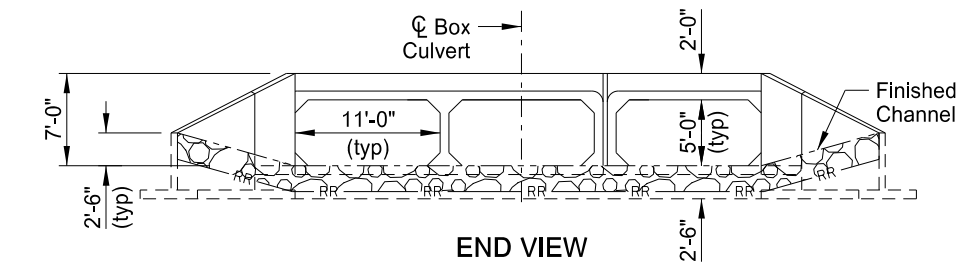
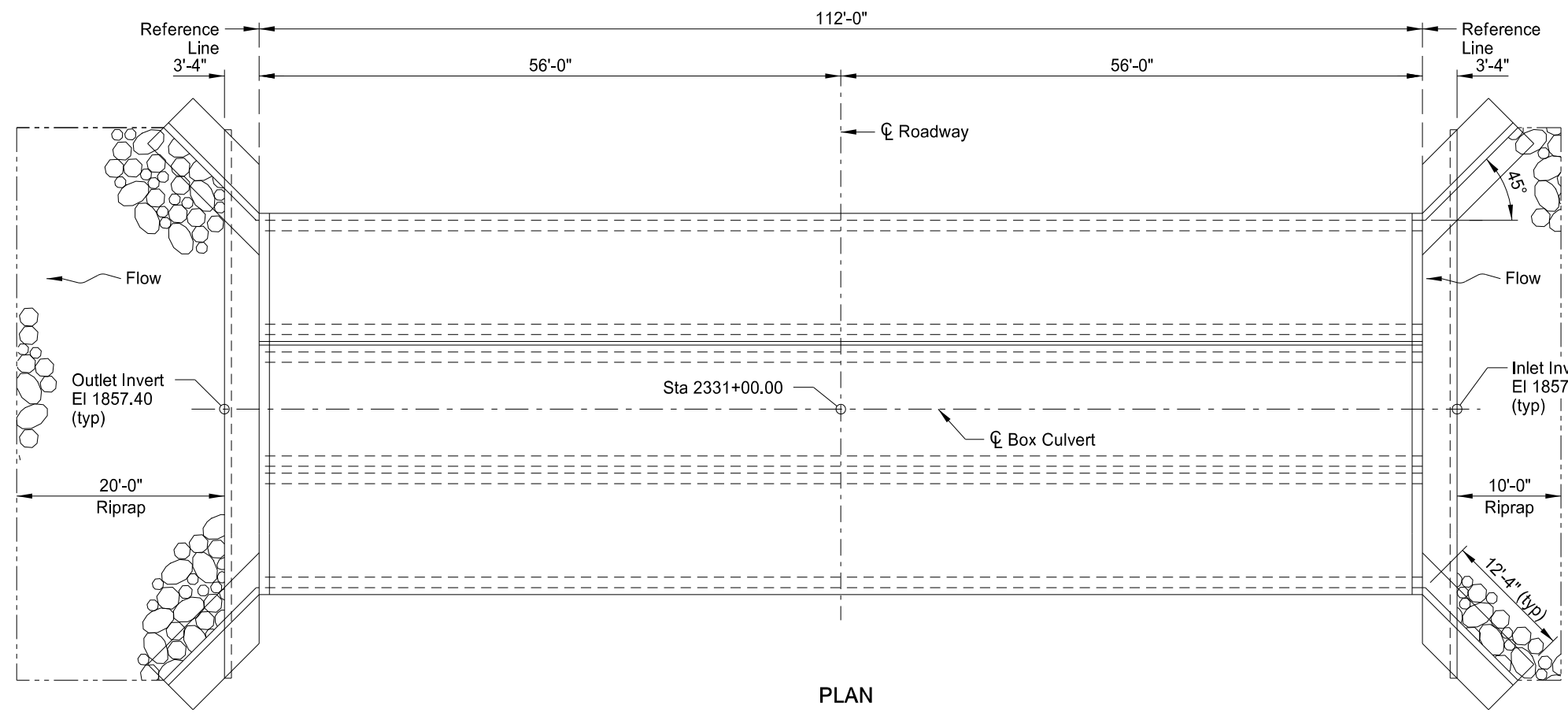


STATE	PROJECT NUMBER	SECTION NO.	SHEET NO.
ND	project number	170	10

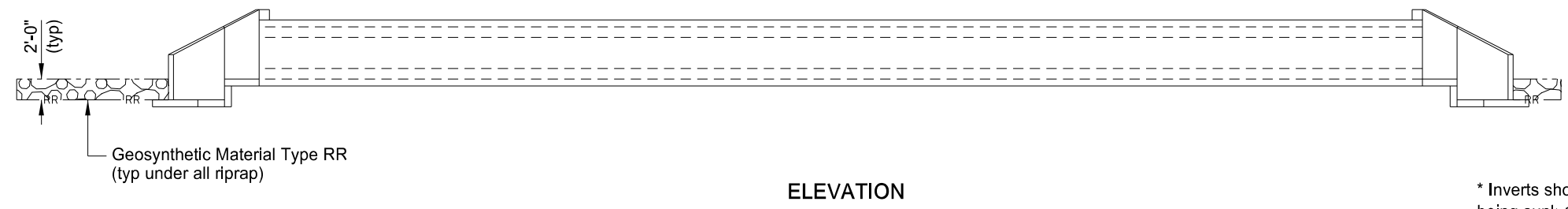


For a single barrel box culvert with 8" thick roof, 8" floor and 8" walls, the following total factored moments and shears would result from the application of the required loads:

FACTORED DESIGN MOMENTS (SINGLE)		FACTORED DESIGN SHEARS (SINGLE)	
WALL MOMENT	1,000 ft-lbs	WALL SHEAR	1,000 lbs
ROOF MOMENTS		ROOF SHEARS	
CORNER	1,000 ft-lbs	CORNER	1,000 lbs
BOTTOM	1,000 ft-lbs	FLOOR SHEARS	
FLOOR MOMENTS		CORNER	1,000 lbs
CORNER	1,000 ft-lbs		
TOP	1,000 ft-lbs		

For a double barrel box culvert with 8" thick roof, 8" floor and 8" walls, the following total factored moments and shears would result from the application of the required loads:

FACTORED DESIGN MOMENTS (DOUBLE)		FACTORED DESIGN SHEARS (DOUBLE)	
WALL MOMENT	1,000 ft-lbs	WALL SHEAR	1,000 lbs
ROOF MOMENTS		ROOF SHEARS	
CORNER	1,000 ft-lbs	CORNER	1,000 lbs
BOTTOM	1,000 ft-lbs	WALL	1,000 lbs
TOP	1,000 ft-lbs	FLOOR SHEARS	
FLOOR MOMENTS		CORNER	1,000 lbs
CORNER	1,000 ft-lbs	WALL	1,000 lbs
TOP	1,000 ft-lbs		
BOTTOM	1,000 ft-lbs		



* Inverts shown include culvert and associated riprap being sunk 1 ft below existing stream bed elevation.

HYDRAULIC DATA:

Drainage Area	9.8	sq mi
Stream Gradient	0.0067	ft/ft
Design Frequency	50	yr
Design Discharge	991	cfs
Design Headwater Stage	1862.38	ft
Design Tailwater Stage	1860.17	ft
Velocity Through Culvert	9.87	fps
100-Year Frequency Discharge	1245	cfs
100-Year Frequency Headwater	1863.18	ft
Overtopping Stage	1867.48	ft
Overtopping Discharge	2243.6	cfs

BOX CULVERT BID ITEMS

SPEC	CODE	ITEM DESCRIPTION	UNIT	QUANTITY
		L SUM		1
202	0105	REMOVAL OF STRUCTURE	EA	1
210	0050	BOX CULVERT EXCAVATION	CY	690
210	0210	FOUNDATION FILL	EA	1
210	0405	FOUNDATION PREPARATION-BOX CULVERT	CY	85
256	0200	RIPRAP GRADE II	LF	112
606	1105	11FT X 5FT PRECAST RCB CULVERT	LF	112
606	3105	DBL 11FT X 5FT PRECAST RCB CULVERT	EA	2
606	7105	DBL 11FT X 5FT PRECAST RCB END SECTION	SY	520
709	0100	GEOSYNTHETIC MATERIAL TYPE G	SY	170
709	0155	GEOSYNTHETIC MATERIAL TYPE RR		

This drawing is preliminary and not for construction or implementation purposes.

SPECIAL PROVISIONS	
SSP 2	MIGRATORY BIRD TREATY ACT
STANDARD DRAWINGS	
D-714-22	
HL-93 DESIGN LOADING	
LOCATION	
CLEAR SPAN 3 x 11' CLEAR HEIGHT 5' MAXIMUM FILL 0' STATION: 2331+00.00	
PRECAST CONCRETE TRIPLE BOX CULVERT LAYOUT	
ND DEPARTMENT OF TRANSPORTATION BRIDGE DIVISION	