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Geology of the 241-BX Tank Farm

April 1976

W. H. Price
K. R. Fecht



Environmental Engineering Section
Research Department
Research and Engineering Division

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GEOLOGY OF THE 241-BX TANK FARM

by

W. H. Price
K. R. Fecht

Environmental Engineering Section
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ATLANTIC RICHFIELD HANFORD COMPANY
RICHLAND, WASHINGTON 99352

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GEOLOGY OF THE 241-BX TANK FARM

INTRODUCTION

A series of maps have been compiled to document the structure and stratigraphy of the sediments underlying the high-level radioactive waste storage tank farms located within the Energy Research and Development Administration Hanford Reservation. The primary purpose of these maps is to provide basic geologic information to be utilized to evaluate the impact of suspected and confirmed tank leaks. For convenience of usage map sets for each tank farm have been published in separate document packets (see Table I). The contents of this packet (see Table II) contain maps compiled only for the 241-BX Tank Farm.

TABLE ITANK FARM GEOLOGY DOCUMENTS AVAILABLE
AS OF APRIL, 1976*

<u>Title</u>	<u>Document Number</u>
Geology of the 241-A Tank Farm	ARH-LD-127
Geology of the 241-AX Tank Farm	ARH-LD-128
Geology of the 241-B Tank Farm	ARH-LD-129
Geology of the 241-BX Tank Farm	ARH-LD-130
Geology of the 241-BY Tank Farm	ARH-LD-131
Geology of the 241-C Tank Farm	ARH-LD-132
Geology of the 241-S Tank Farm	ARH-LD-133
Geology of the 241-SX Tank Farm	ARH-LD-134
Geology of the 241-T Tank Farm	ARH-LD-135
Geology of the 241-TX Tank Farm	ARH-LD-136
Geology of the 241-TY Tank Farm	ARH-LD-137
Geology of the 241-U Tank Farm	ARH-LD-138
Generalized Geology of the 241-SY Tank Farm	ARH-LD-139

*Additional documents will be completed as new tank farms are built and well monitoring networks installed.

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TABLE II

241-BX TANK FARM GEOLOGY MAPS

<u>Title</u>	<u>Drawing Number</u>
241-BX Tank Farm Geologic Map Legend and Plot Plan	H-2-38981
241-BX Tank Farm Geologic Characterization Cross Section A-A'	H-2-64993
241-BX Tank Farm Geologic Characterization Cross Section B-B'	H-2-64994
241-BX Tank Farm Geologic Characterization Cross Section C-C'	H-2-64995
241-BX Tank Farm Geologic Characterization Cross Section D-D'	H-2-64996
241-BX Tank Farm Geologic Characterization Cross Section E-E'	H-2-64997
241-BX Tank Farm Geologic Characterization Cross Section F-F'	H-2-64998
241-BX Tank Farm Geologic Characterization Cross Section G-G'	H-2-64999
241-BX Tank Farm Geologic Characterization Cross Section H-H'	H-2-65000
241-BX Tank Farm Geologic Characterization Cross Section I-I'	H-2-65001
241-BX Tank Farm Geologic Characterization Base of Backfill	H-264992

PROCEDURES

During the drilling of 32 dry wells and 4 water wells in and around the 241-BX Tank Farm, sediment samples were collected from one to 5-foot depth intervals. Information utilized to prepare this series of maps was obtained by the analysis of these samples, numbering approximately 800.

Each sediment sample was quantitatively analyzed according to grain size and CaCO_3 content. Size analysis was carried out utilizing a nest of 9 sieves selected for coincidence with the Wentworth (1922) grain size nomenclature (see H-2-38981). The CaCO_3 content of each sample was determined utilizing a semiquantitative CO_2 displacement method (Horwitz, 1970). Size and CaCO_3 data was input into the Rocksan Computer Program (Parr, 1974) which categorized each sediment sample into 1 of 19 classes (classification scheme modified after Folk, 1968; see H-2-38981). After analysis, each sample was visually examined to aid in further characterization. Each sample was subsequently stored in the Hanford Well Library for future reference.

For convenience of usage, the geologic maps were prepared at the same scale (1" = 16') as drawing H-2-36939 (Wells in 241-BX Farm As-built). Steps outlining the preparation of the maps are listed in Figure 1.

GENERALIZED GEOLOGY

Included within this section is a brief discussion of the geology underlying the 241-BX Tank Farm. The stratigraphic descriptions included, along with the Glossary (see page 10), are designed only to provide sufficient information to permit a general understanding of the Tank Farm maps presented. For a more detailed discussion of the regional geologic setting of the 241-BX Tank Farm, the reader is referred to articles listed in the Selected References (see page 12).

The 241-BX Tank Farm is underlain by three major stratigraphic units (see Figure 2); (1) basalt of the Columbia River Group which forms the bedrock beneath the area; (2) semiconsolidated sediments of the Ringold Formation which directly overlie the bedrock; and (3) unconsolidated sand, silt, and gravel, collectively termed glaciofluvial sediments. A more detailed description of the character of these units underlying the Tank Farm follows.

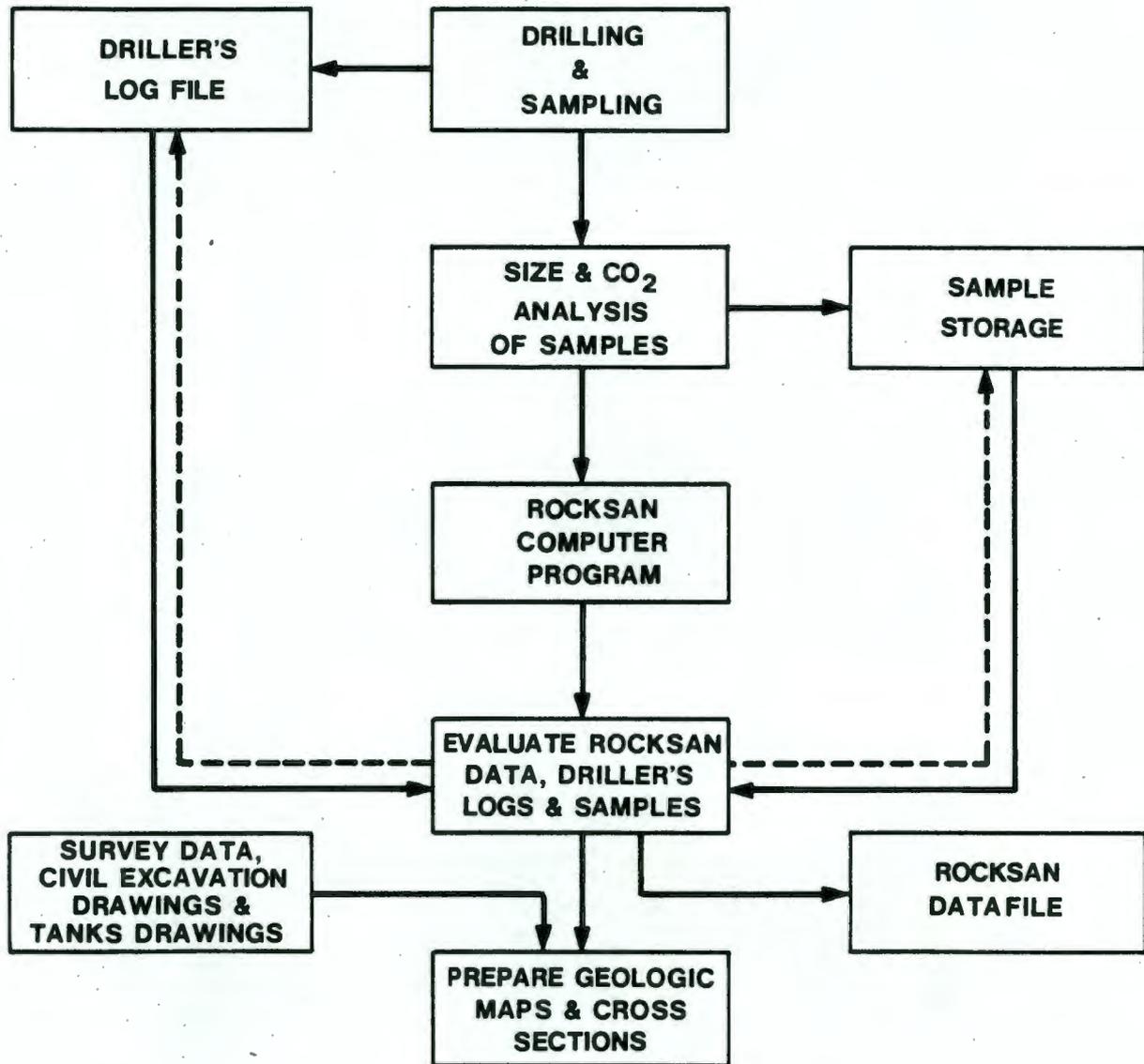


FIGURE 1

STEPS OUTLINING THE PREPARATION OF
TANK FARM GEOLOGY MAPS

ERA	PERIOD	EPOCH	YEARS B. P.	STRATIGRAPHIC NAME AND/OR UNIT	LITHOLOGY DESCRIPTION		
CENOZOIC	QUATERNARY	MODERN	30	BACKFILL	VERY POORLY SORTED GRAVEL, SAND & SILT		
		PLEISTOCENE		GLACIOFLUVIAL SEDIMENTS	FAIRLY WELL SORTED FLUVIAL SAND & SILT WITH SOME GRAVEL		
				EOLIAN SILT	FINE SAND & SILT DERIVED FROM THE UPPER RINGOLD		
	TERTIARY	PLIOCENE	1,000,000	RINGOLD FORMATION	UPPER RINGOLD	WELL SORTED FLUVIAL OR LACUSTRINE SILT & SAND WITH SOME CALCAREOUS LAYERS	
				MIDDLE RINGOLD	FLUVIAL GRAVEL & SAND VARIABLY CEMENTED WITH CALCIUM CARBONATE & SILICA		
		MIOCENE		11,000,000	COLUMBIA RIVER BASALT GROUP	ELEPHANT MOUNTAIN MEMBER	DENSE BLACK EXTRUSIVE IGNEOUS ROCK, MICRO VESICULAR, BRICK BAT ENTABLATURE & NO COLUMNADE
					RATTLESNAKE RIDGE MEMBER	TUFFACEOUS SANDSTONE	
					POMONA MEMBER	DENSE BLACK EXTRUSIVE IGNEOUS ROCK, SCATTERED OLIVINE PHENOCRYSTS, UPPER & SOMETIMES BASAL ENTABLATURE WELL DEVELOPED, FAN JOINTING IN COLUMNADE	

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FIGURE 2

GENERALIZED STRATIGRAPHIC COLUMN FOR
THE 200 AREA TANK FARMS

COLUMBIA RIVER BASALT GROUP

About 20 million years ago a series of fissures opened around the periphery of the subsiding Pasco Basin and large volumes of basaltic lava poured out over the land surface. The highly fluid lava was extruded intermittently from these fissures until approximately 8 million years ago. At the cessation of Columbia River Basalt volcanism, the basin had been filled with more than 12,000 feet of basalt.

The surface of the Columbia River Basalt lies beneath 241-BX Yank Farm at an elevation of 378 feet (all elevations based on feet above mean sea level measured at approximate center of Tank Farm).

RINGOLD FORMATION

Following the cessation of Columbia River Basalt volcanism the ancestral Columbia River transported sediments from the surrounding highlands into the Pasco Basin where they accumulated to form the Ringold Formation. Beneath the Hanford Reservation, this formation is up to 1200 feet thick and can generally be divided into three units on the basis of lithology; the clays and silts of the lower Ringold unit; the pebbles and cobbles of the middle Ringold unit; and the silts and fine sands of the upper Ringold unit.

Within the region beneath 241-BX Tank Farm, the lower and upper Ringold units are missing. The total thickness of the middle Ringold unit present is approximately 48 feet.

Middle Ringold

Beneath the 241-BX Tank Farm, middle Ringold unit lies unconformably on the Columbia River Basalt and dips about one degree to the southeast. The unit consists predominantly of well-rounded pebbles and cobbles with the interstitial spaces filled with very coarse to coarse sand. Table III summarizes the grain size and CaCO_3 values of the middle Ringold sediments.

TABLE III

TYPICAL GRAIN SIZE AND CALCIUM CARBONATE
VALUES FOR MIDDLE RINGOLD LITHOLOGY
BENEATH 241-BX TANK FARM

Lithology	%Pebbles & Cobbles	% Sand					%Silt & Clay	%CaCO ₃
		Very Coarse	Coarse	Medium	Fine	Very Fine		
Silty Sandy Coarse to Very Fine Pebble to Pebbly Silty Very Coarse to Coarse Sand	32	23	17	10	6	4	8	0-12

GLACIOFLUVIAL DEPOSITS

During the close of the Ice Age, approximately 20,000 years ago, a continental ice sheet covered much of northern Washington. As the ice sheet retreated northward, the breakup of ice dams resulted in catastrophic floods in which large volumes of glacial meltwater were released. During one of these floods, over 500 cubic miles of water is estimated to have poured into the Pasco Basin at a rate of more than 9 cubic miles of water per hour. Sediments deposited within the basin by such flooding now comprise the glaciofluvial unit. The characteristic variability of sediment size and degree of sorting within this unit can be attributed to changes in water velocity and water level which occurred during the flooding process.

Glaciofluvial deposits are found beneath the 241-BX Tank Farm between elevations 426 and 614 feet. The 188-foot thick section of these deposits consists predominantly of very coarse to medium sand with some silt and pebbles. Table IV summarizes the grain size and CaCO₃ values of the glaciofluvial sediments.

CLASTIC DIKES

Throughout the Pasco Basin, clastic dikes are found cross-cutting the Ringold Formation and glaciofluvial sediments. These dikes, which range from a few inches to several feet in width, are known to exist to depths of more than 100 feet below the ground surface. Generally, the dikes are

composed of fine silts to coarse sands. The origin of the clastic dikes is still in refute and will not be discussed here (see Selected References). Identification of clastic dikes by drilling is difficult and although some dikes were detected in the 241-BX Tank Farm, they could not be mapped.

TABLE IV

TYPICAL GRAIN SIZE AND CALCIUM CARBONATE VALUES
FOR MAJOR GLACIFLUVIAL LITHOLOGIES
BENEATH 241-BX TANK FARM

Lithology	%Pebbles & Cobbles	% Sand					%Silt & Clay	%CaCO ₃
		Very Coarse	Coarse	Medium	Fine	Very Fine		
Slightly Pebbly Very Coarse to Coarse Sand to Very Coarse to Coarse Sand	5	26	41	15	6	3	4	1.2
Coarse to Medium Sand	3	15	37	26	10	4	5	0.8
Slightly Silty Very Coarse to Coarse Sand to Slightly Pebbly Slightly Silty Very Coarse to Coarse Sand	5	23	24	17	13	6	12	1.0

BACKFILL MATERIAL

In preparation for tank construction, glaciofluvial material was excavated at the 241-BX Tank Farm site. This material, consisting predominantly of cobbles, pebbles, and coarse to medium sands with some silt, was subsequently used as backfill from the base of the completed tanks (614 feet) to the ground surface (656 feet). An inherent characteristic of the backfill is its poor sorting. Grain size and CaCO₃ values for the backfill are found in Table V.

WATER TABLE

The water table beneath the 241-BX Tank Farm is located within the middle Ringold unit at an elevation of 403 feet, 211 feet below the base of the tanks. For further information concerning contours on the water table beneath 200 East Area the reader is referred to drawings H-2-38398 (200 East Area Water Table Map) and H-2-38399 (200 East Area Depth to Water Map).

TABLE V

TYPICAL GRAIN SIZE AND CALCIUM CARBONATE VALUES
FOR THE 241-BX TANK FARM BACKFILL

<u>Lithology</u>	<u>%Pebbles & Cobbles</u>	<u>% Sand</u>					<u>%Silt & Clay</u>	<u>%CaCO₃</u>
		<u>Very Coarse</u>	<u>Coarse</u>	<u>Medium</u>	<u>Fine</u>	<u>Very Fine</u>		
Silty Sandy Gravel to Sand Gravel	28	20	18	11	8	7	8	1.3

GLOSSARY

Basalt. Fine-grained, dark-colored, extrusive igneous rock.

Calcareous. Containing calcium carbonate.

Caliche. Gravel, sand, or silt cemented by calcium carbonate.

Cement. Chemically precipitated material occurring in the interstices between particles of gravel, sand, or silt.

Clastic. A textural term applied to rocks composed of fragmental material derived from pre-existing rocks.

Clastic dike. A tabular body of clastic material transecting the bedding of a sedimentary formation, representing extraneous material that has invaded the containing formation along a crack.

Dip. The angle at which a stratum or any planar feature is inclined from the horizontal.

Eolian. A formation formed by, or deposited from, the wind or currents of air.

Fluvial. Produced by the action of a river or stream.

Formation. The ordinary unit of geologic mapping consisting of a large and persistent stratum of some one kind of rock.

Glaciofluvial. Pertaining to streams flowing from glaciers or to the deposits made by such streams.

Grain. The particles or discrete crystals which comprise a rock or sediment.

Group. A local or provincial subdivision of a series, based on lithologic features and contains two or more formations.

Lacustrine. A formation deposited in a lake environment.

Lava. Fluid rock such as that which issues from a volcano or a fissure in the earth's surface and the same material solidified by cooling.

Lithology. The description of rocks or sediments on the basis of such characteristics as color, mineralogic composition and grain size.

Sediment. Descriptive term for gravel, sand, and silt transported from their sources and deposited by air, water, or ice.

Sieve. A utensil having many small perforated openings, used to separate fine particles from coarser ones.

Siliceous. Containing silica.

Silt. Fine grained material between sand and clay in size.

Sorting. The grain size range of the sediments.

Stratigraphy. The part of descriptive geology of an area that pertains to the discrimination, character, thickness, sequence, age and correlation of the sediments and rocks of the area.

Subaerial. Formed, existing, or taking place on the land surface.

Unconformity. A surface of erosion or nondeposition that separates younger strata from older strata.

Water table. The upper surface of a zone of saturation except where that surface is formed by an impermeable body.

Winnowing. Separation of fine particles from coarser ones by wind action.

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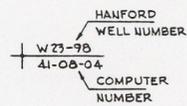
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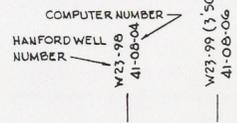
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1- WELL DESIGNATION
WELL NUMBERS PREFIXED BY 299-
PLOT PLAN VIEW



CROSS-SECTION VIEW



SOLID LINE ON CROSS-SECTION.
DASHED LINE WHEN PROJECTED TO
CROSS-SECTION; DISTANCE AND
DIRECTION FROM CROSS-SECTION
ARE GIVEN.

2- COORDINATES
BASED ON HANFORD COORDINATE SYSTEM.

3- PLANE OF CROSS-SECTION
PLOT PLAN VIEW



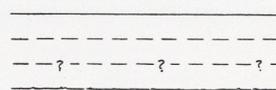
CROSS-SECTION VIEW



4- TANK DESIGNATION
TANKS PREFIXED BY 241-

5- CONTACT BETWEEN LITHOLOGIES

SOLID LINE WHERE ACCURATELY KNOWN
DASHED LINE IF APPROXIMATELY KNOWN
QUERIED DASHED LINE WHERE INFERRED
BASE OF BACKFILL



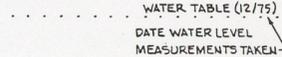
6- LENSES OR STRINGERS

DISCONTINUOUS SEDIMENTS LESS THAN TWO FEET THICK
DISCONTINUOUS SEDIMENTS GREATER THAN TWO FEET THICK



7- WATER TABLE

CROSS-SECTION VIEW
DATUM - MEAN SEA LEVEL



8- HORIZONTAL AND VERTICAL SCALES

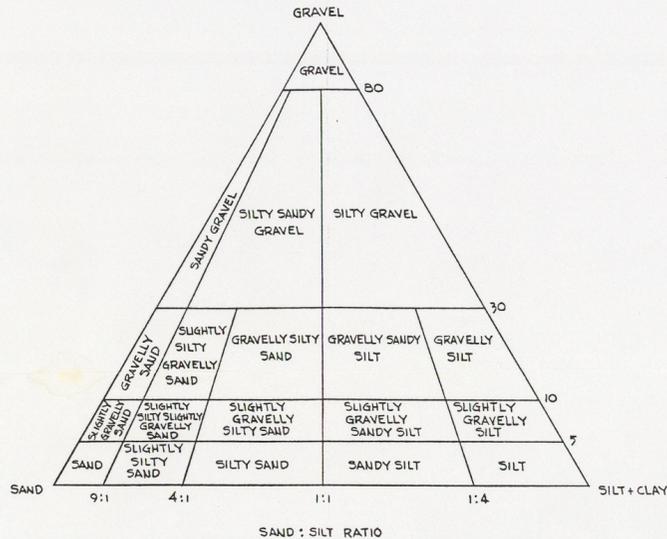
VERTICAL EXAGGERATION - 1X
VERTICAL SCALE - FEET ABOVE MEAN SEA LEVEL



9- SEDIMENT DESCRIPTION

SEDIMENTS BENEATH THE TANK FARMS ARE CLASSIFIED ON THE BASIS OF ONE OF NINETEEN SEDIMENT TYPES (SEDIMENT CLASSIFICATION). FURTHER DETAIL IS GIVEN USING MODIFIERS FROM THE GRAIN SIZE NOMENCLATURE. SEDIMENTS WITH CHEMICALLY PRECIPITATED MATERIALS OCCURRING IN THE INTERSTICES BETWEEN GRAINS ARE PREFIXED BY THE TERM CEMENTED. SEDIMENTS WITH GREATER THAN 10% CALCIUM CARBONATE ARE PREFIXED BY THE MODIFIER CALCAREOUS. SEDIMENTS CONTAINING SILICA IN THE INTERSTICES BETWEEN GRAINS ARE MODIFIED BY THE TERM SILICEOUS.

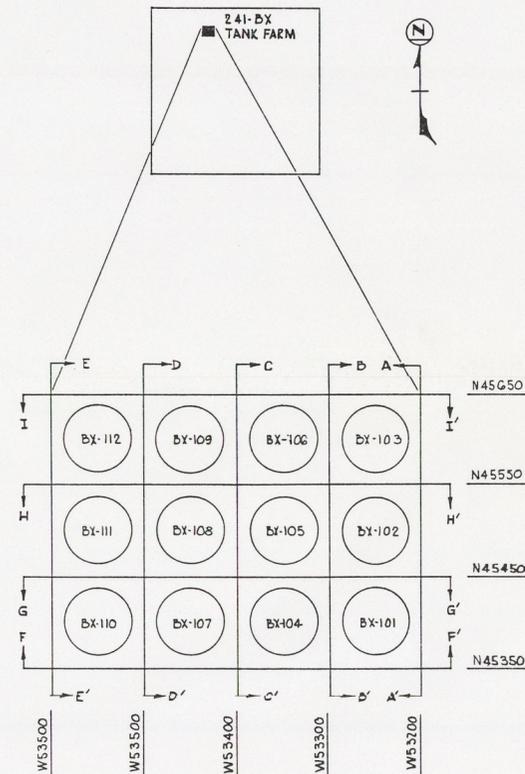
SEDIMENT CLASSIFICATION (MODIFIED AFTER R.L.FOLK, 1968)



GRAIN SIZE NOMENCLATURE (MODIFIED AFTER C.K.WENTWORTH, 1922)

PARTICLE DESIGNATION		PARTICLE DIAMETER (MM)	
GRAVEL	BOULDER	> 256	
	COBBLE	LARGE	256 - 128
		SMALL	128 - 64
	PEBBLE	VERY COARSE	64 - 32
		COARSE	32 - 16
MEDIUM		16 - 8	
FINE		8 - 4	
SAND	VERY FINE	4 - 2	
	VERY COARSE	2 - 1	
	COARSE	1 - 0.5	
	MEDIUM	0.5 - 0.25	
SILT + CLAY	FINE	0.25 - 0.125	
	VERY FINE	0.125 - 0.0625	
		< 0.0625	

200 EAST AREA

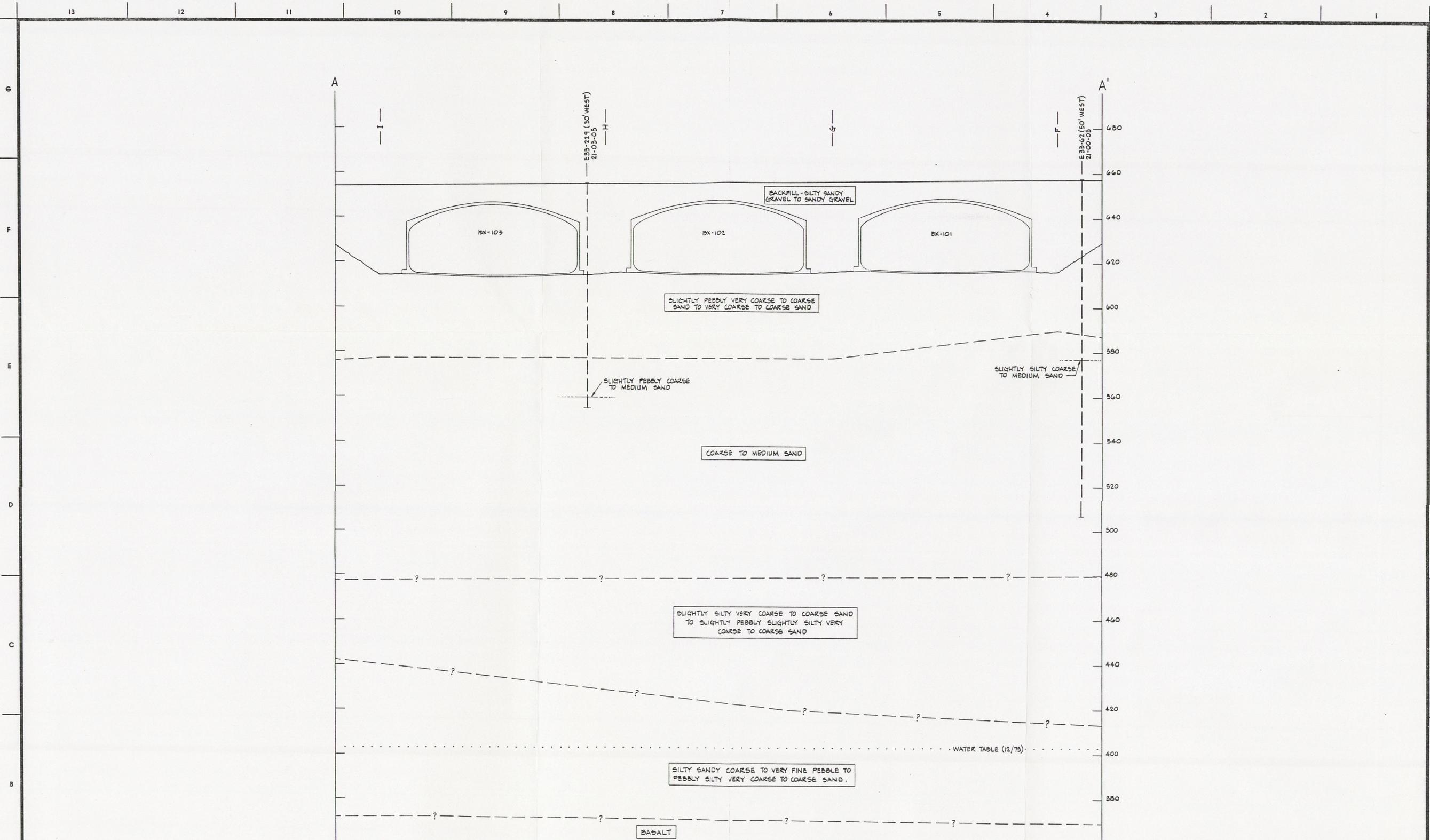


GRAIN SIZE NOMENCLATURE (MODIFIED AFTER C.K.WENTWORTH, 1922)

PARTICLE DESIGNATION		PARTICLE DIAMETER (MM)	
GRAVEL	BOULDER	> 256	
	COBBLE	LARGE	256 - 128
		SMALL	128 - 64
	PEBBLE	VERY COARSE	64 - 32
		COARSE	32 - 16
MEDIUM		16 - 8	
FINE		8 - 4	
SAND	VERY FINE	4 - 2	
	VERY COARSE	2 - 1	
	COARSE	1 - 0.5	
	MEDIUM	0.5 - 0.25	
SILT + CLAY	FINE	0.25 - 0.125	
	VERY FINE	0.125 - 0.0625	
		< 0.0625	

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241-BX TANK FARM GEOLOGIC MAP LEGEND AND PLOT PLAN		
SCALE: NONE	PROJECT NO.: CK-0065	PROJECT TITLE: GEOLOGIC CHARACTERIZATION
CLASSIFIED BY: NOT REQUIRED	DATE: 241-BX	INDEX NO.: 0000
CLASSIFICATION: NONE	DATE: H-238981	INDEX NO.: - -

REV. NO.	REV. DATE	DESCRIPTION
0		REFERENCE DRAWINGS
		COMMENT PRT ISSUE NO. DATE CHECK PRT ISSUE NO. DATE
		DRAWING STATUS

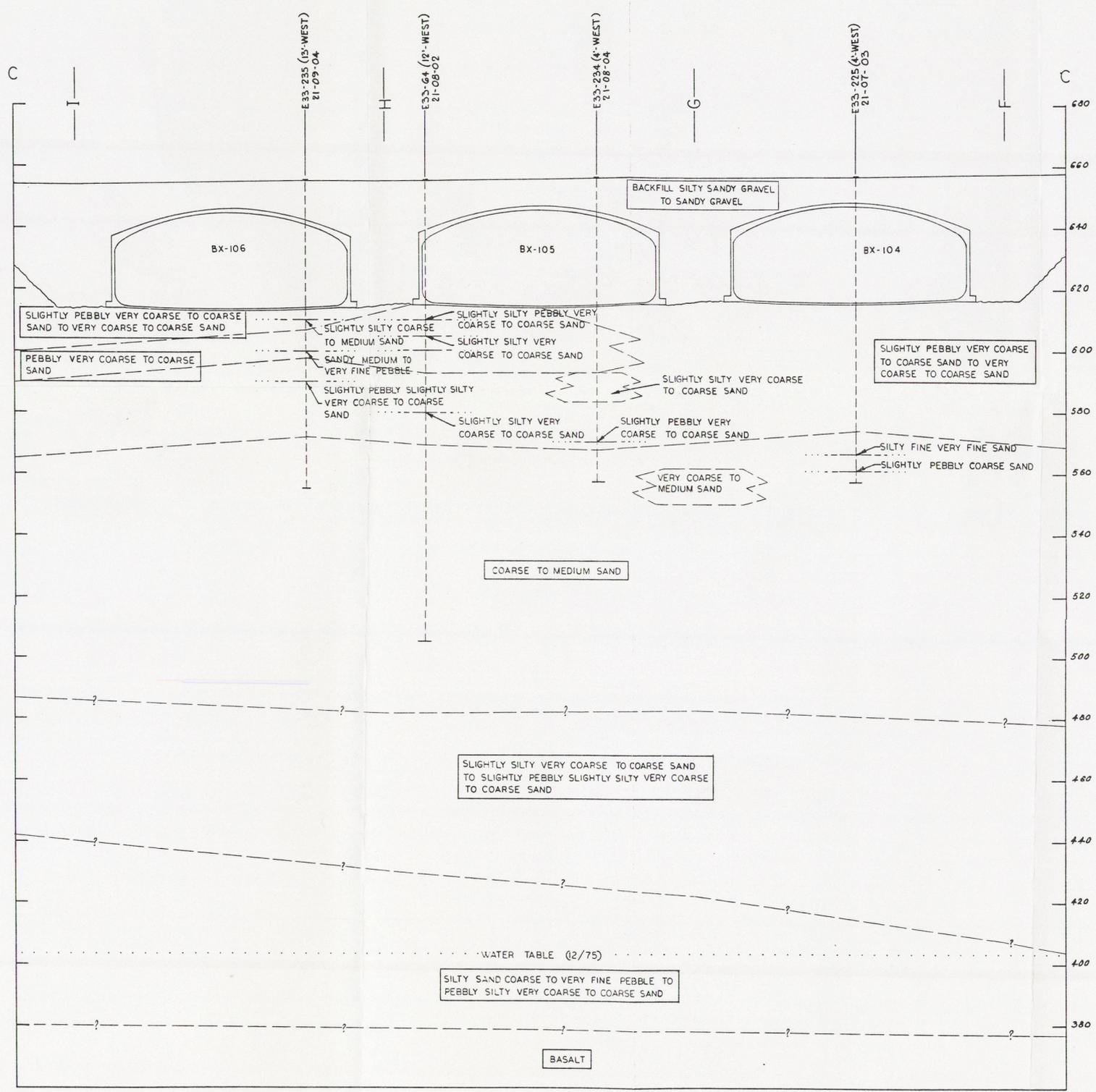


CROSS SECTION A-A'

REV. NO.	REV. DATE	DESCRIPTION

APPD. FOR CONFORMANCE WITH DESIGN CRITERIA BY: <i>KR FEIST</i> DATE: <i>2/24/75</i> FOR: <i>ADHCO</i>		ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE	
DRAWN: <i>D.L. FORT</i> DATE: <i>2/19/75</i> SCALE: 1" = 16'-0"		VITRO ENGINEERING - architects - engineers a division of AUTOMATION INDUSTRIES, INC.	
PROJECT TITLE: 241-BX TANK FARM GEOLOGIC CHARACTERIZATION		PROJECT TITLE: TANK FARM GEOLOGIC CHARACTERIZATION	
CLASSIFIED BY: NOT RECD DATE:		PROJECT NO.: 241-BX DRAWING NO.: 0402.0501	
NEXT USED ON:		CLASSIFICATION: NONE H-2-64993	

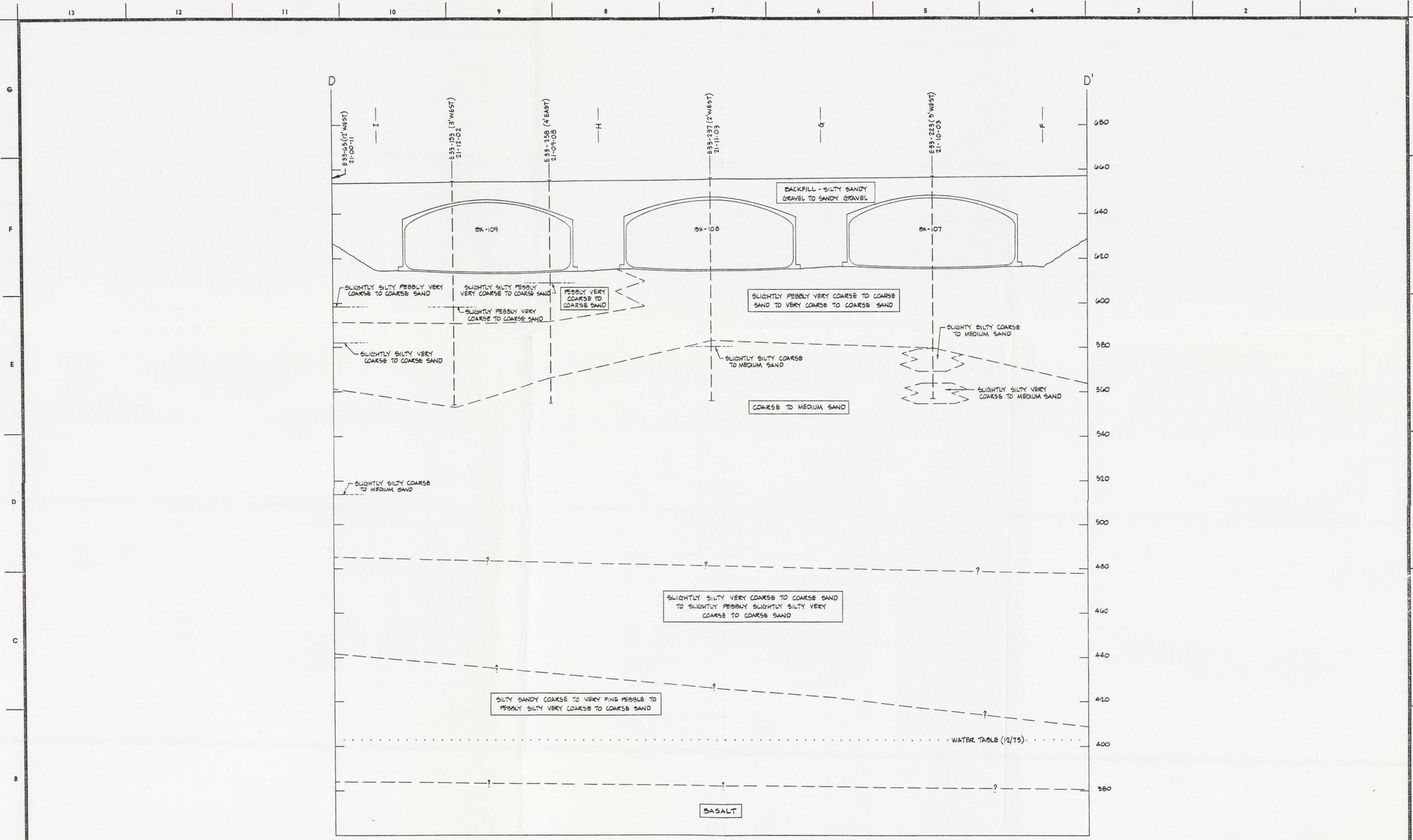
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CROSS SECTION C-C'

REV. NO.	DATE	DESCRIPTION

APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA	DATE	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE
BY: <i>[Signature]</i>	2/21/76	VITRO ENGINEERING - architects & engineers a division of AUTOMATION INDUSTRIES, INC.
FOR: <i>[Signature]</i>		241-BX TANK FARM
APP'D: <i>[Signature]</i>		GEOLOGIC CHARACTERIZATION
ENGR. D. LIEN		CROSS SECTION C-C'
QA APP'D: <i>[Signature]</i>		PROJECT NO. C-0006 PROJECT TITLE: TANK FARM
CHECKED: <i>[Signature]</i>		NO. NO. C-0006B GEOLOGIC CHARACTERIZATION
		DWG. NO. 241-BX INDEX NO. 0402_0501
		CLASSIFICATION
		DWG. NO. H-2-64995



CROSS SECTION D-D'

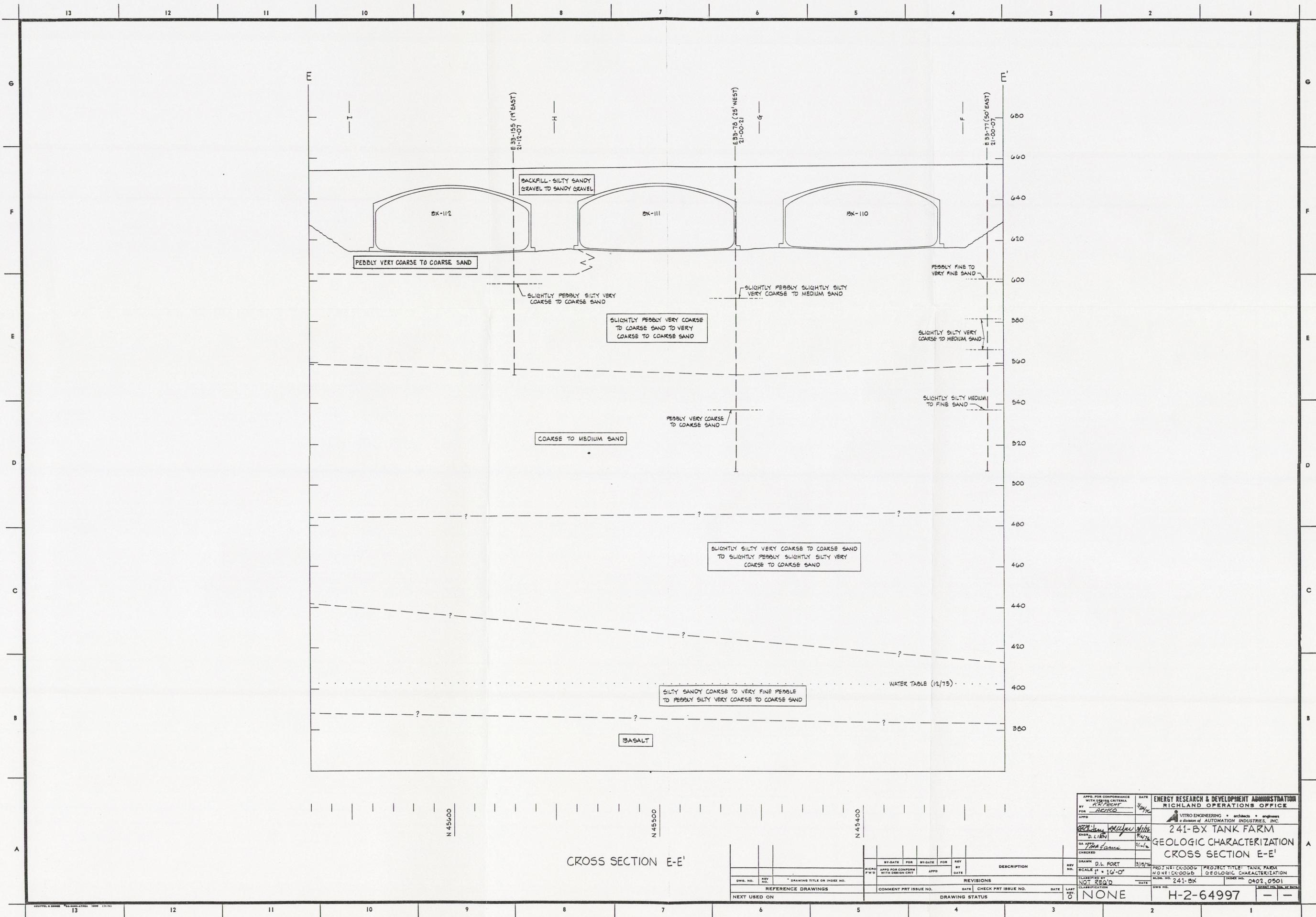
APPROVED FOR PERFORMANCE WITH DESIGN CRITERIA		DATE	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION	
BY: <i>[Signature]</i>		3/21/76	RICHLAND OPERATIONS OFFICE	
FOR: <i>[Signature]</i>			VITRO ENGINEERING, ARCHITECTS & ENGINEERS	
APPD:			A DIVISION OF AUTOMATION INDUSTRIES, INC.	
APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA		DATE	241-BX TANK FARM	
BY: <i>[Signature]</i>		3/21/76	GEOLOGIC CHARACTERIZATION	
FOR: <i>[Signature]</i>			CROSS SECTION D-D'	
APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA		DATE	PROJECT TITLE: TANK FARM	
BY: <i>[Signature]</i>		3/21/76	GEOLOGIC CHARACTERIZATION	
FOR: <i>[Signature]</i>			PROJECT NO. CK0006	
APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA		DATE	SHEET NO. 241-BX	
BY: <i>[Signature]</i>		3/21/76	INDEX NO. 0402.0501	
FOR: <i>[Signature]</i>			CLASSIFICATION	
APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA		DATE	NONE	
BY: <i>[Signature]</i>			H-2-64996	
FOR: <i>[Signature]</i>				

BY	DATE	FOR	BY	DATE	DESCRIPTION	REV. NO.

DWG. NO.	REV. NO.	DESCRIPTION	DATE	CHECK PRT. ISSUE NO.	DATE	LAST

REFERENCE DRAWINGS	COMMENT PRT. ISSUE NO.	DATE	CHECK PRT. ISSUE NO.	DATE	LAST

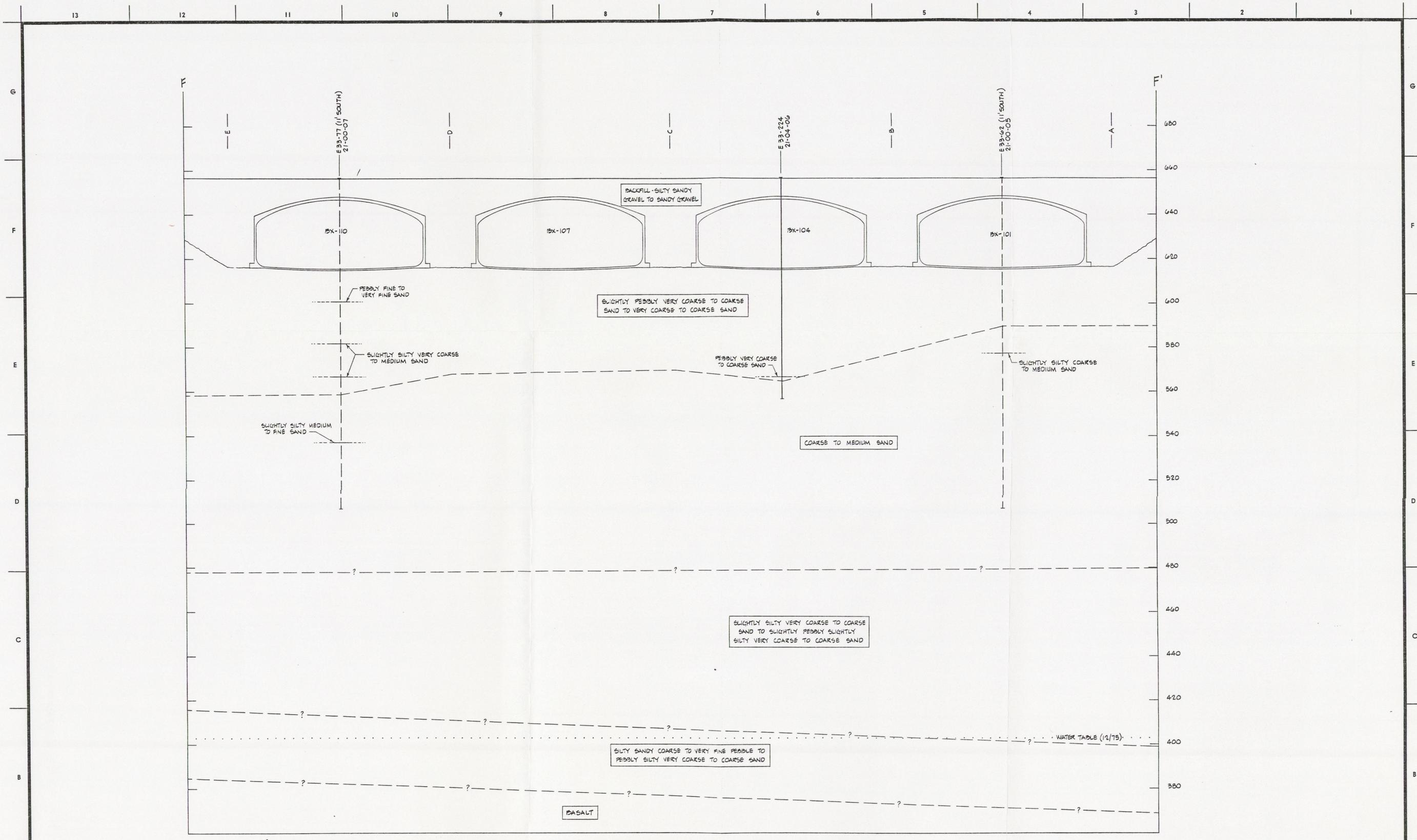
NEXT USED ON	DRAWING STATUS



CROSS SECTION E-E'

BY	DATE	FOR	BY	DATE	FOR	REV	DATE	DESCRIPTION

APP'D FOR CONFORMANCE WITH DESIGN CRITERIA FOR BEHCO ENGR. D. LIBBY DATE 3/15/76 CHECKED LIBBY	DATE 3/15/76 PROJECT NO. CK0006 SHEET NO. 241-BX INDEX NO. 0402, 0501	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE A DIVISION OF AUTOMATION INDUSTRIES, INC. 241-BX TANK FARM GEOLOGIC CHARACTERIZATION CROSS SECTION E-E'
DRAWN D.L. FORT SCALE 1" = 16'-0" CLASSIFIED BY NOT READ CLASSIFICATION NONE	PROJECT TITLE: TANK FARM GEOLOGIC CHARACTERIZATION SHEET FOR JOB BY DATE	H-2-64997



CROSS SECTION F-F'

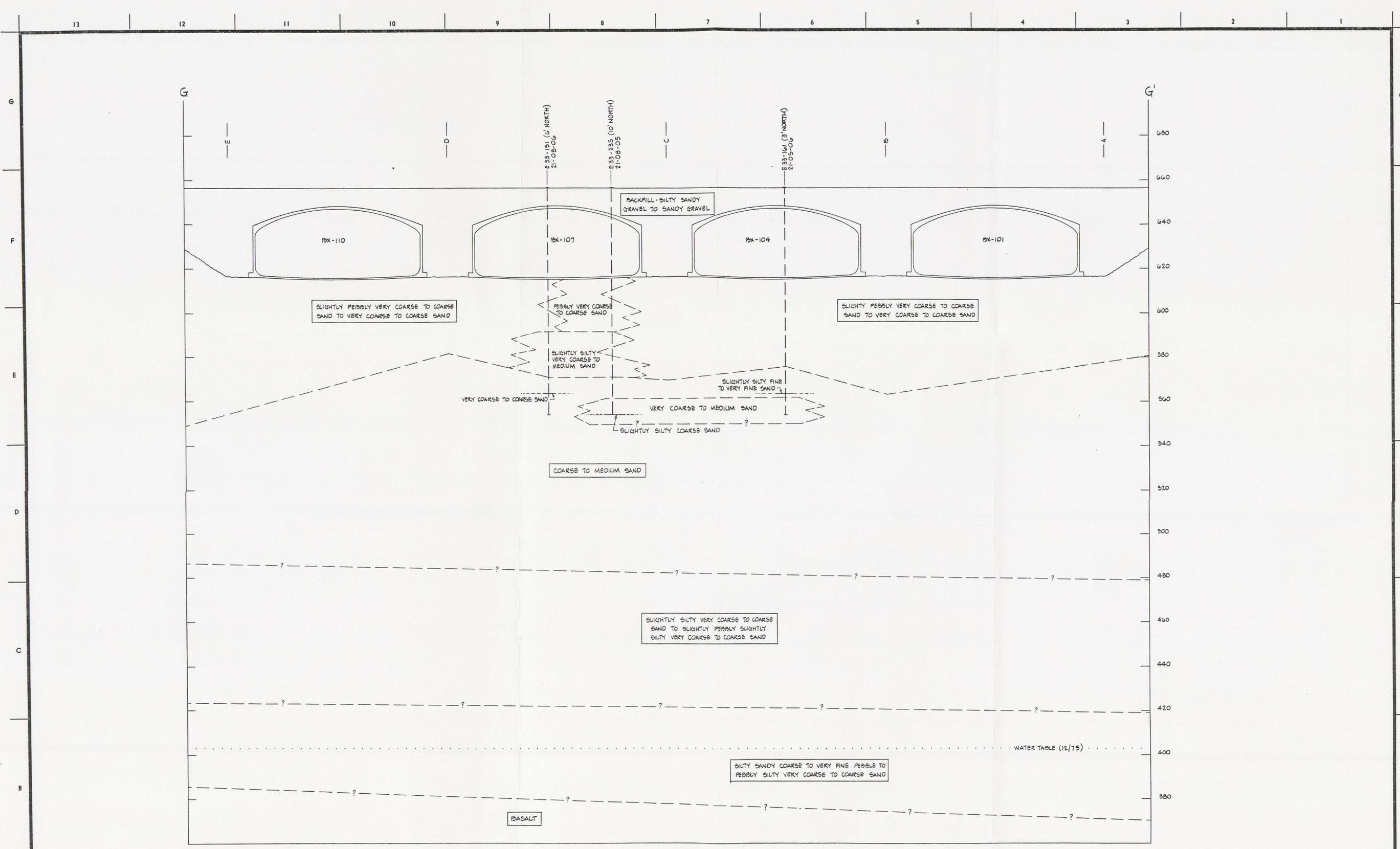
W 53600 W 53500 W 53400 W 53300 W 53200

BY-DATE	FOR	BY-DATE	FOR	REV	DESCRIPTION

APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA BY: <i>[Signature]</i> DATE: 3/1/76	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE
APPROVED FOR CONFORM WITH DESIGN CRT BY: <i>[Signature]</i> DATE: 3/1/76	VITRO ENGINEERING - architects - engineers a division of AUTOMATION INDUSTRIES, INC.
PROJECT: 241-BX TANK FARM	PROJECT TITLE: TANK FARM
CROSS SECTION F-F'	GEOLOGIC CHARACTERIZATION
CLASSIFIED BY: NOT RECD	BLDG. NO. 241-BX
INDEX NO. 0402_0501	DATE: 3/1/76
CLASSIFICATION: NONE	DWG. NO. H-2-64998

DWG. NO.	REV. NO.	REFERENCE DRAWINGS	COMMENT PRT ISSUE NO.	DATE	CHECK PRT ISSUE NO.	DATE	DRAWING STATUS

NEXT USED ON



CROSS SECTION G-G'

W 533600

W 533500

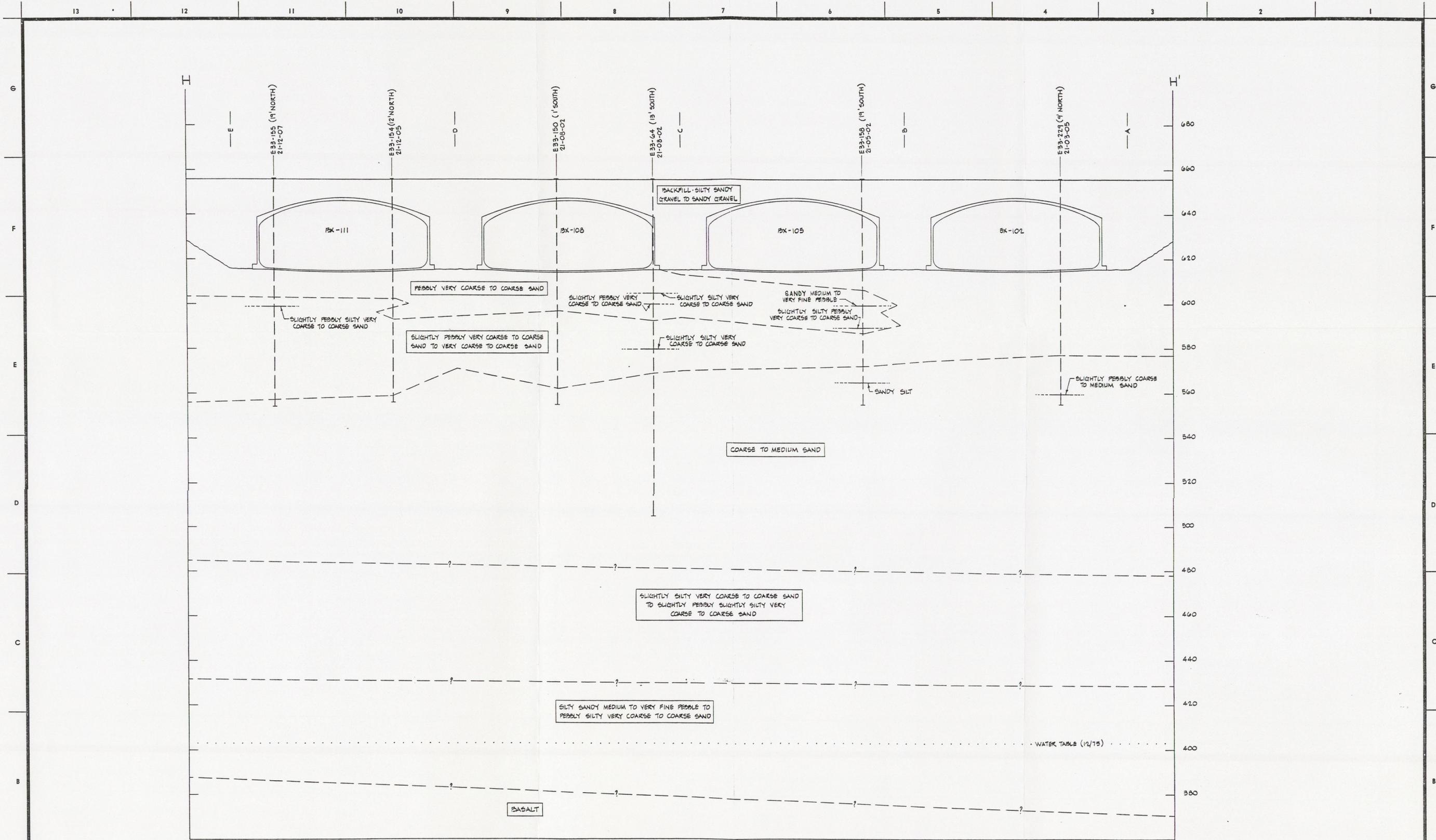
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W 53300

W 53200

DWS. NO.		REV. NO.		DRAWING TITLE OR INDEX NO.		REFERENCE DRAWINGS		COMMENT PRT. ISSUE NO.		DATE		CHECK PRT. ISSUE NO.		DATE		LST. REV.		DRAWING STATUS	
NEXT USED ON																			

APPD. FOR CONFORMANCE WITH DESIGN CRITERIA	DATE	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE	
BY: <i>[Signature]</i>	3/24/70	VITRO ENGINEERING & ARCHITECTS - ENGINEERS A DIVISION OF AUTOMATION INDUSTRIES, INC.	
APPD. FOR CONFORMANCE WITH DESIGN CRT		241-BX TANK FARM	
BY: <i>[Signature]</i>	3/14/70	GEOLOGIC CHARACTERIZATION	
BY: <i>[Signature]</i>	1/16/71	CROSS SECTION G-G'	
CHECKED		PROJECT TITLE: TANK FARM	
		GEOLOGIC CHARACTERIZATION	
		BLDG. NO. 241-BX	
		INDEX NO. 0402.0501	
		DWS. NO. H-2-64999	
		SHEET NO. OF 01	



CROSS SECTION H-H'

W 53300

W 53300

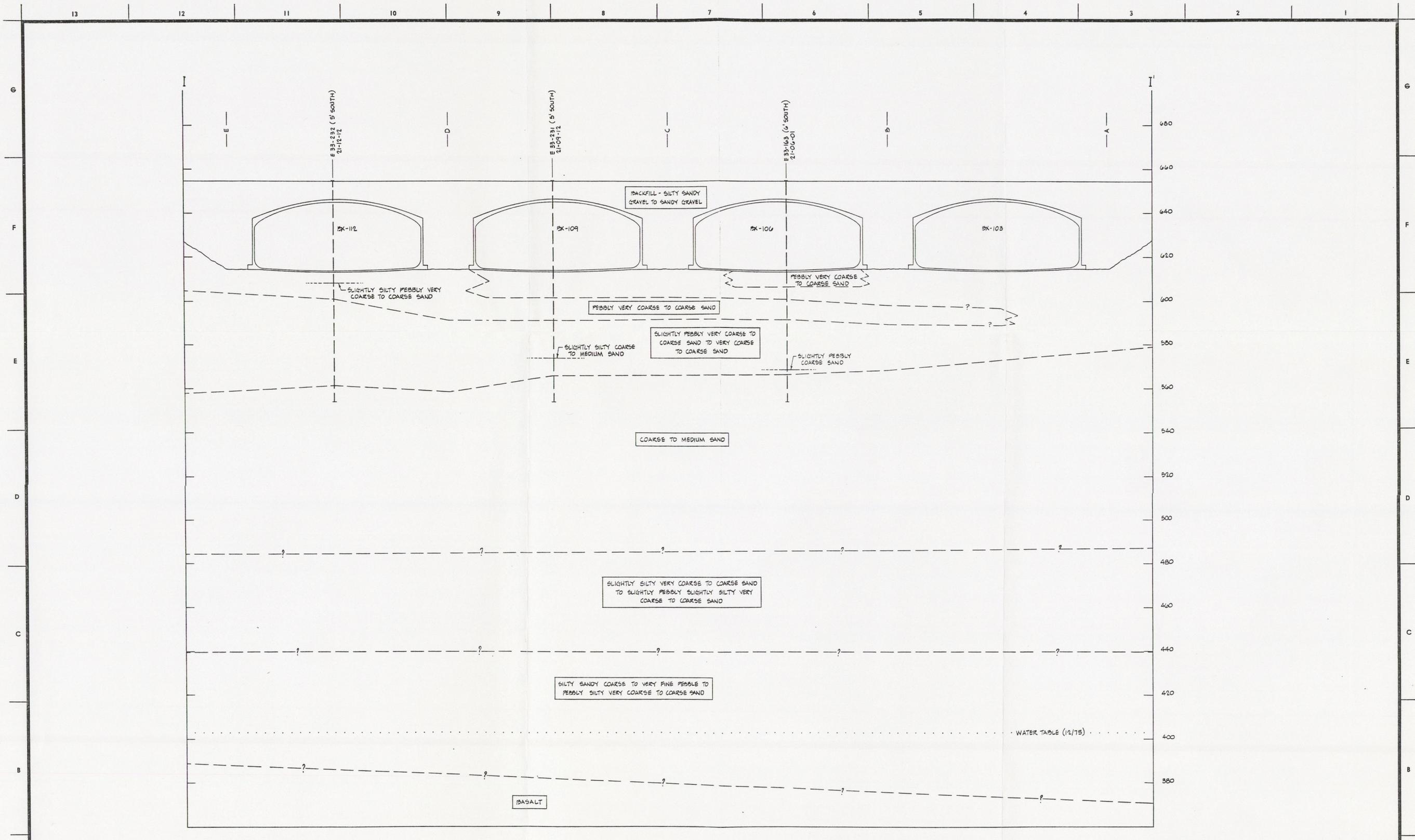
W 53400

W 53300

W 53200

BY DATE	FOR	BY DATE	FOR	REV	DESCRIPTION

APPROVED FOR CONFORMANCE WITH DESIGN CRITERIA	DATE	ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE	
BY: <i>[Signature]</i>	1/24/76	VITRO ENGINEERING - architects - engineers a division of AUTOMATION INDUSTRIES, INC.	
FOR: <i>[Signature]</i>	1/24/76	241-BX TANK FARM	
APP'D		GEOLOGIC CHARACTERIZATION	
BY: <i>[Signature]</i>	1/24/76	CROSS SECTION H-H'	
FOR: <i>[Signature]</i>	1/24/76	PROJECT NO. 241-BX	
DA APP'D	1/24/76	CLASSIFICATION: NOT REQ'D	
CHECKED		DWS NO. H-2-65000	
DRAWN	<i>[Signature]</i>	PROJECT TITLE: TANK FARM	
SCALE: 1" = 16'-0"		GEOLOGIC CHARACTERIZATION	
CLASSIFIED BY: NOT REQ'D	DATE: 1/24/76	ISSUE NO. 0402, 0501	
CLASSIFICATION: NONE		DWS NO. H-2-65000	



CROSS SECTION I-I'

W 534000

W 53500

W 53400

W 53300

W 53200

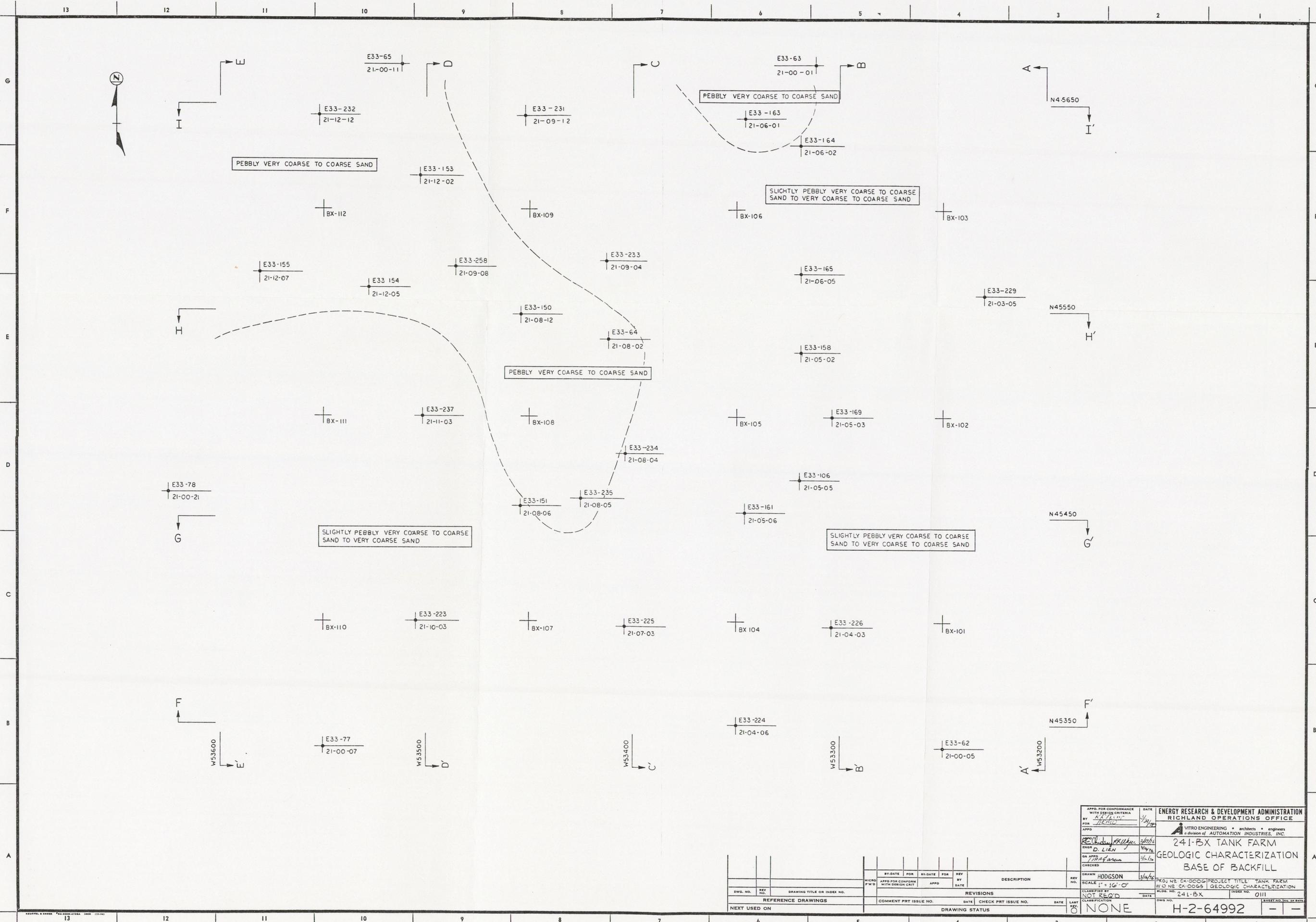
BY-DATE FOR		BY-DATE FOR		REV BY		DESCRIPTION	REV NO.
APPD FOR CONFORM WITH DESIGN CRIT		APPD		DATE			
REVISIONS							
DWG. NO.		REV. NO.		DRAWING TITLE OR INDEX NO.		CLARIFICATION	
NEXT USED ON		COMMENT PRT ISSUE NO.		DATE		CHECK PRT ISSUE NO.	
DRAWING STATUS		DATE		DATE		DATE	

APPD FOR CONFORMANCE WITH DESIGN CRITERIA
 BY: DL PORT
 FOR: ARCO
 APPD: [Signature] 3/76
 QA APPD: [Signature] 3/76
 CHECKED: [Signature] 3/76

ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION
RICHLAND OPERATIONS OFFICE
 VITRO ENGINEERING - ARCHITECTS & ENGINEERS
 a division of AUTOMATION INDUSTRIES, INC.
241-BX TANK FARM
GEOLOGIC CHARACTERIZATION
CROSS SECTION I-I'

PROJ: NST-CK-0006 PROJECT TITLE: TANK FARM
 WO NR: CK-0005 GEOLOGIC CHARACTERIZATION
 SLDG. NO: 241-BX INDEX NO: 0402, 0501
 DWG. NO: H-2-65001 SHEET NO. OF 02

DRAWN: D.L. PORT 3/76
 SCALE: 1" = 10'-0"
 CLASSIFICATION: NONE
 DATE:



APPD. FOR CONFORMANCE WITH DESIGN CRITERIA BY: <i>[Signature]</i> FOR: <i>[Signature]</i> DATE: 7/2/78		ENERGY RESEARCH & DEVELOPMENT ADMINISTRATION RICHLAND OPERATIONS OFFICE VITRO ENGINEERING • architects • engineers a division of AUTOMATION INDUSTRIES, INC.	
DRAWN: <i>[Signature]</i> CHECKED: <i>[Signature]</i> DATE: 7/1/78		241-BX TANK FARM GEOLOGIC CHARACTERIZATION BASE OF BACKFILL	
SCALE: 1" = 10'-0" CLASSIFIED BY: NOT REQ'D DATE:		PROJ. NO. 24-1000G PROJECT TITLE: TANK FARM W.D. NO. 24-0005 GEOLOGIC CHARACTERIZATION Dwg. No. 241-BX INDEX NO. 0111	
REFERENCE DRAWINGS NEXT USED ON:		REVISIONS COMMENT PRT. ISSUE NO. DATE CHECK PRT. ISSUE NO. DATE DRAWING STATUS: NONE	