2017 National ABC Conference

Programmatic Approach to Accelerated Bridge Construction

VERMONT
AGENCY OF TRANSPORTATION

Accelerated Bridge Program
VTRANS

Kristin Higgins, P.E.
Vermont Agency of Transportation
Structures Program Manager

Rob Young, P.E.
Vermont Agency of Transportation
Structures Project Manager

Presentation Outline:

- Accelerated Bridge Program Overview
- Expedited Project Delivery
  - Expedited Scoping Process
  - Expedited Project Development Process
- Programmatic Implementation of ABC
  - Outreach
  - Standardization
  - Lessons Learned
- ABC Results – Cost, schedule and customer satisfaction data
- Round Table Discussion on Programmatic Implementation of ABC

Accelerated Bridge Construction prior to Implementing the Accelerated Bridge Program

ABC Design and Construction Prior to 2012

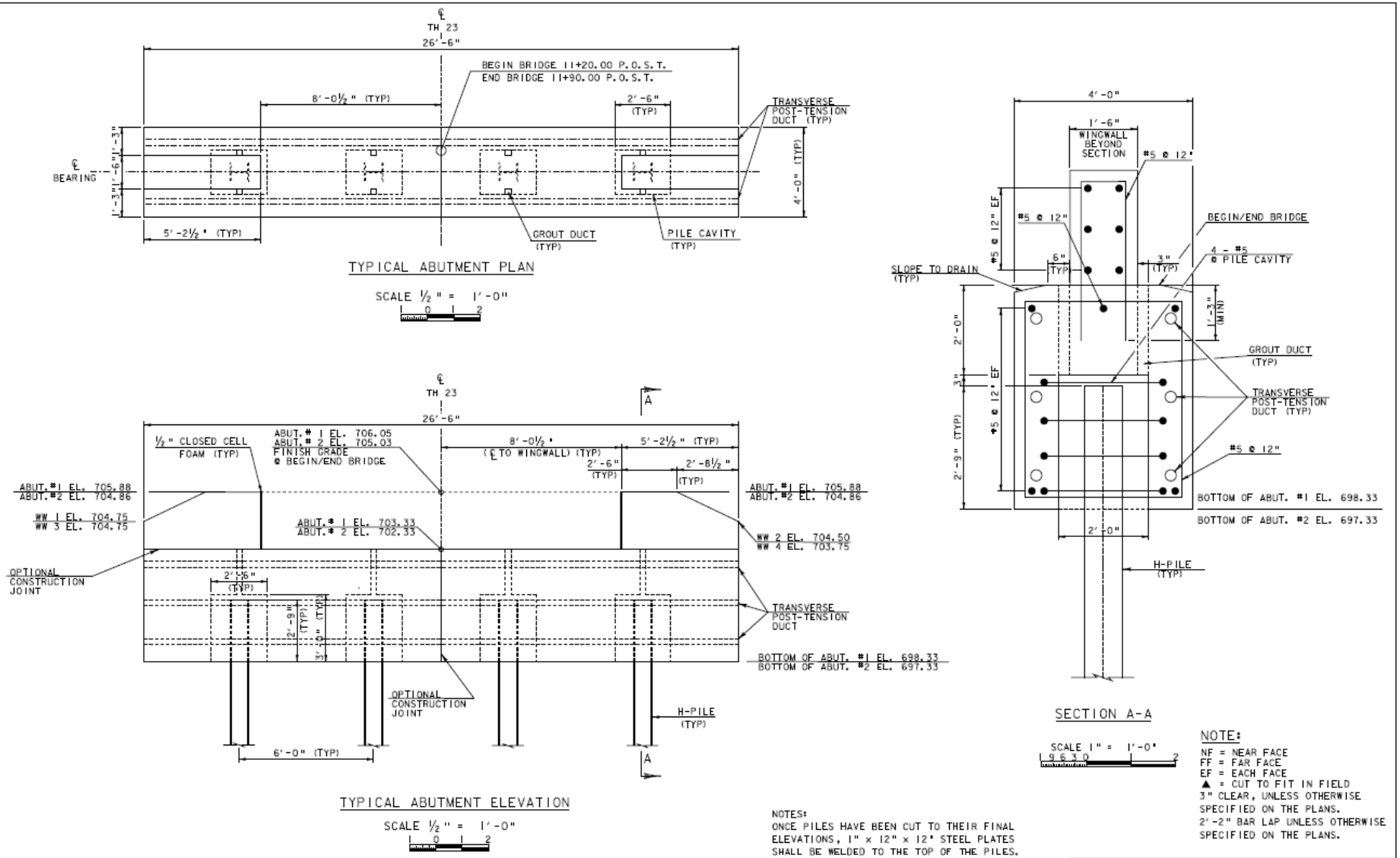
- One-offs from "normal" business practice
  - Resistance from the public
  - Resistance from contractors
  - No proven history
- No Standard details -
  - High Preliminary Engineering Costs
  - Costly Fabrication
  - Difficult to Estimate and Bid
- Project outreach was an after-thought
  - Normal outreach in design
  - Outreach during construction left to the contractors

Braintree BRO 1444(36)

1st ABC Project – Full Replacement

- Construction Year: 2010
- 67’ Prestressed Concrete Box Beams
- Precast Pile Caps and Wingwalls
- 20 day bridge closure planned
- Bridge to two residence

Braintree as Designed



NOTES:
ONCE PILES HAVE BEEN CUT TO THEIR FINAL ELEVATIONS, 1" x 12" x 12" STEEL PLATES SHALL BE WELDED TO THE TOP OF THE PILES.

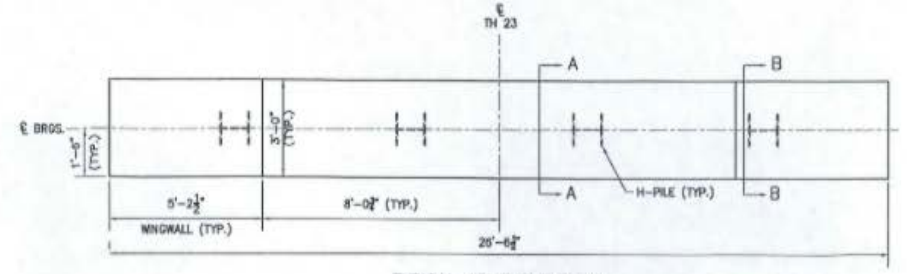
PILE CAVITY GROUT (FILL AND VENT) DUCTS SHALL BE CORRUGATED.

SEE GENERAL NOTES FOR ADDITIONAL FABRICATION, CONSTRUCTION AND SEQUENCE NOTES.

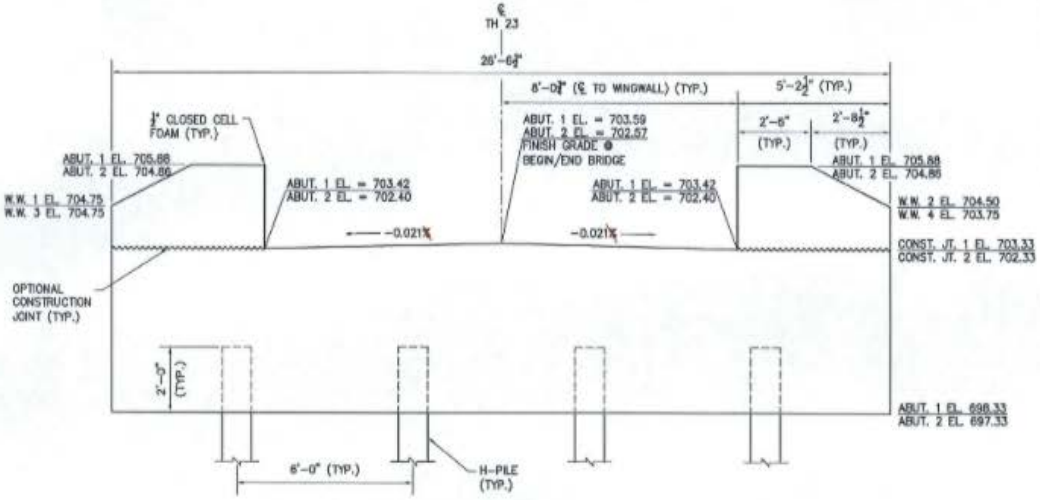
NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME:	BRAINTREE
PROJECT NUMBER:	BRO 1444(36)
FILE NAME: a95j292sub.dgn	PLOT DATE: 14-JAN-2010
PROJECT LEADER: K. HIGGINS	DRAWN BY: K. PATTERSON
DESIGNED BY: T. FILLBACH	CHECKED BY: T. FILLBACH
ABUTMENTS	SHEET 19 OF 26

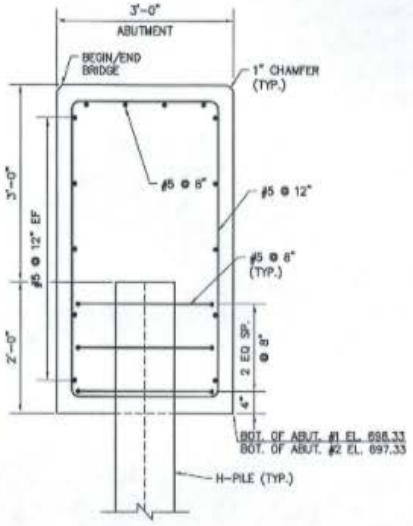
Braintree As Built



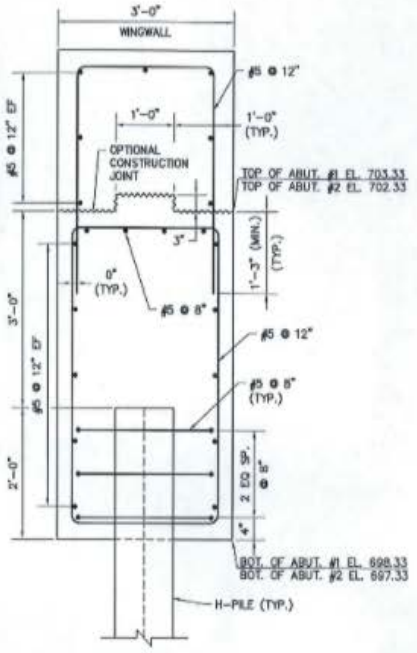
TYPICAL ABUTMENT PLAN



TYPICAL ABUTMENT ELEVATION



SECTION A-A



SECTION B-B

℄ BRGS.

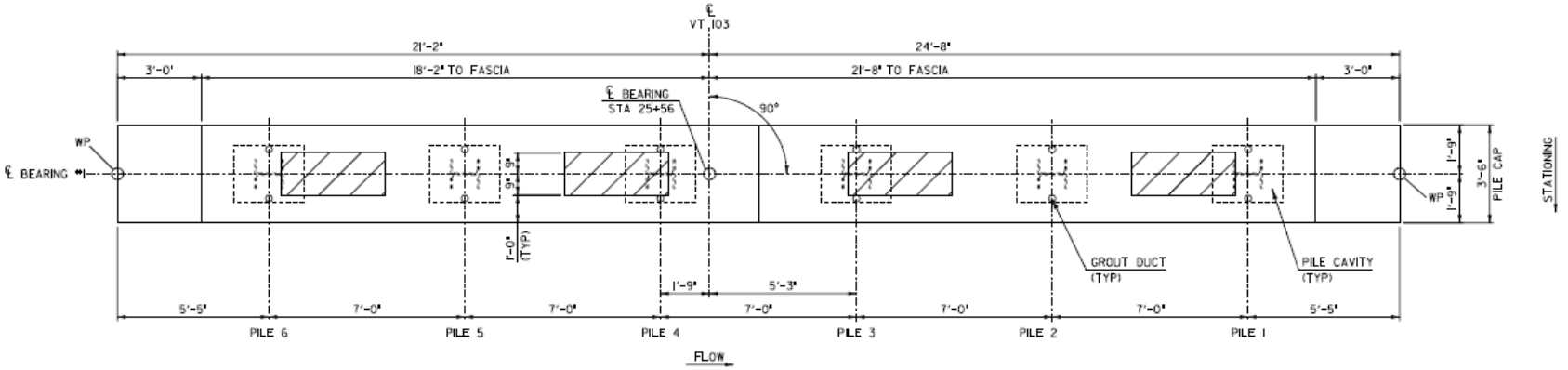
Chester BRF 025-1(28)

2nd ABC Project – Full Replacement

- Construction Year: 2011
- 60’ NEXT Beam
- Precast Abutments
- Maintenance of Traffic via offsite detour
- 21 Day Closure with Incentive/Disincentive

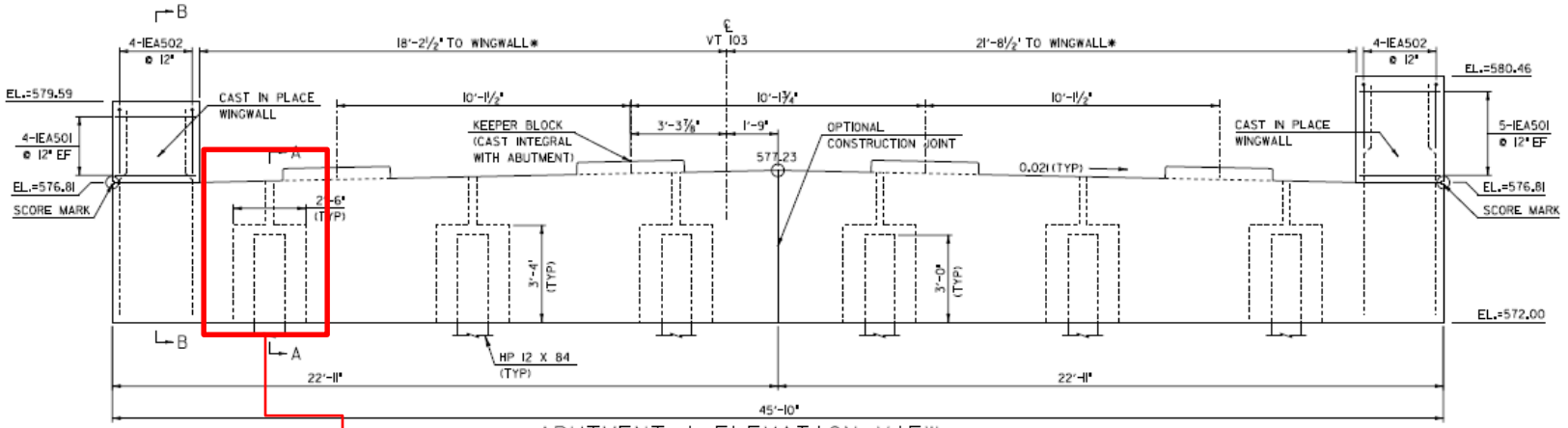
07.01.2011

Chester BRF 025-1(28)



ABUTMENT 1 PLAN VIEW

SCALE ½" = 1'-0



ABUTMENT 1 ELEVATION VIEW

SCALE ½" = 1'-0

SEE SHEET 34 FOR SECTIONS "A-A" & "B-B"

NOTE:

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EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

Square formed cavity
Narrow Grout Pocket

* PROVIDE ½" PREFORMED JOINT FILLER BETWEEN FASCIA AND WINGWALLS

SCALE ½" = 1'-0"

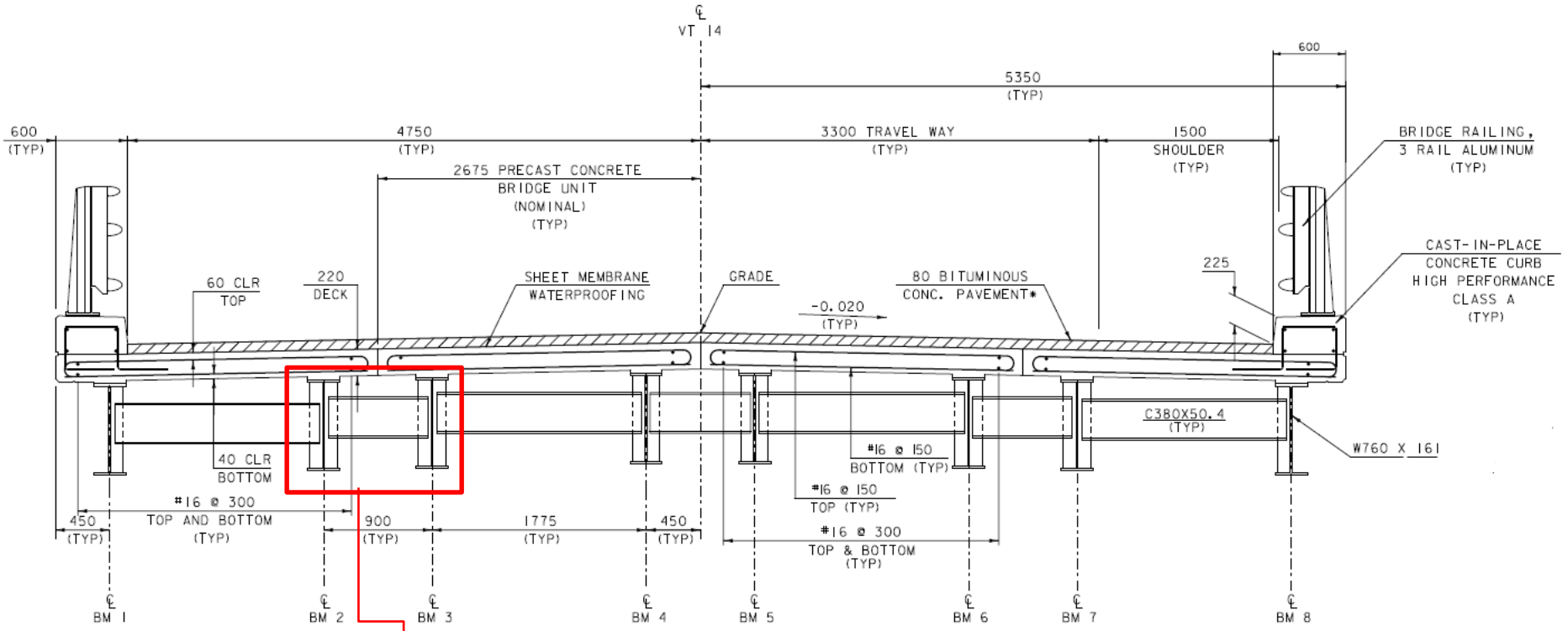
PROJECT NAME:	CHESTER
PROJECT NUMBER:	BRF 025-1(28)
FILE NAME: 84e06l/str/sub.dgn	PLOT DATE: 20-SEP-2010
PROJECT LEADER: CJP.WILLIAMS	DRAWN BY: M.FESSEL
DESIGNED BY: R.S.YOUNG	CHECKED BY: R.S.YOUNG
BRIDGE & ABUTMENT I DETAILS	SHEET 33 OF 124

East Montpelier BRF 037-2(8)

3rd ABC Project – Full Replacement

- Construction Year: 2011
- 64’ precast composite concrete deck on steel beams (Modeled after Inverset) – First PBU bridge
- Cast in Place abutments on bedrock
- 90 Day Closure with Incentive/Disincentive
- Night work not allowed

East Montpelier – First PBU Bridge

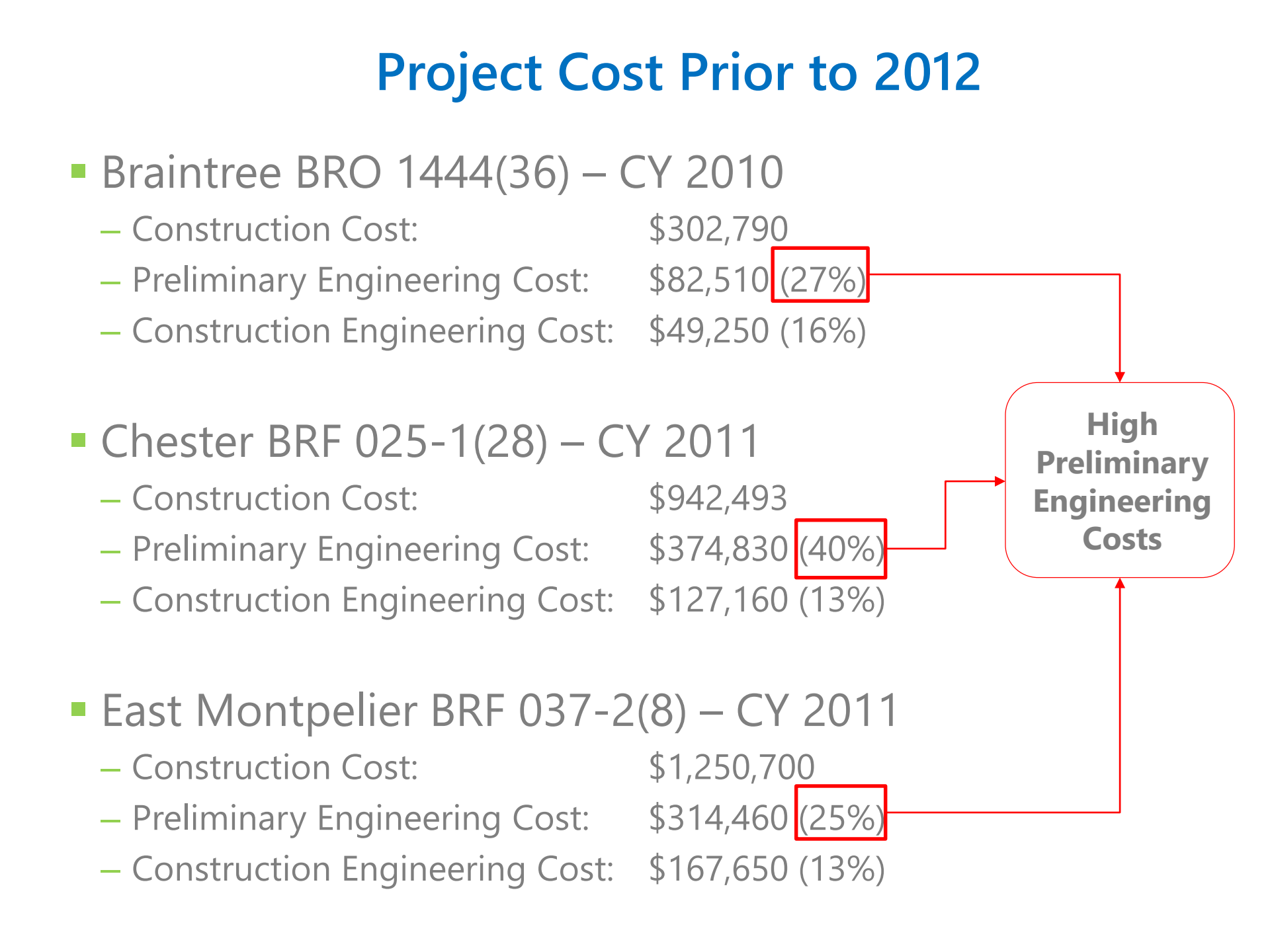


Diaphragms for continuity

3-0” spacing – Narrow for placement

Project Cost Prior to 2012

- Braintree BRO 1444(36) – CY 2010
  - Construction Cost: $302,790
  - Preliminary Engineering Cost: $82,510 (27%)
  - Construction Engineering Cost: $49,250 (16%)
- Chester BRF 025-1(28) – CY 2011
  - Construction Cost: $942,493
  - Preliminary Engineering Cost: $374,830 (40%)
  - Construction Engineering Cost: $127,160 (13%)
- East Montpelier BRF 037-2(8) – CY 2011
  - Construction Cost: $1,250,700
  - Preliminary Engineering Cost: $314,460 (25%)
  - Construction Engineering Cost: $167,650 (13%)



Pre-Program Lessons Learned

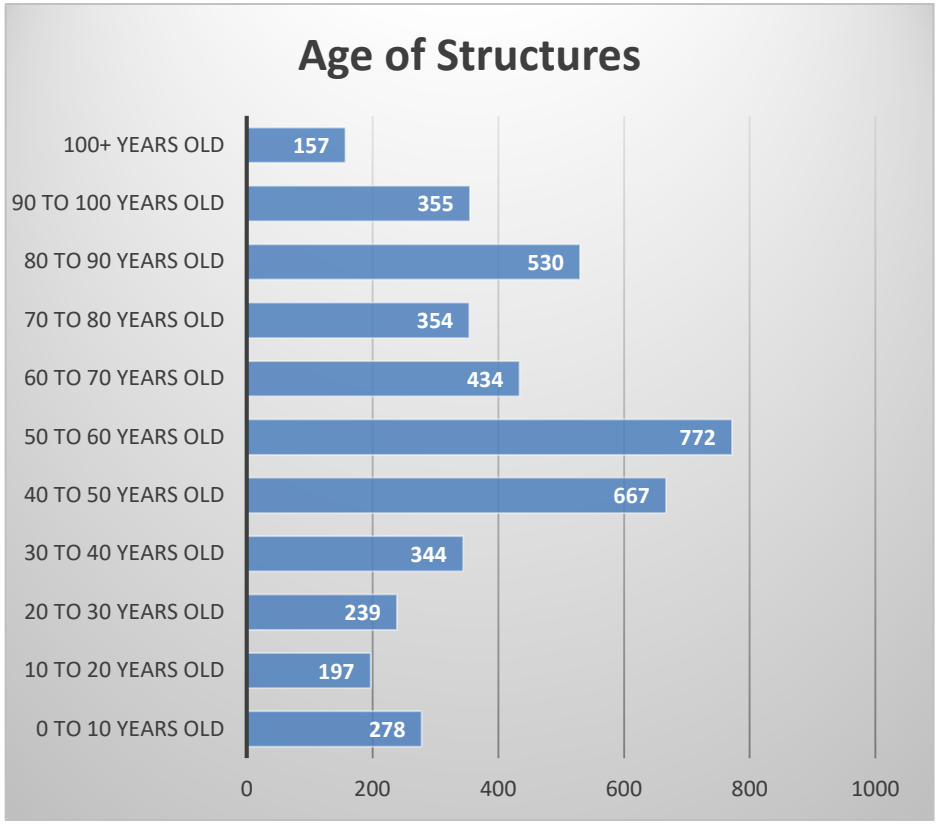
- Complicated Detailing = High Engineering Costs
- Aggressive Project outreach needed during both design and construction
- Seek Contractor Input in design phase
- Quality of Precast elements
- Setting adequate closure durations
- Incentive Disincentive values based on user costs only are very low in Vermont.

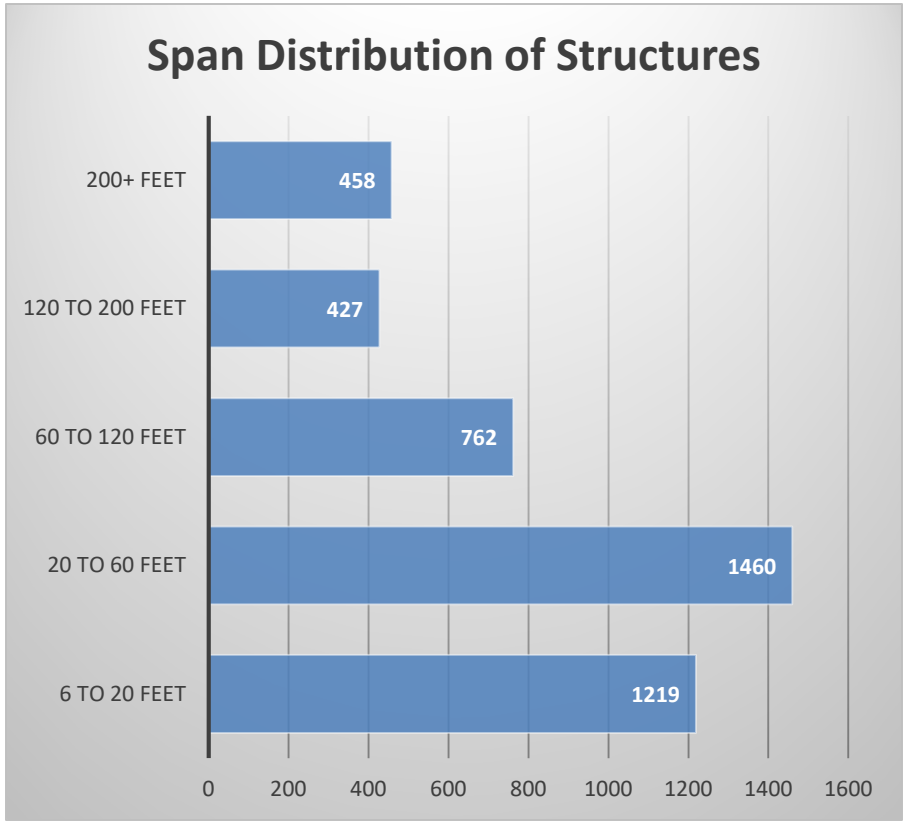
Setting the Stage for the Program

- Aging bridge population
- Dozens of Legacy projects
  - Projects on the books beyond 5 years
- Significant increase in funding for bridges
  - 2009 American Recovery and Reinvestment Act
- Massachusetts FAST14 Showcase: June 2011
- Tropical Storm Irene (August 2011)

Post-Tropical Storm Irene

Vermont's Bridge Population

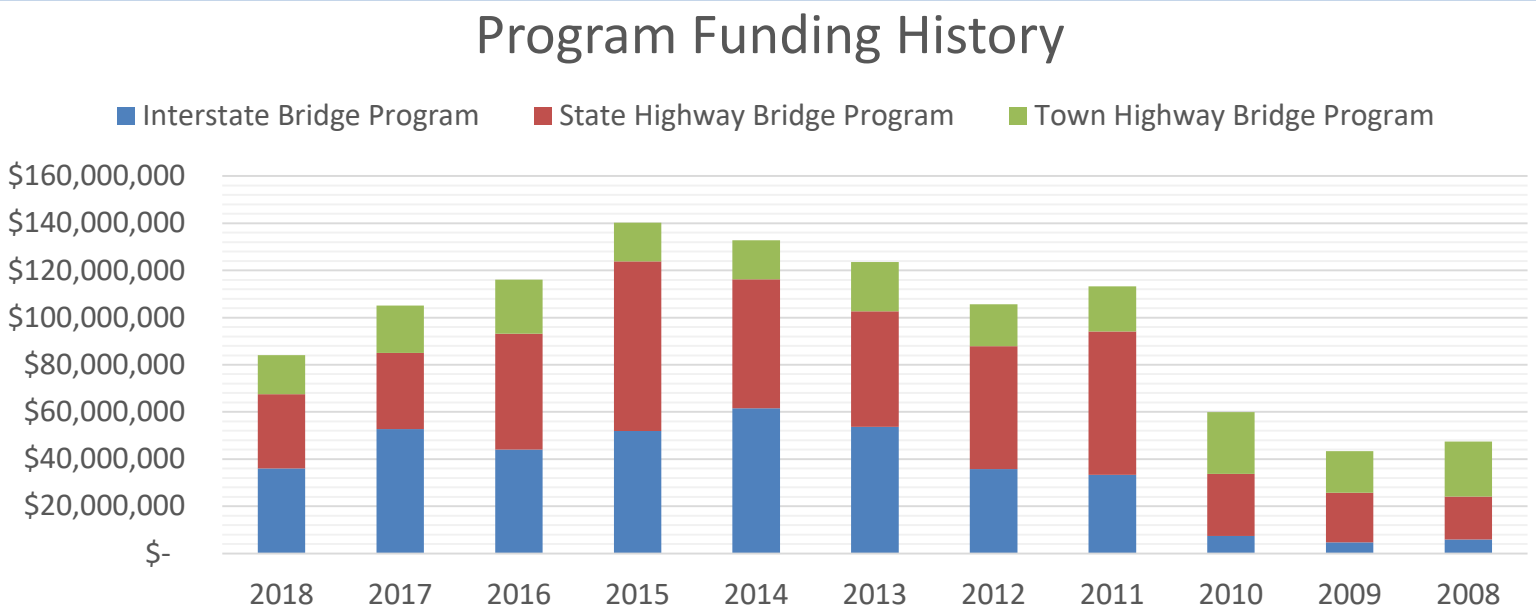




Funding Structures Programs

- State Highway Bridge Program
- Interstate Bridge Program
- Town Highway Bridge Program

	Federal	State	Local
State Highway Bridge Program	80%	20%	0%
Interstate Bridge Program	90%	10%	0%
Town Highway Bridge Program	80%	10%	10%*
*Local Share Reduced via Act 153			



Structures Section Reorganization

Dedicating Staff and Cultivating Proficiency

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Accelerated Bridge Program Implementation

- Structures Section Reorganization in 2012
  - Created Accelerated Bridge Program (ABP) with dedicated leadership and staff
  - Created Project Initiation and Innovation Team (PIIT) with dedicated leadership and staff

Selling the Accelerated Bridge Program

- VTrans Executive staff
  - Secretary of Transportation
  - Chief Engineer
  - Bureau Directors
- Legislature
  - Senate Transportation Committee
  - House Transportation Committee
- Regional Planning Commissions
- FHWA
- Contractors
- Fabricators

Act 153 – Town Highway Bridge Projects

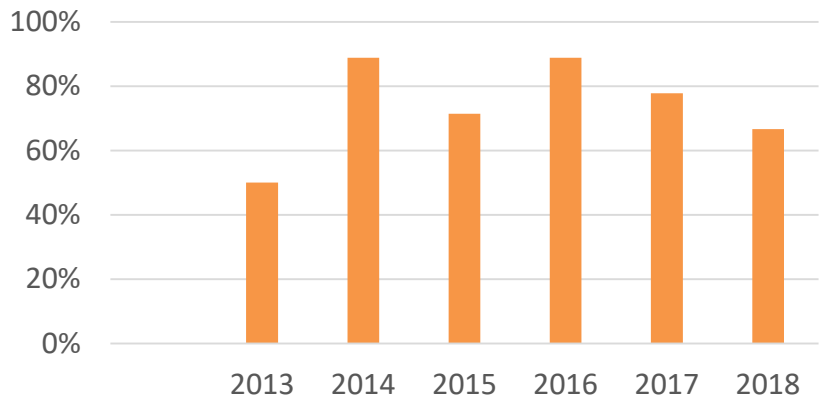
2012: Legislation is passed

- 50% Reduction in local share if the Town closes the bridge during construction
  - 5% local share for Bridge Replacement
  - 2.5% local share for Bridge Rehabilitation

How many Towns are taking advantage of Act 153?

	Number of Towns Taking Advantage of Act 153
2012	Act 153 is passed
2013	3
2014	8
2015	10
2016	8
2017	6
2018	4

% of Towns Taking Advantage of Act 153 Each Year



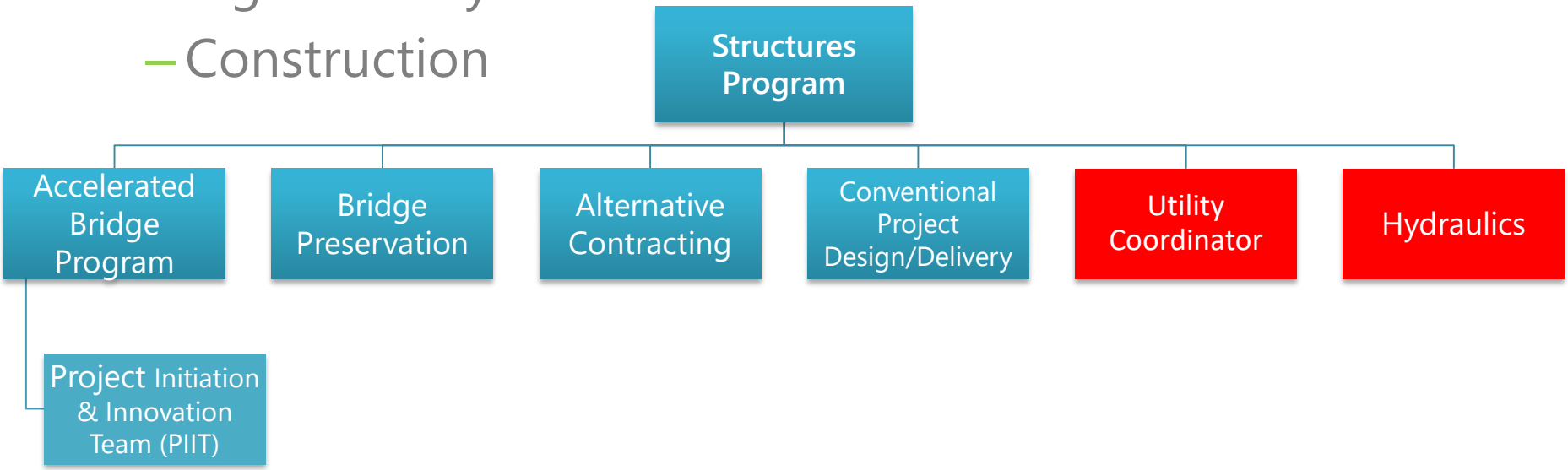
- Highly successful at propelling widespread adoption of ABC
- Very popular and many towns have elected to close roads since legislation
- Encourages Lower Costs, Faster Project Development, and Reduced Environmental Impacts

Collaboration with Industry

- ABP Kick off meeting/workshop in 2012
  - Contractors
  - Fabricators
- Broke in to focus groups
- Used facilitators
- Primary Concerns
  - Loss of Work
  - Cure Times
  - Work force
  - Permitting (Time of Year restrictions)

More Program Reorganization!!

- Team Co-location
  - Utilities and Hydraulics embedded
  - Project initiation and Innovation placed under ABP leadership
- Team Co-organization – Early involvement
  - Environmental
  - Right of Way
  - Construction



Accelerated Bridge Program – Current State

- Program embedded in all Structures units
  - No more special ABP team
  - ABP Brand is used on all ABP project correspondence and presentations
- Teams are chosen for project development
  - All design engineers and technicians trained in ABC
  - Standard details developed and used