# CONSTRUCTION OF THE FRONT STREET / I-435 DIVERGING DIAMOND INTERCHANGE




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# PROJECT INFORMATION

MoDOT Job J4I1121B

Route:  Front Street and Interstate 435

Date Awarded: 03/02/2011

Contractor: Clarkson Construction Company, Kansas City, MO

Value of Contract: $8.13 million

Resident Engineer: Greg Stervinou, Scotty Williams (MoDOT Nashua Project Office)

Notice to Proceed: 04/04/2011

Original Completion Date: 12/01/2011

Time Extension Change Order Completion Date: 05/25/2012

# SUBCONTRACTORS

Augers Unlimited – Jacked 36” RCP under I-435

Collins and Hermann – Guardrail, highway signing items and fencing

Erosion Control Inc. – Erosion control items

Realm Construction – Concrete Items

Schrimpf Landscaping – Sodding, seeding, erosion control blanket, and turf mats

Superior Bowen Asphalt – Asphalt items and coldmilling

Wiedenmann & Godfrey – Waterline relocation items and pipe liner

Capital Electric Line Builders – Highway lighting and traffic signal items

Trekk Design Group – Contractor furnished surveying and staking

Twin Traffic Marking – Pavement markings

Magnum Boring – Conduit for signals and lighting

# SCOPE OF WORK

Utility Relocations – KCMO Water, AT&T, MGE, KCP&L

Pipe lining of existing water main serving KCP&L Hawthorne and Bayer Plants

Storm Sewers

Reconstruction of I-435 Ramps

Widening of Front Street from Universal to Corrington

Addition of Islands from Cambridge to Corrington and under I-435 for DDI

New barrier walls under I-435

Sidewalks

Approaches for businesses along Front Street

Signals

Lighting

Signing

ADA Improvements

Guardrail

Acceleration Lane from Front Street to SB I-435

# CONSTRUCTION CHALLENGES

Extremely tight construction schedule to meet project completion date

Notice to proceed of 04/04/2011

Original Project Completion date of 12/01/2011

# CONSTRUCTION CHALLENGES

Numerous unseen utility relocation issues and delays

- KCMO Water
- AT&T duct bank for phone lines
- MGE gas service lines to businesses
- KCP&L electrical lines

Tight window for shutting down water main which supplied KCP&L Hawthorne Power Plant and Bayer

- 1 week window to complete lining of existing 20” water main based on supply demands
- flow supplied though 8” temporary line
- inadequate flows once temporary line was put in service
- existing 20” line had to be put back in service until adequate flows could be achieved
- required closing of valves in surrounding areas by KCMO WSD to achieve adequate flow to run fire protection systems

# CONSTRUCTION CHALLENGES

Installation of drainage structures

- Front Street is very flat across this project

  less than 3’ of elevation difference between the West and East limits of the project

- Tight specs on drainage structure grades

  required survey to verify culvert grades were within 0.1% of design grade

- High water levels in the Missouri River led to high water table elevation

  pumps required continually to remove water from trenches during installation of culverts

# CONSTRUCTION CHALLENGES

## Condition of existing Front Street Pavement

- 6” ruts in existing pavement at Corrington
  failing pavement near Flying J truck stop

- Unknown condition of underlying concrete pavements
  decision made to mill to existing concrete to evaluate conditions
  thicker SuperPave as a result of deeper milling

- Full depth concrete and partial depth asphalt repairs

# CONSTRUCTION CHALLENGES

Constructing Diverging Diamond Interchange under traffic

- Traffic was to be maintained in at least one lane at all times
- High volume of heavy truck traffic
- Traffic congestion during peak hours

# CONSTRUCTION CHALLENGES

Converting Front Street from existing configuration to functional DDI

- Utility delays to the project led MoDOT and Clarkson Construction to begin discussing options for accelerating the completion of the project

- Main goal was to get traffic into a “functioning DDI” by winter to meet customer expectations

# CONSTRUCTION CHALLENGES

## Converting Front Street from existing configuration to functional DDI

- Changes were made to the original construction phasing to eliminate several phases and lane configurations to accelerate the switch to the DDI

- All concrete widening and ramp construction was completed prior to building islands

    - This allowed us to maintain two lanes of traffic in each direction on existing pavement during the widening of Front Street

    - Traffic was then switched to the new concrete pavement while the center barrier wall was constructed under I-435

    - High early concrete was used in certain areas to reduce cure times and help minimize delays to traffic

- Temporary signals were able to be used as part of the “functioning DDI”

- Eliminated the need to put traffic into a single lane DDI to construct islands

# BARRIERS UNDER I-435 PRIOR TO DDI SWITCH



# CONSTRUCTION CHALLENGES

Converting Front Street from existing configuration to functional DDI

- Traffic was switched to the two lane DDI configuration using channelizers in place of islands on 11/05/2011

  - Front Street was completely closed under I-435 to complete pavement marking
  - Law enforcement was used to assist in the closures and to direct traffic
  - Traffic was maintained using right turns only on and off of the I-435 ramps and by detouring to Parvin Road and 23rd Street

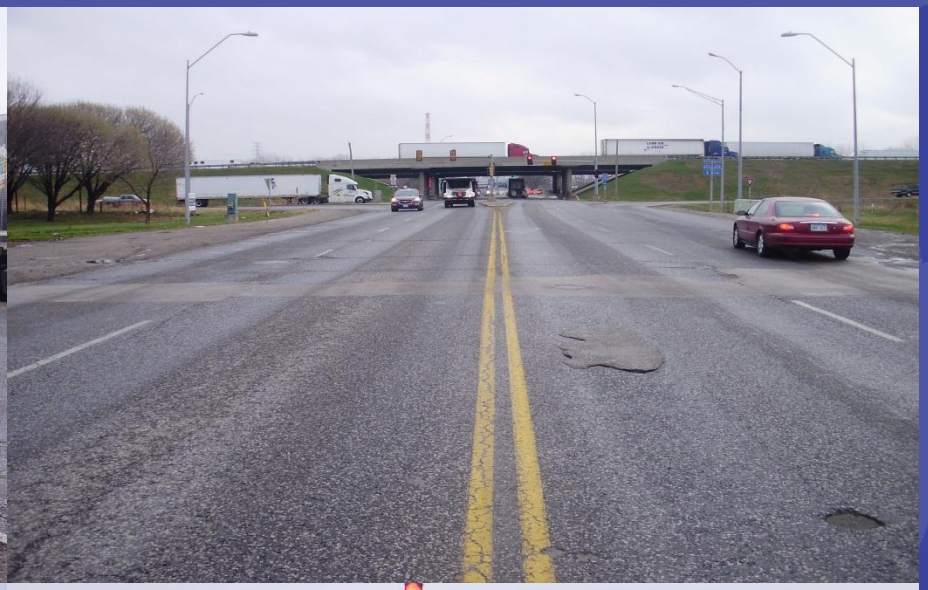
- Once traffic was put into the “functional DDI” congestion was immediately eliminated

- Crews continued working throughout the winter months to build the islands and install signals

- MoDOT held the Ribbon Cutting Ceremony on 05/24/2012

# EXISTING FRONT STREET







# “FUNCTIONING” 2 LANE DDI – LOOKING WEST



# “FUNCTIONING” 2 LANE DDI – LOOKING EAST



# FRONT STREET DDI

