

The IH 10/ Katy Freeway Reconstruction Houston, Texas

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Texas Department of Transportation**

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Houston Facts and Figures

- ❖ **Houston is the fourth most populous city in the nation (trailing only New York, Los Angeles and Chicago), and is the largest in the southern U.S. and Texas.**
- ❖ **The Houston Consolidated Metropolitan Statistical Area covers 8,778 square miles, an area slightly smaller than Massachusetts but larger than New Jersey.**
- ❖ **If Houston were an independent nation, it would rank as the world's 30th largest economy**
- ❖ **The ACCRA Cost of Living Index shows that Houston's overall after-taxes living costs are 12 percent below the nationwide average, largely due to housing costs that are 26 percent below the average.**



The IH 10/Katy Freeway

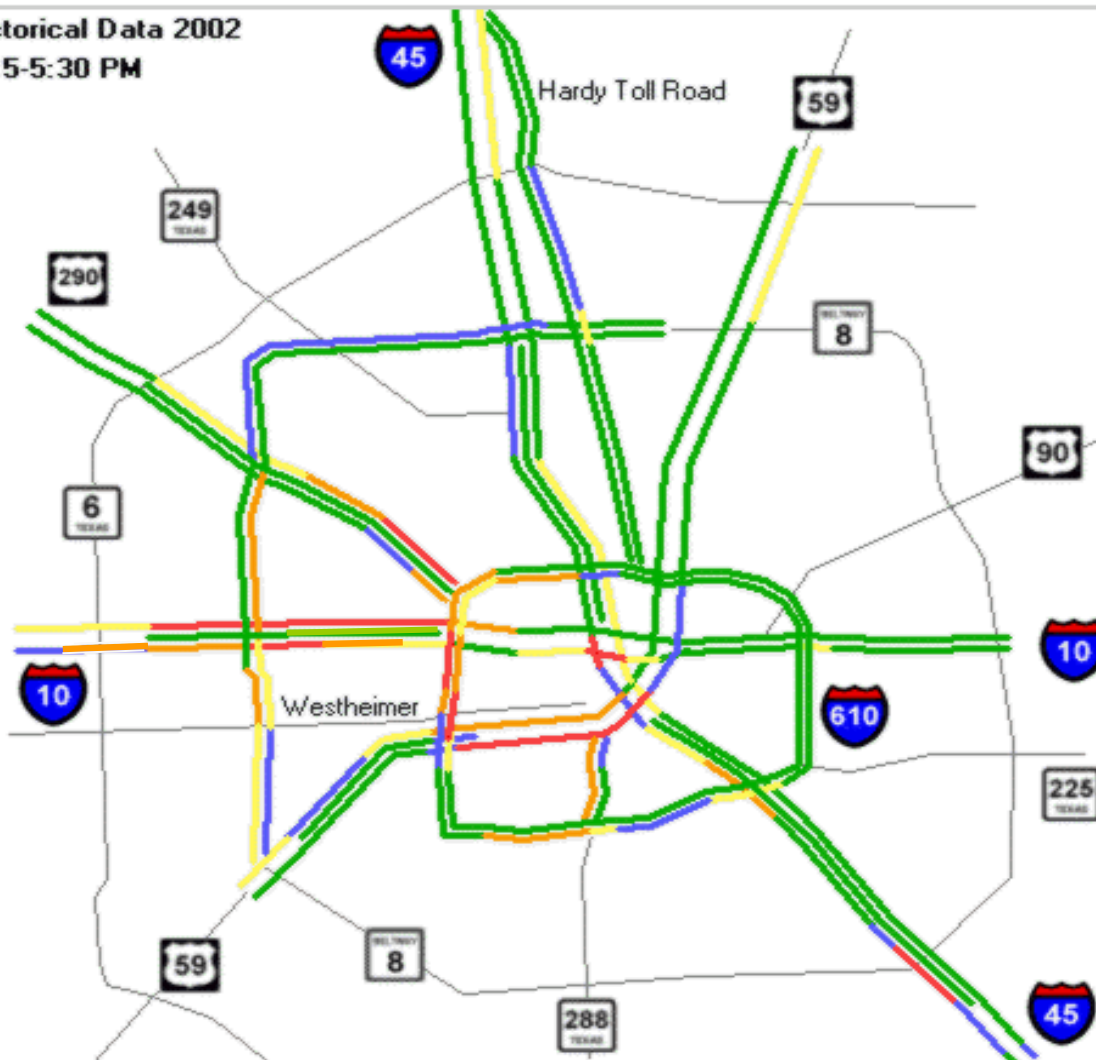


**Existing Corridor Carries
More Than 280,000 Vehicles per Day**

Real-Time Traffic







Historical Data 2002

5:15-5:30 PM



Transportation and Emergency
Management through a partnership
with
Texas Department of Transportation
City of Houston
METRO
Harris County

Speed Ranges (MPH)

0-19	
20-29	
30-39	
40-49	
50+	
N/A	

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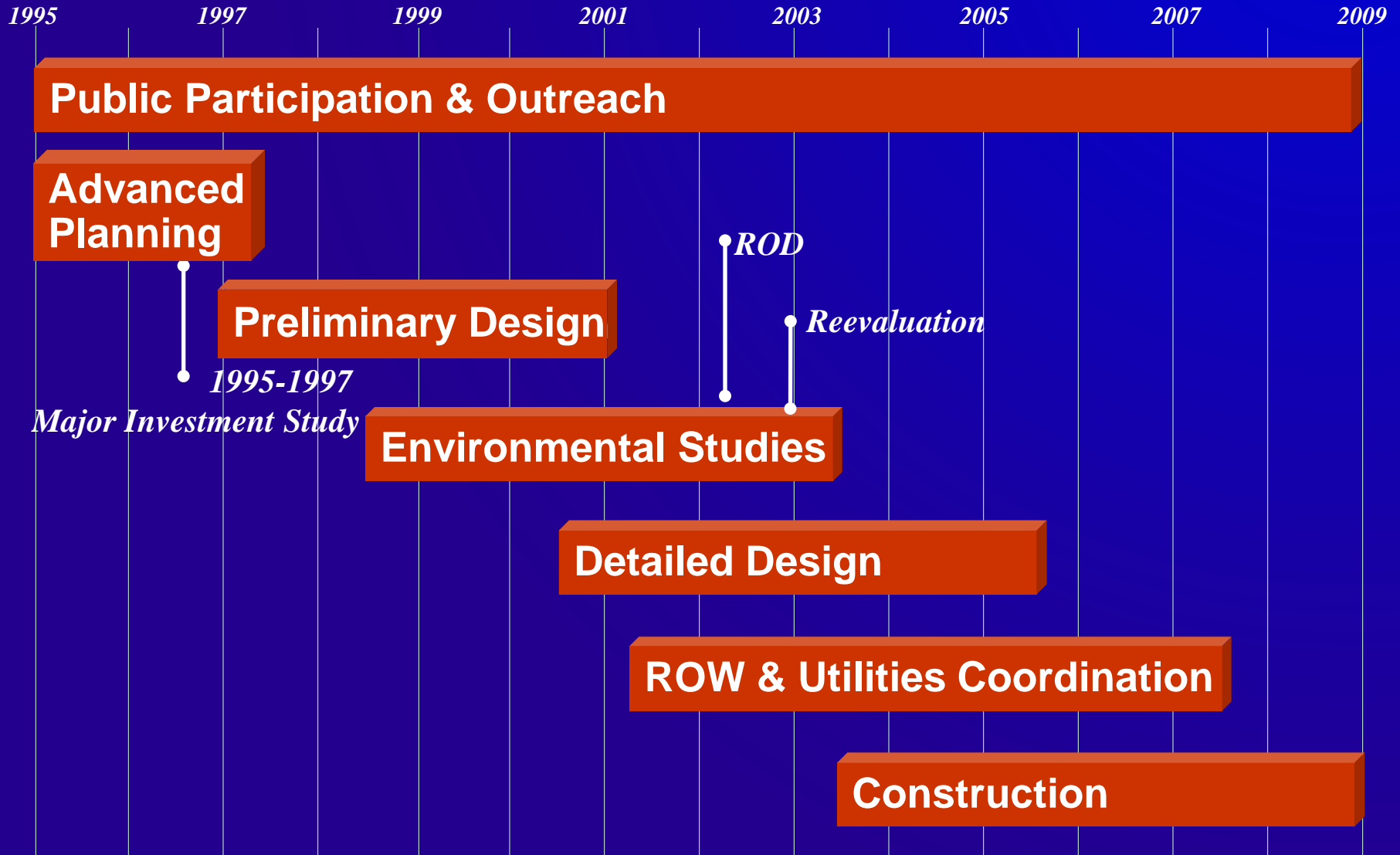
The Katy Freeway Reconstruction Program

- ❖ Reconstruction of 25 miles of Interstate Freeway while under traffic; including 2 miles on IH 610
- ❖ 2 Major Freeway-Freeway Interchanges
- ❖ 27 Grade Separated Intersections
- ❖ Total Construction Cost \$1.6 Billion
 - ROW Acquisition, Relocation Assistance and Utility Relocation Cost - \$599 Million
 - Design and Program Management - \$142 Million
- ❖ One of the Largest Highway Construction Projects in the State's History
- ❖ First Project in the Nation to Construct Toll Lanes on an Existing Interstate Highway
- ❖ Nine Major Construction Contracts

Project Participants

- ❖ **TxDOT Houston District**
- ❖ **General Engineering Consultant (GEC)**
 - Parsons Brinckerhoff Quade & Douglas, Inc. (PB)
 - Plus Nine Subconsultants
- ❖ **10 Section Design Consultants**
 - Plus 30 Subconsultants
- ❖ **9 Construction Contractors**

Project Development Process



Project Map



Click on the highway sections above or the contract letter below to view construction package details.

Construction Package	Contract A	Contract B	Contract C1	Contract C2	Contract D	Contract E1	Contract E2	Contract F	Contract G
Description	Ft. Bend County Line to E of Peek	E of Peek to W of SH 6	W of SH 6 to E of Eldridge	E of Eldridge to E of Kirkwood	E of Kirkwood to E of BW 8	E of BW 8 to E of Campbell	E of Campbell to E of Silber	E of Silber to E of IH 610 & Interchange	E of IH 610 to W of Washington
Proposed Letting Date	7/2003	5/2003	3/2005	12/2004	7/2004	1/2005	2/2005	7/2003	1/2007
End of Construction	7/2006	6/2006	9/2008	8/2008	10/2008	9/2008	10/2008	5/2007	8/2008
Construction Cost Estimate	\$83 Million**	\$208 Million**	\$153 Million**	\$84 Million**	\$250 Million**	\$204 Million**	\$158 Million**	\$263 Million**	\$43 Million**

** Actual Bid Amount.

Vegetative Landscaping and Final Signing/Striping for Toll lanes will be awarded as separate contracts.

Revised November 5, 2008

Construction Costs

- ❖ \$554M bid lettings in 2003
- ❖ \$334M bid lettings in 2004
- ❖ \$515M bid lettings in 2005
- ❖ \$ 48M bid lettings in 2007
- ❖ \$ 27M bid lettings in 2007-2009 (misc. contracts)
- ❖ \$1478M Grand Total

(These amounts do not include change orders or incentives)

Lane Configuration

Existing IH 610

- 8-lane Mainlane
- 4 lanes of Frontage Roads
- 12 Lanes Total

Proposed IH 610

- 8-lane Mainlane
- 4 lanes of Frontage Roads
- 12 Lanes Total

Existing IH 10

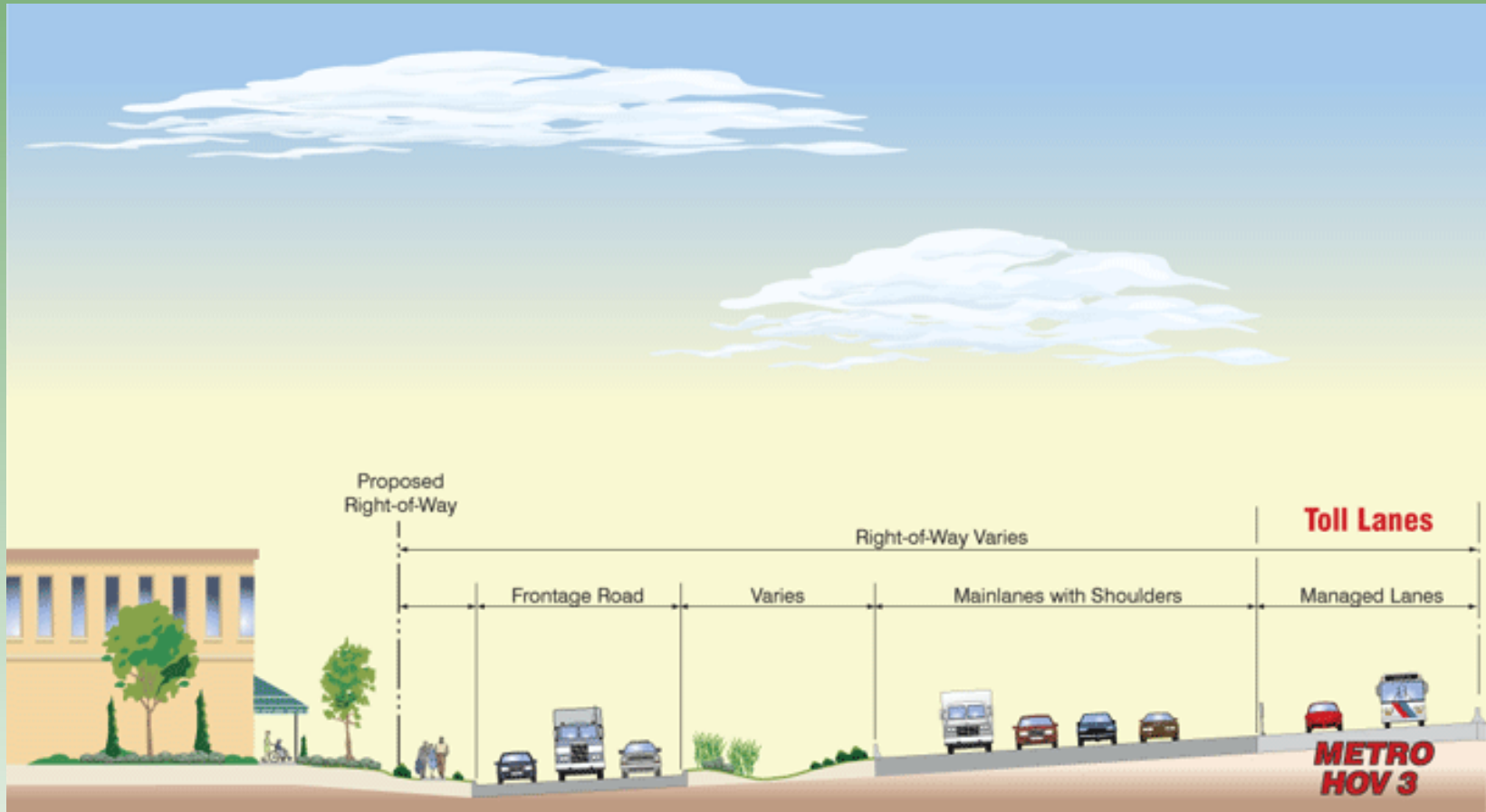
- 6-lane Mainlane
- 4 lanes of Frontage Roads
- 1 reversible HOV lane
- 11 lanes total

Proposed IH 10

- 8-lane Mainlanes
- 6 lanes of Frontage Roads
- 4-lane Managed Toll Lanes
- 18* lanes total

**Additional auxiliary lanes for ingress and egress included in the design.*

Typical Cross Section (Half)



Traffic Requirements

- ❖ **Maintain Existing Number of Lanes during Peak Period**
- ❖ **Maintain HOV in Operation**
- ❖ **Maintain Local Access Across Corridor**
- ❖ **Lane Rental Specification**
- ❖ **Maintain Current ITS Operations**
- ❖ **Variable Message Signs, Cameras, Ramp Meters, etc.**

Construction Schedule

- ❖ The accelerated construction schedule provide the framework for the program to take only **six years** when typically a project of this scope would take **ten to twelve years** to complete. It also created an opportunity for a reduction in cost increases driven by the effects of inflation on supplies and labor.

Construction Overview

- ❖ **Construction occurs in Multiple Phases**
- ❖ **Major Milestones with Incentives and Liquidated Damages**
- ❖ **24/7 Work Day* Schedule**

**A Working Day is defined as a calendar day, not including the 6 legal holidays and 3 “floating” non-work days/month.*



Incentives

- ❖ **Interim Milestones**
- ❖ **Major Milestones for Phase Transitions**
- ❖ **Project Conclusion Milestone**
- ❖ **Maximum Amount for Early Completion**
 - **Contract A-\$3.2 Million**
 - **Contract B-\$5.55Million**
 - **Contract F-\$11.7 Million**

Disincentives

- ❖ **Liquidated Damages**
 - Interim Milestones
 - Major Milestones at End of Each Phase
 - Project Conclusion (substantial completion)

- ❖ **Per/Day Penalties**
 - Contract A= \$5,000 to \$50,000
 - Contract B= \$5,000 to \$50,000
 - Contract F= \$5,000 to \$75,000

Example -Contract F

- ❖ **I-10/I-610 Interchange and I-610 from South of Post Oak Blvd. to North of Old Katy Road**
- ❖ **Reconstruction of 1.08 miles along I-10 and 2.55 miles along I-610**
- ❖ **Total Reconstruction of the 4 Level Directional Interchange**
 - Reconstruction of 8 Direct Connectors
- ❖ **Reconstruction of 14 Structures**
 - Including Bridge Structures at Post Oak, Woodway, Memorial, Buffalo Bayou
- ❖ **51 Months Construction Duration**
- ❖ **\$263 Million Low Bid July 1, 2003**
 - Contract Awarded to Williams Brothers

Major Milestones & Incentives

- ❖ Complete all median rehab work for transition to median in adjoining project
 - \$5,000 per day - Liquidated Damages
- ❖ Complete all SB mainlane work necessary for transition to SB area in adjoining project
 - \$30,000 per day - Liquidated Damages
- ❖ Complete all median area work necessary for transition to median area in adjoining project
 - \$30,000 per day - Liquidated Damages
- ❖ Complete all NB mainlane work necessary for transition to NB area
 - \$30,000 per day - Liquidated Damages
- ❖ Complete all IH 610 work to substantial completion
 - \$75,000 per day – Incentive & Liquidated Damages
- ❖ Complete all work (IH 610 and IH 10) to substantial completion
 - \$75,000 per day – Incentive & Liquidated Damages

Major Milestones & Incentives

- ❖ **Completion of North Post Oak Bridge/Intersection Work Necessary to Return Traffic from 2 lanes to 4 lanes.**
 - \$30,000 per day – Incentive & Liquidated Damages
- ❖ **Completion of I-10 WB exit to Silber Road (Closure to Reopening)**
 - \$5,000 per day – Liquidated Damages
- ❖ **Completion of I-610 to I-10 EB (Closure to Reopening)**
 - \$5,000 per day – Incentive & Liquidated Damages
- ❖ **Completion of I-10 to I-610 NB (Closure to Reopening)**
 - \$30,000 per day – Incentive & Liquidated Damages
- ❖ **Completion of I-610 SB exit to Post Oak Blvd (Closure to Reopening)**
 - \$20,000 per day – Incentive & Liquidated Damages

Construction Package F

❖ Some Key Construction Elements

- 24 New Bridges – 1,520,000 SF
- 582,000 CY of Embankment
- 493,000 SY of CRCP
- 42,000 SY of Fast Track CRCP
- 579,000 SF of Retaining walls
- 130,000 LF of Drilled Shafts
- 9,000 LF of Concrete Box Culvert
- 63,700 LF of U54 Beams
- 45,450,000 Lbs of Structural Steel Beams

❖ 51 Months Construction Duration

SETTING HARD DATES

- ❖ Creation of a no-fault date of July 31, 2008 on a number of the contracts.
- ❖ This encouraged the contractor to expedite field work, solve problems on the job, and coordinate the movements of workers, equipment, and supplies to best to meet the schedule demands.

LANE RENTAL FEES

- ❖ Each contract stipulated a number of hours that the contractor would be allowed to close a lane to traffic during peak periods of the day.
- ❖ If the number of hours was exceeds, the contractor would be charged a rental fee per lane per hour.

RIGHT OF WAY

- ❖ Under normal conditions, TxDOT does not let – or officially release – projects for construction until right of way has been acquired and utilities relocated to clear the site for highway construction.
- ❖ A modified plan had to be used for integrating simultaneous right of way acquisition activities with the timing of utility relocations and certain highway construction work.

Utility Adjustments/Relocations

- ❖ Because of the intricacy and scope of the work involved, TxDOT elected to contract out the coordination and utility inspection to GEC. While this allowed TxDOT to focus on roadway construction, it also created the model for large-scale projects throughout state.

Public Involvement Program

- ❖ **The Katy Freeway Public Information Office was established and located on the corridor.**
- ❖ **Provided overview of various program elements and construction contract updates.**
- ❖ **The regular distribution of lane closure and detour information afforded drivers the ability to plan ahead for their daily commutes.**



Fast Track CRCP Placed

	CRCP (sy)	Fast Track CRCP (sy)
Contract A	452,000	
Contract B	1,370,000	15,400
Contract F	493,000	42,000

About 330 lane miles of CRCP and 8 lane miles of Fast Track CRCP for this three contracts.



Special Spec. 3061

Fast Track Concrete Pavement

❖ Hydraulic Cement Concrete.

Unless otherwise shown on the plans or approved by the Engineer, provide Class HES concrete conforming to Item 421, “Hydraulic Cement Concrete,” with a minimum average flexural strength of 425 psi in 16 hours. Test in accordance with Tex-448-A.



Curing – Fast Track

- ❖ **Wet Mat Curing.** Provide wet mat curing unless otherwise shown on the plans or as directed by the Engineer. Cure the pavement in accordance to Section 420.4.J.2.a, “Wet Mats.” If the air temperature is below 65°F and insulating blanket is used, then apply membrane curing in lieu of wet mat curing.
- ❖ **Membrane Curing.** As approved, provide membrane curing in accordance to Section 360.4.I.1, “Membrane Curing.”

Opening to Traffic

- ❖ **The pavement may be opened to traffic after the concrete has been cured for at least 8 hours and has obtained a minimum a flexural strength of 275 psi or as directed by the Engineer.**

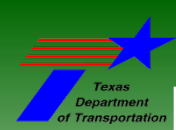


Opening to Traffic

- ❖ Determine the flexural strength in accordance with Tex-448-A, “Flexural Strength of Concrete Using Simple Beam Third-Point Loading” using concrete beams cured at the job site under the same conditions as the pavement, or in accordance with Tex-426-A, “Estimating Concrete Strength by the Maturity Method”.

Travel Speed and Time

- ❖ In June 2008, drivers were averaging speeds of ***33 MPH and travel times of 36 minutes*** during morning commutes between SH 99 and the West Loop. Afternoon commutes were averaging **35 MPH with travel times of 34 minutes**. With the completion of construction, morning commuters are now averaging speeds of ***58 MPH and travel times of 21 minutes*** with afternoon commuters averaging **54 MPH and travel times of 22 minutes** when traveling this same distance. This translates to almost 2 ½ hours per work week that commuters are given back valuable time to spend in other ways besides sitting in traffic.



Program Contact Information

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