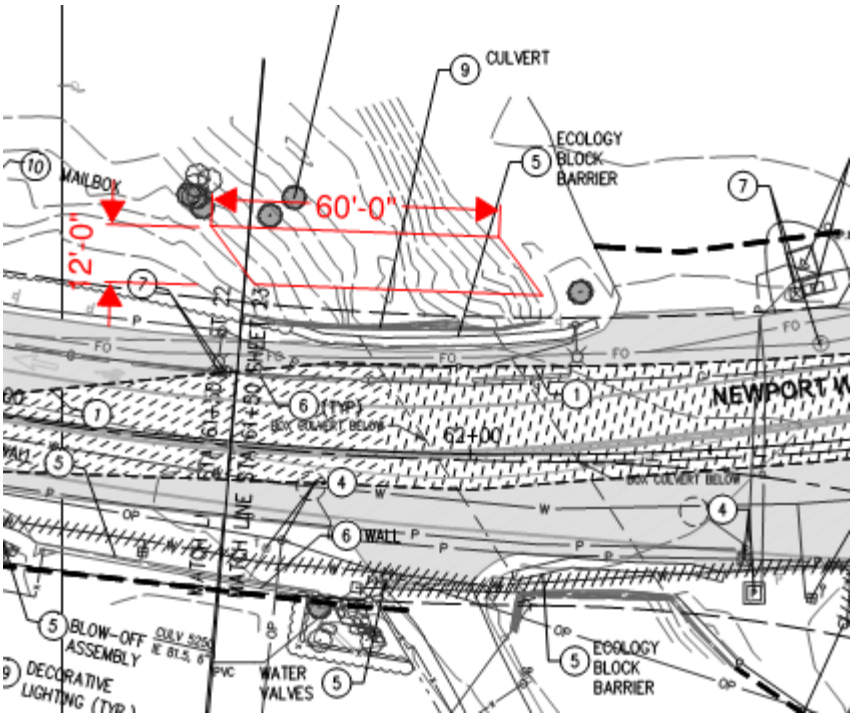
Potentially added cost depending on type of structure selected.

DISCUSSION:

The location of the Tibbetts Creek Pedestrian Bridge presents a unique opportunity to define the character of the corridor. Since the bridge is relatively small, it could be changed to a structure type that provides more of a "Gateway" feel, adding aesthetic value to the project at little or no added cost.

	PROPOSAL	S7
COMPONENT: Pedestrian Bridge – Corridor Character	**AUTHOR**	JM/BB

With a timber arch or steel through truss type structure, the span could also be increased. This would reduce impacts to Tibbetts Creek and provide room for future enhancements to the creek, by moving the foundations farther away from the creek.



Example Timber Arch Pedestrian Bridges

	PROPOSAL	S7
COMPONENT: Pedestrian Bridge – Corridor Character	**AUTHOR**	JM/BB

Confluence Park Pedestrian Bridge over Issaquah Creek

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Pedestrian Bridge - Corridor Character

S7

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Pedestrian Bridge	1	EA	345000	345,000	Pedestrian Bridge (Timber Arch)	1	EA	265000	265,000
				-					-
				-					-
				-					-
				-					-
				-					-
				-					-
Schedule Duration	2	MO	152760	305,520	Schedule Duration	1.5	MO	152760	229,140
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
				-					-
Subtotal				650,520	Subtotal				494,140
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				651,000	Total to nearest $1000				494,000
					Difference				157,000

MENG Analysis

Proposal

S7

	PROPOSAL	S8
COMPONENT: Retaining Walls – Planted Slope	**AUTHOR**	JM/BB

CURRENT CONCEPT:

Wall 11 is currently a soldier pile wall with isolated areas requiring tiebacks (permanent ground anchors or PGA's). Total area ~16,000 SF.

VE CONCEPT:

Replace the Wall 11 with a planted 1. 5H:1V cut slope where applicable.

FUNCTIONS		
Provide space	Minimize ROW	Stabilize hillside

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 7,418,000	**$** 4,031,000	**$** 3,387,000

ADVANTAGES:

- Cost savings.
- Speed up construction.
- Planted slope more attractive than wall up against sidewalk.
- Greener, less gray.

DISADVANTAGES:

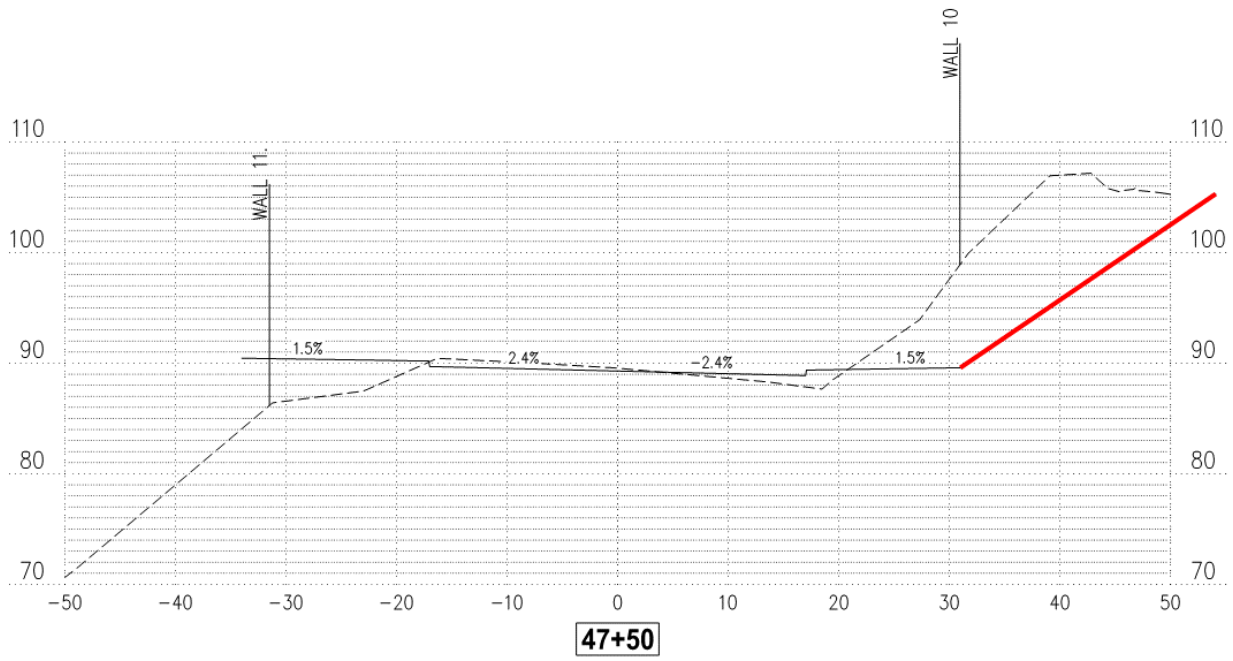
- ROW impacts.
- Requires removal of more mature trees.
- Hauling excavated material offsite.

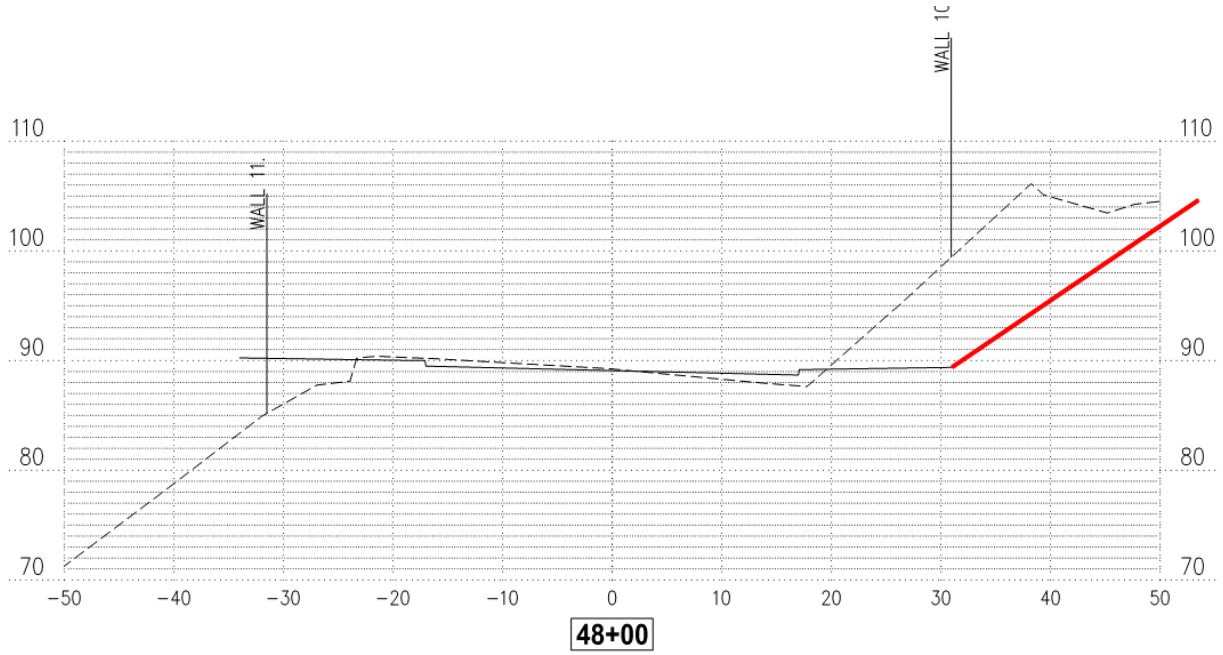
DISCUSSION:

The soldier pile walls are the most expensive element on the project. Reducing or eliminating them presents a significant opportunity to reduce cost. The area behind Wall 11 is owned by either King County or the City (through the recent acquisition of the Bergsma parcels). This makes obtaining slope easements much easier for the project. With that, cut slopes could be utilized in these areas to eliminate a significant portion of soldier pile cut walls. The cut hillsides would then be planted appropriately to stabilize the slopes and re-establish vegetation in the area.

	PROPOSAL	S8
COMPONENT: Retaining Walls – Planted Slope	**AUTHOR**	JM/BB

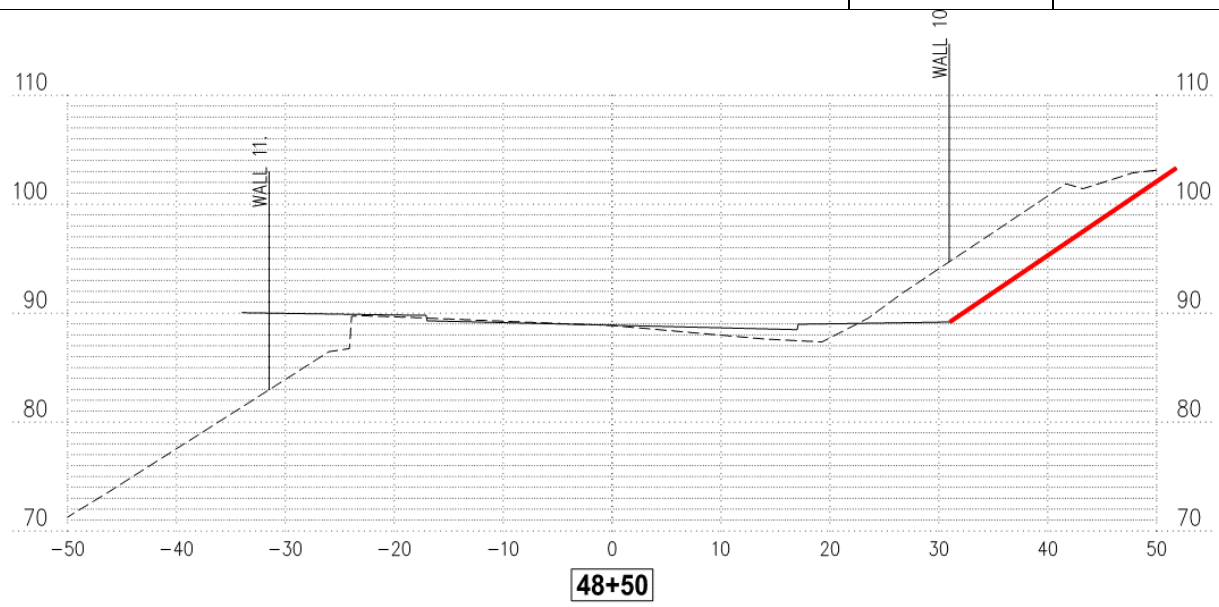
Example Cut Slope Cross Sections:

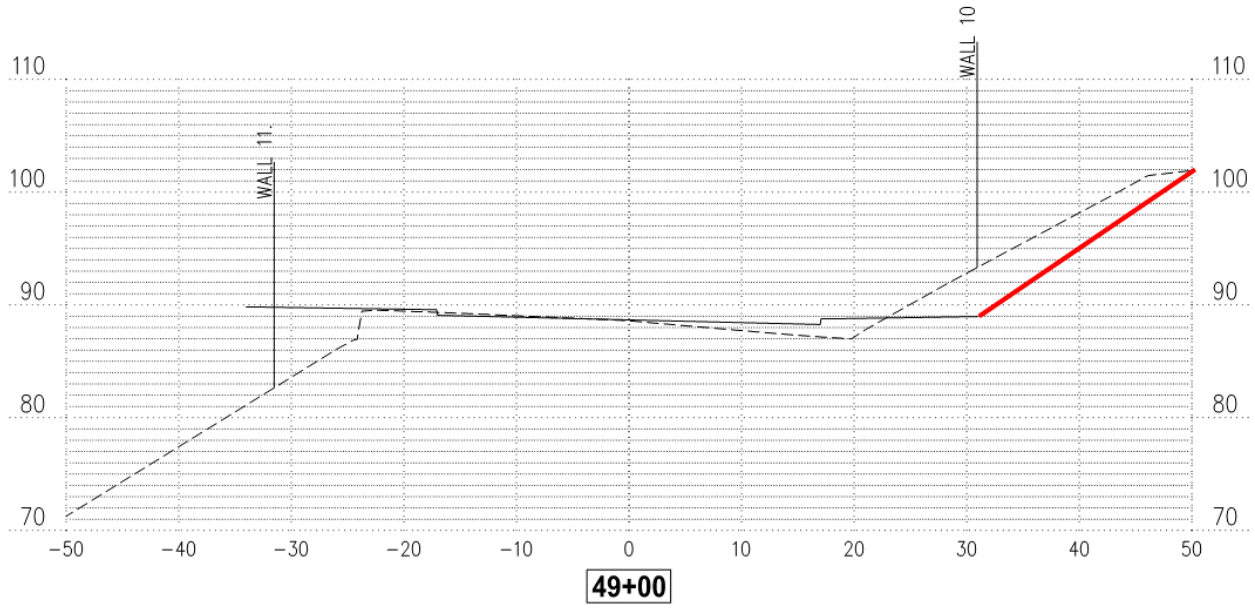




VALUE ENGINEERING

	PROPOSAL	S8
COMPONENT: Retaining Walls – Planted Slope	**AUTHOR**	JM/BB





City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Retaining Walls - Planted Slope

S8

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
Shaft - 24 In. Diam.	1,236	LF	173	213,210	Shaft - 24 In. Diam.	471	LF	173	81,270
Shaft - 30 In. Diam.	1,196	LF	173	206,310	Shaft - 30 In. Diam.	456	LF	173	78,640
Shaft - 36 In. Diam.	2,108	LF	230	484,840	Shaft - 36 In. Diam.	804	LF	230	184,820
Furnishing Soldier Pile - W 14x30 Wide Fl	827	LF	92	76,080	Furnishing Soldier Pile - W 14x30 Wide Fl	315	LF	92	29,000
Furnishing Soldier Pile - W 14x43 Wide Fl	445	LF	132	58,850	Furnishing Soldier Pile - W 14x43 Wide Fl	170	LF	132	22,430
Furnishing Soldier Pile - W 21x44 Wide Fl	495	LF	138	68,310	Furnishing Soldier Pile - W 21x44 Wide Fl	189	LF	138	26,040
Furnishing Soldier Pile - W 21x57 Wide Fl	725	LF	173	125,060	Furnishing Soldier Pile - W 21x57 Wide Fl	276	LF	173	47,670
Furnishing Soldier Pile - W 27x84 Wide Fl	1,446	LF	259	374,150	Furnishing Soldier Pile - W 27x84 Wide Fl	551	LF	259	142,620
Furnishing Soldier Pile - W 27x127 Wide F	700	LF	391	273,700	Furnishing Soldier Pile - W 27x127 Wide F	267	LF	391	104,330
Timber Lagging	24,240	SF	23	557,520	Timber Lagging	9,240	SF	23	212,520
Concrete Fascia Panel	20,725	SF	173	3,575,060	Concrete Fascia Panel	7,900	SF	173	1,362,770
Prefabricated Drainage Mat	866	SY	17	14,940	Prefabricated Drainage Mat	330	SY	17	5,690
Cement Concrete Gutter for Soldier Pile	2,400	LF	46	110,400	Cement Concrete Gutter for Soldier Pile	915	LF	46	42,080
Remove Solider Pile Shaft Obstructions	1	EST	57500	57,500	Remove Solider Pile Shaft Obstructions	0.38	EST	57500	21,920
				-	Roadway Excavation Incl. Haul	10,000	CY	28	280,000
				-	PSIPE Shrubs, Grasses, and Groundcove	36,000	SF	9	320,000
				-					-
Schedule Duration	8	MO	152760	1,222,080	Schedule Duration	7	MO	152760	1,069,320
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				
Estimate only)					***Estimate only)***				
Subtotal				7,418,010	Subtotal				4,031,120
General Contractor Markup		%			General Contractor Markup		%		
Total to nearest $1000				7,418,000	Total to nearest $1000				4,031,000
					Difference				3,387,000

MENG Analysis

Proposal

S8

	PROPOSAL	S9
COMPONENT: Pedestrian Bridge – Tibbetts Creek	**AUTHOR**	JM/BB

CURRENT CONCEPT:

Pedestrian bridge is proposed to facilitate widened section for sidewalk south side of Newport Way (4'-0" wide by 40'-0" long).

VE CONCEPT:

Eliminate pedestrian bridge and replace with a cantilever moment slab barrier (6'-0" wide by 60'-0" long by 1'-6" thick, including 60 LF pedestrian traffic barrier and BP Rail).

FUNCTIONS		
Protect stream	Support trail	Pass fish

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 651,000	**$** 269,000	**$** 382,000

ADVANTAGES:

- Cost reduction.
- Reduce impact to stream and stream buffer.
- Easier to construct.
- Reduce maintenance.

DISADVANTAGES:

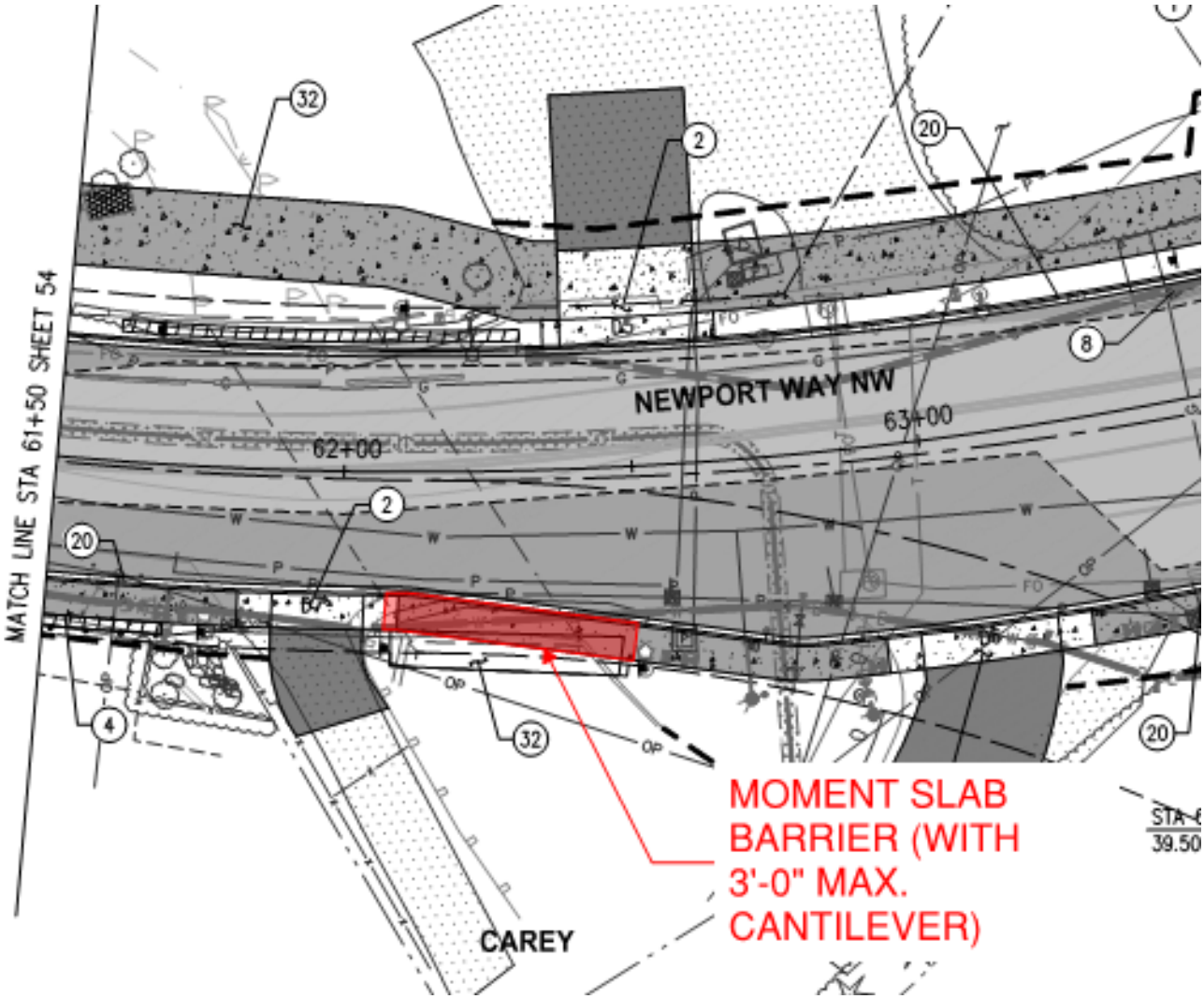
- More temporary traffic impact during construction.
- Relies on existing culvert and headwall for support.

DISCUSSION:

The current design pedestrian bridge is 4'-0" wide by 40'-0" long to support a wedge shaped widening that varies from 0' to ~3' wide along the length of the existing Tibbetts Creek culvert. The bridge has a significant portion of extra area due to the limitation of the precast void slab superstructure shape being rectangular. This proposal would eliminate the bridge and replace it with a moment slab barrier that would cantilever beyond the end of the culvert to provide the space for the sidewalk widening. The moment slab barrier would be supported by the existing culvert and welded wire faced retaining wall headwall. Since the culvert was recently strengthened by the City (9/2018), the culvert should have adequate capacity to take the additional load imparted by the moment slab. This concept also has

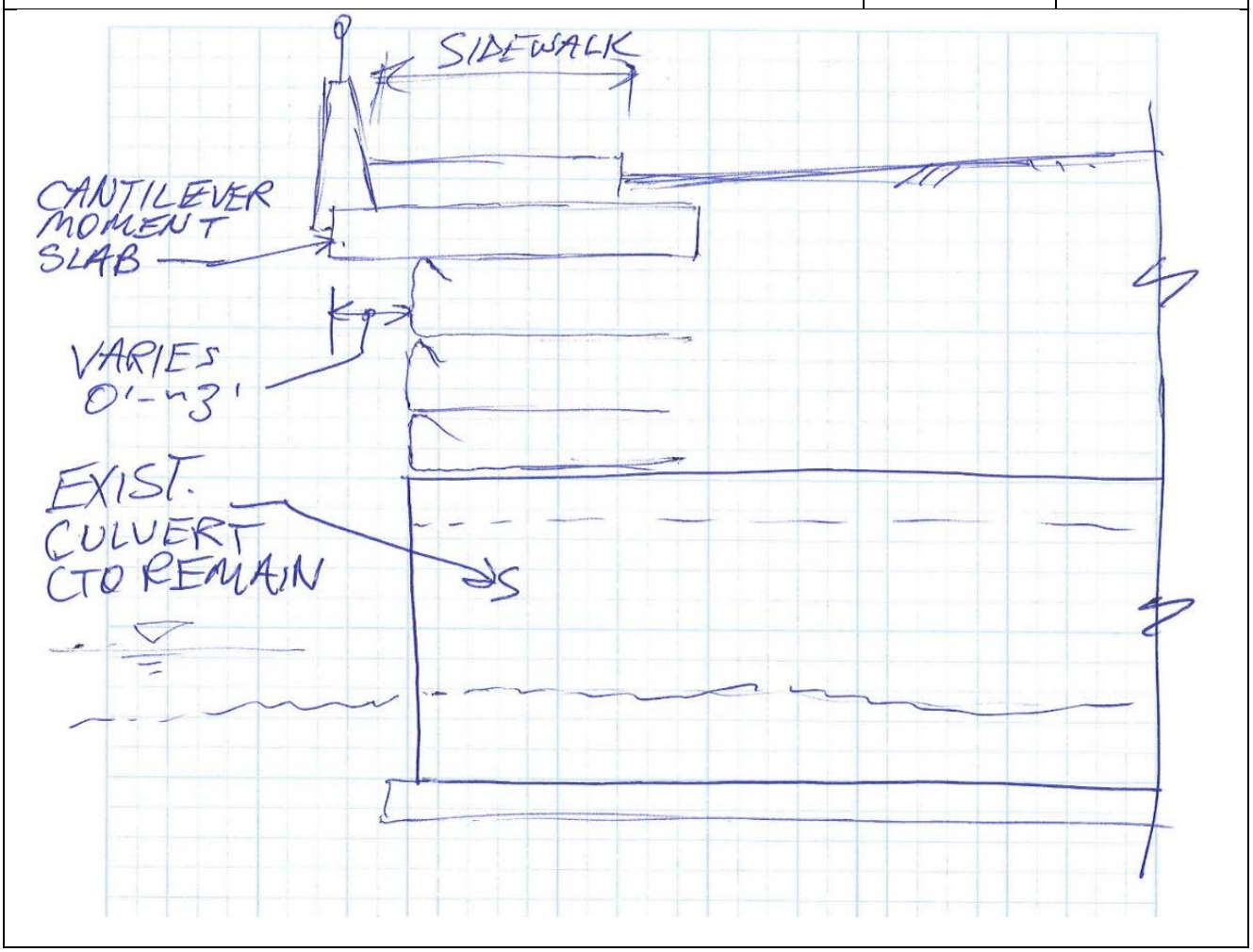
	PROPOSAL	S9
COMPONENT: Pedestrian Bridge – Tibbetts Creek	**AUTHOR**	JM/BB

the added benefit of eliminating bridge foundations adjacent to the creek as well as reducing the covered area over the stream.



VALUE ENGINEERING

	PROPOSAL	S9
COMPONENT: Pedestrian Bridge – Tibbetts Creek	**AUTHOR**	JM/BB



City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Pedestrian Bridge - Tibbetts Creek

S9

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Pedestrian Bridge	1	EA	345000.00	345,000	Concrete Moment Slab	20	CY	2000.00	40,000
				-					-
				-					-
				-					-
				-					-
				-					-
				-					-
Schedule Duration	2	MO	152759.61	305,520	Schedule Duration	1.5	MO	152759.61	229,140
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				650,520	Subtotal				269,140
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				651,000	Total to nearest $1000				269,000
					Difference				382,000

MENG Analysis

Proposal

S9

	PROPOSAL	C1
COMPONENT: Construction – Temporary Access Road	**AUTHOR**	BRB

CURRENT CONCEPT:

Temporary access road.

VE CONCEPT:

Eliminate the temporary access road.

FUNCTIONS		
Provide access for soldier pile wall installation equipment	Reduce ROW acquisition	Reduce cost

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 7,820,000	**$** 6,645,000	**$** 1,175,000

ADVANTAGES:

- Preserves natural hillside area.
- Significantly reduces the risk of adverse slope erosion and instability of the affected area, possibly extending uphill in native growth areas.
- Reduce ROW acquisition.

DISADVANTAGES:

- May require that soldier wall is limited to less height (10 to 12 feet) or require equipment capable of installing soldier pile wall from the existing Newport Way NW5 feet high.

DISCUSSION:

The current concept for slope resupport of soil cuts along the uphill side of Newport Way, primarily at the east part of the alignment, is to use soldier pile walls. In brief, a soldier pile wall involves use of predrilling large diameter holes at 4- to 8-foot, center-to-center spacing that are pre-installed prior to cut excavation, thus allowing for top-down construction. Cantilever soldier pile walls are typically effective in cut situations for wall heights of less than 12 to 14 feet. Higher soldier pile walls require support along the steel column referred to as “tiebacks” to redistribute the lateral load distribution and require a subsurface easement for the tiebacks. In order to install the soldier pile walls, a temporary access road

	PROPOSAL	C1
COMPONENT: Construction – Temporary Access Road	**AUTHOR**	BRB

is needed south (uphill) from the wall. This requires a full width cut into the hillside to support the shaft drilling and pile installation equipment.

The temporary access road will cause considerable disturbance of the hillside and may even cause unintended adverse erosion and slope instability. Avoiding construction of a temporary access road is strongly recommended.

As an alternative, we suggest pile installation be completed at or near the level of Newport Way. This may require considering various methods to achieve this alternative pile installation method:

- Use larger equipment capable of reaching the level needed to drill and install the piles.
- Shift the new road alignment north to reduce the existing planned wall height.

Install a temporary fill road at the base of the proposed wall, to effectively decrease the reach for equipment to drill shafts and install the piles. Some of this fill could be used for other aspects of the project where fill is needed.

City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Construction - Temporary Access Road

C1

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Temporary Construction Access Road	1	LS	1098250	1,098,250	Temporary Construction Access Road		LS	1098250	-
				-					-
				-					-
				-					-
				-					-
				-					-
Schedule Duration	44.0	MO	152759.61	6,721,420	Schedule Duration	43.5	MO	152759.61	6,645,040
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
Subtotal				7,819,670	Subtotal				6,645,040
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				7,820,000	Total to nearest $1000				6,645,000
					Difference				1,175,000

MENG Analysis

Proposal

C1

	PROPOSAL	C2
COMPONENT: Construction - Phasing	**AUTHOR**	AW / EM

CURRENT CONCEPT:

Construction duration estimated at 44 months. Assumes minimum 1 lane travel throughout. Restricted working hours.

VE CONCEPT:

Allow some full closure section from Riva Townhomes to 17th Ave. Extend allowable working hours – especially in non-residential areas. Shorten duration and time-driven costs.

FUNCTIONS		
Construct project	Access neighborhood	Protect users

CURRENT CONCEPT	**PROPOSED CHANGE**	**DIFFERENCE**
$ 9,961,000	**$** 7,081,000	**$** 2,880,000

ADVANTAGES:

- Reduce schedule.
- Reduce neighborhood.
- Improve safety.
- Reduce cost.
- Reduce MOT (Maintenance of traffic).

DISADVANTAGES:

- Limits through-traffic.

DISCUSSION:

The current schedule and cost estimates assume maintenance of at least one traffic lane throughout construction. It also assumes that construction activities are limited to the hours of 9 AM to 3 PM (6 Hrs.), based on city standards for development in that neighborhood. The design team has not yet built a detailed construction schedule estimate, but has cited a 500-day (26 months) target. The VE team built a likely schedule of tasks modeled on these restrictions, based on the current design, indicating that a 26-month duration may net

	PROPOSAL	C2
COMPONENT: Construction - Phasing	**AUTHOR**	AW / EM

be feasible with the current structural and utilities design and the assumed construction restrictions. suggesting the need for a 44-month duration.

This VE proposal would reduce those restrictions for the east half of the project – from Riva Townhomes to 17th Ave., since that portion does not require residential access. Full closures and extended work hours (12 hours and Saturdays) would be allowed for that eastern portion. The charts below illustrate three approaches: 1) the current design (44 months), a 40-month duration based on some full closure section, and 3) a 38-month schedule based on some full closures and extended work hours (12 hours plus Saturdays).

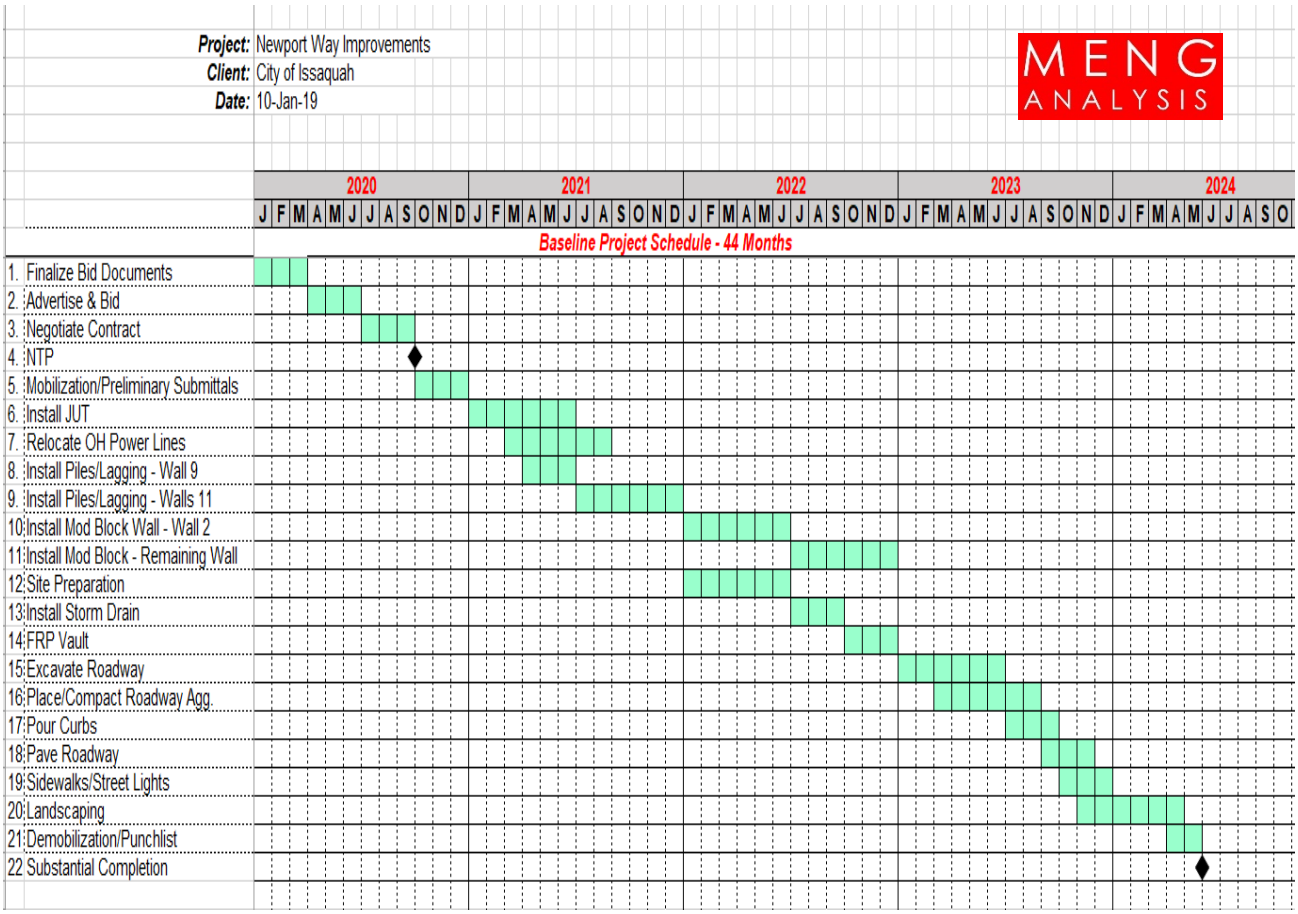
Construction schedule reductions benefit both the contractor and the community. Time – driven contractor costs include staging, office and hygiene facilities, street maintenance, bonds and insurance, field supervision, maintenance of traffic, and labor escalation. Reduced durations benefit residents with less disruption, noise, and safety risks.

OTHER CONSTRUCTION CONSIDERATIONS

- Pedestrian access must be maintained during construction. Temporary trail may be required.
- Locate utilities in fill areas, as much as feasible.
- Define staging area: potential site is the lot at 17th Ave and Newport Way. (PSE easement site).
- Define dewatering / groundwater control requirements.
- Increase underground utility exploration (potholing, utility GPR mapping).

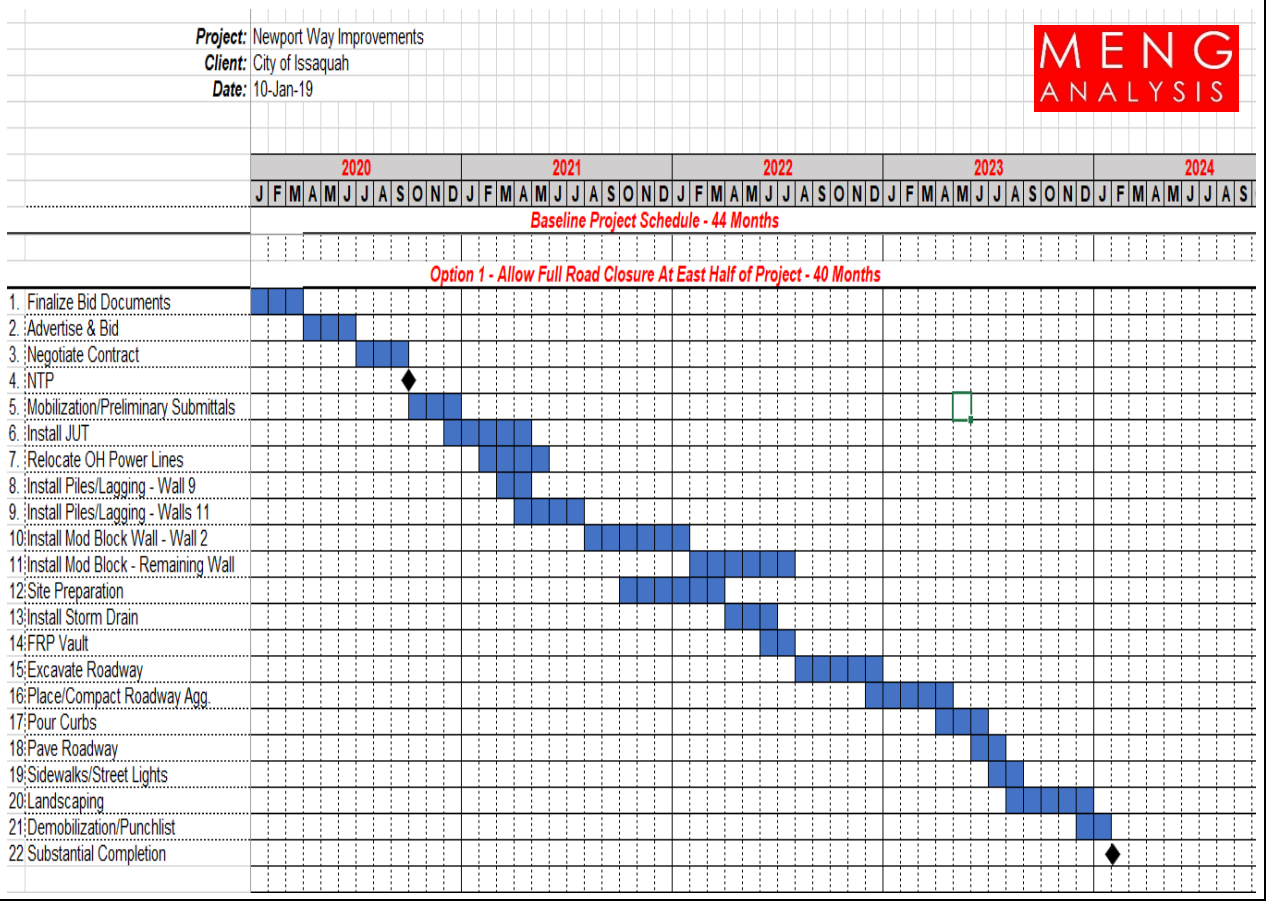
	PROPOSAL	C2
COMPONENT: Construction - Phasing	**AUTHOR**	AW / EM

1) Construction Duration – 44 months. Current design and restrictions



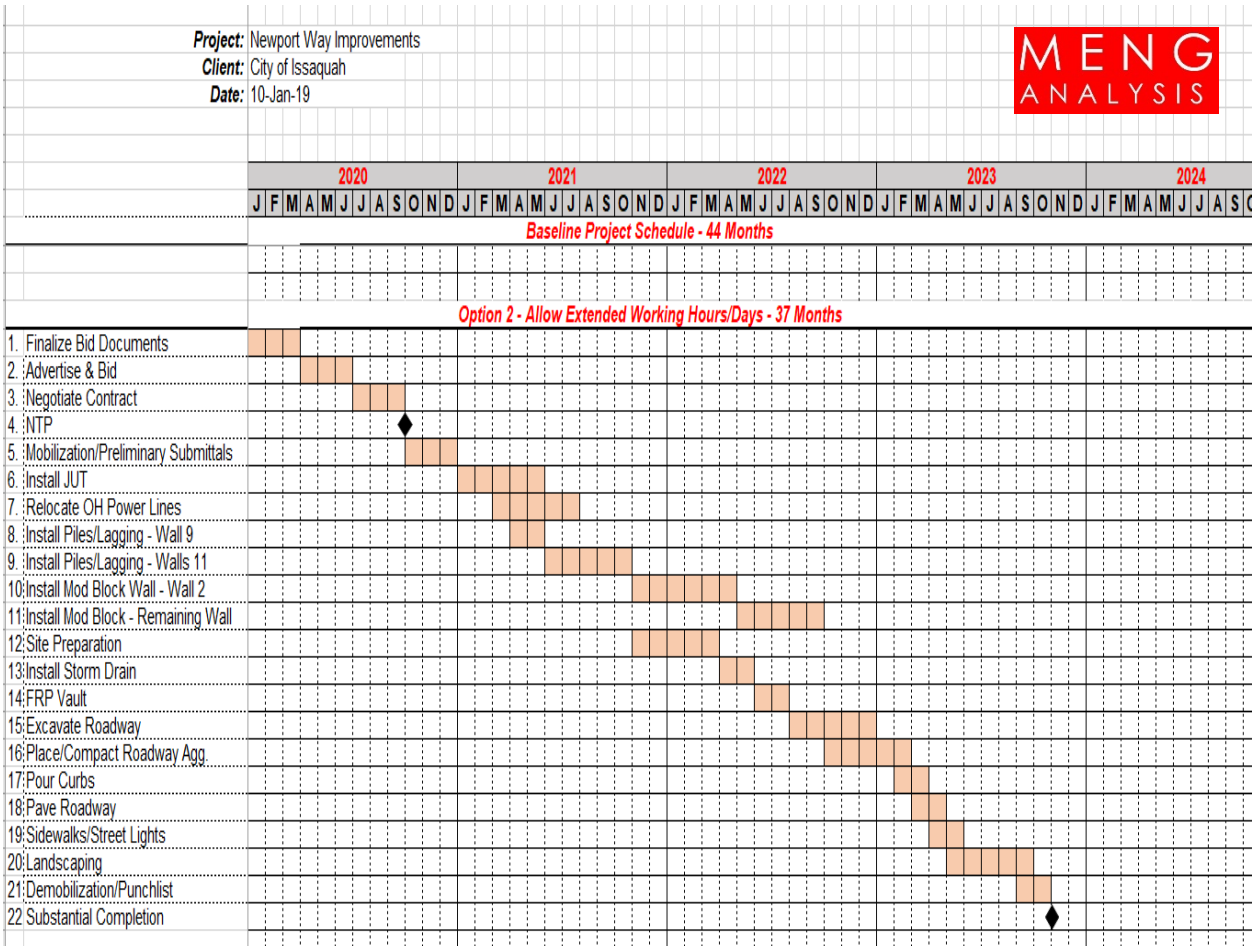
	PROPOSAL	C2
COMPONENT: Construction - Phasing	**AUTHOR**	AW / EM

2) *Construction Duration – 40 months. Some full closure*



	PROPOSAL	C2
COMPONENT: Construction - Phasing	**AUTHOR**	AW / EM

3) Construction Duration – 38 months. Some full closure and extended work hours



City of Issaquah
Newport Way NW

VALUE ENGINEERING

COST ESTIMATE FORM

COMPONENT: Construction - Phasing

C2

CURRENT DESIGN					VA PROPOSAL				
ITEM	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**	**ITEM**	**QTY**	**UNIT**	**UNIT COST**	**TOTAL COST**
				-					-
Project Temporary Traffic Control	880	DAY	3550.16	3,124,140	Project Temporary Traffic Control	740	DAY	1800.00	1,332,000
Pedestrian Traffic Control	1	LS	115000.00	115,000	Pedestrian Traffic Control	1	LS	96704.55	96,700
				-					-
				-					-
				-					-
				-					-
				-					-
Schedule Duration	44.0	MO	152759.61	6,721,420	Schedule Duration	37	MO	152759.61	5,652,110
(Contractor overhead cost/month -					***(Contractor overhead cost/month -***				-
Estimate only)				-	***Estimate only)***				-
				-					-
				-					-
				-					-
				-					-
Subtotal				9,960,560	Subtotal				7,080,810
General Contractor Markup		%		-	General Contractor Markup		%		-
Total to nearest $1000				9,961,000	Total to nearest $1000				7,081,000
					Difference				2,880,000

MENG Analysis

Proposal

C2

IV. Technical Reports

TECHNICAL REPORT	PROPOSAL	T1
COMPONENT: Utility – Franchise Move	**AUTHOR**	JG

CURRENT CONCEPT:

Relocate utilities during construction and install 6,000 linear feet of joint utility trench (JUT).

CONSIDERATIONS:

Suggest keeping the existing overhead utility overhead. Relocate these to avoid conflicts prior to start of roadway construction. Concern is that there are already quite a few underground utilities in the corridor. Finding a conflict free zone to install a JUT is likely to be a challenge (current cost of $190/LF is too little).

If JUT is to be installed, suggest increase potholing or use ground penetrating radar (GPR) to more closely identify the specific locations and depths of exiting utilities to plan for temporary relocations during construction and to minimize conflicts for the installation of the final trench. Due to the limited space available and the existing overhead and underground utilities, identifying specific locations of existing utilities would minimize potential for multiple relocations during construction to accommodate the final utility trench.

TECHNICAL REPORT	PROPOSAL	T2
COMPONENT: Utility - Location	**AUTHOR**	JG

CURRENT CONCEPT:

Separate bid item for AT&T for utility trench location ($500,000).

CONSIDERATIONS:

AT&T is in the city right-of-way and should cover the costs of the utility trench relocation for a cost saving of $500,000.

TECHNICAL REPORT	PROPOSAL	T3
COMPONENT: Slope Stability	**AUTHOR**	BRB

CURRENT CONCEPT:

Based on review of available information (primarily the June 2018 DRAFT Geotechnical Report), limited review of known deep-seated landslides that cross the project alignment has been completed along with no site-specific quantified slope stability analysis of existing conditions and proposed improvements. We are not aware of a Critical Areas Report (CAR) that addresses steep slopes, landslide hazards and others for this project.

CONSIDERATIONS:

SLOPE STABILITY – It is imperative that a well-documented/supported evaluation and interpretation of subsurface conditions should be completed for this project. The basis for design of this project (earthwork, cuts, fills, structures and drainage) rely on this reasonably accurate interpretation of the soil and groundwater conditions.

Two distinct areas of slope stability concern should be evaluated and quantified. These areas of slope stability concern include the following:

1) Overall stability of the project alignment that traverses the toe of a hillside that contains two known deep-seated landslides and other surficial geologic mass wasting processes including debris slides and debris flows/alluvial fan accumulation.
2) Overall stability of the proposed wall systems (soldier pile walls and Structural Earth Walls, or other wall systems/cut and fill slopes, as appropriate).

The following is a list of site review, geologic interpretation (subsurface soil and ground water conditions) and quantified slope stability analysis that should be considered for this project (to be completed by a licensed engineering geologist in Washington state):

- Complete a detailed review of available information from the US Geological Survey (USGS) and the Washington State Department of Natural Resources (DNR) including geologic mapping, landslide inventories and landslide zonation mapping (for Tiger Mountain).
- LiDAR data processing using 2016 King County data from the Washington LiDAR Portal (a DNR website) for Hillshade relief, 5- and 10-foot topographic contour intervals, and slope (40, 70 and 100 percent slopes).

TECHNICAL REPORT	PROPOSAL	T3
COMPONENT: Slope Stability	**AUTHOR**	BRB

- Detailed field reconnaissance of accessible areas north (downhill) and south (uphill) of the project alignment.
- Complete additional subsurface exploration in proposed cut (uphill) wall areas that are primarily in the east part of the project alignment. For any wall system, detailed knowledge of soil and groundwater conditions are essential for adequate quantified analysis of the stability of slopes. The subsurface exploration plan should be peer reviewed before drilling. At this time, we have concluded that some differences in the interpretation of soil conditions exist along the alignment that may have substantial changes in the stability of slopes. These differences in the interpretation of soil conditions should be resolved for consistency in analysis.
- Complete a full geologic and hydrogeologic profile of the project alignment to be included in the final report.
- Complete slope stability analysis using a computer application such as SLIDE, or equal for static and dynamic (earthquake) conditions. The slope stability analysis should be completed at critical cross-sections through the project where wall and backslope/foreslope conditions are at maximum conditions. These critical cross-sections should also be completed where adequate subsurface conditions are well known.
- Provide a detailed summary of surface and subsurface conditions, soil and groundwater input parameters and slope stability analysis.
- Provide recommendations for options of slope support and fill walls to mitigate slope stability concerns as needed.

OTHER CRITICAL AREAS (Seismic, Erosion and Coal Mine Hazards)

We expect that other Critical Areas should be evaluated in detail consistent with city of Issaquah Land Use Code. The possible reinterpretation of soil conditions and new information for groundwater conditions, should be used for this analysis.

Seismic Hazards should be re-evaluated for structures, walls, fills and other features for global stability consider 1 and 2 above.

Erosion hazards should be discussed to the extent of defining these areas within the project site that may require special construction considerations related to seasonal restrictions and other Temporary Erosion and Sediment Control (TESC) measures.

TECHNICAL REPORT	PROPOSAL	T3
COMPONENT: Slope Stability	**AUTHOR**	BRB

Coal Mine Hazards are in close proximity to the project alignment. Coal Mine Hazards are not expected within the project alignment, but should be described by the design team, as appropriate, along with reasoning as to why Coal Mine Hazards are not present.

This evaluation of other Critical Areas should include a summary Seismic, Erosion and Coal Mine Hazard.

OTHER CONSIDERATIONS

We suggest that the design geotechnical report for this project should include geologic and hydrogeologic interpretation on the “Plan Sheets” which usual include individual plan and profile sheets within the design plans. Transverse sections at critical locations where wall/fill heights are maximum, and/or at locations where soil conditions are less favorable should be included.

Geotechnical design reports for Newport Way should be reviewed by an independent third-party.

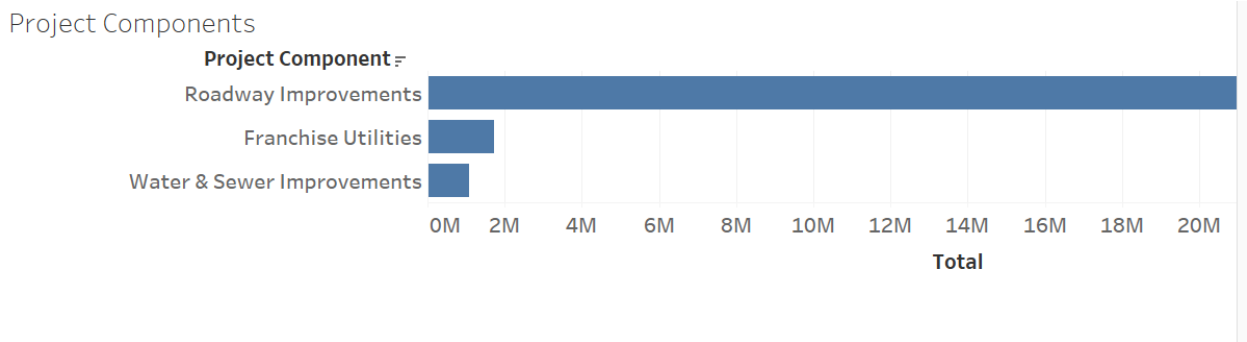
V. VALUE ENGINEERING

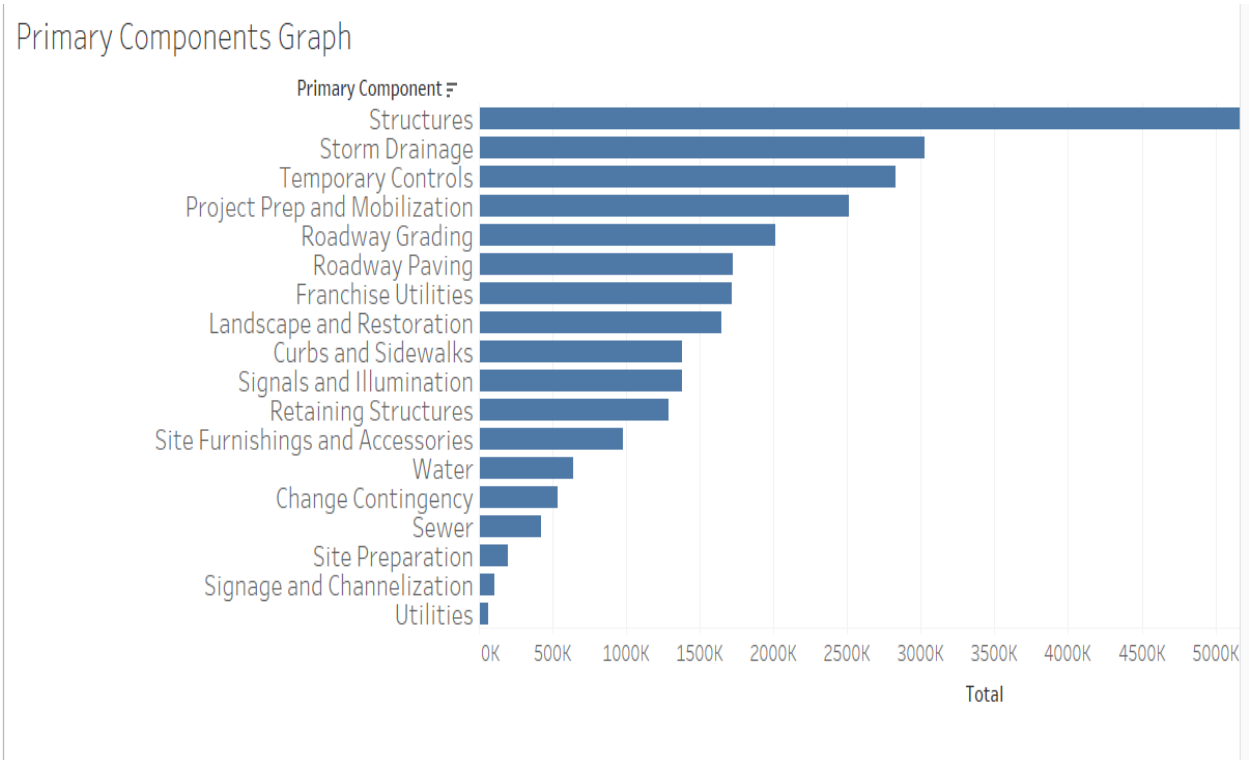
Cost Analysis

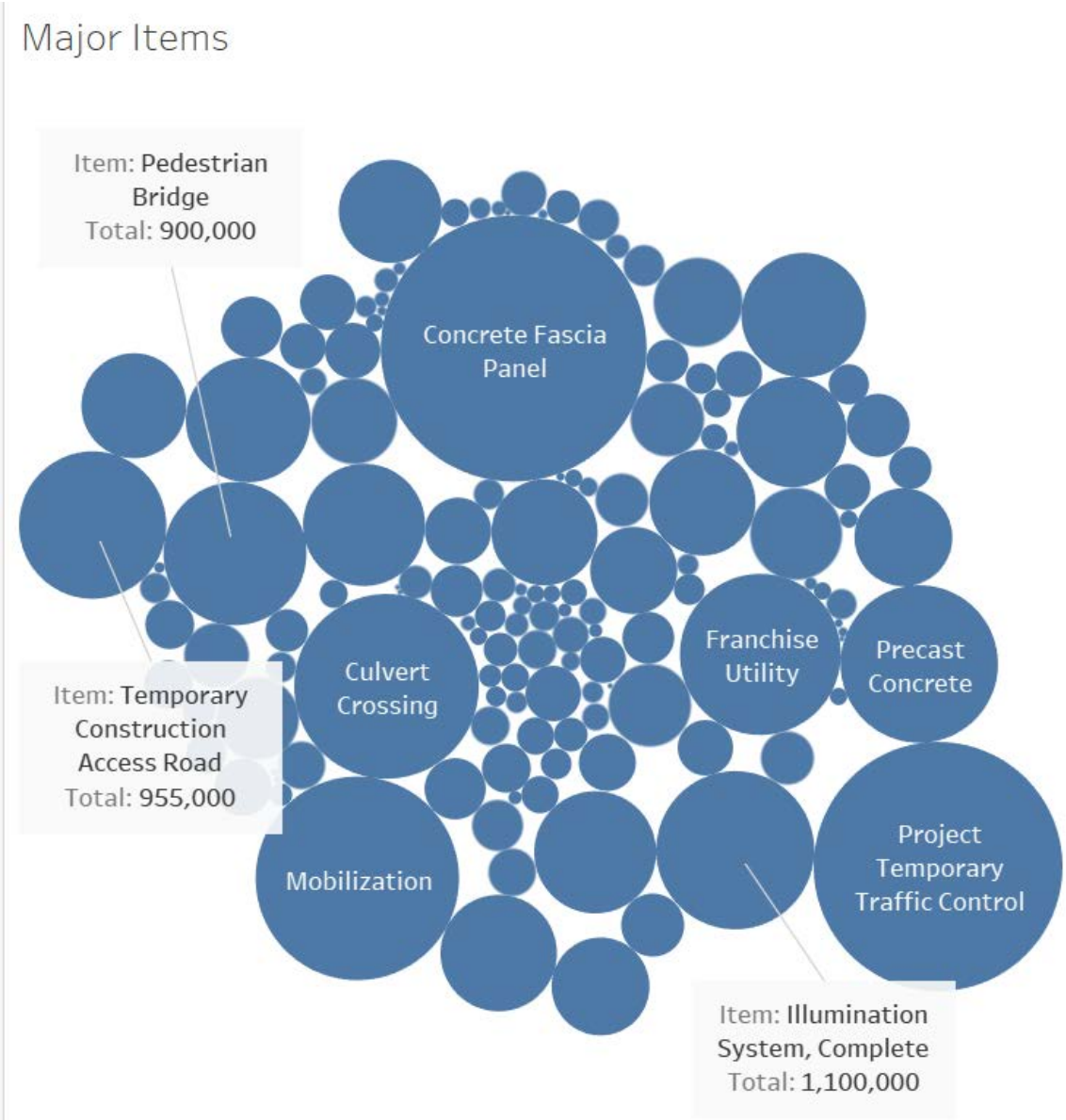
Cost Model:

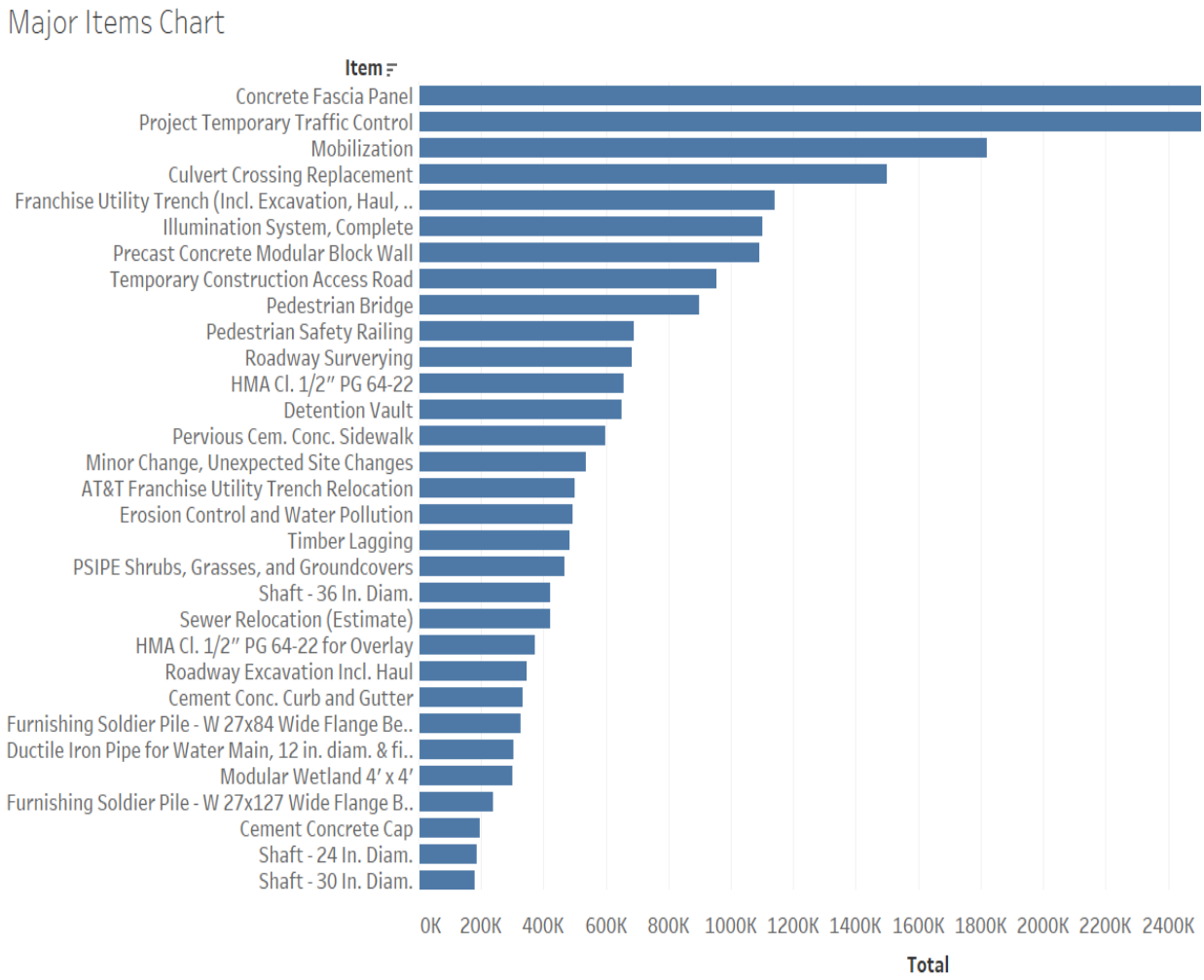
The VE team was not tasked to complete a detailed cost estimate review; but as the various components were explored, the team did review and analyze relevant cost categories and developed a cost model based upon the design team's cost estimates.

The models below illustrate the large cost impact of the retaining wall structures as well as the large relative cost of storm drainage and mitigation work.






Major Items
Item: Pedestrian Bridge
Total: 900,000
Concrete Fascia Panel
Item: Temporary Construction Access Road
Total: 955,000
Culvert Crossing
Franchise Utility
Precast Concrete
Mobilization
Project Temporary Traffic Control
Item: Illumination System, Complete
Total: 1,100,000


Major Items Chart
Item
Concrete Fascia Panel
Project Temporary Traffic Control
Mobilization
Culvert Crossing Replacement
Franchise Utility Trench (Incl. Excavation, Haul, ..
Illumination System, Complete
Precast Concrete Modular Block Wall
Temporary Construction Access Road
Pedestrian Bridge
Pedestrian Safety Railing
Roadway Surverying
HMA Cl. 1/2" PG 64-22
Detention Vault
Pervious Cem. Conc. Sidewalk
Minor Change, Unexpected Site Changes
AT&T Franchise Utility Trench Relocation
Erosion Control and Water Pollution
Timber Lagging
PSIPE Shrubs, Grasses, and Groundcovers
Shaft - 36 In. Diam.
Sewer Relocation (Estimate)
HMA Cl. 1/2" PG 64-22 for Overlay
Roadway Excavation Incl. Haul
Cement Conc. Curb and Gutter
Furnishing Soldier Pile - W 27x84 Wide Flange Be..
Ductile Iron Pipe for Water Main, 12 in. diam. & fi..
Modular Wetland 4' x 4'
Furnishing Soldier Pile - W 27x127 Wide Flange B..
Cement Concrete Cap
Shaft - 24 In. Diam.
Shaft - 30 In. Diam.
0K 200K 400K 600K 800K 1000K 1200K 1400K 1600K 1800K 2000K 2200K 2400K
Total

Cost Estimate Comments

As noted previously, the VE team was not tasked to complete a detailed cost estimate review; but as the various components were explored, the team did review specific cost items. Some potential cost estimate issues were identified and listed in the summary below. The adjusted costs are used in specific VE proposals in order to make "apples to apples" comparisons.

CE#	BUILDING COMPONENT	CURRENT TOTAL	VA TOTAL	DIFF TOTAL	COMMENT
1	Minor Change, Unexpected Site Changes	$535,000.00	$535,000.00		This should be moved out of the above the line items and included in the contingency %. Adding this cost above the line inflates the overall contingency for the project. Suggest deleting this and increasing the contingency from 15% to say 18-20% to account for these changes
2	Roadway Surveying	$680,361.69	$600,000.00	$80,361.69	This is listed as a percentage. Suggest preparing a bottom up estimate for the surveying effort as this is at the 60% design level
3	Mobilization	$1,814,297.84	$1,133,000.00	$681,297.84	**8%** for mobilization is high considering this is a highway project. Suggest capping mobilization to 5-6% Max
4	Project Temporary Traffic Control	$2,716,646.76	$1,760,000.00	$956,646.76	**12%** for traffic control works out to around $3000/day which is high. Suggest preparing a bottom up estimate for the traffic control as this is at the 60% design level
5	Shaft - 36 In. Diam.	$421,600.00	$527,000.00	-$105,400.00	Suggest revisiting shaft prices, 24" & 30" Drilled shafts should not be the same cost for the same project
6	Furnishing Soldier Piles	$848,835.00	$475,000.00	$373,835.00	Suggest revisiting pile prices. For only furnishing the piles, these unit costs work out to over $2/lb for steel which is high.
7	Timber Lagging	$484,800.00	$363,600.00	$121,200.00	Suggest revisiting price for timber lagging. Current unit cost seems high
8	Concrete Fascia Panel	$3,108,750.00	$1,554,375.00	$1,554,375.00	Suggest revisiting price for concrete fascia panels. Current unit cost seems high
9	Culvert Crossing Replacement	$1,500,000.00	$1,500,000.00		Suggest providing more detail rather than 1 lump sum for such a large cost item at this level of project definition
10	Illumination System, Complete	$1,100,000.00	$850,000.00	$250,000.00	Suggest providing more detail rather than 1 lump sum for such a large cost item at this level of project definition
11	Overhead Utility Relocation	$575,000.00	$1,150,000.00	-$575,000.00	Suggest revisiting franchise utility relocation cost.

NOTE: This is not a comment on the bottom overall estimate. The VE team highlighted these items for further study based on differing cost opinion discussion

Risk Analysis

During the Evaluation Phase of the VE workshop, the team brainstormed potential risks for the project based on the current status of documents provided for the study. The team then conducted qualitative risk analysis with the nominal group technique collectively assessing risk probability to the contractor, and resultant potential cost, and project schedule impacts for each risk item. To prioritize the risk register, these impact scores are multiplied, sorted by the resultant weighted scores, then graphed. The risk priority graph appears below.

The intent of the Risk Analysis exercise is to identify major risk elements unique to each project for the benefit of the owner and design team and identify potential mitigation strategies where risk exposure can be controlled or reduced. The owner should collaborate with the design team to mitigate these risks.

Function Analysis

The process of Functional Analysis is unique to Value Engineering compared to other quality and cost control systems. The process frames the projects core needs, identifies the greatest opportunities for value improvement, and helps the team focus on functional requirements. Additionally, functional analysis sets the stage for the Creativity Phase by encouraging alternative approaches for achieving functional requirements rather than merely substituting less expensive materials. Primary and secondary functions for major components are identified in each proposal, and on the creativity alternative sheets in the report Appendix.

VI. VE PURPOSE

Value engineering provides an independent, impartial project review by a team assembled specifically for this project. Value engineering itself is an organized creative process, which examines the proposed project and identifies alternatives to optimize cost and performance and assures compliance with project requirements. Through a structured system of investigation, idea generation and analysis, the independent multi-disciplinary team can consider and identify alternatives for design, budget, schedule and construction methods concurrently in a concentrated study.

After the initial presentation by the City of Issaquah and project team, the VE team analyzed the budget, and defined the basic functions of each project component. The VE team looked for ways to eliminate or modify design elements that add either first cost or life cycle cost without contributing to its required function. Specific proposals and reports were prepared and analyzed by the group for conformance to the project goals and VE study goals, prior to final prioritization.

Prioritization and brainstorming activities were conducted in group sessions alternating with additional small group and individual study sessions. All members supported an "open minded" attitude to new suggestions, and all alternatives were considered valid until rejected by the entire team. Although the earlier sections of this report only elaborate or include the preferred alternatives, the Appendix includes all of the actual brainstorming notes from the workshop.

VII. APPENDIX

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VE Implementation Form

The VE Implementation form is used to track the acceptance of the value engineering proposals.

We request a copy of the completed VE implementation form be returned to MENG Analysis once complete. Receipt of the completed implementation form helps us track and analyze data from our studies in order to improve future value engineering services.

CLIENT:	City of Issaquah						
PROJECT:	Newport Way NW						
DATE:	January 14, 2019						
	VALUE ENGINEERING PROPOSAL	PROPOSED COST AVOIDANCE	ACCEPT	REJECT	MODIFY	ACCEPTED VALUE OF PROPOSAL	COMMENTS / DISCUSSION
R1	Pavement Base	874,000					
R2	Pavement Section	1,009,000					
R3	Roadway Alignment	1,891,000					
i1a	Illumination - Location	687,000					
i1b	Illumination - Intersections	1,240,000					
i1c	Illumination - Pedestrian - East Project	1,163,000					
i2	Pedestrian Crossings	(453,000)					
E1	Storm Treatment - Modular System	460,000					
E2	Storm Detention - Precast	562,000					
E3	Environmental Mitigation	(228,000)					
P1	Planning - Planting Zones	2,935,000					
P2	Sidewalks	7,842,000					
P3	Road Profile - Cross Section	7,601,000					
S1	Retaining Walls - Finish	1,452,000					
S2	Retaining Walls - Structure	3,920,000					
S3	Fill Walls - Structure	199,000					
S4	Wall Structure - Welded Wire Face Wall	153,000					
S5	Fill Wall Structure - Gravity Block	153,000					
S6	Retaining Walls - Grade Slope	461,000					
S7	Pedestrian Bridge - Corridor Character	157,000					
S8	Retaining Walls - Planted Slope	3,387,000					
S9	Pedestrian Bridge - Tibbetts Creek	382,000					
C1	Construction - Temporary Access Road	1,175,000					
C2	Construction - Phasing	2,880,000					
X1	Salvage timber (sell timber, and use for stream enhancement at fish passable culverts)	143,000					
X2	Use common borrow soils in appropriate locations ILO gravel borrow	90,000					
X3	Use pervious HMA for the multi-use trail ILO pervious concrete	412,000					
X4	Maximize native soils, use drought resistant plants, simplify plant list, increase plant spacing, and reduce irrigation	350,000					
X5a	Retain a portion of the power and telecom as overhead services	150,000					
X5b	Retain all of the power and telecom services overhead (none underground)	1,215,000					
X6	Alternative railing materials (steel posts and stainless aircraft cable)	470,000					
	GRAND TOTAL ALL PROPOSALS					0	

The owner has reviewed each of the Value Engineering proposals and recommends the responses contained herein.

by

title

date

GENERAL COMMENTS REGARDING THIS VALUE ENGINEERING STUDY:

Creativity Alternatives Sheets

The Creativity Alternatives Sheets are a record of options discussed during the workshop. They are included here to illustrate the range of options considered during the study for key project elements.

PROJECT: NEWPORT WAY DATE:

COMPONENT: SITE PREPERATION MANUEL

FUNCTIONS:

1 REDUCE RISK
2 PROTECT HABITAT
3 PROTECT PROPERTY
4 ENHANCE SAFETY
5 Build wall
6 Provide access
7 Remove obstacles
8 Prepare Site

#	CURRENT CONCEPT	
	CLEARING & GRUBBING	$35k
	ROADWAY ~~EXCAV.~~ STRUCTURES + REMOVAL	$90k
●	TEMP. ACCESS ROAD	$955k
	Tree Removal, 12"+	$72k
	Erosion Control	$493k

#	ALTERNATE PROPOSALS
C1 ●	- WALL SYSTEM DO NOT REQUIRE TEMP ACCESS ROAD
	- CITY REMOVE EXIST PEDESTRIAN LIGHTING
	- PROVIDE TEMPORARY LIGHTING
	- HARVEST AND SELL TREES
●	- ~~EX~~ REUSE TREES FOR LARGE WOODY MATERIAL
$ ~~$~~ X1	

PROJECT: NEWPORT WAY DATE:

COMPONENT: ROADWAY

FUNCTIONS:

1 Provide safety
2 Enhance Experience
3 Reduce Speed
4 Calm traffic
Change charterstics
5 Install pipes
6 Build project
7 Build road
8 Remove material
Support traffic
MOVE CARS
MOVE PEDESTRIAN
MOVE BIKES

#	CURRENT CONCEPT
	~~MOBILIZATION~~
	~~EXCAVATION~~/Removal SW, HMA, Curb $400k
	~~EMBANKMENT~~ $315k
	PAVING (HMA) $1.2M
	~~CURBS~~ $467k
	~~SIDEWALKS~~/RAMP $743k
	PAVING (CONC.) $176
	Shoring $34
	CSTK/CSBC $219

#	ALTERNATE PROPOSALS
	- Reduce supers
	- Use normal Crown
	- Use rain gardens to eliminate Pervious
R3 O	- optimize alignment + (vertical, horiz)
	- raise roadway profile at east end
	- reduce median width
X2 ●	- Use common borrow in appropate locations
	- evaluate horizontal alignment shifts
	- RUBBILIZE CONCRETE PANEL
R2 ●	- REDUCE PAVEMENT THICKNESS
	- MAINTAIN EXISTING SUPERS
●	- PULERVIZE EXISTING HMA AND REUSE ON SITE
	- Different PROFILES FOR EB and WB lanes
R1	- FULL DEPTH HMA SECTIONS
	- USE CONCRETE PAVEMENT FOR ALL ROADW
	- RAISE ROADWAY AT INTERSECTIONS
X3 ●	- USE PERVIOUS HMA FOR TRAIL
	- REDUCE PAVEMENT SECTION UNDER BIKE LANES
	- SPEED BUMPS

PROJECT: NEWPORT WAY DATE:

COMPONENT: SIGNALS & ILLUMINATION

FUNCTIONS:

1 Improve Safety
2 Allow Access
3 Increase Visibility
4 Accomodate Traffic
5 WARN DRIVERS
6 ILLUMINATE SOR
7 HIGHLIGHT PEOPL
8 NOTIFY PEOPLE

#	CURRENT CONCEPT	
	-Modify Signal @ SR900	$100,000
	-Illumination System (15' both sides)	$1,100,000
	-RRFB	$96,000
	-Interconnect System ~~(15' both sides)~~	$80,000

#	ALTERNATE PROPOSALS
	-COP CAR GATEWAY FEATURE
C	-Illuminate only @ Intesections ●●
	-Photo enforcement of speed.
	-Remove Interconnect System
I1 b	-Ped only illumination along County/Bergsma (Reuse Pe
a	-Illuminate from one side (30' tall) ●●
	-Wireless rather than Interconnect
	-HAWK SIGNALS
	-PED. UNDERCROSSING (w/ culvert)
	~~-RAISED INTER.~~
	-RAISED CROSSWALKS ●●●
I2 ●	Add Ped. CROSSING @ Oakcrest ●●●●●
	-MOVE BUS STOPS TO KING CO. ●●
	-

PROJECT: NEWPORT WAY DATE:

COMPONENT: STORM & ENVIRONMENTAL

FUNCTIONS:
1 WETLAND PROTECTION
2 STREAM/FISH PROTECTION
3 WILDLIFE HABITAT PROTECTION
4 PREVENT FLOODING/EROSION
5 GET ECOLOGY GRANT
6 CODE COMPLIANCE
7 AESTHETICS, IMPROVE
8 MITIGATION, ~~RECRE~~

#	CURRENT CONCEPT
	STORM DRAINAGE $3 mil → 1 vault $650K; permeable sidewalk; 13 modular wetl; maintain/modify 12 12" pipe + CB's
	Restoration $1.6 mil
	LANDSCAPE
	CULVERTS $1.5 mil

#	ALTERNATE PROPOSALS
	- 2.5 AC treatment proposed (0.75 ac required)
(issue)	- restoration adequate? ISSUE
E1 ●	- reduce modular wetlands (13 proposed)
	- multiple vaults
	- drought resistant plants (reduce irrigation needs)
X4 ●	- shift stream
	- plant spacing, material, species #'s
	- maximize native soil for planting
E2 ? ●	a) - pre-cast vault unit
	b) - pipe chambers vs vault
	- retention/detention ponds
	- utilize spyglass pond
	- pervious pavement for road - reduce vault size?
	- more dispersion opportunities
	- arch culverts
	- remove invasives in buffers
E3 ●	- utilize existing staging area near 100

PROJECT: NEWPORT WAY DATE:

COMPONENT: UTILITIES

FUNCTIONS:

1 Provide Water
2 ~~Fight Fire~~
3 Protect Property
4 Improve Aesthetics
SUPPORT GROWTH

5 CONVEY WASTE
6 PROTECT SUPPL
7 FACILITATE COMM
8 TRANSMIT ELEC
ENHANCE RELIABILI

#	CURRENT CONCEPT	
	SAN.	-$420,000
	WATER	-$682,000
	~~GAS~~	
	FRANCHIZES (Undergrounding)	-$1,386,500
	AT&T Fiber	-$500,000

#	ALTERNATE PROPOSALS	
X5	a) partial – Keep Power & Telecom ~~Over~~ Overhead	●●●●●
T2	b) full – Have AT&T Franchise move	●●●
	– USE ALT. MATERIALS FOR WATER	
	– Avoid utility changes w/ alignment changes	
T1	– INCREASE POTHOLING	●●●●
	– GPR FOR Utility locates	●
?0	– IS WATER NEEDED? (EAST END)	
	– SLIP LINE SEWER	
	– No trees over Sewer	●●
	– S/W over sewer	

PROJECT: NEW FORT WAY DATE:

COMPONENT: PLANNING

FUNCTIONS:
1 CONVEY VECHICLES
2 ACCESS PEDESTRIANS
3 PASSAGE BIKES
4 ADAPT TOPOGRAPHY
5 ENHANCE VISIBIL
6 INCREASE PROPER
7 SLOW TRAFFIC
8 INCREASE SAFETY
9 Accommodate Impro

#	CURRENT CONCEPT
	HORIZ. & VERT. - Changing Superelevation ~~SUMPH Design~~
	INTERSECTIONS - Stop Control
	PED - 6' SW (west side), 10-12' Multiuse on east
	BIKE - 5' in roadway both directions
	TRAFFIC - 10' thru lane, 12' center turn
	DESIGN CRITERIA - 30 mph design
	R.O.W. ACQUISITION ~ 27,200 sq Ft ~ 1,103 sq Ft
	MOST ROW Acq. at - relate to Walls intersection 1, ~9600 ft² west of sta 40+00 27200

#	ALTERNATE PROPOSALS
	· Delete S/W on S side for now - future phase ~~40k Co. sidewalk/walls 32k wal~~ 181 sq ft vs. 1,600
P2	· Delete S/W on ~~west~~ side btwn SR900 & King Co. Trail A.
	· ~~Delete S/W on S. side~~ Create nature trail instead
	· Change multi-use trail to 6' S/W
	· Change multi-use trail to 8' S/W
P3	· Change cross-section to have protected bike lane & S/W both sides (5' each - total 10') - reduces width by 6'
	- increase thru lane to 12' - still save 2'
	- Every 1' in width saving is about $1,800
? Cost	· Eliminate super by adding material??
	· Decrease Road Width needs
	· Combine bike & ped lanes
P1	a) · Eliminate Planters (5' Median) (3' S/W Planter) No in fr wa
	· ~~Eliminate Round About~~
X6	· Railing alternatives
	b) · Eliminate planting on south side btwn King Co. parking lot & SR900

PROJECT: DATE:

COMPONENT: STRUCTURES

FUNCTIONS:
1 ~~MINIMIZE STREAM IMPACT~~ AVOID STREAM
2 PROVIDE SPACE ~~FOR FACILITY~~
3 MINIMIZE ROW ~~[illegible]~~
4 ~~FISH PASSAGE~~ / ~~WATER CONVEYANCE~~ PASS FISH
5 ~~CARRY TRAIL OVER~~ BRIAN ~~[illegible]~~ & SPAN STREAMS
6 CONVEY WATER
7 STABILIZE HIL
8 SUPPORT TRA
DEFINE CHAR
AVOID WETL

#	CURRENT CONCEPT
	~~BRIDGES~~ (PED) $900K
	~~RETAINING~~
	· CUT $5.5M
	· FILL $1.7M
	BOX CULVERTS $1.5M
T3	Slope Stability

#	ALTERNATE PROPOSALS
S1 ●	- ELIMINATE PED. BRIDGE S. OF TIBBETTS CULVERT & REPLACE W/ CANTILEVER MOME
2	- USE CONCRETE WALLS INSTEAD OF SE W TO REDUCE WORK ZONE IMPACTS
3	- USE DEEPER THICKENED EDGE SW T ELIMINATE MORE BLOCK WALLS
S2 ●	- USE SOIL NAIL WALLS INSTEAD OF S SP TIEBACK WALLS
S5 ●	- SCULPTED SHOTCRETE FASCIAS ON CU
6	- ALIGNMENT SHIFTS TO REDUCE C WALL HEIGHTS
7	- USE PLANTED / REINFORCED SLOPES OF FILL WALLS
8	- TIERED OR BATTERED CUT WAL
9	- PLACE MTSG AT A LOWER GRADE AREAS WITH TALL FILL WALLS
10	- ELIMINATE PLANTER STRIP IN BET RDWY & MTSG IN ARES W/ TALL FILL WA
S3 ●	- USE SOLDIER PILE WALLS INSTEAD OF SE W IN ~~TA~~ FILL AREAS TO SAVE SPACE TEMP SHORING / STABILIZE SLOPES
S4 ●	- USE WELDED WIRE FACED WALLS (E
S8 ●	- PLANTED / REINF. SLOPE ON CUT
	- USE HEAVIER PILES TO ELIMINAT T

PROJECT: DATE:

COMPONENT: STRUCTURES CONTD. . . .

FUNCTIONS: 1 5
2 6
3 7
4 8

#	CURRENT CONCEPT

#	ALTERNATE PROPOSALS
	- CYLINDER PILE WALLS (SECANT
	- PRECAST CONC. LAGGING ●●●●
	- ALT. FASCIA MATERIALS
	- TIMBER FASCIA (PERMANENT)
	- ELEVATED BOARDWALK TO ELIMINATE W
55 ●	- GRAVITY BLOCK WALL IN LIEU OF S
	- PREFAB TRUSS FOR PED BRIDGES
	- ALUMINUM TRUSS " "
	- SHALLOW FDN'S - (SPREAD FTG.)
	- COMPOSITE PREFAB BRIDGES
57 ●	- TIMBER ARCH OR OTHER "GATEW STRUCTURE FOR MTSG OVER TIB
	- SHIFT MTSG ALIGN N. OVER TIBBE
	- ALT. SLOPE / HILLSIDE STABILIZ STONE COLUMNS, DRAP., BUTTRES
	- MICRO PILES, SOIL NAIL, ETC. FOR HS
	- SHEET PILE WALLS
	- LARGER PILES + GREATER SP
56 ●	- Grade out ILO walls Hildreth

PROJECT: NEWPORT WAY DATE:

COMPONENT: CONSTRUCTION ADAM

FUNCTIONS:

1 BUILD PROJECT
2 ACCESS SITE
3 BUDGET PROJECT
4 CONTROL TRAFFIC
STAGE PROJECT
5 ACCOMPLISH GOALS
6 ASSEMBLE MATERIA
7 FACILITATE WORK
8 CONTROL TIME
9 PROTECT ELEMENT
10 REDUCE RISK

#	CURRENT CONCEPT
$1.8M	ACCESS – MOBILIZATION (8% OF COST), ASSUMING ONE MORE
INCLUDES	STAGING – POTENTIALLY ONE LOCATION @ EAST END
$2.8M	TRAFFIC CONTROL (12% OF COST), HALF CLOSURES
$270k/mo (OR)	SCHEDULE – (KPG SAYS 500WD)
$682k	PHASING – ONE CONTRACT – NOT LINEAR (WALLS, UTILITIES) – NECESSARY FOR TRAFFIC CONTROL – SURVEYING IS A % COST

#	ALTERNATE PROPOSALS
1)	DELAY PROJECT UNTIL APARTMENTS/CONDOS ARE FINISHED (MAKE PROPERTIES PAY FOR IMPROVEMENTS)
2)	SPLIT INTO MULTIPLE CONTRACTS TO INCREASE POOL OF BIDDERS
3)	ALLOW ROAD CLOSURES WITH NIGHT WORK
4)	INDEPENDENT COST ESTIMATE (SEE WHERE YOU REALLY ARE AT)
5)	ELIMINATE 5' LANDSCAPED SECTIONS
6)	USE EXCAVATED MATERIAL FROM CUTS FOR FILL WALLS - $ pavement material

maintain pad access through corridor
temp. traffic signals - Reduce MOT cost

Schedule

- Work from both ends
- Add franchise utility pulls
- Segmental progression with full closures
- Locate utilities in fill zone as much as possible
- Full Close east part of project
- Full Close section that has access to Lakemont
- Develope connection to temp access
- Extend work hours
- Incentivise Contractor
- Sound Wall to extend Construction

PROJECT: DATE: 1.13.19

P = Probablility
I = Impact
S = Schedule

	$I	S
L (Low) =	10-50K	1M 2 wks
LM (Low - Medium) =	50-100K	1-2 MO.
M (Medium) =	100 - 500K	2-6 MO.
MH (Medium - High) =	50 - 750K	6-9 MO.
H (High)=	750K +	9 + MO +

PROJECT RISK

P	I	S	
MH	LM	L	UNDERGROUND UTILITIES
LM	L	L	GROUND WATER
LM	M	M	SLOPE STABILITY (LANDSIDE HAZ.)
L	L	LM	NEW PRECAST SYSTEM DAMAGE
H	LM	L	SHAFT/PILE OBSTRUCTIONS
MH	LM	L	EXCESSIVE WEATHER
L	L	L	HAUL /DISPOSAL OP
MH	M	L	AVAILABILITY OF LABOR
H	M	L	TRADE / MARKET VOTILITY
H	L	LM	SLOW ~~UTILITY~~ Franchise RESPONSIVENESS
L	L	L	SAFETY & SECURITY
L	L	L	ENVIRONMENTAL SENSITIVITY COMPLIANCE
~~MH~~			~~SCHEDULE /LIQUIDATED DAMAGES~~