This report documents the Type F mix design for Pumphrey Drive, Westworth Village, Fort Worth.
TYPE F MIX DESIGN FOR FORT WORTH

by

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Texas Transportation Institute

and

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Texas Transportation Institute

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Project 5-5123-01
Project Title: Implementation of Thin Lift Type F HMAC Mix Design

Performed in cooperation with the
Texas Department of Transportation
and the
Federal Highway Administration

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TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas 77843-3135
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There is no invention or discovery conceived or first actually reduced to practice in the course of or under this contract, including any art, method, process, machine, manufacture, design or composition of matter, or any new useful improvement thereof, or any variety of plant, which is or may be patentable under the patent laws of the United States of America or any foreign country.
ACKNOWLEDGMENTS

This project was made possible by the Texas Department of Transportation in cooperation with the Federal Highway Administration. The authors thank the many personnel who contributed to the coordination and accomplishment of the work presented herein. Special thanks are extended to Richard Willammee, P.E., for serving as the implementation director.
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<th>Page</th>
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CHAPTER 1
TYPE F LATEX MIXTURE DESIGN

Mixture Design Summary: Type F Mix with 3 % Latex

Date: 5/21/2007

Project: Pumphrey Drive, Westworth Village

From/To: SH183 north to
       Entrance to Naval Air Station Joint Reserve Base

CSJ: N/A

Mixture type: Type F Granite

Aggregates: Martin Marietta Materials, Mill Creek, OK
            Producer Code 0050433
            Surface Aggregate Class (SAC) – A

Stockpiles: F-Rock 55 %
            Screenings: 45 %

Asphalt: Valero PG64-22 plus 3 % UP7814 Anionic SBR Polymer
         (70 % min. Solid)

Antistripping agent: 1% Akzo Nobel, Kling-Beta 2550

Optimum asphalt content: 6.8 % based on 3.5 % design air voids, overlay tester, and
                         Hamburg test results

Mixture properties at optimum asphalt content are:

    VMA: 18.8 %
    Bulk specific gravity: 2.317
    Max. specific gravity: 2.399
    Boil test, Tex-530-C: No visual stripping
    Overlay test, Tex-248F: >1200 cycles
    Hamburg test, Tex-242F: 10.5 mm @ 20,000 passes
        (meets PG76-22 requirement)

Design sheets are presented on following pages.
# TEXAS DEPARTMENT OF TRANSPORTATION

## HMACP MIXTURE DESIGN : COMBINED GRADATION

### Aggregates Source:
- F Rock: Sranova

### Sample ID:

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### Aggregate Source & Grade:
- Valero PG 64-22 plus 3% Latex (70% Solid)

### Binder Percent (%):
- 6.8

### Asphalt Spec. Grav: 2.035

### Antislip agent:
- Liquid Antislip

### Remarks:

### Test Method:
- TX207
- TX226
- TX227
- TX235
- TX342
- TX530

### Reviewed By:

### Authorized By:

### Station:

### District:

### Contractor Design #:

---

2
### Mixture Evaluation @ Optimum Asphalt Content

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<th>Rut depth (mm)</th>
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### Hamburg Mixed Tracking Test

### Effective Specific Gravity

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<th>Specific Gravity (G0)</th>
<th>Maximum Specific Gravity (Gm)</th>
<th>Effective Gravity (Ge)</th>
<th>Theor. Max. Specific Gravity (G0)</th>
<th>Density from Gt (Percent)</th>
<th>VMA (Percent)</th>
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### Estimated Percent of Stripping, %

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<td>VMA @ Optimum AC</td>
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### Interpolated Values

- Specific Gravity (G0): 2.317
- Max. Specific Gravity (Gm): 2.356
- Theor. Max. Specific Gravity (G0): 2.401

### Comments:
CHAPTER 2

TYPE F CRUMB RUBBER MIXTURE DESIGN

Mixture Design Summary: Type F Mix with Crumb Rubber

Date: 7/9/2007

Project: Pumphrey Drive, Westworth Village

From/To: SH183 north to Entrance to Naval Air Station Joint Reserve Base

CSJ: N/A

Mixture type: Type F Granite

Aggregates: Martin Marietta Materials, Mill Creek, OK
Producer Code 0050433
Surface Aggregate Class (SAC) – A

Stockpiles: F-Rock 55 %
Screenings: 45 %

Asphalt: Valero PG64-22 plus 7 % Crumb Rubber from Bridges Pavement Solution Inc.

Antistripping agent: N/A

Optimum asphalt content: 6.8 % based on overlay tester and Hamburg test results

Mixture properties at optimum asphalt content are:

Max. specific gravity: 2.398
Overlay test, Tex-248F: >1200 cycles
Hamburg test, Tex-242F: <12.5 mm @ 20,000 passes
(meets PG76-22 requirement)

Special note: Special instruction for mix design has been provided by Bridges Pavement Solutions Inc. and this instruction should be followed during mix production in the plant. Otherwise, the performance of this mix may change.

The detailed aggregate gradation sheet is presented on the following page.
## TEXAS DEPARTMENT OF TRANSPORTATION

### HMACP MIXTURE DESIGN : COMBINED GRADATION

**References:**

- **Sample ID:** [Sample ID]
- **Sample Date:** [Sample Date]
- **Lot Number:** [Lot Number]
- **Lot Date:** [Lot Date]
- **Status:** [Status]
- **County:** [County]
- **Sampled By:** [Sampled By]
- **Sample Location:** [Sample Location]
- **Material Type:** [Material Type]
- **Producer:** [Producer]
- **Area Engineer:** [Area Engineer]
- **Project Manager:** [Project Manager]

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#### Combined Gradation

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