Maine Department of Transportation
Highway Program

GEOTECHNICAL INFORMATIONAL REPORT

Roundabout Construction
Intersection of Route 15, Route 172 and Beech Hill Road
Blue Hill, Maine

Prepared by:
Karen Gross
Geotechnical Design Engineer

Hancock County

Soils Report No. 2012-133

WIN 17258.00
STP-1725(800)X
October 16, 2012

MaineDOT

Highway Program

Brad Foley, Program Manager
Scott Bickford & Heath Cowan, Assistant Program Managers
Phone: 624-3480 Fax: 624-3481

Memorandum

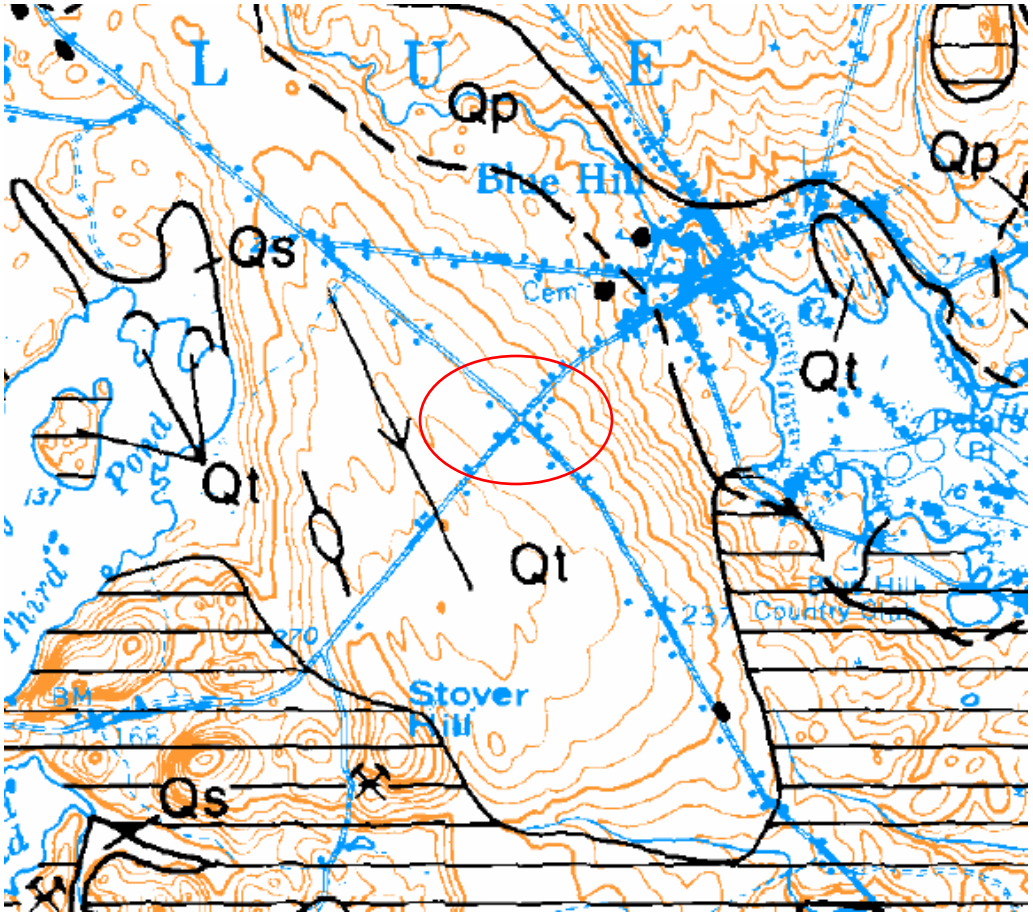
To: Atlee Mousseau
From: Karen Gross
Date: 2/13/2012
Subject: Blue Hill Roundabout
WIN 17258.00
Resilient Modulus

The following is my recommendation for the resilient modulus (Mr) value to use in the pavement design of the proposed roundabout at the intersection of Rt. 15, Rt. 172, and Beech Hill Rd. in the town of Blue Hill.

A Falling Weight Deflectometer (FWD) analysis and subsurface investigations were not done for this project, so the Mr value to use for the pavement design is based on correlations between geology maps and MaineDOT Soil Support values.

The subgrade soils at this location are expected to be glacial till. Till is a mix of clay, silt, sand, gravel, cobbles, and boulders. The agricultural maps indicate that the till at this location is most probably silt, sand, and gravel size particles. The appropriate Mr to use for the pavement design for this type of subgrade soil is 4300 psi. This value is dependent on positive drainage of the pavement structure. Based on the information in the kickoff meeting, I believe you will have either a daylighted or underdrained pavement section. This soil type is also very frost susceptible, therefore I also recommend using a 30" total pavement section depth to reduce frost penetration into the subgrade.

I've attached all supporting documentation. Please let me know if you have any questions.



RECONNAISSANCE

SURFICIAL GEOLOGY

OF THE

BLUE HILL

QUADRANGLE, MAINE

OPEN-FILE NO. 77-36

BY

WOODROW B. THOMPSON
HAROLD W. BORNS, Jr.

Maine Geological Survey
DEPARTMENT OF CONSERVATION
Augusta, Maine 04333
Walter A. Anderson, State Geologist
1977

Qt Till

Heterogeneous mixture of sand, silt, clay, and stones. Stratification is rare. Includes two varieties: basal till and ablation till. Basal till is fine grained and very compact, with low permeability and poor drainage. Ablation till is loose, sandy, and stony, with moderate permeability and fair to good drainage. Unit generally overlies bedrock, but may overlie or include sand and gravel.

Commonly a blanket deposit that conforms to bedrock surface. Also forms glacially streamlined hills (including drumlins), where till thickness locally exceeds 100 feet.

Blue Hill, RT 15 & 172, & Beech Hill Rd

WIN 17258.00

Map Unit Name—Hancock County Area, Maine
(Blue Hill WIN 17258.00)

Map Scale: 1:3,160 if printed on A size (8.5" x 11") sheet.

N

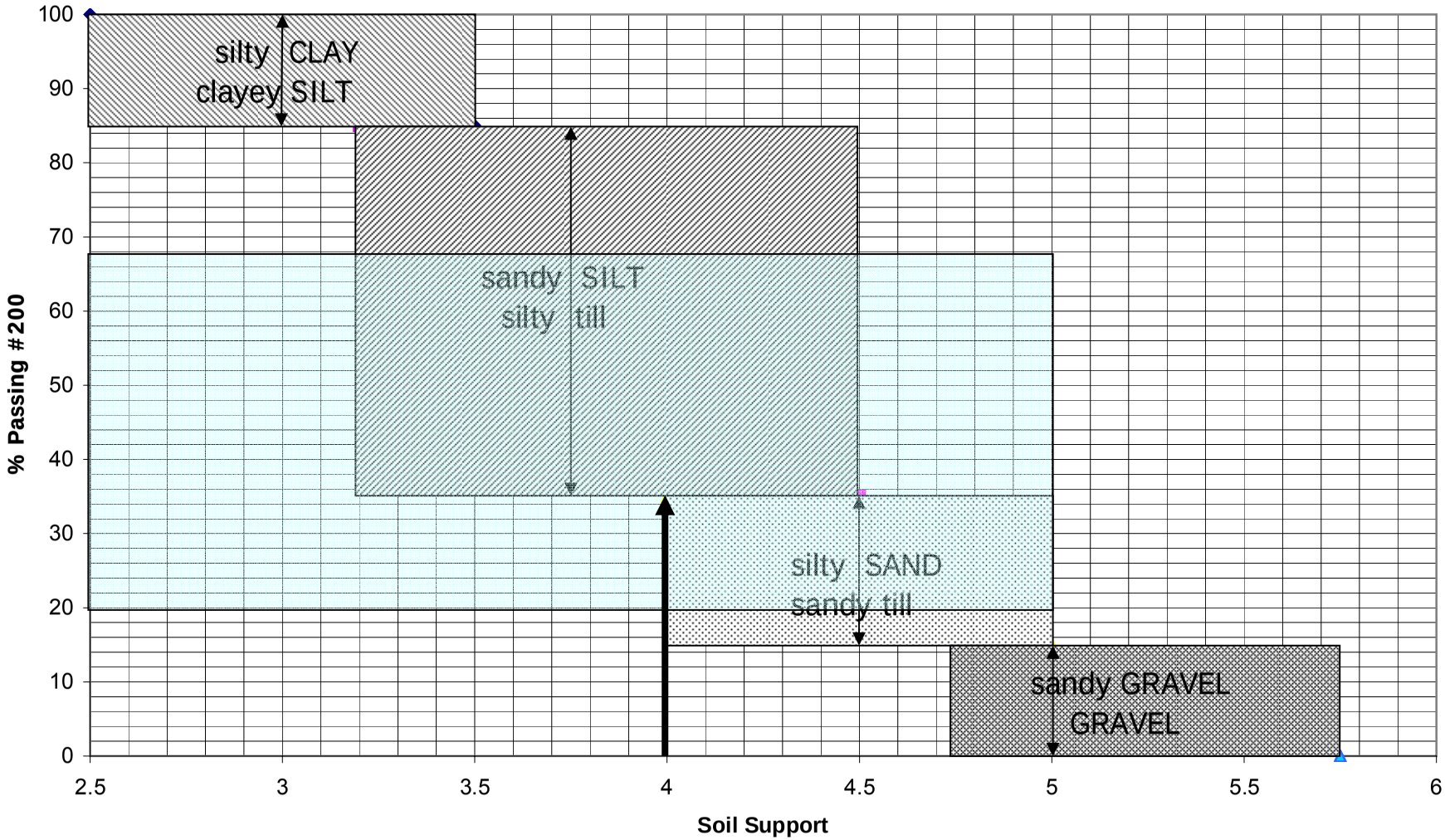
Meters: 0 30 60 120 180

Feet: 0 100 200 400 600

Engineering Properties– Hancock County Area, Maine												
Map unit symbol and soil name	Depth	USDA texture	Classification		Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
			Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DtB—Dixfield-Colonel complex, 3 to 8 percent slopes, very stony												
Dixfield	0-2	*Highly decomposed plant material	PT	—	7-34	0-14	99-100	99-100	60-100	53-89	—	—
	2-6	*Fine sandy loam	ML, SC-SM, SM, CL-ML	A-2, A-4, A-1	1-5	1-15	75-95	60-90	35-85	20-70	15-25	NP-10
	6-28	*Fine sandy loam, Gravelly sandy loam, loam	SM, CL-ML, ML, SC-SM	A-2, A-4, A-1	0-10	0-10	75-95	60-90	35-85	20-70	15-25	NP-10
	28-65	*Gravelly fine sandy loam, Gravelly sandy loam, loam	SC-SM, SM, CL-ML, ML	A-2, A-4, A-1	0-10	0-15	75-95	60-90	35-85	20-70	15-25	NP-10
Colonel	0-2	*Highly decomposed plant material	PT	—	7-34	0-14	99-100	99-100	60-100	53-89	—	—
	2-6	*Fine sandy loam	SM, CL-ML, ML, SC-SM	A-2, A-4	0-1	0-5	85-95	80-90	50-85	25-70	15-25	NP-10
	6-18	*Fine sandy loam, Gravelly sandy loam, loam	SC-SM, SM, CL-ML, ML	A-1, A-2, A-4	0-10	0-10	75-95	60-90	35-85	20-70	15-25	NP-10
	18-65	*Fine sandy loam, Gravelly sandy loam, loam	SC-SM, SM, CL-ML, ML	A-1, A-2, A-4	0-10	0-10	75-95	60-90	35-85	20-70	15-25	NP-10

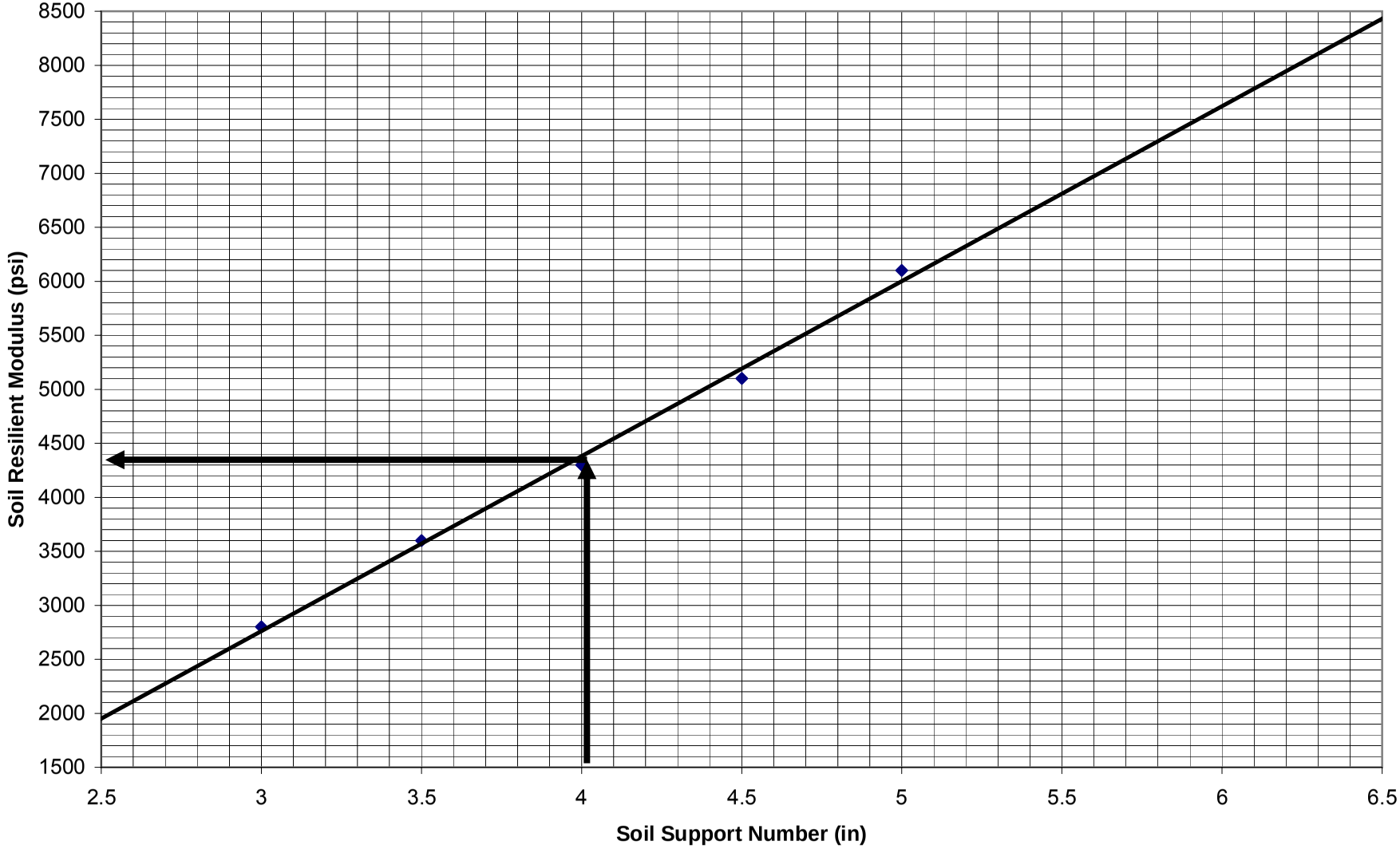
Guidelines for Selection of Soil Support Values for Pavement Design

Blue Hill Roundabout
WIN 17258.00
2/18/2012



Soil Resilient Modulus for DARWin

Blue Hill Roundabout
WIN 17258.00
2/18/2012



Highway Program

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Scott Bickford & Heath Cowan, Assistant Program Managers
Phone: 624-3480 Fax: 624-3481

Memorandum

To: Atlee Mousseau
From: Karen Gross
Date: 2/13/2012/
Subject: Blue Hill Roundabout
WIN 17258.00
Bedrock Locations

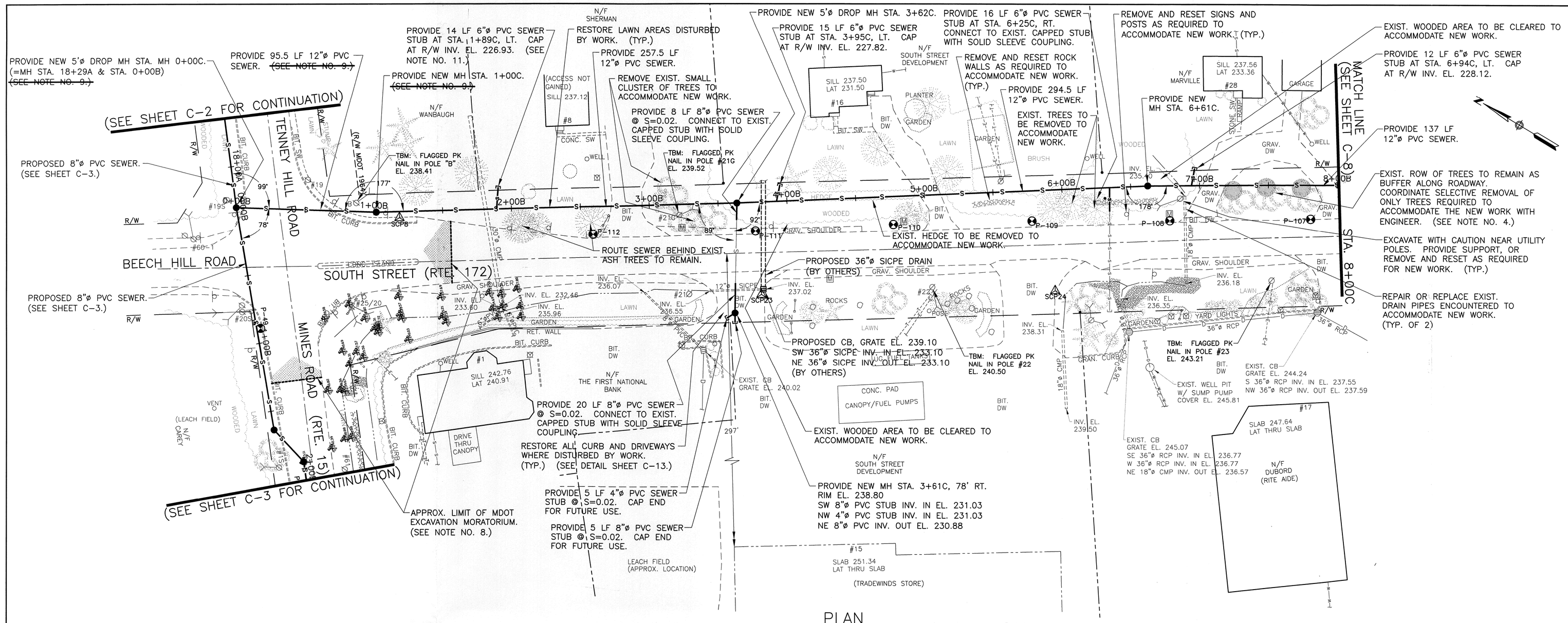
I have completed the review of the Blue Hill sewer plans prepared by Olver Associates in July of 2010 to identify any shallow bedrock that may be present within the new roundabout project limits. These sewer plans show probe locations on the plan sheets, as well as the depth the probes were drilled on the profiles.

There were 7 probes drilled within this project limits on Tenney Hill Road, Mines Road, and South Street. No probes were drilled on Beech Hill Road. The following table is a summary of the sewer plan probe information.

Road Location	Probe #	Offset	Approx. Drilling Depth (ft)	R/NR
Tenney Hill Rd.				
	P-47	Right Shoulder	10	NR
	P-113	Right Shoulder	16	NR
Mines Rd.				
	P-49	Left Shoulder	11	NR
	P-50	Left Shoulder	11	NR
	P-51	Left Shoulder	11	NR
South St.				
	P-111	Right Shoulder	11	NR
	P-112	Right Shoulder	17	NR

In summary, no refusal due to shallow bedrock is expected on Tenney Hill Road, Mines Road, or South Street. Since there were no probes drilled on Beech Hill Road, the existence of shallow bedrock can not be confirmed. Geology and agricultural soils maps indicate that the existing soils consist of glacial till (as stated in the Resilient Modulus memo dated 2/13/2012), and shallow bedrock is not expected. If any refusal encountered will most probably be small boulders.

The Blue Hill sewer plan sheets are attached for your reference, Please let me k now if you have any questions



PLAN
SCALE: 1"=40'

PROFILE
SCALE: 1"=40' HORIZ.
1"=4' VERT.

NOTES:

1) UTILITY LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY WITH TEST PITS PRIOR TO CONSTRUCTION.

2) MODIFY RIM ELEVATIONS OF NEW MANHOLES AS REQUIRED TO ACHIEVE FINAL RIM ELEVATION OF 0.05' BELOW FINAL GRADE.

3) ALL SEWER MAINS AND SERVICES WITH LESS THAN 5' OF COVER SHALL BE INSULATED WITH 2" RIGID INSULATION AT FULL TRENCH WIDTH.

4) NO TREES OR LANDSCAPING ALONG SEWER ROUTES SHALL BE TRIMMED OR REMOVED WITHOUT PRIOR PERMISSION OF THE ENGINEER.

5) RESET OR REPLACE ALL SITE FEATURES DISTURBED BY WORK INCLUDING FENCES, PLANTINGS, WALKWAYS, STEPS, DRIVEWAYS, SIGNS, MAILBOXES, AND DRAINS.

6) NO SEWER SERVICES SHALL BE CONNECTED TO BUILDING UNTIL FINAL INSTALLATION, TESTING, CLEANING, AND ACCEPTANCE OF THE DOWNSTREAM SEWER BY THE OWNER.

7) ALL SEWER TRENCH ROUTES IN PAVEMENT (BEYOND MDOT MORATORIUM AREA) SHALL BE SAWCUT PRIOR TO BEGINNING EXCAVATIONS AND REPAVED TO MATCH EXISTING PAVEMENT THICKNESS.

8) A MDOT EXCAVATION MORATORIUM IS IN EFFECT IN THE AREA OF THE INTERSECTION OF TENNEY HILL ROAD, BEECH HILL ROAD, MINES ROAD AND SOUTH STREET. DISRUPTION OF THE EXISTING PAVEMENT IN THE TRAVELED WAY IS PROHIBITED. APPROXIMATE LIMIT IS AS SHOWN ON THE PLAN VIEW.

DELETED ~~9) THE SOUTH STREET SEWER MAIN LINE BETWEEN MH STA. 0+00C AND MH STA. 1+00C SHALL BE INSTALLED BY HORIZONTAL DIRECTIONAL BORING. THIS LINE SHALL BE INSTALLED PRIOR TO THE INSTALLATION OF OTHER TERMINAL MANHOLES.~~

10) ACCESS NOT GAINED TO NO. 8 SOUTH STREET. VERIFY LOCATION AND ELEVATION OF THE EXISTING SEWER SYSTEM PRIOR TO INSTALLATION OF PROPOSED SEWER SERVICE STUB.

11) CONTRACTOR SHALL PROVIDE CLEARING AND GRUBBING AS REQUIRED.

12) SEWER SERVICES CROSSING SOUTH STREET WILL BE INSTALLED BY OTHERS AS PART OF A PREVIOUS CONTRACT. AS BUILT INFORMATION SHALL BE PROVIDED TO CONTRACTOR FOR CONNECTION TO WORK UNDER THIS CONTRACT.

STATE OF MAINE
WILLIAM M. OLVER
No. 5246
LICENSED PROFESSIONAL ENGINEER

THESE RECORD DRAWINGS HAVE BEEN PREPARED, IN PART, ON THE BASIS OF THE INFORMATION COMPILED AND FURNISHED BY OTHERS, INCLUDING CONTRACTORS AND UTILITY COMPANIES, AND NO REPRESENTATION OF ACCURACY IS MADE FOR ERRORS OR OMISSIONS WHICH HAVE BEEN INCORPORATED INTO THIS DOCUMENT AS A RESULT.

OLVER ASSOCIATES INC.
ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

JULY, 2010	RECORD DRAWING
DATE	ADDITION OR REVISION

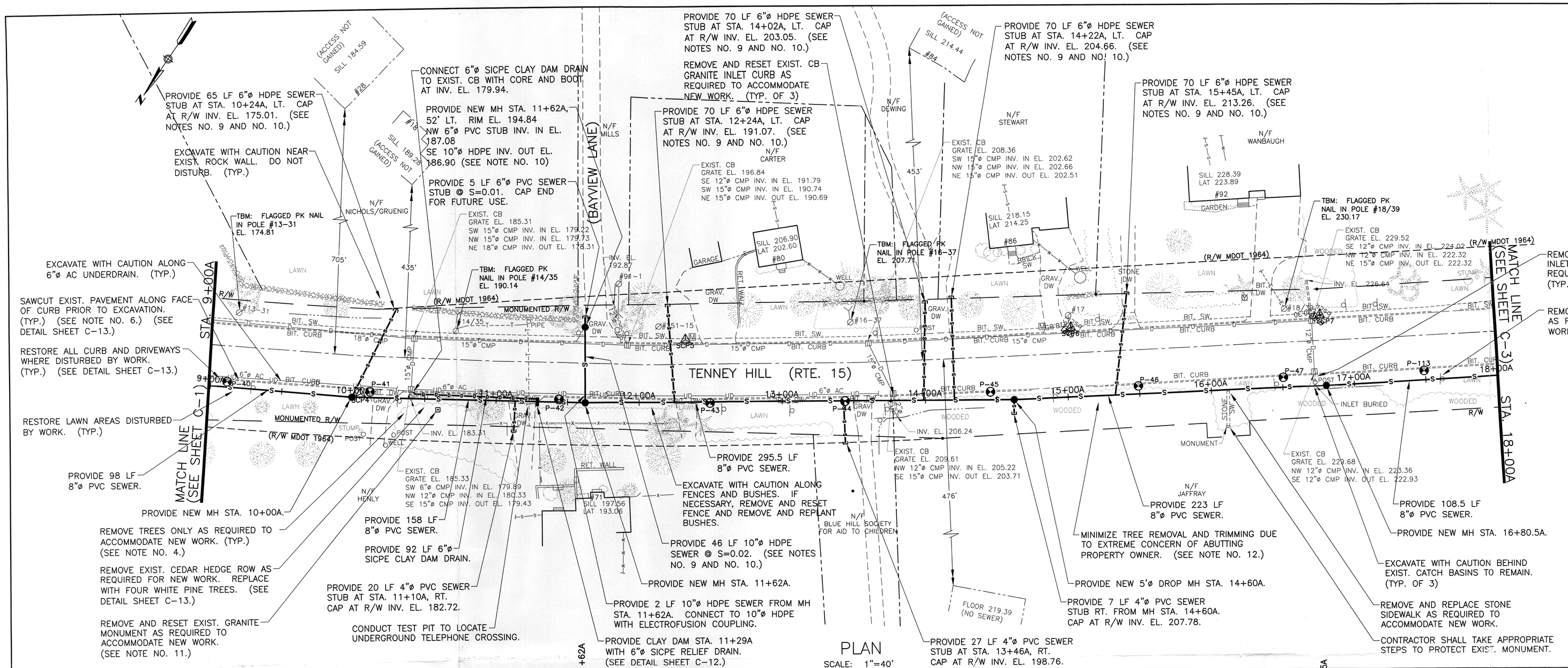
DES.BY:	EWH	DR.BY:	NWD	CK.BY:	WMO

TOWN OF BLUE HILL, MAINE

SOUTH STREET/MINES ROAD SEWER EXTENSION

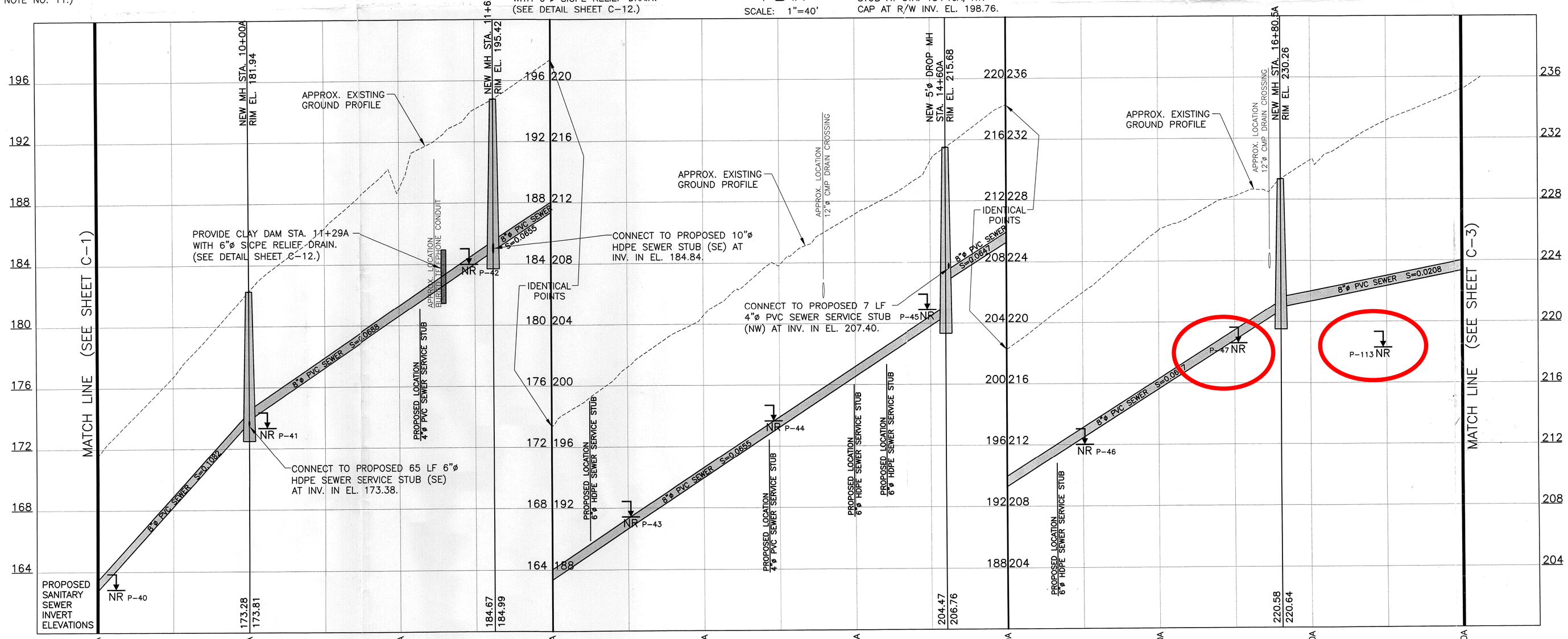
SOUTH STREET SEWER PLAN & PROFILE

SCALE:	1"=40'	PROJECT NO.:	0218
DATE:	JUNE, 2009	SHEET:	C-7



PLAN

SCALE: 1"=40'



PROFILE

SCALE: 1"=40' HORIZ.
1"=4' VERT.

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3) ALL SEWER MAINS AND SERVICES WITH LESS THAN 5' OF COVER SHALL BE INSULATED WITH 2" RIGID INSULATION AT FULL TRENCH WIDTH.

4) NO TREES OR LANDSCAPING ALONG SEWER ROUTES SHALL BE TRIMMED OR REMOVED WITHOUT PRIOR PERMISSION OF THE ENGINEER.

5) RESET OR REPLACE ALL SITE FEATURES DISTURBED BY WORK INCLUDING FENCES, PLANTINGS, WALKWAYS, STEPS, DRIVEWAYS, SIGNS, MAILBOXES, AND DRAINS.

6) INTENT IS TO LOCATE THE NEW SEWER MAIN BEHIND THE EXISTING CURB LINE AND DRAINAGE STRUCTURES TO MINIMIZE DISRUPTION OF THE EXISTING ROADWAY PAVEMENT. THE WORK SHALL INCLUDE THE REMOVAL AND REPLACEMENT OF THE EXISTING BITUMINOUS CURB AND REPAIR OF THE PAVEMENT ALONG THE EDGE OF THE TRAVELED WAY. CONTRACTOR MAY FIELD MODIFY THE MANHOLE LOCATIONS WITH ENGINEER TO MINIMIZE DISRUPTION OF EXISTING PAVEMENT AND SITE FEATURES.

7) NO SEWER SERVICES SHALL BE CONNECTED TO BUILDINGS UNTIL FINAL INSTALLATION, TESTING, CLEANING, AND ACCEPTANCE OF THE DOWNSTREAM SEWER BY THE OWNER.

8) A MDOT EXCAVATION MORATORIUM IS IN EFFECT ON TENNEY HILL ROAD UP TO THE INTERSECTION OF SOUTH STREET, BEECH HILL ROAD, AND MINES ROAD. DISRUPTION OF THE EXISTING PAVEMENT IN THE TRAVELED WAY IS PROHIBITED.

9) ALL TENNEY HILL LONG-SIDE HDPE SEWERS CROSSING THE ROADWAY SHALL BE INSTALLED BY HORIZONTAL DIRECTIONAL BORING.

10) ALL SEWER SERVICE STUBS TO BE INSTALLED BY HORIZONTAL DIRECTIONAL BORING SHALL BE INSTALLED PRIOR TO THE INSTALLATION OF THE MAIN LINE INTERSECTING WYE FITTING OR MANHOLE.

11) IF DISTURBED, MONUMENT SHALL BE RESET BY A REGISTERED LAND SURVEYOR APPROVED BY THE ENGINEER.

12) CONTRACTOR SHALL RETAIN A SURVEYOR TO FLAG RIGHT-OF-WAY LINE ALONG N/F JAFFRAY PROPERTY TO PREVENT INFRINGEMENT ON PROPERTY BOUNDARY.

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ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

JULY, 2010	RECORD DRAWING
DATE	ADDITION OR REVISION

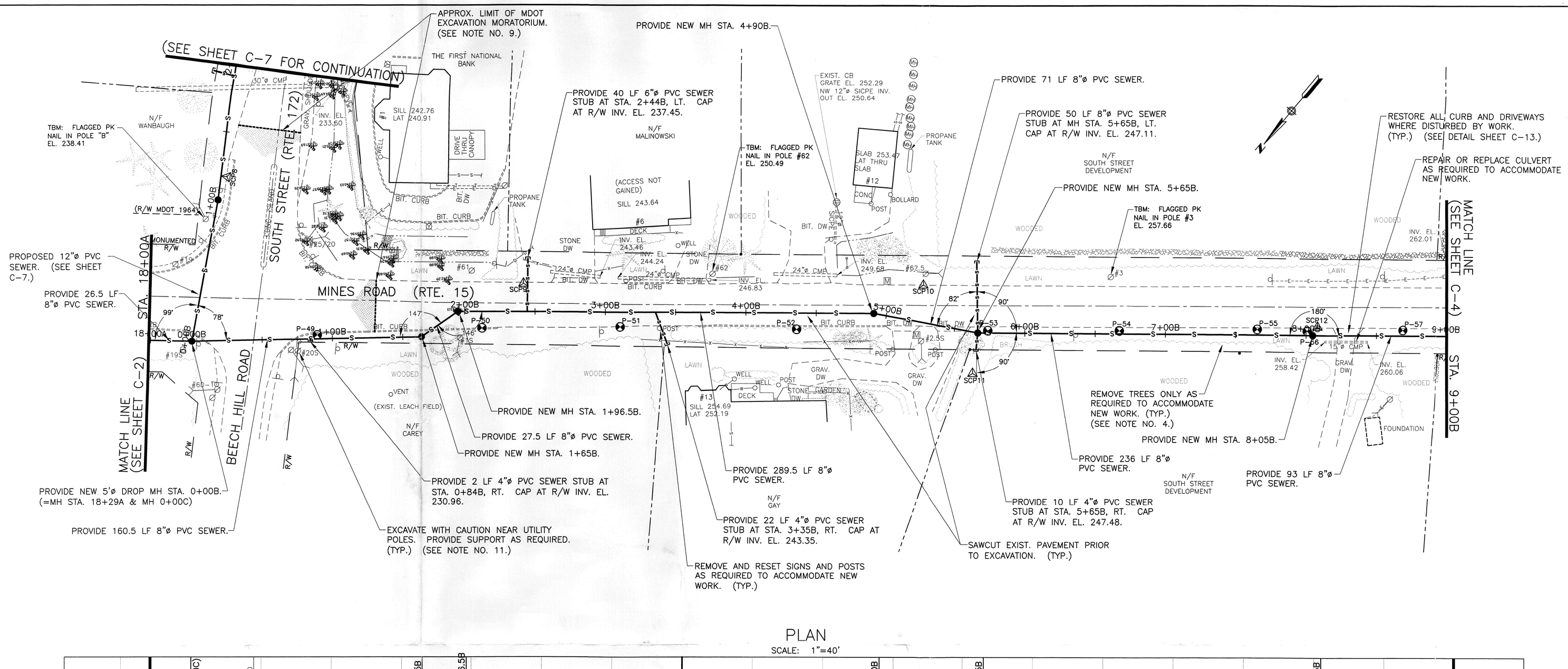
DES.BY: EWH	DR.BY: NWD	CK.BY: WMO

TOWN OF BLUE HILL, MAINE

SOUTH STREET/MINES ROAD SEWER EXTENSION

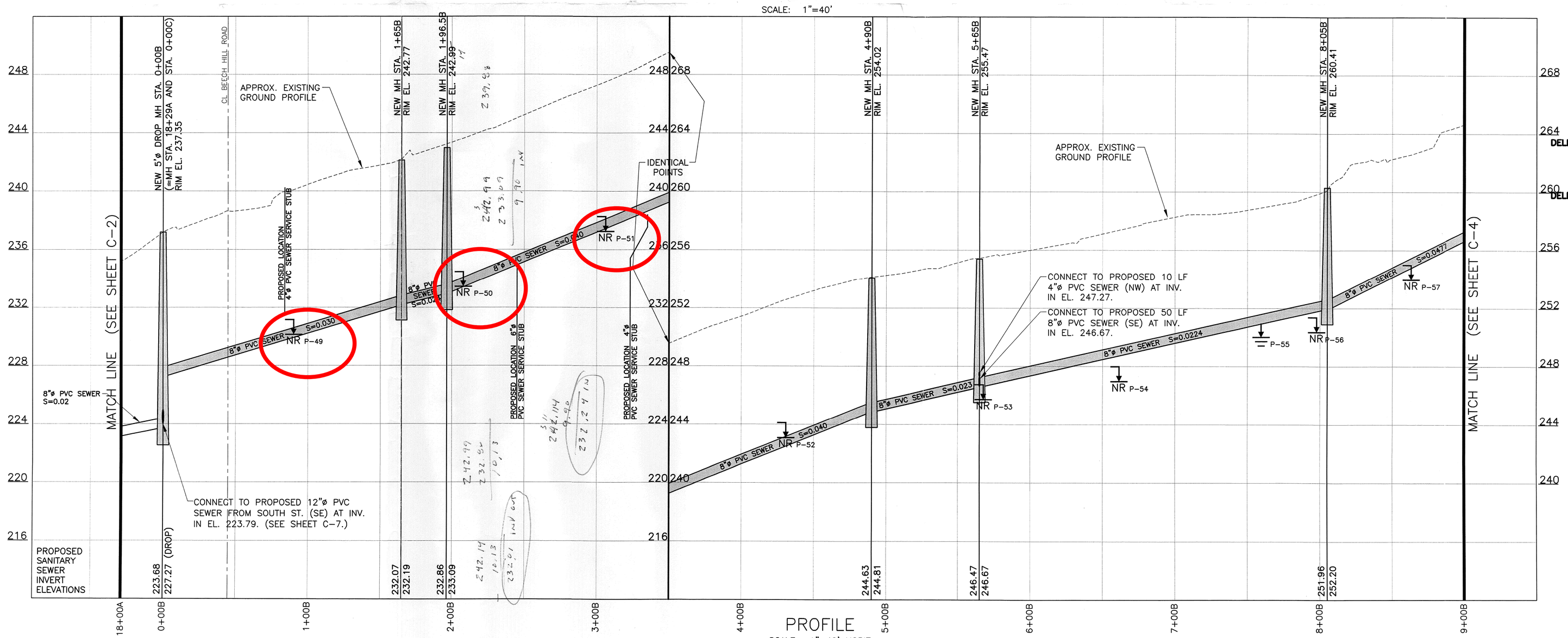
TENNEY HILL SEWER PLAN & PROFILE

SCALE: 1"=40'	PROJECT NO.: 0218
DATE: JUNE, 2009	SHEET: C-2



PLAN

SCALE: 1"=40'



PROFILE

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1"=4' VERT.

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6) INTENT IS TO LOCATE THE NEW SEWER MAIN ALONG THE OUTER SHOULDER AND MINIMIZE DISRUPTION OF THE EXISTING ROADWAY EDGE OF PAVEMENT. CONTRACTOR MAY FIELD MODIFY THE MANHOLE LOCATIONS WITH ENGINEER TO MINIMIZE DISRUPTION OF EXISTING PAVEMENT AND SITE FEATURES.

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~~9) A MDOT EXCAVATION MORATORIUM IS IN EFFECT IN THE AREA OF THE INTERSECTION OF TENNEY HILL, BEECH HILL ROAD, MINES ROAD AND SOUTH STREET. DISRUPTION OF THE EXISTING PAVEMENT IN THE TRAVELED WAY IS PROHIBITED. APPROXIMATE LIMIT IS AS SHOWN ON THE PLAN VIEW.~~ DELETED

~~10) THE MINES ROAD SEWER MAIN LINE BETWEEN MH STA. 0+00B AND MH STA. 2+44B SHALL BE INSTALLED BY HORIZONTAL DIRECTIONAL BORING. THIS LINE SHALL BE INSTALLED PRIOR TO THE INSTALLATION OF EITHER TERMINAL MANHOLE.~~ DELETED

11) COORDINATE WITH UTILITY POLES OWNER TO HAVE GUY WIRES TEMPORARILY REMOVED AND RESET TO FACILITATE SEWER CONSTRUCTION. CONTRACTOR SHALL ARRANGE FOR POLE TO BE SUPPORTED AS NEEDED.

STATE OF MAINE
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ENVIRONMENTAL ENGINEERS
290 MAIN STREET WINTERPORT, MAINE

DATE	ADDITION OR REVISION
JULY, 2010	RECORD DRAWING
MARCH, 2010	REVISIONS TO MAIN LINE LOCATION

DES.BY: EWH | DR.BY: NWD/AWL | CK.BY: WMO

TOWN OF BLUE HILL, MAINE

SOUTH STREET/MINES ROAD SEWER EXTENSION

MINES ROAD SEWER PLAN & PROFILE

SCALE: 1"=40' | PROJECT NO.: 0218

DATE: JUNE, 2009 | SHEET: C-3