



**White Salmon Tree Board Meeting Agenda
October 10, 2022 – 5:30 PM
100 N Main Ave and Via Zoom Teleconference**

**Meeting ID: 814 1997 6517 Passcode: 971958
Call in Number: +1 (253) 215-8782 US (Tacoma)**

Call to Order

Public Comment

Discussion and Action Items

1. Sweet Gum Tree Engineering Option

Adjournment

File Attachments for Item:

1. Sweet Gum Tree Engineering Option

MEMORANDUM

TO: JAN BRENDING
FROM: MIKE MESKIMEN, P.E.
DATE: SEPTEMBER 27, 2022
SUBJECT: SWEETGUM TREE ASSESSMENT

INTRODUCTION

The City of White Salmon contracted with Gray & Osborne to determine possible design concepts to accommodate the existing Sweetgum tree at the intersection of East 2nd Avenue and East Jewett Boulevard (State Route 141). Treecology Consulting Group has previously assisted the City with the evaluation of the condition of the tree. This memo is intended to supplement that evaluation with considerations for the street and pedestrian facility improvements to provide compliance with the Americans with Disabilities Act (ADA). The memo presents six options with cost estimates.

INVESTIGATION

In May 2022, Treecology conducted a risk assessment and site evaluation of the existing Sweetgum tree. In August of 2022, Gray and Osborne met with the city of White Salmon to observe the tree location and adjacent conditions, site use by pedestrians, vehicles, and businesses, and to discuss concerns from City staff. During the site visit, we observed:

- The tree roots are significant and have heaved the area, creating ADA compliance issues for the sidewalk which provides direct access to nearby businesses.
- The adjacent pavement appears to have been replaced within the past decade, and has become disrupted. Currently, the heaved sidewalk has been removed and replaced with gravel. If new sidewalk were installed, Treecology estimated that within a 2-8 year timeframe following the repair, the roots would again disrupt the newly constructed sidewalk.
- The dripline of the tree extends to nearly the center of SR 141/Jewett Blvd. A general rule of thumb is that the root zone of a tree can be approximated by the dripline of a tree. This would result in the root zone encroaching into other public utilities located under the road (sewer main and water service lines) and could result in additional damage to the roadway pavement over time.

- The sidewalk, like the street, is very heavily trafficked. During our site visit, it was noted that in under an hour, three disabled individuals took alternate routes due to the missing sidewalk.
- The driveway located immediately to the east of the tree has significant cross slope, which exceeds the minimum ADA allowances. Replacement of the ADA ramp at the intersection should include replacement of the driveway to provide a level pedestrian access route (PAR) through the driveway. Sight distance for vehicles entering traffic from the driveway could be helped by limiting parking adjacent to the driveway.
- A westbound parallel parking lane on the north side of E. Jewett Boulevard exists to the east and west of the tree. The area directly adjacent to the tree is marked with a yellow curb, indicating no parking. This is in part due to the proximity of the area to the crosswalk which crosses E. Jewett Blvd. The no parking area should be extended to the west. To simplify traffic flow, parallel parking should not be allowed within the intersection of E. Jewett Boulevard and SE 2nd Avenue.



SE 2nd Avenue and E. Jewett Boulevard (State Route 141): Looking north.

TREE REHABILITATION/REPLACEMENT OPTIONS

Six options for next steps to bring the complete street back into service are provided for the City's consideration. Preliminary cost estimates are also included in the appendix.

Option 1 – Do Nothing

This option is to leave things as they are and let the tree continue to grow into the existing infrastructure. This puts the city at risk for infrastructure damage, ADA compliance liability, and other liabilities for injuries to pedestrians.

Design considerations:

- None

Pros:

- Keeps existing tree.
- No initial construction cost.

Cons:

- Not ADA compliant. The City could be liable for non-compliance, possible lawsuits.
- The tree roots will continue to cause damage to the sidewalk area, street, irrigation system, and other underground infrastructure in the immediate area.

Option 2 – Build a New Elevated Sidewalk

This option includes removing the existing sidewalks and building a higher, elevated sidewalk over the root structure of the tree. The elevated sidewalk would allow for continued growth of the tree roots. The existing gutter pan, curb ramp, and driveway to the east of the tree would have to be reconstructed to comply with the 8.3 percent maximum slope allowable by ADA. Due to the higher relative elevation, the drop off from the elevated sidewalk to the street may require installation of a hand rail. This would cost an estimated \$95,000 in construction costs, and would also require additional engineering costs to design the foundation and elevated sidewalk section.

Design considerations:

- The curb ramp and crosswalk on the easterly side of the intersection may not allow for the slope required to elevate the sidewalk significantly. This will need to be explored during design, or the crossing would need to be closed and shifted to the west side of the intersection. WSDOT may require design approval prior to reconfiguring the crossing location.
- The adjacent driveway would likely need to be reconstructed to better transition to the new sidewalk, allowing it to meet the ADA maximum slope of 8.3 percent.
- The drop from the elevated sidewalk may require a hand rail.
- A topographical survey will need to be completed to determine the full extent of the improvements required to meet ADA requirements.

Pros:

- Keeps existing tree.
- Does not require extending the sidewalk into the street. Keeps the sidewalk running parallel to the roadway.

Cons:

- At least one parking spot would be eliminated adjacent to the elevated sidewalk.
- The elevated ramp may require relocating the crosswalk on E. Jewett Blvd to the westerly leg of the intersection.
- The foundation required to support the elevated sidewalk will likely impact the root structure and could cause damage to the tree.
- The root structure may continue to damage the street and curbing, which would not be relocated with this option.
- The cost of piles or a foundation to elevate the sidewalk, along with the thicker, reinforced slab required to support loadings, makes this the costliest option.

Option 3 – Build a Sidewalk Using a Segmented Surface (Pavers) or Hinge Joints

The sidewalk could be rebuilt with pavers, bricks, rubberized sidewalk panels, or segmental material. The sidewalk could also be built with flexible interlocking hinge joints similar to the Tripstop ® joints mentioned in the Tree Assessment by Treecology. With the variable cost of pavers and jointing systems, costs can vary significantly. Assuming median value pricing for those items, construction costs are estimated to be \$66,000, plus engineering costs. This option could also require additional maintenance costs, as the tree roots will continue to grow, and will require resetting the segmental surfacing materials.

Design consideration:

- Will need to design the ADA ramps, or close the easterly crossing, and construct a new concrete curb ramp on the west side of the intersection.
- WSDOT may require design approval prior to reconfiguring the crossing location.

Pros:

- Keeps existing tree.
- Existing sidewalk geometry can remain in place.
- Relatively quick construction timeframe.
- Many construction material options could be used. Colors and patterns can be customized.
- Can be removed and reset periodically to allow for root trimming, and maintenance of the surface.
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Cons:

- Pavers or other segmented surfacing will require periodic maintenance involving removing the surfacing, trimming the roots, and replacing the surfacing to be a smooth ADA compliant surface. This may need to occur as often as every 2-8 years.

- Significant trimming of the roots may be required to maintain a smooth surface, which could damage the tree.
- May require shifting the crossing to the westerly side of the intersection. This will result in additional costs.

Option 4 – Build a Sidewalk Bulb-out

This option consists of bulbing out the sidewalk into the roadway. To maintain traffic flow, the parking lane in the area could be eliminated, and the curb and sidewalk could be moved out to the edge of the travel lane. This is approximately 8-feet from the existing curb. Landscaping would be installed around the base of the tree extending to the new back of sidewalk, creating an extended planter area approximately 8-feet in width. This option would eliminate 2 parking spots for the nearby businesses. The estimated construction cost is \$57,500. Engineering costs would also likely be required to obtain approval from WSDOT since East Jewett Boulevard is also State Route 141.

Design consideration:

- The pedestrian crossing of E. Jewett Boulevard could be realigned to be perpendicular to the street.
- The sidewalk bulb-out will reduce on-street parking.
- Storm drainage in the curb line will need to be evaluated and maintained.
- WSDOT will likely require design approval prior to reconfiguring the curb line and intersection.

Pros:

- Keeps existing tree with additional landscaped area for growth.
- Larger landscaped area will allow for better nourishment of the tree roots.
- Sidewalk bulb-out reduces pedestrian crossing distance on E. Jewett Boulevard.
- Moving the curb ramp out to the edge of the travel lane increases visibility of pedestrians to drivers.
- Sidewalk bulb-outs promote slower traffic speeds.

Cons:

- The curb bulb-out can only be extended into the street to the travel lane, which is not beyond the dripline of the tree. Due to the size of the tree, the sidewalk will likely not be located completely out of the root zone. With the improved landscaping area, future growth of the tree roots may impact the sidewalk.
- Will require a reduction in adjacent street parking.
- The revised curb line may impact stormwater flowing in the curb line. However, the slope of the adjacent roadway will likely allow simplify drainage around the bulb out.

Option 5 – Reroute Sidewalk Traffic to use the Business Sidewalk

This option consists of rerouting sidewalk traffic through the existing sidewalks of the adjacent businesses, demolishing the existing stairs between the upper sidewalk and lower sidewalk, and constructing an ADA compliant ramp to connect the two sidewalks.

The estimated construction cost is \$75,700. This cost does not include the cost to acquire the right-of-way for the upper sidewalk, which is owned by the property owners and would need to be purchased/obtained. Costs to acquire the right-of-way could be significant, and may require the use of a right-of-way specialist and surveyor. The cost estimate assumes that the right-of-way will need to be purchased using specialty consultant. The total project cost with right-of-way and engineering is estimated to be \$128,500.

Design consideration:

- The existing business sidewalk ramp west of the tree should be reconstructed to eliminate excessive slope and provide ADA compliance.
- Right-of -Way will need to be obtained to allow public access to the upper sidewalk currently owned by the adjacent property owner(s).

Pros:

- Existing sidewalk geometry can largely be rebuilt.
- Increased foot traffic through local businesses could increase revenue.

- No loss of parking for area businesses.
- Relatively quick construction timeframe.

Cons:

- Right-of-Way will need to be purchased and obtained from local businesses.

Option 6 – Remove the Tree, Rebuild Existing Sidewalk

This option consists of tree and stump removal, and reconstructing the sidewalk in its existing location. If desired, the tree could be replaced with plants or a younger tree that is better suited to an urban environment. Root barriers or other protective measures to deter damage to the new sidewalks should be installed if a new tree is desired. Construction costs for this option are estimated to be \$56,000.

Design consideration:

- Curb ramp should be realigned to be perpendicular to the roadway.
- The existing driveway east of the tree should be reconstructed to eliminate excessive cross slope and provide ADA compliance.

Pros:

- Existing sidewalk geometry can largely be rebuilt.
- Eliminates impacts on other underground utilities.
- Allows for a “clean-slate” approach to the area and selection of appropriate urban tree or plants.
- Relatively quick construction timeframe.

Cons:

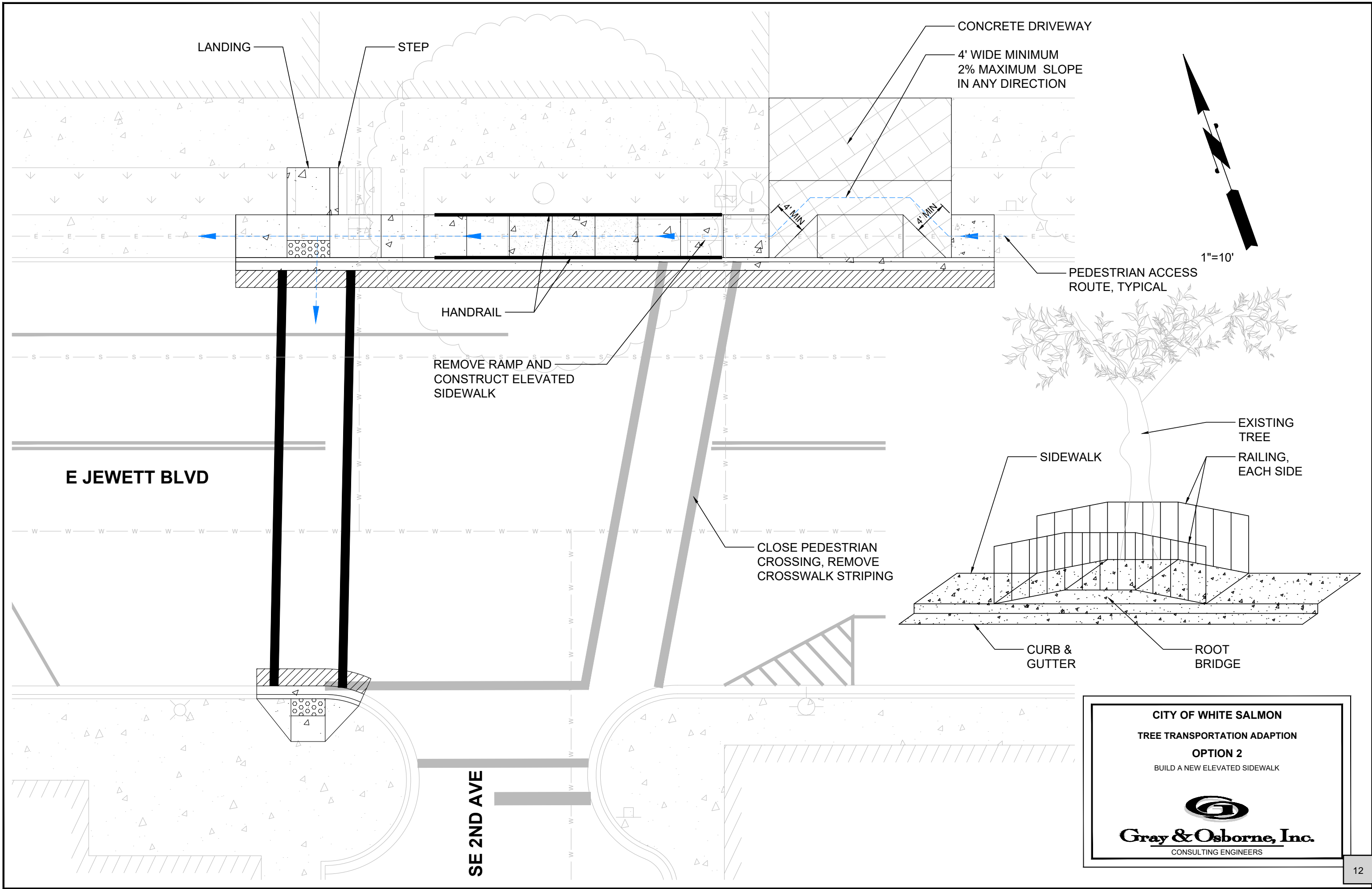
- Does not keep the existing tree.

SUMMARY

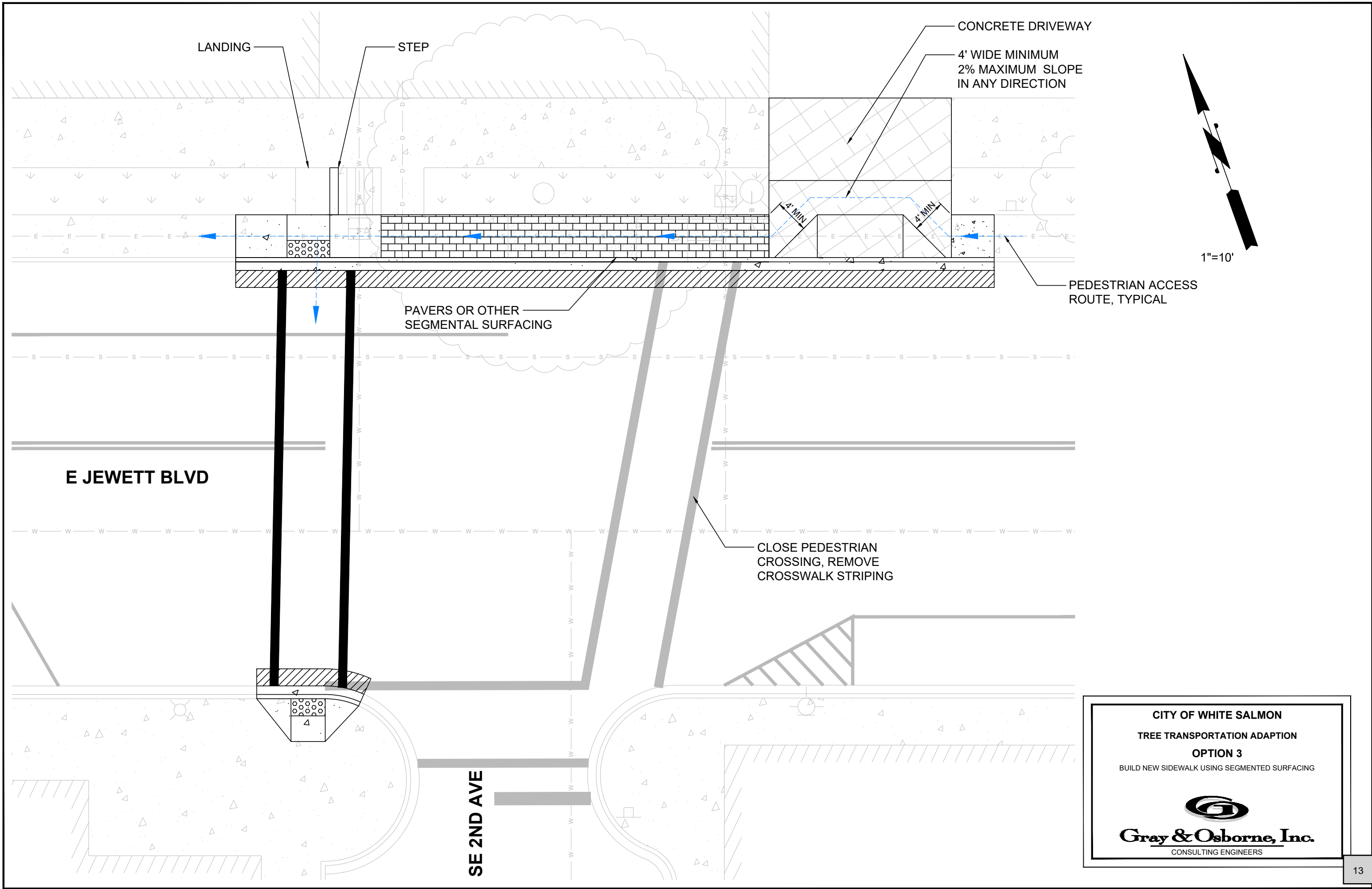
The following table summarizes the options discussed above and the associated costs. Detailed cost estimates and figures showing the options are also attached to this memo.

Option Name	Construction Cost	Total Project Cost	Comments
Option 1 – Do Nothing	\$0	\$0	Creates liability concerns for City.
Option 2 – Build a New Elevated Sidewalk	\$95,000	\$123,500	
Option 3 – Build a Sidewalk Using a Segmented Surface (Pavers) or Hinge Joints	\$66,000	\$86,000	
Option 4 – Build a Sidewalk Bulb-out	\$57,600	\$75,000	
Option 5 – Reroute Sidewalk Traffic to use the Business Sidewalk	\$75,700	\$128,500	Requires right-of-way acquisition.
Option 6 – Remove the Tree, Rebuild Existing Sidewalk	\$56,000	\$73,000	

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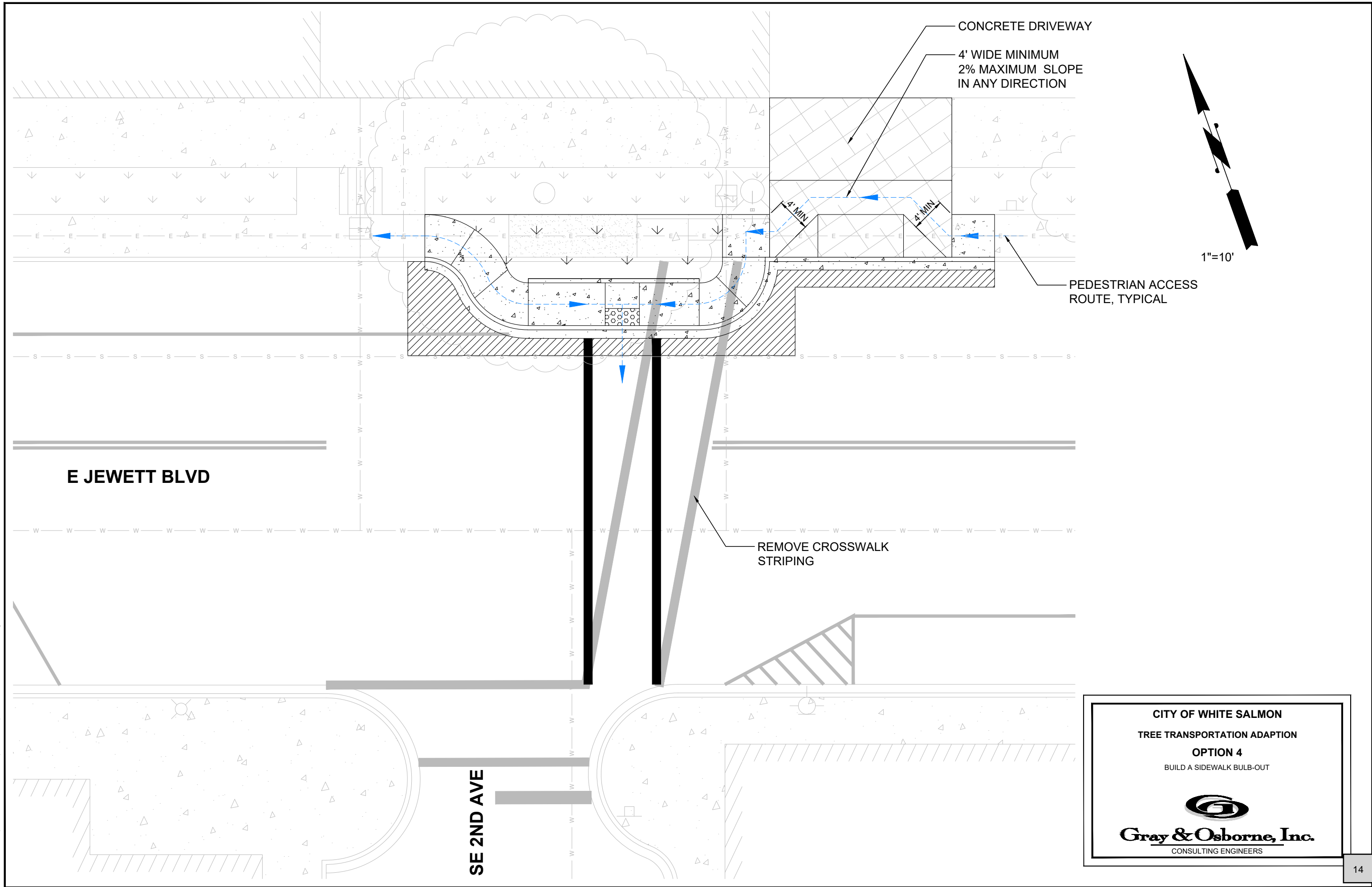
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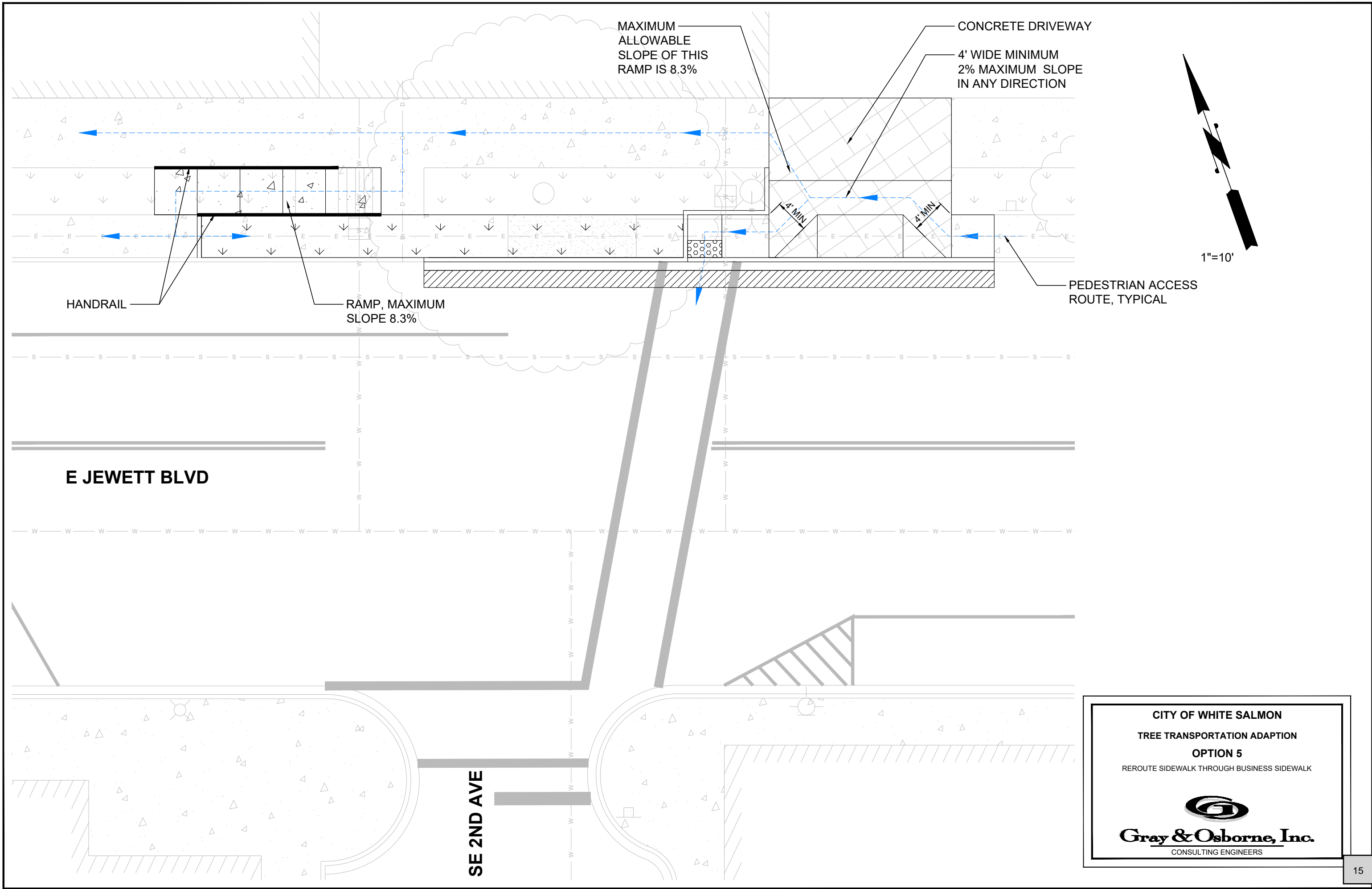
CITY OF WHITE SALMON
TREE TRANSPORTATION ADAPTION
OPTION 3
BUILD NEW SIDEWALK USING SEGMENTED SURFACING


Gray & Osborne, Inc.
CONSULTING ENGINEERS

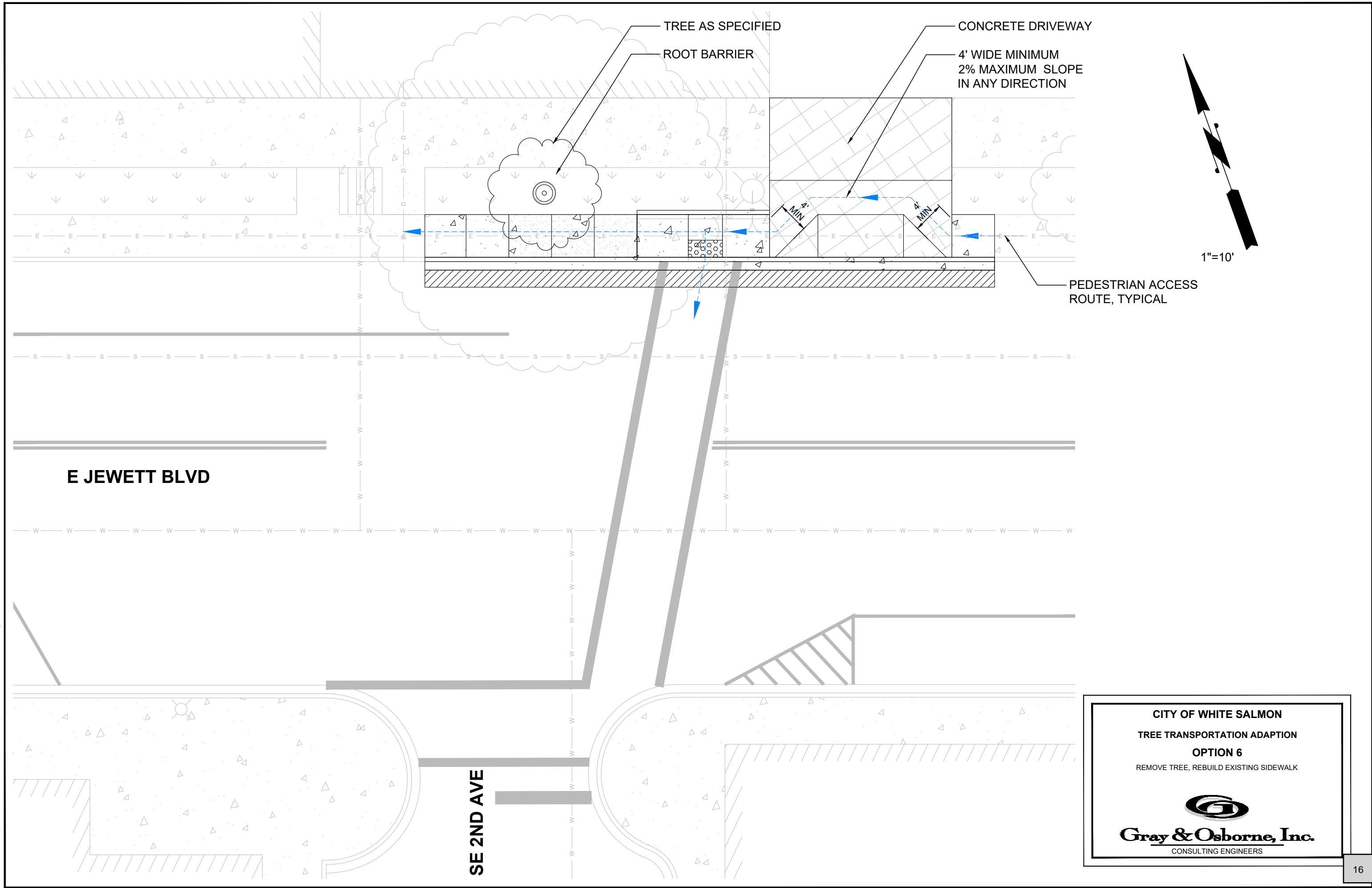
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CITY OF WHITE SALMON

TREE TRANSPORTATION ADAPTION

OPTION 6

REMOVE TREE, REBUILD EXISTING SIDEWALK



Gray & Osborne, Inc.

CONSULTING ENGINEERS

**CITY OF WHITE SALMON
TREE TRANSPORTATION ASSESSMENT
TOTAL ESTIMATED PROJECT COST
OPTION 2: BUILD NEW ELEVATED SIDEWALK**

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	\$7,200	\$7,200
2	Project Temporary Traffic Control	1	LS	\$3,500	\$3,500
3	Excavation, Embankment and Grading, Incl. Haul	35	CY	\$150	\$5,250
4	Unsuitable Foundation Excavation, Incl. Haul.	15	CY	\$200	\$3,000
5	Remove Existing Crosswalk Striping	1	LS	\$1,000	\$1,000
6	Commercial HMA Pavement Repair	25	SY	\$200	\$5,000
7	Adjust Meter Box	2	EA	\$500	\$1,000
8	Planter/Landscaping Strip	30	SY	\$50	\$1,500
9	Cement Conc. Traffic Curb and Gutter	115	LF	\$80	\$9,200
10	Cement Conc. Pedestrian Curb	15	LF	\$60	\$900
11	Cement Conc. Driveway Entrance	50	SY	\$125	\$6,250
12	Cement Conc. Sidewalk	20	SY	\$100	\$2,000
13	Reinforced Concrete Sidewalk	20	SY	\$750	\$15,000
14	Conc. Pile Foundation System	1	LS	\$7,500	\$7,500
15	Detectable Warning Surface	2	EA	\$1,000	\$2,000
16	Handrail	70	LF	\$100	\$7,000
17	Permanent Signing	1	LS	\$1,000	\$1,000
18	Painted Crosswalk Line	100	SF	\$10	\$1,000
Subtotal (rounded):					\$79,300
Construction Contingency @ 20% (rounded):					\$15,700
Total Construction Cost:					\$95,000
Preliminary Engineering, Admin., Fiscal, Legal (20%, rounded):					\$19,000
Construction Engineering (10%, rounded):					\$9,500
Right of Way:					\$0
Total Estimated Project Cost:					\$123,500

**CITY OF WHITE SALMON
TREE TRANSPORTATION ASSESSMENT
TOTAL ESTIMATED PROJECT COST
OPTION 3: BUILD NEW SIDEWALK WITH SEGMENTAL SURFACING**

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	\$5,000	\$5,000
2	Project Temporary Traffic Control	1	LS	\$3,000	\$3,000
3	Excavation, Embankment and Grading, Incl. Haul	40	CY	\$150	\$6,000
4	Unsuitable Foundation Excavation, Incl. Haul.	10	CY	\$200	\$2,000
5	Remove Existing Crosswalk Striping	1	LS	\$1,000	\$1,000
6	Commercial HMA Pavement Repair	25	SY	\$200	\$5,000
7	Adjust Meter Box	2	EA	\$500	\$1,000
8	Planter/Landscaping Strip	30	SY	\$100	\$3,000
9	Cement Conc. Traffic Curb and Gutter	115	LF	\$80	\$9,200
10	Cement Conc. Pedestrian Curb	15	LF	\$60	\$900
11	Cement Conc. Driveway Entrance	50	SY	\$125	\$6,250
12	Cement Conc. Sidewalk	20	SY	\$110	\$2,200
13	Segmental Surfacing (Pavers)	30	SY	\$200	\$6,000
14	Detectable Warning Surface	2	EA	\$1,000	\$2,000
15	Permanent Signing	1	LS	\$1,000	\$1,000
16	Painted Crosswalk Line	160	SF	\$10	\$1,600
Subtotal (rounded):					\$55,200
Construction Contingency @ 20% (rounded):					\$10,800
Total Construction Cost:					\$66,000
Preliminary Engineering, Admin., Fiscal, Legal (20%, rounded):					\$13,300
Construction Engineering (10%, rounded):					\$6,700
Right of Way:					\$0
Total Estimated Project Cost:					\$86,000

**CITY OF WHITE SALMON
TREE TRANSPORTATION ASSESSMENT
TOTAL ESTIMATED PROJECT COST
OPTION 4: BUILD SIDEWALK BULB-OUT**

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	\$4,000	\$4,000
2	Project Temporary Traffic Control	1	LS	\$4,000	\$4,000
3	Excavation, Embankment and Grading, Incl. Haul	40	CY	\$150	\$6,000
4	Unsuitable Foundation Excavation, Incl. Haul.	10	CY	\$200	\$2,000
5	Remove Existing Crosswalk Striping	1	LS	\$1,000	\$1,000
6	Commercial HMA Pavement Repair	25	SY	\$200	\$5,000
7	Adjust Meter Box	1	EA	\$500	\$500
8	Planter/Landscaping Strip	50	SY	\$100	\$5,000
9	Cement Conc. Traffic Curb and Gutter	75	LF	\$80	\$6,000
10	Cement Conc. Pedestrian Curb	20	LF	\$60	\$1,200
11	Cement Conc. Driveway Entrance	50	SY	\$125	\$6,250
12	Cement Conc. Sidewalk	30	SY	\$110	\$3,300
13	Detectable Warning Surface	1	EA	\$1,000	\$1,000
14	Permanent Signing	1	LS	\$1,000	\$1,000
15	Painted Crosswalk Line	160	SF	\$10	\$1,600
Subtotal (rounded):					\$47,900
Construction Contingency @ 20% (rounded):					\$9,700
Total Construction Cost:					\$57,600
Preliminary Engineering, Admin., Fiscal, Legal (20%, rounded):					\$11,600
Construction Engineering (10%, rounded):					\$5,800
Right of Way:					\$0
Total Estimated Project Cost:					\$75,000

**CITY OF WHITE SALMON
TREE TRANSPORTATION ASSESSMENT
TOTAL ESTIMATED PROJECT COST
OPTION 5: REROUTE SIDEWALK TRAFFIC THROUGH BUSINESS SIDEWALK**

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	\$6,000	\$6,000
2	Project Temporary Traffic Control	1	LS	\$3,000	\$3,000
3	Excavation, Embankment and Grading, Incl. Haul	30	CY	\$150	\$4,500
4	Unsuitable Foundation Excavation, Incl. Haul.	15	CY	\$200	\$3,000
5	Commercial HMA Pavement Repair	30	SY	\$200	\$6,000
6	Adjust Meter Box	2	EA	\$500	\$1,000
7	Planter/Landscaping Strip	60	SY	\$100	\$6,000
8	Cement Conc. Traffic Curb and Gutter	70	LF	\$80	\$5,600
9	Cement Conc. Pedestrian Curb	50	LF	\$60	\$3,000
10	Cement Conc. Driveway Entrance	50	SY	\$125	\$6,250
11	Cement Conc. Sidewalk	30	SY	\$110	\$3,300
12	Cement Conc. Retaining Wall	25	LF	\$400	\$10,000
13	Detectable Warning Surface	1	EA	\$1,000	\$1,000
14	Handrail	45	LF	\$100	\$4,500
Subtotal (rounded):					\$63,200
Construction Contingency @ 20% (rounded):					\$12,500
Total Construction Cost:					\$75,700
Preliminary Engineering, Admin., Fiscal, Legal (20%, rounded):					\$15,200
Construction Engineering (10%, rounded):					\$7,600
Right of Way:					\$30,000
Total Estimated Project Cost:					\$128,500

**CITY OF WHITE SALMON
TREE TRANSPORTATION ASSESSMENT
TOTAL ESTIMATED PROJECT COST
OPTION 6: REMOVE TREE, REBUILD EXISTING SIDEWALK**

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1	LS	\$4,000	\$4,000
2	Project Temporary Traffic Control	1	LS	\$2,000	\$2,000
3	Tree Removal	1	LS	\$5,000	\$5,000
4	Excavation, Embankment and Grading, Incl. Haul	40	CY	\$150	\$6,000
5	Unsuitable Foundation Excavation, Incl. Haul.	10	CY	\$200	\$2,000
6	Commercial HMA Pavement Repair	30	SY	\$200	\$6,000
7	Planter/Landscaping Strip	25	SY	\$100	\$2,500
8	Cement Conc. Traffic Curb and Gutter	70	LF	\$80	\$5,600
9	Cement Conc. Pedestrian Curb	20	LF	\$60	\$1,200
10	Cement Conc. Driveway Entrance	50	SY	\$125	\$6,250
11	Cement Conc. Sidewalk	25	SY	\$110	\$2,750
12	Root Barrier	1	LS	\$1,000	\$1,000
13	Tree, 2-In. Diam.	1	LS	\$1,500	\$1,500
14	Detectable Warning Surface	1	EA	\$1,000	\$1,000
Subtotal (rounded):					\$46,800
Construction Contingency @ 20% (rounded):					\$9,200
Total Construction Cost:					\$56,000
Preliminary Engineering, Admin., Fiscal, Legal (20%, rounded):					\$11,300
Construction Engineering (10%, rounded):					\$5,700
Right of Way:					\$0
Total Estimated Project Cost:					\$73,000