STEVENS CREEK TRAIL SURFACING

The surfacing for Stevens Creek Trail must accommodate pedestrians and cyclists, year-round. The adopted Master Plan and the associated environmental clearance document notes that the trail must be all-weather and made of a nonpetroleum-based material. The Master Plan does not cite any other material choices as required, nor as precluded. That determination is, and always has been, part of the design efforts by staff and the consultant team that ensued from the project approvals on June 20, 2006.

The Master Plan also promotes use of pervious paving and cites this goal for parking lot areas. In addition to the Master Plan criteria, the trail surfacing must meet a variety of other requirements:

- Safe, in all types of conditions, for public use
- Accessible for wheelchairs, per Americans with Disabilities Act (ADA)
- Protects creek water quality (runoff is clean)
- Compatible with wildlife
- Meets flood plain standards

This last standard is particularly difficult. Unlike most other trails, much of our trail alignment is within the flood zone. The trail paving must withstand periodic inundation and flood water forces. It must also meet the associated permitting agency criteria. This requirement alone rules out many options. In combination with ADA criteria, few choices remain for the trail material.

There are further goals for the trail surfacing that factor into final material selection. The goals include:

- Durable & strong
    - does not rut, ravel or crack easily
    - stays firm, level and safe
- Long life expectancy
- Low glare
- Low maintenance
- Good for wheelchairs, strollers etc. but less inviting for skateboards and fast traffic
- Accommodates light maintenance vehicles (electric carts e.g.)
- 'Rustic' appearance if possible
- Porous if possible to reduce runoff
- Cost effective
    - good value for the cost, vs. longevity & ongoing maintenance needed

The design team evaluated paving materials. Decomposed granite is a pedestrian-friendly trail surface and is a nice material for footpaths. Unfortunately it has some deficiencies. It tends to rut and ravel. Ruts and ravels at any time can create unsafe conditions for cyclists or wheelchairs. During rainy weather, it may not remain passable for cyclists or wheelchairs. The decomposed

granite (DG) paving at the Civic Center complex shows this difficulty during the rainy season even though it is very highly compacted. Finally, DG is not a flood plain-compatible material. It does not withstand flood plain forces such as scour and erosion during inundation.

The design team sought a material that would be as inviting as DG but would meet the important performance criteria that DG would not. The team found a similar material called "Natural Pave" that would be suitable. Natural Pave was the type of trail surface envisioned during master plan discussions, according to the planning consultant. Staff included Natural Pave in the bid documents for the trail. It was included as a Bid Add Alternate since it is a proprietary product and is costly. The bids came in, and the cost to use Natural Pave was an extra $269,000. The City Council did not authorize including this bid alternate in the project.

A construction contract was awarded in August with the base bid trail design. The base bid included a trail of compacted aggregate base rock, with a "geocell" plastic web product below the surface to provide reinforcement. It was clear at the time, that aggregate base has similar drawbacks to DG. It ruts and ravels easily and is not cohesive. It was never desired as the long-term solution for trail surfacing. In spite of that, we proceeded into construction because any delay for redesign or rebidding of the trail surfacing would lead to a delay in reopening Blackberry Farm and the potential loss of grant funds.

The design team and Public Works staff felt it was important to continue to seek an alternate material that would perform properly in the given site conditions and better address the needs of the community. Not long after construction began, another surfacing material came to the attention of the team -- one of the improved versions of permeable concrete now becoming available. A formulation was found with strong performance, integral color, and a smaller aggregate size suitable for foot traffic.

The design team evaluated this material in October and found that it met the project criteria. Particular strengths included its ability to provide a safe, firm, level, nonskid surface; its ability to maintain this safe surface in all conditions including heavy rain; its durability; its low maintenance requirements; and its suitability for flood plain conditions. Its appearance is more "rustic" than asphalt or conventional concrete due to the voids that allow water infiltration, i.e. a better visual fit for a natural setting. A color was available similar to the color of the native earth. This material was reviewed by our environmental consultant, and was deemed acceptable per the project's environmental documents, master plan and permits.

Permeable concrete has stronger safety characteristics and ADA compliance when compared against DG for use as an all-weather surface. The same is true in a comparison to aggregate base, and the permeable provides a trail surface that is safer, more accessible, and compliant with project requirements.

The primary trail alignment has been installed with pervious concrete. The ultimate color is a tan shade and the final surface will in fact be a buff color and will blend in well. Plantings will be installed along much of the trail alignment and will further soften the edges.