



AGGREGATES

Section 2 – Types and Uses

Aggregate Types

- **Natural Aggregates – alluvial deposits; particle sizes from boulder to clay; generally poor quality without modification**
- **Manufactured Aggregates – produced through crushing, screening, separating, and recombining rock deposits or natural aggregates**
- **Reclaimed Asphalt Pavement (RAP) – Produced by cold milling existing asphalt pavements**

Natural Aggregates

- **Screened Aggregate – produced by screening or fractionating natural aggregates**
- **Pit Run Aggregates – produced by screening to provide a material with a given maximum size**

Manufactured Aggregates

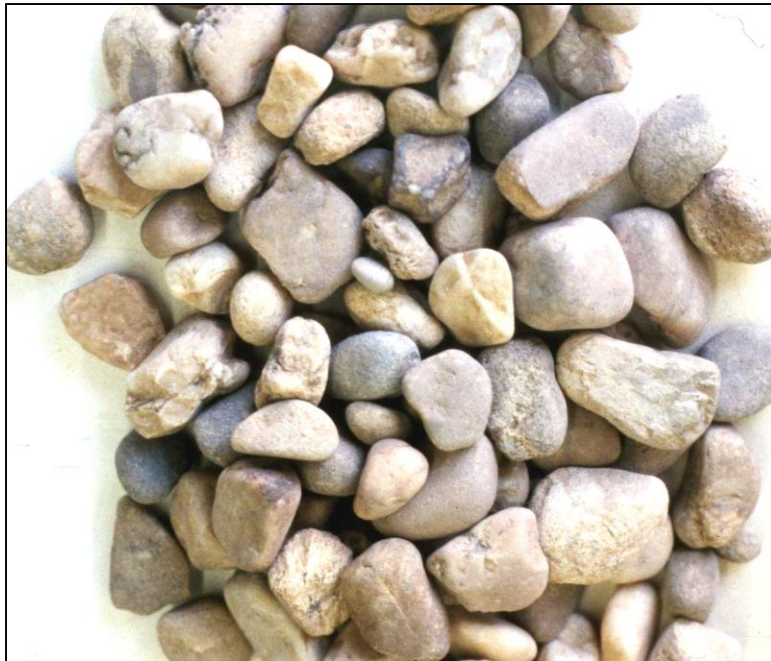
- **Quarried Aggregates – produced by blasting and crushing rock deposits**
- **Crusher Run Aggregates – natural aggregate crushed to provide a material with a given maximum size; contains both crushed and uncrushed particles**

Manufactured Aggregates (continued)

- **Crushed Aggregates – produced by crushing larger sized particles**
- **Treated Aggregates – aggregates treated with an additive to improve strength or durability**

Aggregate Angularity

Pit Run or Screened:
Rounded



Crushed: Angular



Reclaimed Asphalt Pavement

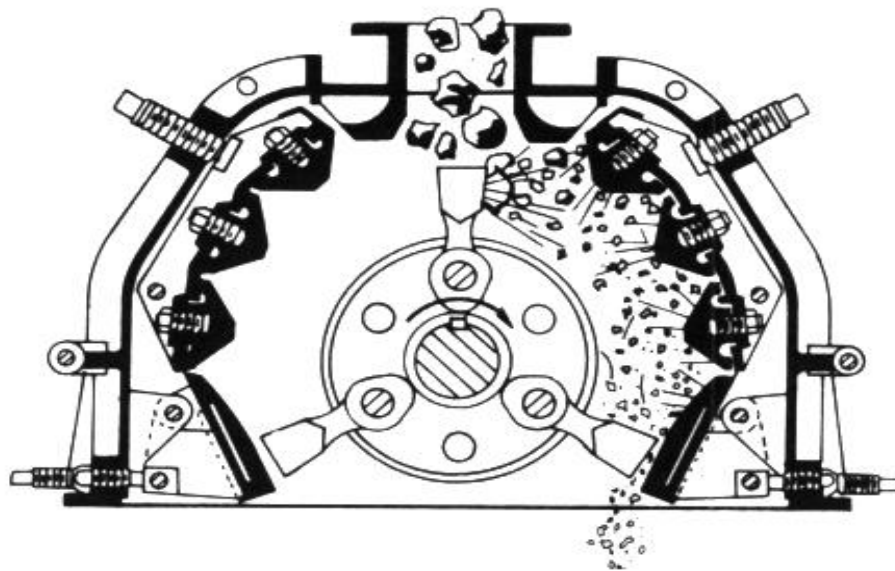
- **Used straight or in combination with other granular materials**
- **If used in combination with other materials, typically limited to 50% maximum to maintain workability and compactability**
- **RAP properties can vary based upon the source layer(s) included.**
- **Use of RAP will be designated on plans.**

Aggregate Crushing

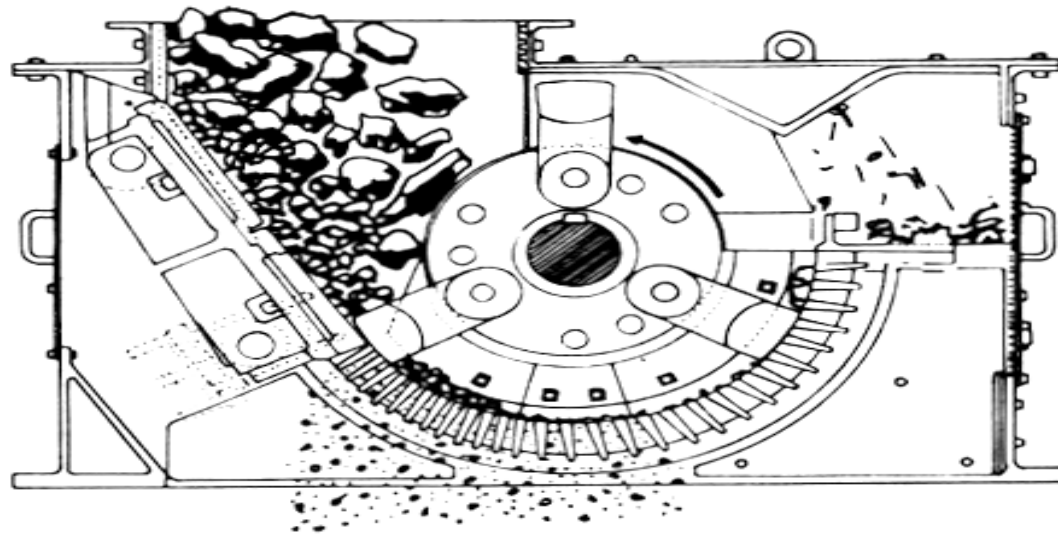
- **Mechanisms:**
 - ▶ **Grinding**
 - ▶ **Shear**
 - ▶ **Compression**
 - ▶ **Impact**

- **For RAP, only Compression type are allowed (WYDOT 401.3.2)**

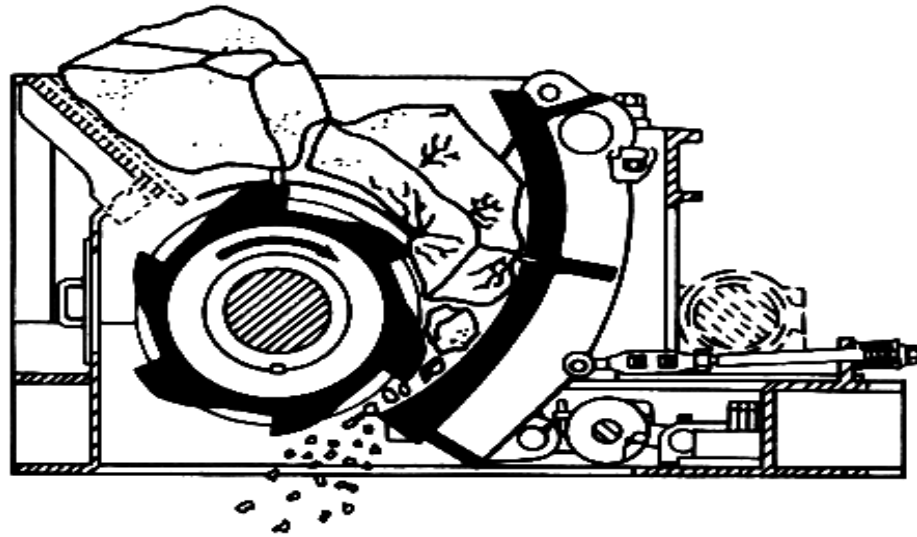
Impact



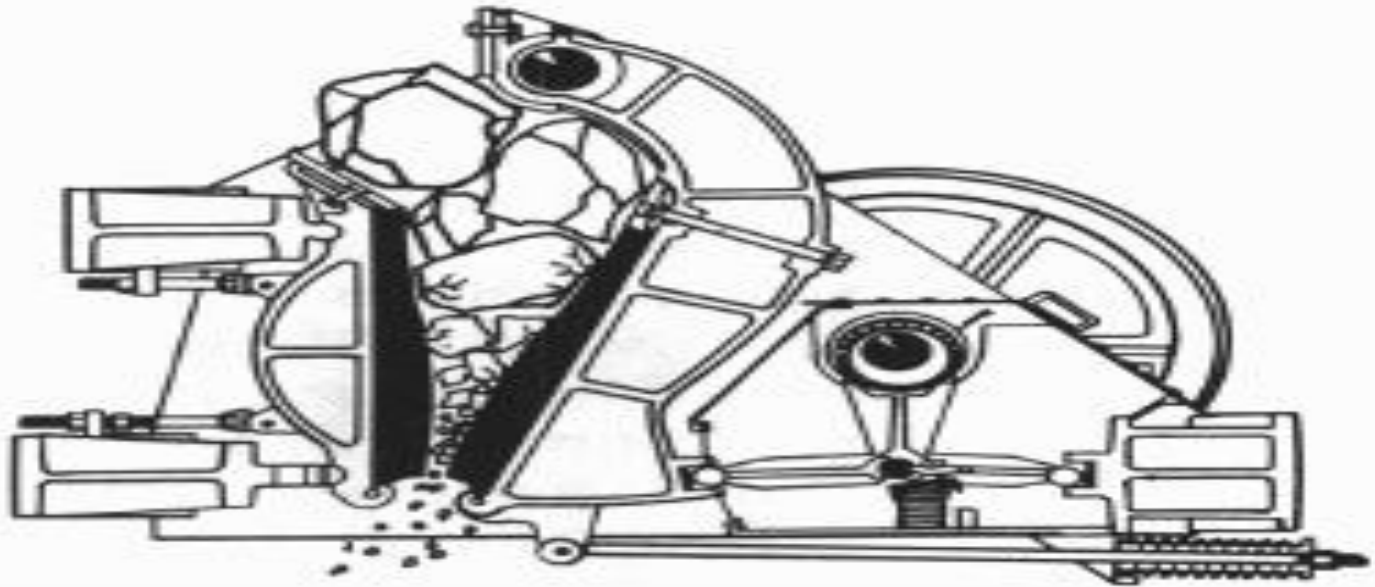
Grinding



Shear & Compression



Compression & Impact



Aggregate Crushing



Aggregate Fractions

- **Coarse Aggregate – larger than #4 sieve**
- **Fine Aggregate – smaller than #4 sieve**

Pavement Layers

CONCRETE PAVEMENT

Concrete

BASE

SUBGRADE

Pavement Layers

ASPHALT PAVEMENT

ASPHALT

BASE

SUB BASE

SUBGRADE

Aggregate Uses

- **Subbase**
 - ▶ **Untreated**
 - ▶ **Lowest Layer**
 - ▶ **Lowest Quality**
 - ▶ **Not Always Used**

Aggregate Uses (continued)

- **Select Embankment – SE**
- **Borrow Special Excavation – BSE**
- **Subbase – SB**
- **Pit Run Subbase – PRSB**
- **Crusher Run Subbase – CRSB**

Aggregate Uses (continued)

➤ **Base**

- ▶ **Untreated or Treated**
- ▶ **Placed on top of subbase or subgrade**
- ▶ **Higher quality than subbase**

Aggregate Uses (continued)

- **Crusher Run Base – CRB**
- **Crushed Base – CB**
- **Pit Run Base – PRB**
- **Cement Treated Base – CTB**
- **Plant Mix Base – PMB**

Aggregate Uses (continued)

- **Asphalt Concrete**
 - ▶ **High quality requirements**
 - ▶ **Asphalt binder**
 - ▶ **Surface layer**

Plant Mix Pavement – PMP

Warm Plant Mix - WPM

Plant Mix Wearing Course – PMWC

Aggregate Uses (continued)

- **Concrete Pavement**
 - ▶ **High Quality requirements**
 - ▶ **Cement/ Fly Ash Binder**
 - ▶ **Surface layer**

Portland Cement Concrete Pavement – PCCP
Coarse Aggregate – CA-PCCP
Fine Aggregate – FA-PCCP

Aggregate Uses (continued)

- **Structural Concrete**
 - ▶ **High quality requirements**
 - ▶ **Cement/ Fly Ash Binder**
 - ▶ **Bridges, culverts, pipes, foundations, some paving**

Aggregate Uses (continued)

- **Seal Coat Aggregate**
 - ▶ **Untreated or Treated**
 - ▶ **Quality requirements depend upon type**
 - ▶ **Seal Coats**
 - ◆ **Chip Seals**
 - ◆ **Slurry Seals and Microsurfacing**
 - ◆ **Bituminous Surface Treatments**

Aggregate Uses

- **Miscellaneous uses**
 - ▶ **Untreated or Treated**
 - ▶ **Quality requirements dependent upon use:**
 - **Maintenance Stockpiles**
 - **Maintenance Sanding**
 - **Drainage Aggregates**
 - **Erosion Control Concrete**
 - **Riprap**
 - **Backfill**
 - **Slope Protection**