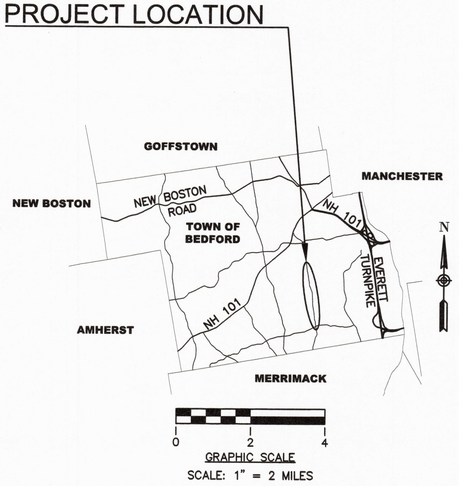
ROADWAY RECONSTRUCTION PLANS
LIBERTY HILL ROAD
PROJECT LENGTH: 1.67 MILES
BEDFORD, NEW HAMPSHIRE

PROJECT LOCATION



TOWN OF BEDFORD 1750 NEW HAMPSHIRE

AUGUST 15, 2017

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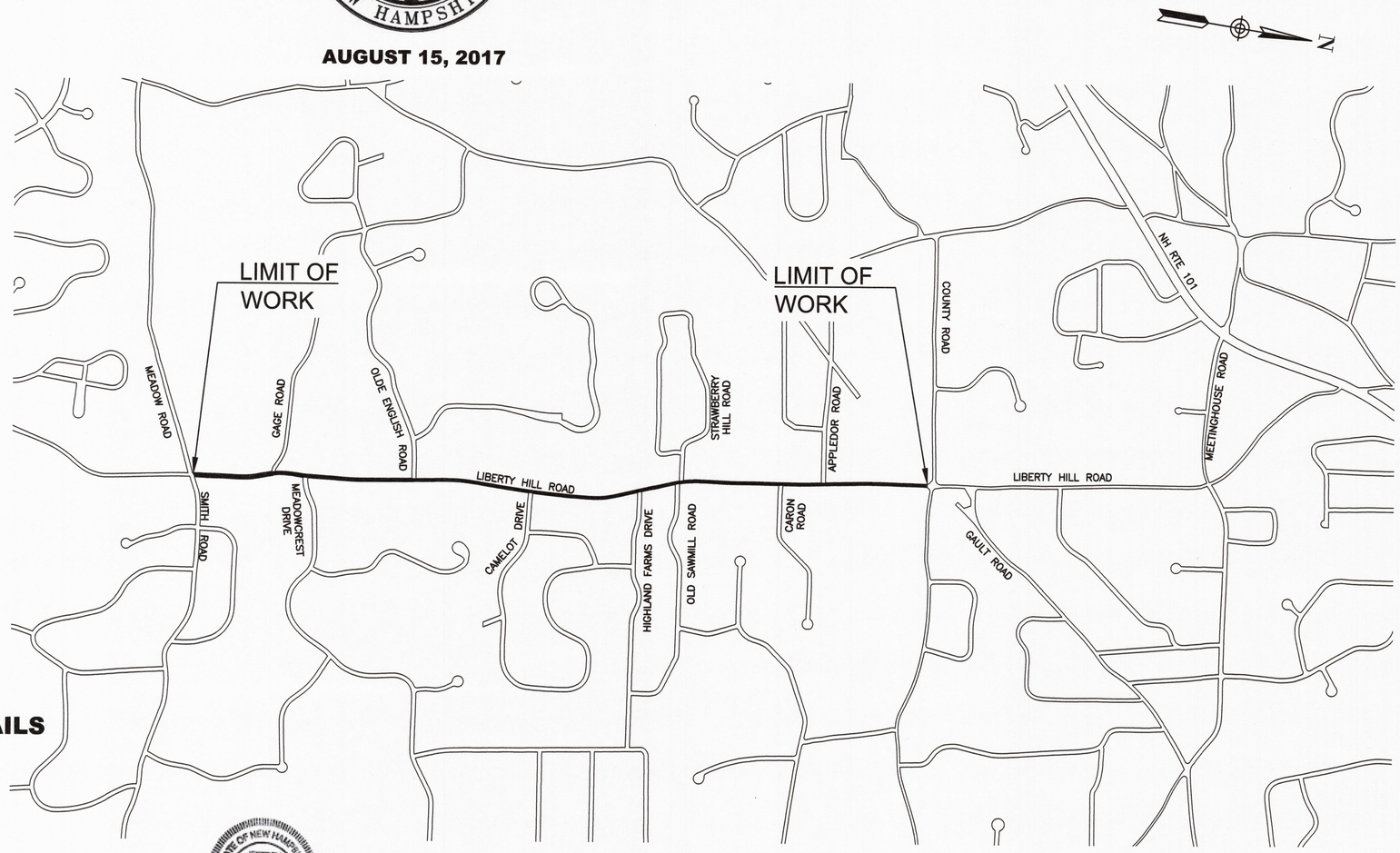


STATE OF NEW HAMPSHIRE — JEFFREY W. FOOTE No. 10653 LICENSED PROFESSIONAL ENGINEER

1/10/2018

ENGINEER

NO.	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506FSC

DESIGNED BY KDP | DRAWN BY KDP | CHECKED BY AGB

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

SCALE: AS SHOWN | DATE: AUGUST 2017

TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

TITLE SHEET

DRAWING NO. FSC

SHEET 1 OF 21

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, DATED 2016 AND "CONTRACT SPECIFICATIONS OF BEDFORD, NH – DEPARTMENT OF PUBLIC WORKS" OF WHICH THESE PLANS ARE A PART. IN THE EVENT ANY DISCREPANCIES EXIST BETWEEN THESE PLANS AND WRITTEN PORTIONS OF THE CONTRACT SPECIFICATIONS, THE CONTENT OF THE WRITTEN SPECIFICATIONS SHALL PREVAIL.

2. THIS PROJECT SHALL ALSO BE CONSTRUCTED IN ACCORDANCE WITH NHDOT STANDARD PLANS FOR ROAD CONSTRUCTION (2010). THESE PLANS CAN BE FOUND ON THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION WEBSITE AT:
   https://www.nh.gov/dot/org/projectdevelopment/highwaydesign/standardplans/index.htm

3. ALL WORK SHALL BE COMPLETED WITHIN THE RIGHT–OF–WAY UNLESS SPECIFIED BY THE PLANS OR THE TOWN ENGINEER. ANY WORK REQUIRED ON PRIVATE PROPERTY SHALL BE COORDINATED WITH THE HOMEOWNER AND THE TOWN ENGINEER TO MINIMIZE INCONVENIENCE AND PROVIDE ACCESS TO THE HOMEOWNER. CONTRACTOR SHALL CONTACT THE TOWN OF BEDFORD, TOWN ENGINEER, FOR LIMITS OF ALL PROPOSED EASEMENTS PRIOR TO CONSTRUCTION.

4. CONTRACTOR SHALL VERIFY LOCATION OF UTILITIES PRIOR TO COMMENCEMENT OF THIS WORK.

5. NO EXISTING MONUMENTS, BOUNDS OR BENCHMARKS SHALL BE DISTURBED WITHOUT FIRST MAKING PROVISIONS FOR RELOCATION.

6. UNSUITABLE MATERIAL, ROOTS AND STUMPS WITHIN THE LIMITS OF ROADBED SHALL BE REMOVED AS ORDERED.

7. DIMENSIONS, ANGLES, BEARINGS, AND ELEVATIONS SHOWN ON THESE PLANS HAVE BEEN OBTAINED FROM LIMITED FIELD INVESTIGATIONS AND SURVEY AND MAY NOT ACCURATELY REFLECT ACTUAL FIELD CONDITIONS. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY PROJECT WORK. ANY DISCREPANCIES IN DIMENSIONS, CHARACTER OR EXTENT OF THE EXISTING FEATURES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE ADVANCING THE WORK. SHOP DRAWINGS REQUIRED FOR VARIOUS ITEMS OF THE WORK SHALL INDICATE THE ACTUAL FIELD MEASUREMENTS AND SHALL BE SO NOTED.

8. REMOVE TOPSOIL FOR ITS TOTAL DEPTH WITHIN THE LIMITS OF THE SLOPE LINES. UNLESS OTHERWISE DIRECTED, STOCKPILE TOPSOIL AND USE IT ON THIS PROJECT AS NEEDED UNDER SECTION 646.

9. THE CONTRACTOR SHALL CONTACT DIGSAFE AT 811 A MINIMUM OF 72 HOURS PRIOR TO ANY EXCAVATION.

10. SHOULD ANY ALTERING, ADJUSTING, OR RELOCATING OF UTILITIES BE REQUIRED, THIS WORK SHALL BE COMPLETED BY THE APPROPRIATE UTILITY COMPANY AND IS NOT PART OF THE CONTRACT. HOWEVER, THE CONTRACTOR SHALL FACILITATE THE UTILITY COMPANY IN THEIR PERFORMANCE OF THIS WORK.

11. ALL SIGNS, PROPERTY BOUNDS, ETC. DISTURBED BY THE CONSTRUCTION ACTIVITIES SHALL BE RESET BY THE CONTRACTOR OR HIS AGENT, UNLESS OTHERWISE NOTED ON THE PLANS OR BY THE RESIDENT ENGINEER.

12. SAWCUT ALL EXISTING PAVEMENT AT LIMITS OF WORK.

13. CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER AND REMOVE TREES AS NECESSARY TO COMPLETE THE WORK AND/OR AS DIRECTED BY THE RESIDENT ENGINEER.

14. CONSTRUCT 3 LF PAVED DRIVE APRON FOR ALL EXISTING DRIVEWAYS AND SIDE ROADS UNLESS OTHERWISE NOTED ON THESE PLANS, OR AS DIRECTED.

15. CONTRACTOR SHALL COORDINATE WITH THE RESIDENT ENGINEER IF LEDGE IS ENCOUNTERED DURING CONSTRUCTION.

16. ALL NEW EMBANKMENT SLOPES SHALL BE LOAMED AND SEEDED. MULCH AS DIRECTED.

17. CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR TRAFFIC CONTROL AND ASSOCIATED SIGNAGE AND WARNING DEVICES DURING EXECUTION OF THIS CONTRACT.

18. CATCH BASIN GRATE ELEVATIONS SHALL BE SET ½" BELOW FINAL GRADE. WEARING COURSE SHALL TAPER INTO THE GRATE.

19. GROUND SURVEY AND BASE PLAN PROVIDED BY GM2 ASSOCIATES, INC.

20. EXPOSED SOILS IN DELINEATED WETLANDS AT OUTFALLS AND ALONG SWALES WILL BE SEEDED WITH ERNMX–137, SPECIALIZED WETLAND MIX FOR SHADED OBL–FACW AREAS, OR EQUIVALENT.

21. CONTRACTOR TO MAINTAIN EXISTING DRIVE PIPES UNLESS OTHERWISE NOTED.

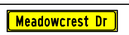
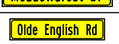
22. NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES ROUTINE ROADWAY AND RAILWAY MAINTENANCE NOTIFICATIONS HAVE BEEN OBTAINED FOR THIS PROJECT. THE CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS SET FORTH IN THESE NOTIFICATIONS AND THE ASSOCIATED PLANS.

23. TYPICAL SECTION MATERIALS FOR PAVEMENT AND SUBBASE PROVIDED BY THE TOWN OF BEDFORD, NH.

24. ANY MAILBOXES THAT NEED TO BE ADJUSTED AND/OR RELOCATED THROUGHOUT THE PROJECT ARE SUBSIDIARY TO ITEM 203.1 – COMMON EXCAVATION.

25. STOP BARS SHALL BE LOCATED 6' OFF OF LIBERTY HILL ROAD EDGE OF PAVEMENT UNLESS DIRECTED BY RESIDENT ENGINEER.

SCHEDULE OF SIGNS

GRAPHIC	LABEL	DIMENSIONS	LOCATION*
	W2–2L	30" x 30"	111+10, RT 117+90, LT 128+00, RT 144+75, LT 157+50, LT 174+50, LT 176+50, RT
	W2–2R	30" x 30"	114+00, LT 115+00, RT 130+65, LT 141+90, RT 154+50, RT 170+75, RT 179+50, LT
	W2–7R	30" x 30"	159+50, RT 162+65, LT
	W16–8aP(a)	42" x 15"	159+50, RT
	W16–8aP(b)	42" x 15"	162+65, LT
	W16–8P(GAGE)	24" x 8"	111+10, RT 114+00, LT
	W16–8P(MEADOWCREST)	42" x 8"	115+00, RT 117+90, LT
	W16–8P(OLDE ENGLISH)	36" x 8"	128+00, RT 130+65, LT
	W16–8P(CAMELOT)	30" x 8"	141+90, RT 144+75, LT
	W16–8P(HIGHLAND FARMS)	42" x 8"	154+50, RT 157+50, LT
	W16–8P(CARON)	24" x 8"	170+75, RT 174+50, LT
	W16–8P(APPLEDOR)	30" x 8"	176+50, RT 179+50, LT

*STATIONING OF SIGNS IS APPROXIMATE. FINAL LOCATIONS TO BE DETERMINED BY RESIDENT ENGINEER DURING CONSTRUCTION IN ACCORDANCE WITH MUTCD REQUIREMENTS.

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506NOTE_GEN

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

DATE: AUGUST 2017

SCALE: AS SHOWN

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

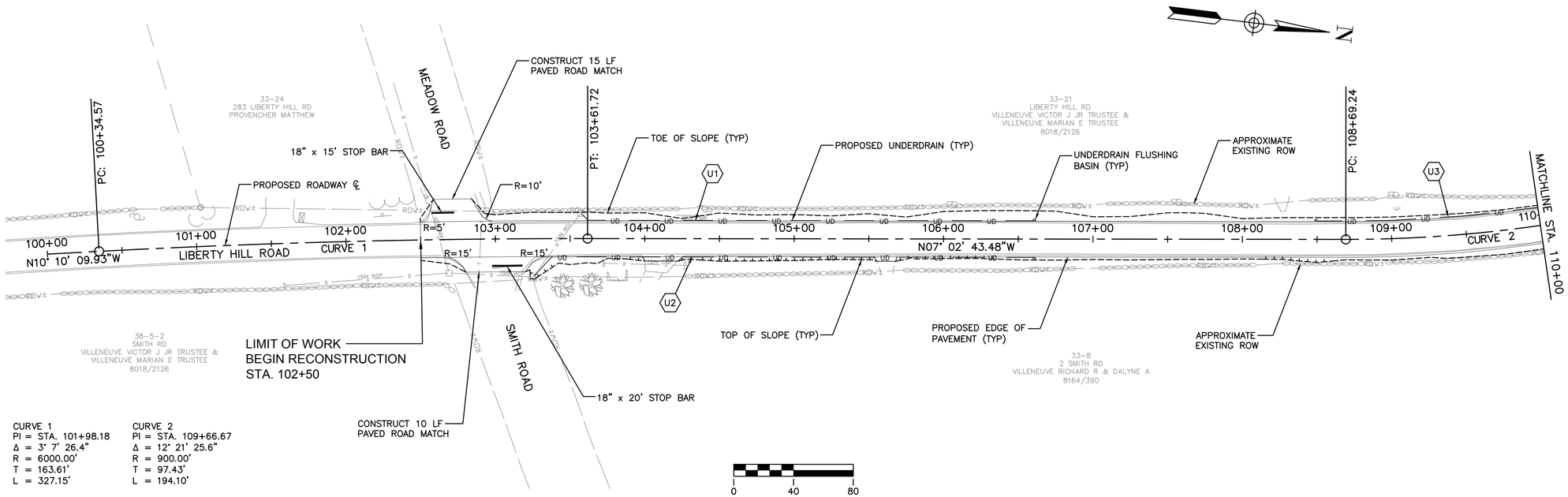
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

GENERAL NOTES

DRAWING NO.

NOTE1

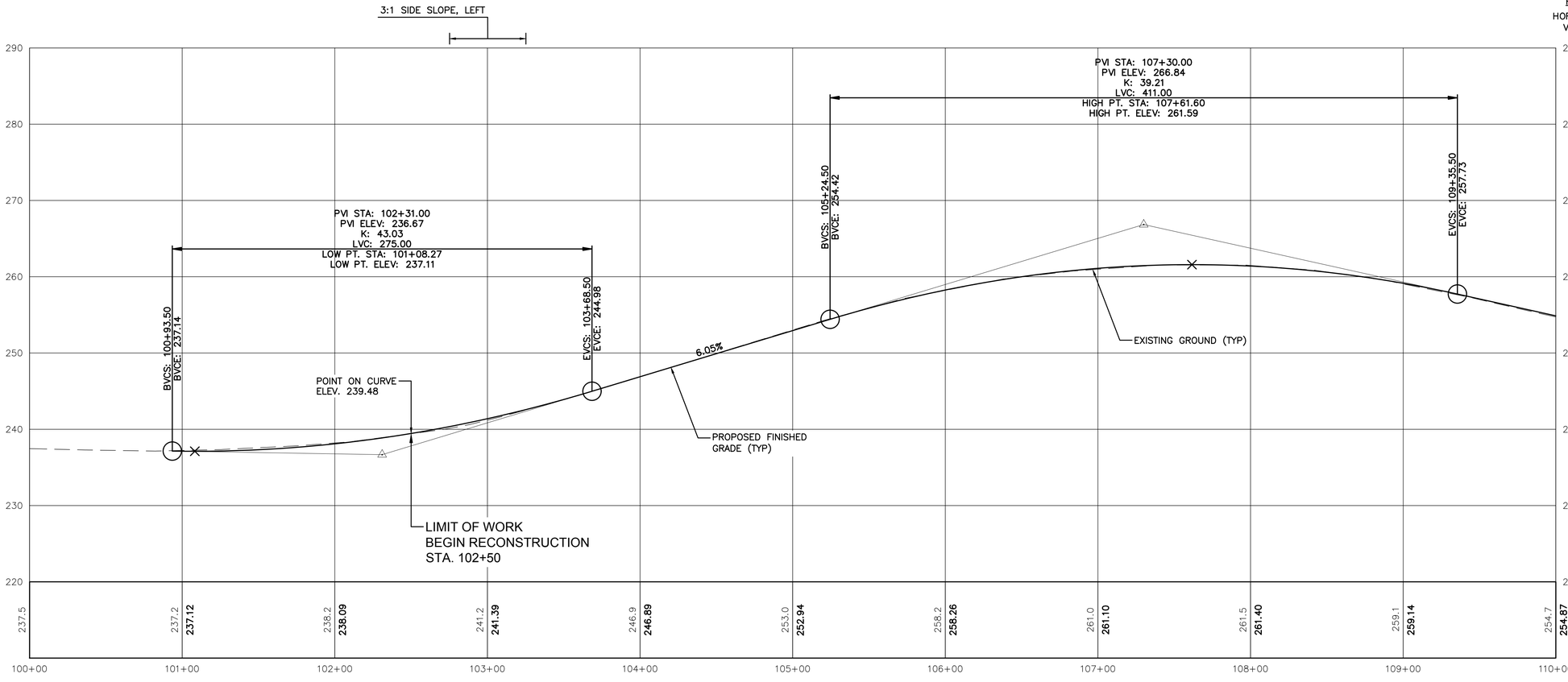


CURVE 1
PI = STA. 101+98.18
Δ = 3° 7' 26.4"
R = 6000.00'
T = 163.61'
L = 327.15'

CURVE 2
PI = STA. 109+66.67
Δ = 12° 21' 25.6"
R = 900.00'
T = 97.43'
L = 194.10'

0 40 80
PLAN GRAPHIC SCALE
SCALE: 1" = 40'

VERTICAL 16 8 0
HORIZONTAL
0 40 80
PROFILE GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DATE	DESCRIPTION	ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoytanner.com

DATE: AUGUST 2017

SCALE: AS SHOWN

TOWN OF BEDFORD, NEW HAMPSHIRE

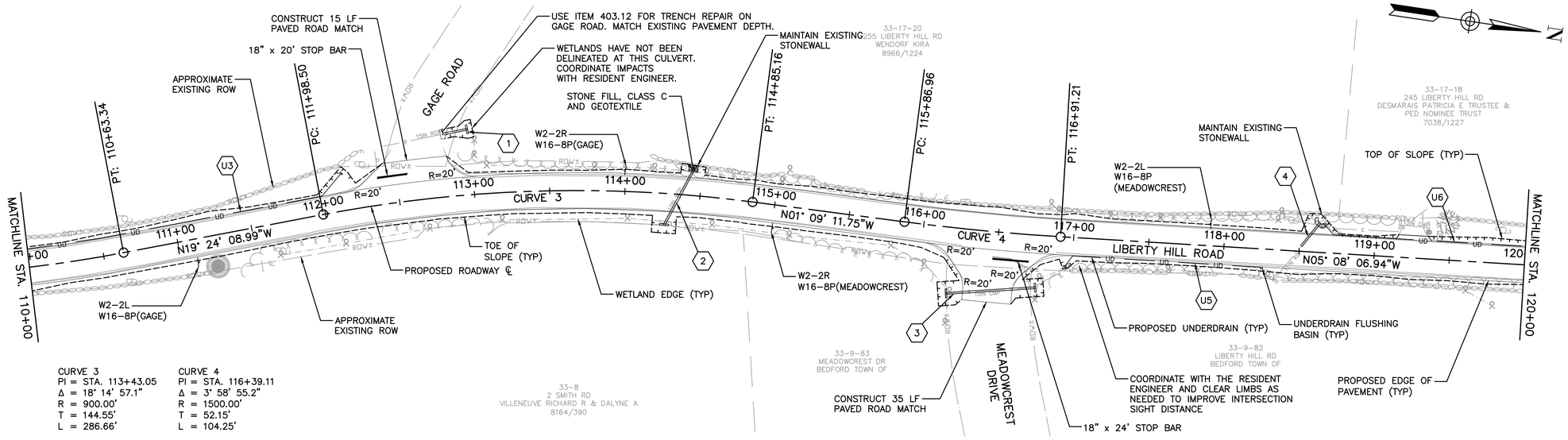
LIBERTY HILL ROAD RECONSTRUCTION

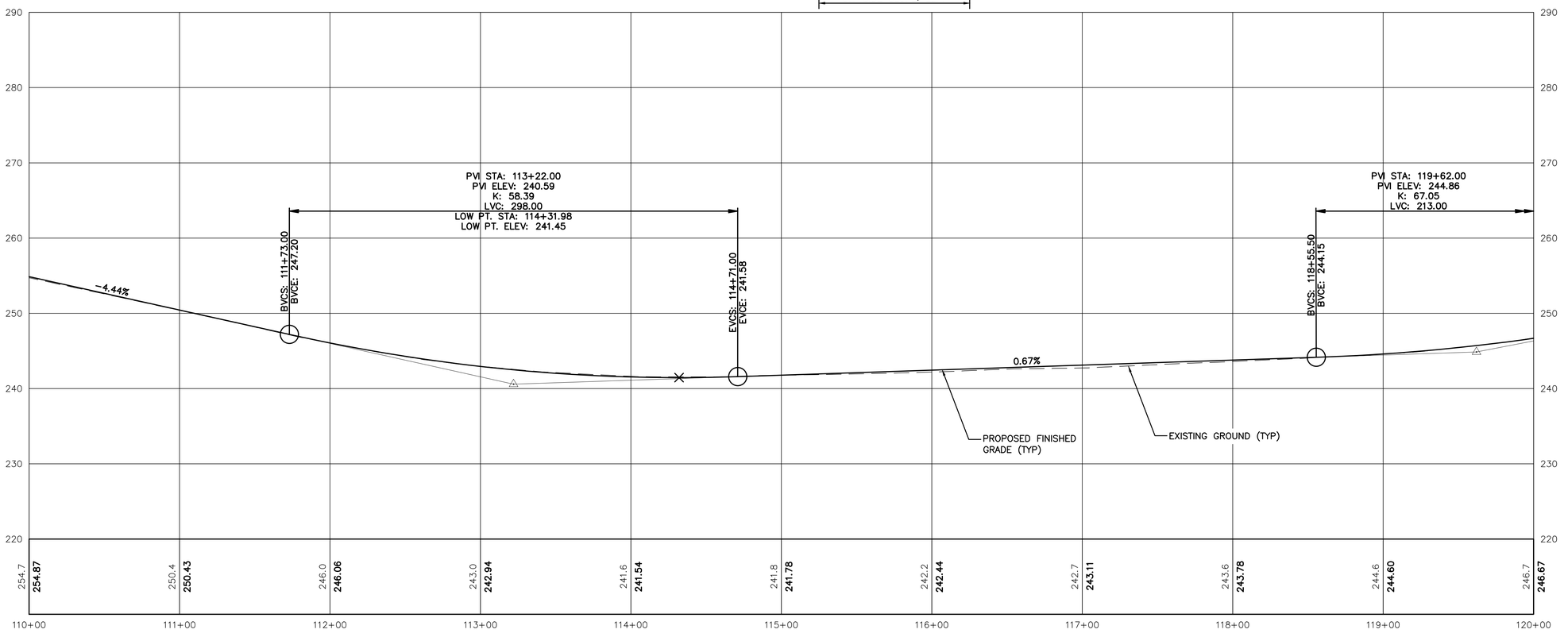
PLAN AND PROFILE 1 OF 9

DRAWING NO.

GEN1

SHEET 3 OF 21





ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 9111506

FILE NAME 9111506GENPLANS

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

SCALE: AS SHOWN

DATE: AUGUST 2017

TOWN OF BEDFORD, NEW HAMPSHIRE

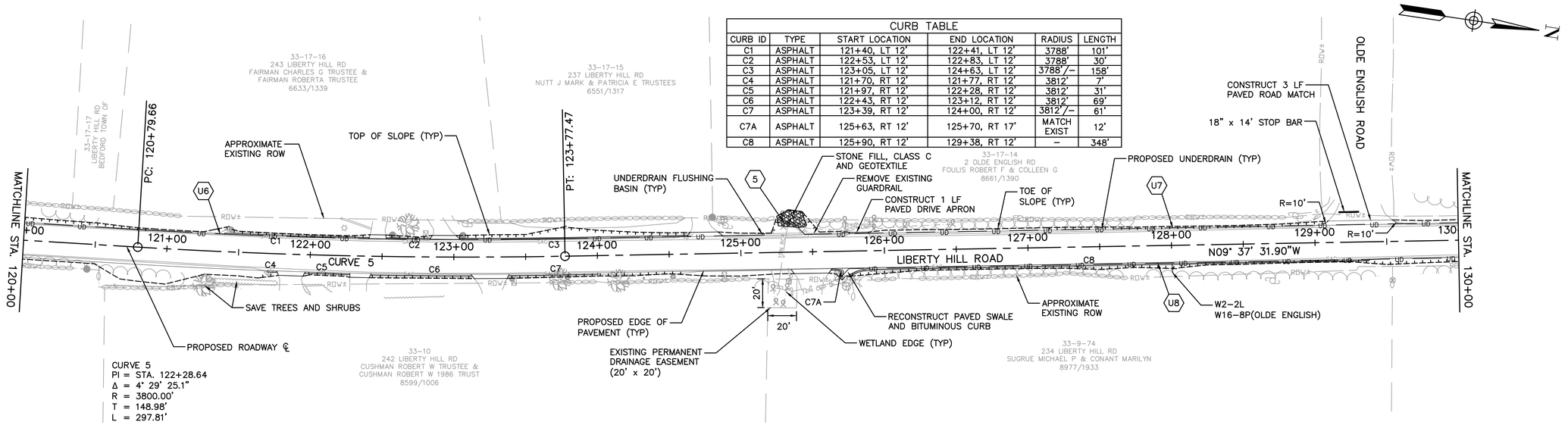
LIBERTY HILL ROAD RECONSTRUCTION

PLAN AND PROFILE 2 OF 9

DRAWING NO.

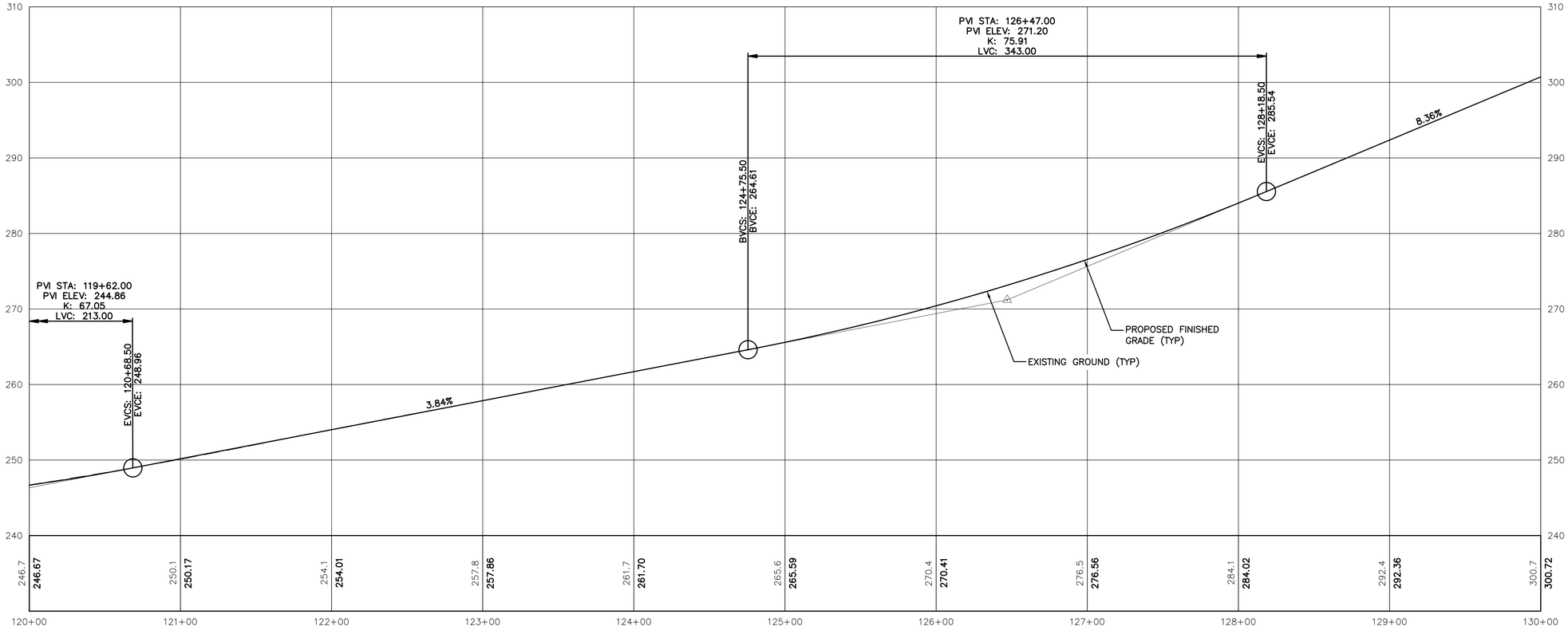
GEN2

CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C1	ASPHALT	121+40, LT 12'	122+41, LT 12'	3788'	101'
C2	ASPHALT	122+53, LT 12'	122+83, LT 12'	3788'	30'
C3	ASPHALT	123+05, LT 12'	124+63, LT 12'	3788'/–	158'
C4	ASPHALT	121+70, RT 12'	121+77, RT 12'	3812'	7'
C5	ASPHALT	121+97, RT 12'	122+28, RT 12'	3812'	31'
C6	ASPHALT	122+43, RT 12'	123+12, RT 12'	3812'	69'
C7	ASPHALT	123+39, RT 12'	124+00, RT 12'	3812'/–	61'
C7A	ASPHALT	125+63, RT 12'	125+70, RT 17'	MATCH EXIST	12'
C8	ASPHALT	125+90, RT 12'	129+38, RT 12'	–	348'



PLAN GRAPHIC SCALE
SCALE: 1" = 40'

PROFILE GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DATE	DESCRIPTION	ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

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Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

SCALE: AS SHOWN

DATE: AUGUST 2017

TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

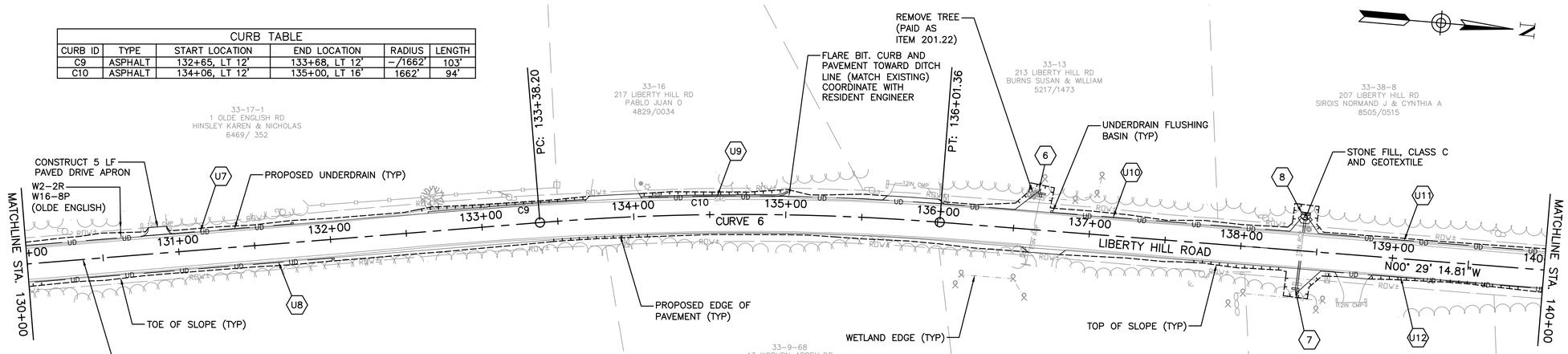
PLAN AND PROFILE 3 OF 9

DRAWING NO.

GEN3

SHEET 5 OF 21

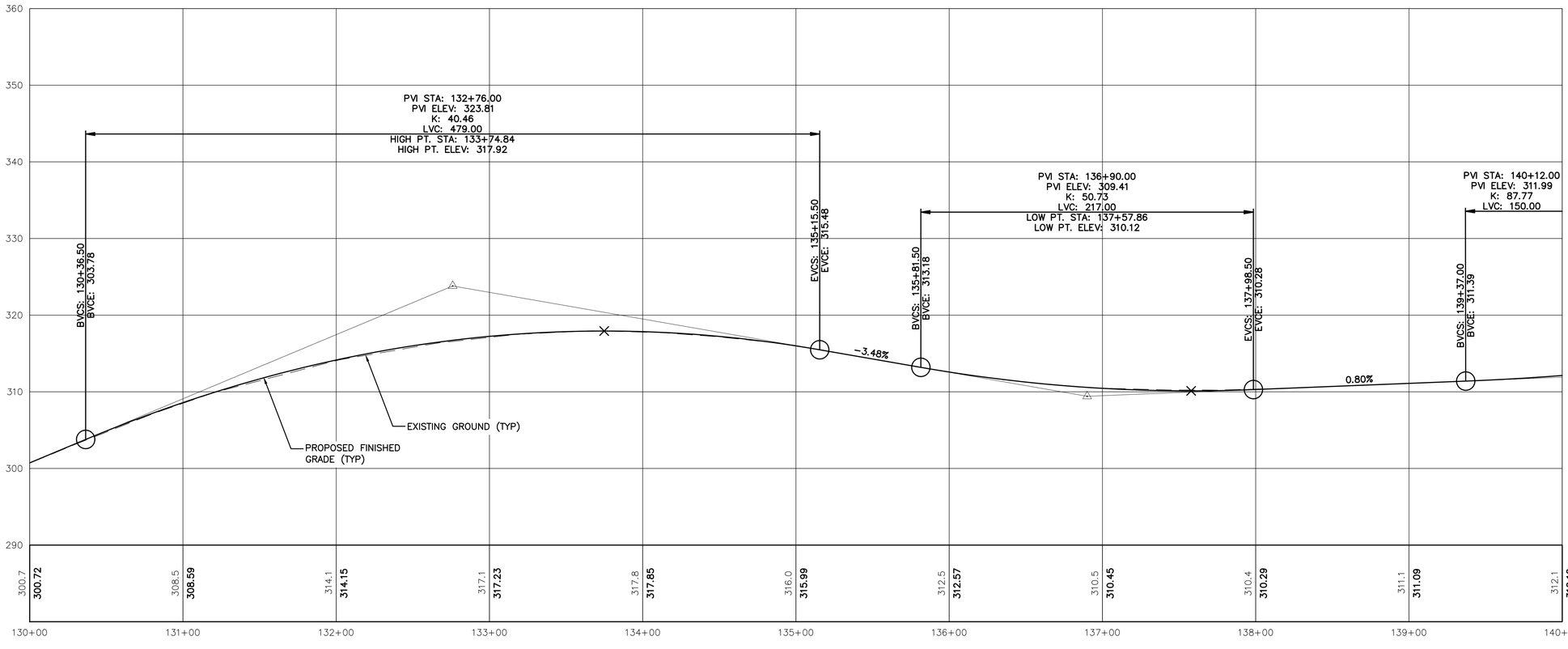
CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C9	ASPHALT	132+65, LT 12'	133+68, LT 12'	-/1662'	103'
C10	ASPHALT	134+06, LT 12'	135+00, LT 16'	1662'	94'



CURVE 6
PI = STA. 134+70.06
Δ = 9° 8' 17.2"
R = 1650.00'
T = 131.86'
L = 263.16'

0 40 80
PLAN GRAPHIC SCALE
SCALE: 1" = 40'

VERTICAL 16 8 0
HORIZONTAL
0 40 80
PROFILE GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DATE	DESCRIPTION	ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

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DRAWN BY KDP
DESIGNED BY KDP

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DATE: AUGUST 2017

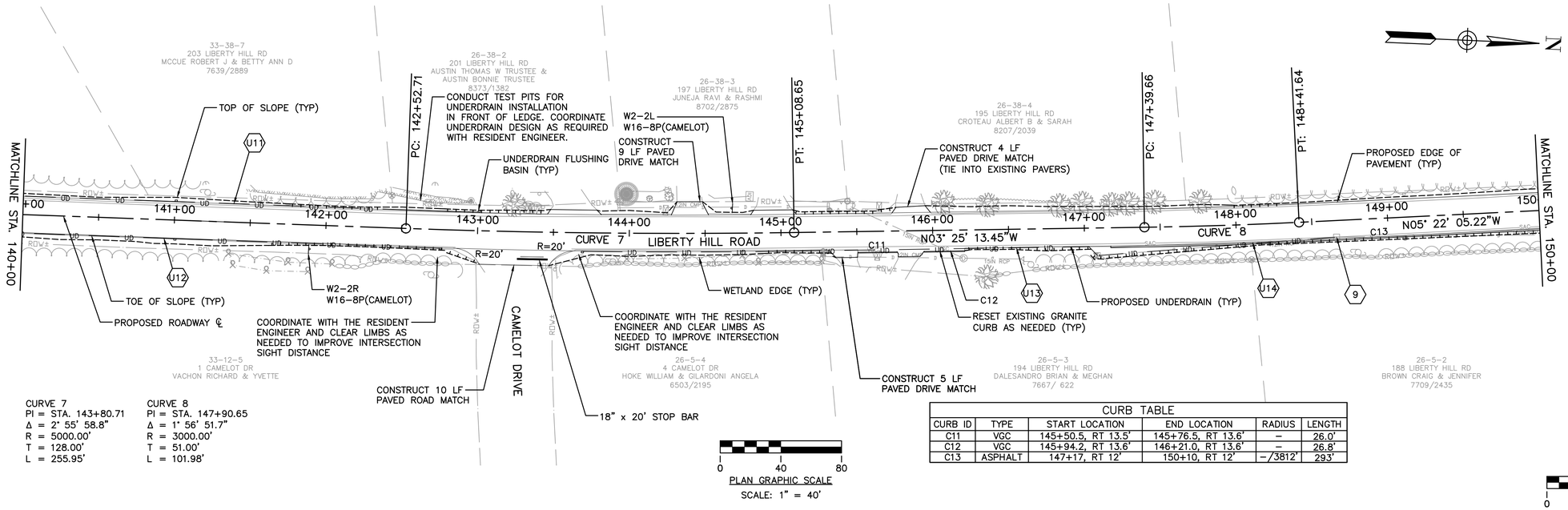
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

PLAN AND PROFILE 4 OF 9

DRAWING NO.
GEN4

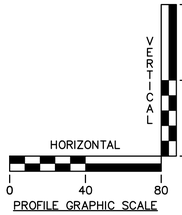
SHEET 6 OF 21



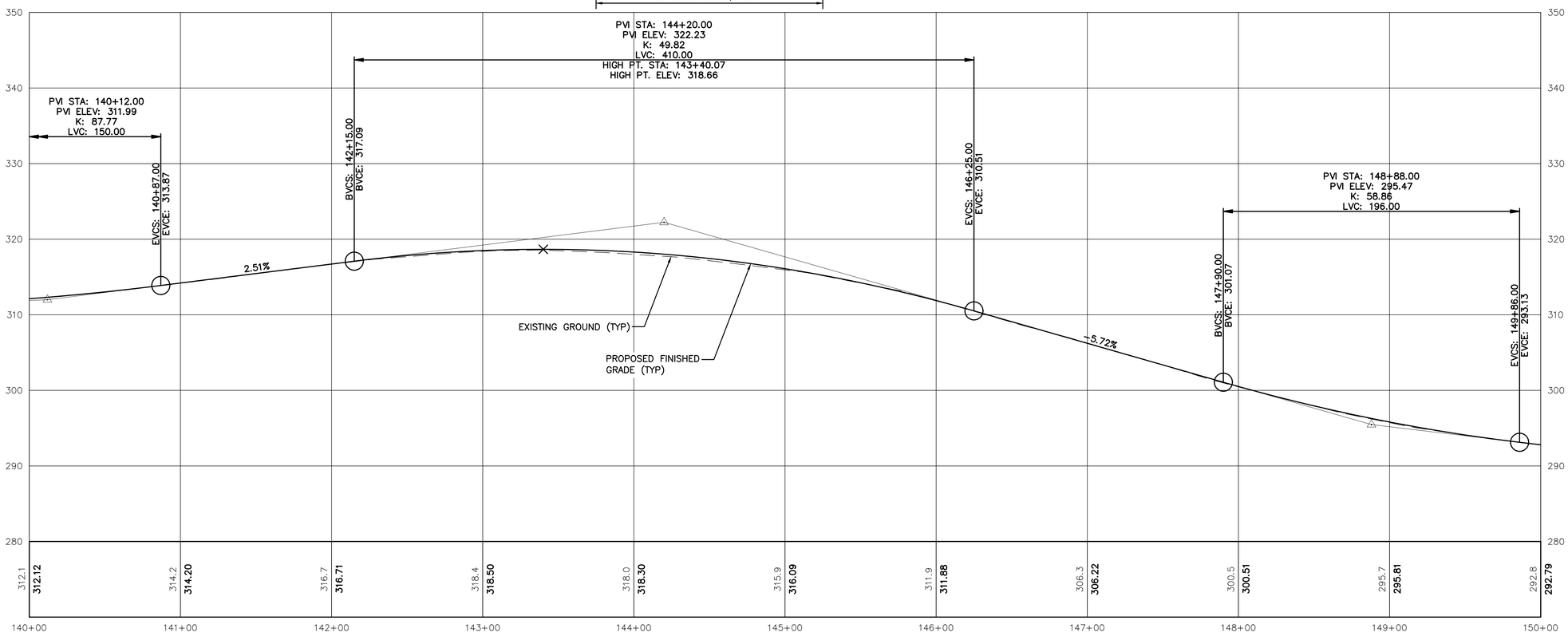
CURVE 7
PI = STA. 143+80.71
Δ = 2° 55' 58.8"
R = 5000.00'
T = 128.00'
L = 255.95'

CURVE 8
PI = STA. 147+90.65
Δ = 1° 56' 51.7"
R = 3000.00'
T = 51.00'
L = 101.98'

CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C11	VGC	145+50.5, RT 13.5'	145+76.5, RT 13.6'	–	26.0'
C12	VGC	145+94.2, RT 13.6'	146+21.0, RT 13.6'	–	26.8'
C13	ASPHALT	147+17, RT 12'	150+10, RT 12'	–/3812'	293'



HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 9111506

FILE NAME 911506GENPLANS

ISSUE	DRAWN BY	CHECKED BY
	KDP	AGB

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

DESIGNED BY	SCALE: AS SHOWN	DATE: AUGUST 2017
KDP		

TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

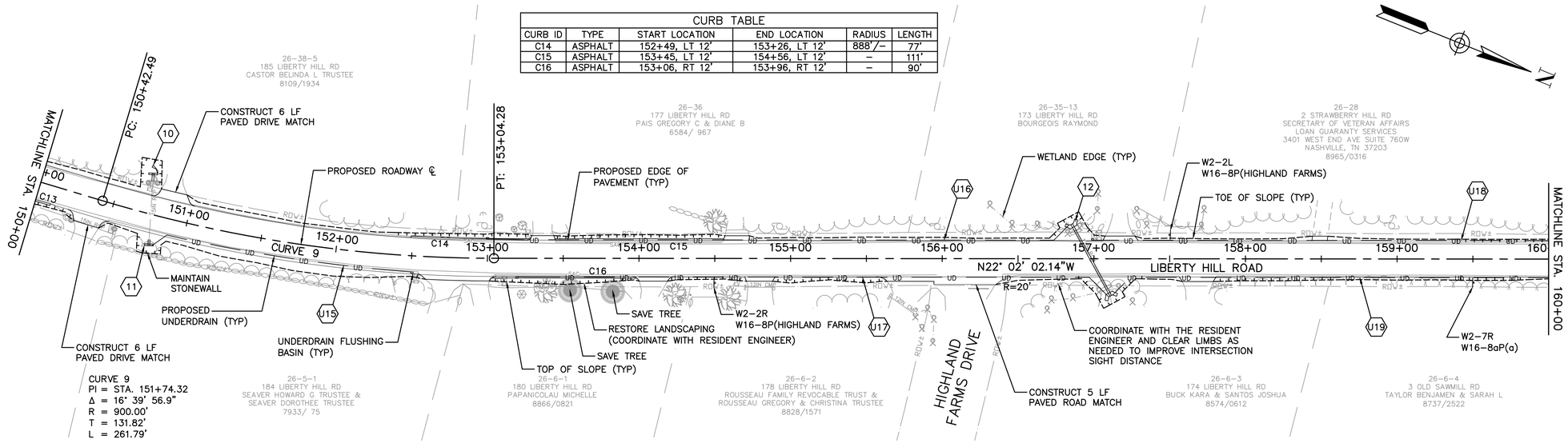
PLAN AND PROFILE 5 OF 9

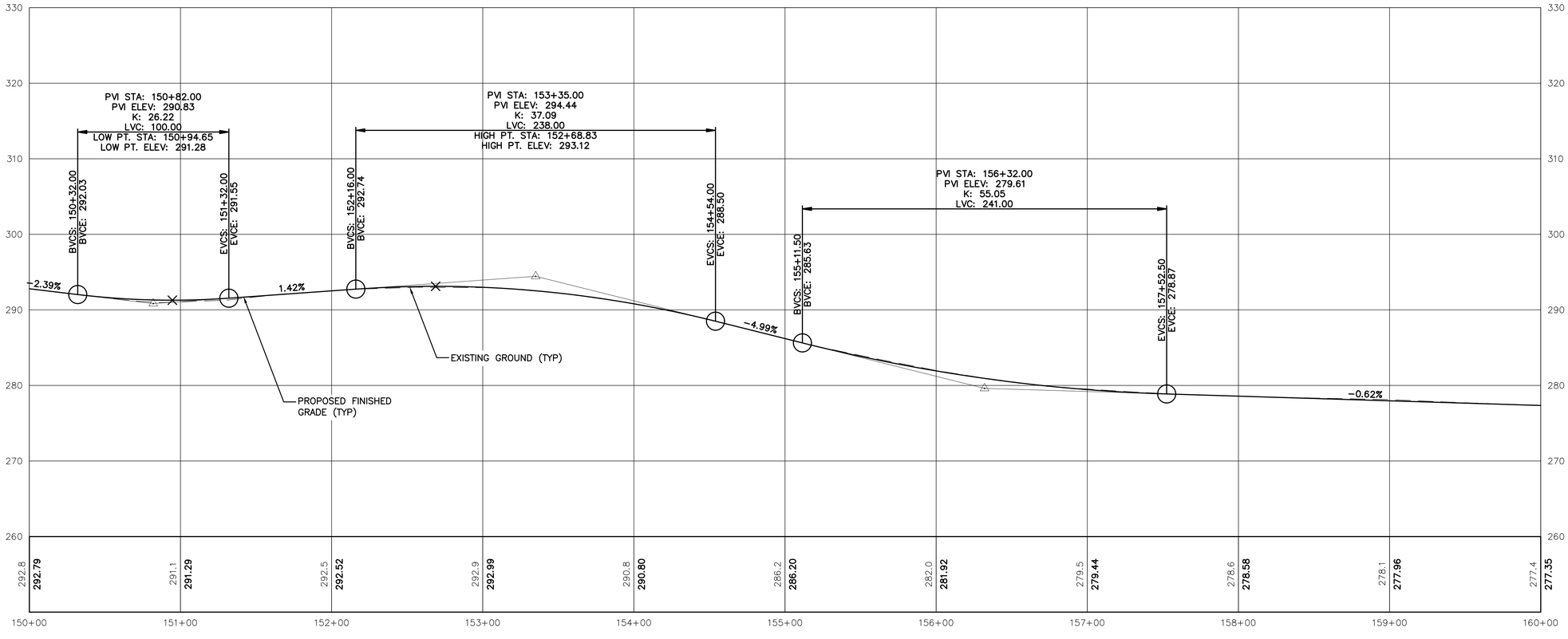
DRAWING NO.

GEN5

SHEET 7 OF 21

CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C14	ASPHALT	152+49, LT 12'	153+26, LT 12'	888'/–	77'
C15	ASPHALT	153+45, LT 12'	154+56, LT 12'	–	111'
C16	ASPHALT	153+06, RT 12'	153+96, RT 12'	–	90'





ENGINEER

DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

ISSUE

CHECKED BY AGB

DRAWN BY KDP

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DATE: AUGUST 2017

TOWN OF BEDFORD, NEW HAMPSHIRE

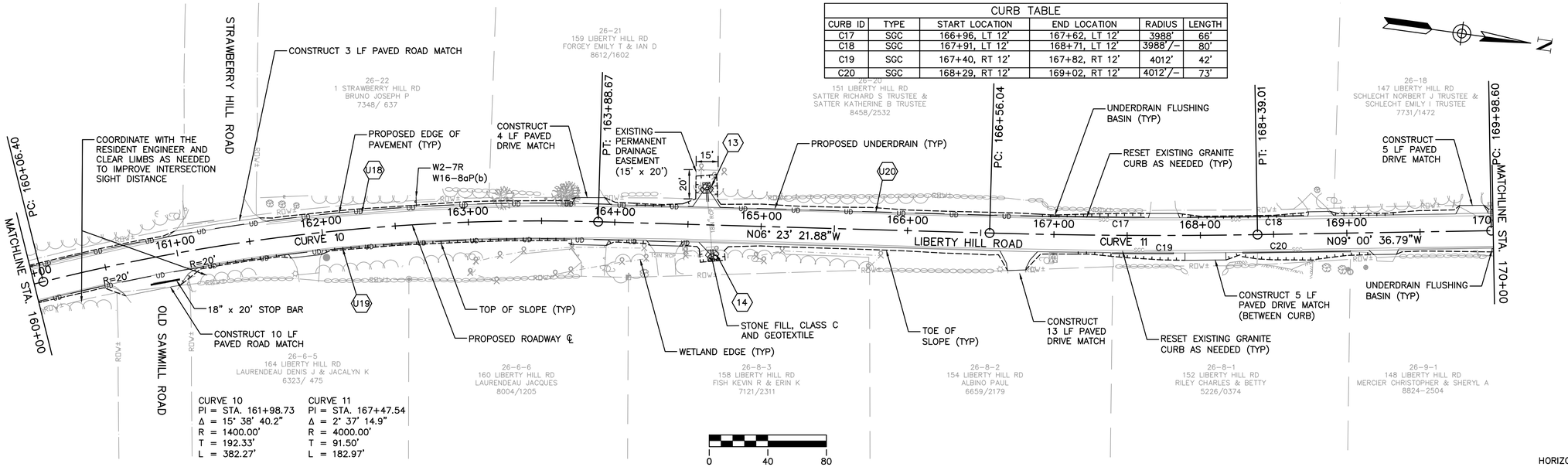
LIBERTY HILL ROAD RECONSTRUCTION

PLAN AND PROFILE 6 OF 9

DRAWING NO.

GEN6

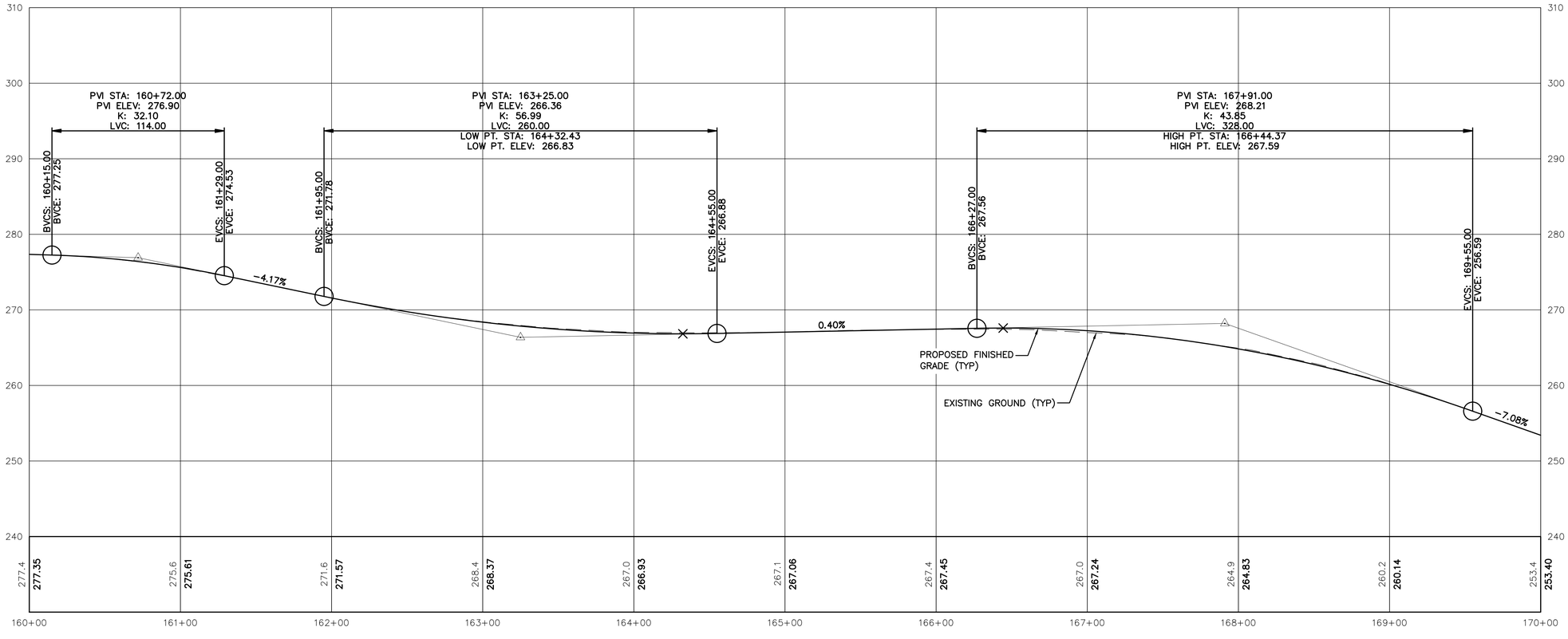
CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C17	SGC	166+96, LT 12'	167+62, LT 12'	3988'	66'
C18	SGC	167+91, LT 12'	168+71, LT 12'	3988'/–	80'
C19	SGC	167+40, RT 12'	167+82, RT 12'	4012'	42'
C20	SGC	168+29, RT 12'	169+02, RT 12'	4012'/–	73'



CURVE 10	CURVE 11
PI = STA. 161+98.73	PI = STA. 167+47.54
Δ = 15° 38' 40.2"	Δ = 2° 37' 14.9"
R = 1400.00'	R = 4000.00'
T = 192.33'	T = 91.50'
L = 382.27'	L = 182.97'

0 40 80
PLAN GRAPHIC SCALE
SCALE: 1" = 40'

VERTICAL 16 8 0
HORIZONTAL
0 40 80
PROFILE GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DATE	DESCRIPTION	ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

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TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

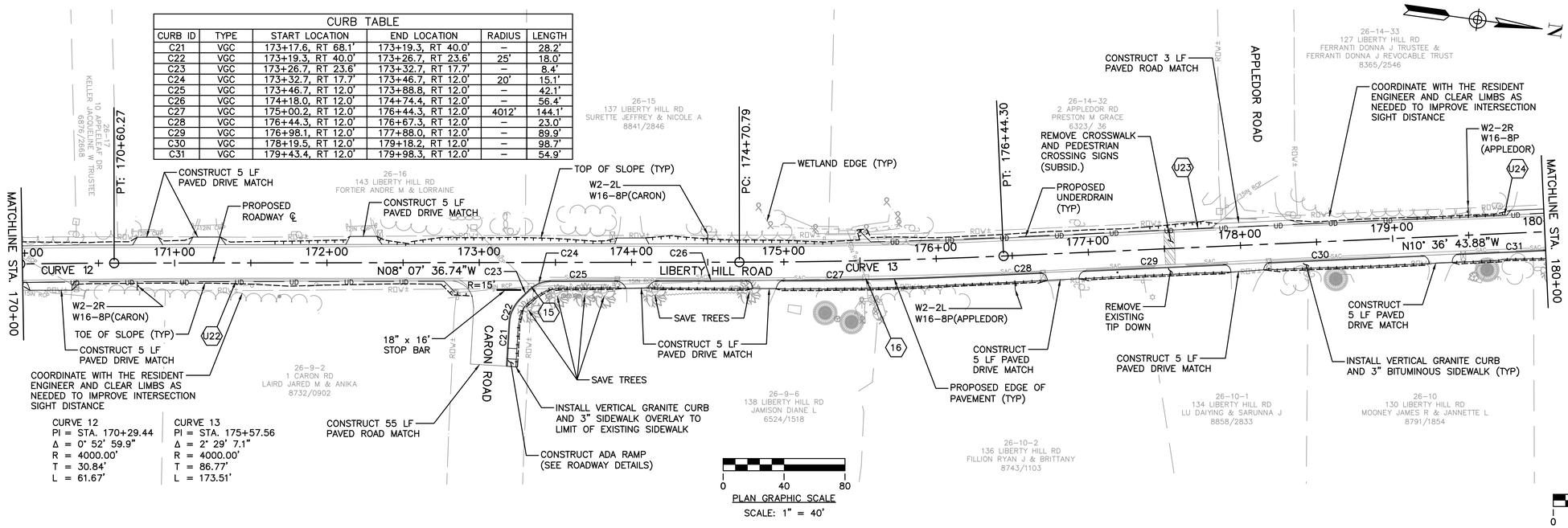
PLAN AND PROFILE 7 OF 9

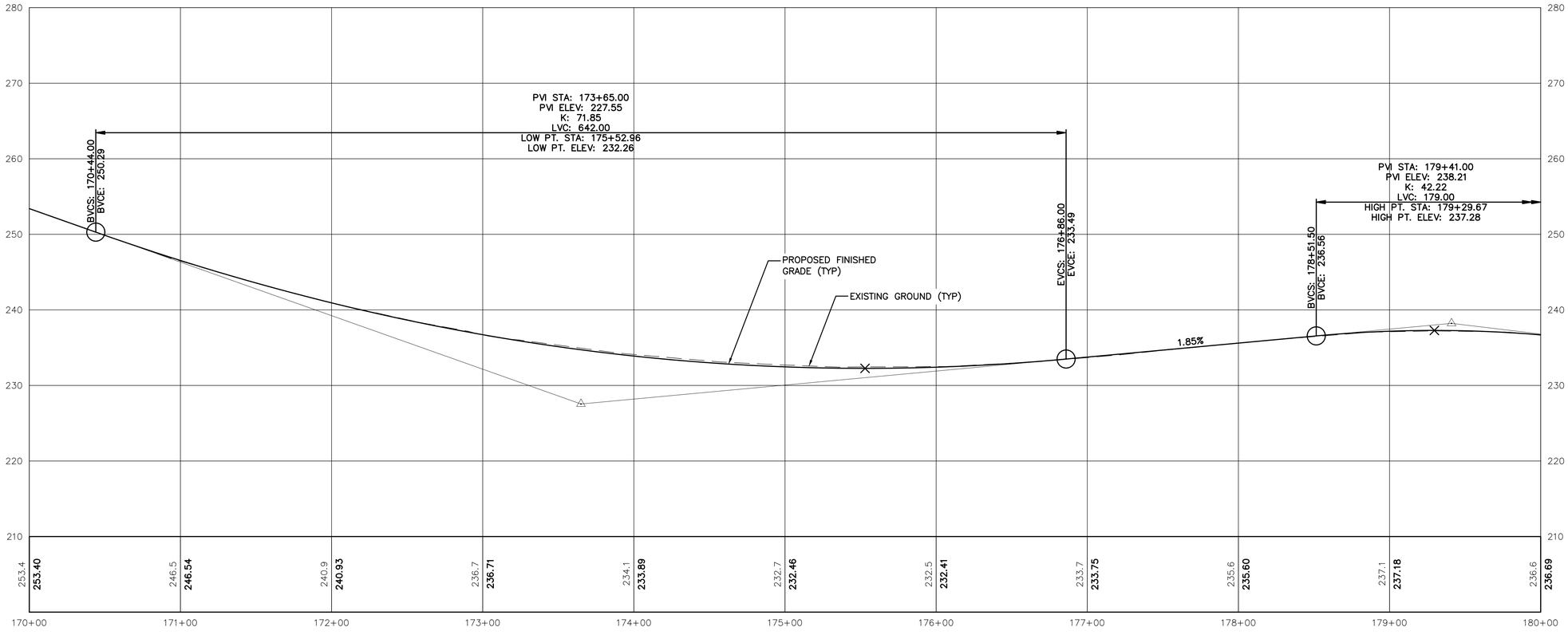
DRAWING NO.

GEN7

SHEET 9 OF 21

CURB TABLE					
CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C21	VGC	173+17.6, RT 68.1'	173+19.3, RT 40.0'	–	28.2'
C22	VGC	173+19.3, RT 40.0'	173+26.7, RT 23.6'	25'	18.0'
C23	VGC	173+26.7, RT 23.6'	173+32.7, RT 17.7'	–	8.4'
C24	VGC	173+32.7, RT 17.7'	173+46.7, RT 12.0'	20'	15.1'
C25	VGC	173+46.7, RT 12.0'	173+88.8, RT 12.0'	–	42.1'
C26	VGC	174+18.0, RT 12.0'	174+74.4, RT 12.0'	–	56.4'
C27	VGC	175+00.2, RT 12.0'	176+44.3, RT 12.0'	4012'	144.1'
C28	VGC	176+44.3, RT 12.0'	176+67.3, RT 12.0'	–	23.0'
C29	VGC	176+98.1, RT 12.0'	177+88.0, RT 12.0'	–	89.9'
C30	VGC	178+19.5, RT 12.0'	179+18.2, RT 12.0'	–	98.7'
C31	VGC	179+43.4, RT 12.0'	179+98.3, RT 12.0'	–	54.9'





ENGINEER

DESCRIPTION	DATE

ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506GENPLANS

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

DATE: AUGUST 2017

SCALE: AS SHOWN

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

TOWN OF BEDFORD, NEW HAMPSHIRE

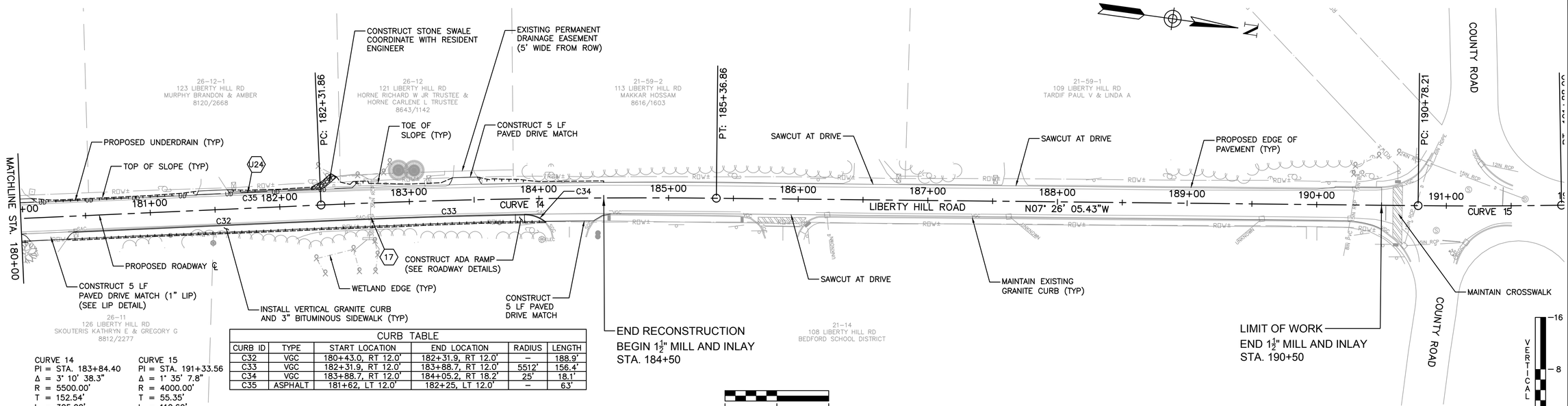
LIBERTY HILL ROAD RECONSTRUCTION

PLAN AND PROFILE 8 OF 9

DRAWING NO.

GEN8

SHEET 10 OF 21



CURVE 14
PI = STA. 183+84.40
Δ = 3° 10' 38.3"
R = 5500.00'
T = 152.54'
L = 305.00'

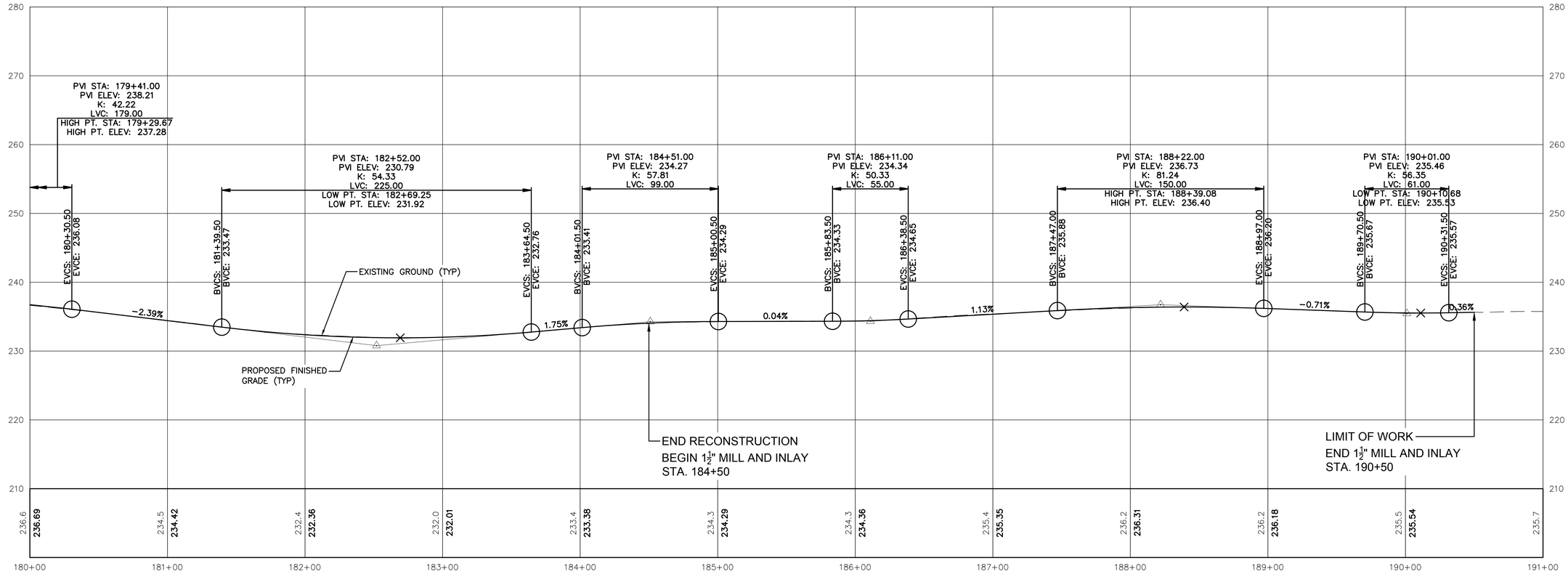
CURVE 15
PI = STA. 191+33.56
Δ = 1° 35' 7.8"
R = 4000.00'
T = 55.35'
L = 110.69'

CURB TABLE

CURB ID	TYPE	START LOCATION	END LOCATION	RADIUS	LENGTH
C32	VGC	180+43.0, RT 12.0'	182+31.9, RT 12.0'	–	188.9'
C33	VGC	182+31.9, RT 12.0'	183+88.7, RT 12.0'	5512'	156.4'
C34	VGC	183+88.7, RT 12.0'	184+05.2, RT 18.2'	25'	18.1'
C35	ASPHALT	181+62, LT 12.0'	182+25, LT 12.0'	–	63'

PLAN GRAPHIC SCALE
SCALE: 1" = 40'

PROFILE GRAPHIC SCALE
HORIZONTAL SCALE: 1" = 40'
VERTICAL SCALE: 1" = 8'



ENGINEER

DATE	DESCRIPTION	ISSUE

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TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

PLAN AND PROFILE 9 OF 9

DRAWING NO.

GEN9

(1) STA. 112+98.70, LT. 43.60' TO STA. 112+83.50, LT. 41.80'
CONST. 16 LF x 15" RCP
CONST. PC-4 HEADWALL @ +98.70, LT. 43.60'
15" OUTLET ELEV. = 240.60
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 240.70

(2) STA. 114+27.30, RT. 21.30' TO STA. 114+44.10, LT. 16.60'
REMOVE 40 LF X 12" RCP (SUBSID.)
REMOVE HEADWALL @ +27.30, RT. 21.30' (SUBSID.)
REMOVE HEADWALL @ +44.10, LT. 16.60' (SUBSID.)
CONST. 41 LF X 15" RCP
CONST. PC-4 HEADWALL @ +27.30, RT. 21.30'
15" OUTLET ELEV. = 237.19
CONST. PC-4 HEADWALL @ +44.10, LT. 16.60'
15" INLET ELEV. = MATCH EXISTING (FIELD VERIFY)
CONST. STONE PROTECTION @ INLET (6' x 3.5' PAD)

(3) STA. 116+19.10, RT. 44.00' TO STA. 116+77.20, RT. 34.90'
REMOVE 60 LF X 15" CMP (SUBSID.)
CONST. 60 LF X 15" RCP
CONST. PC-4 HEADWALL @ +19.10, RT. 44.00'
15" OUTLET ELEV. = 237.19
CONST. PC-4 HEADWALL @ +77.20, RT. 34.90'
15" INLET ELEV. = 237.50
FIELD VERIFY INVERTS WITH RESIDENT ENGINEER DURING CONSTRUCTION

(4) STA. 118+51.20, LT. 3.30' TO STA. 118+62.85, LT. 19.55'
CONST. 20 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 240.60
CONST. PC-8 HEADWALL @ +62.85, LT. 19.55'
6" INVERT ELEV. = 240.80
15" INLET ELEV. = 240.80

(5) STA. 125+32.90, LT. 18.90' TO STA. 125+33.30, LT. 20.90'
REMOVE HEADWALL @ +33.30, LT. 20.90' (SUBSID.)
CONST. 3 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 261.80
CONST. PC-4L HEADWALL (NON-TRAD. SIZE) @ +33.30, LT. 20.90'
6" INVERT ELEV. = 262.50
15" INLET ELEV. = 261.85
CONST. STONE PROTECTION @ INLET (MATCH EXISTING LIMITS)
MAINTAIN ROADWAY DITCH LINE FLOW TO CULVERT

(6) STA. 136+65.25, LT. 21.60' TO STA. 136+66.20 LT. 24.60'
REMOVE HEADWALL @ +66.20, LT. 24.60' (SUBSID.)
CONST. 3 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 306.40
CONST. PC-4L HEADWALL @ +66.20, LT. 24.60'
6" INVERT ELEV. = 306.50
15" INLET ELEV. = 306.50

(7) STA. 138+38.60, RT. 25.75' TO STA. 138+39.50, RT. 6.70'
REMOVE HEADWALL @ +38.60, RT. 25.75' (SUBSID.)
REMOVE 16 LF X 15" RCP (SUBSID.)
CONST. 19 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 306.40
CONST. PC-8 HEADWALL @ +38.60, RT. 25.75'
6" INVERT ELEV. = 306.30
15" OUTLET ELEV. = 306.30

(8) STA. 138+40.40, LT. 12.40' TO STA. 138+40.75, LT. 20.40'
REMOVE HEADWALL @ +40.75, LT. 20.40' (SUBSID.)
REMOVE 4 LF X 15" RCP (SUBSID.)
CONST. 8 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 307.60
CONST. PC-8 HEADWALL @ +40.75, LT. 20.40'
6" INVERT ELEV. (S) = 307.72
6" INVERT ELEV. (N) = 307.72
15" INLET ELEV. = 307.72
CONST. STONE PROTECTION @ INLET (6' X 5' PAD)

(9) STA. 148+65.85, RT. 11.00'
ADJUST CATCH BASIN
CONST. POLYETHYLENE LINER

(10) STA. 150+70.10, LT. 26.70' TO STA. 150+71.10, LT. 21.80'
REMOVE HEADWALL @ +70.10, LT. 26.70' (SUBSID.)
CONST. 5 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 285.70
CONST. PC-4L HEADWALL @ +70.10, LT. 26.70'
15" OUTLET ELEV. = 285.57

(11) STA. 150+78.65, RT. 16.50' TO STA. 150+79.35, RT. 20.45'
REMOVE 4 LF x 15" RCP (SUBSID.)
REMOVE HEADWALL @ +79.35, RT. 20.45' (SUBSID.)
CONST. 4 LF X 15" RCP
CONN. TO 15" RCP (SUBSID.)
15" INVERT ELEV. = 286.70
CONST. PC-4 HEADWALL @ +79.35, RT. 20.45'
6" INVERT ELEV. = 286.80
15" INLET ELEV. = 286.80

(12) STA. 156+85.40, LT. 22.80' TO STA. 157+11.20, RT. 24.50'
REMOVE 44 LF X 12" RCP (SUBSID.)
REMOVE HEADWALL @ +85.40, LT. 22.80' (SUBSID.)
REMOVE HEADWALL @ +11.20, RT. 24.50' (SUBSID.)
CONST. 54 LF X 15" RCP
CONST. PC-8 HEADWALL @ +85.40, LT. 22.80'
6" INVERT ELEV. (S) = 274.16
15" OUTLET ELEV. = 274.16
CONST. PC-8 HEADWALL @ +11.20, RT. 24.50'
6" INVERT ELEV. (S) = 275.64
6" INVERT ELEV. (N) = 275.64
15" INLET ELEV. = 275.64

(13) STA. 164+62.20, LT. 23.85' TO STA. 164+63.10, LT. 15.90'
REMOVE HEADWALL @ +62.20, LT. 23.85' (SUBSID.)
REMOVE 8 LF X 18" RCP (SUBSID.)
CONST. 8 LF X 18" RCP
CONN. TO 18" RCP (SUBSID.)
18" INVERT ELEV. = 261.60
CONST. PC-8 HEADWALL @ +62.20, LT. 23.85'
6" INVERT ELEV. (S) = 261.50
6" INVERT ELEV. (N) = 261.50
18" OUTLET ELEV. = 261.50
CONST. STONE PROTECTION @ OUTLET (5' x 5' PAD)

(14) STA. 164+66.75, RT. 16.70' TO STA. 164+67.10, RT. 19.70'
REMOVE HEADWALL @ +67.10, RT. 19.70' (SUBSID.)
CONST. 3 LF X 18" RCP
CONN. TO 18" RCP (SUBSID.)
18" INVERT ELEV. = 262.50
CONST. PC-8 HEADWALL @ +67.10, RT. 19.70'
6" INVERT ELEV. = 262.60
18" INLET ELEV. = 262.60
CONST. STONE PROTECTION @ INLET (6.5' x 5' PAD)

(15) STA. 173+33.90, RT. 15.70'
ADJUST CATCH BASIN
CONST. POLYETHYLENE LINER

(16) STA. 175+53.40, RT. 11.30'
ADJUST CATCH BASIN
CONST. POLYETHYLENE LINER

(17) STA. 182+69.85, RT. 10.90'
ADJUST CATCH BASIN
CONST. POLYETHYLENE LINER

(U1) STA. 103+57.18, LT. 16.93' TO STA. 106+60.00, LT. 12.25'
CONST. 305 LF x 6" UND.
CONN. TO EXIST. CB @ +57.18, LT. 16.93' (SUBSID.)
6" INV. IN = 238.00
CONST. FLUSHING BASIN @ +60.00, LT. 12.25'
6" INVERT ELEV. = 255.97

(U2) STA. 103+24.90, RT. 25.70' TO STA. 106+60.00, RT. 12.25'
CONST. 335 LF x 6" UND.
CONN. TO EXIST. CB @ +24.90, RT. 25.70' (SUBSID.)
6" INV. IN = 238.10
CONST. FLUSHING BASIN @ +60.00, RT. 12.25'
6" INVERT ELEV. = 255.97

(U3) STA. 112+15.00, LT. 25.00' TO STA. 108+50.00, LT. 12.25'
CONST. 370 LF x 6" UND.
CONST. UH-2 HEADWALL @ +15.00, LT. 25.00'
6" OUTLET ELEV. = 241.24
CONST. FLUSHING BASIN @ +50.00, LT. 12.25'
6" INVERT ELEV. = 256.38

(U4) NOT USED

(U5) STA. 116+95.00 RT. 20.00' TO STA. 118+25.00, RT. 12.25'
CONST. 130 LF x 6" UND.
CONST. UH-2 HEADWALL @ +95.00, RT. 20.00'
6" OUTLET ELEV. = 239.00
CONST. FLUSHING BASIN @ +25.00, RT. 12.25'
6" INVERT ELEV. = 239.76

(U6) STA. 118+62.85, LT. 19.55' TO STA. 122+00.00, LT. 12.25'
REMOVE EXIST. UND. (SUBSID.)
CONST. 335 LF x 6" UND.
CONN. TO HEADWALL @ +62.85, LT. 19.55' (SUBSID.)
(SEE DRAINAGE NOTE 4 FOR INVERT)
UND. INV @ 119+00.00, LT. 12.25' = 241.00
CONST. FLUSHING BASIN @ +00.00, LT. 12.25'
6" INVERT ELEV. = 249.77

STA. 122+00.00, LT. 12.25' TO STA. 125+15.00 LT. 12.25'
CONST. 315 LF X 6" UND.
CONN. TO FB @ +00.00, LT. 12.25' (SUBSID.)
CONST. FLUSHING BASIN @ +15.00, LT. 12.25'
6" INVERT ELEV. = 262.00

(U7) STA. 125+33.30, LT. 20.90' TO STA. 128+50.00, LT. 12.25'
CONST. 317 LF x 6" UND.
CONN. TO HEADWALL @ +33.30, LT. 20.90' (SUBSID.)
(SEE DRAINAGE NOTE 5 FOR INVERT)
CONST. FLUSHING BASIN @ +50.00, LT. 12.25'
6" INVERT ELEV. = 283.94

STA. 128+50.00, LT. 12.25' TO STA. 131+75.00, LT. 12.25'
CONST. 325 LF X 6" UND.
CONN. TO FB @ +50.00, LT. 12.25' (SUBSID.)
CONST. FLUSHING BASIN @ +75.00, LT. 12.25'
6" INVERT ELEV. = 308.75

(U8) STA. 125+67.90, RT. 19.30' TO STA. 129+00.00, RT. 12.25'
CONST. 333 LF x 6" UND.
CONST. UH-2 HEADWALL @ +67.90, RT. 19.30'
6" OUTLET ELEV. = 264.90
CONST. FLUSHING BASIN @ +00.00, RT. 12.25'
6" INVERT ELEV. = 288.12

STA. 129+00.00, RT. 12.25' TO STA. 132+00.00, RT. 12.25'
CONST. 300 LF x 6" UND.
CONN. TO FB @ 129+00.00, RT. 12.25' (SUBSID.)
CONST. FLUSHING BASIN @ 132+00.00, RT. 12.25'
6" INVERT ELEV. = 309.91

(U9) STA. 136+66.20, LT. 24.60' TO STA. 134+10.00, LT. 12.25'
CONST. 317 LF x 6" UND.
CONN. TO HEADWALL @ +66.20, LT. 24.60' (SUBSID.)
(SEE DRAINGE NOTE 6 FOR INVERT)
CONST. FLUSHING BASIN @ +10.00, LT. 12.25'
6" INVERT ELEV. = 313.53

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506NOTE_DRN

CHECKED BY AGB
DRAWN BY KDP
DESIGNED BY KDP

Hoyle, Tanner & Associates, Inc.
150 Dow Street-5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

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TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

DRAINAGE NOTES 1 OF 2

DRAWING NO.
DRN1

U10 STA. 138+38.60, RT. 25.75' TO STA. 136+75.00, LT. 12.25'
CONST. 166 LF x 6" UND.
CONN. TO HEADWALL @ +38.60, RT. 25.75' (SUBSID.)
(SEE DRAINGE NOTE 8 FOR INVERT)
UND. INV. @ 138+00.00, LT. 12.25' = 306.55
CONST. FLUSHING BASIN @ +75.00, LT. 12.25'
6" INVERT ELEV. = 306.56

U11 STA. 138+40.75, LT. 20.40' TO STA. 141+00.00, LT. 12.25'
CONST. 260 LF x 6" UND.
CONN. TO HEADWALL @ +40.75, LT. 20.40' (SUBSID.)
(SEE DRAINGE NOTE 8 FOR INVERT)
UND. INV. @ 139+00.00, LT. 12.25' = 308.22
UND. INV. @ 140+00.00, LT. 12.25' = 308.72
CONST. FLUSHING BASIN @ +00.00, LT. 12.25'
6" INVERT ELEV. = 309.96

STA. 141+00.00, LT. 12.25' TO STA. 143+00.00, LT. 12.25'
CONST. 200 LF x 6" UND.
CONN. TO FB @ 141+00.00, LT. 12.25' (SUBSID.)
CONST. FLUSHING BASIN @ 143+00.00, LT. 12.25'
6" INVERT ELEV. = 314.26
CONDUCT TEST PITS FOR UNDERDRAIN INSTALLATION IN FRONT OF LEDGE

U12 STA. 138+38.60, RT. 25.75' TO STA. 141+00.00, RT. 12.25'
CONST. 262 LF x 6" UND.
CONN. TO HEADWALL @ +38.60, RT. 25.75' (SUBSID.)
(SEE DRAINAGE NOTE 7 FOR INVERT)
CONST. FLUSHING BASIN @ +00.00, RT. 12.25'
6" INVERT ELEV. = 309.96

STA. 141+00.00, RT. 12.25' TO STA. 142+75.00, RT. 12.25'
CONST. 175 LF x 6" UND.
CONN. TO FB @ +00.00, RT. 12.25' (SUBSID.)
CONST. FLUSHING BASIN @ +75.00, RT. 12.25'
6" INVERT ELEV. = 313.99

U13 STA. 147+08.25, RT. 18.20' TO STA. 143+70.00, RT. 12.25'
CONST. 340 LF x 6" UND.
CONN. TO EXIST. CB @ +08.25, RT. 18.20' (SUBSID.)
6" INV. IN = MATCH EXISTING 12" INV. OUT (FIELD VERIFY)
CONST. FLUSHING BASIN @ +70.00, RT. 12.25'
6" INVERT ELEV. = 314.33
CONTRACTOR TO CONFIRM UNDERDRAIN DEPTH WITH RESIDENT ENGINEER TO AVOID CONFLICTS AND PROVIDE POSITIVE FLOW

U14 STA. 148+65.85, RT. 11.00' TO STA. 147+08.25, RT. 18.20'
REMOVE 156 LF x 12" RCP (SUBSID.)
CONST. 156 LF x 12" POLYPROPYLENE PIPE (PERF.)
CONN. TO EXIST. CB @ +65.85, RT. 11.00' (SUBSID.)
12" INV. IN = MATCH EXISTING
CONN. TO EXIST. CB @ +08.25, RT. 18.20' (SUBSID.)
12" INV. OUT = MATCH EXISTING
SEE CARRYING PIPE DETAIL

U15 STA. 150+79.35, RT. 20.45' TO STA. 152+50.00 RT. 12.25'
CONST. 171 LF x 6" UND.
CONN. TO HEADWALL @ +79.35, RT. 20.45' (SUBSID.)
(SEE DRAINAGE NOTE 11 FOR INVERT)
CONST. FLUSHING BASIN @ +50.00, RT. 12.25'
6" INVERT ELEV. = 288.83

U16 STA. 156+85.40, LT. 22.80' TO STA. 153+00.00, LT. 12.25'
CONST. 386 LF x 6" UND.
CONN. TO HEADWALL @ +85.40, LT. 22.80' (SUBSID.)
(SEE DRAINAGE NOTE 12 FOR INVERT)
CONST. FLUSHING BASIN @ +00.00, LT. 12.25'
6" INVERT. ELEV. = 288.75

U17 STA. 157+11.20, RT. 24.50' TO STA. 153+20.00, RT. 12.25'
CONST. 392 LF x 6" UND.
CONN. TO HEADWALL @ +11.20, RT. 24.50' (SUBSID.)
(SEE DRAINAGE NOTE 12 FOR INVERT)
CONST. FLUSHING BASIN @ +20.00, RT. 12.25'
6" INVERT ELEV. = 288.53

U18 STA. 160+00.00, LT. 12.25' TO STA. 157+00.00, LT. 12.25'
CONST. 300 LF x 6" UND.
CONST. FLUSHING BASIN @ 160+00.00, LT. 12.25'
6" INVERT ELEV. = 273.11
CONST. FLUSHING BASIN @ 157+00.00, LT. 12.25'
6" INVERT ELEV. = 275.20

STA. 164+62.20, LT. 23.85' TO STA. 160+00.00, LT. 12.25'
CONST. 458 LF x 6" UND.
CONN. TO FB @ +00.00, LT. 12.25' (SUBSID.)
CONN. TO HEADWALL @ +62.20, LT. 23.85' (SUBSID.)
(SEE DRAINAGE NOTE 13 FOR INVERT)

U19 STA. 160+00.00, RT. 12.25' TO STA. 157+11.20, RT. 24.50'
CONST. 289 LF x 6" UND.
CONST. FLUSHING BASIN @ +00.00, RT. 12.25'
6" INVERT ELEV. = 273.11
CONN. TO HEADWALL @ +11.20, RT. 24.50' (SUBSID.)
(SEE DRAINAGE NOTE 12 FOR INVERT)

STA. 164+67.10, RT. 19.70' TO STA. 160+00.00, RT. 12.25'
CONST. 468 LF x 6" UND.
CONN. TO HEADWALL @ +67.10, RT. 19.70' (SUBSID.)
(SEE DRAINAGE NOTE 14 FOR INVERT)
UND. INV. @ 163+00.00, RT. 12.25' = 263.63
CONN. TO FB @ +00.00, RT. 12.25' (SUBSID.)

U20 STA. 164+62.20, LT. 23.85' TO STA. 167+00.00, LT. 12.25'
CONST. 234 LF x 6" UND.
CONN. TO HEADWALL @ +62.20, LT. 23.85' (SUBSID.)
(SEE DRAINAGE NOTE 13 FOR INVERT)
CONST. FLUSHING BASIN @ +00.00, LT. 12.25'
6" INVERT ELEV. = 263.00

U21 NOT USED

U22 STA. 172+84.20, RT. 19.60' TO STA. 170+00.00, RT. 12.25'
CONST. 285 LF x 6" UND.
CONN. TO EXIST. CB @ +84.20, RT. 19.60' (SUBSID.)
6" INV. IN = MATCH EXISTING CB INV. OUT ELEV. (FIELD VERIFY)
CONST. FLUSHING BASIN @ +00.00, RT. 12.25'
6" INVERT ELEV. = 249.16
CONTRACTOR TO CONFIRM UNDERDRAIN DEPTH WITH RESIDENT ENGINEER TO AVOID CONFLICTS AND PROVIDE POSITIVE FLOW

U23 STA. 175+50.00, LT. 19.70' TO STA. 179+25.00, LT. 12.25'
CONST. 395 LF x 6" UND.
CONST. UH-2 HEADWALL @ +50.00, LT. 19.70'
6" OUTLET ELEV. = 227.95
CONST. FLUSHING BASIN @ +25.00, LT. 12.25'
6" INVERT ELEV. = 233.04

U24 STA. 182+63.50, LT. 18.90' TO STA. 179+55.00, LT. 12.25'
CONST. 310 LF x 6" UND.
CONST. UH-2 HEADWALL @ +63.50, LT. 18.90'
6" OUTLET ELEV. = 227.65
CONST. FLUSHING BASIN @ +55.00, LT. 12.25'
6" INVERT ELEV. = 232.96

ENGINEER

ISSUE	DESCRIPTION	DATE

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FILE NAME 911506NOTE_DRN

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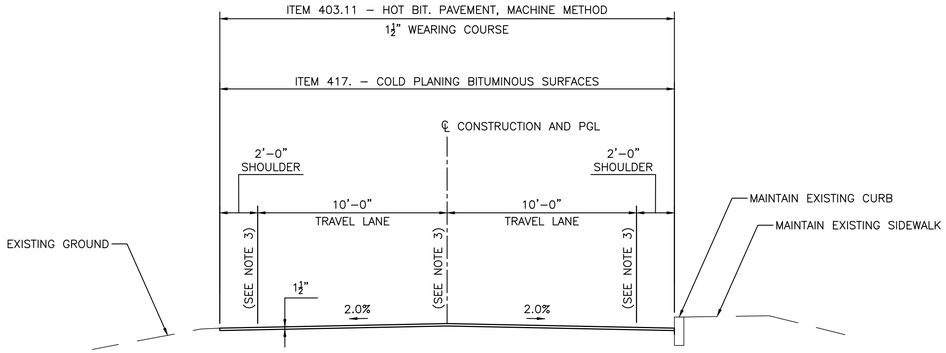
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

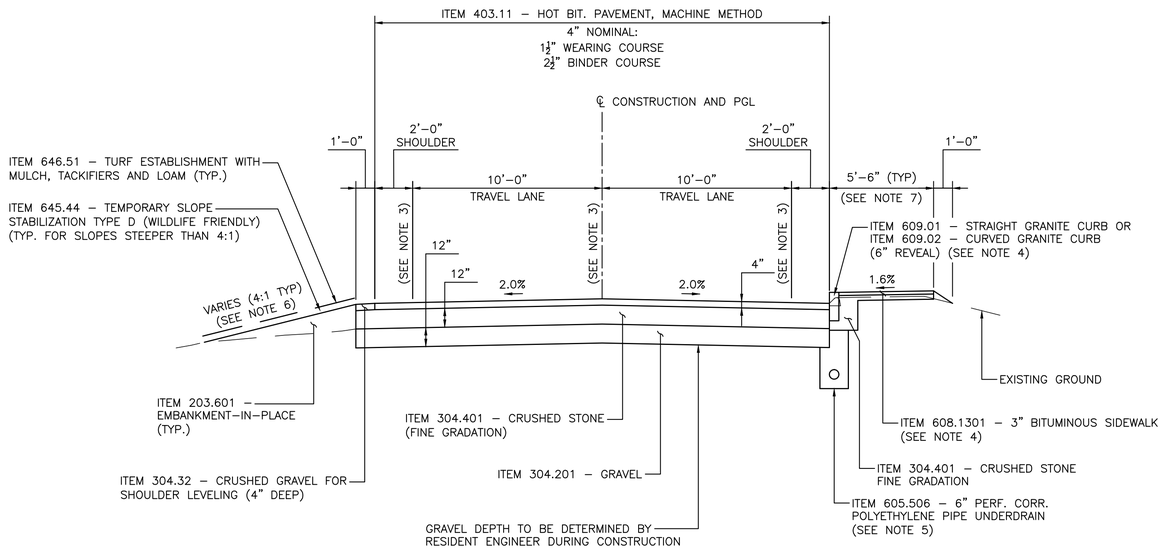
DRAINAGE NOTES 2 OF 2

DRAWING NO.
DRN2



LIBERTY HILL ROAD
MILL AND INLAY SECTION
STA. 184+50 TO STA. 190+50

NOT TO SCALE

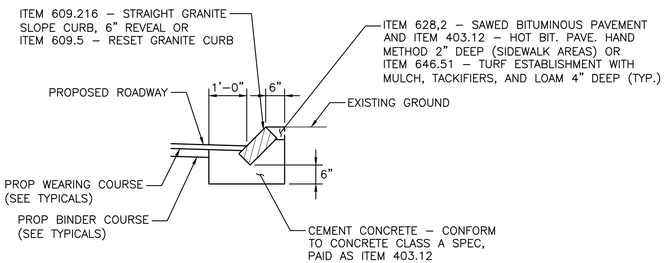


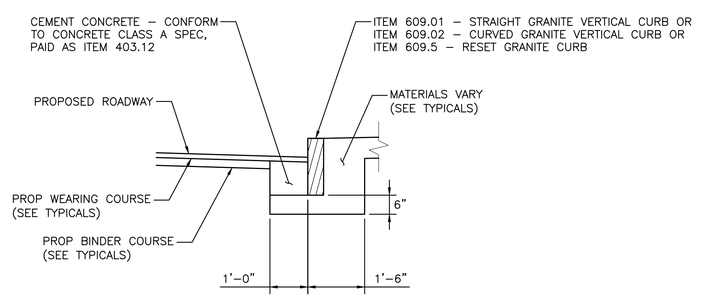
LIBERTY HILL ROAD
FULL DEPTH RECONSTRUCTION SECTION
STA. 102+50 TO STA. 184+50

NOT TO SCALE

NOTES:

1. ITEM 403.6 – PAVEMENT JOINT ADHESIVE SHALL BE APPLIED TO ALL LONGITUDINAL JOINTS ON PAVEMENT COURSES.
2. ITEM 410.22 – ASPHALT EMULSION FOR TACK COAT SHALL BE APPLIED BETWEEN BINDER AND WEARING PAVEMENT COURSES.
3. ITEM 632.0104 – RETROREFLECTIVE PAINT PAVEMENT MARKING, 4" LINE SHALL BE APPLIED ALONG THE ℄ CONSTRUCTION (4" DOUBLE SOLID YELLOW LINE) AND ALONG THE TRAVEL WAY (4" SINGLE SOLID WHITE LINE).
4. INSTALL NEW GRANITE CURB, REMOVE EXISTING BITUMINOUS SIDEWALK, SHIM WITH CRUSHED STONE (FINE GRADATION) AND PAVE 3" OF BITUMINOUS SIDEWALK BETWEEN CARON ROAD AND THE SOUTHERN DRIVEWAY OF MCKELVIE SCHOOL (STA. 173+17± TO STA. 184+05±, RT).
5. SEE GENERAL PLANS AND DRAINAGE NOTES FOR UNDERDRAIN PLACEMENT AND SEE UNDERDRAIN DETAIL ON SHEET 15 FOR ADDITIONAL INFORMATION.
6. THE INTENT OF THE SIDE SLOPES IS TO TIE INTO THE EXISTING SHOULDER BREAK WHEREVER PRACTICAL, OR USE A 4:1 SLOPE. SEE PROFILES FOR LOCATIONS WHERE SIDE SLOPES SHOULD BE STEEPER THAN 4:1 IN ORDER TO AVOID ROW AND/OR WETLAND IMPACTS. CLEARING AND GRUBBING, AS NEEDED, SHALL BE SUBSIDIARY.
7. SIDEWALK SHALL BE CONSTRUCTED 5'–6" WIDE BETWEEN CARON ROAD AND THE SOUTHERN DRIVEWAY OF MCKELVIE SCHOOL EXCEPT IN GUARDRAIL AREAS (STA. 175+25± TO STA. 176+00±, RT AND STA. 182+15± TO STA. 182+85±, RT) WHERE PROPOSED BACK OF SIDEWALK SHALL MATCH EXISTING BACK OF SIDEWALK (36" MIN. SIDEWALK WIDTH).





ENGINEER

DATE	DESCRIPTION	ISSUE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506TYPICALS

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

DATE: AUGUST 2017

SCALE: AS SHOWN

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

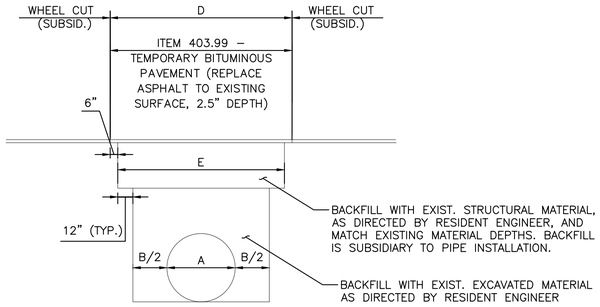
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

TYPICAL SECTIONS

DRAWING NO.

TYP1



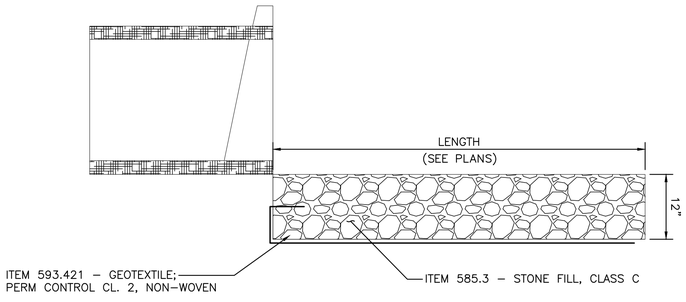
SAMPLE TRENCH DIMENSIONS
SEE DRAINAGE NOTES FOR ACTUAL PIPE DIMENSIONS

A PIPE DIA.	B ADDIT. WIDTH	C TRENCH WIDTH	D CUT WIDTH	E GRAVEL BOX WIDTH
6"	30"	36"	72"	60"
12"	24"	36"	72"	60"
15"	24"	39"	75"	63"
18"	24"	42"	78"	66"
24"	24"	48"	84"	72"
30"	30"	60"	96"	84"

NOTES:
1. SEE NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SECTION 206 FOR TRENCH AND ADDITIONAL WIDTHS.
2. DIMENSION D IS THE PAY LIMITS FOR ITEM 403.99. COSTS FOR RESTORATION BEYOND THESE LIMITS WILL BE AT THE CONTRACTOR'S EXPENSE.
3. AS DIRECTED BY RESIDENT ENGINEER, UNSUITABLE BACKFILL MATERIAL WILL BE REPLACED WITH ITEM 209.1 – GRANULAR BACKFILL. (SUBSID. TO PIPE)

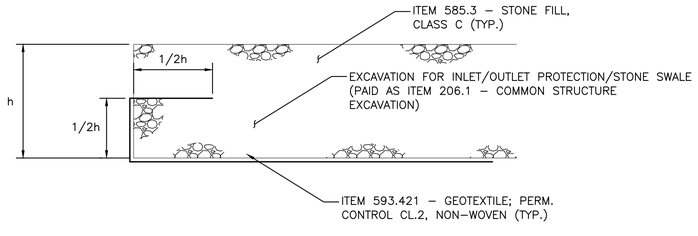
PAVEMENT TRENCH REPAIR DETAIL

NOT TO SCALE



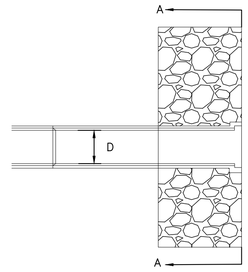
PIPE INLET/OUTLET PROTECTION DETAIL

NOT TO SCALE



GEOTEXTILE WRAP DETAIL

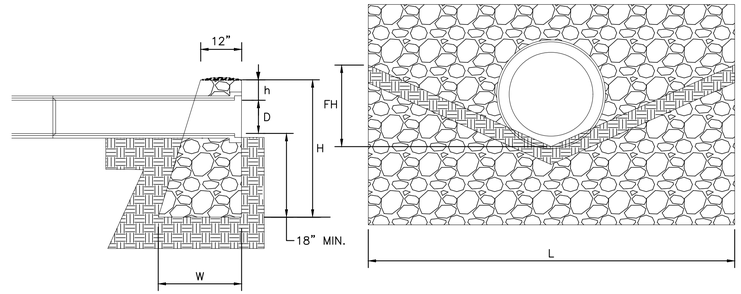
NOT TO SCALE



PLAN

DIA.	HEADWALL LENGTH	HEADWALL HEIGHT	FILL HEIGHT	PIPE COVER	HEADWALL BOTTOM WIDTH
D	L	H	FH	h	W
12	4'–3"	3'–9"	1'–1"	1'–3"	2'–0"
15	6'–0"	4'–3"	1'–7"	1'–6"	2'–1"
18	7'–0"	4'–6"	1'–10"	1'–6"	2'–2"

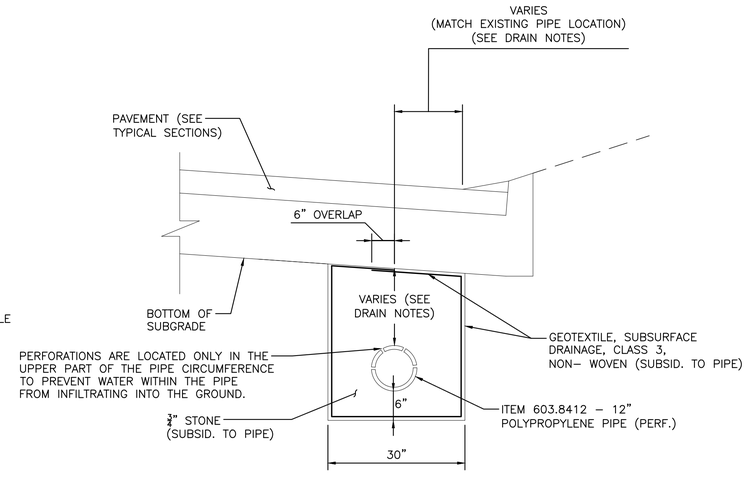
NOTES:
1. ALL DIMENSIONS GIVEN IN FEET AND INCHES EXCEPT PIPE DIAMETER.
2. PROVIDE GROOVE END AT INLET HEADWALL AND TONGUE END AT OUTLET HEADWALL.
3. PC–4 HEADWALL SHOWN. SEE NHDOT STANDARD DETAILS FOR PC–4L AND PC–8 HEADWALLS.



LONGITUDINAL SECTION **SECTION A-A**

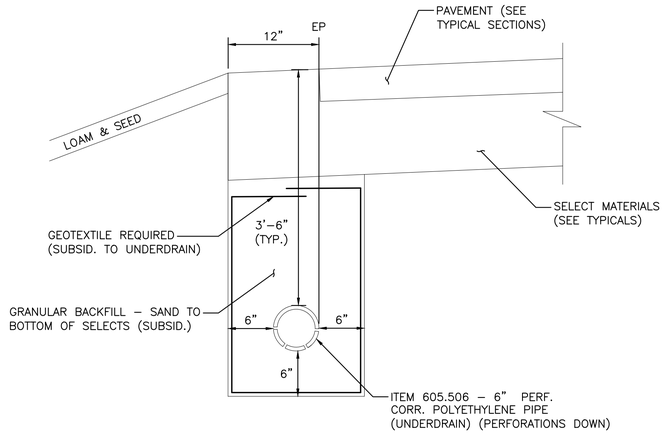
MORTAR RUBBLE MASONRY HEADWALL DETAIL

NOT TO SCALE



CARRYING PIPE DETAIL

NOT TO SCALE



NOTES:
1. DETAIL IS SHOWN WITHOUT CURB. UNDERDRAIN LAYOUT AND DIMENSIONS ARE THE SAME WITH CURB.

UNDERDRAIN DETAIL

NOT TO SCALE

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506DTL_DRN

CHECKED BY AGR

DRAWN BY KDP

DESIGNED BY KDP

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150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

DATE: AUGUST 2017

SCALE: AS SHOWN

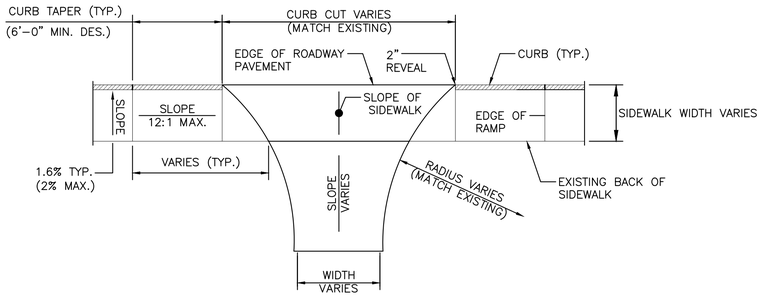
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

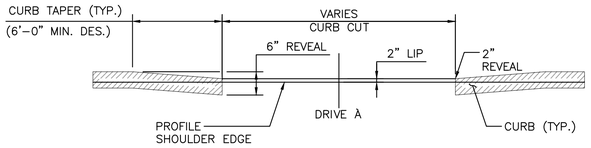
DRAINAGE DETAILS

DRAWING NO.

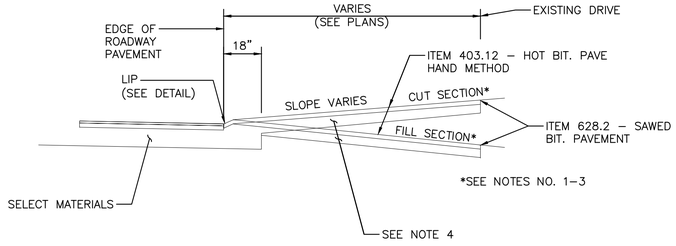
DTL1



PLAN VIEW WITH SIDEWALK RAMP



END VIEW



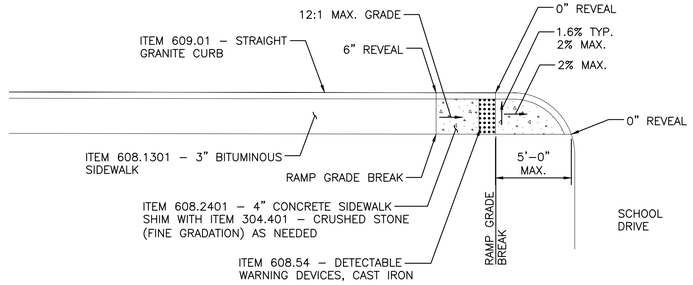
TYPICAL DRIVE AND SIDE ROAD SECTION

NOT TO SCALE

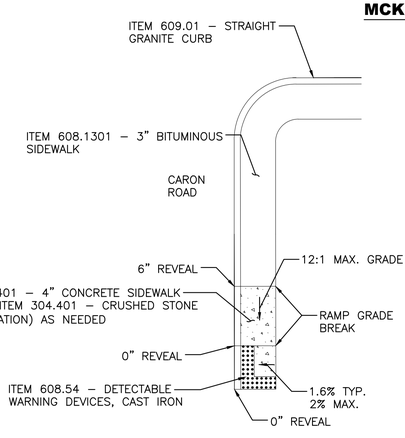
GENERAL DRIVE AND SIDE ROAD NOTES

1. GRADES OF MAJOR ENTRANCES BEYOND THE PLATFORM SHOULD NOT EXCEED 8%.
2. GRADES OF OTHER DRIVES BEYOND THE PLATFORM SHOULD NOT EXCEED 15%.
3. THE ALGEBRAIC DIFFERENCE BETWEEN TWO ADJACENT GRADES SHOULD NOT EXCEED 10% UNLESS SHOWN ON PLANS OR DIRECTED BY THE RESIDENT ENGINEER.
4. FOR DRIVEWAYS, REMOVE EXISTING PAVEMENT AND GRAVEL, AS NEEDED, IN ORDER TO REPLACE WITH 3" OF ITEM 403.12 – HOT BITUMINOUS PAVEMENT, HAND METHOD. SHIM WITH ITEM 304.35 – CRUSHED GRAVEL FOR DRIVES, AS NEEDED.

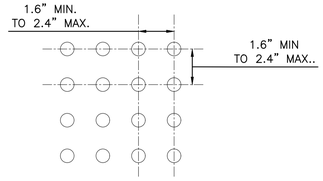
   FOR SIDE ROADS, REMOVE EXISTING PAVEMENT AND GRAVEL, AS NEEDED, IN ORDER TO REPLACE WITH 4" OF ITEM 403.11 – HOT BITUMINOUS PAVEMENT, MACHINE METHOD. SHIM WITH ITEM 304.401 – CRUSHED STONE (FINE GRADATION), AS NEEDED.
5. MATCH EXISTING DRIVEWAY WIDTHS AND RADII.



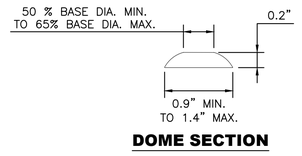
MCKELVIE DRIVEWAY RAMP



CARON ROAD RAMP



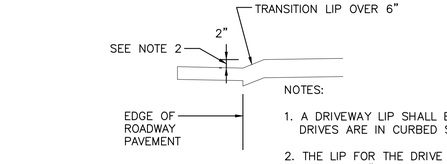
DOME SPACING



DOME SECTION

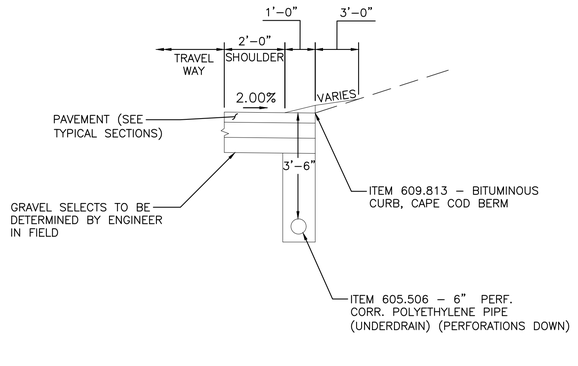
ADA RAMP DETAIL

NOT TO SCALE



LIP DETAIL

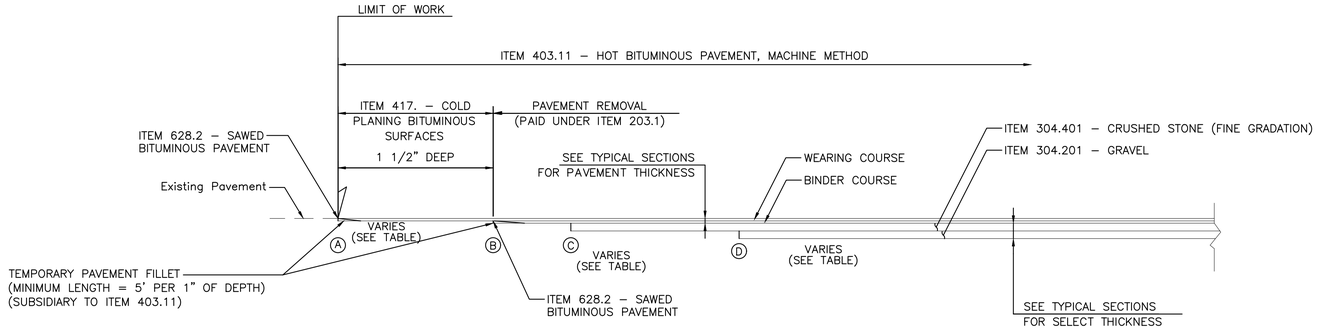
NOT TO SCALE



CAPE COD BERM SECTION DETAIL

NOT TO SCALE

	STATION			
	WEARING	BINDER	CR. STONE	GRAVEL
LOCATION	(A)	(B)	(C)	(D)
LIMIT OF WORK	102+50	103+25	103+50	103+75
LIMIT OF WORK	190+50	184+50	184+25	184+00



PAVEMENT MATCH DETAIL

NOT TO SCALE

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506DTL_RD

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

DATE: AUGUST 2017

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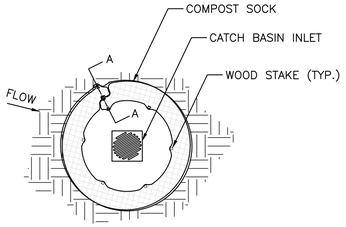
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoyletanner.com

TOWN OF BEDFORD, NEW HAMPSHIRE

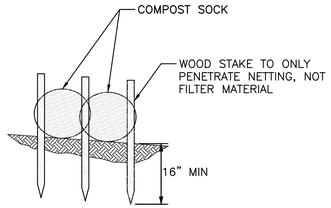
LIBERTY HILL ROAD RECONSTRUCTION

ROADWAY AND DRIVEWAY DETAILS

DRAWING NO. DTL2

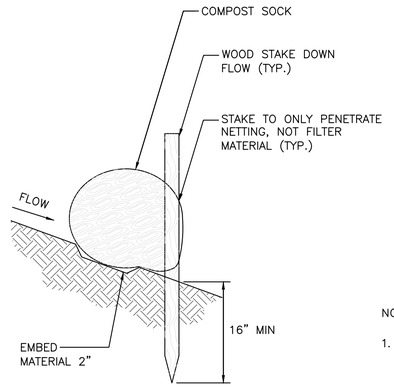


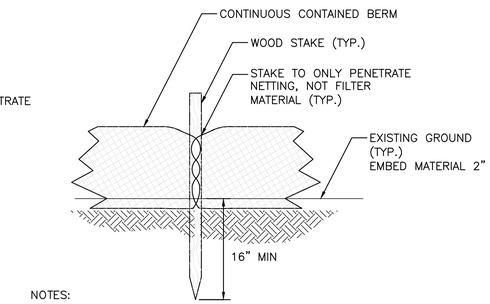
PLAN VIEW



SECTION A-A

INLET PROTECTION AT CATCH BASIN





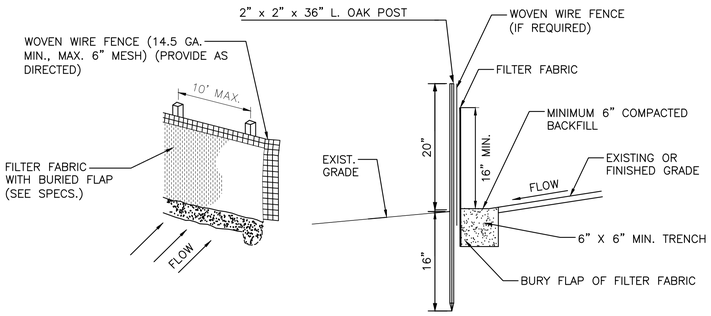
NOTES:

1. CONTINUOUS CONTAINED BERMS CONSIST OF A SYNTHETIC TUBULAR NETTING FILLED WITH EROSION CONTROL MIX OR OTHER APPROVED FILTER MATERIAL AND SHALL BE INSTALLED PER MANUFACTURERS INSTRUCTION.

PLACED ON THE CONTOUR

COMPOST SOCK FOR PERIMETER BERM DETAIL

NOT TO SCALE

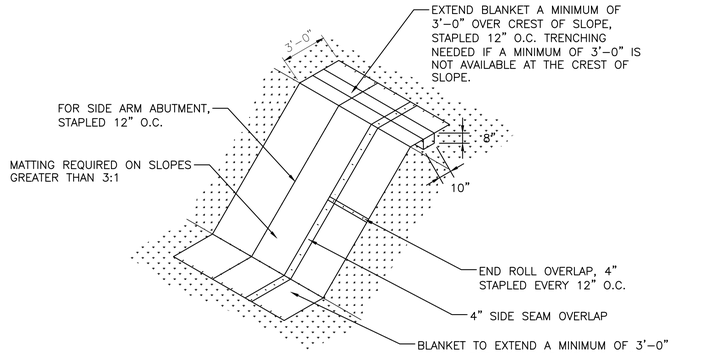


NOTES:

1. SPACING OF WOOD FENCE POSTS NOT TO EXCEED 10'–0".
2. SILT FENCE SHALL BE INSTALLED BEFORE ANY EARTH REMOVAL OR EXCAVATION TAKES PLACE.
3. WOVEN WIRE FENCE (IF REQUIRED) TO BE FASTENED SECURELY TO POSTS WITH WIRE TIES OR STAPLES AT TOP, MIDPOINT AND BOTTOM.
4. FILTER FABRIC TO BE FASTENED SECURELY TO WOVEN WIRE FENCE.
5. OVERLAP BY 6", FOLD AND STAPLE ADJOINING SECTIONS OF FILTER FABRIC.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED, AND THE MATERIAL REMOVED WHEN "BULGES" DEVELOP. DO NOT DEPOSIT MATERIAL NEAR WETLANDS OR WATERCOURSES.
7. FILTER FABRIC SHALL BE ENTRENCHED 6" MIN. BELOW EXISTING OR FINISHED GRADE.

SILT FENCE DETAIL

NOT TO SCALE



NOTES:

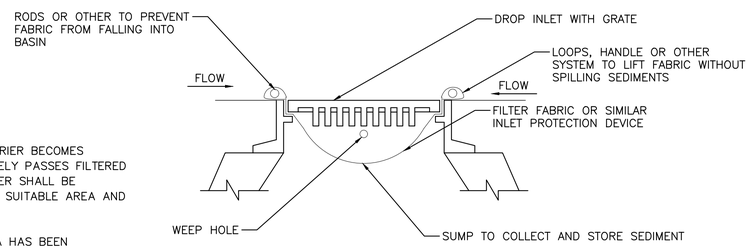
1. BLANKETS SHOULD BE INSTALLED VERTICALLY DOWNSLOPE.
2. DIMENSIONS GIVEN IN THE DRAWINGS ARE EXAMPLES; DEVICE SHOULD BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
3. SLOPE SURFACE SHALL BE FREE OF ROCKS, CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
4. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
5. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH SOIL. DO NOT STRETCH.

EROSION CONTROL BLANKET DETAIL

NOT TO SCALE

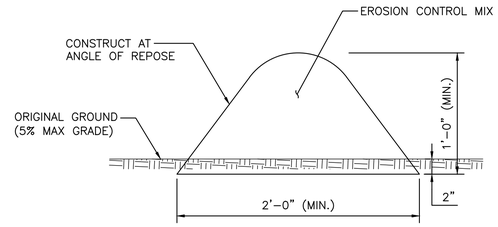
NOTES:

1. CONTRACTOR TO CLEAN AFTER EVERY STORM. IF THE BARRIER BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PASSES FILTERED WATER, THE SEDIMENT SHALL BE REMOVED AND THE BARRIER SHALL BE REPLACED. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
2. THE DEVICE SHALL BE REMOVED WHEN THE DRAINAGE AREA HAS BEEN ADEQUATELY STABILIZED.



FILTER FABRIC INLET PROTECTION AT CATCH BASIN

NOT TO SCALE



EROSION CONTROL MIX BERM DETAIL

NOT TO SCALE

EROSION CONTROL MIX AND COMPOST SOCK GENERAL NOTES

1. EROSION CONTROL MIX CAN BE MANUFACTURED ON OR OFF THE PROJECT SITE. IT MUST CONSIST PRIMARILY OF ORGANIC MATERIAL, SEPARATED AT THE POINT OF GENERATION, AND MAY INCLUDE: SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR ACCEPTABLE MANUFACTURED PRODUCTS. WOOD AND BARK CHIPS, GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS WILL NOT BE ACCEPTABLE AS THE ORGANIC COMPONENT OF THE MIX.

COMPOSITION

2. EROSION CONTROL MIX SHALL CONTAIN A WELL–GRADED MIXTURE OF PARTICLE SIZES AND MAY CONTAIN ROCKS LESS THAN 4" IN DIAMETER. EROSION CONTROL MIX MUST BE FREE OF REFUSE, PHYSICAL CONTAMINANTS, AND MATERIAL TOXIC TO PLANT GROWTH. THE MIX COMPOSITION SHALL MEET THE FOLLOWING STANDARDS:

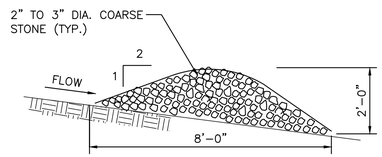
- THE ORGANIC MATTER CONTENT SHALL BE BETWEEN 80 AND 100%, DRY WEIGHT BASIS.
- PARTICLE SIZE BY WEIGHT SHALL BE 100% PASSING A 6" SCREEN AND A MINIMUM OF 70%, MAXIMUM OF 85%, PASSING A 0.75" SCREEN.
- THE ORGANIC PORTION NEEDS TO BE FIBROUS AND ELONGATED.
- LARGE PORTIONS OF SILTS, CLAYS OR FINE SANDS ARE NOT ACCEPTABLE IN THE MIX.
- SOLUBLE SALTS CONTENT SHALL BE < 4.0 MMHOS/CM.
- THE PH SHOULD FALL BETWEEN 5.0 AND 8.0.

INSTALLATION

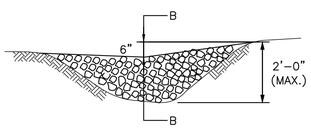
3. THE BARRIER MUST BE PLACED ALONG A RELATIVELY LEVEL CONTOUR. IT MAY BE NECESSARY TO CUT TALL GRASSES OR WOODY VEGETATION TO AVOID CREATING VOIDS AND BRIDGES THAT WOULD ENABLE FINES TO WASH UNDER THE BARRIER THROUGH THE GRASS BLADES OR PLANT STEMS.

4. ON SLOPES LESS THAN 5% OR AT THE BOTTOM OF STEEPER SLOPES (2:1) UP TO 20 FEET LONG, THE BARRIER MUST BE A MINIMUM OF 12" HIGH, AS MEASURED ON THE UPHILL SIDE OF THE BARRIER, AND A MINIMUM OF TWO FEET WIDE (FOR EROSION CONTROL MIX BERMS). ON LONGER OR STEEPER SLOPES, THE EROSION CONTROL MIX BERMS SHOULD BE WIDER TO ACCOMMODATE THE ADDITIONAL RUNOFF.

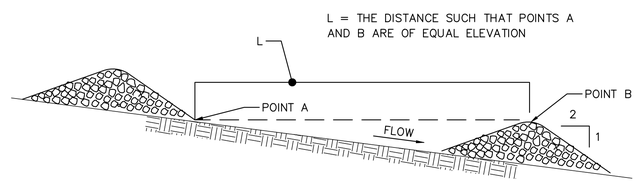
5. FROZEN GROUND, OUTCROPS OF BEDROCK AND VERY ROOTED FORESTED AREAS ARE LOCATIONS WHERE BERMS OF EROSION CONTROL MIX ARE MOST PRACTICAL AND EFFECTIVE. OTHER BMPS SHOULD BE USED AT LOW POINTS OF CONCENTRATED RUNOFF, BELOW CULVERT OUTLET APRONS, AROUND CATCH BASINS AND CLOSED STORM SYSTEMS, AND AT THE BOTTOM OF STEEP PERIMETER SLOPES THAT ARE MORE THAN 50 FEET FROM TOP TO BOTTOM (I.E., A LARGE UP GRADIENT CONTRIBUTING WATERSHED).



SECTION B-B



CROSS SECTION



SPACING BETWEEN CHECK DAMS

STONE CHECK DAM DETAIL

NOT TO SCALE

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506DTL_ERO

CHECKED BY: AGB
DRAWN BY: KDP
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TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

EROSION CONTROL DETAILS

DRAWING NO. DTL3

EROSION CONTROL STRATEGIES

1. ENVIRONMENTAL COMMITMENTS:
   - 1.1. THESE GUIDELINES DO NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH ANY CONTRACT PROVISIONS, OR APPLICABLE FEDERAL, STATE, AND LOCAL REGULATIONS.
   - 1.2. THIS PROJECT WILL BE SUBJECT TO THE US EPA'S NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) STORM WATER CONSTRUCTION GENERAL PERMIT AS ADMINISTERED BY THE ENVIRONMENTAL PROTECTION AGENCY (EPA). THIS PROJECT IS SUBJECT TO REQUIREMENTS IN THE MOST RECENT CONSTRUCTION GENERAL PERMIT (CGP).
   - 1.3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE NHDES WETLAND NOTIFICATIONS INCLUDED IN THE CONTRACT DOCUMENTS.
   - 1.4. ALL STORM WATER, EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE NEW HAMPSHIRE STORMWATER MANUAL, VOLUME 3, EROSION AND SEDIMENT CONTROLS DURING CONSTRUCTION (DECEMBER 2008) (BMP MANUAL) AVAILABLE FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES (NHDES).
   - 1.5. THE CONTRACTOR SHALL COMPLY WITH RSA 485–A:17, AND ALL, PUBLISHED NHDES ALTERATION OF TERRAIN (AoT) ENV–WQ 1500 REQUIREMENTS (HTTP://DES.NH.GOV/ORGANIZATION/COMMISSIONER/LEGAL/RULES/INDEX.HTM). THIS PROJECT FALLS UNDER THE AoT GENERAL PERMIT BY RULE.
   - 1.6. THE CONTRACTOR IS DIRECTED TO REVIEW AND COMPLY WITH THE CONTRACT AS IT REFERS TO SPILLAGE, AND ALSO WITH REGARDS TO EROSION, POLLUTION, AND TURBIDITY PRECAUTIONS.

2. STANDARD EROSION CONTROL SEQUENCING APPLICABLE TO ALL CONSTRUCTION PROJECTS:
   - 2.1. PERIMETER CONTROLS SHALL BE INSTALLED PRIOR TO EARTH DISTURBING ACTIVITIES. PERIMETER CONTROLS AND STABILIZED CONSTRUCTION EXITS SHALL BE INSTALLED AS SHOWN IN THE BMP MANUAL AND AS DIRECTED BY THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARER.
   - 2.2. EROSION, SEDIMENTATION CONTROL MEASURES AND INFILTRATION BASINS SHALL BE CLEANED, REPLACED AND AUGMENTED AS NECESSARY TO PREVENT SEDIMENTATION BEYOND PROJECT LIMITS THROUGHOUT THE PROJECT DURATION.
   - 2.3. EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT AND SECTION 645 OF THE NHDOT SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
   - 2.4. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
     - (A) BASE COURSE GRAVELS HAVE BEEN INSTALLED IN AREAS TO BE PAVED;
     - (B) A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
     - (C) A MINIMUM OF 3" OF NON–EROSIVE MATERIAL SUCH AS STONE OR RIP–RAP HAS BEEN INSTALLED; OR
     - (D) TEMPORARY SLOPE STABILIZATION CONFORMING TO TABLE 1 HAS BEEN PROPERLY INSTALLED.
   - 2.5. ALL STOCKPILES SHALL BE CONTAINED WITH A PERIMETER CONTROL. IF THE STOCKPILE IS TO REMAIN UNDISTURBED FOR MORE THAN 14 DAYS, MULCHING WILL BE REQUIRED.
   - 2.6. A WATER TRUCK SHALL BE AVAILABLE TO CONTROL EXCESSIVE DUST AT THE DIRECTION OF THE ENGINEER.
   - 2.7. TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES SHALL REMAIN UNTIL THE AREA HAS BEEN PERMANENTLY STABILIZED.
   - 2.8. CONSTRUCTION PERFORMED ANY TIME BETWEEN NOVEMBER 30" AND MAY 1" OF ANY YEAR SHALL BE CONSIDERED WINTER CONSTRUCTION AND SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
     - (A) ALL PROPOSED VEGETATED AREAS WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED IN ACCORDANCE WITH TABLE 1.
     - (B) ALL DITCHES OR SWALES WHICH DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15", OR WHICH ARE DISTURBED AFTER OCTOBER 15", SHALL BE STABILIZED TEMPORARILY WITH STONE OR IN ACCORDANCE WITH TABLE 1.
     - (C) AFTER NOVEMBER 30" INCOMPLETE ROAD SURFACES, WHERE WORK HAS STOPPED FOR THE SEASON, SHALL BE PROTECTED IN ACCORDANCE WITH TABLE 1.
     - (D) WINTER EXCAVATION AND EARTHWORK SHALL BE DONE SUCH THAT NO MORE THAN 1 ACRE OF THE PROJECT IS WITHOUT STABILIZATION AT ONE TIME, UNLESS A WINTER STABILIZATION PLAN HAS BEEN APPROVED BY THE ENGINEER.
     - (E) A SWPPP AMENDMENT SHALL BE SUBMITTED TO THE ENGINEER, FOR APPROVAL, ADDRESSING COLD WEATHER STABILIZATION (ENV–WQ 1505.05) NO LESS THAN 30 DAYS PRIOR TO THE COMMENCEMENT OF WORK SCHEDULED AFTER NOVEMBER 30".

GENERAL CONSTRUCTION PLANNING AND SELECTION OF STRATEGIES TO CONTROL EROSION AND SEDIMENT ON HIGHWAY CONSTRUCTION PROJECTS

3. PLAN ACTIVITIES TO ACCOUNT FOR SENSITIVE SITE CONDITIONS:
   - 3.1. CLEARLY FLAG AREAS TO BE PROTECTED IN THE FIELD AND PROVIDE CONSTRUCTION BARRIERS TO PREVENT TRAFFICKING OUTSIDE OF WORK AREAS.
   - 3.2. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS.
   - 3.3. PROTECT AND MAXIMIZE EXISTING NATIVE VEGETATION AND NATURAL FOREST BUFFERS BETWEEN CONSTRUCTION ACTIVITY AND SENSITIVE AREAS.
   - 3.4. WHEN WORK IS PERFORMED IN AND NEAR WATER COURSES, STREAM FLOW DIVERSION METHODS SHALL BE IMPLEMENTED PRIOR TO ANY EXCAVATION OR FILLING.
   - 3.5. WHEN WORK IS PERFORMED WITHIN 50 FEET OF SURFACE WATERS (WETLAND, OPEN WATER OR FLOWING WATER), PERIMETER CONTROL SHALL BE ENHANCED CONSISTENT WITH THE LATEST VERSION OF THE NPDES CONSTRUCTION GENERAL PERMIT.

4. MINIMIZE THE AMOUNT OF EXPOSED SOIL:
   - 4.1. CONSTRUCTION SHALL BE SEQUENCED TO LIMIT THE DURATION AND AREA OF EXPOSED SOILS. MINIMIZE THE AREA OF EXPOSED SOIL AT ANY ONE TIME. PHASING SHALL BE USED TO REDUCE THE AMOUNT AND DURATION OF SOIL EXPOSED TO THE ELEMENTS AND VEHICLE TRACKING.
   - 4.2. UTILIZE TEMPORARY MULCHING OR PROVIDE ALTERNATE TEMPORARY STABILIZATION ON EXPOSED SOILS IN ACCORDANCE WITH TABLE 1.
   - 4.3. THE MAXIMUM AMOUNT OF DISTURBED EARTH SHALL NOT EXCEED A TOTAL OF 5 ACRES FROM MAY 1" THROUGH NOVEMBER 30", OR EXCEED ONE ACRE DURING WINTER MONTHS, UNLESS THE CONTRACTOR DEMONSTRATES TO THE ENGINEER THAT THE ADDITIONAL AREA OF DISTURBANCE IS NECESSARY TO MEET THE CONTRACTORS CRITICAL PATH METHOD SCHEDULE (CPM), AND THE CONTRACTOR HAS ADEQUATE RESOURCES AVAILABLE TO ENSURE THAT ENVIRONMENTAL COMMITMENTS WILL BE MET.

5. CONTROL STORMWATER FLOWING ONTO AND THROUGH THE PROJECT:
   - 5.1. DIVERT OFF SITE RUNOFF OR CLEAN WATER AWAY FROM THE CONSTRUCTION ACTIVITY TO REDUCE THE VOLUME THAT NEEDS TO BE TREATED ON SITE.
   - 5.2. DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM DISTURBED AREAS, SLOPES, AND AROUND ACTIVE WORK AREAS AND TO A STABILIZED OUTLET LOCATION.
   - 5.3. CONSTRUCT IMPERMEABLE BARRIERS AS NECESSARY TO COLLECT OR DIVERT CONCENTRATED FLOWS FROM WORK OR DISTURBED AREAS.
   - 5.4. STABILIZE, TO APPROPRIATE ANTICIPATED VELOCITIES, CONVEYANCE CHANNELS OR PUMPING SYSTEMS NEEDED TO CONVEY CONSTRUCTION STORMWATER TO BASINS AND DISCHARGE LOCATIONS PRIOR TO USE.
   - 5.5. DIVERT OFF–SITE WATER THROUGH THE PROJECT IN AN APPROPRIATE MANNER SO NOT TO DISTURB THE UPSTREAM OR DOWNSTREAM SOILS, VEGETATION OR HYDROLOGY BEYOND THE PERMITTED AREA.

6. PROTECT SLOPES:
   - 6.1. INTERCEPT AND DIVERT STORM RUNOFF FROM UPSLOPE DRAINAGE AREAS AWAY FROM UNPROTECTED AND NEWLY ESTABLISHED AREAS AND SLOPES TO A STABILIZED OUTLET OR CONVEYANCE.
   - 6.2. CONSIDER HOW GROUNDWATER SEEPAGE ON CUT SLOPES MAY IMPACT SLOPE STABILITY AND INCORPORATE APPROPRIATE MEASURES TO MINIMIZE EROSION.
   - 6.3. CONVEY STORMWATER DOWN THE SLOPE IN A STABILIZED CHANNEL OR SLOPE DRAIN.
   - 6.4. THE OUTER FACE OF THE FILL SLOPE SHOULD BE IN A LOOSE RUFFLED CONDITION PRIOR TO TURF ESTABLISHMENT. TOPSOIL OR HUMUS LAYERS SHALL BE TRACKED UP AND DOWN THE SLOPE, DISKED, HARROWED, DRAGGED WITH A CHAIN OR MAT, MACHINE–RAKED, OR HAND–WORKED TO PRODUCE A RUFFLED SURFACE.

7. ESTABLISH STABILIZED CONSTRUCTION EXITS:
   - 7.1. INSTALL AND MAINTAIN CONSTRUCTION EXITS, ANYWHERE TRAFFIC LEAVES A CONSTRUCTION SITE ONTO A PUBLIC RIGHT–OF–WAY.
   - 7.2. SWEEP ALL CONSTRUCTION RELATED DEBRIS AND SOIL FROM THE ADJACENT PAVED ROADWAYS AS NECESSARY.

8. PROTECT STORM DRAIN INLETS:
   - 8.1. DIVERT SEDIMENT LADEN WATER AWAY FROM INLET STRUCTURES TO THE EXTENT POSSIBLE.
   - 8.2. INSTALL SEDIMENT BARRIERS AND SEDIMENT TRAPS AT INLETS TO PREVENT SEDIMENT FROM ENTERING THE DRAINAGE SYSTEM.
   - 8.3. CLEAN CATCH BASINS, DRAINAGE PIPES, AND CULVERTS IF SIGNIFICANT SEDIMENT IS DEPOSITED.
   - 8.4. DROP INLET SEDIMENT BARRIERS SHOULD NEVER BE USED AS THE PRIMARY MEANS OF SEDIMENT CONTROL AND SHOULD ONLY BE USED TO PROVIDE AN ADDITIONAL LEVEL OF PROTECTION TO STRUCTURES AND DOWN–GRADIENT SENSITIVE RECEPTORS.

9. SOIL STABILIZATION:
   - 9.1. WITHIN THREE DAYS OF THE LAST ACTIVITY IN AN AREA, ALL EXPOSED SOIL AREAS, WHERE CONSTRUCTION ACTIVITIES ARE COMPLETE, SHALL BE STABILIZED.
   - 9.2. IN ALL AREAS, TEMPORARY SOIL STABILIZATION MEASURES SHALL BE APPLIED IN ACCORDANCE WITH THE STABILIZATION REQUIREMENTS OF THE CGP. (SEE TABLE 1 FOR GUIDANCE ON THE SELECTION OF TEMPORARY SOIL STABILIZATION MEASURES.)
   - 9.3. EROSION CONTROL SEED MIX SHALL BE SOWN IN ALL INACTIVE CONSTRUCTION AREAS THAT WILL NOT BE PERMANENTLY SEEDED WITHIN TWO WEEKS OF DISTURBANCE AND PRIOR TO SEPTEMBER 15, OF ANY GIVEN YEAR, IN ORDER TO ACHIEVE VEGETATIVE STABILIZATION PRIOR TO THE END OF THE GROWING SEASON.
   - 9.4. SOIL TACKIFIERS MAY BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS AND REAPPLIED AS NECESSARY TO MINIMIZE SOIL AND MULCH LOSS UNTIL PERMANENT VEGETATION IS ESTABLISHED.

10. RETAIN SEDIMENT ON–SITE AND CONTROL DEWATERING PRACTICES:
    - 10.1. TEMPORARY SEDIMENT BASINS (CGP) OR SEDIMENT TRAPS (ENV–WQ) SHALL BE SIZED TO RETAIN, ON SITE, THE VOLUME OF A 2–YEAR 24–HOUR STORM EVENT FOR ANY AREA OF DISTURBANCE OR 3,600 CUBIC FEET OF STORMWATER RUNOFF PER ACRE OF DISTURBANCE, WHICHEVER IS GREATER.
      TEMPORARY SEDIMENT BASINS USED TO TREAT STORMWATER RUNOFF FROM AREAS GREATER THAN 5–ACRES OF DISTURBANCE SHALL BE SIZED TO ALSO CONTROL STORMWATER RUNOFF FROM A 10–YEAR 24 HOUR STORM EVENT. ON–SITE RETENTION OF THE 10–YEAR 24–HOUR EVENT IS NOT REQUIRED.
    - 10.2. CONSTRUCT AND STABILIZE DEWATERING INFILTRATION BASINS PRIOR TO ANY EXCAVATION THAT MAY REQUIRE DEWATERING.
    - 10.3. TEMPORARY SEDIMENT BASINS OR TRAPS SHALL BE PLACED AND STABILIZED AT LOCATIONS WHERE CONCENTRATED FLOW (CHANNELS AND PIPES) DISCHARGE TO THE SURROUNDING ENVIRONMENT FROM AREAS OF UNSTABILIZED EARTH DISTURBING ACTIVITIES.

11. ADDITIONAL EROSION AND SEDIMENT CONTROL GENERAL PRACTICES:
    - 11.1. USE TEMPORARY MULCHING, PERMANENT MULCHING, TEMPORARY VEGETATIVE COVER, AND PERMANENT VEGETATIVE COVER TO REDUCE THE NEED FOR DUST CONTROL. USE MECHANICAL SWEEPERS ON PAVED SURFACES WHERE NECESSARY TO PREVENT DUST BUILDUP. APPLY WATER, OR OTHER DUST INHIBITING AGENTS OR TACKIFIERS, AS APPROVED BY THE ENGINEER.
    - 11.2. ALL STOCKPILES SHALL BE CONTAINED WITH TEMPORARY PERIMETER CONTROLS. INACTIVE SOIL STOCKPILES SHOULD BE PROTECTED WITH SOIL STABILIZATION MEASURES (TEMPORARY EROSION CONTROL SEED MIX AND MULCH, SOIL BINDER) OR COVERED WITH ANCHORED TARPS.
    - 11.3. EROSION AND SEDIMENT CONTROL MEASURES WILL BE INSPECTED IN ACCORDANCE WITH SECTION 645 OF NHDOT SPECIFICATIONS, WEEKLY AND WITHIN 24 HOURS AFTER ANY STORM EVENT GREATER THAN 0.25 IN. OF RAIN PER 24–HOUR PERIOD. EROSION AND SEDIMENT CONTROL MEASURES WILL ALSO BE INSPECTED IN ACCORDANCE WITH THE EPA CONSTRUCTION GENERAL PERMIT.
    - 11.4. THE CONTRACTOR SHOULD UTILIZE STORM DRAIN INLET PROTECTION TO PREVENT SEDIMENT FROM ENTERING A STORM DRAINAGE SYSTEM PRIOR TO THE PERMANENT STABILIZATION OF THE CONTRIBUTING DISTURBED AREA.
    - 11.5. PERMANENT STABILIZATION MEASURES WILL BE CONSTRUCTED AND MAINTAINED IN LOCATIONS AS SHOWN ON THE CONSTRUCTION PLANS TO STABILIZE AREAS. VEGETATIVE STABILIZATION SHALL NOT BE CONSIDERED PERMANENTLY STABILIZED UNTIL VEGETATIVE GROWTH COVERS AT LEAST 85% OF THE DISTURBED AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EROSION AND SEDIMENT CONTROL FOR ONE YEAR AFTER PROJECT COMPLETION.
    - 11.6. CATCH BASINS: CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT ENTER ANY EXISTING CATCH BASINS DURING CONSTRUCTION. THE CONTRACTOR SHALL PLACE TEMPORARY STONE INLET PROTECTION OVER INLETS IN AREAS OF SOIL DISTURBANCE THAT ARE SUBJECT TO SEDIMENT CONTAMINATION.
    - 11.7. TEMPORARY AND PERMANENT DITCHES SHALL BE CONSTRUCTED, STABILIZED AND MAINTAINED IN A MANNER THAT WILL MINIMIZE SCOUR. TEMPORARY AND PERMANENT DITCHES SHALL BE DIRECTED TO DRAIN TO SEDIMENT BASINS OR STORM WATER COLLECTION AREAS.
    - 11.8. WINTER EXCAVATION AND EARTHWORK ACTIVITIES NEED TO BE LIMITED IN EXTENT AND DURATION, TO MINIMIZE POTENTIAL EROSION AND SEDIMENTATION IMPACTS. THE AREA OF EXPOSED SOIL SHALL BE LIMITED TO ONE ACRE, OR THAT WHICH CAN BE STABILIZED AT THE END OF EACH DAY UNLESS A WINTER CONSTRUCTION PLAN, DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST, IS REVIEWED AND APPROVED BY THE ENGINEER.
    - 11.9. CHANNEL PROTECTION MEASURES SHALL BE SUPPLEMENTED WITH PERIMETER CONTROL MEASURES WHEN THE DITCH LINES OCCUR AT THE BOTTOM OF LONG FILL SLOPES. THE PERIMETER CONTROLS SHALL BE INSTALLED ON THE FILL SLOPE TO MINIMIZE THE POTENTIAL FOR FILL SLOPE SEDIMENT DEPOSITS IN THE DITCH LINE.

BEST MANAGEMENT PRACTICES (BMP) BASED ON AMOUNT OF OPEN CONSTRUCTION AREA

12. THE CONTRACTOR SHALL COMPLY WITH RSA 485:A:17 AND ENV–WQ 1500; ALTERATION OF TERRAIN FOR CONSTRUCTION AND USE ALL CONVENTIONAL BMP STRATEGIES.

13. THE CONTRACTOR SHALL INSTALL EROSION AND SEDIMENT CONTROLS AND BMPs PER PLANS AND SPECIFICATIONS.

TABLE 1
GUIDANCE ON SELECTING TEMPORARY SOIL STABILIZATION MEASURES

APPLICATION AREAS	DRY MULCH METHODS				HYDRAULICALLY APPLIED MULCHES[2]				ROLLED EROSION CONTROL BLANKETS[3]			
	HMT	WC	SG	CB	HM	SMM	BFM	FRM	SNSB	DNSB	DNSCB	DNCB
SLOPES[1]												
STEEPER THAN 2:1	NO	NO	YES	NO	NO	NO	NO	YES	NO	NO	NO	YES
2:1 SLOPE	YES[1]	YES[1]	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
3:1 SLOPE	YES	YES	YES	YES	NO	YES	YES	YES	YES	YES	YES	NO
4:1 SLOPE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	NO	NO
WINTER STABILIZATION	4T/AC	YES	YES	YES	NO	NO	YES	YES	YES	YES	YES	YES
CHANNELS												
LOW FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES	YES
HIGH FLOW CHANNELS	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	YES

ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE	ABBREV.	STABILIZATION MEASURE
HMT	HAY MULCH & TACK	HM	HYDRAULIC MULCH	SNSB	SINGLE NET STRAW BLANKET
WC	WOOD CHIPS	SMM	STABILIZED MULCH MATRIX	DNSB	DOUBLE NET STRAW BLANKET
SG	STUMP GRINDINGS	BFM	BONDED FIBER MATRIX	DNSCB	2 NET STRAW–COCONUT BLANKET
CB	COMPOST BLANKET	FRM	FIBER REINFORCED MEDIUM	DNCB	2 NET COCONUT BLANKET

NOTES:
1. ALL SLOPE STABILIZATION OPTIONS ASSUME A SLOPE LENGTH ≤10 TIMES THE HORIZONTAL DISTANCE COMPONENT OF THE SLOPE, IN FEET.
2. PRODUCTS CONTAINING POLYACRYLAMIDE (PAM) SHALL NOT BE APPLIED DIRECTLY TO OR WITHIN 100 FEET OF ANY SURFACE WATER WITHOUT PRIOR WRITTEN APPROVAL FROM THE NH DEPARTMENT OF ENVIRONMENTAL SERVICES.
3. ALL EROSION CONTROL BLANKETS SHALL BE MADE WITH WILDLIFE FRIENDLY BIODEGRADABLE NETTING.

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506DTL_ERO

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

DATE: AUGUST 2017

SCALE: AS SHOWN

Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669–5555 Fax (603) 669–4168 Web: www.hoytanner.com

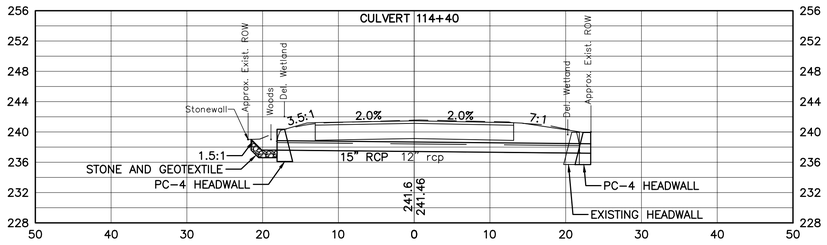
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

EROSION CONTROL NOTES

DRAWING NO.

DTL4



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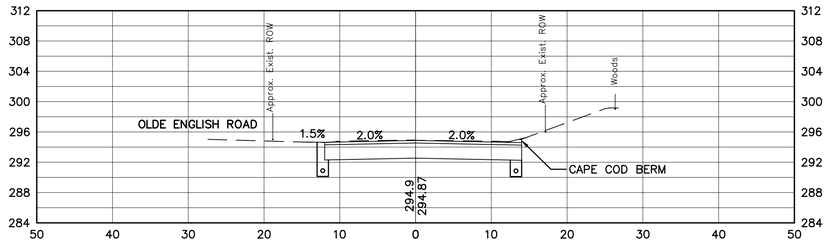

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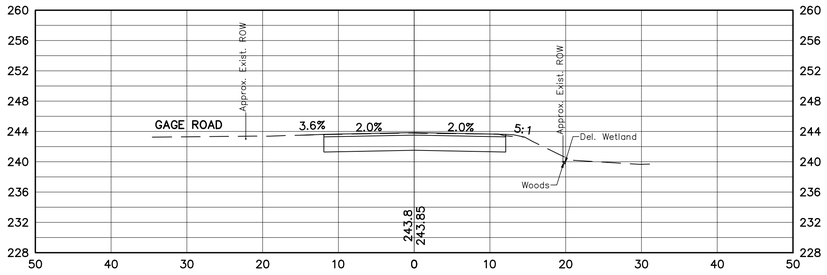

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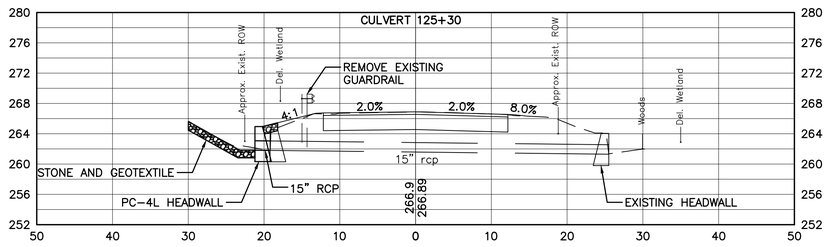

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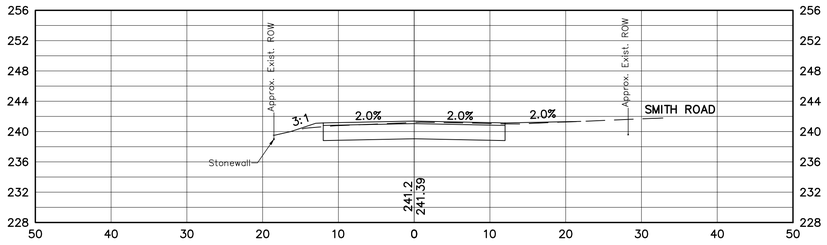

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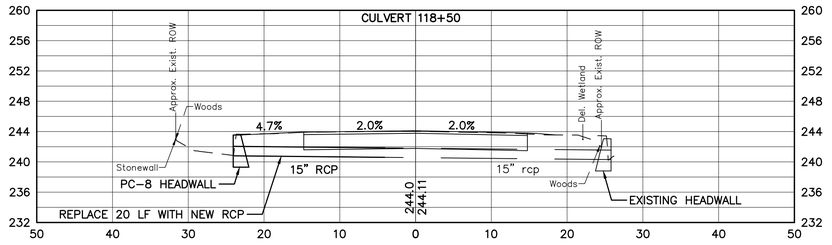

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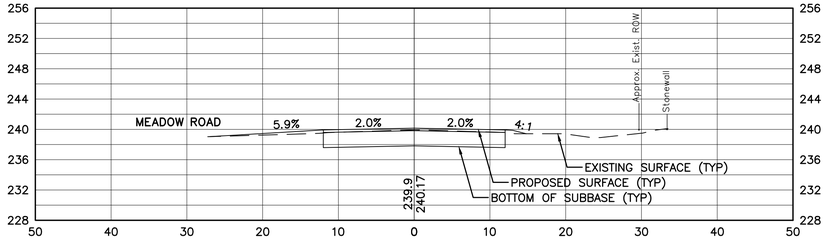

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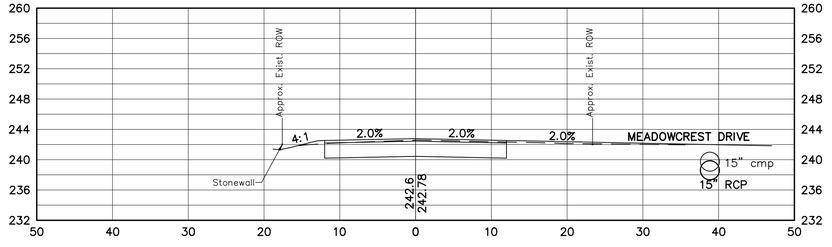

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ENGINEER

ISSUE	DESCRIPTION	DATE

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FILE NAME 911506XSECT

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Hoyle, Tanner & Associates, Inc.
50 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

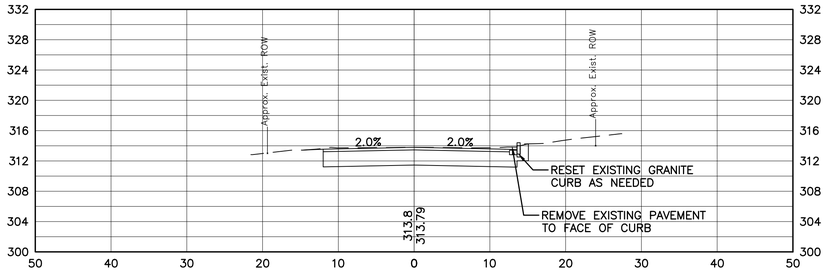
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

CRITICAL SECTIONS 1 OF 3

DRAWING NO.

XS1



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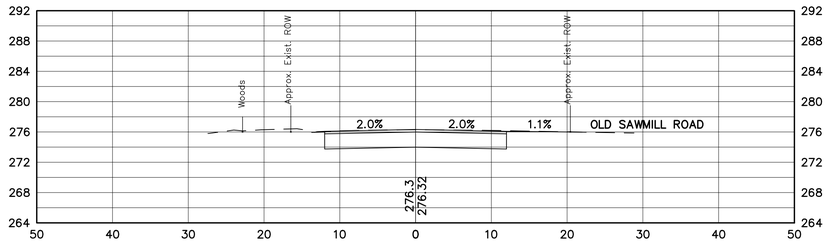

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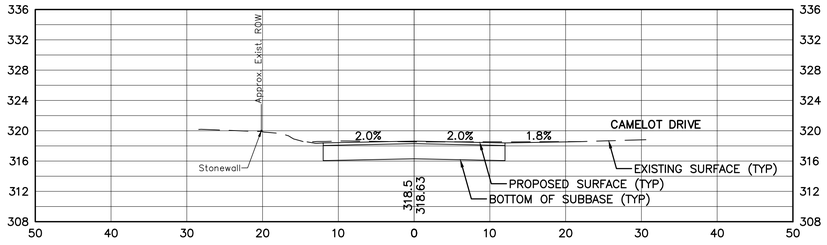

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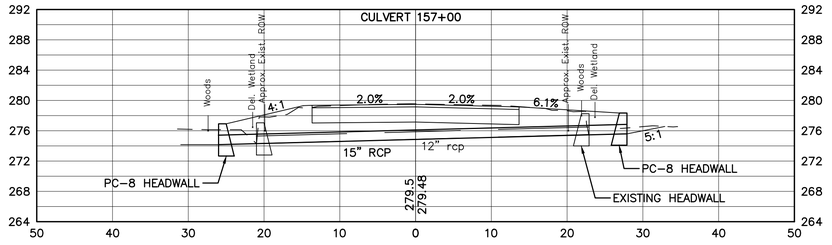

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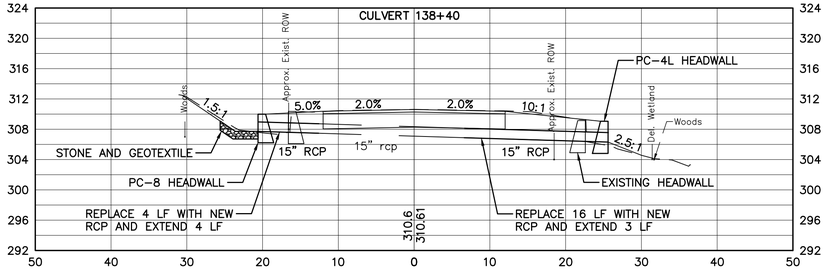

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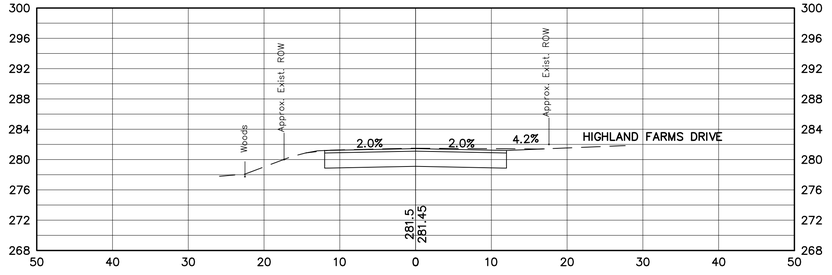

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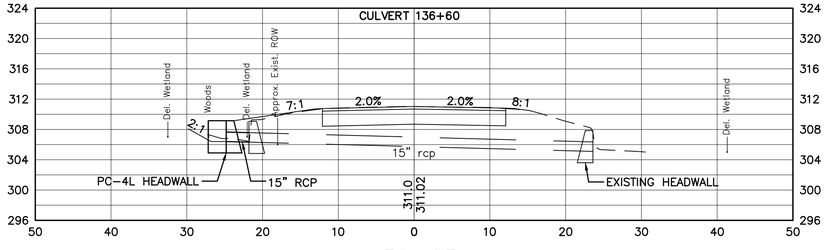

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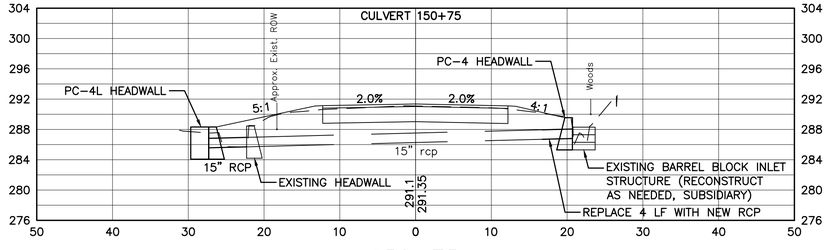

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ENGINEER

ISSUE	DESCRIPTION	DATE

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Hoyle, Tanner & Associates, Inc.
150 Dow Street–5th Floor, Manchester, NH 03101
Tel (603) 669-5555 Fax (603) 669-4168 Web: www.hoyletanner.com

DATE: AUGUST 2017

SCALE: 1" = 10'

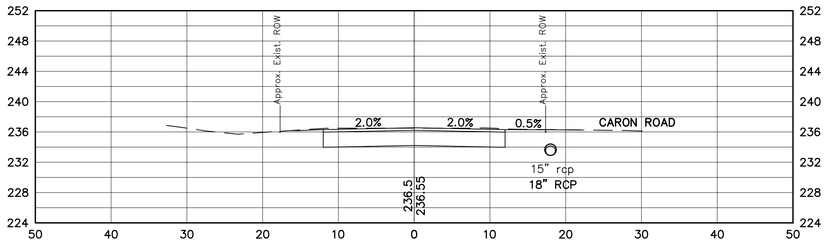
TOWN OF BEDFORD, NEW HAMPSHIRE

LIBERTY HILL ROAD RECONSTRUCTION

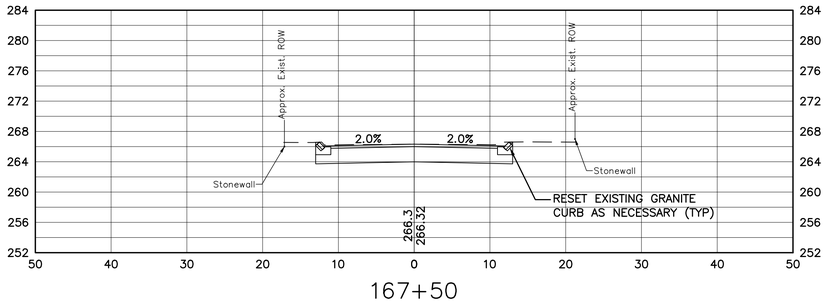
CRITICAL SECTIONS 2 OF 3

DRAWING NO.

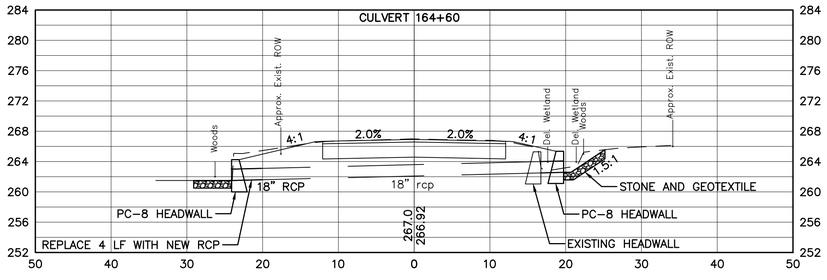
XS2



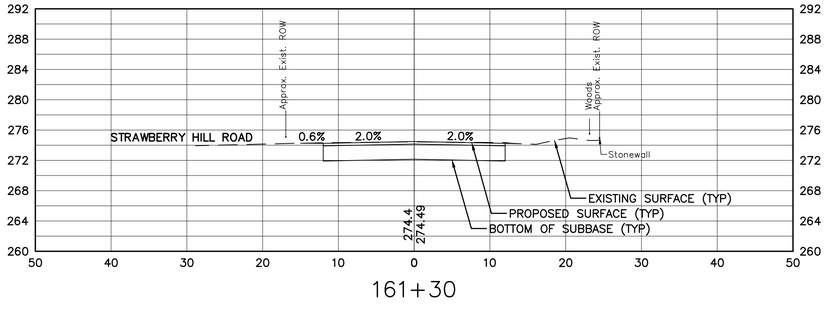
173+05



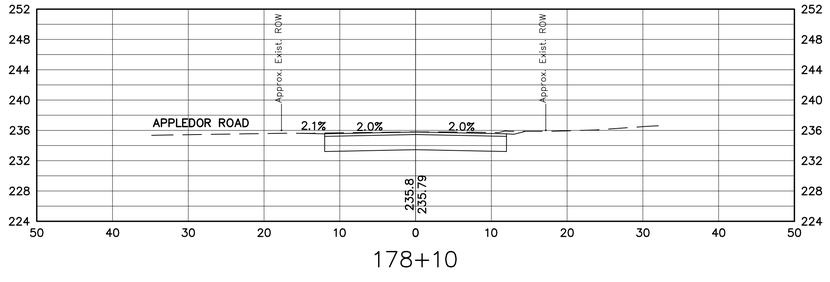
167+50



164+65
(SKEWED TO PIPE)



161+30



178+10

ENGINEER

ISSUE	DESCRIPTION	DATE

HOYLE, TANNER PROJECT NO. 911506

FILE NAME 911506XSECT

CHECKED BY AGB

DRAWN BY KDP

DESIGNED BY KDP

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LIBERTY HILL ROAD RECONSTRUCTION

CRITICAL SECTIONS 3 OF 3

DRAWING NO.

XS3

SHEET 21 OF 21