K4COURT CONDOMINIUMS

NE 31st Ave & Killingsworth St, Portland OR 97211

PROJECT SUMMARY

Project Type:	Residential / 4-condos
Technologies:	Green Roof; 1,000 sq. ft. (area); 3-5 in. composite (soil)
Major Benefits:	Roof longevity – plantings extend life of roof
	Storm water management – substantial reduction in runoff
	Aesthetics – plantings are attractive from various vantage points
	Awareness – project creates awareness by virtue of Killingsworth location
Cost:	Total project cost – $1.1M
	Eco roof construction cost – $16,290
	BES grant - $4,530
Constructed:	January – May 2009

INTRODUCTION

K4 is a 4-unit courtyard style condo project located at the heart of Portland's Alberta Arts / Concordia neighborhood (NE 31st Ave @ Killingsworth St). The development utilizes eco roof surfaces at patio overhangs (8) and atop the property's covered parking component (2), for a total of 906sf. The project was completed in May 2009 and has since been certified Platinum by Earth Advantage.

Motivation to employ green roofs at K4 centered largely on adding to the project's marketability – virtually all surfaces are visible from multiple vantage points (street, shared walk-way, parking, from within units, etc). Given the project's courtyard theme, landscape played an integral role in shaping K4's identity. In addition, Earth Advantage awards 'points' for eco roof initiatives. Point totals are based on percentage of roofing surface covered – in this instance, at less than 25% total coverage, the project earned 2 points (total earned: 141 points).

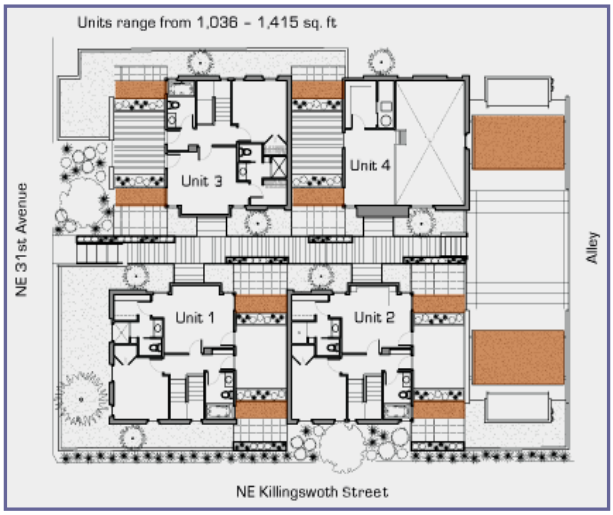
Also worth noting are specific cost implications – very few in this case. K4 is a new construction initiative. Planted roof surfaces were not designed with eco roofs in mind. In other words, the patio overhangs and covered parking stalls were not specifically designed or engineered to accommodate plantings. Planted surfaces employ the same roofing membrane as non-covered areas, and flashing detailing remains consistent throughout. In all, total cost implications are limited to $1K in engineering + the cost of soil, plants, and labor.

STORM WATER SYSTEM OVERVIEW

Roof surfaces absorb most direct rainfall. Patio overhangs also help to mitigate run-off of unit roof decks (120sf per). The average depth of eco roof growing medium (soil) is 4". Although the performance of the roof will vary depending on a number of variables, research indicates that eco roof surfaces will absorb 50% of total run-off. Additional run-off will be captured by two below grade catch basins located at the property's parking area.

SYSTEM COMPONENTS

- Structural roof support – traditional stick-frame
- Membrane – 50 mil PVC
- Drain mat – polypropylene / polystyrene mat sits atop PVC membrane; serves as border between soil and roof surface
- Steel flashing – retains soil at border of roof services. Condition exists at both planted and exposed roof surfaces
- 4 – 6" growing medium – 12 yards total: composite blend consisting of Canadian peet moss (10%), pumice (47%), pumice kale (33%), compost (10%), ammonium phosphate, ferris sulfate, gypsum, apex, and dolomite lime – 69 lbs / cubic foot.
- Vegetation – 438 plants total: Achillea Moonshine, Achillea Walter Funk, Achillea Rose, Allium Glancum, Sedum Angelina, Sedum Lidenkense, and Campanula Birdne Higorst
- Drip irrigation – permanent drip system beneath planted surface; operational during summer months only
- Roof drain – drain / downspout to catch basins at parking area



BUDGET

It's been very tough to quantify specific costs for this project's eco roof component – the difficulty lies in differentiating between eco roof and non eco roof items. Virtually impossible to determine % of cost with regard to design, construction admin, insurance, framing, etc. To this end, I might attribute total cost to those items deemed above and beyond original scope of work; i.e. additional engineering, drain mat, soil, plantings, and irrigation. Not terribly cost prohibitive given grant money received.

ITEM	COST	NOTES
Additional Engineering	1,200	Specific to eco roofs
Framing	6,000	Developer's est.
Membrane	4,750	Total cost divided by eco roof SF
Eco roof components	4,340	Drain mat, plantings, irrigation
Total	16,290	
Less BES Grant	-4,530	
Out-of-Pocket	11,760	

Breakdown per above is: $16,290 / 906sf = $17.98/sf. This number should likely be taken in stride given argument above.

MAINTENANCE

The property's Home Owner Association (HOA) will manage all maintenance activities at K4. Maintenance is limited to weeding and new plantings 2X per year + basic irrigation. Irrigation will need to be turned on and off at peak seasons and checked annually to ensure that the system functions as it should.

SUCCESSES / LESSONS LEARNED

This project is a solid example of how eco roofs can add value to a development while also creating awareness. The cost to implement is thought to be minimal given benefits realized. In addition to those benefits listed above, these eco roofs have sparked conversation and inspired action. In essence, they've contributed to shaping NE Portland's evolving identity as a green and sustainable network of communities. Many thanks again for this opportunity…