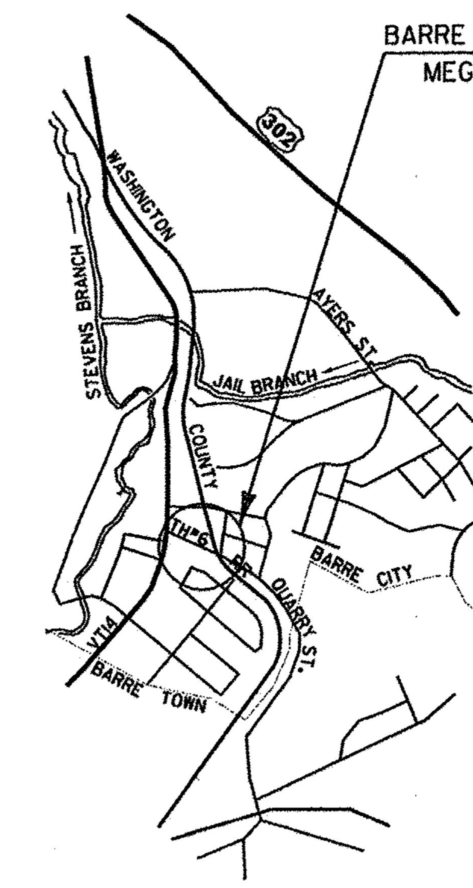
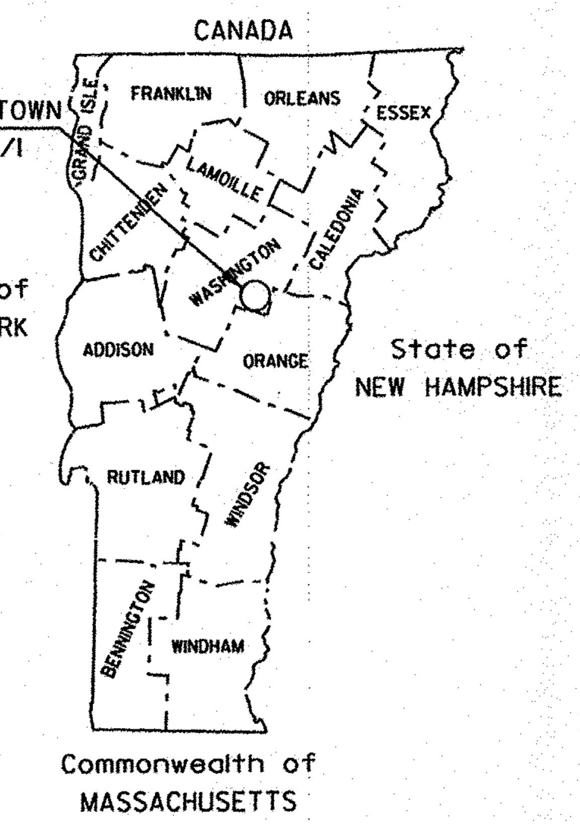
TRAFFIC DATA
QUARRY STREET (TH#6) TRAFFIC DATA
ADT 2017 = 4000
ADT 2037 = 4200
DHV 2037 = 480
%D = 65%
ADTT 2037 = 480
% T = 10%
18 KIP ESALS (2017-2037) = 1,812,000
18 KIP ESALS (2017-2057) = 4,040,000
POSTED SPEED = 25 MPH

STATE OF VERMONT
AGENCY OF TRANSPORTATION





0 1250 2500
SCALE IN FEET

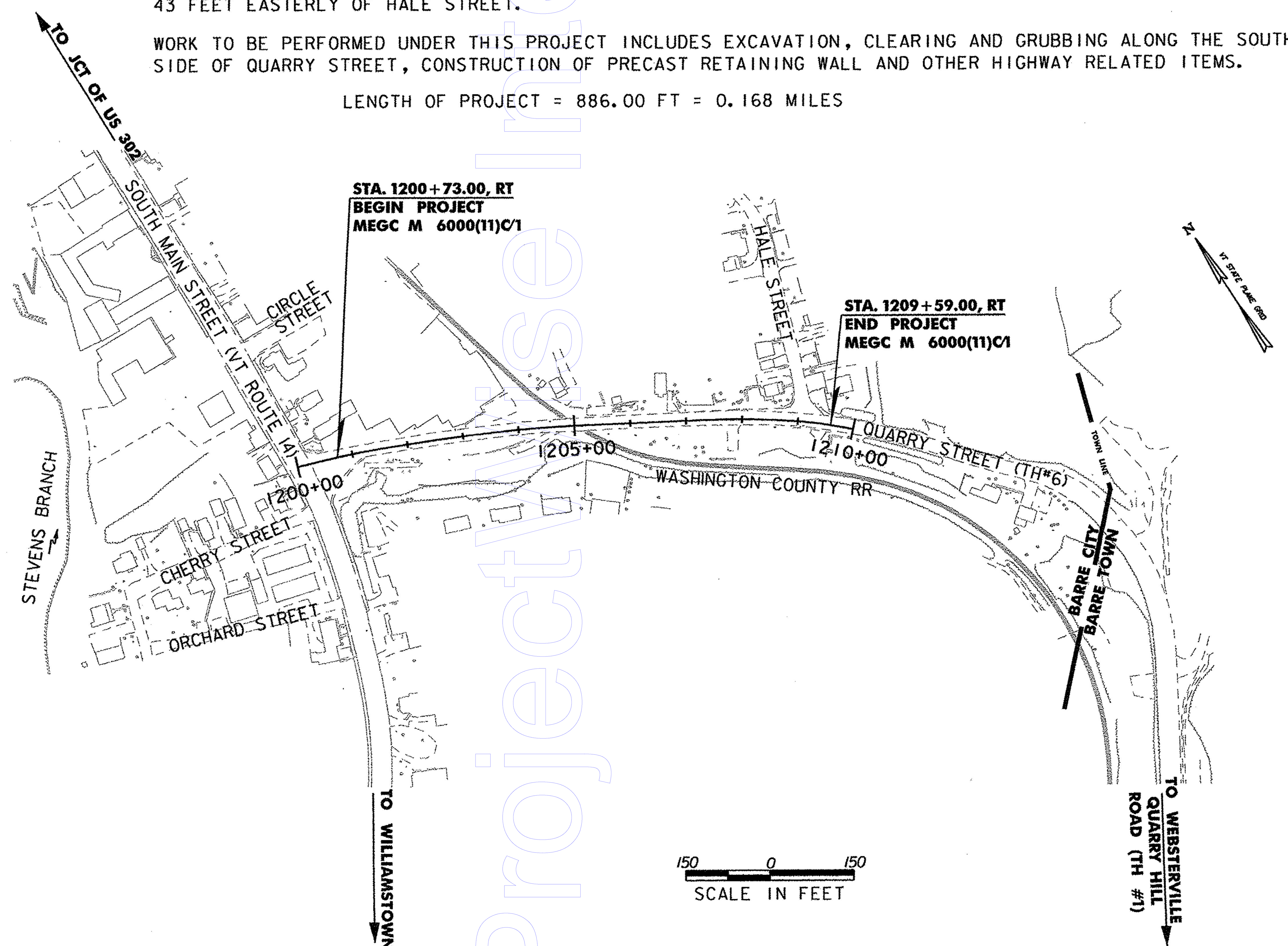
PROPOSED IMPROVEMENT

BARRE CITY - BARRE TOWN
COUNTY OF WASHINGTON
QUARRY STREET (TH 6), (MINOR ARTERIAL)

BEGINNING AT A POINT, IN THE CITY OF BARRE, OFF VERMONT ROUTE 14 AT MM 0.29, (THE INTERSECTION OF VT ROUTE 14 AND QUARRY STREET - TH#6) APPROXIMATELY 73 FEET EASTERLY ALONG QUARRY STREET, AND EXTENDING EASTERLY FOR APPROXIMATELY 886 FEET (0.168 MILES) ALONG QUARRY STREET AND ENDING APPROXIMATELY 43 FEET EASTERLY OF HALE STREET.

WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES EXCAVATION, CLEARING AND GRUBBING ALONG THE SOUTHERLY SIDE OF QUARRY STREET, CONSTRUCTION OF PRECAST RETAINING WALL AND OTHER HIGHWAY RELATED ITEMS.

LENGTH OF PROJECT = 886.00 FT = 0.168 MILES



150 0 150
SCALE IN FEET

RECORD PLANS	
CONTRACTOR:	B.U.R. CONSTRUCTION, LLC, CLAREMONT, NH
RESIDENT ENGINEER:	PETE HODGSON
CONSTRUCTION BEGAN:	APRIL 18, 2017
CONSTRUCTION COMPLETE:	AUGUST 02, 2017
RECORD PLANS BY:	PETE HODGSON & JESSE IVES

I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.

BY P. Hodgson RESIDENT ENGINEER

DATE 10/31/18

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

STATE OF VERMONT
NO. 5437
Civil
LICENSED
PROFESSIONAL ENGINEER
11/7/16

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 2

SURVEYED BY : VTrans
SURVEYED DATE : 12/2013

DATUM
VERTICAL: NAVD 1929
HORIZONTAL: NAD 1983

vhb

DIRECTOR OF PROJECT DELIVERY
APPROVED [signature] DATE 11/8/2016

PROJECT MANAGER : ERIN LEWIS, PE

PROJECT NAME : BARRE CITY - BARRE TOWN
PROJECT NUMBER : MEGC M 6000(11)C/1

SHEET 1 OF 40 SHEETS

INDEX OF SHEETS

STANDARD SHEETS

B-5	06-01-1994
F-2	06-01-1994
D-3	06-01-1994
E-121	08-08-1995
E-190	06-30-2003
T-1	04-25-2016
T-2	04-25-2016
T-10	08-06-2012
T-28	08-06-2012
T-30	08-06-2012
T-45	01-02-2013
T-56	10-26-2015

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/1

FILE NAME: z15d040ind.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: P.A. MILLER
INDEX OF SHEETS

PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 2 OF 39

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

THE SYMBOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOGY. THE SYMBOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT CODE	DESCRIPTION
CH	CHANNEL EASEMENT
CONST	CONSTRUCTION EASEMENT
CUL	CULVERT EASEMENT
D&C	DISCONNECT & CONNECT
DIT	DITCH EASEMENT
DR	DRAINAGE EASEMENT
DRIVE	DRIVEWAY EASEMENT
EC	EROSION CONTROL
HWY	HIGHWAY EASEMENT
I&M	INSTALL & MAINTAIN EASEMENT
LAND	LANDSCAPE EASEMENT
R&RES	REMOVE & RESET
R&REP	REMOVE & REPLACE
SR	SLOPE RIGHT
UE	UTILITY EASEMENT
(P)	PERMANENT EASEMENT
(T)	TEMPORARY EASEMENT
BNDNS	BOUND SET
BNDNS	BOUND TO BE SET
IPNS	IRON PIN SET
IPNS	IRON PIN TO BE SET
CALC	EXISTING ROW POINT
PROW	PROPOSED ROW POINT
[LENGTH]	LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT CODE	DESCRIPTION
APL	BOUND APPARENT LOCATION
BM	BENCHMARK
BND	BOUND
CB	CATCH BASIN
COMB	COMBINATION POLE
DITHR	DROP INLET THROATED DNC
EL	ELECTRIC POWER POLE
FPOLE	FLAGPOLE
GASFIL	GAS FILLER
GP	GUIDE POST
GSO	GAS SHUT OFF
GUY	GUY POLE
GUYW	GUY WIRE
GV	GATE VALUE
H	TREE HARDWOOD
HCTRL	CONTROL HORIZONTAL
HVCTRL	CONTROL HORIZ. & VERTICAL
HYD	HYDRANT
IP	IRON PIN
IPIPE	IRON PIPE
LI	LIGHT - STREET OR YARD
MB	MAILBOX
MH	MANHOLE (MH)
MM	MILE MARKER
PM	PARKING METER
PMK	PROJECT MARKER
POST	POST STONE/WOOD
RRSIG	RAILROAD SIGNAL
RRSL	RAILROAD SWITCH LEVER
S	TREE SOFTWOOD
SAT	SATELLITE DISH
SHRUB	SHRUB
SIGN	SIGN
STUMP	STUMP
TEL	TELEPHONE POLE
TIE	TIE
TSIGN	SIGN W/DOUBLE POST
VCTRL	CONTROL VERTICAL
WELL	WELL
WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOGY

UNDERGROUND UTILITIES

UGU	UTILITY (GENERIC-UNKNOWN)
UT	TELEPHONE
UE	ELECTRIC
UC	CABLE (TV)
UEC	ELECTRIC+CABLE
UET	ELECTRIC+TELEPHONE
UCT	CABLE+TELEPHONE
UECT	ELECTRIC+CABLE+TELEP.
G	GAS LINE
W	WATER LINE
S	SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

AGU	UTILITY (GENERIC-UNKNOWN)
T	TELEPHONE
E	ELECTRIC
C	CABLE (TV)
EC	ELECTRIC+CABLE
ET	ELECTRIC+TELEPHONE
AER E&T	ELECTRIC+TELEPHONE
CT	CABLE+TELEPHONE
ECT	ELECTRIC+CABLE+TELEP.
	UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

CZ	CLEAR ZONE
	PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

	TOP OF CUT SLOPE
	TOE OF FILL SLOPE
	STONE FILL
	BOTTOM OF PROPOSED DITCH
	CULVERT PROPOSED
	STRUCTURE SUBSURFACE
PDF	PROJECT DEMARCATION FENCE
BF	BARRIER FENCE
	TREE PROTECTION ZONE (TPZ)
	STRIPING LINE REMOVAL
	SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

TOWN LINE	TOWN BOUNDARY LINE
COUNTY LINE	COUNTY BOUNDARY LINE
STATE LINE	STATE BOUNDARY LINE
	PROPOSED STATE R.O.W. (LIMITED ACCESS)
	PROPOSED STATE R.O.W.
	STATE ROW (LIMITED ACCESS)
	STATE ROW
	TOWN ROW
	PERMANENT EASEMENT LINE (P)
	TEMPORARY EASEMENT LINE (T)
	SURVEY LINE
P / L	PROPERTY LINE (P/L)
SR	SLOPE RIGHTS
6f	6F PROPERTY BOUNDARY
4f	4F PROPERTY BOUNDARY
HAZ	HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

- FILTER CURTAIN
- SILT FENCE
- SILT FENCE WOVEN WIRE
- CHECK DAM
- DISTURBED AREAS REQUIRING RE-VEGETATION
- EROSION MATTING

SEE EPSC DETAIL SHEETS FOR ADDITIONAL SYMBOLOGY

ENVIRONMENTAL RESOURCES

	WETLAND BOUNDARY
	RIPARIAN BUFFER ZONE
	WETLAND BUFFER ZONE
	SOIL TYPE BOUNDARY
T&E	THREATENED & ENDANGERED SPECIES
HAZ	HAZARDOUS WASTE AREA
AG	AGRICULTURAL LAND
HABITAT	FISH & WILDLIFE HABITAT
FLOOD PLAIN	FLOOD PLAIN
OHW	ORDINARY HIGH WATER (OHW)
	STORM WATER
	USDA FOREST SERVICE LANDS
	WILDLIFE HABITAT SUIT/CONN

ARCHEOLOGICAL & HISTORIC

ARCH	ARCHEOLOGICAL BOUNDARY
HISTORIC DIST	HISTORIC DISTRICT BOUNDARY
HISTORIC	HISTORIC AREA
H	HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

- ROAD EDGE PAVEMENT
- ROAD EDGE GRAVEL
- DRIVEWAY EDGE
- DITCH
- FOUNDATION
- FENCE (EXISTING)
- FENCE WOOD POST
- FENCE STEEL POST
- GARDEN
- ROAD GUARDRAIL
- RAILROAD TRACKS
- CULVERT (EXISTING)
- STONE WALL
- WALL
- WOOD LINE
- BRUSH LINE
- HEDGE
- BODY OF WATER EDGE
- LEDGE EXPOSED

PROJECT NAME:	BARRE CITY - BARRE TOWN		
PROJECT NUMBER:	MEGC M 6000(II)C/I		
FILE NAME:	z15d040_legend.dgn	PLOT DATE:	12/2/2016
PROJECT LEADER:	A.P. GUYETTE	DRAWN BY:	VTRANS
DESIGNED BY:	VTRANS	CHECKED BY:	VTRANS
CONVENTIONAL SYMBOLOGY LEGEND SHEET		SHEET	3 OF 39

vhb

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2011, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 6th EDITION AND ITS LATEST REVISIONS, AND SUCH SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THE FINAL CONTRACT DOCUMENTS.

2. ANY WASTE MATERIAL SHALL BE REMOVED AND HAULED TO A PREVIOUSLY APPROVED FACILITY.

3. THE LOCATIONS, SIZES, AND TYPES OF EXISTING UTILITIES ARE SHOWN AS AN APPROXIMATE REPRESENTATION ONLY. THE OWNER OR DESIGN ENGINEER HAVE NOT INDEPENDENTLY VERIFIED ALL OF THIS INFORMATION AS SHOWN ON THE PLANS. THE UTILITY INFORMATION SHOWN DOES NOT GUARANTEE THE ACTUAL EXISTENCE, SERVICEABILITY, OR OTHER DATA CONCERNING THE UTILITIES, NOR DOES IT GUARANTEE AGAINST THE POSSIBILITY THAT ADDITIONAL UTILITIES MAY BE PRESENT THAT ARE NOT SHOWN ON THE PLANS. PRIOR TO ORDERING MATERIALS AND BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL VERIFY AND DETERMINE THE EXACT LOCATIONS, SIZES, AND ELEVATIONS OF THE POINTS OF CONNECTIONS TO EXISTING UTILITIES, AND SHALL CONFIRM THAT THERE IS NO INTERFERENCE WITH EXISTING UTILITIES AND THE PROPOSED UTILITY ROUTES, INCLUDING ROUTES WITHIN THE PUBLIC RIGHTS OF WAY. ALL COSTS ASSOCIATED WITH VERIFYING AND DETERMINING UTILITY LOCATIONS WILL BE PAID FOR UNDER ITEM 204.22 "TRENCH EXCAVATION OF EARTH, EXPLORATORY"

4. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, OR EXISTING CONDITIONS DIFFER FROM THOSE SHOWN SUCH THAT THE WORK CANNOT BE COMPLETED AS INTENDED, THE LOCATION, ELEVATION, AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED AND THE INFORMATION FURNISHED IN WRITING TO THE ENGINEER FOR THE RESOLUTION OF THE CONFLICT.

5. EXISTING UNDERGROUND AND AERIAL FACILITIES ARE LOCATED THROUGHOUT THE PROJECT AREA. OWNERSHIP OF THESE FACILITIES INCLUDES OPERATIONAL UTILITY COMPANIES, MUNICIPALITIES, AND INDIVIDUAL PROPERTY OWNERS. THESE UNDERGROUND AND AERIAL FACILITIES WILL NOT REQUIRE ADJUSTMENT DURING CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR IS CAUTIONED TO PROTECT THESE FACILITIES FROM DAMAGE.

CONSTRUCTION NOTES

1. THE CONTRACTOR SHALL ERECT, MAINTAIN, REMOVE, AND/OR RESET AS REQUIRED ALL ON-PROJECT CONSTRUCTION SIGNS AND BARRICADES. ALL SIGNS AND BARRICADES SHALL BE INSPECTED AND REPAIRED DAILY. ALL SIGNS AND BARRICADES SHALL CONFORM TO THE LATEST VERSION OF THE MUTCD AND SHALL BE CLEANED OF DUST AND DEBRIS WEEKLY.

2. FULL ACCESS TO ALL DRIVES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED AT ALL TIMES. IF FULL ACCESS CANNOT BE MAINTAINED, THE CONTRACTOR SHALL CONTACT AND COORDINATE WITH THE BUSINESS OR PROPERTY OWNER AT LEAST 24 HOURS IN ADVANCE OF TEMPORARILY CLOSING OFF THE ACCESS.

3. IN THE EVENT THAT SUSPECTED CONTAMINATED SOIL, GROUNDWATER, AND OTHER MEDIA ARE ENCOUNTERED DURING EXCAVATION AND CONSTRUCTION ACTIVITIES BASED ON VISUAL, OLFACTORY, OR OTHER EVIDENCE, THE CONTRACTOR SHALL STOP WORK IN THE VICINITY OF THE SUSPECT MATERIAL TO AVOID FURTHER SPREADING OF THE MATERIAL, AND SHALL NOTIFY THE ENGINEER IMMEDIATELY SO THAT THE APPROPRIATE TESTING AND SUBSEQUENT ACTION CAN BE TAKEN.

4. CONTRACTOR IS RESPONSIBLE FOR DEVELOPING A DETAILED TRAFFIC CONTROL PLAN AND MAINTAINING VEHICULAR AND PEDESTRIAN TRAFFIC IN ACCORDANCE WITH THE TRAFFIC CONTROL NOTES IN THESE PLANS, AND IN ACCORDANCE WITH SECTION 641 FOR TRAFFIC CONTROL AS DEFINED IN THE VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION BOOK, DATED 2011 AND THE LATEST VERSION OF THE MUTCD.

PRECAST CONCRETE RETAINING WALL

1. THE DESIGN, CONSTRUCTION, HANDLING, AND ASSEMBLY OF THE PRECAST CONCRETE RETAINING WALL SHALL BE IN ACCORDANCE WITH THE SPECIAL PROVISIONS. HANDLING AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AS APPLICABLE.

2. THE PRECAST CONCRETE RETAINING WALL WILL BE PAID FOR UNDER ITEM 900.670, (SPECIAL PROVISION (RETAINING WALL).

3. THE CONTRACTOR SHALL ENSURE THAT THE SELECTED PRECAST CONCRETE RETAINING WALL IS CONSTRUCTED ENTIRELY WITHIN THE STATE OWNED RIGHT-OF-WAY AND PROJECT LIMITS AS SHOWN IN THE PLANS. PRECAST CONCRETE RETAINING WALLS WHICH REQUIRE PERMANENT EASEMENTS TO THE ADJACENT PROPERTIES WILL NOT BE PERMITTED.

4. THE PRECAST CONCRETE RETAINING WALL SHALL BE DESIGNED BY THE FABRICATOR IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS REFERENCED IN GENERAL NOTE 1. THE DESIGN SHALL INCLUDE THE EFFECTS OF ALL APPLICABLE LOADS INCLUDING VEHICULAR SURCHARGE. DESIGN CALCULATIONS SHALL BE SUBMITTED WITH FABRICATION DRAWINGS STAMPED BY AN ENGINEER REGISTERED IN THE STATE OF VERMONT.

5. THE DESIGN OF THE WALL SHALL INCORPORATE PROVISIONS FOR ADJACENT OBSTRUCTIONS SUCH AS DRAINAGE FEATURES AND GUARDRAIL POSTS IF NECESSARY. ANY CHANGES TO THE WALL SYSTEM SHALL BE DETAILED IN THE FABRICATION DRAWINGS.

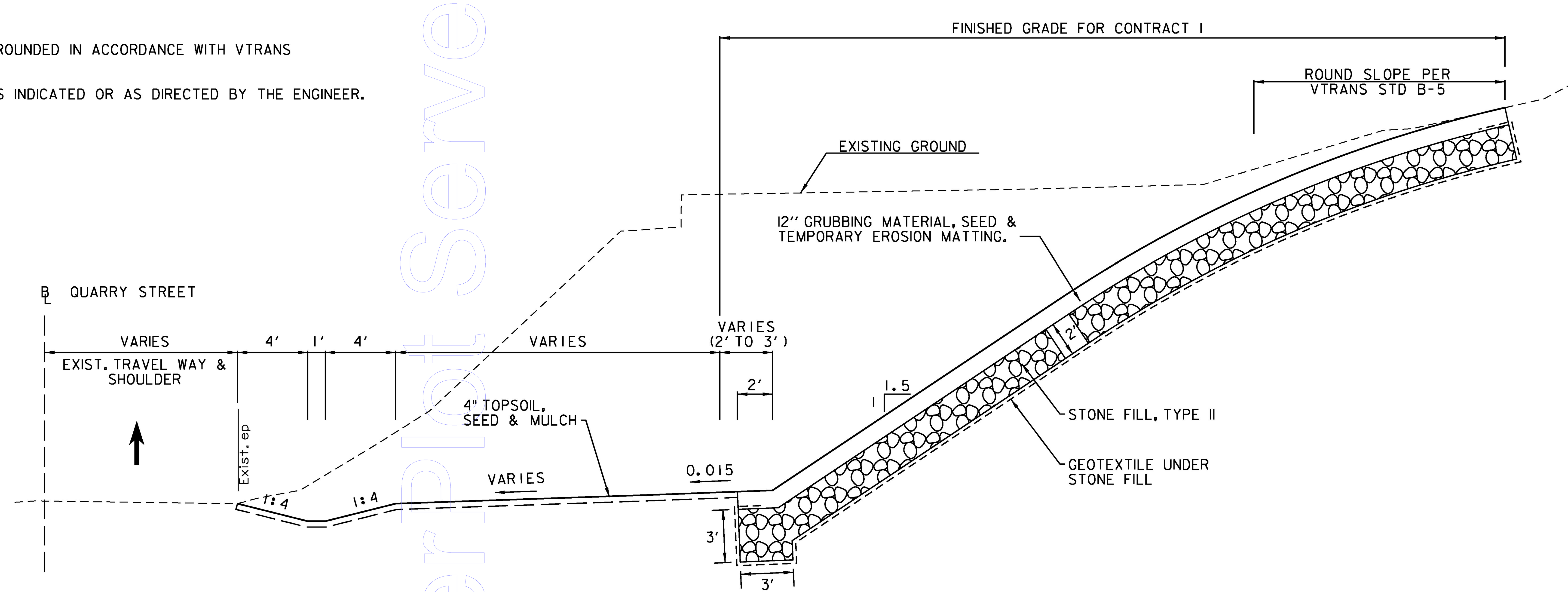
6. DESIGN VALUES:

   A. BACKFILL SOIL PARAMETERS
      i. UNIT WEIGHT = 140 LB/FT³
      ii. FRICTION ANGLE = 34°
   B. BEARING STRATUM AND RETAINED SOIL PARAMETERS
      i. UNIT WEIGHT = 135 LB/FT³
      ii. FRICTION ANGLE = 34°
   C. REQUIRED DESIGN LIFE = 75 YEARS
   D. FACTORED BEARING RESISTANCE AT STRENGTH LIMIT STATE = 7.0 KIPS/FT²

TYPICAL SECTIONS

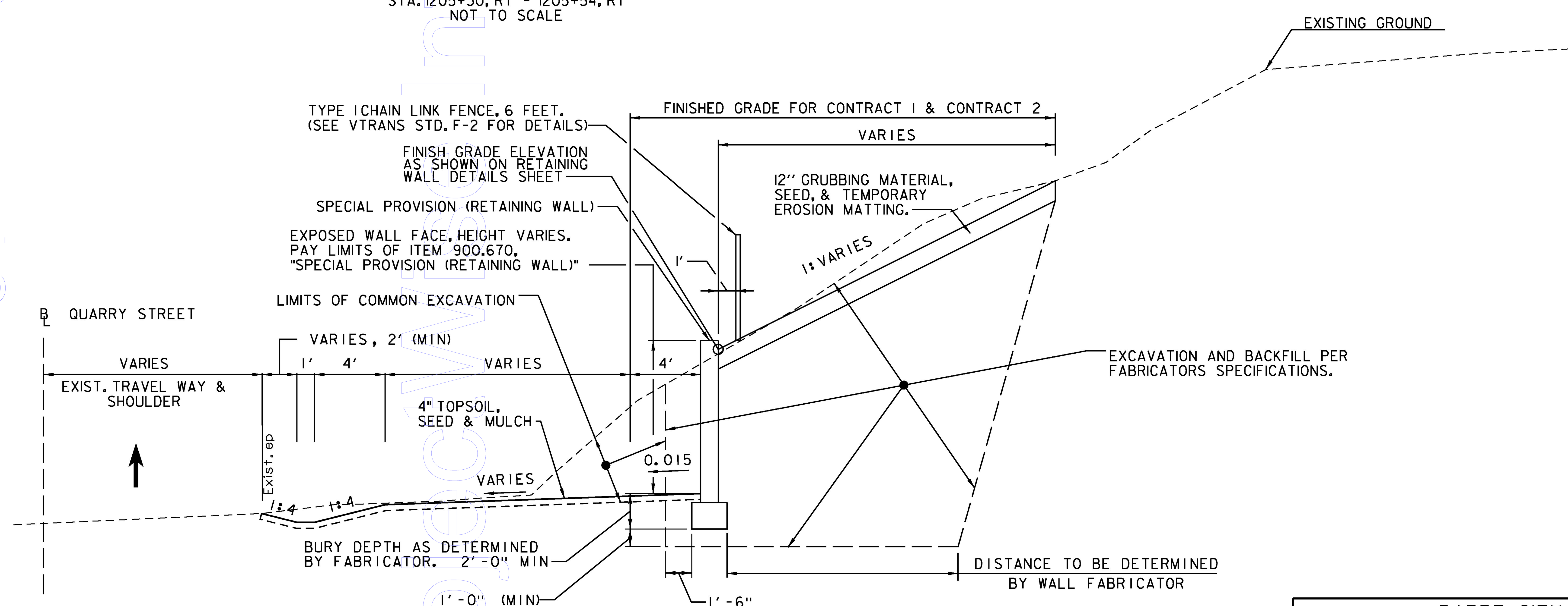
NOTES

1. SLOPE ROUNDING: ALL CUT SLOPES TO BE ROUNDED IN ACCORDANCE WITH VTRANS STANDARD SHEET B - 5.
2. YIELDING MARKER POSTS: TO BE PLACED AS INDICATED OR AS DIRECTED BY THE ENGINEER.



QUARRY STREET SLOPE EXCAVATION

STA. 1200+88, RT - 1204+40, RT
STA. 1205+30, RT - 1205+54, RT
NOT TO SCALE



QUARRY STREET RETAINING WALL

STA. 1204+24, RT - 1205+37, RT
NOT TO SCALE

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(II)C/1	
FILE NAME: z15d040_typ.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: P.A. MILLER	CHECKED BY: D.M. PECK
TYPICAL SECTION SHEET	SHEET 5 OF 39

vhb

GPS CONTROL POINTS

HVCTRL #1

STANDARD DISK STAMPED
Proventure

N = 625936.59
E = 1634048.21
ELEV. = 779.26

DESCRIBED BY VERMONT AGENCY OF TRANSPORTATION 1996 (DJM)
GENERAL LOCATION - RICHARDSON RD, BARRE OWNERSHIP - PHILLIP PROVENCHER TO REACH FROM THE INTERSECTION OF U.S. RTE 302 AND RICHARDSON RD GO 0.5 MI (0.8 KM) NORTHEAST AND NORTHWEST ALONG RICHARDSON RD TO A PRIVATE PAVED DRIVE LEFT. TURN LEFT AND GO NORTHWEST ALONG PRIVATE DRIVE FOR 0.1 MI (0.2 KM) TO A TAN AND WHITE 1½ STORY HOUSE AND END OF CAR TRAVEL. PACK 300 FT (91.4 M) SOUTHWEST THROUGH AN OLD HAY FIELD TO A POINT APPROX 30 FT (9.1 M) SOUTHWEST OF ITS HIGH POINT TO THE STATION. THE STATION IS 195.5 FT (59.6 M) WEST SOUTHWEST OF THE SOUTHWEST CORNER OF A 1 STORY SHED, 110.5 FT (33.7 M) SOUTHEAST OF THE EAST END OF AN EAST-WEST STONE WALL AT A 24 INCH MAPLE, 149 FT (45.4 M) SOUTHWEST OF THE WEST END OF AN OLD STONE FOUNDATION, AND 2 FT (0.6 M) SOUTH OF A FIBERGLASS WITNESS POST.

HVCTRL #2

STANDARD DISK STAMPED
Pepin
N = 611192.20
E = 1641686.70
ELEV. = 984.51

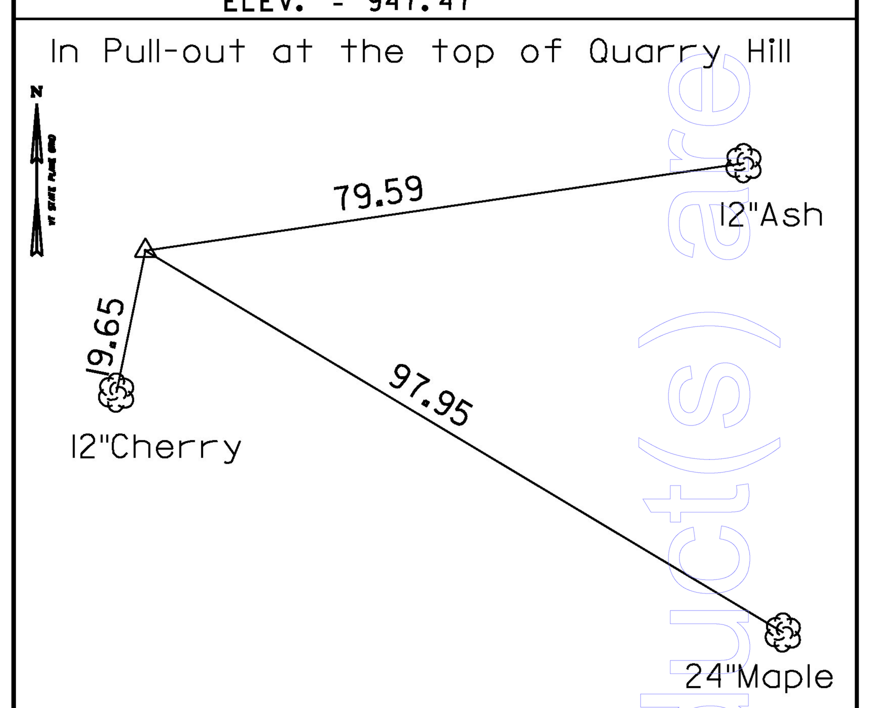
To reach from the intersection of Route 14 and Quarry Hill Road in the south end of Barre City, go southeast along Quarry Hill Road for 0.6 miles to its intersection with Quarry Hill Drive and the station in the southeast quadrant. The mark is a State of Vermont survey disk set in the top of a 1 ft diameter concrete monument that is set flush with the ground and is Mr. Pepins northwest property corner. The mark is 213.5 ft west by nortwest of a concrete highway bound, 152.9 ft northwest of the northwest corner of a chain link fence that surrounds an in ground swimming pool, 76.9 ft southwest of the centerline of Quarry Hill Road, 50.3 ft south of a sign post (Quarry Hill Drive), 39.5 ft east by southeast of the centerline of Quarry Hill Drive

• TO ALLOW THE STATE PLANE COORDINATES TO FIT THE AGENCY DESIGN PLANE, SUBTRACT 600,000 FROM THE NORTHING AND SUBTRACT 1,600,000 FROM THE EASTING

TRAVERSE TIES

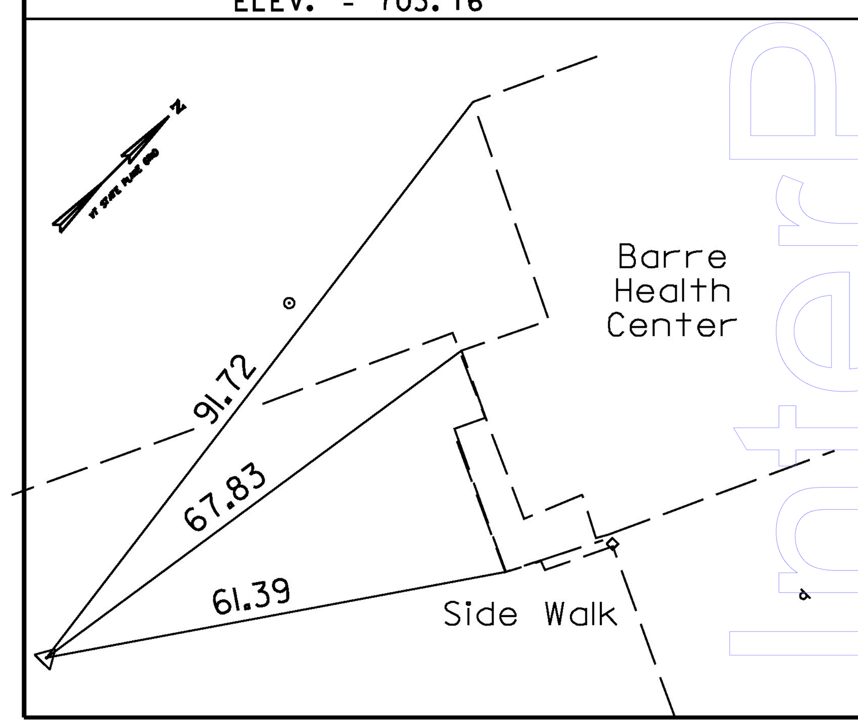
HVCTRL #3

NORTH = 11446.25
EAST = 41395.84
ELEV. = 947.47



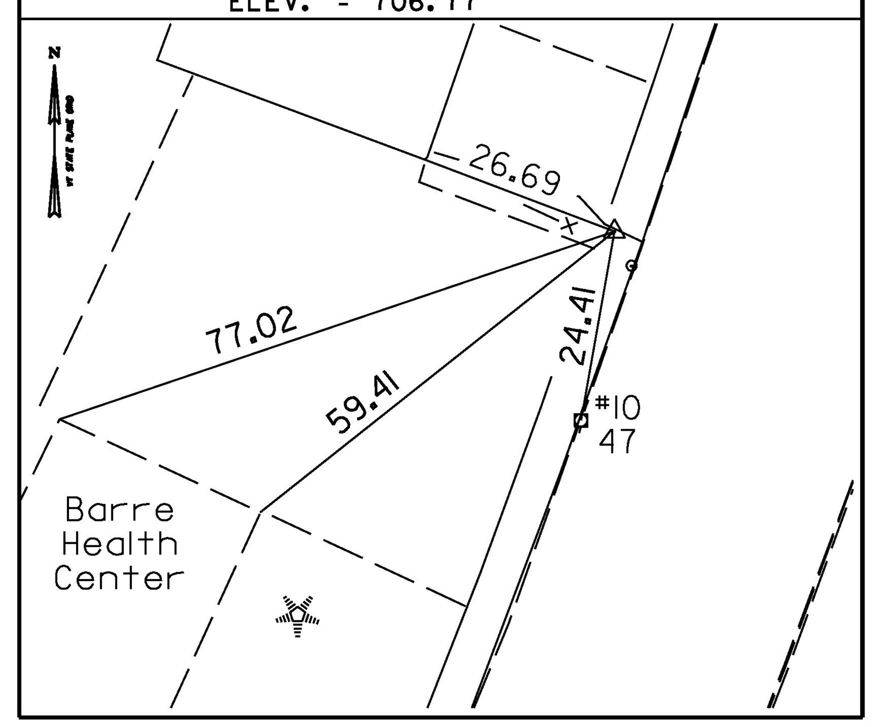
HVCTRL #4

NORTH = 13640.29
EAST = 40546.16
ELEV. = 703.16



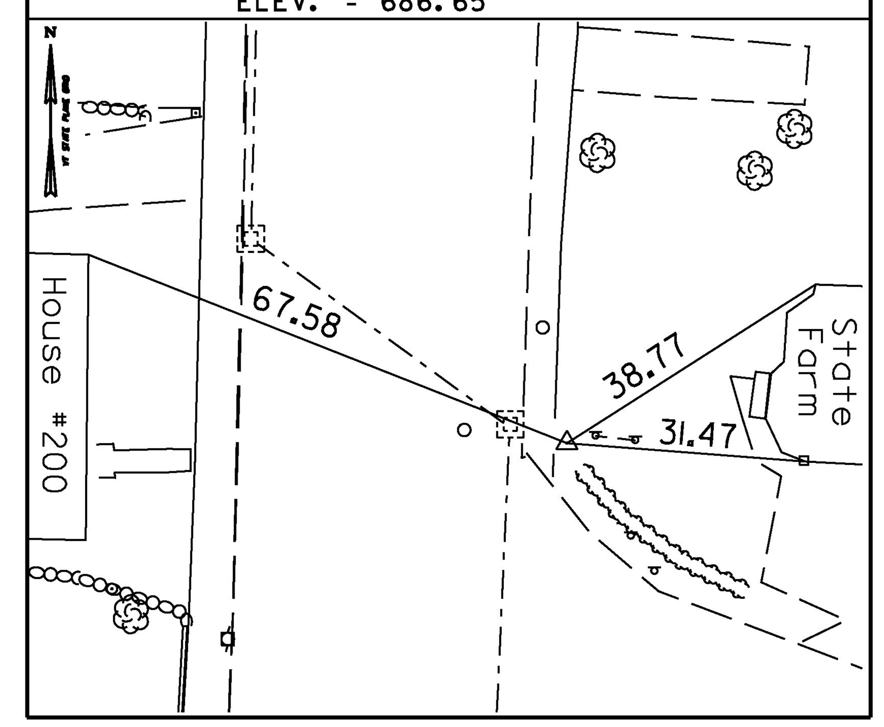
HVCTRL #5

NORTH = 13802.14
EAST = 40661.54
ELEV. = 706.77



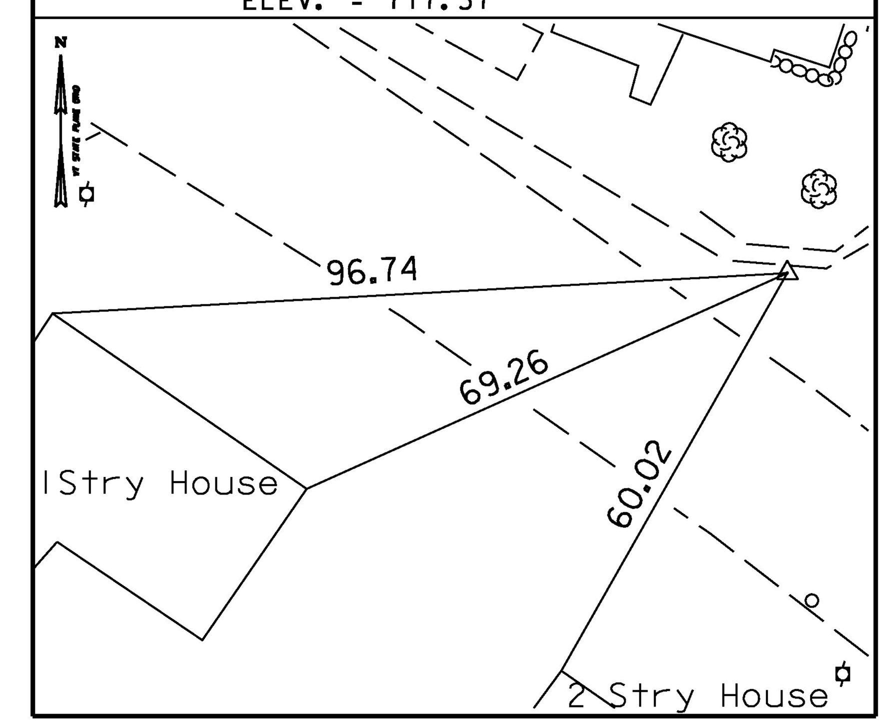
HVCTRL #6 = BND

NORTH = 14164.05
EAST = 40786.37
ELEV. = 686.65



HVCTRL #7

NORTH = 13761.94
EAST = 41555.41
ELEV. = 717.37

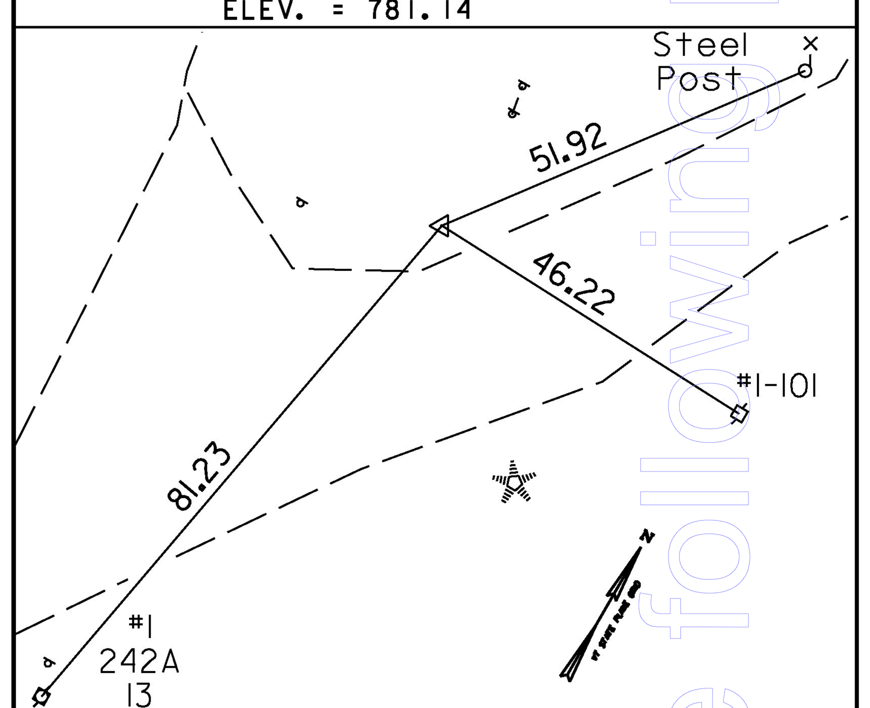


• MAIN TRAVERSE COMPLETED 04/1992 by R. Moreau P.C. & C. Harding & S. Goodwin

TRAVERSE TIES

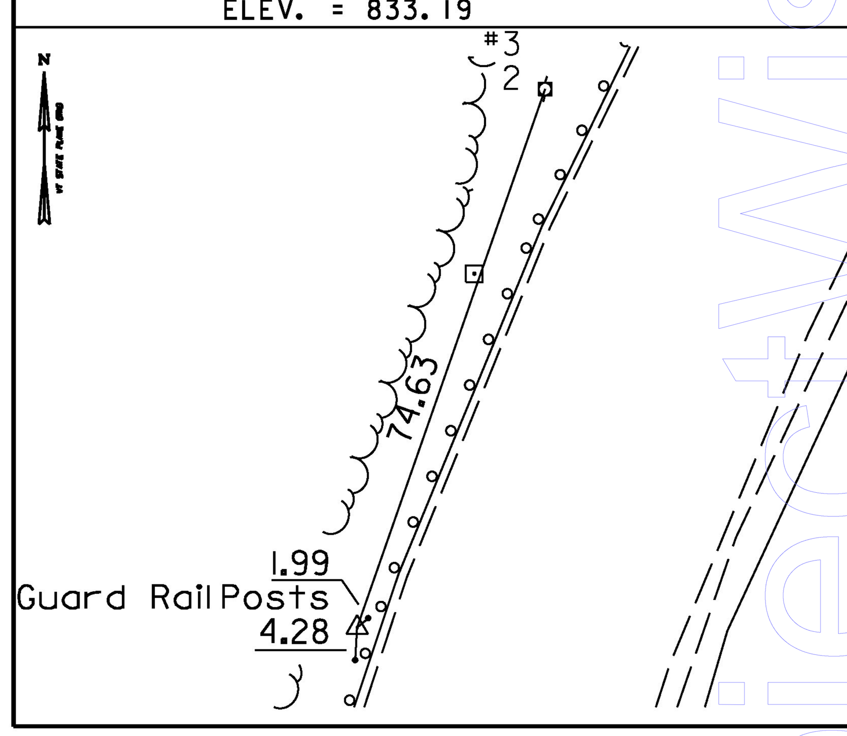
HVCTRL #8

NORTH = 13249.25
EAST = 41990.91
ELEV. = 781.14



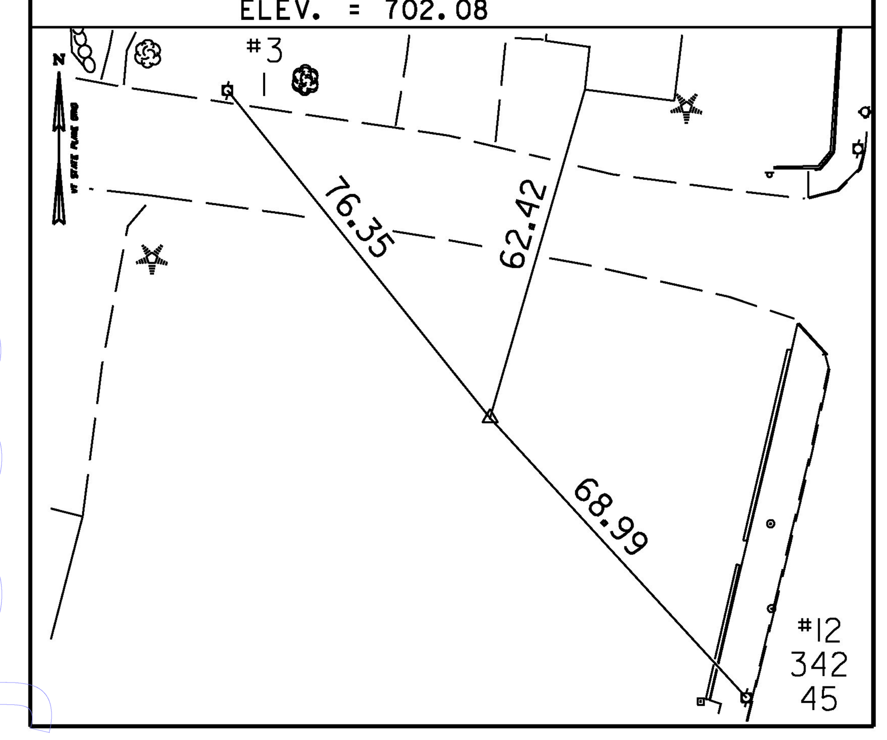
HVCTRL #9

NORTH = 12552.20
EAST = 41603.06
ELEV. = 833.19



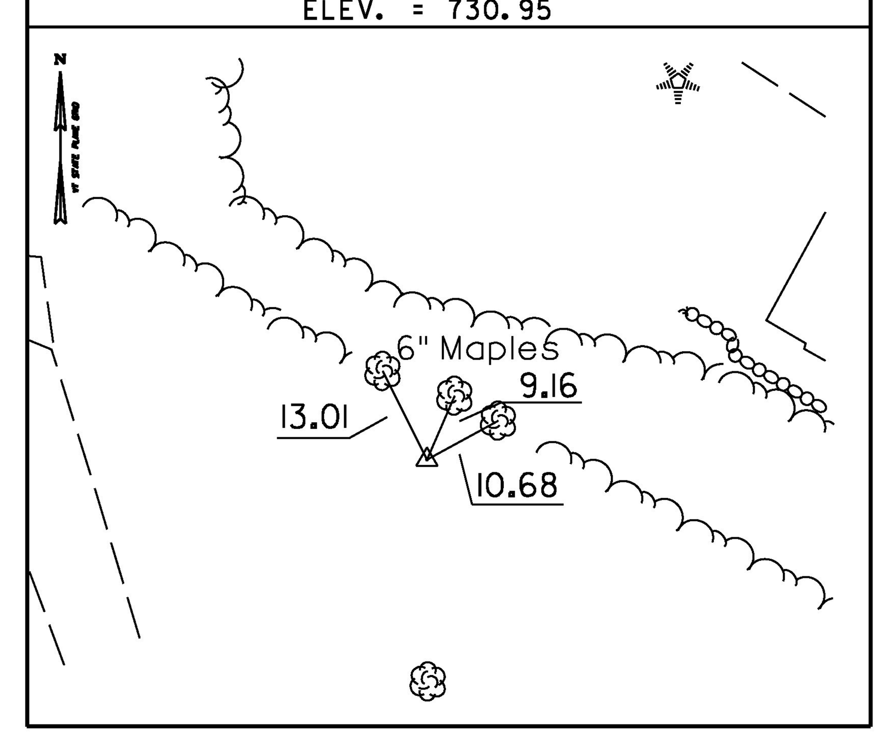
HVCTRL #60

NORTH = 14030.00
EAST = 40670.46
ELEV. = 702.08



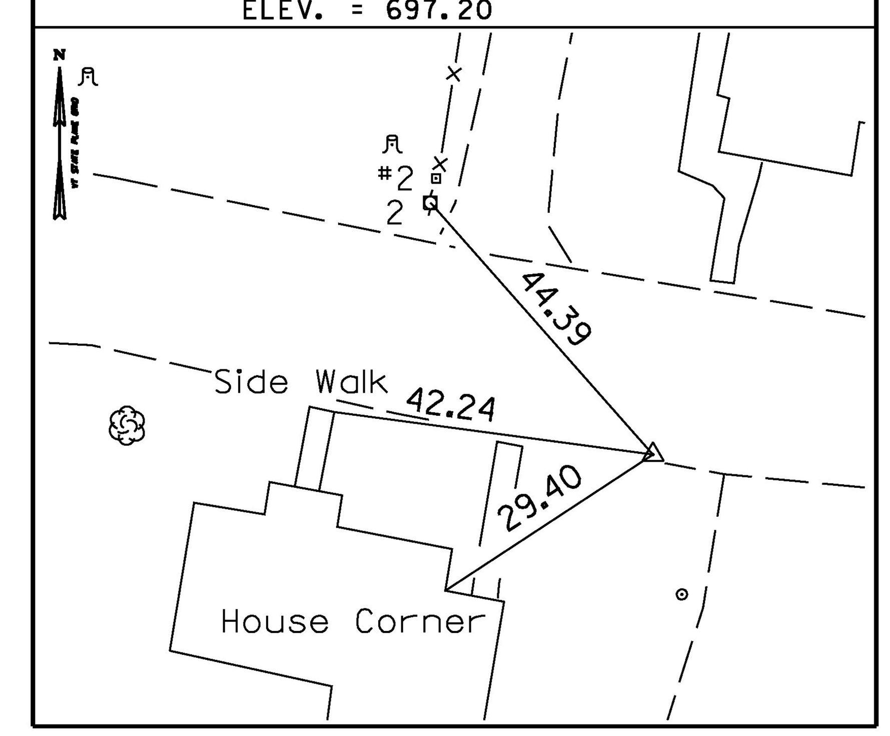
HVCTRL #61

NORTH = 13979.67
EAST = 40889.13
ELEV. = 730.95



HVCTRL #62

NORTH = 14079.19
EAST = 40537.93
ELEV. = 697.20



DATUM	
VERTICAL	NAVD 1929
HORIZONTAL	NAD 1983
ADJUSTMENT	Compass

vhb

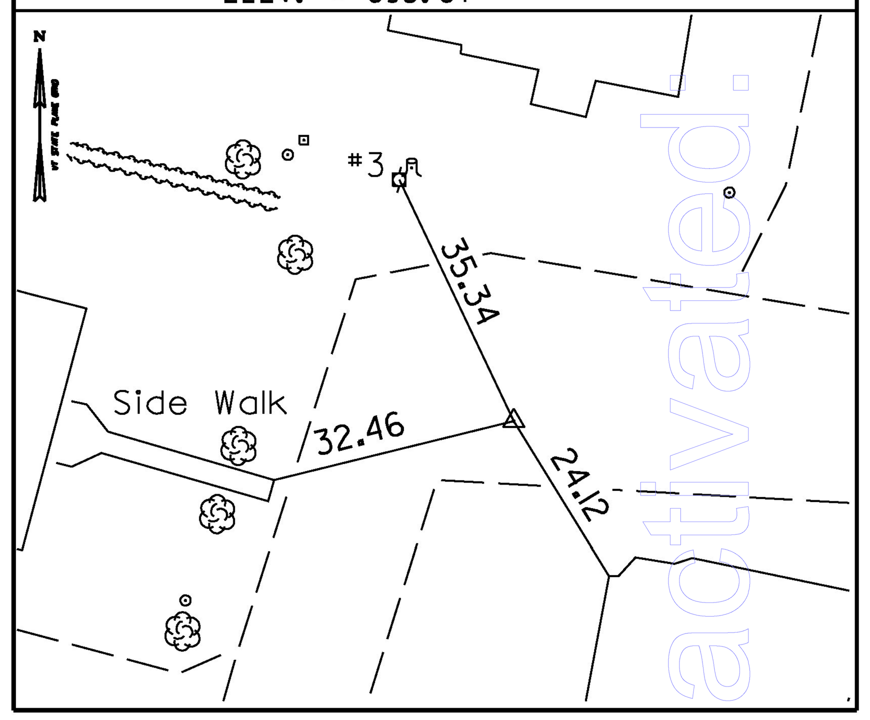
PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(11)C/1

FILE NAME: z15d040_tie.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
TIE SHEET (1of 2)

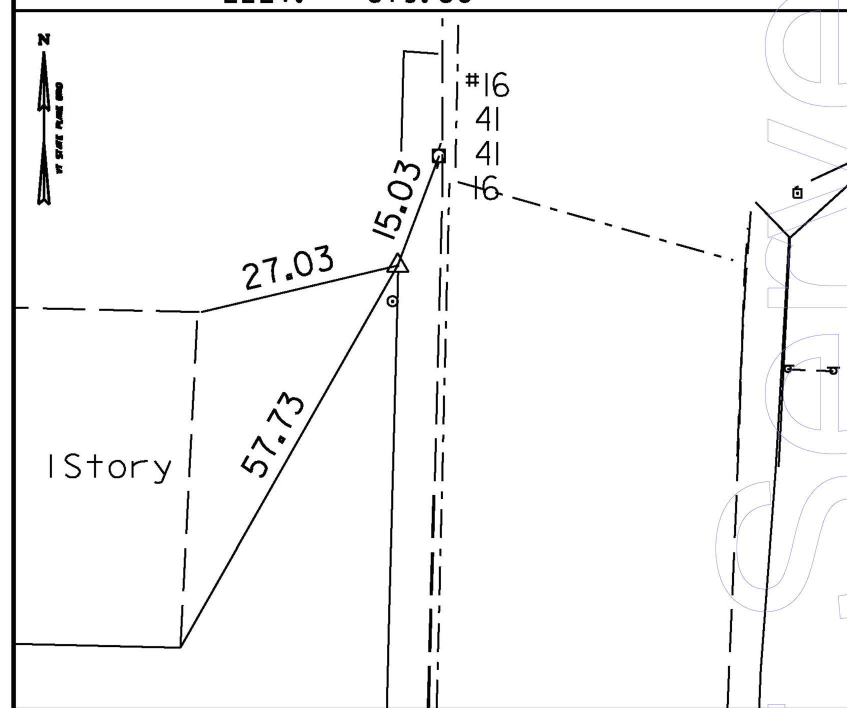
PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 6 OF 39

TRAVERSE TIES

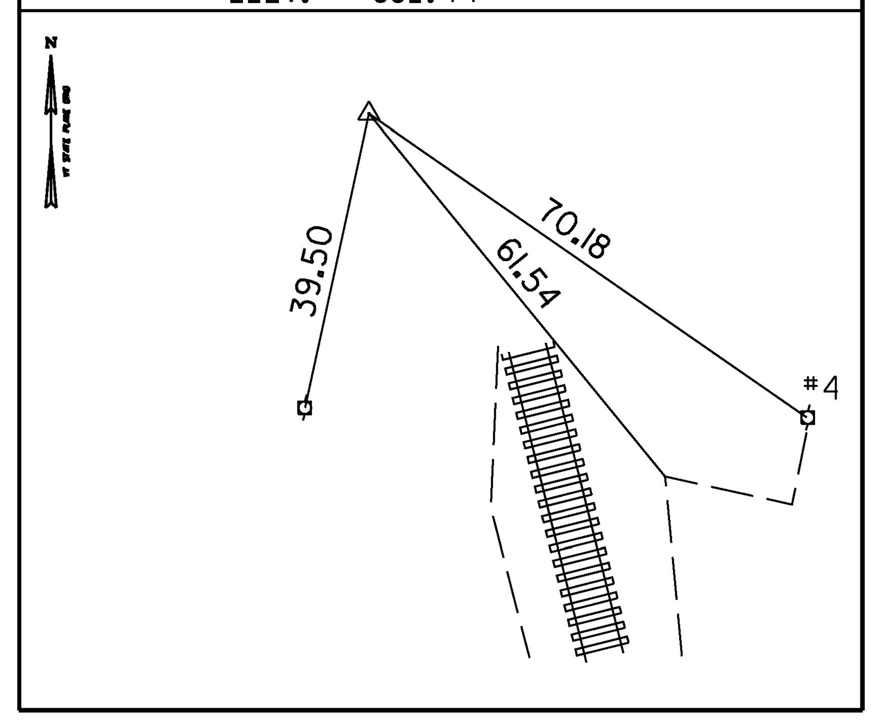
HVCTRL #63
NORTH = 14105.47
EAST = 40399.07
ELEV. = 693.61



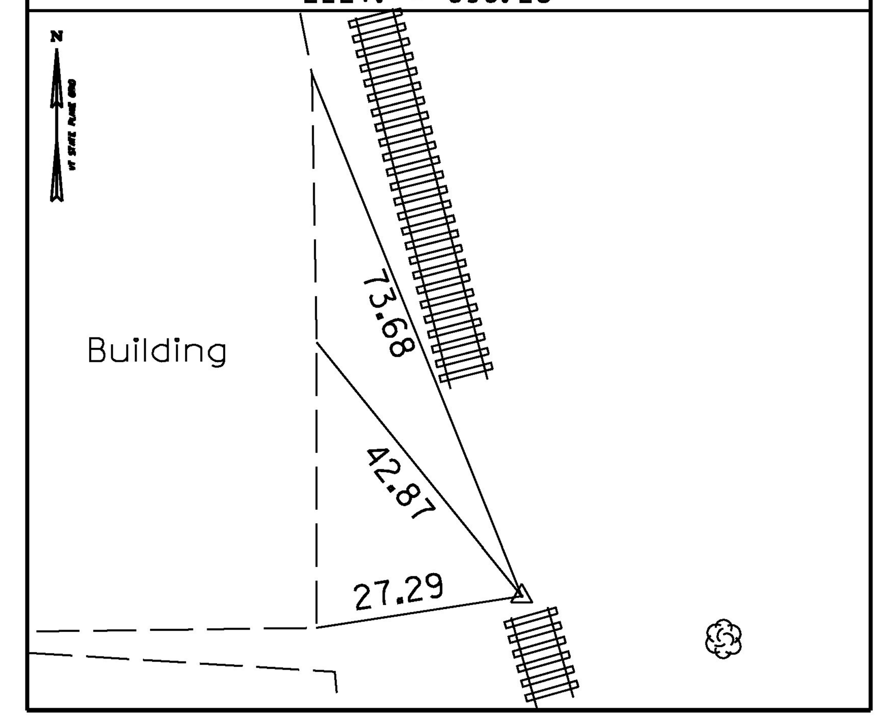
HVCTRL #600
NORTH = 14336.03
EAST = 40741.82
ELEV. = 679.80



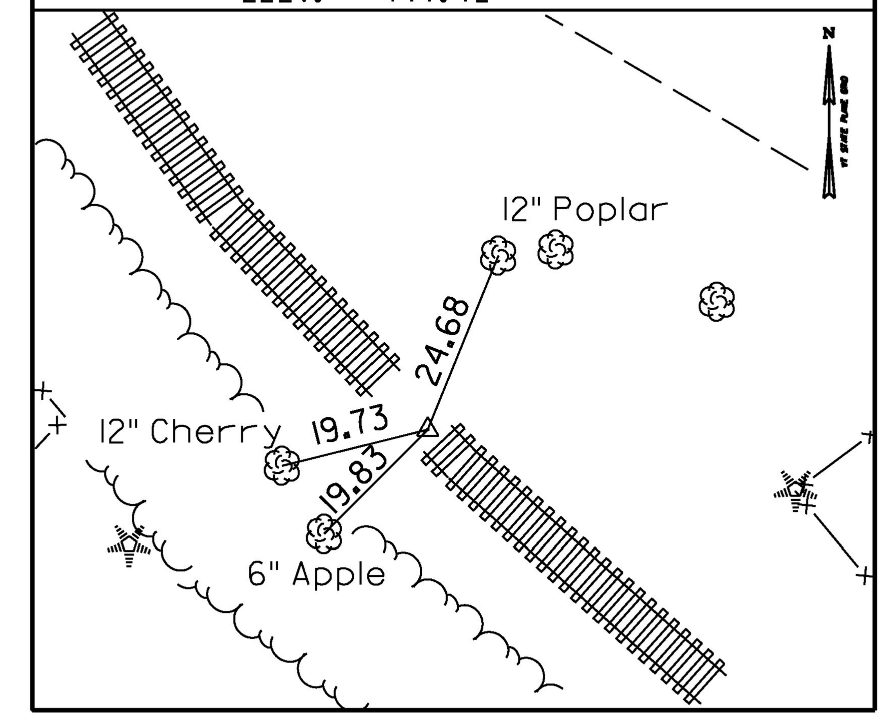
HVCTRL #601
NORTH = 14376.79
EAST = 41075.54
ELEV. = 682.14



HVCTRL #602
NORTH = 14063.32
EAST = 41167.56
ELEV. = 696.23

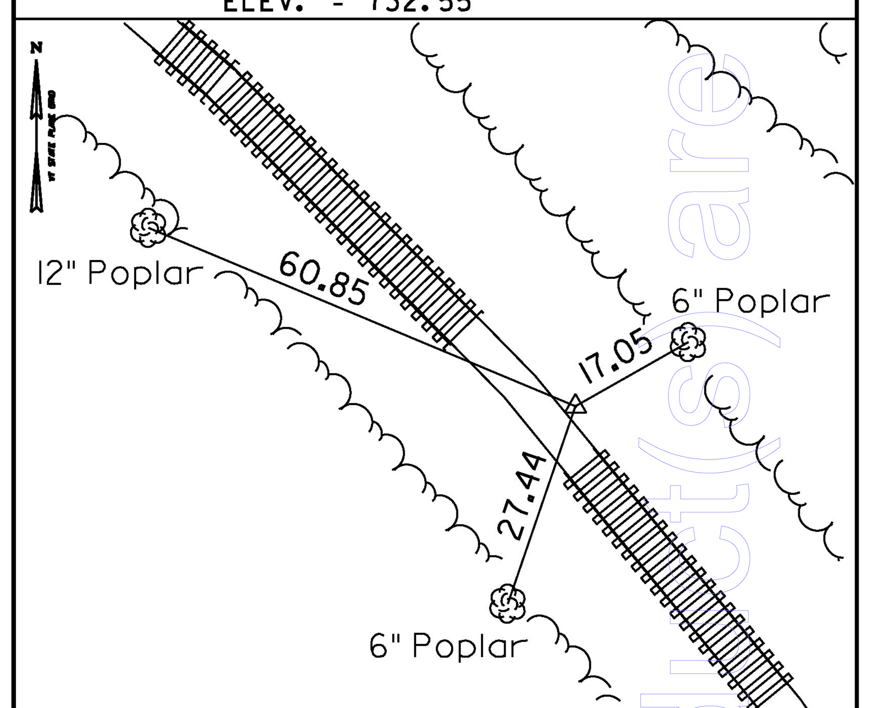


HVCTRL #603
NORTH = 13814.67
EAST = 41302.08
ELEV. = 711.12

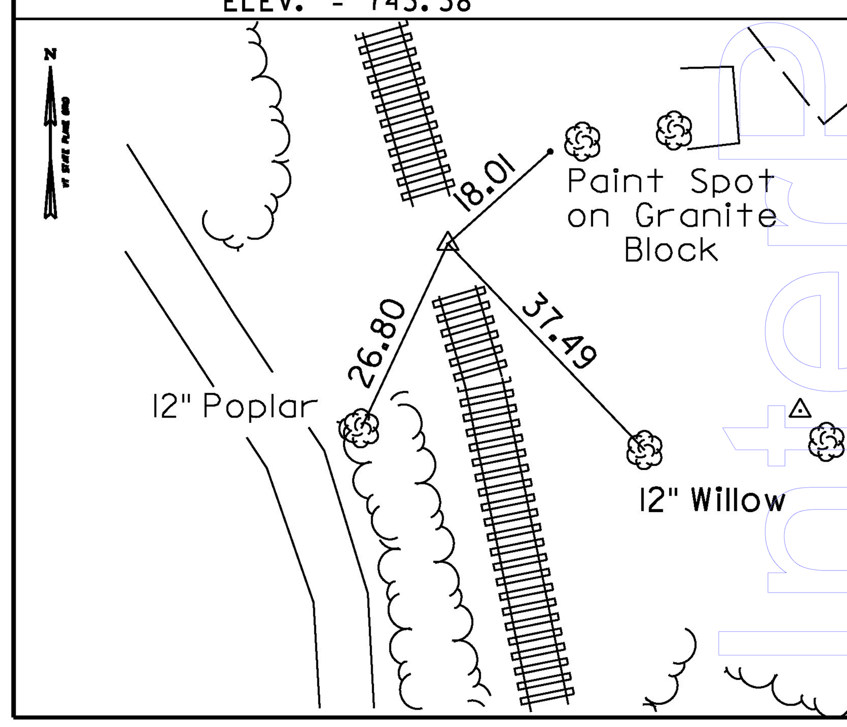


TRAVERSE TIES

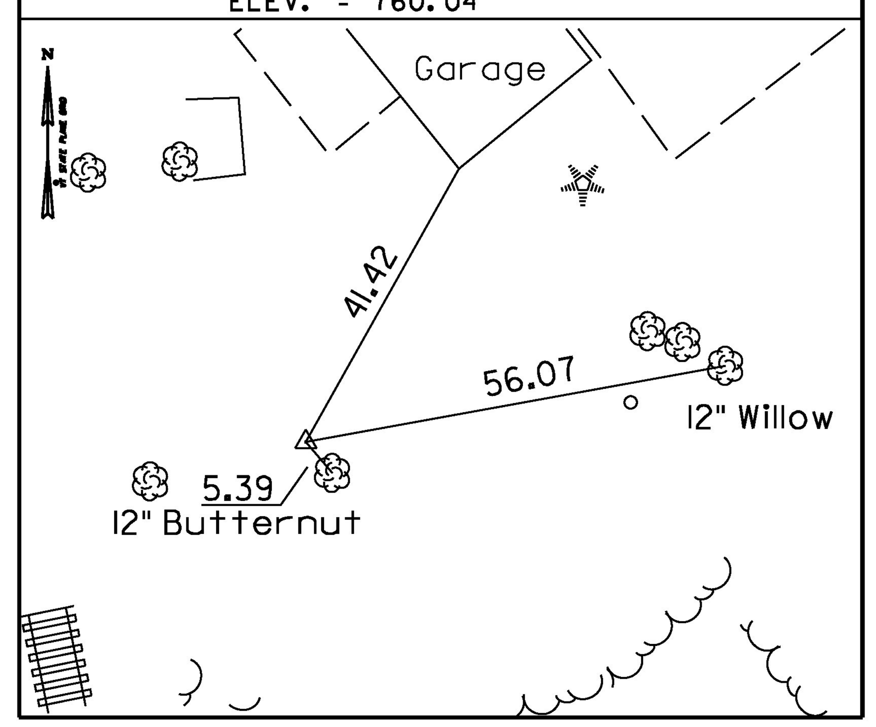
HVCTRL #604
NORTH = 13552.07
EAST = 41633.85
ELEV. = 732.55



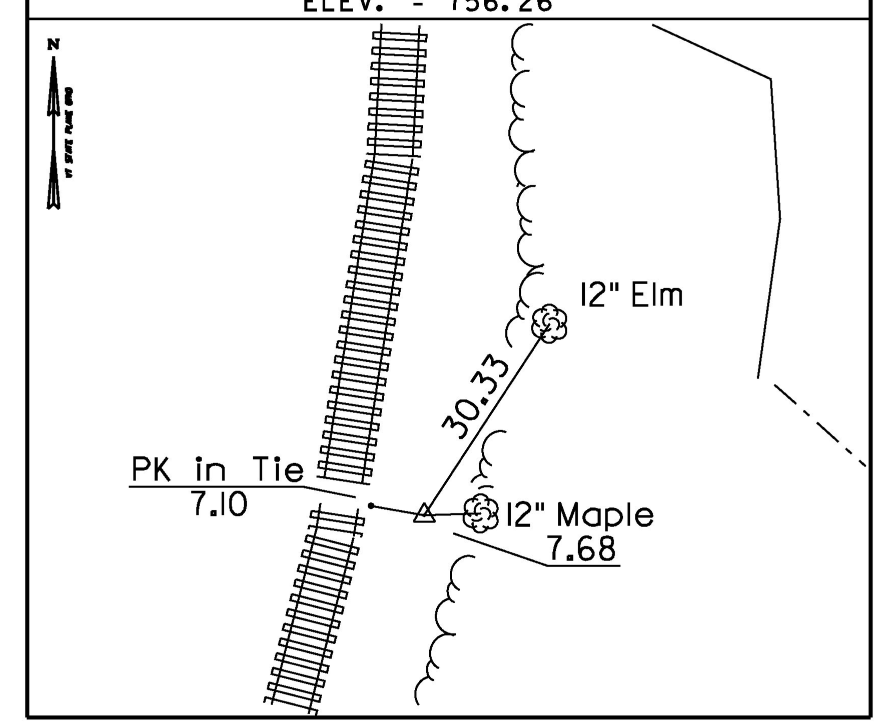
HVCTRL #605
NORTH = 13336.80
EAST = 41746.16
ELEV. = 743.38



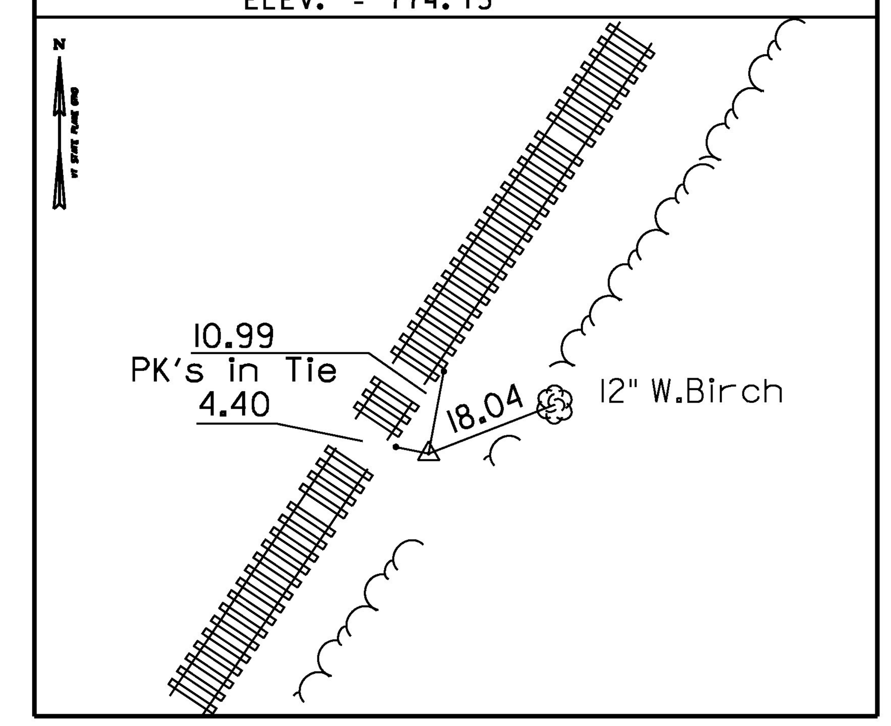
HVCTRL #606
NORTH = 13314.84
EAST = 41792.47
ELEV. = 760.04



HVCTRL #610
NORTH = 13075.91
EAST = 41768.52
ELEV. = 756.26

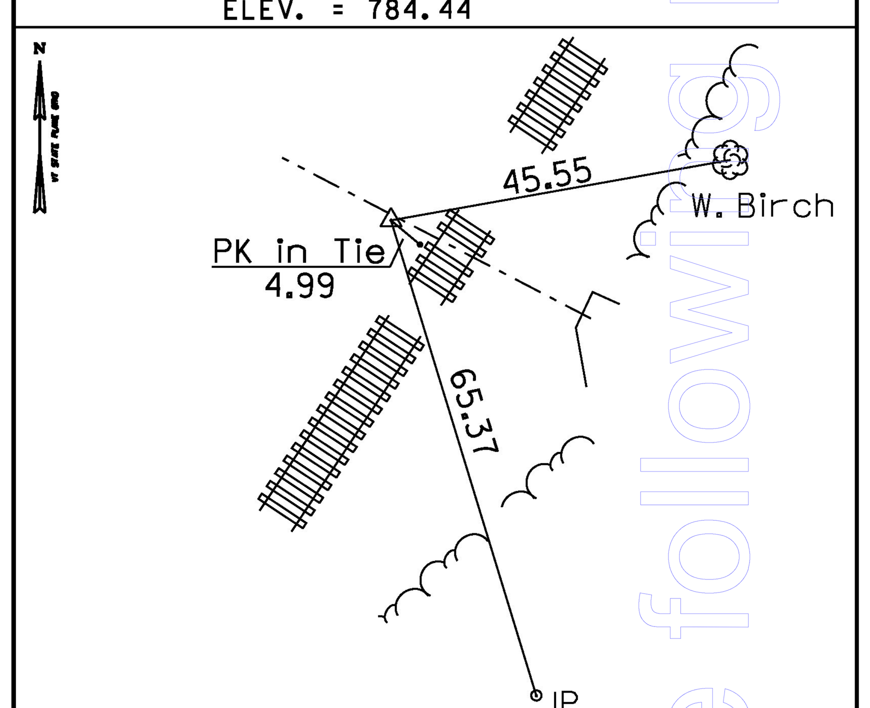


HVCTRL #611
NORTH = 12755.24
EAST = 41604.18
ELEV. = 774.15

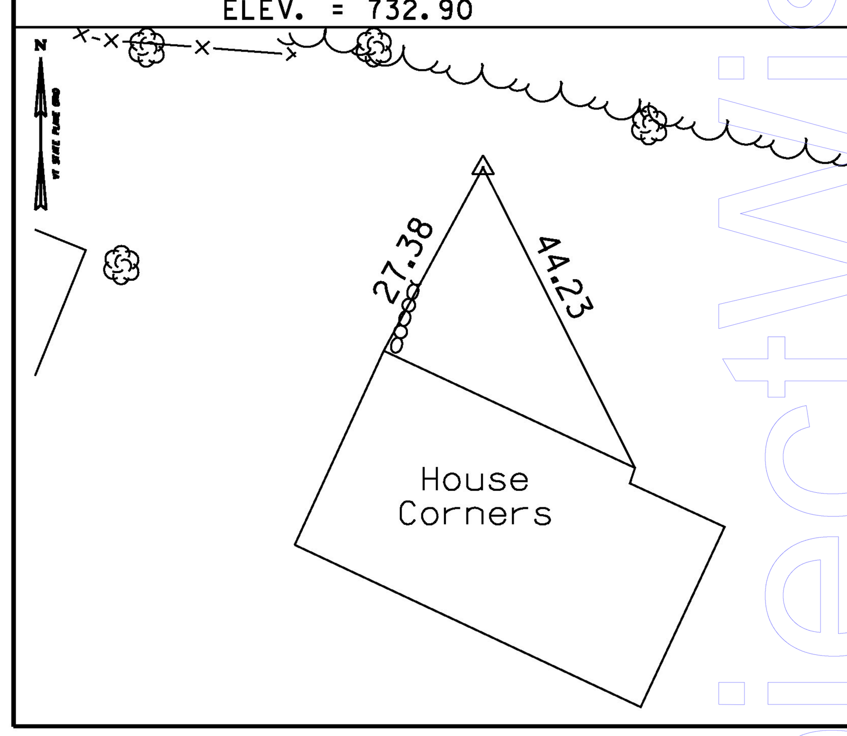


TRAVERSE TIES

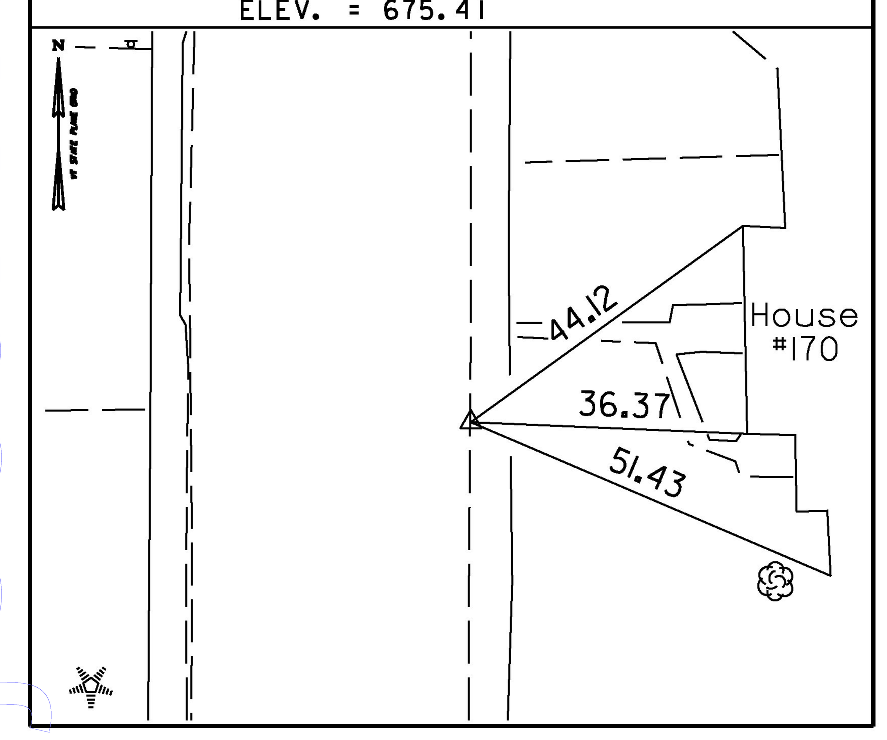
HVCTRL #612
NORTH = 12556.44
EAST = 41450.54
ELEV. = 784.44



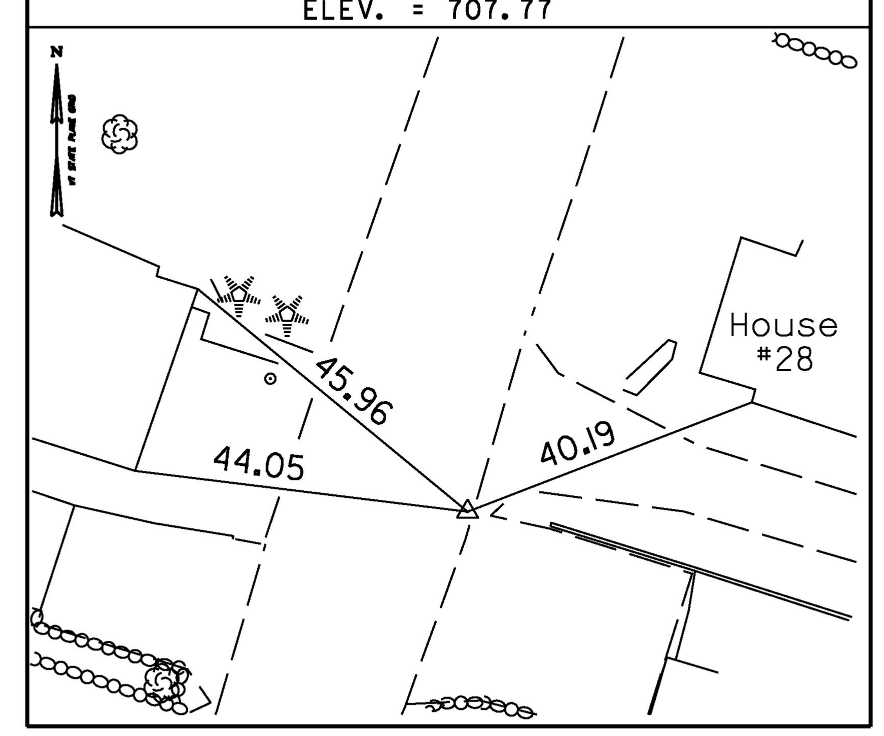
HVCTRL #620
NORTH = 13882.79
EAST = 41106.66
ELEV. = 732.90



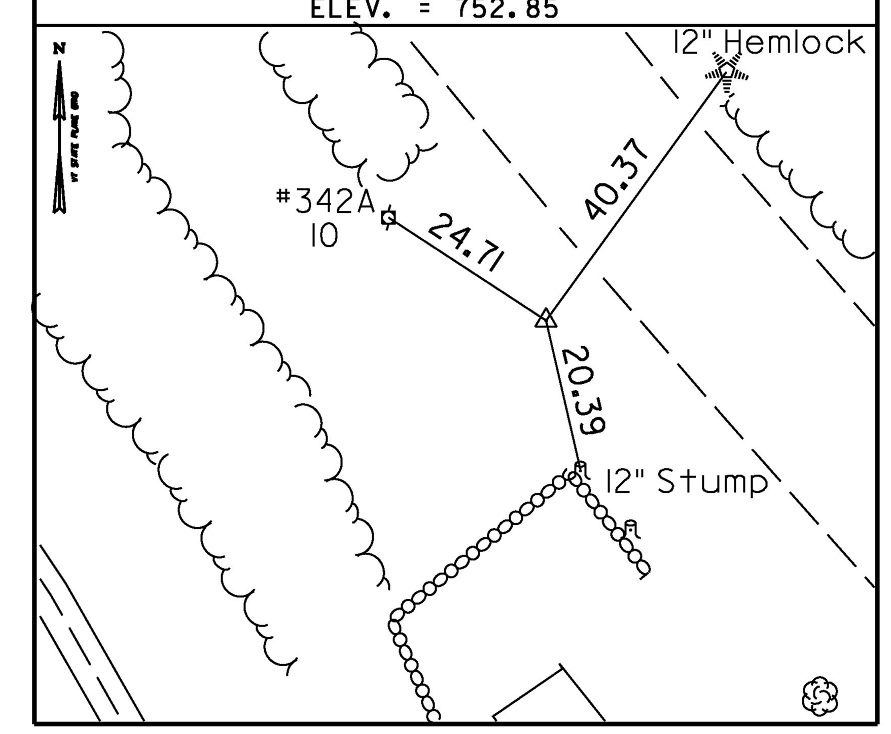
HVCTRL #650
NORTH = 14746.45
EAST = 40792.04
ELEV. = 675.41



HVCTRL #700
NORTH = 13848.16
EAST = 41627.57
ELEV. = 707.77



HVCTRL #800
NORTH = 13509.87
EAST = 41752.22
ELEV. = 752.85



DATUM	
VERTICAL	NAVD 1929
HORIZONTAL	NAD 1983
ADJUSTMENT	Compass

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040_tie.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
TIE SHEET (2 of 2)
PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 7 OF 39

SOIL CLASSIFICATION

AASHTO

A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS) N	DESCRIPTIVE TERM	CONSISTENCY (COHESIVE SOILS) N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

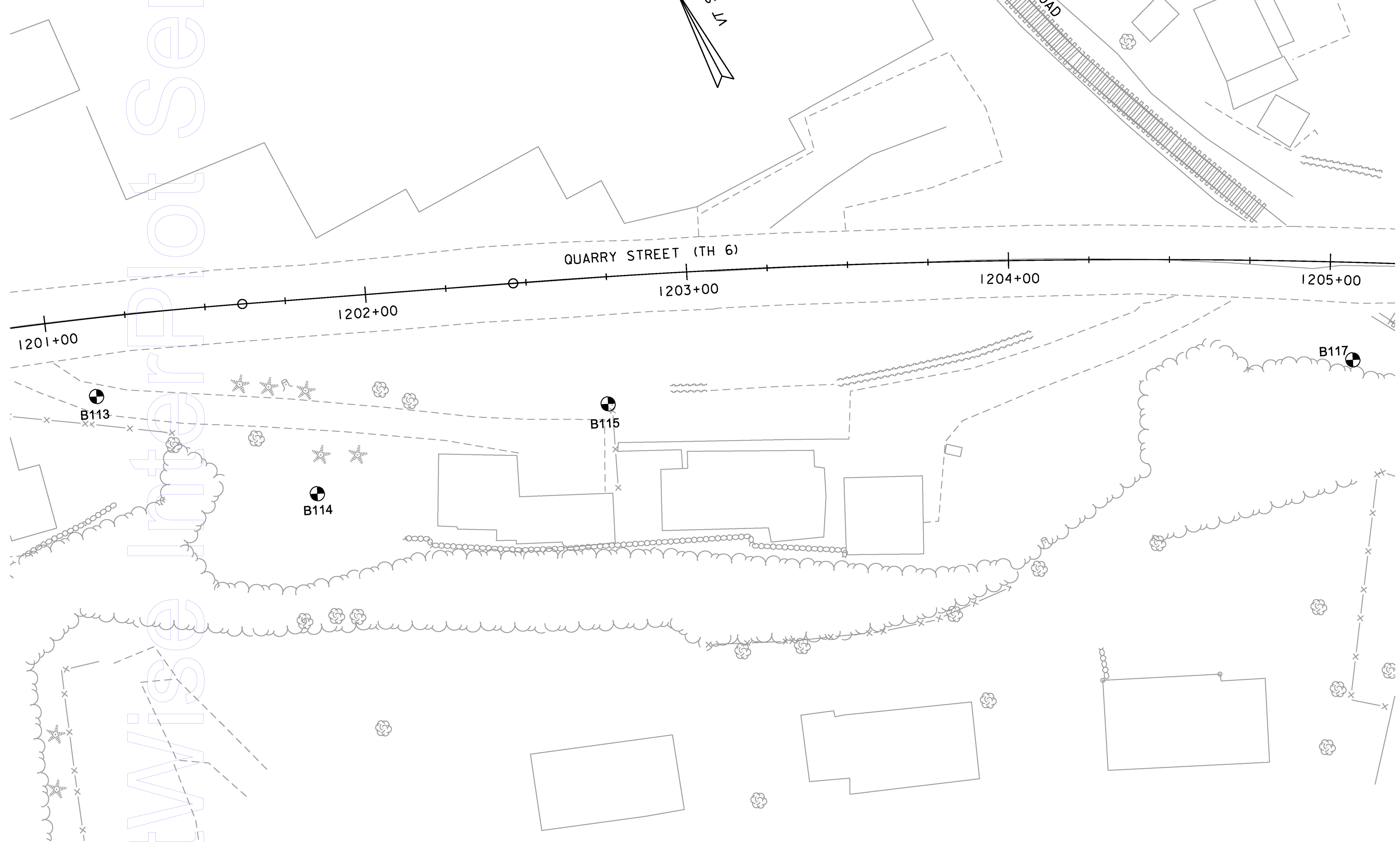
▼	Water Elevation
⊗	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per Foot For: 2" O.D. Sampler 1 3/8" I.D. Sampler Hammer Weight Of 140 Lbs. Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	Top of Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
VTSPG	NAD83 - See Note 7

COLOR

blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

BORING CHART

HOLE NO.	SURV. STATION	BORING LOG OFFSET	PLAN VIEW OFFSET	GROUND ELEV.	ELEV. TLOB
B113	1201+15.00	11.0 RT	24.3 RT	694.88	-
B114	1201+75.00	55.0 RT	60.6 RT	716.26	-
B115	1202+63.00	20.0 RT	39.5 RT	715.32	-
B117	1205+00.00	15.0 RT	30.3 RT	710.70	-



DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 12 inches.

COBBLE - Rock fragments with an average dimension between 3 and 12 inches.

GRAVEL - Rounded particles of rock < 3" and > 0.0787" (#10 sieve).

SAND - Particles of rock < 0.0787" (#10 sieve) and > 0.0029" (#200 sieve).

SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The subsurface explorations B113-B117 shown herein were made between May 9 and May 17, 2007 by the Agency.

2. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.

3. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.

4. Engineering judgment was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgment by the contractor.

5. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.

6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

7. Northing and Easting coordinates are shown in Vermont State Plane Grid North American Datum 1983 in meters and survey feet.

vhb

PROJECT NAME:	HUNTINGTON		
PROJECT NUMBER:	BF 0211(32)		
FILE NAME:	z15d040_bor plan.dgn	PLOT DATE:	12/2/2016
PROJECT LEADER:	S.E. BURBANK	DRAWN BY:	B.M. ROBERTS
DESIGNED BY:	VTrans	CHECKED BY:	J.D. KEENER
BORING INFORMATION SHEET		SHEET	8 OF 39

BORING NUMBER: B-113

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-113
SHEET 1 of 1
DATE STARTED: 5/15/07
DATE COMPLETED: 5/15/07

PROJECT NAME: BARRE CITY - BARRE TOWN
SITE NAME: VT-14 & TH-6
STATION: 1201+15
OFFSET: 11.00
VTSPG: N 614083.23 ft E 1640859.05 ft

PROJECT NUMBER: MEGC M 6000(11)
SITE NUMBER: QUARRY ST.
GROUND ELEVATION: 694.88 ft
GROUNDWATER DEPTH: 46.7 ft 5/15/07
PROJECT PIN NUMBER: 83D106

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: SINGLETON

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		A-4, SaSi, brn, Moist, Rec. = 1.7 ft	5	14.2	2.6	22.1	75.3
		A-4, SaSi, brn, Moist, Rec. = 1.6 ft	5	11.8	1.5	31.5	67.0
10		A-4, Si, brn, Moist, Rec. = 1.9 ft	20	13.5	1.8	19.3	78.9
		A-4, Si, brn, Moist, Rec. = 1.9 ft	21	12.6	3.1	19.7	77.2
20		A-4, Si, brn, Moist, Rec. = 2.0 ft	18	18.2	0.8	6.8	92.4
		A-4, Si, brn, Moist, Rec. = 2.0 ft	26	11.9	1.8	14.9	83.3
30		A-4, SaSi, brn, Moist, Rec. = 2.0 ft	29	9.0	0.5	28.4	71.1
		A-4, Si, brn, Moist, Rec. = 1.9 ft	20	17.1	1.3	18.9	79.8
40		A-4, SaSi, brn, Moist, Rec. = 2.0 ft, Sample contained numerous concretions.	26	14.6	9.7	21.0	69.3
	▽	A-4, SiSa, brn, MTW, Rec. = 1.7 ft	19	22.7	0.5	60.0	39.5
50		A-4, SiSa, brn, Wet, Rec. = 2.0 ft	15	27.6	1.4	56.1	42.5
		Hole stopped @ 52.0 ft					
		DRILLER'S NOTES: 1. No ledge to depth.					

LOG OF BORING BARRE CITY BARRE TOWN MEGC M6000(11).GPJ VT AOT.GDT 1/10/08

BORING NUMBER: B-114

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-114
SHEET 1 of 1
DATE STARTED: 5/11/07
DATE COMPLETED: 5/14/07

PROJECT NAME: BARRE CITY - BARRE TOWN
SITE NAME: VT-14 & TH-6
STATION: 1201+75
OFFSET: 55.00
VTSPG: N 614024.38 ft E 1640905.42 ft

PROJECT NUMBER: MEGC M 6000(11)
SITE NUMBER: QUARRY ST.
GROUND ELEVATION: 716.26 ft
GROUNDWATER DEPTH: No Water Found
PROJECT PIN NUMBER: 83D106

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: SINGLETON

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		A-4, Si, brn, Moist, Rec. = 1.5 ft	4	19.4	0.2	15.4	84.4
		A-4, Si, brn, Moist, Rec. = 1.9 ft	4	26.9	0.1	8.5	91.4
10		A-4, Si, brn, Moist, Rec. = 1.8 ft	7	20.0	0.0	13.3	86.7
		A-4, Si, brn, Moist, Rec. = 1.8 ft	8	24.2	1.1	7.7	91.2
20		A-4, SaSi, brn, Moist, Rec. = 1.9 ft	33	13.4	8.2	29.4	62.4
		A-4, Si, brn, Moist, Rec. = 1.8 ft	26	20.7	0.7	18.0	81.3
30		A-4, Si, brn, Moist, Rec. = 1.9 ft	39	12.7	3.9	18.6	77.5
		A-4, Si, brn, Moist, Rec. = 1.9 ft	27	21.0	0.1	11.2	88.7
40		A-4, Si, brn, Moist, Rec. = 2.0 ft	33	19.2	9.5	19.2	71.3
		A-4, SiSa, brn, Moist, Rec. = 1.9 ft	32	7.4	0.7	60.2	39.1
50		A-2-4, SiSa, brn, Moist, Rec. = 2.0 ft	35	5.4	1.8	67.8	30.4
		Hole stopped @ 52.0 ft					
		DRILLER'S NOTES: 1. No ledge to depth. 2. No water to depth.					

LOG OF BORING BARRE CITY BARRE TOWN MEGC M6000(11).GPJ VT AOT.GDT 1/10/08

vhb

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(II)C/I
FILE NAME: zl5d040_bor.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: P.A. MILLER	CHECKED BY: D.M. PECK
BORING LOG SHEET (1 OF 2)	SHEET 9 OF 39

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-115
SHEET 1 of 1
DATE STARTED: 5/09/07
DATE COMPLETED: 5/09/07

PROJECT NAME: BARRE CITY - BARRE TOWN
SITE NAME: VT-14 & TH-6
STATION: 1202+63
OFFSET: 20.00
VTSPG: N 614006.63 ft E 1640998.25 ft

PROJECT NUMBER: MEGC M 6000(11)
SITE NUMBER: QUARRY ST.
GROUND ELEVATION: 715.32 ft
GROUNDWATER DEPTH: No Water Found
PROJECT PIN NUMBER: 83D106

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: SINGLETON

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		A-4, SaSi, brn, Moist, Rec. = 1.4 ft	4	21.3	1.5	25.5	73.0
		A-4, SaSi, brn, Moist, Rec. = 1.4 ft	2	21.2	0.6	23.7	75.7
10		A-4, SaSi, brn, Moist, Rec. = 1.7 ft	5	18.9	0.3	22.0	77.7
		A-4, SiSa, brn, Moist, Rec. = 1.9 ft	7	12.7	0.5	57.4	42.1
20		A-4, SaSi, brn, Moist, Rec. = 1.9 ft	6	14.0	0.1	38.2	61.7
		A-4, SaSi, brn, Moist, Rec. = 2.0 ft	18	7.3	3.2	44.6	52.2
30		A-4, SaSi, brn, Moist, Rec. = 2.0 ft	27	9.1	11.5	41.7	46.8
		A-2-4, Sa, brn, Moist, Rec. = 1.8 ft	21	7.1	4.8	77.9	17.3
40		A-4, SaSi, brn, Moist, Rec. = 1.8 ft	30	16.2	2.3	24.1	73.6
		A-2-4, Sa, brn, Moist, Rec. = 2.0 ft	26	3.5	0.3	82.1	17.6
50		A-4, SaSi, brn, Moist, Rec. = 1.0 ft	35	8.5	0.3	37.8	61.9
		A-4, Si, Dk/gry, Moist, Rec. = 1.0 ft		18.0	0.4	14.8	84.8
		Hole stopped @ 52.0 ft					
		DRILLER'S NOTES: 1. No ledge to depth. 2. No water to depth.					

LOG OF BORING BARRE CITY BARRE TOWN MEGC M6000(11).GPJ VT AOT.GDT 1/10/08

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING NUMBER: B-117
SHEET 1 of 1
DATE STARTED: 5/17/07
DATE COMPLETED: 5/17/07

PROJECT NAME: BARRE CITY - BARRE TOWN
SITE NAME: VT-14 & TH-6
STATION: 1205+00
OFFSET: 15.00
VTSPG: N 613910.15 ft E 1641208.87 ft

PROJECT NUMBER: MEGC M 6000(11)
SITE NUMBER: QUARRY ST.
GROUND ELEVATION: 710.7 ft
GROUNDWATER DEPTH: No Water Found
PROJECT PIN NUMBER: 83D106

BORING CREW
CREW CHIEF: PORTER
DRILLER: PORTER
LOGGER: SINGLETON

BORING RIG: LAG TRACK RIG w/AUTO HAMMER
BORING TYPE: HOLLOW STEM AUGER
SAMPLE TYPE: SPLIT BARREL
CHECKED BY: CAA

DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		A-4, SaSi, brn, Moist, Rec. = 1.2 ft	2	26.7	0.4	25.3	74.3
		A-4, Si, brn, Moist, Rec. = 1.6 ft	15	25.8	0.0	5.4	94.6
10		A-4, Si, brn, Moist, Rec. = 1.8 ft	11	21.5	0.0	9.9	90.1
		A-4, Si, brn, Moist, Rec. = 1.9 ft	17	21.8	1.7	6.2	92.1
20		A-4, Si, brn, Moist, Rec. = 2.0 ft	21	20.4	3.4	3.6	93.0
		A-4, Si, brn, Moist, Rec. = 1.9 ft	20	18.0	3.5	9.1	87.4
30		A-4, SaSi, brn, Moist, Rec. = 1.9 ft	12	8.0	0.4	48.8	50.8
		A-4, SaSi, brn, Moist, Rec. = 1.8 ft	22	7.3	2.5	44.1	53.4
40		A-4, SaSi, brn, Moist, Rec. = 1.8 ft	27	6.0	5.6	40.4	54.0
		A-4, SiSa, brn, Moist, Rec. = 1.9 ft	29	5.1	2.4	51.9	45.7
50		A-4, SaSi, brn, Moist, Rec. = 2.0 ft	29	10.3	2.2	31.4	66.4
		Hole stopped @ 52.0 ft					
		DRILLER'S NOTES: 1. No ledge to depth. 2. No water to depth.					

LOG OF BORING BARRE CITY BARRE TOWN MEGC M6000(11).GPJ VT AOT.GDT 1/10/08

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(11)C/1

FILE NAME: z15d040_bor.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: P.A. MILLER
BORING LOG SHEET (2 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 10 OF 39

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES: ROADWAY	EROSION CONTROL	FULL C.E. ITEMS	TOTALS: GRAND TOTAL	FINAL	DESCRIPTIONS: UNIT	ITEMS	ITEM NUMBER	ROUND
1			1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-
6930			6930		CY	COMMON EXCAVATION	203.15	91.6
1			1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	EST
20			20		HR	POWER BROOM RENTAL, TYPE II	608.31	EST
20			20		HR	TRUCK RENTAL	608.37	EST
120			120		MGAL	DUST CONTROL WITH WATER	609.10	2.5
1200			1200		CY	STONE FILL, TYPE II	613.11	41.3
2			2		EACH	YIELDING MARKER POSTS	619.17	-
130			130		LF	CHAIN-LINK FENCE, 6 FEET	620.12	-
3			3		EACH	BRACING ASSEMBLY FOR CHAIN-LINK FENCE, 6 FEET	620.21	-
80			80		HR	UNIFORMED TRAFFIC OFFICERS	630.10	EST
440			440		HR	FLAGGERS	630.15	EST
		1	1		LS	FIELD OFFICE, ENGINEERS	631.10	-
		3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26	-
1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11	-
1			1		LS	TRAFFIC CONTROL	641.10	-
2			2		EACH	RAILROAD CROSSING SYMBOL, WATERBORNE PAINT	646.321	-
1800			1800		SY	GEOTEXTILE UNDER STONE FILL	649.31	36.9
	320		320		SY	GEOTEXTILE FOR SILT FENCE	649.51	4
	80		80		LB	SEED	651.15	6.6
	620		620		LB	FERTILIZER	651.18	8.4
	1.5		1.5		TON	AGRICULTURAL LIMESTONE	651.20	0.3
	1.5		1.5		TON	HAY MULCH	651.25	0.3
175			175		CY	TOPSOIL	651.35	11.3
1500			1500		SY	GRUBBING MATERIAL	651.40	12.7
	1		1		LS	EPSC PLAN	652.10	-
	100		100		HR	MONITORING EPSC PLAN	652.20	EST
	1		1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30	-
	1700		1700		SY	TEMPORARY EROSION MATTING	653.20	
	5		5		CY	TEMPORARY STONE CHECK DAM, TYPE I	653.25	2.7
	50		50		CY	VEHICLE TRACKING PAD	653.35	5.6
	1		1		EACH	INLET PROTECTION DEVICE, TYPE II	653.41	-
	560		560		LF	PROJECT DEMARCATION FENCE	653.55	9.4
55			55		SF	TRAFFIC SIGNS, TYPE A	675.20	1.2
140			140		LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	-
5			5		EACH	REMOVING SIGNS	675.50	-
1			1		LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50	-
1			1		EACH	SPECIAL PROVISION (CPM SCHEDULE)	900.620	-
1			1		LU	SPECIAL PROVISION (MAINTENANCE OF RAILROAD TRAFFIC) (N.A.B.I)	900.650	-
100			100		SY	SPECIAL PROVISION (RETAINING WALL)	900.675	1.1

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040quantity.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: P.A. MILLER
QUANTITY SHEET

PLOT DATE: 12/5/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 11 OF 39

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EARTHWORKS

STATION	DIST	TOTAL EXCAVATION EARTH AND ROCK AREA	TOTAL EXCAVATION EARTH AND ROCK VOLUME	ROCK EXCAVATION AREA	ROCK EXCAVATION VOLUME	EMBANKMENT AREA	EMBANKMENT VOLUME	AREA	VOLUME
	FT.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.
QUARRY STREET									
1200+73		0.0							
	2								
1200+75		0.0							
	25		34.4						
1201+00		74.4							
	25		104.5						
1201+25		151.3							
	25		384.4						
1201+50		679.1							
	25		631.3						
1201+75		684.6							
	25		620.6						
1202+00		655.9							
	25		601.6						
1202+25		643.5							
	25		589.9						
1202+50		630.7							
	25		585.6						
1202+75		634.1							
	25		587.3					CUT	6971
1203+00		634.4						ROCK	0
	25		565.4					R.FAC	.495
1203+25		586.9						FILL	0
	25		518					F.FAC	1.15
1203+50		531.6						EX. C	6971
	25		476.8						
1203+75		498.2							
	25		482						
1204+00		543.5							
	25		371						
1204+25		257.8							
	25		182.4						
1204+50		136.2							
	25		118						
1204+75		117.7							
	25		76						
1205+00		45.8							
	25		21.8						
1205+25		1.3							
	25		21						
1205+50		43.6							

STATION	DIST	TOTAL EXCAVATION EARTH AND ROCK AREA	TOTAL EXCAVATION EARTH AND ROCK VOLUME	ROCK EXCAVATION AREA	ROCK EXCAVATION VOLUME	EMBANKMENT AREA	EMBANKMENT VOLUME	AREA	VOLUME
	FT.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.

STATION	DIST	TOTAL EXCAVATION EARTH AND ROCK AREA	TOTAL EXCAVATION EARTH AND ROCK VOLUME	ROCK EXCAVATION AREA	ROCK EXCAVATION VOLUME	EMBANKMENT AREA	EMBANKMENT VOLUME	AREA	VOLUME
	FT.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.	S.F.	C.Y.

SUMMARY AND BALANCES

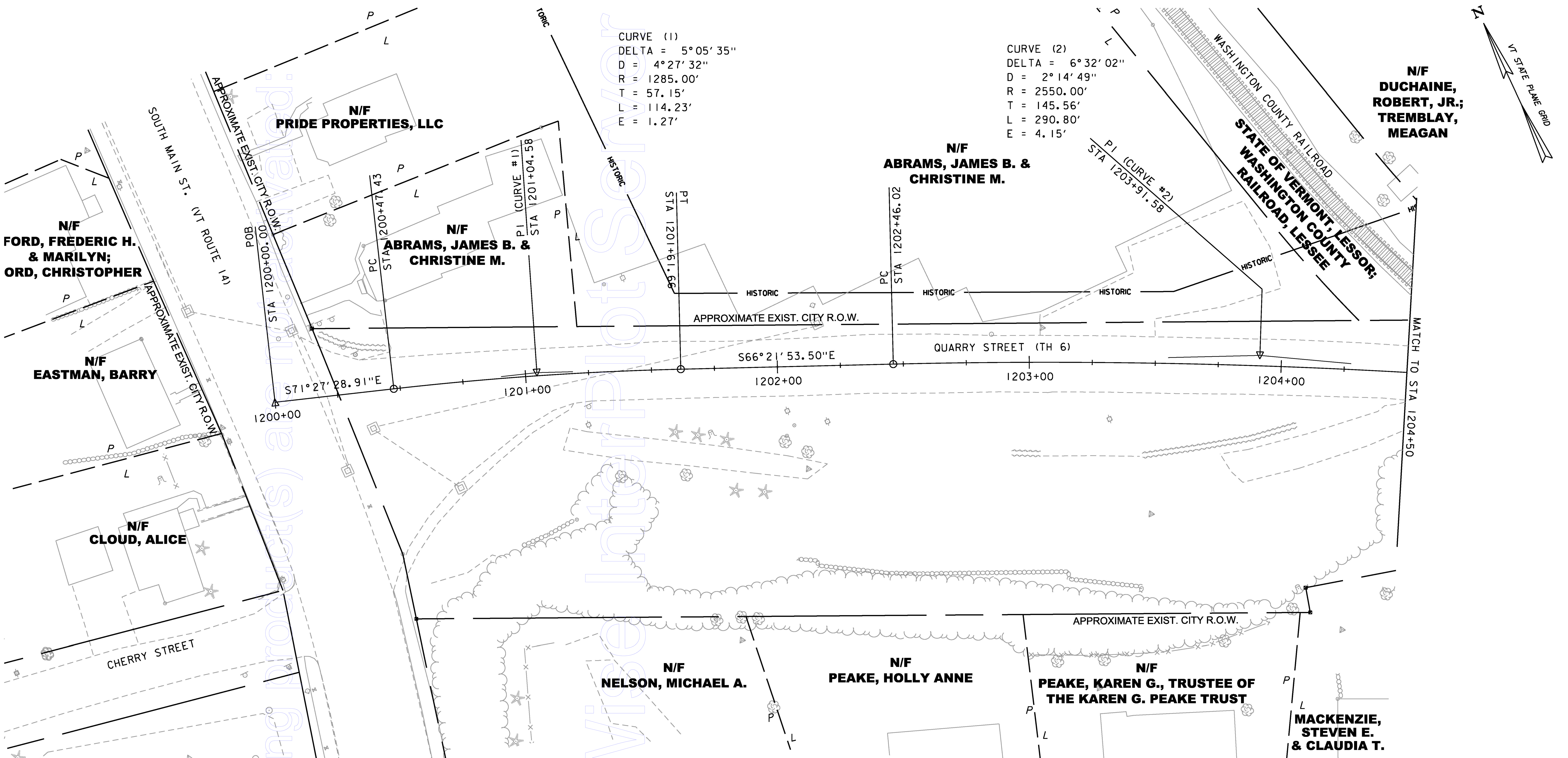
STATION TO STATION	TOT EXC. EARTH & ROCK	ROCK EXCAV	EMBANK	EXCESSES CUT	EXCESSES FILL	ACUMULATIVE EXCESSES CUT	ACUMULATIVE EXCESSES FILL
	C.Y.	C.Y.	C.Y.	CUT	FILL	CUT	FILL

EARTH AND ROCK EXCAVATION	6971
SOLID ROCK EXCAVATION	0
EARTH EXCAVATION	6971
PLANIMETERED FILL	0
LESS FACTORED SOLID ROCK	
LESS DISPLACEMENT OF ANY LARGE STRUCTURES	
NET PLANIMETERED FILL	0
FACTOR	1
PLANIMETERED FILL INCLUDING FACTOR	0
MATERIALS AVAILABLE FOR FILLS	
EARTH EXCAVATION	6971
CHANNEL EXCAVATION	
UNDERDRAIN EXCAVATION	
STRUCTURE EXCAVATION (INCIDENTAL TO RETAINING WALL)	1200
TRENCH EXCAVATION	
TOTAL MATERIAL AVAILABLE FOR FILL	8171
TOTAL FILL INCLUDING FACTOR	
TOTAL MATERIAL FOR FILL	8171
BORROW	
EXCESS EXCAVATION	8171

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040quantity.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: P.A. MILLER
EARTHWORK SHEET

PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK



ALIGNMENT POINT DATA

POINT TYPE	STATION	NORTHING	EASTING
POB	1200+00.00	614143.5405	1640761.0146
PC	1200+47.43	614128.4574	1640805.9837
PI	1201+04.58	614110.2834	1640860.1682
PT	1201+61.66	614087.3709	1640912.5253
PC	1202+46.02	614053.5489	1640989.8116
PI	1203+91.58	613995.1928	1641123.1605
PT	1205+36.82	613922.0415	1641249.0027
PC	1207+44.44	613817.7037	1641428.4952
PI	1208+20.78	613779.3388	1641494.4944
PCC	1208+96.97	613734.0251	1641555.9308
PI	1209+44.63	613705.7336	1641594.2883
PT	1209+92.14	613672.5038	1641628.4570
POE	1210+00.00	613667.0271	1641634.0884

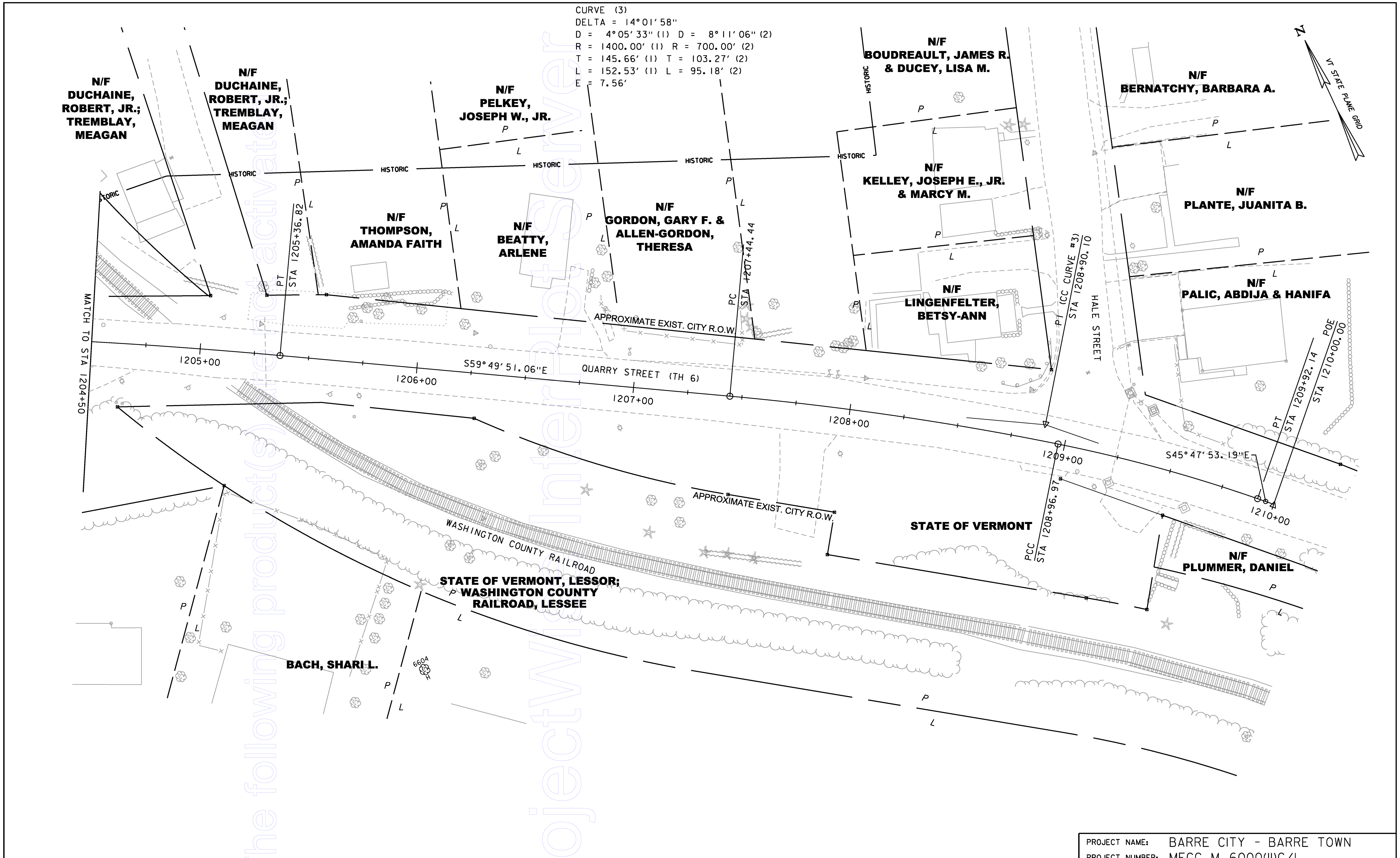
0 20 40
SCALE IN FEET

DATUM
VERTICAL: NAVD 1929
HORIZONTAL: NAD 1983

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(11)C/1

FILE NAME: z15d040bdr_all.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
ALIGNMENT LAYOUT SHEET (1 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 13 OF 39

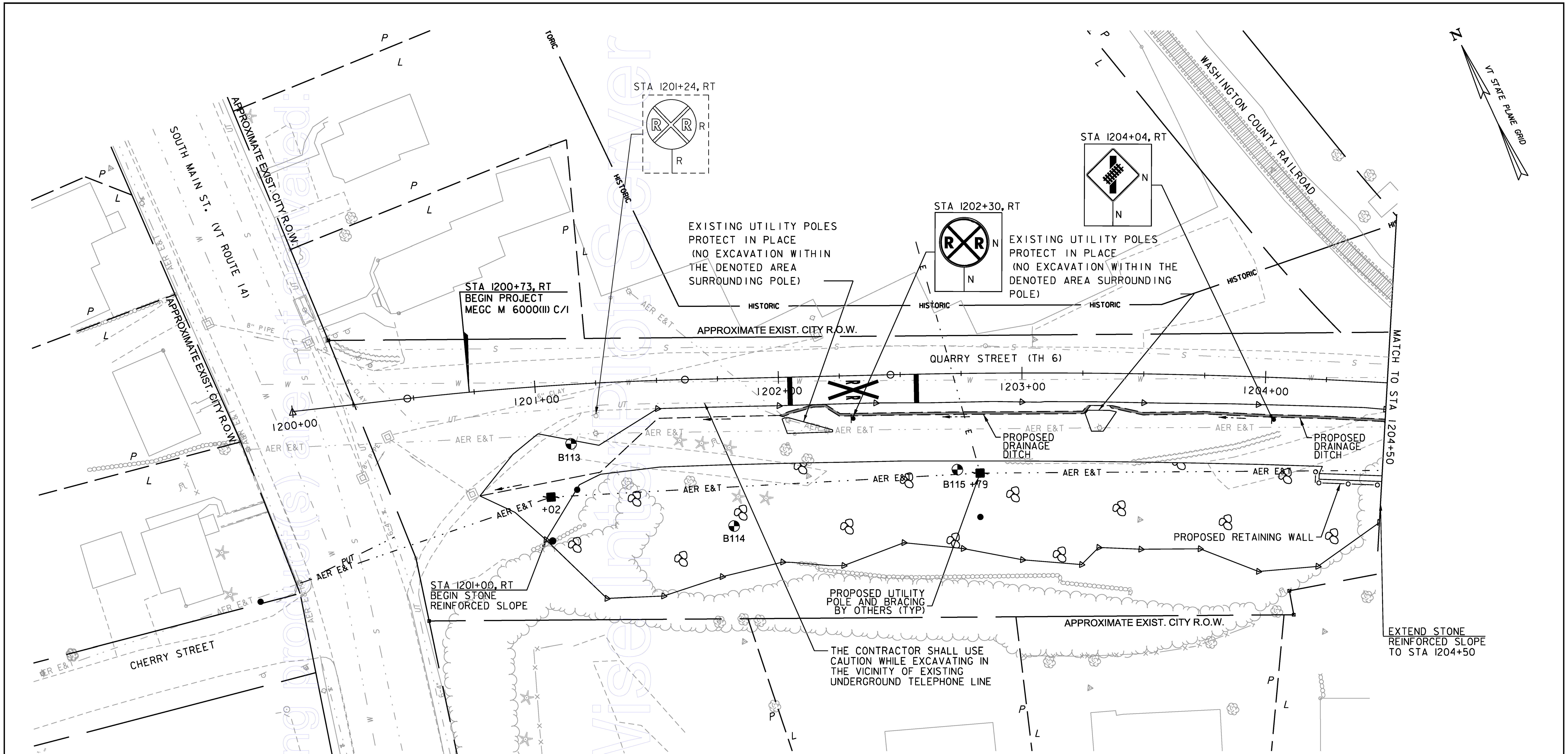


DATUM
VERTICAL: NAVD 1929
HORIZONTAL: NAD 1983

vhb

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(II)C/I

FILE NAME: zl5d040bdr_all.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
ALIGNMENT LAYOUT SHEET (2 OF 2)	SHEET 14 OF 39



CLEARING & GRUBBING, INCL. INDIVIDUAL TREES & STUMPS
STA 1200+73 TO 1204+50, RT

REMOVING SIGNS
STA 1201+24, RT

TRAFFIC SIGNS, TYPE A
STA 1202+30, RT
STA 1204+04, RT

RAILROAD CROSSING SYMBOL, WATERBORNE PAINT
STA 1202+05 - 1204+50, RT

YIELDING MARKER POSTS
STA 1204+19, RT

STONE FILL, TYPE II
STA 1201+00 TO 1204+50, RT

GRUBBING MATERIAL
STA 1201+00 TO 1204+50, RT

SPECIAL PROVISION (RETAINING WALL)
STA 1204+24 TO 1204+50, RT

CHAIN LINK FENCE, 6 FEET
STA 1204+22 TO 1204+50, RT

BRACING ASSEMBLY FOR CHAIN-LINK FENCE, 6 FEET
STA 1204+20, RT
STA 1204+20, RT

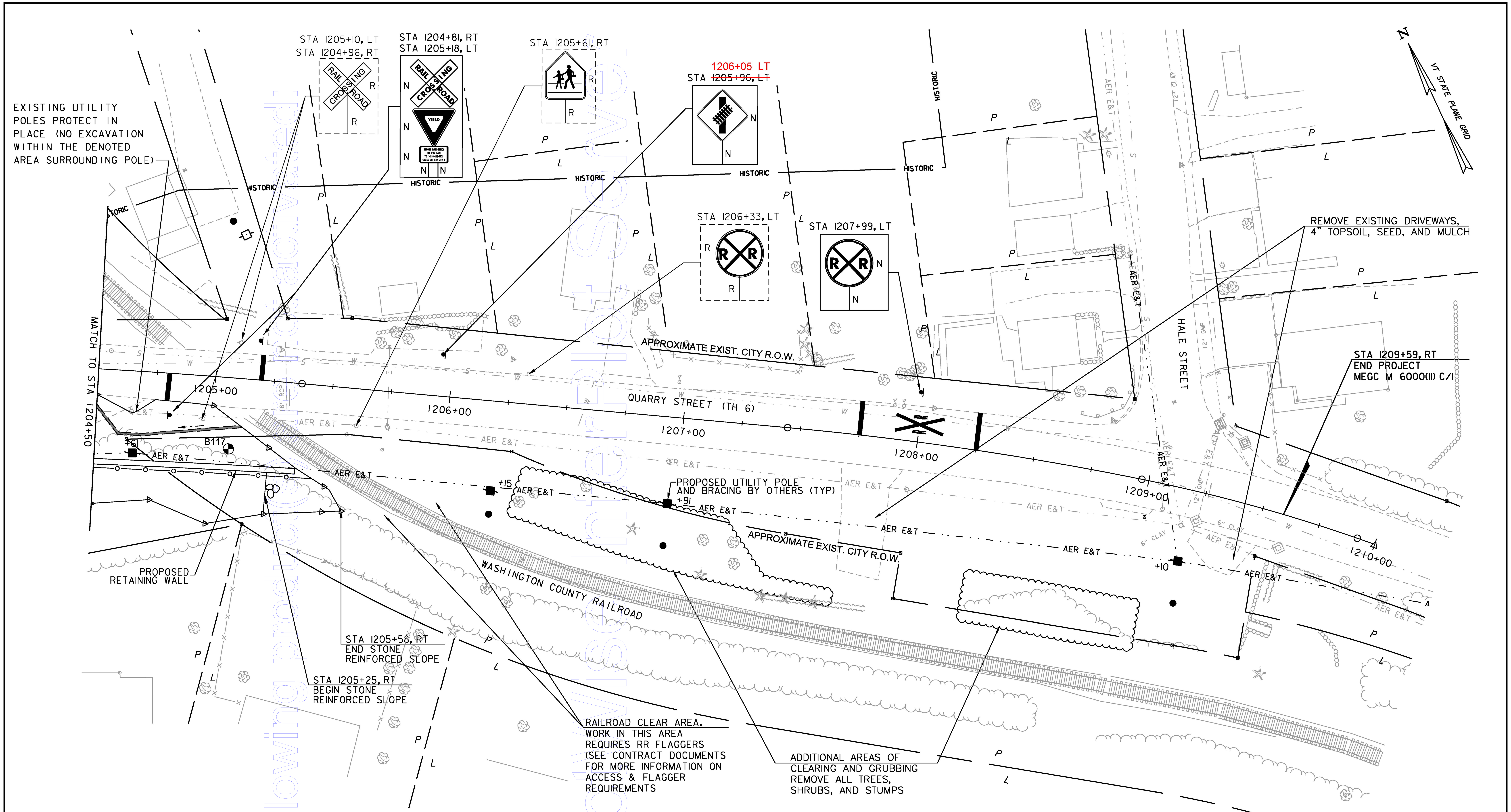
SIGNING LEGEND

N = NEW SIGN
R = REMOVE SIGN
RET = RETAIN SIGN
R&S = REMOVE AND SALVAGE
S = SALVAGED SIGN

0 20 40
SCALE IN FEET

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(II)C/I	
FILE NAME: z15d040bdr_gen.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
GENERAL PLAN SHEET (1 OF 2)	SHEET 15 OF 39



REMOVING SIGNS
STA 1204+96, RT
STA 1205+10, LT
STA 1205+61, RT
STA 1206+33, LT

TRAFFIC SIGNS, TYPE A
STA 1204+81, RT
STA 1205+18, LT
STA 1205+96, LT
STA 1207+99, LT

SIGNING LEGEND
N = NEW SIGN
R = REMOVE SIGN
RET = RETAIN SIGN
R&S = REMOVE AND SALVAGE
S = SALVAGED SIGN

RAILROAD CROSSING SYMBOL, WATERBORNE PAINT
STA 1204+50 - 1204+80, RT
STA 1205+20 - 1208+25, LT

SPECIAL PROVISION (RETAINING WALL)
STA 1204+50 TO 1205+37, RT

STONE FILL, TYPE II
STA 1205+25 TO 1205+58, RT

GRUBBING MATERIAL
STA 1205+25 TO 1205+58, RT

CLEARING & GRUBBING, INCL. INDIVIDUAL TREES & STUMPS
STA 1204+50 - 1205+58, RT
STA 1206+28 - 1207+71, RT
STA 1208+28 - 1209+07, RT

YIELDING MARKER POSTS
STA 1205+37, RT

CHAIN LINK FENCE, 6 FEET
STA 1204+50 TO 1205+44, RT

BRACING ASSEMBLY FOR CHAIN-LINK FENCE, 6 FEET
STA 1205+44, RT

0 20 40
SCALE IN FEET

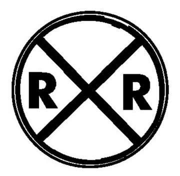
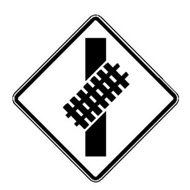
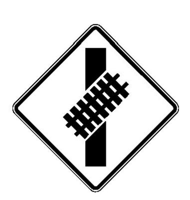
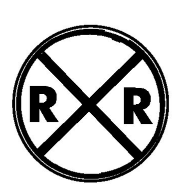
vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: z15d040bdr_gen.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
GENERAL PLAN SHEET (2 OF 2)
PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 16 OF 39

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILEMARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS EA	SIGN DIMENSIONS WIDTH (In)	SIGN DIMENSIONS HEIGHT (In)	NEW & SALVAGED SIGNS "A"	NEW & SALVAGED SIGNS "B"	SALV SIGN	SALV TIS	EXIST POST RETAIN	EXIST POST SALVAGE	NO. OF POSTS	FLANGED CHANNEL lb/ft 1.12	FLANGED CHANNEL lb/ft 2.0	FLANGED CHANNEL lb/ft 3.0	SQUARE STEEL (In) 1.75 lb/ft 1.88	SQUARE STEEL (In) 2.0 lb/ft 2.42	SQUARE STEEL (In) 2.5 lb/ft 3.35	ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (In) 3.0 lb/ft 1.3	TUBULAR ALUMINUM Ø (In) 4.0 lb/ft 1.7	TUBULAR ALUMINUM Ø (In) 4.0 MOD lb/ft 1.7	FOUND-ATION	TUBULAR STEEL Ø (In) 3.0 lb/ft 7.6	TUBULAR STEEL Ø (In) 3.5 lb/ft 9.0	TUBULAR STEEL Ø (In) 4.0 lb/ft 10.8	TUBULAR STEEL Ø (In) 5.0 lb/ft 14.6	W-SHAPE STEEL FTG. SIZE 24"	W-SHAPE STEEL FTG. SIZE 30"	W-SHAPE STEEL WEIGHT	W-SHAPE STEEL POST SIZE	SIGN REFRAMED	REMARKS	SIGN DETAIL: DETAIL ON SHEET NUMBER	SIGN DETAIL: STD. SHEET NUMBER
												OPTION ITEMS																							
BARRE CITY QUARRY STREET																																			
1202+30, RT		1	36	36	7.07						1					13.50 X		X															SHSM W10-1		E 190
1204+04, RT		1	36	36	9.00						1					14.50 X		X															SHSM W10-12		
1204+81, RT		1 1 1	48 48 • 15	9 9 • 9	6.00 3.90 0.94						2					16.00 X + 16.00		X															SIGN POST SHALL INCLUDE 2-INCH WIDE RETROREFLECTIVE STRIPS ON BOTH SIDES PER SECTION 8B.03 OF THE LATEST EDITION OF MUTCD — SHSM R15-1 • SIZE = 36"x36"x36" — SHSM R1-2 ENLARGED VIEW BELOW — SHSM I-13		E 190
1205+18, LT		1 1 1	48 48 • 15	9 9 • 9	6.00 3.90 0.94						2					15.00 X + 15.75		X															SIGN POST SHALL INCLUDE 2-INCH WIDE RETROREFLECTIVE STRIPS ON BOTH SIDES PER SECTION 8B.03 OF THE LATEST EDITION OF MUTCD — SHSM R15-1 • SIZE = 36"x36"x36" — SHSM R1-2 ENLARGED VIEW BELOW — SHSM I-13		E 190
1206+05, LT ~~1205+96, LT~~		1	36	36	9.00						1					16.75 X		X															SHSM W10-12		
1207+99, LT		1	36	36	7.07						1					14.00 X		X															SHSM W10-1		E 190

FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE."

TOTALS	"A"	"B"	SALV SIGN	SALV TIS	EXIST POST	FLANGED CHANNEL	SQUARE STEEL	SLEEVE	TUBULAR ALUMINUM	FOUNDATION	TUBULAR STEEL	FTG. 24"	FTG. 30"	WEIGHT
Subtotals						FT | FT | FT	FT | FT 121.50 ~~140~~ | FT	EA	LB | LB | LB		LB | LB | LB | LB			
TOTALS	SF 53.82	SF	EA.	SF		FT	FT 121.50 ~~140~~		LB	EA.	LB	EA.	EA.	LB

BOW = BLACK LEGEND ON WHITE BACKGROUND - PLAQUE
GOW = GREEN LEGEND ON WHITE BACKGROUND - PLAQUE
WOB = WHITE LEGEND ON BLUE BACKGROUND - PLAQUE
FYG = BLACK LEGEND ON FLUORESCENT YELLOW-GREEN BACKGROUND
SHSM = FHWA STANDARD HIGHWAY SIGNS AND MARKINGS BOOK (WITH 2012 SUPPLEMENT)

POST LENGTH AVERAGES 15 FEET
POST LENGTH WITH '+' AVERAGES 20 FEET

REPORT EMERGENCY
OR PROBLEM
TO 1-888-265-2735
CROSSING 837 359 T

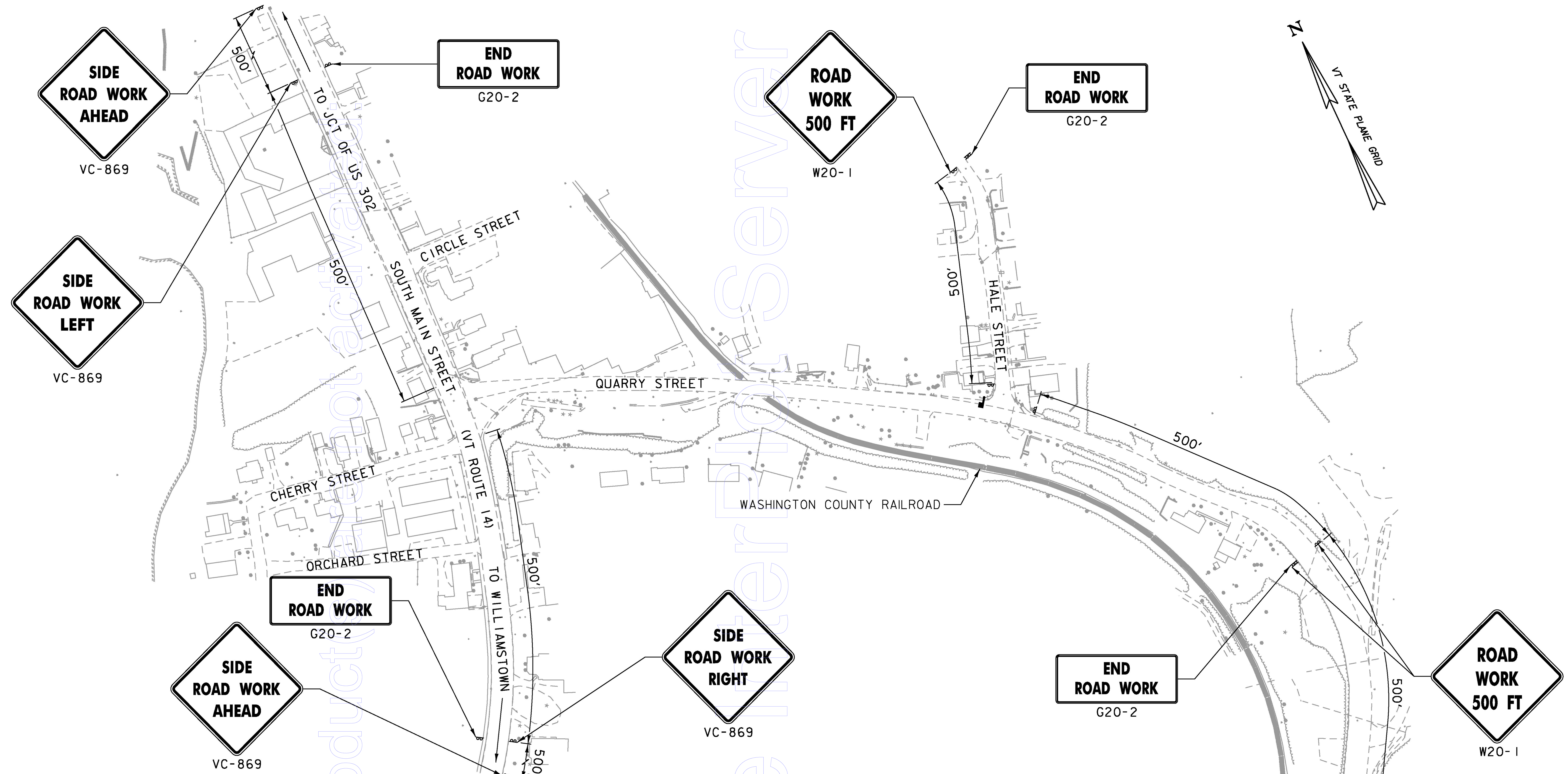
EMERGENCY NOTIFICATION SIGN
NOT TO SCALE

NOTE
SIGN SHALL CONFORM TO THE LATEST EDITIONS OF THE SHSM FOR SIGN I-13

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/1

FILE NAME: z15d040tss.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: E.B. PARIZO
TRAFFIC SIGN SUMMARY SHEET
PLOT DATE: 12/2/2016
DRAWN BY: E.B. PARIZO
CHECKED BY: D.M. PECK
SHEET 17 OF 39



TRAFFIC CONTROL NOTES

1. THE CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN, STAMPED BY A VERMONT LICENSED PROFESSIONAL ENGINEER, TO THE VERMONT AGENCY OF TRANSPORTATION (VTRANS) PROJECT MANAGER. THE CONTRACTOR SHALL ALLOW AT LEAST TWO (2) WEEKS FOR VTRANS REVIEW AND ACCEPTANCE. ALL CHANGES TO THE TRAFFIC CONTROL PLAN MUST BE APPROVED BY VTRANS. MODIFICATIONS TO THE APPROVED TRAFFIC CONTROL PLAN FOR VEHICLES OR PEDESTRIANS SHALL BE SUBMITTED TO THE ENGINEER AT LEAST TWO WEEKS PRIOR TO THE IMPLEMENTATION OF THE CHANGE.

2. ALL TRAFFIC CONTROL DEVICES SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), VAOT "STANDARD DRAWINGS" AND THE SPECIAL PROVISION. ADDITIONAL TRAFFIC CONTROL DEVICES MAY BE REQUIRED AND SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER. PAYMENT SHALL BE INCIDENTAL TO CONTRACT ITEM 641.10 "TRAFFIC CONTROL". THE PLAN SHALL ACCOMMODATE VEHICLE TRAFFIC, PEDESTRIAN TRAFFIC, AND EMERGENCY SERVICES. THE TRAFFIC CONTROL PLAN SHALL INCLUDE ALL TEMPORARY SIGNS, PAVEMENT MARKINGS, CHANNELIZING DEVICES, ARROW PANELS, AND OTHER DEVICES REQUIRED TO PROVIDE COMPLETE MANAGEMENT OF TRAFFIC. ANY SIGNS NOT INCLUDED IN THE FHWA STANDARD HIGHWAY SIGNS BOOK SHALL INCLUDE SIGN FACE DIMENSIONS AND LAYOUT.

3. CONTRACTOR SHALL MAINTAIN PEDESTRIAN ACCESS TO ALL COMMERCIAL AND MUNICIPAL PROPERTIES DURING BUSINESS HOURS. PEDESTRIAN ACCESS SHALL MEET ALL APPLICABLE AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS. POSITIVE GUIDANCE SHALL BE PROVIDED TO SEPARATE PEDESTRIAN ACCESS FROM THE WORK AREA AND VERTICAL GRADE CHANGES. ACCESS TO PROPERTIES MAY BE RESTRICTED FOR SHORT DURATIONS OF NOT MORE THAN TWO HOURS WITH THE PERMISSION AND PRIOR NOTIFICATION OF THE OWNER DURING BUSINESS HOURS. CONTRACTOR SHALL COORDINATE MAJOR WORK ADJACENT TO COMMERCIAL AND MUNICIPAL ACCESS AREAS WITH THE OWNER AND CITY AT LEAST ONE WEEK PRIOR TO STARTING THE WORK IN THE AREA. ALL COSTS ASSOCIATED WITH COORDINATION AND MAINTAINING PEDESTRIAN ACCESS WILL BE CONSIDERED INCIDENTAL TO ITEM 641.10 "TRAFFIC CONTROL".

4. SPECIAL CARE MUST BE TAKEN TO PROVIDE ACCESS THROUGH THE WORK ZONES FOR TRUCK TRAFFIC TO AND FROM THE QUARRIES AND FOR SCHOOL BUSES DURING CONSTRUCTION TAKING PLACE WHEN SCHOOL IS IN SESSION. THE CONTRACTOR SHALL ENSURE ADEQUATE TURNING RADIUS AND LANE WIDTHS ARE PROVIDED FOR THE PASSAGE OF SUCH VEHICLES THROUGH THE CONSTRUCTION ZONE.

5. SPECIAL CARE SHALL BE TAKEN NOT TO OBSTRUCT RAIL SERVICE. ANY WORK THAT BLOCKS OR ALTERS THE NORMAL USE OF THE AT-GRADE RAIL CROSSING SHALL BE COORDINATED IN ADVANCE WITH THE RAILROAD.

6. SEE STANDARD DRAWING T-1 FOR ADDITIONAL INFORMATION

7. IF LANE CLOSURES OR RESTRICTIONS ARE NEEDED, THE CONTRACTOR SHALL REFER TO TA-10 AND TA-13 OF THE MUTCD FOR GUIDANCE REGARDING ADDITIONAL TRAFFIC CONTROL MEASURES.

CONSTRUCTION APPROACH SIGNAGE

NOT TO SCALE

PROJECT NAME:	BARRE CITY - BARRE TOWN		
PROJECT NUMBER:	MEGC M 6000(II)C/I		
FILE NAME:	zl5d040_TCP.dgn	PLOT DATE:	12/2/2016
PROJECT LEADER:	A.P. GUYETTE	DRAWN BY:	J.D. KEENER
DESIGNED BY:	D.M. PECK	CHECKED BY:	D.M. PECK
TRAFFIC CONTROL SHEET (1 OF 2)		SHEET	18 OF 39

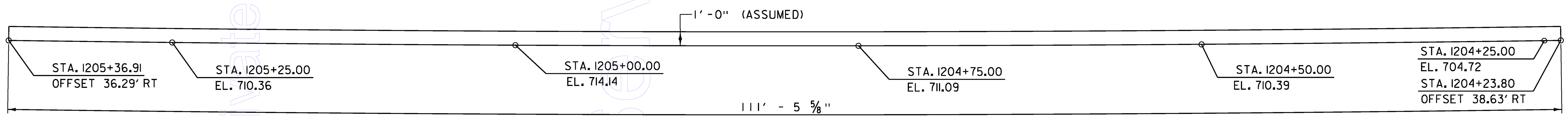
IDENTIFICATION NUMBER	SIZE OF SIGN WIDTH (IN)	SIZE OF SIGN HEIGHT (IN)	TEXT	NUMBER OF SIGNS REQ'D	AREA (SQ FT)	TOTAL AREA (SQ FT)	REMARKS
G20-2	36	18	END ROAD WORK	4	4.5	18.00	MOUNT ON TWO POSTS
VC-869	48	48	SIDE ROAD WORK AHEAD	2	16.0	32.00	MOUNT ON TWO POSTS
VC-869	48	48	SIDE ROAD WORK LEFT	1	16.0	16.00	MOUNT ON TWO POSTS
VC-869	48	48	SIDE ROAD WORK RIGHT	1	16.0	16.00	MOUNT ON TWO POSTS
W20-1	48	48	ROAD WORK AHEAD	2	16.0	32.00	MOUNT ON TWO POSTS
W20-1	48	48	ROAD WORK 500 FT	3	16.0	48.00	MOUNT ON TWO POSTS

vhb

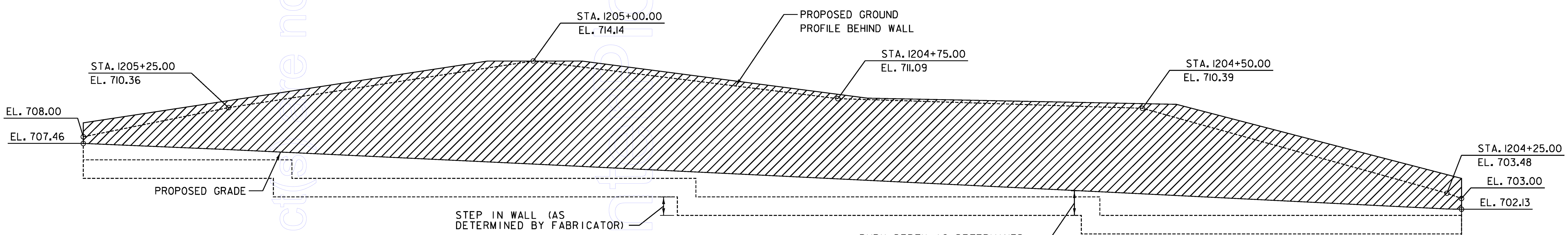
PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/1

FILE NAME: zl5d040_TCP.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
TRAFFIC CONTROL SHEET (2 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK



RETAINING WALL PLAN
SCALE 1/4" = 1'-0"



APPROXIMATE PAY LIMITS OF ITEM 900.670, "SPECIAL PROVISION (RETAINING WALL)". FINAL PAY LIMITS WILL BE BASED ON FINAL QUANTITIES AND FABRICATION DRAWINGS.

RETAINING WALL ELEVATION
SCALE 1/4" = 1'-0"

NOTES:

1. SEE PROJECT NOTES FOR PRECAST CONCRETE RETAINING WALL NOTES.

2. ASSUMED DIMENSIONS AND ELEVATIONS OF PROPOSED WALL ARE SHOWN FOR REFERENCE ONLY. ACTUAL DIMENSIONS AND DETAILS WILL BE DEPENDENT ON THE FABRICATORS DESIGN OF THE PARTICULAR WALL SYSTEM. OVERALL DIMENSIONS AND ELEVATIONS PROVIDED IN THESE PLANS SHALL BE MAINTAINED WITH MINOR VARIATIONS TO BE SHOWN AND APPROVED THROUGH SHOP DRAWINGS.

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(12)C/1	
FILE NAME: z15d040_retwall.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: J.D. KEENER
DESIGNED BY: J.D. KEENER	CHECKED BY: D.M. PECK
RETAINING WALL DETAILS	SHEET 20 OF 39

EROSION CONTROL NARRATIVE

1.1 PROJECT DESCRIPTION

BARRE CITY / BARRE TOWN - MEGC M 6000(11) / P1, INVOLVES RECONSTRUCTION / REGRADING OF THE SLOPES ON THE SOUTHERN SIDE OF QUARRY STREET (TH #6) FROM THE S. MAIN STREET (VT 14) INTERSECTION TO THE RAILROAD CROSSING, APPROXIMATELY 500 EAST OF THE S. MAIN STREET INTERSECTION. THE SLOPES WILL BE STONE REINFORCED AND WILL BE COVERED WITH A GRUBBING MATERIAL AND/OR CLEAN FILL, WHICH WILL BE STABILIZED. THE PROJECT ALSO INCLUDES A MODULAR BLOCK RETAINING WALL NEAR THE RAILROAD CROSSING TO MINIMIZE IMPACTS TO ABUTTING PROPERTIES.

THE TOTAL LENGTH OF THE PROJECT IS APPROXIMATELY 900 FEET. THE SITE IS LOCATED AT 44°11'06"N / 72°29'63"W. THE TOTAL DISTURBED AREA (EXCLUDING WASTE, BORROW AND/OR STAGING AREAS) IS APPROXIMATELY 31,487 SQUARE FEET (0.72 ACRES)

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

THE TOPOGRAPHY OF THE SITE IS FORMER RESIDENTIAL WITH SOME ESTABLISHED VEGETATION ALONG QUARRY STREET AND ON TOP OF THE EXISTING SLOPE. OVERHEAD UTILITIES ARE LOCATED ALONG THE SOUTHERN SIDE OF QUARRY STREET, AND WILL BE RELOCATED UPON COMPLETION OF THIS PROJECT.

1.2.1 OFF SITE DRAINAGE CHARACTERISTICS (UP AND DOWN-GRADIENT)

THE QUARRY STREET / S. MAIN STREET INTERSECTION, DOWN-GRADIENT FROM THE SITE, CONTAINS A COMPREHENSIVE CLOSED DRAINAGE SYSTEM WHICH DIRECTS STORMWATER TO THE STEVENS BRANCH RIVER. THE CLOSED SYSTEM AT THE INTERSECTION RECEIVES RUNOFF FROM THE SITE, AS WELL AS SOME FROM THE SURROUNDING AREA. COLLECTED STORMWATER, BOTH UPSTREAM AND THROUGHOUT THE PROJECT SITE, DISCHARGES INTO THE STEVENS BRANCH AT MULTIPLE LOCATIONS.

1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

THE STEVENS BRANCH IS THE PRIMARY WATER SOURCE NEAR THE PROJECT SITE. THE TRIBUTARY AREA FOR THE STEVENS BRANCH AT THE MOST DOWNSTREAM END OF THE PROJECT SITE IS APPROXIMATELY 34.8 SQUARE MILES.

1.2.3 VEGETATION

THE VEGETATION ALONG THE SOUTHERN SIDE CONSISTS OF SOME TREES, SHRUB BRUSH AND FORMER HOUSE LAWNS. ALL THE VEGETATION WITHIN THE PROJECT LIMITS WILL BE CLEARED TO ACCOMMODATE THE THE NEW SLOPES. SLOPES WILL BE STABILIZED WITH STONE AND APPROPRIATE EROSION CONTROL MEASURES, INCLUDING MATTING, SEEDING, MULCHING, ETC.

1.2.4 SOILS

SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF WASHINGTON, VERMONT. THE SOIL ON THE PROJECT SITE HAS BEEN CLASSIFIED AS "URBAN LAND-UDIPSAMMENTS, OCCASIONALLY FLOODED". THIS SOIL TYPE IS GENERALLY LOCATED IN BARRE AND MONTPELIER, AND CAN GENERALLY BE FOUND WITHIN FLOOD PLAINS AND TERRACES. IT IS MADE UP OF 50% URBAN LAND, 25% UPDIPSAMMENTS, 15% DUMPS, AND 10% OTHER SOILS. ONSITE INVESTIGATION IS REQUIRED TO DETERMINE THE EXACT NATURE OF THE SOIL MAKEUP.

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO
HISTORICAL OR ARCHEOLOGICAL AREAS: NO
PRIME AGRICULTURAL LAND: NO
THREATENED AND ENDANGERED SPECIES: NO

1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

ALL MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.

1.4.1 MARK SITE BOUNDARIES

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED. PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES.

1.4.2 LIMIT DISTURBANCE AREA

PREVENTING INITIAL SOIL EROSION BY MINIMIZING THE EXPOSED AREA IS MUCH MORE EFFECTIVE THAN TREATING ERODED SEDIMENT. EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY. THIS CAN LIMIT THE AREA THAT WILL BE DISTURBED AND EXPOSED TO EROSION. EMPLOY TEMPORARY CONSTRUCTION STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE. FOR PROJECTS WHICH FALL UNDER THE CONSTRUCTION GENERAL PERMIT, ONLY THE ACREAGE LISTED ON THE PERMIT AUTHORIZATION MAY BE EXPOSED AT ANY GIVEN TIME. MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE ESTABLISHED WHEREVER POSSIBLE.

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTORS PROGRESS SCHEDULE. STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

SILT FENCE WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN. INLET PROTECTION DEVICES WILL BE INSTALLED AT DROP INLETS AT THE QUARRY STREET / S. MAIN STREET INTERSECTION.

1.4.5 DIVERT UPLAND RUNOFF

DIVERSIONARY MEASURES SHALL BE USED TO INTERCEPT RUNOFF FROM ABOVE THE CONSTRUCTION AND DIRECT IT AROUND THE DISTURBED AREA SO THAT CLEAN WATER DOES NOT BECOME MUDDIED WHILE TRAVELING OVER EXPOSED SOILS ON THE CONSTRUCTION SITE.

IT IS NOT ANTICIPATED THAT DIVERSION MEASURES WILL BE NECESSARY DUE TO THE TOPOGRAPHY OF THE SURROUNDING AREA

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSIVE POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

CHECK DAMS WILL BE INSTALLED AS PROPOSED ON THE EPSC PLAN ALONG THE PROPOSED DRAINAGE DITCH.

1.4.7 CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

A SHALLOW ROADSIDE DITCH SHALL BE RE-ESTABLISHED ALONG THE SOUTHERN SIDE OF QUARRY STREET.

1.4.8 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE OR IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT 3-9020 AUTHORIZATION.

COVER MATERIAL ON TOP OF TYPE II STONE FILL SHALL BE USED TO REINFORCE THE CONSTRUCTED SLOPE. SURFACE ROUGHENING OF ALL EXPOSED SLOPES, COMBINED WITH TEMPORARY MULCHING, SHALL BE UTILIZED ON A REGULAR BASIS. BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED TO STABILIZE ALL SLOPES STEEPER THAN 1:3.

THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

1.4.9 WINTER STABILIZATION

VARIOUS MEASURES SPECIFIC TO WINTER MAY BE NECESSARY SHOULD THE PROJECT EXTEND INTO WINTER (OCTOBER 15 THROUGH APRIL 15). REFER TO THE LOW RISK SITE HANDBOOK FOR GUIDANCE.

WINTER STABILIZATION IS NOT ANTICIPATED FOR THIS PROJECT.

1.4.10 STABILIZE SOIL AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.
STONE FILL SHALL BE USED TO STABILIZE THE SLOPE. SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

1.4.11 DE-WATERING ACTIVITIES

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS.

DE-WATERING ACTIVITIES IS NOT ANTICIPATED FOR THIS PROJECT

1.4.12 INSPECT YOUR SITE

INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS OR CONSTRUCTION GENERAL PERMIT AUTHORIZATION STIPULATIONS.

1.5 SEQUENCE AND STAGING

THIS SECTION WILL BE DEVELOPED BY THE CONTRACTOR USING THE GUIDANCE OUTLINED IN THE VTRANS EPSC PLAN CONTRACTOR CHECKLIST.

1.5.1 CONSTRUCTION SEQUENCE

1.5.2 OFF-SITE ACTIVITIES

IN ADDITION TO THE CONTRACTOR CHECKLIST ANY ACTIVITIES OUTSIDE THE CONSTRUCTION LIMITS SHALL FOLLOW SPECIFICATION 105.25- 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

1.5.3 UPDATES

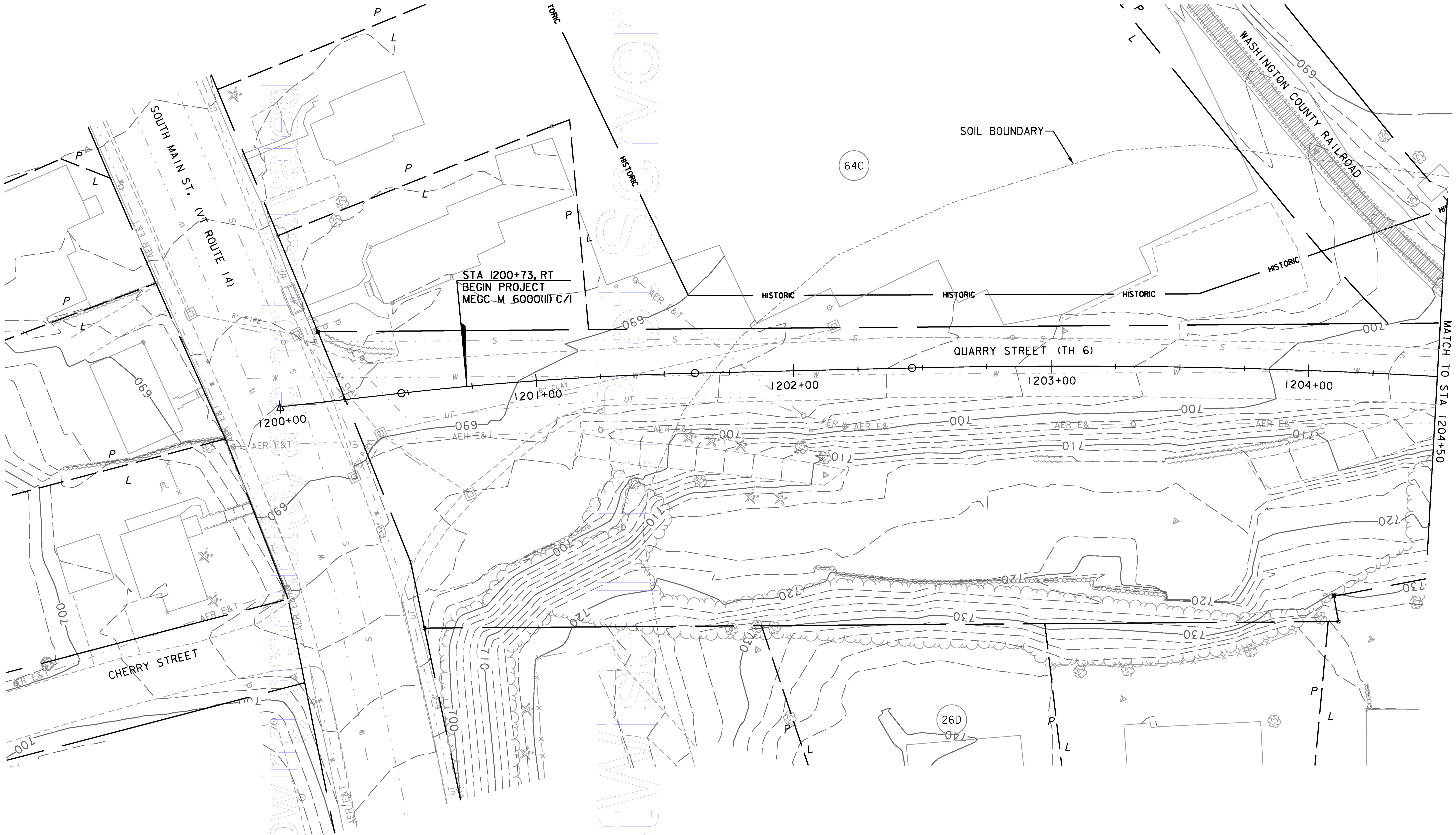
EPSC LEGEND

- CHECK DAM
- INLET PROTECTION DEVICE
- STABLIZED CONSTRUCTION ENTRANCE
- SILT FENCE
- LIMITS OF SOIL DISTURBANCE
- EROSION MATTING
- DISTURBED AREAS REQUIRING REVEGATION
- PDF——PDF PROJECT DEMARCATION FENCE
- RIPARIAN BUFFER ZONE

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(11)C/1

vhb

FILE NAME: zl5d040_EPSC_NARRATIVE.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: J.D. KEENER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
EPSC NARRATIVE	SHEET 21 OF 39



SOIL CLASSIFICATION

SOIL ID	DESCRIPTION
64C	SALMON-ADAMANT COMPLEX, VERY ROCKY HSG B 8 TO 15 PERCENT SLOPES "K FACTOR" 0.64 CLASSIFIED AS HIGHLY ERODIBLE
26D	ADAMS LOAMY FINE SAND HSG A 15 TO 25 PERCENT SLOPES "K FACTOR" 0.17

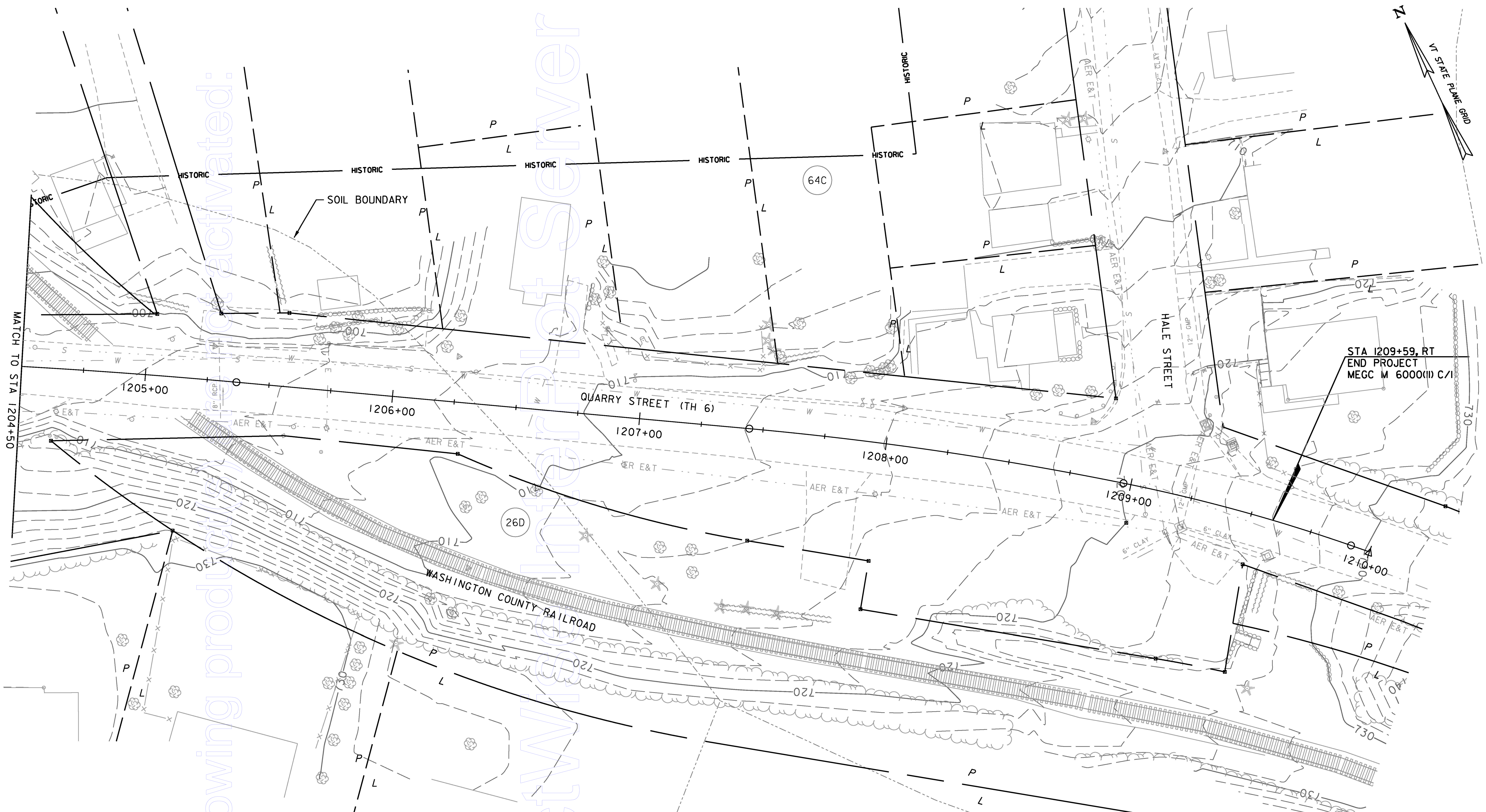
0 20 40
SCALE IN FEET

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040bdr_EPSC_ec.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC-EXISTING CONDITIONS (SHEET 1 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 22 OF 39



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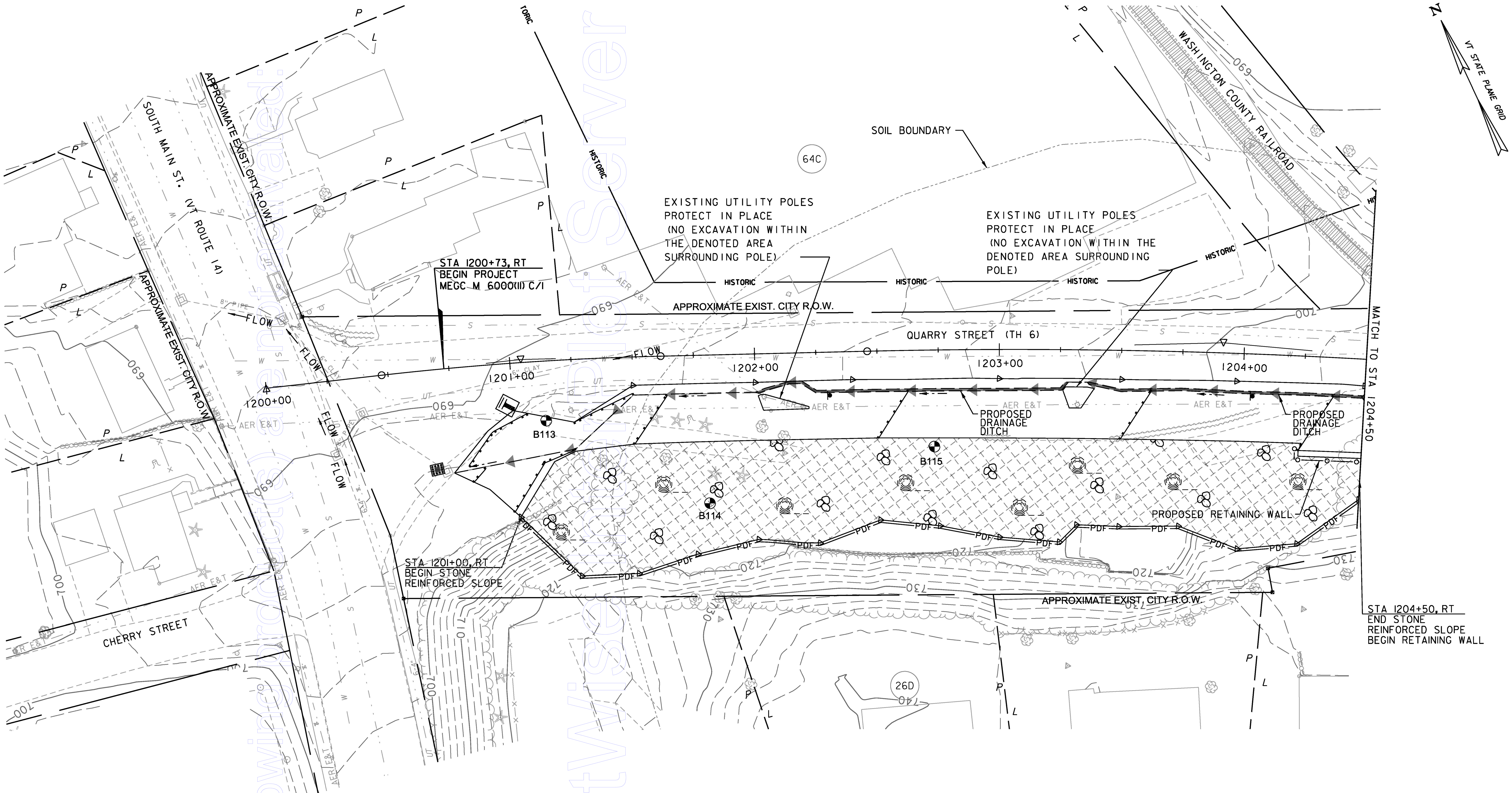
PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040bdr_EPSC_ec.dgn
PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE
DRAWN BY: J.D. KEENER
DESIGNED BY: D.M. PECK
CHECKED BY: D.M. PECK
EPSC-EXISTING CONDITIONS (SHEET 2 OF 2)
SHEET 23 OF 39



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26D	ADAMS LOAMY FINE SAND HSG A 15 TO 25 PERCENT SLOPES "K FACTOR" 0.17

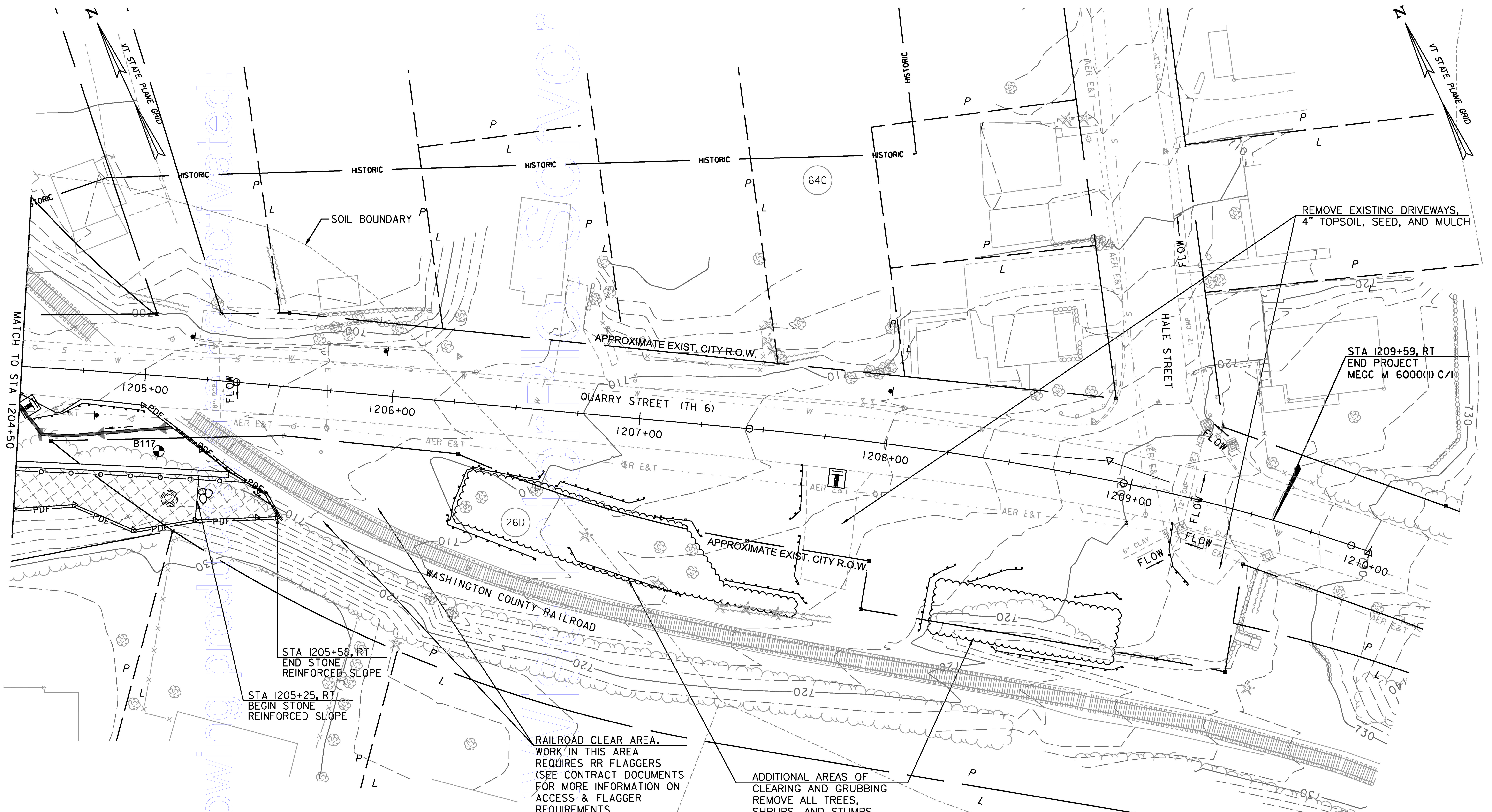
0 20 40
SCALE IN FEET

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040bdr_EPSC_con.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC-CONSTRUCTION PLANS (SHEET 1 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 24 OF 39



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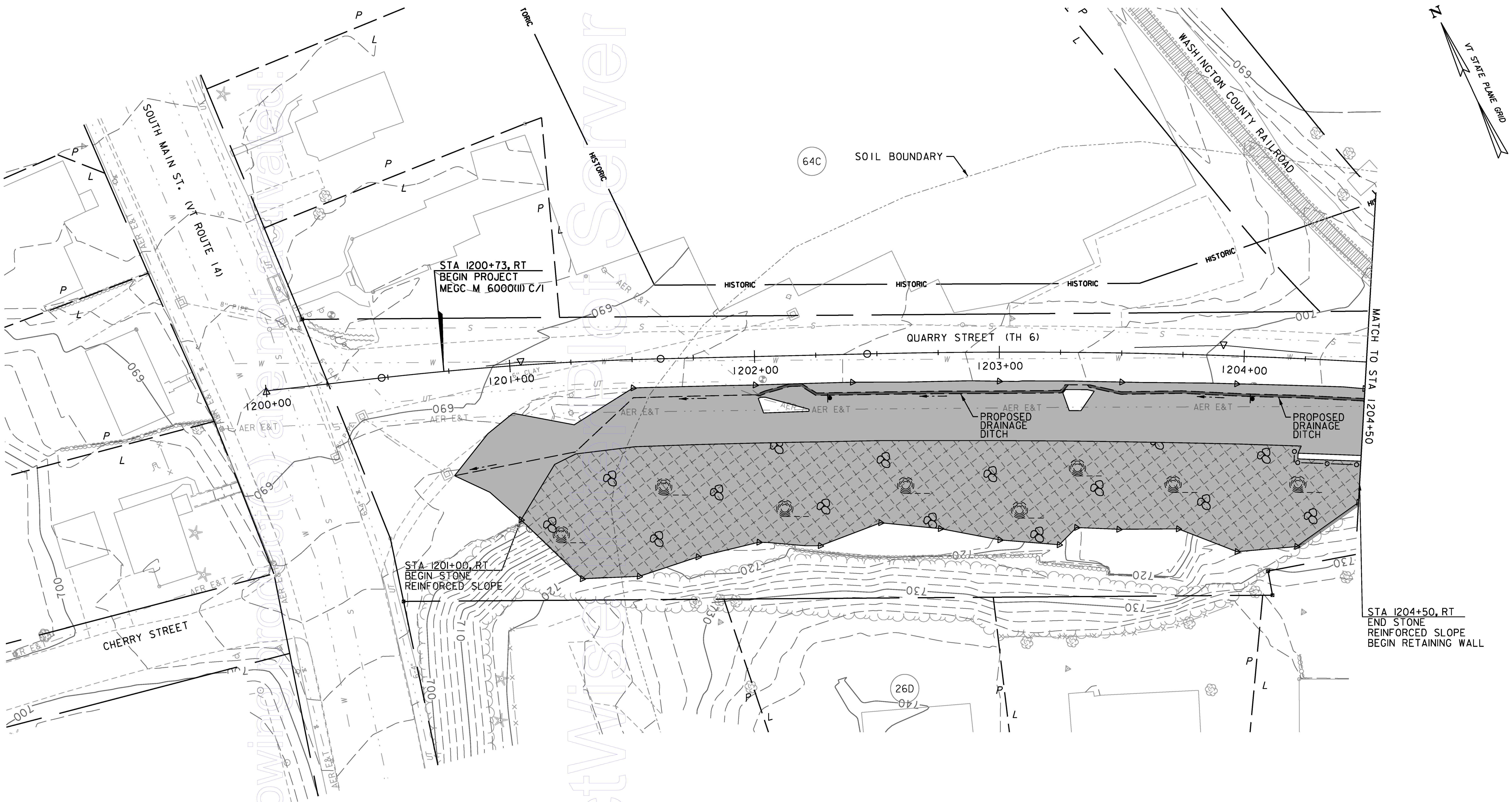
SCALE IN FEET

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: z15d040bdr_EPSC_con.dgn
PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE
DRAWN BY: J.D. KEENER
DESIGNED BY: D.M. PECK
CHECKED BY: D.M. PECK
EPSC-CONSTRUCTION PLANS (SHEET 2 OF 2)
SHEET 25 OF 39



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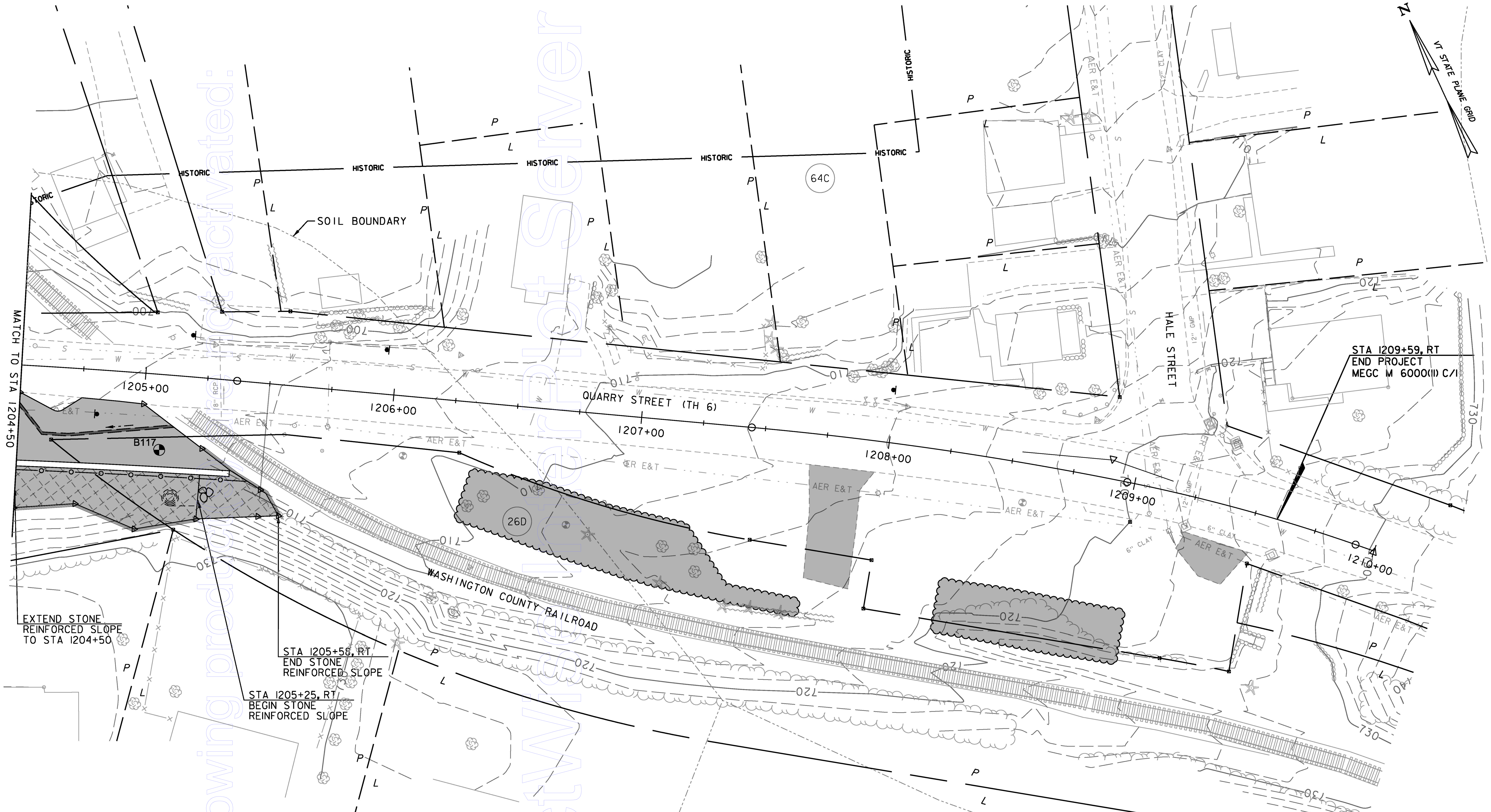
0 20 40
SCALE IN FEET

vhb

PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/I

FILE NAME: zl5d040bdr_EPSC_fc.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC- FINAL PLANS (SHEET 1 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 26 OF 39



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PROJECT NAME: BARRE CITY - BARRE TOWN
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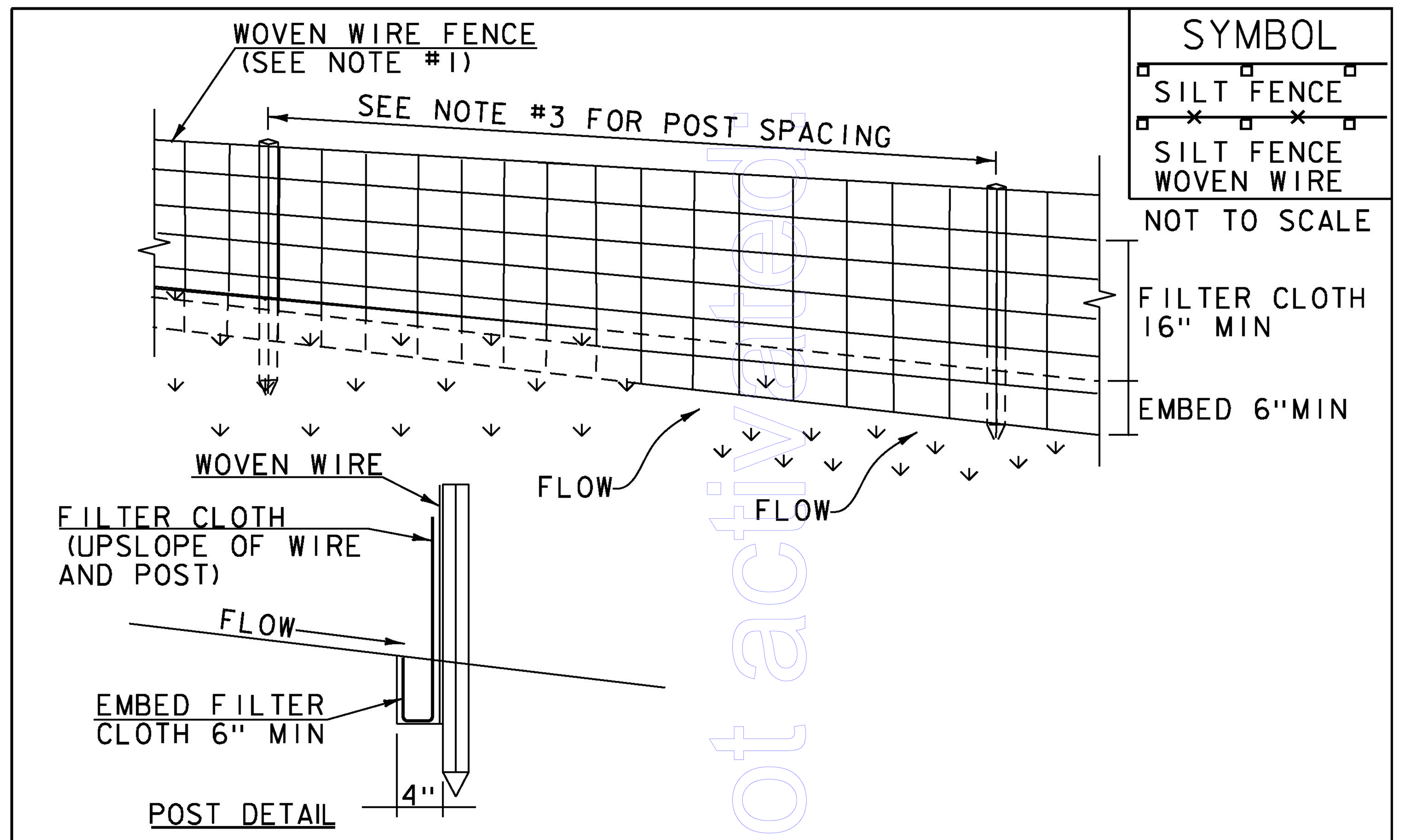
FILE NAME: zl5d040bdr_EPSC_fc.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC-FINAL PLANS (SHEET 2 OF 2)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 27 OF 39



SYMBOL
SILT FENCE
SILT FENCE WOVEN WIRE

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. WOVEN WIRE REINFORCED FENCE IS REQUIRED WITHIN 100' UPSLOPE OF RECEIVING WATERS WHEN THE PROJECT FALLS UNDER A CONSTRUCTION STORMWATER PERMIT. WOVEN WIRE SHALL BE A MIN. 14 GAUGE WITH A 6" MAX. MESH OPENING.
2. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI100X, STABILINKA T140N OR APPROVED EQUIVALENT.
3. POST SPACING FOR WIRE-BACKED FENCE SHALL BE 10' MAXIMUM. FOR FILTER-CLOTH FENCE, WHEN ELONGATION IS >50%, POST SPACING SHALL NOT EXCEED 4' AND WHEN ELONGATION IS <50%, POST SPACING SHALL NOT EXCEED 6'.
4. WOVEN WIRE FENCE IS TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES. FILTER CLOTH IS TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION.
5. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY 6" AND FOLDED.
6. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN SEDIMENT REACHES HALF OF FABRIC HEIGHT.

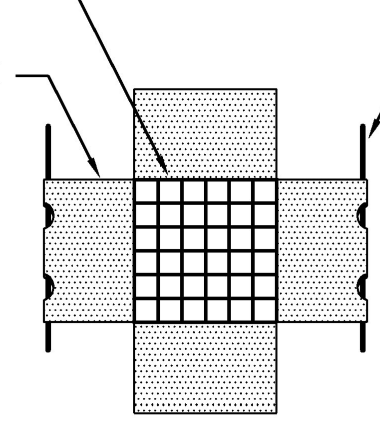
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SILT FENCE

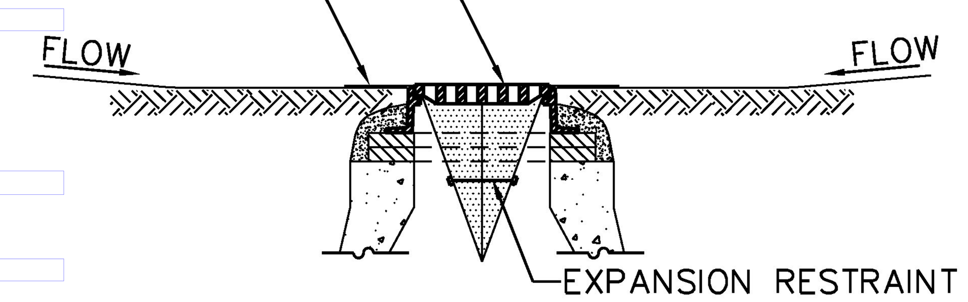
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 AND AS SHOWN IN THE PLANS FOR GEOTEXTILE FOR SILT FENCE (PAY ITEM 649.51) ~~OR GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED (PAY ITEM 649.515).~~

REVISIONS	
MARCH 21, 2008	WHF
DECEMBER 11, 2008	WHF
JANUARY 13, 2009	WHF



PLAN VIEW



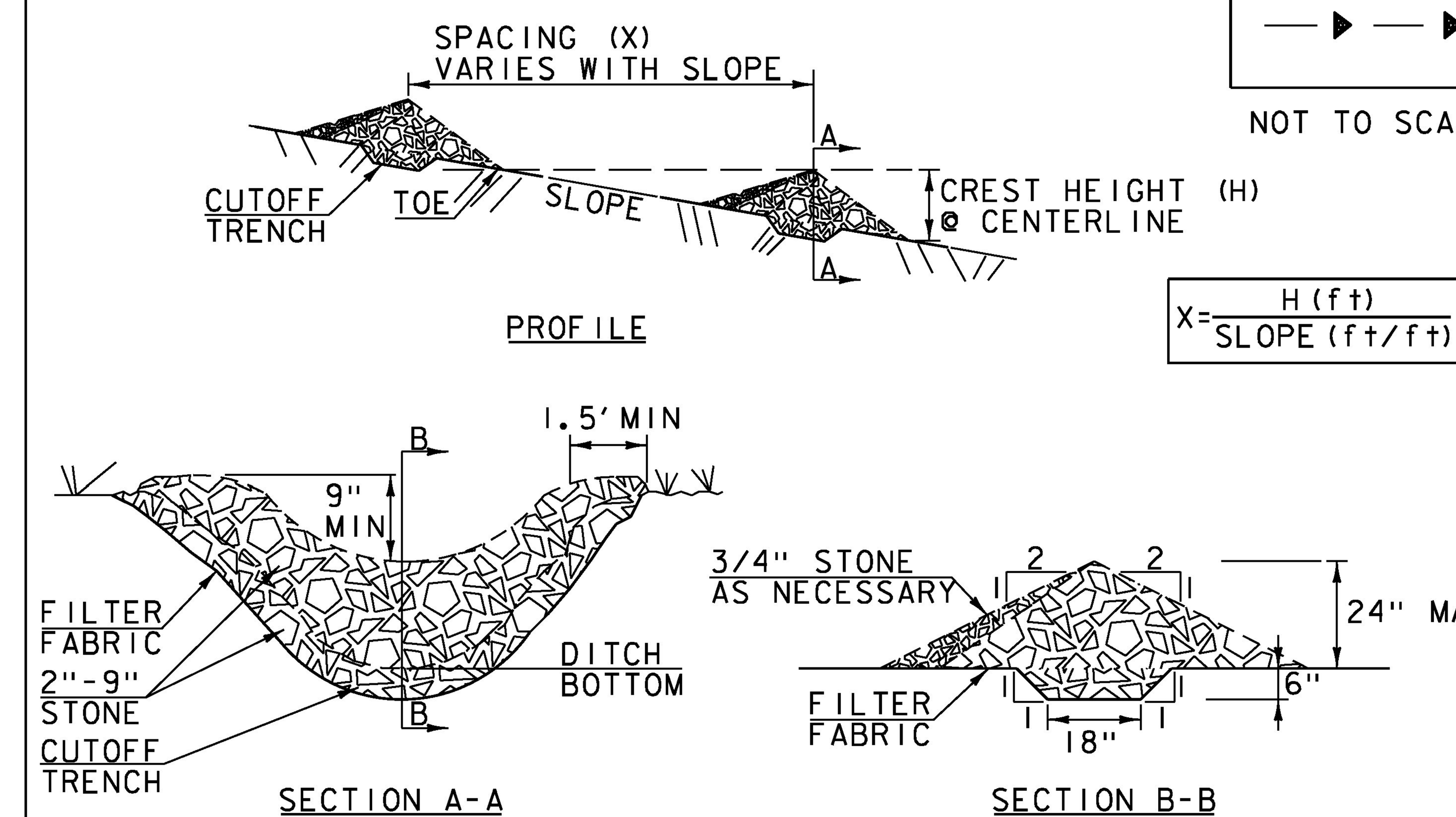
SECTION VIEW

INLET PROTECTION DEVICE, TYPE II

NTS

Notes:

1. INSTALL SILTSACK IN ALL CATCH BASINS WHERE INDICATED ON THE PLAN BEFORE COMMENCING WORK OR IN PAVED AREAS AFTER BINDER COURSE IS PLACED AND HAY BALES HAVE BEEN REMOVED.
2. GRATE TO BE PLACED OVER SILTSACK.
3. SILTSACK SHALL BE INSPECTED PERIODICALLY AND AFTER ALL STORM EVENTS AND CLEANING OR REPLACEMENT SHALL BE PERFORMED PROMPTLY AS NEEDED. MAINTAIN UNTIL UPSTREAM AREAS HAVE BEEN PERMANENTLY STABILIZED



SYMBOL
—►—►

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION.
2. CHECK DAMS SHALL BE SPACED SO THAT THE ELEVATION OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION AS THE TOE OF THE UPSTREAM DAM.
3. 3/4" FILTERING STONE MAY BE ADDED TO THE FACE OF THE CHECK DAM AS NECESSARY.
4. EXTEND THE STONE A MINIMUM OF 1.5' BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
5. PROTECT CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
6. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.
7. MAXIMUM DRAINAGE AREA 2 ACRES.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CHECK DAM

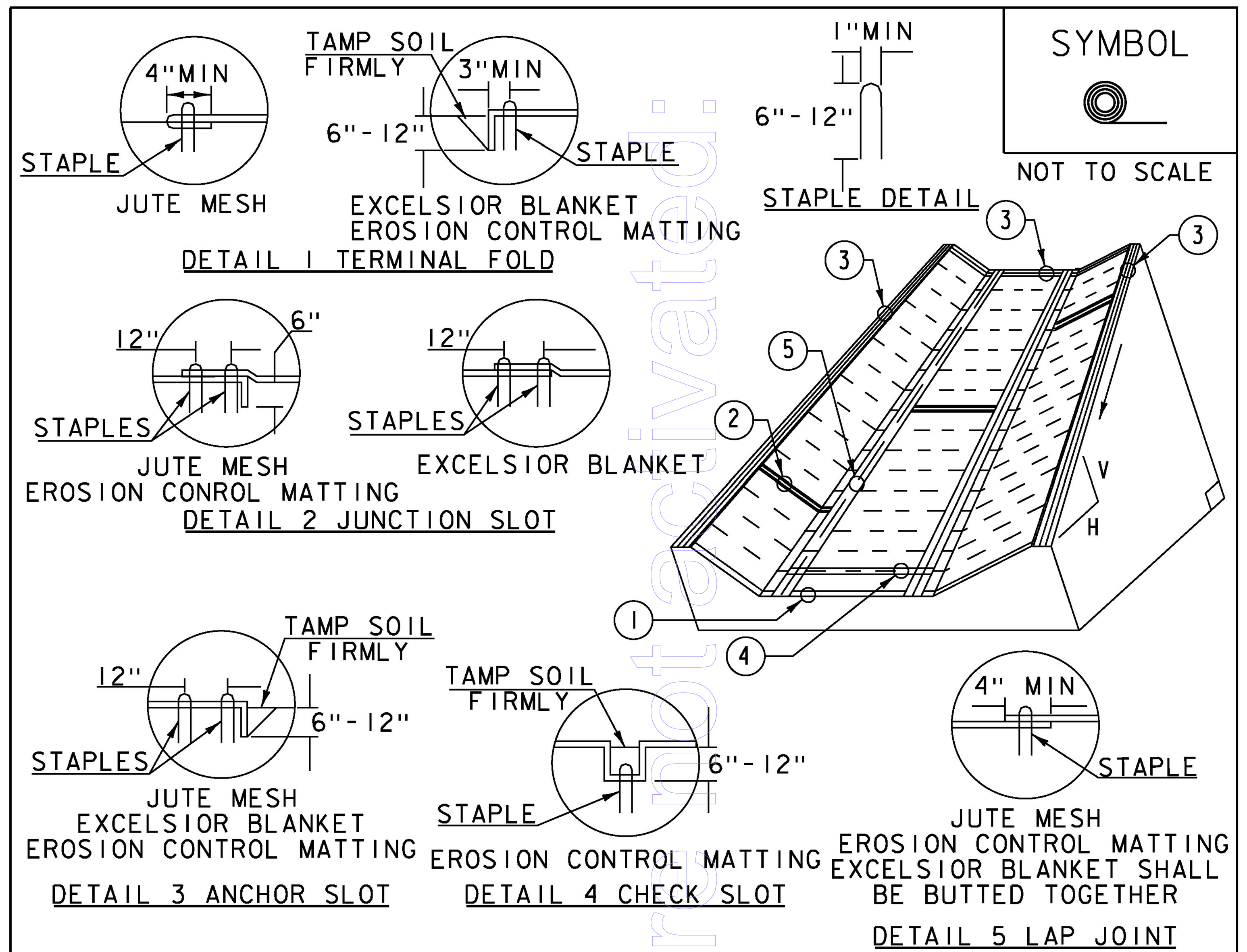
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR TEMPORARY STONE CHECK DAM, TYPE I (PAY ITEM 653.25)

REVISIONS	
MARCH 21, 2008	WHF
JANUARY 8, 2009	WHF

vhb

PROJECT NAME:	BARRE CITY - BARRE TOWN		
PROJECT NUMBER:	MEGC M 6000(II)C/I		
FILE NAME:	z15d040bdr_erodet.dgn	PLOT DATE:	12/2/2016
PROJECT LEADER:	A.P. GUYETTE	DRAWN BY:	J.D. KEENER
DESIGNED BY:	D.M. PECK	CHECKED BY:	D.M. PECK
EPSC DETAILS (1 of 3)		SHEET	28 OF 39



CONSTRUCTION SPECIFICATIONS

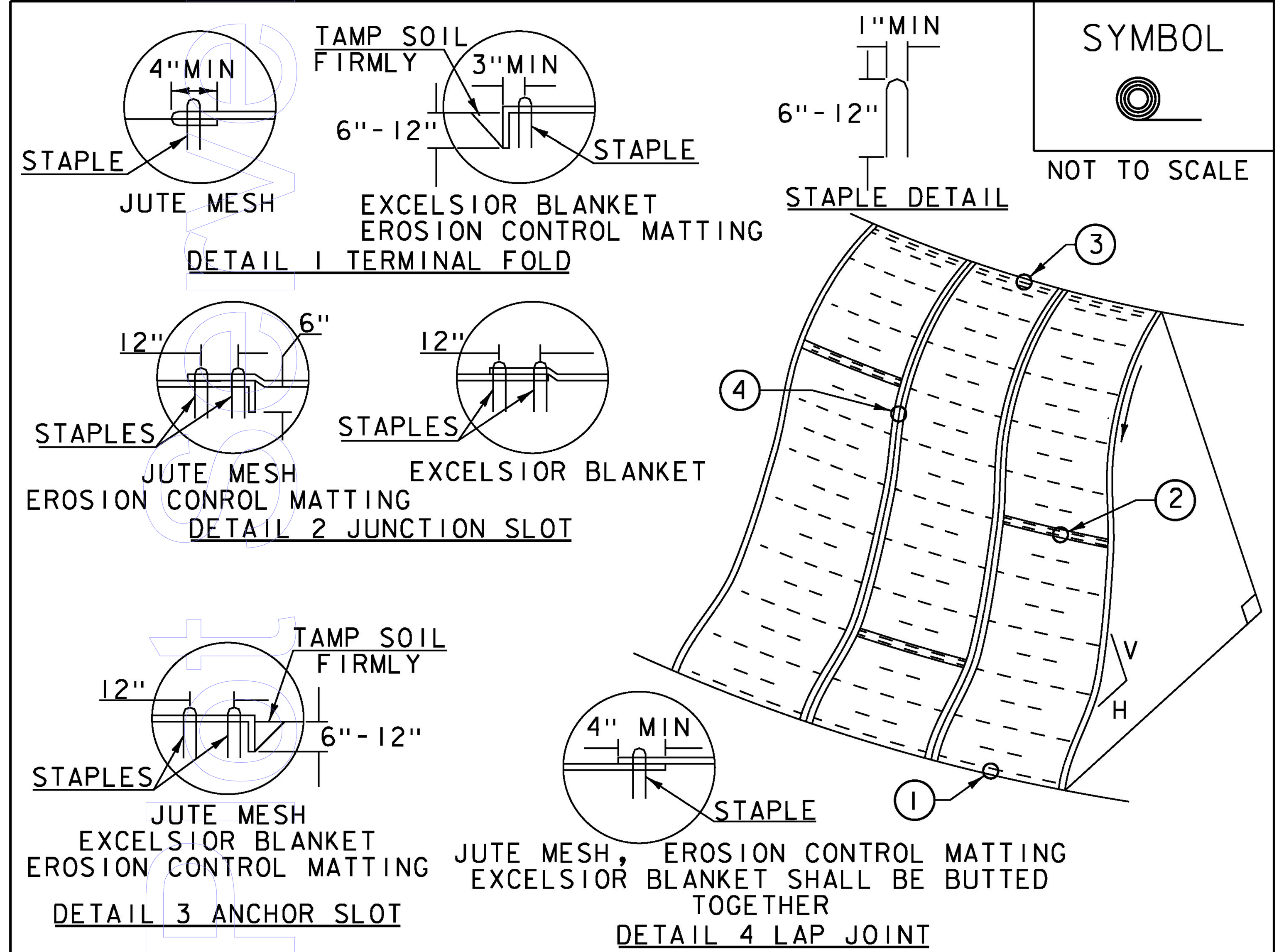
1. EROSION MATTING, CHECK SLOTS, SHALL BE SPACED IN DITCH CHANNEL SO THAT ONE OCCURS WITHIN EACH 50' ON SLOPES OF MORE THAN 4% AND LESS THAN 6%. ON SLOPES OF 6% OR MORE, THEY SHALL BE SPACED SO THAT ONE OCCURS WITHIN EACH 25'.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) DITCH

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 AND AS SHOWN IN THE PLANS FOR TEMPORARY EROSION MATTING (PAY ITEM 653.20) OR PERMANENT EROSION MATTING (PAY ITEM 653.21).

REVISIONS	
MARCH 8, 2007	JMF
APRIL 16, 2007	WHF
JANUARY 13, 2009	WHF



CONSTRUCTION SPECIFICATIONS

1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 AND AS SHOWN IN THE PLANS FOR TEMPORARY EROSION MATTING (PAY ITEM 653.20) OR PERMANENT EROSION MATTING (PAY ITEM 653.21).

REVISIONS	
APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF

VAOT RURAL AREA MIX

	LBS/AC				
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
37.5%	22.5	45	CREEPING RED FESCUE	85%	98%
37.5%	22.5	45	TALL FESCUE	90%	95%
5.0%	3	6	RED TOP	90%	95%
15.0%	9	18	BIRDSFOOT TREFOIL	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	85%	95%
100%	60	120			

VAOT URBAN AREA MIX

	LBS/AC				
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
42.5%	34	68	CREEPING RED FESCUE	85%	98%
10.0%	8	16	PERENNIAL RYE GRASS	90%	95%
42.5%	34	68	KENTUCKY BLUE GRASS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	85%	95%
100%	80	160			

GENERAL GUIDANCE

FERTILIZER		LIME	
BROADCAST	HYDROSEED	BROADCAST	HYDROSEED
10-20-10	19-19-19	PELLETIZED	LIQUID
500 LBS/AC		2 TONS/AC	4.4 GAL/AC

CONSTRUCTION GUIDANCE

1. RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
2. URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

ADAPTED FROM VTRANS TECHNICAL LANSCAPE MAUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

REVISIONS	
JUNE 23, 2009	WHF
JANUARY 15, 2010	WHF

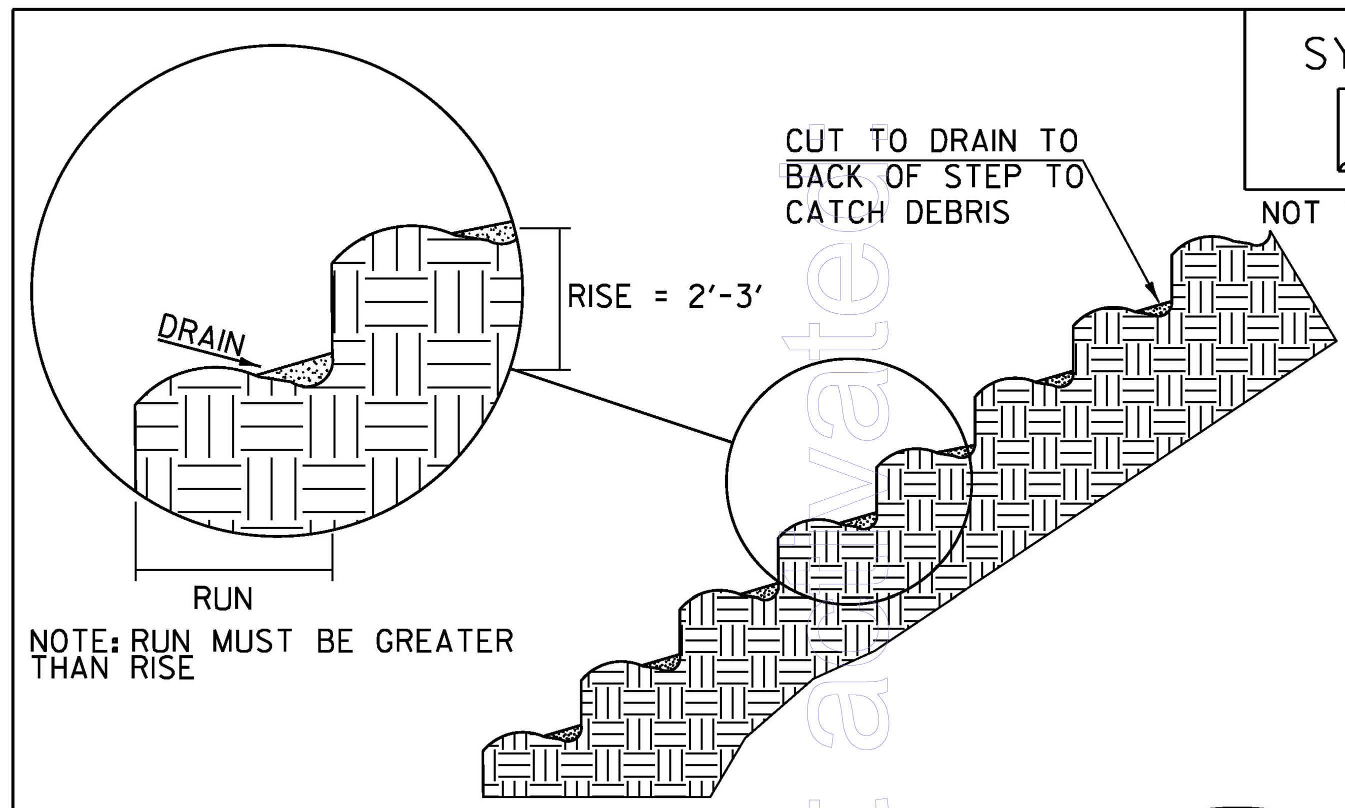
PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(II)C/1

FILE NAME: z15d040bdr_erodet.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC DETAILS (2 of 3)

PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 29 OF 39

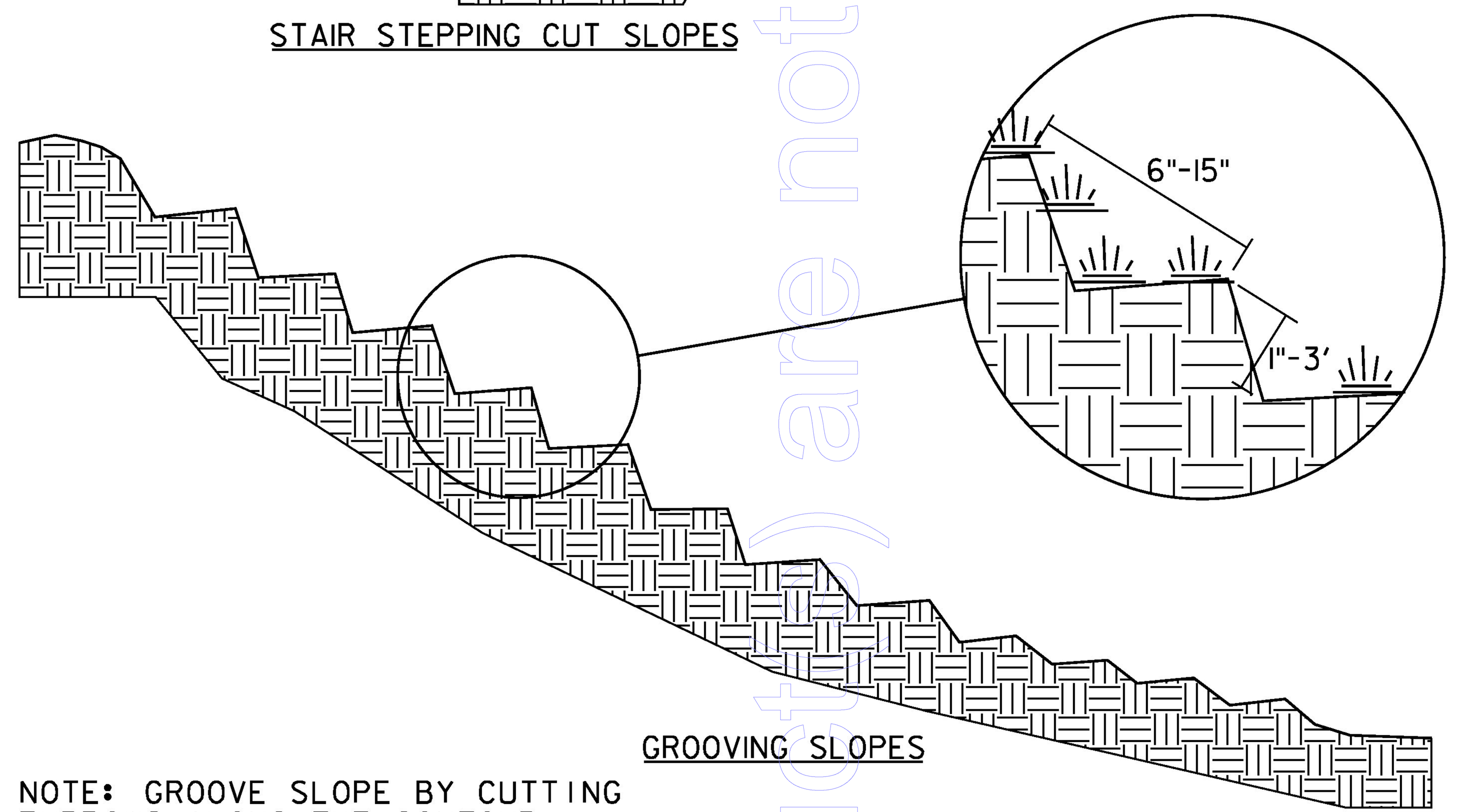
SYMBOL

NOT TO SCALE



NOTE: RUN MUST BE GREATER THAN RISE

STAIR STEPPING CUT SLOPES



GROOVING SLOPES

NOTE: GROOVE SLOPE BY CUTTING FURROWS ALONG THE CONTOUR. IRREGULARITIES IN THE SOIL SURFACE CATCH RAINWATER AND RETAIN LIME, FERTILIZER AND SEED.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SURFACE ROUGHENING

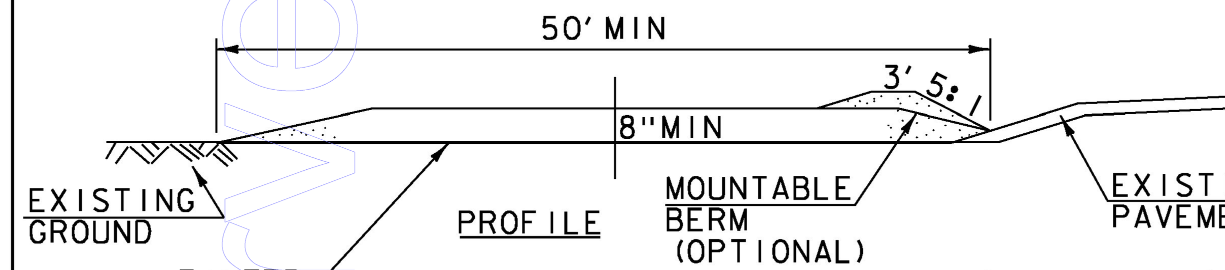
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

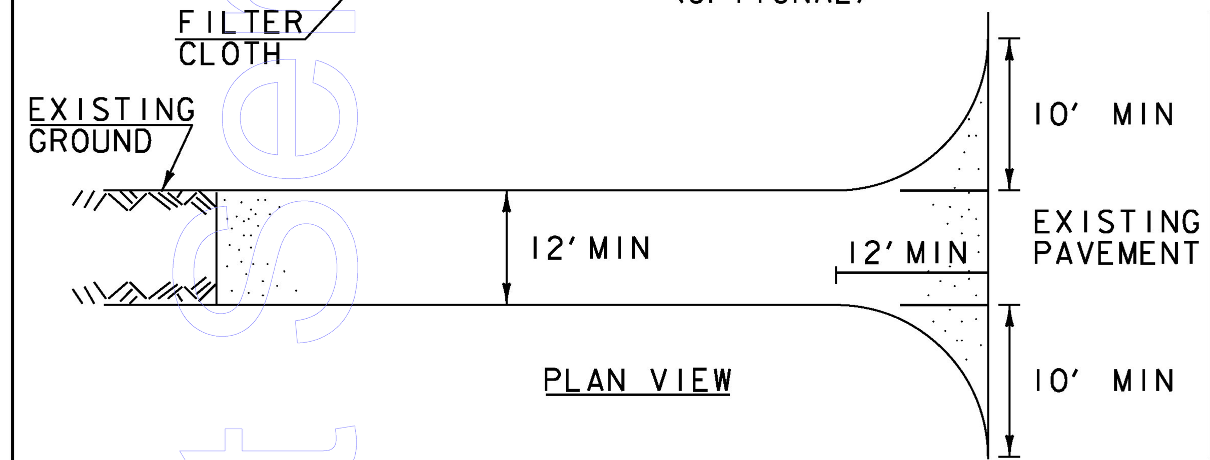
THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT

REVISIONS	
APRIL 1, 2008	WHF
JANUARY 13, 2009	WHF

SYMBOL

NOT TO SCALE





CONSTRUCTION SPECIFICATIONS

1. STONE SIZE- USE 1-4" STONE, RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH- NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH APPLIES).
3. THICKNESS- NOT LESS THAN 8".
4. WIDTH- 12' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE MUST BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC
ORIGINALLY DEVELOPED BY USDA-NRCS
VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STABILIZED CONSTRUCTION ENTRANCE

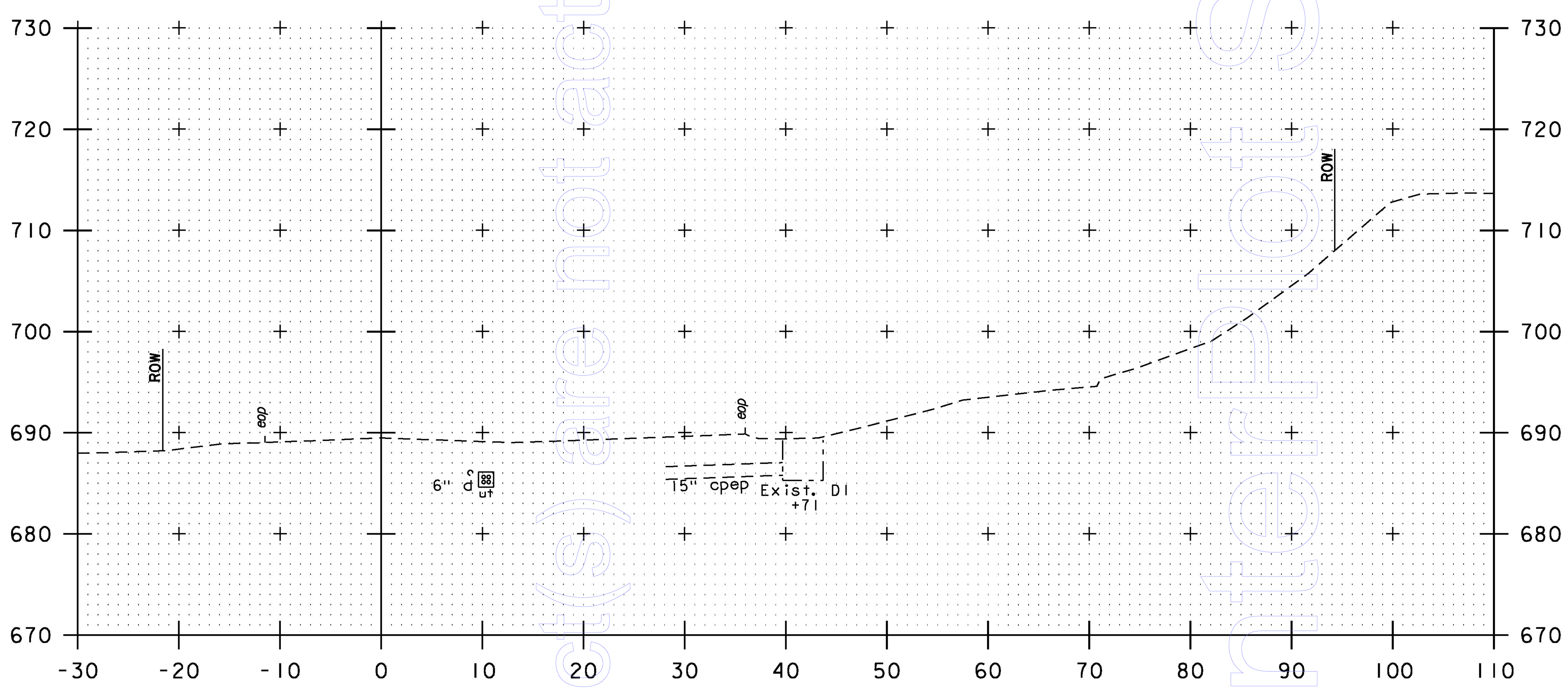
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- " FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF

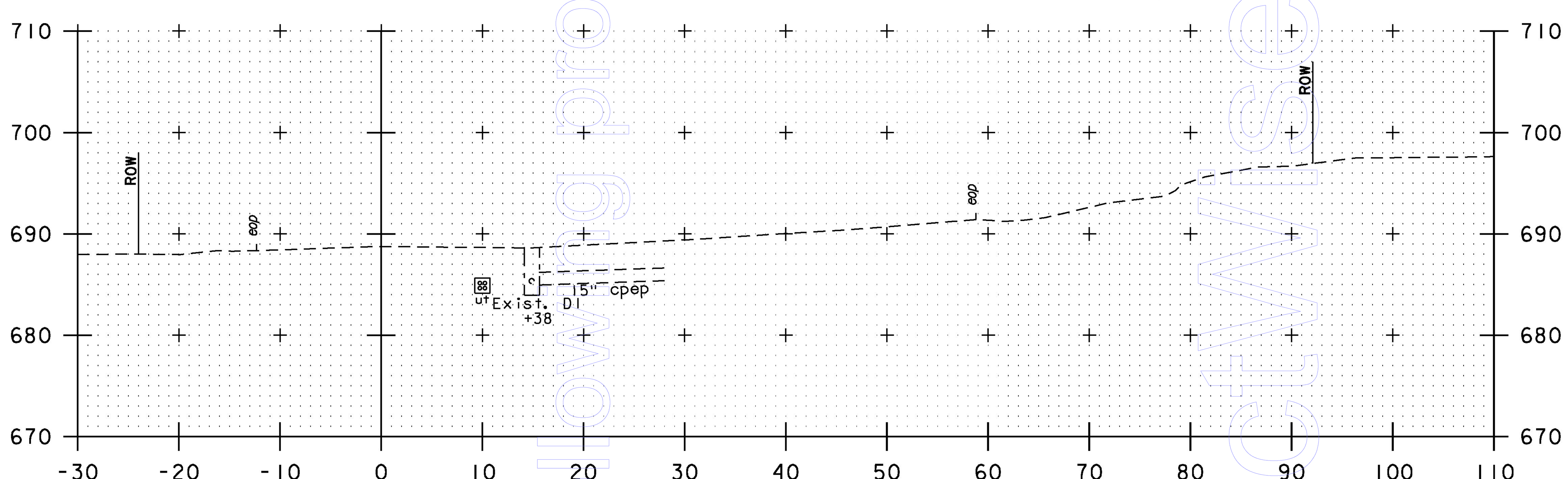
PROJECT NAME: BARRE CITY - BARRE TOWN
PROJECT NUMBER: MEGC M 6000(11)C/1

FILE NAME: z15d040bdr_erodet.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
EPSC DETAILS (3 of 3)
PLOT DATE: 12/2/2016
DRAWN BY: J.D. KEENER
CHECKED BY: D.M. PECK
SHEET 30 OF 39

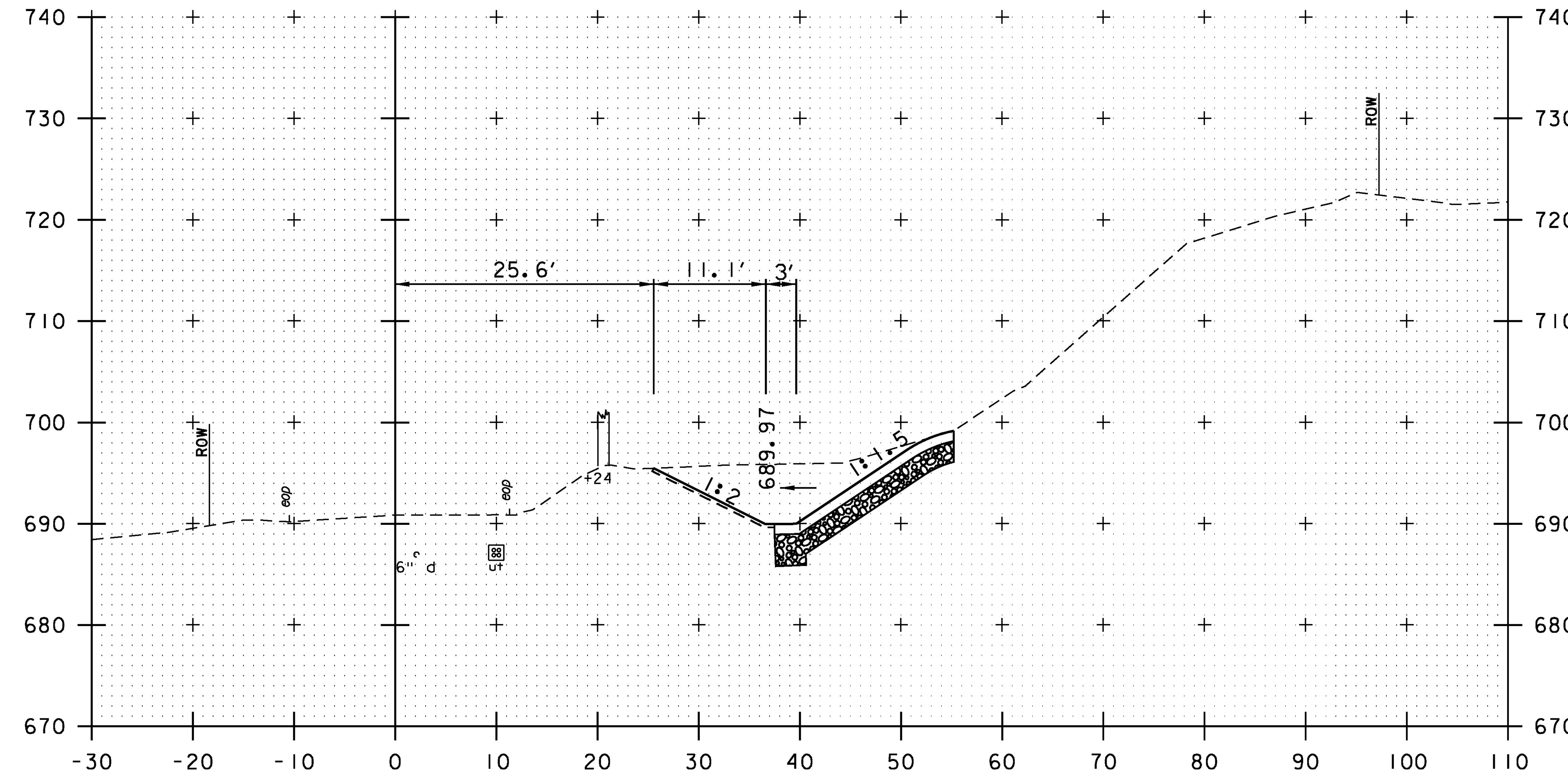


1200+75

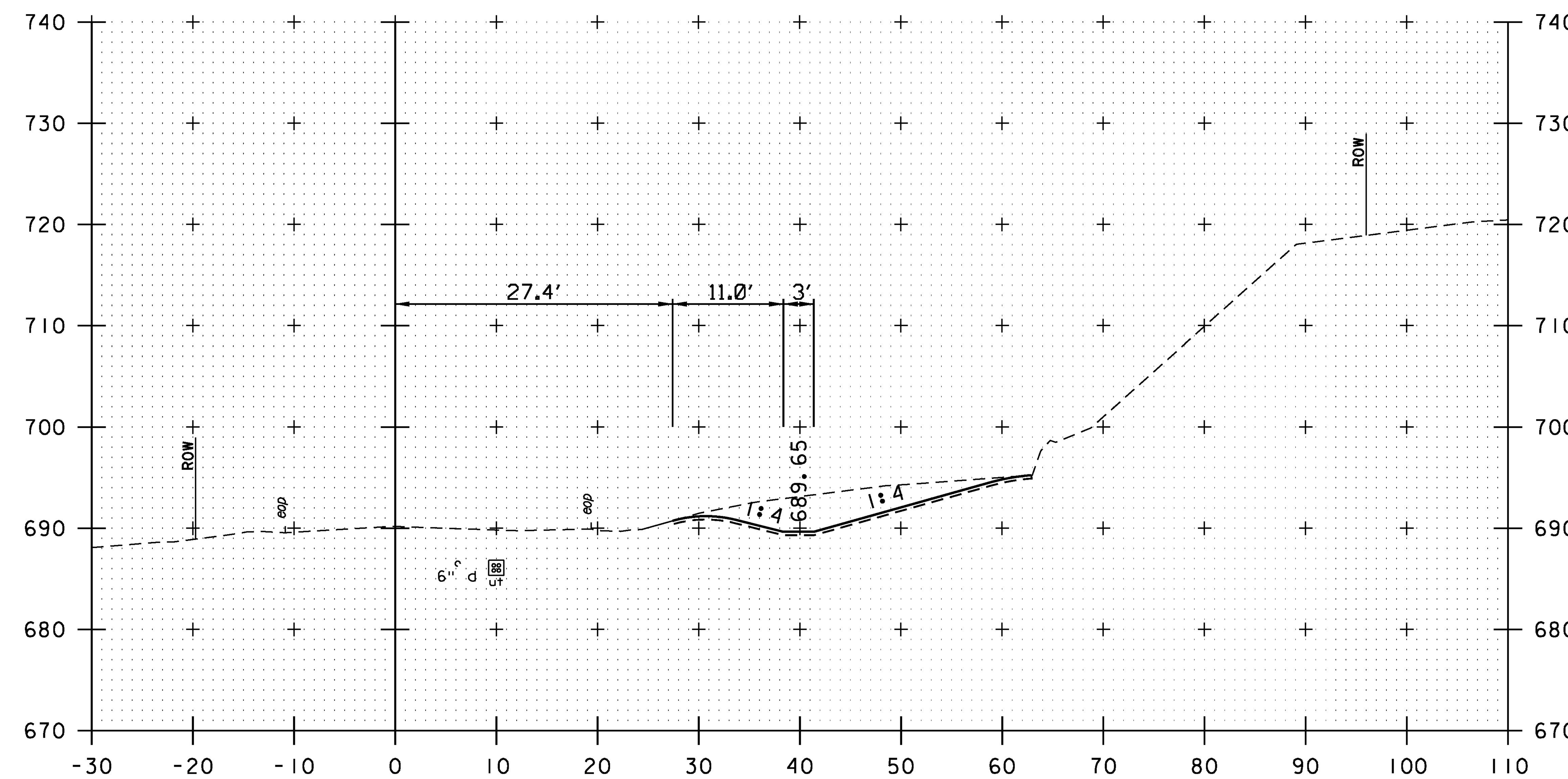
STA. 1200+73, RT
BEGIN PROJECT
MEGC M 6000(11)C/1



1200+50



1201+25



1201+00

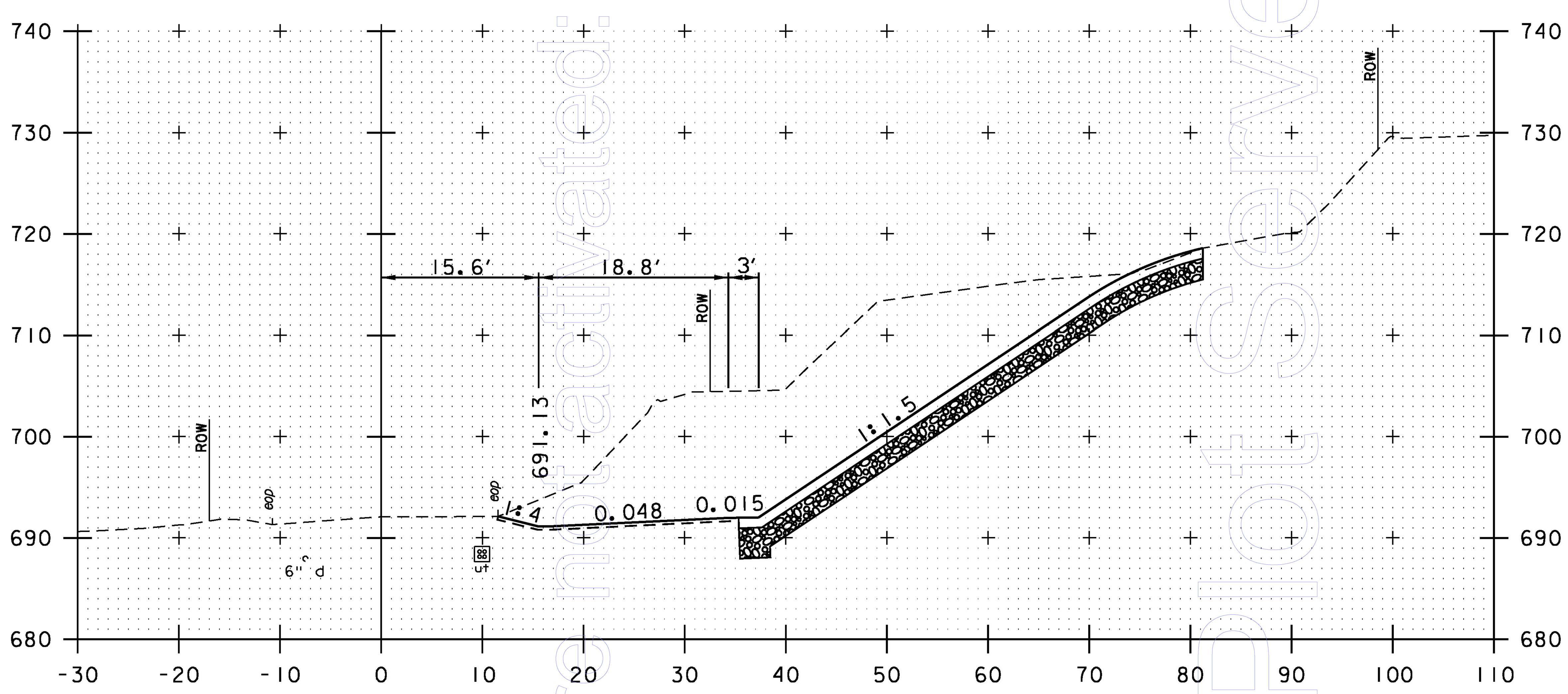
STA. 1201+00.00, RT
BEGIN STONE FILL, TYPE I
BEGIN GEOTEXTILE UNDER STONE FILL
BEGIN GRUBBING MATERIAL

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(12)C/1

vhb

FILE NAME: zl5d040_xs.dgn
PROJECT LEADER: A.P. GUYETTE
DESIGNED BY: D.M. PECK
CROSS SECTIONS (1 OF 9)

PLOT DATE: 12/2/2016
DRAWN BY: P.A. MILLER
CHECKED BY: D.M. PECK
SHEET 31 OF 39



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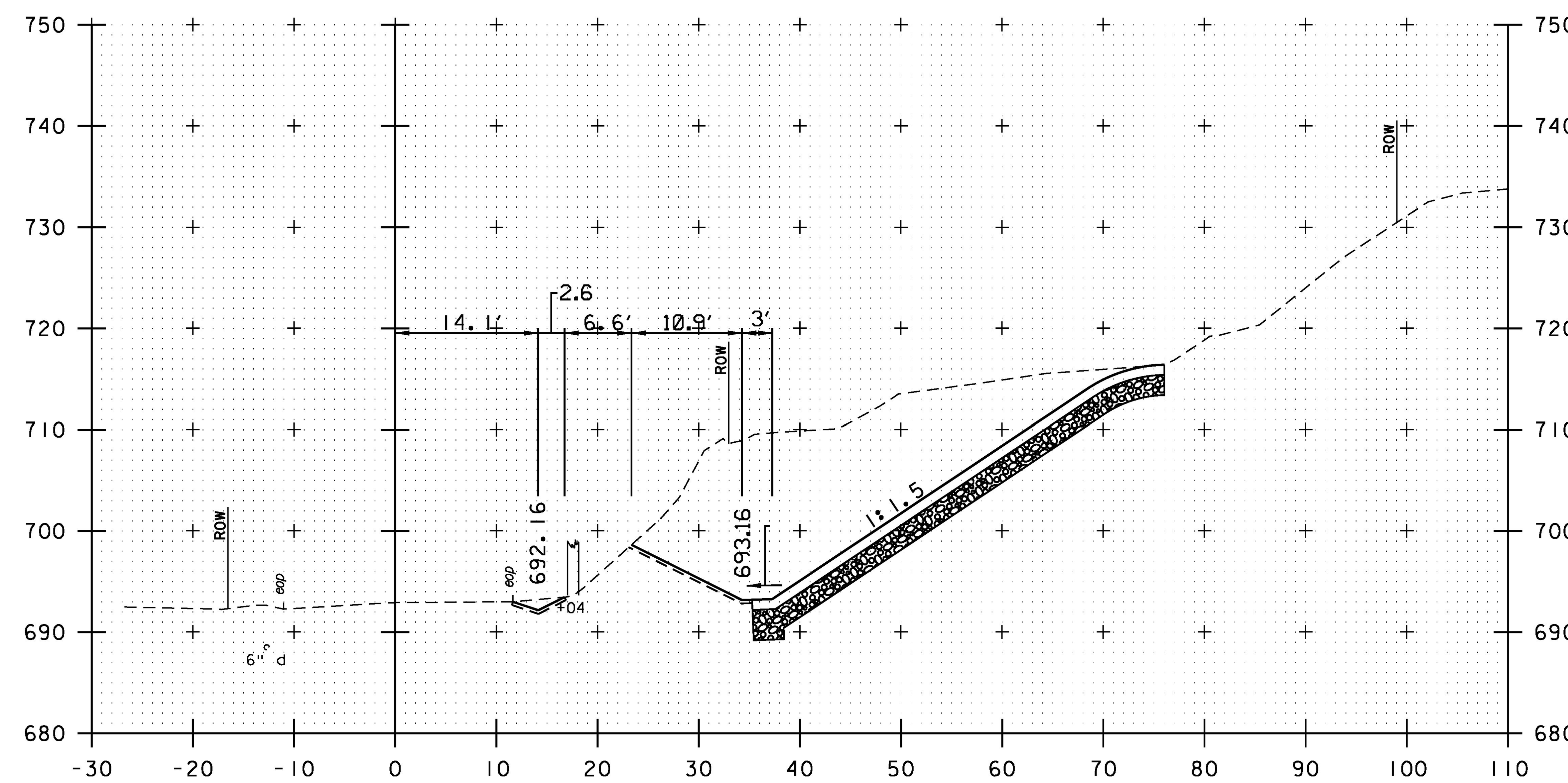
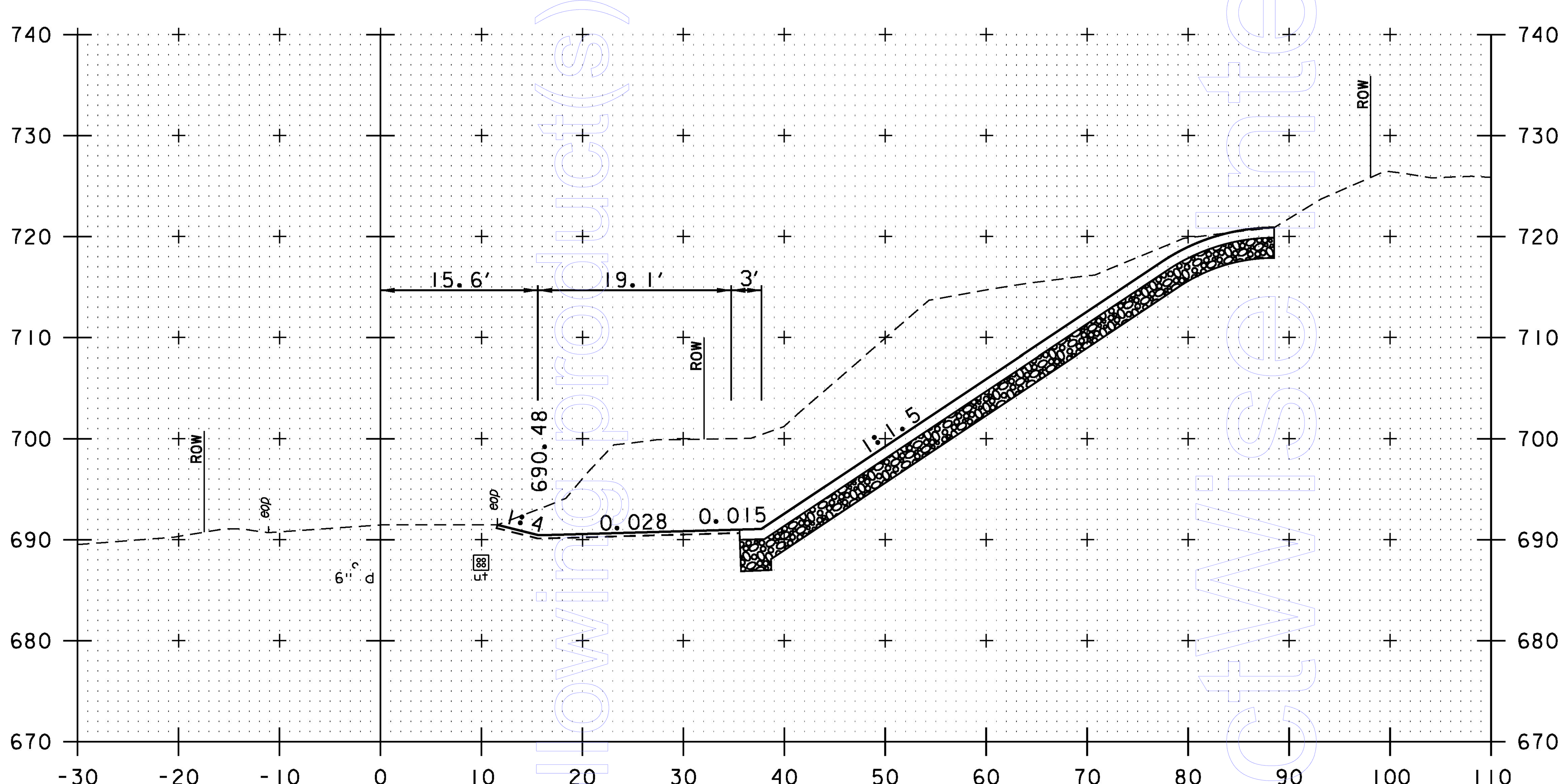
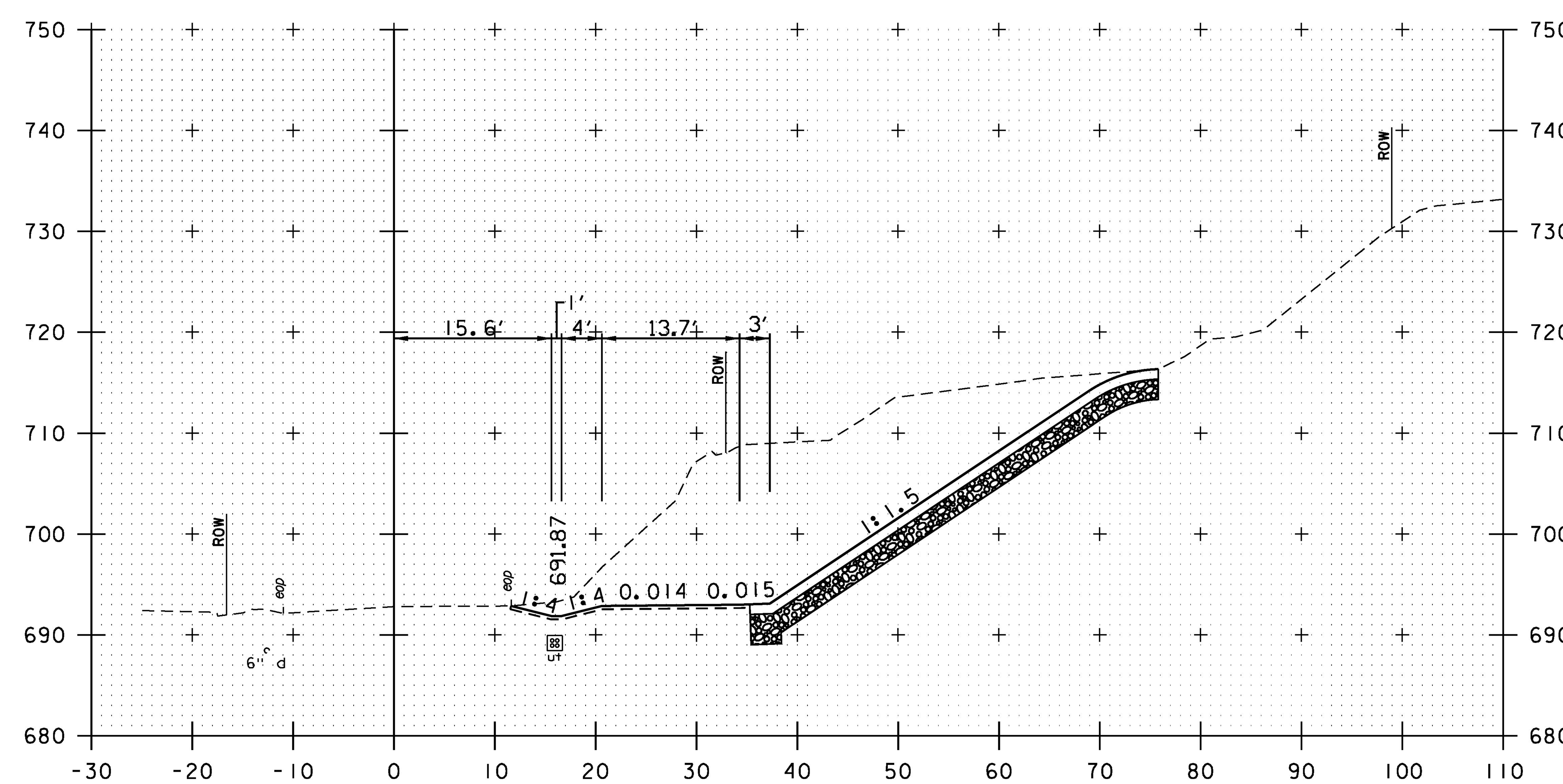


1202+04



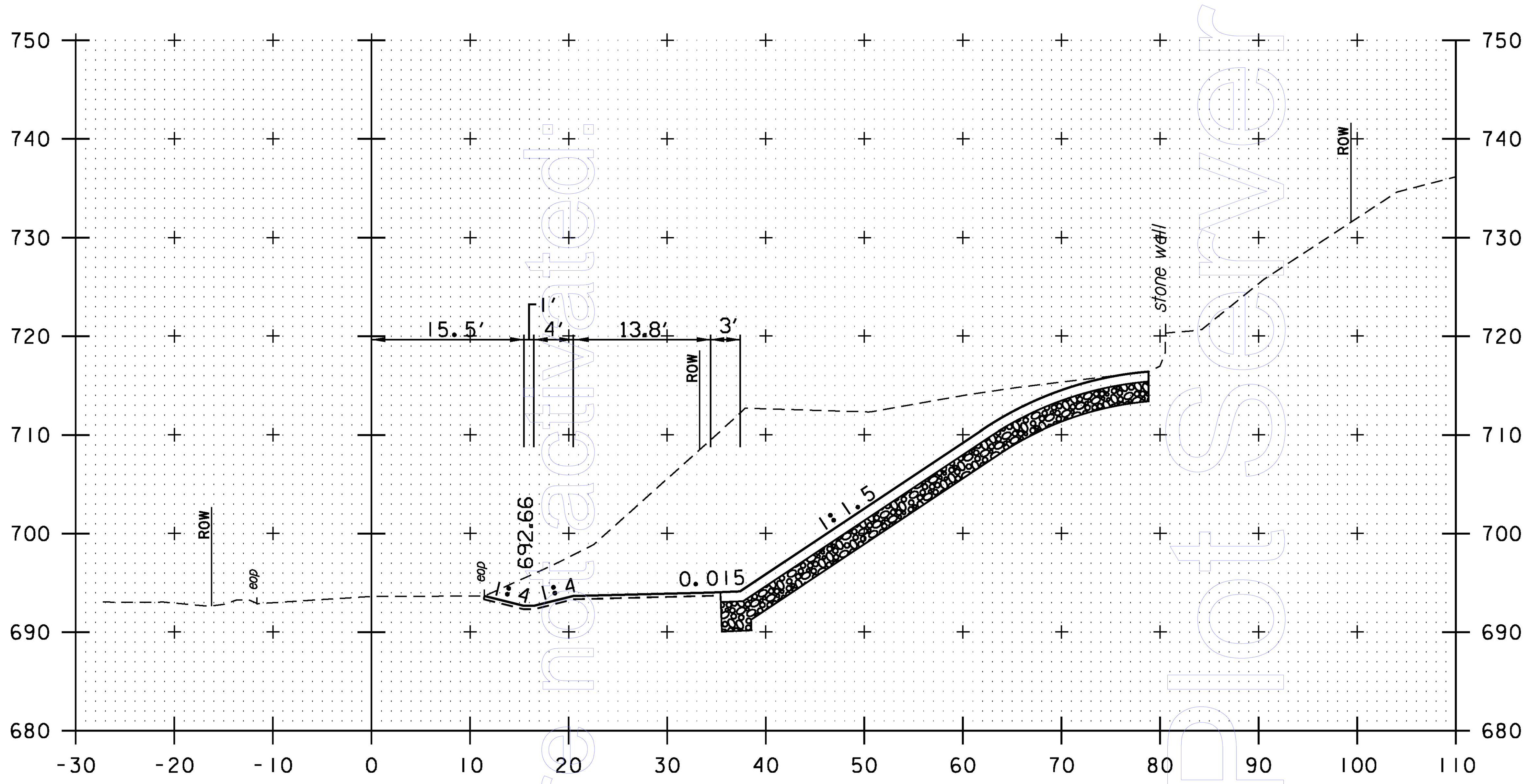
1201+50



1202+00

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(12)C/1

FILE NAME: zl5d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (2 OF 9)	SHEET 32 OF 39



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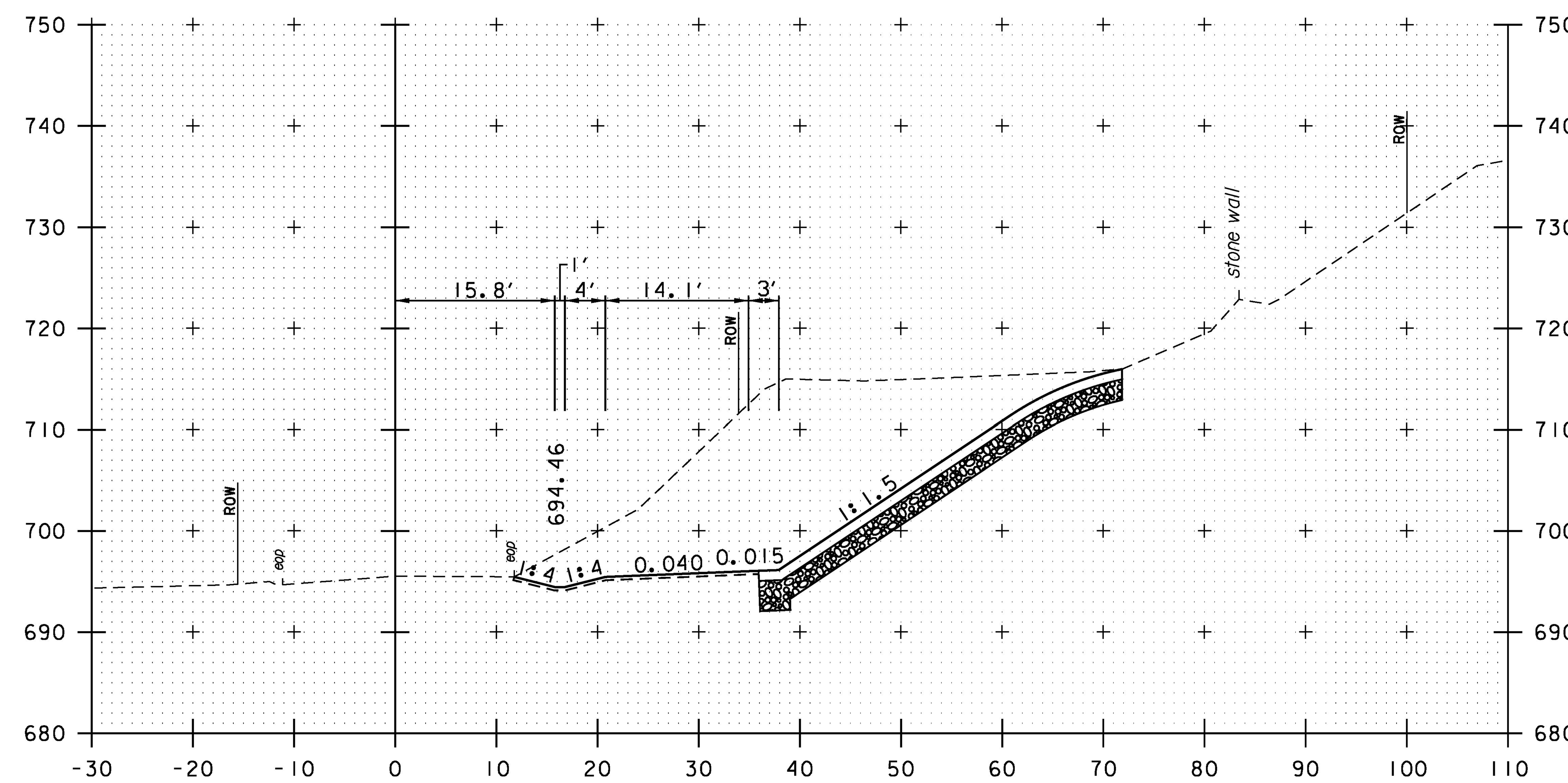

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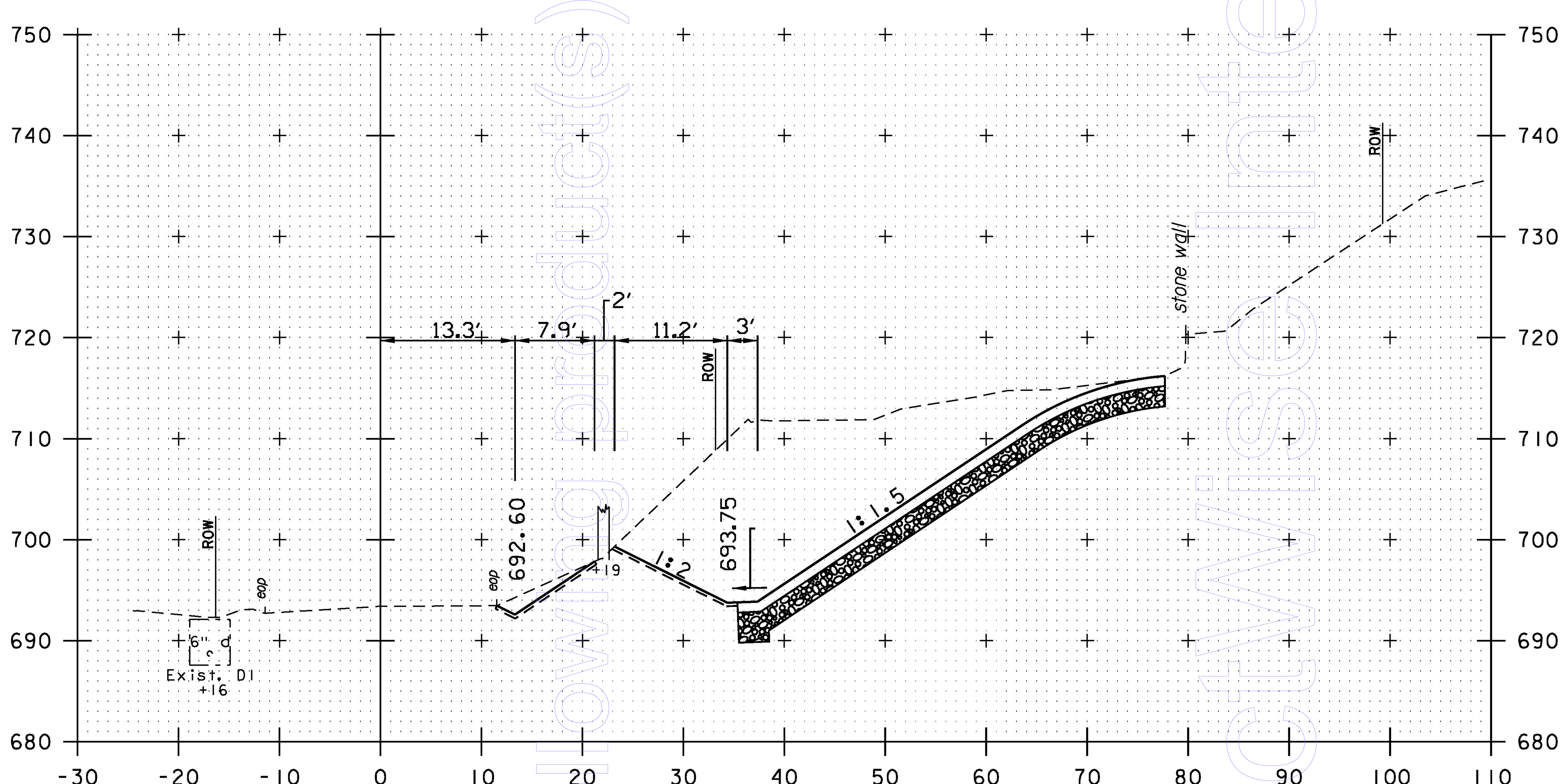

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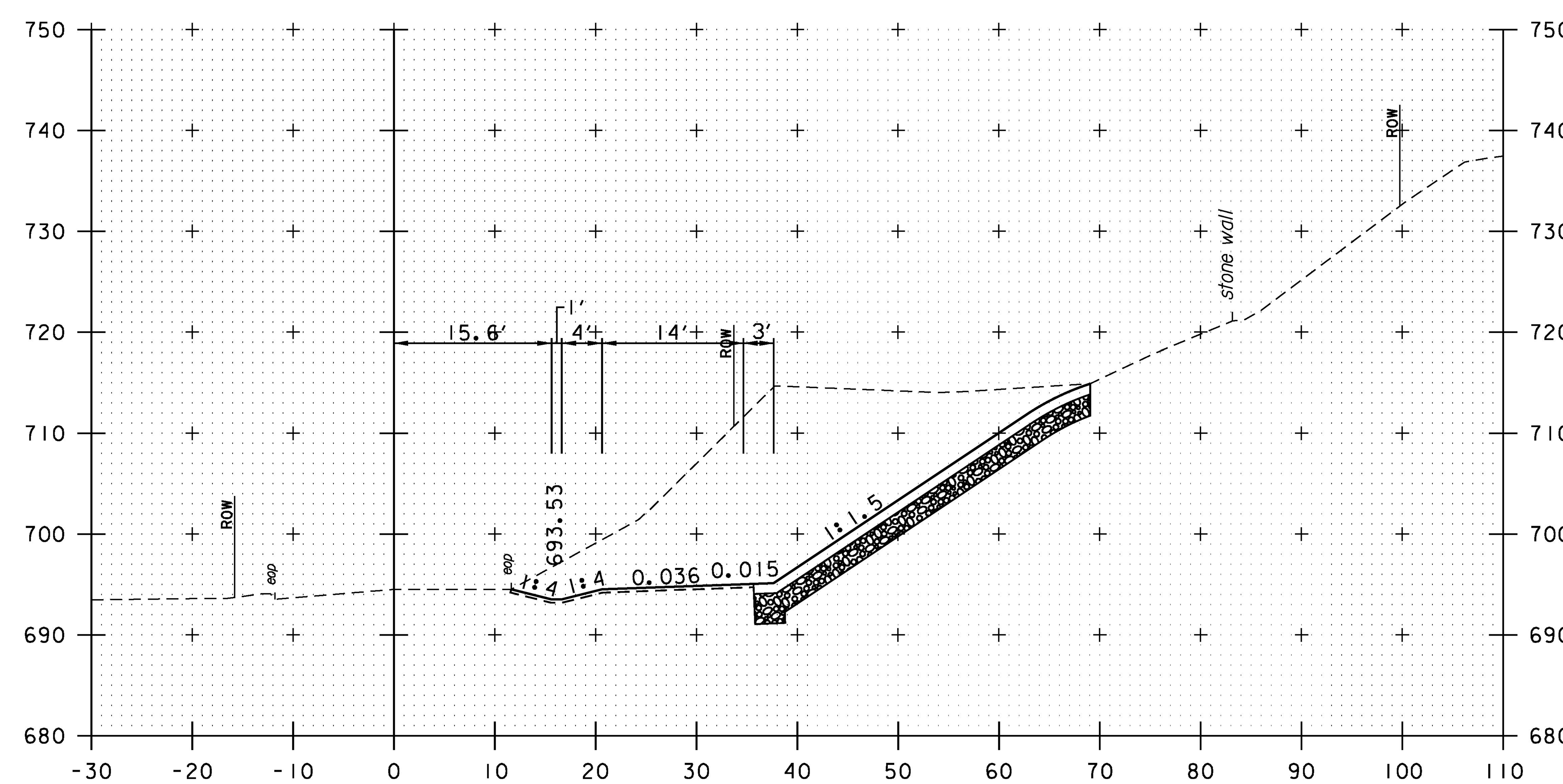
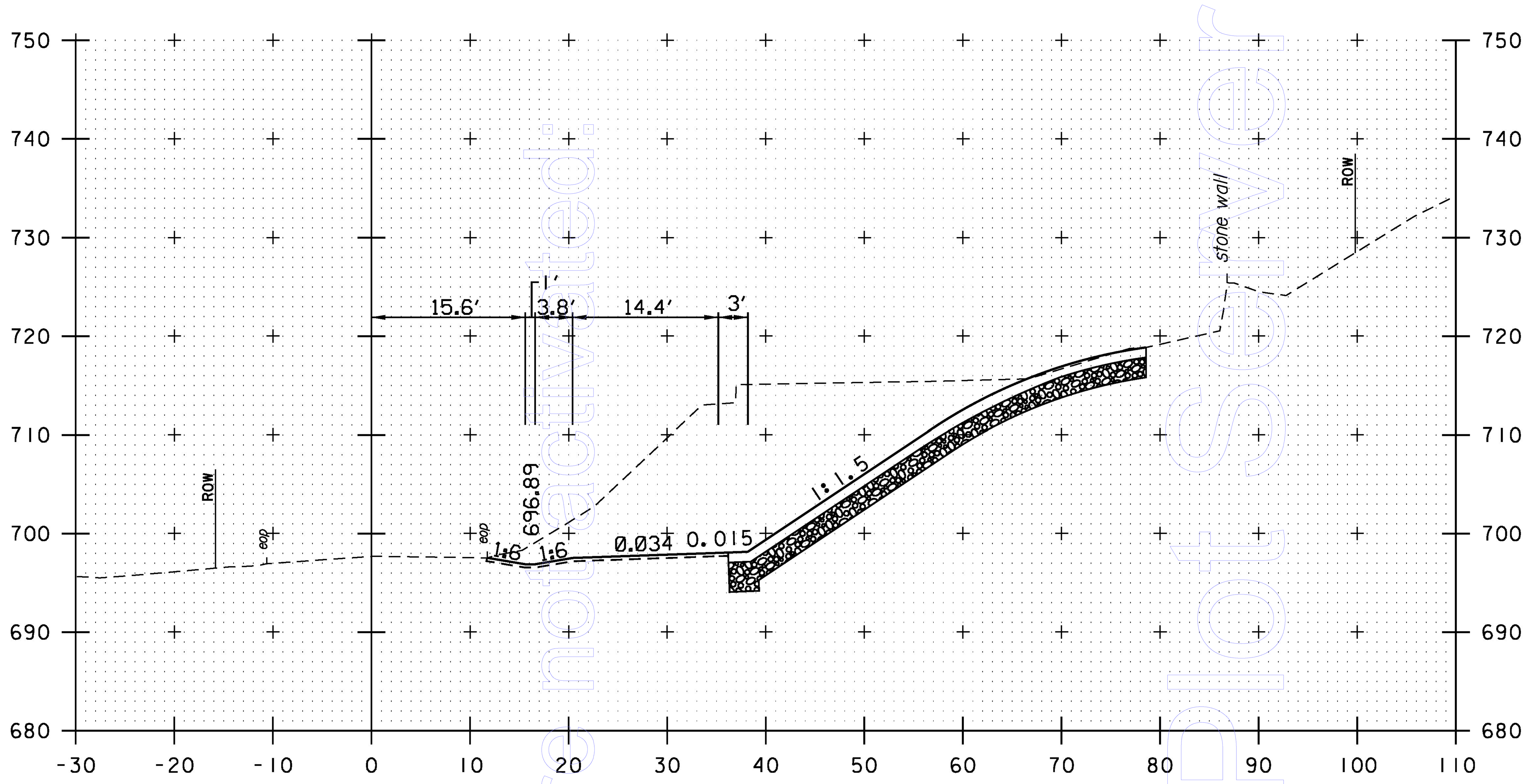


1202+50

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(12)C/1

FILE NAME: z15d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (3 OF 9)	SHEET 33 OF 39



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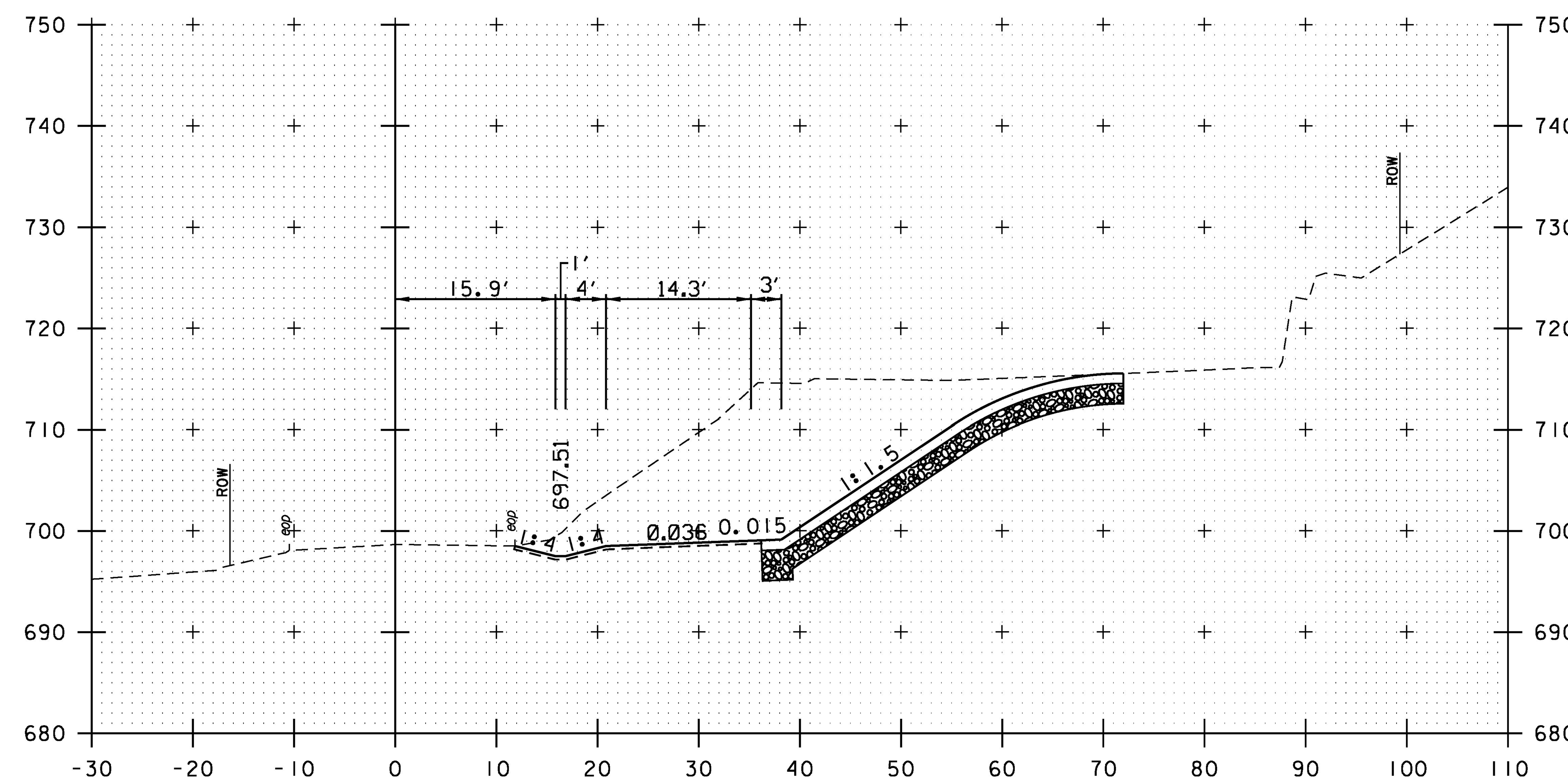

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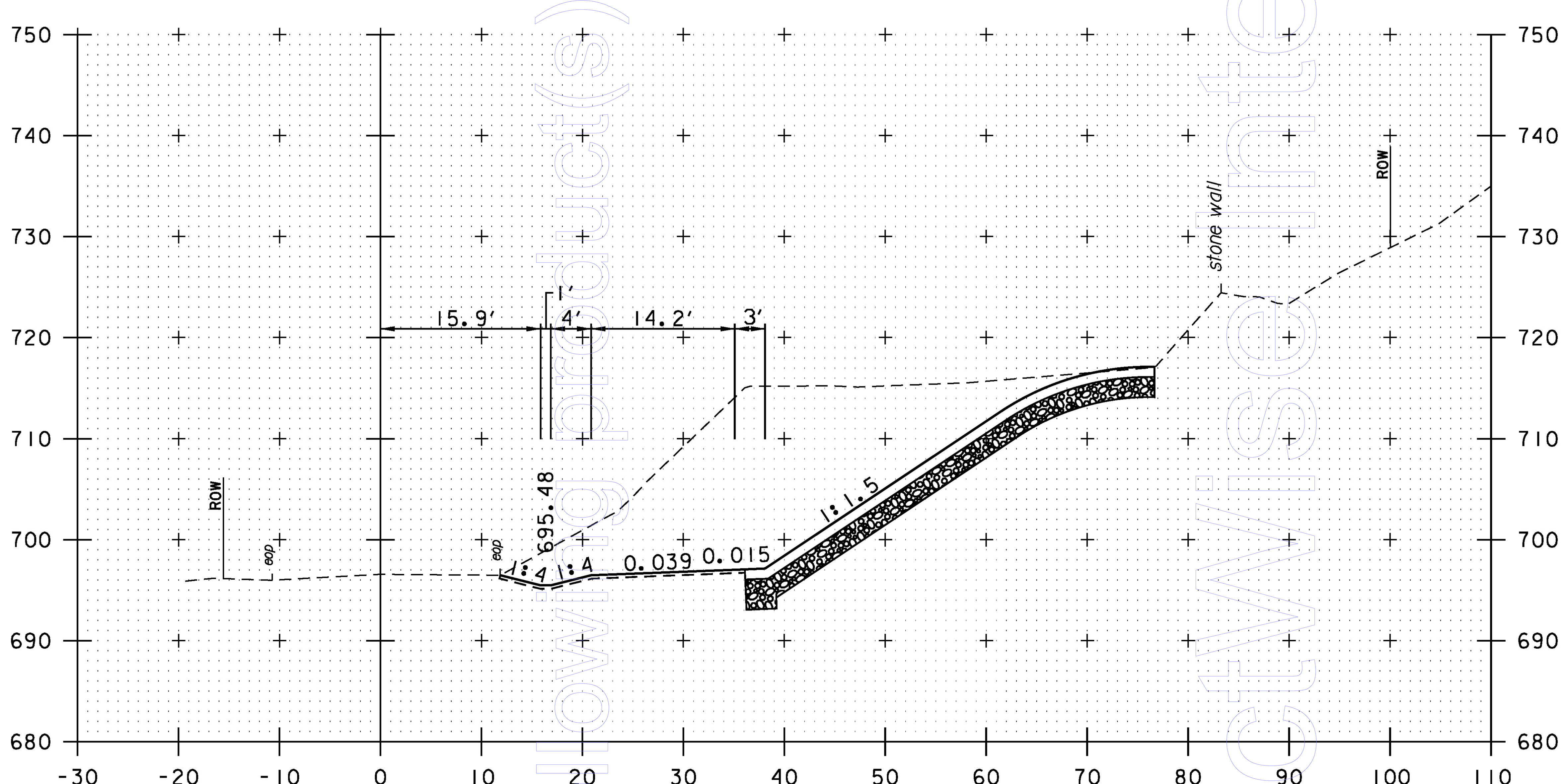
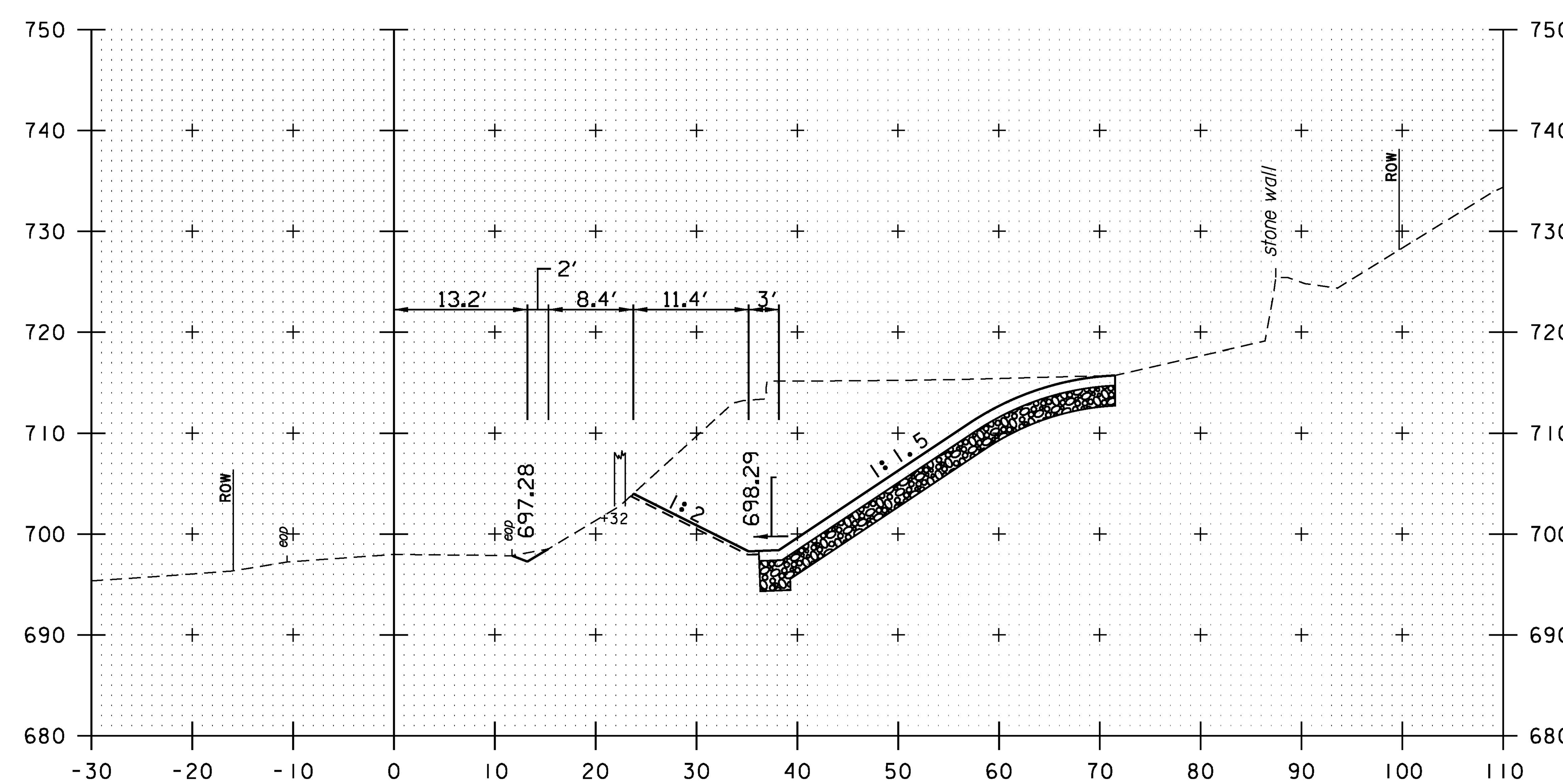
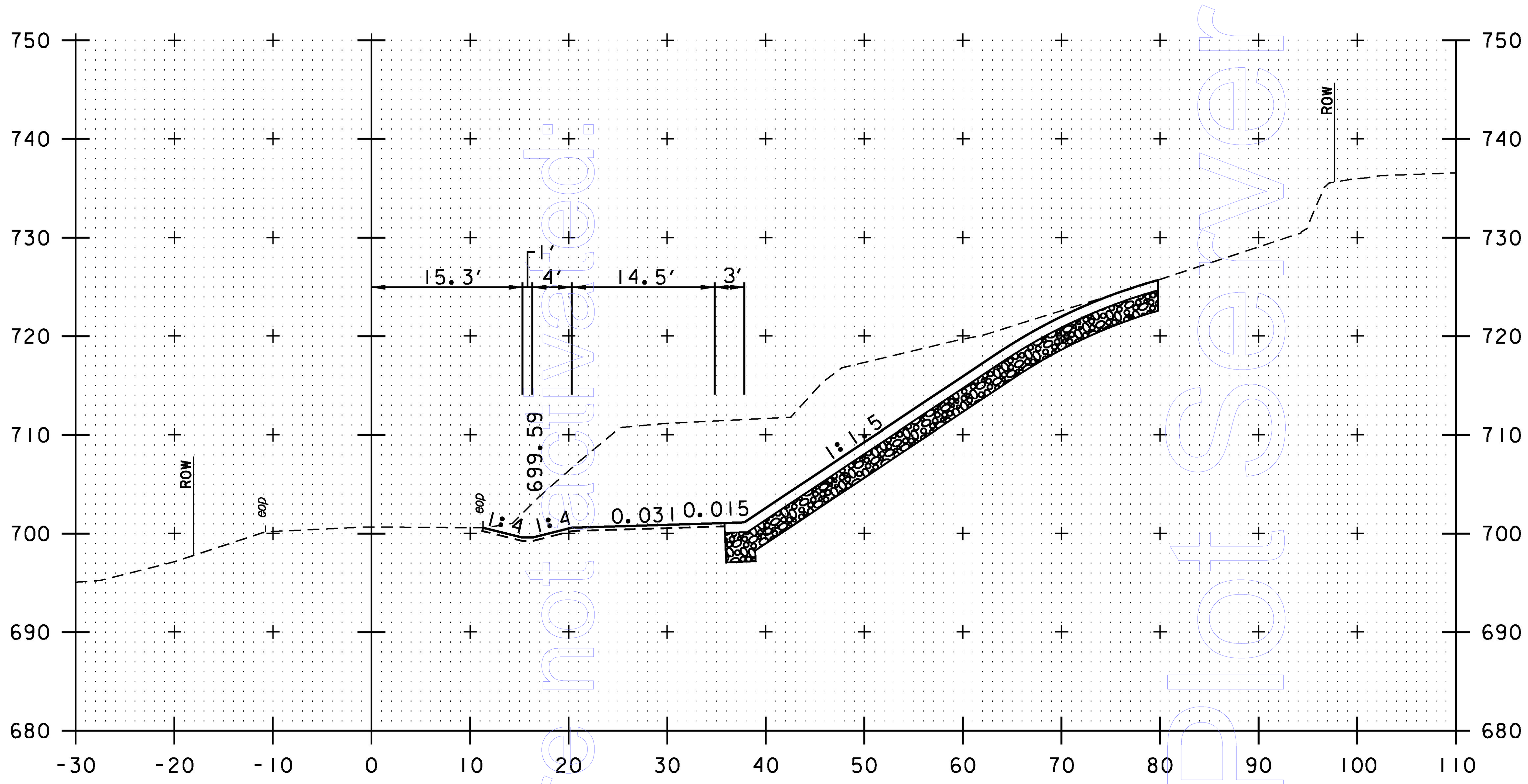


1203+00



1203+32

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(12)C/1	
FILE NAME: zl5d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (4 OF 9)	SHEET 34 OF 39



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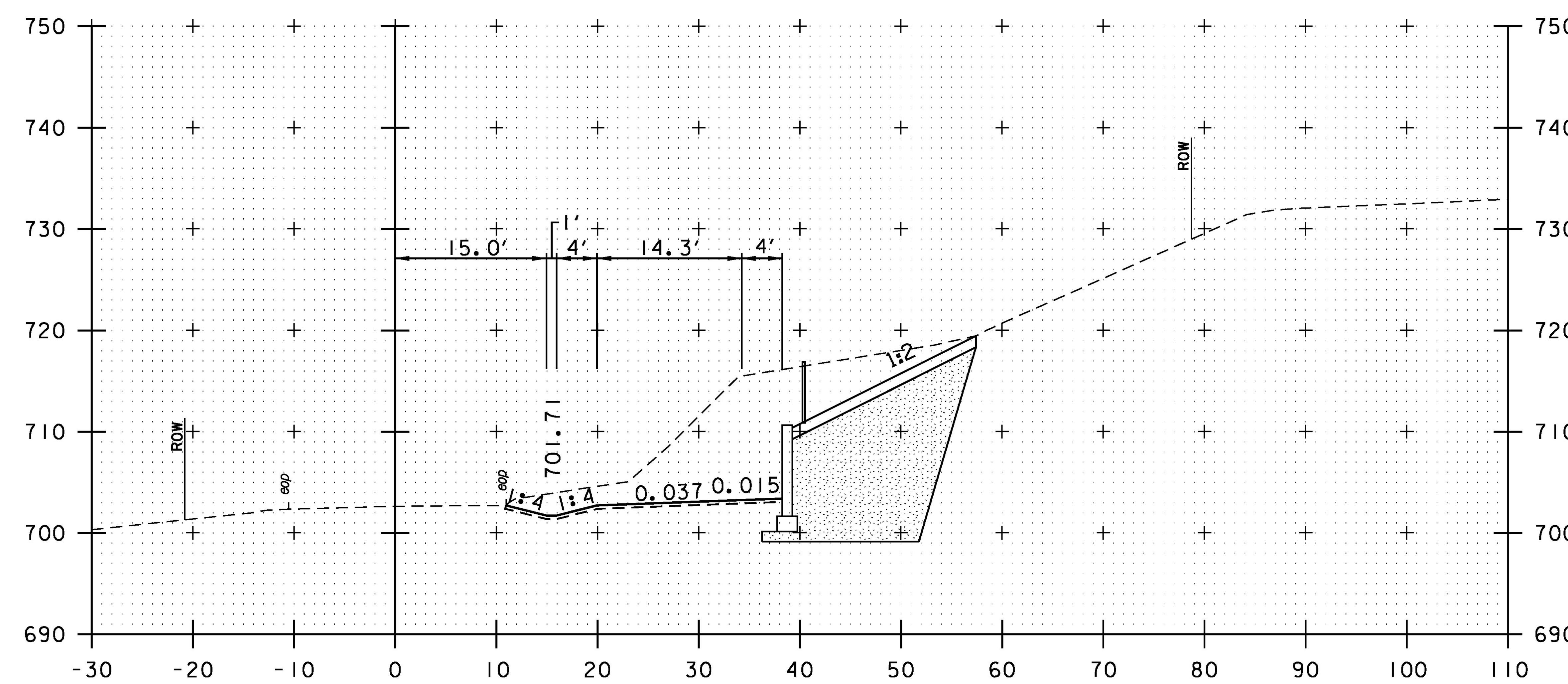

1204+50

STA. 1204+50, RT
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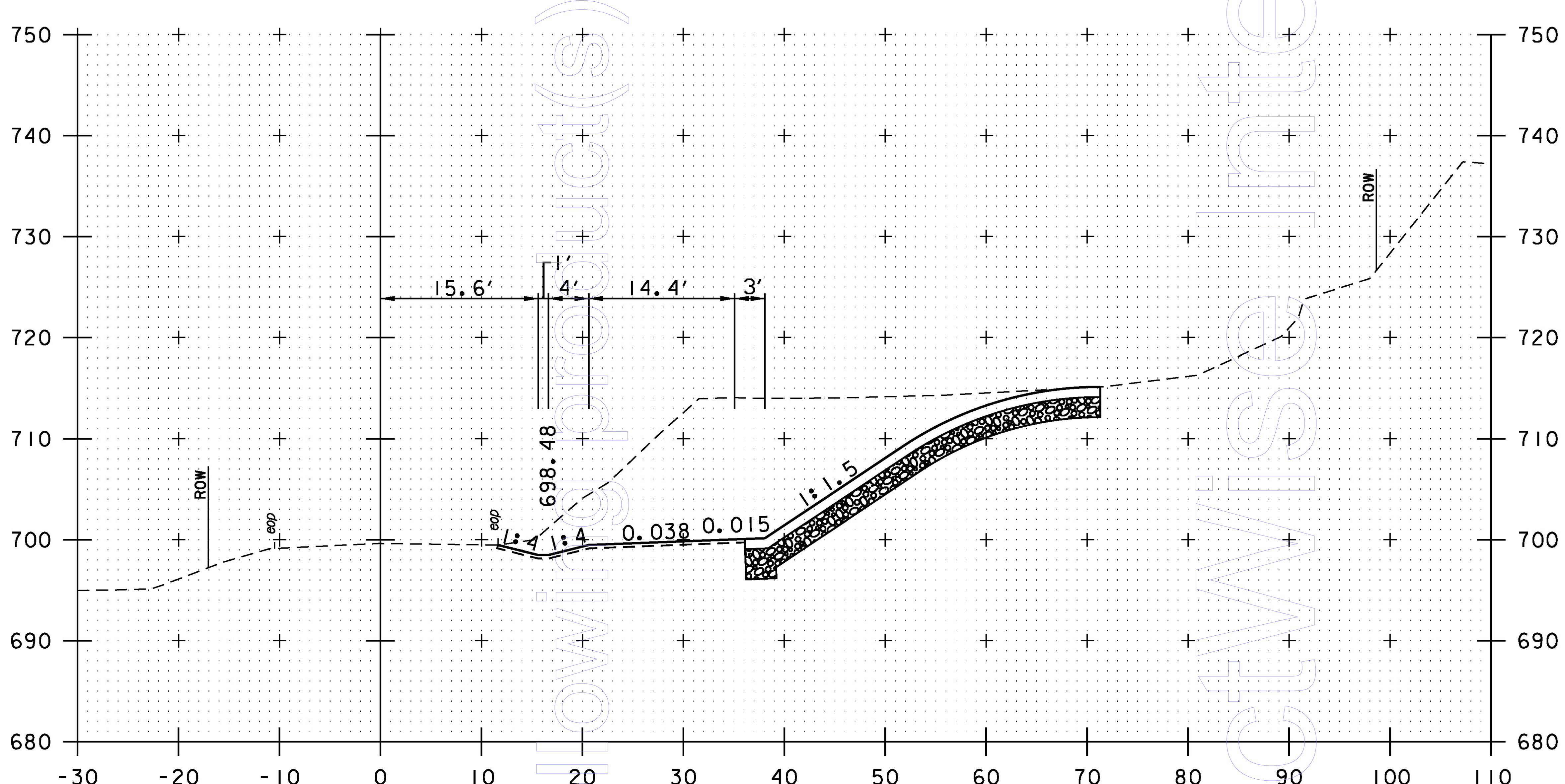
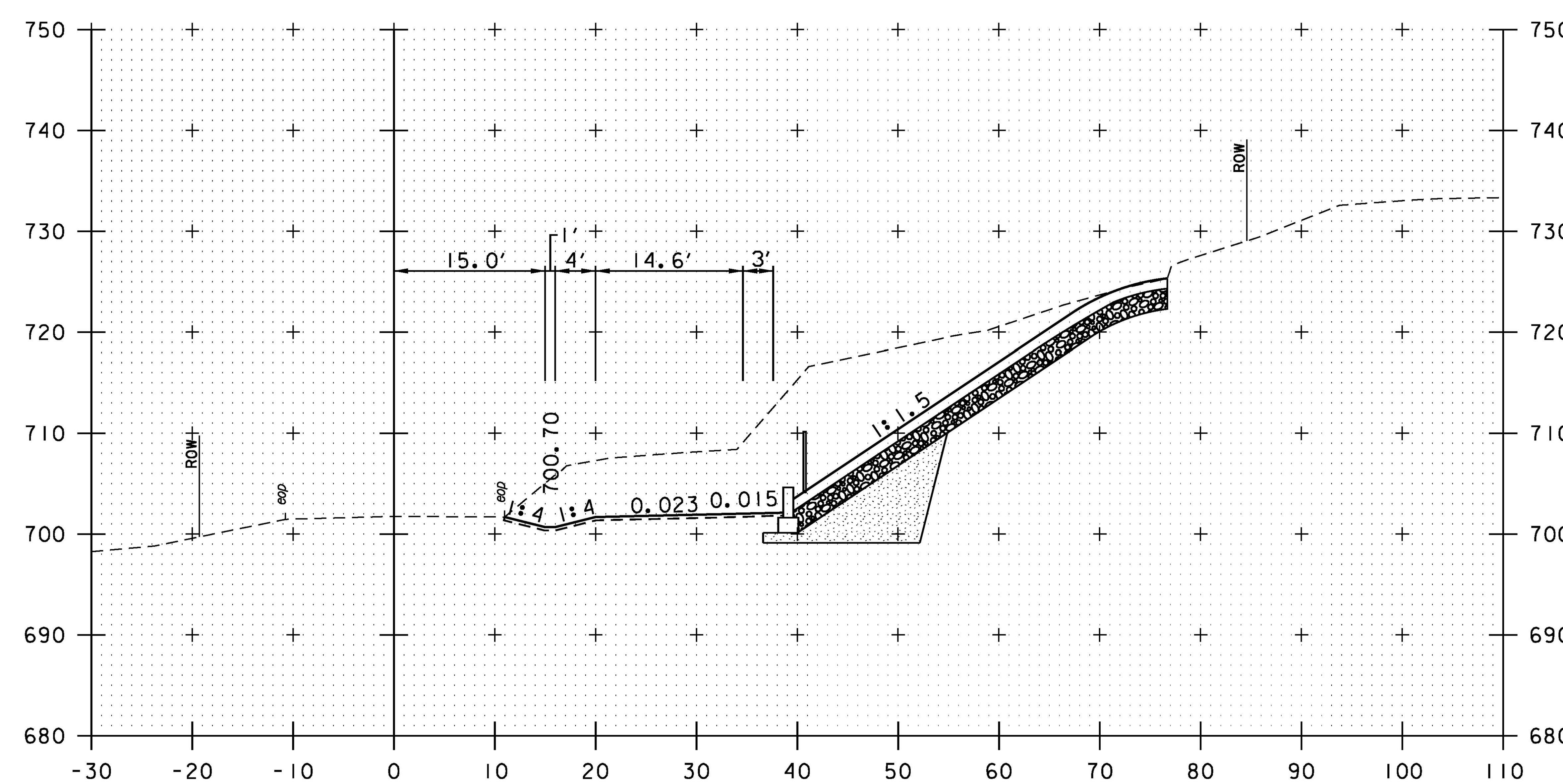
END GEOTEXTILE UNDER STONE FILL



1203+75



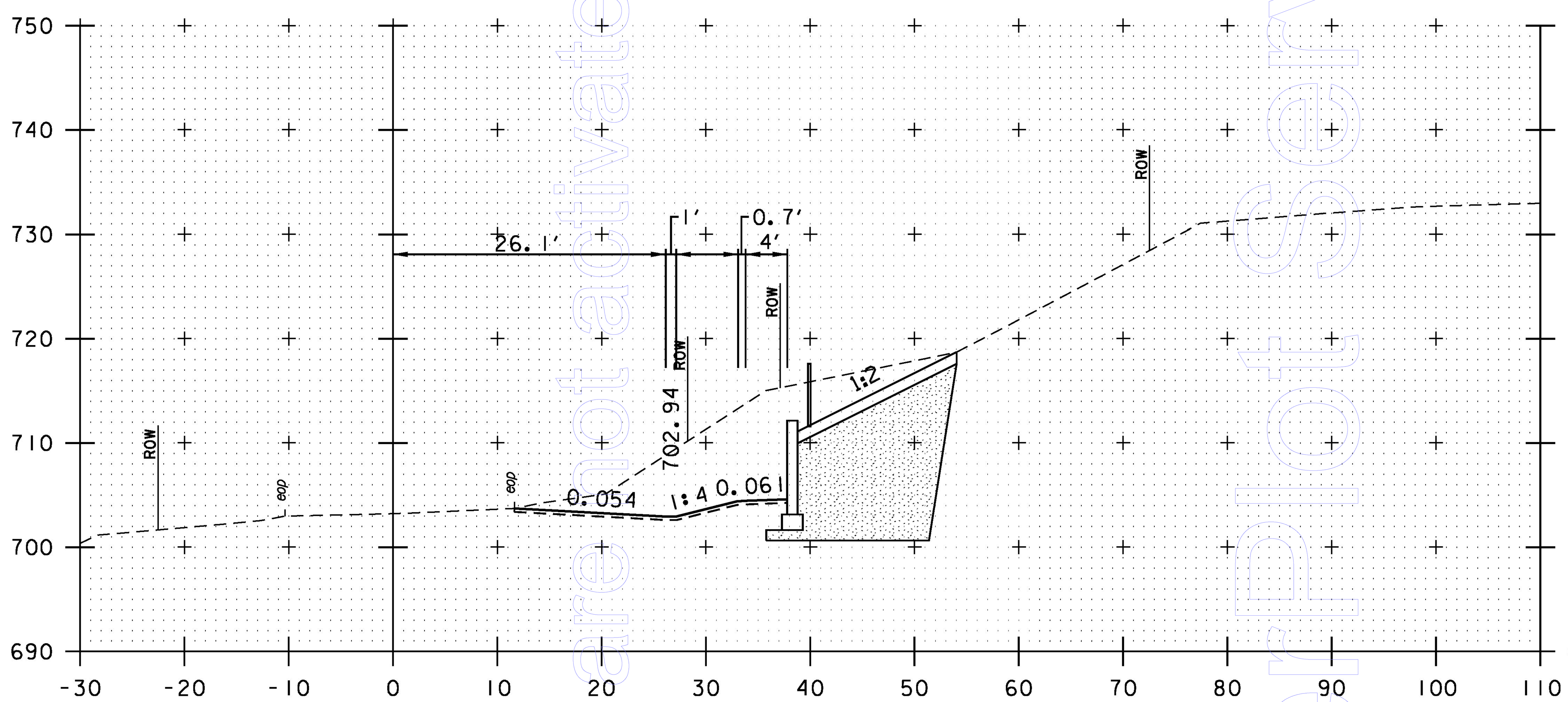
1204+25

STA. 1204+23.80, RT
BEGIN SPECIAL PROVISION (RETAINING WALL)
STA. 1204+22, RT
BEGIN CHAIN LINK FENCE, 6 FEET

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(12)C/1

vhb

FILE NAME: zl5d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (5 OF 9)	SHEET 35 OF 39



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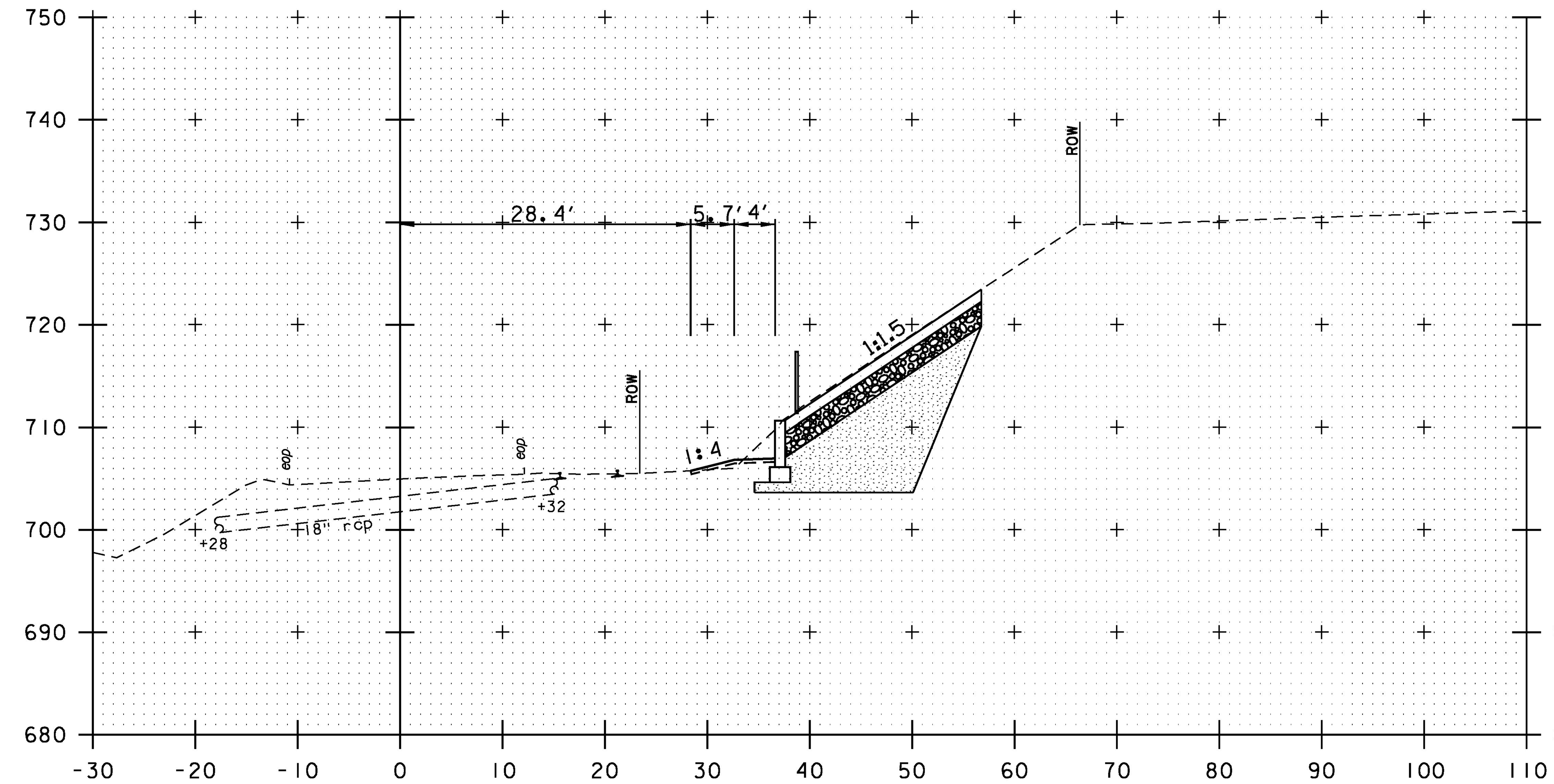
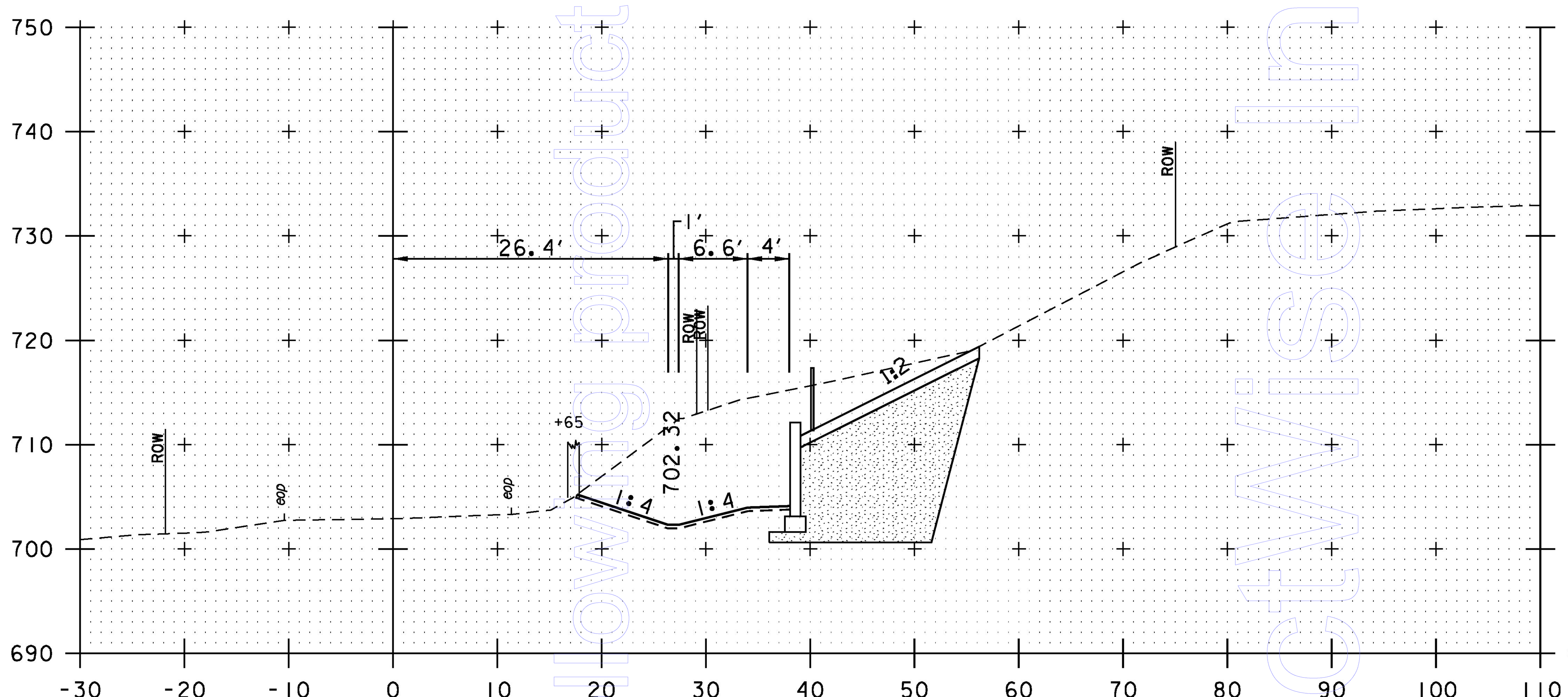
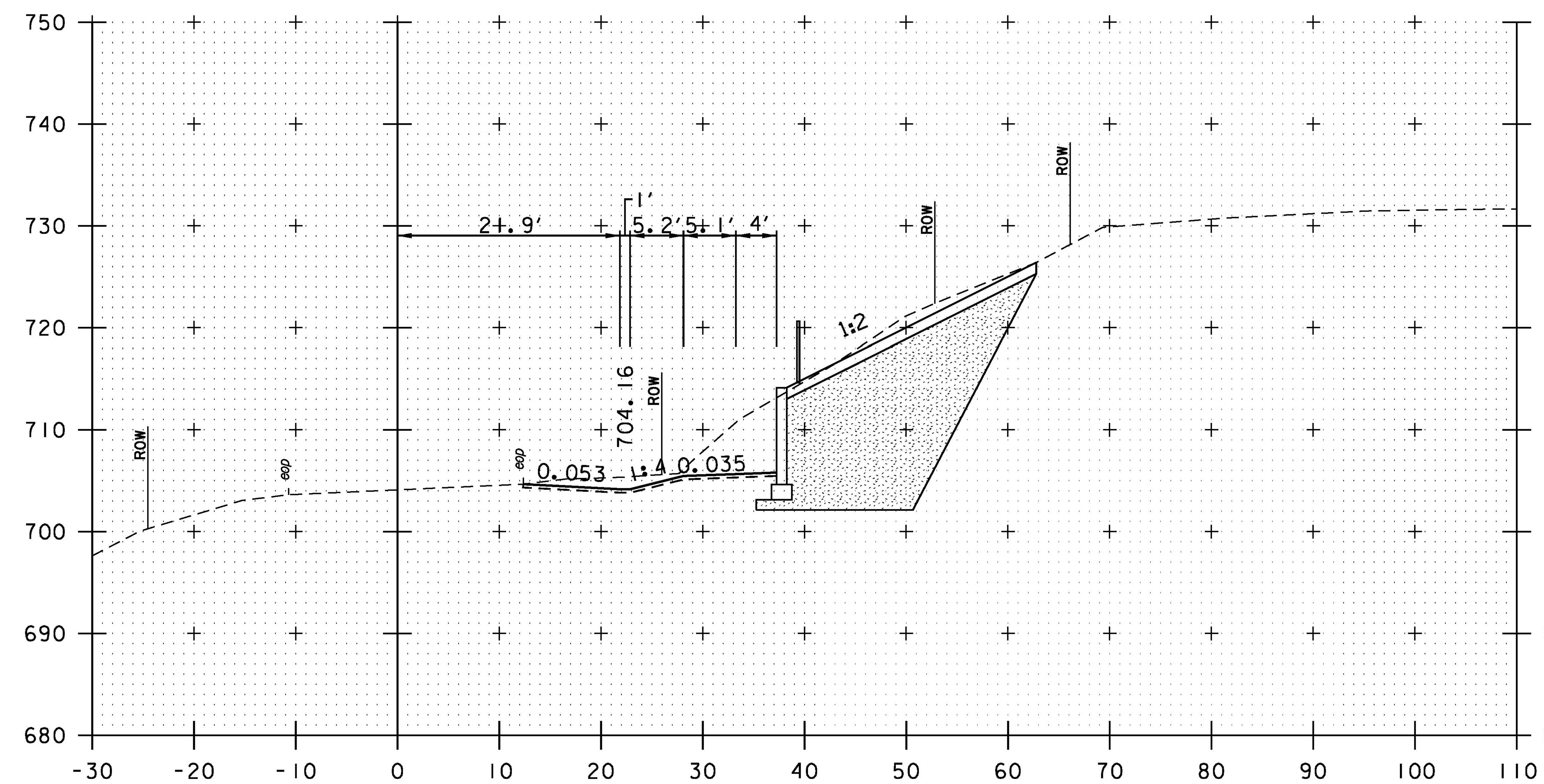


STA. 1205+25, RT
BEGIN STONE FILL, TYPE I
BEGIN GEOTEXTILE UNDER STONE FILL

1205+25

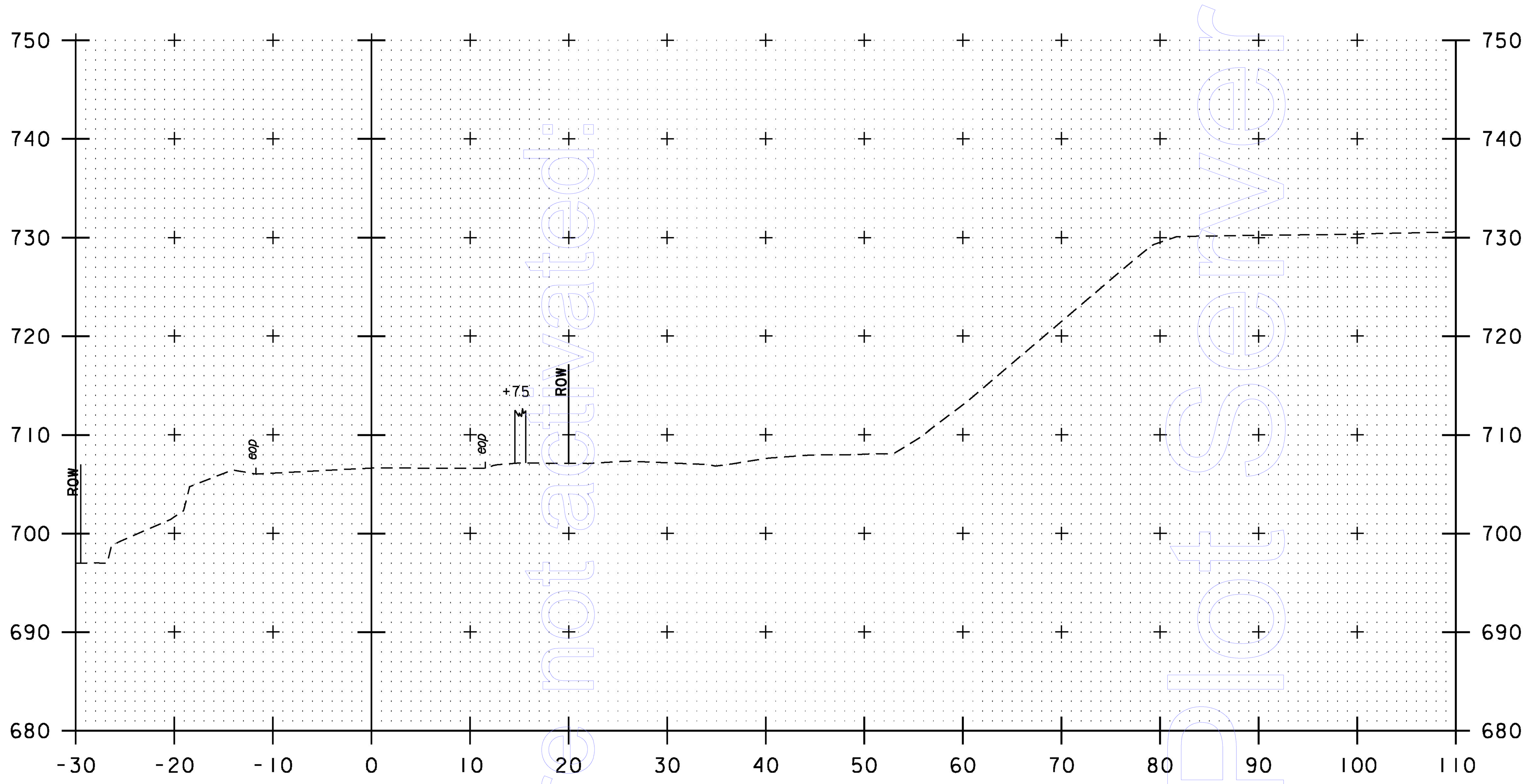


1204+65



1205+00

PROJECT NAME:	BARRE CITY - BARRE TOWN	
PROJECT NUMBER:	MEGC M 6000(12)C/1	
FILE NAME: zl5d040_xs.dgn		PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE		DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK		CHECKED BY: D.M. PECK
CROSS SECTIONS (6 OF 9)		SHEET 36 OF 39



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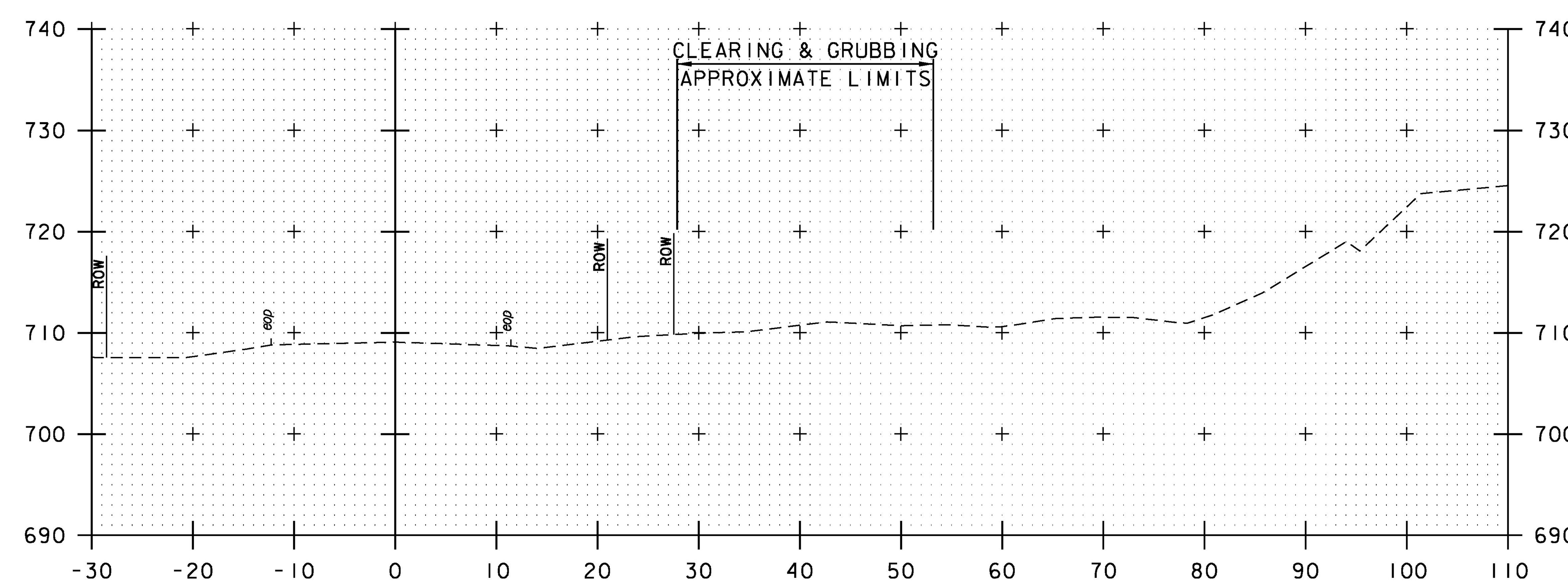

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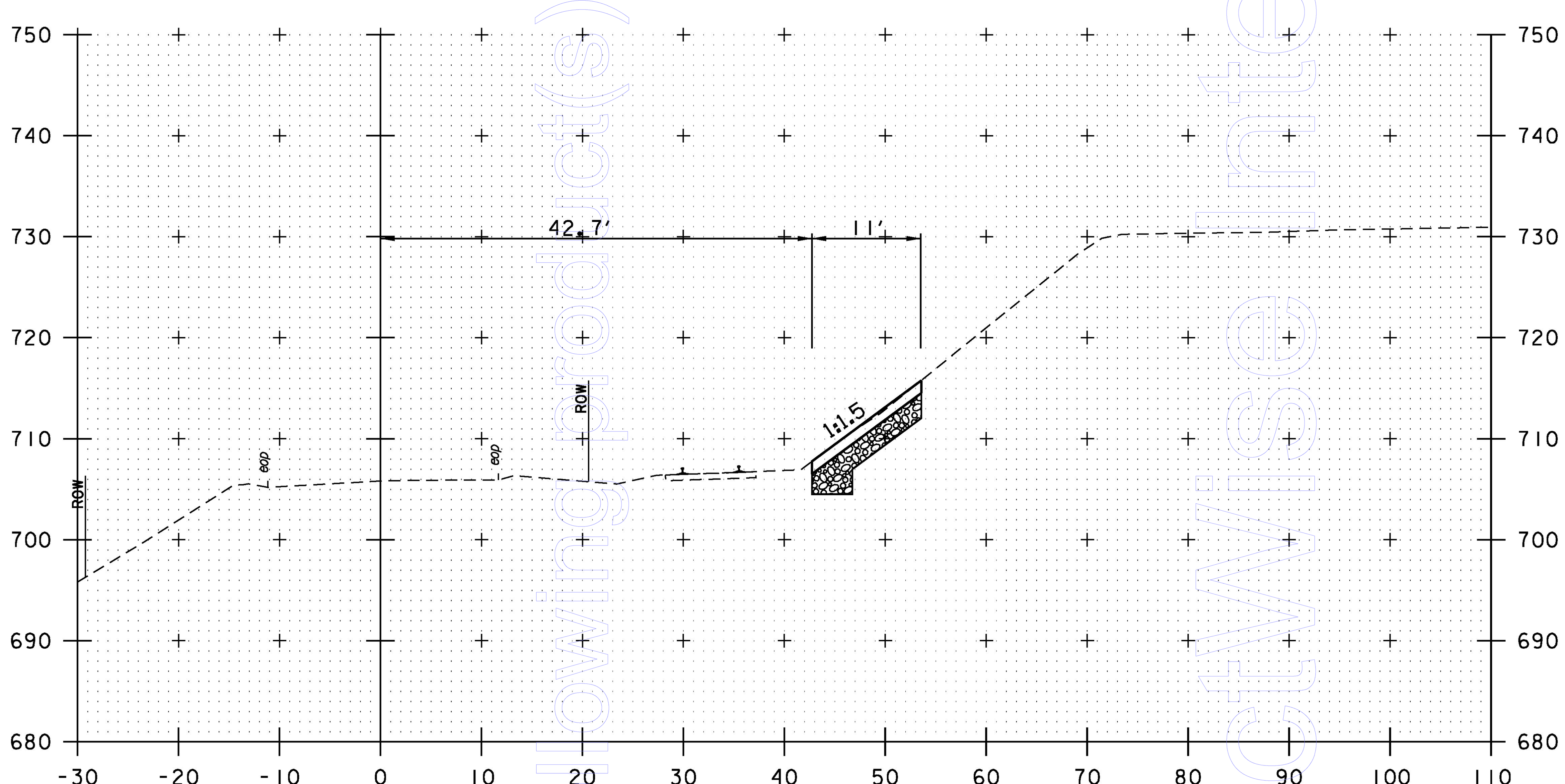

1205+50

STA. 1205+58.00, RT
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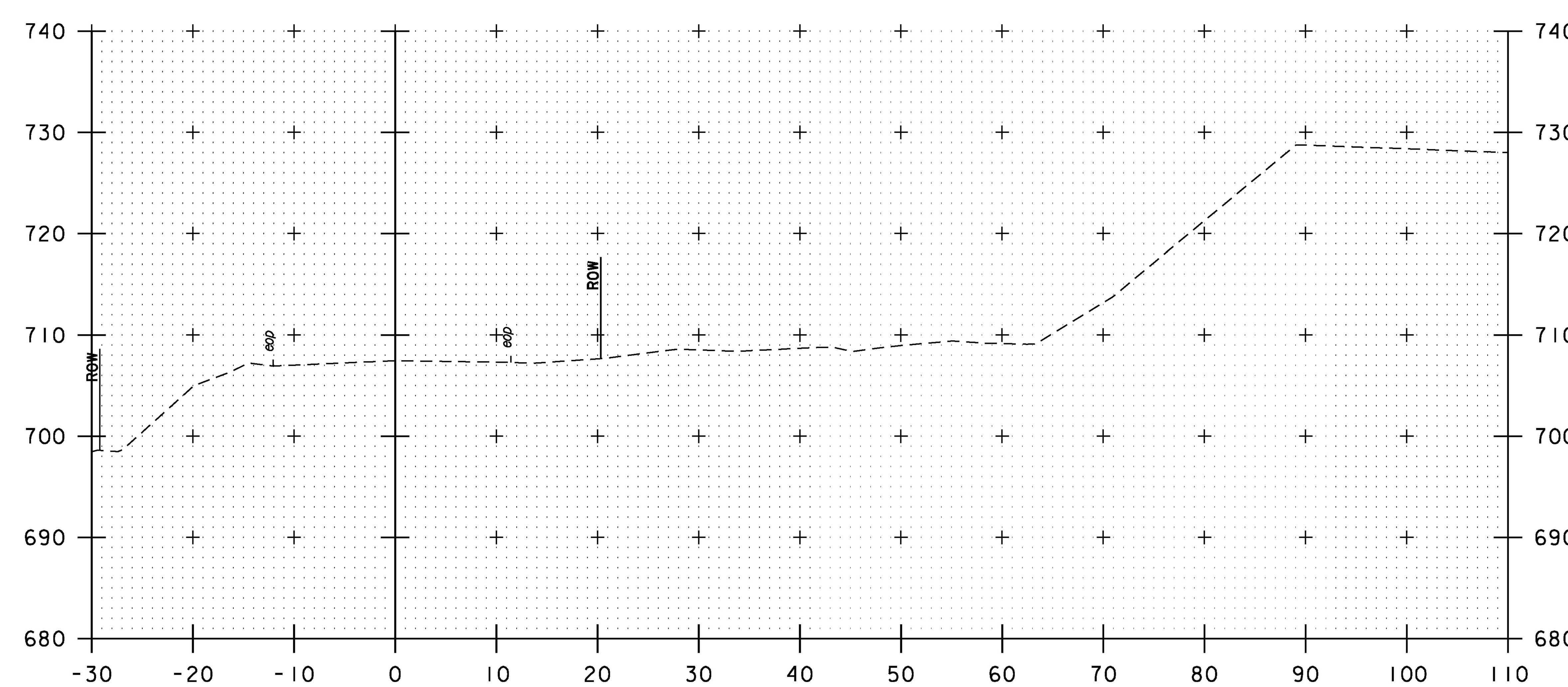
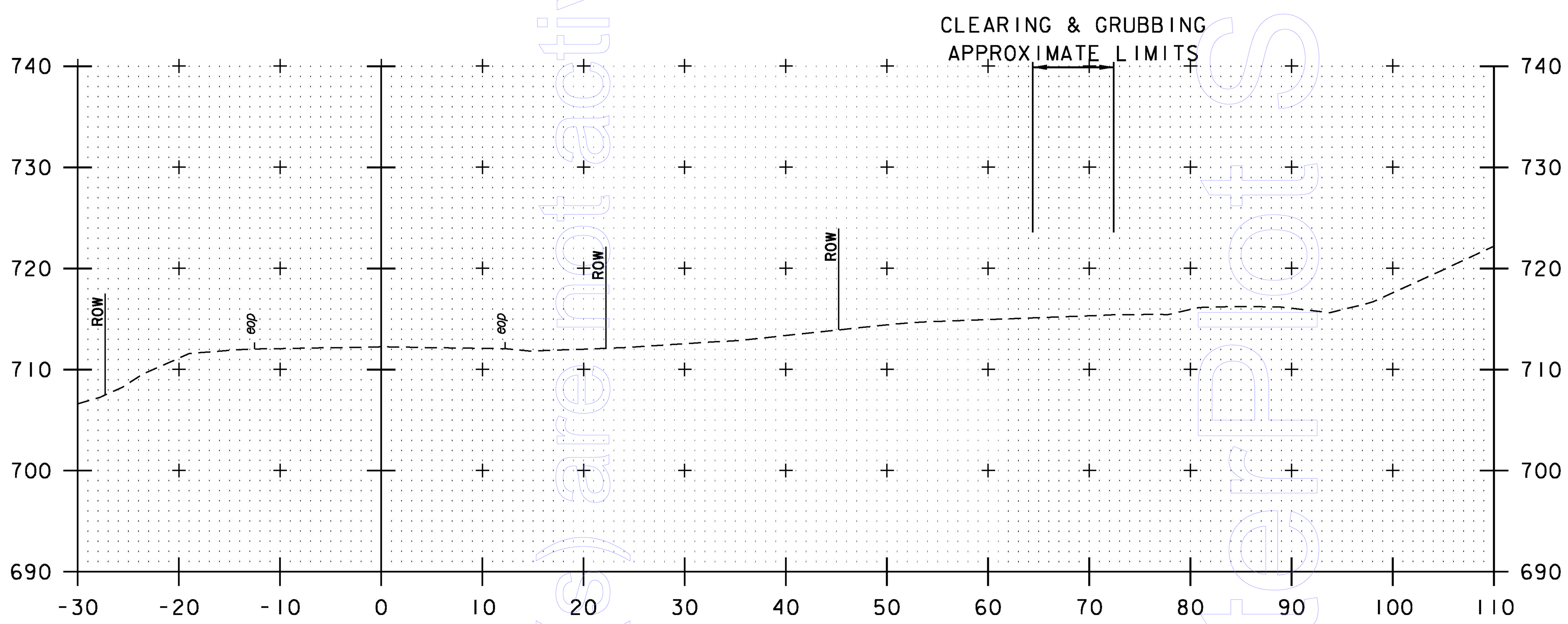
END GEOTEXTILE UNDER STONE FILL
END GRUBBING MATERIAL

STA. 1205+36.91, RT
END SPECIAL PROVISION (RETAINING WALL)
STA. 1205+44, RT
END CHAIN LINK FENCE, 6 FEET



1206+00

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(12)C/1	
FILE NAME: z15d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (7 OF 9)	SHEET 37 OF 39



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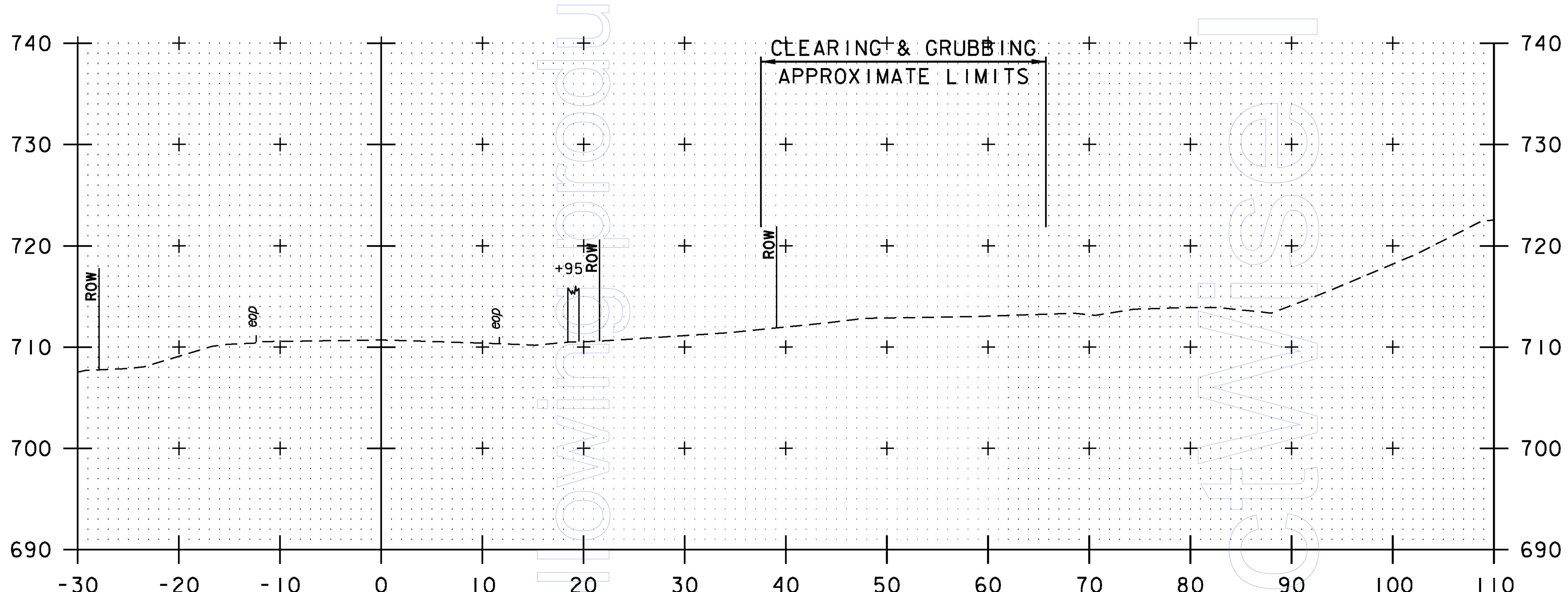

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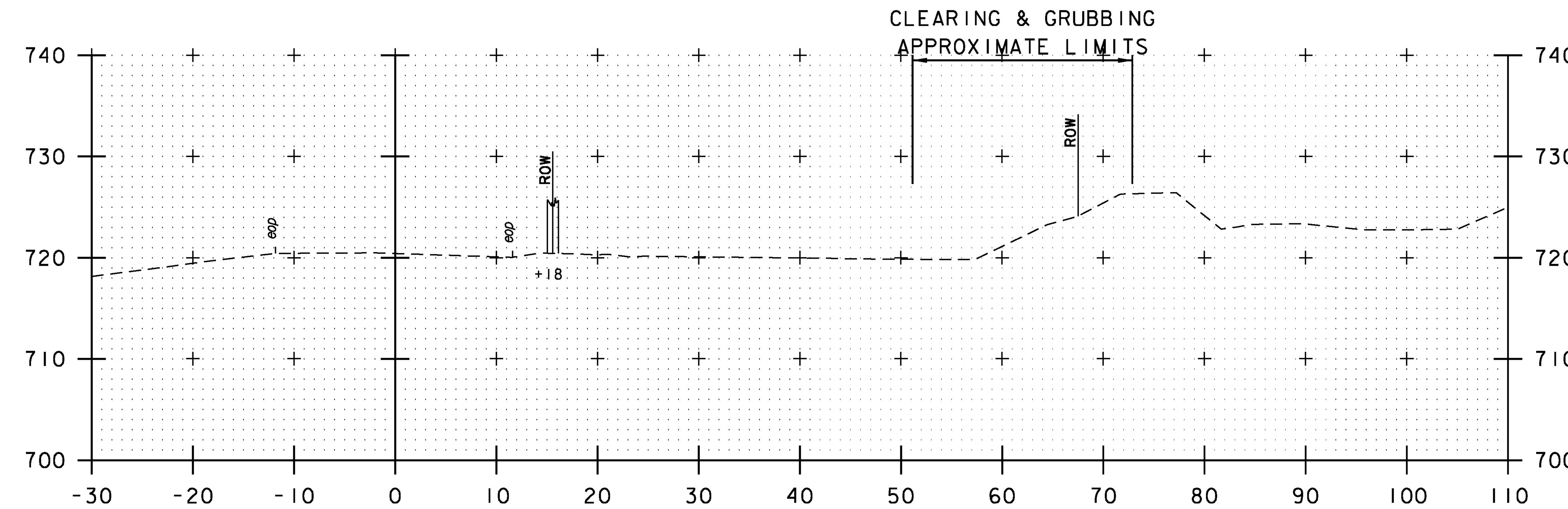

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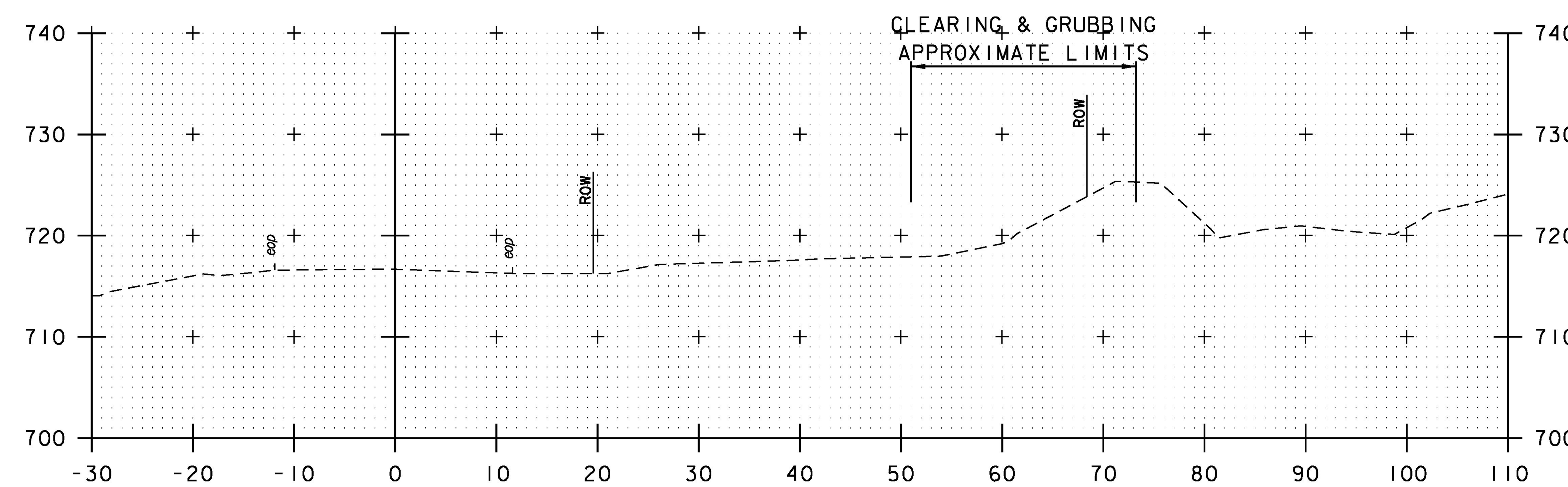

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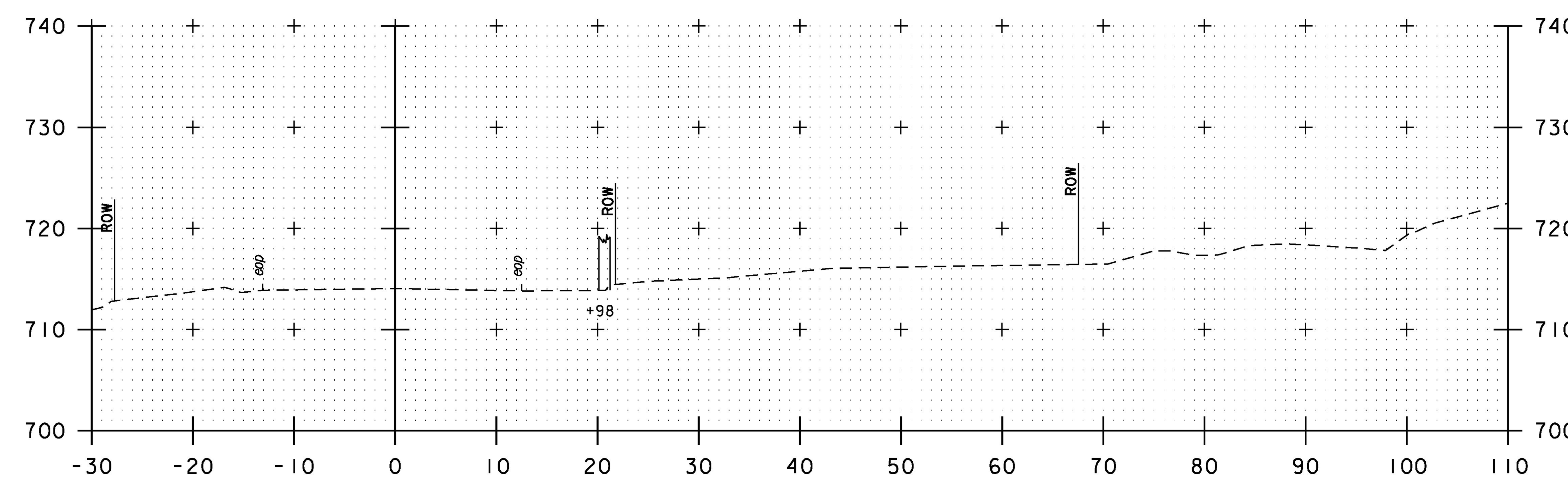
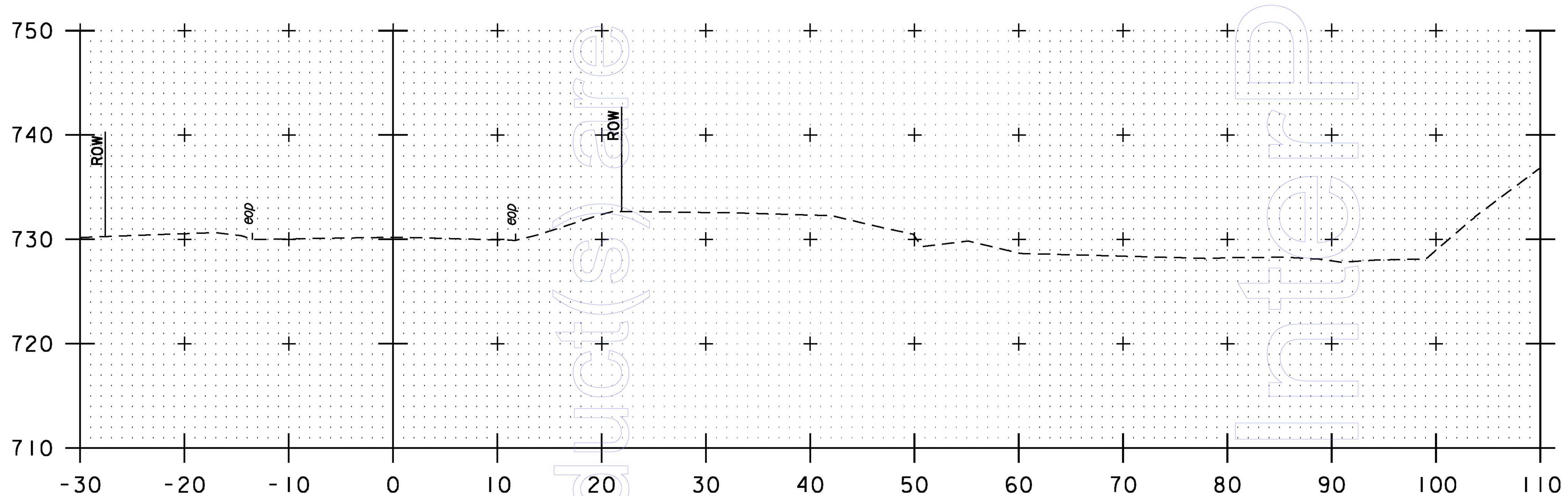


1208+00

PROJECT NAME:	BARRE CITY - BARRE TOWN
PROJECT NUMBER:	MEGC M 6000(12)C/1

FILE NAME: zl5d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (8 OF 9)	SHEET 38 OF 39



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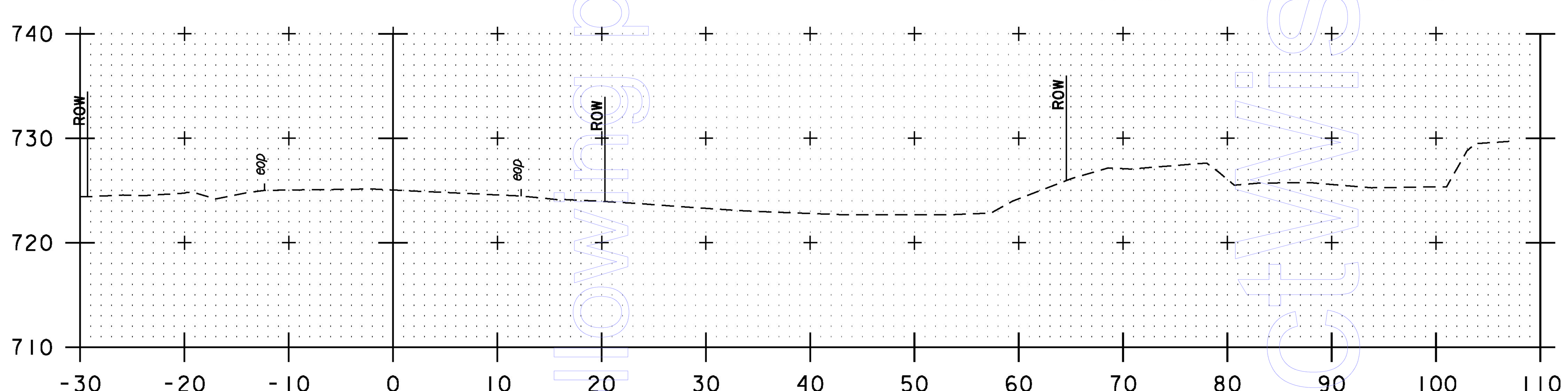
STA. 1209+59, RT
END PROJECT
MEGC M 6000(11)C/1



1209+50

PROJECT NAME: BARRE CITY - BARRE TOWN	
PROJECT NUMBER: MEGC M 6000(12)C/1	
FILE NAME: z15d040_xs.dgn	PLOT DATE: 12/2/2016
PROJECT LEADER: A.P. GUYETTE	DRAWN BY: P.A. MILLER
DESIGNED BY: D.M. PECK	CHECKED BY: D.M. PECK
CROSS SECTIONS (9 OF 9)	SHEET 39 OF 39

VERMONT

State of Vermont
Highway Safety & Design Section

Agency of Transportation
Project Delivery Bureau

TO: PETE HODGSON, RESIDENT ENGINEER

FROM: ERIN LEWIS, P.E.

DATE: APRIL 28, 2017

SUBJECT: BARRE CITY-BARRE TOWN MEGC M 6000(11) C/1 – REDI-ROCK SUBMITTAL APPROVED AS NOTED

We have completed review of the Redi-Rock Submittal dated **4/27/17** for the subject project. Based on our review, the submittal is **approved as noted** with the following conditions:

1) Rapid Chloride Permeability test results, wet test results, and cylinder break tests are submitted and meet associated specification parameters

Please submit the additional test results AOT as soon as they are available.

Please let me know if you have any questions.

Approved AsNoted

BY:	Erin Lewis
DATE:	04/28/2017
RESUBMIT:	No
RECEIVED:	April 27, 2017
CKD BY:	Erin Lewis & Jim Wild

STATE OF VERMONT
AGENCY OF TRANSPORTATION

MIX DESIGN

MICHIE CORPORATION
173 BUXTON INDUSTRIAL DR. HENNIKER, NH
5035CAS-5000 PSI SCC 50% SLAG [0]
04/26/2017

Compressive Strength :	5000 psi at 28 days	Source of Concrete : Michie Corporation, Henniker, NH
Aggregate size :	3/4" -- 19 mm	Construction type : PRECAST
Air :	5.0 to 9.0 %	Placement : Mixer Truck
Water/Cement ratio :	0.359	Unit Weight : 144.42 pcf
Slump :	24.00 to 27.00 in	Design Date : 03/30/2016

Constituents :	Quantity	Density	Volume
Dragon Type III (Dragon Products)	352 lb	3.150	1.79
SLAG (Dragon Products)	352 lb	2.810	2.01
WATER (Michie Corporation)	241 lb	1.000	3.86
#67 3/4" STONE (Michie Corporation, Henniker, NH)	1665 lb	2.724	9.80
WASHED SAND (Michie Corporation, Henniker, NH)	1295 lb	2.669	7.78
ADVACAST 535 (W.R. Grace Chemicals)	180.00 floz (US)/yd³		0.19
DAREX-II (W.R. Grace Chemicals)	3.00 floz (US)/yd³		0.00
Air	6.0 %.		1.62
Total :	3905		27.04

Conditionally approved by James Wild, VAOT Structural Concrete Engineer. Permeability results should be available week of 5/1/17. Need mix wet test results also. If permeability test results are outside spec requirements, any element made with this mix will be rejected. 4/27/17

Remarks :
NOTE: BATCH WEIGHTS ARE S.S.D.
SAND ABSORPTION = 0.6
STONE ABSORPTION = 0.9

Barre City - Barre Town MEGC M 6000 (1) project

Reported by : Rusty Kehr	Approval by :
Date : 10/05/2015	Date : / /

Mix design check list precast/prestress

Precast prestress plant: Michie Precast - Henniker NH

Mix design label: 5053CAS - 5000psi

Date received: 4/27/17

Date checked: 4/28/17

Date approved:

Date sent back: 4/28/17 - conditionally approved. If permeability results are outside spec range, any element made with this mix will be rejected

Checked by: Jim Wild

	Yes	No	N/A
1. Mix design submitted on company letter head	✓		
2. 28 day strength listed	✓		
3. State if SSD or Dry aggregate weights	✓		
4. Material name and source	✓		
5. Aggregate properties and date tested	✓		
6. Admixture names and sources	✓		
7. Target air listed with tolerance	✓		
8. Cement brand	✓		
9. Pozzolans brand	✓		
10. Lab data: slump/spread, air, w/c, strengths, temperatures		✓	
11. Rapid chloride permeability AASHTO T277*		✓	
12. ASR test results*	✓		
13. Does it need to be resubmitted, if so describe why below	✓		

*note: if using 6% silica fume and 25% slag or 20% type F fly ash, rapid chloride testing and ASR can be omitted

Notes: #10 - No lab data or previous test results of mix
#11 - permeability test results not completed yet

BARRE CITY – BARRE TOWN MEGC M 6000 (11)
MONTPELIER, VERMONT
'QUARRY STREET – BARRE, VT'
SUBMITTAL REVISION NO. 3

REDI-ROCK
SUBMITTAL PACKAGE

PREPARED FOR

BUR CONSTRUCTION – CLAREMONT, NH

REDI-ROCK WALLS OF NEW ENGLAND
8 REEDS MILL ROAD
NEWPORT, NH 03773

BRYAN A. SICARD
BSICARD@CARROLLCONCRETE.US
603-340-0719

PACKAGE CONTENTS:

NOTES:

-PAGES 22 & 23 ARE ORIGINAL SIZE FROM WALL DESIGN ENGINEER (24" HIGH BY 36" WIDE). PRINTING THIS PACKAGE AT 8.5" BY 11" WILL RESULT IN THESE SHEETS BEING SCALED ACCORDINGLY.

-AGGREGATE TEST DATA UPDATED AS REQUESTED.

REDI-ROCK WALLS OF NEW ENGLAND
8 REEDS MILL ROAD
NEWPORT, NH 03773

BRYAN A. SICARD
BSICARD@CARROLLCONCRETE.US
603-340-0719

REDI-ROCK

PRODUCTS & SOLUTIONS

GRAVITY SOLUTIONS

NO GEOGRID OR TIE-BACKS IN MANY APPLICATIONS

LIMESTONE | COBBLESTONE | LEDGESTONE

TOP BLOCK

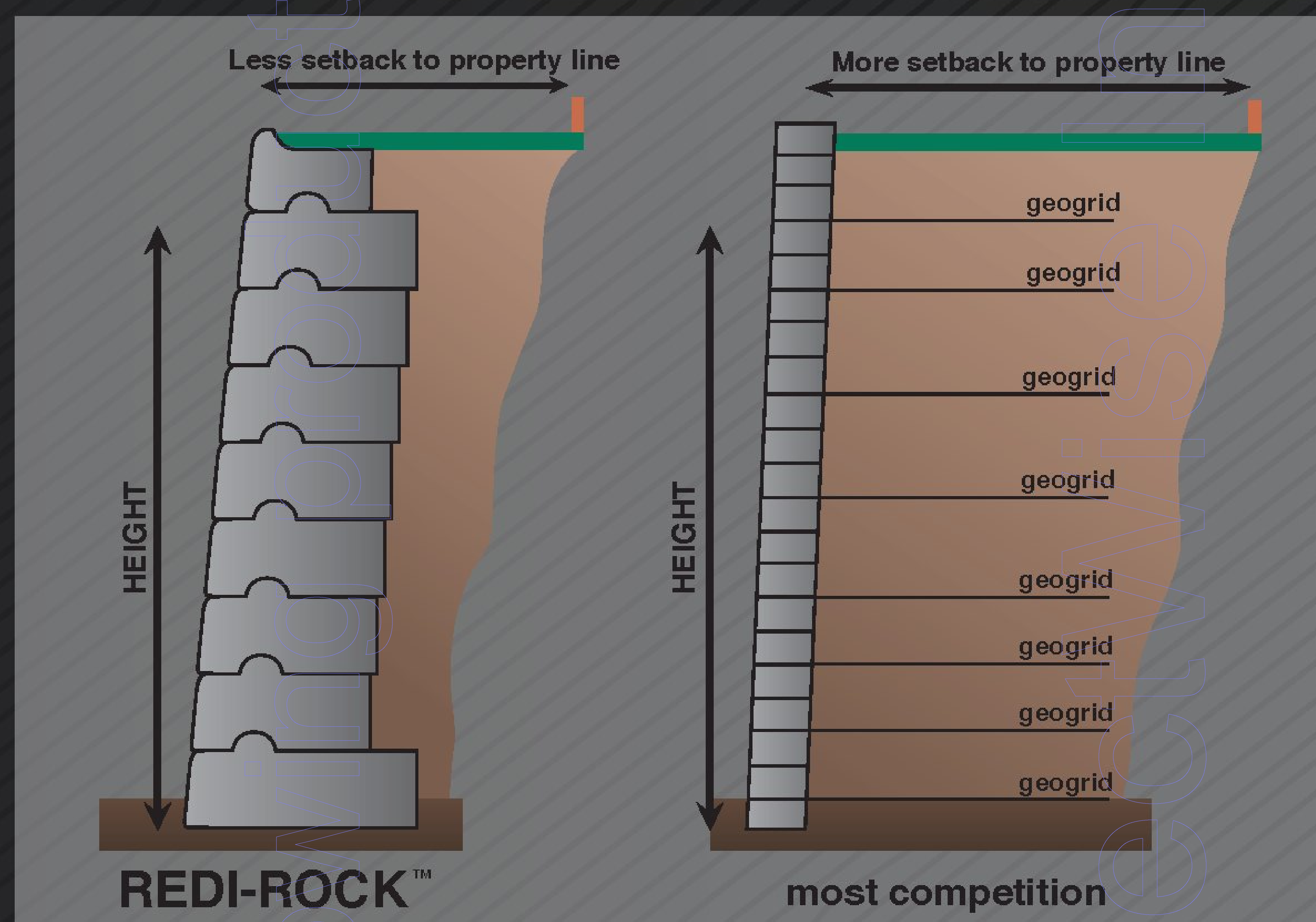
Weight: 1225 lbs.
46" x 28" x 18" High
5.75 sq. ft. of face

MIDDLE BLOCK

Weight: 2400 lbs.
46" x 41" x 18" High
5.75 sq. ft. of face

BOTTOM BLOCK

Weight: 2500 lbs.
46" x 41" x 18" High
5.75 sq. ft. of face



REINFORCED SOLUTIONS

BUILD EVEN TALLER WALLS

REDI-ROCK'S POSITIVE CONNECTION (PC) SYSTEM

Weight: 1540 lbs.
46" x 28" x 18" High
5.75 sq. ft. of face

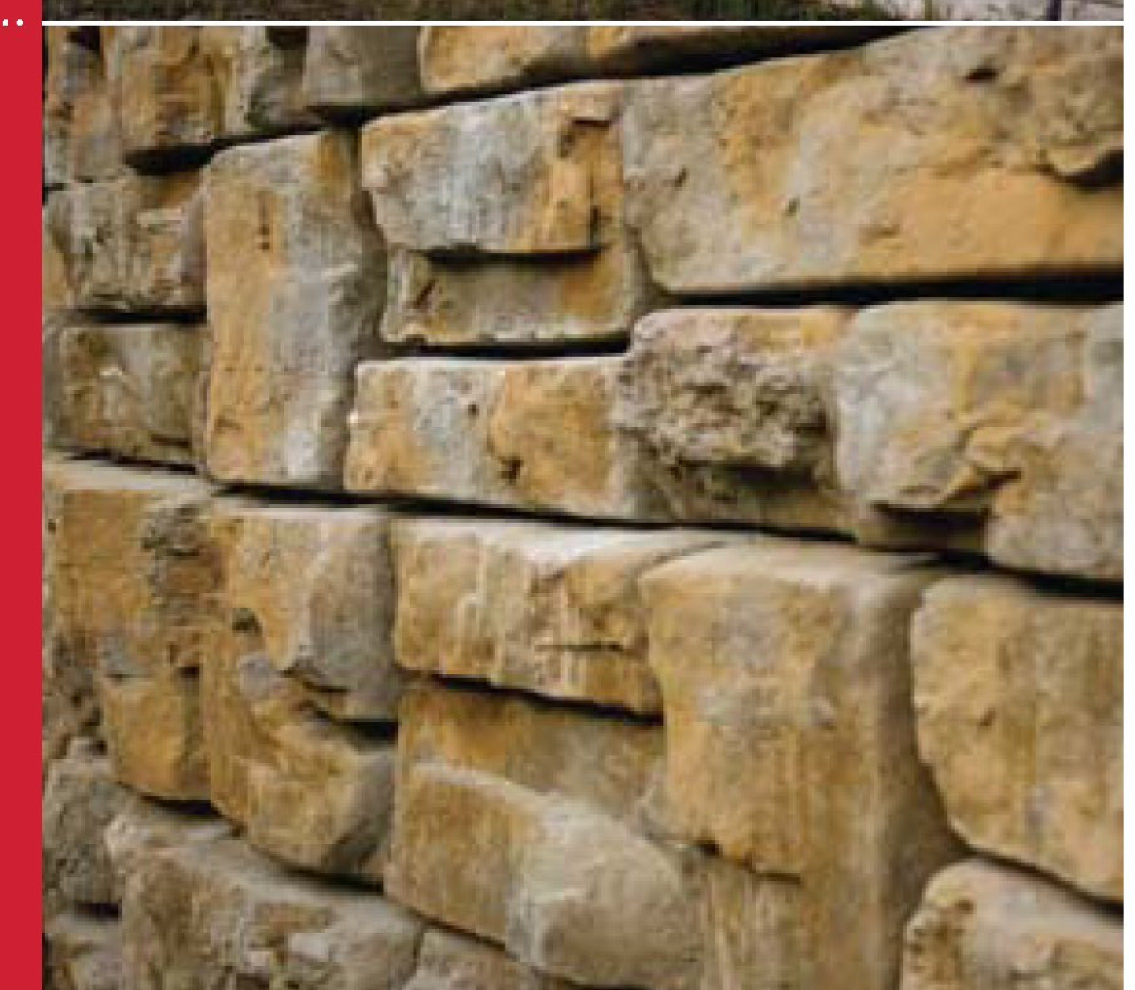
AVAILABLE IN ALL THREE TEXTURES

- Provides superior seismic performance over other geosynthetic reinforced wall systems
- Utilizes a corrosion-free reinforcement system without special connection components
- Increases wall height with reduced geosynthetic reinforcement requirements
- Incorporates a massive, ¾ ton, precast concrete block facing unit
- Addresses the long term connection requirements in the AASHTO LRFD specifications

LIMESTONE

COBBLESTONE

LEDGESTONE



REDI-ROCK

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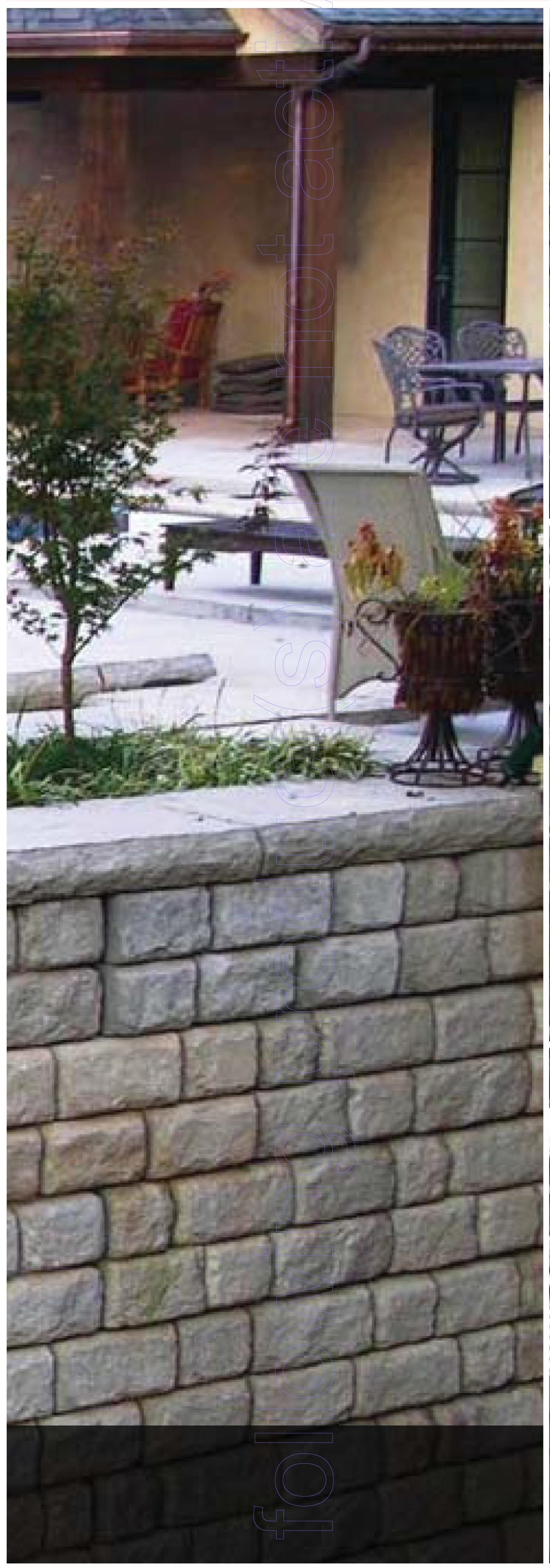
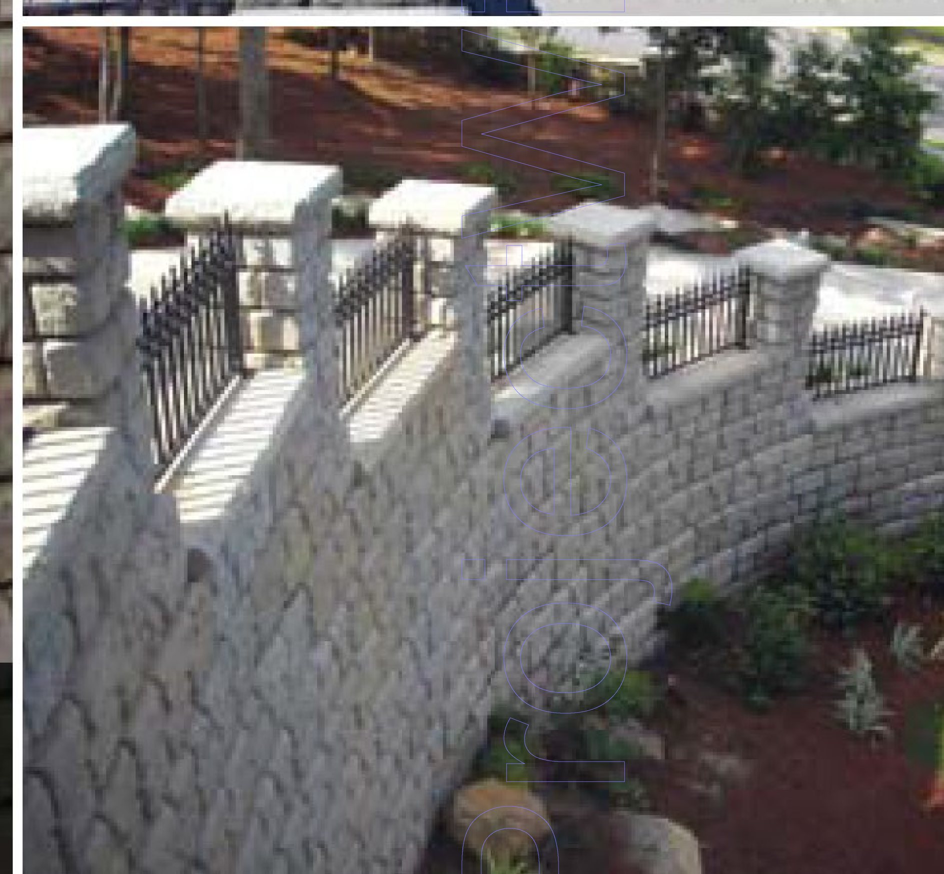




RETAINING WALLS

Massive, one-ton Redi-Rock blocks rely on **gravity** to hold back slopes in many different applications. Even taller reinforced walls are possible using the **Positive Connection System**. Redi-Rock retaining walls can integrate with other Redi-Rock products such as Freestanding walls, Columns and more to give designers the flexibility they need to create a truly unique project.

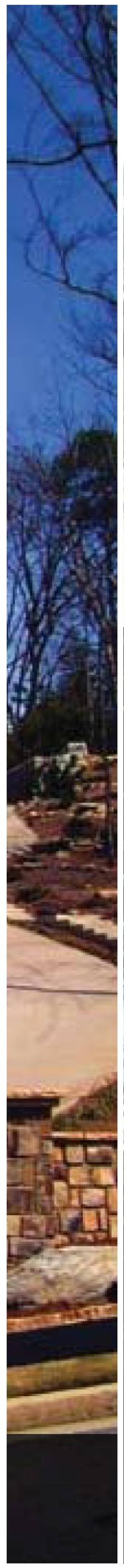
FREESTANDING WALLS

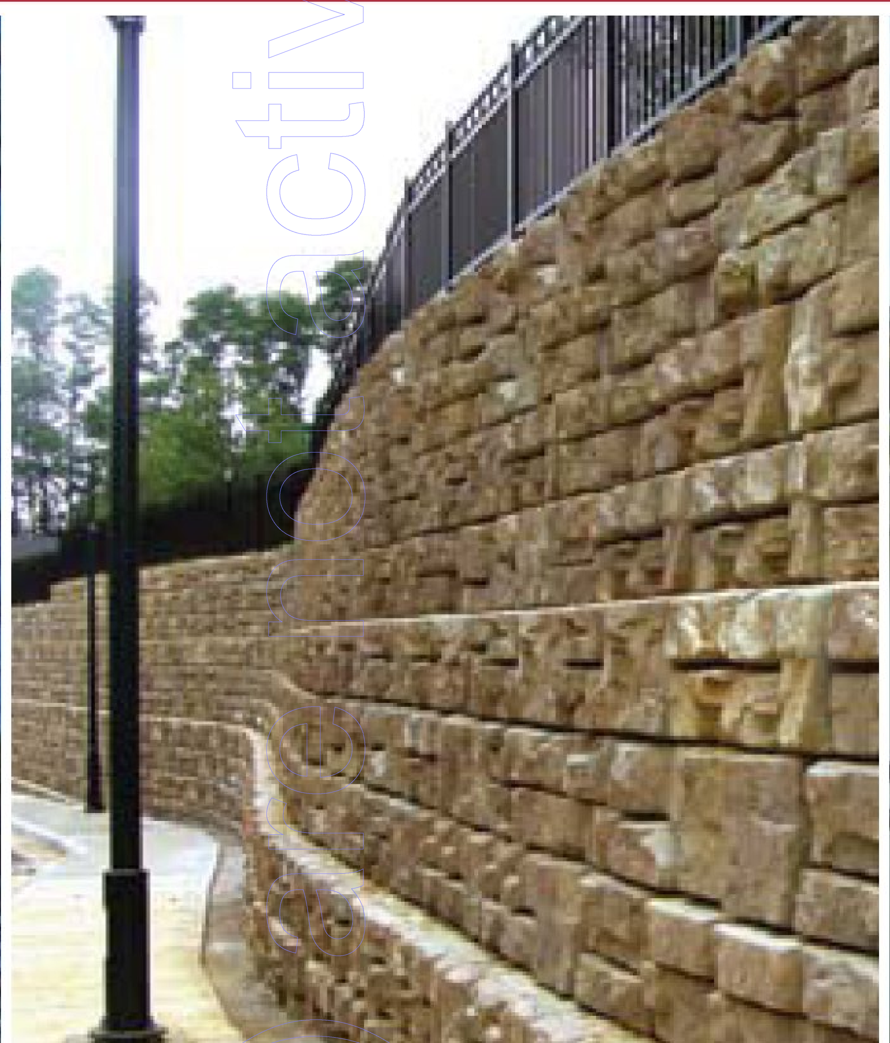
Redi-Rock Freestanding walls feature rich, natural **textures on both sides** to create double-sided barrier walls, seat walls and enclosures. In addition, Redi-Rock Freestanding walls can also be reinforced to use as **roadway or parking barriers**. Place Freestanding walls directly on top of Redi-Rock retaining walls or as stand-alone structures for a unique, durable solution.

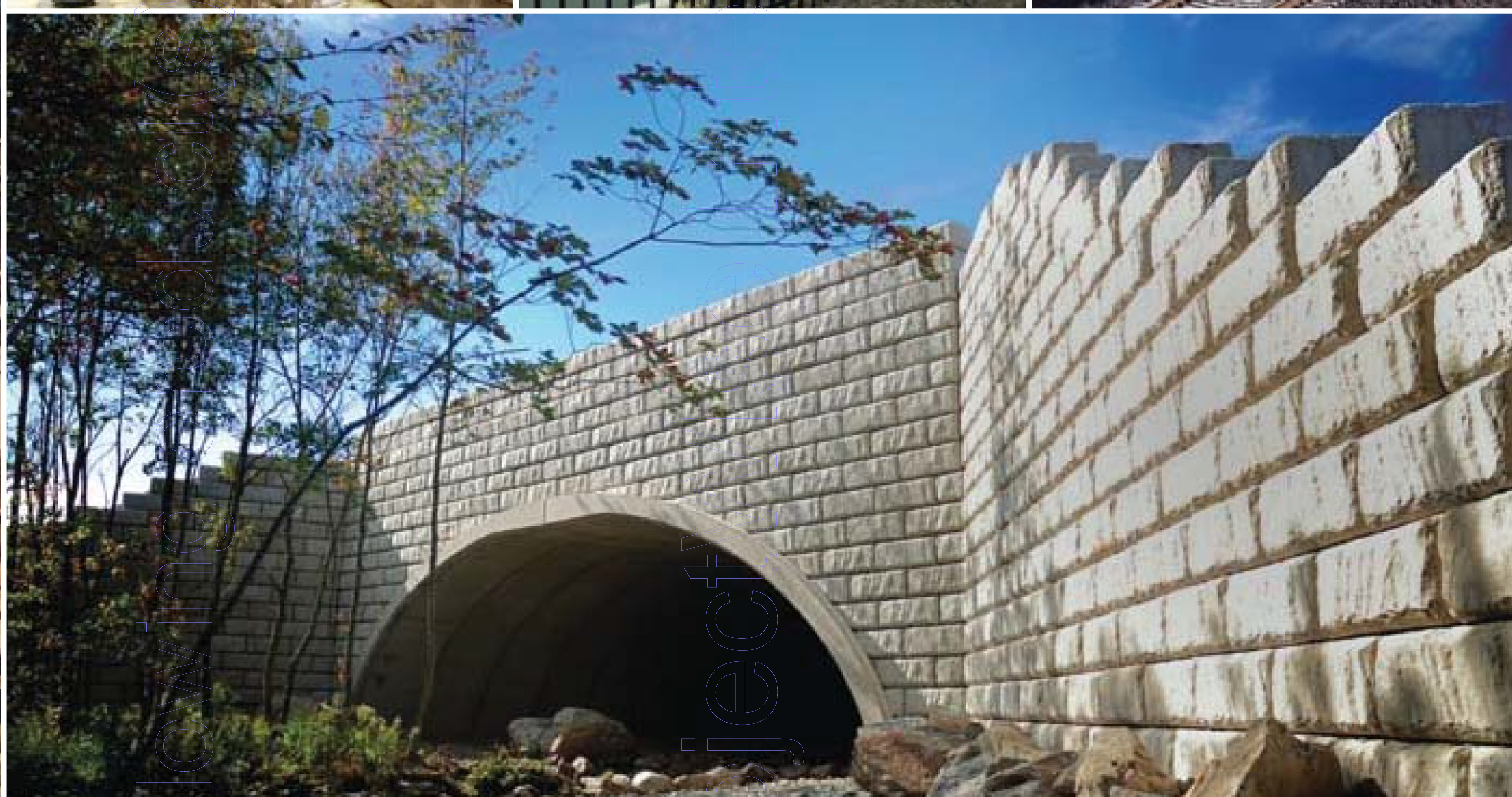
COLUMNS & ACCESSORIES

With Redi-Rock, you've got options.

From **design flexibility**, to varying color or texture choices—designing a hardscape project with Redi-Rock is easier than ever. Integrate fence rail systems, gates, or light fixtures with your Columns, or top with a Redi-Rock **Cap** for a finished look. Redi-Rock staircases, patios and walkways created with the Redi-Rock **Step** and **Paver** series feature the timeless look of natural stone—with consistent dimensions for safe and easy access, plus simple installation.







Redi-Rock is a perfect solution for bridge and culvert applications. For this project, Redi-Rock's proven durability and the Zero Degree-Batter, Limestone texture blocks allowed engineers to create a design that will stand the test of time.

THE APPLICATIONS

Redi-Rock has a proven track record for providing durable, aesthetic solutions in a variety of applications including:

- **Municipal**
- **Residential**
- **Water Applications**
- **DOT Projects**
- **Railway Jobs**
- **Bridges**
- **Storm Channels**
- **Road Construction**
- **Sea Walls**
- **Sustainable Solutions**

Redi-Rock is able to provide solutions for a wide range of projects because it is a versatile system that allows designers to create a custom solution for each project. Plus, the ability to build tall gravity walls and even taller reinforced walls with the Positive Connection System creates opportunity to use Redi-Rock in more applications than ever.

With Redi-Rock, varying batters, creating inside and outside curves, integrating Freestanding walls and Steps and much more is possible. Plus, extensive design and engineering resources are available.

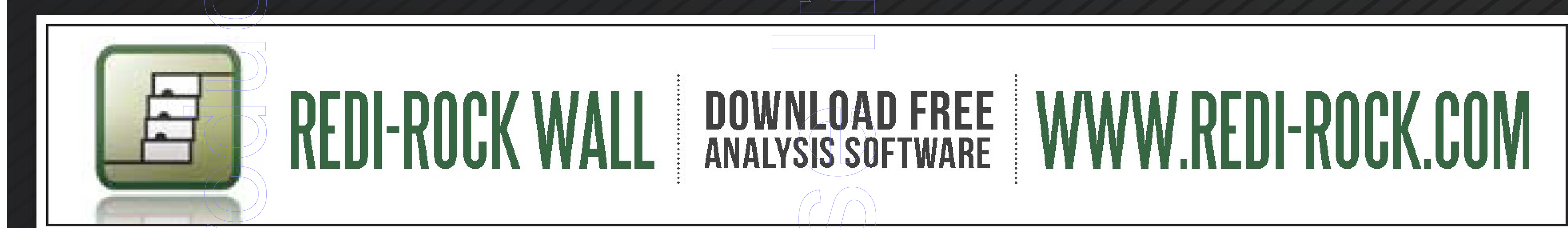
The Redi-Rock system is designed to be a sustainable solution that will last for generations. Our goal is to be environmentally responsible by encouraging recycled content in the product, using less excavating in tall gravity walls and providing regionally available material with the large Redi-Rock manufacturing base. We encourage you to speak to your local Redi-Rock Manufacturer to learn how these walls can help contribute to the U.S. or Canadian Green Build Council's LEED credits.

REDI-ROCK DESIGN AND ENGINEERING RESOURCES

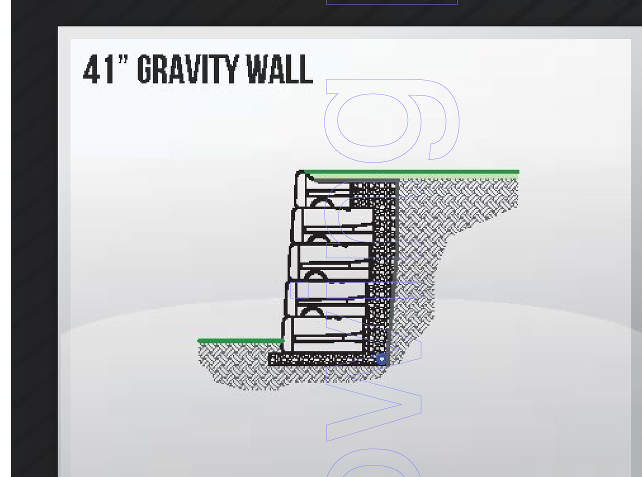
GRAVITY SOLUTIONS

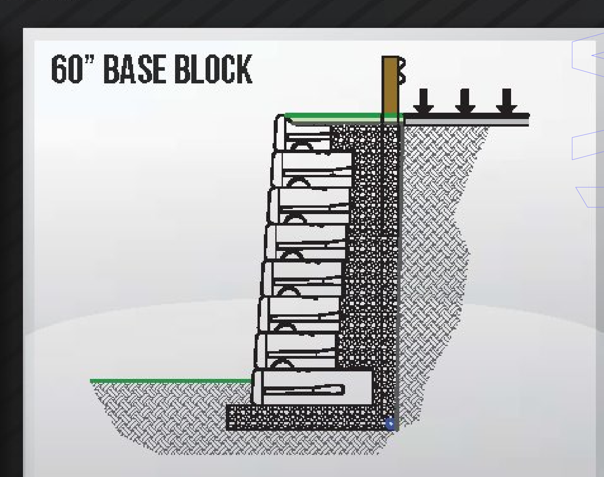
Redi-Rock's **design resources** make designing your retaining walls easy. Here's how:

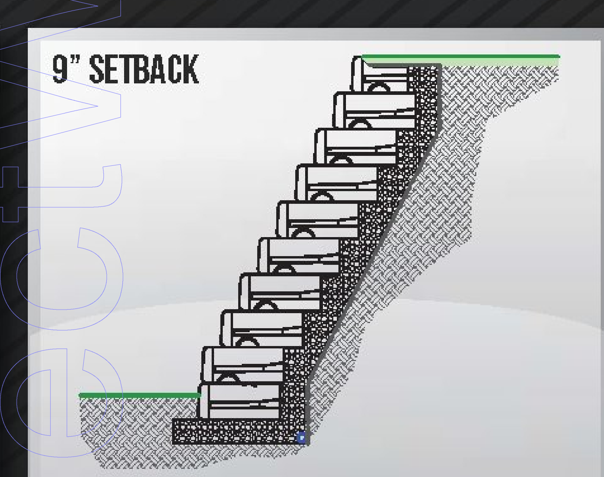
- For design professionals, the complete **Design Resource Manual** is available.
- Redi-Rock **Wall Analysis Software** analyzes Redi-Rock's gravity wall system and is available as a free download at **www.redi-rock.com.** The package includes a wall analysis module, a bearing capacity module and a slope "global" stability module. LRFD calculations are also included.
- Preliminary **Design Charts** and Details of over 700 conditions on **www.redi-rock.com** make getting started with Redi-Rock a snap.
- Redi-Rock's **on-staff Engineering Department** provides support to engineers, contractors and specifiers. The Redi-Rock P.E.s are available to answer your questions and are dedicated to helping you find a Redi-Rock solution for your project.
- Typical Construction Details, Specifications, Installation Manual and more are available at **www.redi-rock.com**.

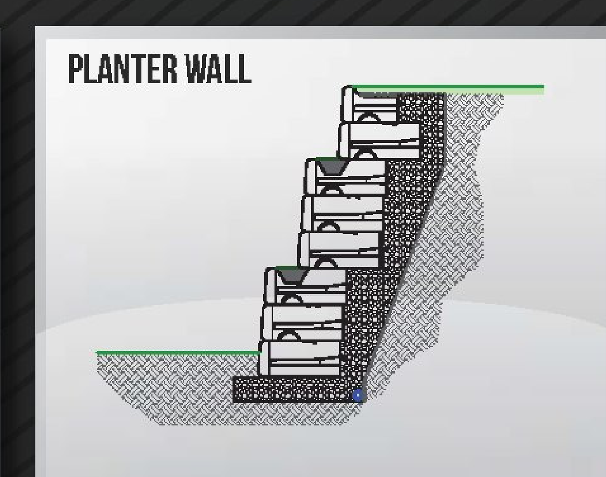


VERSATILE SOLUTIONS



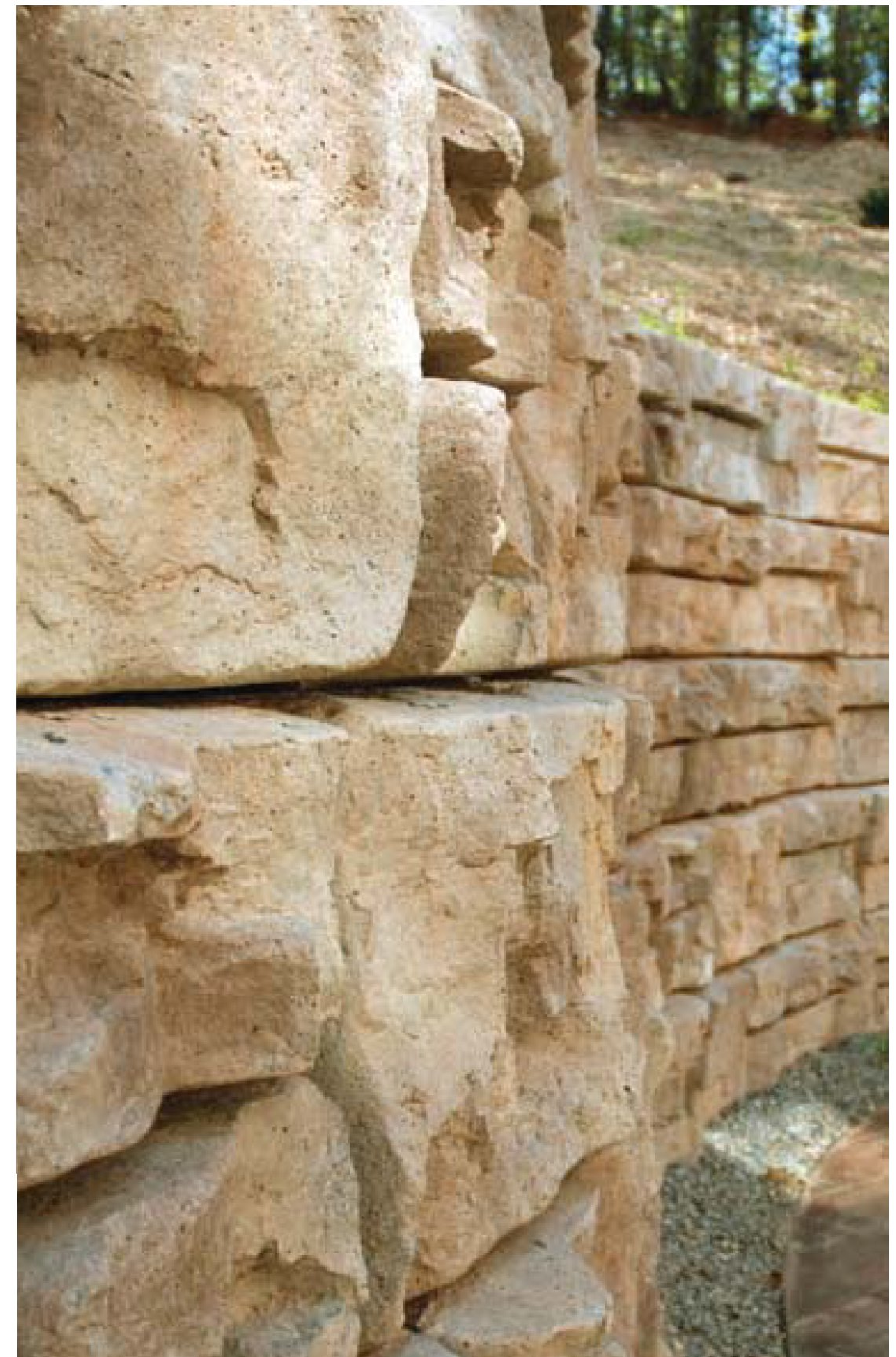




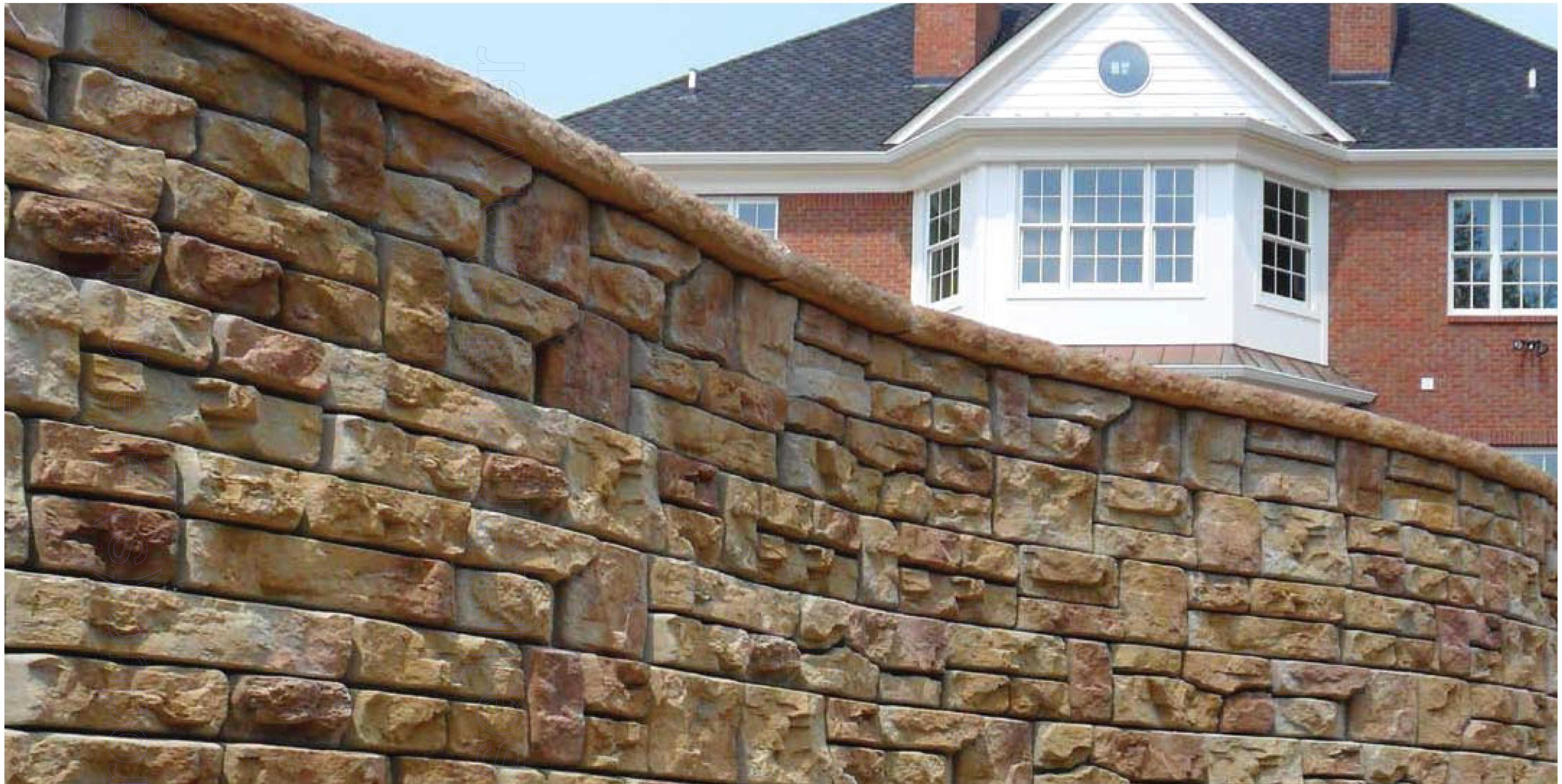


With Redi-Rock's versatile system, you can incorporate a variety of blocks to achieve taller gravity walls while minimizing excavation (pictured above). In addition, varying batters are also possible within the Redi-Rock system—from zero degree batter walls to the standard 5 degree batter walls, plus incorporating 9" Setback blocks and Planter blocks for even more batter options.

LARGE BLOCK GRAVITY SOLUTIONS



Redi-Rock blocks harness the power of gravity to build tall walls that require no geogrid reinforcement in many applications. The benefits of gravity walls include minimizing excavation space, time and costs. Each massive precast concrete block weighs over one ton and stacks like a giant Lego to create walls with the "Essence of Natural Rock" look.



REDI ROCK

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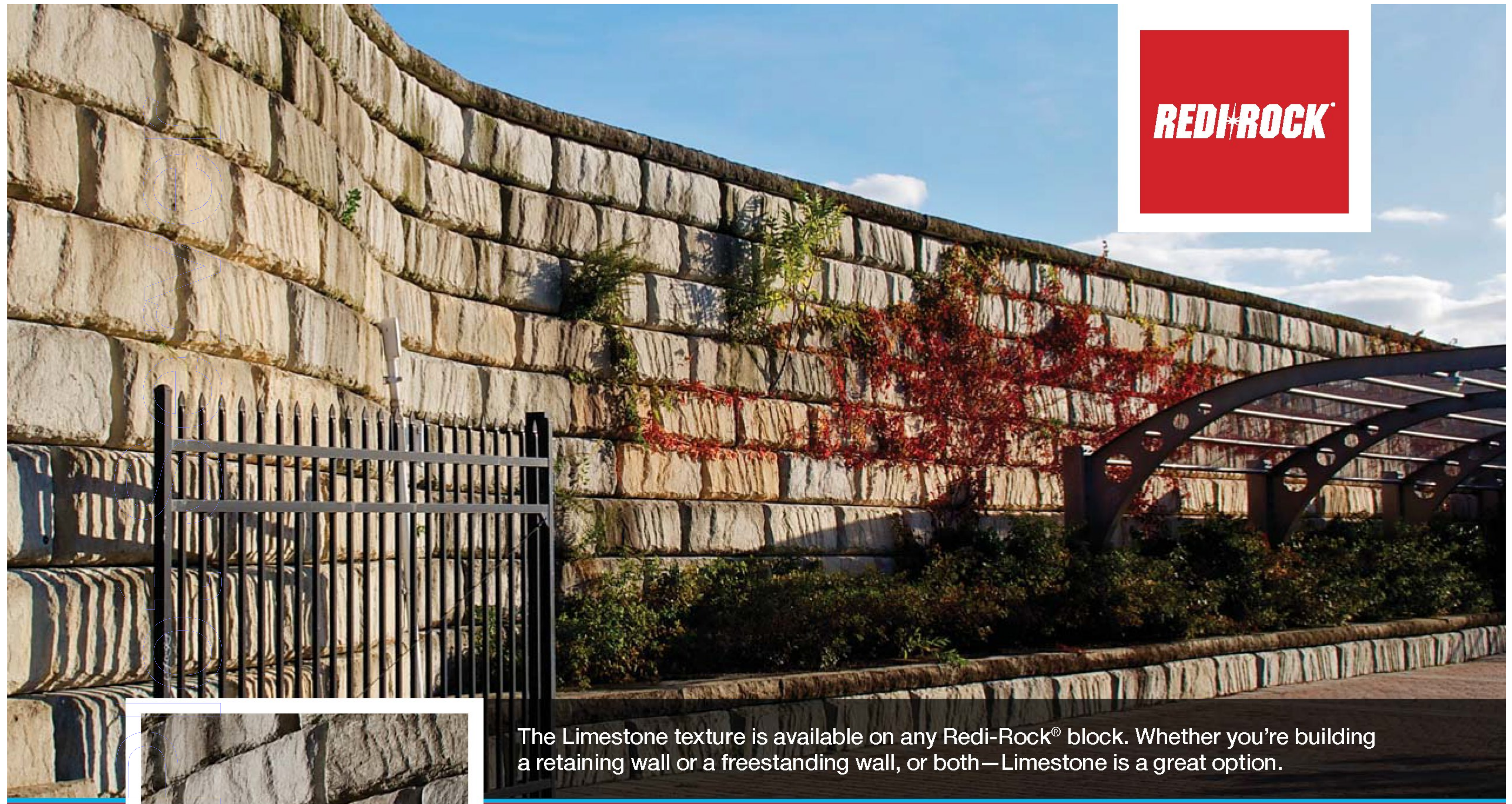
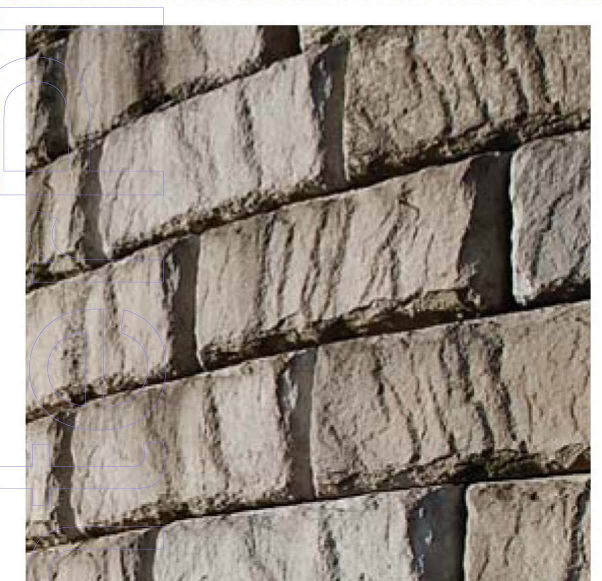
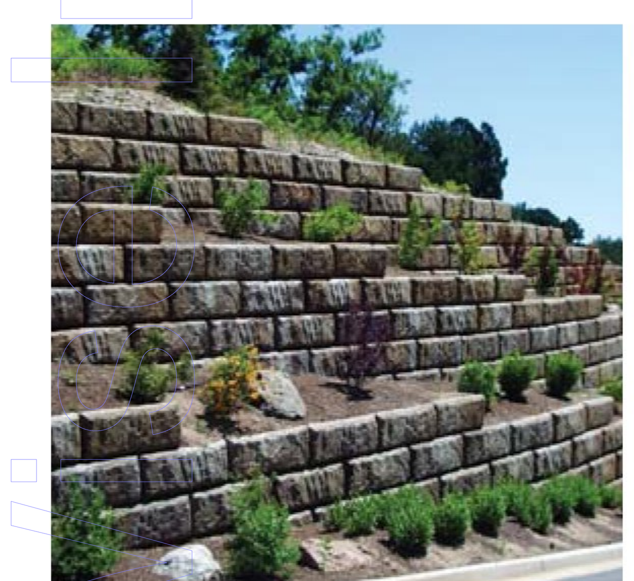
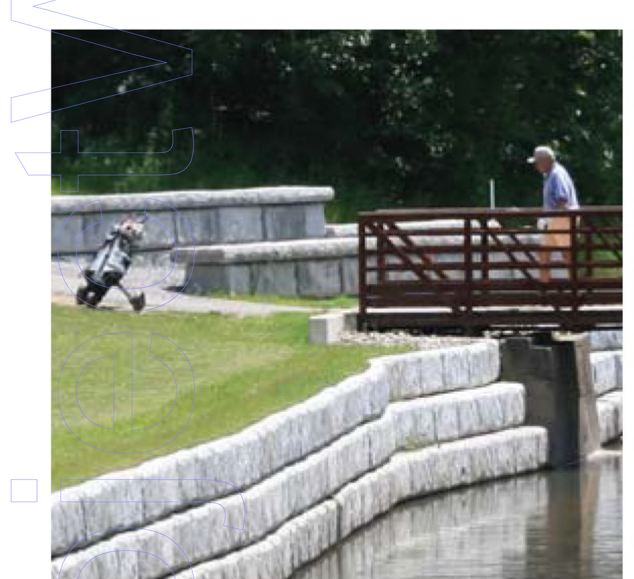


The Limestone texture is available on any Redi-Rock® block. Whether you're building a retaining wall or a freestanding wall, or both—Limestone is a great option.







REDI-ROCK TEXTURE:

LIMESTONE

Legos. You probably loved them as a kid. We still love them, which is why we created these one-ton Redi-Rock blocks that lock together using a knob and groove system. Who wouldn't want a giant block wall on their project?

The design of Redi-Rock blocks goes beyond function, though. These blocks also look great.

Redi-Rock Limestone blocks have a natural split limestone texture that beautifully mimics real quarried stone. These large-scale block faces are perfect for commercial and residential projects—or anything in between!

Regional colors and coordinating accessories are available. Contact your local Redi-Rock retailer or visit **redi-rock.com** to learn more about the Redi-Rock Limestone face today!

LIMESTONE CASE STUDY

construction

Redi-Rock PC Ocean Marina Wall Withstands Worst Storm in Years

The Challenge

In 2012, the City of Rhyl, North Wales launched a massive renovation project. The goal? Transforming the river's edge. This area is subject to large tides and even greater fluctuations in water elevations during storms. To protect the site, designers required a retaining wall solution that could meet the complex structural requirements of the site while providing a scenic park route for pedestrians and cyclists.

The Solution

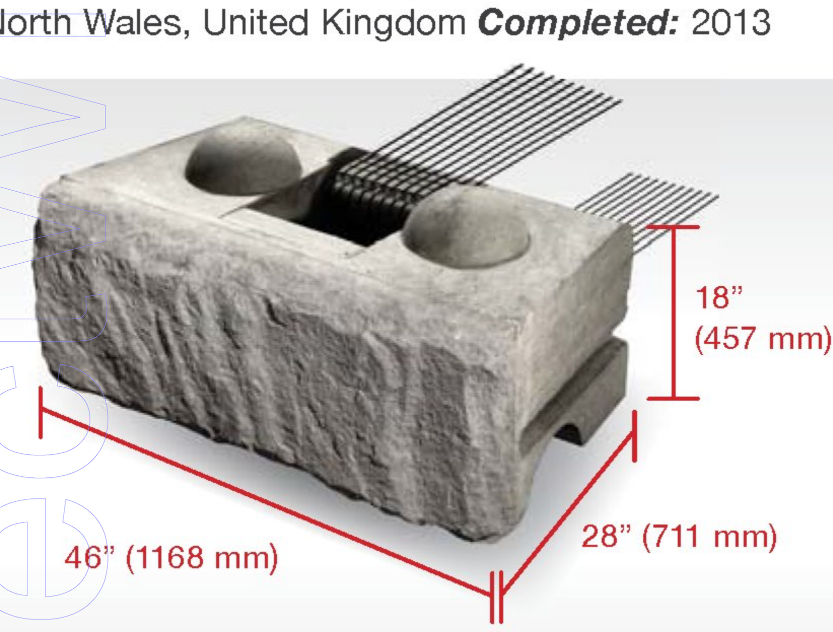
Designers for the project chose the Redi-Rock Positive Connection (PC) System to create the harbor wall that stands 7.4 meters (24.3 feet) high and stretches 188 lineal meters (617 feet). Produced locally by Redi-Rock manufacturer CPM Group, the Redi-Rock PC walls were able to meet the structural requirements of the site as well as provide an aesthetic Limestone finish at a lower cost than other options.

"The Redi-Rock product is very simple but massively effective," said Jamie Turner, Site Agent for general contractor Dawnus Construction. "It is easy to install and the end product looks fantastic. I would definitely use this product again."

During the 2013-2014 winter season, the new harbor sea wall was put to the test. For days, a storm battered the United Kingdom and caused a 60-year high tidal surge. January wave heights were close to 100-year level.

While this massive storm caused damage to many other structures in the area, designers were happy to see that the harbor wall performed exactly as engineered. The city was so impressed with how the Redi-Rock wall performed during the storm, they replaced 1 kilometer (3280 feet) of walls with Redi-Rock

Project: Foryd Harbour Enhancement Project ***Wall Design:*** Groundsolve Ltd Geotechnical Consultants in conjunction with CPM Group ***Block Manufacturer:*** CPM Group ***Project Management:*** Denbighshire County Council ***General Contractor:*** Dawnus Construction ***Location:*** Rhyl, North Wales, United Kingdom ***Completed:*** 2013



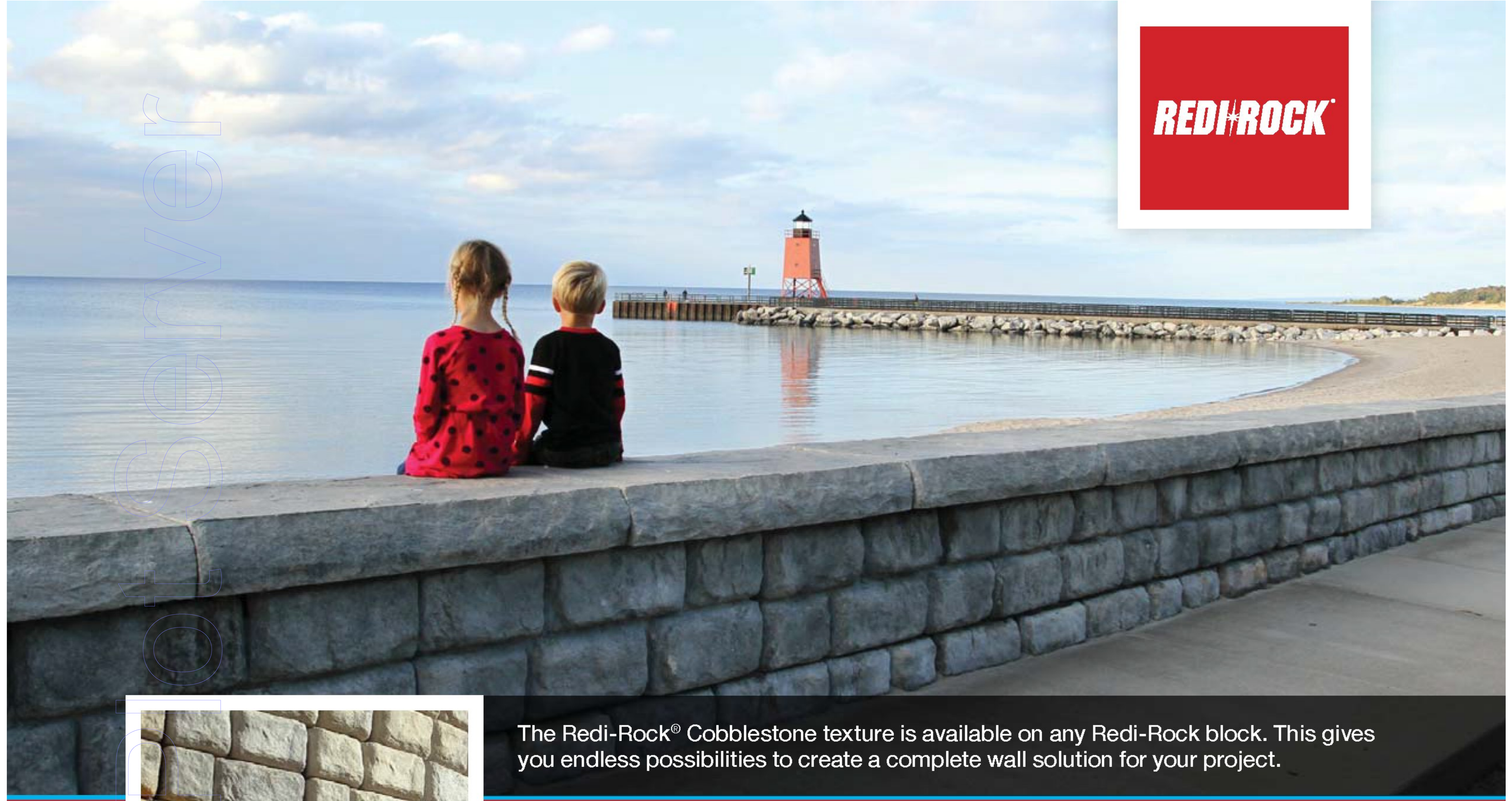
5.75 sq. ft. of face - 1540 lbs
(0.5 sq. meters of face - 699 kgs)

Limestone Block Specifications

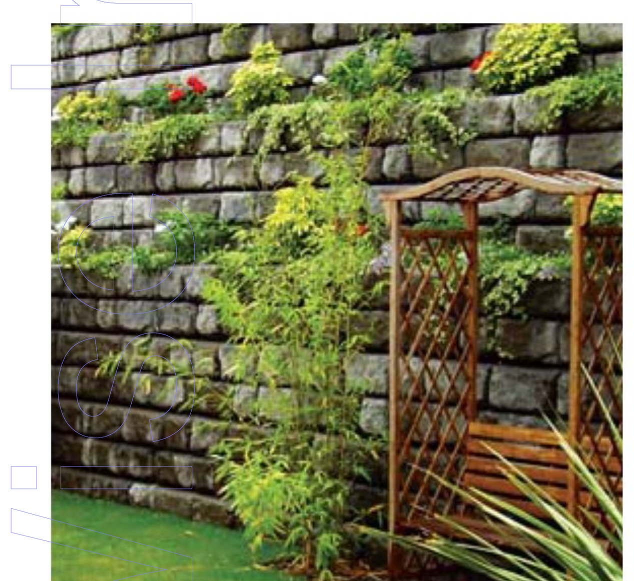
- Quarried stone texture
- 5.75 square feet (0.5 square meters) of face
- Four unique faces to give walls a random aesthetic
- Approximately 23 square feet (2 square meters) of non-repeating texture available
- Wet-cast concrete gives a greater level of detail and durability

REDI-ROCK

Contact your local Redi-Rock retailer or visit **redi-rock.com** to learn more about the Redi-Rock Limestone face today!



The Redi-Rock® Cobblestone texture is available on any Redi-Rock block. This gives you endless possibilities to create a complete wall solution for your project.



REDI-ROCK TEXTURE:

COBBLESTONE

What's more American than giant concrete blocks?

Well, maybe apple pie, but seriously...Redi-Rock blocks couple engineering ingenuity with dashing good looks. The result is the best looking structural walls on the market.

Redi-Rock Cobblestone blocks have a great stacked stone aesthetic. Each block face gives the appearance of six smaller blocks, making it a great look for projects that need a smaller-scale look.

Regional colors and coordinating accessories are available. Contact your local Redi-Rock retailer or visit **redi-rock.com** to learn more about the Redi-Rock Cobblestone face today!

COBBLESTONE CASE STUDY

Redi-Rock Gravity Walls Level Lot for Custom Sports Court

The Challenge

When the owners of this Washington home wanted to install a tennis/basketball court, their hilly property presented some unique challenges. To create enough space for a court, they needed to contend with a 20-foot (6 meter) elevation change on the proposed site.

The Solution

Copper Creek Landscaping considered several options with the owners, including a poured-in-place wall. "But we just thought that would be too sterile and not aesthetically pleasing," explained Matt Barton, owner of Copper Creek Landscaping.

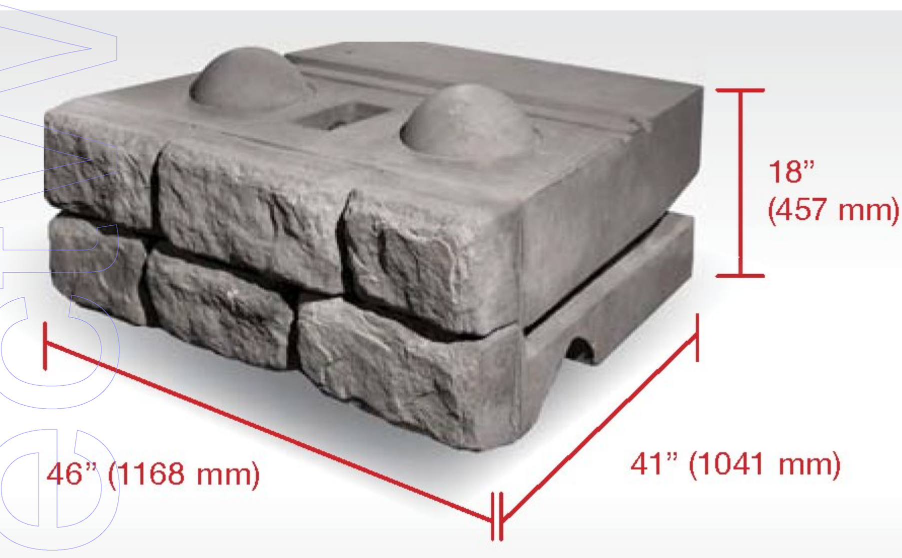
He continued: "We wanted really straight, square walls though, so obviously a boulder retaining wall wouldn't have worked. We had a lot of restrictions with what we were trying to do, and Redi-Rock was the perfect product that allowed us to do everything we needed to do."

"The other options included a lot of engineering and expense. Having a pre-engineered system helped us a lot," said owner Jeff Stockdale.

The biggest selling point of the Redi-Rock system was the ability to build retaining walls without requiring geogrid. After re-grading the area, the tallest wall required was still 11 feet (3.4 meters) and was installed as a gravity structure. This saved installers time because they did not have to excavate for geogrid, in turn saving the owners money. Plus, the aesthetic Cobblestone texture complimented the nearby home.

"We really liked the aesthetics of Redi-Rock because it blends in nicely with the surrounding terrain. We worked with Wilbert to do the custom work and they did a great job. We are really pleased with how it turned out—and we know it's not going anywhere," Stockdale said.

Project: Liberty Lake Sports Court ***Customer:*** Liberty Lake Residence ***Block Manufacturer:*** Wilbert Precast ***Wall Installer:*** Copper Creek Landscaping; Wilbert Precast ***Location:*** Liberty Lake, Washington ***Completed:*** 2010



5.75 sq. ft. of face - 2483 lbs.
(0.5 sq. meters of face- 1126 kgs)

Cobblestone Block Specifications

- Stacked stone texture
- Each block gives the appearance of 6 smaller blocks
- Four unique faces to give walls a random aesthetic
- Up to 23 square feet (2 square meters) of non-repeating texture available
- Wet-cast concrete gives a greater level of detail and durability

REDI-ROCK

Contact your local Redi-Rock retailer or visit **redi-rock.com** to learn more about the Redi-Rock Cobblestone face today!

RETAINING BLOCKS
(FINISHED TEXTURE ON ONE FACE)

The Redi-Rock Retaining wall blocks come in multiple widths and configurations. The defining characteristic is that Retaining blocks have an aesthetic texture cast into only ONE face, and the textured face is the only side exposed to view in the finished wall. These blocks are machine-placed, wet-cast, precast modular block units manufactured from first purpose, non-reconstituted concrete and intended for constructing dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock blocks are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

CONCRETE MIX PROPERTIES (1)

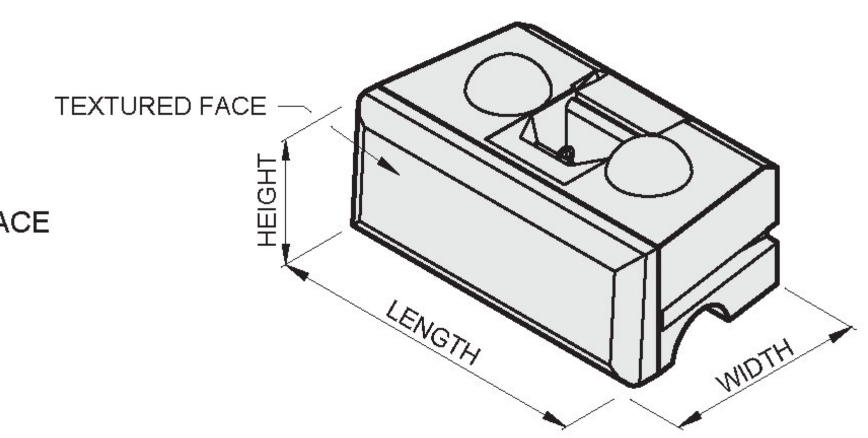
FREEZE THAW EXPOSURE CLASS (2)	MINIMUM 28 DAY COMPRESSIVE STRENGTH (3)	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE (10)	AGGREGATE CLASS DESIGNATION (4)	AIR CONTENT (5)
MODERATE	4,000 psi (27.6 MPa)	0.45	1.0 (25)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1.0 (25)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1.0 (25)	4S	6.0% ± 1.5%

MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl^-) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT (6)	0.015
MAXIMUM CHLORIDE AS Cl^- CONCENTRATION IN MIXING WATER, PARTS PER MILLION	1000

MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT (7, 9) (VERY SEVERE EXPOSURE CLASS ONLY)			
FLY ASH OR OTHER POZZOLANS PER ASTM C618	25	TOTAL ASH, POZZOLANS, SLAG, AND SILICA FUME (8)	50
SLAG CONFORMING TO ASTM C989	50	TOTAL ASH, POZZOLANS, AND SILICA FUME (8)	35
SILICA FUME CONFORMING TO ASTM C1240	10	ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201	

REFERENCE DIMENSIONS:

HEIGHT = VERTICAL DIMENSION OF TEXTURED FACE
LENGTH = HORIZONTAL DIMENSION PARALLEL TO TEXTURED FACE
WIDTH = HORIZONTAL DIMENSION PERPENDICULAR TO TEXTURED FACE



DIMENSIONAL TOLERANCES (10) (11)

HEIGHT	ALL BLOCKS	18 ± 3/16 (457 ± 5)
LENGTH	FULL BLOCKS	46 1/8 ± 1/2 (1172 ± 13)
	HALF BLOCKS	22 13/16 ± 1/2 (579 ± 13)
WIDTH	28" (710) BLOCKS	22 5/8 ± 1/2 (575 ± 13) FORM LINE TO BACK OF BLOCK, PLUS APPROX. 5 3/8 (136) FACE TEXTURE
	41" (1030) BLOCKS	35 1/8 ± 1/2 (892 ± 13) FORM LINE TO BACK OF BLOCK, PLUS APPROXIMATELY 5 3/8 (136) FACE TEXTURE
	60" (1520) BLOCKS	54 5/8 ± 1/2 (1387 ± 13) FORM LINE TO BACK OF BLOCK, PLUS APPROXIMATELY 5 3/8 (136) FACE TEXTURE

(1) Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.
(2) Exposure class is as described in ACI 318.
(3) Test method ASTM C39.
(4) Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete.*
(5) Test method ASTM C231.
(6) Test method ASTM C1218 at age between 28 and 42 days.
(7) The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:
(a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
(b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
(c) Silica fume, ASTM C1240, present in a blended cement.
(8) Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.
(9) Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze-thaw durability in a detailed and current testing program.
(10) All dimensions are shown in units of *inches (mm)*.
(11) Permissible defects: Chips smaller than 1.5" (38mm) in its largest dimension and cracks not wider than 0.012" (0.305mm) and not longer than 25% of the nominal height of the block; bug holes in the architectural face smaller than 0.75" (19mm); and bug holes, water marks, and color variation on non-architectural faces.

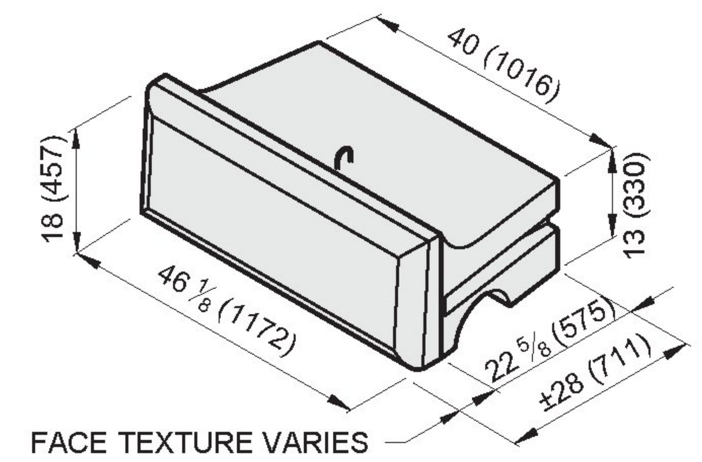
BLOCKS USED IN WALL ARE HIGHLIGHTED IN RED BOXES

RETAINING BLOCKS

Block Library

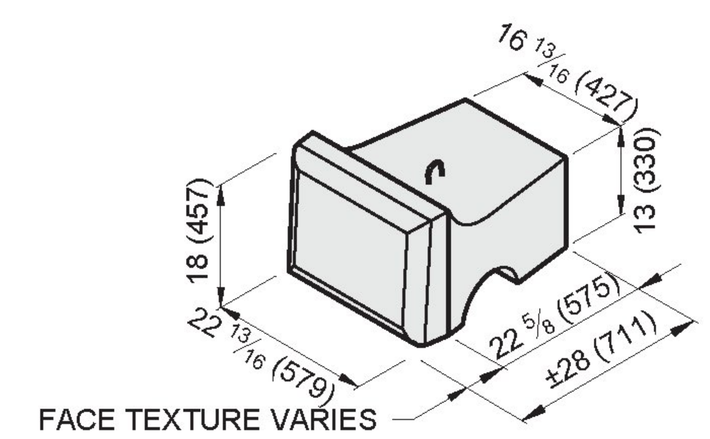
28" (710mm) TOP

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	1229 lb (557 kg)	1158 lb (525 kg)
Block Volume:	8.57 ft^3 (0.243 m^3)	8.07 ft^3 (0.229 m^3)
Center of Gravity:	14.9" (378mm)	14.2" (362mm)



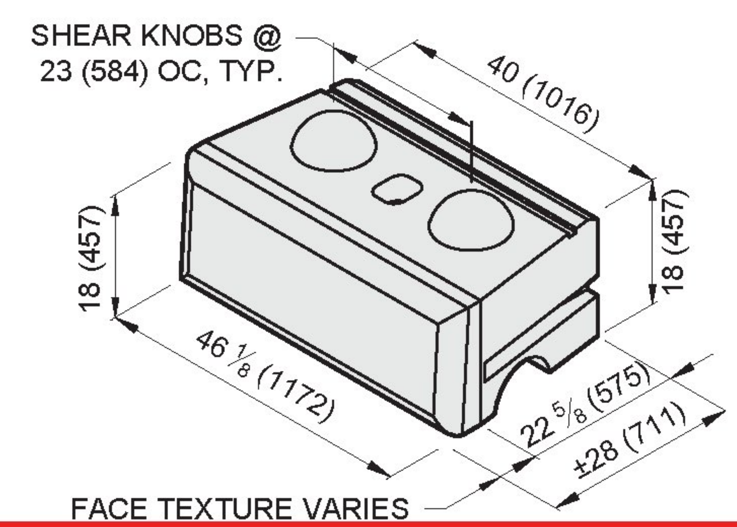
28" (710mm) HALF TOP

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	573 lb (260 kg)	538 lb (244 kg)
Block Volume:	4.01 ft^3 (0.113 m^3)	3.76 ft^3 (0.106 m^3)
Center of Gravity:	15.3" (389 mm)	14.7" (373 mm)



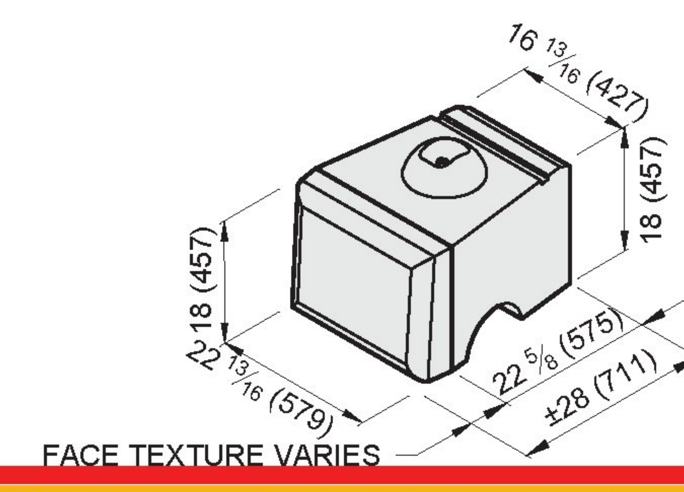
28" (710mm) MIDDLE

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	1613 lb (732 kg)	1542 lb (699 kg)
Block Volume:	11.28 ft^3 (0.319 m^3)	10.78 ft^3 (0.305 m^3)
Center of Gravity:	13.9" (354 mm)	13.4" (340 mm)



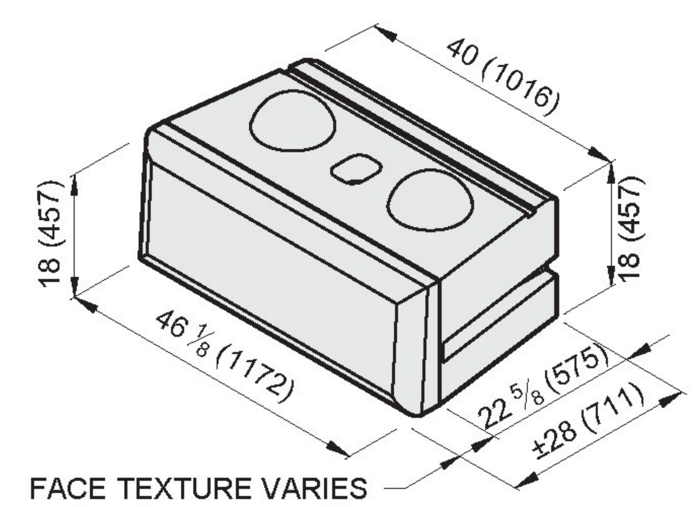
28" (710mm) HALF MIDDLE

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	748 lb (339 kg)	713 lb (323 kg)
Block Volume:	5.23 ft^3 (0.148 m^3)	4.98 ft^3 (0.141 m^3)
Center of Gravity:	14.3" (364 mm)	13.8" (350 mm)



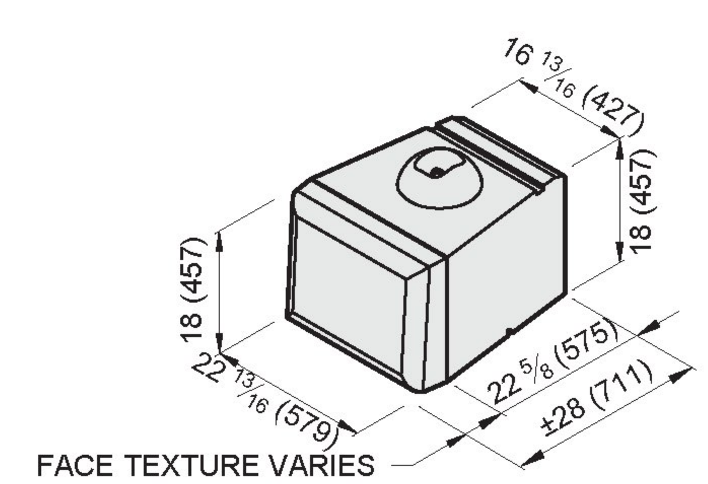
28" (710mm) BOTTOM

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	1744 lb (791 kg)	1672 lb (758 kg)
Block Volume:	12.19 ft^3 (0.345 m^3)	11.70 ft^3 (0.331 m^3)
Center of Gravity:	14.0" (355 mm)	13.5" (343 mm)



28" (710mm) HALF BOTTOM

Face Texture:	Cobble / Limestone	Ledgestone
Block Weight:	809 lb (367 kg)	774 lb (351 kg)
Block Volume:	5.66 ft^3 (0.160 m^3)	5.41 ft^3 (0.153 m^3)
Center of Gravity:	14.3" (364 mm)	13.8" (352 mm)



1. Units for dimensions are inches (mm), typical unless noted otherwise.
2. Confirm block production with licensed Redi-Rock manufacturer.
3. Center of Gravity is measured from the back of block.
4. Actual block volumes and weights may vary.
5. Weights are based upon a concrete density of 143 lb/ft^3 (2291kg/m^3).
6. Half blocks contain a fork slot on only one side of the block.
7. Interface Shear knobs are typically 10" (254mm) diameter by 4" (102mm) tall. Smaller knob diameters are available.

FREESTANDING BLOCKS

(FINISHED TEXTURE ON MORE THAN ONE FACE)

The Redi-Rock Freestanding blocks come in one width and stack in a vertical manner. The defining characteristic is that freestanding blocks have an aesthetic texture cast into multiple faces; the textured face is on at least the two longitudinal vertical faces, and also as required on one end or the top of the blocks. These blocks are machine-placed, wet-cast, precast modular block units manufactured from first purpose, non-reconstituted concrete and intended for constructing dry-stacked modular retaining wall systems. The block units are manufactured from structural-grade concrete mixes in accordance with ASTM C94 or ASTM C685 that produce a finished unit with excellent resistance to freeze-thaw, deicing chemical exposure, and submerged conditions in both fresh water and salt water applications. All Redi-Rock blocks are manufactured and distributed through an international network of individually-owned, licensed precast concrete manufacturers.

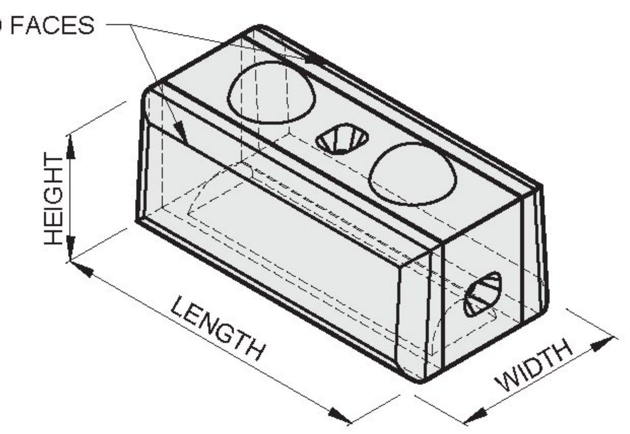
CONCRETE MIX PROPERTIES [(1)]

FREEZE THAW EXPOSURE CLASS [(2)]	MINIMUM 28 DAY COMPRESSIVE STRENGTH [(3)]	MAXIMUM WATER CEMENT RATIO	NOMINAL MAXIMUM AGGREGATE SIZE [(10)]	AGGREGATE CLASS DESIGNATION [(4)]	AIR CONTENT [(5)]
MODERATE	4,000 psi (27.6 MPa)	0.45	1.0 (25)	3M	4.5% ± 1.5%
SEVERE	4,000 psi (27.6 MPa)	0.45	1.0 (25)	3S	6.0% ± 1.5%
VERY SEVERE	4,500 psi (30.0 MPa)	0.40	1.0 (25)	4S	6.0% ± 1.5%
MAXIMUM WATER-SOLUBLE CHLORIDE ION (Cl^-) CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT [(6)]					0.015
MAXIMUM CHLORIDE AS Cl^- CONCENTRATION IN MIXING WATER, PARTS PER MILLION					1000

MAXIMUM PERCENTAGE OF TOTAL CEMENTITIOUS MATERIALS BY WEIGHT [(7, 9)] (VERY SEVERE EXPOSURE CLASS ONLY)			
FLY ASH OR OTHER POZZOLANS PER ASTM C618	25	TOTAL ASH, POZZOLANS, SLAG, AND SILICA FUME [(8)]	50
SLAG CONFORMING TO ASTM C989	50	TOTAL ASH, POZZOLANS, AND SILICA FUME [(8)]	35
SILICA FUME CONFORMING TO ASTM C1240	10	ALKALI-AGGREGATE REACTIVITY MITIGATION PER ACI 201	

REFERENCE DIMENSIONS:

HEIGHT = VERTICAL DIMENSION OF TEXTURED FACE
LENGTH = LONGER HORIZONTAL DIMENSION PARALLEL TO TEXTURED FACES
WIDTH = HORIZONTAL DIMENSION PERPENDICULAR TO LONGER TEXTURED FACES



DIMENSIONAL TOLERANCES [(10) (11)]

HEIGHT	ALL BLOCKS	18 ± $\frac{3}{16}$ (457 ± 5)
LENGTH	FULL BLOCKS	46$\frac{1}{8}$ ± $\frac{1}{2}$ (1172 ± 13)
	HALF BLOCKS	22$\frac{13}{16}$ ± $\frac{1}{2}$ (579 ± 13)
WIDTH	23 -24 (584-610)	13 ± $\frac{1}{2}$ (330 ± 13) FORM LINE TO FORM LINE, PLUS APPROX. 5 $\frac{3}{8}$ (136) FACE TEXTURE ON LONG SIDES

(1) Concrete mix properties are in general accordance with ACI 318 durability requirements. Research has shown that concrete manufactured to these standards demonstrates good durability and performance. When these requirements are followed, specific freeze-thaw testing of the concrete is typically NOT required.
(2) Exposure class is as described in ACI 318.
(3) Test method ASTM C39.
(4) Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregate for Concrete* .
(5) Test method ASTM C231.
(6) Test method ASTM C1218 at age between 28 and 42 days.
(7) The total cementitious material also includes ASTM C150, C595, C845, and C1157 cement. The maximum percentages shall include:
  (a) Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
  (b) Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
  (c) Silica fume, ASTM C1240, present in a blended cement.
(8) Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.
(9) Prescriptive limits shown may be waived for concrete mixes that demonstrate excellent freeze-thaw durability in a detailed and current testing program.
(10) All dimensions are shown in units of *inches (mm)*.
(11) Permissible defects: Chips smaller than 1.5 (38) in its largest dimension and cracks not wider than 0.012 (0.305) and not longer than 25% of the nominal height of the block; bug holes in the architectural face smaller than 0.75 (19); and bug holes, water marks, and color variation on non-architectural faces.

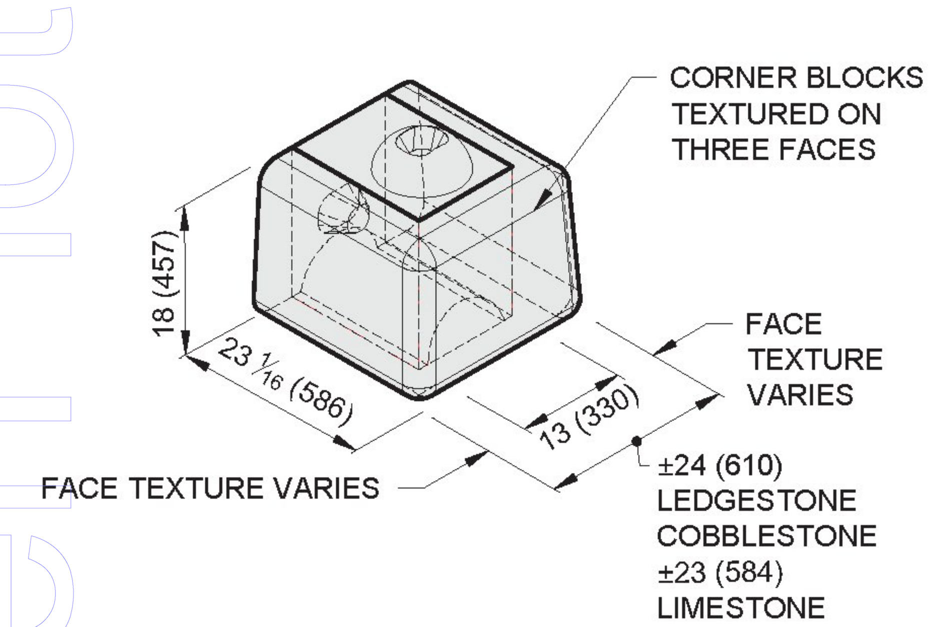
BLOCKS USED IN WALL ARE HIGHLIGHTED IN RED BOXES

FREESTANDING BLOCKS

Block Library

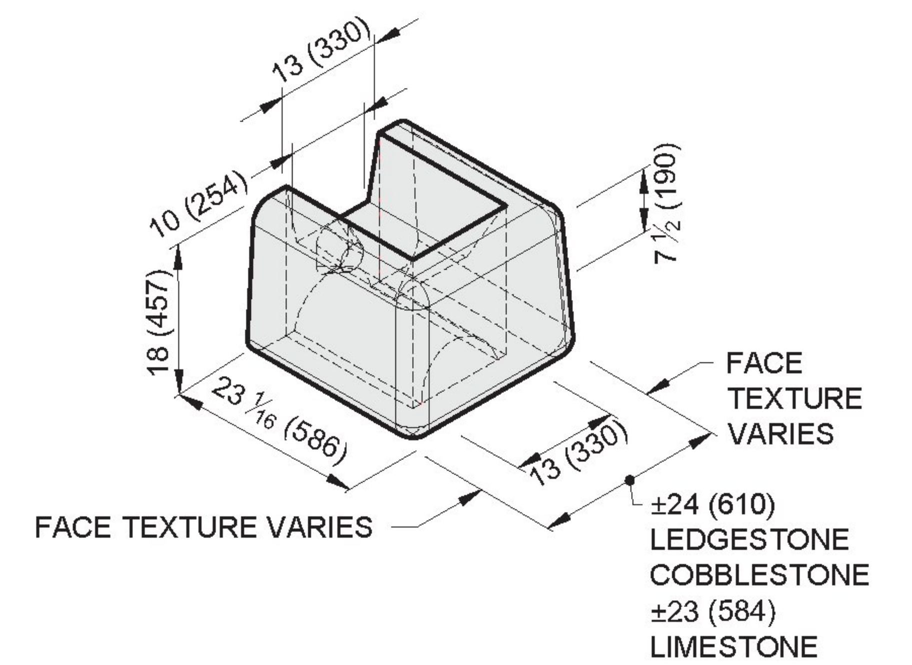
HALF CORNER MIDDLE

Face Texture:	Limestone	Cobblestone	Ledgestone
Block Weight:	660 lb (300kg)	690 lb (310 kg)	650 lb (300kg)
Block Volume:	4.6 ft^3 (0.13m^3)	4.8 ft^3 (0.14m^3)	4.6 ft^3 (0.13m^3)



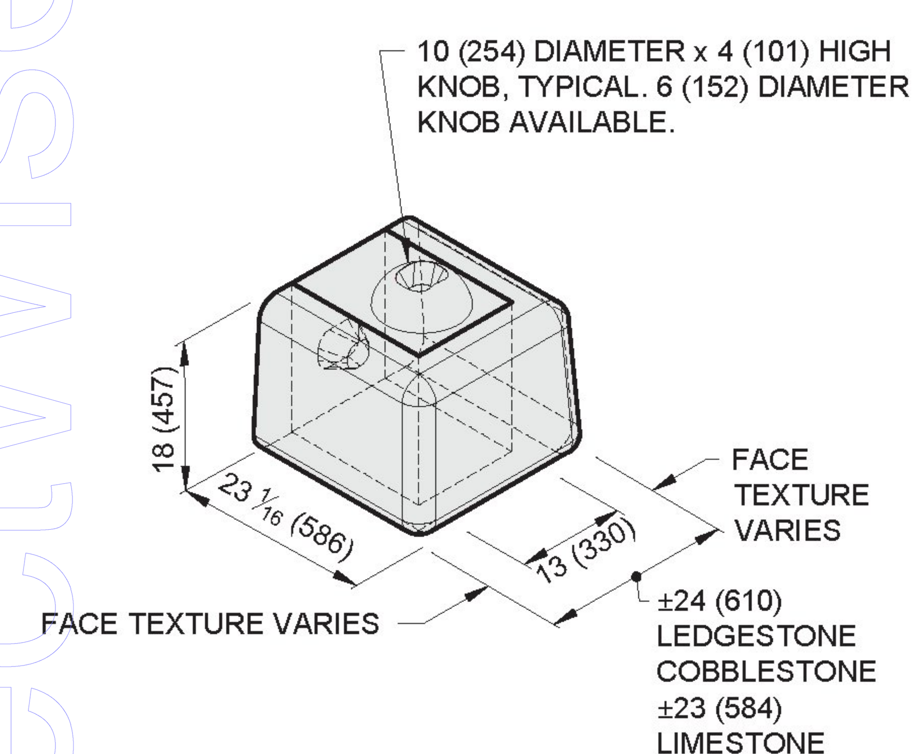
HALF CORNER GARDEN TOP

Face Texture:	Limestone	Cobblestone	Ledgestone
Block Weight:	530 lb (240kg)	570 lb (260 kg)	530 lb (240kg)
Block Volume:	3.7 ft^3 (0.11m^3)	4.0 ft^3 (0.11m^3)	3.7 ft^3 (0.10m^3)



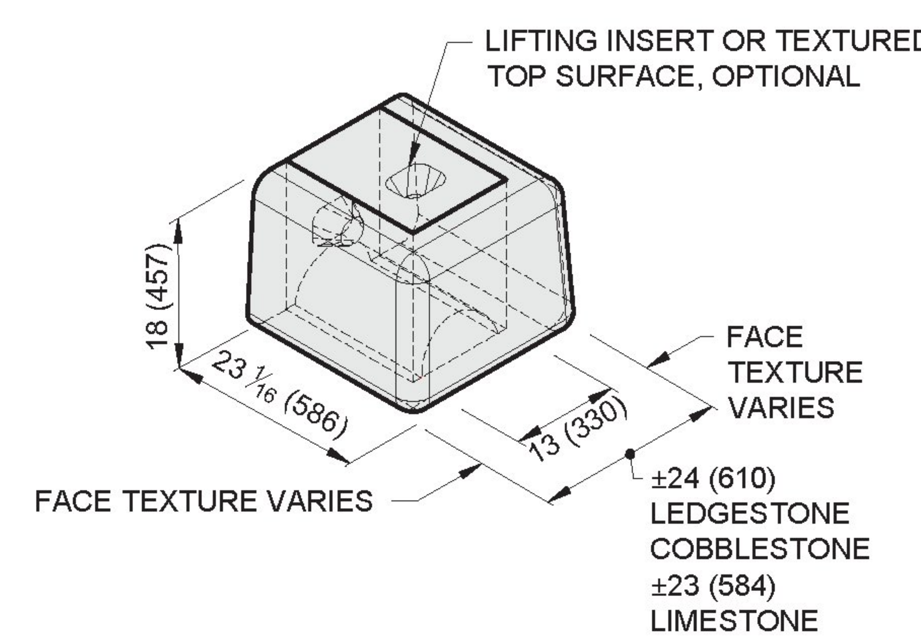
HALF CORNER BOTTOM

Face Texture:	Limestone	Cobblestone	Ledgestone
Block Weight:	710 lb (320kg)	740 lb (340 kg)	700 lb (320kg)
Block Volume:	5.0 ft^3 (0.14m^3)	5.2 ft^3 (0.15m^3)	4.9 ft^3 (0.14m^3)



HALF CORNER TOP

Face Texture:	Limestone	Cobblestone	Ledgestone
Block Weight:	640 lb (290kg)	670 lb (310 kg)	630 lb (290kg)
Block Volume:	4.5 ft^3 (0.13m^3)	4.7 ft^3 (0.13m^3)	4.4 ft^3 (0.13m^3)

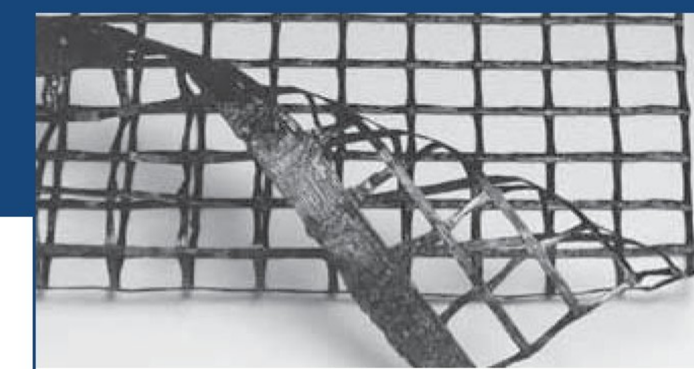


1. Units for dimensions are inches (mm), typical unless noted otherwise.
2. Confirm block production with licensed Redi-Rock manufacturer.
3. Architectural faces on the blocks have varying texture.
4. Actual block volumes and weights may vary.
5. Weights are based upon a concrete density of 143 lb/ft^3 (2291 kg/m^3).
6. Knobs are typically 10" (254mm) diameter by 4" (102 mm) tall. Smaller knobs are available.

TENCATE
Mirafi®

SOIL REINFORCEMENT

Miragrid® Geogrids
for Soil Reinforcement


Miragrid® 5XT

TenCate® develops and produces materials that function to increase performance, reduce costs and deliver measurable results by working with our customers to provide advanced solutions.

The Difference Miragrid® Geogrids Make:

- High long-term design strengths (LTDS). Miragrid® geogrids have more than 100,000 hours of tension creep testing performed at an independent test laboratory. Credible, dependable long term strength assured.
- Cost effective. Creep resistant polyester fibers provide higher allowable tensile strength, minimizing the required number of geogrid layers. Wide rolls significantly reducing placement time, lowering cost.
- Light weight, easy to handle. No sharp edges.
- Flexible, tough. Minimizes movement of soil structure.
- Custom fabrication. Rolls fabricated to meet your specific project requirements.
- Miragrid® geogrids provide the widest strength range, and are the highest strength geogrid material in the market today.

APPLICATIONS

Miragrid® geogrids can be used in most MSE applications for soil reinforcement including internally reinforced soil walls, segmental retaining wall reinforcement, steep reinforced slopes, and reinforcement in a variety of landfill applications including potential voids bridging and veneer stability. When a project specifies for long-term design strength for structure stability use Miragrid® geogrids.

INSTALLATION GUIDELINES

Before placing Miragrid® geogrids, the surface should be cleared of all debris and the foundation base proofrolled. The grids should be rolled out, cut to length, thus eliminating field connections and laid at the proper elevation, location and orientation. Since geogrids vary in strength with roll direction, Miragrid® geogrids should be laid in the direction of main reinforcement.

After rolling out, the geogrid should be tensioned by hand until it is taut, free of wrinkles, and lying flat. Adjacent geogrid rolls may be butted together side-by-side without overlap. Splices in the main reinforcement direction should be avoided.

Certain fill placement procedures may require the reinforcement to be held in place by stakes, sandbags, or fills, as directed by an engineer. A razor blade, sharp knife or scissors may be used to cut the geogrid. Fill placement should follow the standard practice, or as defined in the project specifications or directed by the Engineer. Care should be taken to prevent wrinkles and/or slippage of reinforcement during fill placement and spreading.

These guidelines serve as a general basis for installation. Detailed instructions are available from your TenCate® representative.

Protective & Outdoor Fabrics
Aerospace Composites
Armour Composites
Geosynthetics
Industrial Fabrics
Synthetic Grass

TENCATE™
materials that make a difference

TenCate Mirafi®

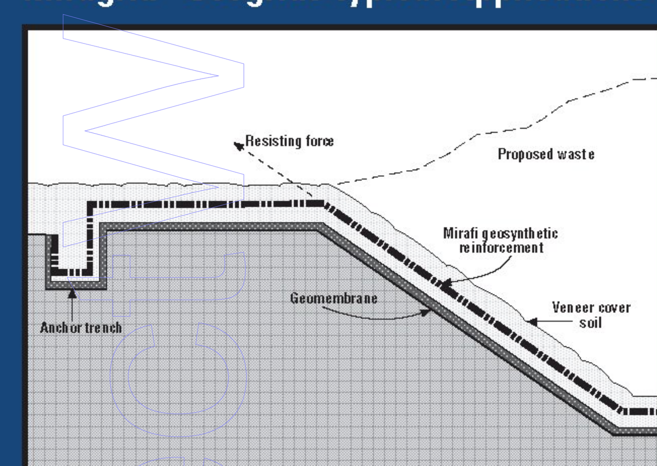
Miragrid® Geogrids
for Soil Reinforcement

Property*	Test Method	Units	2XT[1]	3XT	5XT	7XT	8XT	10XT	20XT	22XT	24XT
Polymer (coating)	–	–	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)	PET (PVC)
Tensile Strength @ Ultimate (MARV)	ASTM D6637	lbs/ft (kN/m)	2000 (29.2)	3500 (51.1)	4700 (68.6)	5900 (86.1)	7400 (108.0)	9500 (139.0)	13705 (200.0)	20559 (300.0)	27415 (400.0)
Creep Reduced Strength	ASTM D5262	lbs/ft (kN/m)	1266 (18.5)	2215 (32.3)	2975 (43.4)	3734 (54.5)	4684 (68.3)	6013 (88.0)	8674 (127)	13012 (190)	17351 (253)
Long Term Design Strength (In Type 3 Backfill) (sand, silt, clay)	GRI-GG4	lbs/ft (kN/m)	1096 (16.0)	1918 (28)	2575 (37.6)	3233 (47.2)	4055 (59.2)	5206 (76)	7510 (110)	11266 (164.0)	15023 (219.0)

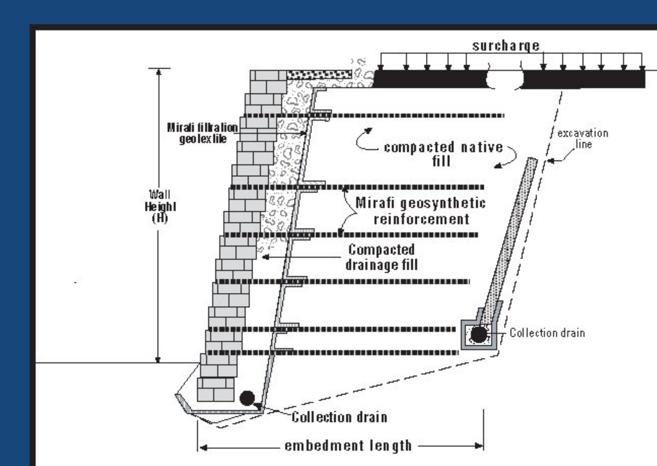
Packaging	Units	2XT[2]	3XT[2]	5XT[2]	7XT[2]	8XT[2]	10XT	20XT	22XT	24XT
Roll Width	ft (m)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)	12 (3.6)
Roll Length	ft (m)	150 (46)	150 (46)	150 (46)	200 (61)	200 (61)	200 (61)	200 (61)	200 (61)	200 (61)
Estimate Roll Weight	lbs (kg)	101 (46)	119 (54)	130 (59)	163 (74)	187 (85)	223 (106)	387 (175)	499 (226)	628 (284)
Area	yd^2 (m^2)	200 (165)	200 (165)	200 (165)	267 (220)	267 (220)	267 (220)	267 (220)	267 (220)	267 (220)

[1]Note: Values shown for 2XT are both machine and cross-machine direction. Values for other Mirafi® products are machine direction only.
[2]Also available in 1.8m (6ft) wide by 45.7m (150ft) long rolls

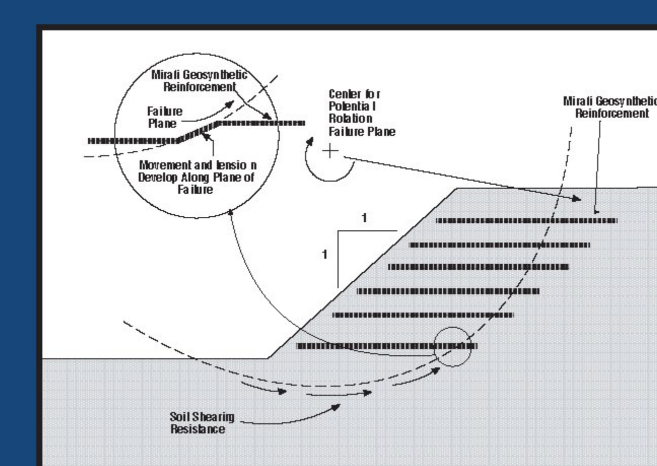
Miragrid® Geogrids Typical Applications



Veneer Reinforcement



Retaining Wall



Steepened Slope

PDS.GRID(M)0313

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Tel 800 685 9990 Tel 706 693 2226
Fax 706 693 4400 www.mirafi.com

TENCATE Mirafi®

TENCATE GEOSYNTHETICS
Americas

Miragrid® 5XT

Miragrid® 5XT geogrid is composed of high molecular weight, high tenacity polyester multifilament yarns which are woven in tension and finished with a PVC coating. Miragrid® 5XT geogrid is inert to biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

TenCate Geosynthetics Americas is accredited by a2La (The American Association for Laboratory Accreditation) and Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP). NTPEP test data.

Mechanical Properties	Test Method	Unit	Minimum Average Roll Value
			Machine Direction
Tensile Strength (at ultimate)	ASTM D6637	lbs/ft (kN/m)	4700 (68.6)
Tensile Strength (at 5% strain)	ASTM D6637	lbs/ft (kN/m)	1740 (25.4)
Creep Reduced Strength	ASTM D5262	lbs/ft (kN/m)	2975 (43.4)
Long Term Allowable Design Load[1]	GRI GG-4(b)	lbs/ft (kN/m)	2575 (37.6)

[1] NOTE: Long Term Allowable Design values are for sand, silt and clay

Physical Properties	Unit	Typical Value
Mass/Unit Area (ASTM D5261)	oz/yd^2 (g/m^2)	9.8 (332)
Roll Dimensions (width x length)	ft (m)	12 x 150 (3.6 x 46)
Roll Area	yd^2 (m^2)	200 (165)
Estimated Roll Weight	lbs (kg)	130 (59)

Creep Reduced Strength (ASTM D5262), and Long Term Allowable Design Load (GRI GG-4(b)) is not covered by our current A2LA accreditation.

Made in USA

365 South Holland Drive
Pendergrass, GA 30567

Tel 706 693 2226
Tel 888 795 0808

Fax 706 693 4400
www.tencate.com

FGS000531
ETQR17

GAI-LAP-25-97

Testing Lab 1291.01 & 1291.02

PLEASE REFER TO RETAINING WALL DESIGN SHEETS FOR ADDITIONAL INFORMATION

Do not operate tracked construction equipment directly on the geogrid reinforcement. A minimum fill thickness of 6” is required for the operation of tracked vehicles over the geogrid reinforcement. Turning of tracked vehicles should be kept to a minimum to prevent displacement of the fill and the geogrid reinforcement. Rubber-tired vehicles may pass over the geogrid reinforcement at a slow speed (less than 5 mph). Sudden breaking and sharp turning should be avoided.

Place retained soil immediately between the reinforced soil zone and the back of the excavation. Material should be placed in lifts of 9” maximum and compacted to 95% maximum density as determined by a standard proctor test (ASTM D698). Bring the reinforced and retained soil up to grade at the same time. At no time should the elevation of the reinforced soil be more than 1 block higher than the retained soil.

GEOGRID CONNECTION TO BLOCKS

Connection between geogrid sheets and the Redi-Rock 28” Series blocks is made with the Redi-Rock Type 1AT connection. The connection is made with one 7/16” diameter solid fiberglass rod available from your local Redi-Rock manufacturer. **(Figure 30)**

The Type 1AT Connection is made with the following steps:

- Install a complete row of retaining wall blocks. Sweep the top of the blocks clean.
- Lay the geogrid across the top of the block and let it hang down to the bottom of the front face.
- Place one 40” fiberglass rod over the geogrid into the geoconnector slot. **(Figure 31)**
- Pull the geogrid back over the rod and extend the tail beyond the back of the block to provide a minimum of 3 feet embedment. TIP: A steel angle can be used to hold the rod and geogrid in position as shown. **(Figure 32)**
- Install the next course of retaining wall blocks to lock the geogrid connection in place.
- Pull the geogrid flat and tight. Secure it in place with pins or staples as recommended by the manufacturer.
- Place 3 inches of drainstone between the anchored tail and the primary geogrid layer.
- Backfill and compact as specified.

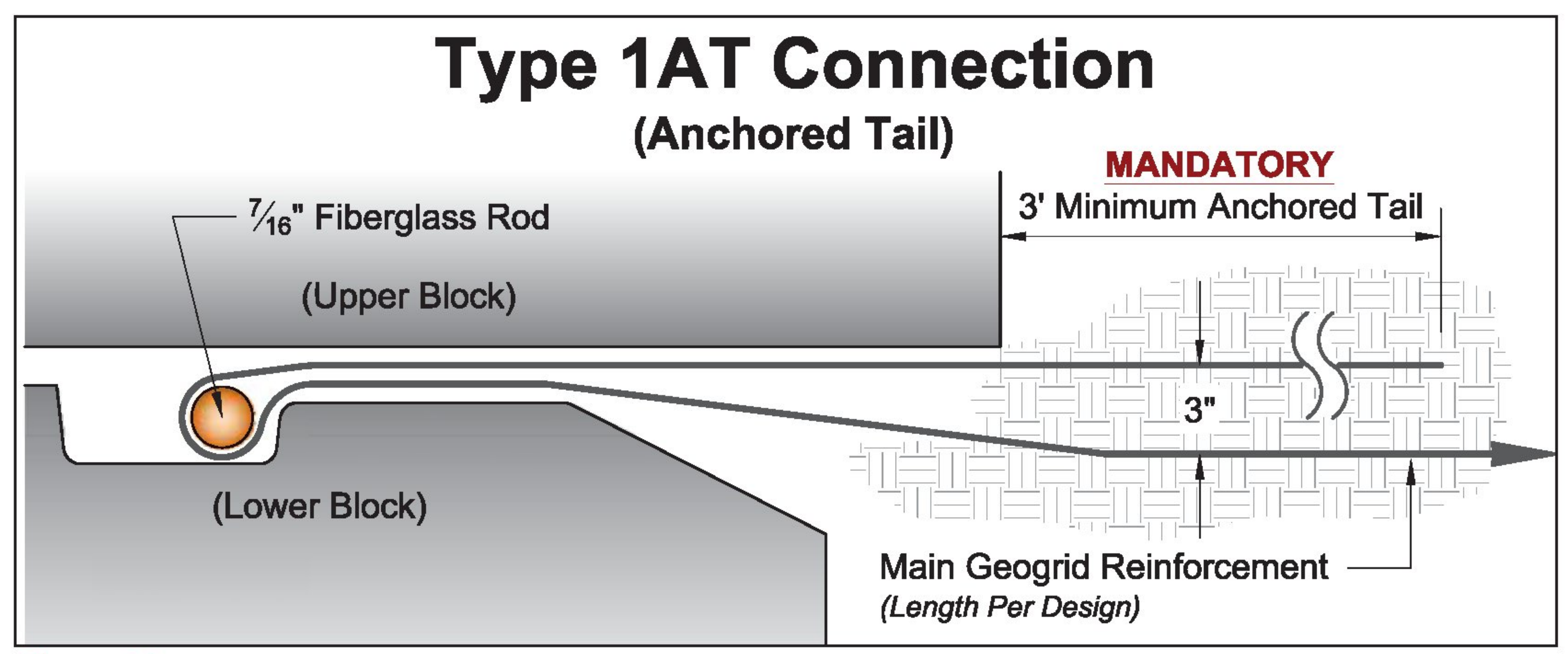


Figure 30

THIS DETAIL CAN BE SEEN ON RETAINING WALL DESIGN, SHEET 2

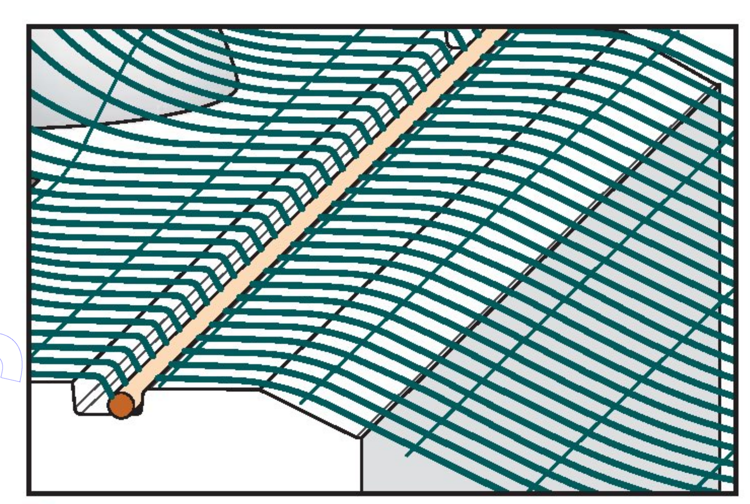


Figure 31

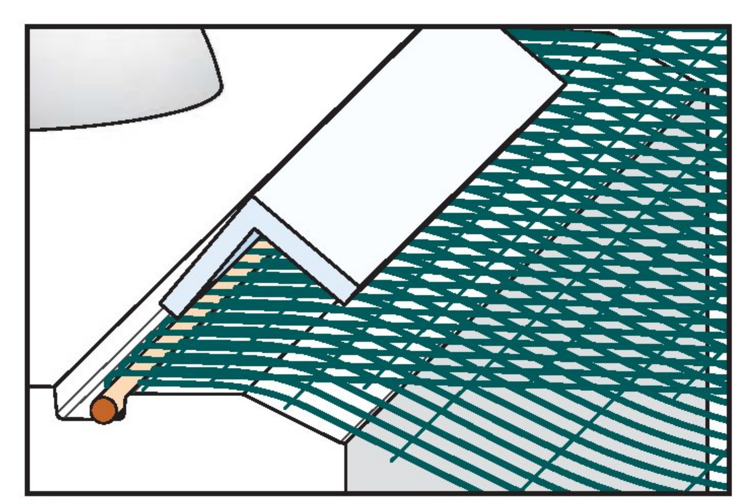


Figure 32

MEMO TO: Bryan Sicard – Redi-Rock Walls of New England

This memo forwarded by e-mail only unless otherwise requested

FROM: Eric Merluzzi, P.E.
184 Rowentown Road
Wentworth, NH 03282
Phone: (603) 786-2751
e-mail: em35@earthlink.net

SUBJECT: Wall Quantities
Quarry Street
Barre, VT
Job No. 2017-001
Plan Date: 12/2/16, No Revisions

DATE: February 27, 2017

Wall #1:

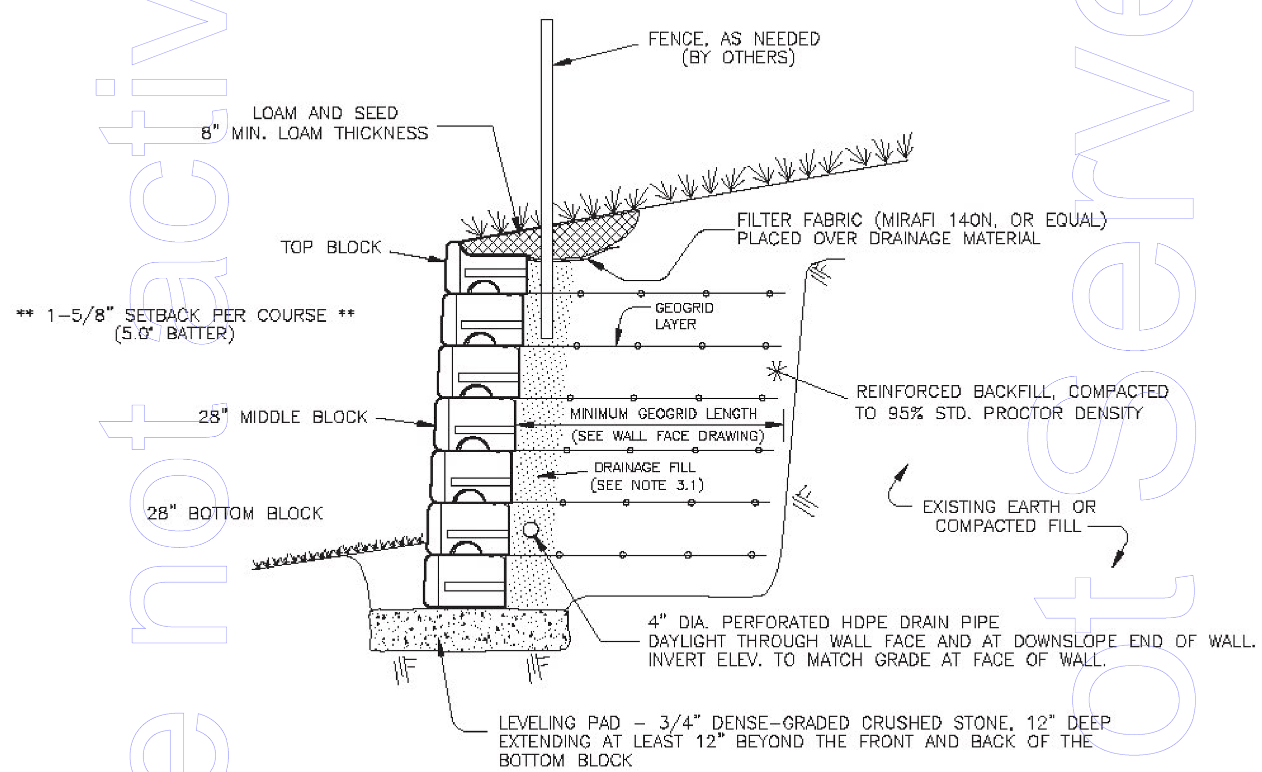
Wall Area: 983 SF
Wall Length: 111 LF

Geogrid: Miragrid 5XT – 950 SY

Block Count:

½ Garden Corner – 12
Top – 23
½ 28" Middle - 1
28" Middle – 114
28" Bottom – 27
Fiberglass Connection Rods - 142

THIS SHEET IS SIZED AT 24" X 36" - PLEASE PRINT AT SCALE FOR FULL SCALE DRAWINGS (APPLIES TO PAGES 22 & 23 OF THIS PACKAGE)



MAXIMUM APPLIED BEARING PRESSURE: 2900 psf

TYPICAL SECTION – REINFORCED WALL
(TYPICAL DETAIL ONLY – SEE WALL FACE DRAWING FOR SPECIFIC BLOCK CONFIGURATIONS)

"REDI-ROCK" SEGMENTAL RETAINING WALL
(NOT TO SCALE)

REINFORCED BACKFILL
GENERAL REQUIREMENTS

SIEVE SIZE	% PASSING
3"	100%
#4	45–75%
#100	0–12%
#200	0–6%

VT AOT 704.08A
GRANULAR BACKFILL FOR STRUCTURES

DENSE GRADED 3/4" CRUSHED STONE
GRADATION REQUIREMENTS

SIEVE SIZE	% PASSING
1"	100%
3/4"	90–100%
3/8"	60–85%
#8	25–60%
#200	10–20%

NOTE: ALTERNATE MATERIALS SHALL ONLY BE USED WITH THE APPROVAL OF THE WALL DESIGN ENGINEER.

DESIGN ASSUMPTIONS

SOIL	SOIL UNIT WEIGHT	Φ
REINFORCED BACKFILL	140	34
RETAINED EARTH	135	34
FOUNDATION SOIL	135	34

APPLIED SURCHARGE LOADING: NONE
SEISMIC ACCELERATION = 0.08
MAX. SLOPE ABOVE WALL – 2H:1V

DRAINAGE FILL – VT AOT 704.02B
GRADATION REQUIREMENTS

SIEVE SIZE	% PASSING
1"	100
3/4"	90 – 100
3/8"	20 – 55
#4	0 – 10
#8	0 – 5

AASHTO LRFD LOAD/RESISTANCE FACTORS

INTERNAL STABILITY:	
VERTICAL EARTH PRESSURE – EV	1.35
EARTHQUAKE LOADS – EQ	1.00
LIVE LOAD SURCHARGE – LS	1.75
DEAD LOAD SURCHARGE – ES	1.50
GEOGRID STRENGTH/CONNECTION/PULLOUT	0.90 (STATIC) 1.20 (COMBINED STATIC/SEISMIC)
EXTERNAL STABILITY:	
VERTICAL EARTH PRESSURE – EV SLIDING & ECCENTRICITY:	1.00 (STATIC) 1.00 (COMBINED STATIC/SEISMIC)
BEARING CAPACITY:	1.35 (STATIC) 1.35 (COMBINED STATIC/SEISMIC)
ACTIVE EARTH PRESSURE – EH	1.50
ACTIVE EARTH PRESSURE (EARTHQUAKE)	1.50
EARTHQUAKE LOADS – EQ	1.00
BEARING CAPACITY	0.65 (STATIC) 0.65 (COMBINED STATIC/SEISMIC)

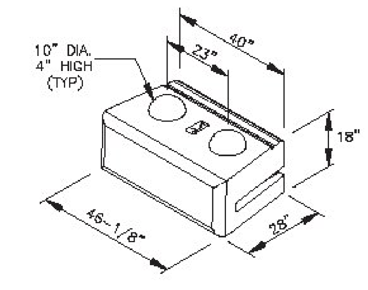
BLOCK SPECIFICATION NOTES:

1. ALL BLOCKS SHALL BE MANUFACTURED BY A LICENSED REDI-ROCK (TM) MANUFACTURER.

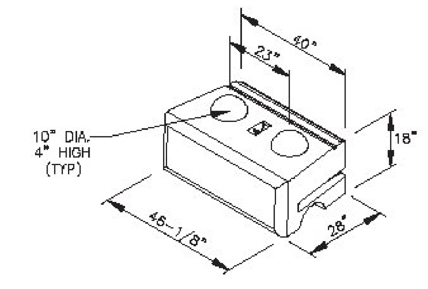
2. BLOCKS SHALL MEET THE MINIMUM REDI-ROCK SPECIFICATIONS OF 4000 psi WITH AN AIR CONTENT OF 4%–8%.

3. THE REDI-ROCK UNITS MAY UTILIZE EITHER THE SPLIT LIMESTONE OR COBBLESTONE FACE CONFIGURATION AS CHOSEN BY THE OWNER OR OWNER'S REPRESENTATIVE.

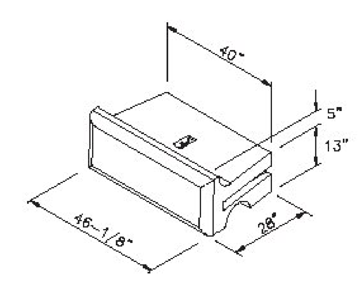
NOTE: HALF-BLOCKS HAVE THE SAME FEATURES AS SHOWN HERE FOR FULL BLOCKS BUT THEY ARE 23-1/16" WIDE, NOT THE FULL 46-1/8" WIDE.



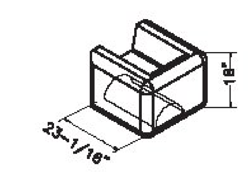
28" BOTTOM BLOCK
NOT-TO-SCALE



28" MIDDLE BLOCK
NOT-TO-SCALE

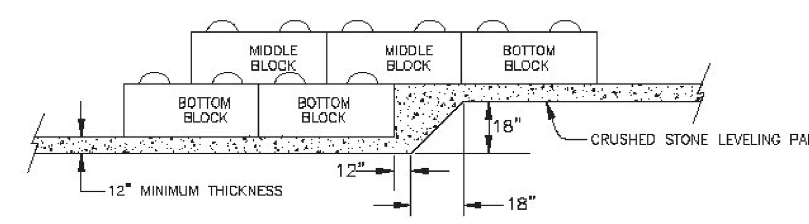


28" TOP BLOCK
NOT-TO-SCALE



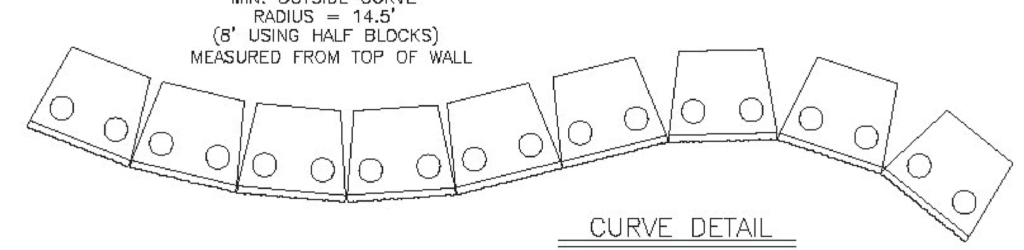
HALF GARDEN CORNER BLOCK
NOT-TO-SCALE

COMPACTION NOTE: WHERE THE RETAINING WALL PASSES OVER ANY UTILITY LINES, COMPACTION OF THE SOIL WITHIN THE UTILITY TRENCH IS CRITICAL IN ORDER TO PREVENT SETTLEMENT OF THE WALL. COMPACTION OF ALL FILL MATERIAL IN UTILITY TRENCHES WHICH PASS UNDER THIS RETAINING WALL MUST BE AT LEAST 95% OF THE MAXIMUM DENSITY OF THE FILL MATERIAL.



BASE STEP DETAIL
(NOT TO SCALE)

MIN. OUTSIDE CURVE RADIUS = 14.5' (8' USING HALF BLOCKS) MEASURED FROM TOP OF WALL



CURVE DETAIL
TYPICAL CURVES
(NOT TO SCALE)

GENERAL NOTES:

1. SITE PREPARATION:
   - 1.1. STRIP ALL VEGETATION, ORGANIC SOILS AND UNSUITABLE FILL SOILS FROM THE WALL ALIGNMENT AREA.
   - 1.2. BENCH CUT ALL EXCAVATED SLOPES.
   - 1.3. DO NOT OVER EXCAVATE UNLESS DIRECTED TO DO SO BY THE OWNER'S SITE REPRESENTATIVE IN ORDER TO REMOVE UNSUITABLE SOIL.
   - 1.4. THE OWNER'S SITE REPRESENTATIVE SHALL VERIFY THE COMPETENCY OF THE FOUNDATION SOILS.
2. LEVELING PAD & BOTTOM BLOCK:
   - 2.1. LEVELING PAD SHALL CONSIST OF DENSE GRADED 3/4" CRUSHED STONE, 12" THICK AND EXTENDING AT LEAST 12" TO EITHER SIDE OF THE BASE BLOCK.
   - 2.2. MINIMUM EMBEDMENT OF WALL BELOW FINISH GRADE SHALL BE AS INDICATED ON THE WALL FACE DRAWING.
   - 2.3. FOLLOW APPLICABLE PROVISIONS OF THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS, ESPECIALLY WITH REGARDS TO LEVELING OF BLOCKS AND BASE.
3. WALL DRAIN:
   - 3.1. DRAINAGE FILL SHALL CONSIST OF VT AOT 704.02B 3/4" CRUSHED STONE PLACED FOR A DEPTH OF AT LEAST 12" BEHIND THE WALL. A FILTER FABRIC SHALL BE PLACED OVER THE CUT OR FILL FACE BEHIND THE WALL TO PREVENT THE MIGRATION OF SOIL INTO THE DRAINAGE MATERIAL.
   - 3.2. THE 4" DIA. PERFORATED HDPE WALL DRAIN SHALL OUTLET THROUGH THE WALL FACE AND AT THE DOWNHILL END OF THE WALL. SEE THE WALL FACE DRAWING FOR OUTLET LOCATIONS.
   - 3.3. PLACE A FILTER FABRIC (MIRAFI 140N, OR EQUAL) OVER THE DRAINAGE MATERIAL TO MINIMIZE SOIL MIGRATION FROM THE SURFACE MATERIAL (TOPSOIL) INTO THE DRAINAGE MATERIAL.
4. BACKFILLING & COMPACTION:
   - 4.1. BACKFILL AND COMPACT THE FILL MATERIAL BEHIND THE WALL AS THE WALL IS INSTALLED.
   - 4.2. COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE OWNER'S SITE REPRESENTATIVE.
   - 4.3. COMPACTION SHALL BE TO A MINIMUM OF 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY.
   - 4.4. RECOMMENDED COMPACTION EQUIPMENT WITHIN 15 FEET OF THE BACK OF THE WALL IS AS FOLLOWS:
     0 – 4 FEET HAND TAMP OR VIBRATORY PLATE COMPACTOR
     4 – 15 FEET NOTHING LARGER THAN TWO-DRUM, WALK-BEHIND VIBRATORY ROLLER
     (LARGER ROLLERS CAN BE USED STATICALLY, PROVIDED LIFT SIZE DOES NOT COMPROMISE ACHIEVEMENT OF NECESSARY COMPACTION RATES.)
5. GENERAL WALL LAYOUT & CONSTRUCTION:
   - 5.1. FINAL WALL ALIGNMENT SHALL BE LOCATED IN THE FIELD BY THE OWNER'S SITE REPRESENTATIVE.
   - 5.2. PROVIDE LATERAL DRAINAGE SWALES TO DIRECT FLOWS AROUND THE ENDS OF THE WALL AND AWAY FROM THE WALL DURING CONSTRUCTION. PERMANENT SWALES SHALL BE PITCHED TO THE WALL ENDS TO PROMOTE DRAINAGE OF SURFACE WATER RUNOFF.
   - 5.3. TURF, OR SOME ACCEPTABLE FORM OF SOIL EROSION PROTECTION, SHOULD BE ESTABLISHED AT THE TOP OF THE WALL (WHERE REQUIRED) BY THE LANDSCAPE CONTRACTOR AS SOON AS THE WALL IS COMPLETED.
   - 5.4. ENDS OF THE RETAINING WALLS SHALL BE BLENDED INTO THE PROPOSED/EXISTING GRADE IN A MANNER SATISFACTORY TO THE OWNER'S SITE REPRESENTATIVE. AT THE ENDS OF A WALL WHERE BLENDING TAKES PLACE, THE ISSUE IS NOT A STRUCTURAL FACTOR BUT AN AESTHETIC FACTOR AND THE OWNER'S SITE REPRESENTATIVE IS QUALIFIED TO MAKE THIS JUDGEMENT.
   - 5.5. IF CONDITIONS ARE DIFFERENT THAN THOSE STATED IN THESE DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR MUST CONTACT THE DESIGN ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.
   - 5.6. THESE WALLS HAVE BEEN DESIGNED WITH CONSIDERATION OF SEISMIC LOADINGS.
   - 5.7. WALL CERTIFICATIONS: OCCASIONALLY A "SIGN OFF" BY THE DESIGN ENGINEER IS NEEDED AFTER COMPLETION OF WALL CONSTRUCTION. IF THIS SERVICE IS NEEDED ARRANGEMENTS MUST BE MADE WITH THE DESIGN ENGINEER PRIOR TO WALL CONSTRUCTION FOR A SERIES OF SITE VISITS TO OBSERVE WALL CONSTRUCTION. ACCEPTANCE LETTERS, SIGN OFFS, CERTIFICATIONS, WARRANTYS, ETC. WILL NOT BE PROVIDED WITHOUT PERIODIC SITE VISITS.
   - 5.8. GEOGRID LENGTHS ARE MEASURED FROM THE REAR FACE OF THE RETAINING WALL. ALL GEOGRID IS TO BE PLACED PERPENDICULAR TO THE WALL FACE, i.e. THE GRID ROLL IS PLACED ON THE WALL, ROLLED OUT BEHIND THE WALL, (PERPENDICULAR TO THE WALL FACE) AND CUT TO LENGTH. BE SURE TO ADD SUFFICIENT LENGTH TO CONSTRUCT THE "TAIL" PORTION OF THE TYPE 1AT CONNECTION (ABOUT 4').

IT IS THE RESPONSIBILITY OF THE INSTALLER TO REVIEW THE NOTES AND DETAILS ON ALL SHEETS OF THIS PLAN SET

NOTE: THIS DRAWING WAS PREPARED FOR USE WITH REDI-ROCK (TM) RETAINING WALL SYSTEMS. CONTACT REDI-ROCK WALLS OF NEW ENGLAND AT (603) 863-1000.

ERIC MERLUZZI, P.E.
184 ROWENTOWN ROAD, WENTWORTH, NH 03282
PHONE: (603) 786-2751 E-MAIL: em35@earthlink.net

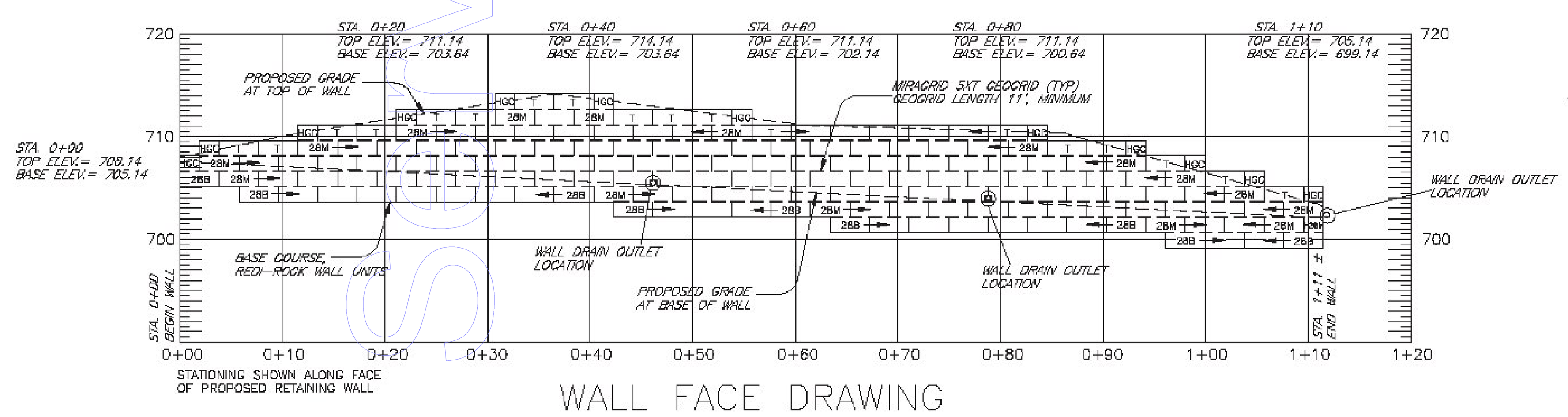
CLIENT: REDI-ROCK WALLS OF NEW ENGLAND, 8 REEDS MILL ROAD, NEWPORT, NH 03773

PROJECT: QUARRY STREET MEGC M 6000(12)C/1, BARRE, VT

SHEET TITLE: RETAINING WALL DESIGN SHEET 1

DATE:	SCALE:	PROJECT No.:
FEBRUARY 27, 2017	AS SHOWN	2017-001

THIS SHEET IS SIZED AT 24" X 36" - PLEASE PRINT AT SCALE
FOR FULL SCALE DRAWINGS
(APPLIES TO PAGES 22 & 23 OF THIS PACKAGE)



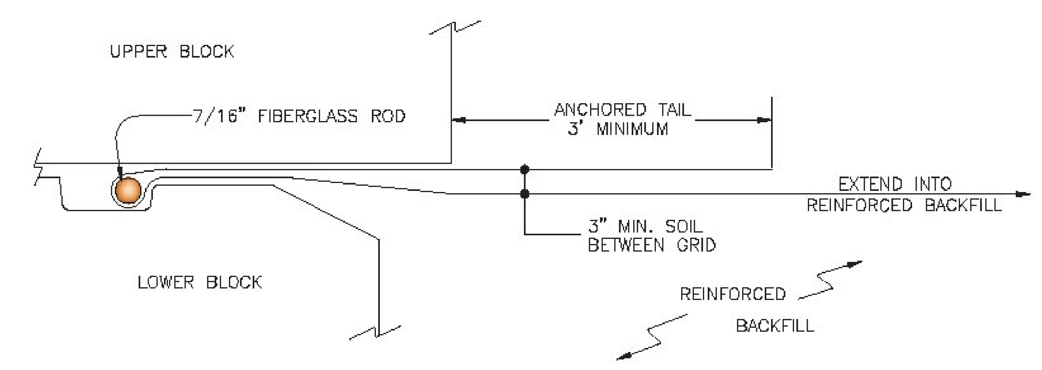
WALL FACE DRAWING

SCALE: 1" = 10'

BLOCK LEGEND & QUANTITIES

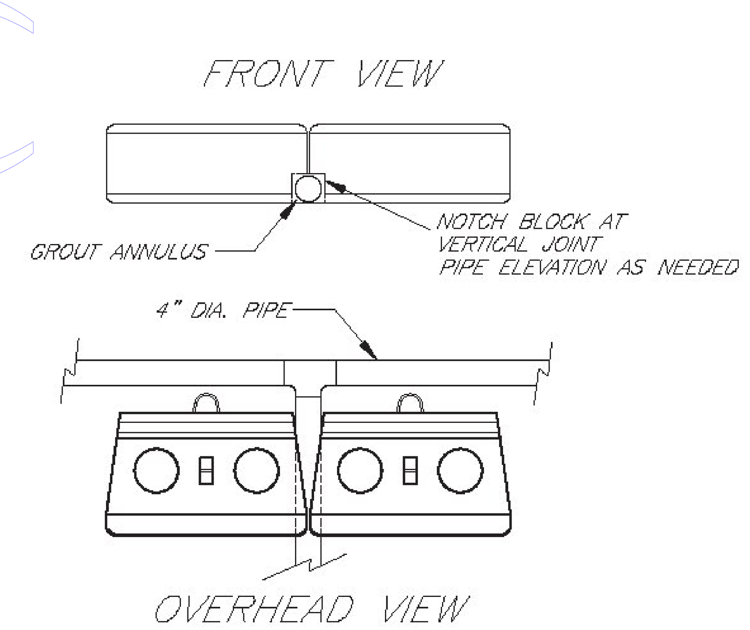
HGC	HALF GARDEN CORNER BLOCK	12
T	TOP BLOCK	23
H28M	HALF 28" MIDDLE BLOCK	1
28M	28" MIDDLE BLOCK	114
28B	28" BOTTOM BLOCK	27
	CONNECTION RODS	142
	MIRAGRID 5XT GEOGRID	950

NOTE: IF THE FIELD CONDITIONS INDICATE THE GRADE AT THE BASE AND/OR TOP OF THE WALL TO BE DIFFERENT FROM THAT SHOWN ON THESE PLANS, THE DESIGN ENGINEER SHALL BE CONTACTED TO VERIFY CHANGES TO THE WALL BASE COURSE AND/OR TOP OF WALL ELEVATION. THE GRADES SHOWN ON THIS PLAN ARE BASED ON THE RETAINING WALL ELEVATION PLAN (SHEET 20 OF 39) PREPARED BY VHB, INC., DATED 12/2/16.



TYPE 1AT GEOGRID CONNECTION
REDI-ROCK GEOGRID REINFORCED WALL

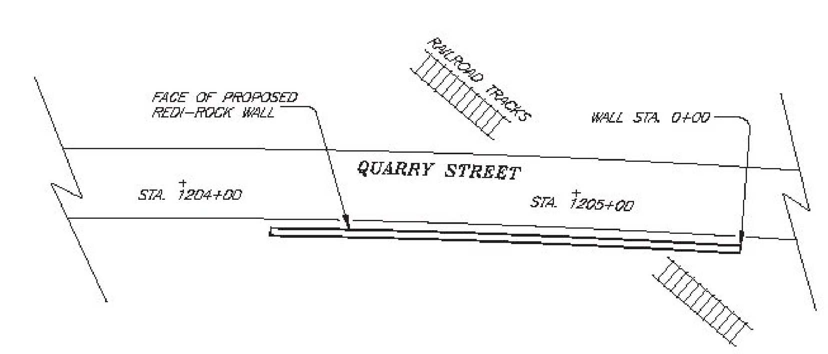
NOT-TO-SCALE



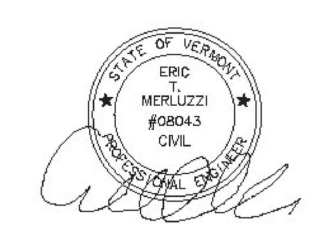
WALL DRAIN OUTLET – STA. 0+46± & STA. 0+79±
PIPE PENETRATION DETAIL

NOT-TO-SCALE

IT IS THE RESPONSIBILITY OF THE INSTALLER TO REVIEW THE NOTES AND DETAILS ON ALL SHEETS OF THIS PLAN SET



VICINITY SKETCH
(NOT TO SCALE)
SEE CONSTRUCTION DRAWINGS BY OTHERS



NOTE: THIS DRAWING WAS PREPARED FOR USE WITH REDI-ROCK (TM) RETAINING WALL SYSTEMS. CONTACT REDI-ROCK WALLS OF NEW ENGLAND AT (603) 863-1000.

ERIC MERLUZZI, P.E.
184 ROWENTOWN ROAD, WENTWORTH, NH 03282
PHONE: (603) 786-2751 E-MAIL: em35@earthlink.net

CLIENT: REDI-ROCK WALLS OF NEW ENGLAND
8 REEDS MILL ROAD, NEWPORT, NH 03773

PROJECT: QUARRY STREET MEGC M 6000(12)C/1
BARRE, VT

SHEET TITLE: RETAINING WALL DESIGN SHEET 2

DATE: FEBRUARY 27, 2017 SCALE: AS SHOWN PROJECT No.: 2017-001

SHEET 2 OF 2

STATE OF VERMONT
ERIC T. MERLUZZI
NO. 08043
Civil
LICENSED
PROFESSIONAL ENGINEER
2/27/17

AASHTO 2007-2010 (LRFD)
QUARRY STREET, BARRE, VT

MSEW(3.0): Update # 14.96

PROJECT IDENTIFICATION

Title:	QUARRY STREET, BARRE, VT
Project Number:	2017-001
Client:	REDI-ROCK WALLS OF NEW ENGLAND
Designer:	E. MERLUZZI, P.E.
Station Number:	WALL STA. 0+50, 10.5' HT

Description:

2H:1V SLOPE ABOVE, LANDSCAPED AREA BELOW

Company's information:

Name: ERIC MERLUZZI, P.E.
Street: 184 ROWENTOWN ROAD

WENTWORTH, NH 03282
Telephone #: 603 786-2751
Fax #:
E-Mail: em35@earthlink.net

Original file path and name: C:\EMPE - 2017\Carroll\Calcs\2017-001.BEN
Original date and time of creating this file: FEBRUARY 27, 2017

PROGRAM MODE: ANALYSIS
of a SIMPLE STRUCTURE
using GEOGRID as reinforcing material.

SOIL DATA

REINFORCED SOIL

Unit weight, γ	140.0 lb/ft ³
Design value of internal angle of friction, ϕ	34.0 °

RETAINED SOIL

Unit weight, γ	135.0 lb/ft ³
Design value of internal angle of friction, ϕ	34.0 °

FOUNDATION SOIL (Considered as an equivalent uniform soil)

Equivalent unit weight, $\gamma_{equiv.}$	135.0 lb/ft ³
Equivalent internal angle of friction, $\phi_{equiv.}$	34.0 °
Equivalent cohesion, $c_{equiv.}$	0.0 lb/ft ²

Factored bearing capacity resistance of foundation is given.

LATERAL EARTH PRESSURE COEFFICIENTS

Ka (internal stability) = 0.2827 (if batter is less than 10°, Ka is calculated from eq. 15. Otherwise, eq. 38 is utilized)
Inclination of internal slip plane, ψ = 62.00° (see Fig. 28 in DEMO 82).
Ka (external stability) = 0.3979 (if batter is less than 10°, Ka is calculated from eq. 16. Otherwise, eq. 17 is utilized)

BEARING CAPACITY

Bearing capacity coefficients (calculated by MSEW): Nc = 42.16 N γ= 41.06

SEISMICITY

Maximum ground acceleration coefficient, A = 0.080
Design acceleration coefficient in Internal Stability: Kh = Am = 0.110
Design acceleration coefficient in External Stability: Kh_d = 0.110 => Kh = Am = 0.110

Kae (Kh > 0) = 0.5734 Kae (Kh = 0) = 0.3383 Δ Kae = 0.2351
Seismic soil-geogrid friction coefficient, F* is 100.0% of its specified static value.

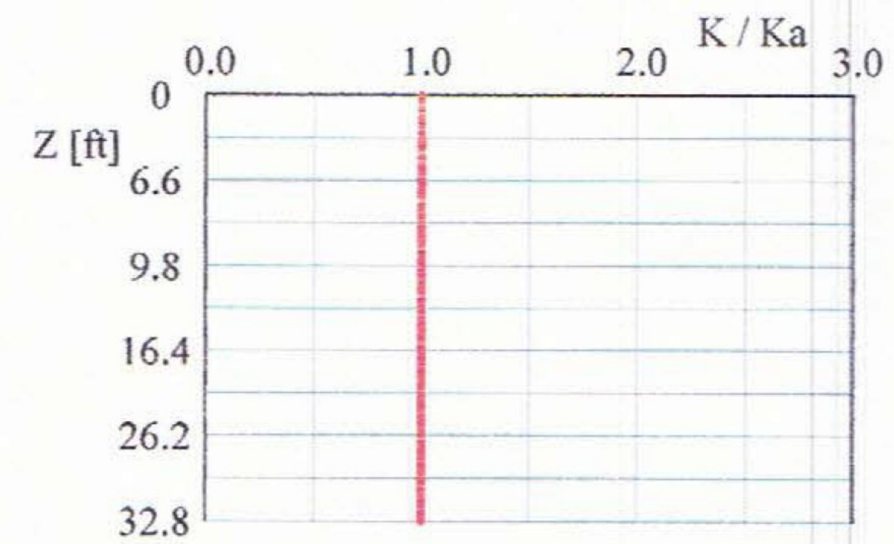
INPUT DATA: Geogrids (Analysis)

5XT

D A T A	Geogrid type #1	Geogrid type #2	Geogrid type #3	Geogrid type #4	Geogrid type #5
Tult [lb/ft]	3500.0	4700.0	7400.0	9500.0	
Durability reduction factor, RFd	1.30	1.30	1.30	1.30	
Installation-damage reduction factor, RFid	1.10	1.10	1.10	1.10	
Creep reduction factor, RFc	1.56	1.56	1.56	1.56	N/A
CDR for strength	N/A	N/A	N/A	N/A	
Coverage ratio, Rc	1.000	1.000	1.000	1.000	
Friction angle along geogrid-soil interface, ρ	31.00	31.00	31.00	31.00	
Pullout resistance factor, F*	0.90·tanϕ	0.90·tanϕ	0.90·tanϕ	0.90·tanϕ	N/A
Scale-effect correction factor, α	0.8	0.8	0.8	0.8	

Variation of Lateral Earth Pressure Coefficient With Depth

Z	K / Ka
0 ft	1.00
3.3 ft	1.00
6.6 ft	1.00
9.8 ft	1.00
13.1 ft	1.00
16.4 ft	1.00
19.7 ft	1.00

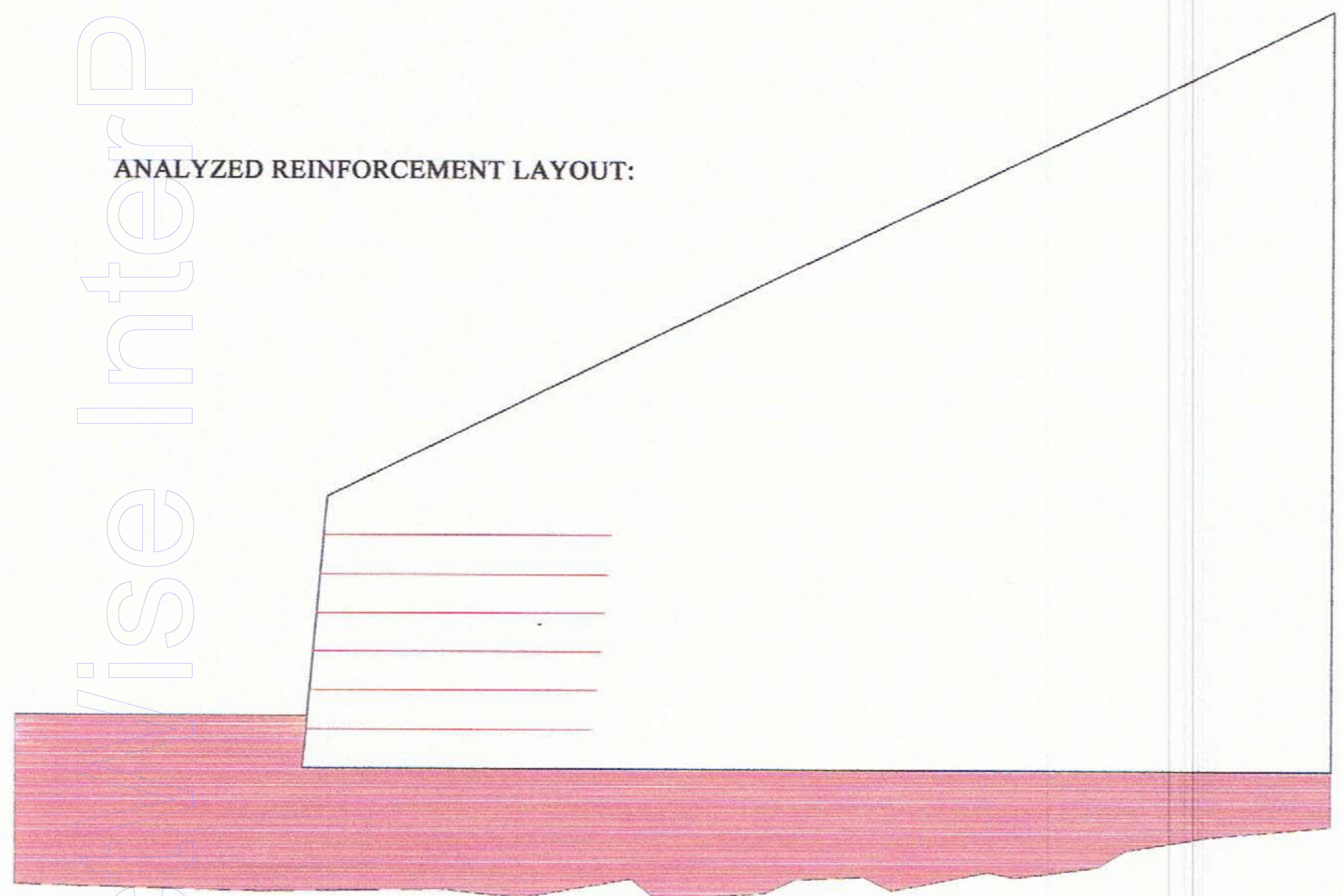


INPUT DATA: Geometry and Surcharge loads (of a SIMPLE STRUCTURE)

Design height, Hd	10.50	[ft]	{ Embedded depth is E = 2.00 ft, and height above top of finished bottom grade is H = 8.50 ft }
Batter, ω	5.0	[deg]	
Backslope, β	26.0	[deg]	
Backslope rise	20.0	[ft]	Broken back equivalent angle, I = 26.00° (see Fig. 25 in DEMO 82)

UNIFORM SURCHARGE
Uniformly distributed dead load is 0.0 [lb/ft ²]

ANALYZED REINFORCEMENT LAYOUT:



SCALE:

0 2 4 6 [ft]

AASHTO 2007-2010 (LRFD) Input Data

INTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2:	γ_{P-EV}	1.35	
Load factor for earthquake loads, EQ, from Table 3.4.1-1:	γ_{P-EQ}	1.00	
Load factor for live load surchrge, LS, from Figure C11.5.5-3(b): (Same as in External Stability).	γ_{P-LS}	1.75	
Load factor for dead load surchrge, ES: (Same as in External Stability).	γ_{P-ES}	1.50	
Resistance factor for reinforcement tension from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20
Resistance factor for reinforcement tension in connectors from Table 11.5.6-1:	ϕ	Static	Combined static/seismic
Geogrid:		0.90	1.20
Resistance factor for reinforcement pullout from Table 11.5.6-1:	ϕ	0.90	1.20

EXTERNAL STABILITY

Load factor for vertical earth pressure, EV, from Table 3.4.1-2 and Figure C11.5.5-2:		Static		Combined Static/Seismic
Sliding and Eccentricity	γ_{P-EV}	1.00	γ_{P-EQ}	1.00
Bearing Capacity	γ_{P-EV}	1.35	γ_{P-EQ}	1.35

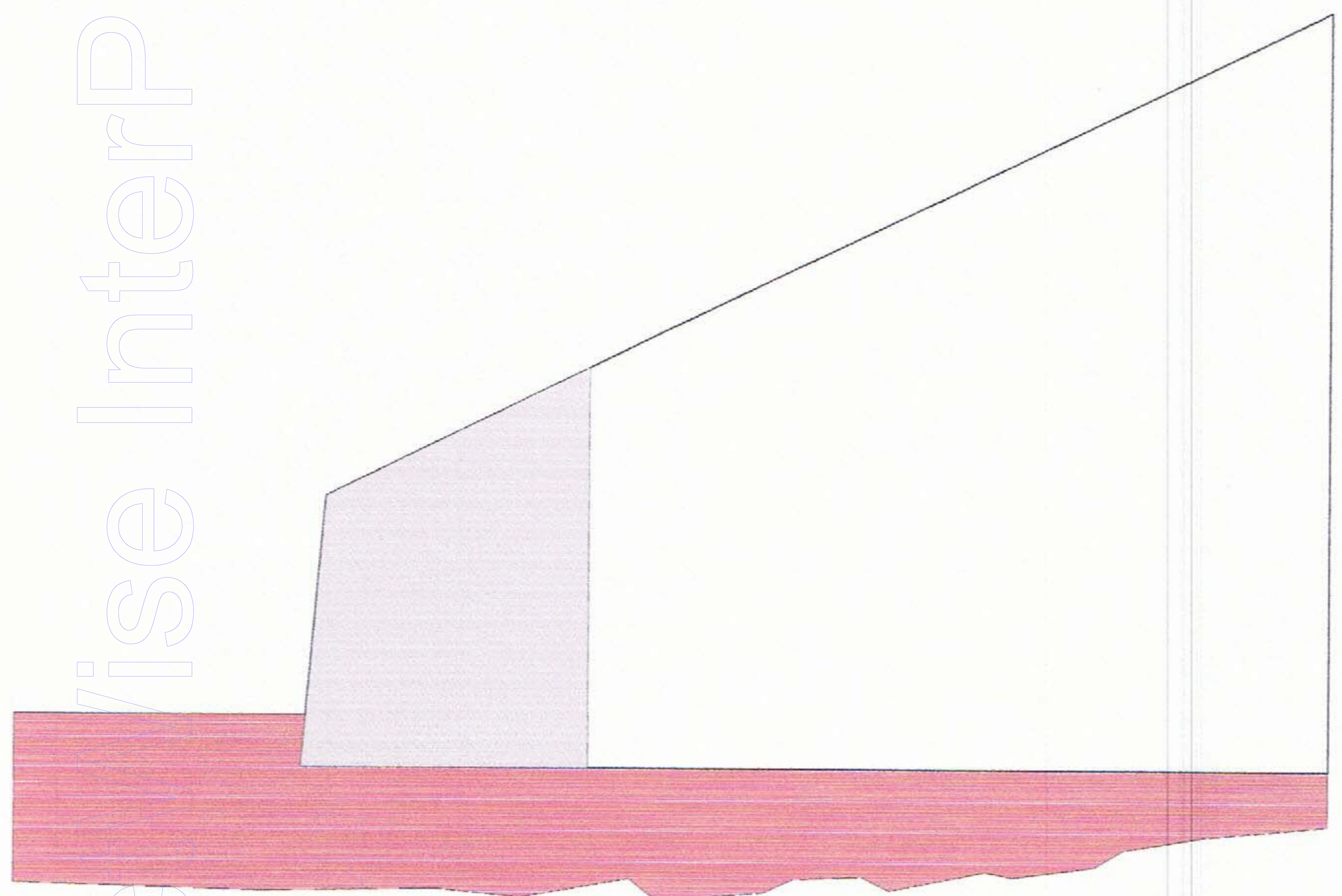
Load factor of active lateral earth pressure, EH, from Table 3.4.1-2 and Figure C11.5.5-2:	γ_{P-EH}	1.50
Load factor of active lateral earth pressure during earthquake (does not multiply P_{AE} and P_{IR}):	$(\gamma_{P-EH})_{EQ}$	1.50
Load factor for earthquake loads, EQ, from Table 3.4.1-1 (multiplies P_{AE} and P_{IR}):	γ_{P-EQ}	1.00

Resistance factor for shear resistance along common interfaces from Table 11.5.6-1:		Static	Combined Static/Seismic
Reinforced Soil and Foundation	ϕ_τ	0.80	0.80
Reinforced Soil and Reinforcement	ϕ_τ	0.80	0.80
Resistance factor for bearing capacity of shallow foundation from Table 11.5.6-1:		Static	Combined Static/Seismic
	ϕ_b	0.65	0.65

BEARING CAPACITY for GIVEN LAYOUT

	STATIC	SEISMIC	UNITS
(Given factored bearing resistance, q-n)			
Factored bearing resistance. q-n	7000	7000	[lb/ft ²]
Factored bearing load, σ_V	2819.0	3243	[lb/ft ²]
Eccentricity, e	0.21	0.76	[ft]
Eccentricity, e/L	0.019	0.069	
CDR calculated	2.48	2.16	
Base length	11.00	11.00	[ft]

Unfactored applied bearing pressure = (Unfactored R) / [L - 2 * (Unfactored e)] =
Static: Unfactored R = 21763.32 [lb/ft], L = 11.00, Unfactored e = 0.15 [ft], and Sigma = 2032.21 [lb/ft ²]
Seismic: Unfactored R = 22378.07 [lb/ft], L = 11.00, Unfactored e = 0.89 [ft], and Sigma = 2428.47 [lb/ft ²]



SCALE:

0 2 4 6 [ft]

DIRECT SLIDING for GIVEN LAYOUT (for GEOGRID reinforcements)

1.0 min 1.0 min

Along reinforced and foundation soils interface: CDR-static = 1.452 and CDR-seismic = 1.168

#	Geogrid Elevation [ft]	Geogrid Length [ft]	CDR Static (1.0 min)	CDR Seismic (1.0 min)	Geogrid Type #	Product name
1	1.50	11.00	1.384	1.134	2	5XT
2	3.00	11.00	1.488	1.248	2	5XT
3	4.50	11.00	1.608	1.388	2	5XT
4	6.00	11.00	1.745	1.560	2	5XT
5	7.50	11.00	1.898	1.768	2	5XT
6	9.00	11.00	2.051	1.997	2	5XT

ECCENTRICITY for GIVEN LAYOUT

1.0 min 1.0 min

At interface with foundation: e/L static = 0.0401, e/L seismic = 0.0997; Overturning: CDR-static = 3.65, CDR-seismic = 2.72

#	Geogrid Elevation [ft]	Geogrid Length [ft]	e / L Static	e / L Seismic	Geogrid Type #	Product name
1	1.50	11.00	0.0176	0.0623	2	5XT
2	3.00	11.00	-0.0040	0.0279	2	5XT
3	4.50	11.00	-0.0252	-0.0042	2	5XT
4	6.00	11.00	-0.0471	-0.0350	2	5XT
5	7.50	11.00	-0.0722	-0.0665	2	5XT
6	9.00	11.00	-0.1061	-0.1046	2	5XT

RESULTS for STRENGTH

Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Tavailable [lb/ft]	Tmax [lb/ft]	Tmd [lb/ft]	Specified minimum CDR static	Actual calculated CDR static 1.0 min	Specified minimum CDR seismic	Actual calculated CDR seismic 1.0 min	Product name
1	1.50	1896	1342.60	96.50	N/A	1.412	N/A	1.800	5XT
2	3.00	1896	744.78	90.27	N/A	2.546	N/A	3.150	5XT
3	4.50	1896	624.56	84.05	N/A	3.036	N/A	3.727	5XT
4	6.00	1896	504.34	77.83	N/A	3.760	N/A	4.562	5XT
5	7.50	1896	384.11	71.61	N/A	4.937	N/A	5.879	5XT
6	9.00	1896	350.74	65.39	N/A	5.406	N/A	6.439	5XT

RESULTS for PULLOUT Live Load included in calculating Tmax

#	Geogrid Elevation [ft]	Coverage Ratio	Tmax [lb/ft]	Tmd [lb/ft]	Le [ft]	La [ft]	Avail.Static Pullout, Pr [lb/ft]	Specified Static CDR	Actual Static CDR 1.0 min	Avail.Seism. Pullout, Pr [lb/ft]	Specified Seismic CDR	Actual Seismic CDR 1.0 min
1	1.50	1.000	1342.6	96.5	10.33	0.67	14482.9	N/A	10.787	19310.5	N/A	13.419
2	3.00	1.000	744.8	90.3	9.67	1.33	12051.8	N/A	16.182	16069.0	N/A	19.243
3	4.50	1.000	624.6	84.1	9.00	2.00	9818.6	N/A	15.721	13091.5	N/A	18.475
4	6.00	1.000	504.3	77.8	8.33	2.67	7793.1	N/A	15.452	10390.8	N/A	17.849
5	7.50	1.000	384.1	71.6	7.67	3.33	5975.2	N/A	15.556	7966.9	N/A	17.482
6	9.00	1.000	350.7	65.4	7.00	4.00	4362.2	N/A	12.437	5816.2	N/A	13.977

GLOBAL/COMPOUND STABILITY ANALYSIS (Using Bishop method and ROR = 0.0)

A horizontal seismic coefficient, Kh=half of 'A', equal to 0.040 has been applied.
The seismic force is applied at the center of the sliding mass.

STATIC CONDITIONS:
For the specified search grid, the calculated minimum Fs is 1.433 1.3min
(it corresponds to a critical circle at Xc = -3.95, Yc = 37.89 and R = 38.10 [ft] where (x=0, y=0) is taken at the TOE or Xc = 26.05, Yc = 137.89 and R = 38.10 [ft] when the terrain coordinate system is used as shown in the table below.)

SEISMIC CONDITIONS:
For the specified search grid, the calculated minimum Fs is 1.322 1.1min
(it corresponds to a critical circle at Xc = -3.95, Yc = 37.89 and R = 38.10 [ft] where (x=0, y=0) is taken at the TOE or Xc = 26.05, Yc = 137.89 and R = 38.10 [ft] when the terrain coordinate system is used as shown in the table below.)

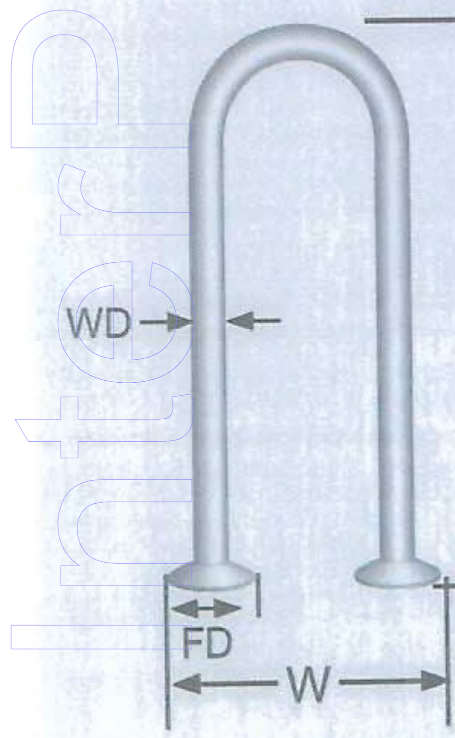
TERRAIN/WATER PROFILE

Soil layer #1: γ = 135.00 [lb/ft ^{3}] ϕ = 34.0° c = 0.00 [lb/ft ^{2}]

Point	#1	#2	#3	#4	#5	#6	#7	#8	#9	#10	#11
x [ft]	0.0	29.5	42.0	43.0	74.0	99.0	102.0	146.0	149.0	198.0	199.0
y [ft]	97.5	99.0	96.5	112.0	127.0	127.0	127.0	127.0	127.0	127.0	150.0

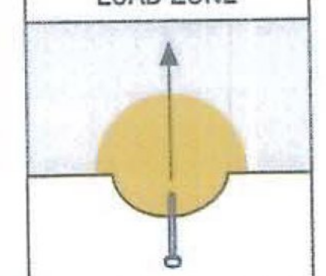
Patterson **R-ANCHOR**

FOR REDI-ROCK® BLOCKS



- Standard finish is **Hot-Dip Galvanized** per ASTM A123. Provides long-term corrosion resistance.
- Fits in **Standard Redi-Rock Recess Member.**
- Anchors have a 4,690 lb. capacity in 1,000 PSI concrete with a 4:1 Safe Working Load (4:1 SWL).

ALLOWABLE LOAD ZONE



3/8" x 7" RECESSED R-ANCHOR

Product Code	WD Wire Diameter	L Length	W Width	FD Foot Diameter	Safe Working Load 1,000 PSI 4:1 SWL (lbs)
LRA387G	3/8"	7"	3-1/4"	1"	4,690

BUY ONLINE! www.patterson-online.com

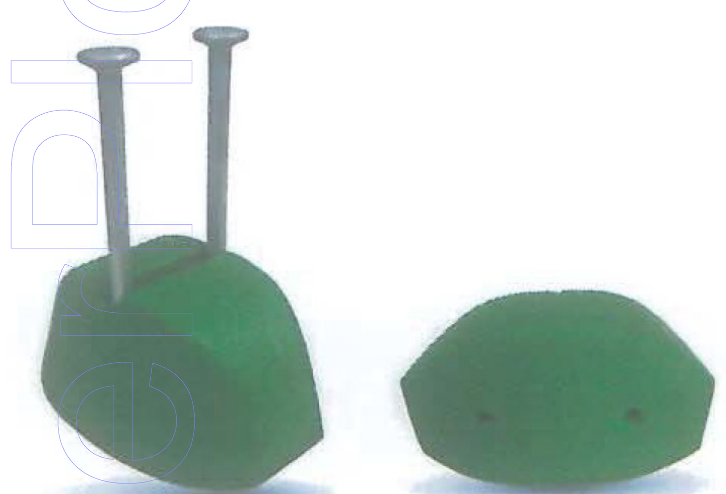
(800) 332-7090

PATTERSON Your Single Source Supplier

INSTALLATION OF R-ANCHOR

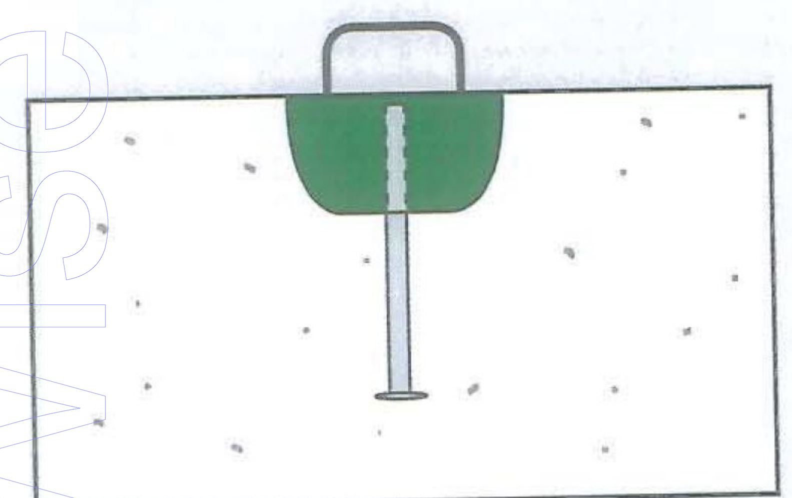
INSIDE FORM

- Use existing **Redi-Rock Recess Member.**
- Note - Recess Members that were designed for lift loops may require some modification to slot in recess member.



- Use **Patterson Recess Member (LRRM38)**
- Has two 1/2" Coil Nuts cast-in for bolting to form using two 1/2" x 2" Coil Bolts (sold separately).

WET-SET



Use Patterson Recess Member with **Optional Mounting Handle**

PATTERSON
SUPPLYING PRECASTERS

Certificate of Compliance

- ALP LIFTING PIN ANCHORS AND LIFT EYES
- ALP QUIKLIFT® ANCHORS AND RING CLUTCHES
- ALP UTILITY LIFT ANCHORS
- ALP LIFT LOOPS
- ALP R-ANCHORS™
- ALP COIL INSERTS

This is to certify that the above lifting and handling product has been manufactured and tested in accordance with the quality control plan established by A.L. Patterson, Inc. and meets or exceeds **OSHA 29 CFR 1926.704** *when compared to the listed catalog rating for the lifting device.*

This document certifies each manufactured product can be related to a quality control plan. The manufacturing quality control tests can be made available upon written request and when appropriate.

The rated capacities are for mechanical capacity of the listed anchor or insert only. Placement, edge distances, embedment depth, concrete strength, attachment device, sling angles, and rigging consideration are not part of this certificate of compliance.

David Jablonsky, P.E., FPCI - Executive Vice President   1/1/17

MICHIE CORPORATION
173 BUXTON INDUSTRIAL DR. HENNIKER, NH
5035CAS-5000 PSI SCC 50% SLAG [0]
04/26/2017

Compressive Strength :	5000 psi at 28 days
Aggregate size :	3/4" -- 19 mm
Air :	5.0 to 9.0 %
Water/Cement ratio :	0.359
Slump :	24.00 to 27.00 in

Source of Concrete : Michie Corporation, Henniker, NH
Construction type : PRECAST
Placement : Mixer Truck
Unit Weight : 144.42 pcf
Design Date : 03/30/2016

Constituents :	Quantity	Density	Volume
Dragon Type III (Dragon Products)	352 lb	3.150	1.79
SLAG (Dragon Products)	352 lb	2.810	2.01
WATER (Michie Corporation)	241 lb	1.000	3.86
#67 3/4" STONE (Michie Corporation, Henniker, NH)	1665 lb	2.724	9.80
WASHED SAND (Michie Corporation, Henniker, NH)	1295 lb	2.669	7.78
ADVACAST 535 (W.R. Grace Chemicals)	180.00 floz (US)/yd³		0.19
DAREX-II (W.R. Grace Chemicals)	3.00 floz (US)/yd³		0.00
Air	6.0 %.		1.62
Total :	3905		27.04

Remarks :
NOTE: BATCH WEIGHTS ARE S.S.D.
SAND ABSORPTION = 0.6
STONE ABSORPTION = 0.9

Reported by : Rusty Kehr	Approval by : ______________________
Date : 10/05/2015	Date : / /

BOSTON TESTING
537 South St.,Waltham, MA 02453
Phone: 617-381-7035 Fax: 617-381-7419

Michie Corp.
173 Buxton Industrial Drive
Henniker, NH 03242
Attn: Mr. Rusty Kehr

Standard Specifications for Concrete Aggregates - ASTM C33
(Coarse Aggregate)

Report Date: 2/24/2017
Tested: 2/23/2017
Received: 1/30/2017

Project: **Michie Corp. - Aggregate Testing**
Project #: 20210

1. Sample No.	Description	Source of Material
Q1597	3/4" Coarse Aggregate	Michie Corp. Henniker, NH

2. Sieve Analysis { X }T11, T27 { X }C117, C136

Sieve Size		Results	Specifications
Standard	Alternate	{% Passing by Wt.}	
50 mm	2"	100	
37.5 mm	1-1/2"	100	
25 mm	1	100	
19 mm	3/4"	100	
12.5 mm	1/2"	63	
9.5 mm	3/8"	36	
4.75 mm	#4	5.5	
2.36 mm	#8	3.3	
0.075 mm	#200	0.7	

	Results		Specifications
3. Fineness Modulus	6.47		
4. Los Angeles Abrasion, % loss {ASTM C131}	31%	Grading "B"	50% max.

5. Specific Gravity of Coarse Aggregate {C127}

Bulk Specific Gravity, O.D.	2.700
Bulk Specific Gravity, S.S.D.	2.724
Apparent Specific Gravity	2.767
Absorption, %	0.9

Approved,

Nicholas Janes

Nick Janes
Quality Supervisor RMX

BOSTON TESTING
537 South St.,Waltham, MA 02453
Phone: 617-381-7035 Fax: 617-381-7419

Michie Corp.
173 Buxton Industrial Drive
Henniker, NH 03242
Attn: Mr. Rusty Kehr

Standard Specifications for Concrete Aggregates - ASTM C33
(Fine Aggregate)

Report Date: 2/24/2017
Project: **Michie Corp. - Aggregate Testing** Tested: 2/16/2017
Project #: 20210 Received: 1/30/2017

1. Sample No.	Description	Source of Material
Q1596	Fine Aggregate	Michie Corp. Henniker, NH

2. Sieve Analysis { }T11, T27 {X}C117, C136

Sieve Size Standard	Sieve Size Alternate	Results {% Passing by Wt.}	Specifications ASTM C33 Fine Aggregate	
12.5 mm	1/2"	100	100	100
9.5 mm	3/8"	100	100	100
4.75 mm	#4	97	95	100
2.36 mm	#8	85	80	100
1.18 mm	#16	69	50	85
0.600 mm	#30	50	25	60
0.300 mm	#50	28	5	30
0.150 mm	#100	8.2	0	10
0.075 mm	#200	2.3		

	Results	Specifications
3. Fineness Modulus	2.63	2.3 to 3.1
4. Organic Impurities in Fine Aggregate {ASTM C40}	1	Plate 3 max.

5. Specific Gravity of Fine Aggregate {C128}

Bulk Specific Gravity, O.D.	2.652
Bulk Specific Gravity, S.S.D.	2.669
Apparent Specific Gravity	2.697
Absorption, %	0.6

Approved,

Nicholas Janes

Nick Janes
Quality Superviosr RMX

	SAMPLE TYPE:	RMS 905	DATE RECEIVED:	LAB NUMBER:
massDOT Massachusetts Department of Transportation Highway Division Rev. 12/09/2016	**VER**	SAMPLE OF 3/4"1		

CEMENT (%)	FLY ASH (%)	SLAG (%)	SILICA (%)
50.0	**0.0**	**50.0**	**0.0**

PLANT, LABORATORY, AGGREGATE, AND MITIGATION SOURCES

Plant:	MICHIE CORPORATION	*Location:*	HENNIKER, NH		
Aggregate:	MICHIE CORPORATION	*Location:*	HENNIKER, NH	*Type:*	COARSE
Cement:	DRAGON PRODUCTS	*Location:*	THOMASTON, ME	*Type:*	III
Fly Ash:		*Location:*		*Type:*	
Slag:	DRAGON PRODUCTS	*Location:*	THOMASTON, ME	*Type:*	100
Silica Fume:		*Location:*			

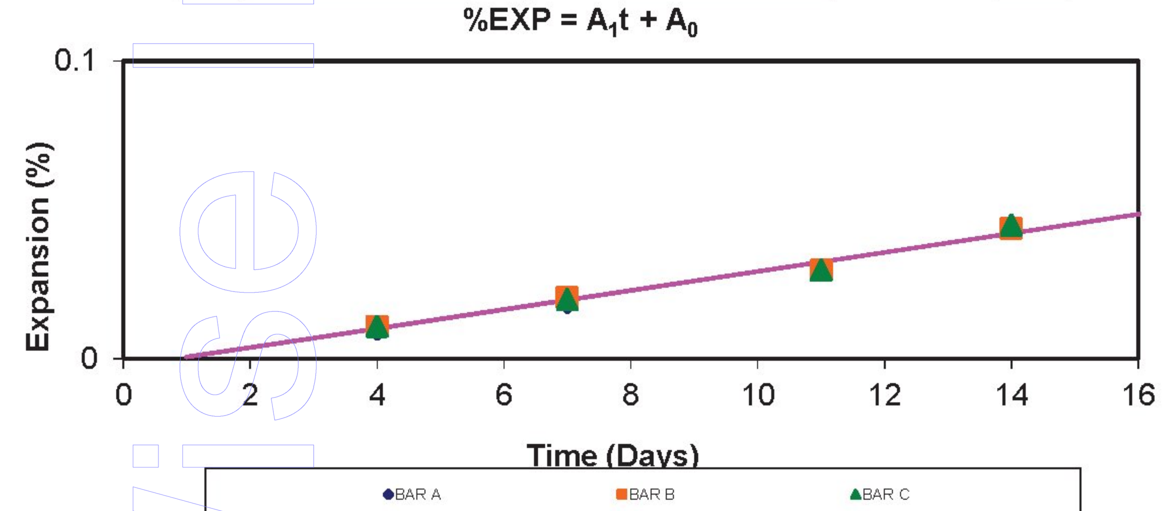
INDEPENDENT LABORATORY		MASSDOT LABORATORY	
Laboratory:	BOSTON TESTING	*Laboratory:*	RESEARCH & MATERIALS
Date Sampled:	1/30/2017	*Date Sampled:*	
Sampler:	MICHIE	*Sampler:*	

TIME (Days)	MORTAR BAR (UNIT OF LENGTH) A	B	C	G	TIME (Days)	MORTAR BAR (UNIT OF LENGTH) A	B	C	G
2	-0.0012	-0.0010	-0.0057	10	2				250
6	-0.0002	0.0001	-0.0046		6				
9	0.0007	0.0011	-0.0037		9				
13	0.0018	0.0020	-0.0027		13				
16	0.0032	0.0034	-0.0012		16				

TIME (Days)	MORTAR BAR (%) A	B	C	AVERAGE	TIME (Days)	MORTAR BAR (%) A	B	C	AVERAGE
0					0				
4	0.010	0.011	0.011	0.01	4	0.000	0.000	0.000	0.00
7	0.019	0.021	0.020	0.02	7	0.000	0.000	0.000	0.00
11	0.030	0.030	0.030	0.03	11	0.000	0.000	0.000	0.00
14	0.044	0.044	0.045	**0.04**	14	0.000	0.000	0.000	**0.00**

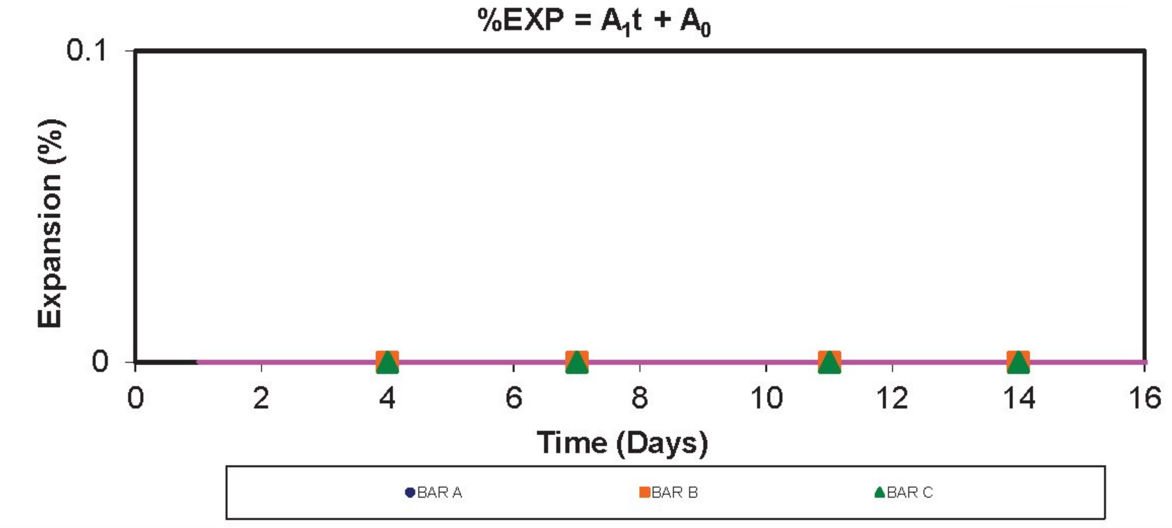
$A_1 =$ 0.003191913 $A_0 =$ -0.00263288 $R^2 =$ 0.98

%EXP = $A_1 t + A_0$



$A_1 =$ 0 $A_0 =$ 0 $R^2 =$ #DIV/0!

%EXP = $A_1 t + A_0$



PASS

MassDOT: Please fill in all cells highlighted in green.

INDEPENDENT LABORATORY REMARKS		MASSDOT LABORATORY REMARKS	
Tested by:	AMY SILBERMAN	*Tested by:*	
Signature:		*Signature:*	
Date:	3/17/2017	*Date:*	
Reviewed by:	NICK JANES	*Reviewed by:*	
Signature:		*Signature:*	
Date:	3/17/2017	*Date:*	

Note: Pass/Fail determination is based on MassDOT's expansion criteria of 0.08% maximum expansion for metamorphic aggregate or 0.10% maximum expansion for all other aggregates. A "12 Point Linear Regression" of 4, 7, 11, and 14 days is used to determine reliability of results and to develop %Expansion = $A_1 t + A_0$ plot. ***Repeat AASHTO T303 (Modified) if r² value is less than 0.95.***

massDOT Massachusetts Department of Transportation Highway Division Rev. 12/09/2016	SAMPLE TYPE: VER	RMS 905 SAMPLE OF FINE1	DATE RECEIVED:	LAB NUMBER:

CEMENT (%)	FLY ASH (%)	SLAG (%)	SILICA (%)
50.0	0.0	50.0	0.0

PLANT, LABORATORY, AGGREGATE, AND MITIGATION SOURCES

Plant:	MICHIE CORPORATION	*Location:*	HENNIKER, NH		
Aggregate:	MICHIE CORPORATION	*Location:*	HENNIKER, NH	*Type:*	FINE
Cement:	DRAGON PRODUCTS	*Location:*	THOMASTON, ME	*Type:*	III
Fly Ash:		*Location:*		*Type:*	
Slag:	DRAGON PRODUCTS	*Location:*	THOMASTON, ME	*Type:*	100
Silica Fume:		*Location:*			

INDEPENDENT LABORATORY

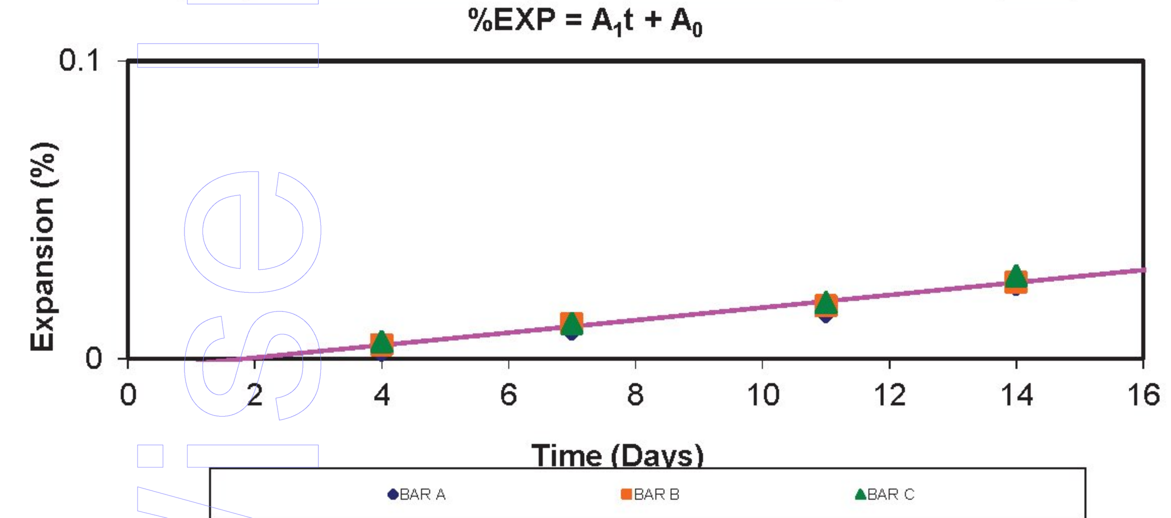
Laboratory:	BOSTON TESTING
Date Sampled:	1/30/2017
Sampler:	MICHIE

TIME (Days)	MORTAR BAR (UNIT OF LENGTH) A	B	C	G
2	0.0011	0.0003	-0.0027	10
6	0.0014	0.0008	-0.0021	
9	0.0021	0.0015	-0.0015	
13	0.0027	0.0021	-0.0008	
16	0.0036	0.0029	0.0001	

TIME (Days)	MORTAR BAR (%) A	B	C	AVERAGE
0				
4	0.003	0.005	0.006	0.00
7	0.010	0.012	0.012	0.01
11	0.016	0.018	0.019	0.02
14	0.025	0.026	0.028	**0.03**

A_1 = 0.002102476 A_0 = -0.00387456 R^2 = 0.96

%EXP = $A_1 t + A_0$



MASSDOT LABORATORY

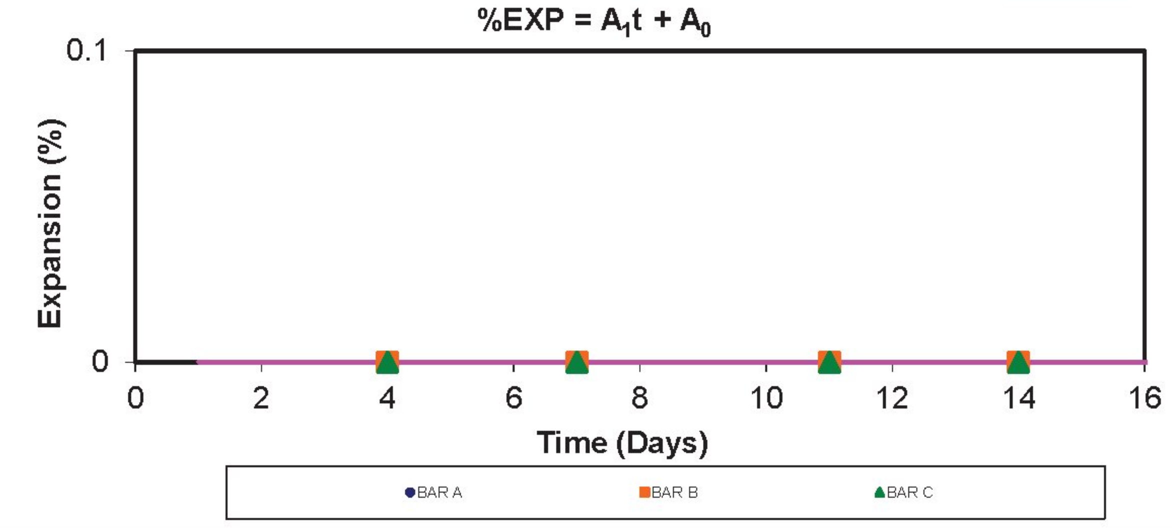
Laboratory:	RESEARCH & MATERIALS
Date Sampled:	
Sampler:	

TIME (Days)	MORTAR BAR (UNIT OF LENGTH) A	B	C	G
2				250
6				
9				
13				
16				

TIME (Days)	MORTAR BAR (%) A	B	C	AVERAGE
0				
4	0.000	0.000	0.000	0.00
7	0.000	0.000	0.000	0.00
11	0.000	0.000	0.000	0.00
14	0.000	0.000	0.000	**0.00**

A_1 = 0 A_0 = 0 R^2 = #DIV/0!

%EXP = $A_1 t + A_0$



PASS

MassDOT: Please fill in all cells highlighted in green.

INDEPENDENT LABORATORY REMARKS	MASSDOT LABORATORY REMARKS

Tested by:	AMY SILBERMAN	*Tested by:*	
Signature:		*Signature:*	
Date:	3/17/2017	*Date:*	
Reviewed by:	NICK JANES	*Reviewed by:*	
Signature:		*Signature:*	
Date:	3/17/2017	*Date:*	

Note: Pass/Fail determination is based on MassDOT's expansion criteria of 0.08% maximum expansion for metamorphic aggregate or 0.10% maximum expansion for all other aggregates. A "12 Point Linear Regression" of 4, 7, 11, and 14 days is used to determine reliability of results and to develop %Expansion = $A_1 t + A_0$ plot. ***Repeat AASHTO T303 (Modified) if r² value is less than 0.95.***

DRAGON PRODUCTS COMPANY
P.O. Box 191, U.S. Route 1 • Thomaston, Maine 04861 • 207-594-5555

MILL TEST RESULTS	Date: February 8, 2017
Laboratory at Thomaston, Maine	Ground Granulated Blast Furnace Slag
	Silo Numbers: 23 & 26

CHEMICAL DATA Percent **PHYSICAL DATA**

Reference Cement Data		**Dragon GGBF Slag Data**	
Specific Surface…………… Blaine (sq m /Lg)	366	Specific Surface…………………… Blaine (sq m /Lg)	538
Alkali Equivalent……………	0.81	Percent Retained on 325 Mesh……	1.2
Compressive Strength (psi of reference portland cement)		Air Content (%)………………………	5.2
7 day………………	3980	Sulfide Sulfur (S)……………………	1.0
28 day………………	5090		
		Compressive Strength (psi of 50:50 slag and reference portland cement)	
Potential Compound Composition			
C3S (%)……………	53	7 day………………………	4100
C2S (%)……………	14	28 day………………………	7125
C3A (%)……………	7		
C4AF (%)	11	Activity Index	
		7 day………………………	103%
		28 day………………………	140%
		Specific Gravity (g/ml)………………	2.81
		Autoclave Expansion………………	0.016

Jennifer Lynn Small
Jennifer Lynn Small
Quality Control & Distribution Manager

We hereby certify that this material complies with current ASTM C 989 and AASHTO M 302 Grade 100 specifications as well as CSA-A3001 Type S specifications for slag

Testing was completed by Brian Secord.
This mill test report is generated for silos produced in the calendar month prior to the date upon this report.

DRAGON PRODUCTS COMPANY
P.O. Box 191, U.S. Route 1 • Thomaston, Maine 04861 • 207-594-5555

MILL TEST RESULTS
Laboratory at Thomaston, Maine

Date: January, 2017 issued 2/10/17
Cement Type: III
Silo Numbers: 16 & 22

CHEMICAL DATA	Percent	PHYSICAL DATA	
Silicon Dioxide................	19.2	Specific Surface............. Blaine (sq m /kg) *(Per ASTM C 204)*	506
Aluminum Dioxide...........	3.7		
Ferric Oxide....................	2.9		
Calcium Oxide................	60.4	Percent Passing 325 Mesh *(Per ASTM C 430)*	99.4
Magnesium Oxide...........	3.1		
Sulphur Trioxide..............	4.0	Compressive Strength (psi) *(Per ASTM C 109)*	
Loss on Ignition...............	1.6		
Insoluble Residue...........	0.3	1 day................	4110
		3 day................	5810
Tricalcium Silicate...........	59	7 day................	6790
Dicalcium Silicate............	10	28 day................	
Tricalcium Aluminate........	5	Vicat Setting Time *(Per ASTM C 191)*	
Sum of C3S + 4.75*C3A....	81		
Sum of C4AF + 2*C3A......	18	Initial (min.)................	130
		Final (min.).................	190
Sodium Oxide.................	0.4		
Potassium Oxide............	1.0	Air Content (%)............... *(Per ASTM C 185)*	6.2
Equivalent Alkalies..........	1.02		
		Autoclave Expansion (%)... *(Per ASTM C 151)*	0.01
Limestone Addition	2.9		
$CaCO_3$ in Limestone	96	Expansion in water (%)...... *(Per ASTM C 1038)*	0.014

(Chemical Analysis all per ASTM C 114)

Certified by:

Jennifer Lynn Small

Jennifer Lynn Small
Quality Control & Distribution Manager

We hereby certify that this cement complies with current ASTM C 150, AASHTO M-85 and CSA A3001 Type HE specifications.

Testing was completed by Brian Secord.
This mill test report is generated for silos produced in the calendar month prior to the date upon this report.