JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING

EAST MONTPELIER, VERMONT

JUNE 21, 2017

OWNER:

JASON COTE-WONG
4028 U.S ROUTE 2
EAST MONTPELIER, VERMONT 05651
(802) 223-7171

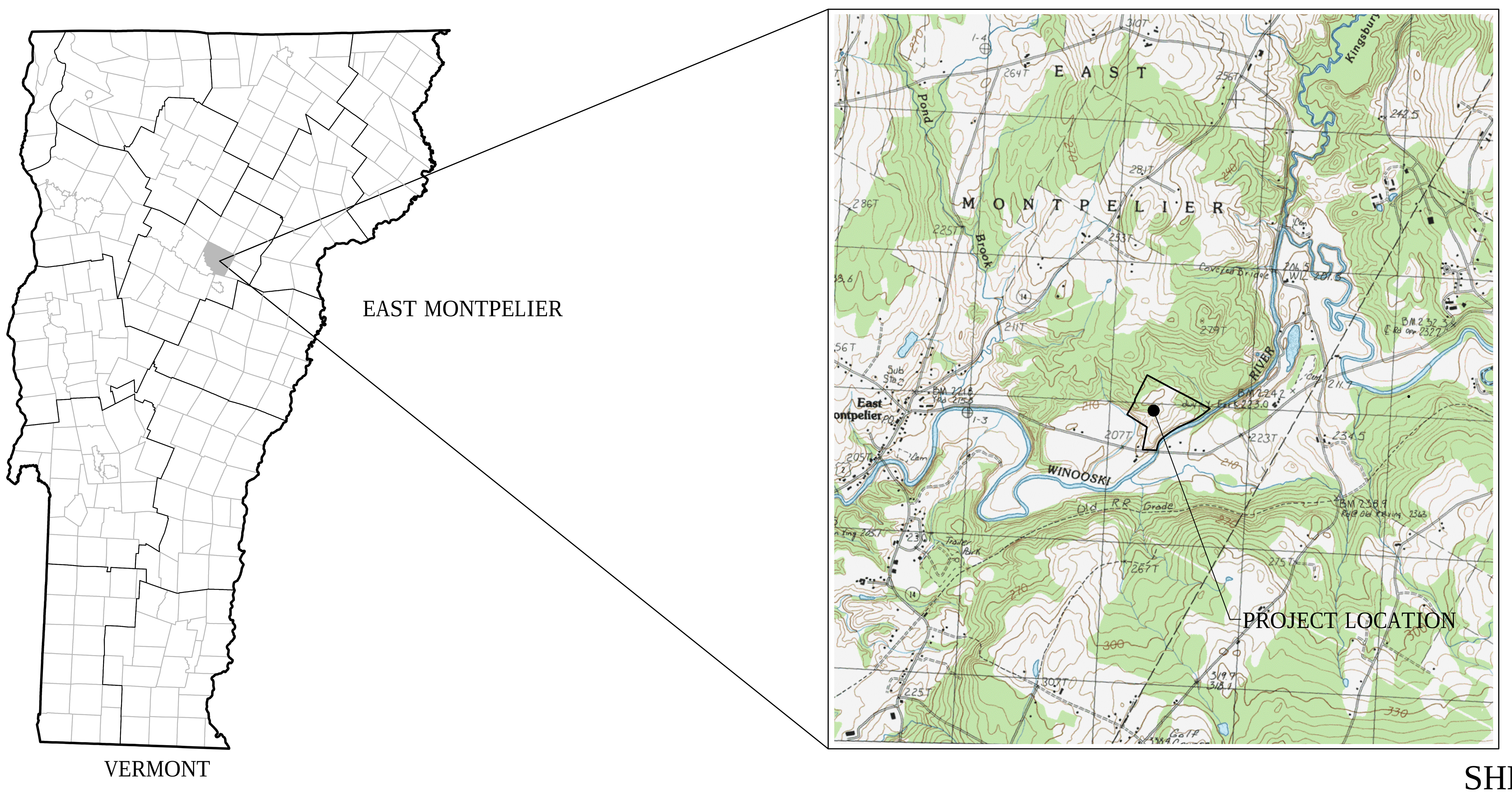
ENGINEER:

horizons Engineering Inc.

34 SCHOOL STREET
LITTLETON, NH 03561
(603) 444-4111

SURVEYOR:

CHASE & CHASE SURVEYORS
301 NORTH MAIN ST., SUITE 1
BARRE, VERMONT 05641
(802) 479-9636



LOCATION PLAN

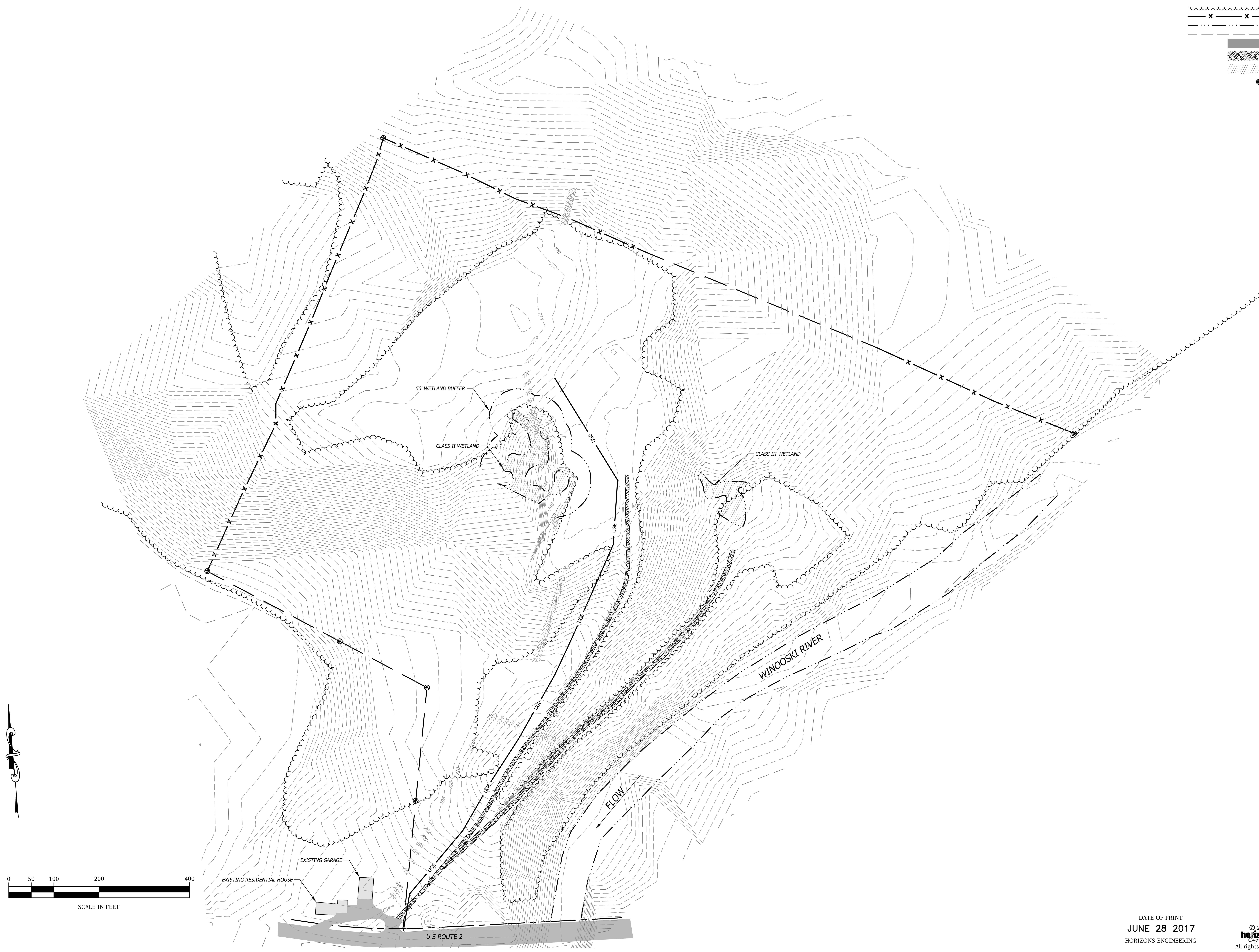
SCALE: 1" = 2000'

SHEET INDEX

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

LEGEND

Symbol	Description
— — 764 — —	2 FOOT CONTOURS
—— 760 ——	10 FOOT CONTOURS
——— ———	APPROX. PROPERTY LINE
︶︶︶	TREELINE
—x—x—x—	FENCELINE
—···—···—	WETLANDS BOUNDARY
— — — —	GRAVEL ROAD
(hatch)	PAVEMENT HATCH
(hatch)	GRAVEL HATCH
(hatch)	WETLAND HATCH
®	IRON ROD FOUND



DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

horizons Engineering Inc.
Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING

EAST MONTPELIER, VERMONT

EXISTING CONDITIONS

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

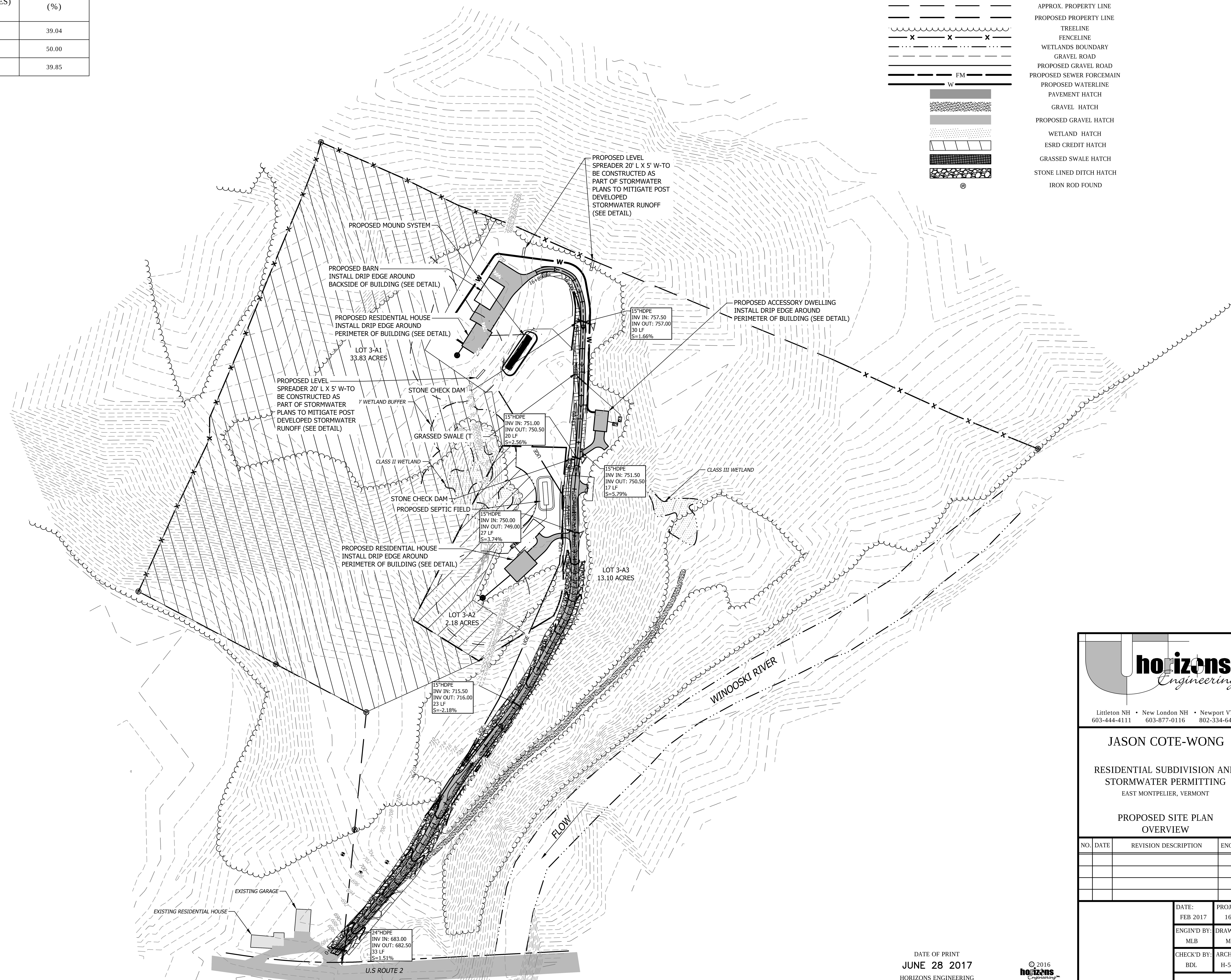
DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334

T:\16202 Wong Stormwater\DWGS\Final\HE_SITEPLAN_4.dwg, SH2-EX COND, 6/28/2017 8:17:30 AM, MBurnell

ENVIRONMENTALLY SENSITIVE RURAL DEVELOPMENT (ESRD) CREDIT					
LOT NUMBER	LOT IMPERVIOUS AREA (ACRES)	LOT TOTAL AREA (ACRES)	IMPERVIOUS PERCENTAGE (%)	CONSERVATION LAND (ACRES)	PERCENT IN CONSERVATION (%)
3-A1	1.04	33.83	3.07	13.21	39.04
3-A2	0.09	2.18	4.12	1.14	50.00
TOTAL	1.13	36.01	3.14	14.35	39.85

LEGEND

- 2 FOOT CONTOURS (764)
- 10 FOOT CONTOURS (760)
- APPROX. PROPERTY LINE
- PROPOSED PROPERTY LINE
- TREELINE
- FENCELINE
- WETLANDS BOUNDARY
- GRAVEL ROAD
- PROPOSED GRAVEL ROAD
- PROPOSED SEWER FORCEMAIN (FM)
- PROPOSED WATERLINE (W)
- PAVEMENT HATCH
- GRAVEL HATCH
- PROPOSED GRAVEL HATCH
- WETLAND HATCH
- ESRD CREDIT HATCH
- GRASSED SWALE HATCH
- STONE LINED DITCH HATCH
- IRON ROD FOUND



0 50 100 200 400

SCALE IN FEET

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

horizons Engineering Inc.

Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

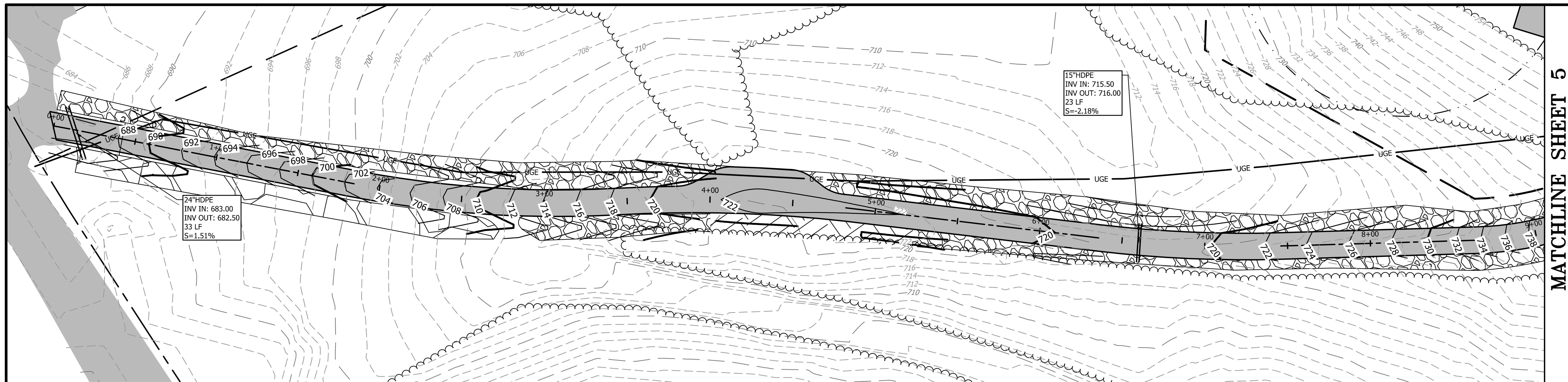
JASON COTE-WONG

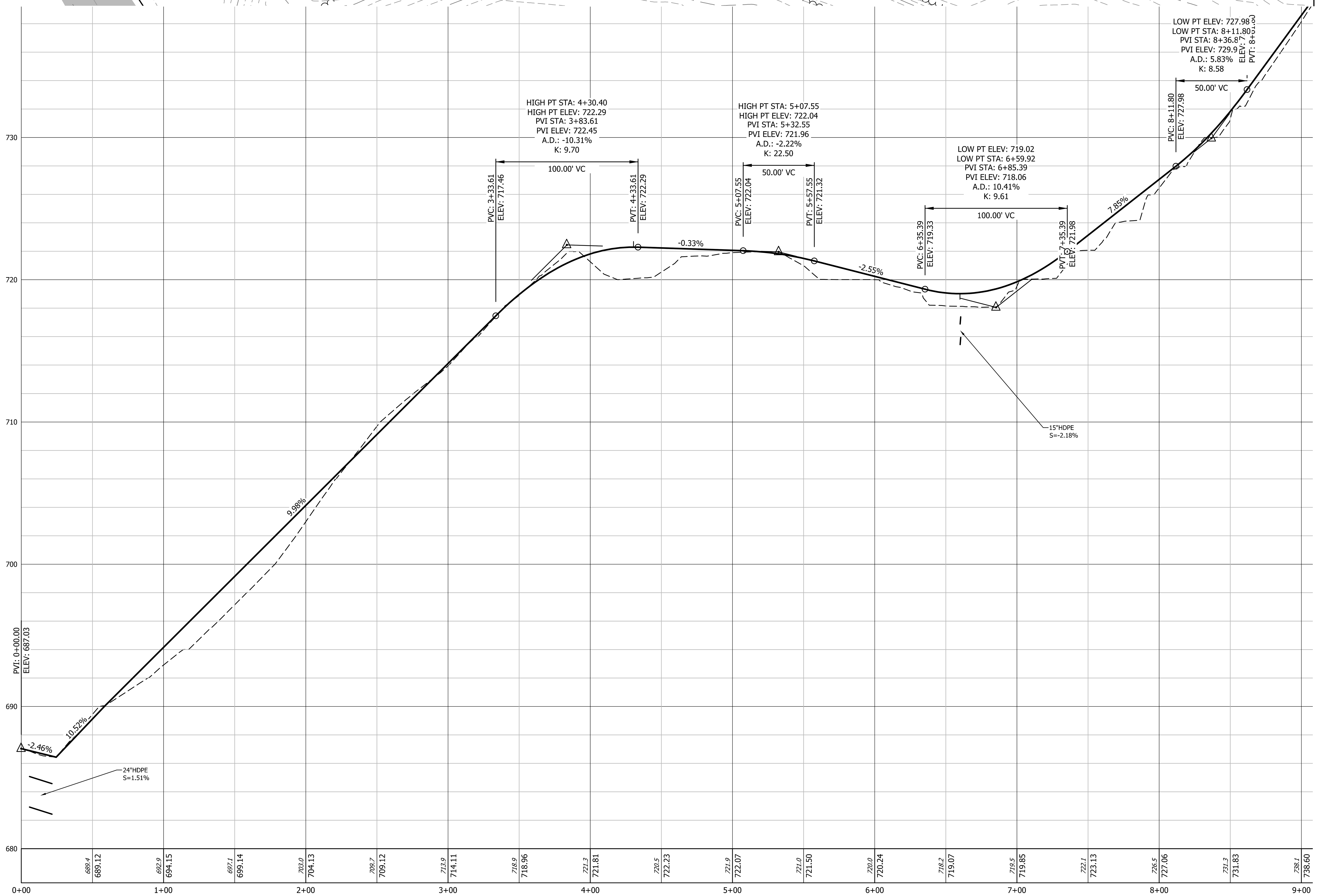
RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING
EAST MONTPELIER, VERMONT

PROPOSED SITE PLAN OVERVIEW

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

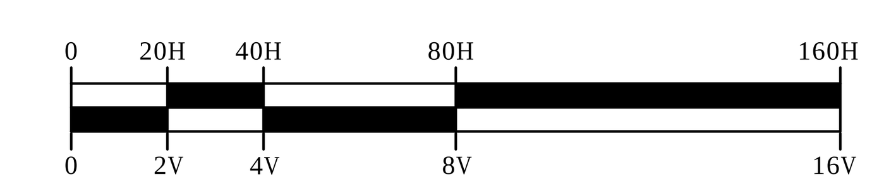
DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334





DRIVEWAY PROFILE

STA: 0+00 to STA: 16+90



SCALE IN FEET

Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING

EAST MONTPELIER, VERMONT

PLAN AND PROFILE
STA 0+00-STA 9+00

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

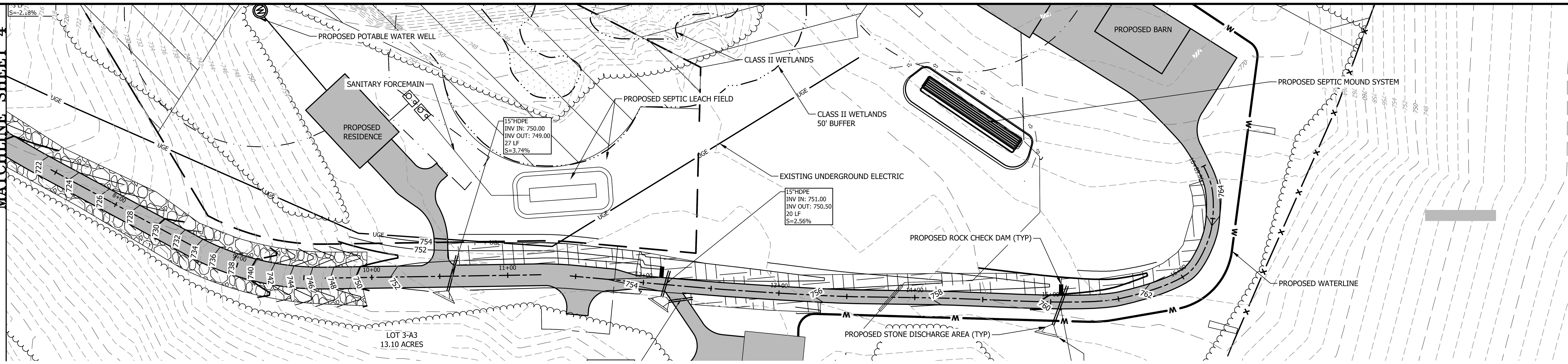
DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334

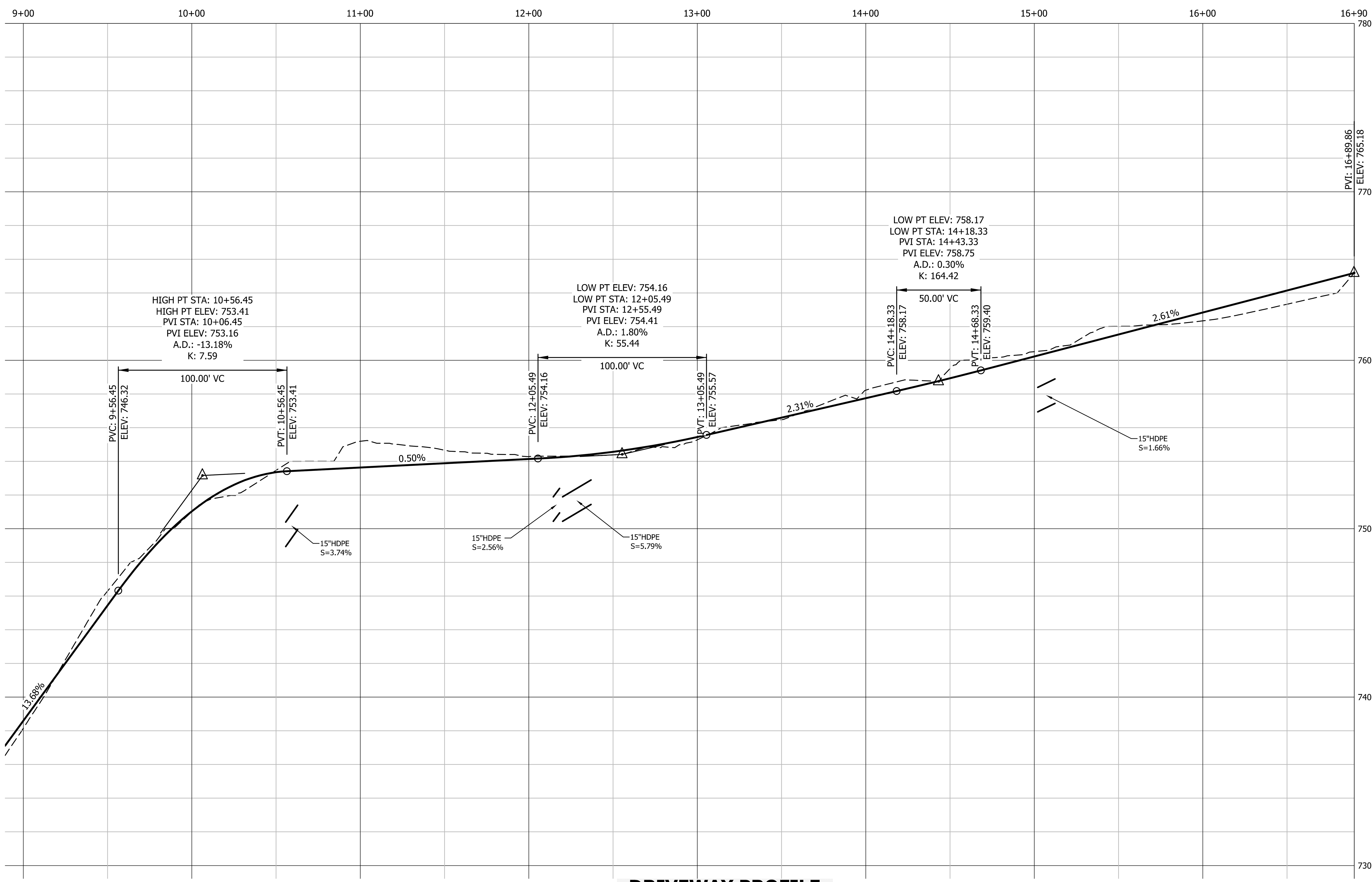
SHEET 4 OF 8

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

T:\16202 Wong Stormwater\DWGS\Final\HE_SITEPLAN_4.dwg, SH4-P&P, 6/28/2017 8:17:40 AM, MBurnell

MATCHLINE SHEET 4





DRIVEWAY PROFILE
STA: 0+00 to STA: 16+90

0 20H 40H 80H 160H
0 2V 4V 8V 16V
SCALE IN FEET

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

horizons Engineering Inc.
Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

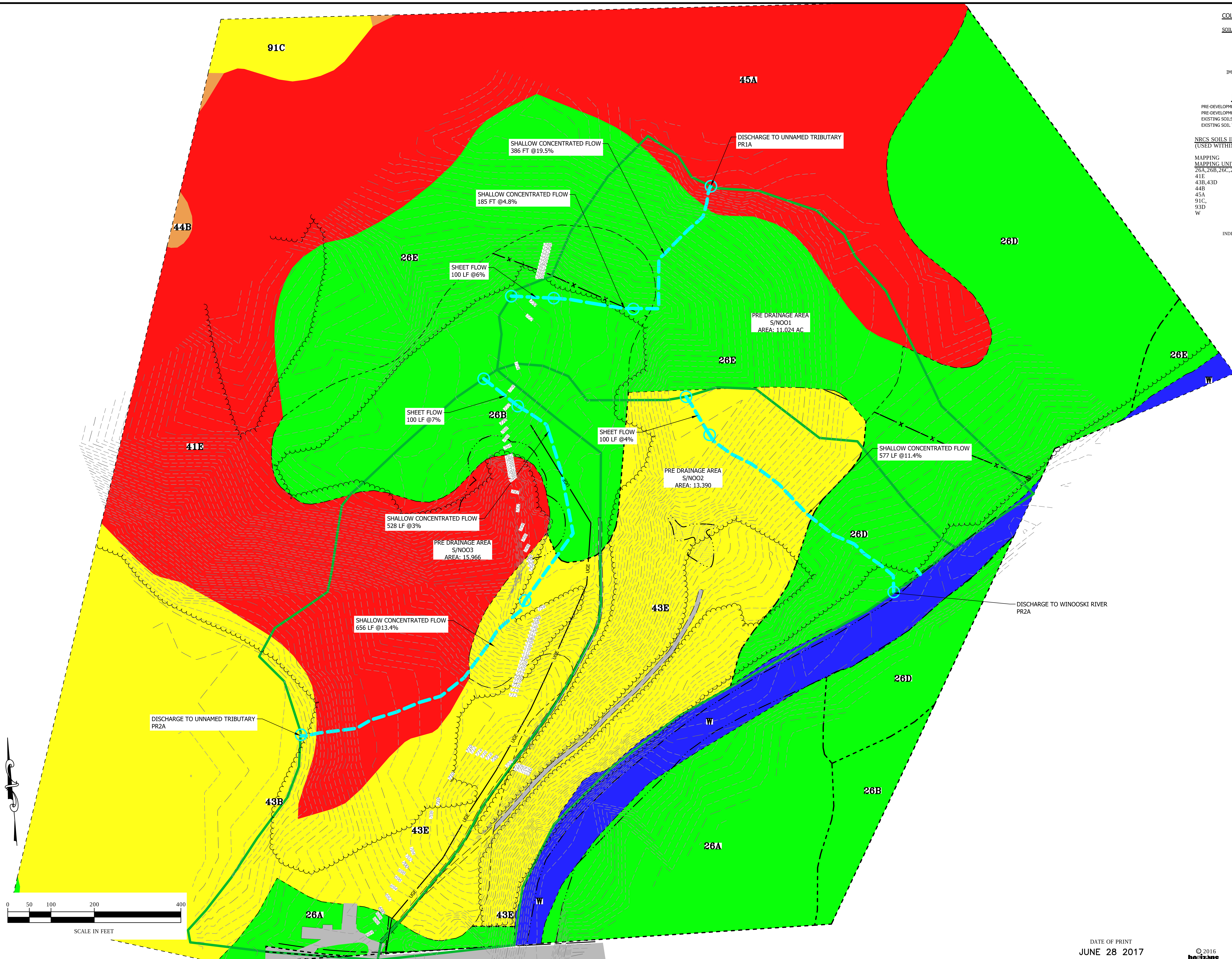
JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING
EAST MONTPELIER, VERMONT

PLAN AND PROFILE
STA 9+00-STA 16+90

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334



COLOR-CODED SITE-SPECIFIC SOIL LEGEND

SOIL GROUP	COLOR
A	green
B	yellow
C	orange
D	red
W	
IMPERVIOUS	grey

DRAINAGE LEGEND

- PRE-DEVELOPMENT DRAINAGE AREA BOUNDARY
- PRE-DEVELOPMENT DRAINAGE PATH
- EXISTING SOILS BOUNDARIES
- EXISTING SOIL TYPE — 61C

NRCS SOILS INFORMATION (WASHINGTON COUNTY SOIL SURVEY)
(USED WITHIN NRCS MAPPING LIMITS)

MAPPING MAPPING UNIT SYMBOL	SOIL MAPPING UNIT NAME	HSG
26A,26B,26C,26D,S6E	ADAMS LOAMY FINE SAND	A
41E	BUXTON SILT LOAM	D
43B,43D	SALMON VERY FINE SANDY LOAM	B
44B	LAMOINE SILT LOAM	C
45A	SCANTIC SILT LOAM	D
91C,	DUMMERSTON FINE SANDY LOAM	B
93D	BUCKLAND LOAM	C/D
W	WATER	--

981 C
INDICATES SOIL NAME — INDICATES SLOPE OF LAND
A = 0 TO 3 PERCENT SLOPE
B = 3 TO 8 PERRECENT SLOPE
C = 8 TO 15 PERCENT SLOPE
D = 15 TO 25 PERCENT SLOPE
E = STEEP
F = VERY STEEP

horizons Engineering Inc.
Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING
EAST MONTPELIER, VERMONT

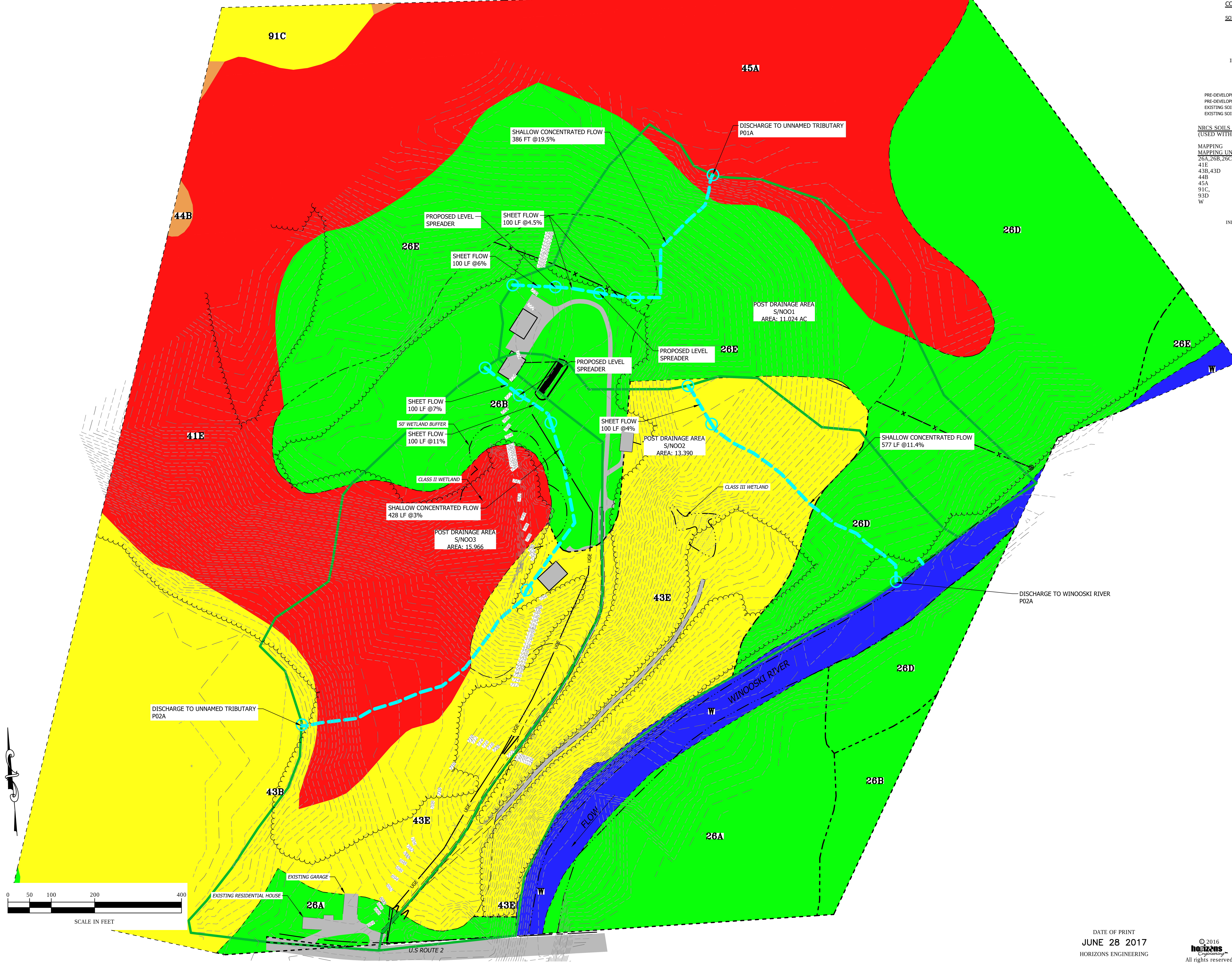
PRE-DRAINAGE AREA MAP WITH SOIL COLOR DELINEATION

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

T:\16202 Wong Stormwater\DWGS\Final\HE_SITEPLAN_4.dwg, SH6-PREDEV COLOR MAP, 6/28/2017 8:17:50 AM, MBurnell



COLOR-CODED SITE-SPECIFIC SOIL LEGEND

SOIL GROUP	COLOR
A	green
B	yellow
C	orange
D	red
W	
IMPERVIOUS	grey

DRAINAGE LEGEND

- PRE-DEVELOPMENT DRAINAGE AREA BOUNDARY
- PRE-DEVELOPMENT DRAINAGE PATH
- EXISTING SOILS BOUNDARIES
- EXISTING SOIL TYPE — 61C

NRCS SOILS INFORMATION (WASHINGTON COUNTY SOIL SURVEY)
(USED WITHIN NRCS MAPPING LIMITS)

MAPPING MAPPING UNIT SYMBOL	SOIL MAPPING UNIT NAME	HSG
26A,26B,26C,26D,S6E	ADAMS LOAMY FINE SAND	A
41E	BUXTON SILT LOAM	D
43B,43D	SALMON VERY FINE SANDY LOAM	B
44B	LAMOINE SILT LOAM	C
45A	SCANTIC SILT LOAM	D
91C,	DUMMERSTON FINE SANDY LOAM	B
93D	BUCKLAND LOAM	C/D
W	WATER	--

981 C
INDICATES SOIL NAME — INDICATES SLOPE OF LAND
A = 0 TO 3 PERCENT SLOPE
B = 3 TO 8 PERRECENT SLOPE
C = 8 TO 15 PERCENT SLOPE
D = 15 TO 25 PERCENT SLOPE
E = STEEP
F = VERY STEEP

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

horizons Engineering Inc.
Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING

EAST MONTPELIER, VERMONT

POST-DRAINAGE AREA MAP WITH SOIL COLOR DELINEATION

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334

SEEDING RECOMMENDATIONS

1. GRADING AND SHAPING
   A. SLOPES SHALL NOT BE STEEPER THAN 2:1; 3:1 SLOPES OR FLATTER ARE PREFERRED. WHERE MOWING WILL BE DONE, 3:1 SLOPES OR FLATTER ARE RECOMMENDED.

2. SEEDBED PREPARATION
   A. SURFACE AND SEEPAGE WATER SHOULD BE DRAINED OR DIVERTED FROM THE SITE TO PREVENT DROWNING OR WINTER KILLING OF THE PLANTS.

   B. STONES LARGER THAN 4 INCHES AND TRASH SHOULD BE REMOVED BECAUSE THEY INTERFERE WITH SEEDING AND FUTURE MAINTENANCE OF THE AREA. WHERE FEASIBLE, THE SOIL SHOULD BE TILLED TO A DEPTH OF ABOUT 4 INCHES TO PREPARE A SEEDBED AND MIX FERTILIZER AND LIME THOROUGHLY INTO THE SOIL. THE SEEDBED SHOULD BE LEFT IN A REASONABLY FIRM AND SMOOTH CONDITION. THE LAST TILLAGE OPERATION SHOULD BE PERFORMED ACROSS THE SLOPE WHEREVER PRACTICAL.

3. ESTABLISHING VEGETATION
   A. LIME AND FERTILIZER SHOULD BE APPLIED PRIOR TO OR AT THE TIME OF SEEDING AND INCORPORATED INTO THE SOIL. KINDS AND AMOUNTS OF LIME AND FERTILIZER SHOULD BE BASED ON AN EVALUATION OF SOIL TESTS. WHEN A SOIL TEST IS NOT AVAILABLE, THE FOLLOWING MINIMUM AMOUNTS SHOULD BE APPLIED:

   -AGRICULTURAL LIMESTONE, 2 TONS PER ACRE OR 100 LBS. PER 1,000 SQ. FT.
   -NITROGEN (N), 50 LBS., PER ACRE OR 1.1 LBS. PER 1,000 SQ. FT.
   -PHOSPHATE (P_2O_5), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.
   -POTASH (K_20), 100 LBS. PER ACRE OR 2.2 LBS. PER 1,000 SQ. FT.

   (NOTE: THIS IS THE EQUIVALENT OF 500 LBS. PER ACRE OF 10-20-20 FERTILIZER OR 1,000 LBS. PER ACRE OF 5-10-10).

   B. SEED SHOULD BE SPREAD UNIFORMLY BY THE METHOD MOST APPROPRIATE FOR THE SITE. METHODS INCLUDE BROADCASTING, DRILLING, AND HYDROSEEDING. WHERE BROADCASTING IS USED, COVER SEED WITH .25 INCH OF SOIL OR LESS, BY CULTIPACKING OR RAKING.

   C. SEEDING GUIDE:

USE	SEEDING MIXTURE (SEE 3D)	SOIL TYPE: DROUGHTY	WELL DRAINED	MOD. WELL DRAINED	POORLY DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD	FAIR
	B	POOR	GOOD	FAIR	FAIR
	C	FAIR	EXCELLENT	EXCELLENT	POOR
WATERWAYS, EMERGENCY SPILL-WAYS, AND OTHER CHANNELS WITH FLOWING WATER	A	GOOD	GOOD	GOOD	FAIR
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES	A	GOOD	GOOD	GOOD	FAIR
	B	GOOD	GOOD	FAIR	POOR

   D. SEEDING RATES:

MIXTURE	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.
A TALL RESCUE	20	0.45
CREEPING RED FESCUE	20	0.45
REDTOP	2	0.05
TOTAL:	42	0.95
B TALL FESCUE	15	0.35
CREEPING RED FESCUE	10	0.25
CROWN VETCH OR	15 OR	0.35 OR
FLATPEA	30	0.75
TOTAL:	40 OR 55	0.95 OR 1.35
C TALL FESCUE	20	0.45
FLATPEA	30	0.75
TOTAL:	50	1.20

   E. WHEN SEEDED AREAS ARE MULCHED, PLANTINGS MAY BE MADE FROM EARLY SPRING TO SEPTEMBER 15. WHEN SEEDED AREAS ARE NOT MULCHED, PLANTINGS SHOULD BE MADE FROM EARLY SPRING TO MAY 20 OR FROM AUGUST 10 TO SEPTEMBER 1.

   F. TEMPORARY SEEDING RATES:

SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SQ. FT.	REMARKS
WINTER RYE	112	2.5	BEST FOR FALL SEEDING. SEED FROM AUGUST TO SEPTEMBER 5TH FOR BEST COVER. SEED TO A DEPTH OF 1 INCH.
OATS	80	2.0	BEST FOR SPRING SEEDING. SEED NO LATER THAN MAY 15TH FOR SUMMER PROTECTION. SEED TO A DEPTH OF 1 INCH.
ANNUAL RYEGRASS	40	1.0	GROWS QUICKLY, BUT IS OF SHORT DURATION. USE WHERE APPEARANCES ARE IMPORTANT. SEED EARLY SPRING AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. COVER SEED WITH NO MORE THAN 0.25 INCH OF SOIL.
PERENNIAL RYEGRASS	30	0.7	GOOD COVER WHICH IS LONGER LASTING THAN ANNUAL RYEGRASS. SEED BETWEEN APRIL 1ST AND JUNE 1ST AND/OR BETWEEN AUGUST 15TH AND SEPTEMBER 15TH. MULCHING WILL ALLOW SEEDING THROUGHOUT THE GROWING SEASON. SEED TO A DEPTH OF APPROXIMATELY 0.5 INCH.

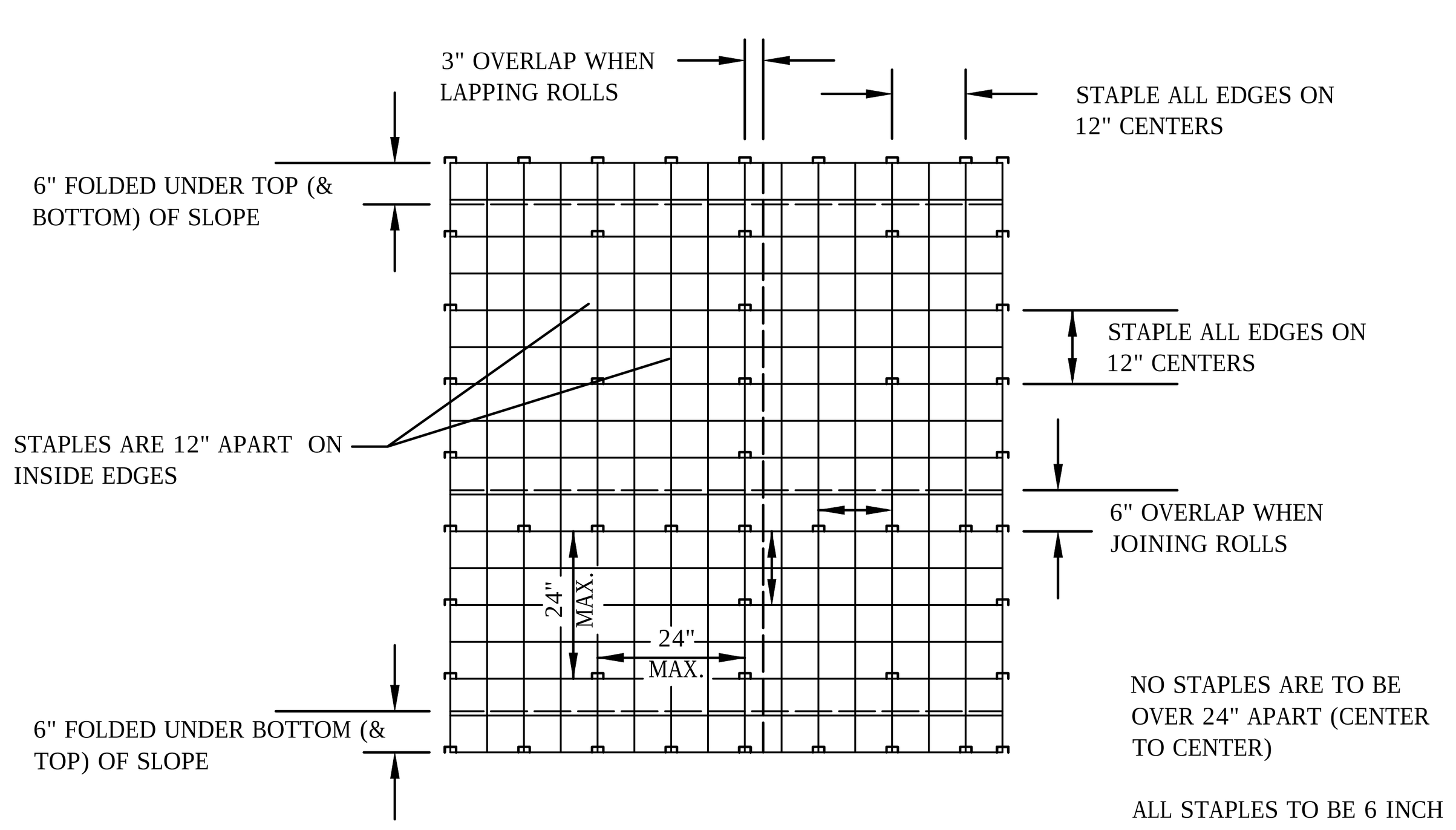
4. MULCH
   A. HAY, STRAW, OR OTHER MULCH, WHEN NEEDED, SHOULD BE APPLIED IMMEDIATELY AFTER SEEDING.

   B. MULCH WILL BE HELD IN PLACE USING APPROPRIATE TECHNIQUES FROM THE BEST MANAGEMENT PRACTICE FOR MULCHING.

5. MAINTENANCE TO ESTABLISH A STAND
   A. PLANTED AREAS SHOULD BE PROTECTED FROM DAMAGE BY FIRE, GRAZING, TRAFFIC, AND DENSE WEED GROWTH.

   B. FERTILIZATION NEEDS SHOULD BE DETERMINED BY ON SITE INSPECTIONS. SUPPLEMENTAL FERTILIZER IS USUALLY THE KEY TO FULLY COMPLETE THE ESTABLISHMENT OF THE STAND BECAUSE MOST PERENNIALS TAKE 2 TO 3 YEARS TO BECOME ESTABLISHED.

   C. IN WATERWAYS, CHANNELS, OR SWALES WHERE UNIFORM FLOW CONDITIONS ARE ANTICIPATED, OCCASIONAL MOWING MAY BE NECESSARY TO CONTROL GROWTH OF WOODY VEGETATION.

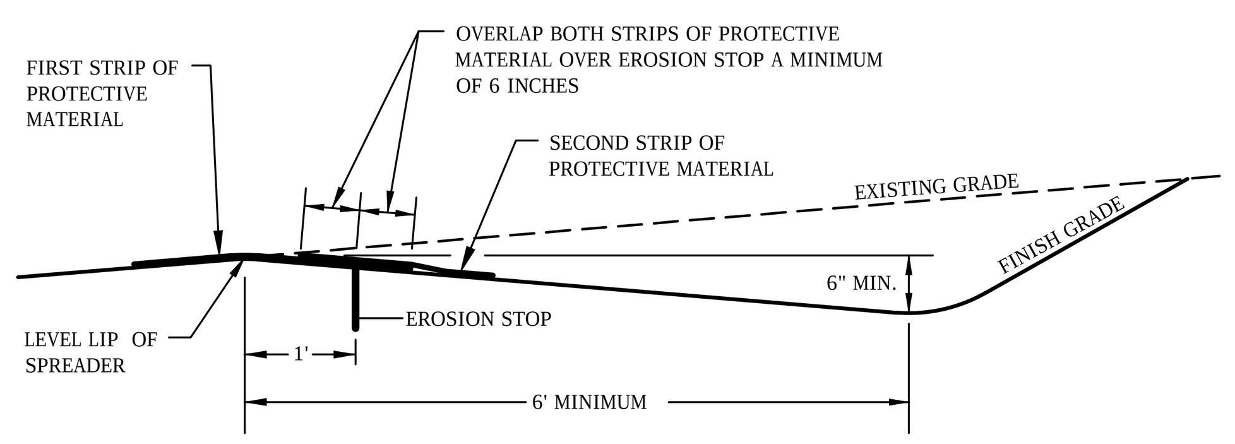


MULCH NETTING DETAIL

NO SCALE SOURCE: USDA SOIL CONSERVATION SERVICE

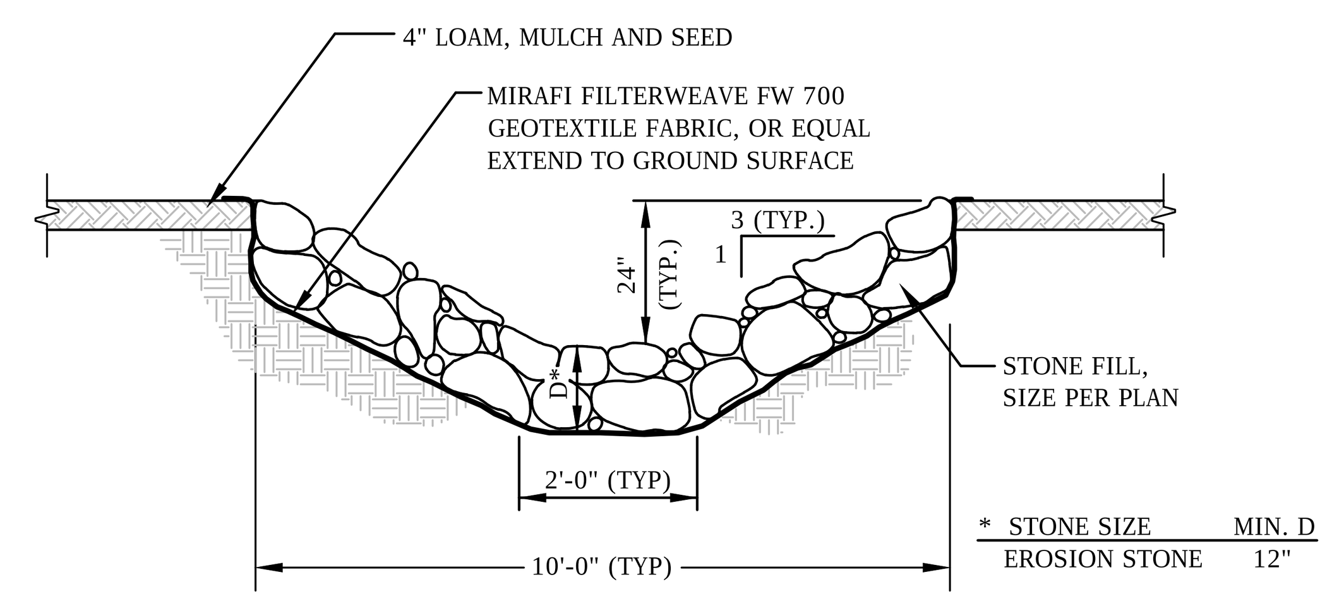
LEVEL LIP SPREADER INSTALLATION

1. CONSTRUCT THE LEVEL SPREADER LIP ON A ZERO PERCENT GRADE TO INSURE UNIFORM SPREADING OF RUNOFF.
2. LEVEL SPREADER SHALL BE CONSTRUCTED ON UNDISTURBED SOIL AND NOT ON FILL.
3. AN EROSION STOP SHALL BE PLACED VERTICALLY A MINIMUM OF SIX INCHES DEEP IN A SLIT TRENCH ONE FOOT BACK OF THE LEVEL LIP AND PARALLEL TO THE LIP. THE EROSION STOP SHALL EXTEND THE ENTIRE LENGTH OF THE LEVEL LIP.
4. THE ENTIRE LEVEL LIP AREA SHALL BE PROTECTED BY PLACING TWO STRIPS OF JUTE OR EXCELSIOR MATTING ALONG THE LIP. EACH STRIP SHALL OVERLAP THE EROSION STOP BY AT LEAST SIX INCHES.
5. THE ENTRANCE CHANNEL TO THE LEVEL SPREADER SHALL NOT EXCEED A 1 PERCENT GRADE FOR AT LEAST 50 FEET BEFORE ENTERING INTO THE SPREADER.
6. THE FLOW FROM THE LEVEL SPREADER SHALL OUTLET ONTO STABILIZED AREAS. WATER SHOULD NOT RE-CONCENTRATE IMMEDIATELY BELOW THE SPREADER.
7. PERIODIC INSPECTION AND REQUIRED MAINTENANCE SHALL BE PERFORMED.
8. PROTECTIVE MATERIAL AND EROSION STOP SHALL BE NORTH AMERICAN GREEN C125 EROSION CONTROL BLANKET OR APPROVED EQUAL.



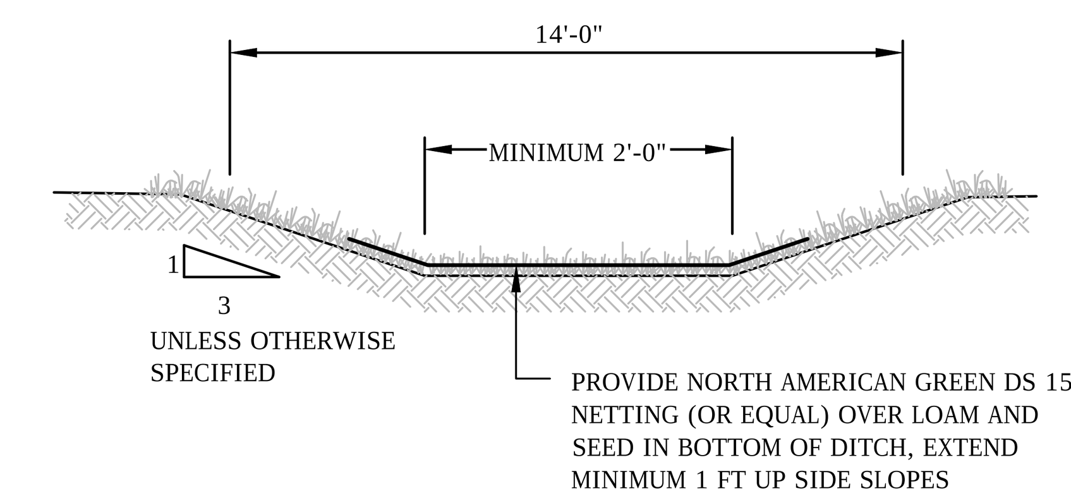
LEVEL SPREADER DETAIL

NO SCALE



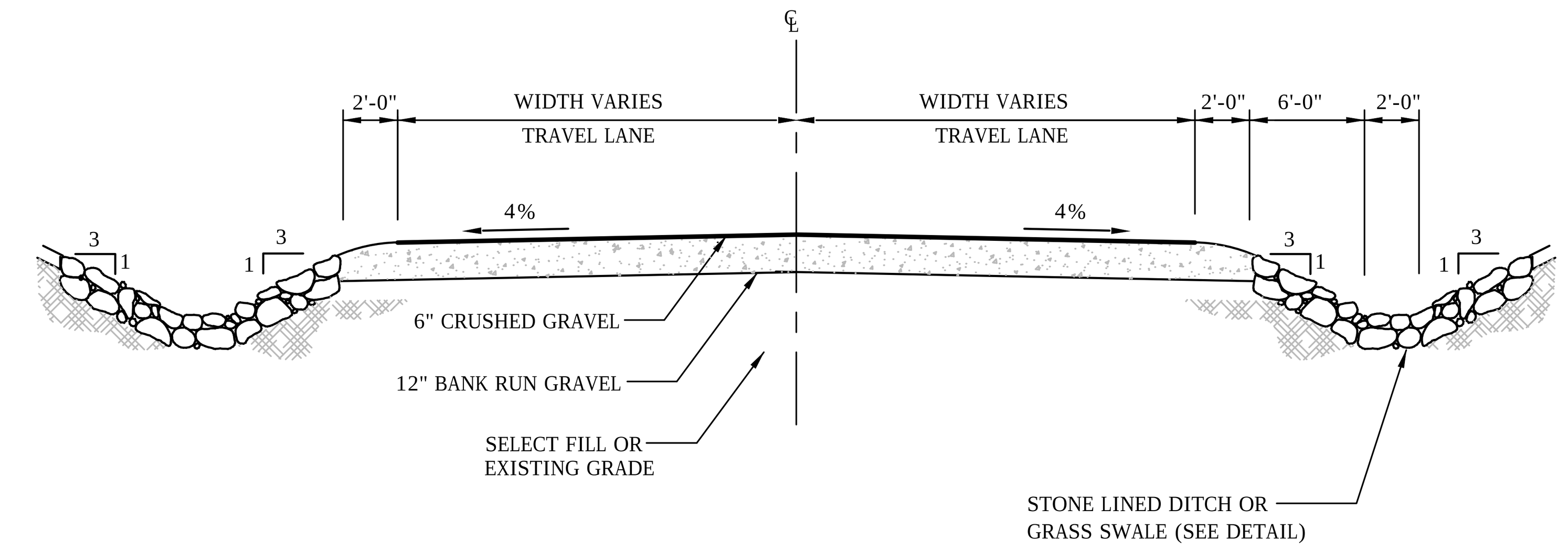
STONE LINED DITCH DETAIL

NOT TO SCALE



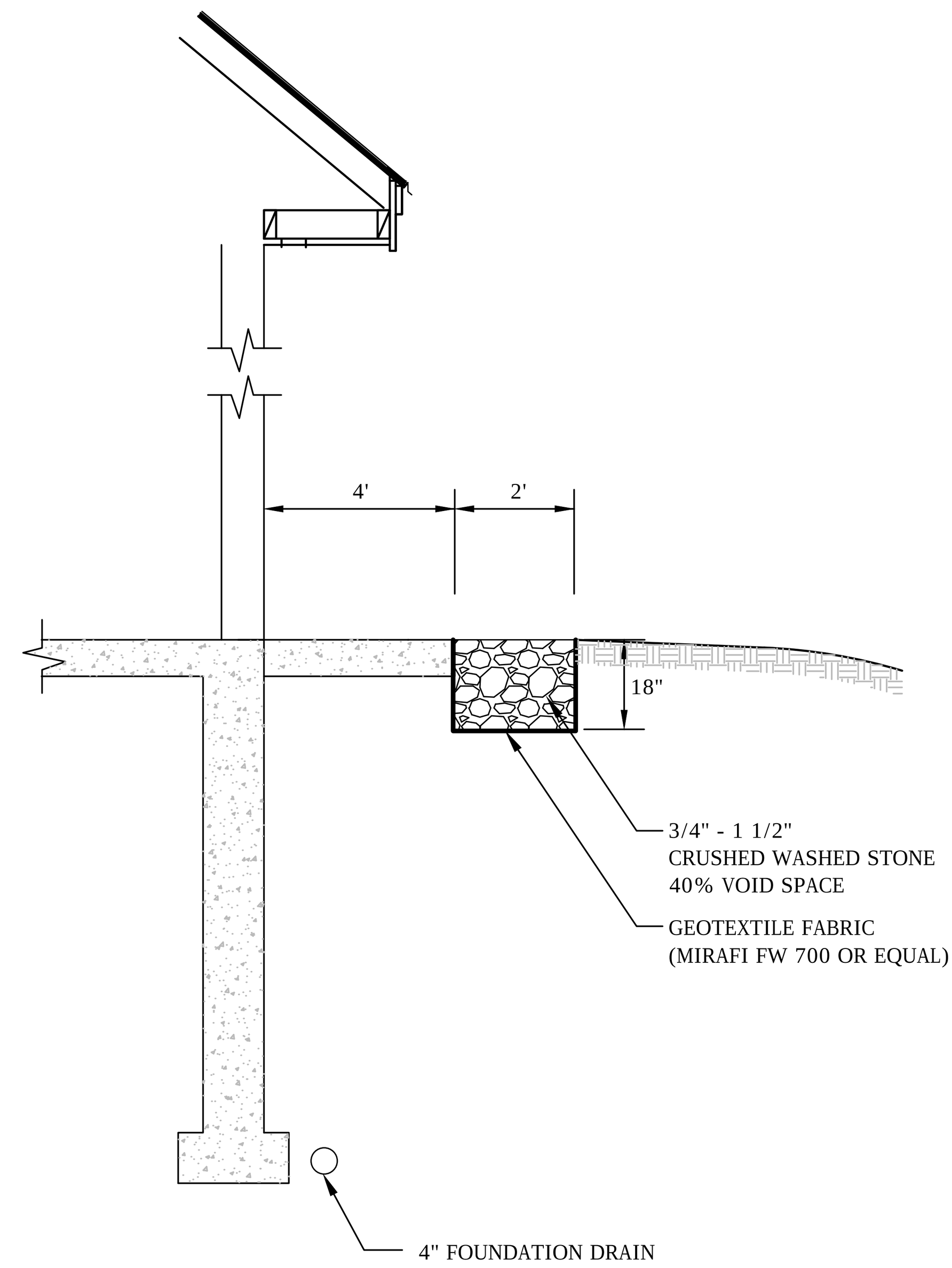
GRASSED SWALE DETAIL

NOT TO SCALE



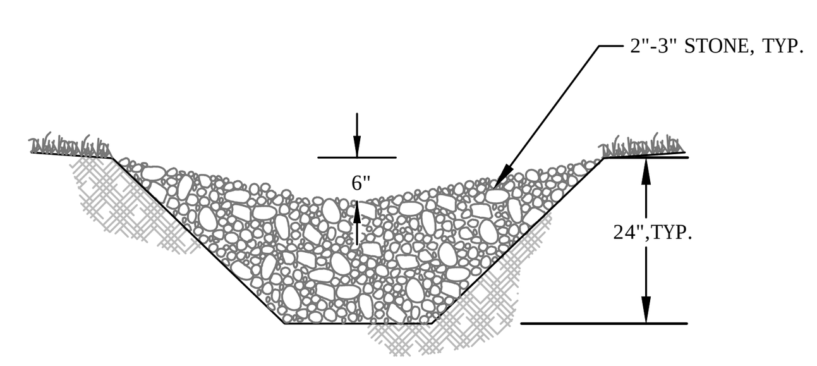
TYPICAL ROAD CROSS SECTION

NOT TO SCALE



STONE DRIP EDGE DETAIL

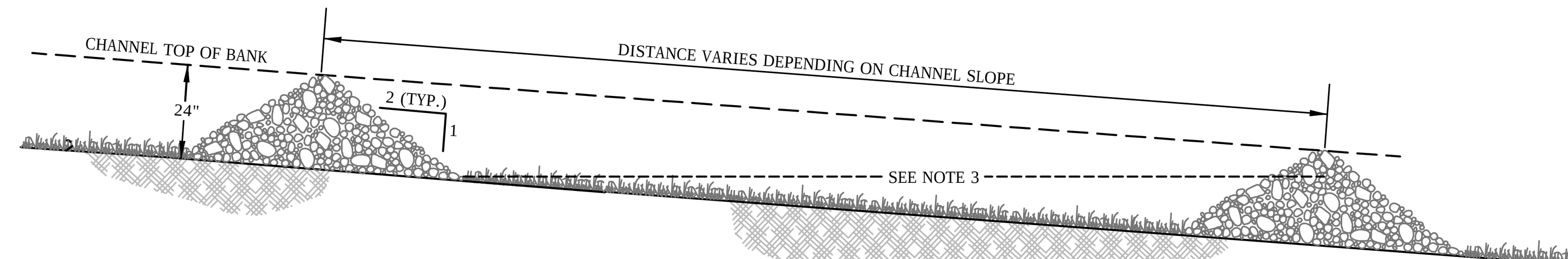
NOT TO SCALE



SECTION VIEW

NOTES

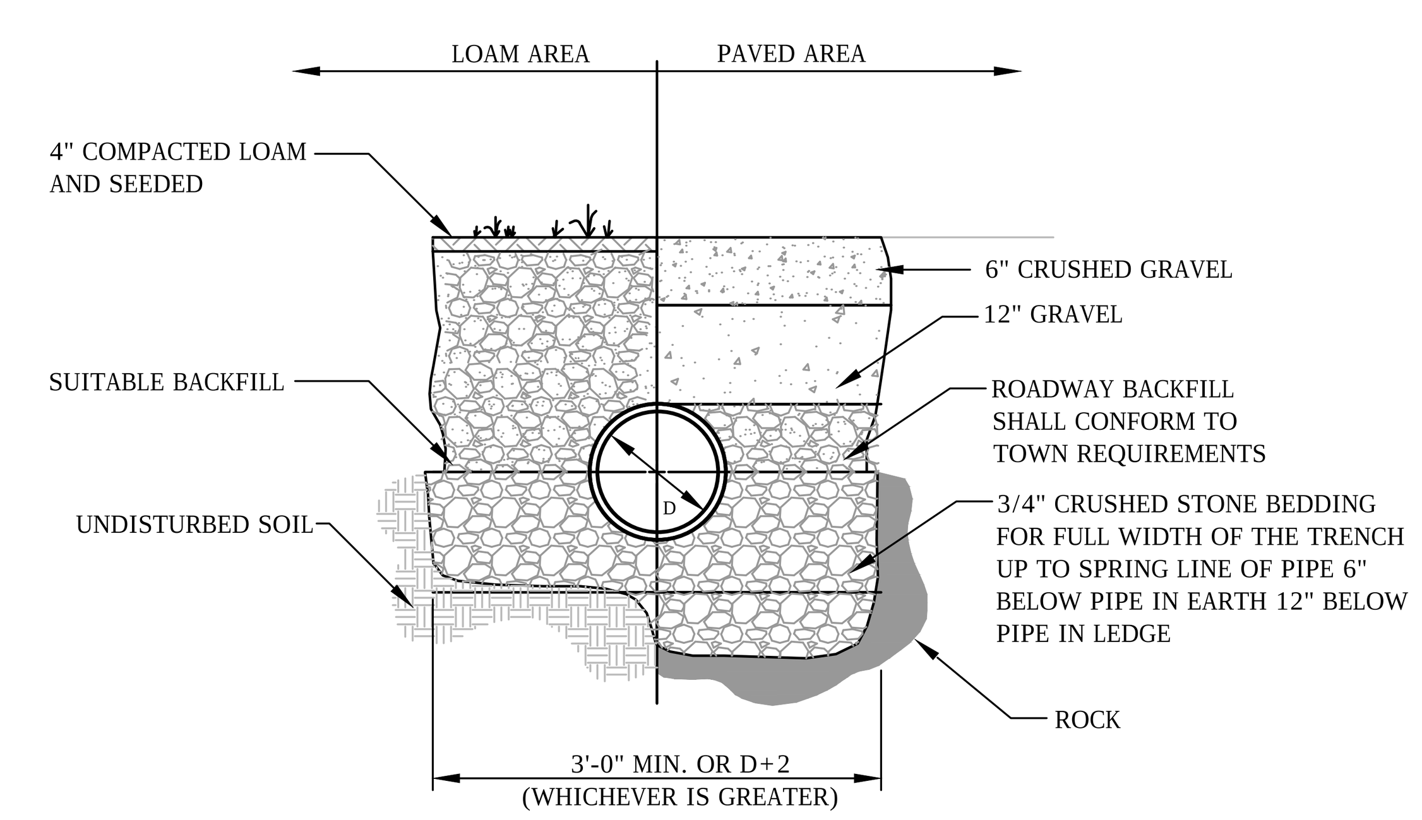
1. CONSTRUCT ROCK CHECK DAMS WHERE INDICATED ON THE PLANS OR AS NECESSARY.
2. CONSTRUCT SPILLWAY IN CENTER OF ROCK CHECK DAM 6" BELOW TOP OF CHANNEL.
3. THE MAXIMUM SPACING BETWEEN THE CHECK DAMS SHOULD BE SUCH THAT THE TOE OF THE UPSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE SPILLWAY ELEVATION OF THE DOWNSTREAM CHECK DAM, THIS WILL VARY DEPENDING ON THE SLOPE OF THE CHANNEL.
4. ROCK CHECK DAMS SHALL CONSIST OF A WELL GRADED MIXTURE OF 2" - 3" STONE.
5. REMOVE ROCK CHECK DAMS AND ANY ACCUMULATED SILT IN CHANNEL ONCE PERMANENT CHANNEL LININGS HAVE BEEN ESTABLISHED AND STABILIZED.



PROFILE VIEW

ROCK CHECK DAM DETAIL

NO SCALE



TYPICAL CULVERT TRENCH DETAIL

NOT TO SCALE

DATE OF PRINT
JUNE 28 2017
HORIZONS ENGINEERING

horizons Engineering Inc.
Littleton NH • New London NH • Newport VT
603-444-4111 603-877-0116 802-334-6434

JASON COTE-WONG

RESIDENTIAL SUBDIVISION AND STORMWATER PERMITTING
EAST MONTPELIER, VERMONT

STORMWATER DETAILS AND NOTES

NO.	DATE	REVISION DESCRIPTION	ENG	DWG

DATE: FEB 2017	PROJECT #: 16202
ENGIN'D BY: MLB	DRAWN BY: MLB
CHECK'D BY: BDL	ARCHIVE #: H-5334

last revised: 2015 MAY 25

T:\16202 Wong Stormwater\DWGS\Final\HE_SITEPLAN_4.dwg, SHT8-DETAILS, 6/28/2017 8:17:59 AM, MBurnell