

Couse Creek RM8 Material and Fill Estimates

The restoration structures (i.e., PALS and BDAs) are intended to be temporary fixtures on the landscape. They may be remobilized and transported or decay over time and are replaced by naturally occurring structural elements. To that end, structures will be constructed entirely of organic material and untreated wooden fence posts. Material calculations are presented here to inform material requirements for staging, assist with budget estimates for material acquisition and hauling costs, and to assist with fill estimates that might be used in permitting required for implementation.

Below, material estimates are provided with respect to structure type (i.e., PALS or BDA) and for each of the three expected phases of restoration (see Temporal Design above). Material estimates rely on the following pieces of information relevant to implementation and structure construction.

Structure Length – Linear distance of BDA and PALS are used to inform estimates of required posts and woody material.

Posts – Untreated wood fenceposts, sourced at 6-foot length and approximately 2.5-8 inches in diameter. Assumed to be installed at a density of approximately 1 post for every 2 linear feet of structure crest length for PALS and every 1.5 linear feet for BDAs with two posts on each end.

Deciduous Woody Vegetation – Willow and alder that can be harvested on site, assumed to have an average stem diameter of 1-4 inches and average length of 8-12 feet.

Coniferous Woody Vegetation – Coniferous woody vegetation harvested primarily off-site.

Three sizes of coniferous woody material were used in fill calculations:

- *Small Coniferous* – Small sized coniferous trees and large branches with a DBH of approximately 4-6 inches and length of 6-8 feet. Approximate volume = 0.02 yards³.
- *Medium Coniferous* – Medium sized coniferous trees and large branches with a DBH of approximately 8-10 inches and length of 10-12 feet. Approximate volume = 0.08 yards³.
- *Large Coniferous* – Large coniferous trees with a DBH of approximately 10-12 inches and length of 12-15 feet. Approximate volume = 0.15 yards³.

Structure Type	Average Structure Length (ft.)	Pieces Per Structure				Total posts	Typical Wood Volume (yards ³)	Typical Soil/Substrate Fill Volume (yards ³)
		Deciduous Woody Material (count)	Coniferous Woody Material (count)					
			Small	Medium	Large			
PALS	16	0	12	6	3	12	1.3	0
BDA	8	50 <i>or</i>	10	5	0	10	0.8	0.25

Table 1: Estimate for the number of individual pieces of each material type needed to construct an average sized BDA or PALS. Material estimates include woody material, posts, and dirt/substrate fill.

Phase	Type	Structure Count	Deciduous Woody Material (count)	Coniferous Woody Material (count)			Posts	Total Wood Fill (yards ³)	Total Soil/Substrate Fill (yards ³)
				Small	Medium	Large			
1	PALS	144	0	1728	864	432	1728	187.2	0
	BDAs	10	500 <i>or</i>	100	50	0	100	8	2.5
2	PALS	40	0	480	240	120	480	52	0
	BDAs	5	250 <i>or</i>	50	25	0	50	4	1.25

Table 2: Material and fill estimates expected for Phase 1 and 2 of restoration implementation. Separate estimates are listed for number of required posts, as well as individual pieces of deciduous and coniferous material that will largely be transported to the project site.

Phase	Type	Structure Count	Deciduous Woody Material (count)	Coniferous Woody Material (count)			Posts	Total Wood Fill (yards ³)	Total Soil/Substrate Fill (yards ³)
				Small	Medium	Large			
Imported Wood	PALS	73	0	876	438	219	876	94.9	0
	BDAs	0	0 <i>or</i>	0	0	0	0	0	0
Onsite Harvest	PALS	71	0	480	240	120	480	52	0
	BDAs	10	500 <i>or</i>	100	50	0	100	8	2.5

Table 3: Material estimates for onsite harvest and importation from another site for phase 1. Phase 2 construction sites are yet to be selected, and therefore onsite harvest versus imported materials are not listed. Note that all posts will be imported to the project, and estimates of amounts for securing imported and onsite harvested wood are listed here.