# TOWN OF EXETER CAPITAL IMPROVEMENT PROGRAM 2017-2022





### Town of Exeter, New Hampshire

1638 2	017 - 2022 CIP Project Request Form	Date Submitted:	6/29/2016
		First Year Funding is Requested:	FY17
Project Title: C	ourt St. Bridge/Culvert Replacement	Project Ranking:1 of	6
Project Type: R	toads/Sidewalks	Useful Life (Years):	75
Project Cost: \$	1,381,000	Master Plan (Y/N):	NO
		Growth Related (Y/N):	YES
Department: P	ublic Works	Service Related (Y/N):	YES
Contact Name: J	ennifer Perry	Externally Mandated (Y/N):	NO

#### Project Description

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1. General Project Description: This project will replace the large roadway culverts on Court Street, which consist of triple 51" metal arch culverts (1965) that carry Little River under Court Street. The Linden Street culvert replacement project was approved for FY15 and was replaced in summer 2015.

Over the years, flow through the culverts has eroded areas on the pipe floor, leaving the earth exposed. As water flows through these damaged areas soil under the culvert is experiencing significant undermining. Culvert walls are experiencing rusting and pitting with some sag in the crown (roof). A consultant prepared an evaluation of the existing conditions, probable fixes and associated costs in 2012. An updated cost estimate was recently prepared by the consultants based on final design plans for the replacement.

2. Rationale: Design funds of \$150,000 were approved in March 2013. The engineering contract was signed in May 2014 for the design of both Court Street and Linden Street Little River crossings. Geotechnical evaluations and borings were performed in summer 2014. The consultant performed hydrologic and hydraulic (H&H) calculations for sizing the river crossings by modifying the H&H work performed on the Exeter River for the Great Dam project. Final design was completed 2015. The Linden Street culvert was replaced in summer 2015. The Court Street culvert is now scheduled to follow in 2017.

3. Cost Estimate: The opinions of probable project costs have been developed by the consultant in June 2015 subsequent to geotechnical testing (borings), utility evaluations and final design. The cost presented below replaces preliminary estimates originally developed in 2012. The Court Street structure will be prestressed concrete box beams on piles. The Court Street bridge will span 55 feet and include the replacement of the 10 inch diameter water main \$45,000 and rehabilitation of the retaining wall on the northwest corner.

Estimated Start Date: May 2017 Estimated Completion Date: October 2017

Total Capital Cost	by Fiscal Year								
FY17	FY18	FY19	FY20	FY21	FY22				
\$1,381,000	\$0	\$0	\$0	\$0	\$0				
Operating Budget Impact by Fiscal Year									
Total Operating E	Total Operating Expense (estimated) by Fiscal Year								
	\$0	\$0	\$0	\$0	\$0				



#### Check all that apply 2017 - 2022 Source of Funding

GO Bond/Borrowing Grants Taxes Water Fees Sewer Fees Impact Fees Revolving Funds Other

#### **Project Benefits**

X Reduces Liability Health or Safety Reduces Long Term Debt Other:



DG 17-XXX Northern Utilities, Inc. Attachment B Page 1 of 3

Town of Exeter, NH

Linden Street & Court Street

**Culvert Replacement Project** 

## NEW HAMPSHIRE WETLANDS BUREAU STANDARD DREDGE AND FILL PERMIT APPLICATION

November 2014

Prepared for:

Town of Exeter Public Works Department 13 Newfields Road Exeter, NH 03833

Prepared by:



35 Bow Street Portsmouth, NH 03801 (603) 431-6196 · Fax (603) 431-5376



NHDES	THE STATE OF NE DEPARTMENT OF ENVIR LAND RESOURCES <b>WETLANDS</b> 29 Hazen Drive, PO Box 95, Phone: (603) 271-2147 <u>http://des.nh.gov/organization</u> <b>PERMIT API</b>	EW HAMPSHIRE CONMENTAL SERVICI S MANAGEMENT <b>BUREAU</b> Concord, NH 03302-0 Fax: (603) 271-6588 n/divisions/water/wetland	DG 17-XXX Northern Utilities, Inc. Attachment B Page 2 of 3 ES 095 S					
Administrative Use Only	Administrative Use Only	Administrative Use Only	File No.: Check No.: Amount: Initials:					
1. REVIEW TIME:	Pofer to Cuidence Decument & for i	natruationa						
Indicate your Review Time below.	Refer to Guidance Document A for I	nstructions.						
Standard Review (Minir	num, Minor or Major Impact)	Expedi	ted Review (Minimum Impact)					
2. PROJECT LOCATION: Separate applications must be filed with each municipality that jurisdictional impacts will occur in.								
ADDRESS: Linden Street & Court St	reet		TOWN/CITY: Exeter					
TAX MAP: Maps 82, 83 & 95	BLOCK: N/A	LOT: ROW	UNIT:					
USGS TOPO MAP WATERBODY NAM	ME: Little River		VATERSHED SIZE: <b>15.7 mi</b> <sup>2</sup> NA					
LOCATION COORDINATES (If known	): Linden 42.9723,-70.9596 Cou	rt: 42.9726, -70.9510						
3. PROJECT DESCRIPTION:								
Provide a brief description of the p of your project. DO NOT reply "Se	roject outlining the scope of work. A e Attached" in the space provided b	ttach additional sheets as elow.	s needed to provide a detailed explanation					
The Town of Exeter is seeking to replace two existing crossings of the Little River. The Linden Street crossing consists of two 12'-10" by 8'- 4" steel plate arch culverts that were built in 1967. The Court Street crossing consists of three 14'-0" by 9'- 8" that were built in 1965. The existing culverts are deteriorating and need to be replaced. The proposed replacement structure will be a single span bridge at each crossing. Approximately 2,850 sq. ft. of wet land impacts are proposed at the Linden Street crossing for removal of the existing culverts and regrading around the proposed wing walls. Approximately, 4,650 sq. ft. of wetland impacts are proposed at the Court Street crossing for removal of the existing culverts and regrading around the proposed wing walls.								
4. RELATED PERMITS, ENFORCEMENT, EMERGENCY AUTHORIZATION, SHORELAND, ALTERATION OF TERRAIN, ETC								
None								
5. NATURAL HERITAGE BUREA See the Instructions & Required A	<b>U &amp; DESIGNATED RIVERS:</b> ttachments document for instructions	s to complete a & b below	Ι.					
a. Natural Heritage Bureau File II	D: NHB 14-2008 and 14-2	<u>033 .</u>						
<ul> <li>Designated River the project is in ¼ miles of:; and date a copy of the application was sent to Local River Advisory Committee: Month: Day: Year:</li> <li>NA</li> </ul>								

2

# E. Project Need and Minimization & Avoidance

The Linden Street crossing over the Little River is a causeway like structure built in 1967 with a total length of 50 feet measured along the road. The river meanders upstream of the crossing and turns right as it flows through two Corrugated Metal Pipe (CMP) arch culverts, each with a 12.8-foot span and 8.3-foot rise. The CMP culverts are separated by 3.5 feet of fill with stone and cast-in-place concrete infill headwalls between the arches. The structure is listed in poor condition and is currently on the Municipal Red List of structures that require replacement. Heavy rusting over time has resulted in section loss of the structural metal pipe arches to the extent that holes and severe pitting can be observed in the lower section of the side walls along the water line.

The Court Street Culvert crosses the Little River approximately a half mile downstream of the Linden Street Culvert. The structure was built in 1965 and is of similar construction to the Linden Street crossing with one 14.1 by 8.75-foot and two 12.8 by 8.3-foot CMP culverts and a total length of 85 feet measured along the road. The sidewalk at the Court Street Culvert runs along the downstream (east) side of the roadway and is approximately 5 feet wide with granite curbing. Including the sidewalk, the roadway has an overall width of 39 feet. The Court Street Culvert is not presently on the Municipal Red List, however its condition is borderline and near Red List status. Despite the higher condition rating, the Court Street Culvert was observed by CMA Engineers to be in similar condition to the Red List Linden Street culvert. The Court Street Culvert is also currently classified as hydraulically deficient.

The Town is proposing to replace the Linden Street crossing in 2015 and the Court Street crossing in 2016 with single span bridges. The projects are being permitted together due to their geographic location and similar construction methods.

See Attachment A – Minor & Major 20 questions on the following page.



COURT STREET HDD

COURT STREET EXETER, NH



LOCUS scale: nts



1600 Providence Highway Walpole, MA 02081 781.829.0524 processolpelineservices.com

INDEX OF SHEETS

TO1 COVER SHEET

C01 GENERAL NOTES C02 HDD PLAN AND PROFILE

DO1 BORING LOGS B-1

DO2 BORING LOGS B-2 DO3 HDD WORKSPACE PLAN

TITLE

NUMBER NAME

1

3

4

PREL	I M	1 N	A R	Y
ISSUE STATUS	DATE	REVIEWED	CHECKED	APPROVED
25% SUBMISSION	_			
50% SUBMISSION				
75% SUBMISSION				
90% SUBMISSION			land and	
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FILE NAME: HOD-001.DWG				3216
PLOT DATE: 12/12/2016 3:42 1	рМ			T01
		1	SHEET	OF 6

#### GENERAL HDD NOTES:

- 1. THE DRAWINGS SHOW EXISTING UTILITIES THAT ARE BELIEVED TO BE NEAR THE HORIZONTAL DIRECTIONAL DRILL ALIGNMENT. THERE IS NO GUARANTEE THAT THESE UTILITIES ARE LOCATED AS SHOWN OR THAT OTHER UTILITIES MAY NOT BE PRESENT. THE CONTRACTOR IS TO FIELD LOCATE EXISTING UTILITIES IN ADVANCE OF THE WORK AND TO AVOID CONFLICT OR DISRUPTION OF UTILITY SERVICES.
- 2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES WITH UNDERGROUND UTILITIES IN THE WORK AREA VIA THE STATE OR LOCAL "ONE CALL", TO OBTAIN UTILITY LOCATIONS.
- 3. THE CONTRACTOR SHALL PLACE SILT FENCE BETWEEN ALL BORING OPERATIONS AND ANY DRAINAGE, WETLAND, WATERWAY OR OTHER AREAS DESIGNATED FOR PROTECTION BY STATE, FEDERAL, AND LOCAL REGULATIONS.
- 4. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO ELIMINATE THE DISCHARGE OF WATER, DRILLING MUD, AND CUTTINGS TO NEARBY WATERWAYS DURING DRILLING OPERATIONS
- 5. THE CONTRACTOR SHALL INSTALL THE CASING PIPE BY MEANS OF HORIZONTAL DIRECTIONAL DRILLING. THE CONTRACTOR SHALL ASSEMBLE AND SUPPORT THE CASING PRIOR TO THE INSTALLATION IN THE DIRECTIONAL DRILL BORE.
- 6. THE LAY DOWN AREA BEYOND THE EXIT POINT MUST EQUAL THE LENGTH OF THE DRILL FOR CONTINUOUS LENGTH OF FABRICATED PIPE.
- 7. THE REQUIRED CASING SHALL BE ASSEMBLED IN A MANNER THAT DOES NOT OBSTRUCT ADJACENT ROADWAYS, DRIVEWAYS, OR PUBLIC ACTIVITIES.
- 8. THE ENTIRE DRILL PATH SHALL BE ACCURATELY SURVEYED WITH ENTRY AND EXIT STAKES PLACED IN THE APPROPRIATE LOCATIONS WITHIN THE AREAS INDICATED ON THESE DRAWINGS.
- THE PILOT HOLE SHALL BE DRILLED ALONG THE BORE PATH TO THE FOLLOWING 9. TOLERANCE AREAS, ELEVATION, ALIGNMENT, CURVE RADIUS, ENTRY POINT LOCATION, EXIT POINT LOCATION, AND LIMITATIONS ON DEPTH.
- 10. THERE SHALL BE A SYSTEM TO DETECT ELECTRICAL CURRENT FROM THE DRILLING STRING AND AN AUDIBLE ALARM WHICH AUTOMATICALLY SOUNDS WHEN AN ELECTRICAL CURRENT IS DETECTED.
- 11. THE CONTRACTOR SHALL PROVIDE ALL COMPONENTS AND MATERIALS TO INSTALL, OPERATE, AND MAINTAIN THE GUIDANCE SYSTEM, THE SYSTEM MUST BE REMOTELY STEERABLE AND PERMIT ELECTRONIC MONITORING OF THE DIRECTIONAL DRILL. THE GUIDANCE SYSTEM SHALL BE ACCURATE AND CALIBRATED ACCORDING TO THE MANUFACTURERS SPECIFICATIONS.
- 12. THE CONTRACTOR SHALL FURNISH AS-BUILT PLANS AND PROFILE DRAWING BASED ON THE RECORDINGS SHOWING ACTUAL LOCATION HORIZONTALLY AND VERTICALLY OF THE INSTALLATION.
- 13. UPON COMPETITION OF THE DIRECTIONAL BORE, THE CONTRACTOR SHALL TEST THE TRACER WIRE CONTINUITY.
- 14. REAMING AND PULL BACK MEASURES SHALL BE TAKEN TO ENSURE THE CASING PIPE IS PULLED WITHOUT EXCESSIVE GROUND MOVEMENT, OVER STRESSING THE CASING PIPE, INADVERTENT RETURNS OF DRILLING FLUID, PREVENTING TRANSFER OF THE SOIL CUTTINGS FROM THE FACE OF THE EXCAVATION TO THE LAUNCHING OR EXIST POINT.
- 15. THE PULL BACK SECTION SHALL BE SUPPORTED USING A COMBINATION OF ROLLER STANDS AND PIPE HANDLING EQUIPMENT TO MINIMIZE TENSILE FORCES ON THE PIPE CASING.
- 16. ADDITIVES TO DRILLING FLUIDS SHALL BE ENVIRONMENTALLY SAFE AND APPROVED FOR SUCH USAGE. THE DRILLING MUD SHALL BE BENTONITE SLURRY OR POLYMER ADDITIVES OR APPROVED EQUAL AND CONTAINED AND DISPOSED OF IN ACCORDANCE WITH STATE, FEDERAL, AND PERMIT CONDITIONS WITH NO ENVIRONMENTAL RISK.
- 17. EXCESS PIPE SHALL BE REMOVED AND THE BORE HOLE ASSOCIATED WITH THE EXCESS PIPE SHALL BE FILLED WITH FLOWABLE FILL OR GROUT UNLESS THE AREA OF THE EXCESS PIPE IS EXCAVATED AND BACKFILLED AS PART OF THE TIE-IN OPERATIONS.
- 18. THE CONTRACTOR SHALL DE-MOBILIZE EQUIPMENT AND RESTORE THE WORK-SITE AREA TO ORIGINAL CONDITION OR BETTER. RESTORATION SHALL INCLUDE BUT NOT LIMITED TO PAVED AND UNPAVED SURFACES, SHRUBBERY, LANDSCAPING, TREES, AND STRUCTURES.

LEGE	ND
стер Пер	UTILITY POLE & CUY WRE UTILITY POLE W/ LIGHT
P.	LIGHT POLE MAILBOX
-0-0-	SIGN (TWO POSTS)
	SIGN COLUMN FORMULA
0	IRON PIPE ROD FOUND
*	BARBED WRE FOUND ON GROUND
K.	FIRE HYDRANT
W	WATER CATE VALVE
<sup>co</sup>	TAILOR GATE VALVE
$\bowtie$	CLEANOUT
0	CATCH BASIN (ROUND)
	DRAIN MANHOLE
(C)	ELECTRIC MANHOLE
Õ	TELEPHONE MANHOLE
S	SEWER MANHOLE
60	MANHOLE
高	JURISDICTIONAL WEILAND SYMBOL
	IREE STOMP
1	CONFEROOS TREE
6	DECIDUOUS TREE
C	BUSH
· · · · ·	CONCRETE
64	RIP RAP
	LANDSCAPED AREA
	CRUSHED STONE
LTH .	GRANITE
	BOULDER
FES.	DRAINAGE FLOW DIRECTION ARROW FLARED END SECTION
RFT.	RETAINING
FF	FINISHED FLOOR
EP	EDGE OF PAVENENT
SWL	SINGLE WHITE LINE
CONC.	CONCRETE
VGC	VERTICAL GRANITE CURB
VBC	CONDUCT
XW	CROSS WALK
D.H.	DRILL HOLE
0.000	RIGHT OF WAY SEE (NOTE #8)
OHW	OVERHEAD WIRES
D	DRAIN LINE
C	GAS LINE SEE (NOTE #7)
annannan	SHRUB LINE
	WATER LINE SEE (NOTE #7)
	APPROX ABUTTERS LOT LINE
	(PER REFERENCE PLANS AND TAX MAP)
	TREE LINE
100	CONTOUR LINE
	EDGE OF JURISDICTIONAL
	WETLAND (SEE NOTE #2) FLOOD HAZARD ZONE (SEE NOTE#8)

- NOIES: I. FIELD SURVEY PERFORMED BY J.P.E. & P.J.S. DURING 06/14 USING A TRIMBLE 5603 DR 200 PLUS TOTAL STATION WITH A TDS RANGER DATA COLLECTOR AND A SOKKIA B21 AUTO/TRIMBLE DINI DIGITAL LEVEL. TRAVERSE ADJUSTMENT BASED ON LEAST SQUARE ANALYSIS.
- JURISDICTIONAL WETLANDS DELINEATED BY NHSC, INC., A GZA COMPANY, DURING JUNE 2014 IN ACCORDANCE WITH 1987 CORPS OF ENGINEERS WETLANDS DELINEATIONS MANUAL, TECHNICAL REPORT Y-B7-1.
- HORIZONTAL DATUM BASED ON NEW HAMPSHIRE STATE PLANE(2800) NADB3(2011) DERIVED FROM STATIC GPS OBSERVATIONS PROCESSED BY THE NATIONAL GEODETIC SURVEY ON-LINE POSITIONING USER SERVICE (OPUS).
- VERTICAL DATUM IS BASED ON NGVD29, LINDEN ST. DISK STAMPED B 13 1934 ELEV.=60.47 AND COURT ST. DISK STAMPED B 14 1934 ELEV.=37.67.
- 5, THE ACCURACY OF MEASURED UTILITY INVERTS AND PIPE SIZES/TYPES IS SUBJECT TO NUMEROUS FIELD CONDITIONS, INCLUDING; THE ABILITY TO MAKE VISUAL OBSERVATIONS, DIRECT ACCESS TO THE VARIOUS ELEMENTS, MAINFOLE CONFIGURATION, ETC.
- 6. UNDERGROUND UTILITY DATA WAS MARKED BY DIGSMART OF MAINE TO ASCE QUALITY LEVEL B. THIS DATA IS FOR PLANNING PURPOSES ONLY AND DOUCET SURVEY DOES NOT GUARANTEE THE ACCURACY OR EXISTENCE OF THE DATA PROVDED. ON-STIE INSPECTION SHOULD BE CONDUCTED PRIOR FINAL DESIGN AND/OR CONSTRUCTION
- 7. DUE TO THE COMPLEXITY OF RESEARCHING ROAD RECORDS AS A RESULT OF INCOMPLETE, UNORGANIZED, INCONCLUSIVE, OBLITERATED, OR LOST DOCUMENTS, THERE IS AN INHERENT UNCERTAINTY INVOLVED WHEN ATTEMPTING TO DETERMINE THE LOCATION AND WIDTH OF A ROADWAY RIGHT OF WAY. THE EXTENT OF THE ROADS AS DEPICTED HEREON ARE BASED ON PHYSICAL EVIDENCE FOUND AND RECORD PLANS OBTIANED THROUGH RESEARCH CONDUCTED AT THE ROCKINGHAM COUNTY REGISTRY OF DEEDS AND THE TOWN OF EXETER MUNICIPAL OFFICES.
- 8. FLOOD HAZARD ZONE: "AE", PER FIRM MAP #33015C0402E, DATED 5/17/05.
- REFERENCE PLANS: 1. "PLAT OF LAND FOR ULLIAN MORRISSETTE FOR EXETER SCHOOL DISTRICT IN EXETER, NH", BY PARKER SURVEY ASSOCIATES, INC., DATED AUGUST 1973, R.C.R.D. PLAN #D-4024.
- 2. "LAND OF JOSEPH CONTI IN EXETER, NH", BY J. LEAVITT CROM, CIVIL ENGINEER, DATED DECEMBER 18, 1954, R.C.R.D. PLAN #02195.
- 3. "SUBDIVISION PLAN TAX MAP 09-17 BLOCK 01 PARCEL 003 AS DRAWN FOR ESTATE OF KENT A. FRENCH EXETER, NEW HAMPSHIRE", BY WALTER J. ZWEARCAN LLS, DATED MAY, 1996 R.C.R.D. PLAN #D-24715.
- "PLAT OF LAND FOR JOHN SINCLAIR REVOCABLE TRUST IN EXETER, NH", BY PARKER SURVEY ASSOCIATES, INC., DATED AUGUST, 1998, R.C.R.D. PLAN #C-26550.
- 5. "LOT LINE ADJUSTMENT PLAN TAX MAP 83, LOTS 9 & 10", BY LITTLE RIVER SURVEY COMPANY. DATED JUNE, 1999, R.C.R.D. PLAN #0-27357.
- "PLAN OF LAND FOR CHRIST EPISCOPAL CHURCH EXETER", BY JOHN W. DURGIN CIVIL ENGINEERS, DATED DECEMBER, 1963, R.C.R.D. PLAN #953.
- "CONDOMINIUM SITE PLAN PREPARED FOR NORTH COURT STREET CONDOMINIUMS", BY JONES & BEACH ENGINEERS INC., DATED 12/07/01, R.C.R.D. PLAN #D-29657. "LOT UNE ADJUSTMENT FOR RICHARD A. & EMILY M. LEPAGE IN EXETER", BY PARKER SURVEY ASSOC INC., DATED SEPTEMBER, 1983, R.C.R.D. PLAN #D-13156.
- 9. "PLAN OF LOTS EXETER, NH FOR LILLIAN MORRISSETTE", BY JOHN W. DURGIN CIVIL ENGINEERS, DATED JUNE, 1972, R.C.R.D. PLAN #2183-126.
- 10. "PLAT OF LAND IN EXETER, NH SHOWING LINDEN COMMONS SUBDIVISION AT 85A LINDEN STREET", BY MILLENNIUM ENGINEERING INC., DATED JUNE 20, 2007, R.C.R.D. PLAN #D-23901.
- 11. "SUBDIVISION PLAN AS DRAWN FOR MARK HAYDEN", BY WALTER J. ZWEARCON, DATED JULY 1997, R.C.R.D. PLAN #D-36726.
- 12. \*LOT LINE REVISION PLAN FOR EXETER REGION COOPERATIVE SCHOOL DISTRICT\*, DOUGET SURVEY, INC., DATED JULY 6, 2007 R.C.R.D. PLAN  $\#0{-}35520.$

							PRJ MANAGER: M PRJ ENGINEER: D	vark d. W David B. H	DOD OGUE	CLENT INFORMATION	Initil	SHEET TITLE	
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							DESIGNED BY:	MOW	1922				
							DRAFTED BY:	DBH	12/12/16	DESIGN MANAGER: T. BICKFORD	REVIEWED BY:	PROJECT LOCATIO	,OH
	_						CHECKED BY:	SMR		DESIGN ENGINEER: M. DUPUIS	CHECKED BY:		
REV	BY	DATE	DESCRIPTION	DWG NO.	REFERENCE DRAWINGS	SEAL AND SIGNATURE	APPROVED BY:	MDW		ACTIVATION ORDER:	APPROVED BY:		

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GENERAL NOTES	PROCESS PIPELINE SERVICES	1800 Providence Highway Welpole, MA 02081. 781.829.0524 processpipelinsservices.com
URT STREET HDD		
	FILE NAME: HDD-001.DWG	SIZE SHEET REY
COURT STREET	PLOT DATE: 12/12/2016 3:42 PM	22X34 C01 A
leter, new hampshike	PLOT SCALE: NTS	SHEET: 2 OF 6





				Boring No. B–1 Station 12+04, 12.9 Right						Boring No. B-1 (Continued)		
			r	<b>FEST BORING LOG</b>		]			1	TEST BORING LOG	A EL ANGUNAR A MANAGANA ANA EL ANGUNAR	]
	CMA E Civil/Environ 35 Bow Street	Engineers, Inc. prironmental Engineers PROJECT Test Boring Number Bescription: Court St. Bridge B-1		ber CMA Engineers, Inc. Civil/Environmental Engineers Local		PROJECT Description: Court St. Bridge Location: Exeter, NH	Test Boring Number B-1	_				
	Portsmouth,	NH 03801		Notes:	Sheet 1 of 2		Portsmou	th, NH 03801		Notes:	Sheet 2 of 2	
	Fax: 603.431	431.6196 1.5376		Contractor: Great Works Pump & Test Boring, Inc.	Date: July 7, 2014		Fax: 603.	431.5376		Contractor: Great Works Pump & Test Boring, Ind	c. Date: July 7, 2014	7
	CMA Engin	neer: Bob Grille	)	Equipment: Acker Track Rig	Ground Elevation: 31.5' +/-		CMA En	gineer: Bob Grill	o	Equipment: Acker Track Rig	Ground Elevation: 31.5' +/-	
	File Numbe	er: #923		Operator: Peter Michaud	Weather: Sun 80F		File Nun	nber: #923		Operator: Peter Michaud	Weather: Sun 80F	
	Depth	Sample No.	Blow	Sample Descriptions and Classifications	Remarks	1	Depth	Sample No Depth (ft)	. Blow Count	Sample Descriptions and Classifications	Remarks	
itom of stub abutment Jtment A (EL. 25.13)	1 2 3 4	S-1 0.5' - 2.5'	9 10 16 16	Brown Sand and Gravel, trace silt. Fill. Dry.	4" Asphalt Cobble at 1'		26 27 28 29 30	25' - 27'	9 10			
ABI	- 6 - 7	S-2 5' - 7'	7 2 1 1	Brown Sandy Clay. Roots and organics. Fill. Moist.			31 32	S-6 30' - 32'	5 7 6 6	Gray Clayey Fine to Medium Sand, trace gravel and cobbles.		
			9	<u>.</u> 	Groundwater Encountered at 8.0'		— 33 — 34 — 35		12			
	11 12	8-3 5' - 7'	8 5 4	Gray Medium Sand, trace silt. Wood fragments. Fill.	<ul> <li>— Change to Silty Clay at 12.5'</li> </ul>		36 37	S-7 35' - 37'	7 10 15	Same, some gravel.	Cobbles encountered	
	13 14 15	S-4 13' - 15' T-1	WOH / 2'	Gray Silty Clay.	Solid stem augers to 10' 4" Casing to 13'. Drive and wash drilling.			S-8	18 15	Same	37.5' to 38.5'	
		15' - 17' Vane Shear 17' - 17.75' Vane Shear 17.75' - 18.5		440 psf 440 psf			42 43 44	40' - 42'			Refused to drilling tools at 42.5'. — Roller bit drilled to 45' through rock.	A R Y
	20	Vane Shear 20' - 20.75' Vane Shear 20.75' - 21.5		450 psf 450 psf			45 46 47					Z 
	23 24				— Change to Sand at 23.7'		47 					  
	25	S-2	10 8	Gray Fine to Medium Sand, some silt, little gravel. Moist.			50					
							PRJ MANAGER: MARK D. WOOD CU PRJ ENGINEER: DAVID B. HOGUE PRJ NAME: COURT STREET HDD	ENT INFORMATION	Unit	BORING LOGS	PROCESS	1800 Providence Highway Walpole, MA 02081 781 820 0524
							PRJ NUMBER: 5232 PRJ MILESTONE: PRELIMINARY PRJ PHASE: DESIGN		Northern Utilities	I. I. PROJECT NAME S, Inc. COURT STREET H	HDD SERVICES	processpipelinesorvices.com
EV BY	DATE		DESCRIPTION	DWG NO.	REFERENCE DRAWINGS	seal and signature	DESIGNED BY:         MUW         -           DRAFTED BY:         DBH         12/12/16         DI           CHECKED BY:         SMR         -         DI           APPROVED BY:         MDW         -         AK	ESIGN MANAGER: T. BICKFC ESIGN ENGINEER: M. DUPU CTIVATION ORDER:	RD REVIEWED BY S CHECKED BY APPROVED E	Y: PROJECT LOCATION COURT STREET	IRE PLOT SCALE: NIS	42 PM 22X34 D01 A SHEET: 4 QF 6

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-			Boring No. B-2 Station 12+79, 10.9' Right						Boring No. B-2 (Continued)
			TEST BORING LOG		]			1	TEST BORING I
	CIVIL/Environ 35 Bow Street Portsmonth, N Phone: 603.43 Fax: 603.431.	ngineers, Inc. mental Engineers H 03801 11.6196 5376	PROJECT Description: Court St. Bridge Location: Exeter, NH Notes: Contractor: Great Works Pump & Test Boring, Inc.	Test Boring Number B-2 Sheet 1 of 2 Date: July 7, 2014		CMA Civil/Envir 35 Bow Str Portsmouth Phone: 603 Fax: 603.43	Engineers, conmental Engineers eet , NH 03801 .431.6196 .1.5376	Inc.	PROJECT Description: Court St. Bridge Location: Exeter, NH Notes: Contractor: Great Works Pump & Tes
	CMA Engine	er: Bob Grillo	Equipment: Acker Track Rig	Ground Elevation: 31.5' +/-		CMA Eng	neer: Bob Grillo		Equipment: Acker Track Rig
	File Number	: #923	Operator: Peter Michaud	Weather: Sun 80F	_	File Numb	er: #923		Operator: Peter Michaud
	Depth	Sample No. Blow Depth (ft) Count	Sample Descriptions and Classifications	Remarks		Depth	Sample No. Depth (ft)	Blow Count	Sample Descriptions and Classifications
STUB ABUTMENT (EL. 25.13)	1 2 3	S-1 0.5' - 2.5'	Brown Sand and Gravel, trace silt. Dry. Fill	4" Asphalt		26 27 28			
TOM OF	- 4			Solid Stem Augers to advance boring		29			
ABU	- 5 - 6 - 7	S-2 5' - 7' 5	- Same			30 31 32	8-7 31' - 33'	11 14 24	Gray Clayey Sand, little grave
	8 9		- <del>\\\\</del> \\\\- \\\-	Groundwater at 8.0'		33 34		30/5"	
	10 11 12	S-3 10' - 12' 2 9 7 3	Gray Silty Clay overlaying Gray Fine to Medium Sand, trace silt fill.			35 36 37			0
	13 14	S-4 12'-14' 3 4	12" Gray Sand, trace silt. Wood Fragments. Fill. 12" Gray Silty Clay	— Change to Silty Clay at 12.5'	2	38 39			
	15 16 17	S-5 15' - 17' 2 1/12"	Gray Silty Clay	Change to Soft Silty Clay at 15.2'		40 41 42	-		
	18 19			— Change to Sand at 19'		43 44	-		
	20 21	Rock Core-1 19' - 22.5'		Cored through boulder		45 46	-		
	22 23					47 48			
	24 25	S-6 24' - 26' 12	Gray Fine to Coarse Sand, little silt and gravel			49 50	-		
			1 1						Serr me
						PRJ NAVANGLEX: NAVAS U. NOOU PRJ ENGINEER: DAVID B. HOGUE PRJ NAME: COURT STREET HDD PRJ NUMBER: 5232 PRJ MILTSTONE: PRELIMINARY	PE UNALION	Unit	
		1				PRJ PHASE: DESIGN DESIGNED BY: MDW -		Northern Utilities, I	nc. COUF
REV BY	DATE	DESCRIPTION	DWG NO.	REFERENCE DRAWINGS	seal and signature	DRAFTED BY: DBH 12/12/16 DESIG CHECKED BY: SMR - DESIG APPROVED BY: MDW - ACTIV	n Manager: T. Bickford n Engineer: M. Dupuis Ation order:	CHECKED BY: APPROVED BY:	PROJECT LOCATION

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GLOG				
- -	Test Bori	ng Number B-2		
	Shee	t 2 of 2		
& Test Boring, Inc.	Date: July 7, 201	14		
	Ground Elevation	n: 31.5' +/-		
	Weather: Sun 801	F		
	Re	marks		
gravel.	Cobbles encount Could not advance boulder. Borehol s.s. sam Refusal to drill — Roller bit d throu	ered from 29.5' - 30' casing through cored le collapsed. Pushed pler to 31'. ling tools at 40.5'. Irilled to 41.5' gh rock.		
				P R E L I M I N A R Y
BORING LOGS		PROCESS PIPELINE SERVICES	1800 Prov Walpole, M 781.829.0 processpip	dence Highway A 02081 524 elineservices.com
COURT STREET HD	D			SZE   SHFT   RFV
COURT STREET EXETER, NEW HAMPSHIRE		PLOT DATE: 12/12/2016 3:42 PLOT SCALE: NTS	PM	22X34 D02 A SHEET: 5 OF 6



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WORKSPACE PLAN	PROCESS PIPELINE SERVICES	1600 Providence Highway Welpole, MA 02061 761.829.0524 processpipelineservices.com	
URT STREET HDD			
Court Street Eter, New Hampshire	FILE NAME: HDD-001.DWG	SIZE SHEET R	EV
	PLOT DATE: 12/12/2016 3:43 PM	22X34 D03	A
	PLOT SCALE: NTS	SHEET: 3 OF 6	