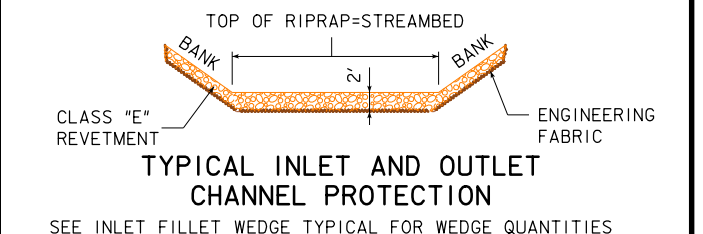
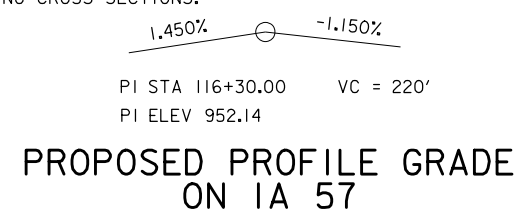


GRADING CONTROL POINTS  
 THESE POINTS REPRESENT THE TOE OF BANK/STREAMBED FOR PROPOSED TURNING POINTS TO THE EXISTING CREEK. TOP OF BANK IS APPROXIMATED. THESE POINTS ARE TO BE CONSIDERED AS AIDS IN ESTIMATING QUANTITIES OR PREPARING CROSS SECTIONS. OFFSETS ARE FROM IA 57 C.  
 G1 STA 116+41.10, 120.60' LT  
 G2 STA 116+42.14, 107.55' LT  
 G3 STA 116+25.23, 124.14' LT  
 G4 STA 116+24.35, 114.64' RT



ESTIMATED REVETMENT QUANTITIES			
LOCATION	REVETMENT CL. E (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
INLET	475	450	300
OUTLET	575	550	375
TOTALS	1050	1000	675

ARTICULATING BLOCK MAT PROPERTIES	
SIZE, INCHES	4
AVERAGE THICKNESS, INCHES	4.0
MASS PER UNIT AREA, LB/FT <sup>2</sup>	45
MASS PER BLOCK, LB	88
NOMINAL BLOCK DIMENSIONS, IN	20 x 14
SHEAR RESISTANCE, LB/FT <sup>2</sup>	26
CONCRETE COVERAGE, FT <sup>2</sup> /YD <sup>3</sup>	75

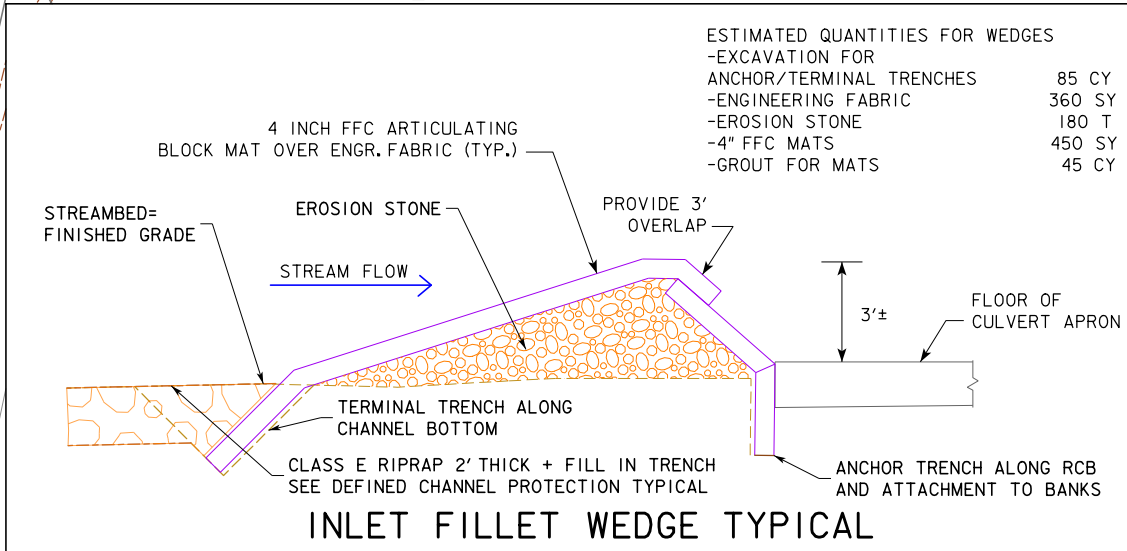
EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. ASSUMES CHANNEL AND BANKS TO BE GRADED TO GRADING SURFACE PRIOR TO EXCAVATION, THEN RIPRAP PLACED. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.

**UTILITIES LEGEND:**  
 PPA MIDAMERICAN ENERGY  
 TI CENTURYLINK  
 W CENTRAL IOWA WATER ASSOC.  
 G MIDAMERICAN ENERGY

**HYDRAULIC DATA**  
 DRAINAGE AREA= 8.93 MI<sup>2</sup>  
 STREAM SLOPE= 7.08 FT./MI.  
 Q<sub>50</sub>= 3560 CFS  
 CALC. BACKWATER= 0.23'  
 HEADWATER= 942.28  
 AVG. OUTLET VELOCITY= 8.24 FT/SEC  
 Q<sub>100</sub>= 4230 CFS  
 CALC. BACKWATER= 0.99'  
 HEADWATER= 943.31  
 Q<sub>200</sub>= 5500 CFS  
 Q<sub>500</sub>= 6040 CFS

**TRAFFIC ESTIMATE**  
 2017 AADT 2800 V.P.D.  
 2037 AADT 2900 V.P.D.  
 20?? DHV - V.P.H  
 TRUCKS 15 %  
 TOTAL DESIGN ESAL's -  
 STA. 116+27.88  
 60' X 30' DECK GIRDER BRIDGE  
 DA= 8.93 MI  
 DESIGN #1428/356  
 REPLACE RCB/FLOWABLE MORTAR

**LOCATION**  
 IA 57 OVER PHELPS CREEK  
 T-90N R-16W  
 SECTION 29/32  
 ALBION TOWNSHIP  
 BUTLER COUNTY  
 FHWA NO. 16421  
 BRIDGE MAINT. NO. 1224.9S057  
 LATITUDE 42.570345° N  
 LONGITUDE 92.765135° W

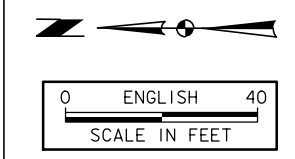


ESTIMATED QUANTITIES FOR WEDGES	
-EXCAVATION FOR ANCHOR/TERMINAL TRENCHES	85 CY
-ENGINEERING FABRIC	360 SY
-EROSION STONE	180 T
-4" FFC MATS	450 SY
-GROUT FOR MATS	45 CY

**TYPICAL BANK PROTECTION**  
 GRADING SURFACE 4'  
 CLASS "E" REVETMENT  
 ENGINEERING FABRIC

ESTIMATED REVETMENT QUANTITIES INCLUDED WITH ROAD PLANS			
LOCATION	REVETMENT CL. "E" (TON)	ENGINEERING FABRIC (SY)	EXCAVATION (CY)
CHANNEL	590	730	365

EXCAVATION QUANTITY CALCULATED FROM GRADING SURFACE. QUANTITIES SHOWN FOR INFORMATION ONLY. SEE ROAD SHEETS.



PRELIMINARY

DESIGN FOR 4° SKEW LA

**TRIPLE 12' x 12' x 107' REINFORCED CONCRETE BOX CULVERT**  
 WITH 0° HEADWALLS & INLET FILLET WEDGES

**SITUATION PLAN**  
 STATION: 116+27.88

**BUTLER COUNTY**

IOWA DEPARTMENT OF TRANSPORTATION - HIGHWAY DIVISION  
 DESIGN SHEET NO. \_\_\_\_\_ OF \_\_\_\_\_ FILE NO. 31237 DESIGN NO. 117