Diamond Grinding Slurry
Best Management Practices

Integrating Engineering, Economics and the Environment
Introduction

- John H. Roberts
- Executive Director - International Grooving and Grinding Association
- Vice President – American Concrete Pavement Association’s Pavement Restoration Division
The Facts of (Pavement) Life
Concrete Sawing Residue - Slurry
What is Slurry?

- Inert, (typically) nonhazardous byproduct of the diamond grinding and concrete sawing processes
- Combination of the cooling water and the concrete fines brought into suspension during the sawing process
- Water is introduced to the saw blades to increase their life expectancy, decrease dust emissions and increase worker safety
Saw Cutting Slurry
On-Board Slurry Vacuum System
Resultant Near-Dry Surface
Specs Are Driven by Poor Performance
IGGA – Best Management Practices
IGGA - Best Management Practices

- Slurry spreading disposal
- Slurry collection and pond decanting
- Slurry collection and plant processing
- Slurry collection and recycling
- Alternative solutions
Slurry Spreading Disposal
Slurry Spreading Disposal

- Used in rural areas that have vegetated slopes
- Engineer and Contractor should conduct a site inspection identifying sensitive areas
- Slurry spreading start and stop points should be clearly marked on road shoulder
- Slurry must be picked up and hauled while grinding in these areas
Slurry Spreading Disposal

- Vacuumed slurry should be spread evenly on adjacent slopes, starting a minimum of 1 foot from the shoulder.
- Slurry should not be spread within 100 ft. of any natural stream or lake, or within 3 ft. of a water filled ditch.
- At no time will slurry be allowed to enter a closed drainage system.
Liming Effects of Slurry

- One of the main concerns with applying CGR to soils is the liming effect and subsequent increase in soil pH.
- Three things effect the pH of the saw slurry:
  - Composition of the concrete
  - Quality of the water used to cool the blades
  - Amount of removal and quantity of water used
NDSU Slurry Research - 2010

- Smooth Brome (Bromus inermis Leyss) and Soil Chemical Response to Concrete Grinding Residue Application (Greenhouse Study)

- Concrete Grinding Residue Characterization and Influence on Infiltration (Soil Mechanics)
  - Tom DeSutter & Patricia Goosen-Alix & Lyle Prunty & Paul White Jr. & Frank Casey
Five CGR materials from widely dispersed sites in the United States were analyzed for particle size distribution and evaluated with a suite of USEPA physical and chemical analyses. Values found for the parameters examined are not considered harmful.
NDSU Conclusions

“Current CGR materials, at least those represented in this study, do not present a hazard. While direct deposition of the CGR machine product on the vegetated parts of highway rights-of-way may be unsightly to some, the environmental impact is negligible.”
Caltrans CGR Characterization

- The fresh water samples and slurry samples for inorganic and organic constituents displayed no hazardous characteristics when compared to Title 22 haz-waste standard
  - Holmes & Narver 1997
NYSDOT Guidance

Except for sites in Nassau and Suffolk Counties, the disposal of pavement diamond grinding slurry can occur at a site(s) under the control of a transportation agency, such as, but not limited to, NYSDOT, the Thruway Authority, or municipal (county, city, or town) highway departments provided, however, that said agency provides proper oversight of the generation and placement of the slurry to assure that the slurry is not contaminated with the spill of a petroleum product and is not comingled with other solid waste during the process. The basis of this determination is that under the preconditions above, diamond grinding slurry can be determined to be recognizable and, therefore, the site at which it is placed qualifies for exemption pursuant to 6 NYCRR 360-7.1(b)(1)(i).
NYSDOT Guidance

For pavement slurry grindings proposed for placement within Nassau or Suffolk County, the Department has determined that the diamond grinding slurry falls within the definition of clean fill (see 6 NYCRR 360-8.2(a)(1)), and it follows that the site proposed for placement is exempt from regulation under Part 360, so long as the site is under the ownership or control of the transportation agency; the transportation agency has implemented proper inspection protocols to assure that only pavement diamond grinding slurry is placed at the site; the slurry is not contaminated with the spill of a petroleum product or comingled with other solid waste; and the conditions found in subdivision 360-8.6(b) are met. For the purpose of this item, “transportation agency” includes, but is not limited to, the Thruway Authority, NYSTA, or municipal (county, city, or town) highway departments.
MNDOT Slurry BMP
Other Options Are Available
Slurry Collection & Pond Decanting

- Used in urban areas with closed drainage systems
- Slurry collected in water-tight haul units and transported to settlement ponds
- Ponds located within or outside of right-of-way – water is decanted and reused on job
- Upon completion solids used as fill, lime or other commercially useful application
Water-tight Haul Units
Slurry Decanting Area
Slurry Decanting & Pond Processing

- Cheaper than disposal in Type II landfills or plant processing
- Keeps all project elements on project site when kept in right of way
- Environmentally friendly
Slurry Collection & Plant Processing

- Slurry is collected and hauled to processing plant in water-tight haul units
- Various plant designs available such as centrifuge and belt press
- The site will be prepared to control any storm water runoff
- Processed water and solids are handled in same fashion as in decanting ponds
Processing Plants
Slurry Collection & Plant Processing

- Allows for 100% control of the slurry product cradle to grave
- Final product is a cement and aggregate based solid that can be used as fill
- Plant setup expense makes it impossible to use for smaller projects
- Operating costs can more than double the grinding cost
Additional Disposal Options
Beneficial Use Determinations

- Soil stabilization
- Agricultural lime
- Fill
- Waste water treatment plants
- Power plants
LET'S HAVE ONE MORE
AND THEN WE'LL GO!!
Visit Us on the Web

International Grooving and Grinding Association
at
igga.net