# APPENDIX D

PROJECT DESCRIPTION

ADDITIONAL INFORMATION

## Appendix D - Asphaltic Concrete Processing

Although not the exact configuration proposed by the Applicant, the following photos serve to depict the major components of the Project. This information has been supplied by the applicant.

A process description is as follows:

1. Sorted aggregates are delivered and stored onsite by size and type in separate stockpiles. Aggregate is placed by wheeled loader into the cold feed storage system where the different aggregate types/sizes are proportioned by the calibrated belt feeders onto a common collecting belt that transports the aggregates to a scalping screen. The Applicant proposes a five-bin cold feed storage system.

Cold Feed Storage System (left)

Asphaltic Concrete Silos (right)

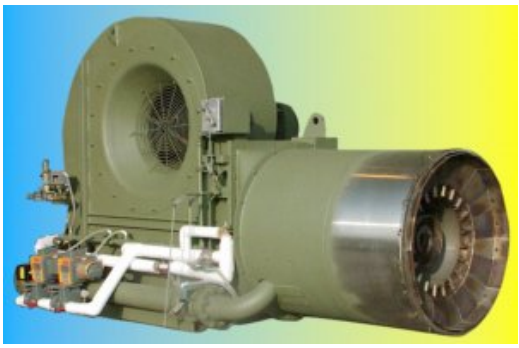
2. Aggregates are passed over a vibrating “scalping” screen to remove over-sized material and the screened material is weighed by an aggregate belt scale located on the cold feed truss conveyor. Over-sized material removed by the scalping screen will include trash or tramp iron, which will be placed in refuse bins for disposal at a regulated landfill. Some over-sized material suitable for use will be placed in the unprocessed RAP stockpile for processing. The weigh scale generates a signal, which is sent via a blending computer to the drives on the asphalt pump system. Asphaltic oil is usually introduced at the rate of 5-7 percent based on the weight of the aggregate. (Asphaltic oil is introduced into the mixing drum in step 8.)

Vibrating “Scalping” Screen

3. The aggregate enters a hopper and falls onto a high-speed “slinger conveyor” (below) which transports the material via the 30” truss frame cold feed conveyor into the drying drum.

4. The drying drum unit is equipped with a natural gas burner to dry the aggregate. At 300 tons/hour and 5 percent initial moisture, the final dry product will be 315 °F, and the burner will consume about 0.082 MMcf/hr of natural gas.

Drying Drum



Hauck Eco-Star II Low NOx Burner and Controls

5. While the aggregate moves to the end of the drum, the emissions (air born dust, water vapor, and combustion products) from the drying process are pulled by an exhaust fan through a knock-out box and baghouse in the opposite direction of the aggregate flow.

Baghouse (foreground) and Knock-out (left)

Baghouse (left), Knock-out connecting to Drying Drum(center), and Conveyor from Cold Feeder Bins (right).

Note: The silo in the background is for a dry lime treatment system, which is not part of the Project Description.

6. Dust removed by the baghouse is conveyed into the mixing drum and added to the asphaltic concrete being mixed. The photo below contains the Drying Drum (black horizontal drum to the right), dust/emission collection system to the Knock-out Box (center), and Baghouse (left).

7. When RAP is used in the manufacturing of asphaltic concrete, the desired amount of RAP is added with the dry aggregate at the end of the counter flow drum for a brief pre-heat. Dried material is then conveyed from the end of the drying drum into the mixing drum via an enclosed chute.

Silos (left) and RAP Feeder and Conveyor (right) to the Drying Drum

8. The aggregate, RAP and baghouse fines continue down through the mixing drum, where they are combined with the asphaltic oil (amount determined at step 2) to create the final product. The asphaltic oil is pumped into a point approximately midway in the mixing drum unit. This point may be varied to allow more or less heating time for the RAP before the aggregate meets the asphaltic oil. Asphaltic oil is stored in two 20,000-gallon horizontal above-ground tanks. Each tank includes a two million BTU/hr hot oil heater to pre-heat the asphaltic oil before it is introduced into the mixing drum.

Asphaltic Oil Tank

9. The asphaltic oil vapors from the mixing drum, and from the finished product in the incline drag and load-out areas, are removed by a vacuum pulled by a scavenger fan on the mixing drum discharge housing. These vapors are fed into the burner flame of the counter flow dryer to be burned up. The flue gas recirculation incorporates BACT.
10. The final product exits the mixing drum through a gravity-activated door into a sealed drag conveyor. As stated in step 9, the asphaltic oil vapors in the incline drag conveyor are scavenged back to the drum burner to be consumed.
11. The hot paving material exits the incline drag into the silos via sealed batchers and a sealed cross drag if filling the second or third silo. The sealed batchers and cross drag prevent asphaltic oil vapors from escaping and allow the scavenged incline drag to return them to the drum burner.
12. The paving material is stored in one of two 180-ton silos (69 feet high) and is discharged into trucks passing beneath the silos. Vapors released during truck loading are removed through (2) scavenger hoods and returned to the six-stage filtration system. The facility will appear similar to the photo below. However, the smaller white silo (cold batch) is not proposed.

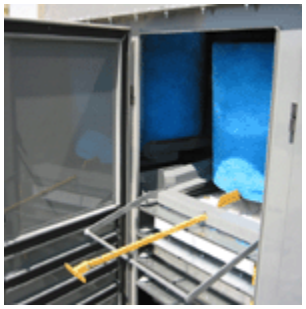
Silos and Conveyor

13. The Blue Smoke Control six-stage filter cartridge is made from proprietary filter media developed exclusively for collecting oil mist. This media, combined with a special outer wrap, allows the filter cartridge to drain and prevents the collected liquid from entering the clean air stream. In addition, Blue Smoke Control filter cartridges sit vertically inside the collector, allowing gravity to aid the draining process. The result is more complete capturing of the oil droplets, easier maintenance and higher filtration efficiency.

Blue Smoke Control

All six stages of filters are readily accessible through the filter access doors. Filters or stages are installed two deep behind each door.

The first 4 stages are readily accessible. The filter removal handle, illustrated here with the first stage partially removed, enables access to the back filter without reaching deep into the collector.



The fifth and sixth stage filters are also accessible without reaching deep inside the collector. The filter removal handle enables the rear filter to be pulled out to the access opening for service.

14. The entire operation is controlled from a control room that includes the following:
    - Elevated steel control cabin (insulated and air-conditioned) with access staircase and platform.
    - Tinted glass windows providing a $270^0$ plant view.
    - Pre-installed and pre-wired electrical panels.

Control Room

**Rubberized Asphaltic Concrete Processing**

California has more registered vehicles than any other state. As a result, Californians generate more than 31 million reusable and waste tires annually, based on estimated data for 2000. Approximately 8.7 million tires are disposed of in landfills or stockpiled in California annually,

while 72 percent (22.9 million tires) are diverted by recycling and other means. Another 3.2 million waste tires are imported into the state for recycling.

Of these recycled tires, an estimated 2 million tires have been recycled into Rubberized Asphaltic Concrete (RAC). In its five-year tire plan, California Integrated Waste Management Board endorsed continued funding for activities in southern and northern California through fiscal year 2005-06. To further encourage its use, the State's contracting process gives a five percent preference for the purchase of products made from recycled tires, including RAC.

To manufacture RAC, a third-party contractor moves a portable system onsite, on a temporary basis. This is a specialized production system that uses finely ground crumb rubber (i.e., from tires that would otherwise be dumped in a landfill), and mixes it with liquid asphaltic oil at high temperatures. The mix is blended, agitated and stored to allow the ingredients to react. The result is a more flexible, durable and crack-resistant asphaltic concrete paving material, which can withstand higher temperature variations resulting in a pavement that will last longer than conventional asphaltic concrete materials.

While in the agitating tank, the ground crumb rubber is blended with pre-heated asphaltic oil to produce a molten material. This molten material is pumped into a point approximately midway in the mixing drum unit where it is mixed with the hot, dry aggregate that has just come from the drying drum. Because the molten material is added to the mixing drum, rather than the drying drum, it is never in contact with a flame and will not be subject to oxidation. Other than possibly installing a 3-way valve to the Project's plumbing, the asphaltic concrete plant requires no modifications to produce RAC. This portable system operates under its own APCD Permit to Operate with its own emissions controls.

Ground Crumb Rubber (2,000-pound sacks)

Lifting ground crumb rubber into hopper for loading into the agitating tank

**Recycling Operations**

**Recycled Asphalt Products (RAP)**

In recent years, the use of RAP has become more widely used within the asphaltic concrete industry. Using RAP to produce asphaltic concrete significantly reduces the amount of virgin rock and asphaltic cement needed. In the reclamation process, old asphalt pavement (RAP) is removed from road base and transported to a facility that crushes and screens the material to the appropriate size for use in the manufacture of asphaltic concrete. RAP is then mixed and

heated with new aggregate (if applicable), and the proper amount of asphaltic oil is added to produce asphaltic concrete that meets the required quality specifications.

RAP Feeder

**Lime Treatment Process**

Occasionally, the specifications for asphaltic concrete calls for the use of lime treated aggregate. This requires that aggregate bathe in a lime slurry blend, then permitted to "marinate" in separate lime-treated material stockpiles. This process will involve the use of the Excel Slurry Blend System (Excel Machinery Ltd.), which is a two chassis plant, or a comparable system. The process begins at the slurry plant, where hydrated lime and water are combined to form a lime slurry. The slurry is stored in a 631-gallon agitation tank and pumped to the mixing plant by means of a 3-inch slurry pump.

Lime Slurry Blend System, Silo and Guppy

Port-a-Pug Mixer Used with Lime Slurry Plant

The mixing plant adds the slurry to the aggregate and blends the two in a twin-shaft pugmill (Port-a-Pug Mixer).

Accuracy of mix is assured by means of a Programmable Logic Controller (PLC) that is networked to an IBM compatible PC, to perform data logging functions, and with a color touch-screen operator's terminal for data input and output. Dry commodities are weighed using a belt scale and liquid commodities are metered through coreolis-type meters. This allows the slurry blend to achieve mix accuracies consistent with the California Specification 109 calibration tests.

The slurry plant works to maintain a dynamic liquid level in the agitation tank for delivery to the pugmill. On the slurry plant, the actual rate of the hydrated lime is used as the benchmark for the water set point. As the rate of flow for the hydrated lime fluctuates up and down, the water is dynamically adjusted to match. This assures the highest quality of mixing proportioning for the slurry.

On the mixing plant, the aggregate is used as the benchmark for the slurry set point. As the actual rate of flow for the aggregate fluctuates up and down, the slurry is dynamically adjusted to match. The finished product is a lime treated aggregate that is transferred by radial stackers to stockpiles, specific to aggregate size. A data-logging program records the accuracy of the overall process through snap shot intervals, rather than through averaging.

The specifications also require that the lime ratio for the combined aggregates shall not be less than 1.2 percent and not more than 1.5 percent.

Approximately 72 hours after treatment, the lime treated material can be introduced into the production process for asphaltic concrete. The purpose of lime treatment is to sufficiently etch aggregate surfaces to improve material bonding within the finished asphaltic concrete. To accommodate such orders, the Applicant proposes to install and use a portable Excel Slurry Blend System, when needed. The use of lime treated aggregate is not yet common practice so the portable system will be driven to the Project site when product orders require that capability. Lime treated aggregate is transported from its stockpiles to the cold feed bin system by wheeled loader.

Hydrated lime is delivered in bulk and stored in the portable silo component of the Excel Slurry Blend System, or comparable system. Depending upon the contractor used, the silo may be a tilt-up with a height of approximately 35 feet, or a horizontal silo similar in appearance to a guppy. During periods of high-volume production, one or two “guppies” (i.e., highway semi-trailers) are used to provide additional temporary storage for hydrated lime. Guppies are positioned adjacent to the silo hydrated lime is transferred to the silo via a closed system. By using guppies in this manner, materials are available onsite when the system demand surges beyond silo storage capacity. In addition, because hydrated lime deliveries can be made directly to the guppies, such delivery can be more evenly spaced over the course of the day without interrupting the lime treatment process.