

PRELIMINARY INFORMATION SHEET (CULVERT)

INDEX OF SHEETS

FINAL HYDRAULIC REPORT

PLAN SHEETS

| | |
|-------|-----------------------------------|
| 32 | TITLE SHEET |
| 33 | PRELIMINARY INFORMATION SHEET |
| 34 | PROJECT NOTES |
| 35-36 | QUANTITY SHEETS |
| 37 | TYPICAL SECTIONS |
| 38 | TIE SHEET |
| 39 | EXISTING CONDITIONS |
| 40 | LAYOUT SHEET |
| 41 | ROADWAY PROFILE & BANKING DIAGRAM |
| 42 | CHANNEL PROFILE |
| 43 | DETOUR (1) |
| 44 | DETOUR (2) |
| 45 | BORING INFORMATION SHEET |
| 46 | BORING LOGS |
| 47 | BOX LAYOUT |
| 48 | RAIL LAYOUT SHEET |
| 49-52 | MAINLINE SECTIONS |
| 53-56 | CHANNEL SECTIONS |
| 57 | EPSC NARRATIVE |
| 58 | EPSC CONSTRUCTION SITE PLAN |
| 59-61 | EPSC DETAILS |
| 62 | ROW LAYOUT SHEET |
| 63 | ROW DETAIL SHEET |

STANDARDS LIST

| | | |
|-------|--|------------|
| B-71 | STANDARD FOR RESIDENTIAL AND COMMERCIAL DRIVES | 07-08-2005 |
| E-193 | PAVEMENT MARKING DETAILS | 08-18-1995 |
| G-1 | STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS) | 03-10-2017 |
| G-1D | STEEL BEAM GUARDRAIL DETAILS (END TERMINAL, ANCHOR MEDIAN) | 03-10-2017 |
| T-1 | TEMPORARY TRAFFIC CONTROL GENERAL NOTES | 04-25-2016 |
| T-10 | CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING | 08-06-2012 |
| T-17 | TRAFFIC CONTROL MISCELLANEOUS DETAILS | 08-06-2012 |
| T-28 | CONSTRUCTION SIGN DETAILS | 08-06-2012 |
| T-30 | CONSTRUCTION SIGN DETAILS | 08-06-2012 |
| T-42 | BRIDGE NUMBER PLAQUE | 04-09-2014 |
| T-45 | SQUARE TUBE SIGN POST AND ANCHOR | 01-02-2013 |

DETAIL SHEETS

| | | |
|------------|----------------------------|------------|
| HSD-400.01 | SAFETY EDGE DETAILS | 03-29-2016 |
| SD-502.00 | CONCRETE DETAILS AND NOTES | 10-10-2012 |

HYDROLOGIC DATA

Date: October 2016

DRAINAGE AREA : 1.1 sq. mi.
 CHARACTER OF TERRAIN : Mostly forested, rural
 STREAM CHARACTERISTICS : Sinuous and incised
 NATURE OF STREAMBED : Sand, gravel, cobbles

PEAK FLOW DATA - ANNUAL EXCEEDANCE PROBABILITY (AEP)

| | | | |
|-------|---------|--------|---------|
| 43% = | 70 cfs | 2% = | 260 cfs |
| 10% = | 160 cfs | 1% = | 310 cfs |
| 4% = | 210 cfs | 0.2% = | 430 cfs |

DATE OF FLOOD OF RECORD : Unknown
 ESTIMATED DISCHARGE : Unknown
 WATER SURFACE ELEV. : Unknown
 NATURAL STREAM VELOCITY : @ 2% AEP = 10.9 fps
 ICE CONDITIONS : Moderate
 DEBRIS : Light to moderate
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No
 IS ORDINARY RISE RAPID? No
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
 IF YES, DESCRIBE:

WATERSHED STORAGE: <1% HEADWATERS:
 UNIFORM: X
 IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated galvanized metal plate pipe
 YEAR BUILT: 1981
 CLEAR SPAN(NORMAL TO STREAM): 8'
 VERTICAL CLEARANCE ABOVE STREAMBED: 8'
 WATERWAY OF FULL OPENING: 50 sq. ft.
 DISPOSITION OF STRUCTURE: Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: See borings

WATER SURFACE ELEVATIONS AT:

| | | | |
|-----------|--------|------------|----------|
| 43% AEP = | 713.0' | VELOCITY = | 9.4 fps |
| 10% AEP = | 714.4' | " | 12.3 fps |
| 4% AEP = | 715.0' | " | 13.6 fps |
| 2% AEP = | 715.5' | " | 14.6 fps |
| 1% AEP = | 715.9' | " | 15.5 fps |

LONG TERM STREAMBED CHANGES: Scour hole at outlet

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 725.2'
 DISCHARGE OVER ROAD @ 1% AEP: N/A

UPSTREAM STRUCTURE

TOWN: Waterford DISTANCE: 1800'
 HIGHWAY #: TH 19 STRUCTURE #:
 CLEAR SPAN: CLEAR HEIGHT:
 YEAR BUILT: FULL WATERWAY:
 STRUCTURE TYPE:

DOWNSTREAM STRUCTURE

TOWN: Waterford DISTANCE: 1000'
 HIGHWAY #: STRUCTURE #:
 CLEAR SPAN: CLEAR HEIGHT:
 YEAR BUILT: FULL WATERWAY:
 STRUCTURE TYPE: Confluence with Connecticut River

AS BUILT "REBAR" DETAIL

| LEVEL I | LEVEL II | LEVEL III |
|---------|----------|-----------|
| TYPE: | TYPE: | TYPE: |
| GRADE: | GRADE: | GRADE: |

CULVERT DESIGN CRITERIA

- PROPOSED CULVERT IS A PRECAST CONCRETE STRUCTURE (16'-0" X 8'-0" X 122' BOX).
- CULVERT ENDS ARE NOT SKEWED. CULVERT ENDS ARE PLUMB.
- CULVERT WILL BE SET AT A SLOPE OF 7.361 FT ON 100 FT.

TRAFFIC DATA

| YEAR | ADT | DHV | % D | % T | ADTT | 20 year ESAL for flexible pavement from 2015 to 2035 : 593,000 |
|------|------|-----|-----|-----|------|--|
| 2015 | 1100 | 150 | 57 | 6.2 | 90 | 40 year ESAL for flexible pavement from 2015 to 2055 : 1,254,000 |
| 2035 | 1100 | 150 | 57 | 8.5 | 130 | Design Speed : 50 mph |

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete box

CLEAR SPAN(NORMAL TO STREAM): 16'
 VERTICAL CLEARANCE ABOVE STREAMBED: 5'
 WATERWAY OF FULL OPENING: 80 sq. ft.

WATER SURFACE ELEVATIONS AT:

| | | | |
|-----------|--------|------------|----------|
| 43% AEP = | 711.2' | VELOCITY = | 7.1 fps |
| 10% AEP = | 712.0' | " | 9.7 fps |
| 4% AEP = | 712.4' | " | 10.4 fps |
| 2% AEP = | 712.8' | " | 11.0 fps |
| 1% AEP = | 713.2' | " | 12.3 fps |

IS THE ROADWAY OVERTOPPED BELOW 1% AEP: No
 FREQUENCY: N/A
 RELIEF ELEVATION: 725.2'
 DISCHARGE OVER ROAD @ 1% AEP: N/A

BRIDGE LOW CHORD ELEVATION: 715.1'
 FREEBOARD: @ 2% AEP = 2.3'

SCOUR: Scour not calculated for a box

REQUIRED CHANNEL PROTECTION: Stone Fill Type III*

PERMIT INFORMATION

AVERAGE DAILY FLOW: - DEPTH OR ELEVATION:
 ORDINARY LOW WATER: -
 ORDINARY HIGH WATER: -

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: None required
 CLEAR SPAN (NORMAL TO STREAM):
 VERTICAL CLEARANCE ABOVE STREAMBED:
 WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

* E-stone Type E3 should be used to fill the box and in the channel.

TRAFFIC MAINTENANCE NOTES

- MAINTAIN TRAFFIC ON AN OFF SITE DETOUR.
- TRAFFIC SIGNALS ARE NOT NECESSARY.
- SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

| | |
|--|--|
| 1. DESIGN LIVE LOAD | HL-93 |
| 2. FUTURE PAVEMENT | d _p : 3.0 INCH |
| 3. CULVERT OPENING | D: 16.00 FT |
| 4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS) | Δ: --- |
| 5. PRESTRESSING STRAND | f _y : --- |
| 6. PRESTRESSED CONCRETE STRENGTH | f'c: --- |
| 7. PRESTRESSED CONCRETE RELEASE STRENGTH | f'ci: --- |
| 8. CONCRETE, HIGH PERFORMANCE CLASS AA | f'c: 4.0 KSI |
| 9. CONCRETE, HIGH PERFORMANCE CLASS A | f'c: 4.0 KSI |
| 10. CONCRETE, HIGH PERFORMANCE CLASS B | f'c: 3.5 KSI |
| 11. CONCRETE, CLASS C | f'c: 3.0 KSI |
| 12. REINFORCING STEEL | f _y : 60 KSI |
| 13. STRUCTURAL STEEL AASHTO M270 | f _y : --- |
| 14. NOMINAL BEARING RESISTANCE OF SOIL | q _n : 12 KSF |
| 15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) | φ: 0.45 |
| 16. NOMINAL BEARING RESISTANCE OF ROCK | q _n : --- |
| 17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD) | φ: --- |
| 18. PILE RESISTANCE FACTOR | φ: --- |
| 19. LATERAL PILE DEFLECTION | Δ: --- |
| 20. BASIC WIND SPEED | V _{3s} : --- |
| 21. MINIMUM GROUND SNOW LOAD | p _g : --- |
| 22. SEISMIC DATA | PGA: 9%g S _s : --- S ₁ : --- |
| 23. | --- |
| 24. | --- |
| 25. | --- |
| 26. | --- |

PROJECT NAME: WATERFORD

PROJECT NUMBER: BF 0225(5)

FILE NAME: z15b051pi.dgn PLOT DATE: 9/27/2017
 PROJECT LEADER: T. LEVINS DRAWN BY: B. WILLIAMS
 DESIGNED BY: B. WILLIAMS CHECKED BY: T. LEVINS
 PRELIMINARY INFORMATION SHEET SHEET 33 OF 63