	Estimated Quantities (Roadway)			Final Quantities
**	Mobilization	Lump Sum	1	
	Contractor Furnished Surveying and Staking	Lump Sum	1	
	Removal of Improvements	Lump Sum	1	
	Clearing and Grubbing	Lump Sum	1	
	Maintenance of Temporary Bypass	Lump Sum	1	
	Removal of Temporary Bypass	Lump Sum	1	
	Construction Signs	Square Foot	181.5	
	Type III Movable Barricade	Each	2	
	Type III Movable Barricade w/ Light	Each	2	
	Type 5 Aggregate for Base 4" Thick	Square Yard	233	
	8" Thick Asphalt Pavement	Square Yard	233	
	4" Thick Gravel Pavement	Square Yard	100	
	Silt Fence	Linear Foot	383	
	Type I Ditch Check	Each	7	
	Type II Ditch Check	Each	5	
	Sediment Removal	Cubic Yard	10	
	Perm Erosion Control Geotextile (Rip Rap)	Square Yards	214	
*	Furnishing Type 2 Rock Blanket	Cubic Yard	72	
*	Placing Type 2 Rock Blanket	Cubic Yard	72	
	Type III Object Markers	Each	12	
***	Restoration	Lump Sum	1	
	Estimated Quantities (Bridge)			
	Removal of Bridges (3310004)	Lump Sum	1	
	Class 2 Excavation in Rock	Cubic Yard	34	
	Geosynthetic Reinforced Soil System (GRS)	Lump Sum	2	
****	Pre-Engineered Superstructure	Square Foot	1284	
	Corral Rail	Linear Foot	107	

GRS Abutment Open-Graded Backfill (AASHTO No. 89)		
	U.S. Sieve Size	Percent Passing
Gradation (AASHTO M-43)	1/2 Inch	100
	3/8 Inch	90-100
	No. 4	20-55
	No. 8	5-30
	No. 16	0-10
	No. 50	0-5
Plasticity Index (PI) (AASHTO T-90)	PI ≤ 6	
Soundness (AASHTO T-104)	The backfill shall be substantially free of shale or other poor durability particles. The material shall have a magnesium sulfate loss of less than 30 percent after four cycles (or a sodium value less than 15 percent after five cycles)	
Min. Internal Friction Angle	42°	

1

Notes:

All construction materials and methods shall comply with the latest edition of the Missouri Standard Specifications for Highway Construction and the Missouri Standard Plans for Highway Construction unless specified otherwise.

The Contractor shall maintain proper drainage and erosion control at all times during construction.

The locations of existing utilities are shown for informational purposes only and are not guaranteed to be accurate or complete. It is the responsibility of the Contractor to contact all necessary utility companies and obtain utility staking prior to the start of construction.

Contractor shall repair or replace any fencing or gates removed or damaged during construction activities to equal or better than existing condition. Work shall be done to the approval of the affected land owner and the Engineer. Payment for this work shall be included in the pay item for "Removal of Improvements".

(*) Materials, construction requirements and payment for both Furnishing and Placing Type 2 Rock Blanket shall be in accordance with Sec 611 and the Job Special Provisions.

(**) Mobilization will include demobilization and any expenses required for coordination with utilities.

(***) Restoration shall conform to the Job Special Provisions.

(****) Square Feet of Bridge quantity shall not exceed plan quantity.

General Notes:

Design Specifications:
2002 – AASHTO 17th Edition (Seismic)
Load Factor Design
Seismic Performance Category A
2011 – Geosynthetic Reinforced Soil Integrated Bridge System Interim Implementation Guide FHWA-HRT-4-026.

For Bridge Railing only:
2012 – AASHTO LRFD 6th Edition and 2013 Interims
· Load and Resistance Factor Design

Design Loading:
HS-20-44 (LFD Superstructure, LFD Substructure)
35#/Sq. Ft. Future Wearing Surface
Earth 120 #/Cu. Ft., Equivalent Fluid Pressure 45#/Cu. Ft.

Design Unit Stresses:

Class B Concrete (Substructure)	f'c	= 3,000 psi
Class B-1 Concrete (Corral Rail)	f'c	= 4,000 psi
Class A-1 Concrete (Superstructure, except Corral Rail)	f'c	= 5,000 psi
Reinforcing Steel (Grade 60)	fy	= 60,000 psi
Structural Steel (ASTM A709 Grade 36)	fy	= 50,000 psi
Geotextile Fabric:		
– Minimum Tensile Strength		= 4800 lb/ft
– Tensile Strength @ 2% Strain (see JSP's)		= 960 lb/ft

GRS Backfill Material:
AASHTO No. 89 Clean, Crushed Angular Stone (See Table Below)

1

Block Wall:
For Details of blocks not shown in plans, see Job Special Provisions.
CMU= Concrete Masonry Unit

Excavation:
Comply with Occupational Safety and Health Administration (OSHA) for all excavations.

Joint Filler:
All joint filler shall be in accordance with Sec 1057 for preformed sponge rubber expansion and partition joint filler, except as noted.

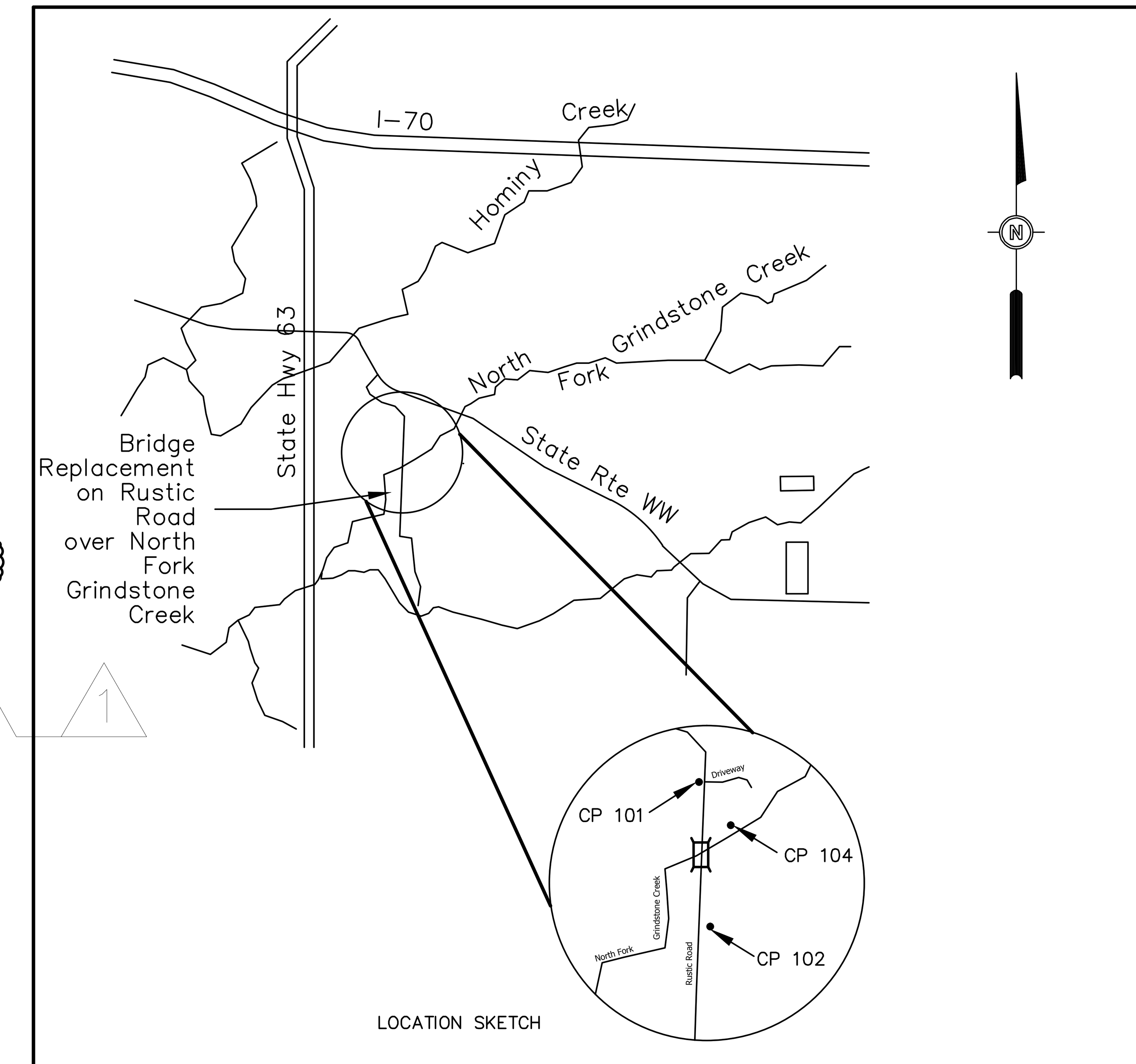
Reinforcing Steel:
Minimum clearance to reinforcing steel shall be 1 1/2 ", unless otherwise shown.

Traffic Handling:
Close road at bridge during construction and maintain temporary bypass. See Traffic Control Plan on sheet no. 8.

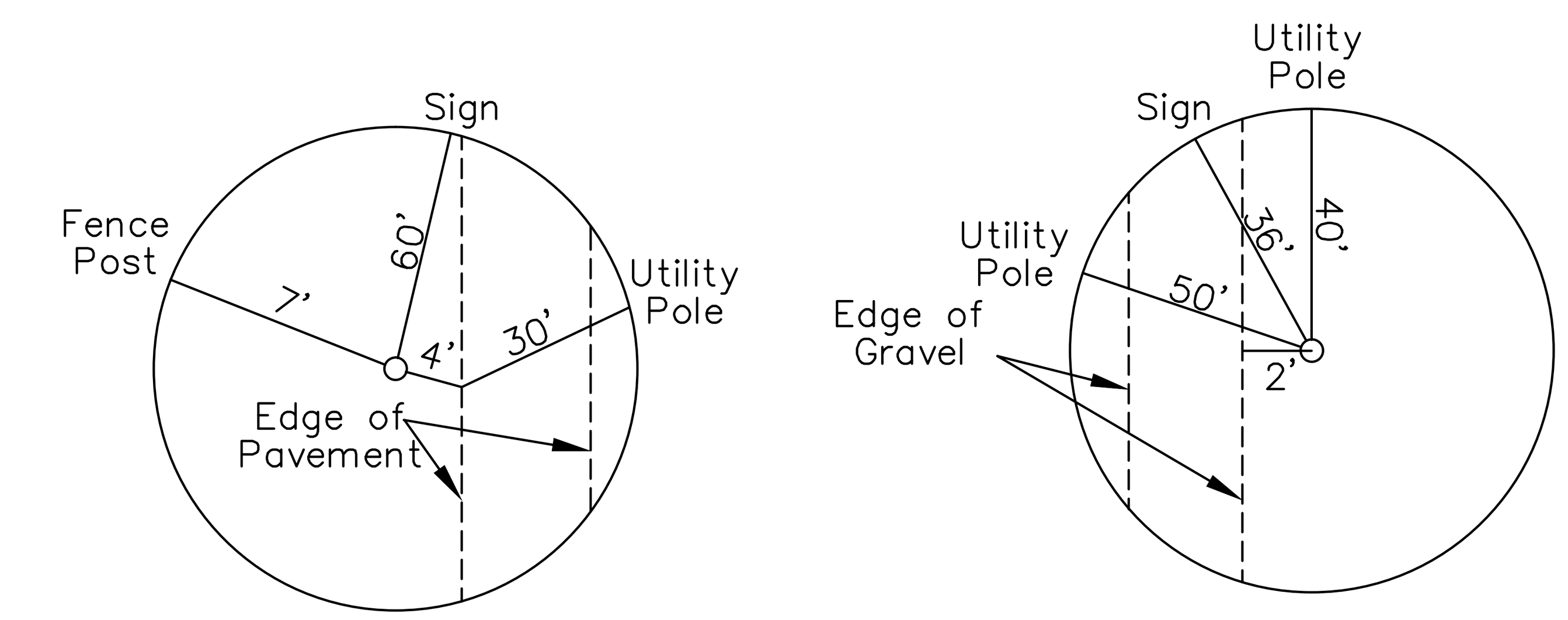
Miscellaneous:
"Sec" refers to the sections in the Missouri Standard and supplemental Specifications unless specified otherwise.

High strength bolts, nuts and washers may be sampled for quality assurance as specified in Sec 106.

HYDROLOGIC DATA
Drainage Area = 6.45 Square Miles
BACKWATER/BASE FLOOD DATA (100 YR)
High Water Elev. = 688.53
Design Discharge = 6,400 cfs
Estimated Backwater = 0.84 ft.
Ave Velocity thru Opening = 7.64 ft/s
FREEBOARD
Design Frequency = 25 (year)
Design Discharge = 54,400 cfs
Freeboard = -2.99 ft.
Design High Water (DHW) Elev. = 686.91
ROADWAY OVERTOPPING
Design Elev.(1' Below Shoulder) = 685.87
Design Discharge = 2000 cfs
Design Frequency > 4 (year)



LOCATION SKETCH



Control Point 101/BM 1

N: 1130161.7400
E: 1701659.0880
Elev. 684.26

Control Point 102/ BM 2

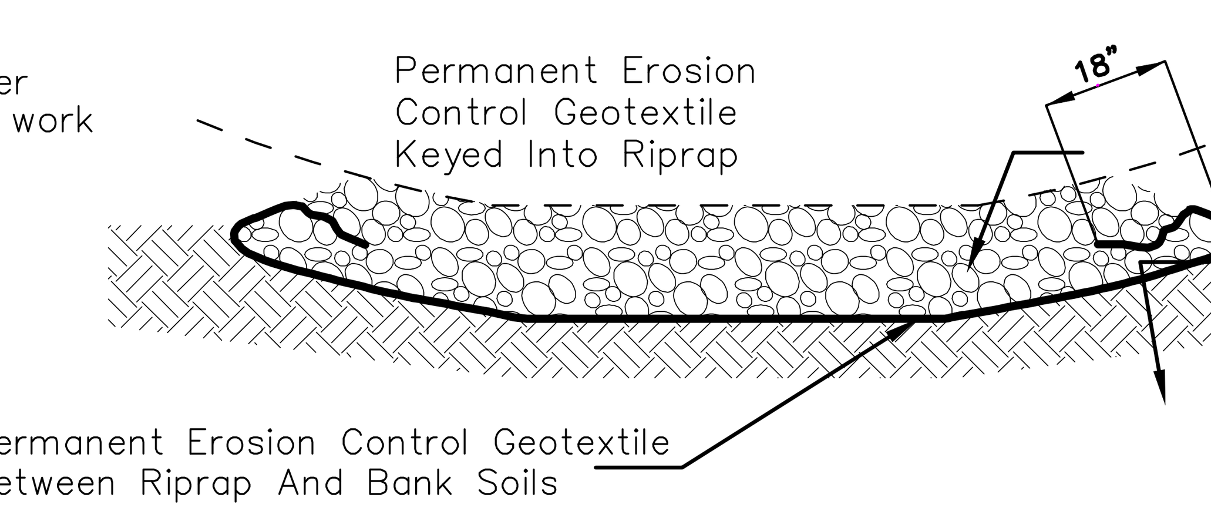
N: 1129633.390
E: 1701673.301
Elev. 708.78

Control Point 104

Cut X in Concrete of Manhole Structure Approximately 1460' SE of CP 101 and 890' Northeast of CP 102

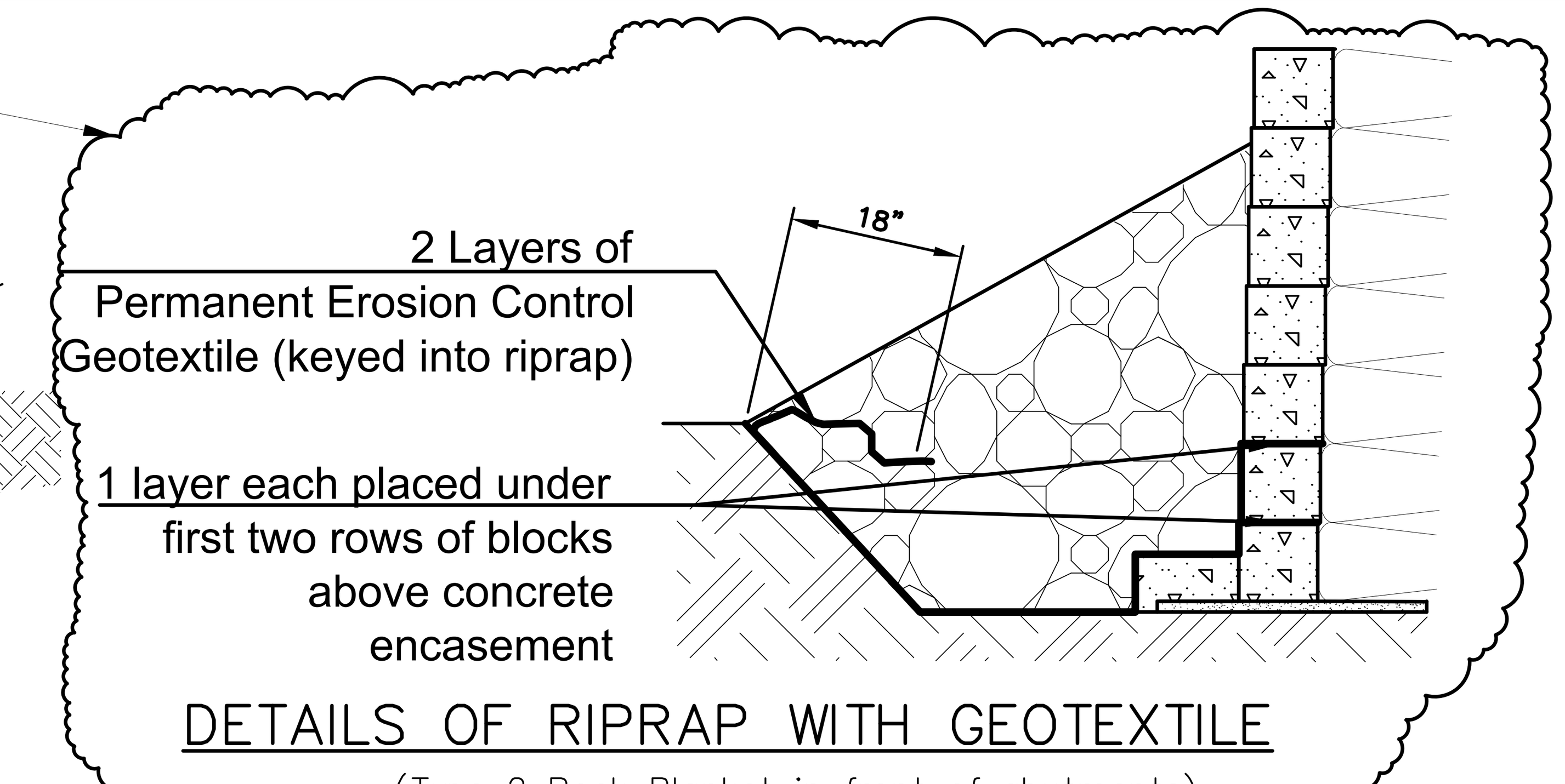
N: 1130398.3850
E: 1702129.1190
Elev. 690.12

1



DETAILS OF RIPRAP WITH GEOTEXTILE

(Type 2 Rock Blanket)



DETAILS OF RIPRAP WITH GEOTEXTILE

(Type 2 Rock Blanket in front of abutments)

Note: This Drawing is Not to Scale. Follow Dimensions

#	DATE	DESCRIPTION	BY
100	8/29/14	Updated geotextile properties and minimum friction angle for backfill.	

BARTLETT & WEST
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PHONE 573.634.3181 - FAX 573.634.7904
MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING
WWW.BARTWEST.COM

GENERAL NOTES AND QUANTITIES

RUSTIC ROAD BRIDGE REPLACEMENT
FEDERAL PROJECT NO. IBRD 9900(592)
BOONE COUNTY, MISSOURI

STATE OF MISSOURI
TIMOTHY D. LEAF
NUMBER PE-2012000778
PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

SEALED DATE:	08/29/14
DESIGNED BY:	TDL
DRAWN BY:	MSS
APPROVED BY:	RAG
DESIGN PROJ:	16137.110
SCALE:	AS NOTED
DATE:	AUGUST/2014
DRAWING NO:	NONE
SHEET NO:	2 of 22