# Invisible FAX

Via Fax #: 425-486-2489

Date: 2-12-99
To: Rich Needham, DPW, City of Bothell
From: Bill Bohnhoff, VP, ASLA
Re: Grass Paving - Safe Gradients

Message: Rich - I am sending our complete technical kit to you via mail, to update your old Ritterings brochure. Thank you for keeping it so long (it may be a collectors piece).

The issue raise about maximum gradients possible with grass paving must be answered with respect to a couple of variables, which I will try to address below.

**Minimum Gradients**

Because grass pavements (at least our Grasspave2 system) are designed to be porous, there is no minimum gradient required - water will enter the surface and subsoils vertically, and maintain traffic stability at the same time.

**Safety - Traction**

A key issue involved between asphalt and concrete surfaces compared to grass is traction (or friction) and the need for traffic to safely manouver over the surface under differing weather conditions. We have created the chart below as a general guide, with information gained from our 17 years of manufacturing and observance of installations all over the country. These gradients do not take into account other design factors such as cross-slope, soil types, traffic speed, wind, etc. Keep in mind that 20% grades are some of the steepest streets in San Francisco, and that a fire vehicle needs to get to the building to fight a fire, so a steep downhill slope will get the truck there, and it could always by winched out after the fire.

| | % Maximum Gradient Recommended | | |
|---|---|---|---|
| Traffic Condition | Asph/Conc | Dry Grass | Wet Grass |
| Firelane/Emergency Access | 20% | 10% | 5% |
| Maintenance Vehicle-heavy | 20% | 15% | 5% |
| Light Trucks & Autos | 20% | 15% | 8% |
| Golf Carts | 40% | 30% | 15% |
| Pedestrians | 15% | 15% | 10% |
| Snow, Sleet, or Ice | 2% | 2% | 2% |

I hope this information is helpful. Please call if you need additional information. Thank you.

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