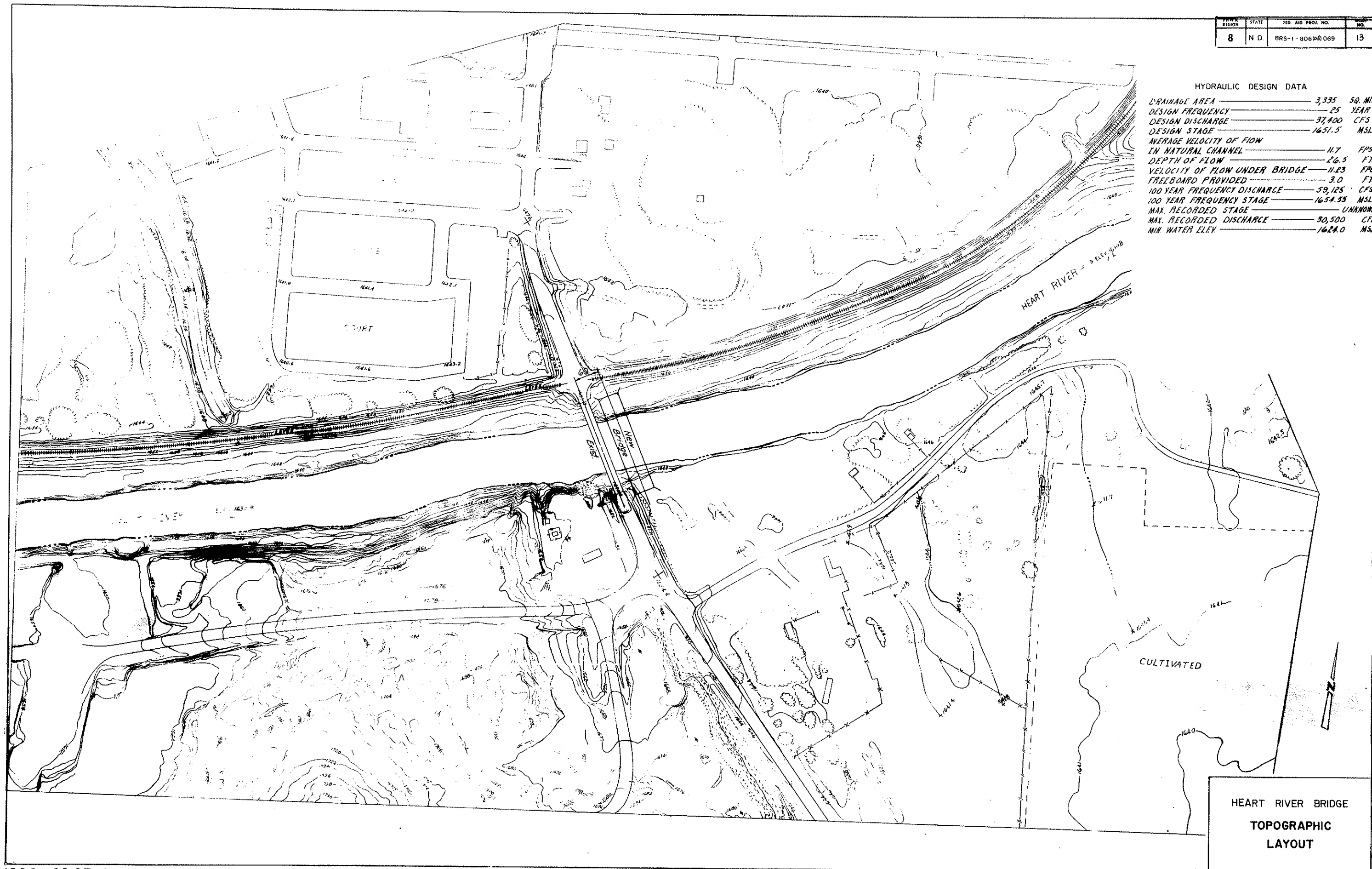


FEDERAL REGION	STATE	FED. AID PROJ. NO.	PROJ. NO.
8	N D.	BRS-1-806(4)069	13

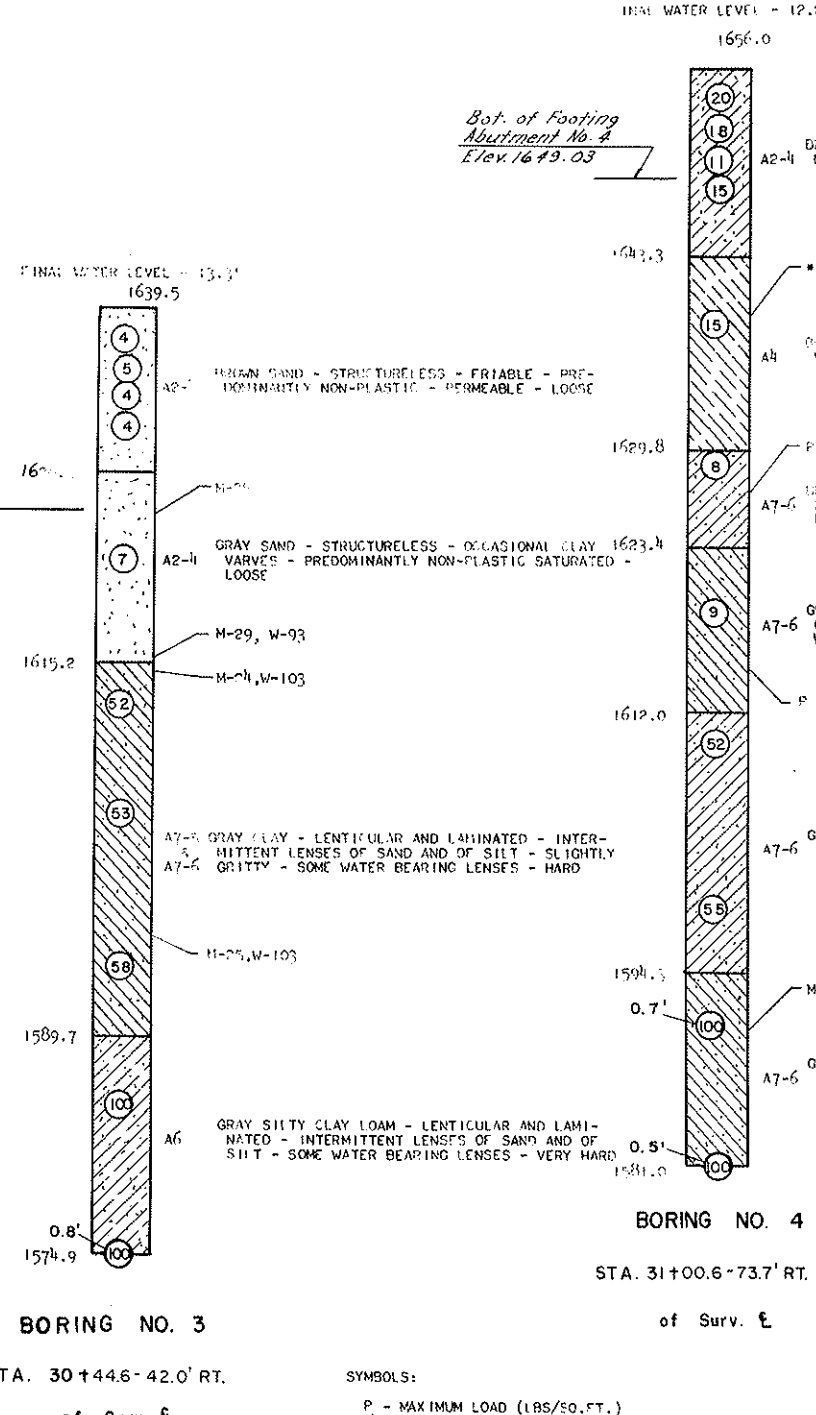
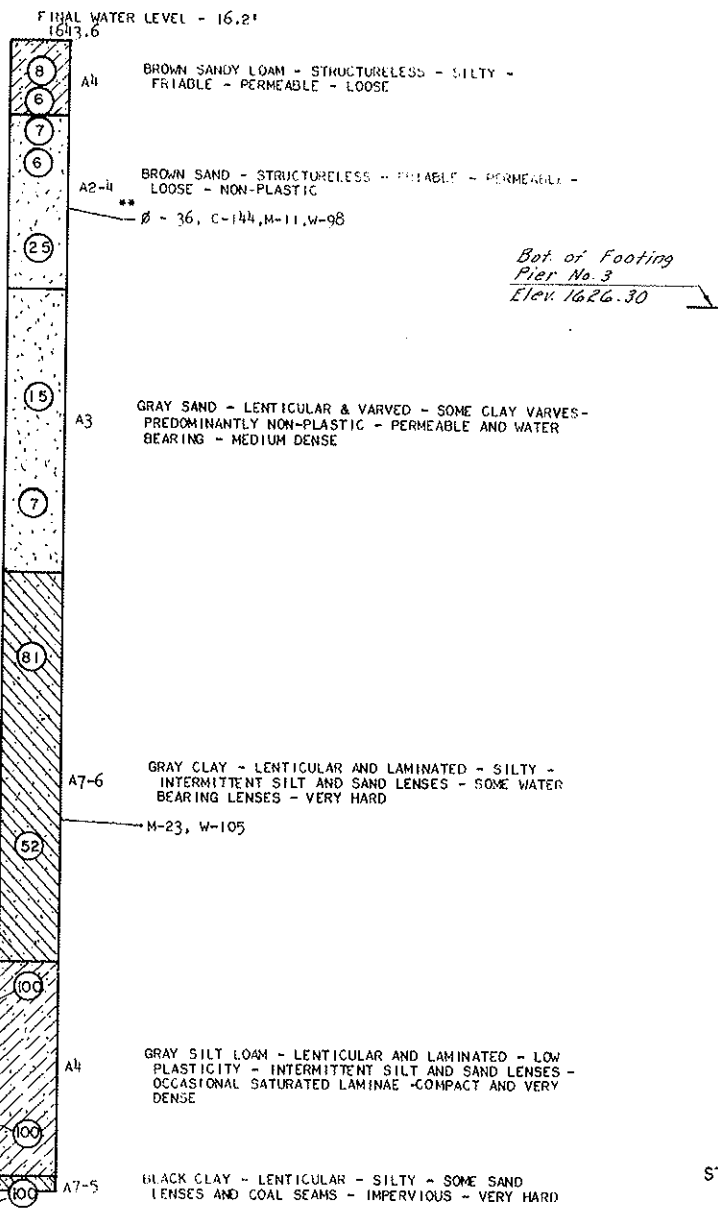
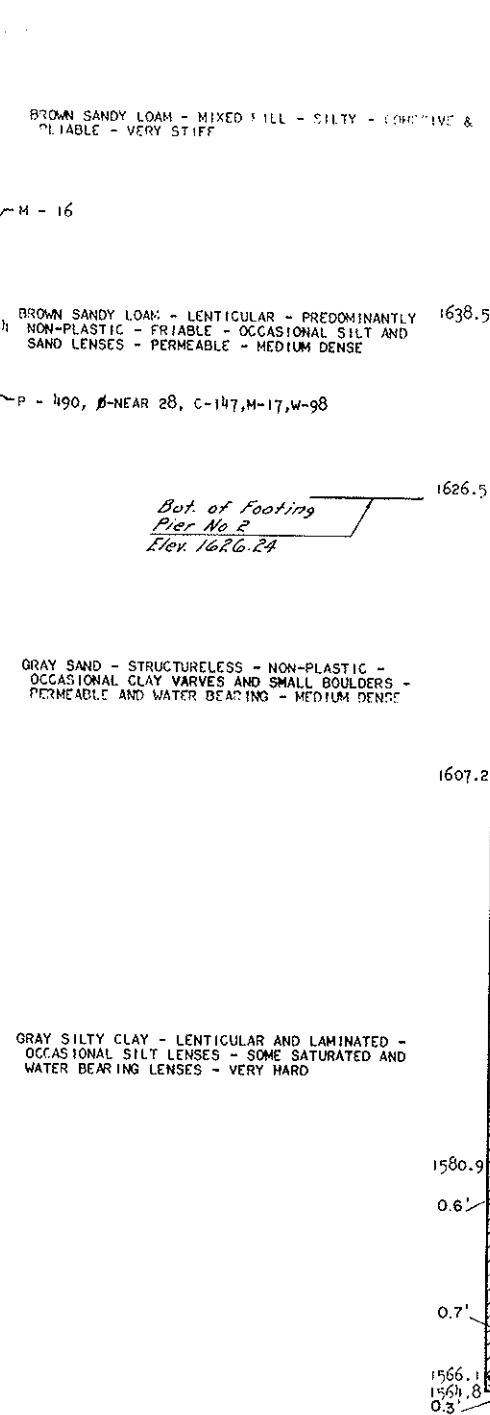
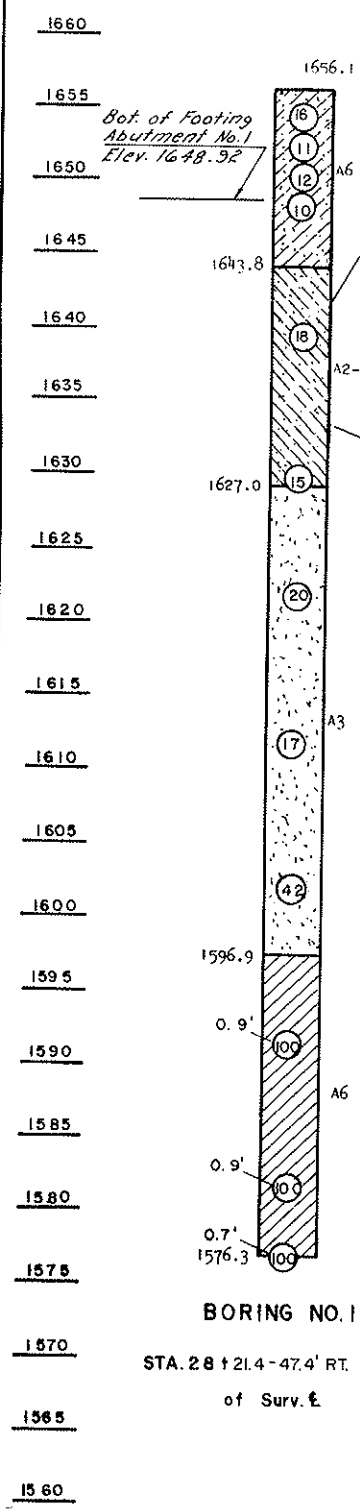
HYDRAULIC DESIGN DATA

DRAINAGE AREA	3,335	SQ. MI.
DESIGN FREQUENCY	25	YEAR
DESIGN DISCHARGE	37,400	CFS
DESIGN STAGE	1651.5	MSL
AVERAGE VELOCITY OF FLOW IN NATURAL CHANNEL	11.7	FPS
DEPTH OF FLOW	26.5	FT
VELOCITY OF FLOW UNDER BRIDGE	11.83	FPS
FREEBOARD PROVIDED	3.0	FT
100 YEAR FREQUENCY DISCHARGE	59,125	CFS
100 YEAR FREQUENCY STAGE	1654.55	MSL
MAX. RECORDED STAGE		UNKNOWN
MAX. RECORDED DISCHARGE	30,500	CFS
MIN. WATER ELEV.	1624.0	MSL



HEART RIVER BRIDGE
TOPOGRAPHIC
LAYOUT

FED. ROAD DIST. NO.	STATE	PROJ. NO.	SHEET NO.	TOTAL SHEETS
8	N. D.	BRS-1-806/51069	14	



SYMBOLS:
P - MAXIMUM LOAD (LBS/SQ. FT.)
 ϕ - ANGLE OF INTERNAL FRICTION (DEGREES)
C - COHESION (LBS/CU. FT.)
M - MOISTURE (PERCENT)
W - DRY WEIGHT (LBS/CU. FT.)
** - TRIAXIAL

NOTES:
ENCIRCLED NUMBERS INDICATE THE NUMBER OF BLOWS DELIVERED BY A 140 LB. HAMMER FROM A HEIGHT OF 30" TO DRIVE CORE TUBE 1.0'.
THE BORING LOG DATA SHOWN IS FOR DESIGN PURPOSES ONLY. THE STATE ASSUMES NO RESPONSIBILITY IF SOIL CONDITIONS ENCOUNTERED DURING CONSTRUCTION DIFFER FROM THOSE SHOWN.

BORING LOG
HEART RIVER BRIDGE
MORTON COUNTY