Final Environmental Impact Statement

Spaulding Turnpike Improvements

NHS-027-1(37), 11238

Newington to Dover

New Hampshire

November 2007

Volume 2

Federal Highway Administration

New Hampshire Department of Transportation

0 5 10 15 20 MILES

0 5 10 15 20 KILOMETERS

Vanasse Hangen Brustlin, Inc.

Figure 1.2-1
Project Location Map

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- STUDY AREA BOUNDARY

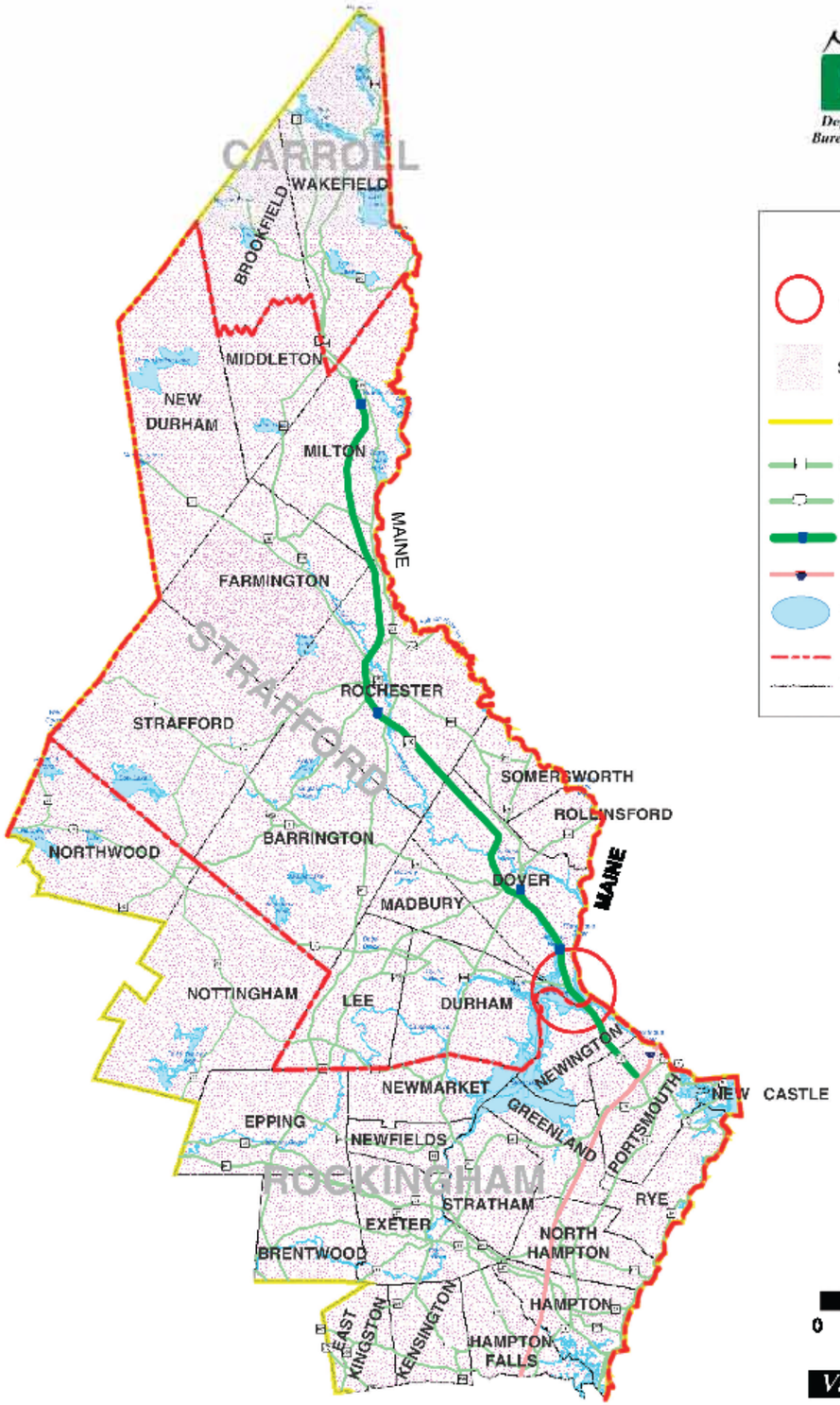
EXIT 1	GOSLING ROAD / PEASE BOULEVARD
EXIT 2	FOX RUN ROAD
EXIT 3	WOODBURY AVENUE
EXIT 4	NIMBLE HILL ROAD / SHATTUCK WAY
EXIT 4N	MEDIAN TURNAROUND (DISCONTINUED IN 2005)
EXIT 5	WENTWORTH TERRACE (HILTON PARK)
EXIT 6	US ROUTE 4 / DOVER POINT ROAD

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 1.2-2
Project Study Area

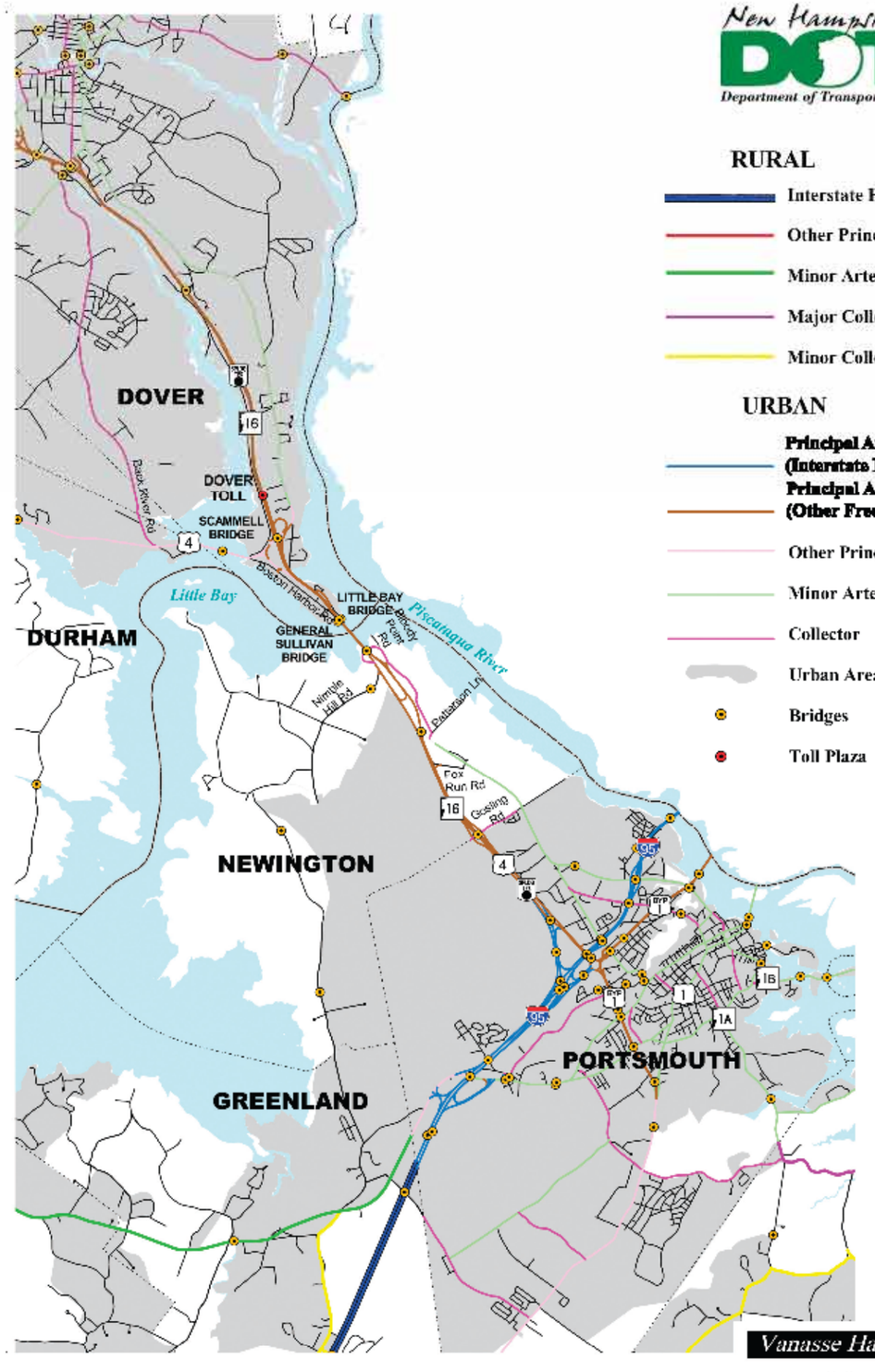
Date Created:10/9/2007 J:\s1428\eau\Alphaeus\SDEIS\fig010209.dgn



New Hampshire DOT
Department of Transportation
Bureau of Transportation Planning

Vanasse Hangen Brustlin, Inc.

Figure 1.3-1
Socio-economic Study Area



New Hampshire DOT
Department of Transportation

RURAL

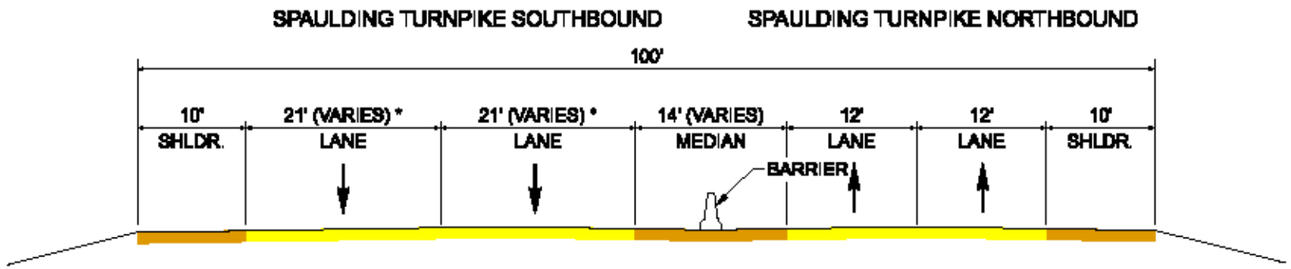
- Interstate Highways
- Other Principal Arterials
- Minor Arterials
- Major Collector
- Minor Collector

URBAN

- Principal Arterials (Interstate Highways)
- Principal Arterials (Other Freeways & Expressways)
- Other Principal Arterials
- Minor Arterials
- Collector
- Urban Area
- Bridges
- Toll Plaza

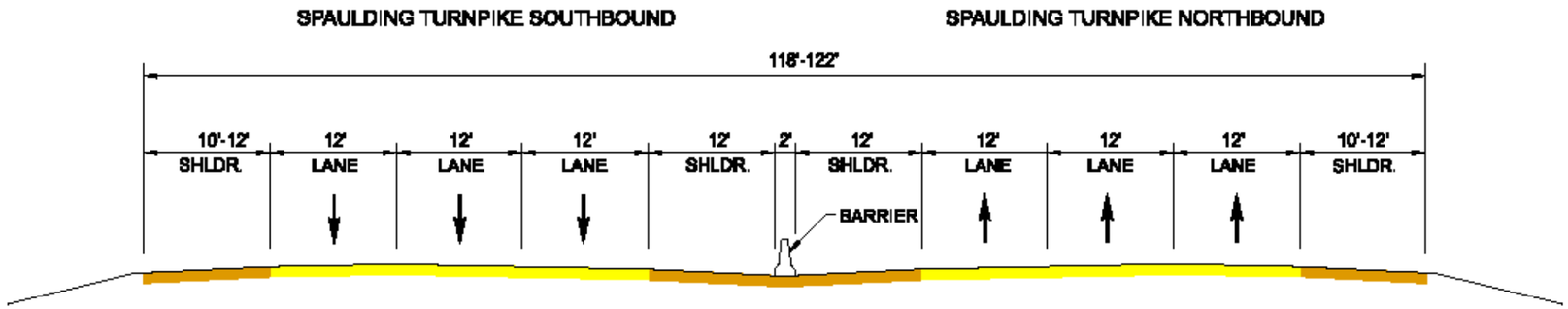
Vanasse Hangen Brustlin, Inc.

Figure 1.3-2
Functional Classification Map

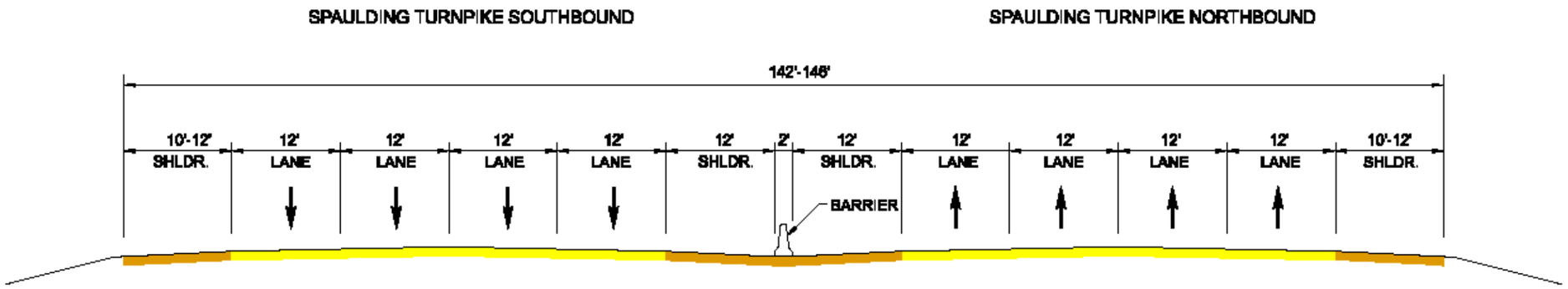


EXISTING FOUR - LANE ROADWAY CROSS SECTION (NORTH OF LITTLE BAY BRIDGES)

* TAPERS TO 12' APPROACHING BRIDGE



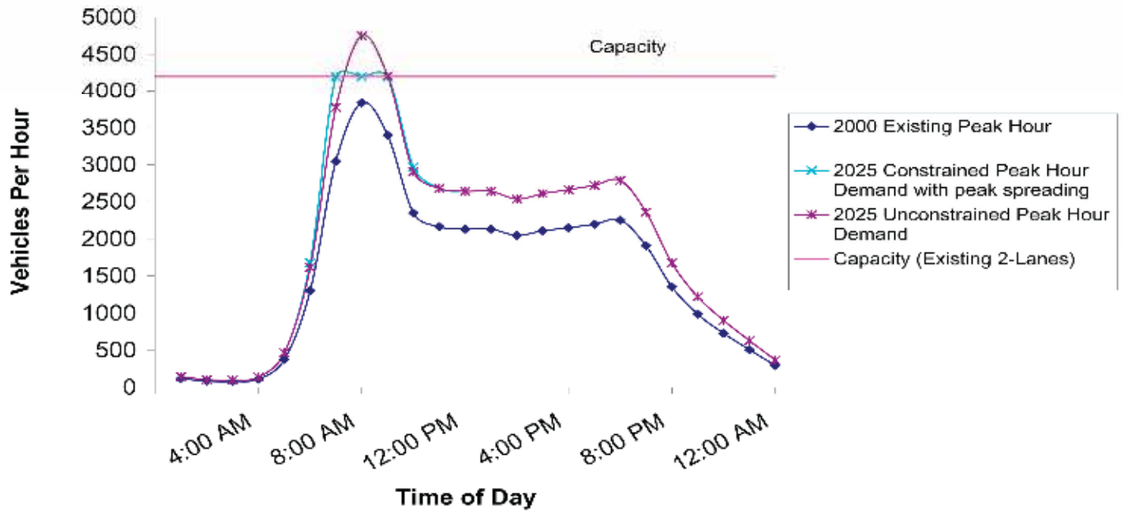
SIX - LANE TYPICAL SECTION



EIGHT - LANE TYPICAL SECTION

Figure 2.3-1
Typical Roadway / Bridge
Cross Sections

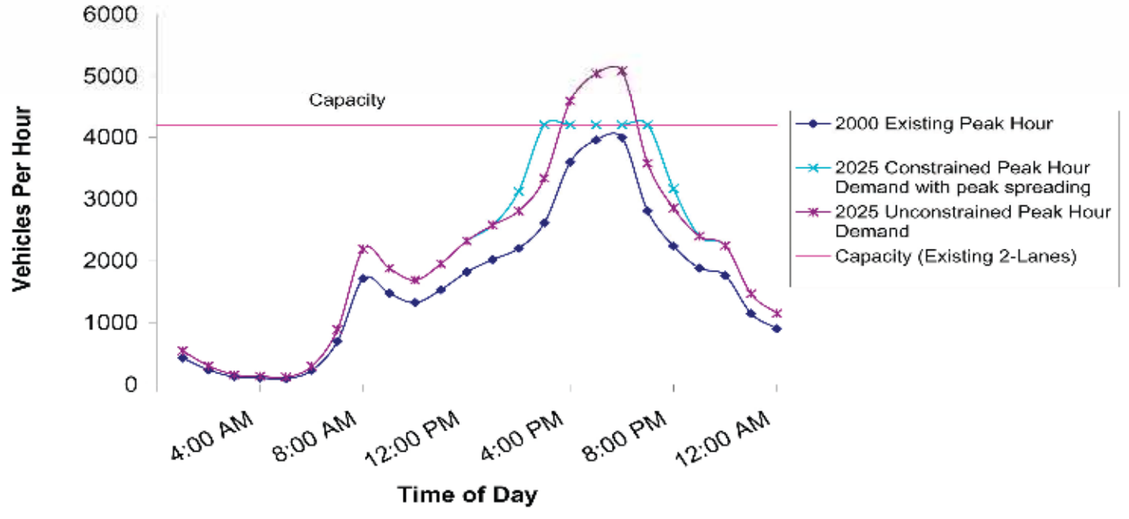
Figure 2.4-1
Temporal Distribution of 2000 and 2025 Average Weekday Traffic, Little Bay Bridges, Southbound



June 10, 2003

Vanasse Hangen Brustlin, Inc.
Temporal Distribution of 2000 and 2025 Average Weekday Traffic
Little Bay Bridges, Southbound
Figure 2.4-1

Figure 2.4-2
Temporal Distribution of 2000 and 2025 Average Weekday Traffic, Little Bay Bridges, Northbound



June 16, 2003

Vanasse Hangen Brustlin, Inc.
Temporal Distribution of 2000 and 2025 Average Weekday Traffic
Little Bay Bridges, Northbound
Figure 2.4-2

BOSTON HARBOR RD

SPUR RD

DOVER POINT RD

DOVER POINT RD

400 '

Lengthen Exit 6W Deceleration Lane
By 400 Feet By Shimming and Re-Striping
Lane and Shoulder.

Construction Completed June 2005.

New Hampshire DOT
Department of Transportation

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Shoulder

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-3
Dover TSM
Exit 6, Northbound

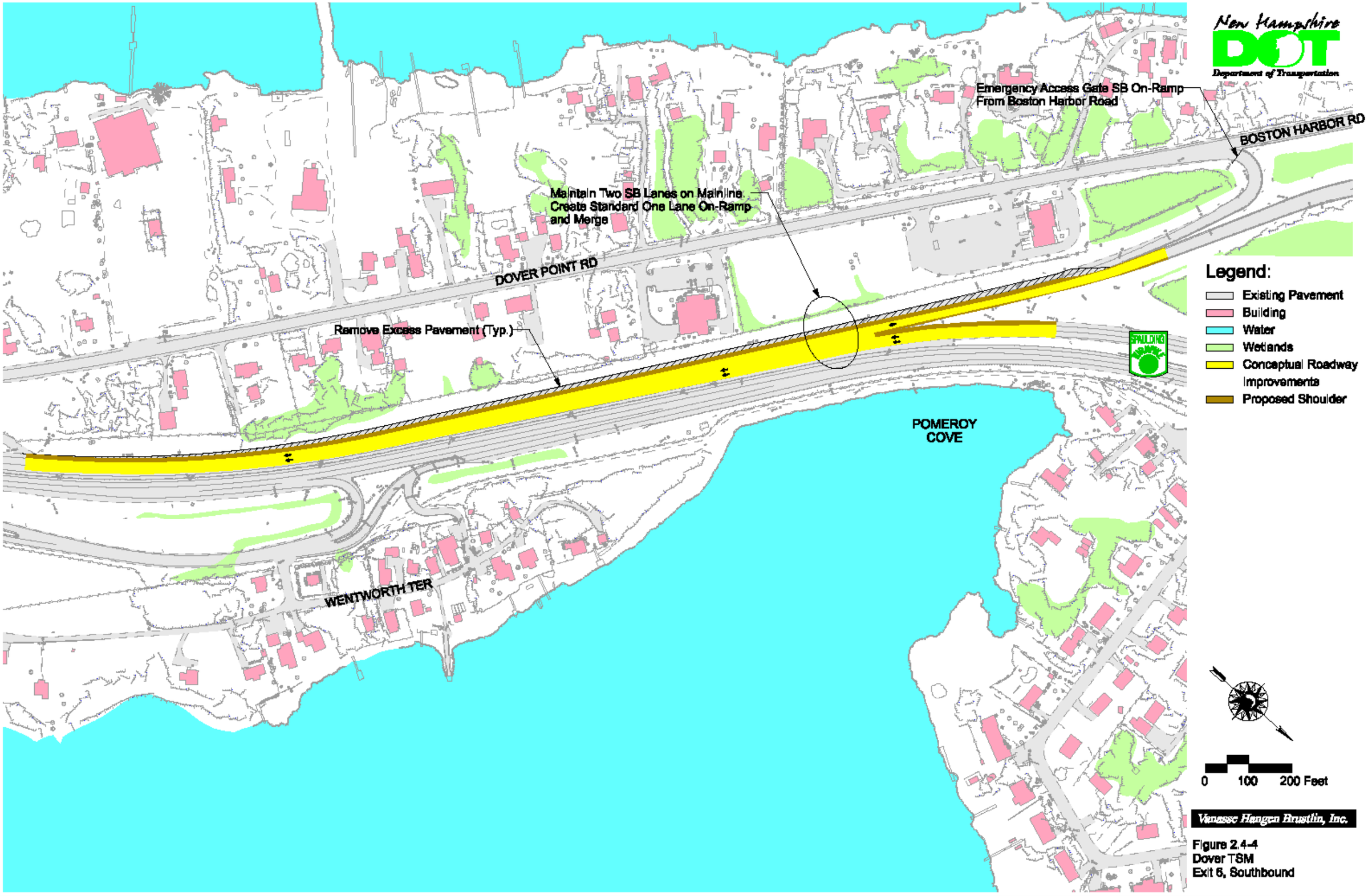
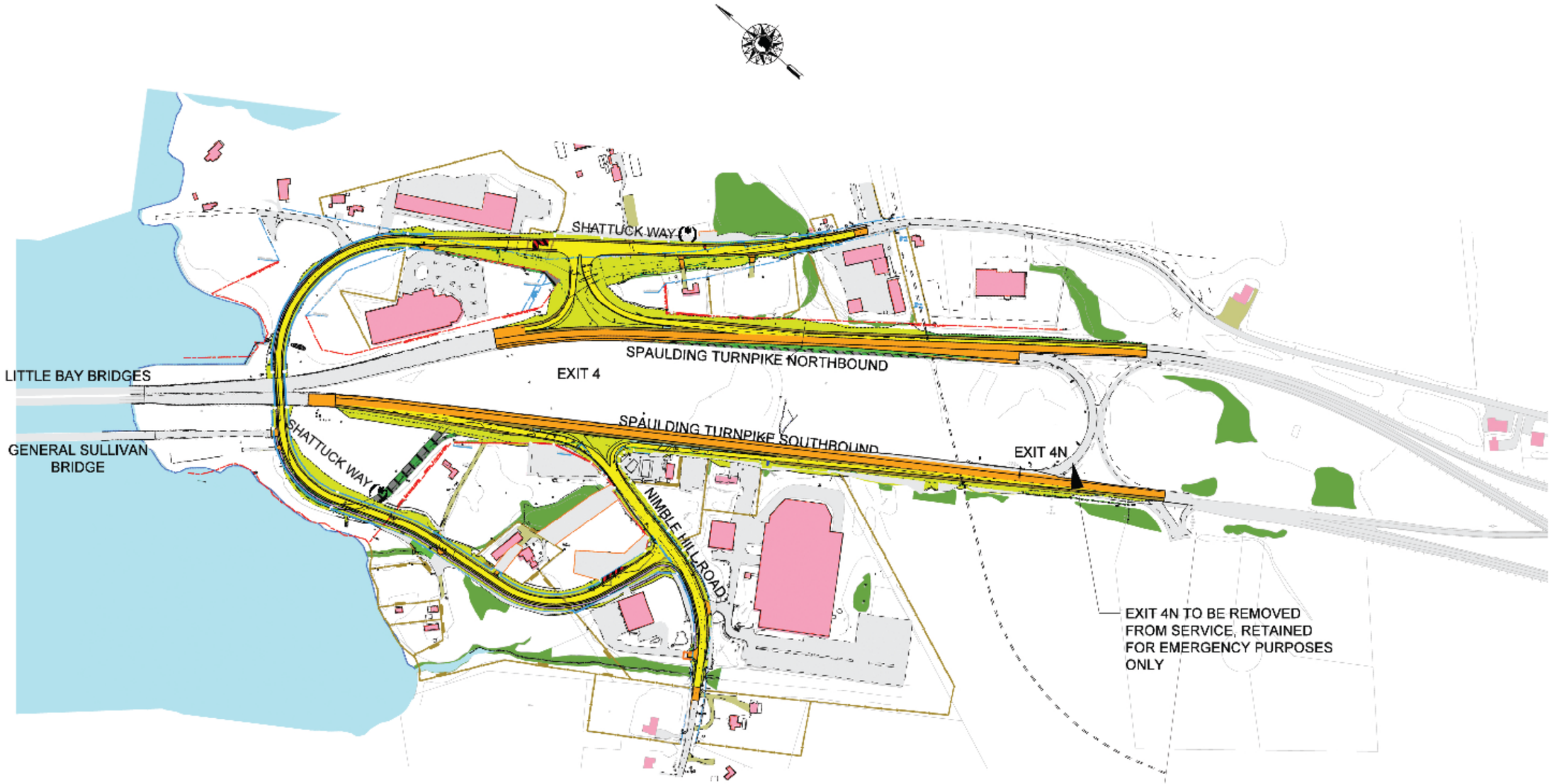


Figure 2.4-4
Dover TSM
Exit 6, Southbound



(*) Note: Segments formerly known as River Road and River Road Extension now known as Shattuck Way

Proposed Work
Existing Pavement
Wetlands
Resurfacing / Driveway Improvements
Existing Buildings
Water
Buildings to be Removed
Pavement Removal

Newington
Interim Safety Improvements

Proposed Interchange Improvements
Exit 4 / River Road / Nimble Hill Road
Newington, New Hampshire
A000(115), 11238-C

New Hampshire DOT Department of Transportation

Figure 2.4-5

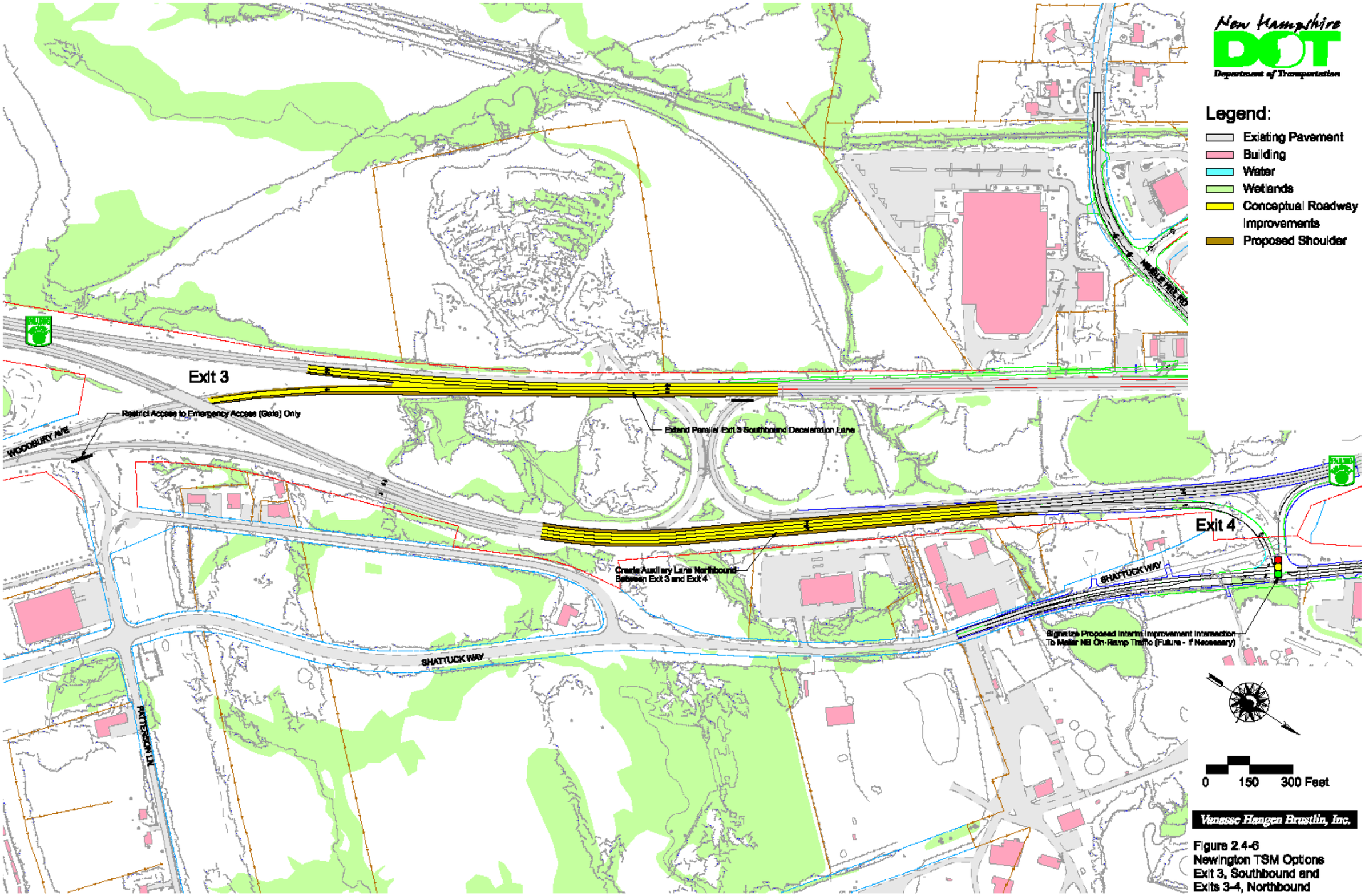
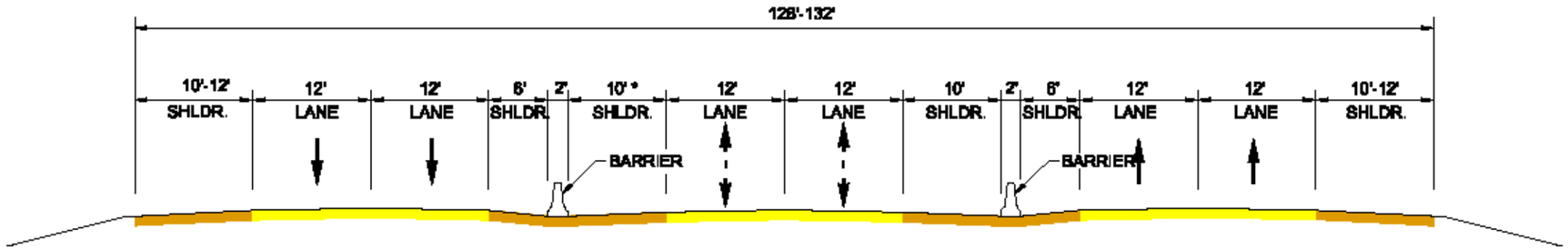


Figure 2.4-6
Newington TSM Options
Exit 3, Southbound and
Exits 3-4, Northbound

SPAULDING TURNPIKE SOUTHBOUND

SPAULDING TURNPIKE NORTHBOUND

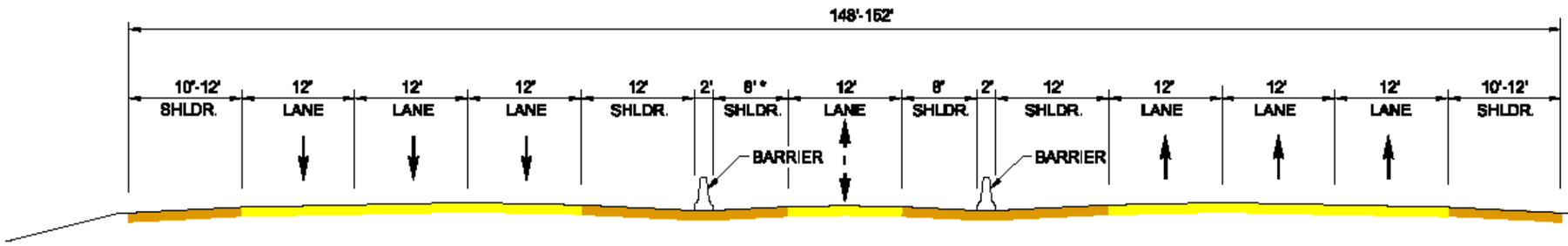


(* reduced typical 4')

SIX - LANE WITH TWO CONTRAFLOW HOV LANES TYPICAL SECTION

SPAULDING TURNPIKE SOUTHBOUND

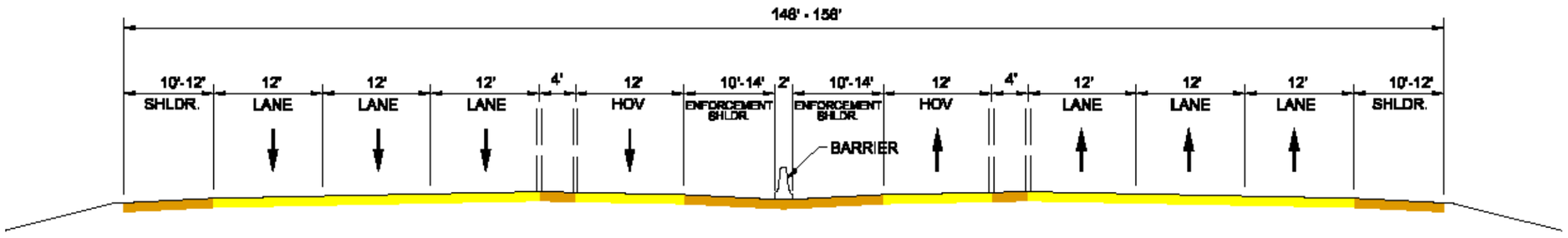
SPAULDING TURNPIKE NORTHBOUND



SEVEN - LANE WITH ONE CONTRAFLOW HOV LANE TYPICAL SECTION

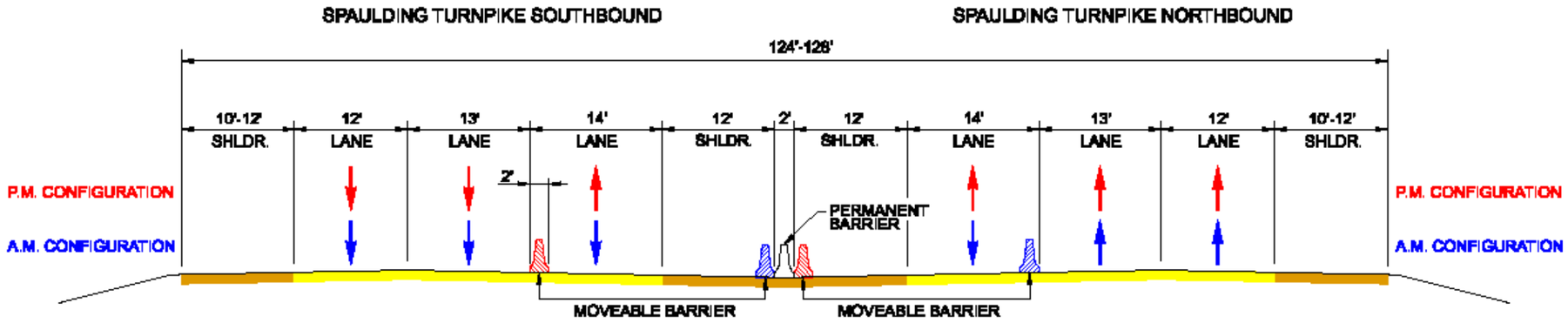
SPAULDING TURNPIKE SOUTHBOUND

SPAULDING TURNPIKE NORTHBOUND

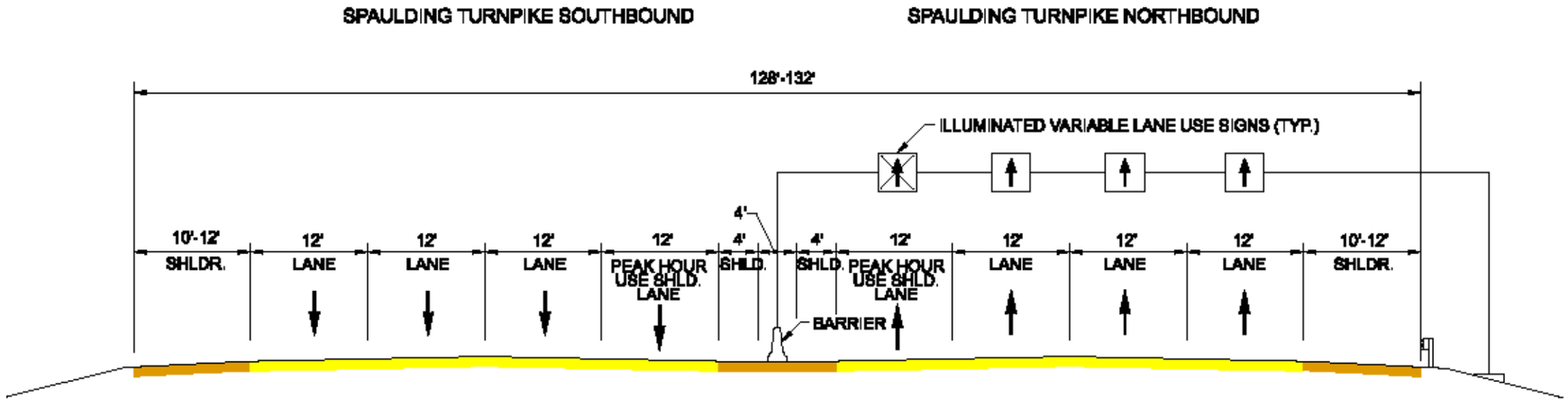


EIGHT - LANE WITH CONCURRENT HOV LANE TYPICAL SECTION

Figure 2.4-7
Six, Seven and Eight Lane HOV
Typical Section Alternatives



SIX - LANE WITH CONTRAFLOW (ZIPPER LANE) LANE TYPICAL SECTION

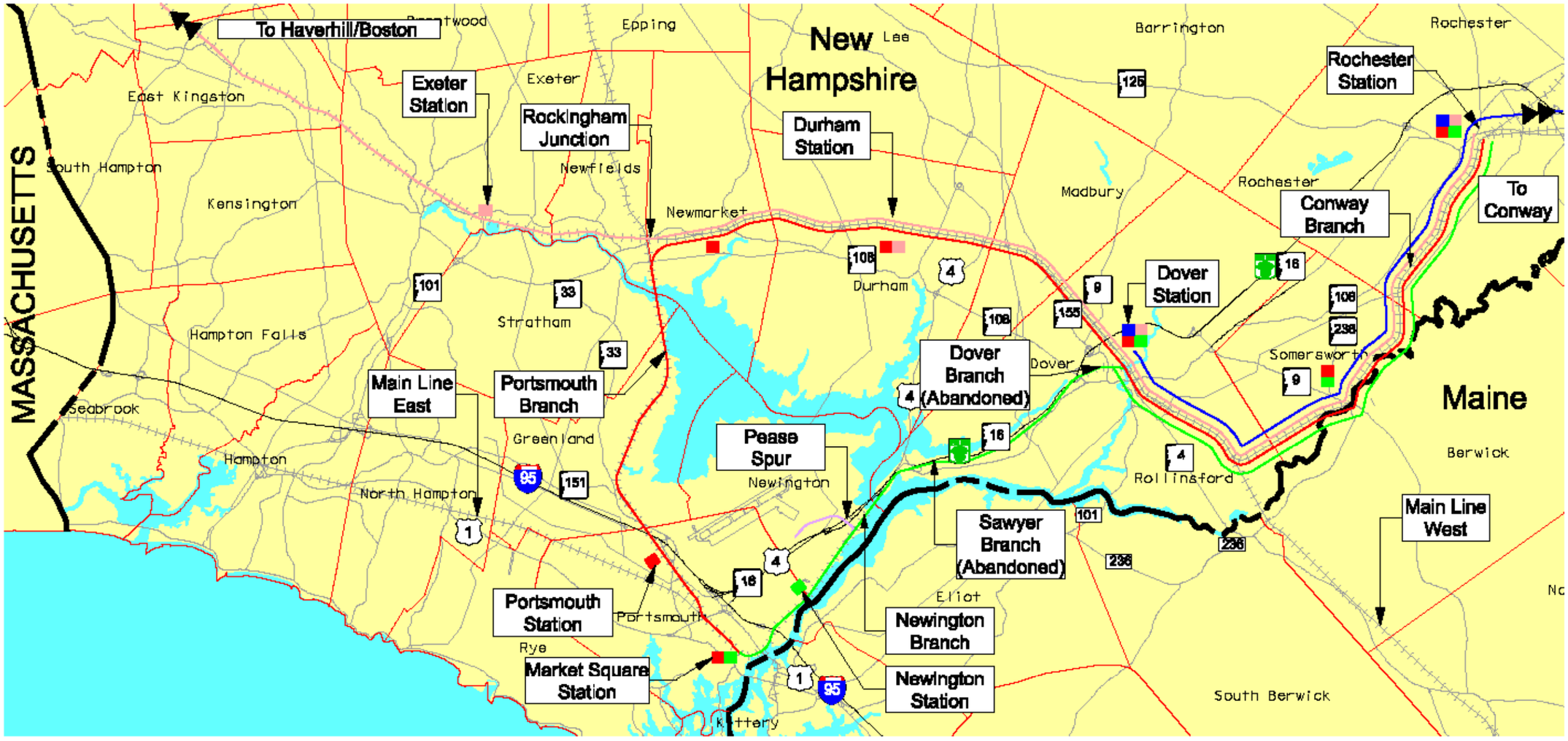


SIX LANE PLUS TWO PEAK HOUR USE SHOULDER LANES TYPICAL SECTION

Vanasse Hangen Brustlin, Inc.

Figure 2.4-8
Six Lane Contraflow (Zipper Lane) and Six Lane Plus Two Shoulder Lanes Typical Section Alternatives

New Hampshire DOT
Department of Transportation



Legend:

- ALT. 1 Alignment/Station — Expanded Downeaster Service
- ALT. 2A Alignment/Station — Rochester-Portsmouth via Rockingham Junction
- ALT. 2B Alignment/Station — Rochester-Portsmouth via Turnpike
- ALT. 3 Alignment/Station — Conway Branch
- ALT. 4 Alignment — Pease Spur

0 1.25 2.5 Miles

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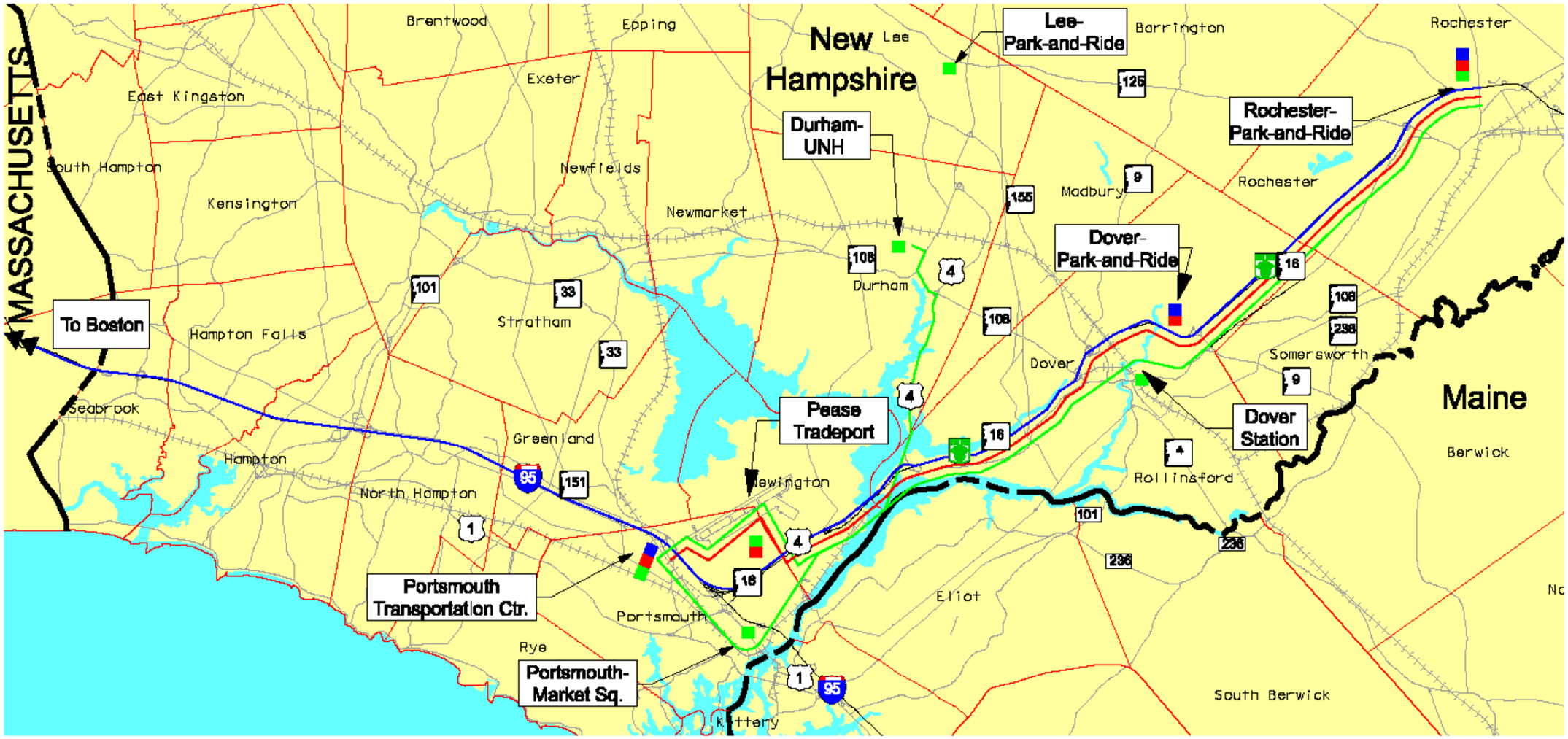
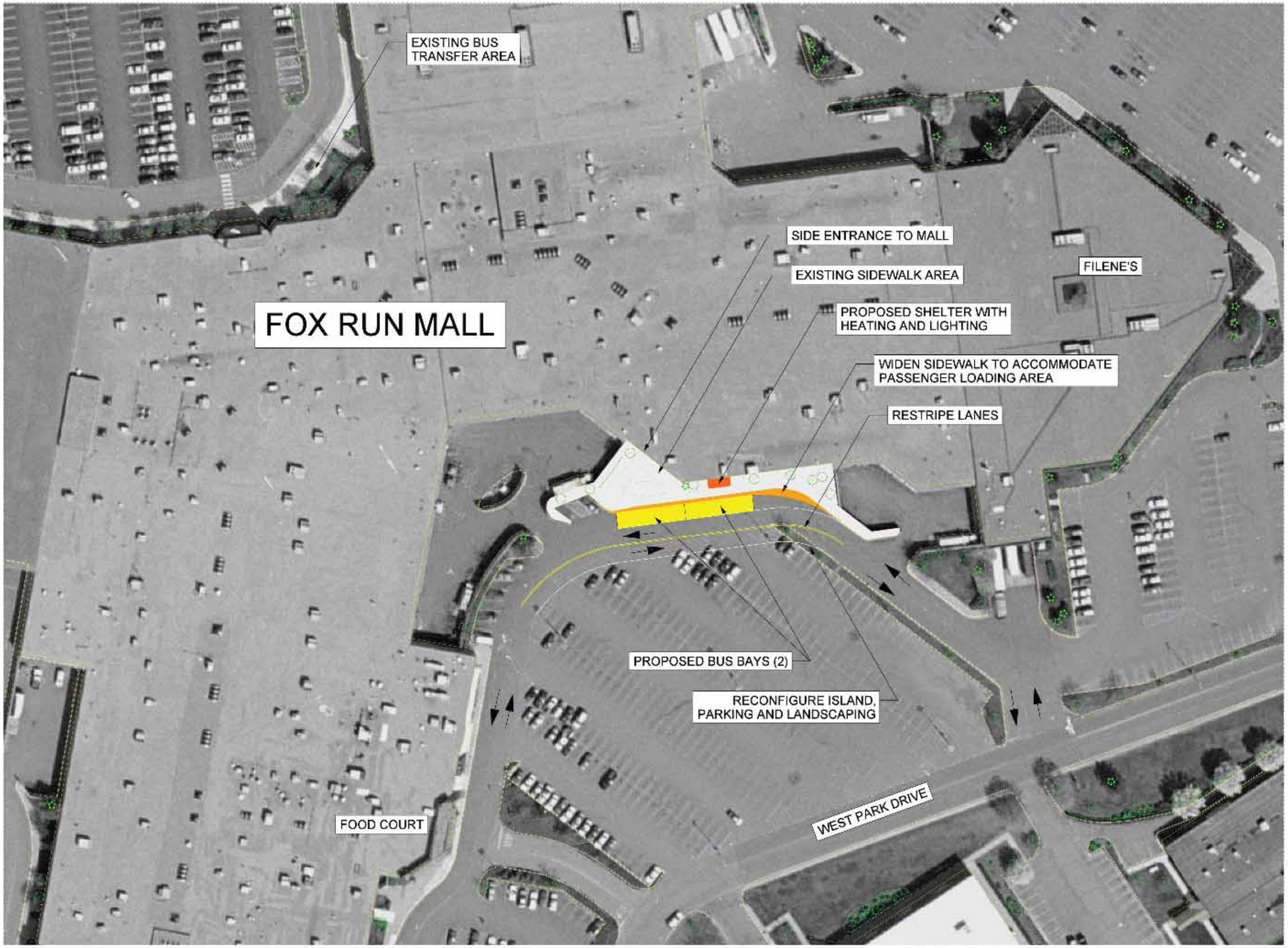
Figure 2.4-9
Rail Alternatives

New Hampshire DOT
Department of Transportation



Vanasse Hangen Brustlin, Inc.

Figure 2.4-10
Bus Alternatives



DOT
Department of Transportation

Vanasse Hangen Brustlin, Inc.

Figure 2.4-11
Proposed Relocated
Fox Run Mall Bus Transfer Point
Newington

LEGEND

- Travel Way of Proposed Roadway
- Shoulder of Proposed Roadway
- Proposed Raised Traffic Islands
- Proposed Sidewalk
- Access Points to Proposed Roadway (Drives, etc.)
- Approximate Limit of Slope Work and Landscaping
- Removal of Existing Pavement Outside of Slope Work
- Existing Pavement (Roadways, Drives, Sidewalks, etc.)
- Existing Gravel Surface (Drives, Paths, etc.)
- Existing Tree and/or Brush Line
- Water (Rivers, Streams, Lakes, Ponds, Swamps, etc.)
- Buildings
- Buildings To Be Removed
- Bridge Removal
- Wetlands
- Property Lines
- State, County, City and Town Lines
- Existing Easement Lines
- Proposed Easement Lines
- Existing R.O.W. (Right -of-Way)
- Proposed R.O.W.
- Existing C.A.R.O.W. (Controlled Access)
- Proposed C.A.R.O.W.
- Existing L.A.R.O.W. (Limited Access)
- Proposed L.A.R.O.W.

Prepared for
New Hampshire Department of Transportation
Highway Design Bureau

GRID

NORTHEAST CREDIT UNION
1 POINT OF ACCESS
APPROX. EXIST. CAROW
LIMIT OF WORK
DOT PROJECT 14287
3'-6"
37'-0"
26'-0" TYP
12'-0"
1 POINT OF ACCESS
69' x 77'
414 SPACES
PROPOSED PRIVACY FENCE AND LANDSCAPED BUFFER
(SEE CROSS SECTION)
MS4 BOUNDARY
ELLIS, JAMES F. & MOLLY B.
STATE OF NEW HAMPSHIRE formerly CITY OF DOVER
Alder Lane
Glenwood Avenue
Liberty Way
Sixth Street
APPROX. EXIST. ROW
CAROW ROW
9'-0"x18'-6" ALL SPACES IN ALL ROWS UNLESS OTHERWISE NOTED
9'-0"x18'-0" ALL SPACES THIS ROW
0 POINTS OF ACCESS
DOMPKOUSKI, RICHARD & SUSANNE
FUCCI, THOMAS & GEORGIANA
COLLINS, MARK & SUSAN
GAUTHIER GEORGE I & MARY
EDGAR SUSAN D. & PAUL T.
BUCABREY, INC.
LIBERTY MUTUAL INSURANCE CO
WHITTLE FLOYD & WENDY
WONG MD Y
To Spaulding Turnpike & Somersworth
FC 116+74.59

50 0 50 100
SCALE IN FEET

Vanasse Hangen Brustlin, Inc.

Figure 2.4-12
Exit 9 / Indian Brook Drive
Park-and-Ride Facility Dover

New Hampshire DOT
Department of Transportation

Vanasse Hangen Brustlin, Inc.

Figure 2.4-13
Potential Park-and-Ride Facility
Exit 13 / Washington Street
East of Spaulding Turnpike
Rochester

New Hampshire DOT
Department of Transportation

N

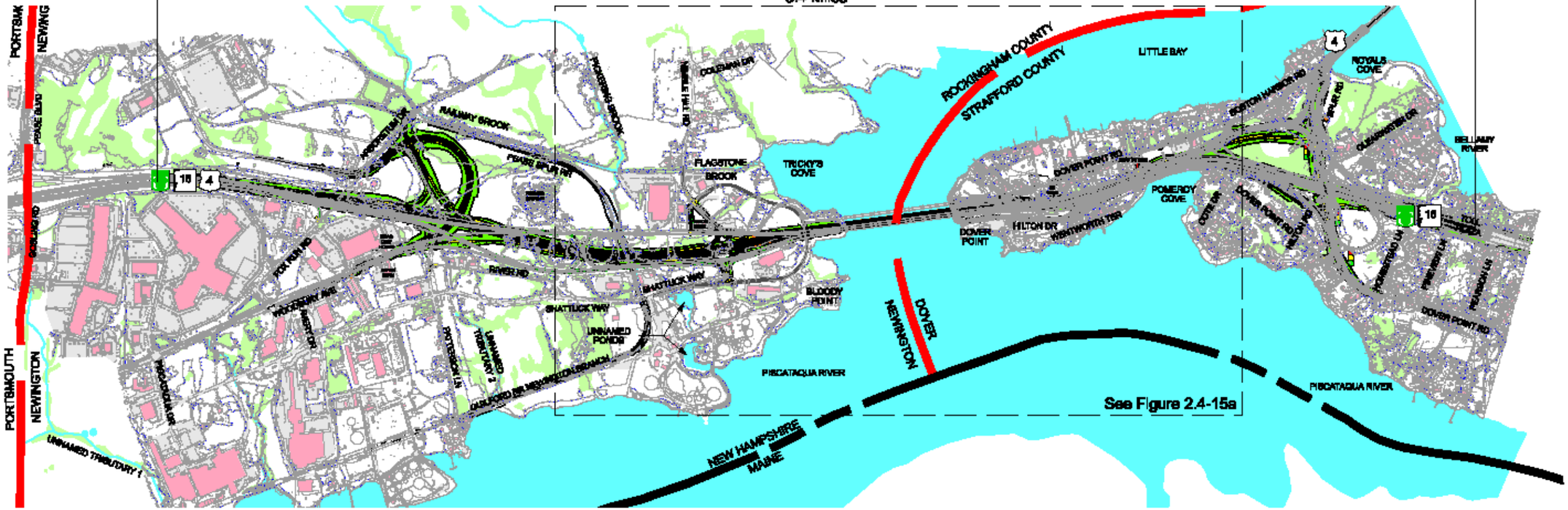
0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-14
Potential Park-and-Ride Facility
Exit 13 / Washington Street
West of Spaulding Turnpike
Rochester

Six-Lane

Six-Lanes
3.4 Miles

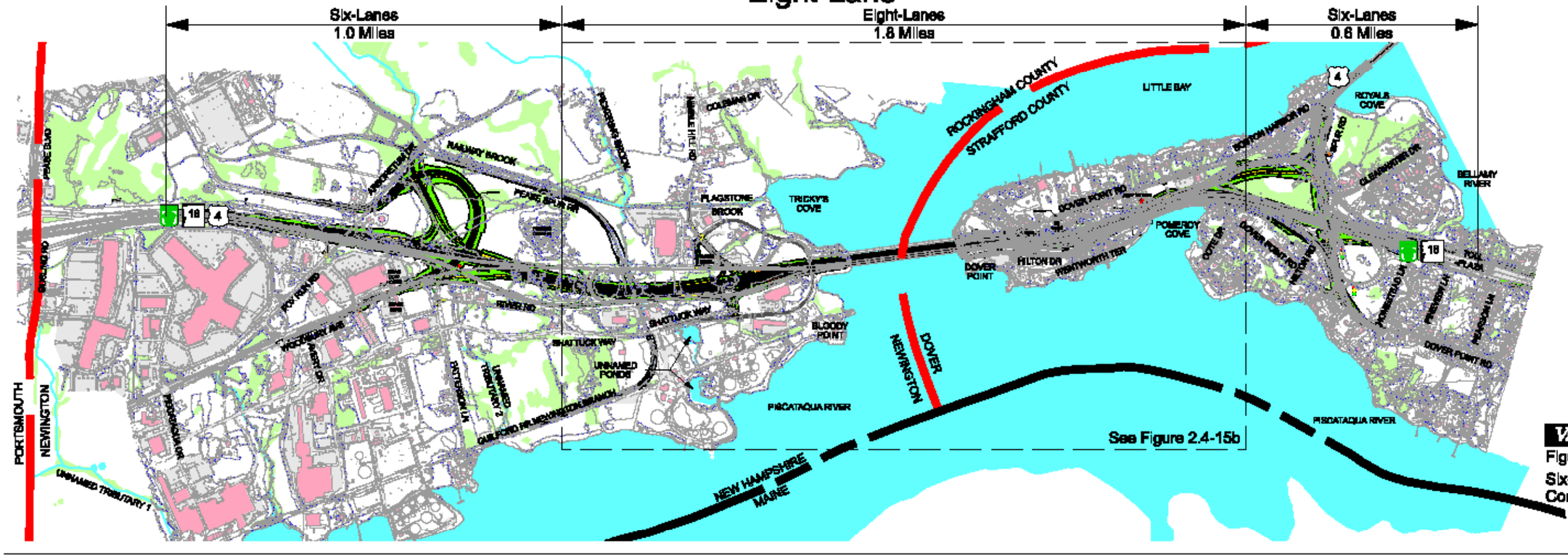


Eight-Lane

Six-Lanes
1.0 Miles

Eight-Lanes
1.8 Miles

Six-Lanes
0.6 Miles



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Future Pease Railroad Spur
- Proposed Acquisition
- Pavement Removal
- Newington Interim Safety Improvements

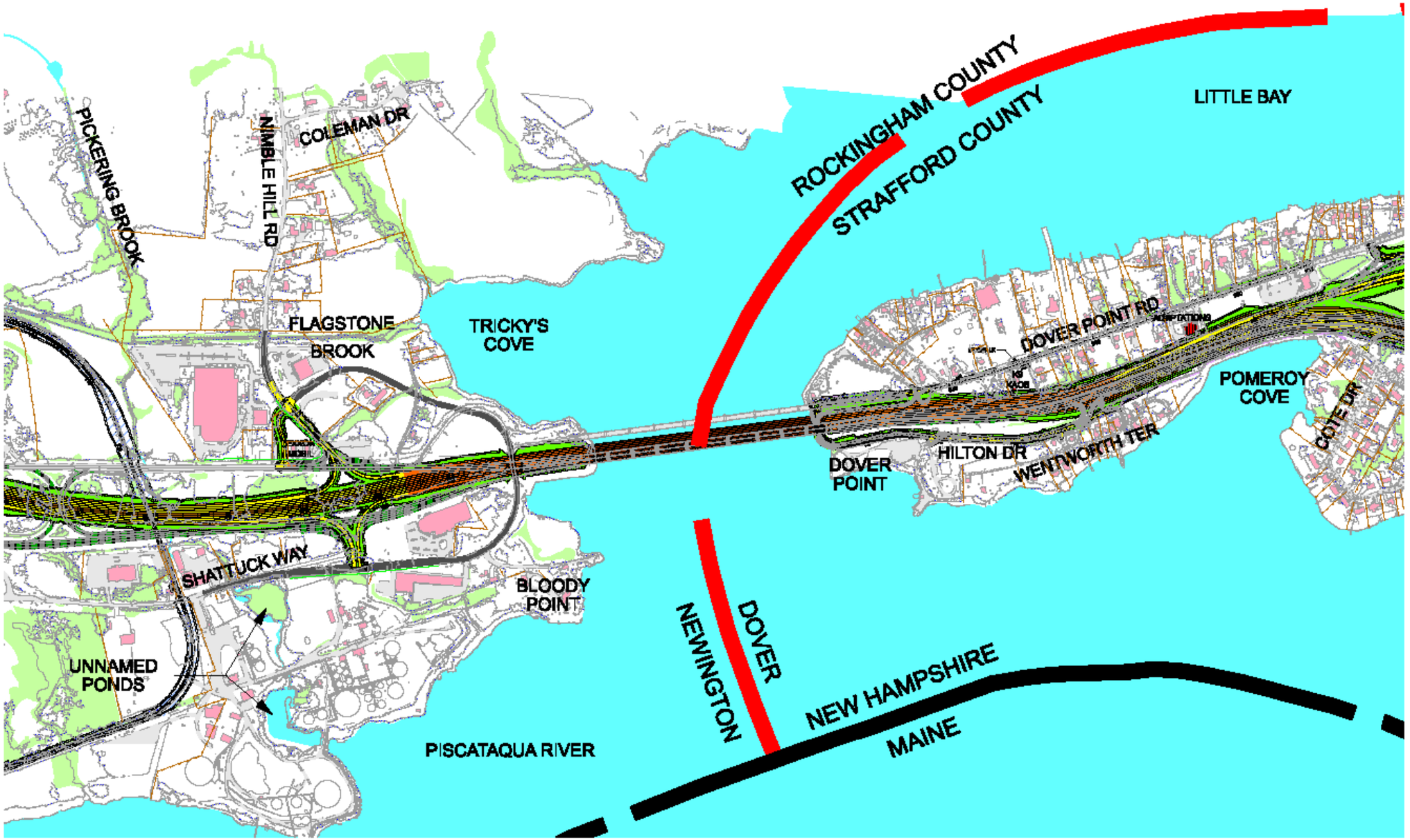
0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-15
Six-Lane and Eight-Lane Comparison

Date Created: 09/2007 j:\s1482\res\daily\news\SDEIS\fig02415b.dgn

New Hampshire DOT
Department of Transportation



Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Future Pease Railroad Spur
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Newington Interim Safety Improvements

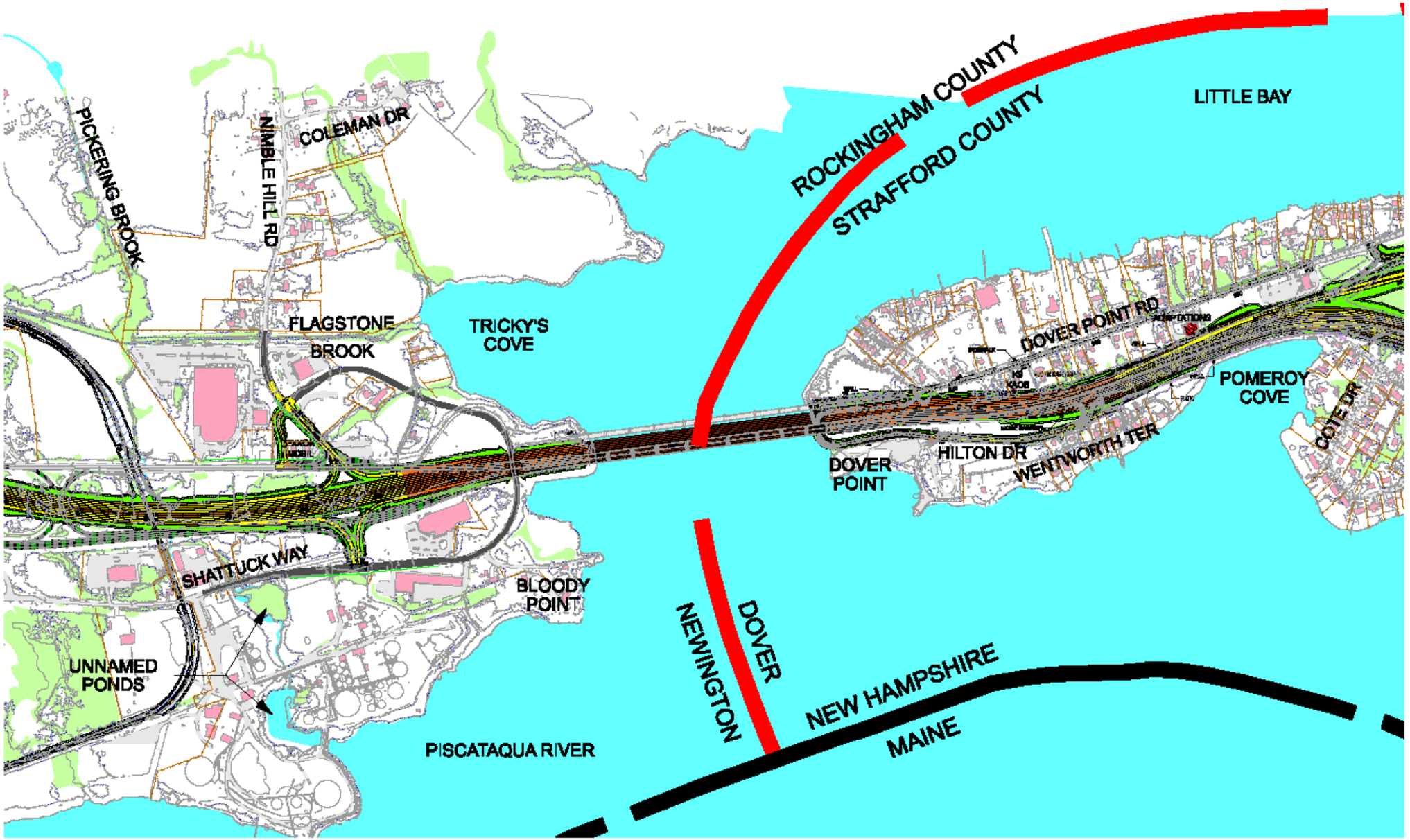
N

0 350 700 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-15a
Six-Lane Overview

New Hampshire DOT
Department of Transportation



Legend:

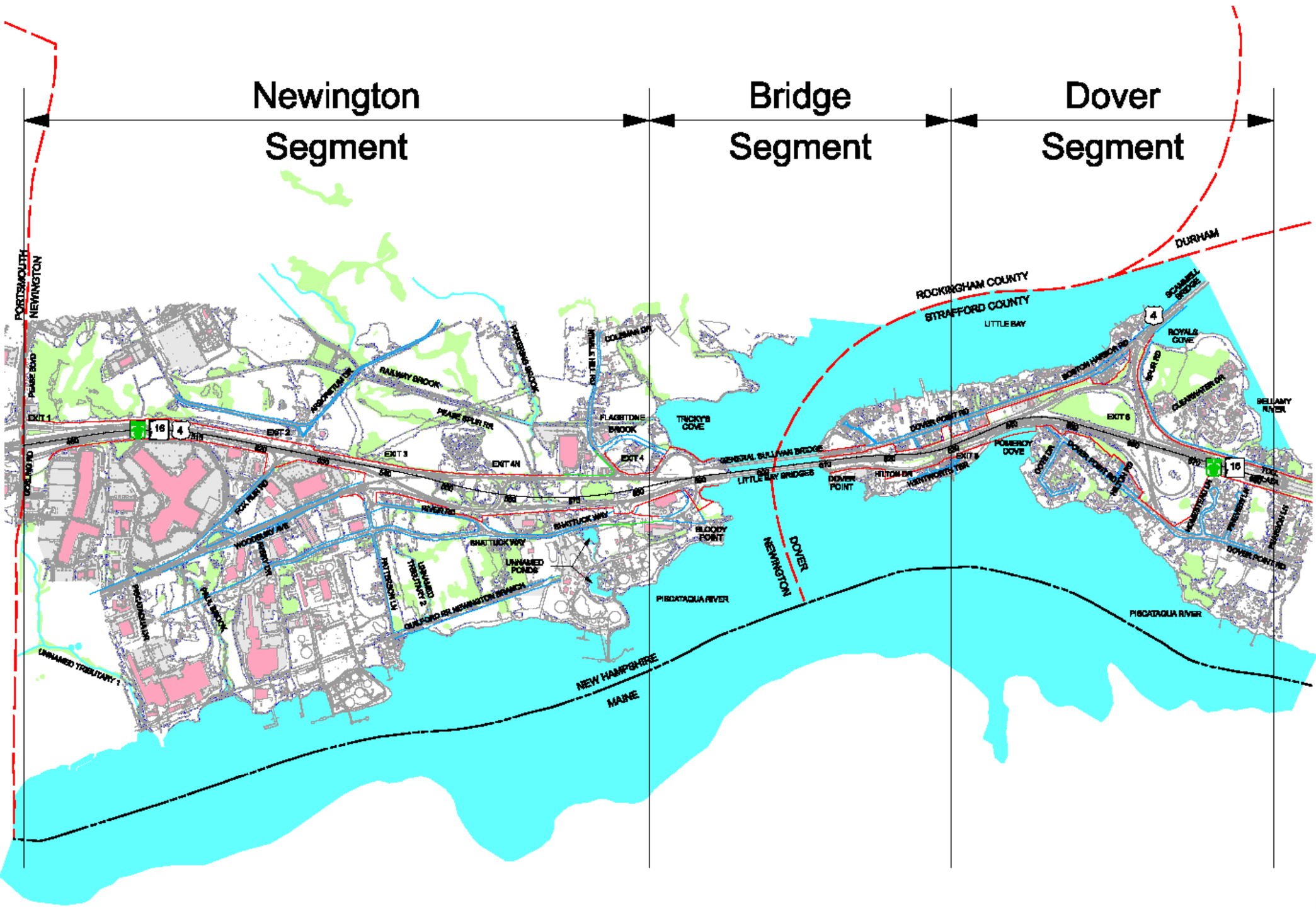
- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Future Pease Railroad Spur
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Newington Interim Safety Improvements

N

0 350 700 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-15b
Eight-Lane Overview



New Hampshire DOT
Department of Transportation

Legend:

- Existing Pavement
- Building
- Water
- Wetlands

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-16
Segment Breakout Map

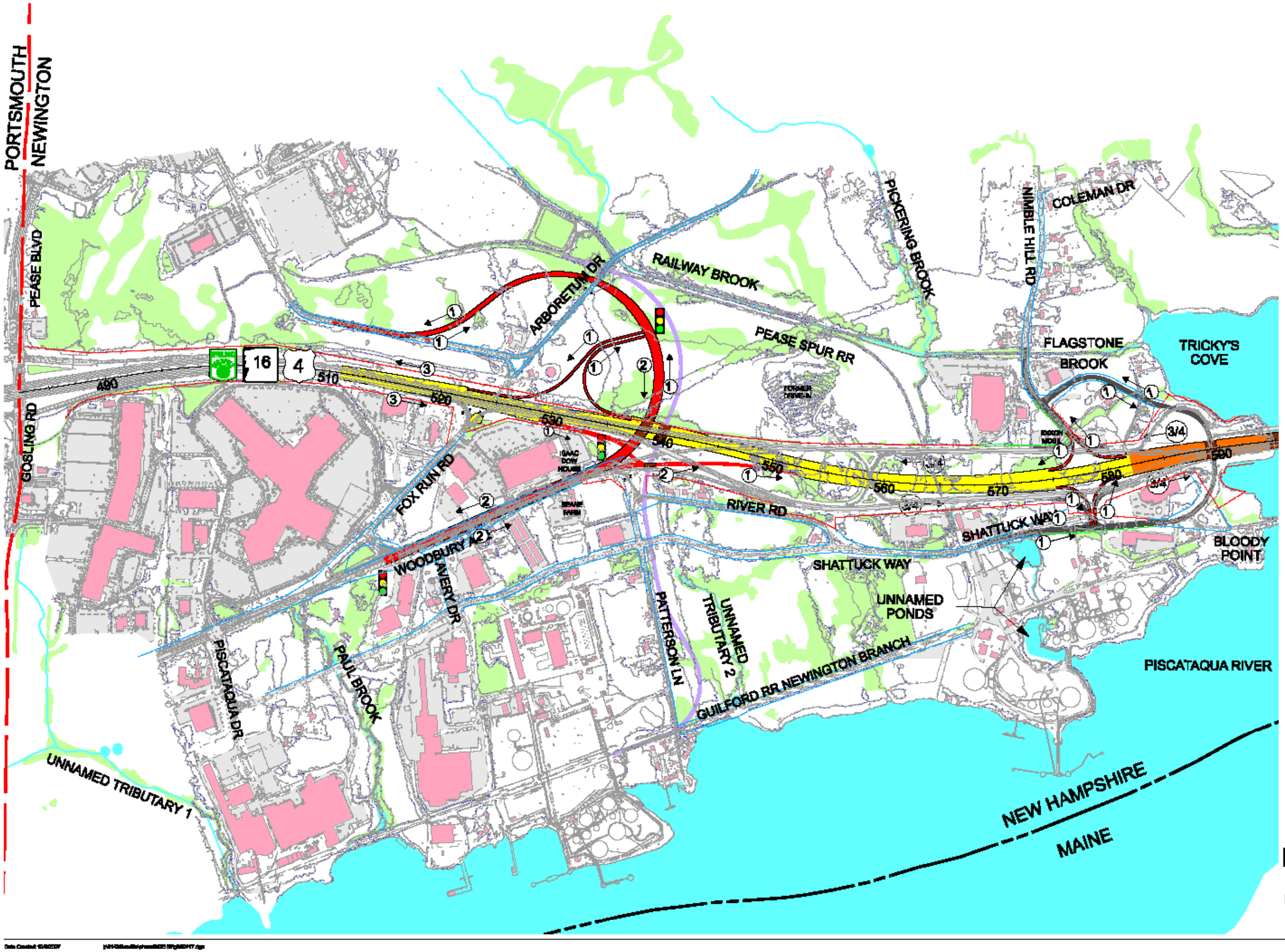


Figure 2.4-17
Newington Alternative 6 Revised

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON

PEASE BLVD
GOSLING RD
ARBORETUM DR
RAILWAY BROOK
INDUSTRIAL TRAFFIC CONNECTOR
PEASE SPUR RR
PICKERING BROOK
NIMBLE HILL RD
COLEMAN DR
FLAGSTONE BROOK
TRICKY'S COVE
FOX RUN RD
WOODBURY AVE
AVERY DR
RIVER RD
SHATTUCK WAY
BLOODY POINT
PATTERSON LN
UNNAMED TRIBUTARY 2
UNNAMED PONDS
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA DR
PAUL BROOK
UNNAMED TRIBUTARY 1
PISCATAQUA RIVER
NEW HAMPSHIRE
MAINE

16 4

490 510 520 530 540 550 560 570 580 590

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Bridge
- 1 or 2 Lane Conceptual Roadway
- Proposed Signal
- 3/4 Proposed Roadway Lanes
- Existing ROW
- Existing Property Lines
- Newington Interim Safety Improvements
- Relocated Rail Spur

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-18
Newington Alternative 7

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
PEASE BLVD
GOSLING RD
FOX RUN RD
WOODBURY AVE
AVERY DR
PISCATAQUA DR
PAUL BROOK
UNNAMED TRIBUTARY 1
ARBORETUM DR
RAILWAY BROOK
PEASE SPUR RR
INDUSTRIAL TRAFFIC CONNECTOR
PICKERING BROOK
POSSIBLE LOCAL CONNECTION
LOCAL TRAFFIC CONNECTOR
NIMBLE HILL RD
COLEMAN DR
FLAGSTONE BROOK
TRICKY'S COVE
POSSIBLE SB OFF RAMP
RIVER RD
SHATTUCK WAY
BLOODY POINT
PATTERSON LN
UNNAMED TRIBUTARY 2
UNNAMED PONDS
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA RIVER
NEW HAMPSHIRE
MAINE
16
4
490
510
520
530
540
560
570
580
3/4

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Bridge
- 1 or 2 Lane Conceptual Roadway
- Proposed Signal
- (3/4) Proposed Roadway Lanes
- Existing ROW
- Existing Property Lines
- Newington Interim Safety Improvements
- Relocated Rail Spur

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-19
Newington Alternative 9

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
PEASE BLVD
GOSLING RD
FOX RUN RD
WOODBURY AVE
AVERY DR
PISCATAQUA DR
PAUL BROOK
UNNAMED TRIBUTARY 1
PATTERSON LN
UNNAMED TRIBUTARY 2
GUILFORD RR NEWINGTON BRANCH
ARBORETUM DR
RAILWAY BROOK
PEASE SPUR RR
INDUSTRIAL TRAFFIC CONNECTOR
PICKERING BROOK
NIMBLE HILL RD
COLEMAN DR
FLAGSTONE BROOK
TRICKY'S COVE
POSSIBLE SB OFF RAMP
POSSIBLE LOCAL CONNECTION
LOCAL TRAFFIC CONNECTOR
RIVER RD
SHATTUCK WAY
UNNAMED PONDS
BLOODY POINT
PISCATAQUA RIVER
NEW HAMPSHIRE
MAINE
16
4
490
510
520
530
540
550
560
570
580
590
3/4

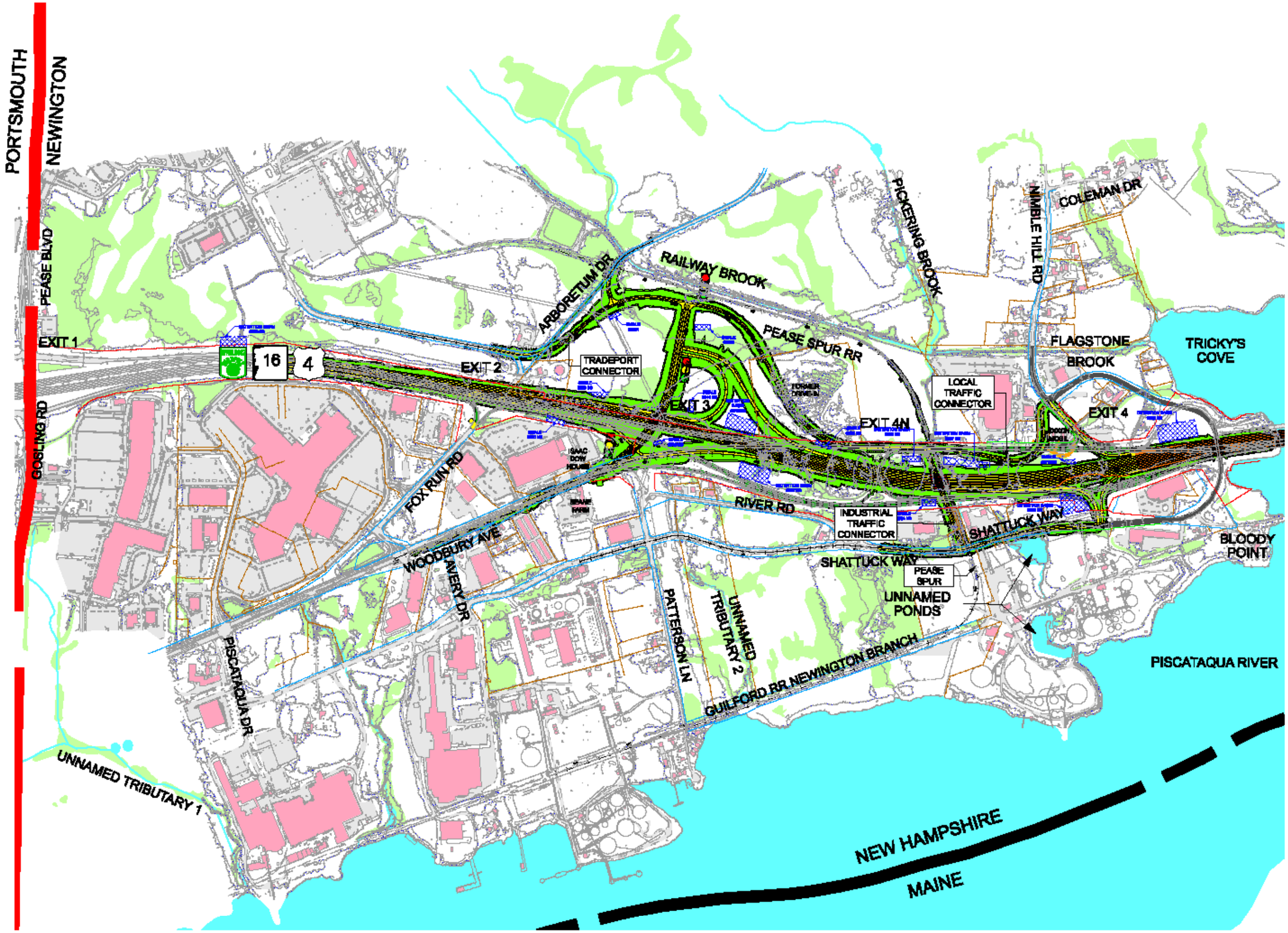
Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Bridge
- 1 or 2 Lane Conceptual Roadway
- Proposed Signal
- (3/4) Proposed Roadway Lanes
- Existing ROW
- Existing Property Lines
- Newington Interim Safety Improvements
- Relocated Rail Spur

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-20
Newington Alternative 10



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements

N

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-21
Newington Alternative 10A

Date Created: 10/9/2007

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
PEASE BLVD
GOSLING RD
16
4
490
510
520
530
540
550
560
570
580
3/4
ARBORETUM DR
RAILWAY BROOK
PEASE SPUR RR
INDUSTRIAL TRAFFIC CONNECTOR
PICKERING BROOK
NIMBLE HILL RD
COLEMAN DR
FLAGSTONE BROOK
TRICKY'S COVE
POSSIBLE SB OFF RAMP
POSSIBLE LOCAL CONNECTION
FOX RUN RD
WOODBURY AVE
AVERY DR
RIVER RD
SHATTUCK WAY
BLOODY POINT
PATTERSON LN
UNNAMED TRIBUTARY 2
UNNAMED PONDS
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA DR
PAUL BROOK
UNNAMED TRIBUTARY 1
PISCATAQUA RIVER
NEW HAMPSHIRE
MAINE

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Bridge
- 1 or 2 Lane Conceptual Roadway
- Proposed Signal
- 3/4 Proposed Roadway Lanes
- Existing ROW
- Existing Property Lines
- Newington Interim Safety Improvements
- Relocated Rail Spur

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-22
Newington Alternative 11

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON

PEASE BLVD
GOSLING RD
ARBORETUM DR
RAILWAY BROOK
INDUSTRIAL TRAFFIC CONNECTOR
PICKERING BROOK
NIMBLE HILL RD
COLEMAN DR
PEASE SPUR RR
FLAGSTONE BROOK
TRICKY'S COVE
POSSIBLE LOCAL CONNECTION
POSSIBLE SB OFF RAMP
FOX RUN RD
WOODBURY AVE
RIVER RD
SHATTUCK WAY
BLOODY POINT
FERY DR
PATTERSON LN
UNNAMED TRIBUTARY 2
UNNAMED PONDS
PISCATAQUA DR
PAUL BROOK
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA RIVER
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

16 4

490 510 520 530 540 550 560 570 580 590

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- Proposed Bridge
- 1 or 2 Lane Conceptual Roadway
- Proposed Signal
- 3/4 Proposed Roadway Lanes
- Existing ROW
- Existing Property Lines
- Newington Interim Safety Improvements
- Relocated Rail Spur

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-23
Newington Alternative 12

PORTSMOUTH

NEWINGTON

PEASE BLVD

GOSLING RD

EXIT 1

16

4

EXIT 2

TRADEPORT CONNECTOR

ARBORETUM DR

RAILWAY BROOK

PEASE SPUR RR

EXIT 3

INDUSTRIAL TRAFFIC CONNECTOR

EXIT 4N

LOCAL TRAFFIC CONNECTOR

PICKERING BROOK

NIMBLE HILL RD

COLEMAN DR

FLAGSTONE BROOK

EXIT 4

TRICKY'S COVE

FOX RUN RD

WOODBURY AVE

AVERY DR

PISCATAQUA DR

RIVER RD

SHATTUCK WAY

SHATTUCK WAY

BLOODY POINT

PEASE SPUR

PATTERSON LN

UNNAMED TRIBUTARY 2

UNNAMED PONDS

GUILFORD RR NEWINGTON BRANCH

PISCATAQUA RIVER

UNNAMED TRIBUTARY 1

NEW HAMPSHIRE

MAINE

New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements

N

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-24
Newington Alternative 12A

Date Created: 12/9/2007

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
PEASE BLVD
GOSLING RD
EXIT 1
16
4
EXIT 2
TRADEPORT CONNECTOR
ARBORETUM DR
RAILWAY BROOK
PEASE SPUR RR
PICKERING BROOK
NIMBLE HILL RD
COLEMAN DR
FLAGSTONE BROOK
TRICKY'S COVE
PEASE SPUR
EXIT 4N
EXIT 4
FOX RUN RD
RIVER RD
SHATTUCK WAY
BLOODY POINT
WOODBURY AVE
AVERY DR
PATTERSON LN
UNNAMED TRIBUTARY 2
UNNAMED PONDS
PISCATAQUA DR
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA RIVER
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements

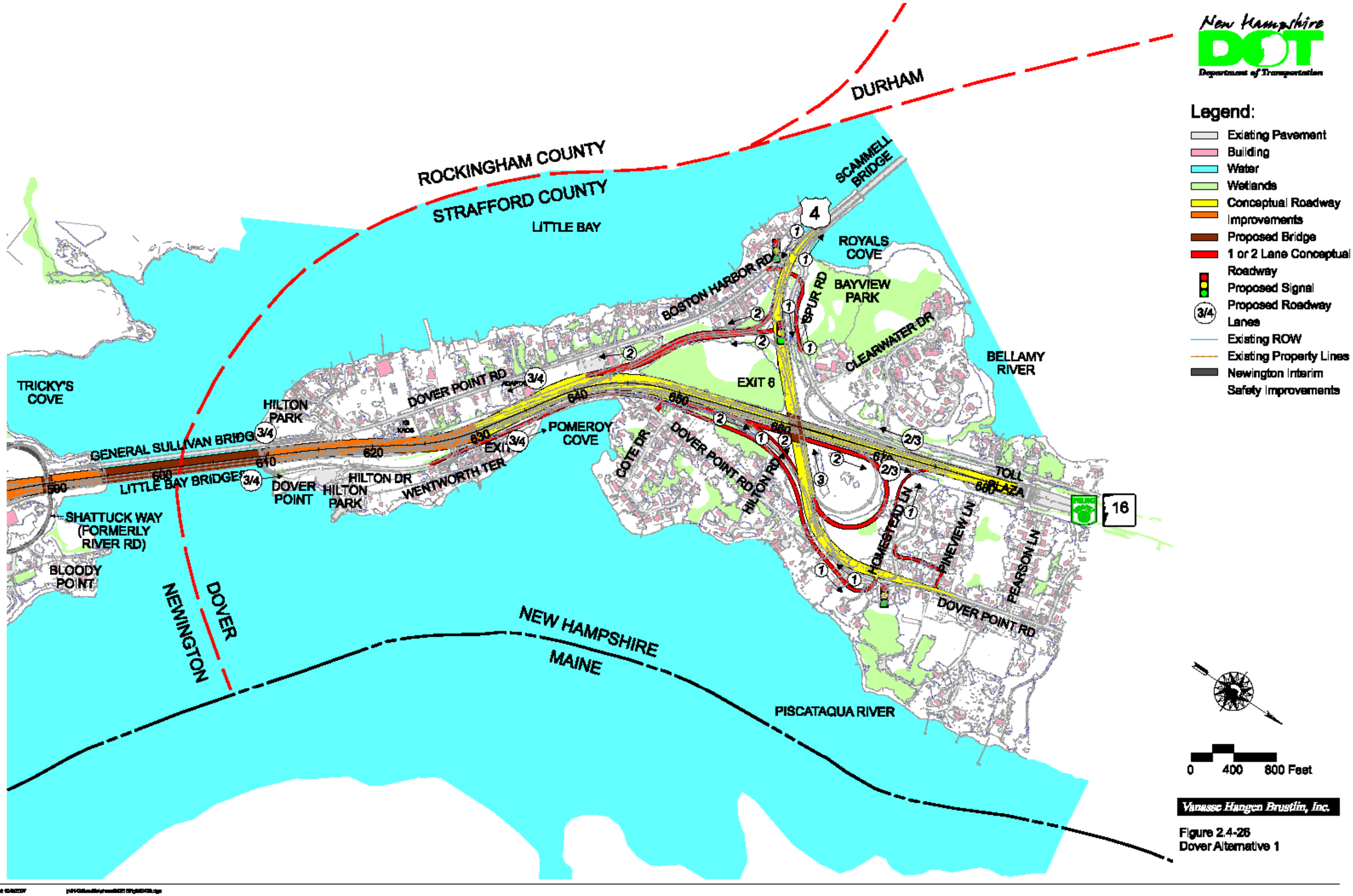
N

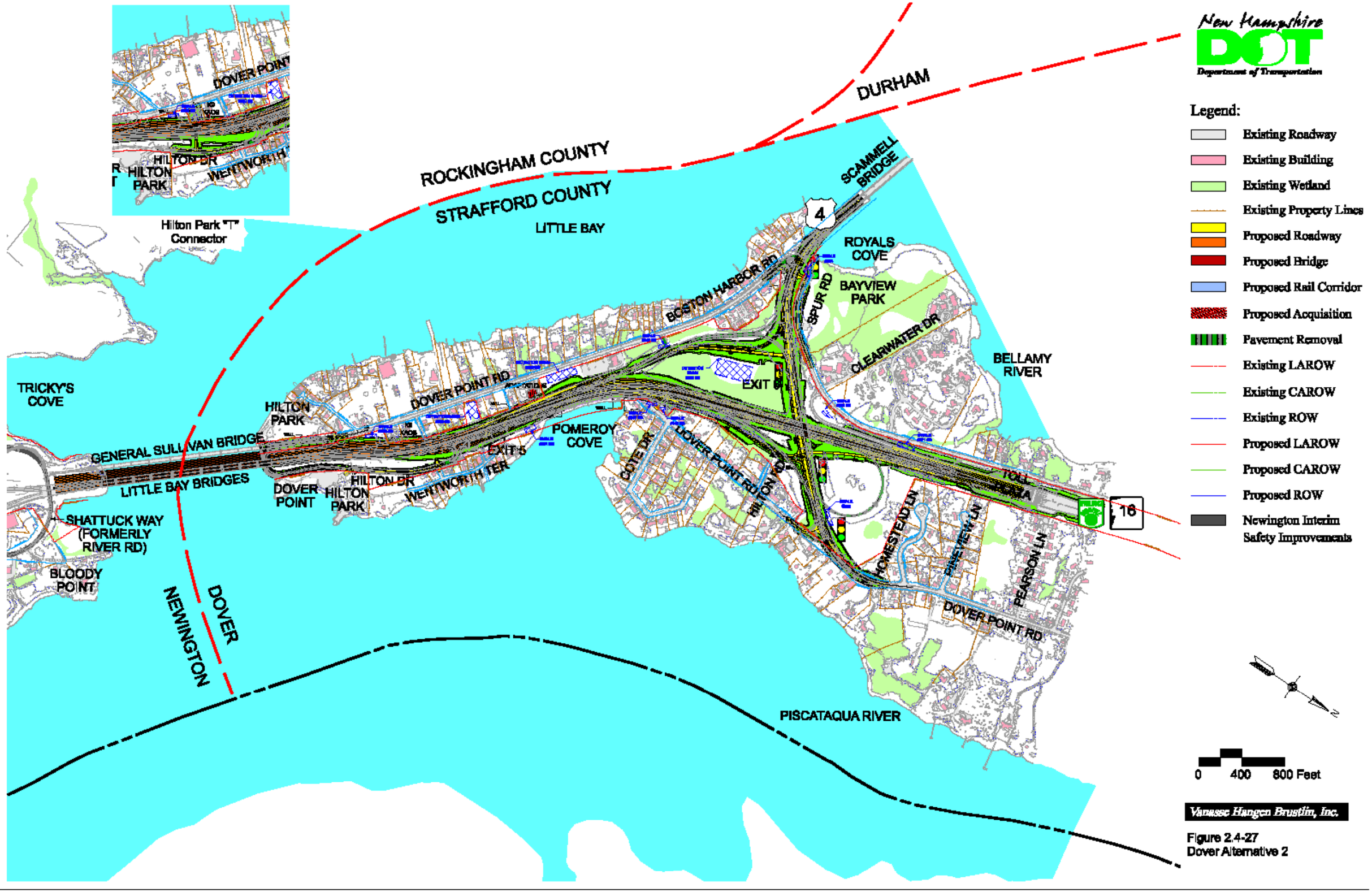
0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-25
Newington Alternative 13

Date Created: 10/9/2007


New Hampshire DOT
Department of Transportation
Legend:
Existing Pavement
Building
Water
Wetlands
Conceptual Roadway Improvements
Proposed Bridge
1 or 2 Lane Conceptual Roadway
Proposed Signal
Proposed Roadway Lanes
Existing ROW
Existing Property Lines
Newington Interim Safety Improvements
DURHAM
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
SCAMMELL BRIDGE
ROYALS COVE
BOSTON HARBOR RD
SPUR RD
BAYVIEW PARK
CLEARWATER DR
BELLAMY RIVER
TRICKY'S COVE
HILTON PARK
DOVER POINT RD
EXIT 6
POMEROY COVE
GENERAL SULLIVAN BRIDGE
LITTLE BAY BRIDGE
DOVER POINT
HILTON PARK
HILTON DR
WENTWORTH TER
EXIT 4
COTE DR
HILTON RD
TOLL PLAZA
HOMESTEAD LN
PINEVIEW LN
PEARSON LN
SHATTUCK WAY (FORMERLY RIVER RD)
BLOODY POINT
NEWINGTON
DOVER
NEW HAMPSHIRE
MAINE
PISCATAQUA RIVER
0 400 800 Feet
Vanasse Hangen Brustlin, Inc.
Figure 2.4-26
Dover Alternative 1



New Hampshire DOT
Department of Transportation

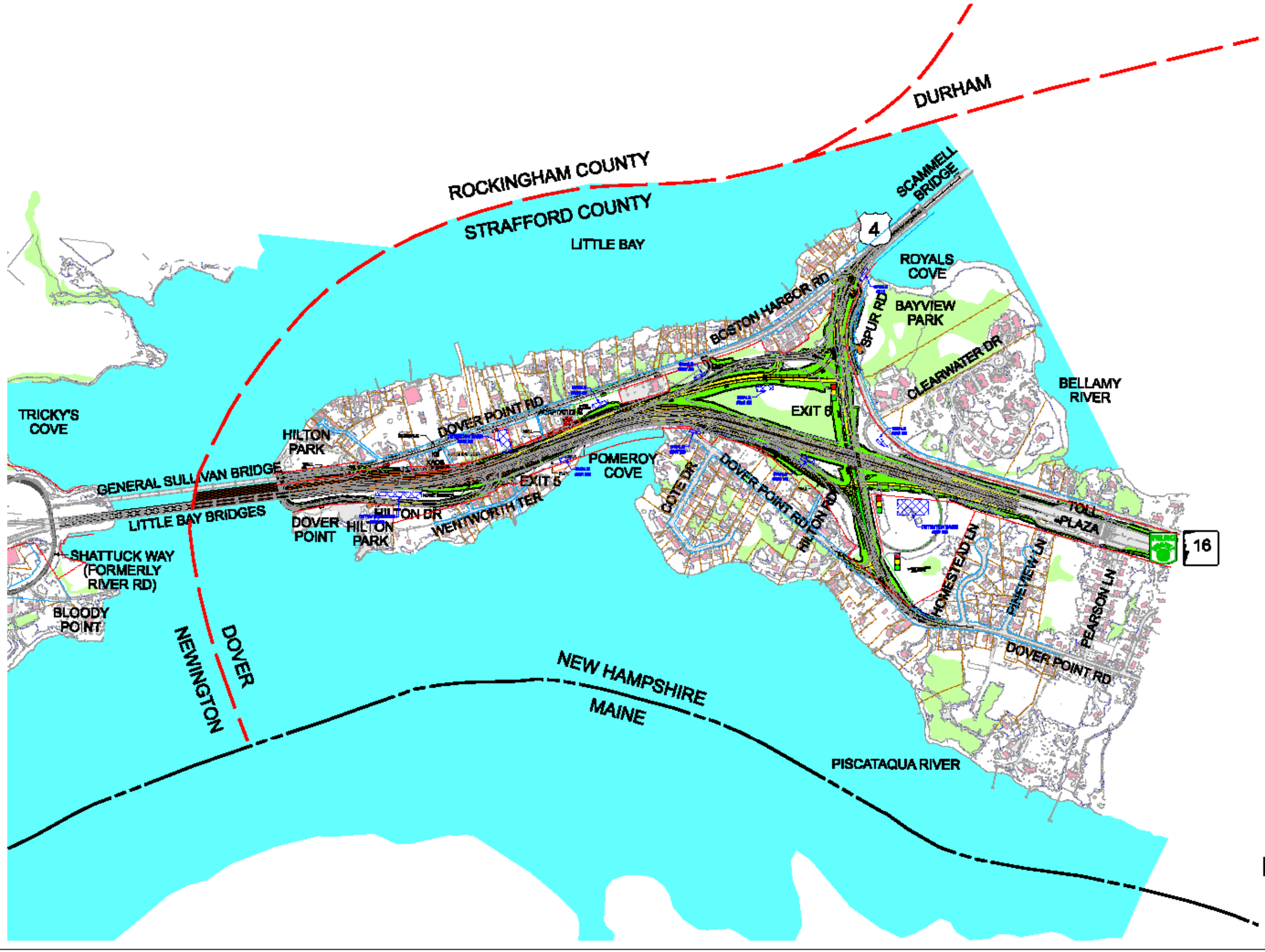
Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements

Vanasse Hangen Brustlin, Inc.

Figure 2.4-27
Dover Alternative 2

Date Created: 1/9/2007



New Hampshire DOT
Department of Transportation

Legend:

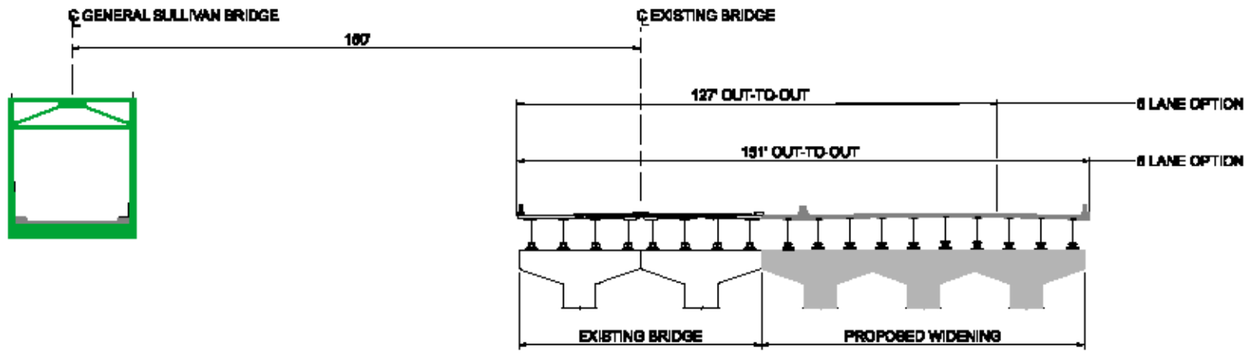
- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements

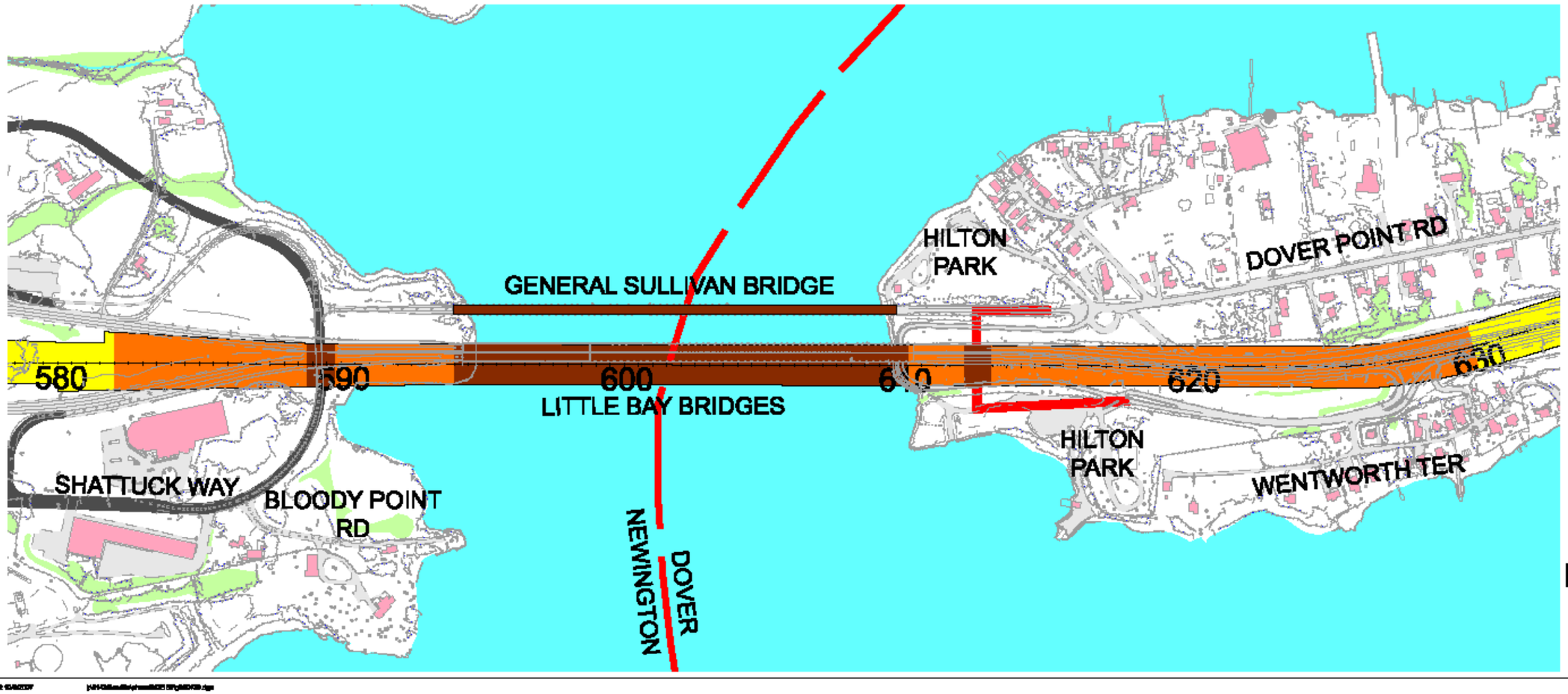
Vanasse Hangen Brustlin, Inc.

Figure 2.4-28
Dover Alternative 3

Date Created: 1/9/2007

Conceptual Cross-Section





New Hampshire DOT
Department of Transportation

Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Newington Interim Safety Improvements

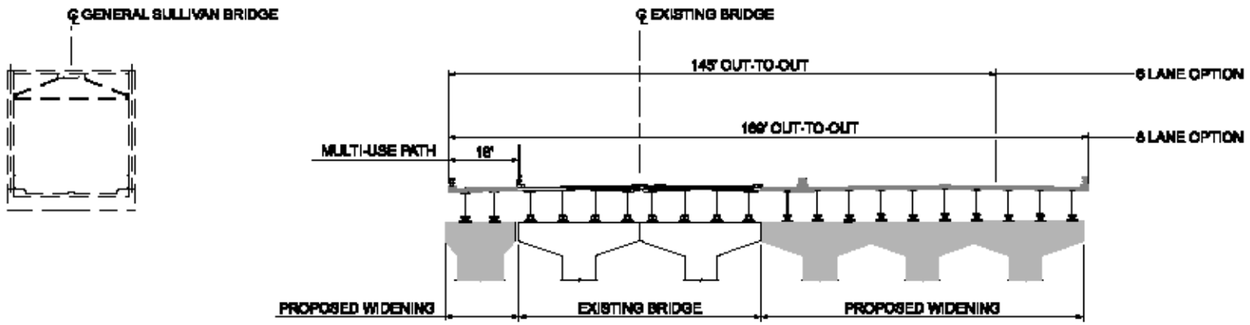
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-29
Widen Little Bay Bridges to East Side and Rehabilitate General Sullivan Bridge

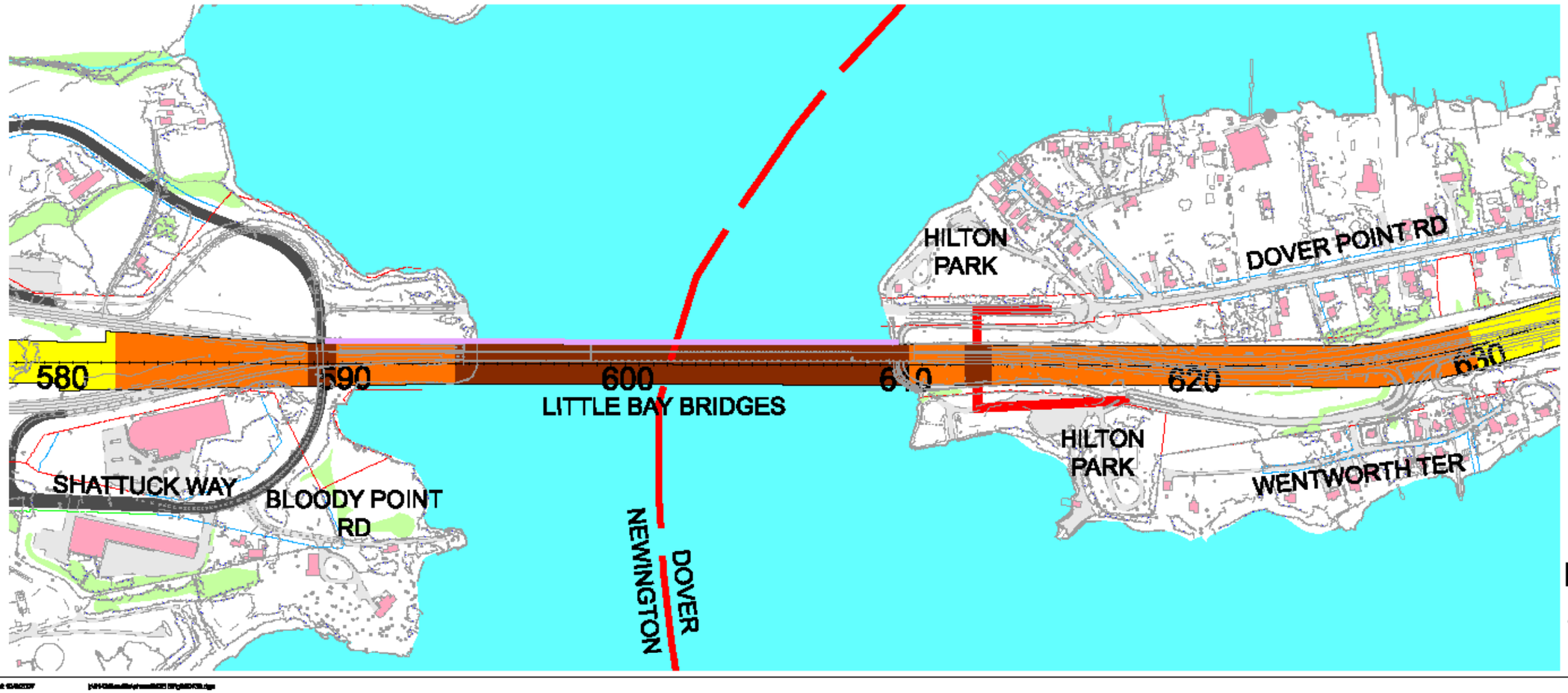
New Hampshire DOT
Department of Transportation

Conceptual Cross-Section



Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

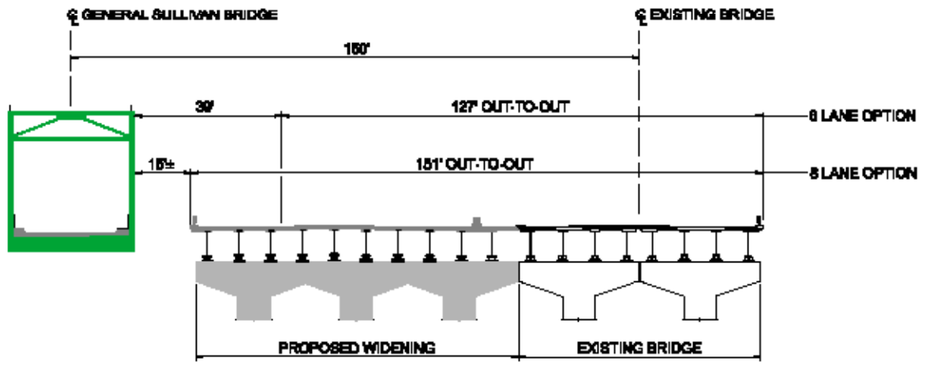


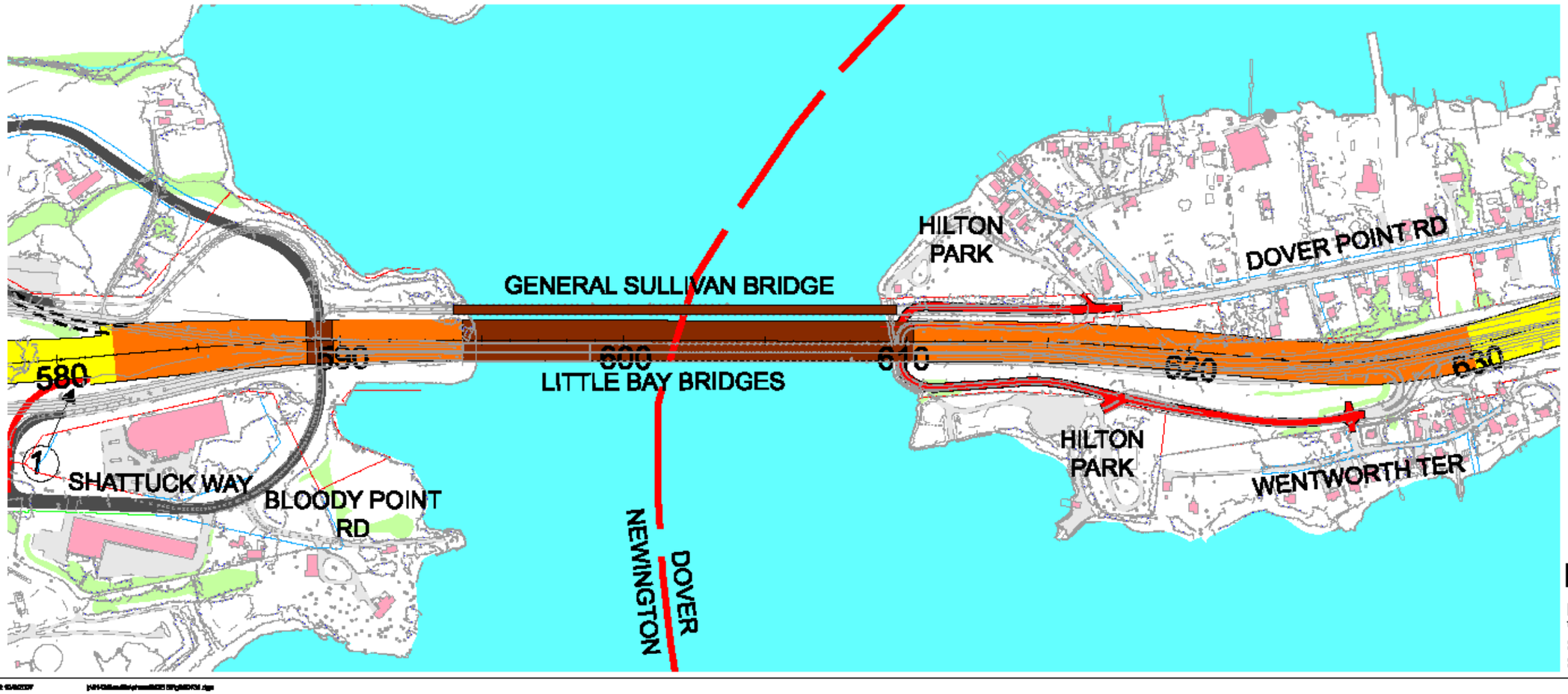
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-30
Widen Little Bay Bridges to East Side with Multi-Use Path and Remove General Sullivan Bridge

Conceptual Cross-Section





New Hampshire DOT
Department of Transportation

Legend:

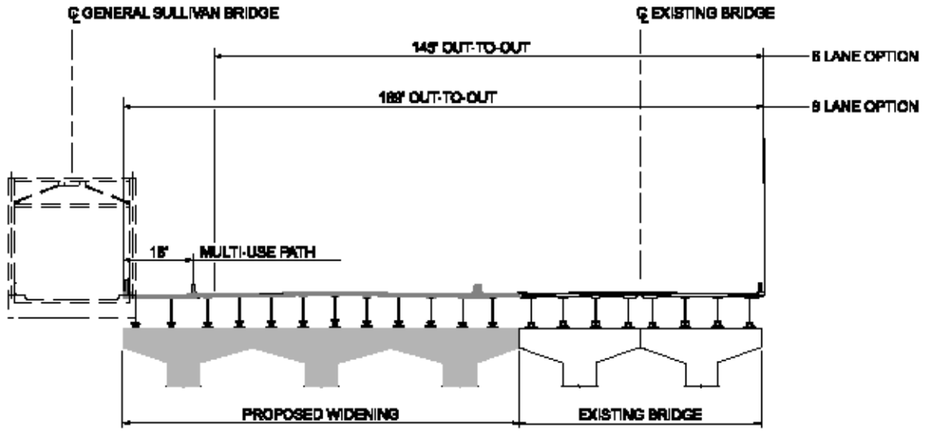
- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Newington Interim Safety Improvements

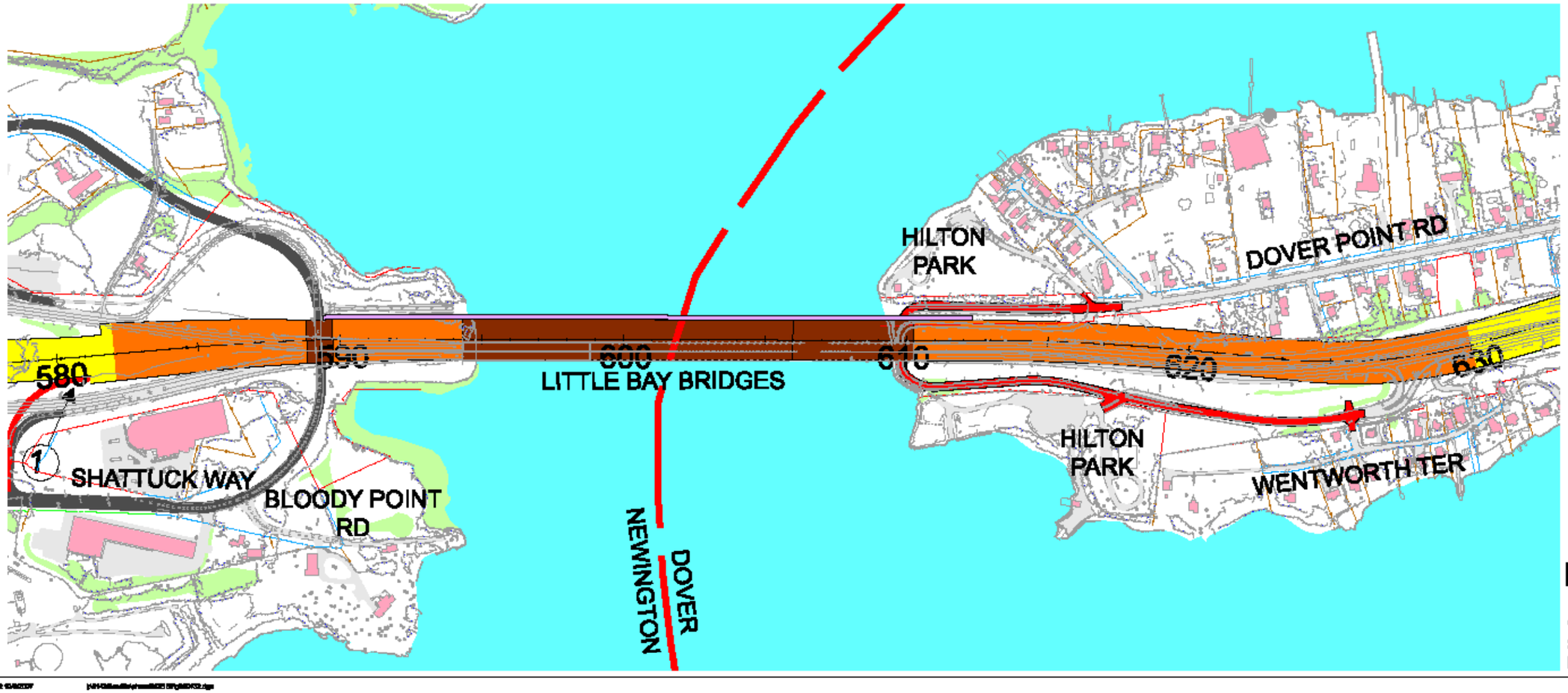
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-31
Widen Little Bay Bridges to West Side and Rehabilitate General Sullivan Bridge

Conceptual Cross-Section





Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

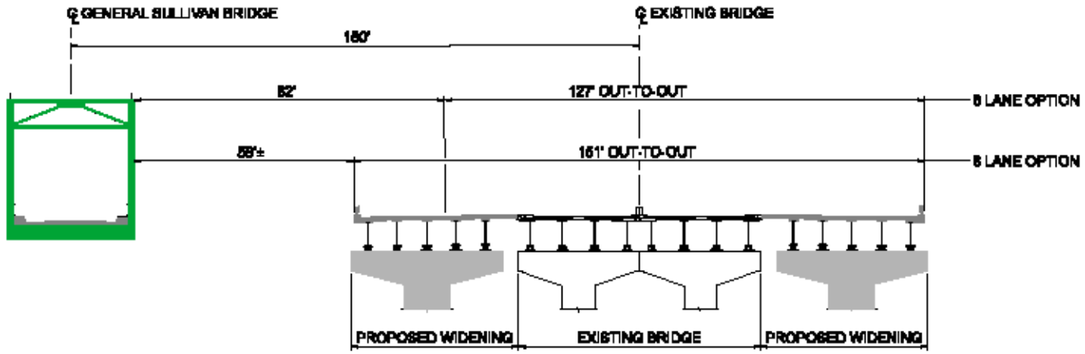
0 200 400 Feet

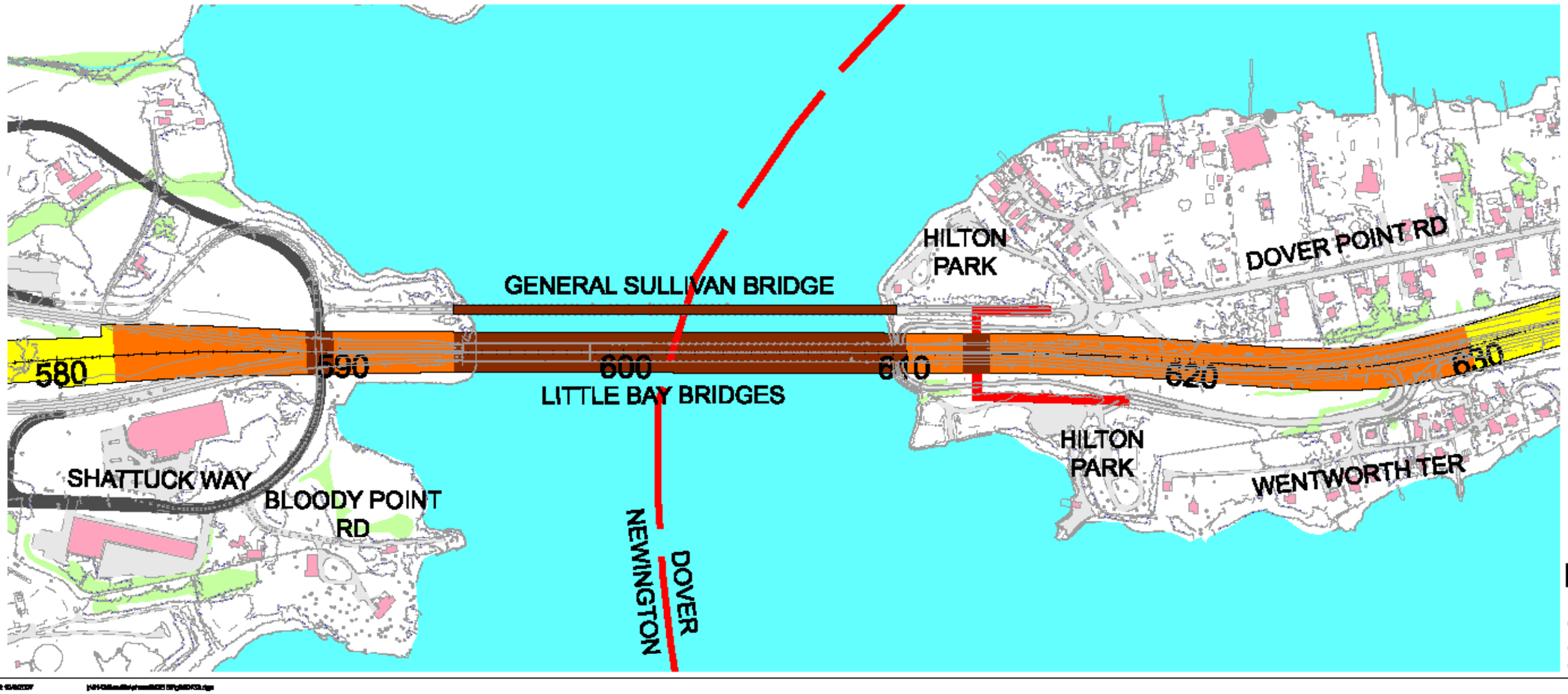
Vanasse Hangen Brustlin, Inc.

Figure 2.4-32
Widen Little Bay Bridges to West Side with Multi-Use Path and Remove General Sullivan Bridge

New Hampshire DOT
Department of Transportation

Conceptual Cross-Section





Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Newington Interim Safety Improvements

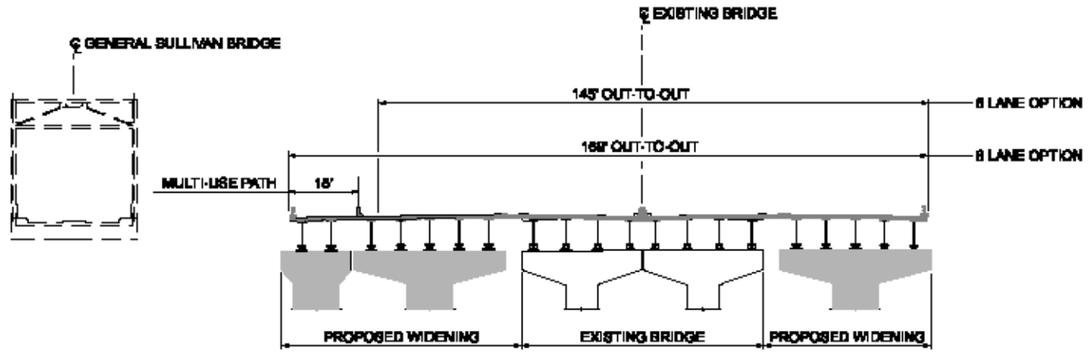
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-33
Widen Little Bay Bridges to Both Sides and Rehabilitate General Sullivan Bridge

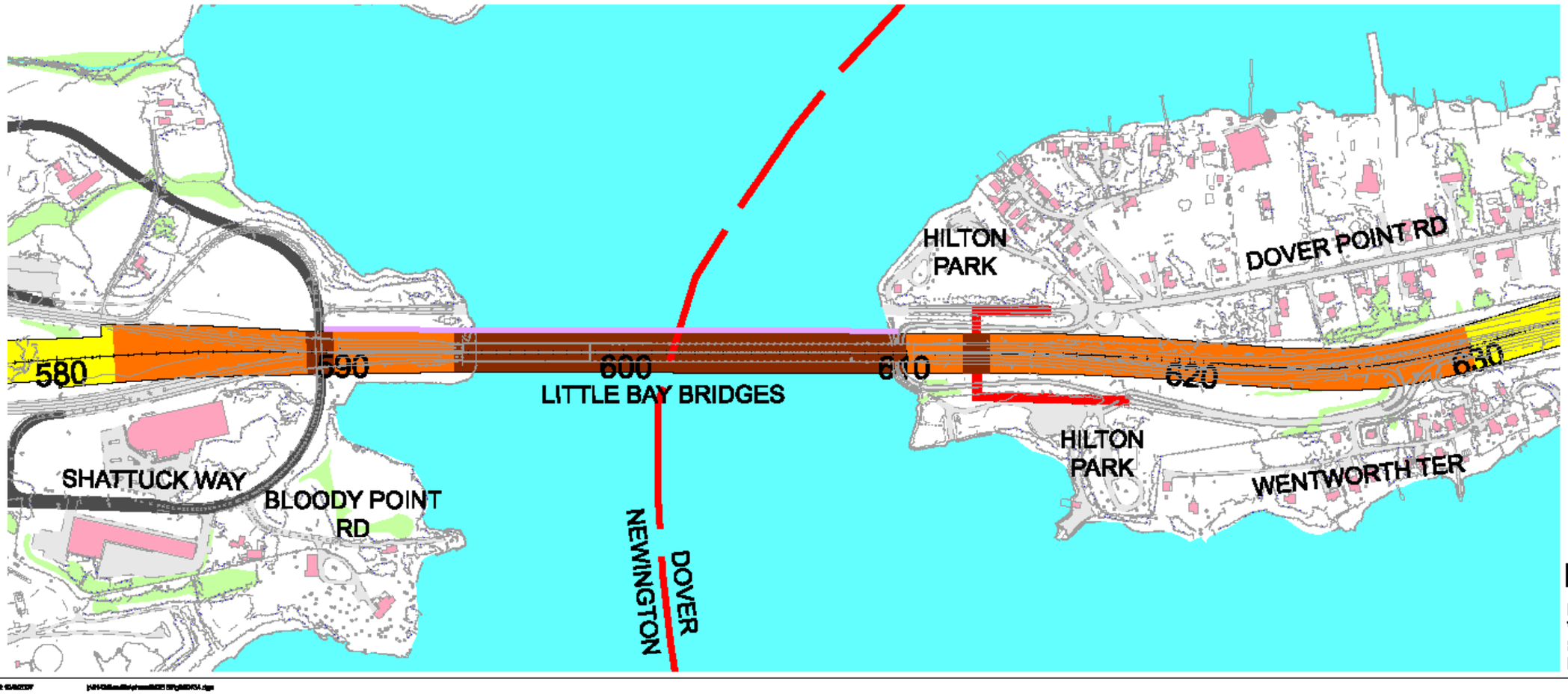
New Hampshire DOT
Department of Transportation

Conceptual Cross-Section



Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

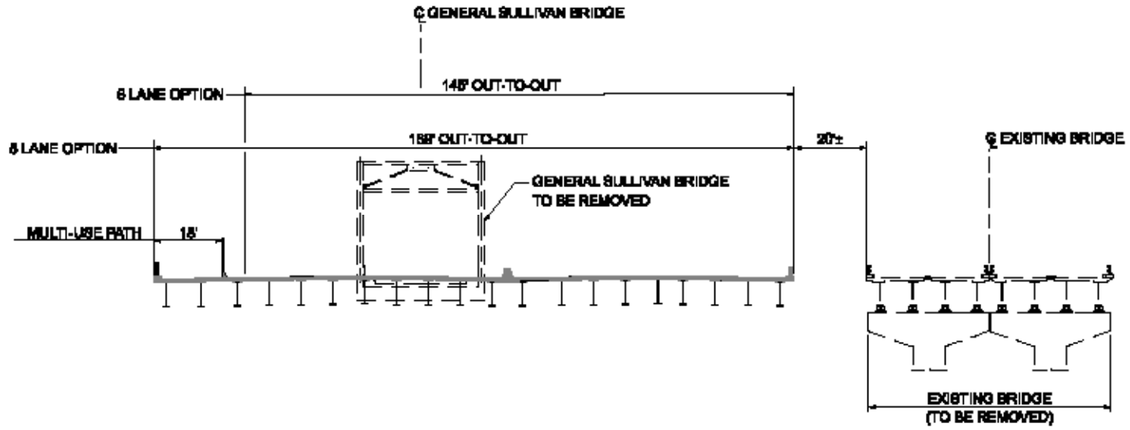


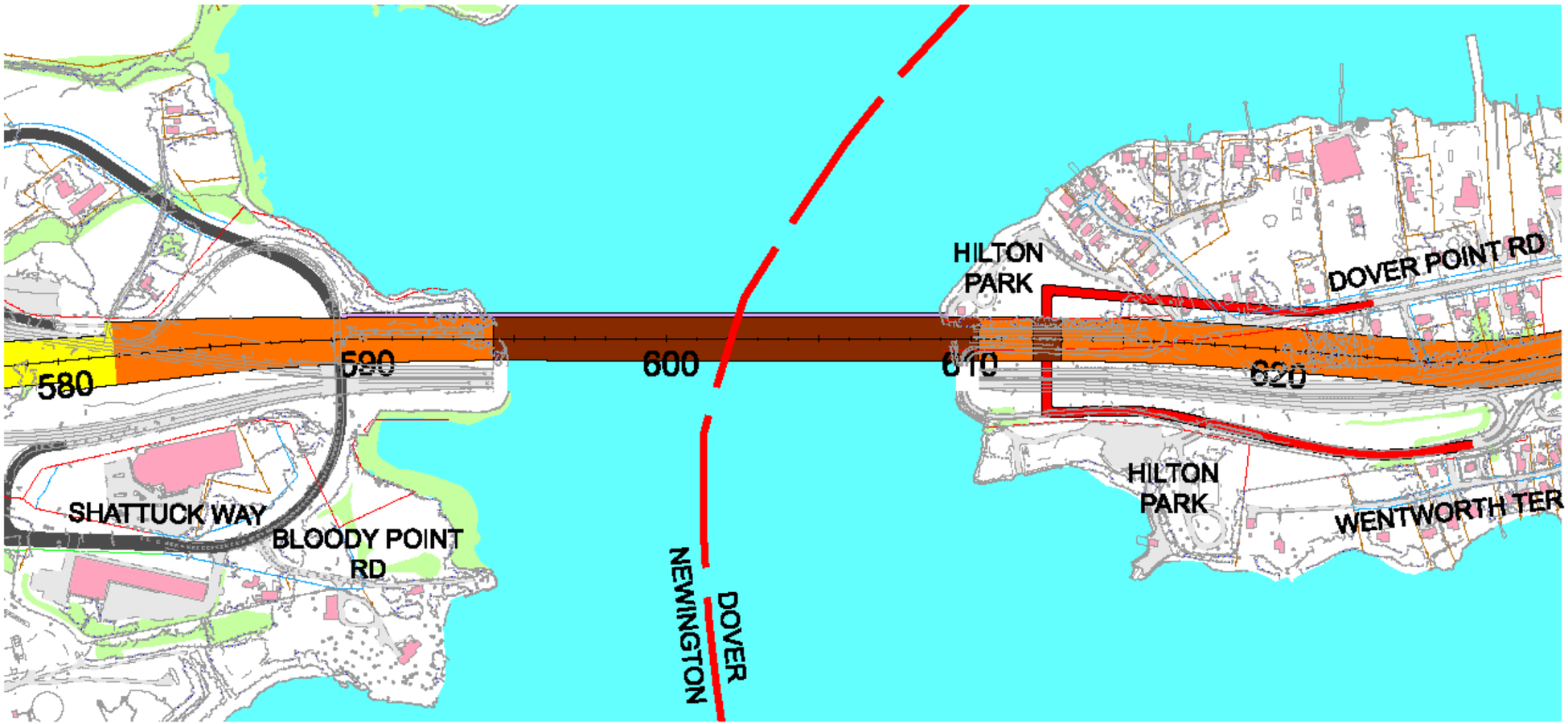
0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-34
Widen Little Bay Bridges to Both Sides with Multi-Use Path and Remove General Sullivan Bridge

Conceptual Cross-Section





New Hampshire DOT
Department of Transportation

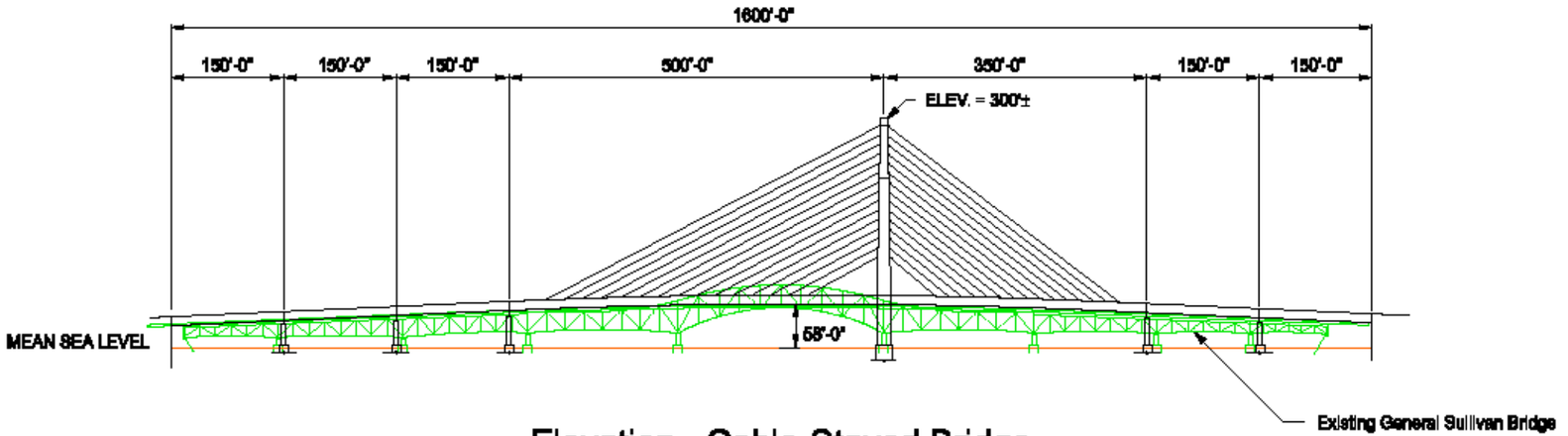
Legend:

- Existing Pavement
- Building
- Water
- Wetlands
- Conceptual Roadway Improvements
- 1 or 2 Lane Conceptual Roadway
- Proposed Bridge Improvements
- Multi-use Pathway
- Newington Interim Safety Improvements

0 200 400 Feet

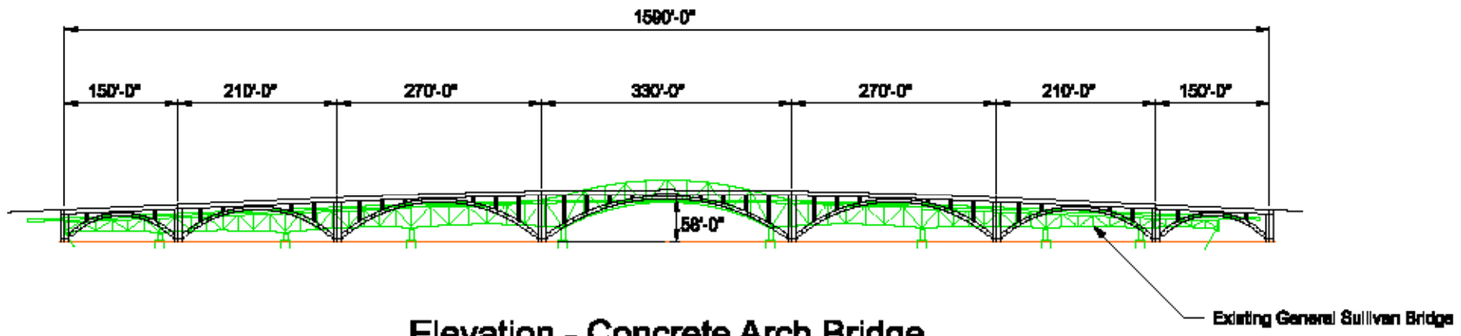
Vanasse Hangen Brustlin, Inc.

Figure 2.4-35
Construct New Bridge with Multi-Use Path - Replace Little Bay Bridges and General Sullivan Bridge



Elevation - Cable-Stayed Bridge

N.T.S.



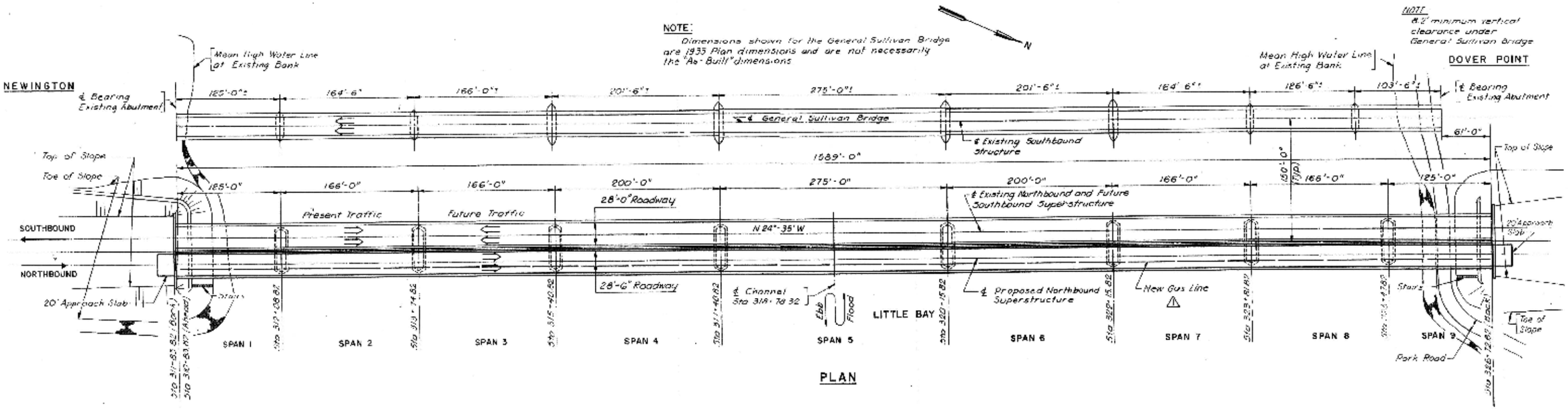
Elevation - Concrete Arch Bridge

N.T.S.

Vanasse Hangen Brustlin, Inc.

Figure 2.4-36
Conceptual Elevations of
New Signature Bridge Alternatives

New Hampshire DOT
Department of Transportation



*** Clearance dimensions in this figure shown to mean low water.**

Note:
Figures on this sheet are from the General Plan and Elevation, NHDOT Project No. P-2222-D, Contract #1, U.S. Route 4, N.H. Rte 16 and Spaulding Turnpike over Little Bay prepared by Hardesty & Hanover, Inc. dated March, 1982.

0 50 100 Feet

Vanasse Hangen Brustlin, Inc.

Figure 2.4-37
Existing Little Bay Bridges
Plan and Elevation

Newington - Dover, NH NHS-027-1(37)/11238

Summary of Roadway and Bridge Impacts (Eight Lanes)

IMPACTS	UNIT OF MEASUREMENT	NO BUILD	ROADWAY SEGMENT NEWINGTON			BRIDGE SEGMENT WIDEN WEST		ROADWAY SEGMENT DOVER	
			ALT 10A	ALT 12A	ALT 13	Remove GSB	Rehab GSB	ALT 2	ALT 3
WATER QUALITY, AQUATIC LIFE, & FISHERIES	Number of Perennial Stream Crossings	0	1	1	1	0	0	0	0
	Length of Perennial Stream Crossings (Feet)	0	420	330	280	0	0	0	0
	Number of Intermittent Stream Crossings	0	0	0	0	0	0	0	0
	Length of Intermittent Stream Crossings (Feet)	0	0	0	0	0	0	0	0
GROUNDWATER QUALITY	Stratified-Drift Aquifer Under New Roadway Area (Acres)	0	4.0	4.0	4.6	1.2	1.2	8.1	8.3
	Number of Well Head Protection Area (WHPA) crossings	0	0	0	0	0	0	0	0
FLOODPLAINS	Floodplain Area Impacted (Acres)	0	0	0	0	0.4	0.4	1.5	0.8
	Floodplain Volume Impacts (Acre-feet)	0	0	0	0	2.7	2.7	1.5	1.2
WETLANDS	TOTAL Wetland Impacted (Acres)	0	13.6	12.8	11.8	1.1	0.9	8.2	7.9
PEM		0	4.7	4.7	3.2	0.2	0.2	2.6	2.5
PFO		0	6.7	6.4	6.8	0.2	0.2	5.4	5.4
POW		0	0	0	0	0	0	0	0
PSS		0	2.2	1.7	1.6	0	0	0.1	0
E1/E2		0	0	0	0	0.6	0.5	0.1	0
THREATENED & ENDANGERED SPECIES	Number of Populations Impacted	0	0	0	0	0	0	0	0
VISUAL	Impacts to Views from and to the Highway (Qualitative)	N/A	Mod	Mod	Low/Mod	Low	Low	Mod	Mod
ARCHAEOLOGICAL	Number of Sensitive Areas Affected (Native American / Historic)	0	9	11	8	5	6	9	8
	Verified Sites and Cemetaries (ac)	0	0	0.03	0	0.2	0.2	0.01	0
	Exhibits Sensitivity (ac)	0	6.6	9.5	5.3	1.8	1.9	12.6	14.4
	Exhibits Probable Sensitivity (ac)	0	23.1	23.9	20.4	3.5	2.8	0.6	0.6
HISTORICAL	Number of Potentially Eligible or Listed Sites Impacted (Adverse Effect)	0	3	3	3	1	1	1	1
RIGHT-OF-WAY DISPLACEMENT	Number of Residential Total Property Acquisitions	0	1	0	0	0	0	0	0
	Number of Business Total Property Acquisitions	0	0	0	0	1	1	1	1
PUBLIC PARKS & RECREATIONAL LAND[1]	Number of Affected Recreational 4(f) Properties	0	0	0	0	1	1	1	1
	Area of Affected Recreational 4(f) Properties (Acres)	0	0	0	0	0.002	0.002	0.4	0.4
PETROLEUM & HAZARDOUS MATERIALS	Number of Potentially Contaminated Properties Impacted	0	19	19	19	0	0	1	1
FARMLANDS	Active Farmlands Impacted (Acres)	0	0	0	0	0	0	0	0
Important Farmland Soils (Acres)	Prime	0	3.8	7.8	2.7	0	0	0	0
	Unique	0	0	0	0	0	0	0	0
	Statewide	0	0	1.5	0	0	0	0	0
	Local	0	0.01	0.01	0.01	0	0	0	0
WILDLIFE HABITAT[2]	High Value Habitat Impacted (Acres)	0	24.9	26.7	20.8	2.3	2.6	3.6	3.7
Riparian Areas	Riparian Impact Areas (Acres)	0	6.8	6.9	4.6	0	0	0	0
Unfragmented Lands (>25 acres)	Impacts to Unfragmented Lands (Acres)	0	12.0	13.1	9.0	0	0	0	0
HYDRODYNAMICS	Change in Tidal Flow Characteristics	0				Minimal	Minimal		
AIR	Microscale CO Exceedances (2025)	0	0	0	0	0	0	0	0
NOISE	Number of Receptors Exceeding FHWA Abatement Criteria	0	1	1	1	0	0	85	85

NOTES:
1 Hilton Park is located in the Bridge Segment of the study area. Bayview Park is located in the Dover portion.
2 High Value Habitat and other wildlife habitat measures are based on mapping by NH F&G D (Coarse Filter Analysis).

Selected Alternative

Figure 2.5-1
Summary of Environmental Impacts

Newington - Dover, NH 11238

Summary of Costs (FY 2007) for the Newington - Dover 6-lane Alternatives

COST FACTORS AND TRANSPORTATION DATA		ROADWAY SEGMENT NEWINGTON			BRIDGE SEGMENT		ROADWAY SEGMENT DOVER		COMBINED SEGMENT COMPARISON RANGE		
					WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST & REHABILITATE GENERAL SULLIVAN BRIDGE (GSB) FOR USE AS MULTI-USE PATH	WIDEN LITTLE BAY BRIDGE (LBB)TO THE WEST, INCLUDE MULTI-USE PATH AND REMOVE GENERAL SULLIVAN BRIDGE (GSB)			MINIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 13, LBB w/o GBB, ALT 2)	MAXIMUM ROADWAY LENGTH / NUMBER OF BRIDGES (ALT 12A, LBB w/GBB, ALT 3)	UNIT
		ALT 10A	ALT 12A	ALT 13	LBB w/GSB	LBB w/o GSB	ALT 2	ALT 3			
TRANSPORTATION DATA	LENGTH OF FREEWAY (LANE MILES)	9.5	9.5	9.5	3.7	3.7	6.8	6.8	20.0	20.0	LANE MILES
	LENGTH OF RAMPS (LANE MILES)	2.3	2.3	2.5	0	0	2.3	2.4	4.8	4.7	LANE MILES
	LENGTH OF LOCAL ROADWAYS (LANE MILES)	6.2	6.6	5.0	1.1	1.1	4.0	4.6	10.1	12.3	LANE MILES
	TOTAL LENGTH OF IMPROVEMENTS (LANE MILES)	18.0	18.4	17.0	4.8	4.8	13.1	13.8	34.9	37.0	LANE MILES
	NUMBER OF BRIDGES	3	7	1	1	1	1	2	3	10	EACH
COST FACTORS	ALL COSTS ARE IN MILLIONS OF DOLLARS (FY 2007)								LOWEST COMBINED SEGMENT COST (ALT 13, LBB w/o GBB, ALT 2)	HIGHEST COMBINED SEGMENT COST (ALT 12A, LBB w/GBB, ALT 3)	$
ROADWAY COST	ALL ROADWAY COSTS ASSOCIATED w/ FREEWAY, RAMPS & LOCAL ROADS	39.3	41.8	36.3	12.2	12.2	32.0	32.2	80.5	86.2	MILLIONS
	COST ASSOCIATED WITH INTELLIGENT TRANSPORTATION SYSTEM DEPLOYMENT	0.9	0.9	0.9	0.5	0.5	0.6	0.6	2.0	2.0	MILLIONS
RAIL ACCOMMODATION COST (1)	ALL ROADWAY AND BRIDGE COSTS ASSOCIATED WITH ACCOMMODATING PEASE SPUR	1.3	2.3	0.1					0.1	2.3	MILLIONS
	TOTAL ROADWAY AND PEASE SPUR ACCOMMODATION COSTS	41.5	45.0	37.3	12.7	12.7	32.6	32.8	82.6	90.5	MILLIONS
BRIDGE COST	COST FOR ALL BRIDGES (EXCEPT LITTLE BAY, GENERAL SULLIVAN, AND PEASE SPUR)	13.2	16.3	9.4	1.2	1.2	6.9	10.0	17.5	27.6	MILLIONS
	WIDEN LITTLE BAY BRIDGE TO SIX LANES				52.8	62.1			62.1	52.8	MILLIONS
	REHABILITATE GENERAL SULLIVAN BRIDGE FOR PEDESTRIAN / BICYCLE USE				26.0				0.0	26.0	MILLIONS
	REMOVE GENERAL SULLIVAN BRIDGE					5.7			5.7	0.0	MILLIONS
	TOTAL BRIDGE COST	13.2	16.3	9.4	80.0	69.0	6.9	10.0	**85.2**	**106.3**	MILLIONS
ROADWAY AND BRIDGE COST TOTAL		**54.7**	**61.3**	**46.7**	**92.7**	**81.6**	**39.5**	**42.8**	**167.8**	**196.8**	MILLIONS
PRELIMINARY ENGINEERING	COST ASSOCIATED WITH DESIGN ENGINEERING, GEOTECHNICAL EVALUATION	3.8	4.3	3.3	6.5	5.7	2.8	3.0	**11.7**	**13.8**	MILLIONS
RIGHT OF WAY COSTS (2)	ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS	2.1	2.2	1.0	0.0	0.0	1.1	1.2	2.1	3.4	MILLIONS
TOTAL SEGMENT COST		**60.6**	**67.8**	**51.0**	**99.1**	**87.3**	**43.3**	**47.0**	**181.7**	**214.0**	MILLIONS
BUS COSTS (3)	COMBINATION OF THREE BUS ALTERNATIVES (ALTERNATIVES 1,2,3)	5.5							5.5	5.5	MILLIONS
RAIL COSTS (4)	RANGE OF RECOMMENDED NEAR TERM AND FUTURE RAIL SERVICE	1.7 TO 13.5							1.7 [#]	1.7 [#]	MILLIONS
PARK AND RIDE COSTS (5)	COMBINATION OF TWO PARK AND RIDE LOTS IN ROCHESTER AND DOVER	4.7							4.7	4.7	MILLIONS
MITIGATION AND ENHANCEMENT COSTS	WETLAND CREATION, RESTORATION, PRESERVATION. (INCLUDING RIGHT OF WAY AND CONST COST)	**4.6**							**4.6**	**4.6**	MILLIONS MILLIONS
RANGE OF TOTAL COSTS									**198.2**	**230.5**	MILLIONS

[#] w/ NEAR TERM RAIL COST ALTERNATIVE 1 C

(1) THE RAIL ACCOMMODATION COST FOR NEWINGTON ALTERNATIVES 10A, 12A AND 13 ARE FOR ONLY THOSE NECESSARY ROADWAY ELEMENTS (BRIDGE, EXCAVATION AND DRAINAGE COSTS) THAT NEED TO BE CONSTRUCTED AS PART OF THESE ALTERNATIVES TO ALLOW FOR THE OPERATION OF THE PEASE SPUR, IF REACTIVATED. FOR ALTERNATIVE 13, THE COST TO ACCOMMODATE THE SPUR IS THE COST ASSOCIATED WITH THE MEDIAN PIER SUBSTRUCTURE ONLY ($120,000), NO OTHER ROADWAY ELEMENTS NEED TO BE CONSTRUCTED AS PART OF ALTERNATIVE 13 TO ACCOMMODATE THE RR SPUR. IF THE SPUR IS REACTIVATED, THE RAIL CAN BE ELEVATED (OVERPASS) WITHOUT SIGNIFICANTLY IMPACTING THE OPERATION OF THE TURNPIKE (ESTIMATED COST IS $5.0 MILLION).

(2) ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS (BASED UPON 2004 MUNICIPAL ASSESSMENT RECORDS AND AVERAGE LAND VALUES IN NEWINGTON AND DOVER.) THE ESTIMATED COSTS DO NOT REPRESENT ACTUAL APPRAISED VALUES OF ACQUISITIONS OR OTHER RIGHT OF WAY DAMAGES, AND ALSO DO NOT INCLUDE APPRAISAL, RELOCATION, OR OTHER ADMINISTRATIVE COSTS.

(3) COSTS ASSOCIATED WITH IMPROVING BUS SERVICE IN SEACOAST AREA INCLUDE A COMBINATION OF ALTERNATIVES: BUS ALTERNATIVE 1 @ $0.4 MILLION; BUS ALTERNATIVE 2 @ $440,000; BUS ALTERNATIVE 3 @ $4.5 MILLION. IN ADDITION, THE COST ASSOCIATED WITH AN ENHANCEMENT OF THE EXISTING BUS TRANSFER POINT AT THE FOX RUN MALL IS $115,000.

(4) COSTS ASSOCIATED WITH IMPROVING RAIL SERVICE INCLUDE A RANGE OF ALTERNATIVES: FOR NEAR TERM, ALTERNATIVE 1C IS RECOMMENDED WHICH EXPANDS THE EXISTING *DOWNEASTER* SERVICE ($1.7 MILLION); ALTERNATIVES 1A &1B INVOLVE FUTURE EXPANSION OF SERVICE INTO DOVER AND ROCHESTER (RANGE OF FUTURE COSTS ARE $11.8 TO $12.1 MILLION)

(5) THE COSTS ASSOCIATED WITH THE CONSTRUCTION OF A PARK AND RIDE LOT IN DOVER ARE $3.4 MILLION. THE COSTS FOR THE PARK AND RIDE LOT IN ROCHESTER RANGES FROM $1.2 TO $1.3 MILLION DEPENDING UPON WHICH SITE IS SELECTED.

SUMMARY OF COSTS (FY 2007) SIX-LANE ALTERNATIVES
FIGURE 2.6-1

Newington - Dover, NH 11238

Summary of Costs (FY 2007) for the Newington - Dover 8-lane Alternatives

COST FACTORS AND TRANSPORTATION DATA		ROADWAY SEGMENT NEWINGTON			BRIDGE SEGMENT		ROADWAY SEGMENT DOVER		COMBINED SEGMENT COMPARISON RANGE		
					WIDEN LITTLE BAY BRIDGE (LBB) TO THE WEST & REHABILITATE GENERAL SULLIVAN BRIDGE (GSB) FOR USE AS MULTI-USE PATH	WIDEN LITTLE BAY BRIDGE (LBB)TO THE WEST, INCLUDE MULTI-USE PATH AND REMOVE GENERAL SULLIVAN BRIDGE (GSB)			MINIMUM ROADWAY LENGTH / NUMBER OF BRIDGES	MAXIMUM ROADWAY LENGTH / NUMBER OF BRIDGES	
		ALT 10A	ALT 12A	ALT 13	LBB w /GSB	LBB w/o GSB	ALT 2	ALT 3	(ALT 13, LBB w/o GSB, ALT 2)	(ALT 12A, LBB w/ GSB, ALT 3)	
TRANSPORTATION DATA	LENGTH OF FREEWAY (LANE MILES)	10.6	10.6	10.6	5.0	5	7.6	7.6	23.2	23.2	LANE MILES
	LENGTH OF RAMPS (LANE MILES)	2.3	2.1	2.5	0	0	2.5	2.4	5.0	4.5	LANE MILES
	LENGTH OF LOCAL ROADWAYS (LANE MILES)	6.2	6.6	5.0	1.1	1.1	4.1	4.6	10.2	12.3	LANE MILES
	TOTAL LENGTH OF IMPROVEMENTS (LANE MILES)	19.1	19.3	18.1	6.1	6.1	14.2	14.6	38.4	40.0	LANE MILES
	NUMBER OF BRIDGES	3	7	1	1	1	1	2	3	10	EACH
COST FACTORS	ALL COSTS ARE IN MILLIONS OF DOLLARS (FY 2007)								LOWEST COMBINED SEGMENT COST (ALT 13, LBB w/o GSB, ALT 2)	HIGHEST COMBINED SEGMENT COST (ALT 12A, LBB w/ GSB, ALT 3)	$
ROADWAY COST	ALL ROADWAY COSTS ASSOCIATED w/ FREEWAY, RAMPS & LOCAL ROADS	40.3	42.9	37.5	13.1	13.1	32.9	33.1	83.5	89.1	MILLIONS
	COST ASSOCIATED WITH INTELLIGENT TRANSPORTATION SYSTEM DEPLOYMENT	0.9	0.9	0.9	0.5	0.5	0.6	0.6	2.0	2.0	MILLIONS
RAIL ACCOMMODATION COST (1)	ALL ROADWAY AND BRIDGE COSTS ASSOCIATED WITH ACCOMMODATING PEASE SPUR	1.3	2.3	0.1					0.1	2.3	MILLIONS
	TOTAL ROADWAY COST	42.5	46.1	38.5	13.6	13.6	33.5	33.7	85.7	93.4	MILLIONS
BRIDGE COST	COST FOR ALL BRIDGES (EXCEPT LITTLE BAY, GENERAL SULLIVAN, AND PEASE SPUR)	13.2	16.4	9.4	2.0	2.0	6.9	10.0	18.3	28.4	MILLIONS
	WIDEN LITTLE BAY BRIDGE TO EIGHT LANES				63.0	72.4			72.4	63.0	MILLIONS
	REHABILITATE GENERAL SULLIVAN BRIDGE FOR PEDESTRIAN / BICYCLE USE				26.0				0.0	26.0	MILLIONS
	REMOVE GENERAL SULLIVAN BRIDGE					5.7			5.7	0.0	MILLIONS
	TOTAL BRIDGE COST	13.2	16.4	9.4	91.0	80.1	6.9	10.0	**96.3**	**117.4**	MILLIONS
ROADWAY AND BRIDGE COST TOTAL		**55.7**	**62.5**	**47.9**	**104.6**	**93.7**	**40.4**	**43.7**	**182.0**	**210.8**	MILLIONS
PRELIMINARY ENGINEERING	COST ASSOCIATED WITH DESIGN ENGINEERING, GEOTECHNICAL EVALUATION	3.9	4.4	3.4	7.3	6.6	2.8	3.1	12.6	14.7	MILLIONS
RIGHT OF WAY COSTS (2)	ESTIMATED COST FOR RIGHT OF WAY ACQUISITIONS	2.1	2.2	1.0	0.0	0.0	1.1	1.2	2.1	3.4	MILLIONS
TOTAL SEGMENT COST		**61.7**	**69.1**	**52.3**	**111.9**	**100.2**	**44.3**	**48.0**	**196.7**	**228.9**	MILLIONS
BUS COSTS (3)	COMBINATION OF THREE BUS ALTERNATIVES AND ENHANCED TRANSFER POINT	5.5							5.5	5.5	MILLIONS
RAIL COSTS (4)	RECOMMENDED NEAR TERM AND FUTURE RAIL SERVICE	1.7							1.7 #	1.7 #	MILLIONS
PARK AND RIDE COSTS (5)	COMBINATION OF TWO PARK AND RIDE LOTS IN ROCHESTER AND DOVER	4.7							4.7	4.7	MILLIONS
MITIGATION AND ENHANCEMENT COSTS	WETLAND CREATION, RESTORATION, PRESERVATION. (INCLUDING RIGHT OF WAY AND CONST COST)	**4.6**							**4.6**	**4.6**	MILLIONS MILLIONS
RANGE OF TOTAL COSTS									**213.2**	**245.4**	MILLIONS

THE COLOR SHOWN IN THE SEGMENT COLUMNS ABOVE IDENTIFIES THE DEPARTMENTS SELECTED ALTERNATIVE

w/ NEAR TERM RAIL COST ALTERNATIVE 1 C

(1) THE RAIL ACCOMMODATION COST FOR NEWINGTON ALTERNATIVES 10A, 12A AND 13 ARE FOR ONLY THOSE NECESSARY ROADWAY ELEMENTS (BRIDGE, EXCAVATION AND DRAINAGE COSTS) THAT NEED TO BE CONSTRUCTED AS PART OF THESE ALTERNATIVES TO ALLOW FOR THE OPERATION OF THE PEASE SPUR, IF REACTIVATED. FOR ALTERNATIVE 13, THE COST TO ACCOMMODATE THE SPUR IS THE COST ASSOCIATED WITH THE MEDIAN PIER SUBSTRUCTURE ONLY ($120,000), NO OTHER ROADWAY ELEMENTS NEED TO BE CONSTRUCTED AS PART OF ALTERNATIVE 13 TO ACCOMMODATE THE RR SPUR. IF THE SPUR IS REACTIVATED, THE RAIL CAN BE ELEVATED (OVERPASS) WITHOUT SIGNIFICANTLY IMPACTING THE OPERATION OF THE TURNPIKE (ESTIMATED COST IS $5.0 MILLION).

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(3) COSTS ASSOCIATED WITH IMPROVING BUS SERVICE IN SEACOAST AREA INCLUDE A COMBINATION OF ALTERNATIVES: BUS ALTERNATIVE 1 @ $3.4 MILLION; BUS ALTERNATIVE 2 @ $440,000; BUS ALTERNATIVE 3 @ $4.5 MILLION. IN ADDITION, THE COST ASSOCIATED WITH AN ENHANCEMENT OF THE EXISTING BUS TRANSFER POINT AT THE FOX RUN MALL IS $115,000.

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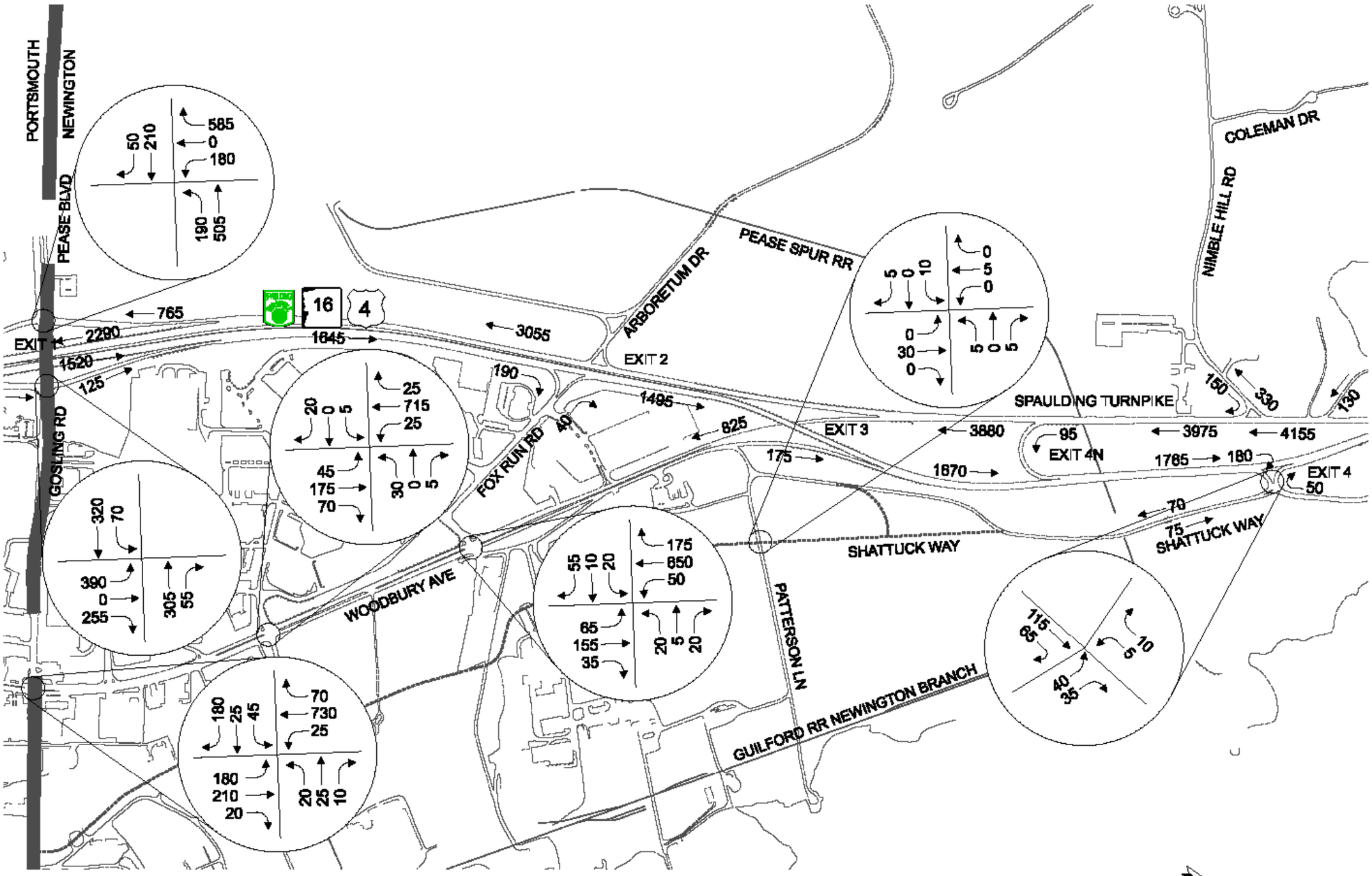
(5) THE COSTS ASSOCIATED WITH THE CONSTRUCTION OF A PARK AND RIDE LOT IN DOVER ARE $3.4 MILLION. THE COSTS FOR THE PARK AND RIDE LOT IN ROCHESTER RANGES FROM $1.2 TO $1.3 MILLION DEPENDING UPON WHICH SITE IS SELECTED.

SELECTED ALTERNATIVE COST (MILLIONS)	
NEWINGTON SEGMENT (ALT 13)	52.3
BRIDGE SEGMENT (LBB w/GSB)	111.9
DOVER SEGMENT (ALT 3)	48.0
BUS SERVICE	5.5
RAIL SERVICE	1.7
PARK AND RIDE LOTS	4.7
MITIGATION	4.6
TOTAL	228.7

SUMMARY OF COSTS (FY 2007) EIGHT-LANE ALTERNATIVES
FIGURE 2.6-2



New Hampshire DOT
Department of Transportation

Vanasse Hangen Brustlin, Inc.

Figure 3.2-1 - Newington
2003 Existing Conditions
Weekday AM Peak Hour
Sheet 1 of 2

New Hampshire DOT
Department of Transportation

ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
PISCATAQUA RIVER
NEW HAMPSHIRE
MAINE
DOVER
NEWINGTON
DOVER POINT RD
EXIT 5
EXIT 6
HILTON DR
WENTWORTH TER
COTE DR
BOSTON HARBOR RD
SPUR RD
US 4
HOMESTEAD LN
PINEVIEW LN
TOLL PLAZA
4
16
4025
1635
1665
1520
1010
510
2505
1675
1435
2530
900
535
615
260
240
1050
625
40 975 35
20 65 30
5 5 5
25 600 10
5 5
30
130

Vanasse Hangen Brustlin, Inc.

Figure 3.2-1 - Dover
2003 Existing Conditions
Weekday AM Peak Hour
Sheet 2 of 2

0 375 750 Feet

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
PEASE BLVD
GOSLING RD
EXIT 1
EXIT 3
EXIT 4N
EXIT 4
16
4
260
1330
2615
705
3320
1590
355
3155
715
760
3915
2305
135
2440
2420
4050
140
160
40
190
150
220
240
ARBORETUM DR
PEASE SPUR RR
NIMBLE HILL RD
COLEMAN DR
SPAULDING TURNPIKE
FOX RUN RD
SHATTUCK WAY
WOODBURY AVE
PATTERSON LN
GUILFORD RR NEWINGTON BRANCH

145 840 135 0 125 725 300

20 0 110 5 15 0 0 70 5 5 0 5

245 5 35 75 650 0 240 715 20 60 15 10

490 475 205 0 560 820 230

160 15 75 160 525 15 95 720 35 15 15 15

375 55 100 185 780 45 320 855 30 75 50 45

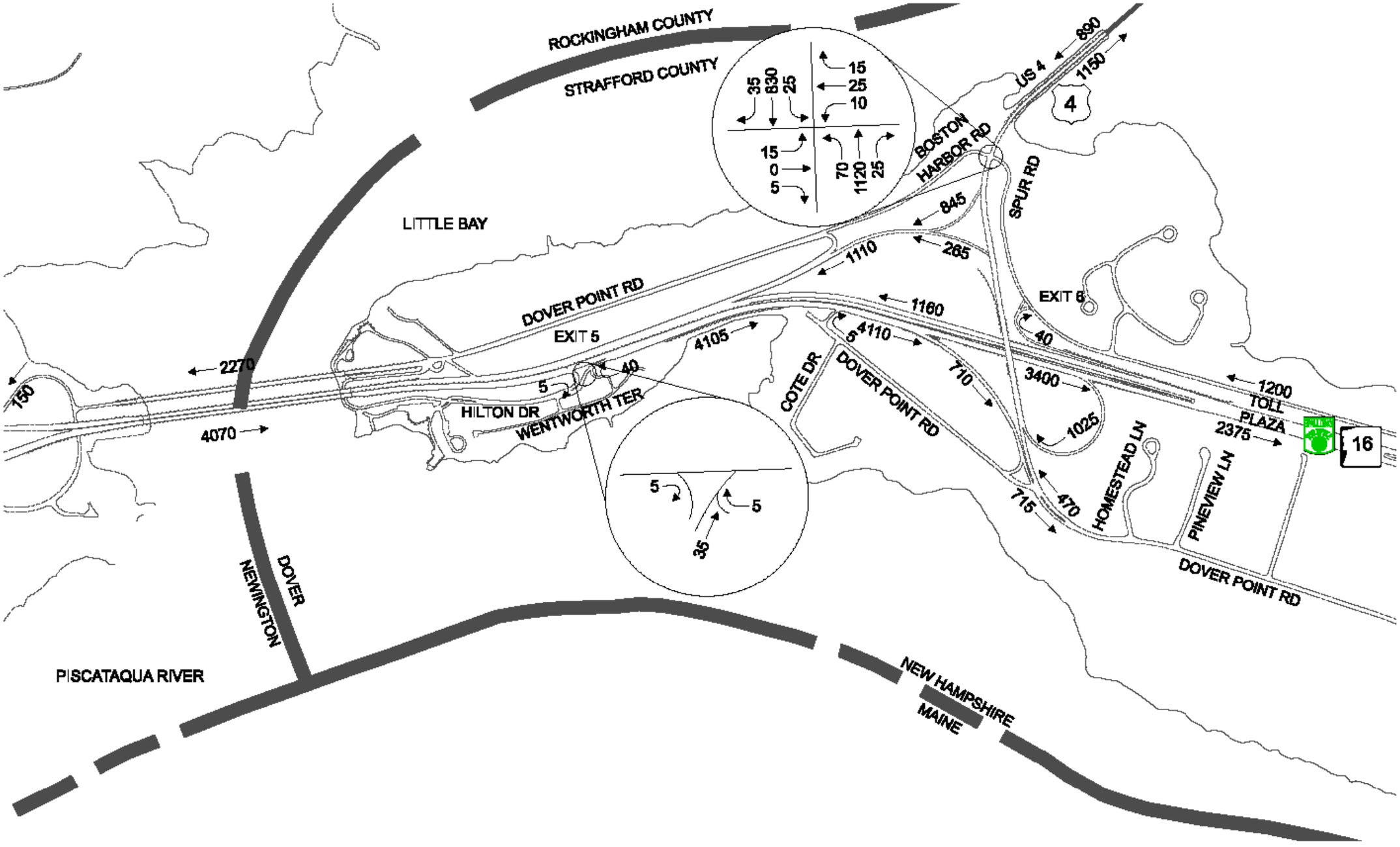
105 35 30 5 130 60

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-2 - Newington
2003 Existing Conditions
Weekday PM Peak Hour
Sheet 1 of 2

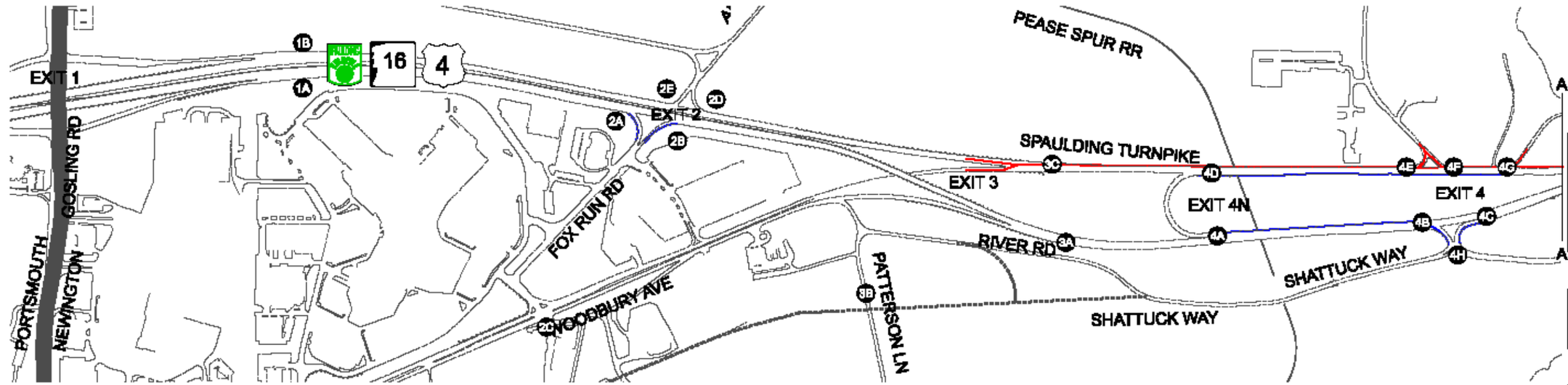
New Hampshire DOT
Department of Transportation

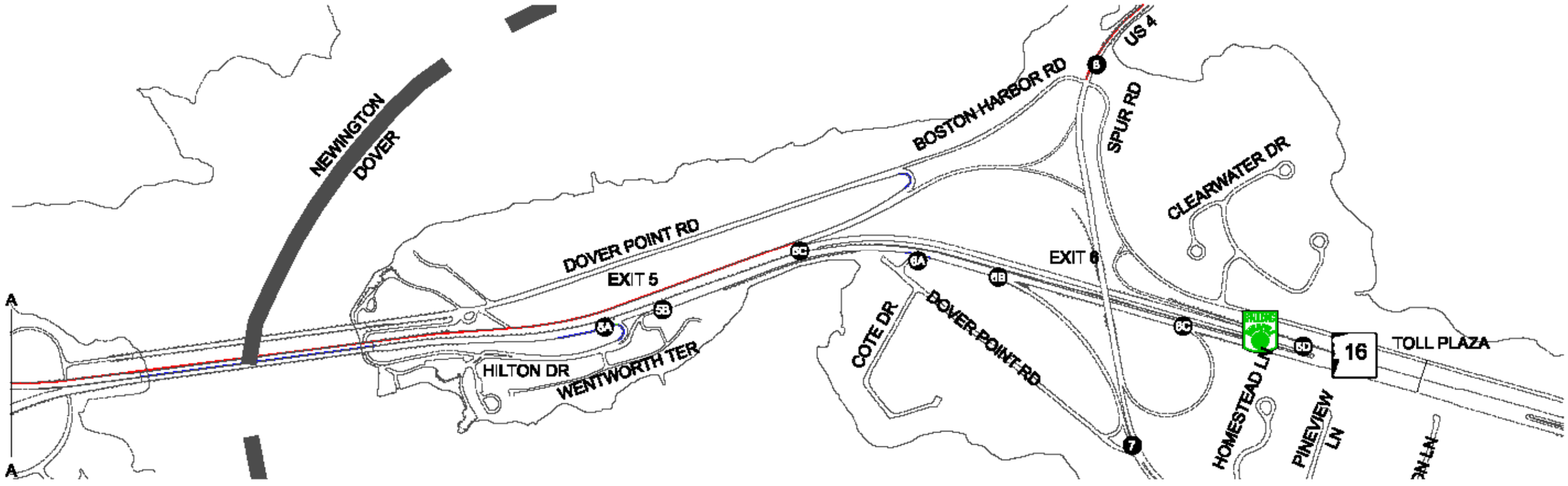


Vanasse Hangen Brustlin, Inc.

Figure 3.2-2 - Dover
2003 Existing Conditions
Weekday PM Peak Hour
Sheet 2 of 2

0 375 750 Feet





New Hampshire DOT
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Arterial LOS

Node		2003 LOS
From	To	
2C	3C	D
3B	4H	A
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2003 LOS
2C	B
8	C

Unsignalized Intersection LOS

Node	2003 LOS
3B	A
4H	B

Weave Analysis LOS

Node		2003 LOS
From	To	
4G	4F	E
4E	4D	F
4A	4B	B
6A	6B	B

Ramp Junction LOS

Node	2003 LOS
2A	B
2B	B
3A	B
3C	E
4A	B
4B	B
4C	B
4D	D
4E	E
4F	F
4G	F
5A	B
5B	B
6A	B
6B	B
6C	B
6D	B

Legend:

CAPACITY DEFICIENCY

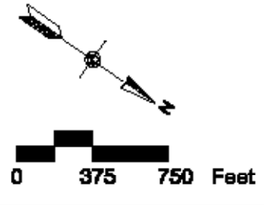
SUBSTANDARD GEOMETRICS

Freeway LOS

Node		2003 LOS
From	To	
Spaulding Turnpike NB		
1A	2A	B
2B	3A	B
4A	4B	C
4C	5A	B
5B	6A	B
6C	TOLL	A

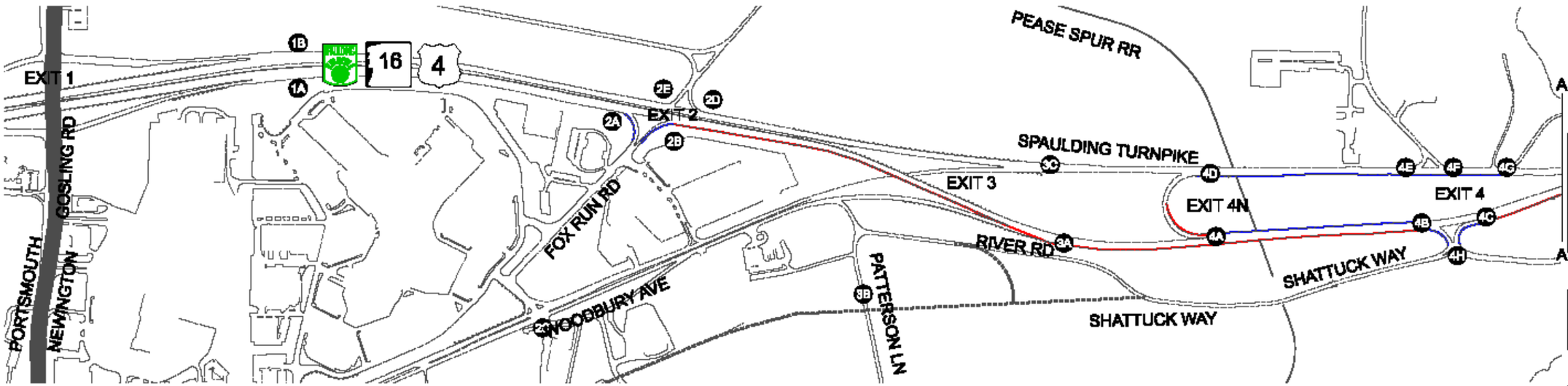
Freeway LOS

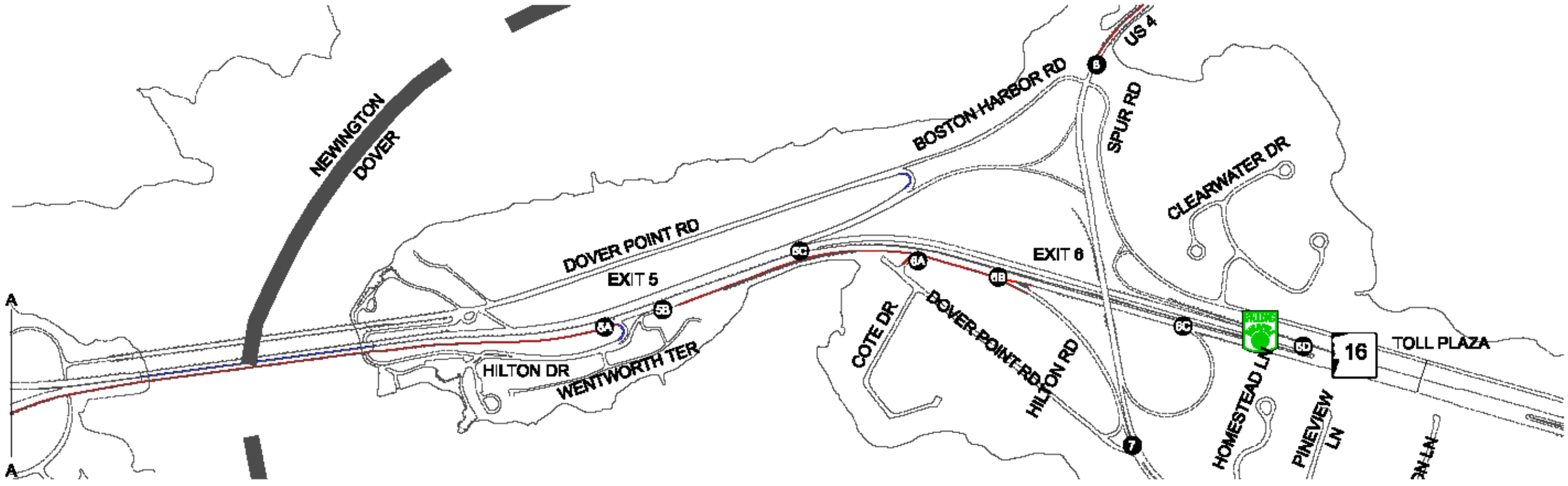
Node		2003 LOS
From	To	
Spaulding Turnpike SB		
TOLL	6D	C
6D	5C	C
5C	4G	E
4E	3C	E
3C	2D	D
2E	1B	D



Vanasse Hangen Brustlin, Inc.

Figure 3.2-3
Level of Service Summary
2003 Existing Conditions
Weekday AM Peak Hour





New Hampshire DOT
A Department of Transportation

Arterial LOS

Node		2003 LOS
From	To	
2C	3C	D
3B	4H	C
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2003 LOS
2C	B
8	C

Unsignalized Intersection LOS

Node	2003 LOS
3B	B
4H	B

Weave Analysis LOS

Node		2003 LOS
From	To	
4G	4F	C
4E	4D	D
4A	4B	E
6A	6B	E

Ramp Junction LOS

Node	2003 LOS
2A	D
2B	C (F)*
3A	D (F)*
3C	C
4A	F
4B	D
4C	D
4D	C
4E	C
4F	C
4G	C
5A	D
5B	D
6A	E
6B	E
6C	D
6D	A

* Isolated facility analyses do not account for impacts associated with system deficiencies and failures. Field observations have confirmed that ramp nodes 2B & 3A and freeway segment 2B to 3A are regularly blocked by the rolling queue on the Turnpike, resulting from system capacity issues at Exits 4 through 6

Legend:

CAPACITY DEFICIENCY

SUBSTANDARD GEOMETRICS

Freeway LOS

Node		2003 LOS
From	To	
Spaulding Turnpike NB		
1A	2A	D
2B	3A	D (E)*
4A	4B	E
4C	5A	E
5B	6A	E
6C	TOLL	C

Freeway LOS

Node		2003 LOS
From	To	
Spaulding Turnpike SB		
TOLL	6D	B
6D	5C	B
5C	4G	C
4E	3C	C
3C	2D	B
2E	1B	B

N

0 375 750 Feet

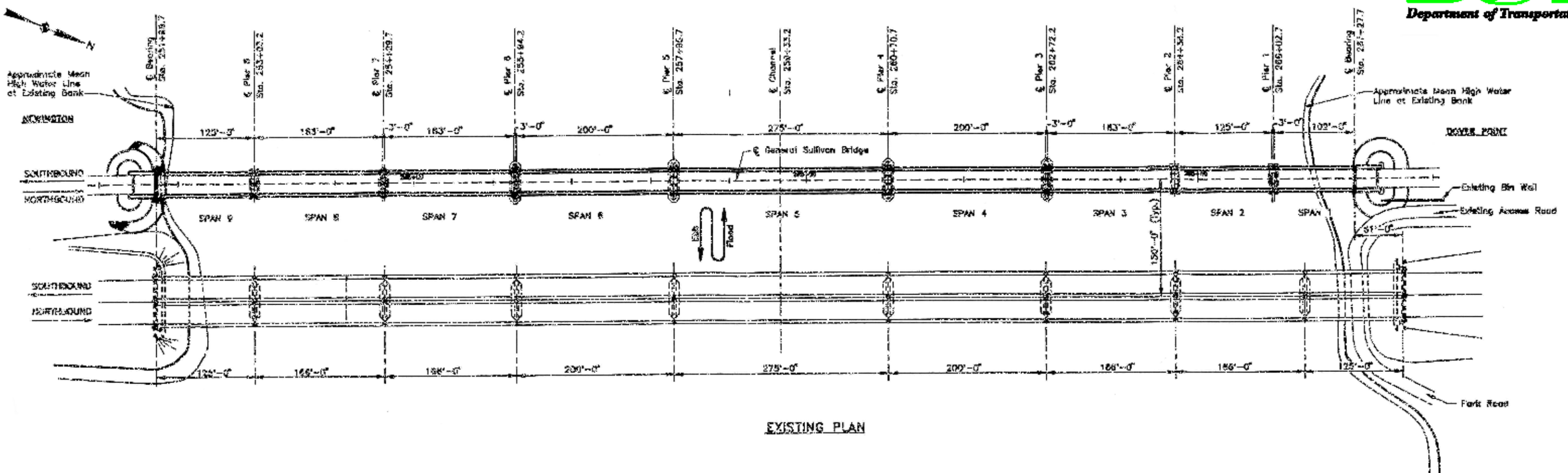
Vanasse Hangen Brustlin, Inc.

Figure 3.2-4
Level of Service Summary
2003 Existing Conditions
Weekday PM Peak Hour

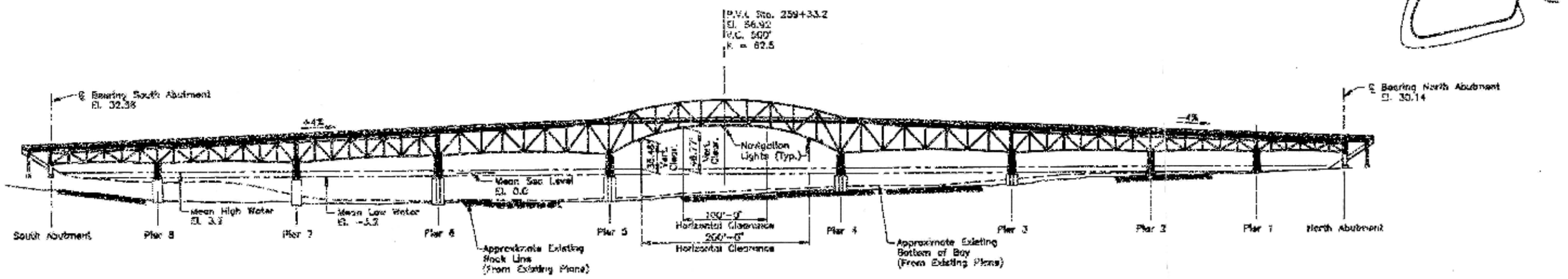
INTERSECTION		Spaulding Tpk Exit 1 / Gosling Rd	Spaulding Tpk Exit 1 NB / Gosling Rd	Spaulding Tpk Exit 1 SB / Gosling Rd	Between Exits 1 - 2	Spaulding Tpk Exit 2 / Fox Run Rd	Spaulding Tpk Exit 2 NB / Fox Run Rd	Spaulding Tpk Exit 2 SB / Fox Run Rd	Between Exits 2 - 3	Spaulding Tpk Exit 3 / Woodbury Ave	Spaulding Tpk Exit 3 NB / Woodbury Ave	Spaulding Tpk Exit 3 SB / Woodbury Ave	Between Exits 3 - 4	Spaulding Tpk Exit 4	Spaulding Tpk Exit 4N Turnaround	Spaulding Tpk Exit 4 / Nimble Hill Rd	Spaulding Tpk Exit 4 / River Rd	Spaulding Tpk Exit 4S Turnaround	Between Exit 4 - Bridge	Spaulding Tpk on Little Bay Bridge	Between Bridge - Exit 5	Spaulding Tpk Exit 5	Spaulding Tpk Exit 5 / Hilton Dr	Spaulding Tpk Exit 5 / Wentworth Ter	Between Exits 5 - 6	Spaulding Tpk Exit 6	Spaulding Tpk Exit 6N / Dover Pt Rd	Spaulding Tpk Exit 6W / Rt 4	Spaulding Tpk Exit 6 / Spur Rd	Between Exit 6 - Toll	Woodbury Ave / Gosling Rd	Woodbury Ave / Fox Run Rd	Woodbury Ave / River Rd	Gosling Rd / Industrial Access Rd	River Rd / Patterson Ln	River Rd / Industrial Access Rd	Dover Point Rd / Cote St	Rt 4 / Boston Hr Rd / Spur Rd / Dover Pt Rd	Along Spaulding Tpk (Dover)	Along Spaulding Tpk (Newington)	Along Woodbury Ave (Newington)	Along Gosling Rd	Along Fox Run Rd	Along River Rd	Along Nimble Hill Rd (STpk - Fox Point Rd)	Along Dover Point Rd (s/o Pineview Dr)	Along Boston Harbor Rd	Along Cote Dr	Along Route 4 (Dover)	Along Spur Rd	TOTAL	PERCENT
YEAR																																																				
1997		9	4		4	1	1		1	6		1	3	7	1	4	1		5	11	3				1	3	3	4		3	15	2						2	1	6	19	6	2		2	2	2		9		144	11%
1998		10			1	2	1			2		1	1	5	1		2		1	19	5	2		1			5	13		4	17						2		7	20	16		1	1	3	1		12		156	12%
1999		16	1	3	1	3			1	2		1	8	9	1	3	1		4	15	3	4			3	1	5	5		4	18	2	1				12		8	14	18	3	1		1	1		12	2	187	15%
2000		11	7	3	3	4			3	2		2	8	5	5	5	1	1	5	24	7	2		1		4	2	1		3	24		2				6		7	23	14	1	1		5		1	8		201	16%
2001		9	6	3	2	4	4			2			3	9	7	1	2	3	5	28	7	5			2	2	1	3		3	22	2					6		15	25	19	3	4		4			9		220	17%
2002		5			4	6			1	5			3	7	3		2	2	6	29	4	1			1	2	3	1		5	6	1					6		15	23	8	1	1	1	3	2		10	1	168	13%
2003		6	1		6	4			3	7			6	8	4	1	1	2	9	33	6	3			2	1	3	3		2	4						4	2	5	27	17	6	1	1	1	1		7		187	15%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
TYPE																																																				
Angle		2														1					1										4						3				9					1				21	2%
Rear-End		8	3	2	2	6	2		1	3			5	8	4	4	6	1	3	36	11	1				2	4	5		2	13	2	1				12		13	6	6		1		6	2		26		207	16%
Head-on																															1										1						1	1		4	0%
Sideswipe		1		1									1		2			1		2		1						1		1	1					1													13	1%
Fixed Object		3			2	2				2			2	2	2			1	1	7	3	2			1		2			2	3						1	2	5	3	1				1		2	1	53	4%
Other/Unknown		52	16	6	17	16	4		8	21		5	24	40	14	9	4	5	31	114	20	13		2	8	11	16	24		19	84	5	2				21	1	45	142	81	16	8	5	13	3		38	2	965	76%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SEVERITY																																																			
Property Damage		6			3	2				6			1	4	2	1	2		3	10	2	1					4			12	3	1				12		7	9	6	2		3	1		16	2	121	10%
Personal Injury		16	5	2	3	5	2		2	7		1	5	8	3	1	3	2	11	31	5	4			4	5	5	7		4	25		1				8		9	40	24	6	4		8	1		12	1	280	22%
Pedestrian Injury																				1	1										1																	1		4	0%
Fatality																																													1				1	0%
Unknown/None		44	14	7	15	17	4		7	13		4	26	38	17	12	5	6	21	117	27	12		2	5	8	13	23		20	68	4	1				18	3	47	102	68	8	5	5	7	5	1	38		857	68%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
DAY OF WEEK																																																		
Mon-Fri		53	15	7	19	21	2		8	21		5	26	45	17	9	9	7	30	135	29	14		1	9	12	16	28		15	81	6	2				26	3	55	105	82	9	6	4	11	4	1	43	2	993	79%
Sat-Sun		13	4	2	2	3	4		1	5			6	5	5	5	1	1	5	24	6	3		1		1	6	2		9	25	1	1				12		8	46	16	7	3	1	8	3		24	1	270	21%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SURFACE CONDITION																																																		
Dry		36	13	4	19	19	5		7	20		4	27	42	17	10	9	7	27	124	22	11			6	11	18	26		16	75	5	2				30		48	115	66	11	7	4	14	6	1	52	3	939	74%
Wet		14	4	2		4	1		2	4			5	5	5	2	1	1	5	20	8	4		1	2	1	3	3		5	26	1					7	1	9	24	26	2	2		4	1		12		217	17%
Snow/Ice		13	2	3	2	1				1		1		3		1			3	14	5	2		1	1	1	1	1		3	3	1					1	2	3	9	4	2		1	1					86	7%
Other/Unknown		3								1						1				1											2		1						3	3	2	1						3		21	2%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
WEATHER																																																		
Clear/Cloudy		44	13	4	18	20	5		6	20		4	27	45	18	12	9	8	31	130	24	12			7	12	19	28		18	90	5	2				31	1	49	127	74	14	8	5	15	6	1	57	3	1022	81%
Rain		8	2	2	2	3	1		1	4			4	3	4	1	1		2	18	6	3		1	2		2	1		3	13	1	1				5	1	8	16	18	1	1		3	1		7		150	12%
Snow/Ice		12	3	3	1	1				1		1	1	2					2	11	5	2		1		1	1	1		3	2	1					1	1	4	6	3	1			1			1		73	6%
Other/Unknown		2	1						2	1						1														1						1		2	2	3							2		18	1%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%
SEASON																																																		
Winter (Dec-Feb)		24	5	4	6	6	1		2	3		2	2	18	7	2	2	2	7	28	10	3			3	2	4	6		5	35	2					3	2	20	39	34	8	1	1	4	2		12		317	25%
Spring (Mar-May)		17	6	2	2	5	1		3	4		1	4	10	3	6	1	1	11	35	12	5		1	2	3	7	6		3	27	1	1				15	1	11	42	21	1	3		4	1		9		288	23%
Summer (Jun-Aug)		14	4		8	11	2		3	7			14	12	10	4	3	2	13	39	7	2		1	1	4	5	11		7	21	2	1				9		15	34	27	3	1	2	5	3		19	3	329	26%
Fall (Sept-Nov)		11	4	3	5	2	2		1	12		2	12	10	2	2	4	3	4	57	6	7			3	4	6	7		9	23	2	1				11		17	36	16	4	4	2	6	1	1	27		329	26%
Total		66	19	9	21	24	6	0	9	26	0	5	32	50	22	14	10	8	35	159	35	17	0	2	9	13	22	30	0	24	106	7	3	0	0	0	0	38	3	63	151	98	16	9	5	19	7	1	67	3	1263	100%

Source: New Hampshire Department of Safety, Dover Police Department, Newington Police Department, and Portsmouth Police Department.

Figure 3.2-5
Spaulding Turnpike - Crash Summary (1997-2003)



EXISTING PLAN



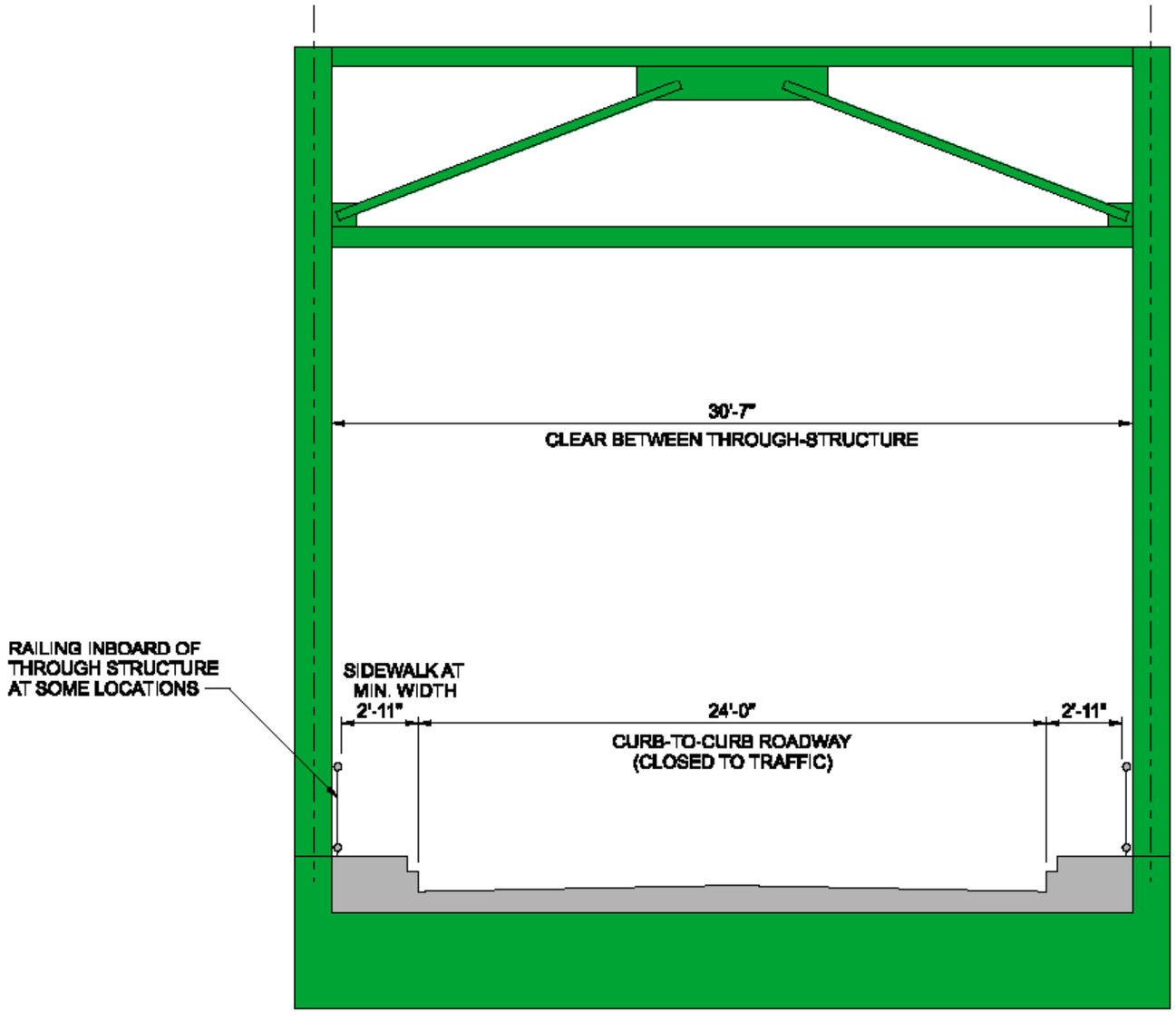
EXISTING ELEVATION

Note:
Figures on this sheet are from the Existing Plan and Elevation figure in the report:
General Sullivan Bridge over Little Bay Bridges
Rehabilitation Final Report prepared by
Kimball Chase, Inc. dated June, 1991.

0 50 100 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-6
Existing General Sullivan Bridge
Plan and Elevation

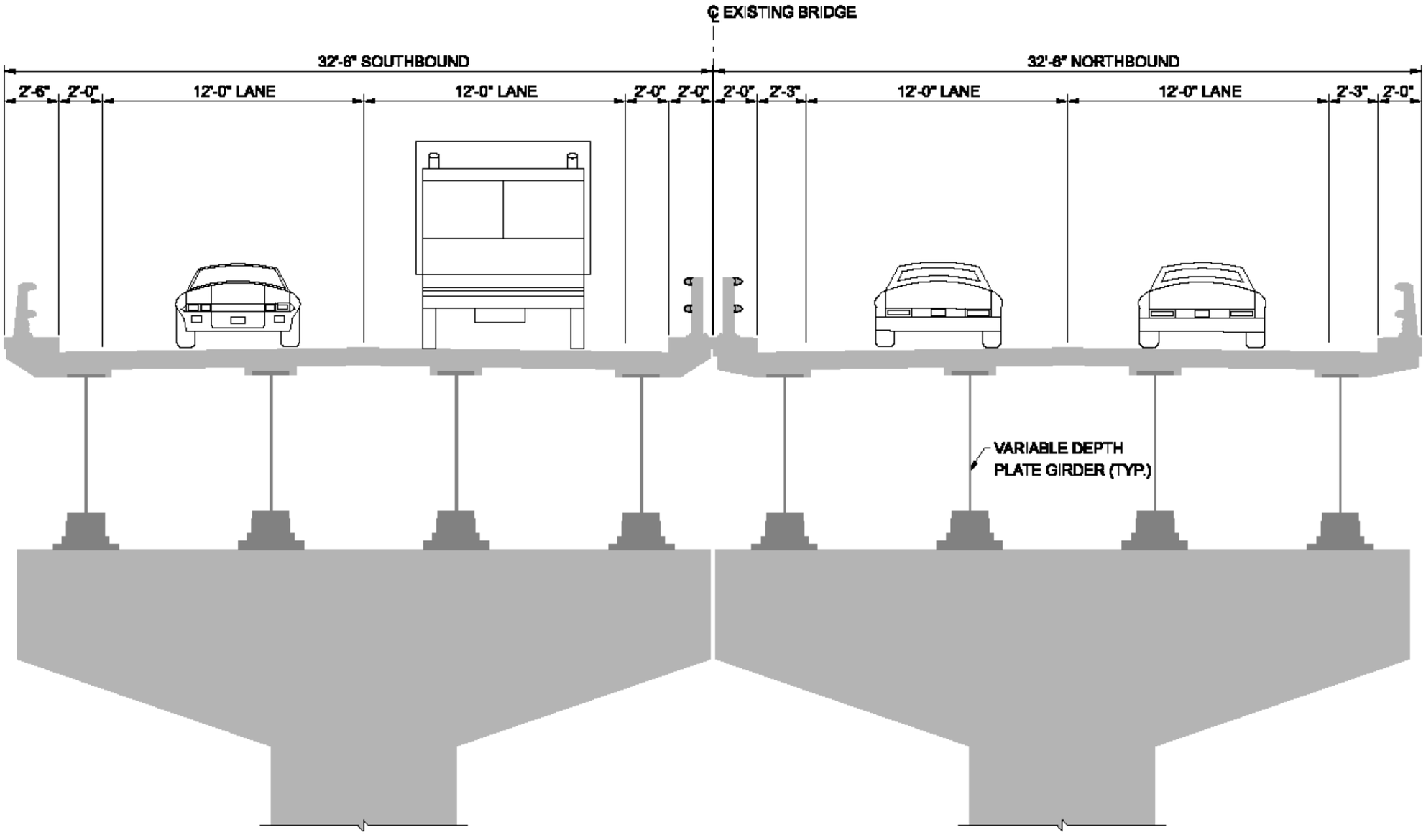


EXISTING CROSS SECTION

GENERAL SULLIVAN BRIDGE

0 2.5 5 Feet

Figure 3.2-7
Existing General Sullivan Bridge
Cross Section



EXISTING CROSS SECTION

LITTLE BAY BRIDGES

0 2.5 5 Feet

Figure 3.2-6
Existing Little Bay Bridges
Cross Section

Figure 3.2-9
Existing Park-and-Ride Facilities

New Hampshire DOT
Department of Transportation

Legend:

COAST Services
- Route 1
- Route 2
- Route 6
- Route 7
- Dover Points North
- Dover Points South
- Dover Points West
- Lafayette Road Trolley
- Pease Tradeport Trolley

Wildcat Transit Services
- Route 3
- Route 4
- Route 5

Commuter/Intercity Services
- C&J
- Vermont Transit

- State Line
- Town Line

N

0 6000 12000 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.2-10
Existing Bus Services

Date Created:10/8/2007 J:\61425\cad\arlphase3\DES\fig3302210.dgn

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
DURHAM
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
CROSS RD
PEASE BLVD
PEASE INTERNATIONAL TRADE PORT
AIRPORT TURN DR
RAILWAY BROOK
PEASE INTERNATIONAL TRADE PORT
PEASE BLVD
PORTSMOUTH BRANCH
DOUGLAS DR
NEWINGTON-DOVER RD
FLAGSTONE BROOK
TRICKY'S COVE
DOVER POINT RD
BOSTON HARBOR RD
ROYALE COVE
SPUR RD
RM-12
CLEARWATER DR
BELLAMY RIVER
TOLL PLAZA
DOVER POINT
HILTON DR
WENTWORTH DR
POMEROY COVE
COVE DR
DOVER POINT ROAD EXTENSION
R-20
DOVER POINT RD
FOX RUN RD
WOODBURY AVE
RIVER DR
RIVER RD
SHATTUCK WAY
BLOODY POINT
UNNAMED TRIBUTARY 2
UNNAMED PONDS
GUILFORD RR NEWINGTON BRANCH
PATTERSON LN
PAUL BROOK
PROVIDENCE DR
UNNAMED TRIBUTARY 1
FISCATAQUA RIVER
DOVER
NEWINGTON
NEW HAMPSHIRE
MAINE
A
LI
MH
NG
AI
R
C
O
H
W
I
B-1
16
4

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE

NEWINGTON ZONING

- R — RESIDENTIAL DISTRICT
- C — COMMERCIAL DISTRICT
- AI — AIRPORT INDUSTRIAL DISTRICT
- I — INDUSTRIAL DISTRICT
- MH — MOBILE HOME DISTRICT
- H — HISTORIC DISTRICT
- W — WATERFRONT INDUSTRIAL DISTRICT
- A — AIRPORT DISTRICT
- O — OFFICE DISTRICT
- LI — LIGHT INDUSTRIAL
- NG — NEW HAMPSHIRE NATIONAL GUARD (NOT LOCALLY ZONED)

DOVER ZONING

- B-1 — NEIGHBORHOOD BUSINESS DISTRICT
- RM-12 — LOW-DENSITY MULTIRESIDENTIAL DISTRICT
- R-20 — LOW-DENSITY RESIDENTIAL DISTRICT

N

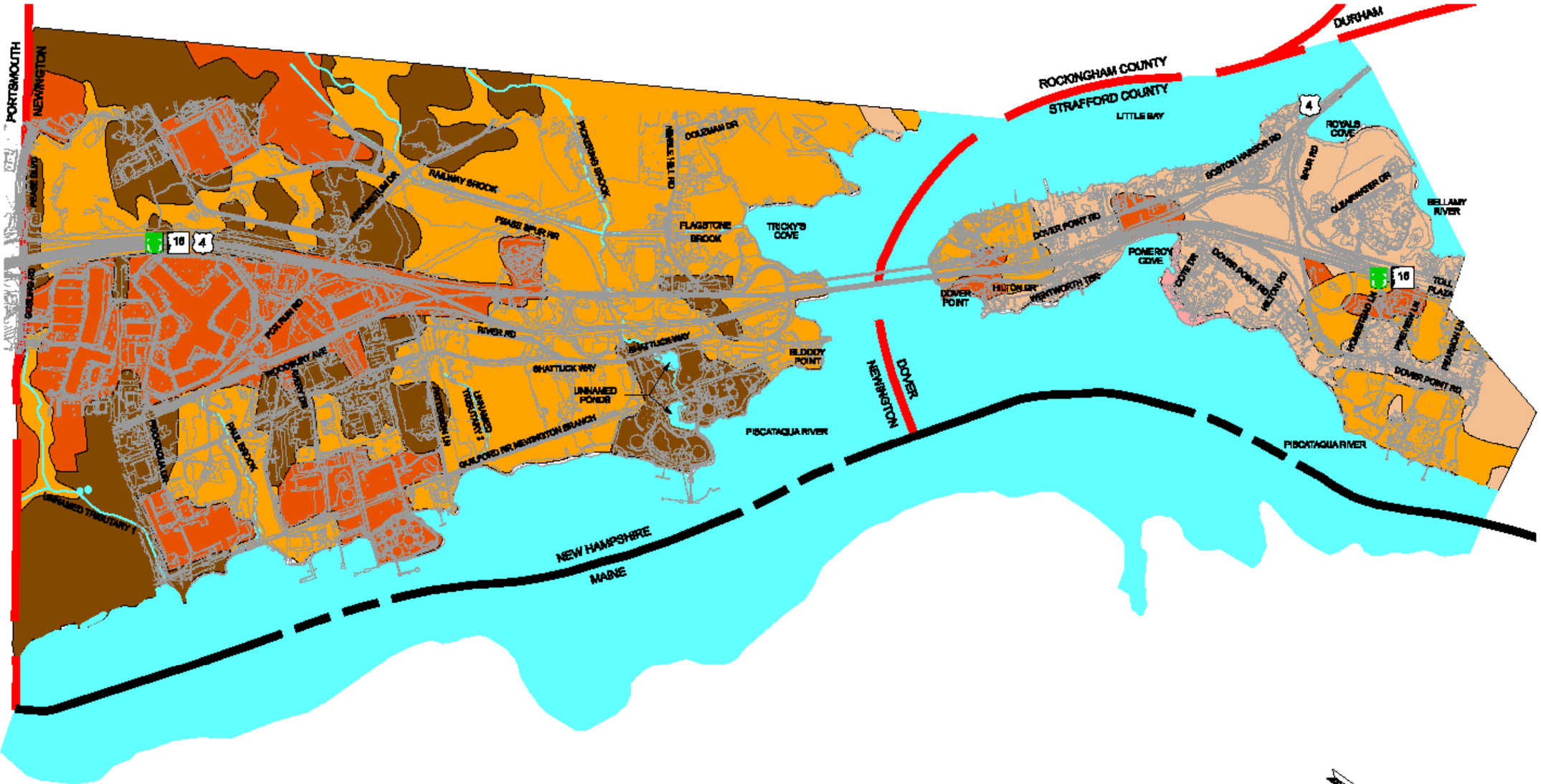
0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.3-1
Zoning Districts,
Newington and Dover

Date Created:10/9/2007 J:\ts1428\cad\arcmap\3DEIS\fig030901.mxd

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- MARINE/LACUSTRINE
- GLACIOFLUVIAL
- ANTHROPOGENIC
- ORGANIC MATERIAL
- TILL

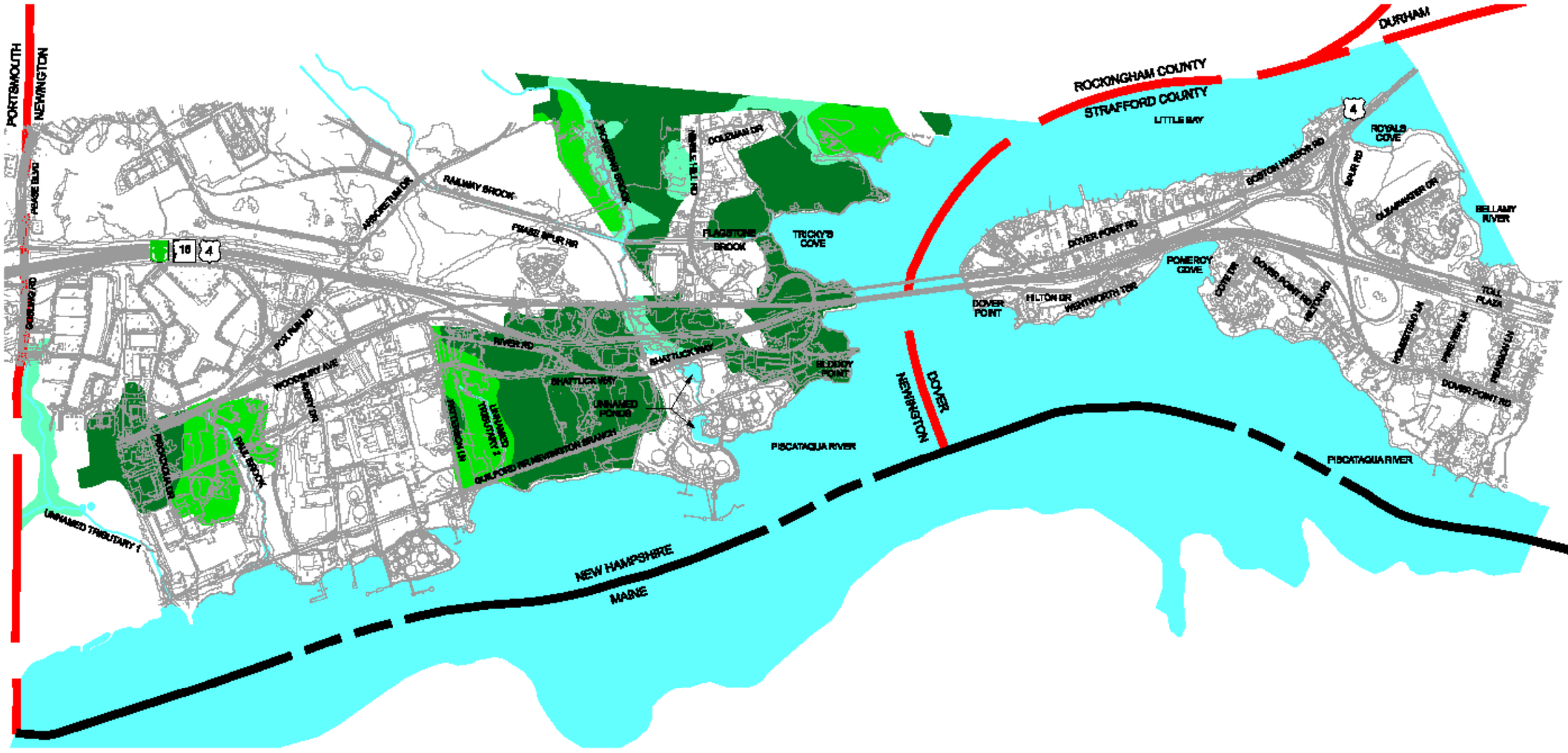
0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.4-1
Major Soil Associations

Date Created:10/9/2007 J:\s1429\esd\sdp\exes3\DES\fig030401.dgn

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- PRIME FARMLANDS
- FARMLANDS OF STATEWIDE IMPORTANCE
- FARMLANDS OF LOCAL IMPORTANCE

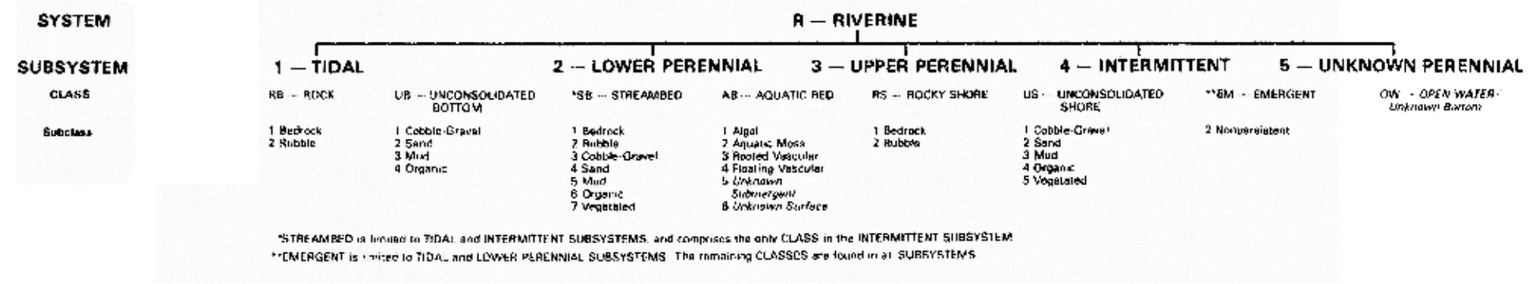
Source: NRCS soil survey, Rockingham & Strafford counties. Farmland soils in urbanized areas of Dover and Newington (US Census Bureau) are not shown, as per Farmland Protection Policy Act.

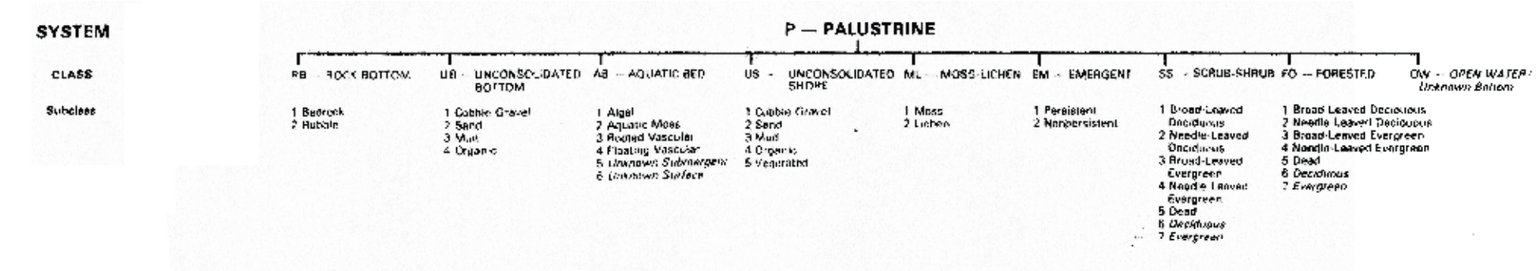
0 750 1500 Feet

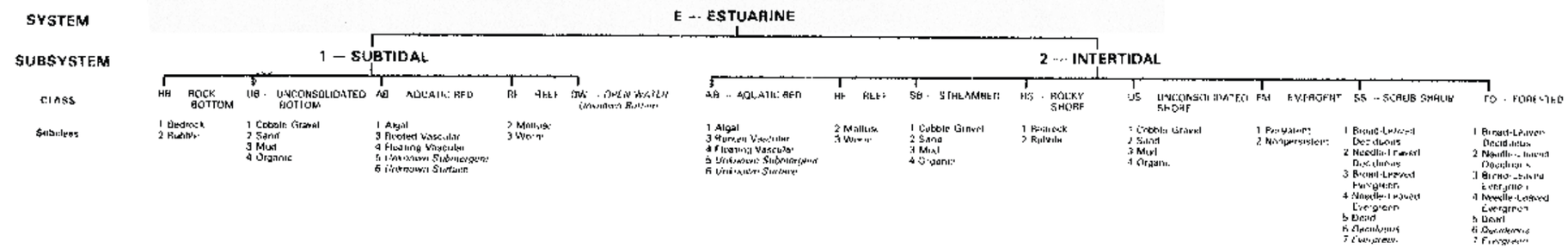
Vanasse Hangen Brustlin, Inc.

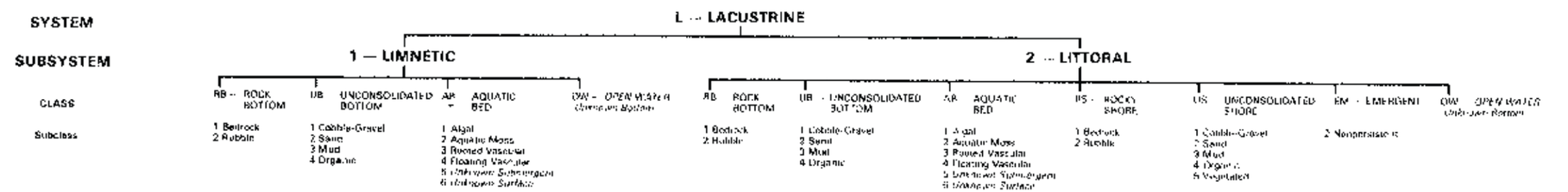
Figure 3.5-1
Important Farmland Soils

Date Created:10/9/2007 J:\s1452\ea\Italy\new\3DEIS\fig030501.dgn









MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non-Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded-Temporary
- Y Saturated-Semipermanent-Seasonal
- Z Intermittently Exposed/Permanent
- U Unknown

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- S Temporary Tidal
- R Seasonal Tidal
- T Semipermanent-Tidal
- V Permanent Tidal
- U Unknown

*Tidal water regimes can only occur in coastal or estuarine deepwater systems.

WATER CHEMISTRY

Coastal Halinity

- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline (Brackish)
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- c Circumneutral
- k Alkaline

SOIL

- g Organic
- m Mineral

SPECIAL MODIFIERS

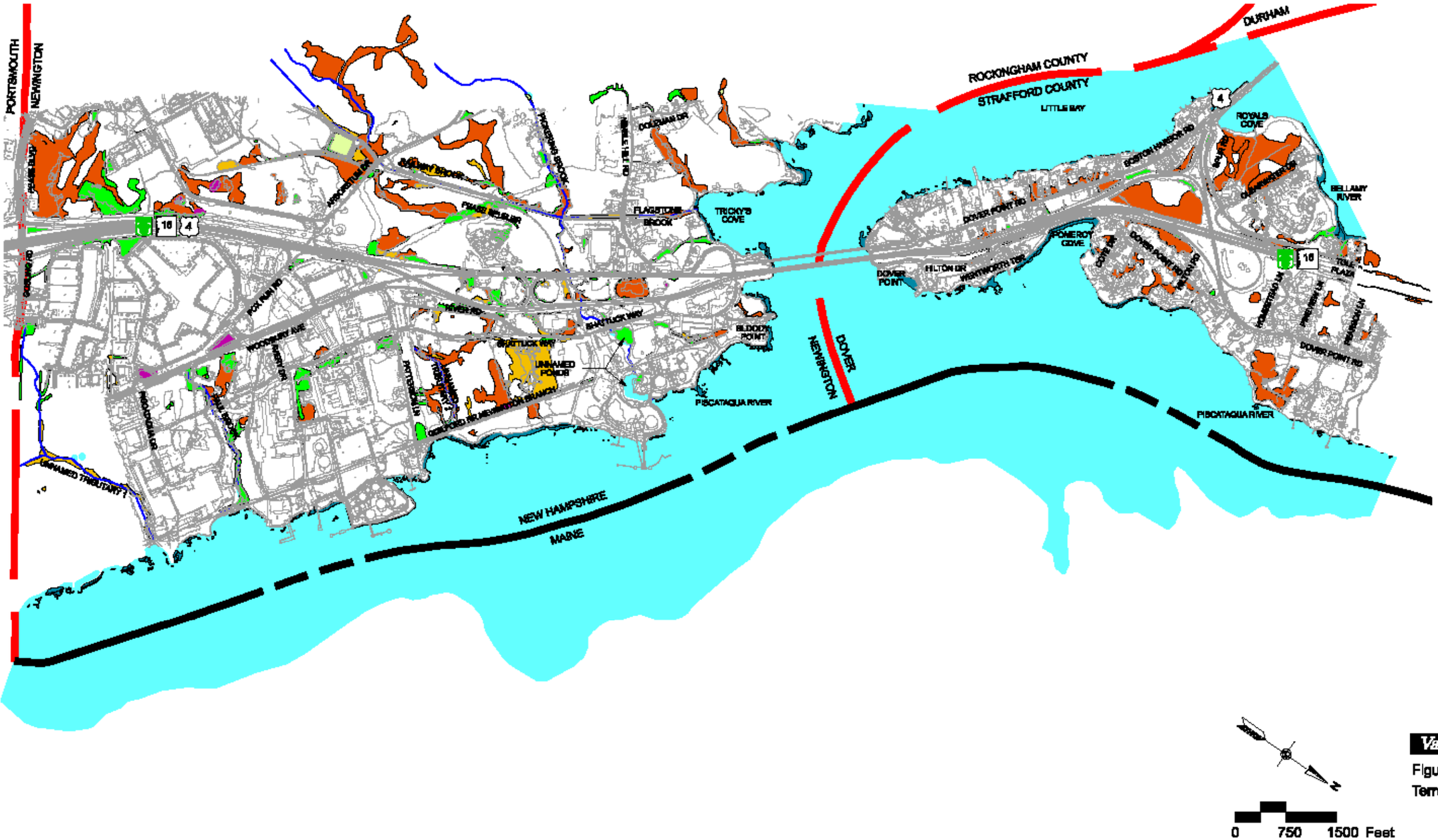
- b Beaver
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

Source: USFWS, National Wetlands Inventory, after Cowardin, *et al.* (1979).

Vanasse Hangen Brustlin, Inc.

Figure 3.6-1
Wetland Classification System
(Cowardin, *et al.* 1979)

New Hampshire DOT
Department of Transportation



Legend:

- TOWNLINE
- STATELINE

DOMINANT WETLAND COVER TYPE

- PALUSTRINE, FORESTED
- PALUSTRINE, SCRUB-SHRUB
- PALUSTRINE, EMERGENT
- PALUSTRINE, UNCONSOLIDATED BOTTOM
- ESTUARINE, INTERTIDAL
- ESTUARINE, SUBTIDAL
- POTENTIAL VERNAL POOLS
- RIVERINE, LOWER OR UPPER PERENNIAL

N

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-2
Terrestrial Wetland Resources

Date Created:10/9/2007 J:\s1420\eau\arcinfo\wet3OE\fig030602.dgn

Wetland I.D.		Approximate Total Acres

ES

Indicates Principal Function or Value

Ground Water Recharge / Discharge

Floodflow Alteration (Storage & Desynchronization)

Fish & Shellfish Habitat

Sediment / Toxicant Retention

Nutrient Removal / Retention / Transformation

Production Export (Nutrient)

Sediment / Shoreline Stabilization

Wildlife Habitat

Recreation (Consumptive & Non-Consumptive)

Education Scientific Value

Uniqueness / Heritage

Visual Quality Aesthetics

ES Endangered Species

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems
Functions and Values
Sheet 1 of 6

New Hampshire DOT
Department of Transportation

NEWINGTON

PEASE BLVD

ARBORETUM DR

SPAULDING TURNPIKE

16

4

N-1

N-2

N-3b

PVP 6

PVP 7

PVP 8

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 2 of 8

Date Created: 1/24/2007

New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

N

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 3 of 8

Date Created: 1/29/2007

GOSLING RD

FOX RUN RD

WOODBURY AVE

AVERY DR

SHATTUCK WAY

PISCATAQUA DR

UNNAMED TRIBUTARY 1

ISAAC DOW HOUSE

BEANE FARM

PVP 1

PVP 2

PVP 3

N-13

N-14

N-15a

N-15b

N-16

N-18c

New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

N

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 4 of 8

Date Created: 1/9/2007

PICKERING BROOK

EXXON MOBIL

PVP 5

N-3b

N-19c

RIVER RD

N-17

N-6a

N-23

SHATTUCK WAY

N-21

N-22

BLOODY POINT

N-16

SHATTUCK WAY

UNNAMED PONDS

See Sheet 6 for Detail

PATTERSON LN

UNNAMED TRIBUTARY 2

PVP 4

GUILFORD RR NEWINGTON BRANCH

N-20a

Newington Segments

Bridge Segments

PISCATAQUA RIVER

NEW HAMPSHIRE

MAINE

New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

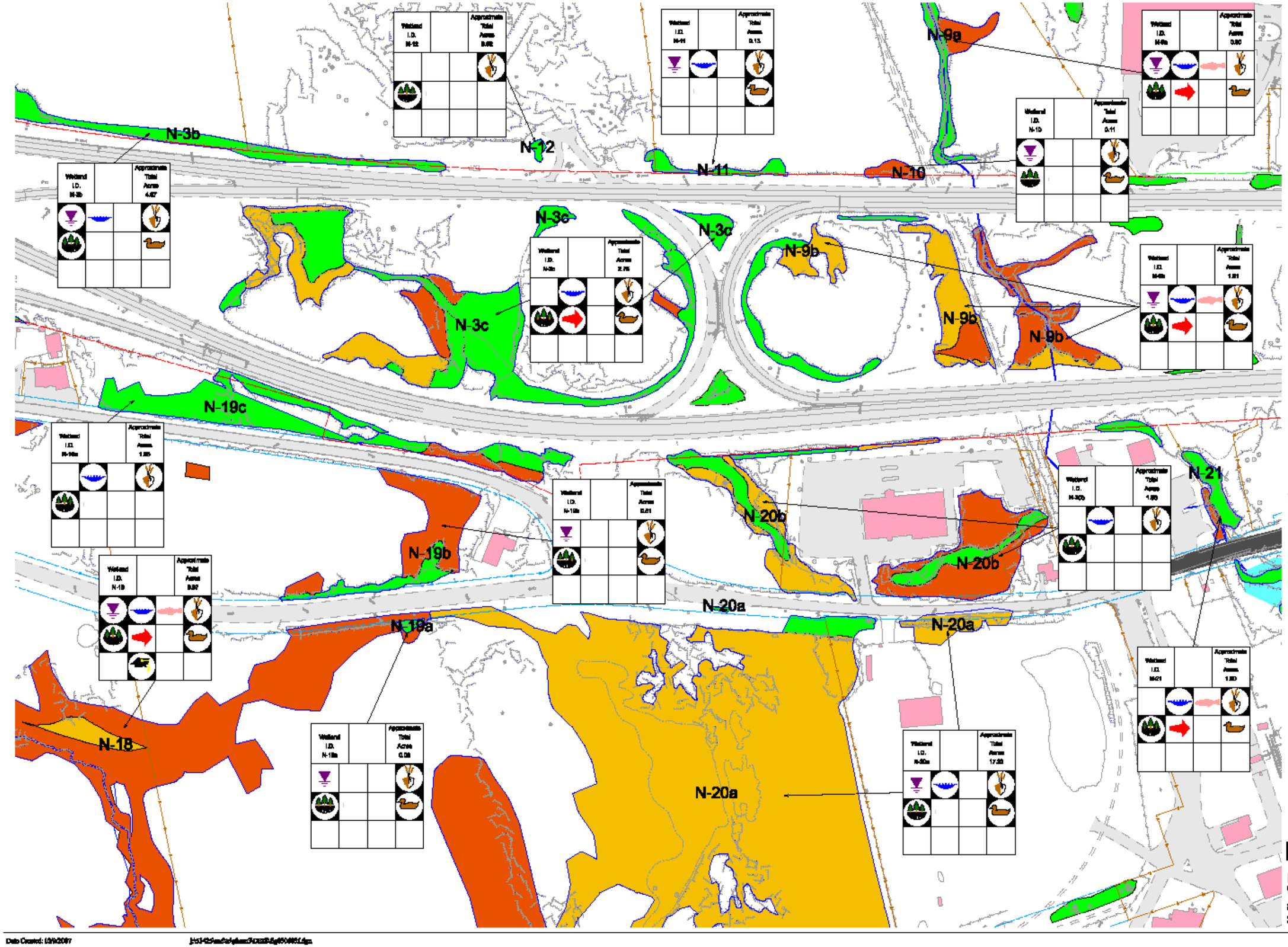
Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 5 of 8

Date Created: 12/9/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

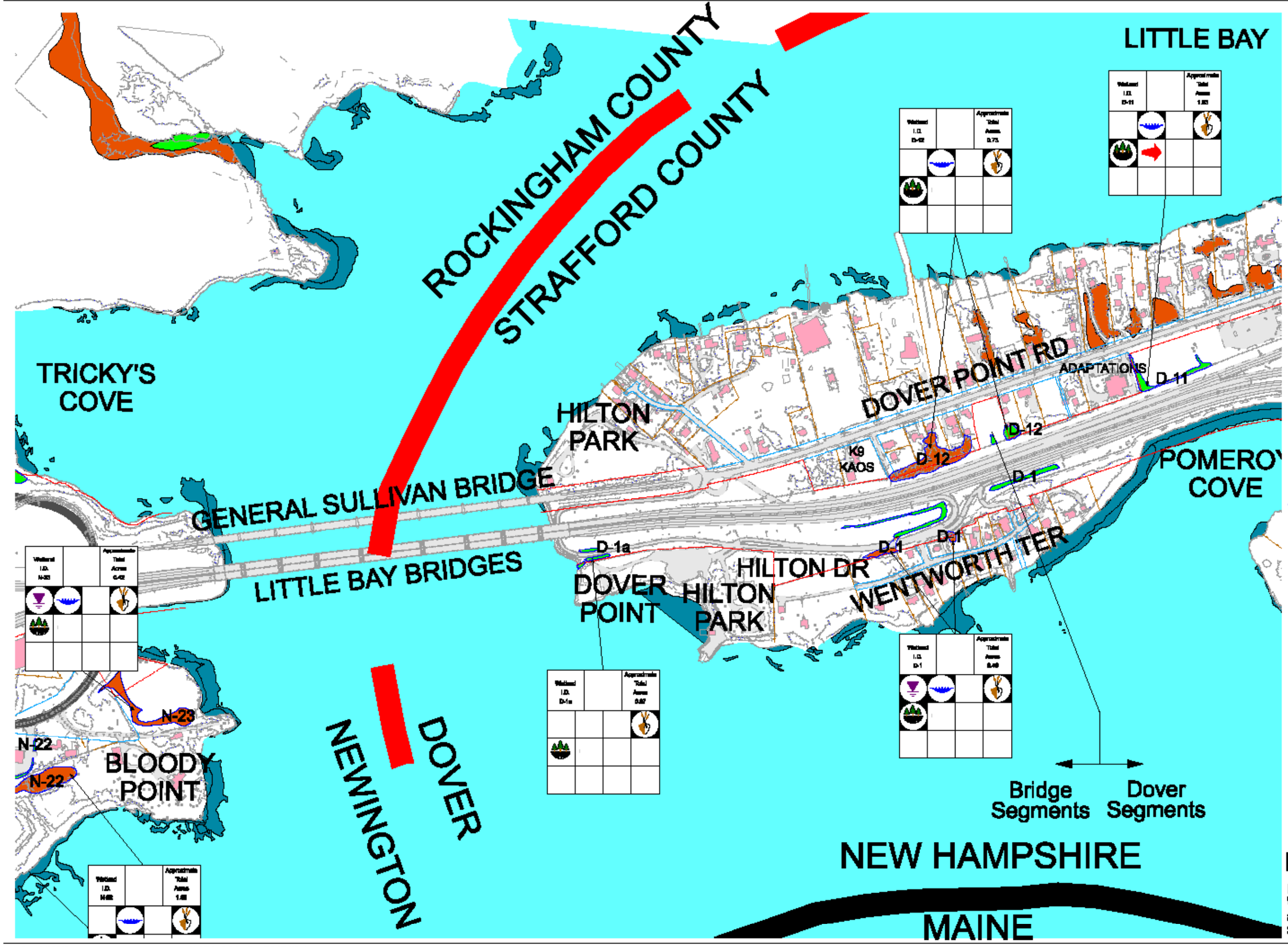
N

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 6 of 8

Date Created: 1/29/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

N

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 7 of 8

Date Created: 1/29/2007

New Hampshire DOT
Department of Transportation

ROYALS COVE

BAYVIEW PARK
D-7a

BELLAMY RIVER

BOSTON HARBOR RD

SPUR RD

CLEARWATER DR

DOVER POINT RD

HILTON RD

TOLL PLAZA

HOMESTEAD LN

PEARSON LN

SPAULDING TURNPIKE

16

D-1 D-2 D-3 D-4 D-5 D-6 D-7 D-8 D-9 D-10

Legend:

- Existing Roadway
- Existing Building
- Existing Property Lines
- Existing LAROW
- Existing CAROW
- Existing ROW
- PFO Wetland
- PSS Wetland
- PEM Wetland
- POW Wetland
- Estuarine Wetland
- Potential Vernal Pool
- Riverine Wetland
- # Wetland System

Note:
Unlabeled wetlands are isolated and/or not impacted by any alternative.

N

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.6-3
Wetland Systems Functions and Values
Sheet 8 of 8

Date Created: 1/9/2007

Wetland Number	Wetland Name	Watershed	Total Wetland Area (acres)	Cover Type(s)	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish and Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness/ Heritage	Visual Quality/ Aesthetics
N-1	Newington 1	Coastal Drainage	9.1	PFO1E	✓	O		O	O	✓		O				
N-2	Newington 2	Great Bay	36.2	PSS1E & PFO1/4E & PEM/SS1E	✓	O		O	O	O		O	✓		O	
N-3a	Newington 3a	Coastal Drainage	0.0	PEM/SS1C	✓			O	O			O				
N-3b	Newington 3b	Coastal Drainage	4.9	PEM1E	O	✓		O	O			✓				
N-3c	Newington 3c	Coastal Drainage	2.8	PEM1E & PFO1E & PSS1E		O		O	O	O		O				
N-4a	Newington 4a	Great Bay	10.6	PFO1E & PEM1E & PSS1E	✓	O		O	O	O		O	✓			
N-4b	Newington 4b	Great Bay	4.4	PFO5H & PEM1E & R2UB3Hb	✓	O	✓	O	✓	✓	✓	O	O	✓	✓	✓
N-5	Newington 5	Great Bay	1.2	R2UB2/1Hbhx & PSS1E & PFO1E	✓	O	✓	✓	✓	✓	O	O				
N-6	Newington 6	Great Bay	1.1	PSS1E & R3UB3H	✓	O	✓	✓	✓		O	✓				
N-7	Newington 7	Great Bay	1.3	PFO1E & R3UB1Hh & E2EM & E2US3	O	O	O				O	✓				✓
N-8	Newington 8	Great Bay	0.5	PEM1C & E2EM1	O	✓		✓				✓			✓	✓
N-8a	Newington 8a	Coastal Drainage	2.9	PFO1C & PEM1E	O	O		O				O				
N-9a	Newington 9a	Coastal Drainage	0.8	R2UB3Hb & PFO1E & PEM1E	O	O	✓	✓	✓	✓		✓				
N-9b	Newington 9b	Coastal Drainage	1.8	R2UB3Hb & PFO1E & PEM1E	✓	O	✓	O	O	✓		O				
N-10	Newington 10	Coastal Drainage	0.1	PFO1C	O			O	✓			O				
N-11	Newington 11	Coastal Drainage	0.1	PFO/EM1E	✓	O		O				O				
N-12	Newington 12	Coastal Drainage	0.0	PEM1E				O	O							
N-13	Newington 13	Coastal Drainage	4.5	PEM1E & PSS1E & PFO1E & R2UB1H	✓	O		O	O			O				
N-14	Newington 14	Coastal Drainage	3.2	PEM1C & PFO1C	✓	O		O	O							
N-15a	Newington 15a	Coastal Drainage	0.9	PEM1C	✓	✓		O								
N-15b	Newington 15b	Coastal Drainage	0.4	PFO1E	O	O		✓	✓							
N-16	Newington 16	Coastal Drainage	1.0	PEM1E	✓	O		O	O							
N-17	Newington 17	Coastal Drainage	0.3	PFO1C	O							O				
N-18	Newington 18	Coastal Drainage	9.0	PFO1E & PEM1E	O	O	O	O	O	✓	✓	O		O		
N-19a	Newington 19a	Coastal Drainage	0.0	PFO1C	✓			O	O			O				
N-19b	Newington 19b	Coastal Drainage	0.8	PEM1E	✓			O	O			O				
N-19c	Newington 19c	Coastal Drainage	1.6	PEM1E		O		O	O							
N-20a	Newington 20a	Coastal Drainage	17.3	PSS/EM1E	✓	O		O	O			O				
N-20b	Newington 20b	Coastal Drainage	1.9	PSS/EM1E & PFO1E		O		O	O							
N-21	Newington 21	Coastal Drainage	1.5	PEM1E & R2UB3Hb		O	✓	O	O	✓		✓				
N-22	Newington 22	Coastal Drainage	1.5	PEM1E & PFO1E		O		O	O	✓		✓				
N-23	Newington 23	Coastal Drainage	0.4	PFO1C	O	O		O	✓							

Figure 3.6-4
Summary of Wetland Resources (Sheet 1 of 2)

Wetland Number	Wetland Name	Watershed	Total Wetland Area (acres)	Cover Type(s)	Groundwater Recharge/ Discharge	Floodflow Alteration	Fish and Shellfish Habitat	Sediment/ Toxicant Retention	Nutrient Removal	Production Export	Sediment/ Shoreline Stabilization	Wildlife Habitat	Recreation	Educational/ Scientific Value	Uniqueness/ Heritage	Visual Quality/ Aesthetics
D-1	Dover 1	Coastal Drainage	0.5	PEM1E & PFO1E	O	O		O	O							
D-1a	Dover 1a	Coastal Drainage	0.1	PEM1A				O	✓							
D-2	Dover 2	Coastal Drainage	2.6	PFO1E & PSS1E & PEM1E	O	O		O	O			O		✓		
D-3	Dover 3	Coastal Drainage	0.1	PEM1E	✓	O		O	O			✓				
D-4	Dover 4	Bellamy River	0.2	PFO1E & PEM1E	✓	✓		O	O			✓				
D-5	Dover 5	Coastal Drainage	0.5	PFO1B	O							O				
D-6	Dover 6	Bellamy River	0.1	PEM1E	✓	O		O	✓			✓				
D-7	Dover 7	Bellamy River	0.2	PFO1B	O			✓	✓			O				
D-7a	Dover 7a	Bellamy River	14.3	PFO1/4E	O	✓		O	O			O	O	✓		
D-8	Dover 8	Bellamy River	0.8	PFO1/4E	O	O		✓	✓			O				
D-9	Dover 9	Coastal Drainage	1.4	PFO1E & PEM1E	✓	O		O	O			✓				
D-10	Dover 10	Coastal Drainage	9.0	PFO1E/& PEM1E	O	O		O	O			O				
D-11	Dover 11	Coastal Drainage	1.8	PEM1E		O		O	O	✓						
D-12	Dover 12	Coastal Drainage	0.7	PEM1E & PFO1E		O		O	O							

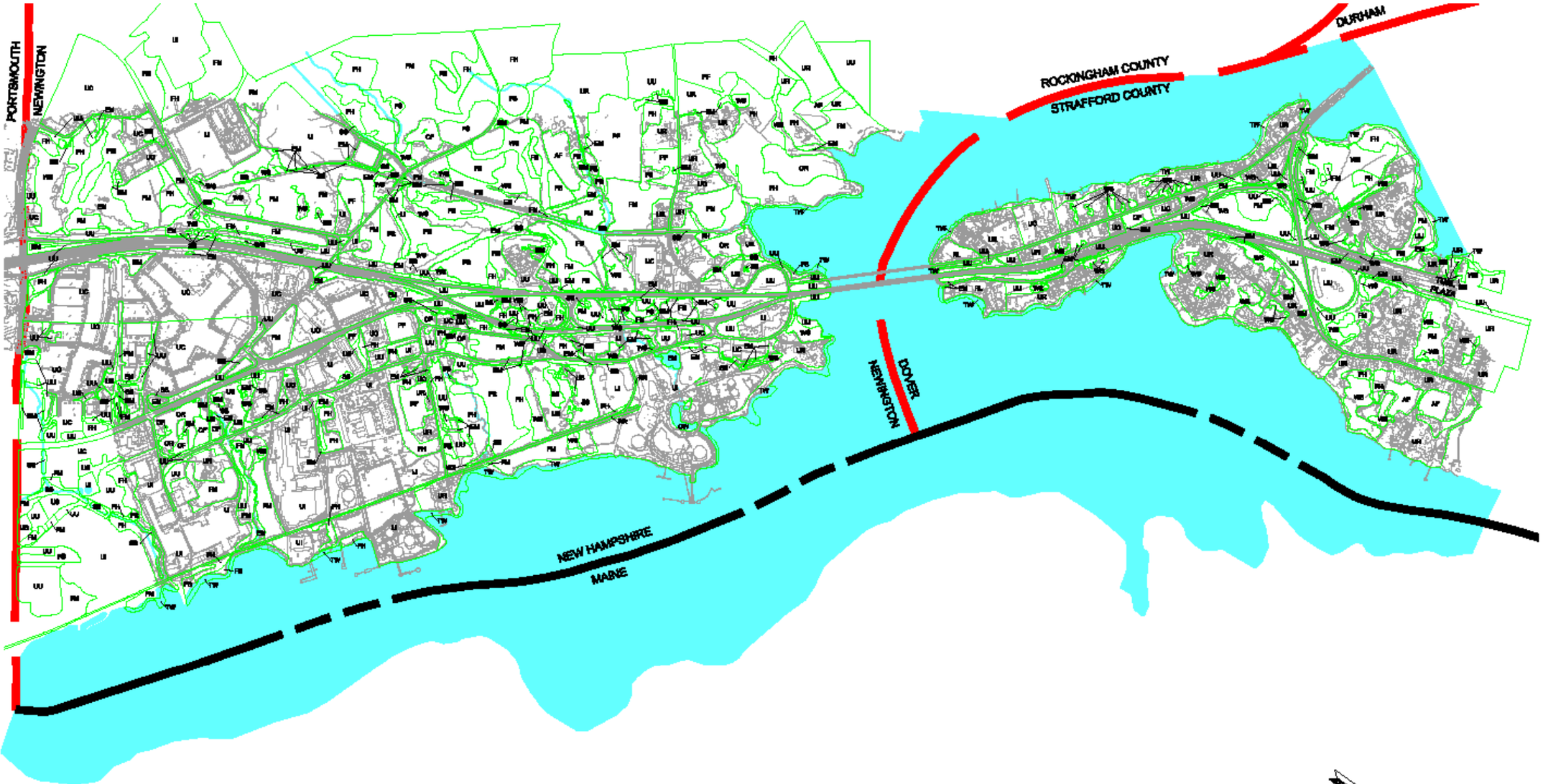
✓ = Function Present

O = Principal Function

Note: No known populations of wetland-dependent threatened or endangered species are present in the study area wetlands that are subject to impact from the proposed alternatives.

Figure 3.6-4
Summary of Wetland Resources (Sheet 2 of 2)

New Hampshire DOT
Department of Transportation



Legend:

	SURFACE WATERS
	TOWNLINE
	STATELINE
TW	Tidal Wetland
UI	Urban Industrial
UC	Urban Commercial
OW	Open Water
UU	Urban Undeveloped
US	Upland Shrub
FM	Forested Mixed
FH	Forested Hardwood
FS	Forested Softwood
RR	Railroad
UR	Urban Residential
PF	Pasture, Field
OR	Orchard
AF	Agriculture Field
OF	Old Field
RL	Recreational Land
WS	Wooded Swamp
SS	Scrub-Shrub Swamp
EM	Emergent Marsh

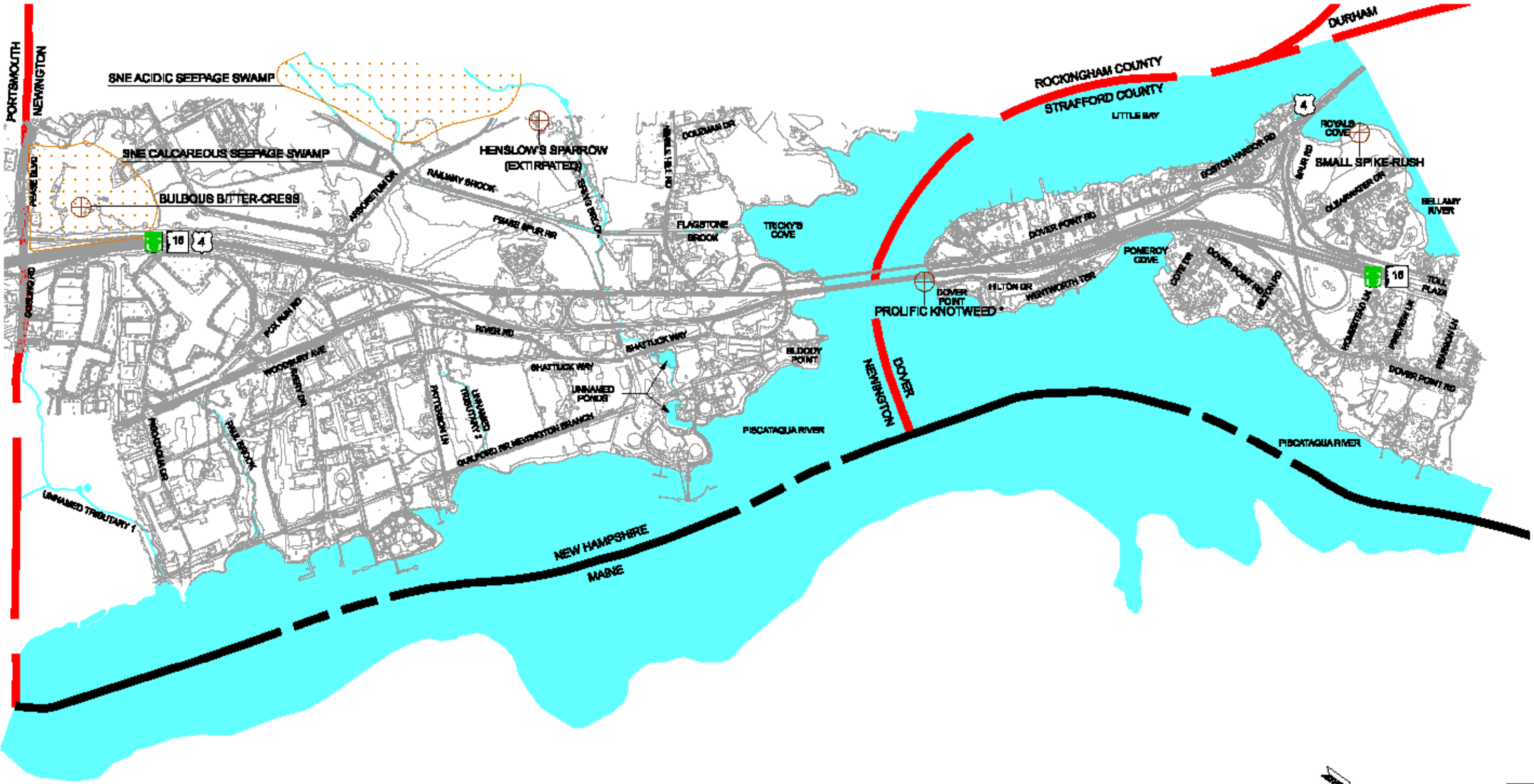
N

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.7-1
Wildlife Habitat Cover Types

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- POPULATION OF PROTECTED SPECIES
- EXEMPLARY NATURAL COMMUNITY (NHNHB)

* Prolific knotweed population known only from an historic record.

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.8-1
Threatened and Endangered Species

New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- WATERSHED BOUNDARY

PORTSMOUTH
NEWINGTON
DURHAM
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
GREAT BAY WATERSHED
BELLAMY RIVER WATERSHED
COASTAL DRAINAGE WATERSHED
PEASE BLVD
CORPORATE DR
ARBORETUM DR
RAILWAY BROOK
FRANKLIN PIERCE HWY
FLAGSTONE BROOK
THOMPSONS BROOK
COLEMAN DR
NEWINGTON RD
TRICKY'S COVE
BOSTON HARBOR RD
ROYAL'S COVE
BAY RD
CLEARWATER DR
BELLAMY RIVER
DOVER POINT RD
POMEROY COVE
COVE DR
DOVER POINT
HILTON DR
WENTWORTH DR
TOLL PLAZA
DOVER POINT RD
FOX RUN RD
WOODBURY AVE
RIVER RD
SHATTUCK WAY
BLOODY POINT
UNNAMED PONDS
UNNAMED TRIBUTARY 2
PATTERSON LN
GUILFORD RR NEWINGTON BRANCH
PISCATAQUA RIVER
NEWINGTON
DOVER
RIVERSIDE DR
TAGE BROOK
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

Note: The watershed boundaries shown here are taken from the USGS HUC 12-digit code (from GRANIT). The break between the Great Bay watershed and the Coastal Drainage was modified based on field observations of the Railway / Flagstone / Pickering Brook system with the USGS boundary shown as a dashed line and the modified boundary shown as a solid line.

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.9-1
Watersheds and Surface Water Resources

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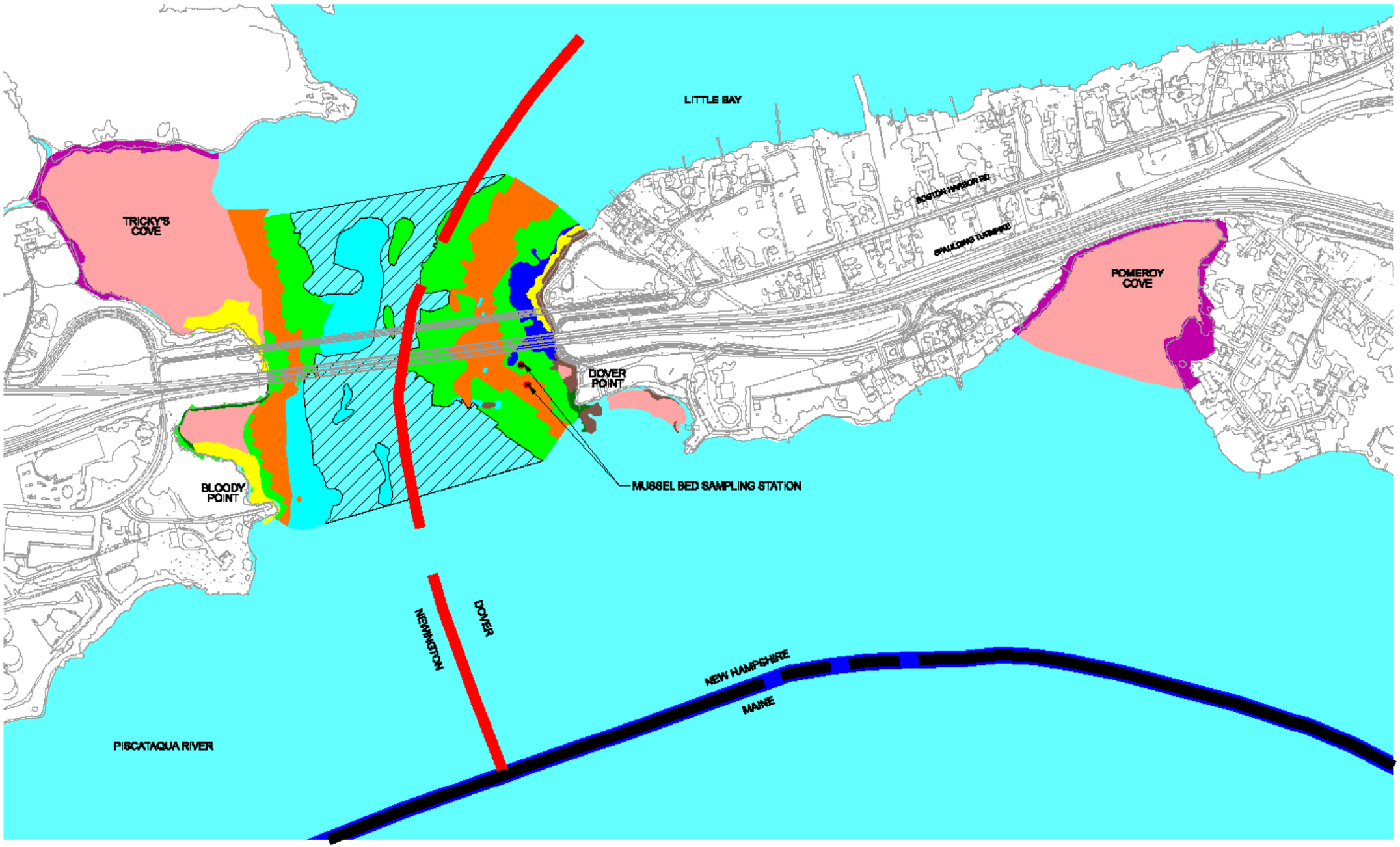


New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE

INTERTIDAL HABITATS

- HARD BOTTOM WITH ROCKWEED
- MUDFLAT
- ROCK / ALGAL / ABUNDANT MUSSEL
- ROCK / ALGAL / SPARSE MUSSEL
- SALT MARSH
- SCATTERED ROCK / ALGAL / SOFT SEDIMENT

SUBTIDAL HABITATS

- KELP BED
- MACROALGAL (NON-KELP) BED
- MUSSEL REEF
- OTHER
- MUSSEL BED SAMPLING STATION

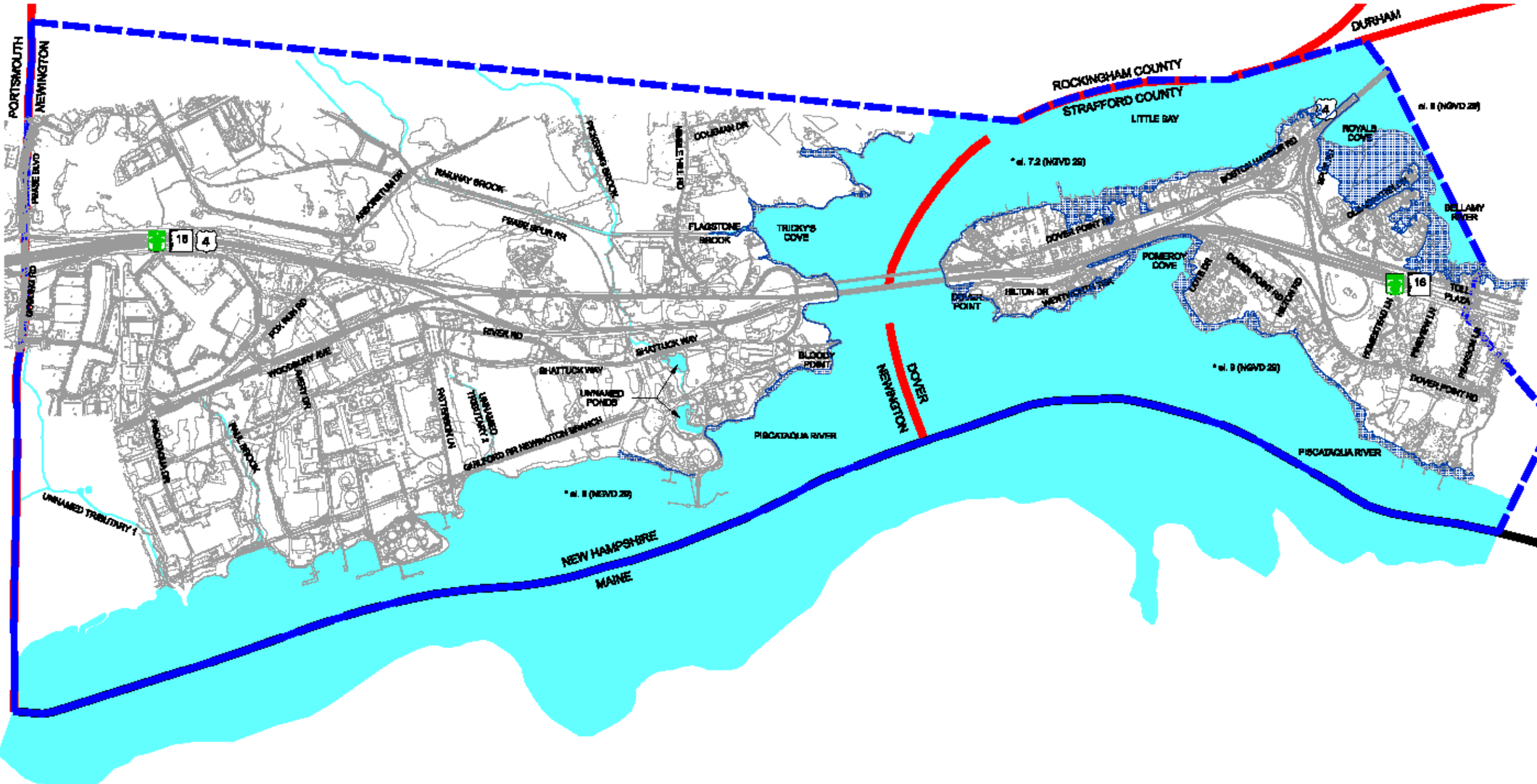
N

0 250 500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.10-1
Intertidal and Subtidal Habitats

New Hampshire DOT
Department of Transportation



Legend:

- STREAM
- OPEN WATER
- 100-YEAR FLOODPLAIN

0 750 1500 Feet

* 100-Year Flood Elevation

Source: FEMA Flood Insurance Study
Rockingham County Study #33015CZ001A (May 3, 2005)
Strafford County Study #33017CZ000A (May 17, 2005)

Vanasse Hangen Brustlin, Inc.

Figure 3.11-1
Study Area Floodplain Map

New Hampshire DOT
Department of Transportation

PORTSMOUTH
NEWINGTON
DURHAM
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
PEASE BLVD
CORPORATE DR
RAILWAY BROOK
PEASE INTER RR
FLAGSTONE BROOK
TRICKY'S COVE
DOLLOMAN DR
THOMPSONS BROOK
NEWINGTON HILL RD
BOSTON HARBOR RD
ROYALS COVE
SPUR RD
CLEARWATER DR
BELLAMY RIVER
DOVER POINT RD
POMEROY COVE
COVE DR
HILTON DR
WENTWORTH TER
DOVER POINT
TOLL PLAZA
HOMESTEAD LN
PINE RIVER LN
PEMBROKE LN
FOX RUN RD
WOODBURY AVE
RIVER RD
SHATTUCK WAY
UNNAMED POND
BLIDDOY POINT
DOVER
NEWINGTON
PISCATAQUA RIVER
PISCATAQUA RIVER
PINE BROOK
PATTERSON LN
UNNAMED TRIBUTARY 2
GUILFORD RR NEWINGTON BRANCH
UNNAMED TRIBUTARY 1
NEW HAMPSHIRE
MAINE

Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- WELLHEAD PROTECTION AREA (NHDES PHASE 1)
- PRIVATE WELLS WITH 75' WELL PROTECTION ZONE

USERS OF 20,000+ (GAL./DAY)

- (B) SURFACE WATER
- (G) GROUNDWATER
- (T) TRANSFERRED WATER BETWEEN TWO FACILITIES

TRANSMISSIVITY VALUES (SQ. FT/DAY)

- 4000 - 6000
- 2000 - 4000
- 1000 - 2000
- 1 - 1000

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.12-1
Groundwater Resources

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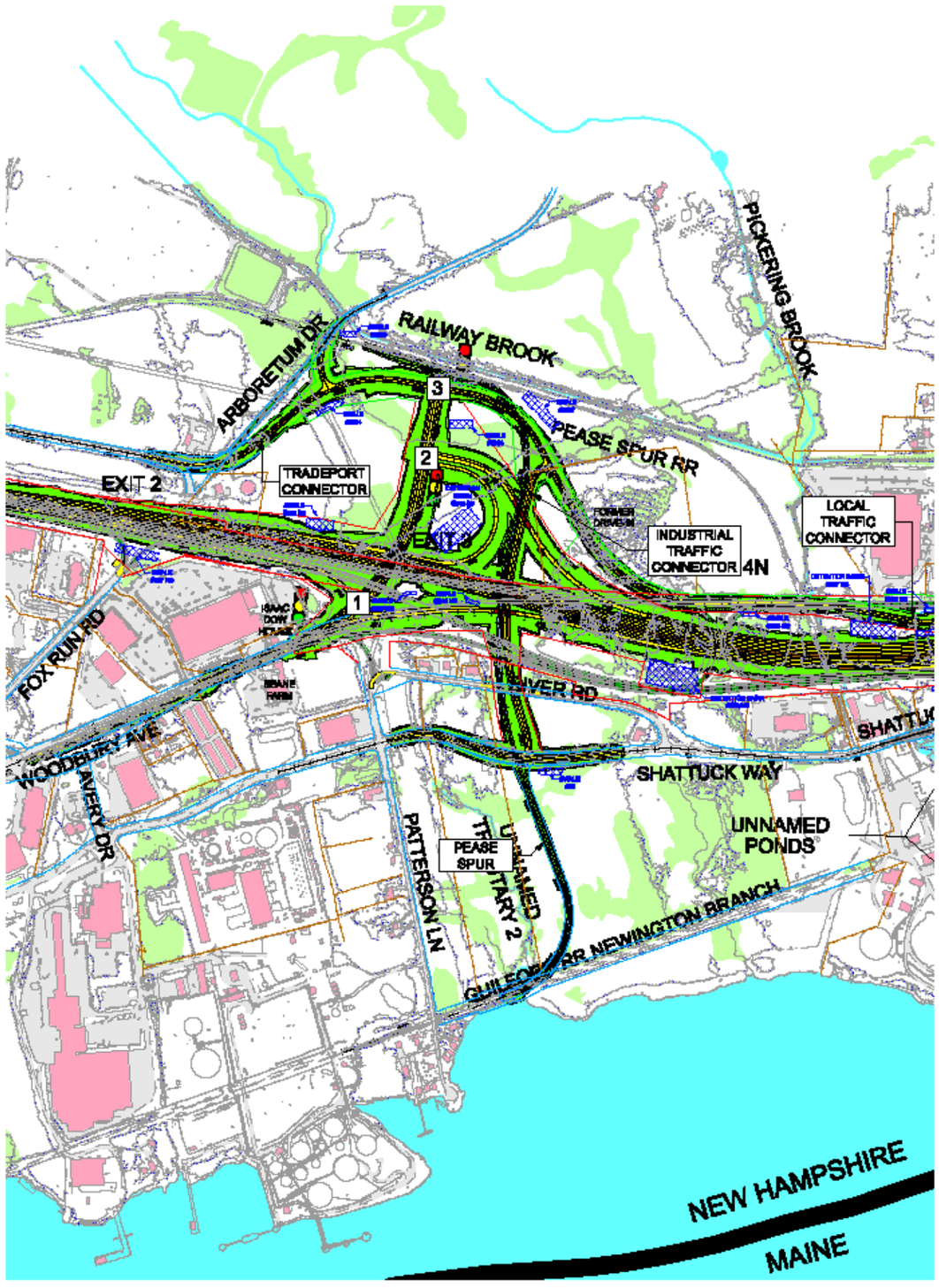
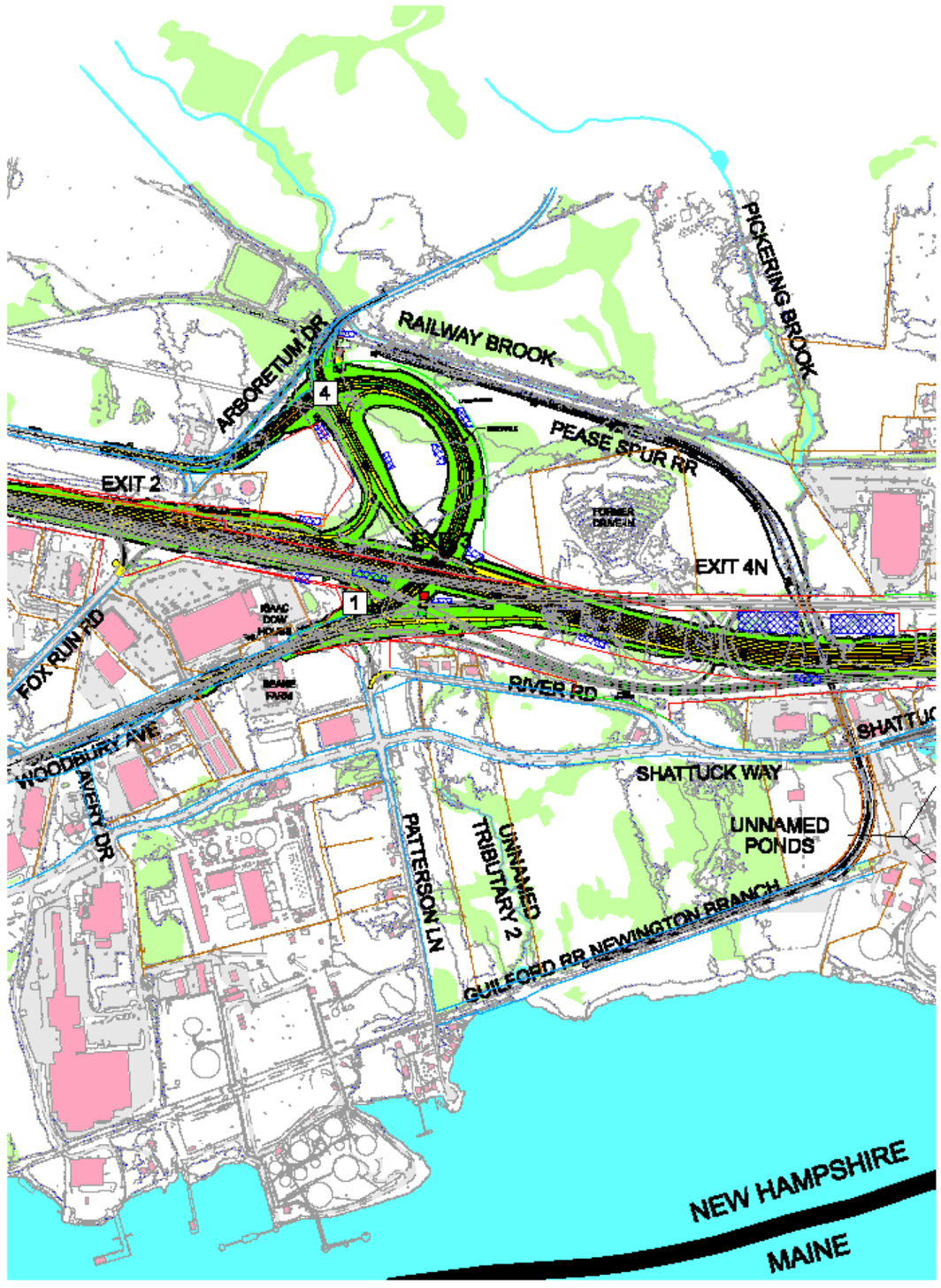
NEWINGTON ALTERNATIVE 12A*



* Newington Alternative 10A and 12A have Similar Signalized Intersection Configurations.

NEWINGTON ALTERNATIVE 13



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- # Microscale Study Area Intersection Location

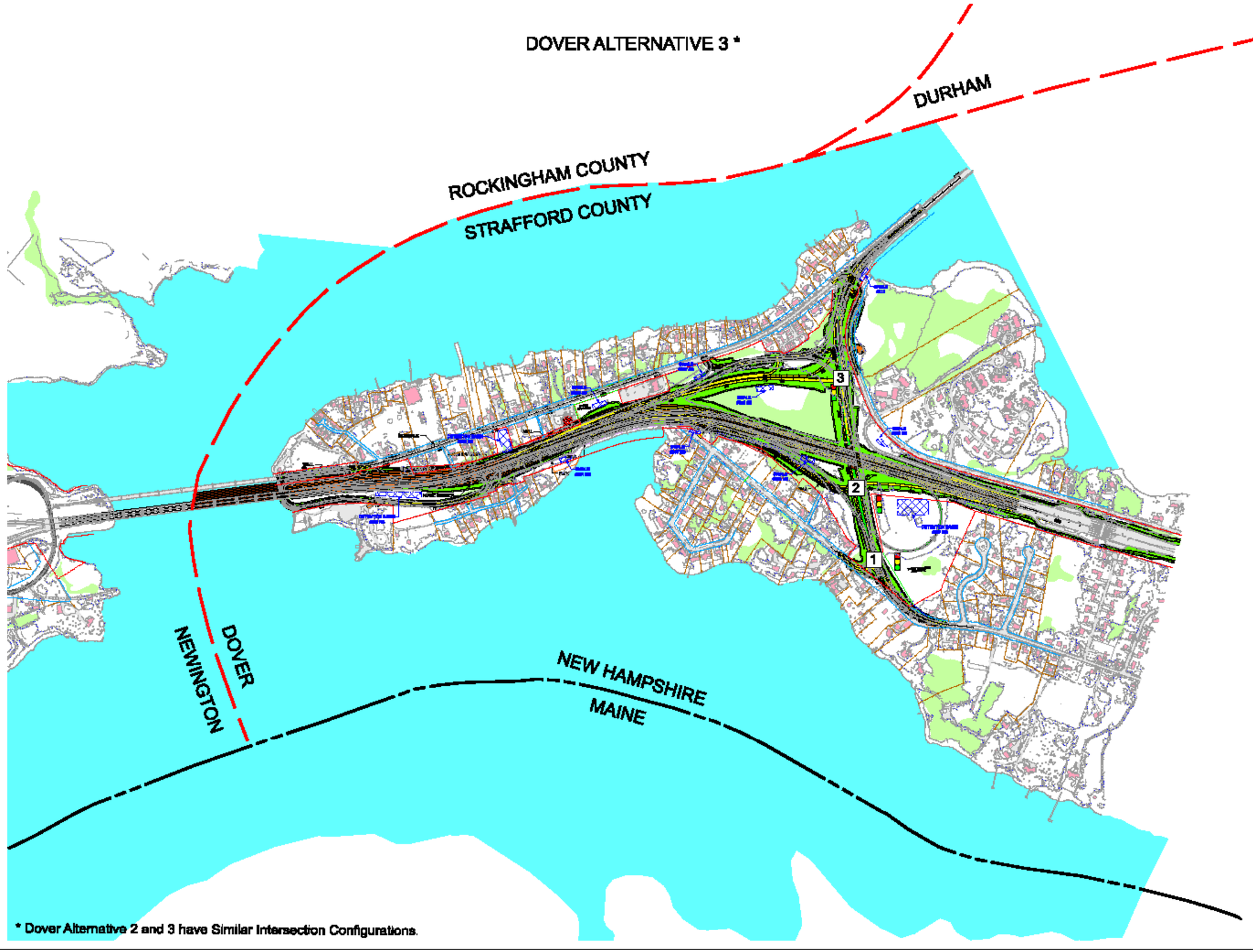
N

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.13-1
Microscale Study Area Intersections, Newington Alternatives

Date Created: 12/9/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- # Microscale Study Area Intersection Location

N

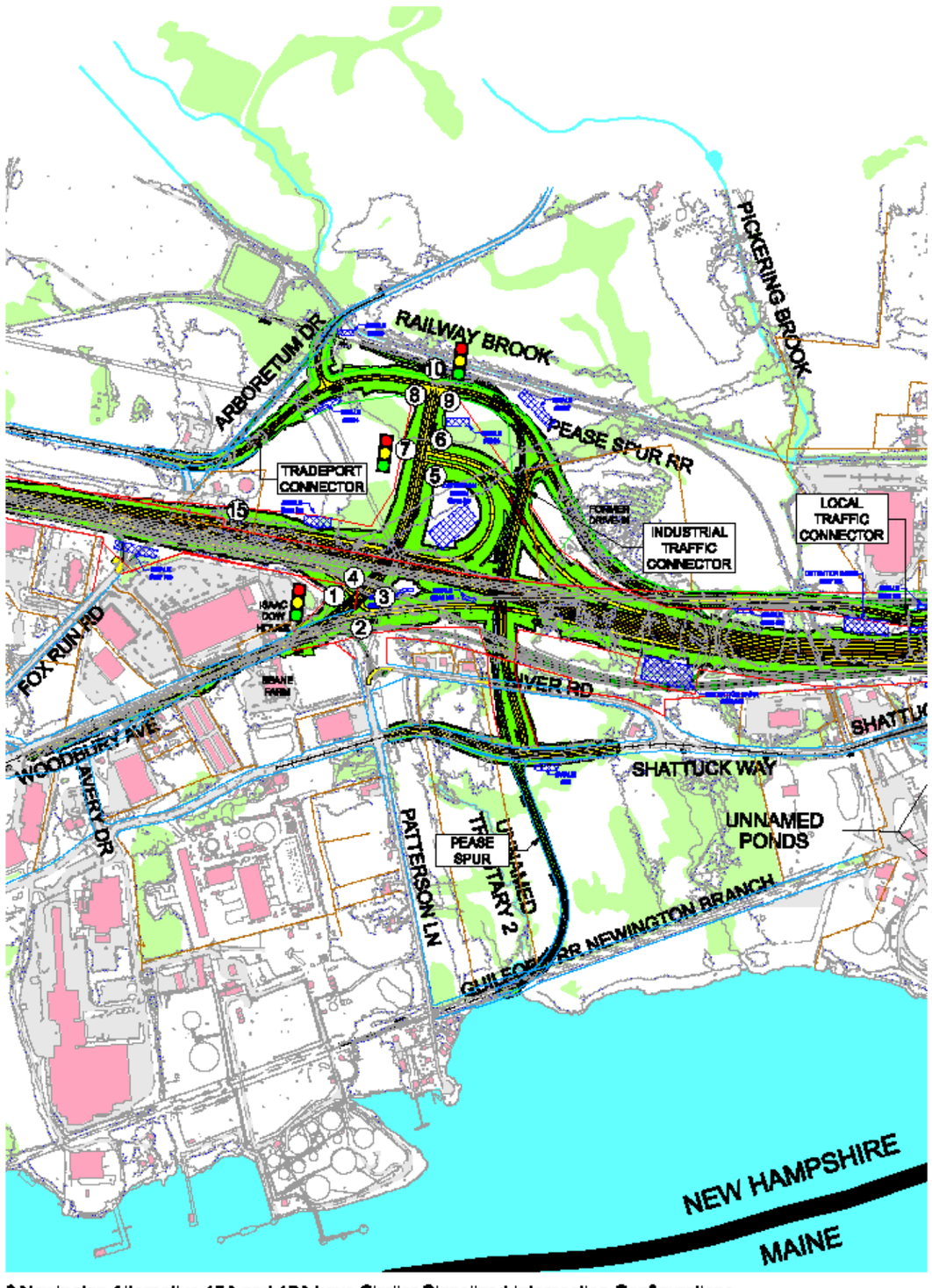
0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.13-2
Microscale Study Area Intersections, Dover Alternatives

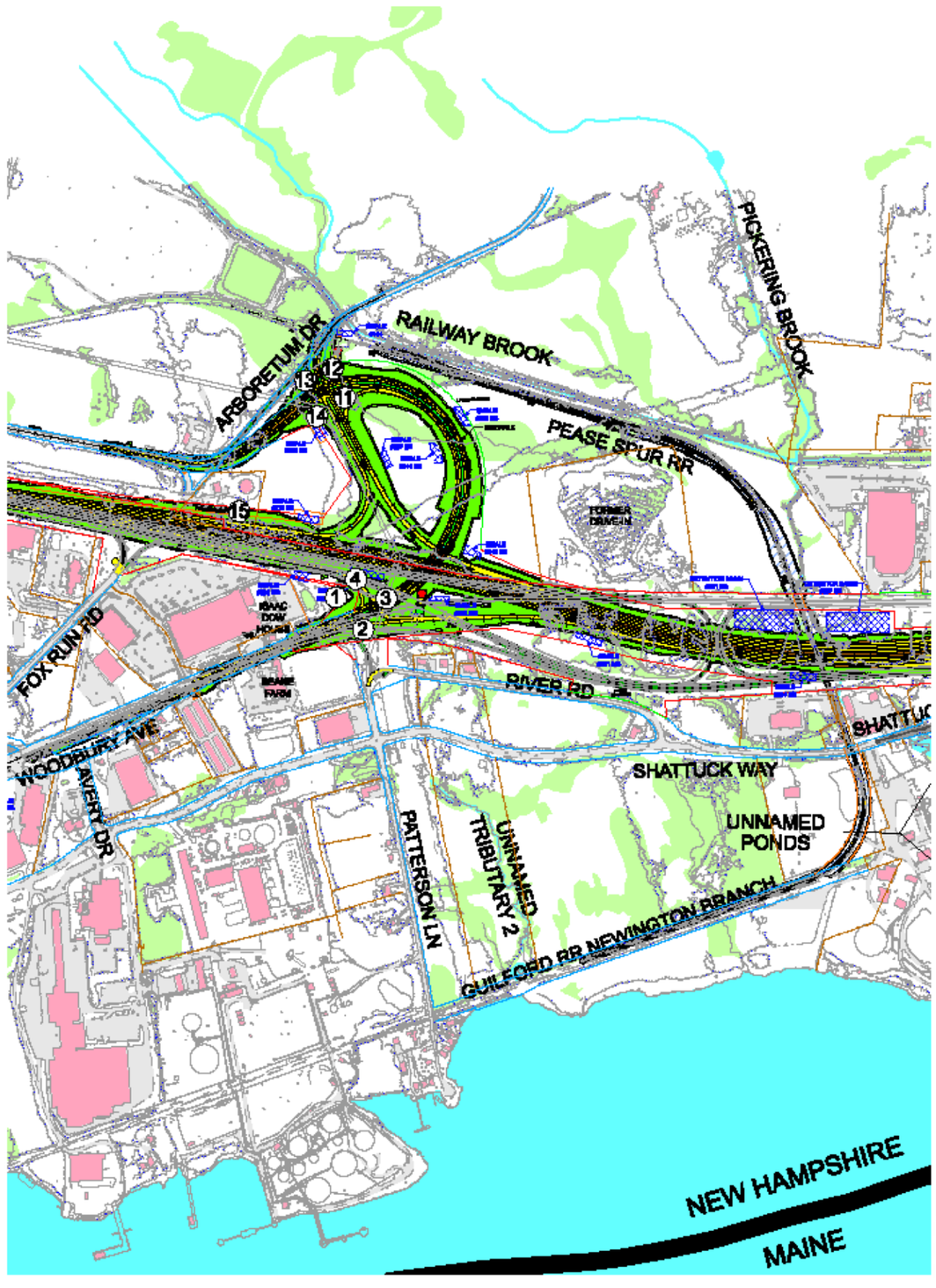
Date Created: 1/29/2007

NEWINGTON ALTERNATIVE 12A *



* Newington Alternative 10A and 12A have Similar Signalized Intersection Configurations.

NEWINGTON ALTERNATIVE 13



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- (#) Microscale Receptor Location

N

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.13-3
Microscale Receptor Locations
Newington Alternatives

Date Created: 10/9/2007

DOVER ALTERNATIVE 3 *

DURHAM

ROCKINGHAM COUNTY

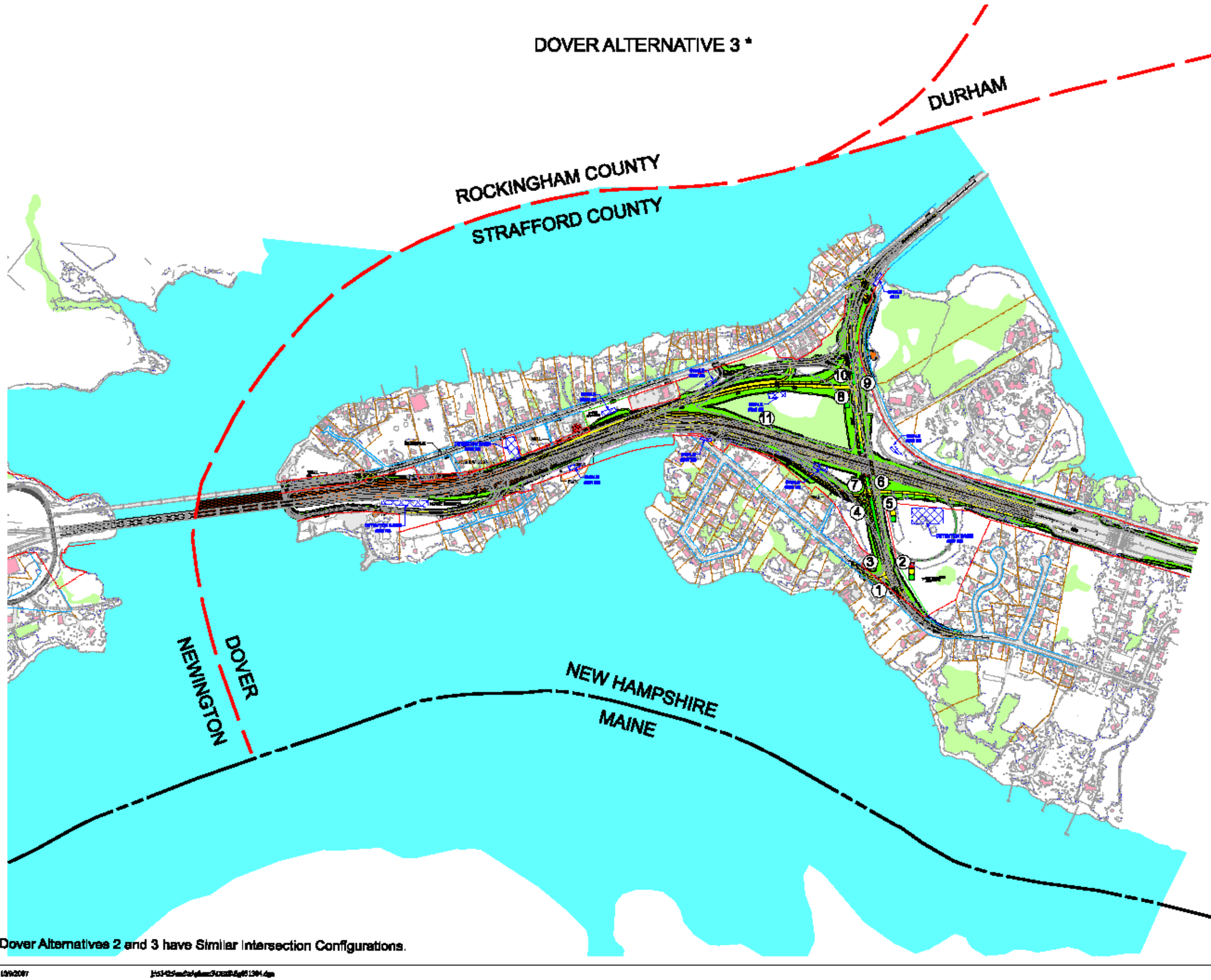
STRAFFORD COUNTY

DOVER

NEWINGTON

NEW HAMPSHIRE

MAINE



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Newington Interim Safety Improvements
- (#) Microscale Receptor Location

N

0 400 800 Feet

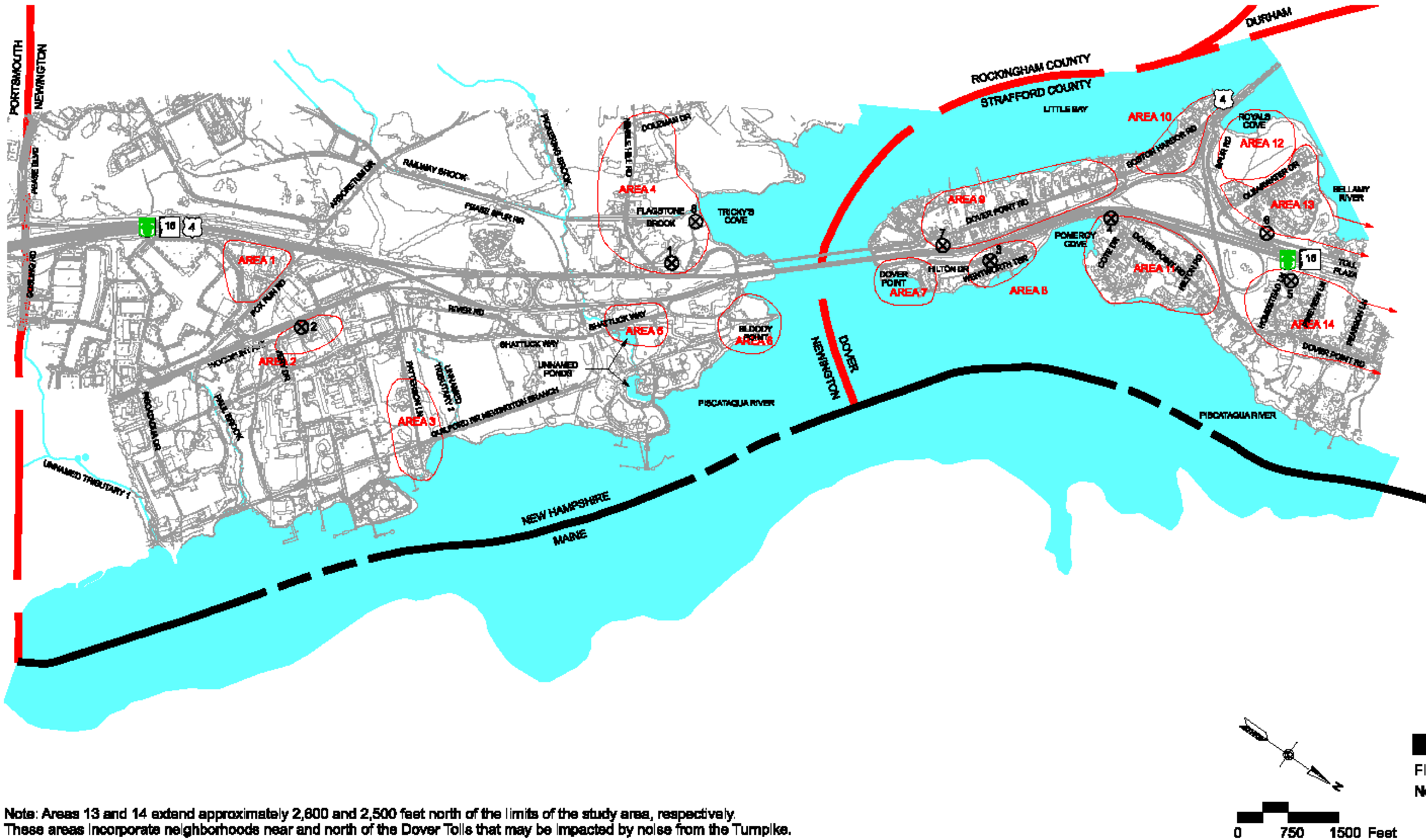
Vanasse Hangen Brustlin, Inc.

Figure 3.13-4
Microscale Receptor Locations
Dover Alternatives

* Dover Alternatives 2 and 3 have Similar Intersection Configurations.

Date Created: 12/9/2007

New Hampshire **DOT** *Department of Transportation*



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- EXISTING NOISE MONITORING LOCATION
- NOISE EVALUATION AREA

Vanasse Hangen Brustlin, Inc.

Figure 3.14-1

Noise Sensitive Receptor Locations

Note: Areas 13 and 14 extend approximately 2,600 and 2,500 feet north of the limits of the study area, respectively.
These areas incorporate neighborhoods near and north of the Dover Tolls that may be impacted by noise from the Turnpike.

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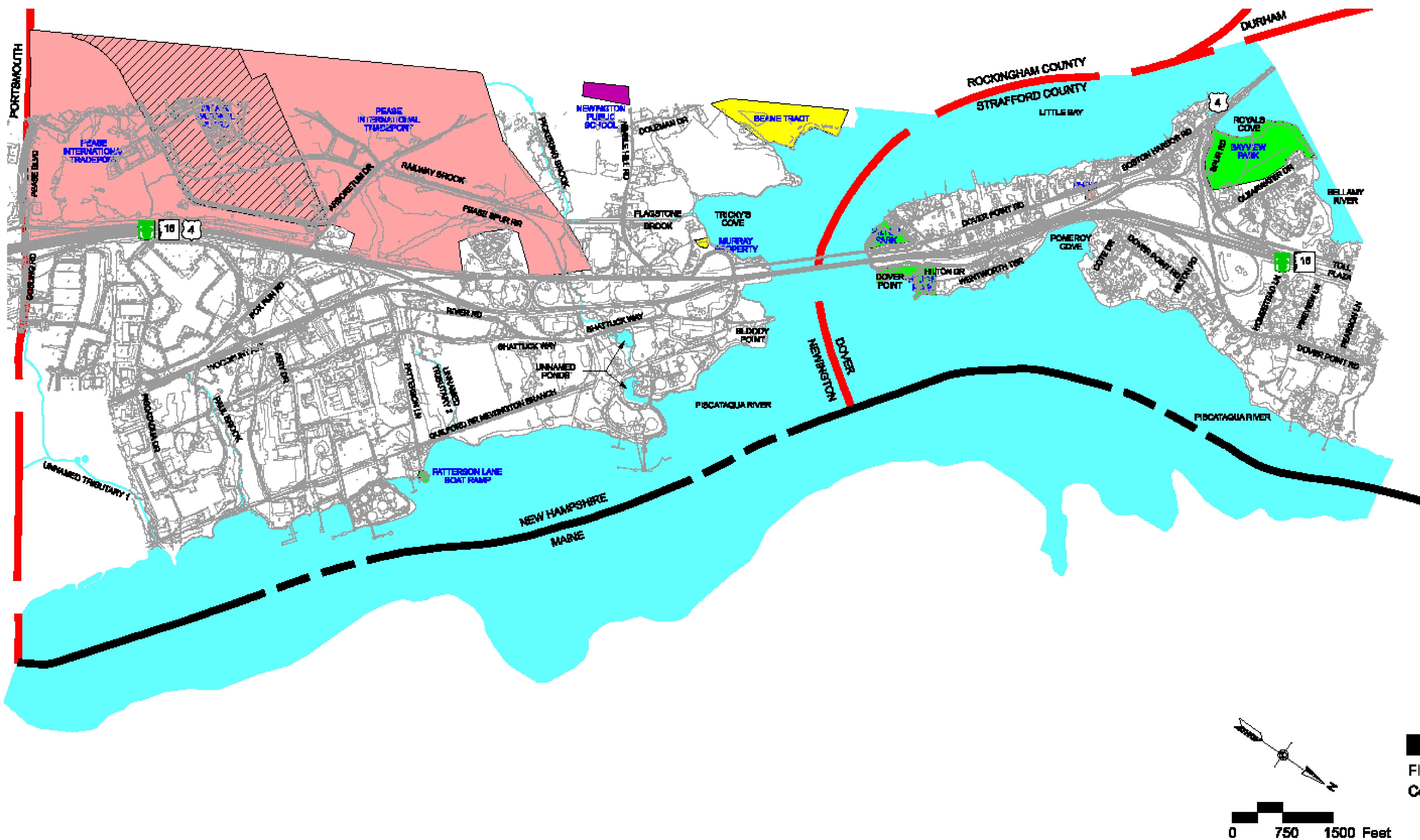
New Hampshire DOT
Department of Transportation

Legend:

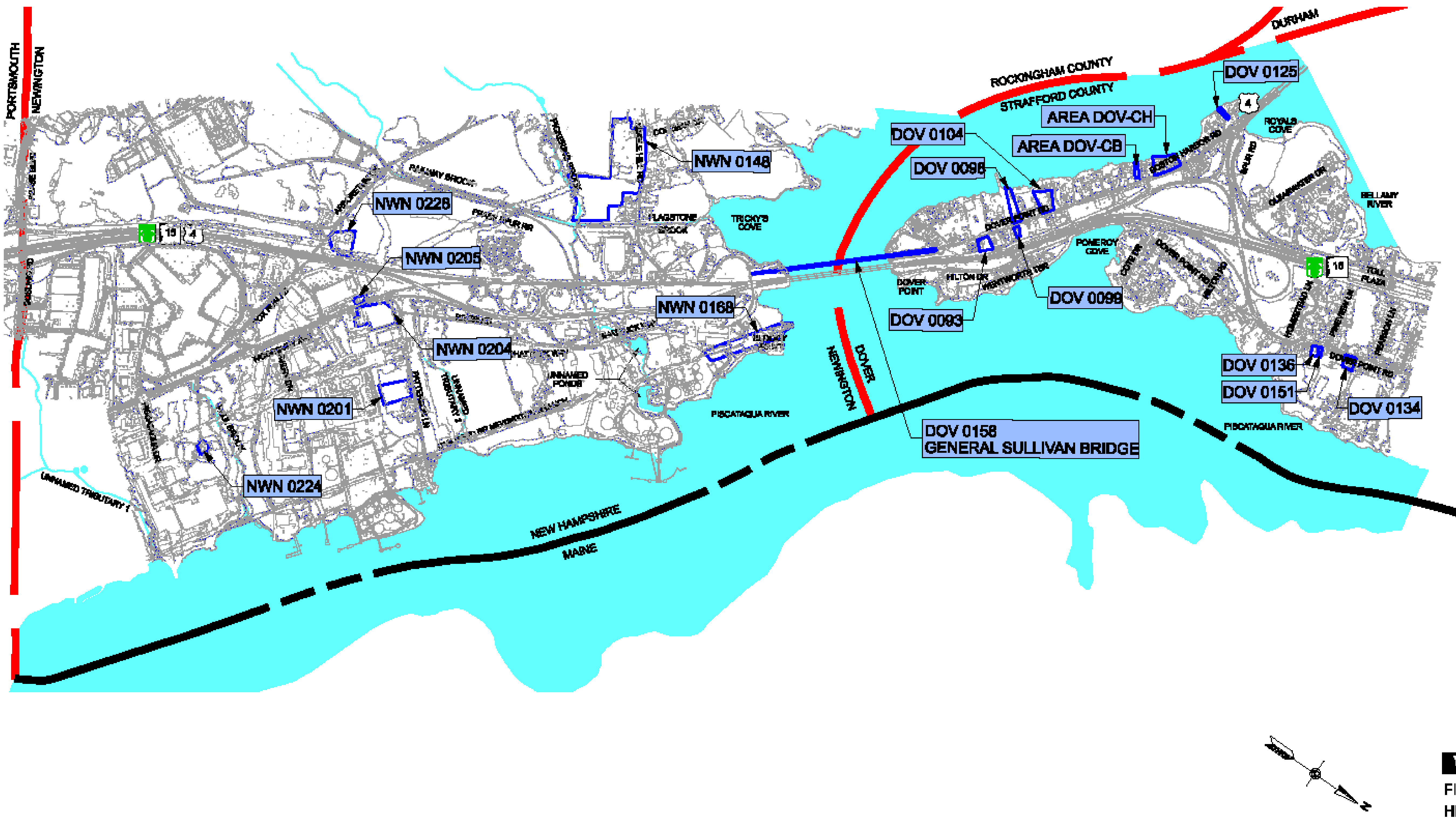
- SURFACE WATERS
- TOWNLINE
- STATELINE
- PEASE INTL. TRADEPORT
- NH AIR NATIONAL GUARD
- PARKS AND RECREATION
- SCHOOL
- CONSERVATION LAND



Vanasse Hangen Brustlin, Inc.

Figure 3.15-1
Community Resources

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- NWN/DOV — HISTORIC STRUCTURE (LISTED OR ELIGIBLE FOR LISTING)
- BOUNDARY OF LISTED OR ELIGIBLE PROPERTY

Vanasse Hangen Brustlin, Inc.

Figure 3.17-1
Historical Structures

Note: The DeRochemont property (NWN 0224) was determined eligible for listing as part of an earlier project.

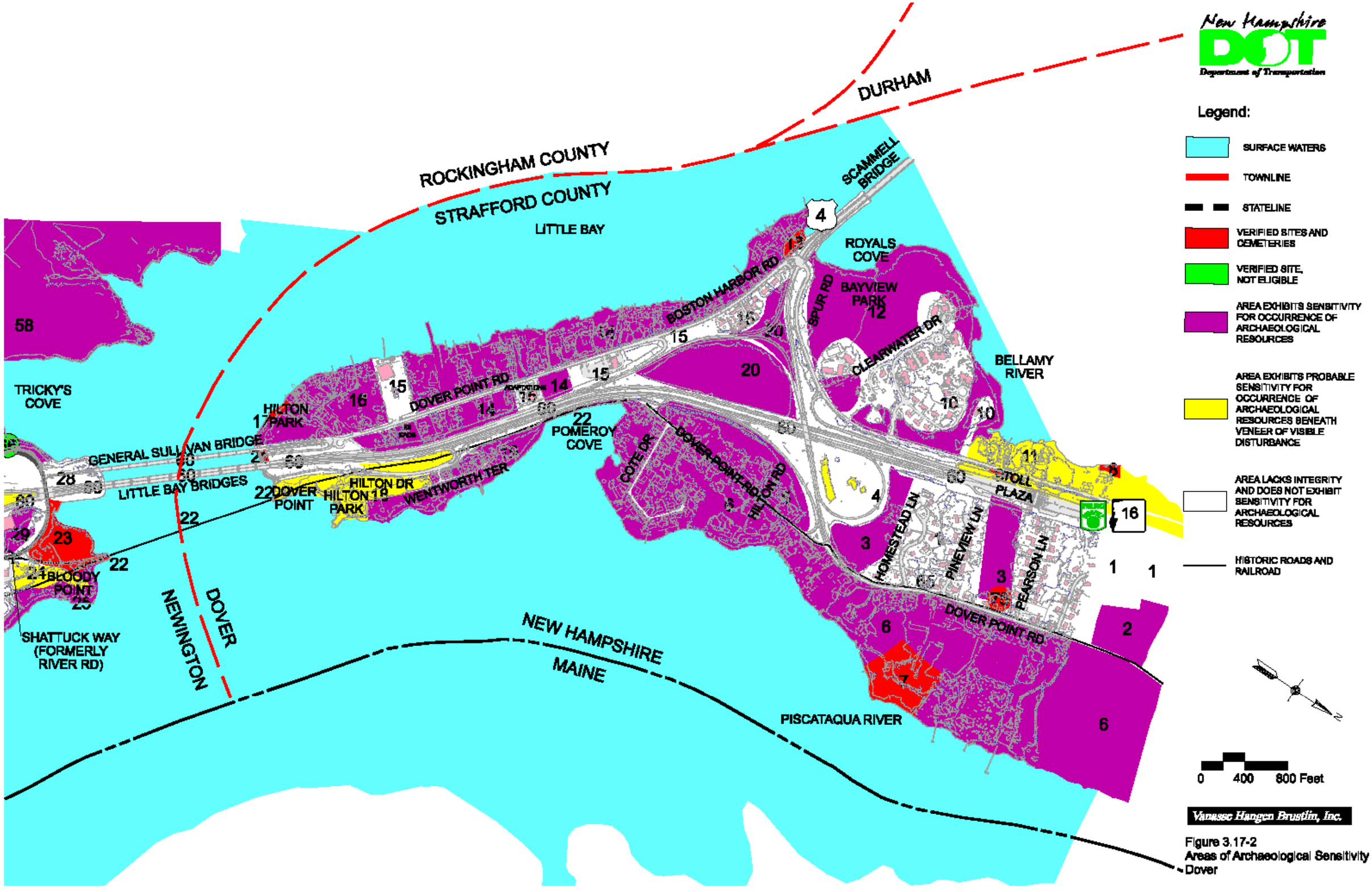


Figure 3.17-2
Areas of Archaeological Sensitivity
Dover

New Hampshire DOT
Department of Transportation

Legend:

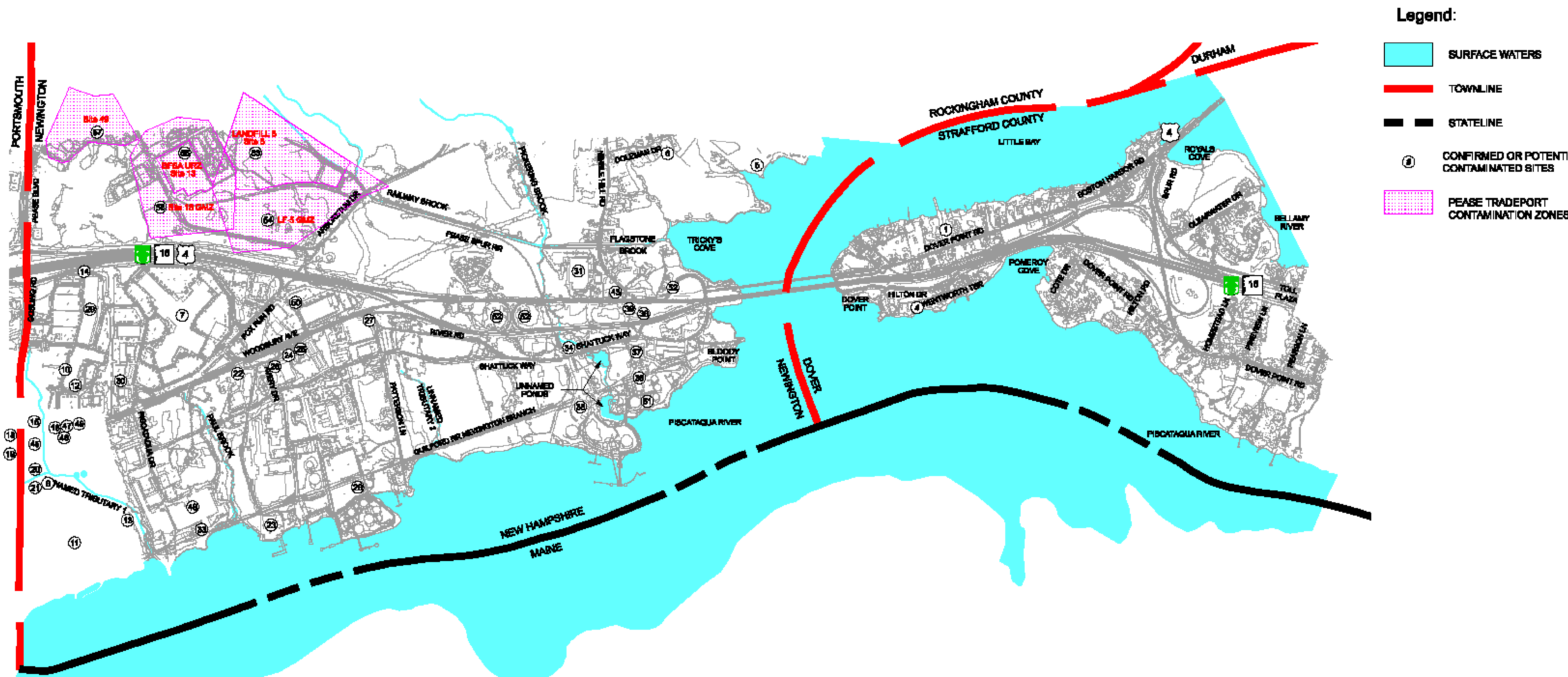
- SURFACE WATERS
- TOWNLINE
- STATELINE
- VERIFIED SITES AND CEMETERIES
- VERIFIED SITE, NOT ELIGIBLE
- AREA EXHIBITS SENSITIVITY FOR OCCURRENCE OF ARCHAEOLOGICAL RESOURCES
- AREA EXHIBITS PROBABLE SENSITIVITY FOR OCCURRENCE OF ARCHAEOLOGICAL RESOURCES BENEATH VENEER OF VISIBLE DISTURBANCE
- AREA LACKS INTEGRITY AND DOES NOT EXHIBIT SENSITIVITY FOR ARCHAEOLOGICAL RESOURCES
- HISTORIC ROADS AND RAILROAD

0 400 800 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.17-3
Areas of Archaeological Sensitivity
Newington

Date Created: 12/9/2007



0 750 1500 Feet

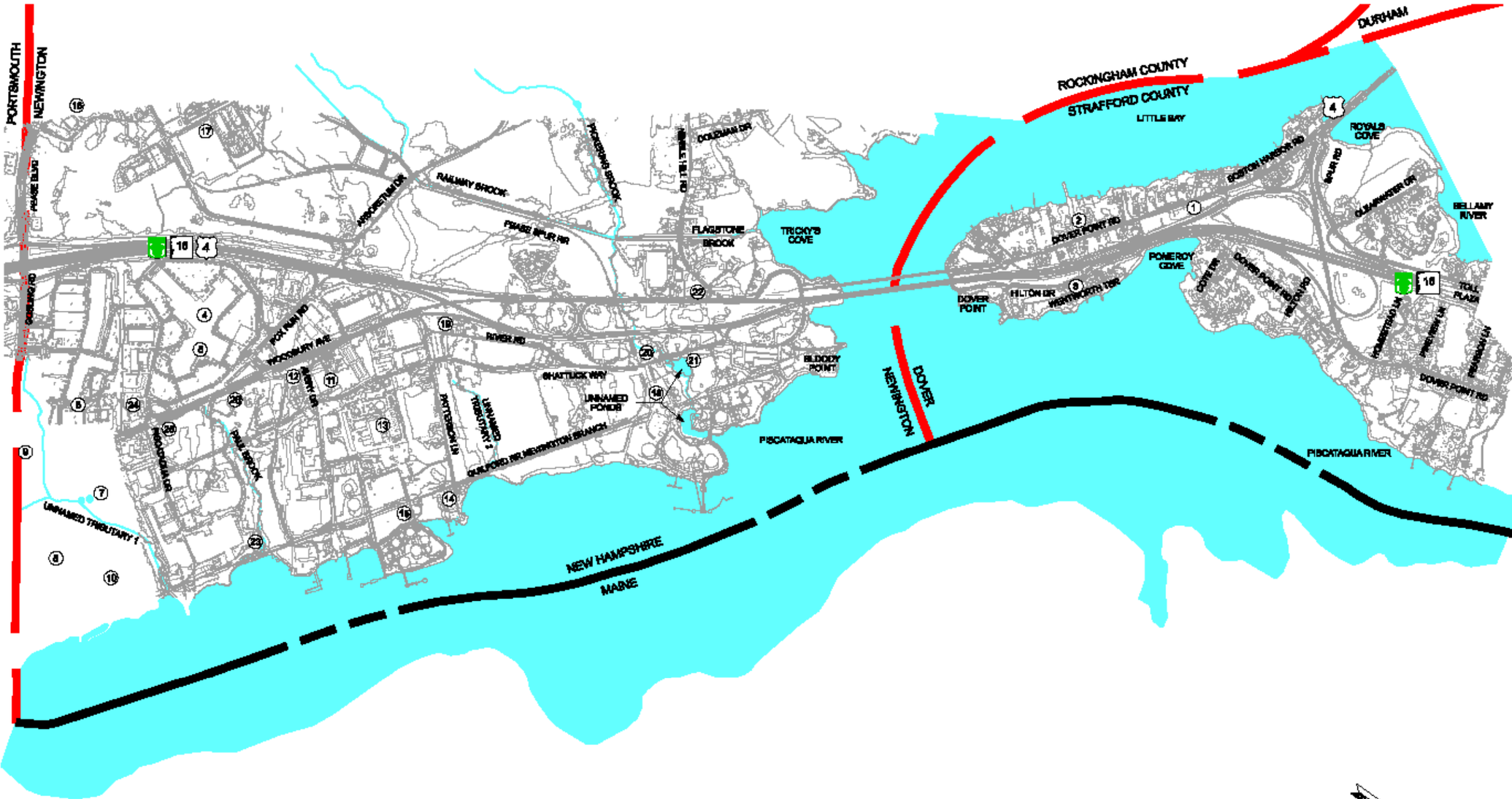
Vanasse Hangen Brustlin, Inc.

Figure 3.18-1
Confirmed and Potential
Contaminated Sites

Note: Refer to Table 3.18-1 of the EIS for site data
Sites 2, 3, 9, 13A, 17, 21A, 40, 41, 42 and 44 are not mapped.
Site 32 supplanted by sites 53 thru 57.

Date Created 10/9/2007 j:\b14\sw\eis\phase3\DEIS\fig031801.dgn

New Hampshire DOT
Department of Transportation



Legend:

- SURFACE WATERS
- TOWNLINE
- STATELINE
- ③ REGISTERED AST/UST SITES

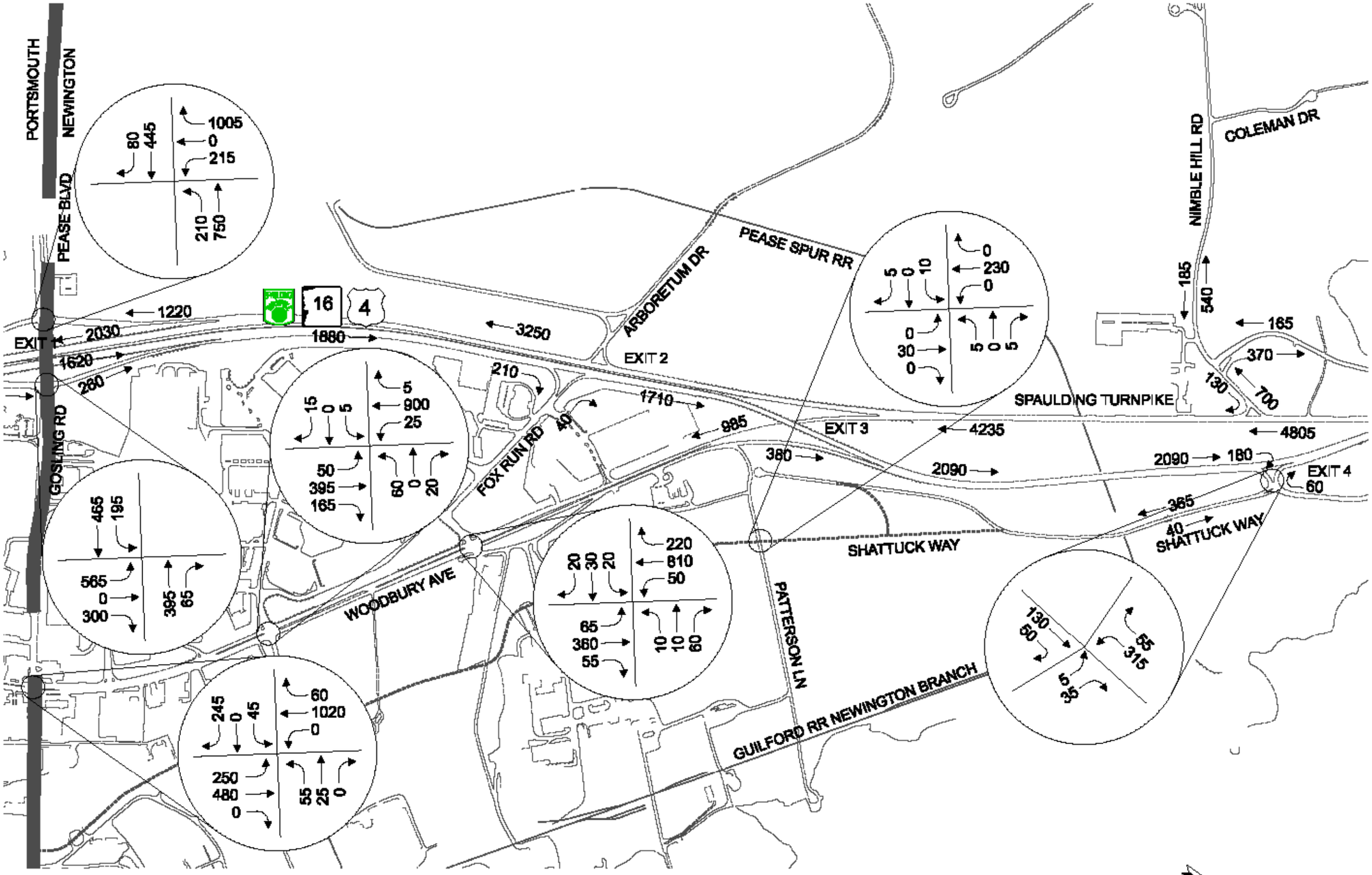
Note: Refer to Table 3.18-2 of the EIS for site data

0 750 1500 Feet

Vanasse Hangen Brustlin, Inc.

Figure 3.18-2
Registered AST/UST Sites

New Hampshire DOT
Department of Transportation

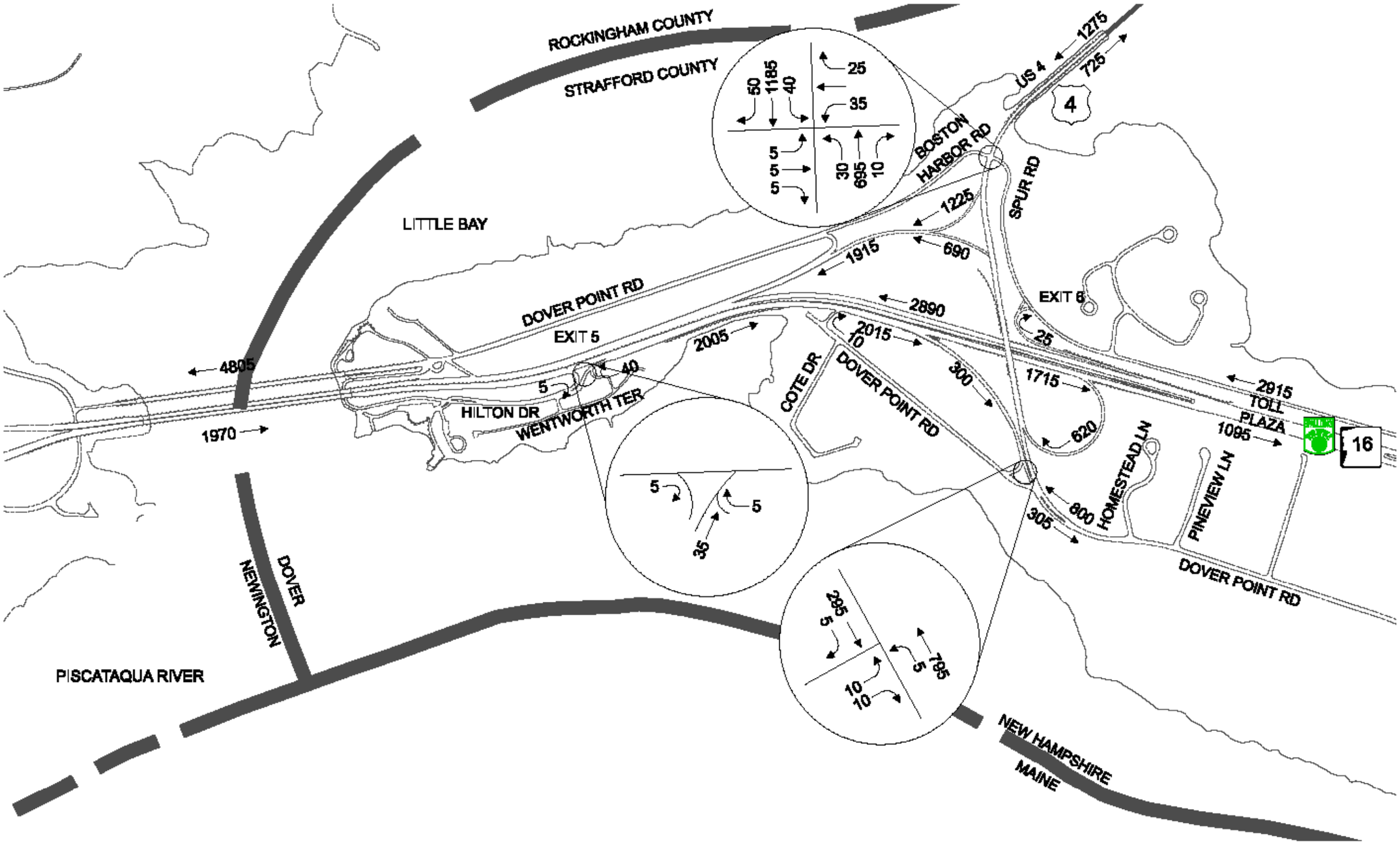


Vanasse Hangen Brustlin, Inc.

Figure 4.2-1 - Newington
2025 No Build
Weekday AM Peak Hour Volumes
Sheet 1 of 2

0 375 750 Feet

New Hampshire DOT
Department of Transportation



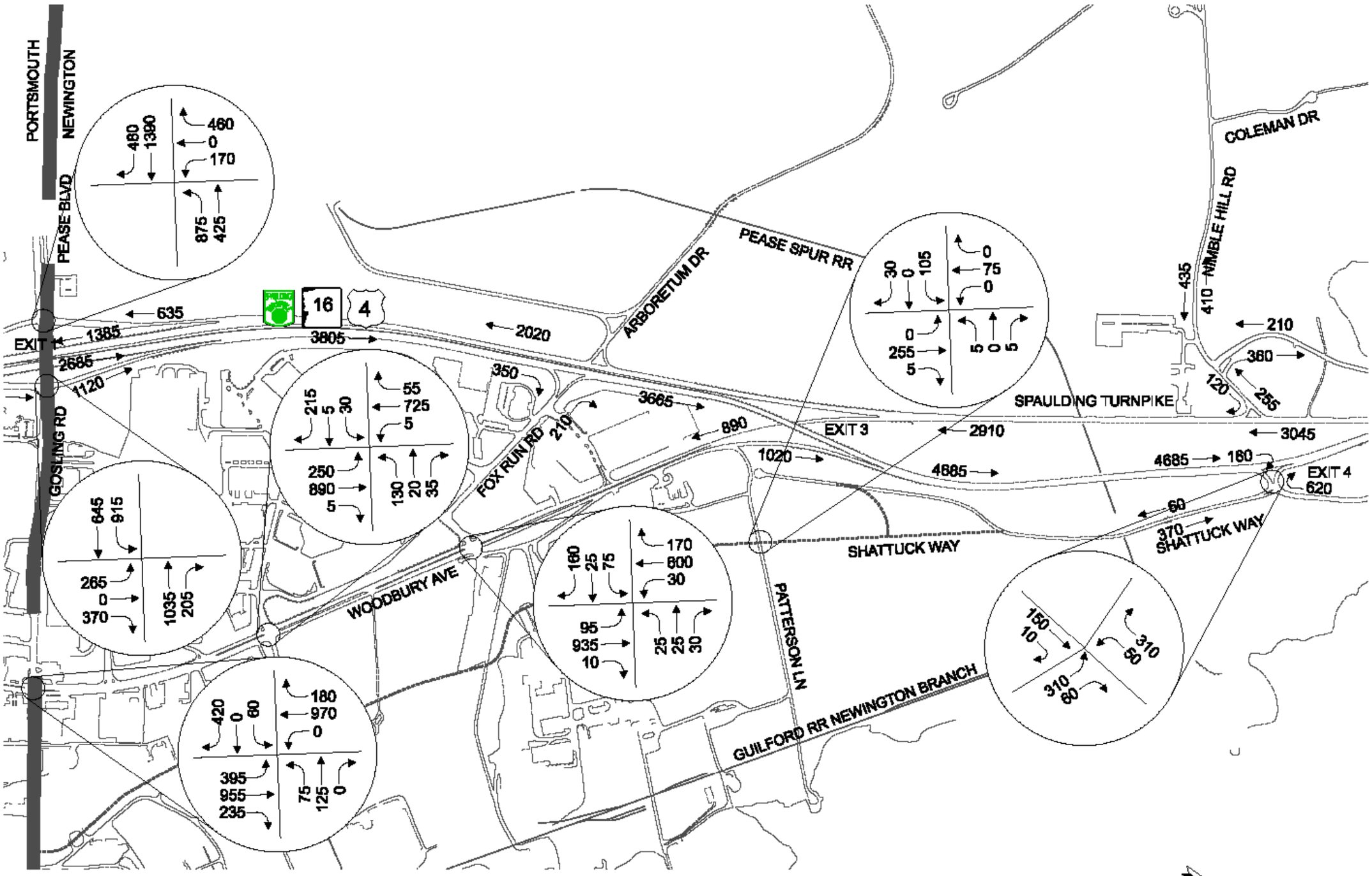
Vanasse Hangen Brustlin, Inc.

Figure 4.2-1 - Dover
2025 No Build
Weekday AM Peak Hour Volumes
Sheet 2 of 2

0 375 750 Feet

Date Created:10/9/2007 jobs\4200\mxd\dwg\4200fb.dgn

New Hampshire DOT
Department of Transportation



Vanasse Hangen Brustlin, Inc.

Figure 4.2-2 - Newington
2025 No Build
Weekday PM Peak Hour Volumes
Sheet 1 of 2

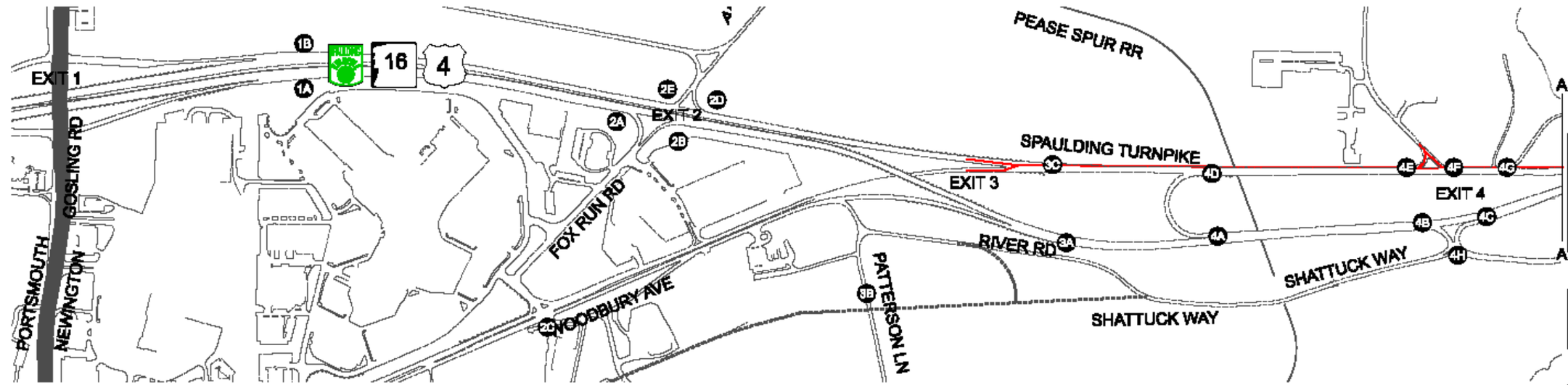
New Hampshire DOT
Department of Transportation

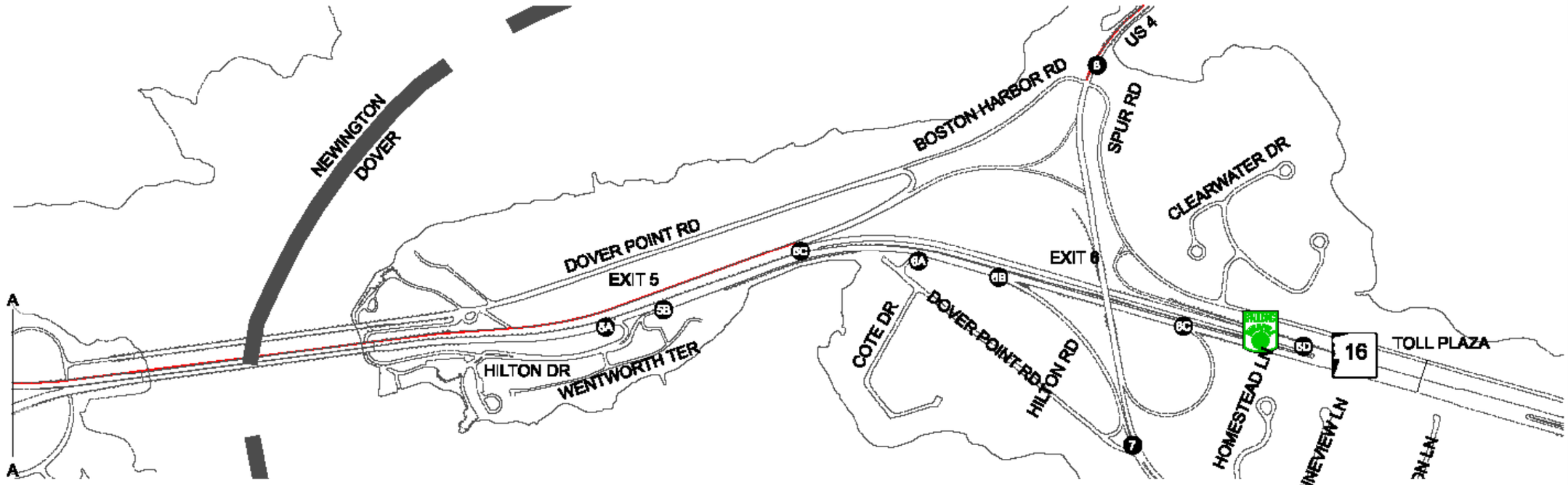
ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
PISCATAQUA RIVER
NEWINGTON
DOVER
NEW HAMPSHIRE
MAINE
DOVER POINT RD
EXIT 5
EXIT 6
HILTON DR
WENTWORTH TER
COTE DR
BOSTON HARBOR RD
SPUR RD
US 4
HOMESTEAD LN
PINEVIEW LN
TOLL PLAZA
16
4
3045
5145
5185
5195
1455
475
980
1590
40
4205
1315
1630
2890
1035
1325
985
630
45
10
5
20
30
40
85
90
1300
625

Vanasse Hangen Brustlin, Inc.

Figure 4.2-2 - Dover
2025 No Build
Weekday PM Peak Hour Volumes
Sheet 2 of 2

0 375 750 Feet





New Hampshire DOT
A Department of Transportation

Arterial LOS

Node		2025 LOS
From	To	
2C	3C	D
3B	4H	C
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2025 LOS
2C	B
8	D

Unsignalized Intersection LOS

Node	2025 LOS
3B	A
4H	B

Weave Analysis LOS

Node		2025 LOS
From	To	
4E	3C	F
6A	6B	B

Ramp Junction LOS

Node	2025 LOS
2A	B
2B	B
3A	B
3C	F
4B	C
4C	B
4E	F
4F	F
5A	B
5B	B
6A	C
6B	C
6C	B
6D	C

Legend:

CAPACITY DEFICIENCY

Freeway LOS

Node		2025 LOS
From	To	
Spaulding Turnpike NB		
1A	2A	C
2B	3A	B
4A	4B	C
4C	5A	C
5B	6A	C
6C	TOLL	B

Freeway LOS

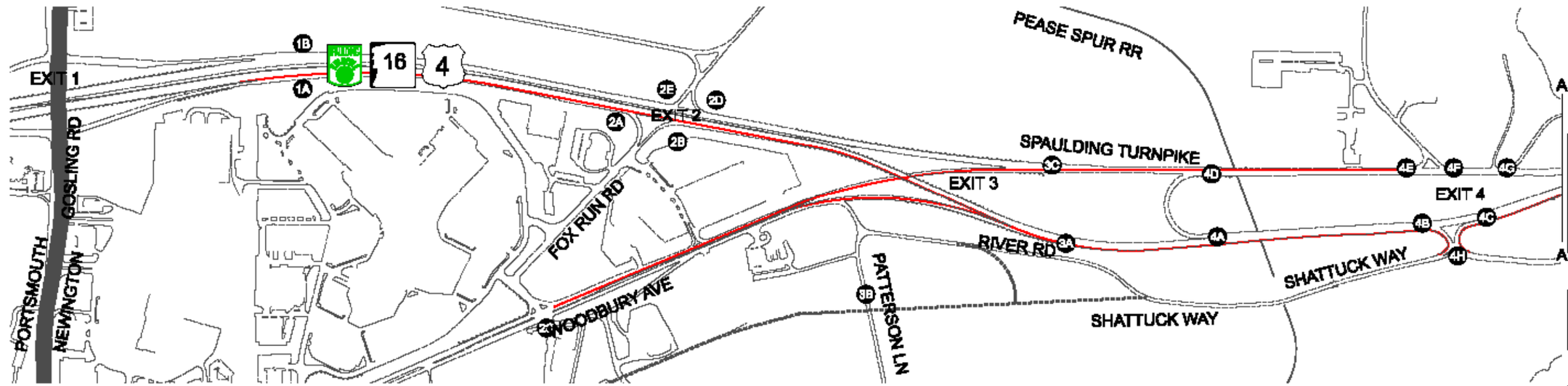
Node		2025 LOS
From	To	
Spaulding Turnpike SB		
TOLL	6D	D
6D	5C	D
5C	4G	F
4E	3C	F
3C	2D	D
2E	1B	D

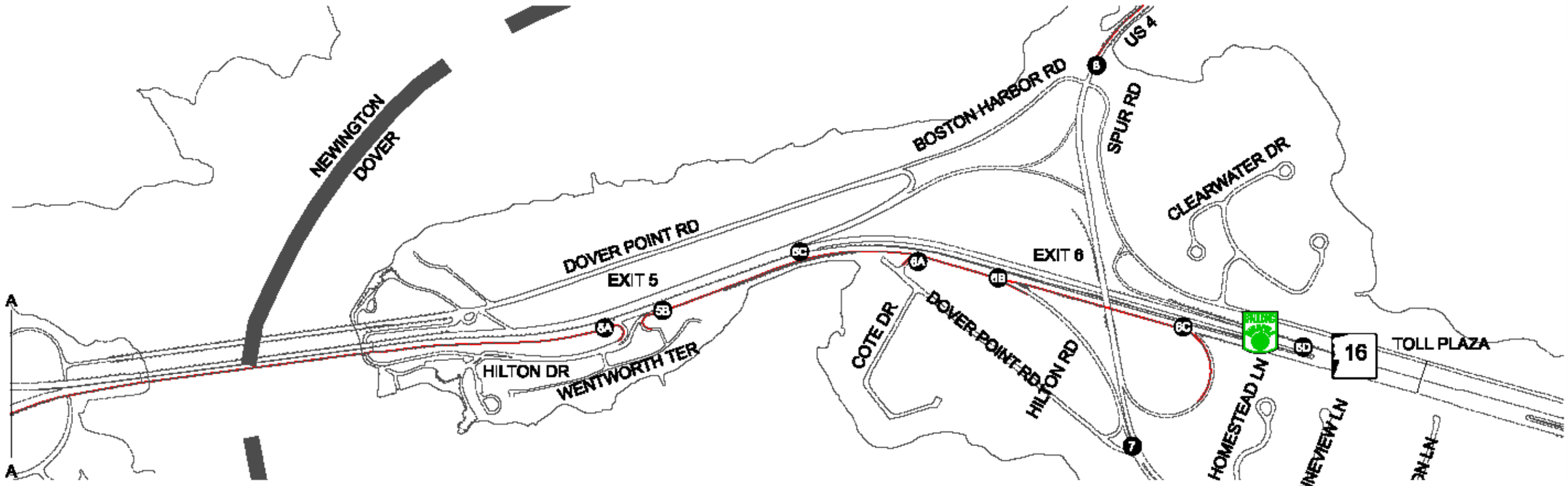
N

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.2-3
Level of Service Summary
2025 No Build Condition
Weekday AM Peak Hour





New Hampshire DOT
A Department of Transportation

Arterial LOS

Node		2025 LOS
From	To	
2C	3C	E
3B	4H	C
7	NORTH	D
8	WEST	E

Signalized Intersection LOS

Node	2025 LOS
2C	B
8	C

Unsignalized Intersection LOS

Node	2025 LOS
3B	B
4H	D

Weave Analysis LOS

Node		2025 LOS
From	To	
4E	4D	F
6A	6B	F

Ramp Junction LOS

Node	2025 LOS
2A	D
2B	D
3A	F
3C	D
4B	F
4C	F
4E	C
4F	D
5A	F
5B	F
6A	F
6B	F
6C	F
6D	B

Legend:

CAPACITY DEFICIENCY

Freeway LOS

Node		2025 LOS
From	To	
Spaulding Turnpike NB		
1A	2A	E
2B	3A	E
4A	4B	F
4C	5A	F
5B	6A	F
6C	TOLL	D

Freeway LOS

Node		2025 LOS
From	To	
Spaulding Turnpike SB		
TOLL	6D	B
6D	5C	B
5C	4G	D
4E	3C	D
3C	2D	C
2E	1B	C

N

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.2-4
Level of Service Summary
2025 No Build Condition
Weekday PM Peak Hour

New Hampshire DOT
Department of Transportation

Bellamy River
Toll Plaza
Noise Barrier #3
Blue Heron Dr
Spur Rd
Exit 6
Noise Barrier #4
Lillians Ln
Belanger Dr
Homestead Ln
Pineview Ln
Pearson Dr
Roberta Dr
Baldwin Way
Dover Point Rd
Forsythia Dr

LEGEND

- Soundwall Limit of Work
- Wetland (VHB)

Notes:

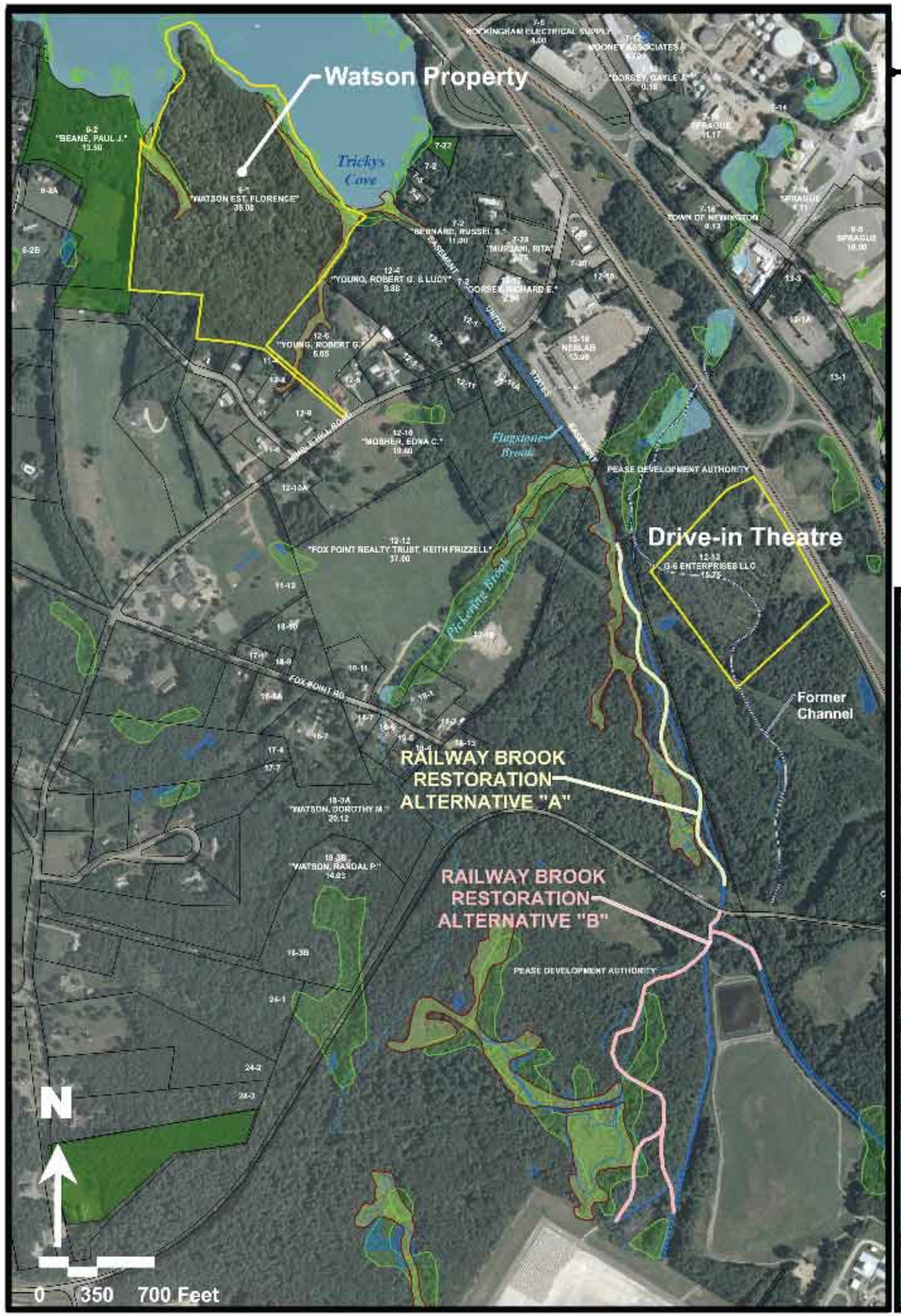
Wetlands GPS Located by VHB (Jan/Feb 2006)

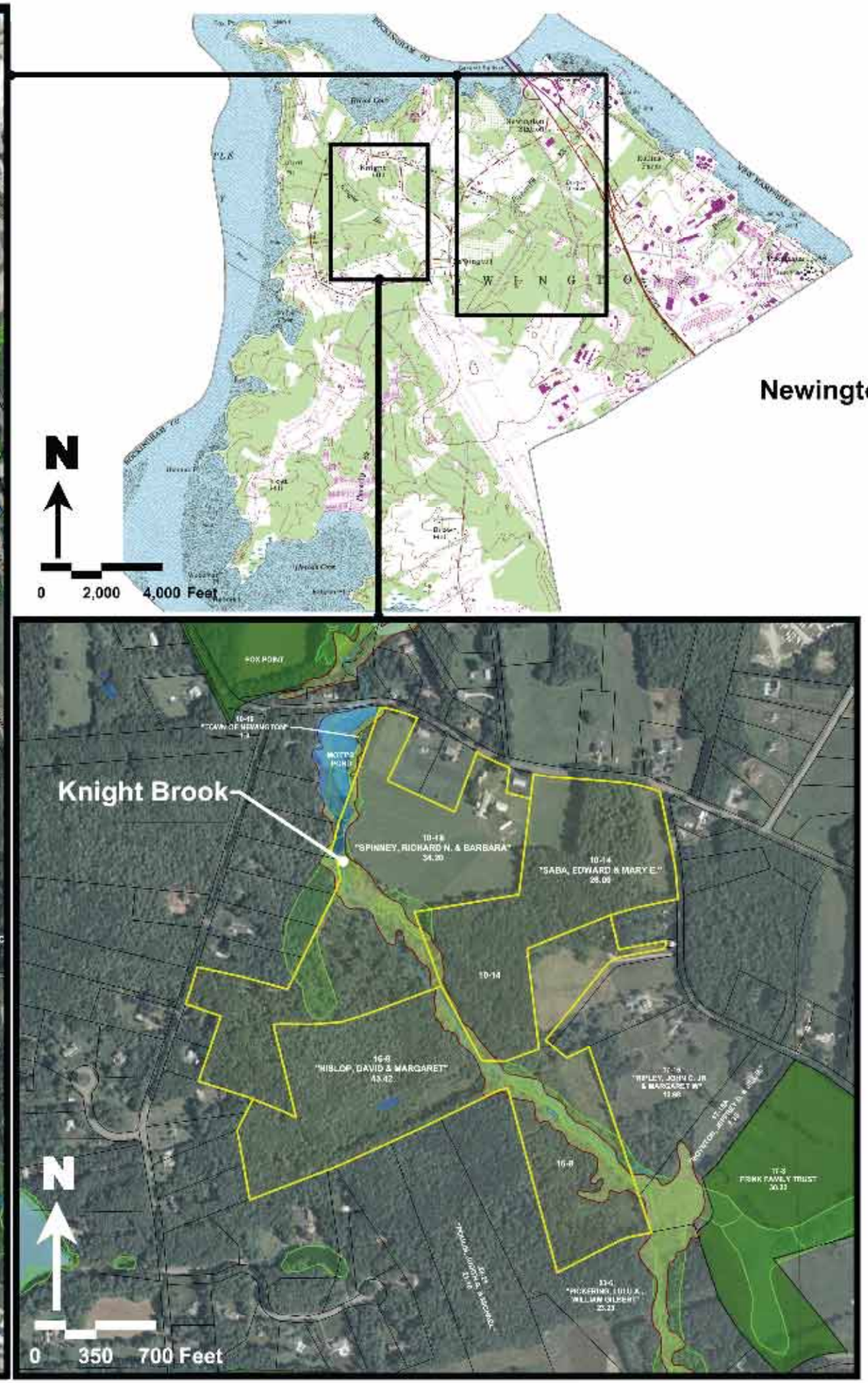
Noise Barrier limit of disturbance based on conceptual design.

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.6-1
Wetland Impacts
(Noise Barrier Locations)
North of Exit 6, Dover





New Hampshire DOT
Department of Transportation

LEGEND

- Streams
- Lot Lines
- Preservation
- NWI (USFWS)
- Prime Wetlands
- Waterbodies
- Conserved Public Lands

Vanasse Hangen Brustlin, Inc.

Figure 4.6-2
Potential Newington Mitigation Sites

New Hampshire DOT
Department of Transportation

Blackwater Brook Properties

Tuttle Farm & Bellamy River

Dover, NH

Tuttle Farm

Bellamy River

Land Protection Underway

Dover

Madbury

Durham

N

0 4,500 9,000 Feet

0 700 1,400 Feet

0 500 1,000 Feet

LEGEND
- Streams
- Lot Lines
- Preservation
- Wetlands
- Waterbodies
- Conserved Public Lands

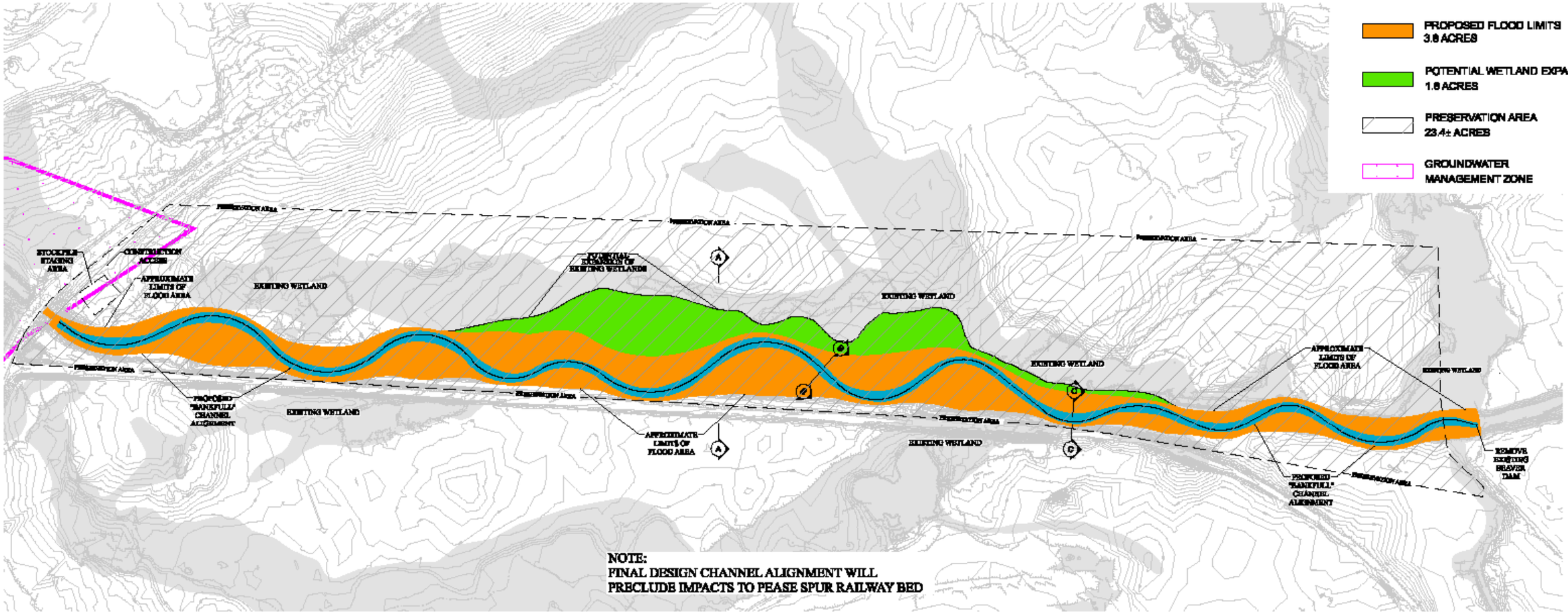
Vanasse Hangen Brustlin, Inc.

Figure 4.6-3
Potential Dover Mitigation Sites

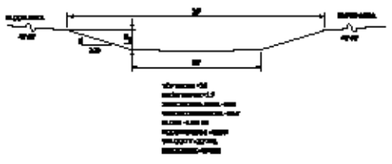
New Hampshire DOT
Department of Transportation

Legend:

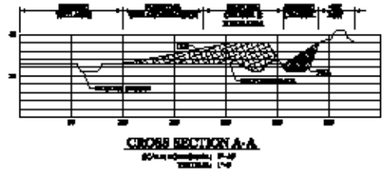
- PROPOSED "BANKFULL" CHANNEL 3,158 LF. - 1.5 ACRES
- PROPOSED FLOOD LIMITS 3.8 ACRES
- POTENTIAL WETLAND EXPANSION 1.8 ACRES
- PRESERVATION AREA 23.4± ACRES
- GROUNDWATER MANAGEMENT ZONE



NOTE:
FINAL DESIGN CHANNEL ALIGNMENT WILL PRECLUDE IMPACTS TO PEASE SPUR RAILWAY BED



Typical Channel Dimensions



Typical Cross Section Midway Through Project Reach

CROSS SECTION B-B

Typical Cross Section Between Meander Bends

CROSS SECTION C-C

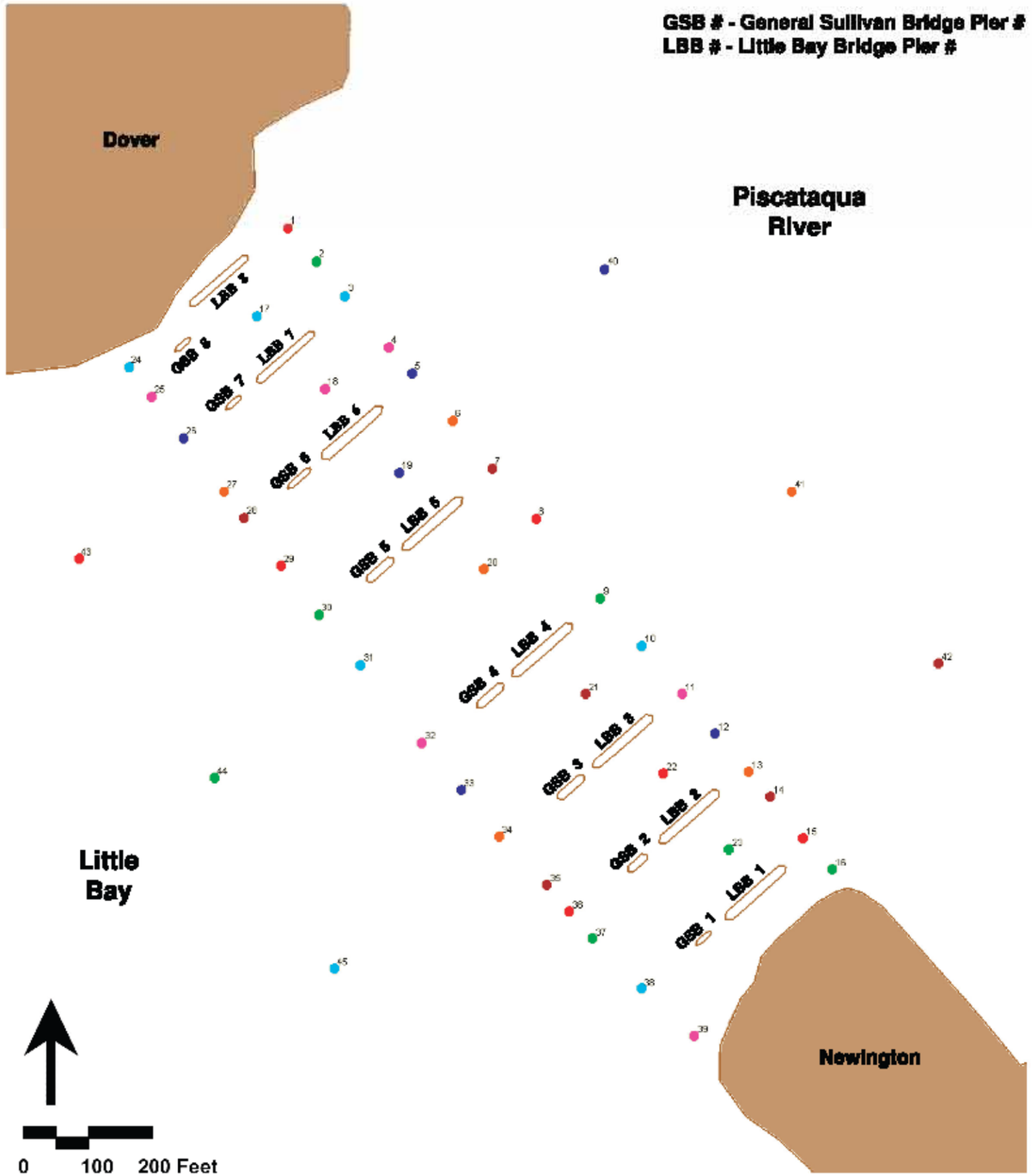
Typical Cross Section at Meander Bend

N

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.6-4
Railway Brook Restoration
Conceptual Plan



Vanasse Hangen Brustlin, Inc.

Figure 4.10-1
Current Velocity Model Data Locations

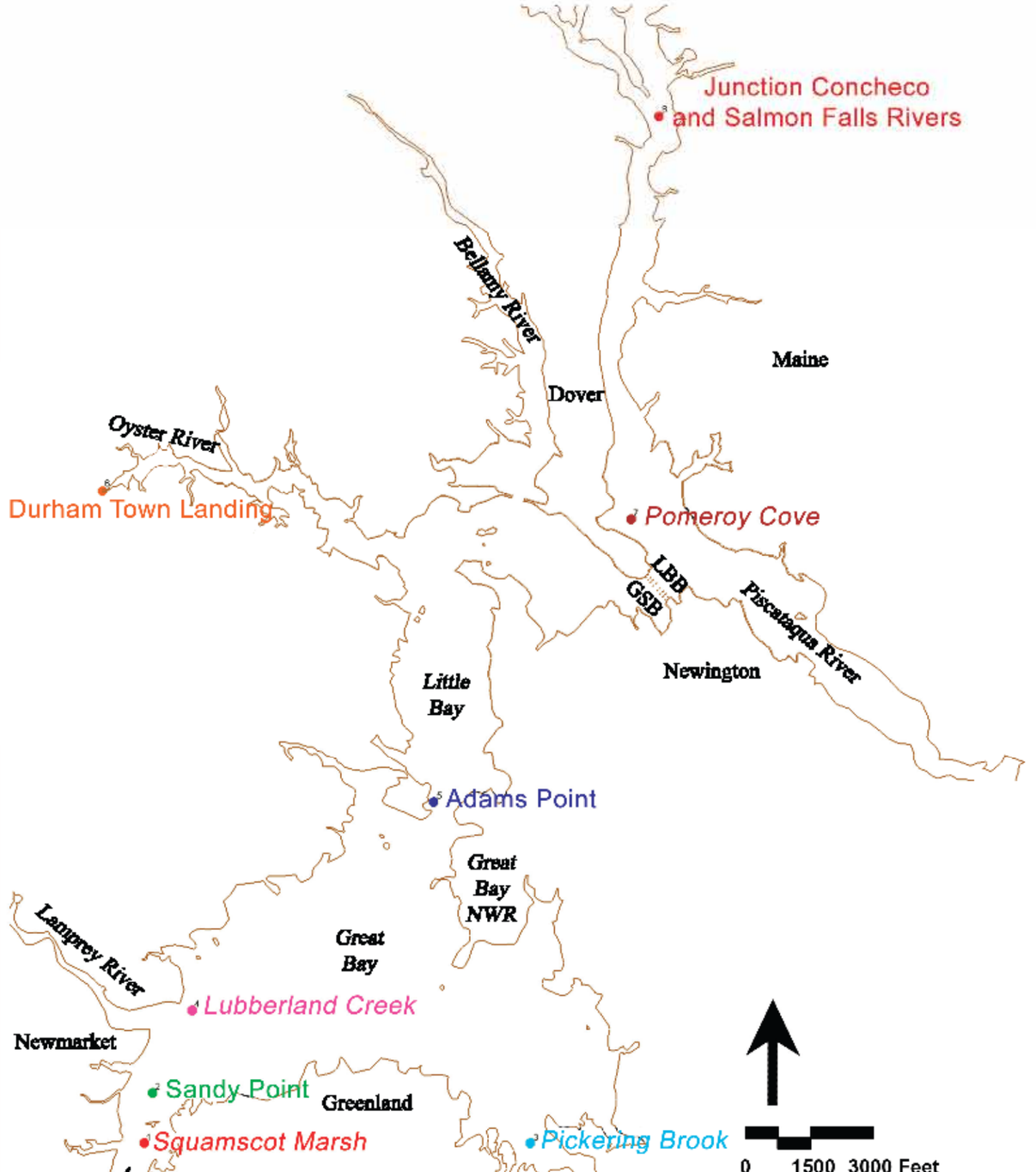


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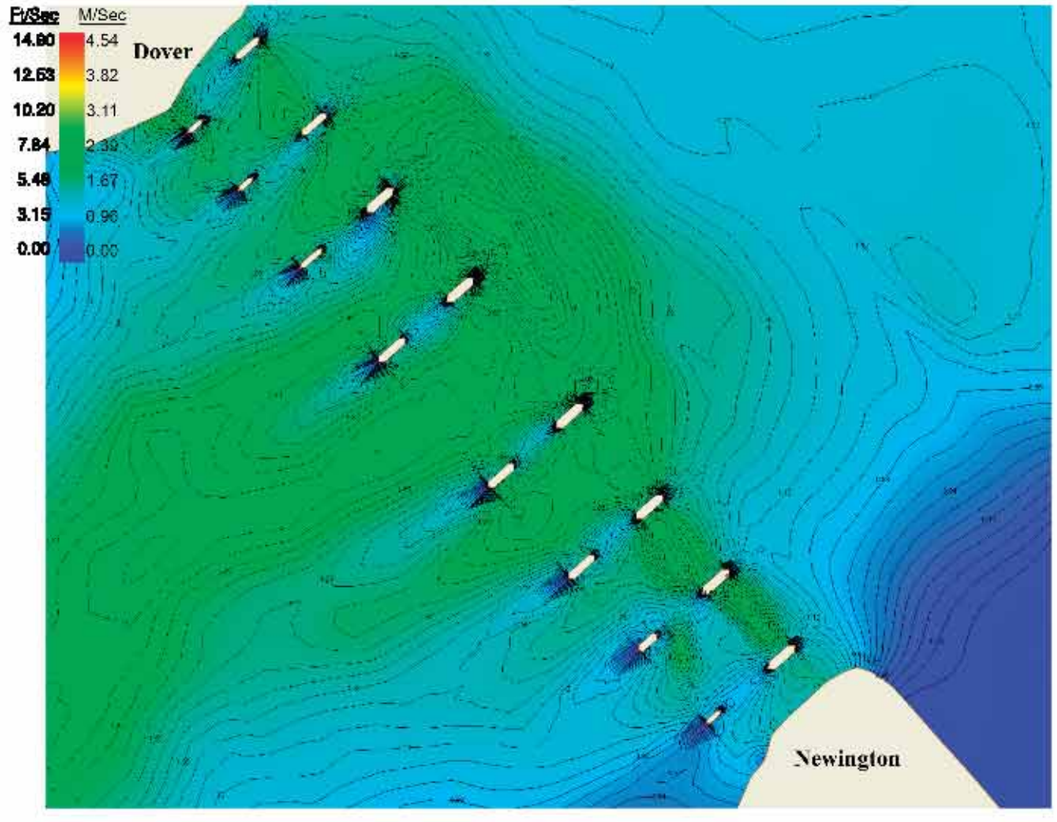
Figure 4.10-2
Tidal Height Model Locations



Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

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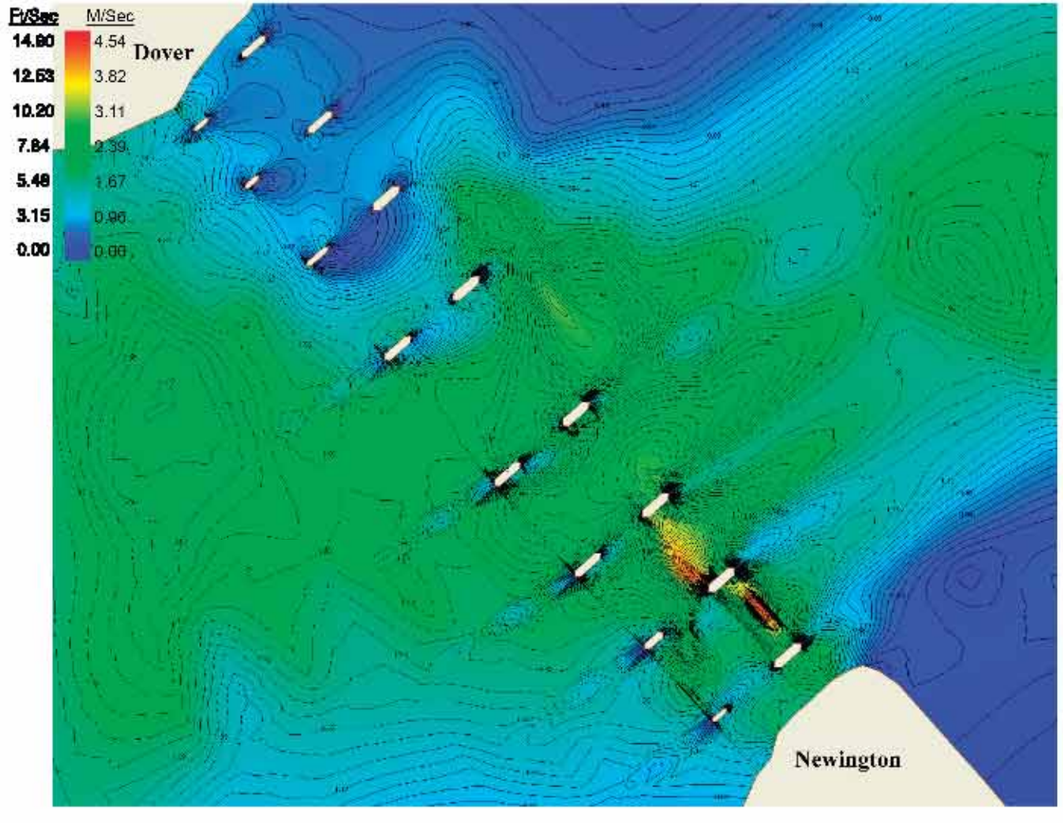
Figure 4.10-3
Maxdum Flood Currents for
Case Study 1 (Existing Conditions)

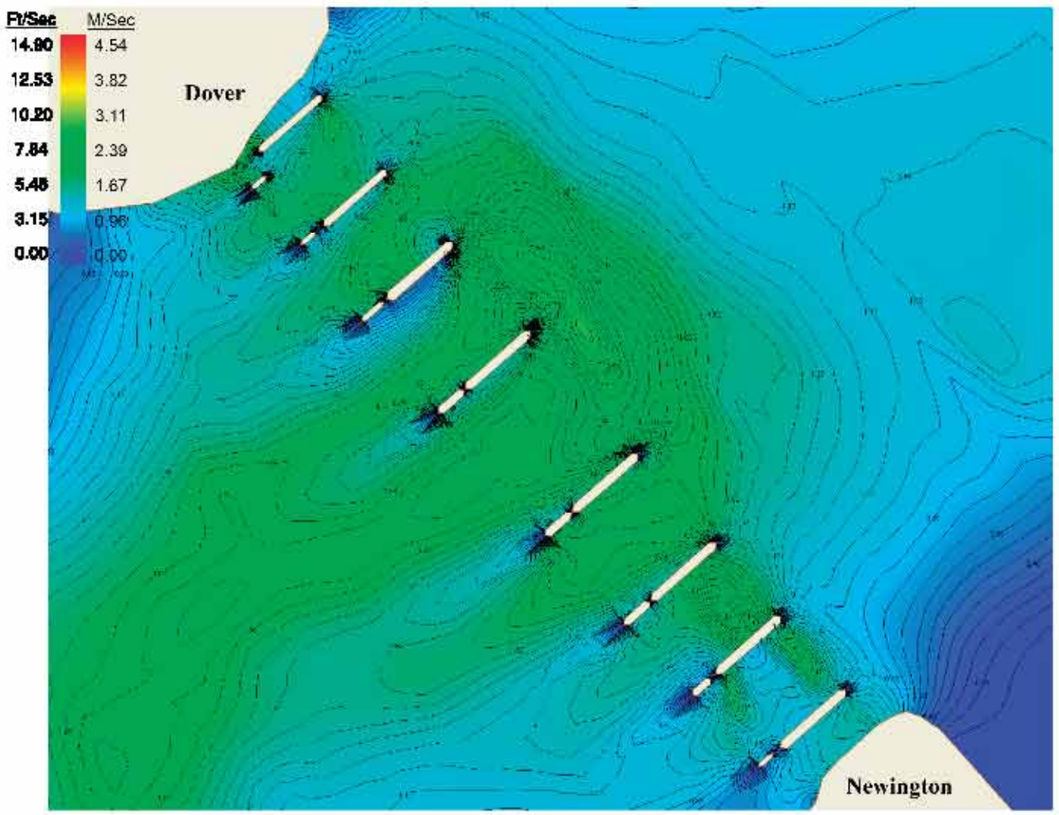


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-4
Maximum Ebb Currents for
Case Study 1 (Existing Conditions)

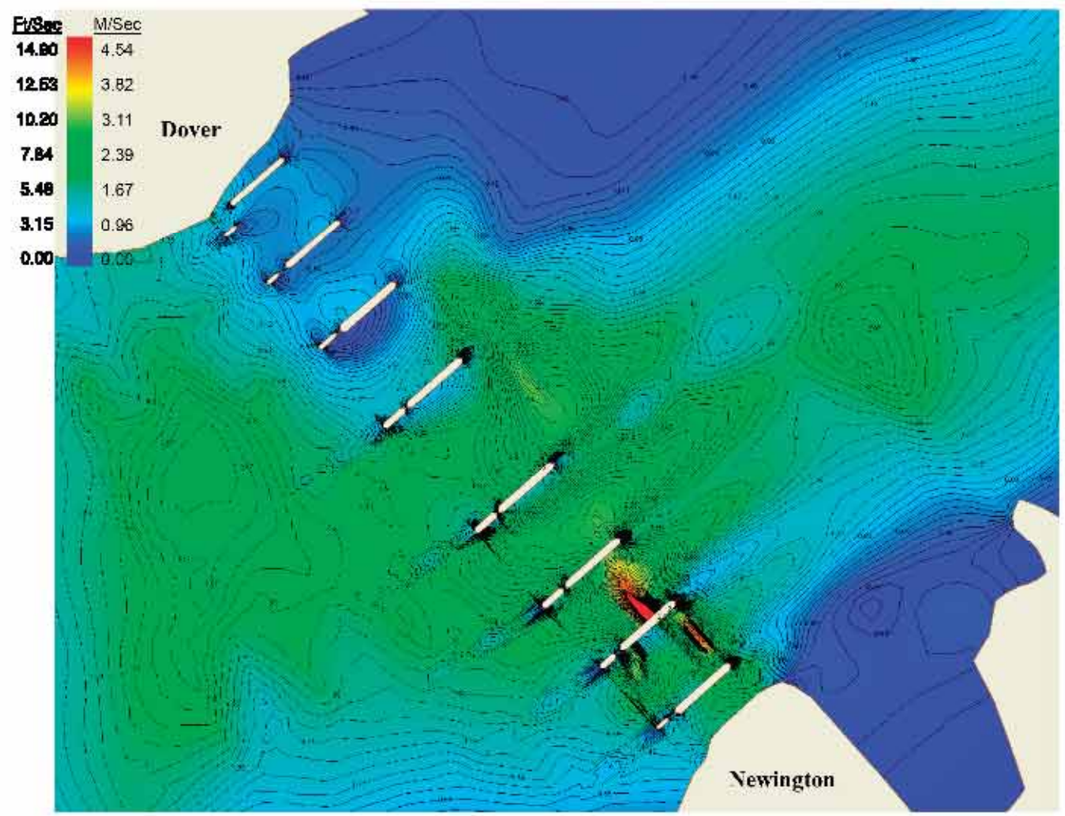


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-5
Maximum Flood Currents for
Case Study 2 (Hydraulic Alternative 1)

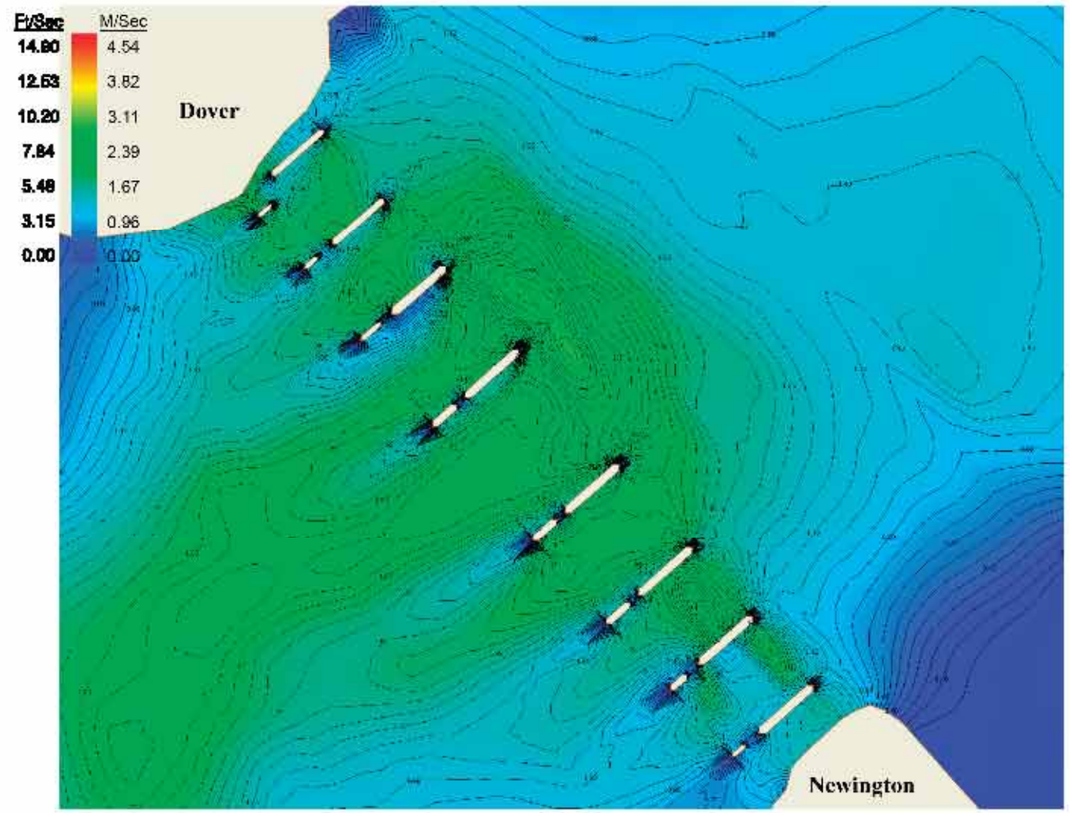


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-6
Maximum Ebb Currents for
Case Study 2 (Hydraulic Alternative 1)

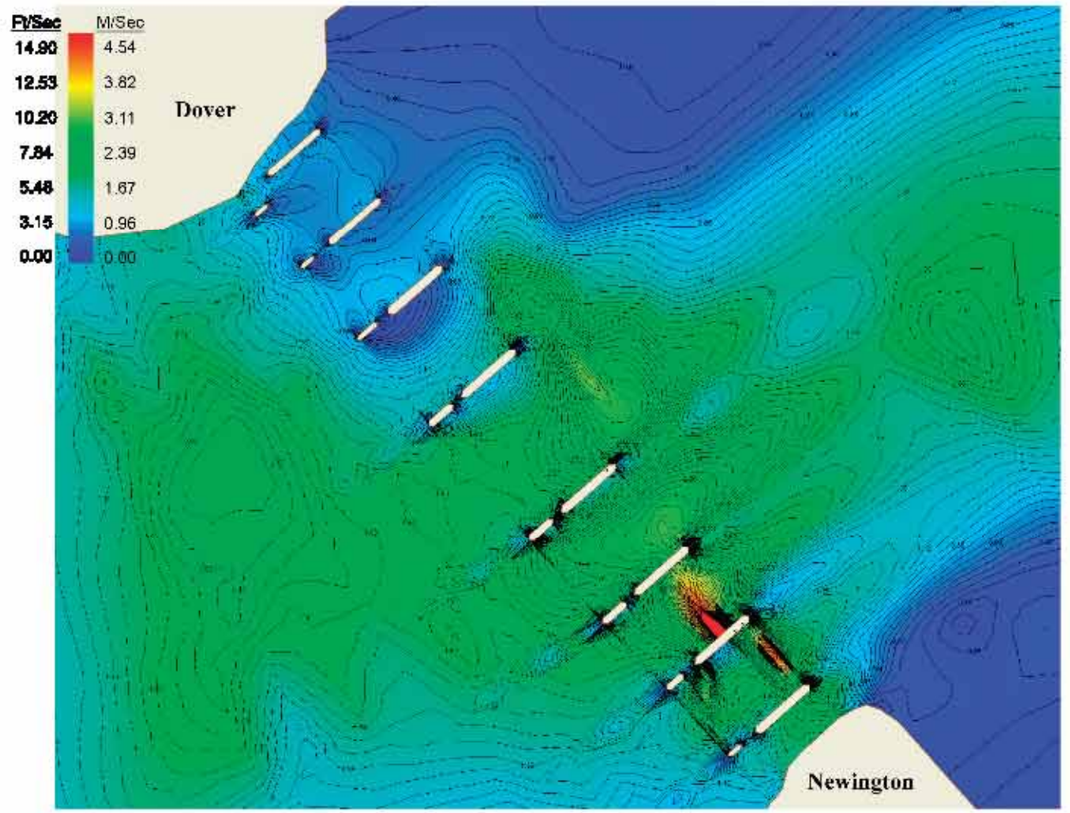


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-7
Maximum Flood Currents for
Case Study 3 (Hydraulic Alternative 2)

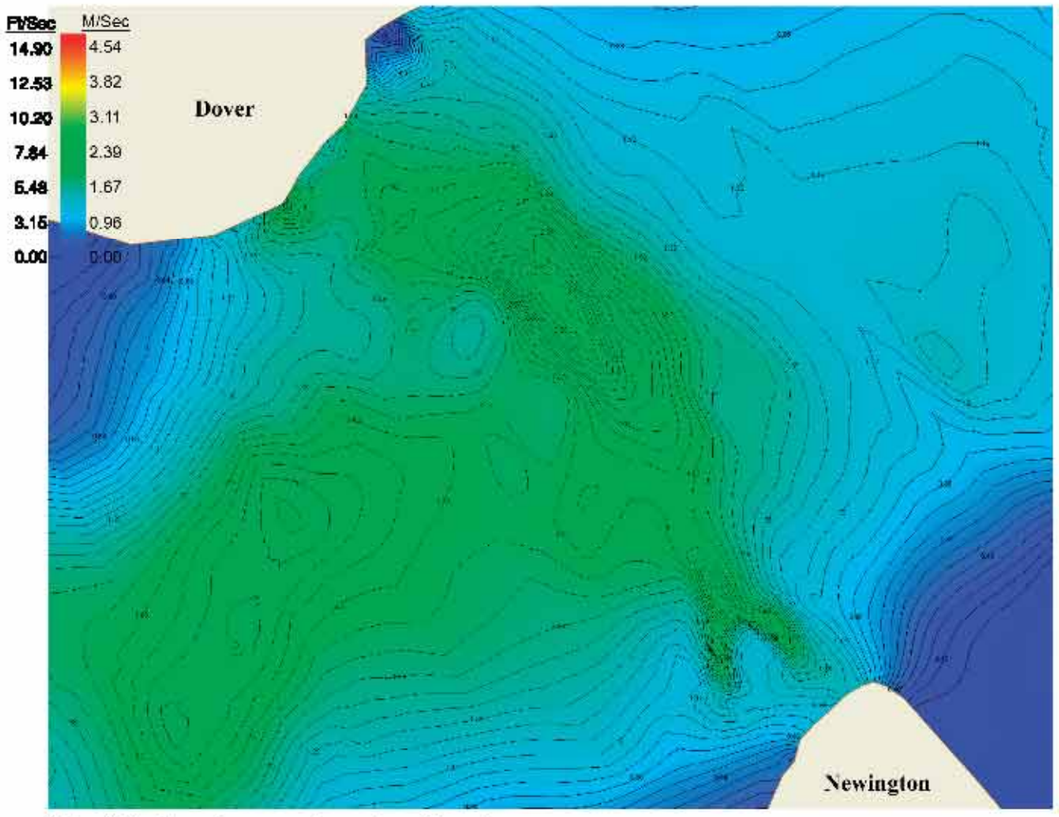


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-8
Maximum Ebb Currents for
Case Study 3 (Hydraulic Alternative 2)

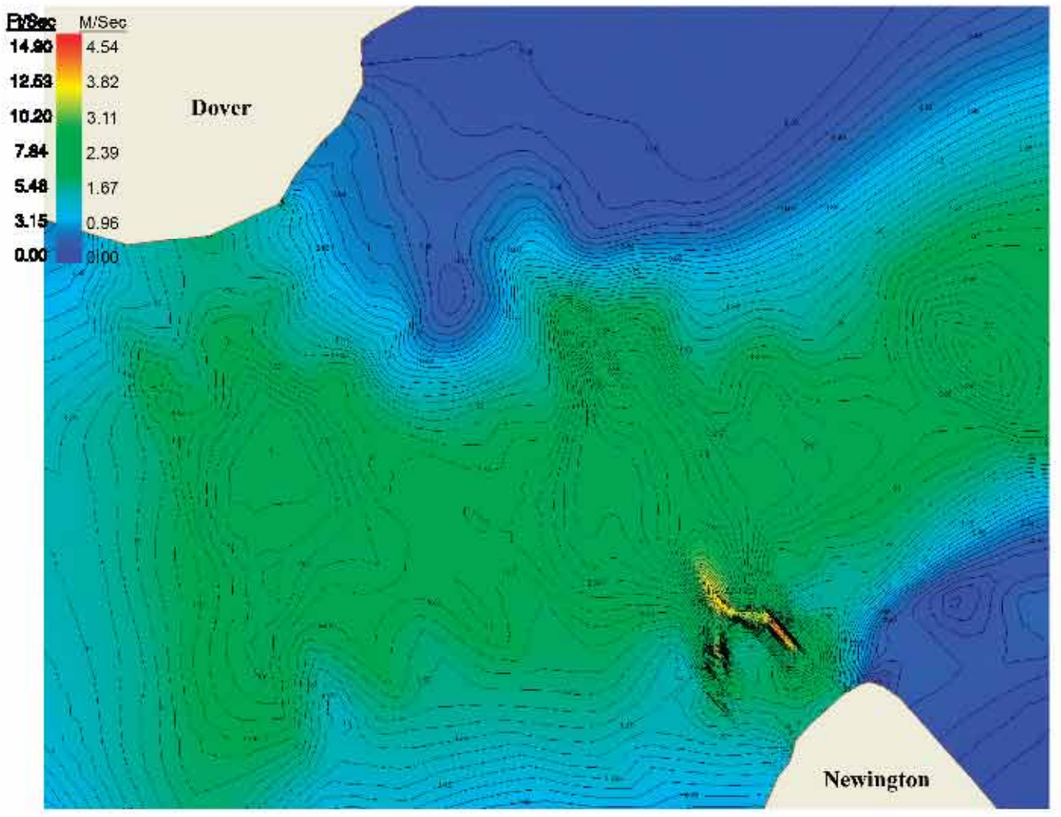


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-9
Maximum Flood Currents for
Case Study 4 (No Piers)

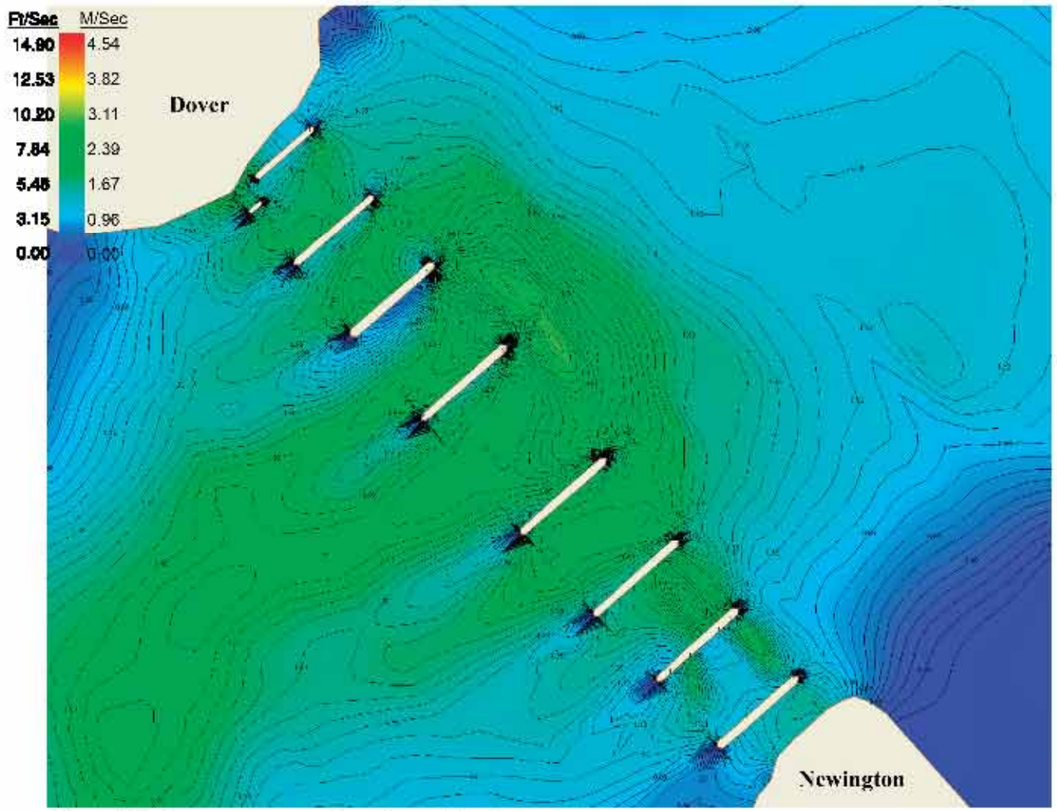


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

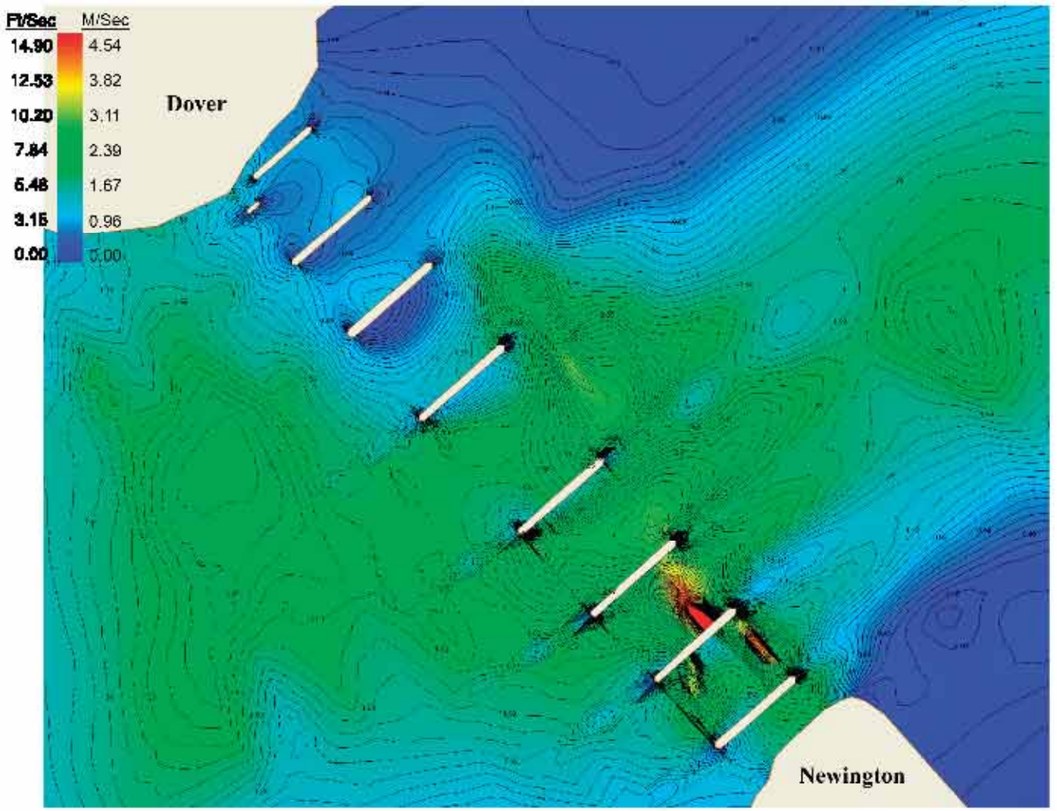
Vanasse Hangen Brustlin, Inc.

Figure 4.10-10
Maximum Ebb Currents for
Case Study 4 (No Piers)



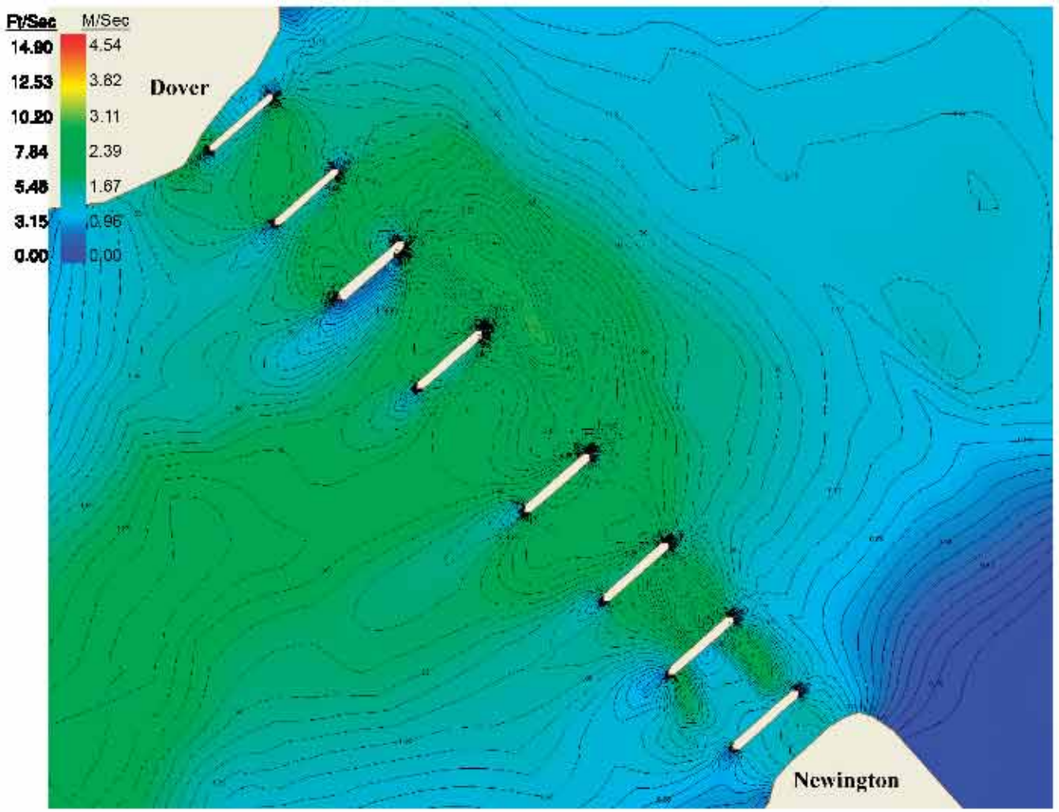
Vanasse Hangen Brustlin, Inc.

Figure 4.10-11
Maximum Flood Currents for
Case Study 5 (Combined Piers)



Vanasse Hangen Brustlin, Inc.

Figure 4.10-12
Maximum Ebb Currents for
Case Study 5 (Combined Piers)

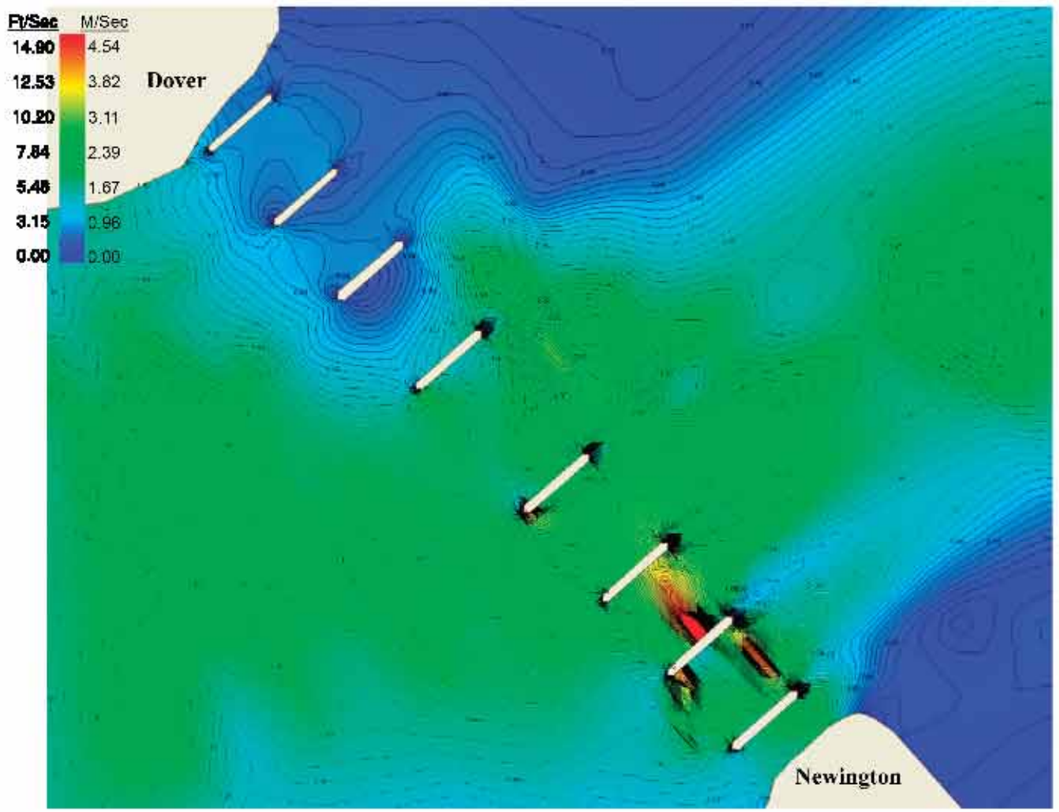


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-13
Maximum Flood Currents for
Case Study 6
(General Sullivan Bridge Removed)

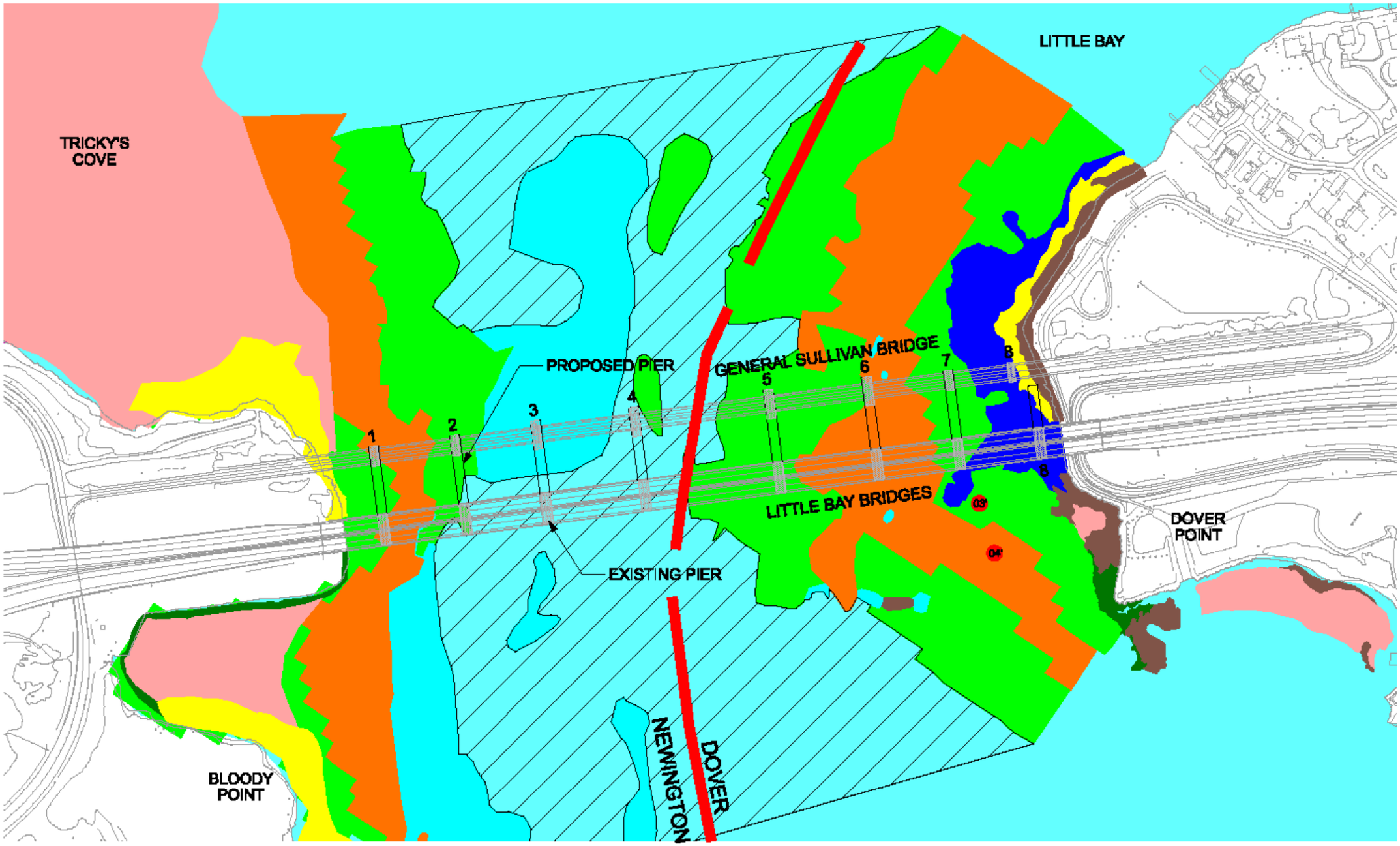


Note: Velocity contours are shown in metric units.
Contour Interval is 0.8 Meters/Second.
1 Meter/Second = 3.281 Feet/Second

0 60 120 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-14
Maximum Ebb Currents for
Case Study 6
(General Sullivan Bridge Removed)



New Hampshire DOT
Department of Transportation

Legend:

- SURFACE WATERS
- TOWNLINE

INTERTIDAL HABITATS

- HARD BOTTOM WITH ROCKWEED
- MUDFLAT
- ROCK / ALGAL / ABUNDANT MUSSEL
- ROCK / ALGAL / SPARSE MUSSEL
- SALT MARSH
- SCATTERED ROCK / ALGAL / SOFT SEDIMENT

SUBTIDAL HABITATS

- KELP BED
- MACROALGAL (NON-KELP) BED
- MUSSEL REEF
- OTHER

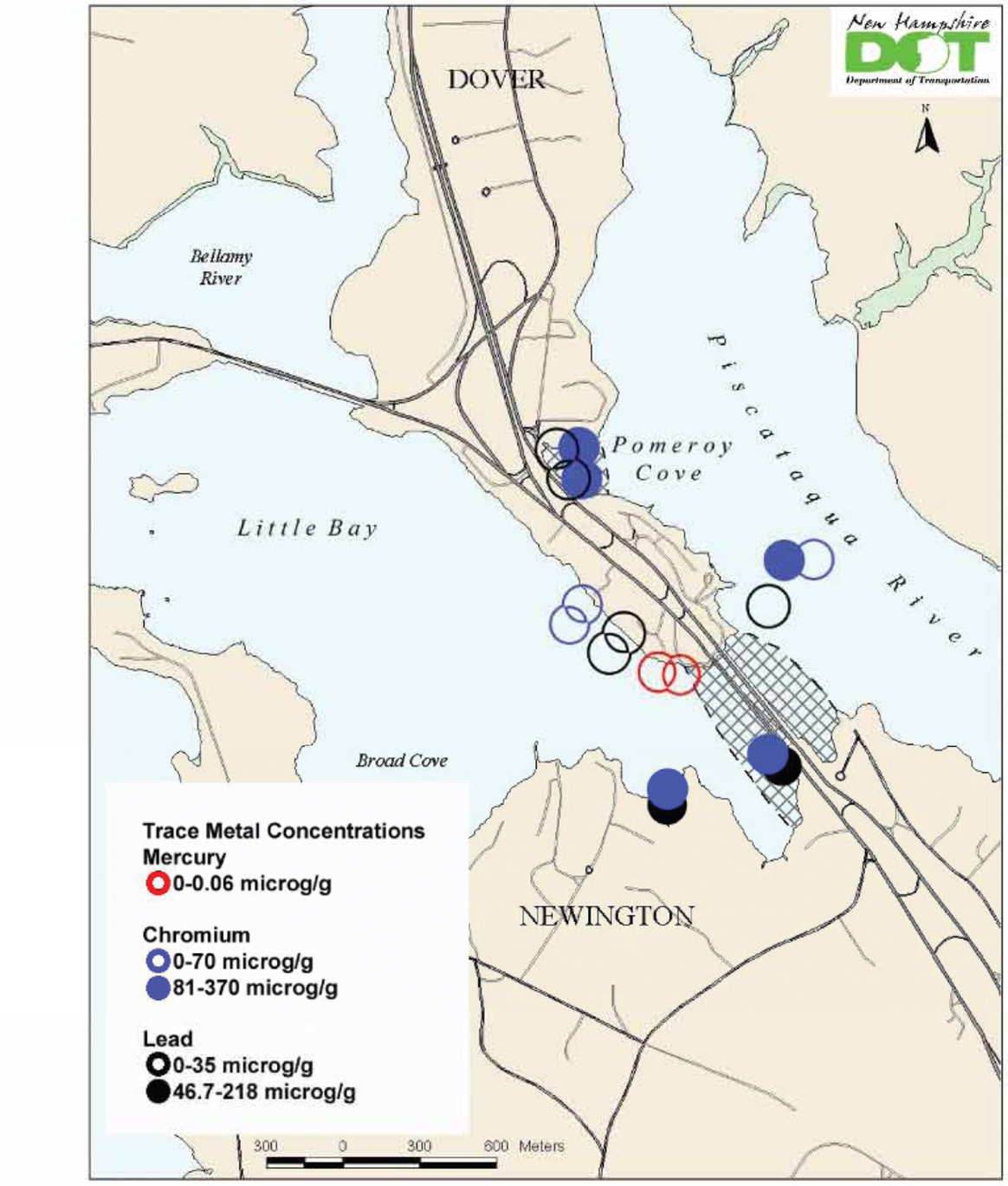
YR — MUSSEL BED SAMPLING STATION

N

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-15
Pier Impacts on
Intertidal and Subtidal Habitats
Selected Alternative



Note: Cross-hatched area represents the limits of study for the benthic (subtidal) habitat survey

NOAA (1999) Screening Threshold Effects Levels for Marine Sediment Toxicity are as follows:
Mercury: 0.13 mg/g ; Chromium: 52.3 mg/g; Lead: 30.24 mg/g

Vanasse Hangen Brustlin, Inc.

Figure 4.10-16
Water Quality Sampling Stations of NHDES Shellfish Program

New Hampshire DOT
Department of Transportation

ROCKINGHAM COUNTY
STRAFFORD COUNTY
LITTLE BAY
SCAMMELL BRIDGE TBZ
4
ROYALS COVE
BOSTON HARBOR RD
SPUR RD
CLEARWATER DR
BELLAMY RIVER
POMEROY COVE TBZ
DOVER POINT RD
TRICKY'S COVE
DOVER POINT TBZ
NEWINGTON TBZ
POMEROY COVE
COTE DR
DOVER POINT RD
HILTON RD
16
TOLL PLAZA
HILTON DR
WENTWORTH TER
DOVER POINT
HOMESTEAD LN
PINEVIEW LN
PEARSON LN
DOVER POINT RD
BLOODY POINT
NEWINGTON
DOVER
NEW HAMPSHIRE
MAINE
PISCATAQUA RIVER

Legend:
- SURFACE WATERS
- TOWNLINE
- STATELINE
- LIMIT OF GRADING
- TIDAL BUFFER ZONE
- TIDAL BUFFER ZONE IMPACT

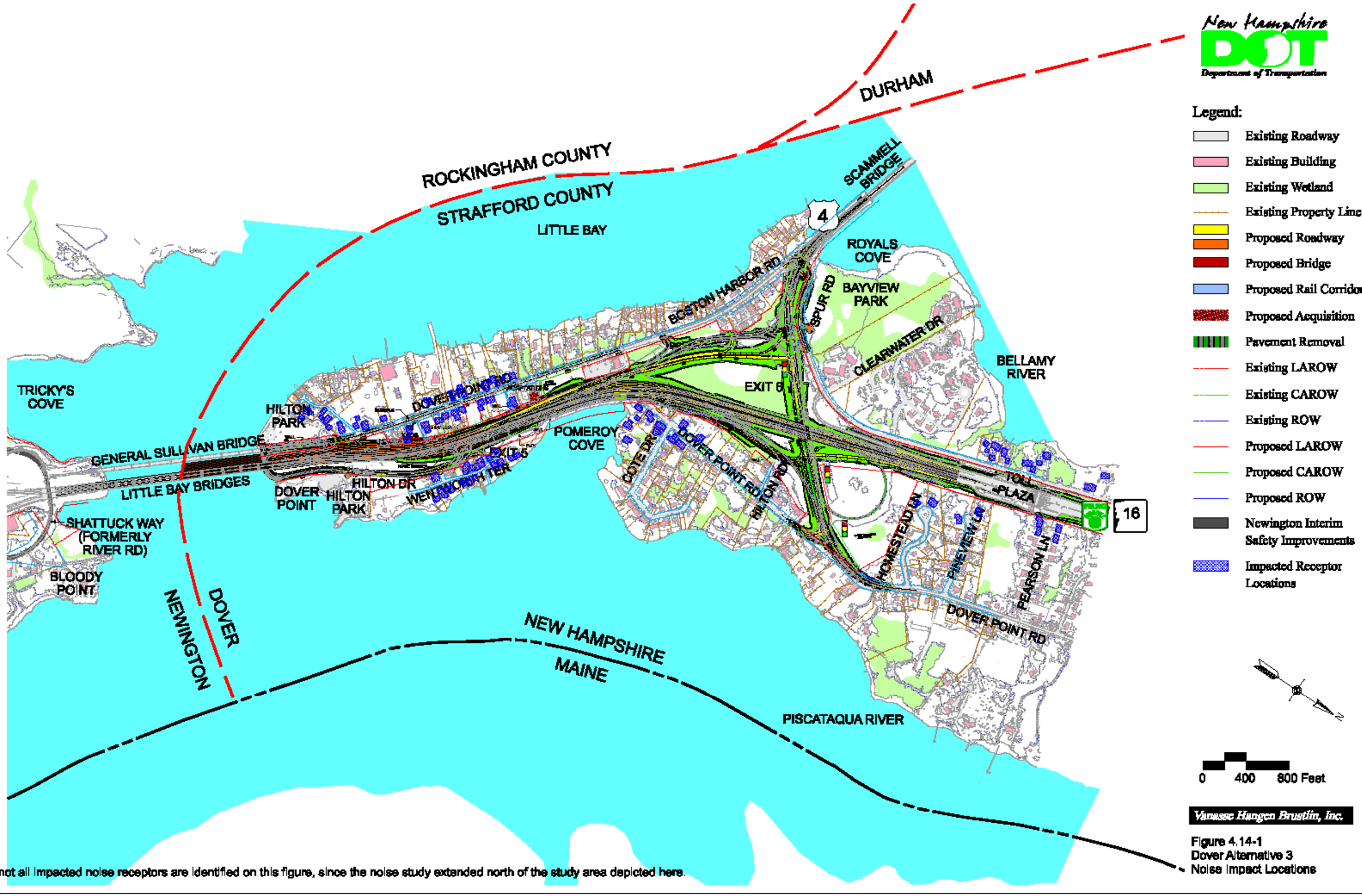
N

0 375 750 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.10-17
Tidal Buffer Zone Impact

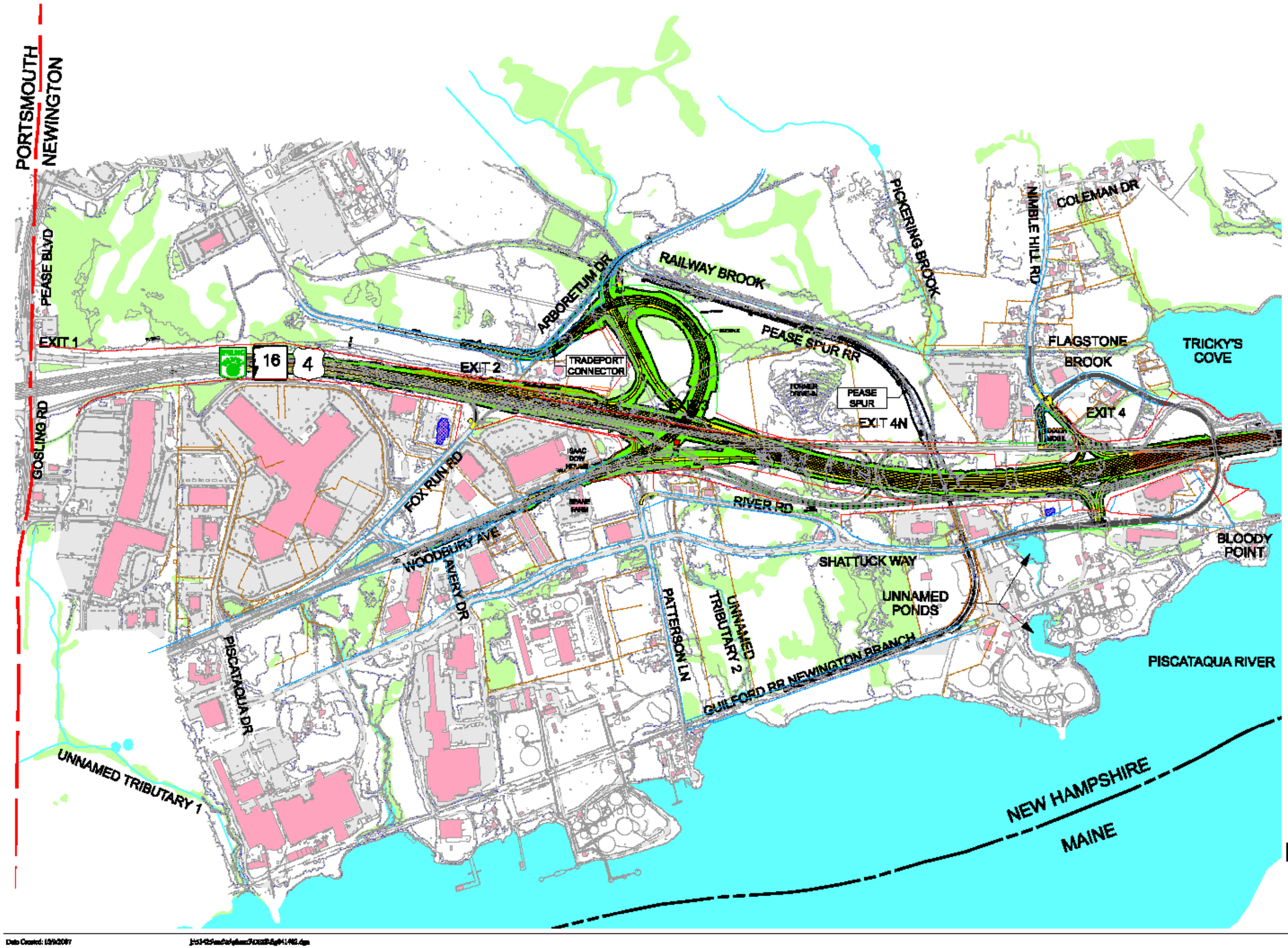
Date Created: 10/26/2007 J:\c1428\mxd\arlphase3\DES\tbz\410-17.mxd



Vanasse Hangen Brustlin, Inc.

Figure 4.14-1
Dover Alternative 3
Noise Impact Locations

Note: not all impacted noise receptors are identified on this figure, since the noise study extended north of the study area depicted here.



Vanasse Hangen Brustlin, Inc.

Figure 4.14-2
Newington Alternative 13
Noise Impact Locations

Date Created: 1/29/2007

Dover Alternative 3

New Hampshire DOT Department of Transportation

LITTLE BAY

ROYALS COVE

BELLAMY RIVER

BOSTON HARBOR RD

SPUR RD

CLEARWATER DR

4

EXIT 6

DOVER POINT RD

ADAPTATION

SIDEWALK

K9 KAOS

POMEROY COVE

EXIT 5

WENTWORTH TER

HILTON DR

DOVER POINT

COTE DR

HILTON RD

TOLL PLAZA

HOMESTEAD LN

PINEVIEW LN

PEARSON LN

DOVER POINT RD

DETENTION BASIN #007 NB

NOISE BARRIER

Noise Barrier #1
Dover Point Road
Length 4,100 feet
Height 14 feet

Noise Barrier #2
Wentworth Terrace / Cote Drive
Length 4,200 feet
Height 14 feet

LEGEND

- Conceptual Roadway Improvements
- Pavement Removal
- Newington Interim Improvements
- Proposed Signal
- Conceptual Path
- Proposed Bridge
- Building
- Existing Pavement
- Wetlands
- Water

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.14-3
Proposed Noise Mitigation
Dover - South of Exit 6

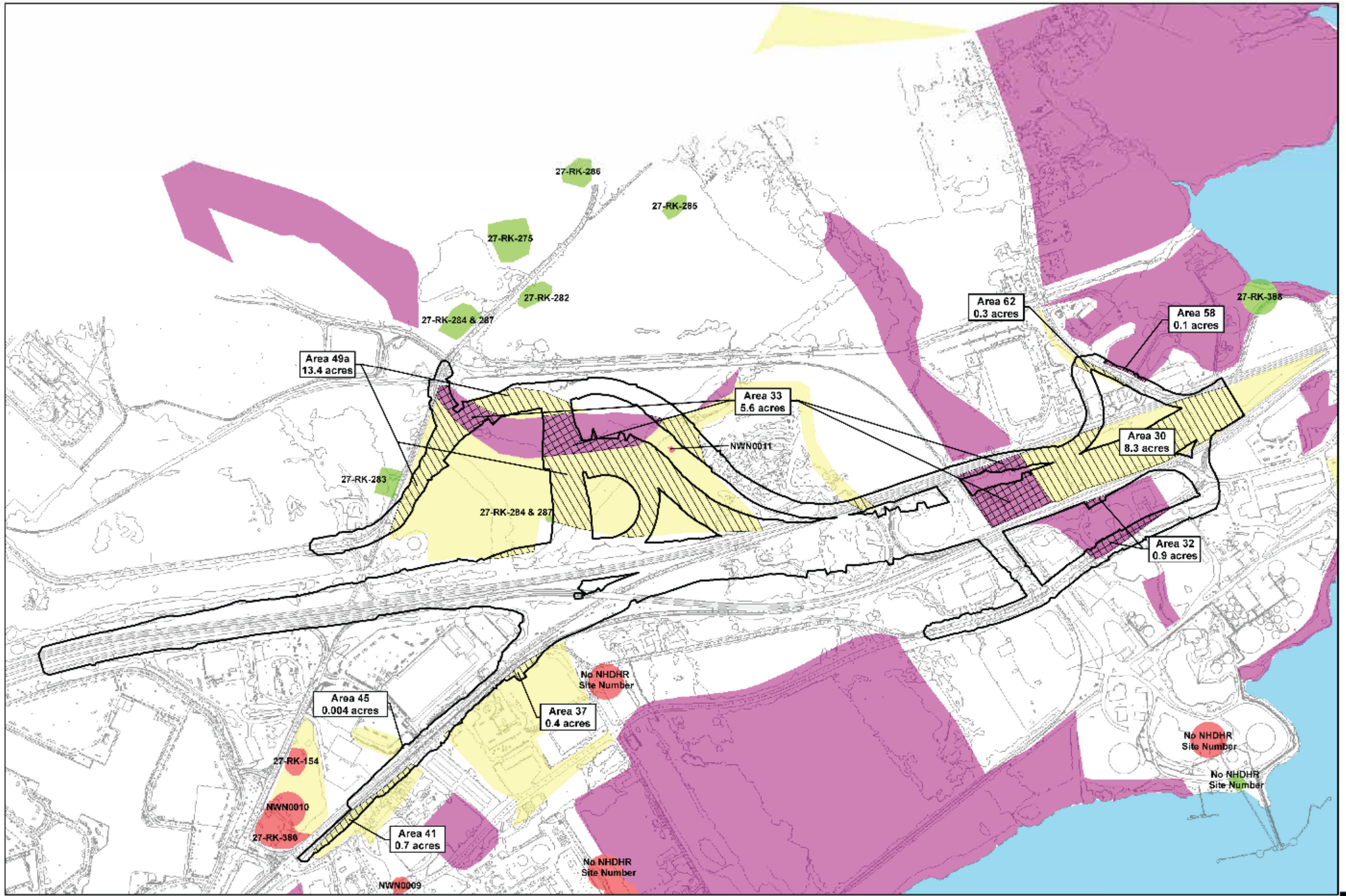
Date Created: 12/9/2007

New Hampshire DOT
Department of Transportation

Not To Scale

Vanasse Hangen Brustlin, Inc.

Figure 4.14-4
Proposed Noise Mitigation
Dover - North of Exit 6



New Hampshire DOT
Department of Transportation

Legend

- Alternative 10a Limit of Grading

Archaeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

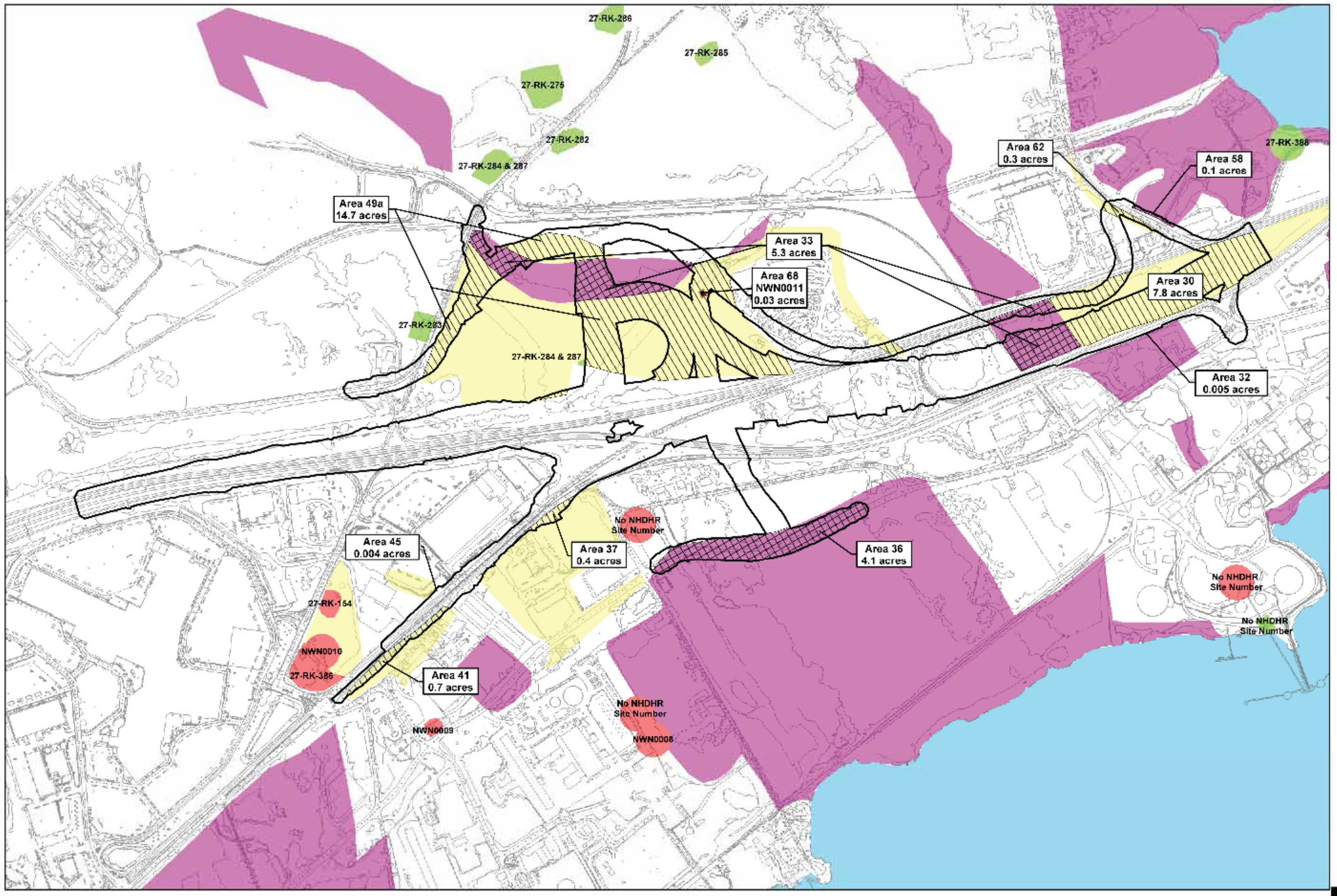
Archaeological Resource

- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

0 300 600 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-1
Potential Archaeological Impacts, Newington Alternative 10A



New Hampshire DOT
Department of Transportation

Legend

- Alternative 12a Limit of Grading

Archaeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

Archaeological Resource

- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

N

0 300 600 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-2
Potential Archaeological Impacts, Newington Alternative 12A

New Hampshire DOT
Department of Transportation

27-RK-286
27-RK-285
27-RK-275
27-RK-282
27-RK-284 & 287
Area 49a
11.5 Acres
Area 33
5.1 Acres
Area 62
0.3 Acres
Area 58
0.03 Acres
27-RK-388
NWN0011
Area 30
6.9 Acres
27-RK-283
27-RK-284 & 287
Area 32
0.1 Acres
No NHDHR
Site Number
Area 37
0.5 Acres
27-RK-154
NWN0010
27-RK-386
Area 41
0.6 Acres
NWN0009
No NHDHR
Site Number
NWN0008
No NHDHR
Site Number
No NHDHR
Site Number

Legend

- Alternative 13 Limit of Grading

Archeological Resource Impacts

- Probable Sensitivity
- Sensitivity
- Verified Site

Archeological Resource

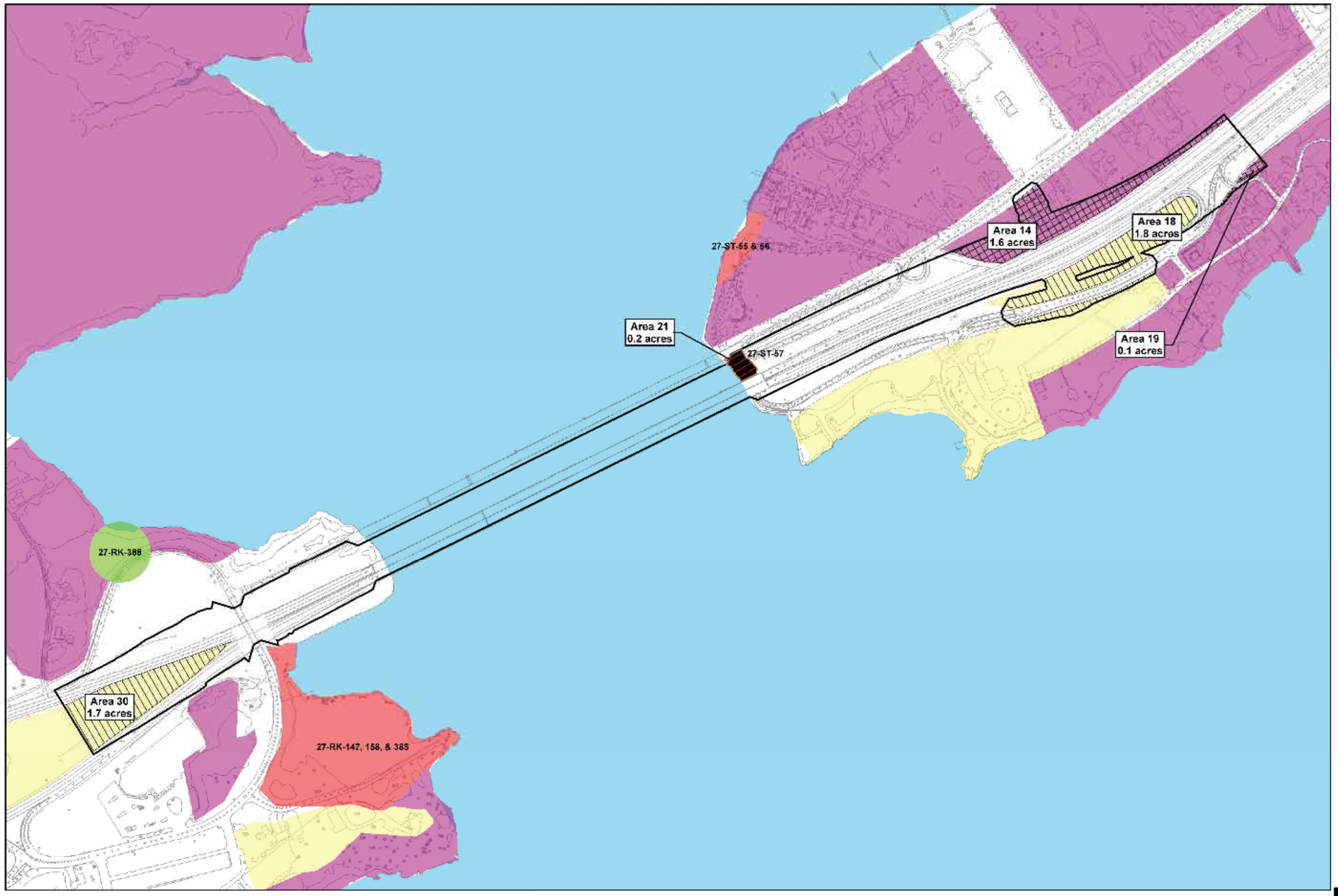
- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

N

0 300 600 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-3
Potential Archaeological Impacts, Newington Alternative 13



New Hampshire DOT
Department of Transportation

Legend

- Bridge - Widen & Remove
- Limit of Grading

Archeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

Archeological Resource

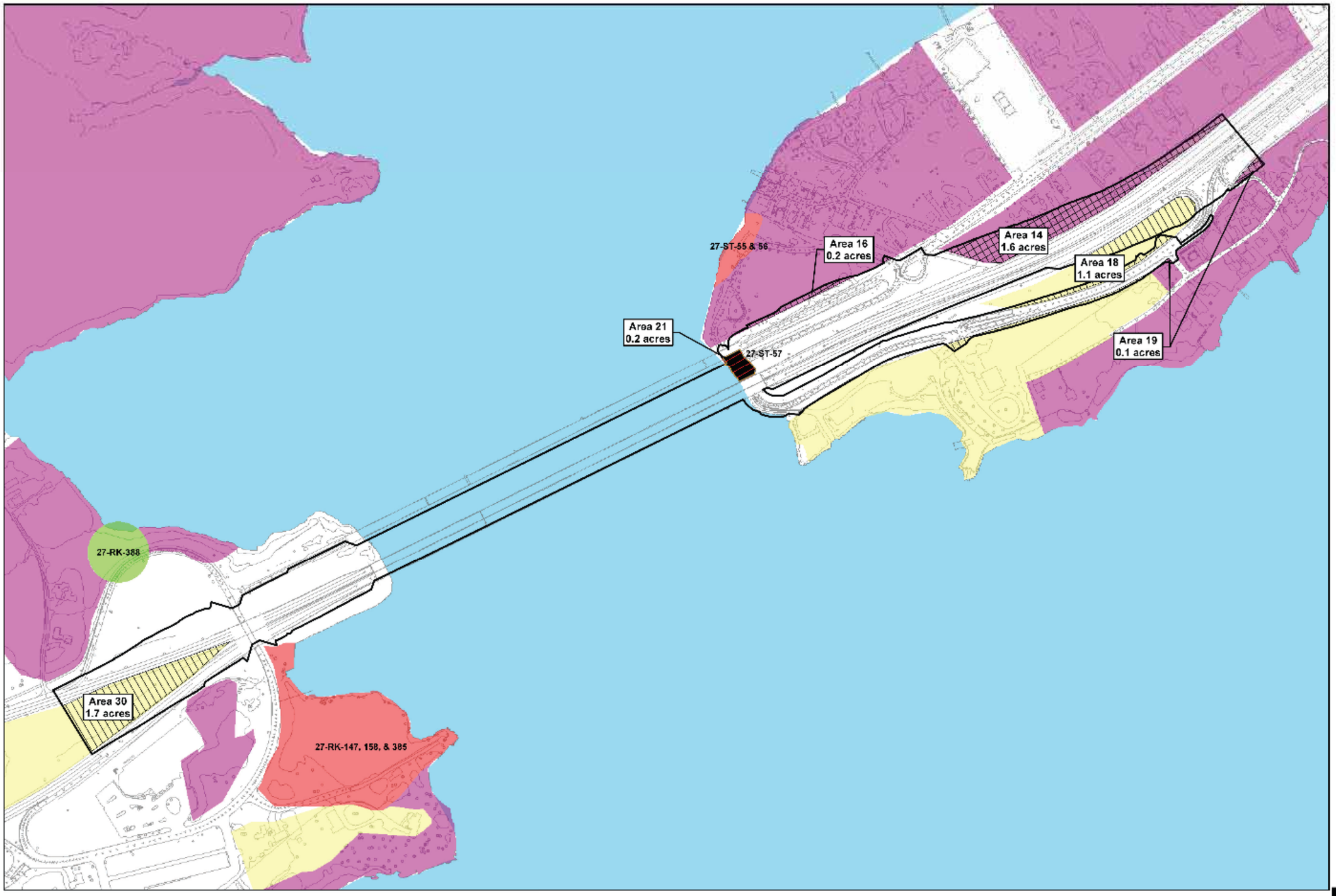
- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

N

0 175 350 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-4
Potential Archaeological Impacts, Widen West / Remove Alternative



New Hampshire DOT
Department of Transportation

Legend

- Widen & Remove Limit of Grading

Archeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

Archeological Resource

- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

N

0 175 350 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-5
Potential Archaeological Impacts, Widen West / Rehabilitate Alternative

New Hampshire DOT
Department of Transportation

Legend

- Alternative 2 Limit of Grading

Archeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

Archeological Resource

- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

N

0 200 400 Feet

Vanasse Hangen Brustlin, Inc.

Figure 4.17-6
Potential Archaeological Impacts, Dover Alternative 2

New Hampshire DOT
Department of Transportation

Legend

- Alternative 3 Limit of Grading

Archeological Resource Impacts

- Probable Sensitivity
- Sensitive
- Verified Site

Archeological Resource

- Probable Sensitivity
- Sensitivity
- Verified Sites & Cem
- Verified Sites-Not Eligible

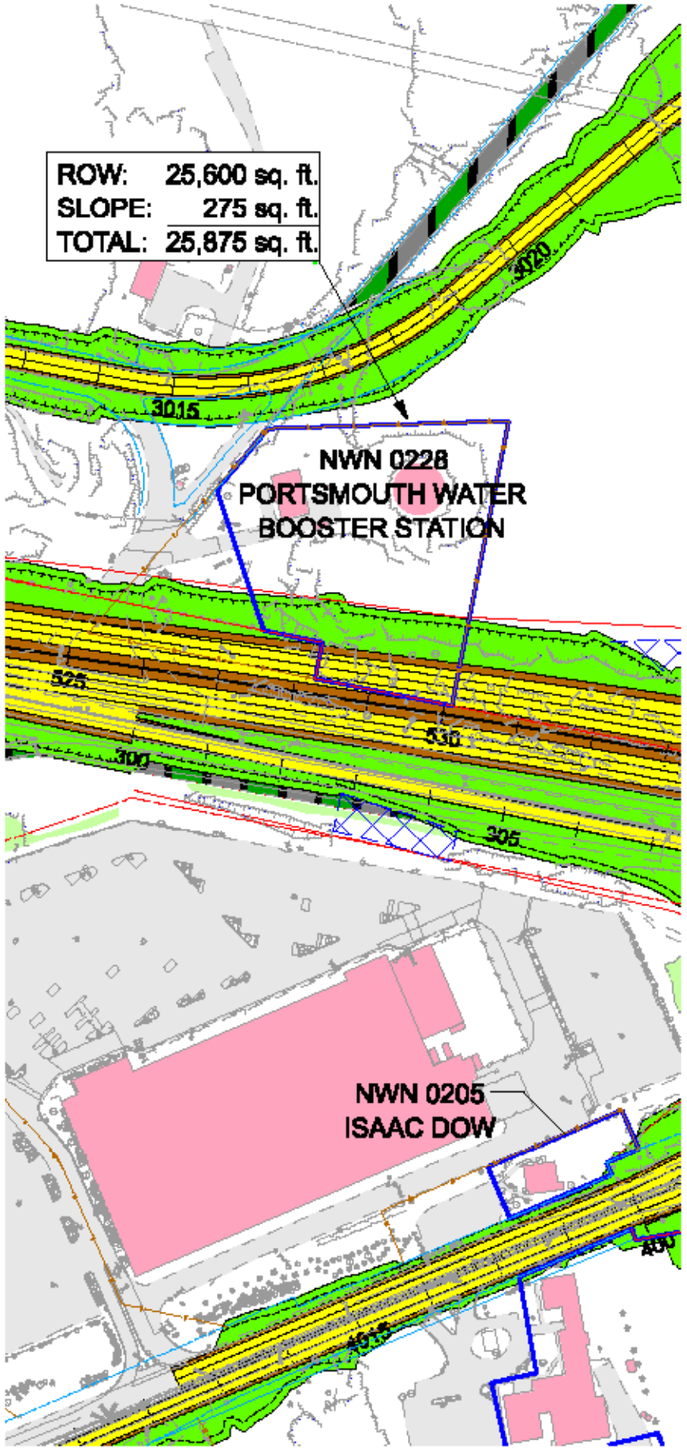
N

0 200 400 Feet

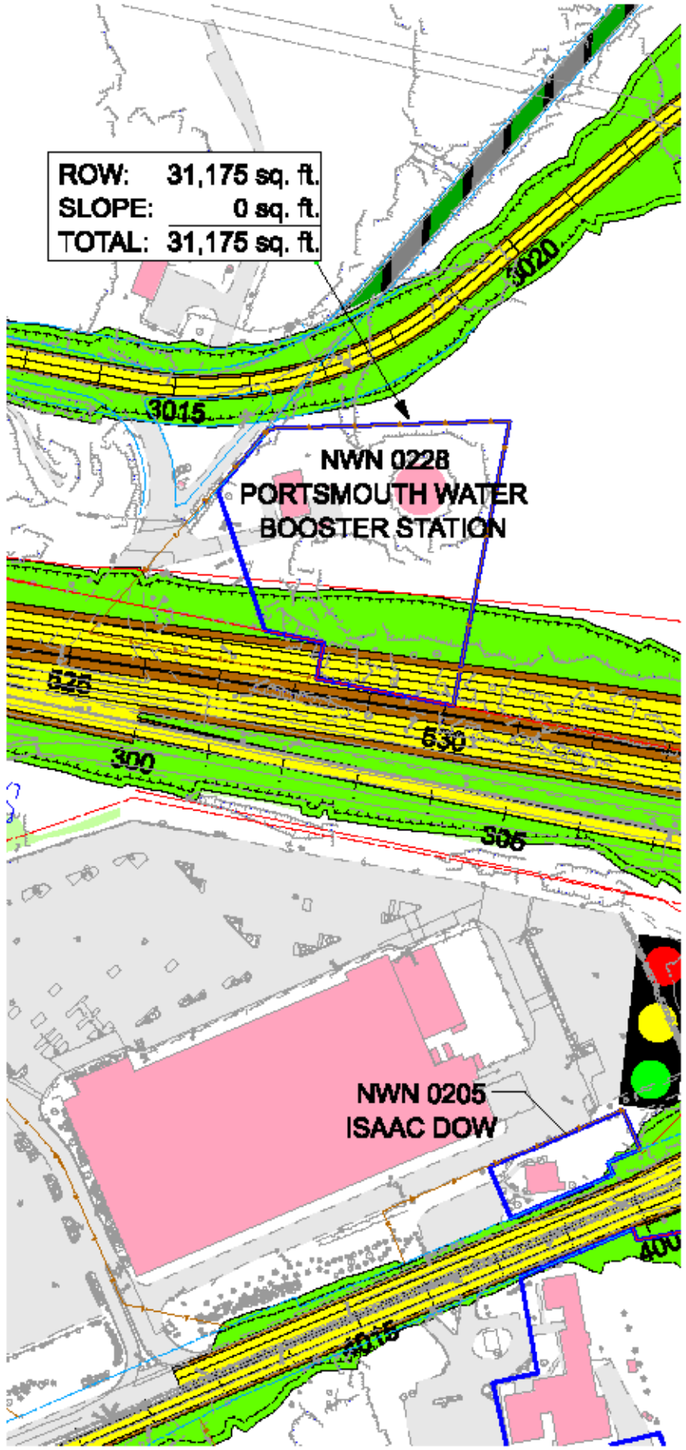
Vanasse Hangen Brustlin, Inc.

Figure 4.17-7
Potential Archaeological Impacts, Dover Alternative 3

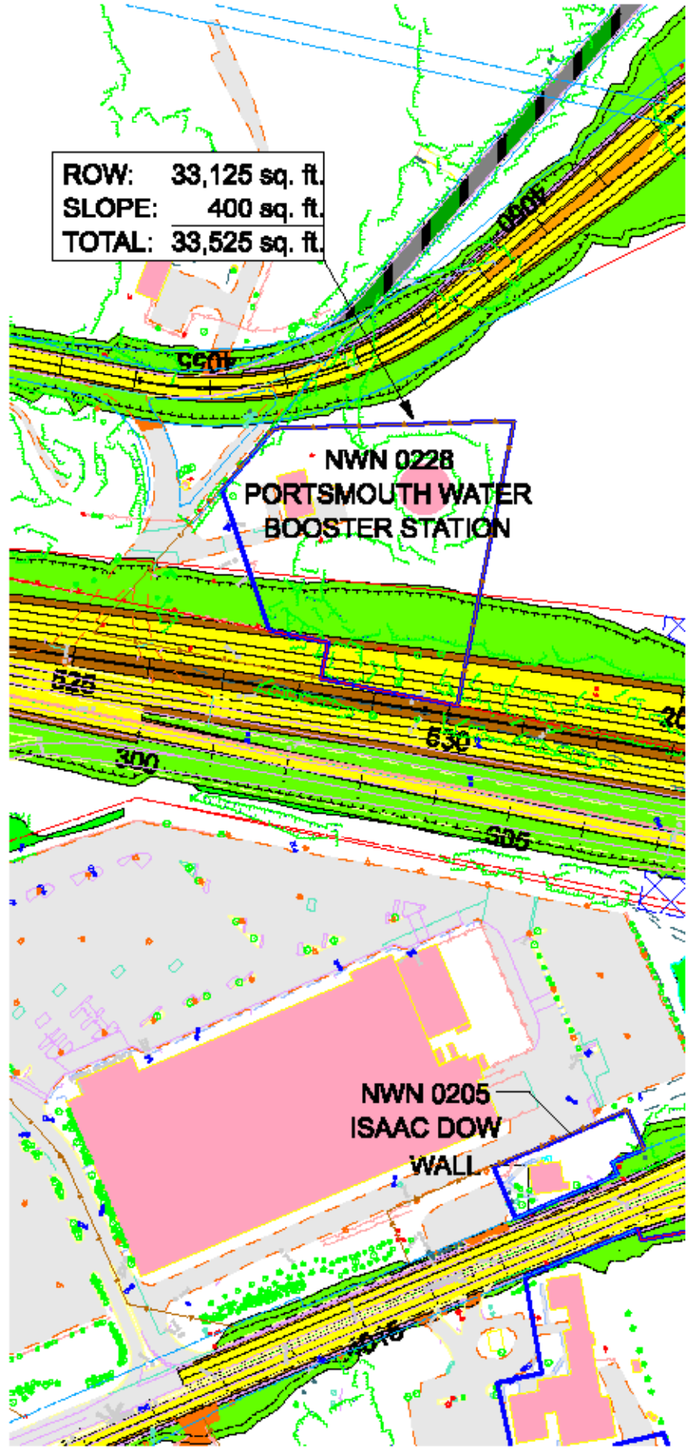
NEWINGTON ALTERNATIVE 10A



NEWINGTON ALTERNATIVE 12A



NEWINGTON ALTERNATIVE 13



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Historic Structure (Listed or Eligible for Listing)

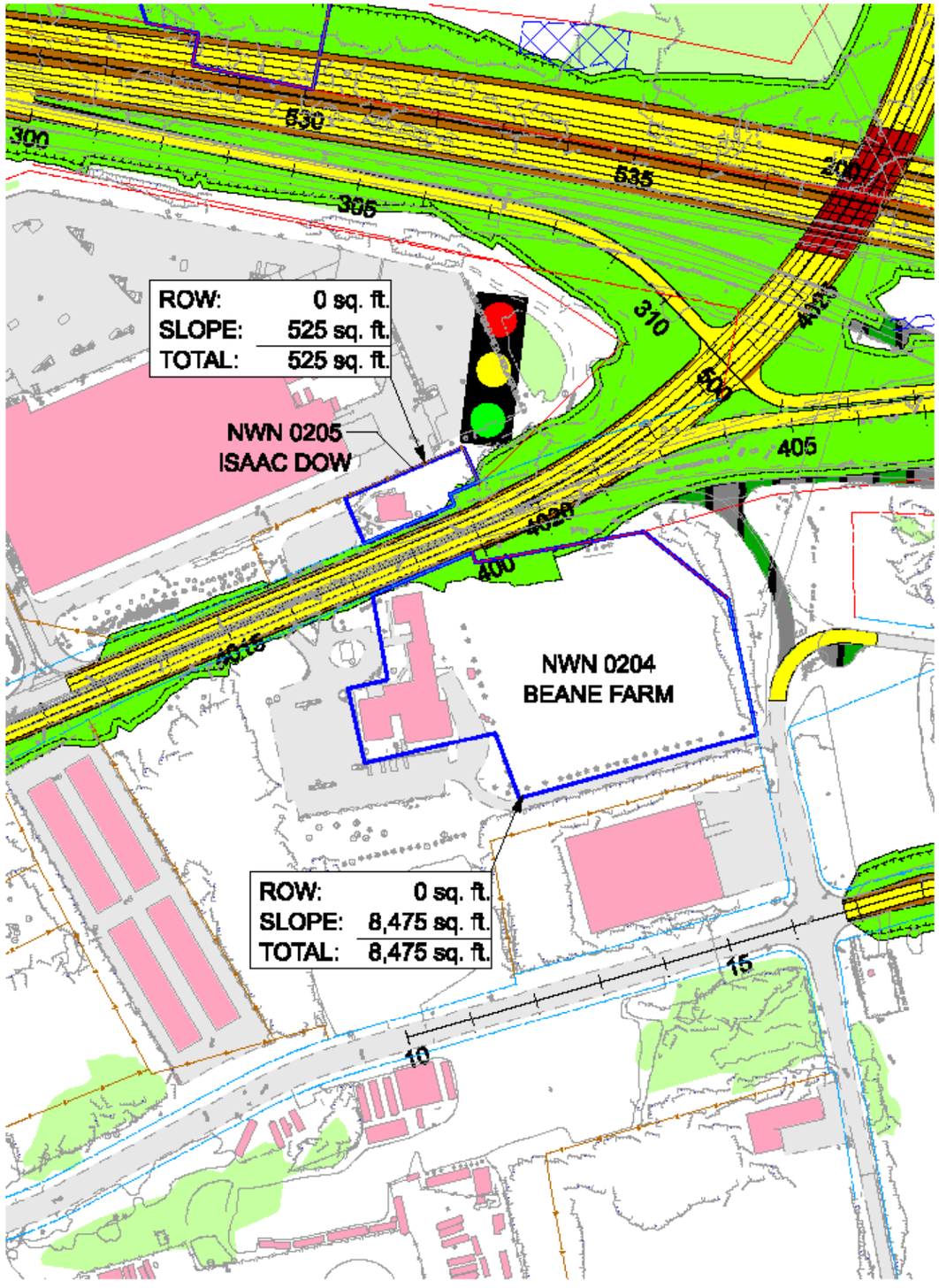
0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

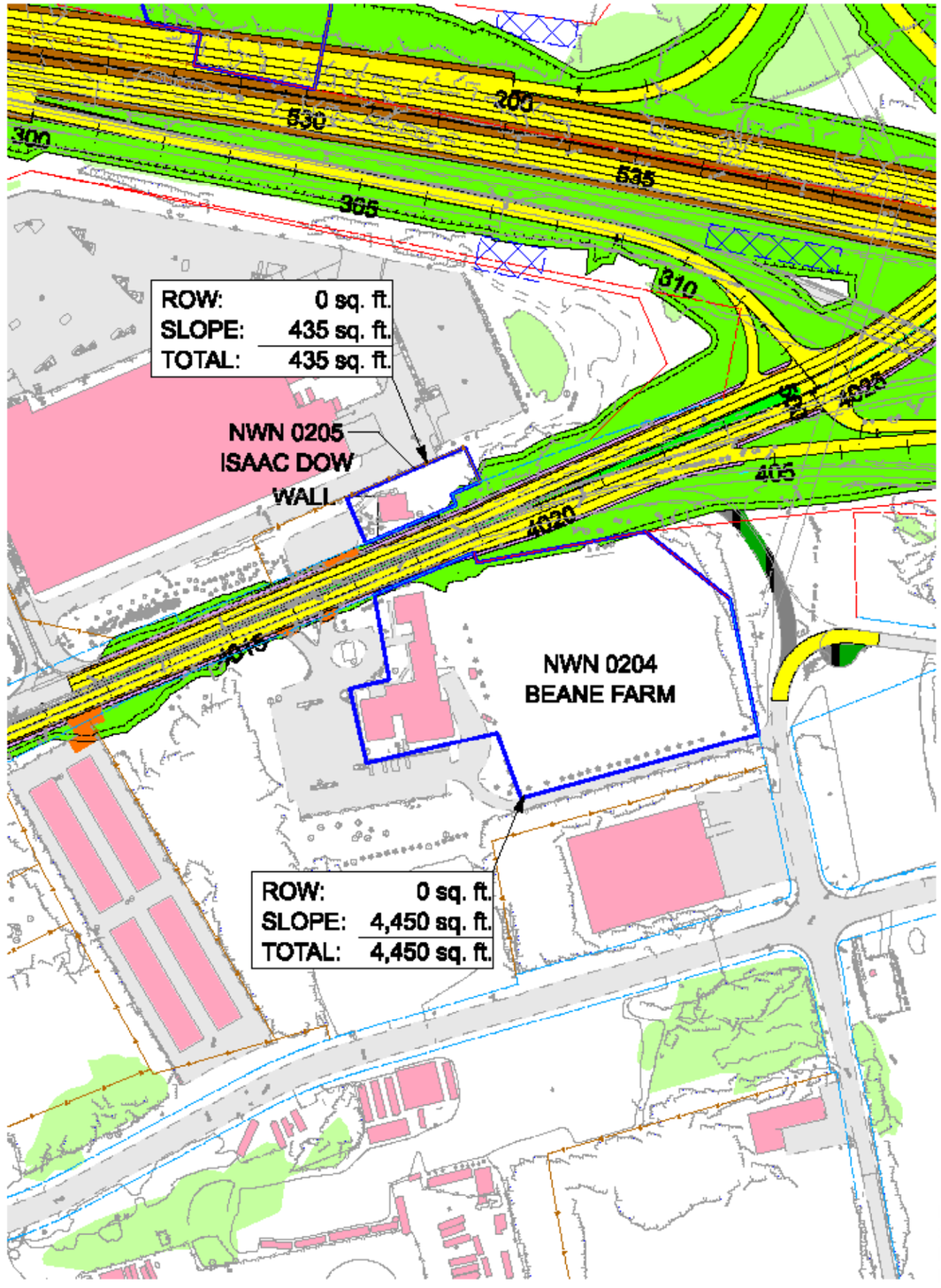
Figure 5.4-1
Section 4(f) Impacts
NWN 0228
Newington

Date Created: 10/9/2007

NEWINGTON ALTERNATIVE 12A



NEWINGTON ALTERNATIVE 13



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Historic Structure (Listed or Eligible for Listing)

N

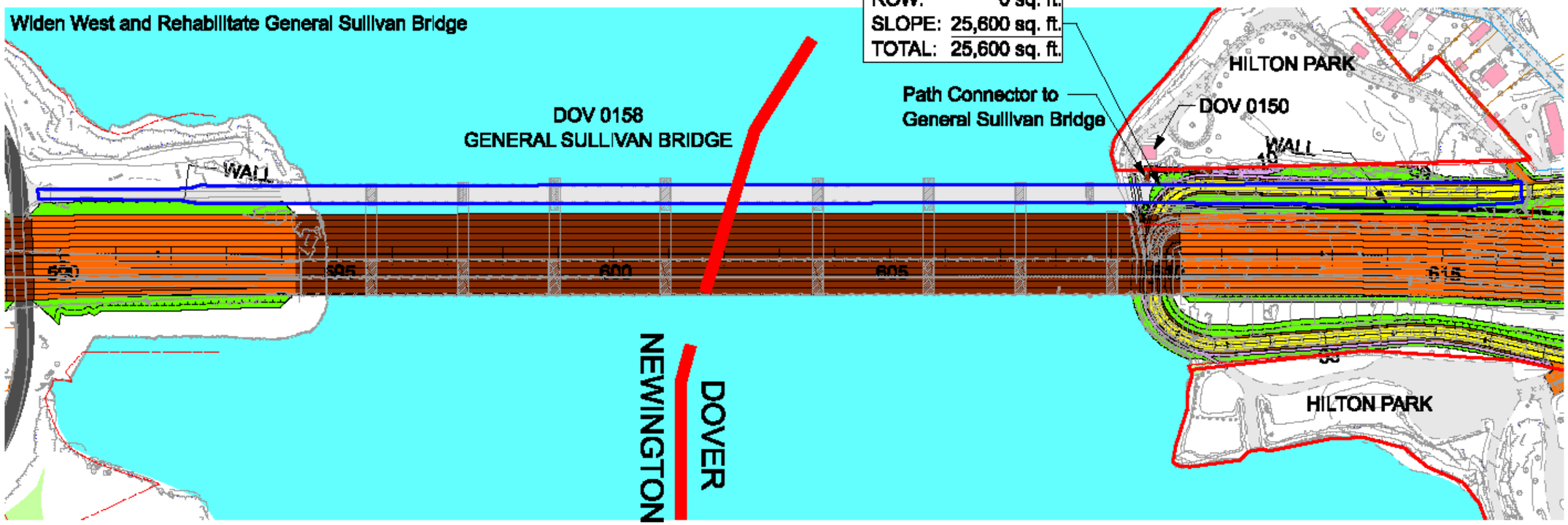
0 100 200 Feet

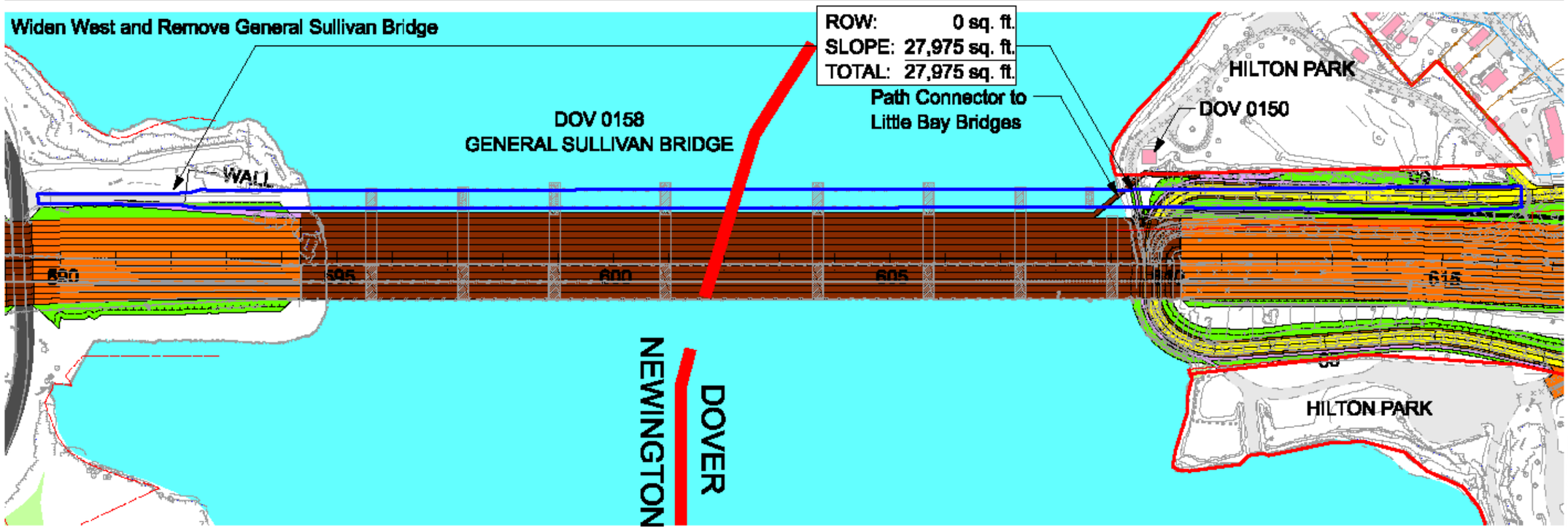
* Newington Alternative 10A and 12A have Similar Configurations.

Vanasse Hangen Brustlin, Inc.

Figure 5.4-2
Section 4(f) Impacts
NWN 0204, NWN 0205
Newington

Date Created: 1/29/2007





New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Sidewalk
- Proposed Acquisition
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Historic Structure (Listed or Eligible for Listing)
- Park Boundary

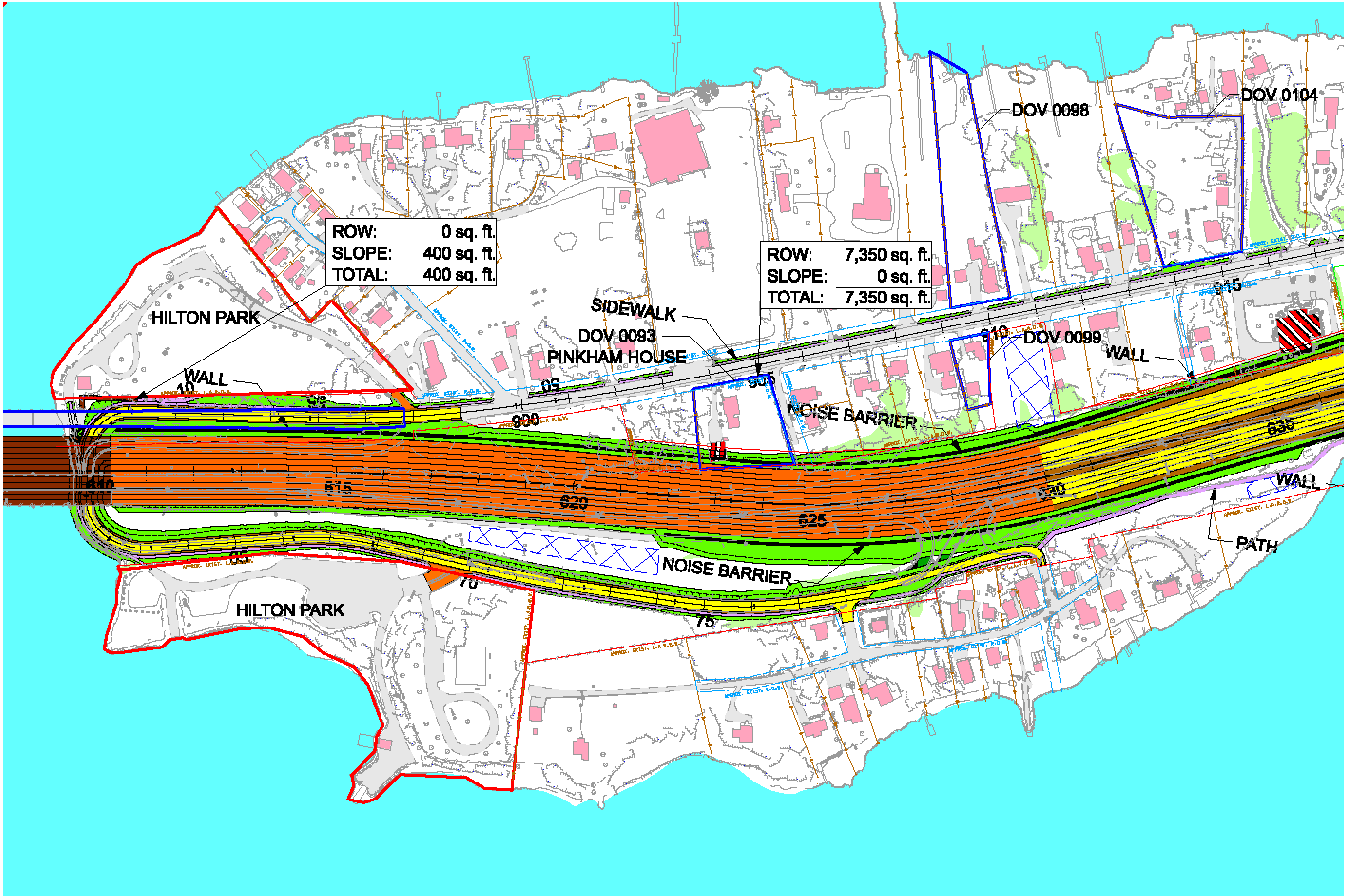
0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 5.4-3
Section 4(f) Impacts
DOV 0158
General Sullivan Bridge, Dover

* Newington Alternatives 10A, 12A and 13 have Similar Configurations.
Dover Alternatives 2 and 3 have Similar Configurations.

Date Created: 1/29/2007



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Historic Structure (Listed or Eligible for Listing)
- Park Boundary

N

0 100 200 Feet

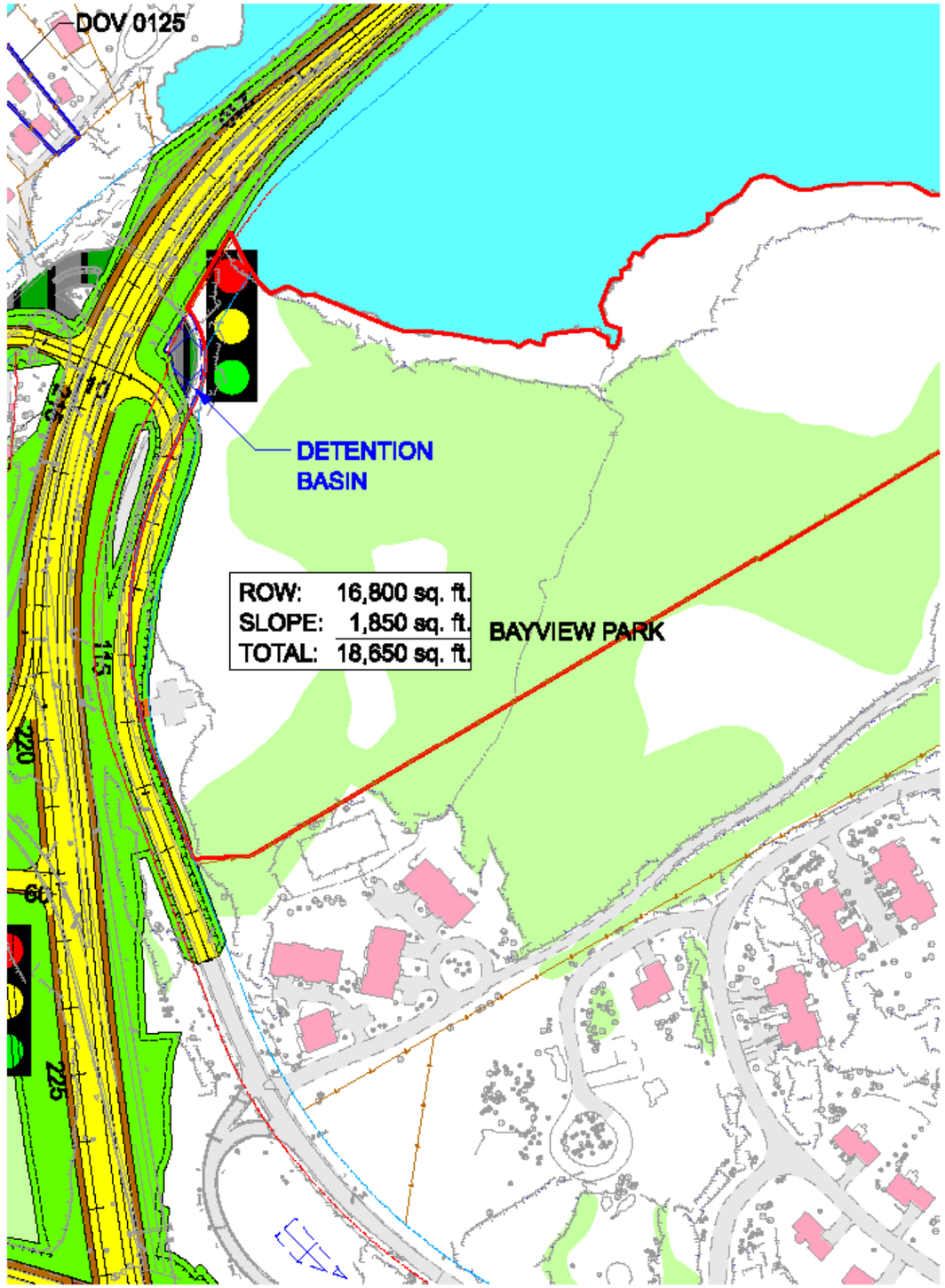
Vanasse Hangen Brustlin, Inc.

Figure 5.4-4
Section 4(f) Impacts
Hilton Park, DOV 0093
Dover

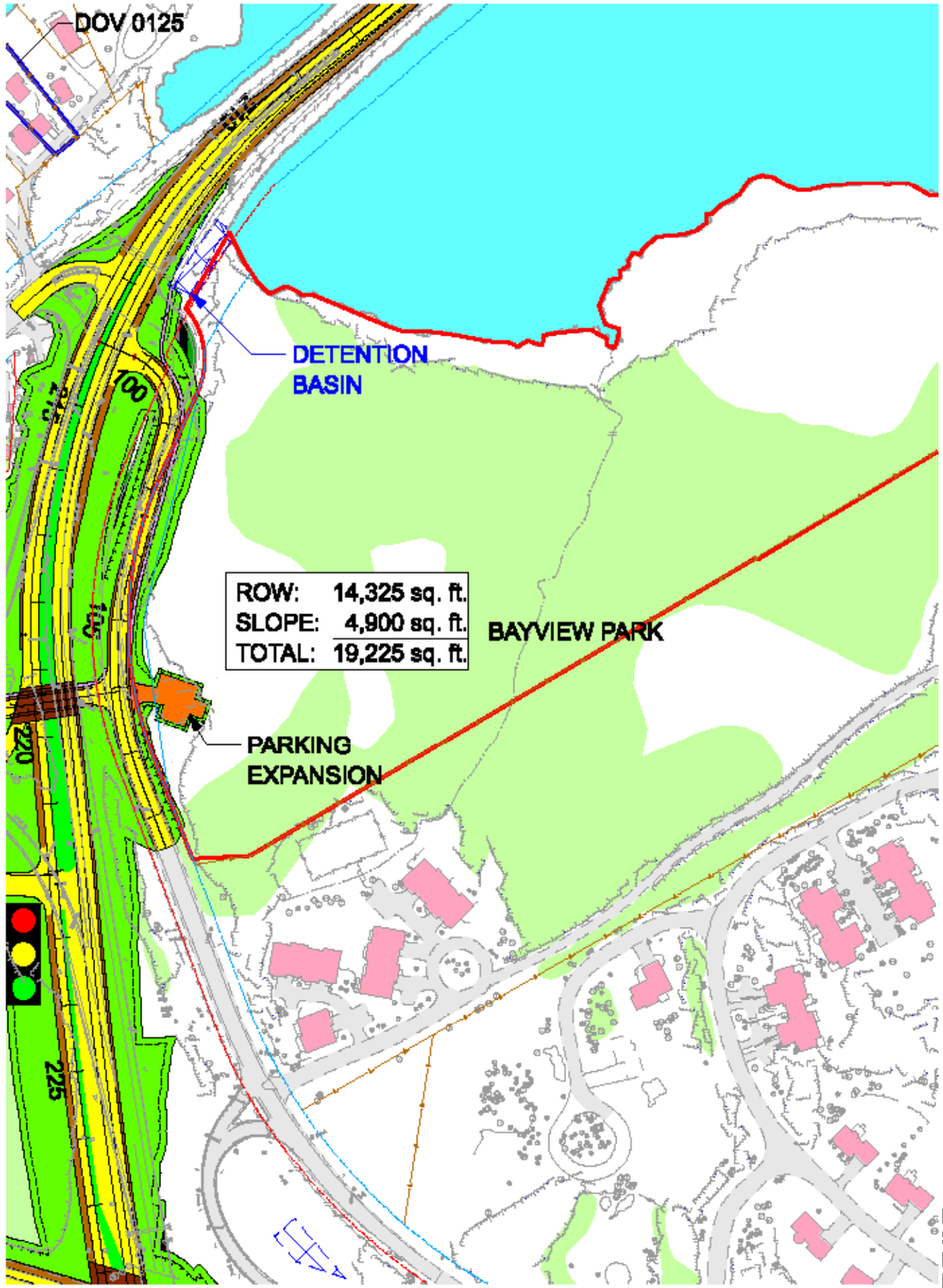
* Dover Alternatives 2 and 3 have Similar Configurations.

Date Created: [illegible] [illegible]

DOVER ALTERNATIVE 2



DOVER ALTERNATIVE 3



New Hampshire DOT
Department of Transportation

Legend:

- Existing Roadway
- Existing Building
- Existing Wetland
- Existing Property Lines
- Proposed Roadway
- Proposed Bridge
- Proposed Rail Corridor
- Proposed Acquisition
- Pavement Removal
- Existing LAROW
- Existing CAROW
- Existing ROW
- Proposed LAROW
- Proposed CAROW
- Proposed ROW
- Historic Structure (Listed or Eligible for Listing)
- Park Boundary

N

0 100 200 Feet

Vanasse Hangen Brustlin, Inc.

Figure 5.4-5
Section 4(f) Impacts
Bayview Park
Dover

Date Created: 12/9/2007


VHB Vanasse Hangen Brustlin, Inc.