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Evaluation of Tieback Performance

Appendix A Summary of Tieback Observations

WA-RD 269.2

Final Technical Report
January 1993



Washington State Department of Transportation
Washington State Transportation Commission
Transit, Research, and Intermodal Planning (TRIP) Division

in cooperation with the
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16. ABSTRACT <p>The economy and effectiveness of tiebacks for support of temporary excavations has led to their increased use for support of permanent excavations. To better understand the characteristics and performance of tiebacks, a field observation program was undertaken.</p> <p>Various characteristics of over 900 tiebacks exhumed from an excavation along I-90 in Mercer Island, Washington were observed in the field. The geometric spacing of the tiebacks appeared to be quite uniform. Centering of the anchor tendon in the augered hole was generally good, although some instances of significantly off-center anchor tendons were observed. Significant corrosion was not observed on any of the anchor tendons that could be examined in the field. Evidence of grease leakage at the end of the trumpets was observed at a number of tieback locations. While physical disturbance of the tiebacks during excavation was undoubtedly responsible for much of the observed leakage, leakage was also observed at a number of tiebacks that appeared to be undisturbed.</p> <p>On the basis of the observations made in the field, no specific changes in the current WSDOT design methods and specifications for tiebacks appear to be necessary.</p>		
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Final Technical Report
Research Project GC 8719, Task 19
Tieback Performance

EVALUATION OF TIEBACK PERFORMANCE
APPENDIX A
SUMMARY OF TIEBACK OBSERVATIONS

by

Steven L. Kramer
Associate Professor

Washington State Transportation Center (TRAC)
University of Washington, JE-10
The Corbet Building, Suite 204
4507 University Way N.E.
Seattle, Washington 98105

Washington State Department of Transportation
Technical Monitor
A. P. Kilian
Chief Geotechnical Engineer

Prepared for

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APPENDIX A

SUMMARY OF TIEBACK OBSERVATIONS

(Available upon request from WSDOT Research Office)

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
30 U			X	X						X
31 U			X							
32 U			X		X					
33 U			X		X					
34 U			X			X				
35 U			X		X					
36 U			X		X					
37 U			X		X					
38 U			X		X					
39 U			X		X					
40 U			X		X					
41 U			X		X					
42 U			X		X					
43 U			X		X					
44 U			X		X					
45 U			X		X					
46 U			X		X					
47 U			X		X					
48 U			X		X					
49 U			X		X					
50 U			X		X					
51 U			X		X					
52 U			X		X					
53 U			X		X					
54 U			X		X					
55 U			X		X					
56 U			X		X					
57 U			X		X					
58 U			X		X					
59 U			X		X					
60 U			X		X					
61 U			X		X					
62 U			X		X					
63 U			X		X					
64 U			X		X					
65 U			X		X					
66 U			X		X					
67 U			X		X					
68 U			X		X					
69 U			X		X					
70 U			X		X					
71 U			X		X					
72 U			X		X					
73 U			X		X					
74 U			X		X					
75 U			X		X					
76 U			X		X					
77 U			X		X					
78 U			X		X					
79 U			X		X					
80 U			X		X					
81 U			X		X					
82 U			X		X					
83 U			X		X					
84 U			X		X					
85 U			X		X					
86 U			X		X					
87 U			X		X					
88 U			X		X					
89 U			X		X					
90 U			X		X					
91 U			X		X					
92 U			X		X					
93 U			X		X					
94 U			X		X					
95 U			X		X					
96 U			X		X					
97 U			X		X					
98 U			X		X					
99 U			X		X					
100 U			X		X					

I-90 MERCER ISLAND TIEBACK OBSERVATION

Date	Disturbance of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod		
	None	Mild	Significant	None	Mild	Significant	None	Mild	Severe
4-1 U	X			X					
4-1 MU		X				X		X	
4-1 ML		X							
4-2 U									
4-2 MU		X		X			X		
4-2 ML		X							
4-3 U		X							
4-3 MU		X							
4-3 ML									
4-4 U		X							
4-4 MU		X							
4-4 ML									
4-5 U		X							
4-5 MU		X							
4-5 ML									
4-6 U		X							
4-6 MU		X							
4-6 ML									
4-7 U		X							
4-7 MU		X							
4-7 ML									
4-8 U		X							
4-8 MU		X							
4-8 ML									
4-9 U		X							
4-9 MU		X							
4-9 ML									
4-9 L									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	Note	Mild	Significant/Can't tell	None	Little	Moderate	Severe
50 U			X							
51 U			X							
52 U			X							
53 U			X							
54 U			X							
55 U			X							
56 U			X							
57 U			X							
58 U			X							
59 U			X							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
60 U			X	X						X
61 U			X							
62 U			X							
63 U			X							
64 U			X							
65 U			X							
66 U			X							
67 U			X							
68 U			X							
69 U			X							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Composition of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
70 U			X				X			
MJ										
ML										
L			X							
71 U			X				X			
MJ										
ML										
L			X							
72 U			X				X			
MJ										
ML										
L			X							
73 U			X				X			
MJ										
ML										
L			X							
74 U			X				X			
MJ										
ML										
L			X							
75 U			X				X			
MJ										
ML										
L			X							
76 U			X				X			
MJ										
ML										
L			X							
77 U			X				X			
MJ										
ML										
L			X							
78 U			X				X			
MJ										
ML										
L			X							
79 U			X				X			
MJ										
ML										
L			X							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant (Can't tell)	None	Mild	Significant (Can't tell)	None	Little	Moderate	Severe
8 0 U			X							X
8 1 U			X							
8 1 MJ			X							
8 1 ML			X							
8 2 U			X			X				
8 2 MJ			X							X
8 2 ML			X							
8 3 U			X			X				
8 3 MJ			X							
8 3 ML			X							
8 4 U			X			X				X
8 4 MJ			X							X
8 4 ML			X							
8 5 U			X							
8 5 MJ			X							
8 5 ML			X							
8 6 U			X							
8 6 MJ			X							
8 6 ML			X							
8 7 U			X							
8 7 MJ			X							
8 7 ML			X							
8 8 U			X							
8 8 MJ			X							
8 8 ML			X							
8 9 U			X							
8 9 MJ			X							
8 9 ML			X							
8 9 L			X							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
220 U	X			X						
MJ										
ML										X
L	X									X
221 U	X									
MJ										
ML										X
L	X									
222 U										
MJ										
ML										X
L	X									
223 U										
MJ										
ML										X
L	X									
224 U										
MJ										
ML										X
L	X									
225 U										
MJ										
ML										X
L	X									
226 U										
MJ										
ML										X
L	X									
227 U										
MJ										
ML										X
L	X									
228 U										
MJ										
ML										X
L	X									
229 U										
MJ										
ML										X
L	X									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
2300 U			X							
MJ										X
ML										X
2310 U			X							
MJ										
ML										
2320 U			X			X			X	
MJ										
ML										
2330 U			X			X				X
MJ			X			X				
ML										
2340 U			X						X	
MJ										
ML										
2350 U			X			X				X
MJ			X			X				
ML										
2360 U			X			X			X	
MJ										
ML										
2370 U			X			X				X
MJ			X							
ML										
2380 U			X							X
MJ										
ML										
2390 U			X			X				X
MJ										X
ML										
L										X

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod					
	None	Mild	Significant	Can't tell	None	Mild	Significant	Can't tell	None	Little	Moderate	Severe
240 U				X								
MJ												
ML												
241 U				X								
MJ												
ML												
242 U				X								
MJ												
ML												
243 U				X								
MJ												
ML												
244 U				X								
MJ												
ML												
245 U				X								
MJ												
ML												
246 U				X								
MJ												
ML												
247 U				X								
MJ												
ML												
248 U				X								
MJ												
ML												
249 U				X								
MJ												
ML												
L												

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	Note	Mild	Significant Can't tell	Note	Mild	Significant Can't tell	None	Little	Moderate	Severe
250 U			X							X
251 U	X									
252 U	X									
253 U	X									
254 U	X									
255 U	X									
256 U	X									
257 U	X									
258 U	X									
259 U	X									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
260 U			X							X
MJ										
ML										
L	X					X				
261 U	X									
MJ										
ML										
L	X									X
262 U			X							
MJ										
ML										
L	X									
263 U			X							
MJ										
ML										
L	X									
264 U	X									
MJ										
ML										
L	X									
265 U	X									
MJ										
ML										
L	X									
266 U			X							
MJ										
ML										
L	X									
267 U			X							
MJ										
ML										
L	X									
268 U			X							
MJ										
ML										
L	X									
269 U			X							
MJ										
ML										
L	X									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant	None	Mild	Significant	None	Little	Moderate	Severe
270 U	X			X						X
MJ										
ML										
L	X									X
271 U										
MJ										
ML										
L										
272 U										
MJ										
ML										
L										
273 U										
MJ										
ML										
L										
274 U										
MJ										
ML										
L	X									
275 U										
MJ										
ML										
L	X									
276 U										
MJ										
ML										
L										
277 U										
MJ										
ML										
L										
278 U										
MJ										
ML										
L	X									
279 U										
MJ										
ML										
L	X									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
280 U										
280 MJ										
280 L										
281 U					X					
281 MJ					X					
281 L										
282 U										
282 MJ										
282 L					X					
283 U										
283 MJ										
283 L					X					
284 U										
284 MJ										
284 L					X					
285 U										
285 MJ										
285 L					X					
286 U										
286 MJ										
286 L										
287 U										
287 MJ										
287 L										
288 U										
288 MJ										
288 L										
289 U										
289 MJ										
289 L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
290 U	X			X			X			
290 MJ										
290 ML										
291 U	X									
291 MJ										
291 ML										
292 U			X			X				X
292 MJ										
292 ML										
293 U			X			X				X
293 MJ										
293 ML										
294 U	X					X				X
294 MJ										
294 ML										
295 U	X									
295 MJ										
295 ML										
296 U	X								X	
296 MJ										
296 ML										
297 U	X									X
297 MJ										
297 ML										
298 U	X								X	
298 MJ										
298 ML										
299 U	X									X
299 MJ										
299 ML										
299 L										X

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
300 U	X			X			X
301 U	X			X		X	
302 U	X		X	X			X
303 U	X		X	X		X	
304 U	X		X	X		X	
305 U	X		X	torn off			X
306 U	X		X	X		X	
307 U	X		X	X		X	
308 U	X		X	X		X	
309 U	X		X	X		X	

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod					
	None	Mild	Significant	Can't tell	None	Mild	Significant	Can't tell	None	Little	Moderate	Severe
310 U	X				X					X		
310 MJ												
310 ML												
311 U	X									X		
311 MJ												
311 ML												
312 U	X						X				X	
312 MJ												
312 ML												
313 U	X											X
313 MJ												
313 ML												
314 U	X										X	
314 MJ												
314 ML												
315 U										X		
315 MJ												X
315 ML												
316 U	X											
316 MJ											X	
316 ML												
317 U	X											
317 MJ											X	
317 ML												
318 U	X											
318 MJ	X											
318 ML											X	
319 U	X											
319 MJ												
319 ML											X	
319 L												

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
3 2 0 U			X							X
MJ										
ML										
3 2 1 U			X		X					
MJ										
ML										
3 2 2 U			X		X					X
MJ										
ML										
3 2 3 U			X		X					X
MJ										
ML										
3 2 4 U			X		X					X
MJ										
ML										
3 2 5 U			X		X					X
MJ										
ML										
3 2 6 U			X		X					X
MJ										
ML										
3 2 7 U			X		X					X
MJ										
ML										
3 2 8 U			X		X					X
MJ										
ML										
3 2 9 U			X		X					X
MJ										
ML										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
330 U		X		X			X
330 MU							
330 ML							
331 U		X					X
331 MU							
331 ML							
332 U							
332 MU		loose					
332 ML							
333 U		X		X			X
333 MU							
333 ML							
334 U		X					X
334 MU							
334 ML							
335 U		X		X			X
335 MU							
335 ML							
336 U		X					X
336 MU							
336 ML							
337 U		X					X
337 MU							
337 ML							
338 U		X		X			X
338 MU							
338 ML							
339 U		X		X			X
339 MU							
339 ML							
339 L							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
340 U		X		X		X	
MJ							
ML							
L							
341 U		X		X		X	
MJ							
ML							
L							
342 U		X		X		X	
MJ							
ML							
L							
343 U		X		X		X	
MJ							
ML							
L							
344 U		X		X		X	
MJ							
ML							
L							
345 U		tor out					
MJ							
ML							
L							
346 U		X		X		X	
MJ							
ML							
L							
347 U		X		X		X	
MJ							
ML							
L							
348 U		X		X		X	
MJ							
ML							
L							
349 U		X		X		X	
MJ							
ML							
L							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
350 U			X							
MJ										
ML										
351 U	X								X	
MJ		tor out								
ML										
352 U			X						X	
MJ									X	
ML										
353 U			X							
MJ			X			X				
ML										
354 U			X							
MJ										
ML		X				X				
355 U			X							
MJ		tor out								
ML										
356 U			X							
MJ										
ML		X								
357 U			X							
MJ										
ML		X								
358 U			X							
MJ		X								
ML										
359 U			X							
MJ		X								
ML										
L		X								

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
360 U	X			X			X			
360 MJ										
360 ML										
361 U	X	tor out		X			X			
361 MJ										
361 ML										
362 U	X	tor out		X			X			
362 MJ										
362 ML										
363 U	X			X			X			
363 MJ										
363 ML										
364 U	X			X			X			
364 MJ										
364 ML										
365 U	X			X			X			
365 MJ										
365 ML										
366 U	X	tor out		X			X			
366 MJ										
366 ML										
367 U	X			X			X			
367 MJ										
367 ML										
368 U	X			X			X			
368 MJ										
368 ML										
369 U	X	tor out		X			X			
369 MJ										
369 ML										
369 L	X			X			X			

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod	
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate Severe
370 U		X	X		X	
371 U	X		X		X	
372 U	X		X		X	
373 U	X		X		X	
374 U	X	torn out	X		X	
375 U	X	torn out	X		X	
376 U	X		X		X	
377 U	X		X		X	
378 U	X		X		X	
379 U	X		X		X	

note: 380-402 can be found towards the end

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
390 U							
MU							
ML	x						x
391 U							
MU							
ML							
392 U							
MU							
ML	x						
393 U							
MU							
ML	x						x
394 U							
MU							
ML	x						x
395 U							
MU							
ML	x						x
396 U							
MU							
ML	x						x
397 U							
MU							
ML	x						x
398 U							
MU							
ML	x						x
399 U							
MU							
ML	x						x
399 U							
MU							
ML	x						x
399 U							
MU							
ML	x						x
399 U							
MU							
ML	x						x

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
4000 U	X			X				X		
4000 MU										X
4000 ML	X			X				X		
4001 U			X							
4001 MU				X						
4001 ML										X
4002 U	X									
4002 MU				X						
4002 ML	X								X	
4003 U			X							
4003 MU				X						
4003 ML	X									
4004 U			X							
4004 MU				X						
4004 ML	X									
4005 U										
4005 MU				X						
4005 ML										X
4006 U			X							
4006 MU				X						
4006 ML										
4007 U										
4007 MU				X						
4007 ML										X
4008 U										
4008 MU				X						
4008 ML										X
4009 U										
4009 MU				X						
4009 ML										X
4010 U										
4010 MU										
4010 ML										X

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild	Significant	Can't tell	None	Mild	Severe
4110	U				X		
	MJ						
	ML						
	L						
4111	U						
	MJ						
	ML						
	L						
4112	U						
	MJ						
	ML						
	L						
4113	U						
	MJ						
	ML						
	L						
4114	U						
	MJ						
	ML						
	L						
4115	U						
	MJ						
	ML						
	L						
4116	U						
	MJ						
	ML						
	L						
4117	U						
	MJ						
	ML						
	L						
	U						
	MJ						
	ML						
	L						
	U						
	MJ						
	ML						
	L						

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
4 1 8 U	X		X			X	
MJ				X			X
ML							
4 1 9 U		X	X			X	
MJ				X			X
ML							
4 2 0 U		X	X			X	
MJ				X			X
ML							
4 2 1 U		X				X	
MJ				X			X
ML							
4 2 2 U		X				X	
MJ				X			X
ML							
4 2 3 U		X				X	
MJ				X			X
ML							
4 2 4 U		X				X	
MJ				X			X
ML							
4 2 5 U							
MJ							
ML							
4 2 6 U		X					
MJ				X			X
ML							
4 2 7 U		X					
MJ				X			X
ML							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
4 2 6 U	X									X
MJ										
ML										
4 2 9 U										
MJ				X						X
ML										
4 3 0 U										
MJ										
ML				X						X
4 3 1 U										
MJ										
ML				X						X
4 3 2 U										
MJ										
ML				X						X
4 3 3 U										
MJ										
ML										
4 3 4 U										
MJ										
ML										
4 3 5 U										
MJ										
ML										
4 3 6 U										
MJ										
ML										
4 3 7 U										
MJ										
ML										
L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod					
	None	Mild	Significant	Can't tell	None	Mild	Significant	Can't tell	None	Little	Moderate	Severe
448 U	X								X			
448 MU												X
448 ML												
449 U									X			
449 MU												
449 ML												
450 U												X
450 MU												
450 ML												
451 U												X
451 MU												
451 ML												
452 U												X
452 MU												
452 ML												
453 U												X
453 MU												
453 ML												
454 U												X
454 MU												
454 ML												
455 U												X
455 MU												
455 ML												
456 U												X
456 MU												
456 ML												
457 U												X
457 MU												
457 ML												
457 L												

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
458 U	X									X
MJ										
ML										
459 U				X						
MJ										
ML										
460 U										
MJ										
ML										
461 U										
MJ										
ML										
462 U										
MJ										
ML										
463 U										
MJ										
ML										
464 U										
MJ										
ML										
465 U										
MJ										
ML										
466 U										
MJ										
ML										
467 U										
MJ										
ML										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumper			Disturbance of the Tie Rod			
	Note	Mild	Significant/Can't tell	Note	Mild	Significant/Can't tell	Note	Little	Moderate	Severe
476	U	X			X		X			
	MJ									
	ML									
478	U	X			X					
	MJ									
	ML									
470	U	X			X					
	MJ									
	ML									
471	U	X			X					
	MJ									
	ML									
472	U	X			X					
	MJ									
	ML									
473	U	X			X					
	MJ									
	ML									
474	U	X			X					
	MJ									
	ML									
475	U	X			X					
	MJ									
	ML									
478	U	X			X					
	MJ									
	ML									
477	U	X			X					
	MJ									
	ML									
	L	X								

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
478 U	X						X			X
MJ										
ML										
L		X								
479 U										
MJ										
ML										
L										
480 U										
MJ										
ML										
L										
481 U										
MJ										
ML										
L										
482 U										
MJ										
ML										
L										
483 U										
MJ										
ML										
L										
484 U										
MJ										
ML										
L										
485 U										
MJ										
ML										
L										
486 U										
MJ										
ML										
L										
487 U										
MJ										
ML										
L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod					
	None	Mild	Significant	Can't tell	None	Mild	Significant	Can't tell	Note	Little	Moderate	Severe
488 U				X						X		
488 MU				X							X	
488 ML												X
489 U				X							X	
489 MU				X							X	
489 ML												X
490 U				X						X		
490 MU				X								X
490 ML												X
491 U				X							X	
491 MU				X								X
491 ML												X
492 U				X						X		
492 MU				X								X
492 ML												X
493 U				X						X		
493 MU				X								X
493 ML												X
494 U				X							X	
494 MU				X								X
494 ML												X
495 U				X						X		
495 MU				X								X
495 ML												X
496 U				X							X	
496 MU				X								X
496 ML												X
497 U				X						X		
497 MU				X								X
497 ML												X
498 U				X							X	
498 MU				X								X
498 ML												X
499 U				X							X	
499 MU				X								X
499 ML												X

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
498 U			X			X				X
MJ			X							
ML			X							
499 U			X			X			X	
MJ		X			X					
ML		X								
500 U			X			X			X	
MJ			X							
ML			X							
501 U			X			X			X	
MJ			X		X					
ML			X		X					
502 U			X			X				
MJ		X								
ML		X								
503 U			X			X				
MJ		X			X					
ML		X								
504 U			X			X				
MJ			X							
ML			X							
505 U			X			X				
MJ		X			X					
ML		X								
506 U			X			X				
MJ			X							
ML			X							
507 U			X			X				
MJ			X							
ML			X							

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpei			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
508 U	X		X			X				
508 MU								X		
508 ML	X									X
509 U			X							
509 MU			X					X		
509 ML	X									
510 U			X		X					
510 MU			X					X		
510 ML	X				X					
511 U			X							
511 MU					X					
511 ML	X				X					
512 U			X							
512 MU	X							X		
512 ML	X									
513 U			X							
513 MU	X							X		
513 ML	X									
514 U			X							
514 MU			X							
514 ML			X							
515 U			X							
515 MU			X							
515 ML			X							
516 U			X							
516 MU	X							X		
516 ML	X									
517 U			X							
517 MU	X									
517 ML	X									
517 L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	Note	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
518	U		X	X			X			
	MU	TORNOFF								X
	ML			X						
	L			X						
519	U			X						X
	MU	TORNOFF				X				X
	ML			X						
	L			X						
520	U			X					X	
	MU			X		X				X
	ML			X		X				
	L			X						
521	U		X						X	
	MU			X		X				X
	ML			X						X
	L			X						
522	U		X							X
	MU			X		X				X
	ML			X		X				X
	L			X						
523	U		X							X
	MU	TORNOFF								
	ML			X						
	L			X						
524	U		X							X
	MU			X		X				X
	ML			X						X
	L			X						
525	U		X					X		
	MU			X		X				
	ML			X						
	L			X						
526	U		X					X		
	MU			X		X				
	ML			X						X
	L			X						
527	U		X					X		
	MU			X		X				X
	ML			X		X				X
	L			X						X

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumper			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
5	X		X			X				
2	X									X
8	X									X
U										
MJ										
ML										
U										
MJ										
ML										
U										
MJ										
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I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
731 U										
MJ										
ML			these two tiebacks							
732 U										
MJ			are not exposed							
ML										
733 U				X						
MJ										
ML										
734 U				X						
MJ										
ML										
735 U				X						
MJ										
ML										
736 U				X						
MJ										
ML										
737 U				X						
MJ										
ML										
738 U				X						
MJ										
ML										
739 U				X						
MJ										
ML										
740 U				X						
MJ										
ML										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
741 U	X			X			X			
742 U										
743 U										
744 U										
745 U										
746 U										
747 U										
748 U										
749 U										
750 U										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
751	D			X						X
	MU									
	ML									
	L									
752	U			X						X
	MU									
	ML									
	L									
753	D			X						X
	MU									
	ML									
	L									
754	U			X						X
	MU									
	ML									
	L									
756	U			X						X
	MU									
	ML									
	L									
756	U			X						X
	MU									
	ML									
	L									
757	U			X						X
	MU			X						X
	ML									
	L									
758	U			X						X
	MU			X						X
	ML									
	L									
759	U			X						X
	MU			X						X
	ML			X						X
	L									
760	U			X						X
	MU			X						X
	ML			X						X
	L									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
761 U	X			X					X	
MJ	X			X					X	
ML	X			X						
762 U	X			X						
MJ	X			X						
ML	X			X						
763 U	X			X						
MJ	X			X						
ML	X			X					X	
764 U	X			X						
MJ	X			X						
ML	X			X						
765 U	X			X						
MJ	X			X						
ML	X			X						
766 U	X			X						
MJ	X			X						
ML	X			X						
767 U	X			X						
MJ	X			X						
ML	X			X						
768 U	X			X						
MJ	X			X						
ML	X			X						
769 U	X			X						
MJ	X			X						
ML	X			X						
770 U	X			X						
MJ	X			X						
ML	X			X						
L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
771 U	X			X			X			
MJ	X									
ML	X					X				
L										
772 U	X			X			X			
MJ	X									
ML	X									
L										
773 U	X			X			X			
MJ	X									
ML	X									
L										
774 U	X			X			X			
MJ	X									
ML	X									
L										
775 U	X			X			X			
MJ	X									
ML	X									
L										
776 U	X			X			X			
MJ	X									
ML	X									
L										
777 U	X			X			X			
MJ	X									
ML	X									
L										
778 U	X			X			X			
MJ	X									
ML	X									
L										
779 U	X			X			X			
MJ	X									
ML	X									
L										
780 U	X			X			X			
MJ	X									
ML	X									
L										

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Conductor of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
781 U	X			X						
MJ	X			X						
ML	X			X						
782 U	X			X						
MJ	X			X						
ML	X			X						
783 U	X			X						
MJ	X			X						
ML	X			X						
784 U	X			X						
MJ	X			X						
ML	X			X						
785 U	X			X						
MJ	X			X						
ML	X			X						
786 U	X			X						
MJ	X			X						
ML	X			X						
787 U	X			X						
MJ	X			X						
ML	X			X						
788 U	X			X						
MJ	X			X						
ML	X			X						
789 U	X			X						
MJ	X			X						
ML	X			X						
790 U	X			X						
MJ	X			X						
ML	X			X						
L	X			X						

1-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant/Can't tell	None	Mild	Significant/Can't tell	None	Little	Moderate	Severe
787 U	X			X			X			
787 MJ	X			X					X	
787 ML	X			X						
792 U	X			X			X			
792 MJ	X			X			X			
792 ML	X			X			X			
793 U	X			X			X			
793 MJ	X			X			X			
793 ML	X			X			X			
794 U	X			X			X			
794 MJ	X			X			X			
794 ML	X			X			X			
795 U	X			X			X			
795 MJ	X			X			X			
795 ML	X			X			X			
796 U	X			X			X			
796 MJ	X			X			X			
796 ML	X			X			X			
797 U	X			X			X			
797 MJ	X			X			X			
797 ML	X			X			X			
798 U	X			X			X			
798 MJ	X			X			X			
798 ML	X			X			X			
799 U	X			X			X			
799 MJ	X			X			X			
799 ML	X			X			X			
800 U	X			X			X			
800 MJ	X			X			X			
800 ML	X			X			X			
800 L	X			X			X			

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
801 U										
	MU									
	ML									
	L									
802 U										
	MU									
	ML									
	L									
803 U										
	MU									
	ML									
	L									
804 U										
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805 U										
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806 U										
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807 U										
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808 U										
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	ML									
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809 U										
	MU									
	ML									
	L									
810 U										
	MU									
	ML									
	L									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
811 U							
812 U	X		X		X		
813 U	X		X		X		
814 U	X		X		X		
815 U	X		X		X		
816 U	X		X		X		
817 U	X		X		X		
818 U	X		X		X		
819 U	X		X		X		
820 U	X		X		X		

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod			Grease leakage from the Trumpet			Disturbance of the Tie Rod			
	None	Mild	Significant Can't tell	None	Mild	Significant Can't tell	None	Little	Moderate	Severe
8 2 1 U	X			X						X
MJ	X									X
ML	X			X						X
L	X									
8 2 2 U	X			X						
MJ	X									
ML	X									
L	X									
8 2 3 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 2 4 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 2 5 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 2 6 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 2 7 U	X			X						
MJ	X									
ML	X									
L	X									
8 2 8 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 2 9 U	X			X						
MJ	X									
ML	X			X						
L	X									
8 3 0 U	X			X						
MJ	X									
ML	X									
L	X									

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumpet		Disturbance of the Tie Rod		
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate	Severe
B 3 1 U		X			X		
B 3 1 MJ	X						
B 3 1 ML	X						
B 3 1 L		NOT EXPOSED					
B 3 2 U	X			X			
B 3 2 MJ	X						
B 3 2 ML	X						
B 3 2 L		NOT EXPOSED					
B 3 3 U				X			
B 3 3 MJ	X			X			
B 3 3 ML	X			X			
B 3 3 L		NOT EXPOSED					
B 3 4 U				X			
B 3 4 MJ	X						
B 3 4 ML	X			X			
B 3 4 L		NOT EXPOSED					
B 3 5 U				X			
B 3 5 MJ	X						
B 3 5 ML	X			X			
B 3 5 L				X			
B 3 6 U							
B 3 6 MJ		TIERODS REMOVED					
B 3 6 ML							
B 3 6 L	X						
B 3 7 U				X			
B 3 7 MJ							
B 3 7 ML							
B 3 7 L	X						
B 3 8 U							
B 3 8 MJ	X	TIEROD REMOVED					
B 3 8 ML	X			X			
B 3 8 L	X						
B 3 9 U							
B 3 9 MJ		TIERODS REMOVED					
B 3 9 ML							
B 3 9 L	X						
B 3 0 U							
B 3 0 MJ		TIERODS REMOVED					
B 3 0 ML							
B 3 0 L	X						

I-90 MERCER ISLAND TIEBACK OBSERVATION

Tieback Number	Corrosion of the Tie Rod		Grease leakage from the Trumper		Disturbance of the Tie Rod	
	None	Mild Significant Can't tell	None	Mild Significant Can't tell	None	Little Moderate Severe
B 4 1 U		TIEROD REMOVED		X		X
	MU					
	ML					
	L	NOT EXPOSED				
B 4 2 U		TIERODS REMOVED				
	MU					
	ML					
	L	NOT EXPOSED				
B 4 3 U		TIERODS REMOVED				
	MU					
	ML					
	L	NOT EXPOSED				
B 4 4 U		TIERODS REMOVED				
	MU					
	ML					
	L	NOT EXPOSED				
	U					
	MU					
	ML					
	L					
	U					
	MU					
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