

**APPENDIX C**  
**GLENBROOK GULCH ANADROMOUS FISH HABITAT RESTORATION**  
**DETAILED PROJECT CONSTRUCTION TASKS**

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
<b>ROAD A6.03</b>				
30	275	Fillsite – Brush and rip roadway and lower portion of adjacent cutslope; fill roadbed and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed areas for native planting.		1000
25	75	Construct a concentrated slash barrier sufficiently wide to prevent vehicle access into the restored area.		
S150	S400	Remove Oversteepened and Failing Fillslope and Restore Floodplain – Excavate oversteepened fill along the streambank 4 to 7 feet down to original floodplain/terrace surface as determined by the PI; all excavation work to be conducted from the top of the existing fill prism; no heavy equipment shall operate in the active stream channel; re-establish a near-planar floodplain/terrace width of at least 10 feet between the graded slope and active channel under the direction of the PI. The toe of the final graded slope shall be at least 10 feet from the top of the active channel streambank. The ideal restoration goal is 25- to 35-foot flood prone width (hillslope to hillslope), but it is recognized that this will not be achievable along the entire length. Place and compact fill evenly along designated fillsite as directed by the PI; all graded slopes shall be no steeper than 2:1(horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	150	
275	300	Temporary Watercourse Crossing over Kaisen Gulch – Construct small bridge to accommodate passage of heavy equipment during construction activities.		
300	365	Fillsite – Brush and rip roadway and adjacent cutslope along A6.3 and the skid trail trending up Kaisen Gulch; fill roadbed and flat areas immediately adjacent not more than 4 feet by evenly placing and compacting excavated fill;		125

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
		access and/or fill placement along the Kaisen Gulch skid trail shall not be undertaken within 10 feet of the active channel streambank as designated by the PI. There shall be no disturbance of the Kaisen Gulch corridor within 10 feet of the active channel streambanks. Place and compact fill evenly along designated fillsite as directed by the PI; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.		
300	640	Remove Oversteepened and Failing Fillslope and Restore Floodplain – Brush and rip cutbench and adjacent cutslope; excavate oversteepened fill along the streambank 4 to 7 feet down to original floodplain/terrace surface as determined by the PI; all excavation work to be conducted from the top of the existing fill prism; no heavy equipment shall operate in the active stream channel; re-establish a floodplain/terrace width of at least 10 feet between the graded slope and active channel under the direction of the PI. The toe of the final graded slope shall be at least 10 feet from the top of the active channel streambank. The general restoration goal is to create a 25- to 35-foot flood prone width (hillslope to hillslope), but it is recognized that will not be achievable along the entire length. Fill cutbench and flat areas immediately adjacent not more than 4 feet by placing and compacting fill evenly along cutbench; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	420	201
S525	S550	Weir Construction – Install and anchor large redwood stumps or logs (greater than 1 foot in diameter) as a weir in the stream between narrow reach (upstream) and wider reach (downstream). The purpose of these logs is to provide channel complexity, cover, and to also trap sediment. Logs must be anchored/embedded into the adjacent floodplain and the top of the weir shall be 1 foot above the channel bed.		
670	775	Temporary Crossing – Fillslope failures and		

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Begin	End			
		streamflow scour have significantly reduced the roadway width at this location and created a near vertical streambank 3 to 4 feet high. Remove vegetation/debris from scour area and place as little fill as necessary to ramp down and up through this area to accommodate passage of heavy equipment during construction activities further up the road; all fill placed in this area shall be removed during site grading for Stations 640 through 950 (described below).		
640	950	Remove Oversteepened and Failing Fillslope and Restore Floodplain – Brush and rip cutbench and adjacent cutslope; excavate oversteepened fill along the streambank 4 to 7 feet down to original floodplain/terrace surface as determined by the PI; all excavation work to be conducted from the top of the existing fill prism; no heavy equipment shall operate in the active stream channel; re-establish a near-planar floodplain/terrace width of at least 10 feet between the graded slope and active channel under the direction of the PI. The toe of the final graded slope shall be at least 10 feet from the top of the active channel streambank. The restoration goal is 25- to 35-foot flood prone width (hillslope to hillslope), but it is recognized that this will not be achievable along the entire length. Fill cutbench and flat areas immediately adjacent not more than 4 feet by placing and compacting fill evenly along cutbench; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	55	184
S600	S630	Weir Construction – Install and anchor large redwood stumps or logs (greater than 1 foot in diameter) as a weir in the stream between narrow reach (upstream) and wider reach (downstream). All materials needed for construction are anticipated to be available locally. The purpose of these logs is to provide channel complexity, cover, and to also trap sediment. Logs must be anchored/embedded into the adjacent floodplain and the top of the weir shall be 1 foot above the channel bed.		

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Begin	End			
S790	S830	Weir Construction – Install and anchor large redwood stumps or logs (greater than 1 foot in diameter) as a weir in stream between narrow reach (upstream) and wider reach (downstream). All materials needed for construction are anticipated to be available locally. The purpose of these logs is to provide channel complexity, cover, and to also trap sediment. Logs must be anchored/embedded into the adjacent floodplain and the top of the weir shall be 1 foot above the channel bed.		
950	1000	Temporary Ramp – construct ramp across failed slopes; all fill placed is to be removed following construction activities.		
935	1025	Restriction – No fill placement on road cutbench – debris slide slope area above outside meander bend.		
1050	1080	Drainage Swale – Under the direction of the PI excavate a shallow swale 10 feet wide, 2 feet deep, and 150 feet long to control drainage off the hillside and the remains of Road A6.3.	135	
1080	1170	Remove Oversteepened and Failing Fillslope – Brush and rip cutbench and adjacent cutslope; excavate oversteepened fill along the roadway as determined by the PI; all excavation work to be conducted from the top of the existing fill prism. Fill cutbench and flat areas immediately adjacent not more than 4 feet by placing and compacting fill evenly along cutbench; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	55	50
1180	1325	Remove Oversteepened and Failing Fillslope – Excavate oversteepened fill along outboard edge of the road as determined by the PI; place and compact fill evenly along fill site approved by the PI; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	410	
S1375	S1500	Glenbrook Dam Removal – Clear old skid trail beginning at Station 11+40 down to dam for heavy equipment access; construct silt fences to prevent sediment from entering stream channel; clear trees	900	600

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
		off of dam; pump out approximately 0.5 acre-feet of water ponded behind the dam; temporarily divert streamflow (~5 cfs) around dam site; remove dam fill; place and compact fill in spillway; brush and rip old borrow area and adjacent skid trails along left (looking downstream) hillslope under the direction of the PI; brush and rip old skid trail along the base of the left hillslope under the direction of the PI; excavate dam fill to accommodate channel restoration (described below and see also Plan Sheet 13). Expect to encounter deleterious material (e.g., large wood and logging detritus) as part of the dam fill; organic detritus can be used as mulch but anthropogenic trash shall be hauled offsite to an appropriate disposal site. Place and compact excavated fill evenly into spillway, borrow area, and along cutbench of old skid trail after those areas have been brushed, ripped, and approved by the PI. Borrow area can likely be filled to a depth of 5 or 6 feet in areas if approved in advance by the PI; skid trail along the base of the left hillslope shall be filled no more than 4 feet by placing and compacting fill evenly along cutbench; all graded (cut or fill) slopes shall be no steeper than 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.		
S1375	S1500	Channel Restoration at the Glenbrook Gulch Dam Site - - For the full length of the dam excavate the upstream side of dam down to the level of the upstream floodplain (previously the pond bottom) as determined by the PI; similarly excavate the downstream side of the dam down to 2 feet below the level of the upstream floodplain. Expect to encounter deleterious material (e.g., large wood and logging debris) during the excavation and pay close attention to indicators of the native ground surface. The goal of this rough grading is to expose the buried native hillslopes and create a 45- foot wide floodplain that generally matches the upstream floodplain (pond bottom). The restored floodplain segment shall be gently inclined (min. 2 percent) to drain towards the axis of the valley bottom. Once the floodplain has been created and		

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
		the surface compacted, excavate an 8-foot wide and 2-foot deep channel through the center of the floodplain. Under the direction of the PI place various roughness elements (e.g., large wood and large rocks) on the reconstructed floodplain to maintain streamflow down the center of the floodplain and through the excavated channel. Following the excavation work, install and anchor large wood (2-foot diameter redwood logs and old-growth stumps) as channel grade control along base of the remaining downstream dam face; the top of the grade control shall be 2 feet below the floodplain (old pond bottom). All logs, stumps, and rocks required for the channel and weir construction are expected to be available locally. Specifically, a large redwood tree near Station 11+80 shall be cut and used as the primary weir element at this location. Place other large wood and rocks on the reconstructed floodplain as channel roughness elements as directed by the PI and mulch all disturbed areas.		
S1350	S1425	Weir Construction Downstream of Glenbrook Dam Restoration Site – The channel segment immediately downstream of the dam was modified by the dam and will likely be impacted by the proposed restoration. Consequently, upon completion of the dam removal and channel reconstruction, one or two weirs made out of large wood shall be installed to control the channel gradient and serve as a transition between the restored channel segment and the natural channel downstream; the location of the weir will be determined in the field by the PI in conjunction with the installation of the weir discussed previously. The top of the weir shall be 1 foot above the channel bed and the ends shall be firmly anchored and embedded into the adjacent floodplain.		
1180	1220	Drainage Swale – Under the direction of the PI excavate a shallow swale 10 feet wide, 2 feet deep, and 100 feet long to control drainage off the hillside and the remains of Road A6.3.	90	
1260	1300	Drainage Swale – Under the direction of the PI excavate a shallow swale 10 feet wide, 2 feet	120	

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
		deep, and 130 feet long to control drainage off the hillside and the remains of Road A6.3.		
1325	1400	Remove Oversteepened and Failing Fillslope – Brush and rip cutbench and lower portion of adjacent cutslope; excavate oversteepened fill along outboard edge of the road as determined by the PI. Fill cutbench and flat areas immediately adjacent not more than 4 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	65	45
1400	1500	Fillsite – Skid Trail intersection behind landing – Brush and rip flat area; fill roadbed and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.		290
1400	1500	Remove Landing – excavate outboard portion of landing down to native slope as determined by the PI; graded slopes shall not exceed 2:1 (horizontal:vertical). Place and compact fill evenly along designated fill storage site as directed by the PI; finish grade and mulch the fill prism for native planting.	960	
1375	1425	Construct a concentrated slash barrier sufficiently wide to prevent vehicle access into the restored area.		
1450	1500	Drainage Swale – Under the direction of the PI excavate a shallow swale 10 feet wide, 2 feet deep, and 100 feet long to control drainage off the hillside and the remains of Road A6.3.	90	
Road 50	A6.3 1 350	Fillsite – Toe of Cutslope – Brush and rip roadway and lower portion of adjacent cutslope; raise cutbench not more than 2 feet by evenly placing and compacting excavated fill creating a 12-foot wide roadbed; no fillslope shall exceed 2:1 (horizontal:vertical); construct rolling dips every 150 feet; finish grade and mulch all disturbed slope areas for native planting.		400
Road 50	A6.3 1 100	Construct a concentrated slash barrier sufficiently wide to prevent vehicle access into the restored area.		
Skid	Trail	Fillsite – Toe of Cutslope – Brush and rip roadway		145

*Project Stationing		Restoration/Remediation Task	Cut Vol. cu.yds	Fill Vol. cu.yds
Begin	End			
downs lope 0	X of Rd. A6.3 1 250	and lower portion of adjacent cutslope; fill cutbench and flat areas immediately adjacent not more than 4 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.		
1500	1975	Remove Oversteepened and Failing Fillslope – Brush and rip cutbench and lower portion of adjacent cutslope; excavate oversteepened fill along outboard edge of the road as determined by the PI. Fill cutbench and flat areas immediately adjacent not more than 4 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.	410	280
1975	2025	Fillsite – Toe of Cutslope – Brush and rip cutbench and lower portion of adjacent cutslope; excavate oversteepened fill along outboard edge of the road as determined by the PI. Fill cutbench and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); finish grade and mulch all disturbed slope areas for native planting.		45
2020	2050	Temporary Crossing – Place as little fill as necessary to ramp down and up through this area to accommodate passage of heavy equipment during construction activities; all fill placed in this area shall be removed prior to completing the project as directed by the PI. The temporary crossing to be constructed at this location shall include erosion and sedimentation control.		
2010	2020	Watercourse Crossing Approach – Ramp (excavate) down approximately 6.5' at 70% down to original stream channel bottom as determined by the PI.	5	
2020	2050	Watercourse Crossing Fill Removal – Remove fill remaining in watercourse under direction of the PI; final channel gradient is to connect undisturbed upstream and downstream channel segments and will likely be approximately 40 percent; place large wood and angular rock (greater than 1 foot diameter) in the restored stream channel as	820	



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Begin	End			
		channel control under the direction of the PI; obliterate roadway approaches and install rolling dips if necessary to control roadway runoff from entering the watercourse; finish grade and mulch disturbed slopes. Place and compact fill evenly along fill site approved by the PI.		
2060	2050	Watercourse Crossing Approach – Ramp (excavate) down approximately 6.5' at 70% down to original stream channel bottom as determined by the PI.	5	
2050	2120	Fillsite – Toe of Cutslope – Brush and rip cutbench and lower portion of adjacent cutslope; fill cutbench and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); construct rolling dips every 150 feet and at the approaches (heads of ramps) leading down to watercourses; finish grade and mulch all disturbed slope areas for native planting.		75
2150	2425	Fillsite – Toe of Cutslope – Brush and rip cutbench and lower portion of adjacent cutslope; fill cutbench and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting excavated fill; no fillslope shall exceed 2:1 (horizontal:vertical); construct rolling dips every 150 feet and at the approaches (heads of ramps) leading down to watercourses; finish grade and mulch all disturbed slope areas for native planting.		300
2500	2800	Fillsite - this road shall be brushed and ripped; fill cutbench and flat areas immediately adjacent not more than 5 feet by evenly placing and compacting excavated fill and no fillslope shall exceed 2:1 (horizontal:vertical); construct rolling dips every 150 feet and at the approaches (heads of ramps) leading down to watercourses.		
2800	2900	Fillsite – old landing at this location shall be brushed and ripped; fill adjacent flat areas immediately adjacent not more than 4 feet by evenly placing and compacting excavated fill and no fillslope shall exceed 2:1; finish grade and mulch all disturbed slope areas for native planting.		400
2800	2900	Remove Oversteepened and Failing Fillslope of Landing – excavate outboard portion of landing to	330	

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Begin	End			
		a 2:1 slope (horizontal:vertical). Place and compact fill evenly along designated fill storage site as directed by the PI; finish grade and mulch the fill prism for native planting.		
2900	3300	Fillsite - this road shall be brushed and ripped; fill cutbench and flat areas immediately adjacent not more than 3 feet by evenly placing and compacting excavated fill and no fillslope shall exceed 2:1 (horizontal:vertical); construct rolling dips every 150 feet and at the approaches (heads of ramps) leading down to watercourses. excavate oversteepened outboard edge of the landing fillslope below the zone of cracking to a more gentle inclination (2:1, horizontal:vertical); place and compact excavated fill along nearby cutslopes; finish grade and mulch all disturbed slope areas for native planting.		300
3380	3430	Construct a concentrated slash barrier sufficiently wide to prevent vehicle access into the restored area.		
<b>ROAD A6.0</b>				
0	3960	Reopening and storm-proofing Road A6.0 and the upper segment of Road A6.3 shall include the installation of waterbars as specified by the PI, remove obstructing debris and fill from culvert inlets and outlets.		

**NOTE:** The total volume of failing and oversteepened fill to be removed along A6.3, the dam, and the stream channel is estimated to be 5,020 cubic yards. The excavated material will be placed and compacted along nearby roads and skid trails within the immediate project area. Thus, it is estimated that approximately 350 cubic yards of excavated material will need to be hauled to the abandoned quarry site along Road M1.0.

\* Stationing numbers indicate linear feet. Numbers for Road A6.3 begins at the southernmost end, near the Albion River; numbers for Road A6.0 indicate the entire length from Comptche-Ukiah Road to the intersection with Road A6.3. "S" stationing refers to the stream channel.