

GAS MAIN EXTENSION

NORTH PEMBROKE ROAD

PEMBROKE, NEW HAMPSHIRE

PREPARED FOR:
LIBERTY UTILITIES
15 BUTTRICK ROAD
LONDONDERRY, NEW HAMPSHIRE 03053

PREPARED BY:
KEACH-NORDSTROM ASSOCIATES, INC.
10 COMMERCE PARK NORTH, SUITE 3
BEDFORD, NEW HAMPSHIRE 03110
(603) 627-2881



KNA KEACH-NORDSTROM ASSOCIATES, INC.
Civil Engineering Land Surveying Landscape Architecture
10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

APRIL 2, 2019
LAST REVISED: JUNE 26, 2019
PROJECT NO. 18-0910-1

SHEET TITLE

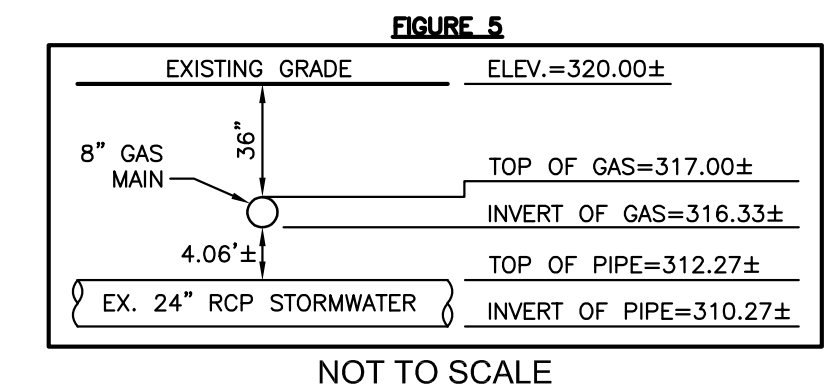
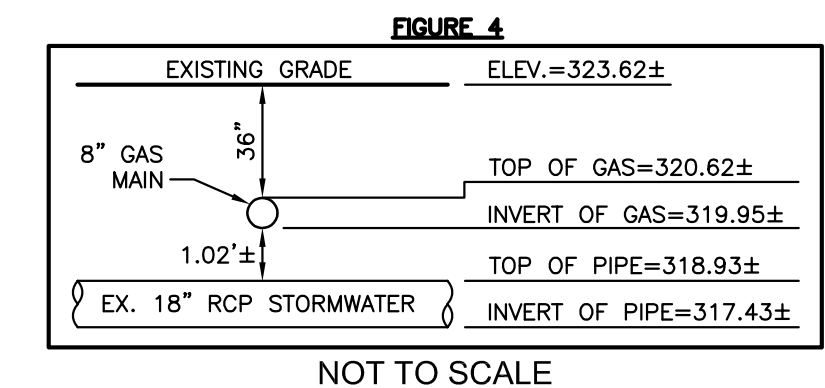
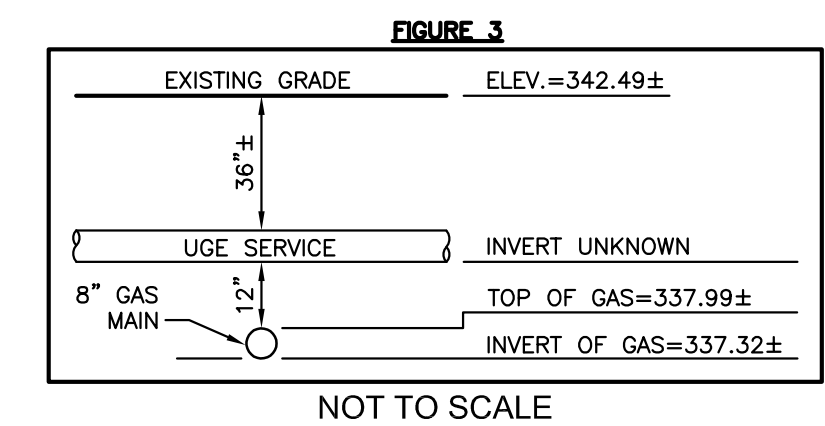
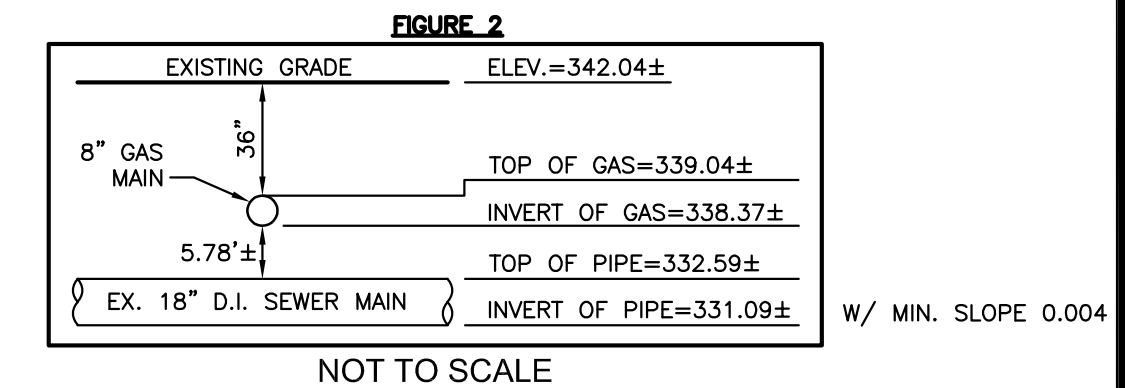
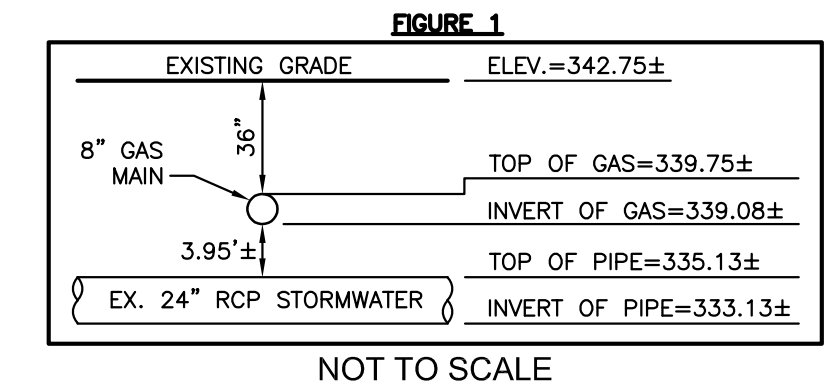
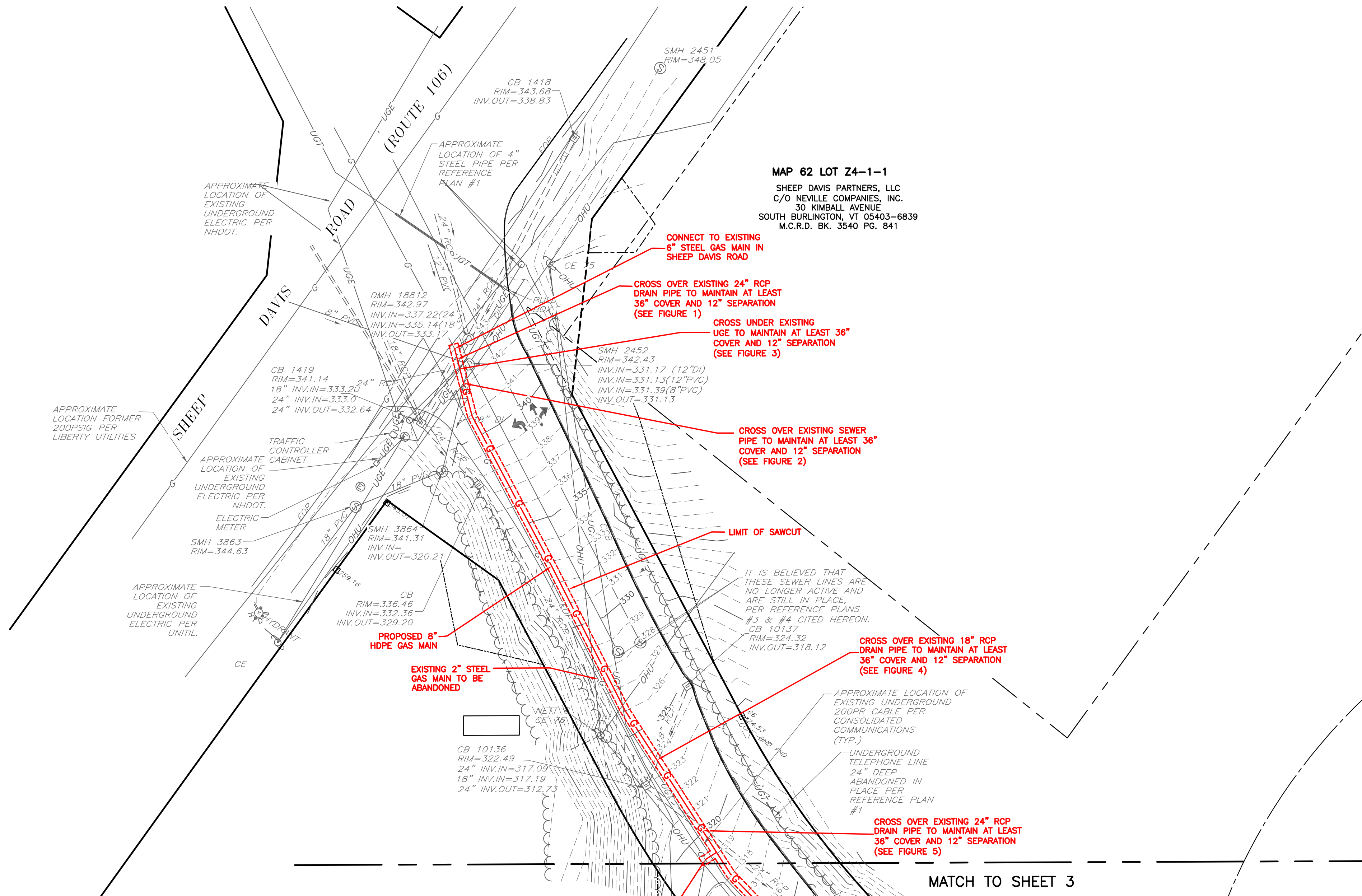
GAS MAIN EXTENSION OVERVIEW PLAN
GAS MAIN EXTENSION LAYOUT PLAN
GAS MAIN EXTENSION PROFILE PLAN
CONSTRUCTION DETAILS

SHEET No.

1
2 - 4
5
6 - 7

SEE SHEET 1 FOR NOTES

LOAM & SEED ALL DISTURBED
AREAS THAT ARE BEYOND THE
EDGE OF GRAVEL SHOULDER (TYP.)



LEGEND

	CNCB-F	CONCRETE BOUND FOUND		O-H-U	OVERHEAD UTILITIES
	NHNB-F	NH HIGHWAY BOUND FOUND		G	GAS LINE
	IP-F	IRON PIN FOUND		W	WATER LINE
	DH-F	DRILL HOLE FOUND		S	SEWER LINE
		UTILITY POLE		D	DRAINAGE LINE
		SIGN		T	TREELINE
		MAILBOX		DWL	DOUBLE YELLOW LINE
		STREET LIGHT		SWL	SINGLE WHITE LINE
		LIGHT POST		EOP	EDGE OF PAVEMENT
		GAS VALVE		VGC	VERTICAL GRANITE CURB
		WATER VALVE			EDGE OF GRAVEL
		HYDRANT			10' CONTOUR
		WATER SHUT OFF			2' CONTOUR
		SEWER MANHOLE			STONEWALL
		DRAINAGE MANHOLE		G	PROPOSED GAS LINE
		CATCH BASIN			SAWCUT LINE
		SHRUB			LIMIT OF PROPOSED HORIZONTAL DIRECTIONAL DRILL
		TREES			TEMPORARY SILT FENCE
		ABUTTER LINE			
		RIGHT-OF-WAY LINE			
		POST & RAIL FENCE			



GRAPHIC SCALE



(IN FEET)
1 inch = 30' ft.

GAS MAIN EXTENSION LAYOUT PLAN

**NORTH PEMBROKE ROAD
GAS MAIN EXTENSION**

NORTH PEMBROKE ROAD
PEMROKE, NEW HAMPSHIRE
MERRIMACK COUNTY

PREPARED FOR:
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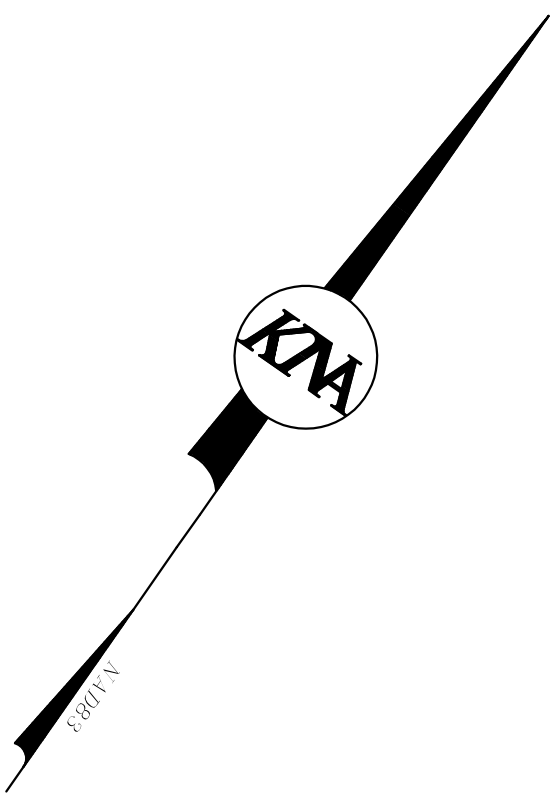
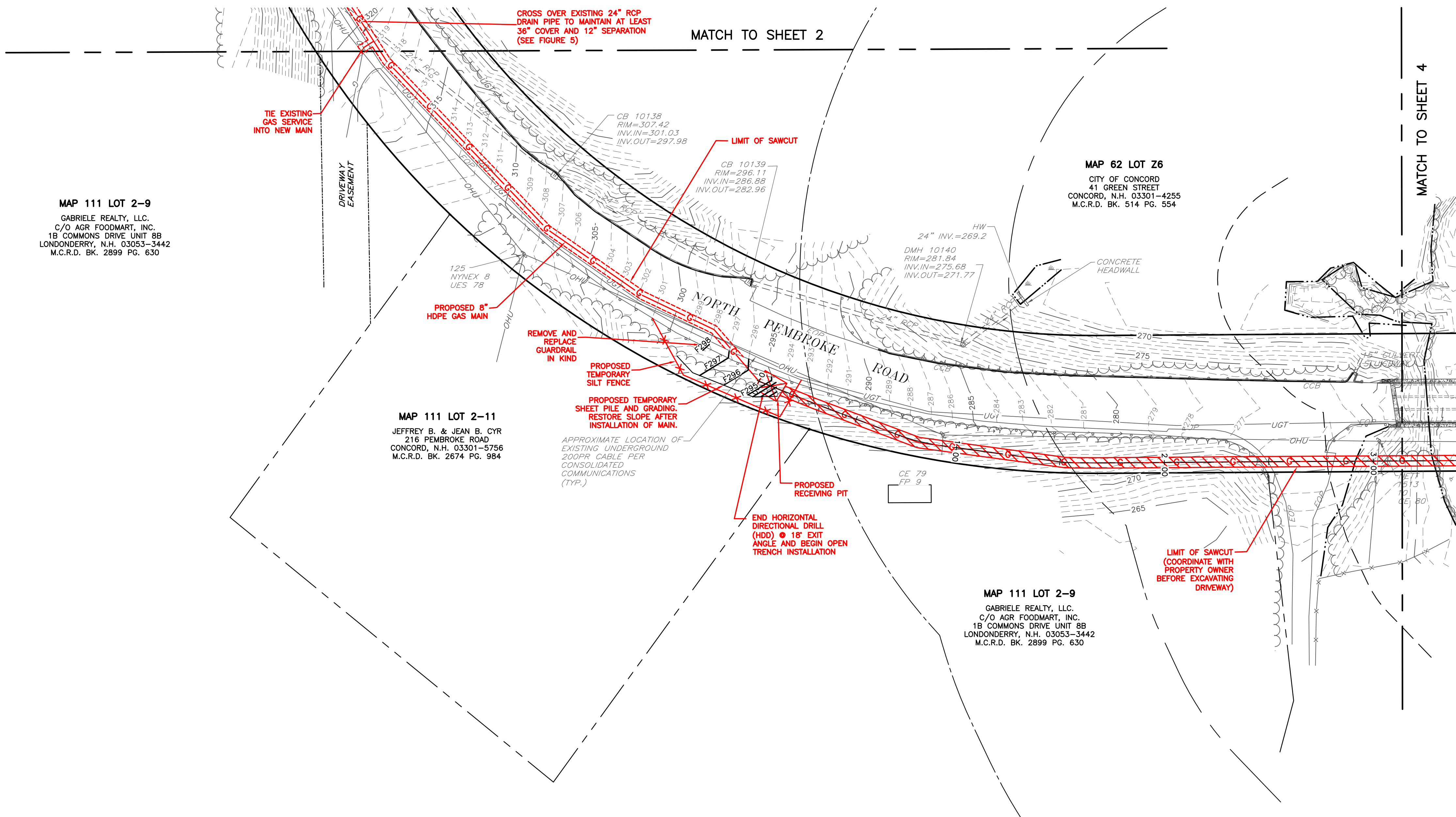
KMA
KEACH-NORDSTROM ASSOCIATES, INC.

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10 Commerce Park North, Suite 3B, Bedford, NH 03110 Phone (603) 627-2881

REVISIONS			
No.	DATE	DESCRIPTION	BY
1	6/26/19	CLIENT COMMENT	MAC
DATE: APRIL 2, 2018		SCALE: 1" = 30'	
PROJECT NO: 18-0910-1		SHEET 2 OF 7	

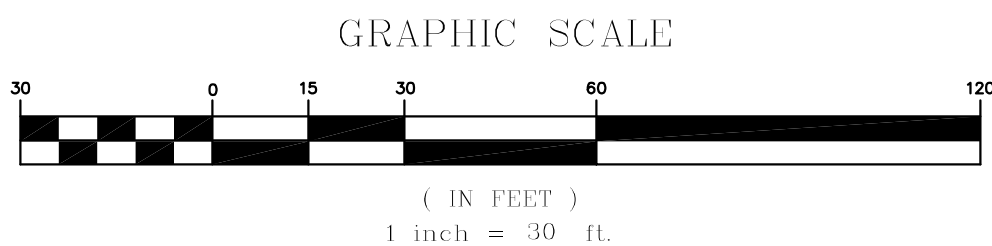
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LOAM & SEED ALL DISTURBED
AREAS THAT ARE BEYOND THE
EDGE OF GRAVEL SHOULDER (TYP.)



LEGEND

	CNCB-F	CONCRETE BOUND FOUND
	NHHB-F	NH HIGHWAY BOUND FOUND
	IP-F	IRON PIN FOUND
	DH-F	DRILL HOLE FOUND
		UTILITY POLE
		SIGN
		MAILBOX
		STREET LIGHT
		LIGHT POST
		GAS VALVE
		WATER VALVE
		HYDRANT
		WATER SHUT OFF
		SEWER MANHOLE
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		TREES
		ABUTTER LINE
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		POST & RAIL FENCE
	OHU	OVERHEAD UTILITIES
	G	GAS LINE
	W	WATER LINE
	S	SEWER LINE
		DRAINAGE LINE
	DWL	TREELINE
	SWL	DOUBLE YELLOW LINE
	EOP	SINGLE WHITE LINE
	VGC	EDGE OF PAVEMENT
		VERTICAL GRANITE CURB
		EDGE OF GRAVEL
		10' CONTOUR
		2' CONTOUR
		STONEWALL
	G	PROPOSED GAS LINE
		SAWCUT LINE
		LIMIT OF PROPOSED HORIZONTAL DIRECTIONAL DRILL
	X	TEMPORARY SILT FENCE



GAS MAIN EXTENSION LAYOUT PLAN
NORTH PEMBROKE ROAD
GAS MAIN EXTENSION

NORTH PEMBROKE ROAD
PEMROKE, NEW HAMPSHIRE
MERRIMACK COUNTY

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LOAM & SEED ALL DISTURBED
AREAS THAT ARE BEYOND THE
EDGE OF GRAVEL SHOULDER (TYP.)

MATCH TO SHEET 3

MAP 559 LOT 11
TOWN OF PEMBROKE
311 PEMBROKE STREET
PEMBROKE, N.H. 03275
M.C.R.D. BK. 863 PG. 134

MAP 559 LOT 14
NEW ENGLAND FLOWER FARMS, LLC.
7316 PLEASANT STREET
LOUDON, N.H. 03301
M.C.R.D. BK. 3422 PG. 816

MAP 559 LOT 9
VIVIAN POWERS BEER &
MARIANA ROSAS GARCIA
817 NORTH PEMBROKE ROAD
PEMBROKE, N.H. 03275
M.C.R.D. BK. 3549 PG. 590

TEMPORARY SHORELAND
IMPACT FOR DRILL STAGING
(APPROX. 1,200 SF)

START HORIZONTAL
DIRECTIONAL DRILL (HDD)
18° ENTRY ANGLE AND
END OPEN TRENCH

APPROXIMATE LOCATION OF
EXISTING UNDERGROUND
200PR CABLE PER
CONSOLIDATED
COMMUNICATIONS
(TYP.)

PROPOSED
SENDING PIT

PROPOSED 8"
HDPE GAS MAIN
PROPOSED TEMPORARY
SILT FENCE AROUND
SHORELAND IMPACT AREA

LIMIT OF SAWCUT
(COORDINATE WITH
PROPERTY OWNER BEFORE
EXCAVATING DRIVEWAY)

HDD PROPOSED 8"
HDPE GAS MAIN IN
12" HDPE SLEEVE

LEGEND

■ CNCB-F CONCRETE BOUND FOUND
■ NHFB-F NH HIGHWAY BOUND FOUND
● IP-F IRON PIN FOUND
● DH-F DRILL HOLE FOUND
○ UTILITY POLE
□ SIGN
□ MAILBOX
□ STREET LIGHT
□ LIGHT POST
□ GAS VALVE
□ WATER VALVE
□ HYDRANT
□ WATER SHUT OFF
□ SEWER MANHOLE
□ DRAINAGE MANHOLE
□ CATCH BASIN
□ SHRUB
□ TREES
□ ABUTTER LINE
□ RIGHT-OF-WAY LINE
□ POST & RAIL FENCE

— OHU — OVERHEAD UTILITIES
— G — GAS LINE
— W — WATER LINE
— S — SEWER LINE
— D — DRAINAGE LINE
— DWL — TREE LINE
— SWL — DOUBLE YELLOW LINE
— EOP — SINGLE WHITE LINE
— VGC — EDGE OF PAVEMENT
— V — VERTICAL GRANITE CURB
— 10' — 10' CONTOUR
— 2' — 2' CONTOUR
— ○ — STONEWALL
— G — PROPOSED GAS LINE
— S — SAWCUT LINE
— L — LIMIT OF PROPOSED
HORIZONTAL DIRECTIONAL
DRILL
— X — TEMPORARY SILT FENCE

OVERHEAD UTILITIES
GAS LINE
WATER LINE
SEWER LINE
DRAINAGE LINE
TREE LINE
DOUBLE YELLOW LINE
SINGLE WHITE LINE
EDGE OF PAVEMENT
VERTICAL GRANITE CURB
EDGE OF GRAVEL
10' CONTOUR
2' CONTOUR
STONEWALL
PROPOSED GAS LINE
SAWCUT LINE
LIMIT OF PROPOSED
HORIZONTAL DIRECTIONAL
DRILL
TEMPORARY SILT FENCE



GRAPHIC SCALE



(IN FEET)
1 inch = 30' ft.

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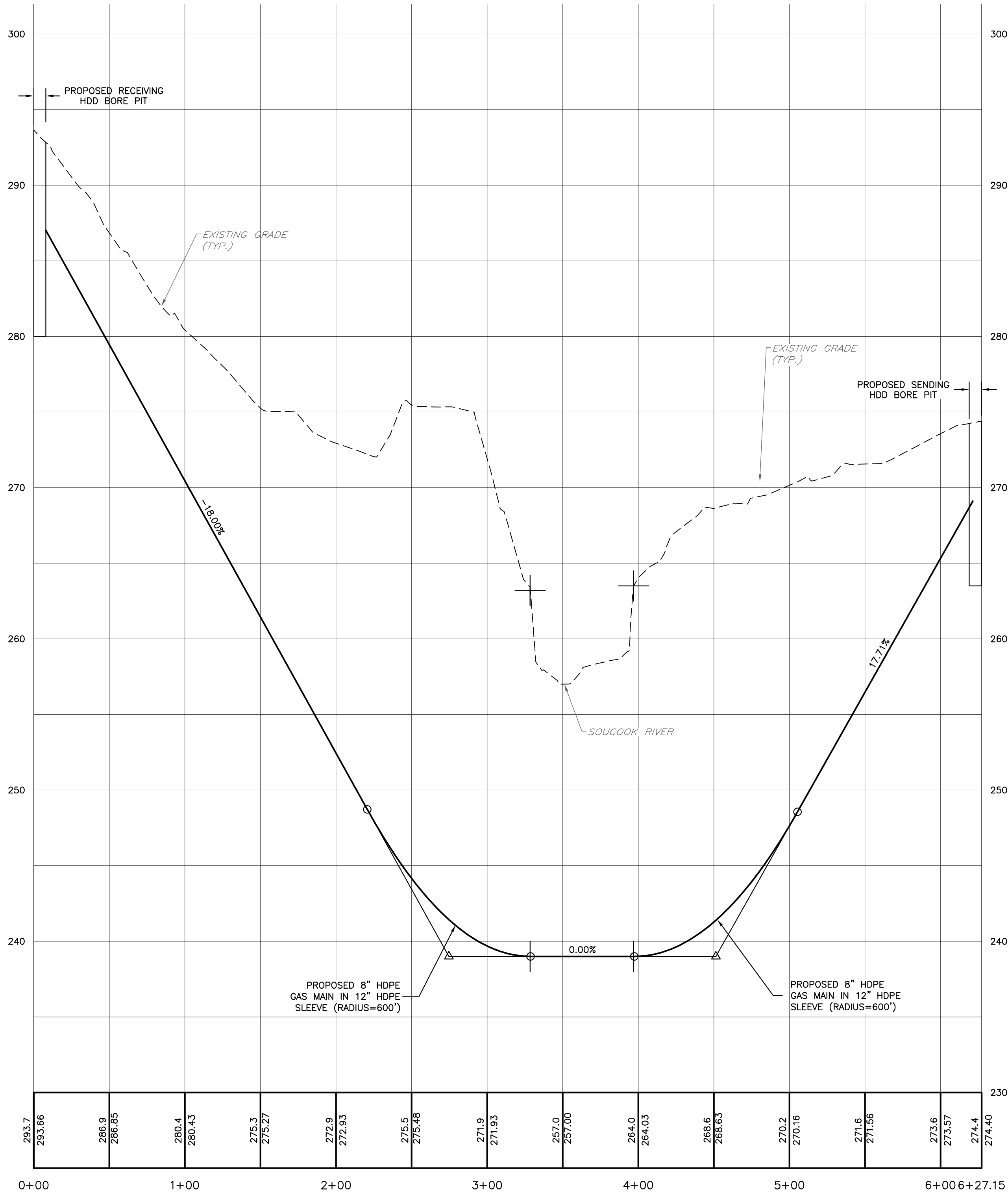
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LEGEND		
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	NHHB-F	NH HIGHWAY BOUND FOUND
	IP-F	IRON PIN FOUND
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		VERTICAL GRANITE CURB
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		10' CONTOUR
		2' CONTOUR
	G	PROPOSED GAS LINE



PROPOSED GAS MAIN HDD PROFILE

SCALE: 1" = 50'(HORIZ.)
1" = 5'(VERT.)



GAS MAIN EXTENSION PROFILE PLAN

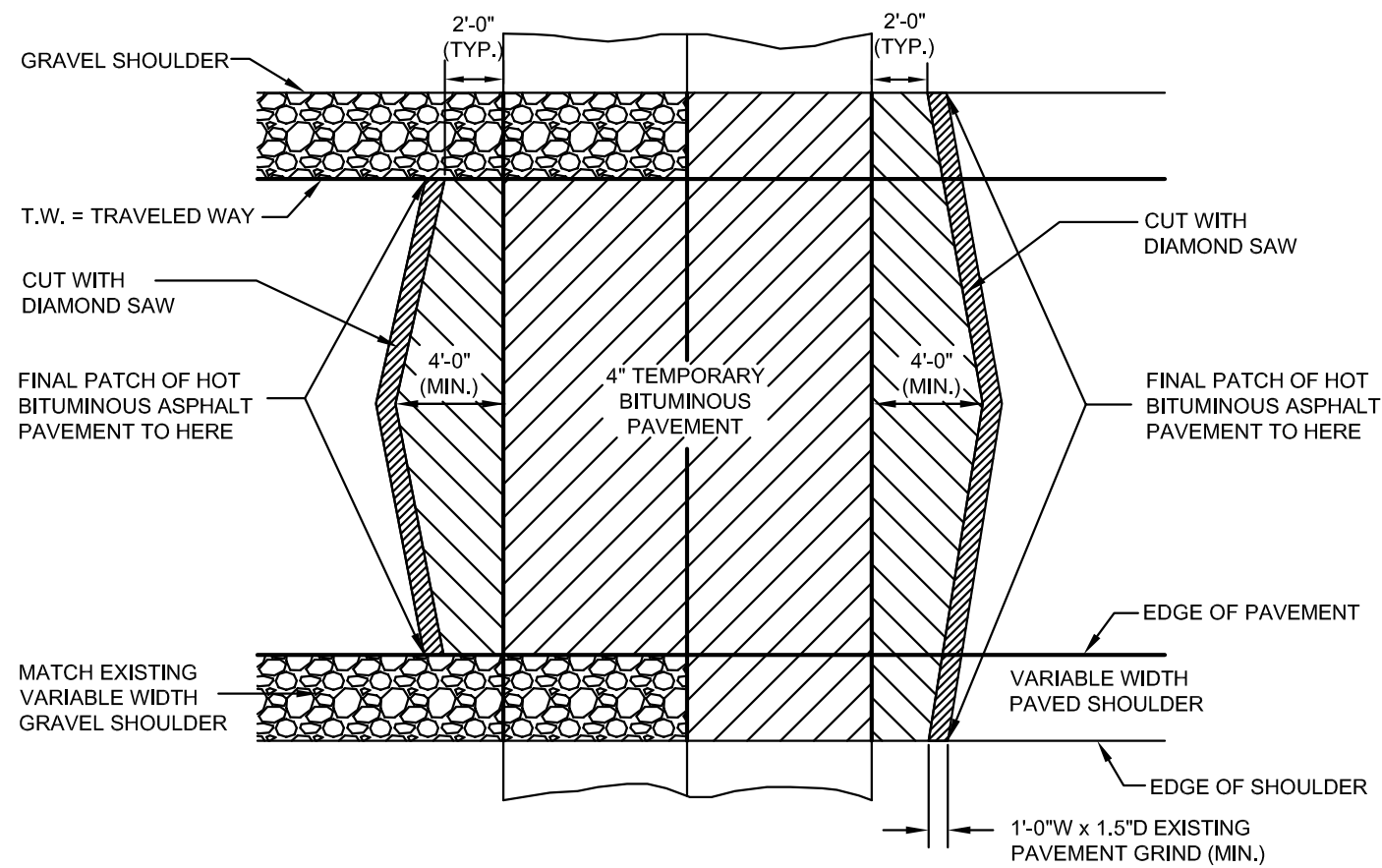
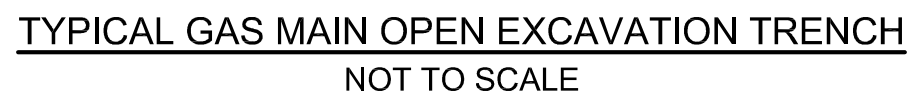
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GAS MAIN EXTENSION

NORTH PEMBROKE ROAD
PEMROKE, NEW HAMPSHIRE
MERRIMACK COUNTY

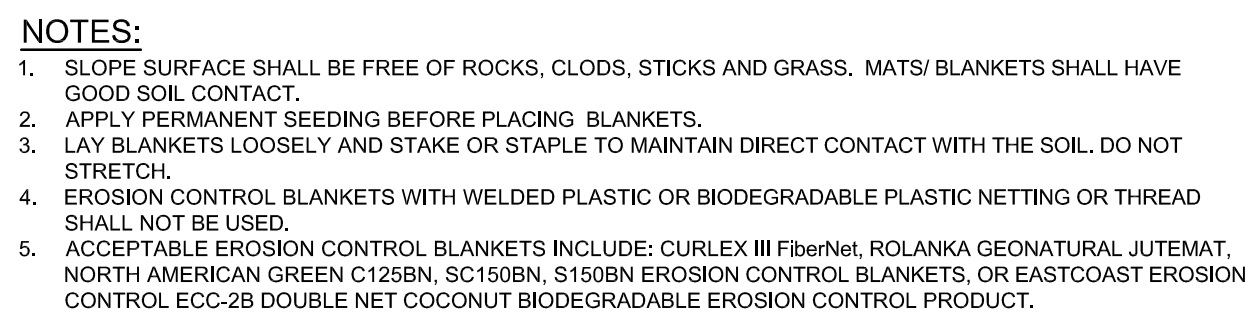
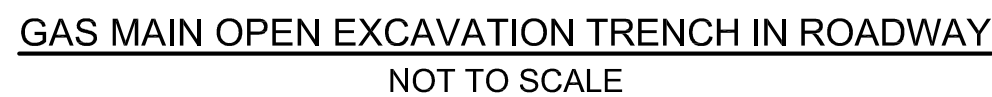
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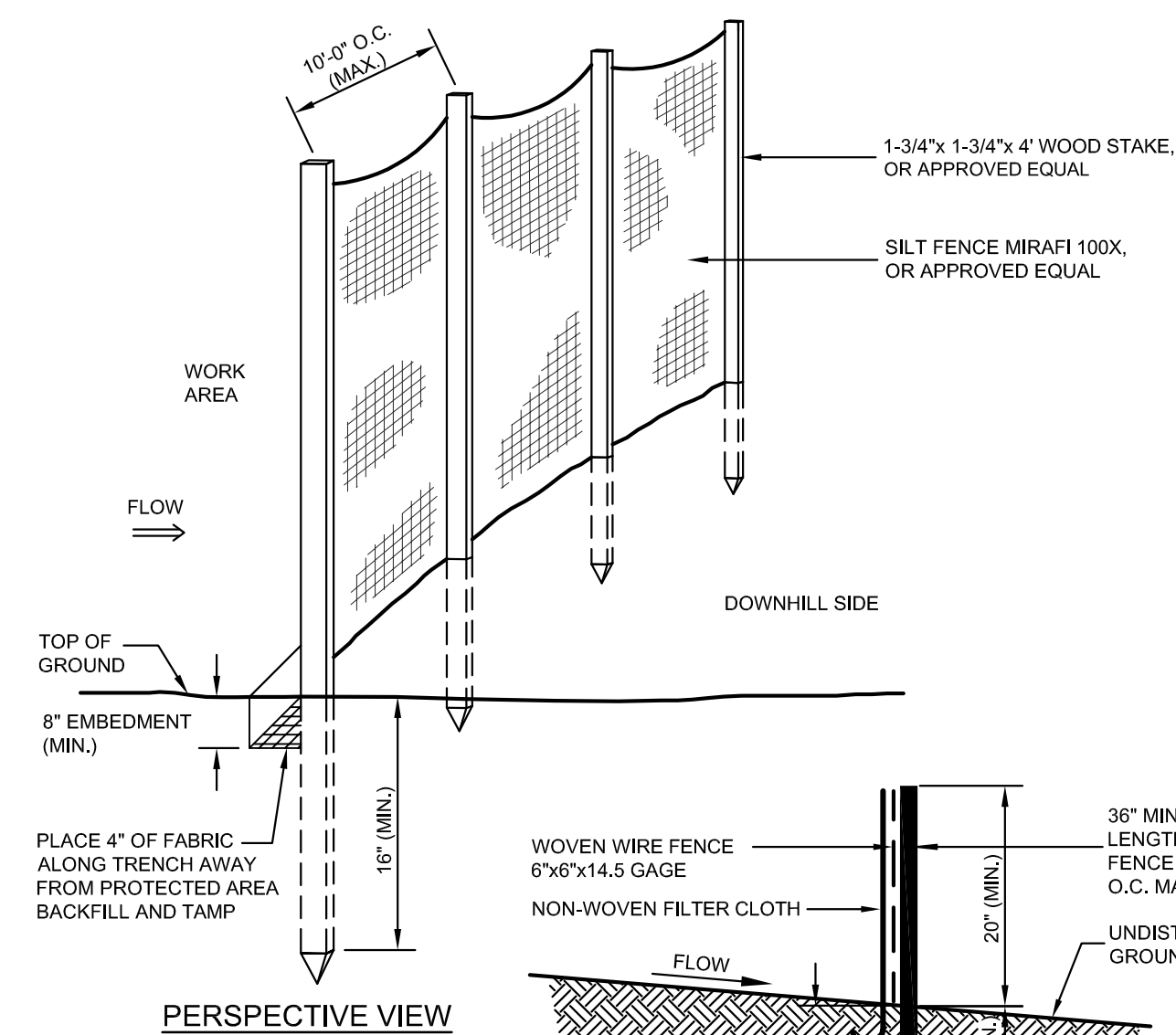
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PERMANENT PAVEMENT REPAIR
NOT TO SCALE
(MARCH 2008)



EROSION CONTROL BLANKETS - SLOPE INSTALLATION
NOT TO SCALE
(AUGUST 2011)



SILT FENCE DETAIL
NOT TO SCALE
(MARCH 2008)



MECHANICAL PROPERTIES	TEST METHOD	UNITS	MARV
GRAB TENSILE STRENGTH	ASTM D 4632	kN (lbs)	1.62 (365) x 0.89 (200)
GRAB TENSILE ELONGATION	ASTM D 4632	%	24 x 10
PUNCTURE STRENGTH	ASTM D 4833	kN (lbs)	0.40 (90)
MULLEN BURST STRENGTH	ASTM D 3786	kPa (psi)	0.397 (45)
TRAPEZOID TEAR STRENGTH	ASTM D 4243	kN (lbs)	0.11 (15) x 0.33 (75)
UV RESISTANCE	ASTM D 4355	%	90
APPARENT OPENING SIZE	ASTM D 4751	Mm (US Std Sieve)	0.425 (40)
FLOW RATE	ASTM D 4481		5827 (145)
PERMEABILITY	ASTM D 4481	1/min/in ² (gal/min/ft ²)	

DANDY BAG[®]
NOT TO SCALE
(APRIL 2010)

1. SILT FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REPAIRS THAT ARE REQUIRED SHALL BE MADE IMMEDIATELY.
2. IF THE FABRIC ON A SILT FENCE SHOULD DECOMPOSE OR BECOME INEFFECTIVE DURING THE EXPECTED LIFE OF THE FENCE, THE FABRIC SHALL BE REPLACED PROMPTLY.
3. SEDIMENT DEPOSITS SHOULD BE INSPECTED AFTER EVERY STORM EVENT. THE DEPOSITS SHOULD BE REMOVED WHEN THEY REACH APPROXIMATELY ONE-HALF THE HEIGHT OF THE BARRIER.
4. SEDIMENT DEPOSITS THAT ARE REMOVED OR LEFT IN PLACE AFTER THE FABRIC HAS BEEN REMOVED SHALL BE GRADED TO CONFORM WITH THE EXISTING TOPOGRAPHY AND VEGETATED.

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Traffic control is a vital public service.

Functions of Flagging.

Guide traffic safely through work areas.

Make every effort to give the traveling public the right of way.

Protect the lives of workers.

Avoid unreasonable delays to the traveling public or work crew.

Answer reasonable questions courteously and intelligently.

Clothing and Equipment.

Hard hat (orange or other bright color)

Safety vest

Hand paddle "Stop/Slow"

at least 18" wide with 6" letters

(keep spare handy)

Flashlight with 6" wand for night control

*All gear used at night must be reflectorized.

Flagging station should be illuminated.

DO'S

Be alert.

Wear equipment properly

Stand clear, in good view

Know plans

Treat every driver as you would like to be treated

DONT'S

Stand in open traffic lane

Turn your back on traffic

Walk between vehicles

Leave your position unattended

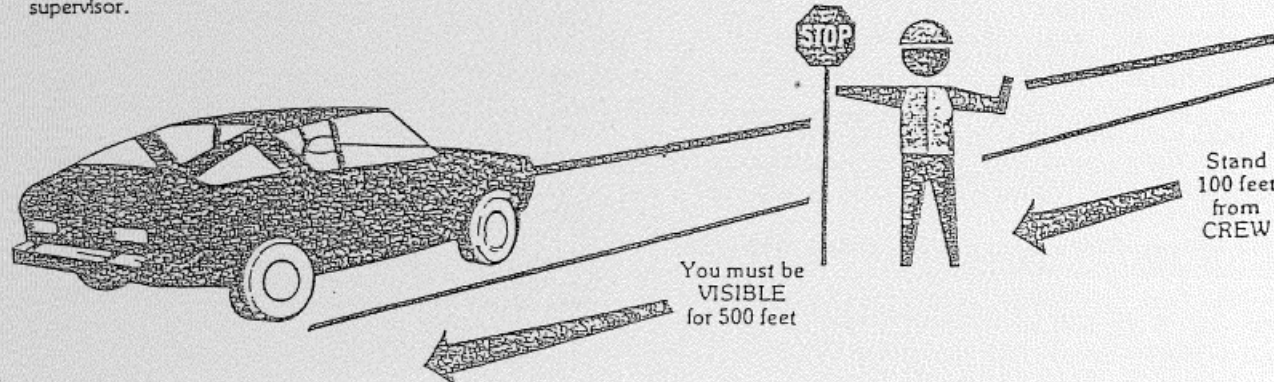
STATION OR POSITION

The flagperson shall stand in a conspicuous position on the right edge of the traveled way FACING THE DIRECTION OF THE APPROACHING TRAFFIC. The position taken should be near enough to the workers being protected so that there is no doubt as to the flagperson's purpose, but not so close as to be mistaken for one of the workers. This position may vary up to 500 feet depending upon sight distances, etc.

In urban areas the distance from the flagperson to the worksite can be reduced. Special care must be taken to avoid long traffic delays that may "clog up" the local street system.

At a "spot" work site it may be necessary to stand on the shoulder of the left hand lane or opposite the work site in order to effectively control the traffic. Flagging positions must be adequately covered by proper advance warning signs and night time stations must have adequate illumination.

A flagperson should not leave the flagging station to pick up or replace signs or barricades. This is the responsibility of the supervisor.



NHDOT DAYTIME TRAFFIC CONTROL PROCEDURE
NOT TO SCALE

Traffic control procedures with paddles

- To stop traffic.
 - Face the traffic
 - Extend the paddle in a vertical position so the "STOP" side is visible to oncoming driver
 - Make eye contact with driver
 - Raise and expose palm of free hand to indicate vehicle is required to stop

- To alert and slow traffic
 - Extend the sign paddle vertically with the "STOP" side visible to driver
 - Before vehicle comes to a complete stop, turn paddle to show "SLOW" side
 - For emphasis the free hand may be raised and lowered with the palm down

- To release traffic
 - Stop to side of road
 - Show "SLOW" side of paddle
 - With free hand, motion traffic to proceed

Traffic Control With Flags

EMERGENCY USE ONLY

- To stop traffic
 - Face traffic and extend flag horizontally across the traffic lane in stationary position. Raise free hand, palm up, toward traffic.
- To alert or slow traffic
 - Face traffic and slowly wave flag in a sweeping motion of the extended arm from shoulder level to straight down, without raising the arm above the horizontal position.

- To release traffic
 - Stand on side of road with flag and arm lowered to your side. Motion traffic ahead with free hand.

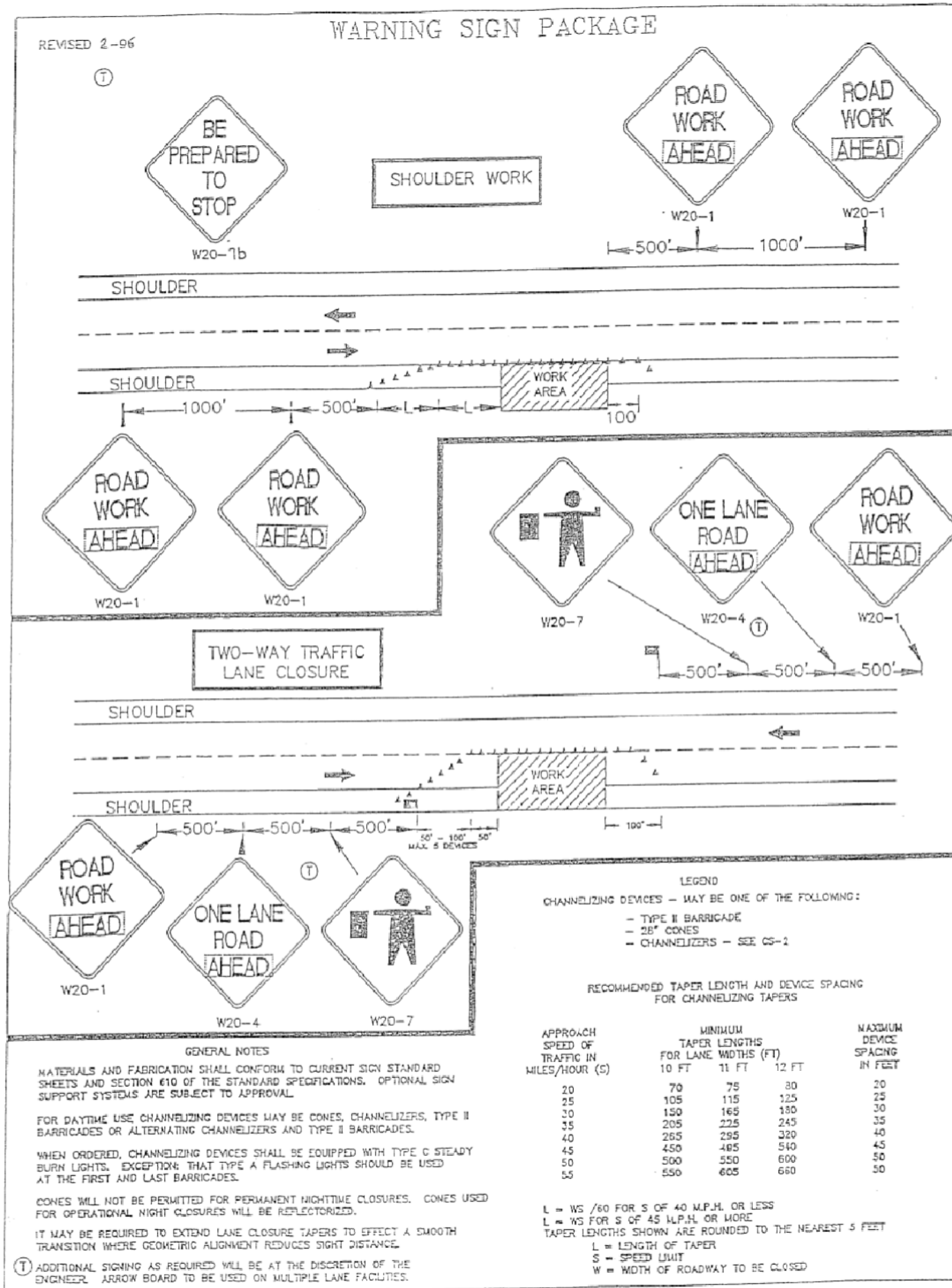
FLAGS SHALL NOT BE USED TO SIGNAL TRAFFIC TO PROCEED.

New Hampshire Department of Transportation

REMEMBER

THE FLAGPERSON SHOULD BE VISIBLE AT ALL TIMES
NEVER STAND IN AN OPEN TRAFFIC LANE
STAND ALONE AND DON'T PERMIT WORKERS TO GATHER AROUND YOU
DO NOT STAND NEAR EQUIPMENT
DO NOT WATCH THE OPERATIONS
NEVER TURN YOUR BACK TO THE TRAFFIC

Your job is to provide the motorist with guidance. You will lose their respect and add to their confusion by turning your back to them.



NHDOT WARNING SIGN PACKAGE DETAIL
NOT TO SCALE

CONSTRUCTION DETAILS NORTH PEMBROKE ROAD GAS MAIN EXTENSION

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