GOLDEN EAGLE PARK DAM

STRUCTURE NO. 4

FOUNTAIN HILLS

GENERAL DATA

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HYDROLOGY AND HYDRAULIC

CALCULATIONS

FEB 3 1 8
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TRICO INTERNATIONAL INC.
CIVIL ENGINEERING & LAND PLANNING
TEMPE, ARIZONA

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JOB NO.		
SHEET	OF	

FOUNTAIN HILLS STRUCTURE NO. 4

REFERENCE

RETARDATION STRUCTURE

NO. 4

FOUNTAIN HILLS, ARIZONA

ENGINEERING CALCULATIONS

TRICO INTERNATIONAL INC.
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FOUNTAIN HILLS

STRUCTURE NO. 4

REFERENCE

METHOD OF ANALYSIS

1. USE SOIL CONSERVATION SERVICE COMPUTER PROGRAM TR-20 "PROJECT- FORMULATION" FOR STREAM FLOW ROUTING AND TO ESTABLISH INVERT OF EMERG. SPILLWAY, SIZE OF PRINCIPAL SPILLWAY PIPE, CAPACITY OF EMERG. SPILLWAY, TOP OF DAM AND FREEBOARD

2. GENERAL CRITERIA - STORMS FOR CLASS "C" DAMS

THE FOLLOWING STORMS ARE TO BE USED AS THE BASIS OF DESIGN OF THE DAM

STORM "A" - 100 YR / 24 HR PRECIP = 4.2" ✓

STORM "B" - 100 YR / 6 HR PRECIP = 3.2" ✓

(U.S. WEATHER BUREAU PRECIPITATION MAPS FOR ARIZONA DATED 1970 (ATTACHED))

STORM "C" - 100 YR 6HR + 0.26 (PMP - 100 YR 6HR)

@ PMP = 19"

= 3.2 + 0.26 (19.0 - 3.2) = 3.2 + 4.1 = 7.3" ✓

(PER SCS DESIGN CRITERIA FOR EARTH DAMS (ATTACHED))

(U.S. WEATHER BUREAU)

STORM "D" - PMP = 19.0"

(PMP MEANS PROBABLE MAX. PRECIPITATION)

(U.S. WEATHER BUREAU & SOIL CONS. SER.)

3. GENERAL CRITERIA - BASIS OF DESIGN

1. POOL BEHIND DAM MUST HAVE SUFFICIENT STORAGE TO CONTAIN RUNOFF FROM STORM "A" OR STORM "B" (WHICHEVER IS GREATER) WITH DISCHARGE FROM PRINCIPAL SPILLWAY BUT NO DISCHARGE FROM EMERGENCY SPILLWAY.

2. TOP OF DAM SET TO CONTAIN POOL GENERATED BY STORM "D" WITH BOTH PRINCIPAL & EMERGENCY SPILLWAYS OPERATING

3. FREEBOARD (POOL ELEV. TO TOP OF DAM) BASED UPON STORM "C". FREEBOARD TO BE AT LEAST 1.0 FT.

BASED UPON GENERAL CRITERIA OF S.C.S. FOR EARTHFILL DAMS (ATTACHED)

CRITERIA, REFERENCES AND PROCEDURE FOR HYDROLOGIC DESIGN OF EARTH DAMS

SUBJECT	CRITERIA	REFERENCES	PROCEDURE
Structure Classification	Class (a) structures located in rural or agricultural areas where failure may damage farm buildings, agricultural lands, or township or county roads. Class (b) structures located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, or minor railroads or cause interruption of use or service of relatively important public utilities. Class (c) structures located where failure may cause loss of life, serious damage to home, industrial or commercial buildings, or important public utilities.	Section B, SCS Engineering Memo 27 (Rev.) 3/19/65, Earth Dams. Hydrology of Spillway Design Small Structures - Limited Data, by H. O. Ogrosky, May 1964, ASCE Journal Hydraulics Division.	Footnotes 1/ Structures involving [illegible] ipal water will use [illegible] lent to that for class [illegible] pending on site condit[illegible] approaching that f[illegible] used when the [illegible] for agricultural use or [illegible] 2/ P_{100} = 100 year precipit[illegible] 3/ PMP = probable maxi[illegible] 4/ Equations can [illegible] duration. 5/ Chapter referenc[illegible] Engr. Handbook, Sect[illegible]
Sediment Storage	For all structure classifications - evaluation life of structure, usually 100 yrs.	Section D, SCS Engr. Memo 27, (Rev.), 3/19/65 and Supplement 3, 5/18/67.	S Technical Release 12, [illegible] Storage Requirements [illegible] January 1968.
Principal Spillway Design Hydrograph	Allowable Frequency of Use of Emergency Spillway Struct. Class: a — Maximum Use - years, No structures upstream: Earth 50, Vegetated 25; Maximum Use - years, Existing or Proposed Struc. Upstream: Earth 100, Vegetated 50 b — 100, 50, 100, 50 c — 100, 100, 100, 100	Section F, SCS Engr. Memo 27 (Rev.), 3/19/65. R. E. Rallison's Memo, 10/6/66, a procedure for adjusting the channel loss factor in Chapter 21. R. E. Rallison's Memo, 1/7/69, a technique for estimating the 10 day precipitation volume.	Any one of the following p[illegible] able as a basis for design of principal spillway capacity and retarding st[illegible] 1. Method described in [illegible] 2. Regionalization and transposition [illegible] volume-duration-probability data. 3. Local streamflow data.
Emergency Spillway Design Hydrograph	Minimum Precipitation Amounts by Structure Class Class a — Purpose: single or multiple 1/; No Structure upstream: 6 hr. P_{100} 2/, ES-1020, Sheet 1; Maximum Use - years, Existing or Proposed Str. Upstream: 6 hr P_{100} + .12(PMP-P_{100}) 3/, ES-1020 Sheet 2 (not less than criteria for upper structure. b — single or multiple; 6 hr P_{100}+.12(PMP-P_{100}) 4/, ES-1020, Sheet 2; Same as without structure but not less than criteria for upper structures. c — single or multiple; 6 hr P_{100}+.26(PMP-P_{100}), ES-1020, Sheet 4; Same as without structure.	Sections C and F, SCS Engr. Memo 27 (Rev.) 3/19/65, Earth Dams. Chapter 21 (Design Hydrographs) 5/ Hydrology of Spillway Design Small Structures - Limited Data, By H. O. Ogrosky, May 1964. ASCE Journal Hyd. Div. Advisory ENG-65, 12/5/69, Design Criteria for Larger Dams.	Select storm precipitation values from appropriate references. When only 100-year and PMP values are available, compute other values by equation. For areas east of 105th Meridian, use USWB-HMR-33 for durations longer than 6 hrs. Ore., Wash., Idaho — USWB - HMR-43 Ariz., Utah, Colo. — 100 yr-6 hr from revised TP-40 maps. 6 hr PMP from Sheet 5 of ES-1020 Nevada — ES-1020 Sheets 1-5 New Mexico — 100 yr-6 hr from revised TP-40 maps. 6 hr PMP from Sheet 5 of ES-1020 "Upper Rio Grande Study" 6 and 24 hr PMP California — ES-1020 and HMR 36 Hawaii — ES-1021 Alaska — ES-1022
Emergency Spillway Freeboard Hydrograph	Class a — single or multiple; 6 hr P_{100}+.12(PMP-P_{100}), ES-1020, Sheet 2; 6 hr P_{100} + .4(PMP-P_{100}) ES-1020, Sheet 3 (not less than criteria for upper structure) b — single or multiple; 6 hr P_{100}+.40 (PMP-P_{100}), ES-1020, Sheet 3; Same as without structure but not less than criteria for upper structure. c — single or multiple; 6 hr. PMP, ES-1020, Sheet 5; Same as without structure.		

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REFERENCE

VOLUME OF STORAGE POOL

ELEV	SQ IN	SQ FT	AC	(AC-FT) ΔVOL	(AC-FT) Σ VOL
1695	0.0	0.0	0.0	0.0	0.0
1700			0.68	1.7	1.7
1704			4.32	10.0	11.7
1708			5.58	19.8	31.5
1712			14.12	39.4	70.9
1716			20.43	69.1	140.0
1717			27.57	24.0	164.0
1718			20.43	24.0	188.0
1720			27.57	48.0	236.0
1723			3.10	46.0	282.0

agree w/ printout

2

PRINCIPAL SPILLWAY DISCHARGE

60" ϕ RCP

$Q = 0.62 \cdot A \cdot \sqrt{2gH}$

$A = 2 \times 5^2 \times \frac{\pi}{4} = 39.27$ FT²

39.27

H IS MEASURED TO ℄ OF PIPE

39.27 × .62 = 24.35

ELEV	H	$\sqrt{2gH}$	Q
1695	0.0	0.0	0.0
1700	2.5	12.69	310
1704	6.5	20.46	497
1708	10.5	26.00	630
1712	14.5	30.56	744
1716	18.5	34.52	840
1717	19.5	35.44	863
1718	20.5	36.33	885
1720	22.5	38.06	927
1723	25.5	40.52	987

sched
PG 4-3
FIG 4-11

KING'S HANDBOOK OF HYDRAULICS PG 3-5 (4TH EDITION)

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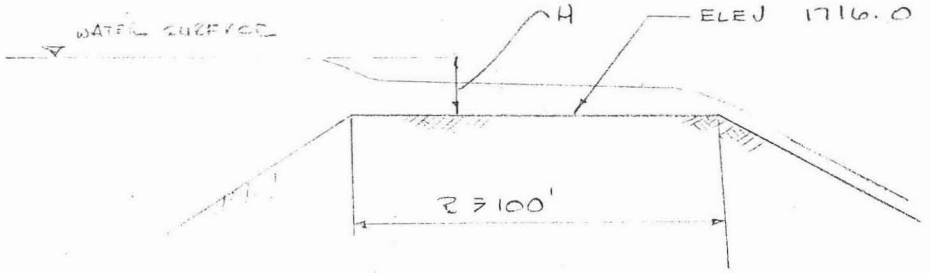
SHEET 3 OF		

REFERENCE

EMERGENCY SPILLWAY CHARACTERISTICS



SPILLWAY WIDTH = L = 300

5-3
5-23

KING'S HANDBOOK OF HYDRAULICS
PG 5-4
PG 5-12
(4TH EDITION)

$Q = CLH^{3/2}$ (5-10)

C = 2.63 ✓ 5-23

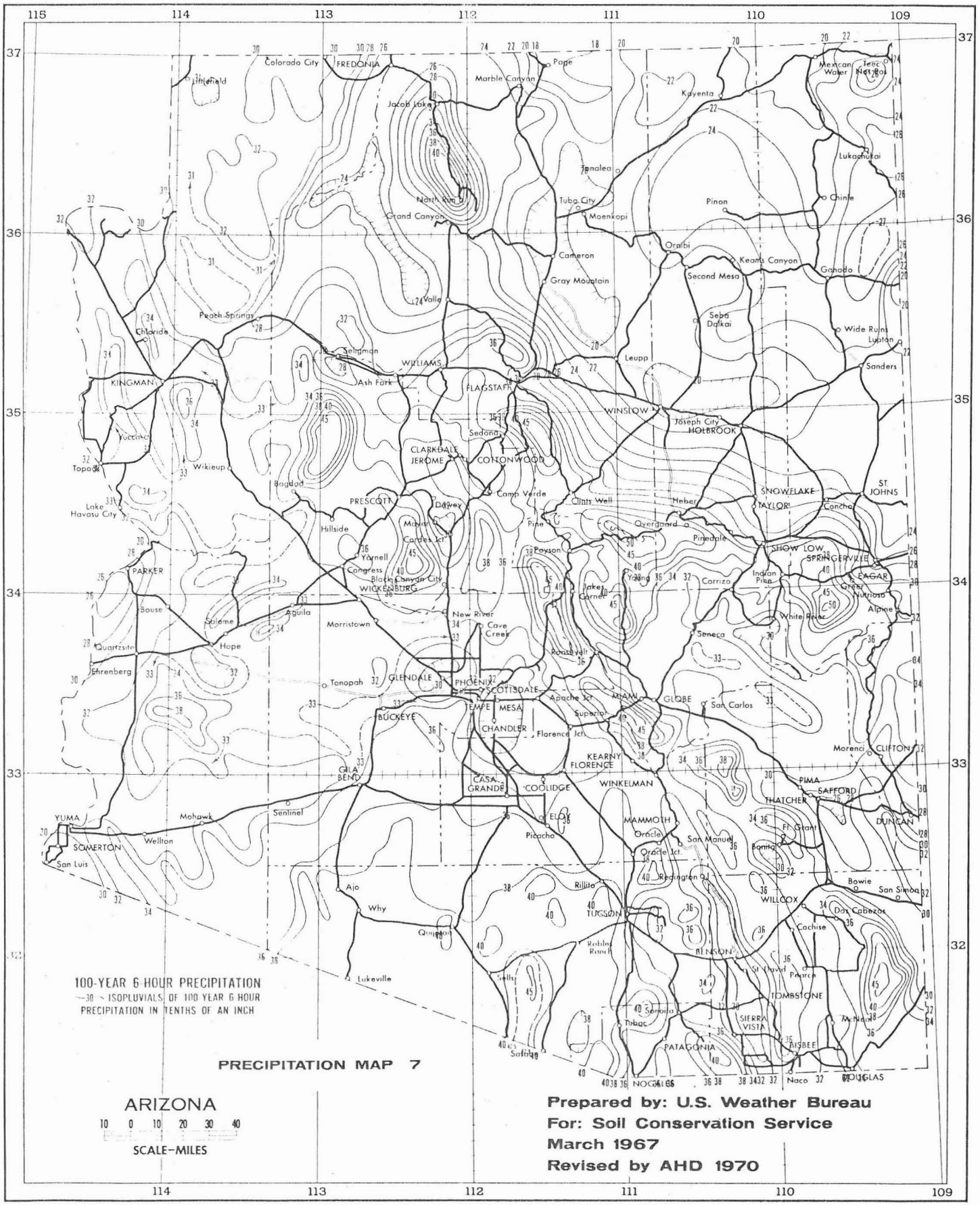
ELEV	H	L	$Q_{EMERG.}$	$Q_{PRINC.}$	Q_{TOT}
1716	0	300	0	840.	840.
1717	1.0	300	725 789	863.	1588.
1718 2.83	2.0	300	1104 2232	885.	1989.
1720 1.00	4.0	300	6060 6312	927.	6987.
1723	7.0	300	14562 N 6172	987.	15550.
1730.2	14.2		47,052		
1732.3	16.3	300	51,922		

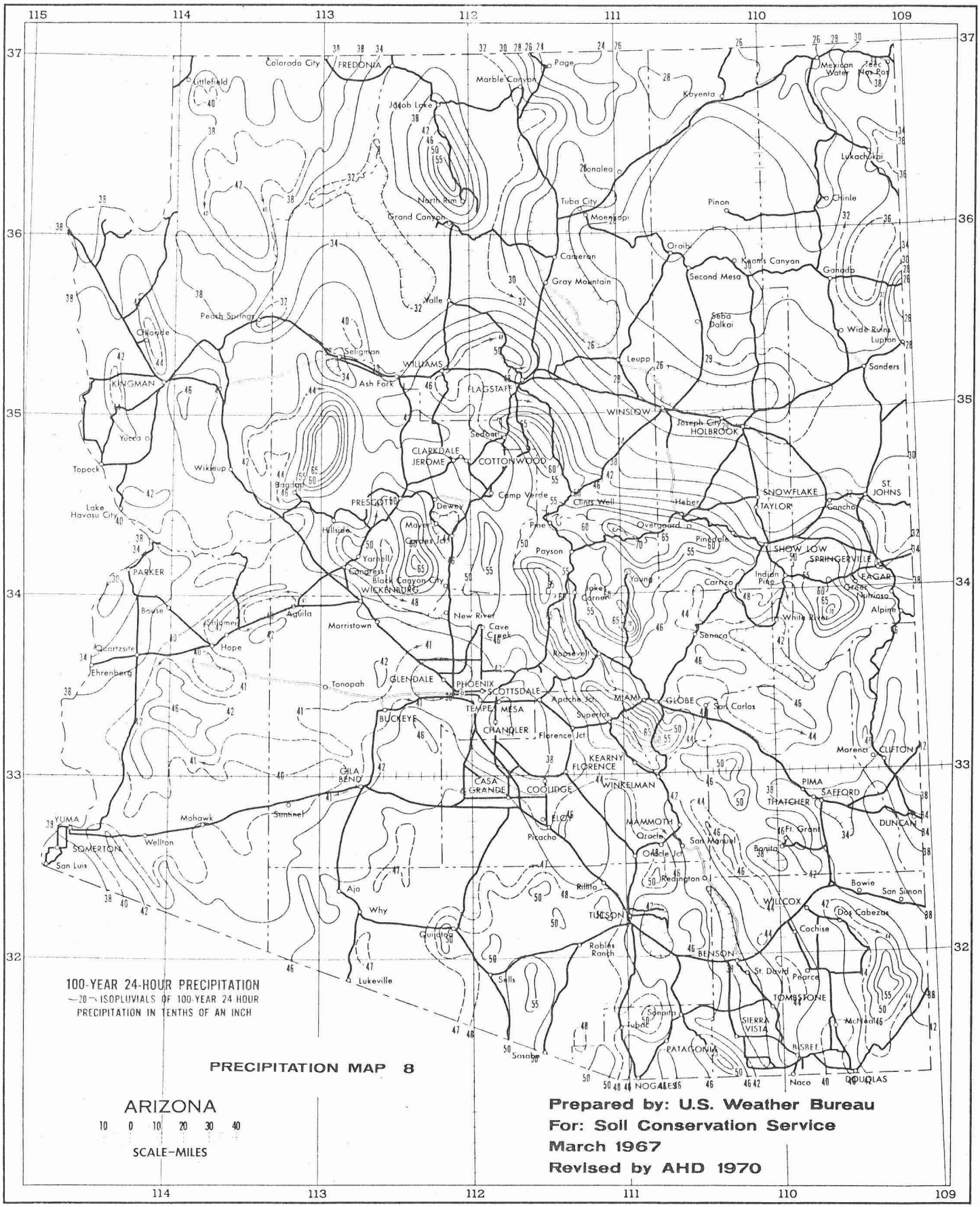
pg 5-23 w/ printout

2.63
300
789.00

1716 – 840
1717 – 1650
1718 – 3100
1720 – 7250
1723 – 15,500
1730 – 43,000 ±

1 cfs = 2 AC.FT / 24 HRS.
= .0833 A.F. / 1 HR


100-YEAR 6-HOUR PRECIPITATION
ISOPLUVIALS OF 100 YEAR 6 HOUR PRECIPITATION IN TENTHS OF AN INCH
PRECIPITATION MAP 7
ARIZONA
SCALE-MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
March 1967
Revised by AHD 1970
Colorado City
FREDONIA
Page
Marble Canyon
Jacob Lake
Kayenta
Tonalea
Tuba City
Moenkopi
Pinon
Chinle
Lukachukai
Cameron
Gray Mountain
Oraibi
Keams Canyon
Second Mesa
Ganado
Valle
Peach Springs
Chloride
Seligman
WILLIAMS
Ash Fork
FLAGSTAFF
KINGMAN
Leupp
Wide Ruins
Lupton
Sanders
WINSLOW
Joseph City
HOLBROOK
Sedona
CLARKDALE
JEROME
COTTONWOOD
Yucca
Topock
Wikieup
Bagdad
Lake Havasu City
PRESCOTT
Dewey
Camp Verde
Clints Well
Heber
SNOWFLAKE
TAYLOR
Concho
ST. JOHNS
Hillside
Mayer
Cordes Jct.
Pine
Overgaard
Pinedale
Yarnell
Congress
Black Canyon City
WICKENBURG
Payson
Young
Carrizo
Indian Pine
SHOW LOW
SPRINGERVILLE
EAGAR
Greer
Nutrioso
Alpine
PARKER
Bouse
Aguila
Salome
Morristown
New River
Cave Creek
Lake Carnegie
White River
Seneca
Quartzsite
Hope
Ehrenberg
Roosevelt
Tonopah
GLENDALE
PHOENIX
SCOTTSDALE
Apache Jct.
MIAMI
GLOBE
San Carlos
BUCKEYE
TEMPE
MESA
Superior
CHANDLER
Florence Jct.
Morenci
CLIFTON
KEARNY
FLORENCE
GILA BEND
CASA GRANDE
COOLIDGE
WINKELMAN
PIMA
SAFFORD
THATCHER
YUMA
Mohawk
Sentinel
ELOY
Picacho
MAMMOTH
Oracle
San Manuel
Oracle Jct.
Bonita
Ft. Grant
DUNCAN
SOMERTON
Wellton
San Luis
Rillito
Redington
Bowie
San Simon
Ajo
Why
TUCSON
WILLCOX
Dos Cabezas
Cochise
Quitobaquito
Robles Ranch
MINSON
St. David
Pearce
Lukeville
Sells
TOMBSTONE
Sonoita
Tubac
SIERRA VISTA
McNeal
PATAGONIA
BISBEE
Sasabe
NOGALES
Naco
DOUGLAS


100-YEAR 24-HOUR PRECIPITATION
—20— ISOPLUVIALS OF 100-YEAR 24-HOUR PRECIPITATION IN TENTHS OF AN INCH
ARIZONA
10 0 10 20 30 40
SCALE–MILES
Prepared by: U.S. Weather Bureau
For: Soil Conservation Service
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Colorado City
FREDONIA
Page
Marble Canyon
Kayenta
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Teec Nos Pos
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Chinle
Lukachukai
Oraibi
Cameron
Gray Mountain
Keams Canyon
Second Mesa
Ganado
Valle
Peach Springs
Seba Dalkai
Wide Ruins
Lupton
Chloride
Seligman
WILLIAMS
Leupp
Sanders
KINGMAN
Ash Fork
FLAGSTAFF
WINSLOW
Joseph City
HOLBROOK
Yucca
Sedona
CLARKDALE
JEROME
COTTONWOOD
Topock
Wikieup
Bagdad
Camp Verde
Clints Well
Heber
SNOWFLAKE
TAYLOR
ST. JOHNS
Ganado
Lake Havasu City
PRESCOTT
Dewey
Hillside
Mayer
Cordes Jct
Fine
Overgaard
Pinedale
SHOW LOW
SPRINGERVILLE
EAGAR
Yarnell
Congress
Payson
Yavapai
Carnero
Carrizo
Indian Pine
Grace
Nutrioso
PARKER
Black Canyon City
WICKENBURG
Bouse
Stillwell
Aguila
Morristown
New River
Cave Creek
White River
Alpine
Quartzsite
Hope
Roosevelt
Seneca
Ehrenberg
Tonopah
GLENDALE
PHOENIX
SCOTTSDALE
Apache Jct
MIAMI
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PIMA
SAFFORD
THATCHER
YUMA
Mohawk
Sentinel
ELOY
MAMMOTH
Oracle
San Manuel
Ft. Grant
DUNCAN
SOMERTON
Wellton
Picacho
Oracle Jct
Bonita
San Luis
Redington
Ajo
Rillito
Bowie
San Simon
Why
TUCSON
WILLCOX
Dos Cabezas
Quitobaquito
Cochise
Robles Ranch
BENSON
St. David
Pearce
Lukeville
Sells
TOMBSTONE
Sonoita
Tubac
SIERRA VISTA
McNeal
BISBEE
PATAGONIA
Sasabe
Naco
NOGALES
DOUGLAS
PRECIPITATION MAP 8

SPECIFICATIONS

RIPRAP SPECIFICATION

A single six inch layer of filter material shall be placed on the prepared slope or area in one operation, using methods which will not cause segregation of particle sizes within the bedding. Compaction of filter is not required, but the surface of the finished layer should be reasonably even and free from mounds or windows. Not more than 5 percent of the filter material should pass the No. 200 sieve.

Stone for riprap should be placed on the filter blanket in a manner which will produce a reasonably well-graded mass of stone with the minimum practical percentage of voids. The entire mass of stone should be placed in conformance with the lines, grades, and thicknesses shown on the plans. The riprap should be placed to its full course thickness at one operation and in such a manner as to avoid displacing the underlying material. Placing riprap in layers or by dumping into chutes and similar methods likely to cause segregation should not be permitted.

The larger stones should be well distributed so that there will be no large accumulations of either the larger or smaller sizes of stone.

Material shall be hard, sound, angular quarry stones weighing from 20 lbs to 400 lbs each of which at least 60 percent shall weigh more than 100 lbs.

Need: Sources from which riprap material is to be obtained.

JN/ckl
8-9-71

GROUTED RIPRAP

Grout consists of one part Portland Cement and three parts of sand, thoroughly mixed with water to produce grout having a thick creamy consistency. The minimum amount of water should be used to prevent excess shrinkage of the grout after placement.

The median stone to have a minor diameter of 12 inches of which four inches should project from the grout face and 4 inches is to be imbedded into the prepared slope. To assure penetration to this depth, stone smaller than 75-lb. should be minimized.

The stones shall be thoroughly moistened and any excess of fines shall be sluiced to the underside of the stone blanket be fore grouting.

The grout may be delivered to the place of final deposit by any means that will insure uniformity and prevent segregation of the grout. If penetration of grout is obtained by gravity flow into the interstices, the grout will be spaded or rodded into the interstices to completely fill the voids in the stone blanket. Pressure grouting shall not unseat the stones; and after placing by this method, the grout shall be spaded or rodded into the voids. Penetration of the grout shall be to the depth specified on the plans. When a rough surface is specified, stone shall be brushed until from one-forth to one-half of the depth of surface stone is exposed. For a smooth surface, grout shall fill the interstices to within a $\frac{1}{2}$ inch of the surface.

Weep holes shall be provided through the blanket as shown on the plans or as directed by the engineer.

EXCAVATION SPECIFICATION

The contractor shall do all excavation of whatever substances encountered to the depth shown on drawings. Excavated materials not required for fill or backfill shall be removed from site as directed by the Engineer and disposed of by the Contractor.

Excavation shall not be carried below the required level.

~~Excess shall not be carried below the required level.~~

Excess excavation below required level shall be backfilled at the contractor's expense with earth, sand, gravel, or concrete, as directed by the Engineer, and thoroughly tamped.

Unstable soil shall be removed and replaced with gravel, crushed stone, or crushed slag, which shall be thoroughly tamped. The Engineer shall determine the depth of removal of unstable soil.

BACKFILL SPECIFICATIONS

After pipes have been tested and approved, backfilling shall be done with approved material free from large clods or stones.

Backfill material shall be placed evenly and carefully around and over pipe in 6 inch maximum layers. Each layer shall be thoroughly and carefully rammed until 1 foot of cover exists over pipe.

The remainder of backfill material shall be placed, moistened, and compacted.

Water settling will not be permitted in clay soils. It may be required at the option of the Engineer in sandy soils.

JN/ckl
8-9-71

HOT WEATHER CONCRETING

1. Work at night.

2. Shade operations.

3. Necessary to use richer mixes to offset excessive slump loss.

4. Use of wet butlap to retain moisture for longer periods.

5. Kept moist for 14 days.

DESIRABILITY OF CURING WITH SEALING MEMBRANE

1. Use white pigmented sealing compound. (in hot weather may decrease temperature 40° F.).

2. Kept intact for 28 days = 14 days continuous moist curing.

CONCRETE PRODUCTION

1. Temperature less than 90° as deposited.

2. Use cold mixing water or ice.

3. Insulate water supply lines and tanks (at least paint exposed surfaces white).

4. Cool coarse aggregate with water (cooled) by sprinkling.

5. Insulate mixer drums or cool with sprays or wet burlap coverings.

6. Shade materials and facilities.

7. Work only at night.

NOTE: Use Portland Cement AASHO M-85, Type II, Min 28 day compressive stringth of 3000 psi.

JN/ckl

c. DURING COMPACTION THE MOISTURE CONTENT OF THE $-\frac{3}{4}$ FRACTION OF THE FILL SHALL BE MAINTAINED WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D1557, METHOD D.

(E) DESIGNATED EMBANKMENT MATERIALS

1. EMBANKMENT FILL MATERIALS SHALL COME FROM SUITABLE PORTIONS OF EXCAVATIONS FOR THE CORE TRENCH, SPILLWAY AND OUTLET PIPE AND FROM BORROW AREAS DESIGNATED BY THE ENGINEER. EMBANKMENT FILL MATERIALS SHOULD BE FREE OF VEGETATION AND DEBRIS AND OTHERWISE MEET THE FOLLOWING REQUIREMENTS:

(A) FILL IN ZONE I (CORE)

PASSING 3 INCH SIEVE	- 100 PERCENT
PASSING NO. 4 SIEVE	- 60-100 PERCENT
PASSING NO. 200 SIEVE	- 15-35 PERCENT
PLASTICITY INDEX	- 15-25

(B) FILL IN ZONE II (SHELL)

PASSING 12 INCH SQUARE OPENING	- 100 PERCENT
PASSING $\frac{1}{4}$ INCH SIEVE	- 25-75 PERCENT
PASSING NO. 200 SIEVE	- 0-12 PERCENT
PLASTICITY INDEX	- 5 MAXIMUM

(C) FILL IN ZONE III (UPPER PORTION OF DOWNSTREAM SHELL)

PASSING 12 INCH SQUARE OPENING	- 100 PERCENT
PASSING NO. 200 SIEVE	- 0-35 PERCENT
PLASTICITY INDEX	- 15 MAXIMUM

3. FOR PURPOSES OF ACCEPTANCE THE IN-PLACE DENSITY SHALL BE DEFINED AS THAT DETERMINED IN ACCORDANCE WITH ASTM D1556, "DENSITY OF SOIL IN PLACE BY SAND-CONE METHOD". APPROPRIATE "ROCK CORRECTION" SHALL BE MADE TO ACCOUNT FOR THE FRACTION OF SOIL RETAINED ON THE NO. 4 SIEVE.

4. COMPACTION OF COARSE EMBANKMENT MATERIALS IN ZONE II AND ZONE III (SHELL) WHICH CANNOT BE ACCURATELY TESTED BY FIELD DENSITY TESTS SHALL BE CONTROLLED ON A MINIMUM ROLLING BASIS AS FOLLOWS:

   A. LIFTS SHALL BE PLACED SO THEIR THICKNESS, WHEN COMPACTED, DOES NOT EXCEED 12 INCHES.

   B. COMPACTION SHALL BE ACCOMPLISHED BY A SPECIFIED NUMBER OF PASSES OF EQUIPMENT APPROVED BY THE SOIL ENGINEER. THE FOLLOWING TYPES OF PNEUMATIC ROLLERS WILL BE SATISFACTORY:

ROLLER TYPE	ROLLER RATING	WHEEL LOAD	TIRE INFLATION PRESSURE
A	45 TON MIN.	11 TON MIN.	140 PSI MIN.
B	45 TON MIN.	$5\frac{1}{2}$ TON MIN.	90 PSI MIN.

EACH LIFT SHALL BE COMPACTED WITH A MINIMUM OF 3 PASSES OF ROLLER A OR 5 PASSES WITH ROLLER B. OTHER TYPES OF ROLLERS CAN BE EVALUATED AS TO SUITABILITY AND REQUIRED COMPACTIVE EFFORT ESTABLISHED FOR THOSE WHICH ARE ACCEPTABLE BY THE ENGINEER.

ROLLERS, COMPACTION SHALL BE ACCOMPLISHED BY MANUAL METHODS WITH PNEUMATIC OR SIMILAR EQUIPMENT. MANUAL COMPACTION SHALL BE CONTINUOUSLY INSPECTED BY REPRESENTATIVES OF THE SOIL ENGINEER TO INSURE UNIFORM COMPACTIVE EFFORT.

THE DIFFERENCE IN ELEVATION BETWEEN ADJACENT ZONES OF COMPACTED FILL MATERIALS SHALL NOT EXCEED 4 FEET AT ANY TIME DURING EMBANKMENT CONSTRUCTION.

(D) <u>REQUIRED DEGREE OF COMPACTION</u>

1. MAXIMUM DENSITY AND OPTIMUM MOISTURE CONTENT OF SOILS IN WHICH ACCURATE FIELD DENSITY TESTS CAN BE PERFORMED SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D1557.

2. ALL EMBANKMENT MATERIALS IN ZONE I (CORE) AND THOSE MATERIALS IN ZONE II AND ZONE III (SHELL) FOR WHICH ACCURATE FIELD DENSITY TESTS CAN BE PERFORMED SHALL BE PLACED IN HORIZONTAL LIFTS AND COMPACTED TO A MINIMUM OF 95 PERCENT OF MAXIMUM DENSITY. THE LIFTS, WHEN COMPACTED, SHALL NOT EXCEED 6 INCHES IN THICKNESS. A MINIMUM OF 5 FIELD DENSITY TESTS SHALL BE PERFORMED FOR EACH LIFT. FIFTY PERCENT OF THE FIELD DENSITY TESTS SHALL BE AT OR ABOVE 97 PERCENT OF MAXIMUM DENSITY.

1. ROLLING AND WATERING OF ALL FILL AND MANUAL COMPACTION IN THE VICINITY OF THE FLOOD CONTROL OUTLET AS HEREAFTER SPECIFIED.

2. EXCAVATION OF NECESSARY MATERIALS FROM DESIGNATED BORROW AREAS AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN DESIGNATED EMBANKMENT SECTIONS.

3. EXCAVATION OF NECESSARY MATERIALS FROM TEMPORARY STOCKPILE AREAS AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN DESIGNATED EMBANKMENT SECTIONS.

(B) WATERING OF FILL

PRIOR TO COMPACTION ALL FILL SHALL BE BROUGHT TO WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT. THIS SHALL BE ACCOMPLISHED BY EITHER PRESOAKING THE BORROW AREAS OR MECHANICALLY MIXING WATER WITH THE EMBANKMENT MATERIALS ON GRADE.

(C) PLACEMENT AND COMPACTION OF FILL

ALL FILL MATERIALS SHALL BE PLACED IN CONTINUOUS HORIZONTAL LIFTS AND PROPERLY COMPACTED. THE ROLLED SURFACES OF ALL LAYERS OF EARTH FILL SHALL BE SO CONSTRUCTED AS TO PROVIDE A FIRM BOND WITH THE OVERLYING LAYER AND PREVENT DEVELOPMENT OF A STRATIFIED STRUCTURE.

IN AREAS ADJACENT TO THE FLOOD CONTROL OUTLET WHICH CANNOT BE COMPACTED BY MOTORIZED

MATERIALS FROM THE CORE TRENCH, SPILLWAY AND OUTLET PIPE FOUNDATION TO THE LINES AND GRADES SHOWN ON THE PLANS OR DESIGNATED BY THE SOIL ENGINEER, AND TRANSPORTING AND PLACING SAID MATERIALS IN STOCKPILE OR EMBANKMENT AREAS. IT SHALL ALSO INCLUDE EXCAVATION OF ANY LOOSE COMPRESSIBLE MATERIALS FROM AREAS TO RECEIVE FILL.

(B) CONSTRUCTION DETAILS

SUITABLE EXCAVATED SOILS SHALL BE INCORPORATED INTO DESIGNATED ZONES OF THE EMBANKMENT. SUCH SUITABLE EXCAVATED MATERIALS SHALL EITHER BE PLACED DIRECTLY IN EMBANKMENT ZONES OR INITIALLY PLACED IN DESIGNATED STOCKPILE AREAS. UNSUITABLE EXCAVATED SOILS SHALL BE PLACED IN DESIGNATED DISPOSAL AREAS. THE SOIL ENGINEER MAY REQUIRE EXCAVATION OF SOFTER MORE COMPRESSIBLE SOILS IN THE CORE TRENCH AND OUTLET PIPE FOUNDATION BEYOND THE LINES AND GRADES SHOWN ON THE PLANS TO SUCH AN ELEVATION WHERE FIRM CEMENTED SOIL IS EXPOSED THROUGHOUT. PROPER EXCAVATION TO FIRM CEMENTED SOILS SHALL BE VERIFIED BY INSPECTION BY THE SOIL ENGINEER.

SECTION IV - EMBANKMENT

(A) DESCRIPTION

EMBANKMENT SHALL CONSIST OF THE FOLLOWING ITEMS:

GUIDE SPECIFICATIONS FOR EARTHWORK
RETENTION BASIN PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA
(REVISED AUGUST 18, 1971)

SECTION I - GENERAL

THE SOIL ENGINEER SHALL ACT AS THE OWNER'S REPRESENTATIVE DURING CONSTRUCTION, SHALL PERFORM NECESSARY OBSERVATIONS AND TESTS TO VERIFY COMPLIANCE WITH SPECIFICATIONS AND SHALL APPROVE ALL ITEMS SPECIFIED. TEST PROCEDURES SHALL BE THOSE OUTLINED IN THE 1971 BOOK OF STANDARDS OF THE AMERICAN SOCIETY OF TESTING AND MATERIALS.

SECTION II - CLEARING

(A) DESCRIPTION

CLEARING SHALL CONSIST OF REMOVING ALL TREES, STUMPS, BRUSH, CACTI, ROOTS, RUBBISH, DEBRIS AND OTHER OBJECTIONABLE MATTER FROM ALL AREAS TO RECEIVE EMBANKMENT IN THE RESERVOIR AREA AND THE BORROW AREAS AS DESIGNATED BY THE ENGINEER.

(B) DISPOSAL OF MATERIALS

MATERIALS FROM CLEARING OPERATIONS SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.

SECTION III - EXCAVATION

(A) DESCRIPTION

EXCAVATION SHALL CONSIST OF EXCAVATING ALL

SUBSURFACE

INVESTIGATION

DATA

SERGENT, HAUSKINS & BECKWITH CONSULTING SOIL AND FOUNDATION ENGINEERS

B. DWAINE SERGENT, P.E. • JOHN B. HAUSKINS, P.E. • GEORGE H. BECKWITH, P.E. • DALE V. BEDENKOP, P.E.

AUGUST 19, 1971

TRICO INTERNATIONAL INC.
8718 EAST MCDOWELL ROAD
SCOTTSDALE, ARIZONA 85257

JOB NO. E70-178
ADDENDUM NO. 1

ATTENTION: MR. JOE CHOPRA

RE: STRUCTURE NO. 4
PROPOSED RETENTION BASIN
PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA

GENTLEMEN,

PURSUANT TO A LETTER OF AUGUST 2, 1971 BY MR. BENSON SCOTT, ARIZONA WATER COMMISSION, WE HAVE MADE REVISIONS TO EARTHWORK SPECIFICATIONS FOR THE REFERENCED PROJECT AND HAVE PERFORMED ADDITIONAL EXPLORATION AND TESTING FOR THE ZONE 1 EMBANKMENT SOURCES.

THE REVISED SPECIFICATIONS AND RELATED DATA APPLY TO ALL OTHER FLOOD CONTROL STRUCTURES AT FOUNTAIN HILLS PRESENTLY UNDER DESIGN (DAM NOS. 6, 7, 11 AND 36) AND SHOULD SUPERCEDE ADDENDUM NO. 1 TO OUR REPORT FOR STRUCTURE NO. 7 (JOB NO. E70-180) AND OTHER PREVIOUSLY RECOMMENDED GUIDE SPECIFICATIONS.

REVISED "GUIDE SPECIFICATIONS FOR EARTHWORK" ARE ATTACHED. THEY INCLUDE CHANGES RELATIVE TO THE FOLLOWING ITEMS REQUESTED IN MR. BENSON'S LETTER.

PHOENIX, ARIZONA
3940 WEST CLARENDON
(602) 272-6848
272-6848

FLAGSTAFF, ARIZONA
2029 NORTH 4TH STREET
(602) 774-4433

EL PASO, TEXAS
201 NORTH CLARK ROAD
(915) 772-3030

EMBANKMENT

3(A) MAXIMUM LIFT THICKNESS OF CORE MATERIAL

3(B) MOISTURE CONDITIONING OF EMBANKMENT MATERIAL

FLOOD CONTROL OUTLETS

2(D) SPECIAL BACKFILL REQUIREMENTS IN PROXIMITY OF OUTLETS

ALSO, AS DISCUSSED WITH MESSRS. CHOPRA AND BENSON DURING OUR LAST VISIT IN THE FIELD, WE HAVE INCLUDED A PROVISION FOR ZONE III; THE UPPER PORTION OF THE DOWNSTREAM SHELL WHICH IN NO CASE WOULD BE SUBJECT TO SATURATION DURING THE LIFE OF THE STRUCTURES. AN ATTACHED SKETCH SHOWS THE PROPOSED EXTENT OF ZONE III. THE SPECIFICATIONS WILL ALLOW THE USE OF EXCAVATION FROM THE CUTOFF TRENCHES AND SPILLWAY IN THE EMBANKMENT AT SOME SITES WHERE OTHERWISE THE MATERIAL WOULD NOT MEET ZONE 1 OR II REQUIREMENTS. THIS MATERIAL WILL HAVE VERY HIGH SHEAR STRENGTHS AT MOISTURE CONTENTS AT OR NEAR OPTIMUM.

A NUMBER OF BACKHOE TEST PITS WERE EXCAVATED ON RIDGES ADJACENT TO STRUCTURE NOS. 4 AND 7 TO FURTHER INVESTIGATE FOR ZONE I BORROW. THE ATTACHED TEST RESULTS ARE FROM AN AREA IMMEDIATELY SOUTH OF STRUCTURE NO. 4. THE MATERIAL IS REPRESENTATIVE OF THE COMPACTION CHARACTERISTICS OF THE ZONE I BORROW WHICH WILL BE USED FOR ALL STRUCTURES PRESENTLY BEING STUDIED. THE DEPOSIT TESTED IS UP TO 4 FEET IN THICKNESS AND CAN BE USED FOR STRUCTURE NO. 4. SUITABLE MATERIAL ON RIDGES

NEAR STRUCTURE NO. 7 IS THINNER AND WILL REQUIRE REMOVAL OF OVERSIZE PARTICLES. AS HAS BEEN DISCUSSED, WE CAN COORDINATE SELECTION OF BORROW AREAS WITH YOUR LAND PLANNER IN ORDER TO PICK THE SUITABLE AREAS MOST DESIRABLE FROM HIS STANDPOINT. WE CAN THEN PRETEST BORROW IN DETAIL PRIOR TO CONSTRUCTION TO INSURE PROPER QUALITY CONTROL. ZONE I BORROW CAN COME FROM WITHIN THE RESERVOIR IN SOME CASES.

OF COURSE, ZONE II AND III BORROW CAN BE OBTAINED FROM WITHIN THE RESERVOIRS AND SPILLWAY OR CUTOFF TRENCH EXCAVATIONS FOR ALL STRUCTURES. DETAILED TEST DATA HAS BEEN DEVELOPED FOR ALL STRUCTURES FOR THESE MATERIALS.

RESPECTFULLY SUBMITTED,
SERGENT, HAUSKINS & BECKWITH ENGINEERS

Registered Professional Engineer (Civil)
CERTIFICATE NO. 5633
GEORGE HENRY BECKWITH
Date Signed 8-10-71
ARIZONA, U.S.A.

BY _____
GEORGE H. BECKWITH, P.E.

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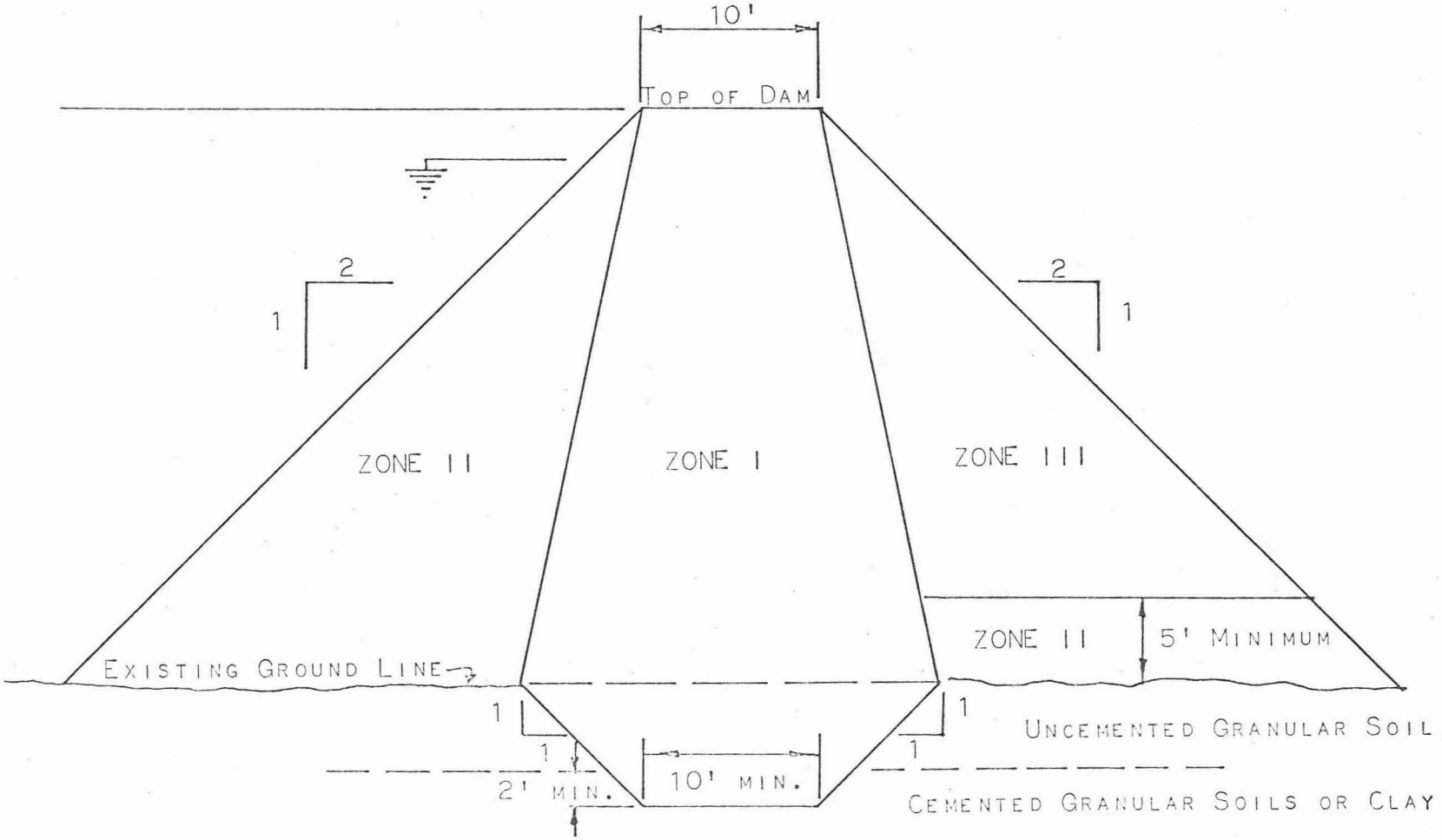


RECOMMENDED EMBANKMENT DETAILS

RETENTION BASIN PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • FLAGSTAFF • EL PASO

TABULATION OF TEST RESULTS

Job No. E71-178, ADDENDUM No. 1 Date

Client:

Project STRUCTURE No. 4
PROPOSED RETENTION BASIN PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA

Material ZONE I BORROW

Source

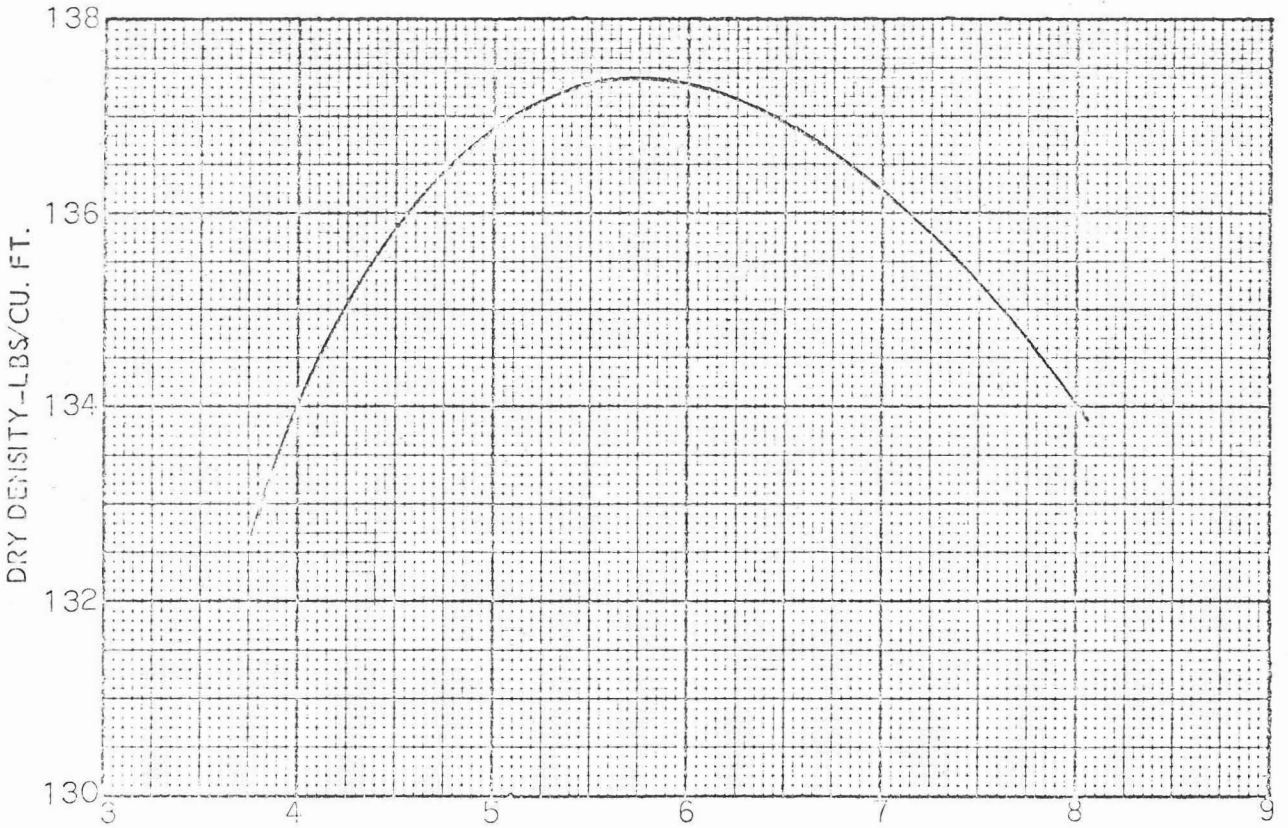
HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	¼	⅜	¾	1	1½	2	
2B	S OF DAM	0-14"	SC-SM	24	7	32	39	46	57	67	85	90	92	96	100			

SERGENT, HAUSKINS & BECKWITH

SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT STRUCTURE No. 4 FOUNTAIN HILLS, ARIZONA JOB NO. E70-178

ADDENDUM No. 1



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS/CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
	PIT #2B @ 0-14"	5.7	137.4	ASTM D1557	C	178-1

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.59"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.59"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.59"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.59"	5	56	10.0 LBS.	18"	55,986

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • FLAGSTAFF • EL PASO

GUIDE SPECIFICATIONS FOR EARTHWORK
RETENTION BASIN PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA
(REVISED AUGUST 18, 1971)

SECTION I - GENERAL

THE SOIL ENGINEER SHALL ACT AS THE OWNER'S REPRESENTATIVE DURING CONSTRUCTION, SHALL PERFORM NECESSARY OBSERVATIONS AND TESTS TO VERIFY COMPLIANCE WITH SPECIFICATIONS AND SHALL APPROVE ALL ITEMS SPECIFIED. TEST PROCEDURES SHALL BE THOSE OUTLINED IN THE 1971 BOOK OF STANDARDS OF THE AMERICAN SOCIETY OF TESTING AND MATERIALS.

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(A) DESCRIPTION

CLEARING SHALL CONSIST OF REMOVING ALL TREES, STUMPS, BRUSH, CACTI, ROOTS, RUBBISH, DEBRIS AND OTHER OBJECTIONABLE MATTER FROM ALL AREAS TO RECEIVE EMBANKMENT IN THE RESERVOIR AREA AND THE BORROW AREAS AS DESIGNATED BY THE ENGINEER.

(B) DISPOSAL OF MATERIALS

MATERIALS FROM CLEARING OPERATIONS SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.

SECTION III - EXCAVATION

(A) DESCRIPTION

EXCAVATION SHALL CONSIST OF EXCAVATING ALL

MATERIALS FROM THE CORE TRENCH, SPILLWAY AND OUTLET PIPE FOUNDATION TO THE LINES AND GRADES SHOWN ON THE PLANS OR DESIGNATED BY THE SOIL ENGINEER, AND TRANSPORTING AND PLACING SAID MATERIALS IN STOCKPILE OR EMBANKMENT AREAS. IT SHALL ALSO INCLUDE EXCAVATION OF ANY LOOSE COMPRESSIBLE MATERIALS FROM AREAS TO RECEIVE FILL.

(B) CONSTRUCTION DETAILS

SUITABLE EXCAVATED SOILS SHALL BE INCORPORATED INTO DESIGNATED ZONES OF THE EMBANKMENT. SUCH SUITABLE EXCAVATED MATERIALS SHALL EITHER BE PLACED DIRECTLY IN EMBANKMENT ZONES OR INITIALLY PLACED IN DESIGNATED STOCKPILE AREAS. UNSUITABLE EXCAVATED SOILS SHALL BE PLACED IN DESIGNATED DISPOSAL AREAS. THE SOIL ENGINEER MAY REQUIRE EXCAVATION OF SOFTER MORE COMPRESSIBLE SOILS IN THE CORE TRENCH AND OUTLET PIPE FOUNDATION BEYOND THE LINES AND GRADES SHOWN ON THE PLANS TO SUCH AN ELEVATION WHERE FIRM CEMENTED SOIL IS EXPOSED THROUGHOUT. PROPER EXCAVATION TO FIRM CEMENTED SOILS SHALL BE VERIFIED BY INSPECTION BY THE SOIL ENGINEER.

SECTION IV - EMBANKMENT

(A) DESCRIPTION

EMBANKMENT SHALL CONSIST OF THE FOLLOWING ITEMS:

1. ROLLING AND WATERING OF ALL FILL AND MANUAL COMPACTION IN THE VICINITY OF THE FLOOD CONTROL OUTLET AS HEREAFTER SPECIFIED.

2. EXCAVATION OF NECESSARY MATERIALS FROM DESIGNATED BORROW AREAS AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN DESIGNATED EMBANKMENT SECTIONS.

3. EXCAVATION OF NECESSARY MATERIALS FROM TEMPORARY STOCKPILE AREAS AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN DESIGNATED EMBANKMENT SECTIONS.

(B) WATERING OF FILL

PRIOR TO COMPACTION ALL FILL SHALL BE BROUGHT TO WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT. THIS SHALL BE ACCOMPLISHED BY EITHER PRESOAKING THE BORROW AREAS OR MECHANICALLY MIXING WATER WITH THE EMBANKMENT MATERIALS ON GRADE.

(C) PLACEMENT AND COMPACTION OF FILL

ALL FILL MATERIALS SHALL BE PLACED IN CONTINUOUS HORIZONTAL LIFTS AND PROPERLY COMPACTED. THE ROLLED SURFACES OF ALL LAYERS OF EARTH FILL SHALL BE SO CONSTRUCTED AS TO PROVIDE A FIRM BOND WITH THE OVERLYING LAYER AND PREVENT DEVELOPMENT OF A STRATIFIED STRUCTURE.

IN AREAS ADJACENT TO THE FLOOD CONTROL OUTLET WHICH CANNOT BE COMPACTED BY MOTORIZED

ROLLERS, COMPACTION SHALL BE ACCOMPLISHED BY MANUAL METHODS WITH PNEUMATIC OR SIMILAR EQUIPMENT. MANUAL COMPACTION SHALL BE CONTINUOUSLY INSPECTED BY REPRESENTATIVES OF THE SOIL ENGINEER TO INSURE UNIFORM COMPACTIVE EFFORT.

THE DIFFERENCE IN ELEVATION BETWEEN ADJACENT ZONES OF COMPACTED FILL MATERIALS SHALL NOT EXCEED 4 FEET AT ANY TIME DURING EMBANKMENT CONSTRUCTION.

(D) <u>REQUIRED DEGREE OF COMPACTION</u>

1. MAXIMUM DENSITY AND OPTIMUM MOISTURE CONTENT OF SOILS IN WHICH ACCURATE FIELD DENSITY TESTS CAN BE PERFORMED SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D1557.

2. ALL EMBANKMENT MATERIALS IN ZONE I (CORE) AND THOSE MATERIALS IN ZONE II AND ZONE III (SHELL) FOR WHICH ACCURATE FIELD DENSITY TESTS CAN BE PERFORMED SHALL BE PLACED IN HORIZONTAL LIFTS AND COMPACTED TO A MINIMUM OF 95 PERCENT OF MAXIMUM DENSITY. THE LIFTS, WHEN COMPACTED, SHALL NOT EXCEED 6 INCHES IN THICKNESS. A MINIMUM OF 5 FIELD DENSITY TESTS SHALL BE PERFORMED FOR EACH LIFT. FIFTY PERCENT OF THE FIELD DENSITY TESTS SHALL BE AT OR ABOVE 97 PERCENT OF MAXIMUM DENSITY.

3. FOR PURPOSES OF ACCEPTANCE THE IN-PLACE DENSITY SHALL BE DEFINED AS THAT DETERMINED IN ACCORDANCE WITH ASTM D1556, "DENSITY OF SOIL IN PLACE BY SAND-CONE METHOD". APPROPRIATE "ROCK CORRECTION" SHALL BE MADE TO ACCOUNT FOR THE FRACTION OF SOIL RETAINED ON THE NO. 4 SIEVE.

4. COMPACTION OF COARSE EMBANKMENT MATERIALS IN ZONE II AND ZONE III (SHELL) WHICH CANNOT BE ACCURATELY TESTED BY FIELD DENSITY TESTS SHALL BE CONTROLLED ON A MINIMUM ROLLING BASIS AS FOLLOWS:

   A. LIFTS SHALL BE PLACED SO THEIR THICKNESS, WHEN COMPACTED, DOES NOT EXCEED 12 INCHES.

   B. COMPACTION SHALL BE ACCOMPLISHED BY A SPECIFIED NUMBER OF PASSES OF EQUIPMENT APPROVED BY THE SOIL ENGINEER. THE FOLLOWING TYPES OF PNEUMATIC ROLLERS WILL BE SATISFACTORY:

ROLLER TYPE	ROLLER RATING	WHEEL LOAD	TIRE INFLATION PRESSURE
A	45 TON MIN.	11 TON MIN.	140 PSI MIN.
B	45 TON MIN.	$5\frac{1}{2}$ TON MIN.	90 PSI MIN.

EACH LIFT SHALL BE COMPACTED WITH A MINIMUM OF 3 PASSES OF ROLLER A OR 5 PASSES WITH ROLLER B. OTHER TYPES OF ROLLERS CAN BE EVALUATED AS TO SUITABILITY AND REQUIRED COMPACTIVE EFFORT ESTABLISHED FOR THOSE WHICH ARE ACCEPTABLE BY THE ENGINEER.

c. DURING COMPACTION THE MOISTURE CONTENT OF THE $-\frac{3}{4}$ FRACTION OF THE FILL SHALL BE MAINTAINED WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D1557, METHOD D.

(E) DESIGNATED EMBANKMENT MATERIALS

1. EMBANKMENT FILL MATERIALS SHALL COME FROM SUITABLE PORTIONS OF EXCAVATIONS FOR THE CORE TRENCH, SPILLWAY AND OUTLET PIPE AND FROM BORROW AREAS DESIGNATED BY THE ENGINEER. EMBANKMENT FILL MATERIALS SHOULD BE FREE OF VEGETATION AND DEBRIS AND OTHERWISE MEET THE FOLLOWING REQUIREMENTS:

(A) FILL IN ZONE I (CORE)

PASSING 3 INCH SIEVE	- 100 PERCENT
PASSING NO. 4 SIEVE	- 60-100 PERCENT
PASSING NO. 200 SIEVE	- 15-35 PERCENT
PLASTICITY INDEX	- 15-25

(B) FILL IN ZONE II (SHELL)

PASSING 12 INCH SQUARE OPENING	- 100 PERCENT
PASSING $\frac{1}{4}$ INCH SIEVE	- 25-75 PERCENT
PASSING NO. 200 SIEVE	- 0-12 PERCENT
PLASTICITY INDEX	- 5 MAXIMUM

(C) FILL IN ZONE III (UPPER PORTION OF DOWNSTREAM SHELL)

PASSING 12 INCH SQUARE OPENING	- 100 PERCENT
PASSING NO. 200 SIEVE	- 0-35 PERCENT
PLASTICITY INDEX	- 15 MAXIMUM

JOE CHOPRA'S
COPY

FOUNDATION AND MATERIALS INVESTIGATION REPORT

STRUCTURE No. 4

PROPOSED RETENTION BASIN PROGRAM FOR 1971

FOUNTAIN HILLS, ARIZONA

JOB No. E70-178

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • FLAGSTAFF • EL PASO

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS

B. DWAINE SERGENT, P.E. • JOHN B. HAUSKINS, P.E. • GEORGE H. BECKWITH, P.E. • DALE V. BEDENKOP, P.E.

APRIL 5, 1971

TRICO INTERNATIONAL INC.
8718 EAST MCDOWELL ROAD
SCOTTSDALE, ARIZONA 85257

JOB NO. E70-178

ATTENTION: MR. LARRY WETSTEIN

RE: STRUCTURE NO. 4
PROPOSED RETENTION BASIN
PROGRAM FOR 1971
FOUNTAIN HILLS, ARIZONA

GENTLEMEN,

OUR FOUNDATION AND MATERIALS INVESTIGATION REPORT FOR THE REFERENCED PROJECT IS HEREWITH SUBMITTED. THE REPORT INCLUDES THE RESULTS OF TEST DRILLING AND LABORATORY ANALYSIS ALONG WITH OUR CONCLUSIONS AND RECOMMENDATIONS.

SHOULD ANY QUESTIONS ARISE CONCERNING THIS REPORT, WE WOULD BE PLEASED TO DISCUSS THEM WITH YOU.

RESPECTFULLY SUBMITTED,
SERGENT, HAUSKINS & BECKWITH ENGINEERS

BY Robert D. Booth
ROBERT D. BOOTH, P.E.

REVIEWED BY George H. Beckwith
GEORGE H. BECKWITH, P.E.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 5633
GEORGE HENRY BECKWITH
Date Signed 4-5-71
ARIZONA, U.S.A.

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TABLE OF CONTENTS

REPORT	PAGE
INTRODUCTION	1
PROPOSED CONSTRUCTION	1
INVESTIGATION	1
SITE CONDITIONS & GEOLOGIC PROFILE	2
DISCUSSION & RECOMMENDATIONS	3
APPENDIX A	
TEST DRILLING EQUIPMENT & PROCEDURES	A-1
UNIFIED SOIL CLASSIFICATION SYSTEM	A-2
SITE PLAN	A-3
LOGS OF TEST BORINGS	A-4
APPENDIX B	
LABORATORY TESTING PROCEDURES	B-1
CLASSIFICATION TEST DATA	B-2
CONSOLIDATION TEST DATA	B-4
MOISTURE-DENSITY RELATIONSHIP TEST DATA	B-5
APPENDIX C	
SOIL PROFILE	C-1
RECOMMENDED EMBANKMENT DETAILS	C-2
GUIDE SPECIFICATIONS FOR EARTHWORK	C-3

JOB NO. E70-178

STRUCTURE NO. 4
FOUNTAIN HILLS, ARIZONA
JOB NO. E70-178

INTRODUCTION

THIS REPORT PRESENTS THE RESULTS OF A FOUNDATION AND MATERIALS INVESTIGATION MADE BY THIS FIRM FOR THE PROPOSED FLOOD CONTROL DAM, STRUCTURE NO. 4, RETENTION BASIN PROGRAM FOR 1971, FOUNTAIN HILLS, ARIZONA. THE OBJECT OF THE INVESTIGATION WAS TO DETERMINE THE PHYSICAL PROPERTIES OF THE SOILS UNDERLYING THE SITE TO PROVIDE RECOMMENDATIONS FOR DESIGN OF THE DAM EMBANKMENT AND SPILLWAY.

PROPOSED CONSTRUCTION

THE PROPOSED DAM WILL BE APPROXIMATELY 950 FEET IN LENGTH WITH A MAXIMUM HEIGHT OF 32 FEET. THE WIDTH AT THE TOP OF THE DAM WILL BE ~~10~~ 12 FEET AND APPROXIMATELY 45,000 CUBIC YARDS OF EMBANKMENT WILL BE INVOLVED. THE SPILLWAY ELEVATION WILL BE ~~1724.5~~ 1716' OR 2.5 FEET BELOW THE TOP OF THE PROPOSED EMBANKMENT. THE PROPOSED STRUCTURE WILL BE USED FOR FLOOD CONTROL PURPOSES ONLY. THE DESIGN IS BASED UPON THE TOTAL TIME REQUIRED FOR FILLING AND DRAINING BEING LESS THAN 2 DAYS.

INVESTIGATION

SIX EXPLORATORY BORINGS WERE DRILLED TO DEPTHS OF BETWEEN ABOUT 16 AND 44 FEET BELOW EXISTING GRADE. STANDARD PENETRATION TESTING AND UNDISTURBED SAMPLING WERE PERFORMED AT SELECTED INTERVALS IN SOME OF THE BORINGS. GENERALLY, $6\frac{1}{2}$ INCH HOLLOW STEM AUGER WAS USED TO ADVANCE THE BORINGS TO THEIR FULL DEPTH. HOWEVER, NX DIAMOND CORING WAS UTILIZED IN ADVANCING BORING NO. 6 FOR EVALUATION OF SPILLWAY DESIGN. INFORMATION ON THE PERMEABILITY OF THE SOILS INVOLVED WAS OBTAINED BY FILLING THE

BOREHOLES WITH WATER AND TAKING PERIODIC OBSERVATIONS OF WATER SURFACE ELEVATION. THE RESULTS OF THE EXPLORATORY DRILLING ARE PRESENTED IN APPENDIX A WHICH INCLUDES A BRIEF DESCRIPTION OF DRILLING AND SAMPLING EQUIPMENT AND PROCEDURES, A SITE PLAN SHOWING BORING LOCATIONS AND LOGS OF THE TEST BORINGS.

IN ADDITION TO THE 6 EXPLORATORY BORINGS, 10 TEST PITS WERE EXCAVATED WITH A WARNER & SWASEY HOPTO SERIES 200 TRUCK MOUNTED BACKHOE IN THE RESERVOIR AREA TO LOCATE BORROW FOR THE DAM EMBANKMENT. EACH TEST PIT WAS CAREFULLY EXAMINED, VISUALLY CLASSIFIED AND LOGGED. WHEREVER APPLICABLE, LARGE BULK SAMPLES WERE OBTAINED FOR LABORATORY ANALYSIS. THE LOGS OF THE TEST PITS ALSO ARE PRESENTED IN APPENDIX A. THEIR LOCATIONS ARE NOTED ON THE SITE PLAN.

GRAIN-SIZE ANALYSIS, ATTERBERG LIMITS, CONSOLIDATION AND MOISTURE-DENSITY RELATIONSHIP TESTS WERE PERFORMED ON SELECTED SAMPLES OF THE BORROW AND EMBANKMENT FOUNDATION SOILS. THE RESULTS OF THESE TESTS ARE PRESENTED IN APPENDIX B.

SITE CONDITIONS & GEOLOGIC PROFILE

THE SITE IS COVERED BY A LIGHT TO MODERATE GROWTH OF BRUSH, CACTI AND SMALL TREES. THE SITE OF THE PROPOSED DAM LIES IN A RELATIVELY BROAD AND GENTLY SLOPING DRAINAGE AREA. THE SOUTHERN SLOPE OF THE CANYON IS RATHER GENTLY SLOPING WHEREAS THE NORTHERN SLOPE IS A NEAR VERTICAL CLIFF.

THE GEOLOGIC PROFILE ALONG THE DAM AXIS, AS INDICATED BY OUR TEST BORINGS, VARIES SOMEWHAT BUT GENERALLY CAN BE DESCRIBED AS FOLLOWS:

1. GRANULAR SOILS CONSISTING OF SAND AND GRAVEL WITH VARYING AMOUNTS OF CLAY AND SILT WERE ENCOUNTERED AT THE SURFACE AND EXTENDED TO DEPTHS VARYING BETWEEN 10 AND 25 FEET BELOW EXISTING GRADE (ELEVATION 1683 TO 1692.5). THESE SOILS ARE GENERALLY UNCEMENTED AT THE SURFACE BUT BECOME CEMENTED TO VARYING DEGREES WITH DEPTH. THEY ARE GENERALLY VERY FIRM TO HARD, HOWEVER, A FEW LOOSER ZONES WERE PRESENT (SEE BORING NO. 4 AT $9\frac{1}{2}$ TO 14 FEET). THESE SOILS ARE EITHER ALLUVIAL FAN DEPOSITS OR RECENT CHANNEL ALLUVIUM.

2. DIRECTLY UNDERLYING THE SURFACE LAYER, CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY GENERALLY WERE ENCOUNTERED AND EXTENDED TO THE FULL DEPTH OF THE BORINGS. THESE SOILS ARE GENERALLY MODERATELY TO STRONGLY CEMENTED AND VERY HARD. THEY APPARENTLY ARE OLD LAKE BED DEPOSITS.

AS INDICATED BY BORING NO. 6, THE NORTHERN ABUTMENT CONSISTS OF VERY HEAVILY CEMENTED SAND, GRAVEL AND COBBLE DEPOSITS AND ARE VERY HARD. THE GEOLOGIC PROFILE ALONG THE DAM AXIS IS PRESENTED IN APPENDIX C.

NO FREE GROUND WATER WAS ENCOUNTERED IN THE TEST BORINGS AND SOIL MOISTURE CONTENTS WERE RELATIVELY LOW, BEING NEAR TO SOMEWHAT BELOW THE PLASTIC LIMIT FOR THE FINE GRAINED SOILS.

DISCUSSION & RECOMMENDATIONS

GENERAL

BECAUSE THE PROPOSED DAM IS FOR FLOOD CONTROL PURPOSES AND WILL NOT RETAIN WATER FOR EXTENDED PERIODS OF TIME, NORMAL SEEPAGE CONSIDERATIONS WILL NOT BE APPLICABLE TO THE PROJECT.

EXTENSION OF THE CORE TRENCH TO SLIGHTLY PENETRATE VERY FIRM CEMENTED SOILS OR CLAY IS RECOMMENDED. WITH THIS TREATMENT, EMBANKMENT SETTLEMENTS WILL BE VERY SLIGHT. THIS WILL PREVENT THE POSSIBILITY OF EMBANKMENT CRACKING AND SUBSEQUENT PIPING DURING ISOLATED WATER RETENTION PERIODS DUE TO EXCESSIVE MOVEMENTS OF THE FILL.

CLASSIFICATION BY THE SYSTEM DEVELOPED BY SHERARD, ET AL* INDICATES THAT BOTH THE EMBANKMENT FOUNDATION SOILS AND THOSE IN PROSPECTIVE BORROW AREAS HAVE A COMPARATIVELY HIGH RESISTANCE TO PIPING. WATER LOSS IN THE BOREHOLES INDICATES THAT BOTH THE CLAY AND CEMENTED SOILS ARE LOW IN PERMEABILITY. THE USE OF SOILS WITH RELATIVELY HIGH RESISTANCE TO PIPING AND LOW PERMEABILITY IS RECOMMENDED FOR THE CENTER PORTION OF THE EMBANKMENT. ALSO, SINCE THE EMBANKMENT SOILS WILL BE SUBJECT TO PERIODIC WETTING AND DRYING, THE USE OF GRANULAR SOILS IN THE SHELL TO PREVENT SHRINKAGE CRACKING IS RECOMMENDED. THE RECOMMENDED DETAILS WILL PRECLUDE PIPING THROUGH THE DAM FOUNDATION AND EMBANKMENT AND ENABLE ECONOMICAL CONSTRUCTION WITH MATERIALS AVAILABLE IN THE IMMEDIATE VICINITY OF THE DAM.

EMBANKMENT DETAILS

A ZONED EMBANKMENT IS RECOMMENDED. RECOMMENDED DETAILS FOR THE EMBANKMENT ARE ILLUSTRATED ON A DRAWING PRESENTED IN APPENDIX C. MATERIALS RECOMMENDATIONS ARE DISCUSSED IN THE FOLLOWING SECTION OF THIS REPORT.

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* SHERARD, J.L., WOODWARD, R.J., GIZIENSKI, S.F. & CLEVENGER, W.A., "EARTH AND EARTH-ROCK DAMS", JOHN WILEY & SONS, 1963, PAGE 129.

THE CORE TRENCH SHOULD BE A MINIMUM OF ~~10~~ 12 FEET IN WIDTH AT THE BOTTOM AND PENETRATE THE CEMENTED SOILS OR CLAY AT LEAST 2 FEET. IT APPEARS THAT THE TRENCH CAN BE EXCAVATED THROUGHOUT AND ONLY LIGHT RIPPING WILL BE REQUIRED.

THIS TRENCH SHOULD ALSO EXTEND INTO THE FACE OF THE NORTHERN SLOPE A MINIMUM OF 2 FEET INTO HARD CEMENTED SOILS. BLASTING THE FACE OF THE SLOPE MAY BE THE MOST ECONOMICAL METHOD OF ACHIEVING THIS, BOTH FOR THE SAFETY OF WORKMEN AND TO CREATE A SLOPE TO FACILITATE COMPACTION OPERATIONS NEAR THE FACE.

BASED ON AN ANGLE OF INTERNAL FRICTION OF 38° FOR THE SHELL (ZONE II), THE FACTOR OF SAFETY WAS CALCULATED AT ABOUT 2.1 FOR $2\frac{1}{2}$:1 SLOPES, 1.6 FOR 2:1 SLOPES AND 1.3 FOR $1\frac{1}{2}$:1 SLOPES. NO SEEPAGE FORCES DURING DRAWDOWN WERE CONSIDERED IN THIS ANALYSIS. BECAUSE SLIGHT SEEPAGE FORCES MAY BE INVOLVED NEAR THE FACE OF THE SHELL DURING THE VERY RAPID DRAWDOWN, 2:1 FILL SLOPES ARE RECOMMENDED.

EMBANKMENT MATERIALS & CONSTRUCTION

RECOMMENDATIONS FOR QUALITY AND REQUIRED DEGREE OF COMPACTION FOR EMBANKMENT MATERIALS ARE INCORPORATED INTO THE "GUIDE SPECIFICATIONS FOR EARTHWORK" PRESENTED IN APPENDIX C.

REQUIREMENTS FOR ZONE II ARE DESIGNED TO ELIMINATE MATERIALS HIGHLY SENSITIVE TO PIPING, CRACKING OR THE DEVELOPMENT OF HIGH SEEPAGE FORCES DURING DRAWDOWN. IN PRACTICE, VIRTUALLY ALL SOILS FROM THE RESERVOIR, CORE TRENCH EXCAVATION AND SPILLWAY EXCAVATION WILL MEET THESE REQUIREMENTS. APPROXIMATELY 120,000 CUBIC YARDS OF ZONE II MATERIAL (IN TERMS

OF VOLUME IN PLACE) CAN BE OBTAINED WITHIN THE RESERVOIR WITHOUT RIPPING.

IN ORDER TO ACHIEVE PROPER PERMEABILITY CHARACTERISTICS, REQUIREMENTS FOR ZONE I MATERIAL ARE SOMEWHAT MORE STRINGENT. VERY FEW MATERIALS MEETING THESE REQUIREMENTS ARE AVAILABLE WITHIN THE RESERVOIR. BLENDING THE CLAYS WITH THE OVERLYING GRANULAR SOILS FROM WITHIN THE RESERVOIR WOULD PRODUCE MATERIALS MEETING ZONE I REQUIREMENTS. HOWEVER, CONSIDERABLE DIFFICULTY WOULD PROBABLY BE ENCOUNTERED IN BLENDING DUE TO THE HARD CEMENTED NATURE OF THE CLAYS PRESENT WITHIN THE RESERVOIR. THUS, IT MAY BE NECESSARY TO BORROW MATERIALS FROM NEARBY RIDGES IN ORDER TO MEET THE REQUIREMENTS FOR ZONE I EMBANKMENT MATERIALS.

IT WILL BE NECESSARY TO IMPORT RIPRAP FOR EMBANKMENT SLOPE PROTECTION FROM AREAS OUTSIDE THE IMMEDIATE LIMITS OF THE SITE. HOWEVER, SUITABLE MATERIALS FOR USE AS RIPRAP ARE AVAILABLE NEARBY.

OUTLET PIPE

IT IS UNDERSTOOD THAT REINFORCED CONCRETE OUTLET PIPES ARE BEING CONSIDERED. CONCRETE CRADLE-TYPE BEDDING BEARING ON THE CEMENTED SOILS IS RECOMMENDED. IN ORDER TO MINIMIZE THE THICKNESS OF THE CRADLE, IT IS RECOMMENDED THAT ITS BASE BE BENCHED INTO THE NORTH SLOPE IN THE MANNER SHOWN ON THE GEOLOGIC PROFILE IN APPENDIX C. THE BASE OF THE CRADLE SHOULD EXTEND TO AT LEAST 2 FEET BELOW THE CONTACT OF THE CEMENTED SOILS.

WITH THE BEDDING RECOMMENDED ABOVE, SETTLEMENT OF $\frac{1}{2}$ INCH AT THE CENTER OF THE PIPE IS RECOMMENDED FOR STRUCTURAL ANALYSIS BY SOIL CONSERVATION SERVICE PROCEDURES. BY EXCAVATING TO THE CEMENTED SOILS FOR 5 FEET ON EACH SIDE OF THE PIPES THROUGHOUT THEIR LENGTH AND RECOMPACTION, IT CAN BE ASSURED THAT EXTERNAL PRESSURES ON THE PIPES WILL NOT BE SIGNIFICANTLY HIGHER THAN THE WEIGHT OF THE OVERBURDEN.

SEEPAGE COLLARS SHOULD BE PROVIDED.

SPILLWAY

SPILLWAY DESIGN AT THE SOUTH ABUTMENT IS CONTROLLED BY CLEAN UNCEMENTED WELL-GRADED SANDS. ACCORDINGLY, IT IS RECOMMENDED THAT A VELOCITY OF 2.5 FEET PER SECOND NOT BE EXCEEDED IN THE DESIGN OF A SPILLWAY AT THAT LOCATION.

AS BORING NO. 6 INDICATES, A SPILLWAY AT THE NORTH ABUTMENT WOULD INVOLVE VERY HARD CEMENTED SAND, GRAVEL AND COBBLES. IT IS ESTIMATED THAT THESE MATERIALS WILL RESIST VELOCITIES UP TO 8 FEET PER SECOND WITHOUT SIGNIFICANT EROSION. THUS, CUTTING A SPILLWAY AT THE NORTH ABUTMENT THROUGH TO THE DRAINAGE TO THE NORTH MAY MERIT CONSIDERATION.

APPENDIX 'A'

TEST DRILLING EQUIPMENT & PROCEDURES

DRILLING EQUIPMENT TRUCK MOUNTED CME-55 DRILL RIGS POWERED WITH 4 OR 6 CYLINDER FORD INDUSTRIAL ENGINES ARE USED IN ADVANCING TEST BORINGS. THE 4 CYLINDER AND 6 CYLINDER ENGINES ARE CAPABLE OF DELIVERING ABOUT 4350 AND 6500 FT. LBS. TORQUE TO THE DRILL SPINDLE, RESPECTIVELY. THE SPINDLE IS ADVANCED WITH TWIN HYDRAULIC RAMS CAPABLE OF EXERTING 12,000 POUNDS DOWNWARD FORCE. DRILLING THROUGH SOIL OR SOFTER ROCK IS PERFORMED WITH 6½" O.D. 3¼" I.D. HOLLOW STEM AUGER OR 4½" CONTINUOUS FLIGHT AUGER. CARBIDE INSERT TEETH ARE NORMALLY USED ON THE AUGER BITS SO THEY CAN OFTEN PENETRATE ROCK OR VERY STRONGLY CEMENTED SOILS WHICH REQUIRE BLASTING OR VERY HEAVY EQUIPMENT FOR EXCAVATION. WHERE REFUSAL IS EXPERIENCED IN AUGER DRILLING, THE HOLES ARE SOMETIMES ADVANCED WITH TRICONE GEAR BITS AND NW RODS USING WATER OR AIR AS A DRILLING FLUID.

SAMPLING PROCEDURES DYNAMICALLY DRIVEN TUBE SAMPLES ARE USUALLY OBTAINED AT SELECTED INTERVALS IN THE BORINGS BY THE ASTM D1586 PROCEDURE. TWO INCH O.D. 1-3/8" I.D. SAMPLERS ARE USED IN MANY CASES TO OBTAIN THE STANDARD PENETRATION RESISTANCE. "UNDISTURBED" SAMPLES OF FIRMER SOILS ARE OFTEN OBTAINED WITH 3" O.D. SAMPLERS LINED WITH 2.42" I.D. BRASS RINGS. DRIVING ENERGY IS GENERALLY RECORDED AS THE NUMBER OF BLOWS OF A 140 POUND 30 INCH FREE FALL DROP HAMMER REQUIRED TO ADVANCE THE SAMPLERS IN 6 INCH INCREMENTS. HOWEVER, IN STRATIFIED SOILS DRIVING RESISTANCE SOMETIMES IS RECORDED IN 2 OR 3 INCH INCREMENTS SO THAT SOIL CHANGES AND THE PRESENCE OF SCATTERED GRAVEL OR CEMENTED LAYERS CAN BE READILY DETECTED AND REALISTIC PENETRATION VALUES OBTAINED FOR CONSIDERATION IN DESIGN. THESE VALUES ARE EXPRESSED IN BLOWS PER FOOT ON THE LOGS. "UNDISTURBED" SAMPLING OF SOFTER SOILS IS SOMETIMES PERFORMED WITH THIN WALLED SHELBY TUBES (ASTM D1587). WHERE SAMPLES OF ROCK ARE REQUIRED, THEY ARE OBTAINED BY NX DIAMOND CORE DRILLING (ASTM D2113). THE TUBE SAMPLES ARE LABELED AND PLACED IN WATERTIGHT CONTAINERS TO MAINTAIN FIELD MOISTURE CONTENTS FOR TESTING. WHEN NECESSARY FOR TESTING, LARGER BULK SAMPLES ARE TAKEN FROM AUGER CUTTINGS.

CONTINUOUS PENETRATION TESTS CONTINUOUS PENETRATION TESTS ARE PERFORMED BY DRIVING A 2" O.D. BLUNT NOSED PENETROMETER ADJACENT TO OR IN THE BOTTOM OF BORINGS. THE PENETROMETER IS ATTACHED TO 1-5/8" O.D. DRILL RODS TO PROVIDE CLEARANCE AND MINIMIZE SIDE FRICTION SO THAT PENETRATION VALUES ARE AS NEARLY AS POSSIBLE A MEASURE OF END RESISTANCE. PENETRATION VALUES ARE RECORDED AS THE NUMBER OF BLOWS OF A 140 POUND 30 INCH FREE FALL DROP HAMMER REQUIRED TO ADVANCE THE PENETROMETER IN ONE FOOT INCREMENTS OR LESS.

BORING RECORDS DRILLING OPERATIONS ARE DIRECTED BY OUR FIELD ENGINEER OR GEOLOGIST WHO EXAMINES SOIL RECOVERY AND PREPARES BORING LOGS. SOILS ARE VISUALLY CLASSIFIED IN ACCORDANCE WITH THE UNIFIED SOIL CLASSIFICATION SYSTEM (ASTM D2487) WITH APPROPRIATE GROUP SYMBOLS BEING SHOWN ON THE LOGS.

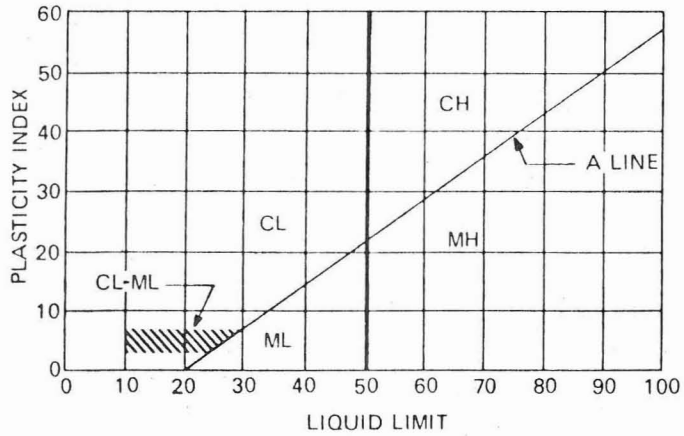
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

MAJOR DIVISIONS				GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or less of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)			GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
					GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 seive)			SW	Well graded sands, gravelly sands.
					SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve)	Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
			Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS (LIMITS PLOT BELOW "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)			ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)			MH	Inorganic silts, micaceous or diatomaceous silty soils, elastic silts.
	CLAYS (LIMITS PLOT ABOVE "A" LINE & HATCHED ZONE ON PLASTICITY CHART)	CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)			CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART



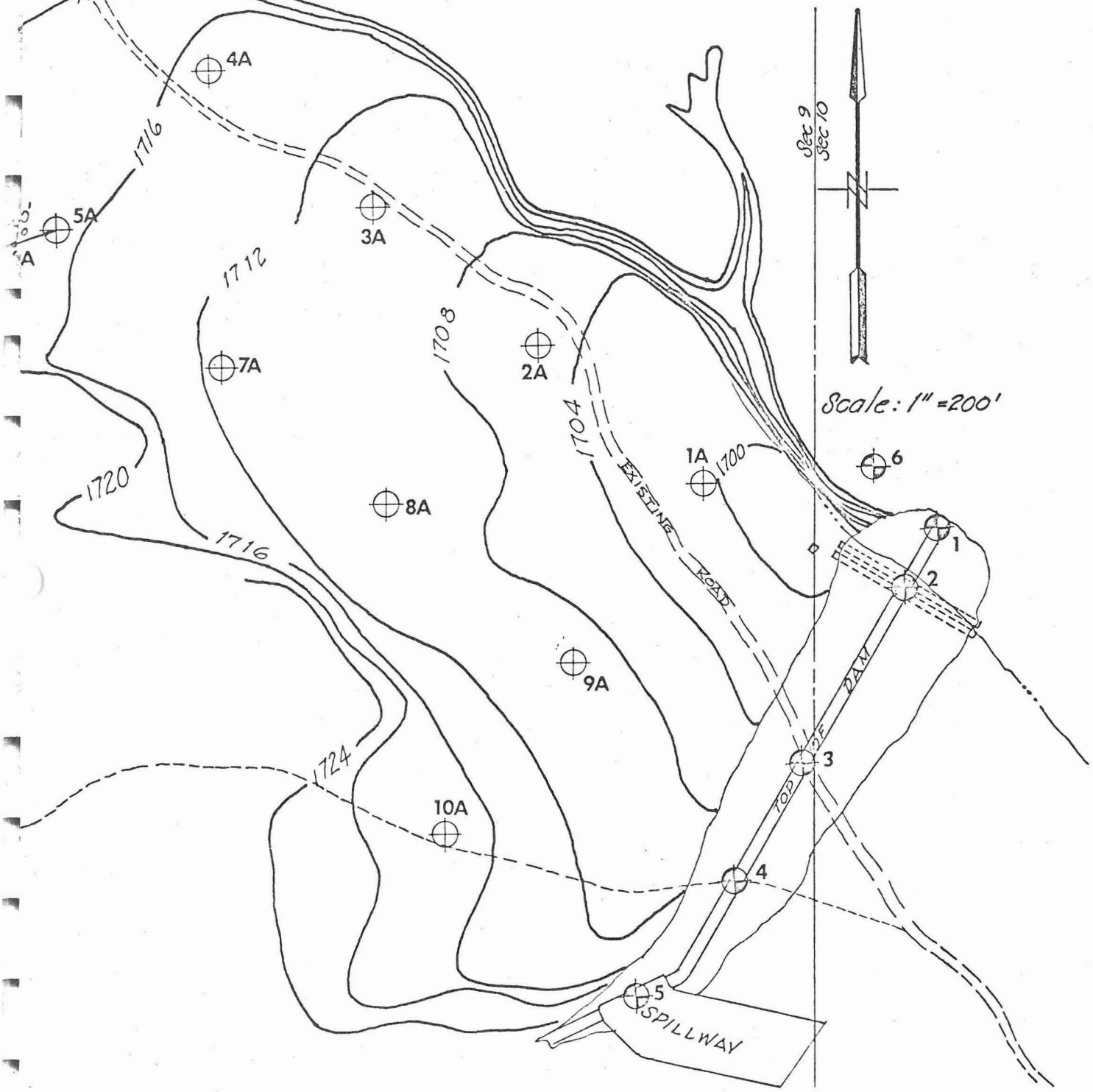
DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve

SITE PLAN

SHOWING LOCATIONS OF TEST BORINGS

STRUCTURE No. 4
FOUNTAIN HILLS, ARIZONA
JOB No. E70-178



AUGER BORINGS

BACKHOE TEST PITS

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • FLAGSTAFF • EL PASO

PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 12-31-70

LOG OF TEST BORING NO.

RIG TYPE CME-55

BORING TYPE 6½" HOLLOW STEM AUGER

SURFACE ELEV. 1703.8'

DATUM TRICO INTERNATIONAL TOP(

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0								GW	LOOSE TO MEDIUM DENSE	SAND & GRAVEL, SOME COBBLES, WELL GRADED NONPLASTIC, GRAY
5			☒	S	28		6			
								SC	VERY FIRM TO HARD	CLAYEY SAND, SOME GR & COBBLES, WELL GRADE SLIGHTLY CEMENTED, LO PLASTICITY, REDDISH-BROWN
10			☒	S	116	(NO RECOVERY)				
15			☒	U	100/6½"	114	16	CH	VERY HARD	SILTY CLAY, SOME SAND GRAVEL, MODERATELY TO HIGHLY CEMENTED, MEDI TO HIGH PLASTICITY, REDDISH-BROWN
20										AUGER REFUSED AT 19½'

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample

SERGENT, HAUSKINS & BECKWITH

PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 12-29-70

LOG OF TEST BORING NO. 2

RIG TYPE CME-55

BORING TYPE $6\frac{1}{2}$" HOLLOW STEM AUGER

SURFACE ELEV. 1696.1'

DATUM TRICO INTERNATIONAL TOPO

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			☒	S	20		2	GW	MEDIUM DENSE	SAND & GRAVEL, GENERALLY WELL GRADED, NONPLASTIC, BROWN
5			☒	S	73		3	GW	HARD	SAND & GRAVEL, GENERALLY WELL GRADED, SLIGHTLY CEMENTED, NONPLASTIC, BROWN
10			☒	S	112		17		VERY HARD	SILTY CLAY, SOME GRAVEL, TRACE OF SAND, SLIGHTLY TO MODERATELY CEMENTED, MEDIUM TO HIGH PLASTICITY, REDDISH-BROWN
15			☒	U	100/6"	105	17	CH		
20			☒	U	100/$6\frac{1}{2}$"	110	17			
25			☒	U	100/$4\frac{1}{2}$"	106	19		VERY HARD	SILTY CLAY, SOME GRAVEL, TRACE OF SAND, HIGHLY CEMENTED, MEDIUM TO HIGH PLASTICITY, REDDISH-BROWN
30			☒	U	100/4"	102	20	CH		
35			☒	U	100/$6\frac{1}{2}$"	101	21	CH	VERY HARD	SILTY CLAY, SOME GRAVEL, TRACE OF SAND, SLIGHTLY TO MODERATELY CEMENTED, MEDIUM TO HIGH PLASTICITY, REDDISH-BROWN
40										AUGER REFUSED AT $38\frac{1}{2}$'

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample.

U – 3" O.D. 2.42" I.D. tube sample.

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS

PHOENIX • FLAGSTAFF • EL PASO

PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 12-31-70

LOG OF TEST BORING NO. 3

RIG TYPE CME-55

BORING TYPE $6\frac{1}{2}$" HOLLOW STEM AUGER

SURFACE ELEV. 1702.6'

DATUM TRICO INTERNATIONAL TOPO

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	27		1		MEDIUM DENSE	SAND & GRAVEL, FAIRLY WELL GRADED, NONPLASTIC, BROWN
5			X	S	12		2	GW		
10			X	S	87		15		VERY HARD	SANDY SILT, TRACE OF GRAVEL, MODERATELY TO HIGHLY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN
15				U	100/$5\frac{1}{2}$"	105	14			
20				U	100/$3\frac{1}{2}$"	114	14			
								ML		
25				U	100/5"	109	14			
30				U	100/5"	96	19			
35										AUGER REFUSED AT 34'

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample.

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CONSULTING SOIL AND FOUNDATION ENGINEERS
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PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 12-30-70

LOG OF TEST BORING NO. 4

RIG TYPE CME-55

BORING TYPE 6½" HOLLOW STEM AUGER

SURFACE ELEV. 1708.0'

DATUM TRICO INTERNATIONAL TOPO

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0				S	10		2	SP	LOOSE TO MEDIUM DENSE	SAND, PREDOMINANTLY MEDIUM TO FINE, SOME FINE GRAVEL, NONPLASTIC, BROWN
5				S	43			SM	VERY FIRM	SILTY SAND & GRAVEL, POORLY GRADED, MODERATELY CEMENTED, NONPLASTIC, GRAY
10				S	8		2	GW	LOOSE TO MEDIUM DENSE	SAND & GRAVEL, GENERALLY WELL GRADED, SLIGHTLY CEMENTED, NONPLASTIC, BROWN
15				S	74		1		VERY HARD	CLAYEY SAND & GRAVEL, FAIRLY WELL GRADED, MODERATELY TO STRONGLY CEMENTED, MEDIUM PLASTICITY, GRAY
20				S	50/4½"		2	SC		
25				S	97		9		VERY HARD	SILTY CLAY, SOME SAND & GRAVEL, MODERATELY TO STRONGLY CEMENTED, MEDIUM TO HIGH PLASTICITY, REDDISH-BROWN
30				S	109		19	CL		
35				U	100/4"	112	14			
40				U	100/8"	97	12	CL	VERY HARD	SANDY CLAY, SOME GRAVEL, MODERATELY TO STRONGLY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN
45										AUGER REFUSED AT 44'3"

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample.

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS

PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 12-31-70

LOG OF TEST BORING NO. 5

RIG TYPE CME-55

BORING TYPE 6½" HOLLOW STEM AUGER

SURFACE ELEV. 1720.8'

DATUM TRICO INTERNATIONAL TOPO

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			X	S	25		6	CH	FIRM	SANDY CLAY, SOME GRAVEL & COBBLES, SLIGHTLY CEMENTED, MEDIUM TO HIGH PLASTICITY, RED
5				S	50/5"		3	SC	HARD	CLAYEY SAND, SOME GRAVEL & COBBLES, LOW PLASTICITY, REDDISH-BROWN
10			X	S	28		1	SW	VERY FIRM TO HARD	SAND, SOME GRAVEL, GENERALLY WELL GRADED, SLIGHTLY CEMENTED, NON-PLASTIC, GRAY
15			X	S	77		1			
20										STOPPED AUGER AT 14½' STOPPED SAMPLER AT 16'

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample.

U – 3" O.D. 2.42" I.D. tube sample.

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS

PHOENIX • FLAGSTAFF • EL PASO

PROJECT FOUNTAIN HILLS-STRUCTURE NUMBER 4

JOB NO. E70-178 DATE 3-5-71

LOG OF TEST BORING NO.

RIG TYPE CME-55

BORING TYPE 6½" HOLLOW STEM AUGER &

SURFACE ELEV. DIAMOND

DATUM TRICO INTERNATIONAL TOP

Depth in Feet	Continuous Penetration Resistance	Graphical Log	Sample	Sample Type	Blows per foot 140 lb. 30" free-fall drop hammer	Dry Density Lbs. per cu. ft.	Moisture Content Per Cent of Dry Wt.	Unified Soil Classification	REMARKS	VISUAL CLASSIFICATION
0			S	S	10 50/5"			CH	VERY HARD	SILTY CLAY, SOME SAN SOME COBBLES, MEDIUM HIGH PLASTICITY, RED DISH-BROWN
				S	50/3"				VERY HARD	SAND, GRAVEL & COBBLE SOME SILT, VERY STRO CEMENTED, LOW TO MEDI PLASTICITY, GRAYISH-T
5				AUGER REFUSED AT 5' BEGAN CORING						
				NX					100% WATER RETURN 50% CORE RECOVERY TAN	
10										
				NX					100% WATER RETURN 100% CORE RECOVERY TAN	
15										
				NX				GW	100% WATER RETURN 50% CORE RECOVERY TAN	
20										
				NX					100% WATER RETURN 15% CORE RECOVERY TAN	
25										
				NX					100% WATER RETURN 15% CORE RECOVERY TAN	
30										
35										STOPPED CORING AT 35'

GROUND WATER

DEPTH	HOUR	DATE
	NONE	

SAMPLE TYPE

A – Auger cuttings. B – Block sample

S – 2" O.D. 1.38" I.D. tube sample.

SERGENT, HAUSKINS & BECKWITH

FOUNTAIN HILLS-STRUCTURE #4
FOUNTAIN HILLS, ARIZONA
JOB NO. E70-178

PROPOSED BORROW AREA

HOLE NO.	DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	
1A	0-1'	SM	SILTY SAND, SOME GRAVEL, NONPLASTIC, TAN	NS
	1'-3'	GW	SAND & GRAVEL, SOME COBBLES TO 8", SUBROUNDED, GENERALLY WELL GRADED, NONPLASTIC, TAN	S
	3'-8'	GW	SAND, GRAVEL & COBBLES, WELL GRADED, NONPLASTIC, BROWN	NS
	8'-11'	CL	CLAY, SLIGHT CEMENTATION, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	NS
2A	0-2'	ML	SANDY SILT, TRACE OF GRAVEL, NONPLASTIC, TAN	NS
	2'-4'	GW	SAND & GRAVEL, OCCASIONAL COBBLES TO 10", SUBROUNDED, GENERALLY WELL GRADED, NONPLASTIC, BROWN	
	4'-6'	SW	SAND, OCCASIONAL GRAVEL, NONPLASTIC, BROWN	NS
	6'-11½'	CL	CLAY, SLIGHTLY CEMENTED, MEDIUM PLASTICITY, BROWN (DUG WITH BACKHOE)	S
3A	0-2'	SM	SILTY SAND, SOME GRAVEL, NONPLASTIC, TAN	NS
	2'-6'	GW-GM	SAND, GRAVEL & COBBLES, GENERALLY WELL GRADED, SUBROUNDED, NONPLASTIC, TAN	S

FOUNTAIN HILLS-STRUCTURE #4
FOUNTAIN HILLS, ARIZONA
JOB NO. E70-178

PROPOSED BORROW AREA

HOLE NO.	DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	
3A	6'-12'	CL	CLAY, SLIGHTLY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	NS
4A	0-2'	GM	SILTY SAND & GRAVEL, OCCASIONAL COBBLES, SUBROUNDED, NONPLASTIC, TAN	S
	2'-6'	GW-GM	SAND, GRAVEL & COBBLES, GENERALLY WELL GRADED, NONPLASTIC, TAN	S
	6'-10'	CL	CLAY, SLIGHT CEMENTATION, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	NS
5A	0-4'	SM	SILTY SAND, SOME GRAVEL, LOW PLASTICITY TO NONPLASTIC	NS
	4'-6'	GW-GM	SAND & GRAVEL, SOME COBBLES TO 8", GENERALLY WELL GRADED, NONPLASTIC, TAN	S
	6'-10'	CL	CLAY, MODERATELY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	S
6A	0-2'	SM	SILTY SAND, SOME GRAVEL, NONPLASTIC, BROWN	NS
	2'-5'	GW	SAND & GRAVEL, FEW COBBLES, GENERALLY WELL GRADED, NONPLASTIC, TAN	S

FOUNTAIN HILLS-STRUCTURE #4
FOUNTAIN HILLS, ARIZONA
JOB NO. E70-178

PROPOSED BORROW AREA

HOLE NO.	DEPTH	UNIFIED SOIL CLASSIFICATION	DESCRIPTION	
6A	5'-8'	CL	CLAY, SLIGHTLY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	NS
7A	0-7'	SW-SM	SILTY SAND & GRAVEL, FEW COBBLES, GENERALLY WELL GRADED TO 3", NONPLASTIC, TAN	S
	7'-9'	CL	CLAY, SLIGHTLY CEMENTED, MEDIUM PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	S
8A	0-6'	GW-GM	SAND & GRAVEL, OCCASIONAL COBBLES, SOME SILT, SUB-ANGULAR, GENERALLY WELL GRADED, NONPLASTIC, TAN	S
	6'-9'	CH	CLAY, SLIGHTLY CEMENTED, HIGH PLASTICITY, REDDISH-BROWN (DUG WITH BACKHOE)	S
9A	0-1'	SM	SILTY SAND, SOME GRAVEL, NONPLASTIC, TAN	NS
	1'-3'	ML	SANDY SILT, NONPLASTIC, TAN	S
	3'-6'	GW-GM	SAND & GRAVEL, FEW COBBLES, GENERALLY WELL GRADED, NONPLASTIC, TAN (DUG WITH BACKHOE)	S
10A	0-11'	SW	SAND & GRAVEL, SOME COBBLES, TRACE OF SILT, NONPLASTIC, TAN (DUG WITH BACKHOE)	S

APPENDIX B

LABORATORY TESTING PROCEDURES

CONSOLIDATION TESTS. SOILTEST OR CLOCKHOUSE APPARATUS OF THE "FLOATING-RING" TYPE ARE EMPLOYED FOR THE ONE-DIMENSIONAL CONSOLIDATION TESTS. THEY ARE DESIGNED TO RECEIVE ONE INCH HIGH 2.5 INCH O.D. BRASS LINER RINGS WITH SOIL SPECIMENS AS SECURED IN THE FIELD. PROCEDURES FOR THE TESTS ARE GENERALLY THOSE OUTLINED IN ASTM D2435-65T. LOADS ARE APPLIED IN SEVERAL INCREMENTS TO THE UPPER SURFACE OF THE TEST SPECIMEN AND THE RESULTING DEFORMATIONS ARE RECORDED AT SELECTED TIME INTERVALS FOR EACH INCREMENT. FOR SOILS WHICH ARE ESSENTIALLY SATURATED, EACH INCREMENT OF LOAD IS MAINTAINED UNTIL THE DEFORMATION VERSUS LOG OF TIME CURVE INDICATES COMPLETION OF PRIMARY CONSOLIDATION. FOR PARTIALLY SATURATED SOILS, EACH INCREMENT OF LOAD IS MAINTAINED UNTIL THE RATE OF DEFORMATION IS EQUAL OR LESS THAN 1/10,000 INCH PER HOUR. APPLIED LOADS ARE SUCH THAT EACH NEW INCREMENT IS EQUAL TO THE TOTAL PREVIOUSLY APPLIED LOADING. POROUS STONES ARE PLACED IN CONTACT WITH THE TOP AND BOTTOM OF THE SPECIMENS TO PERMIT FREE ADDITION OR EXPULSION OF WATER. FOR PARTIALLY SATURATED SOILS, THE TESTS ARE NORMALLY PERFORMED AT IN SITU MOISTURE CONDITIONS UNTIL CONSOLIDATION IS COMPLETE UNDER STRESSES APPROXIMATELY EQUAL TO THOSE WHICH WILL BE IMPOSED BY THE COMBINED OVERBURDEN AND FOUNDATION LOADS. THE SAMPLES ARE THEN SUBMERGED TO SHOW THE EFFECT OF MOISTURE INCREASE AND THE TESTS CONTINUED UNDER HIGHER LOADINGS. GENERALLY THE TESTS ARE CONTINUED TO ABOUT TWICE THE ANTICIPATED STRESS DUE TO OVERBURDEN AND STRUCTURAL LOADS WITH A REBOUND CURVE THEN BEING ESTABLISHED BY RELEASING LOADS.

EXPANSION TESTS. THE SAME TYPE OF CONSOLIDOMETER APPARATUS DESCRIBED ABOVE IS USED IN EXPANSION TESTING. UNDISTURBED SAMPLES CONTAINED IN BRASS LINER RINGS ARE PLACED IN THE CONSOLIDOMETERS, SUBJECTED TO APPROPRIATE SURCHARGE LOADS AND SUBMERGED. THE LOADS ARE MAINTAINED UNTIL THE EXPANSION VERSUS LOG OF TIME CURVE INDICATES COMPLETION OF "PRIMARY SWELL".

TABULATION OF TEST RESULTS

Job No. E70-178

Date

Client:

Project FOUNTAIN HILLS-STRUCTURE #4

FOUNTAIN HILLS, ARIZONA

Material EMBANKMENT FOUNDATION SOILS

Source

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS — ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	1/4	3/8	3/4	1	1 1/2	2	
2		15'	CH	55	30	97	99	100										2587-7
3		15'	ML	38	11	94	95	98	100									2587-15
4		15'	SC	31	15	26	32	40	50	58	71	75	80	100				2587-22

SERGENT, HAUSKINS & BECKWITH

TABULATION OF TEST RESULTS

Job No. E70-178

Date

Client:

Project FOUNTAIN HILLS-STRUCTURE #4

FOUNTAIN HILLS, ARIZONA

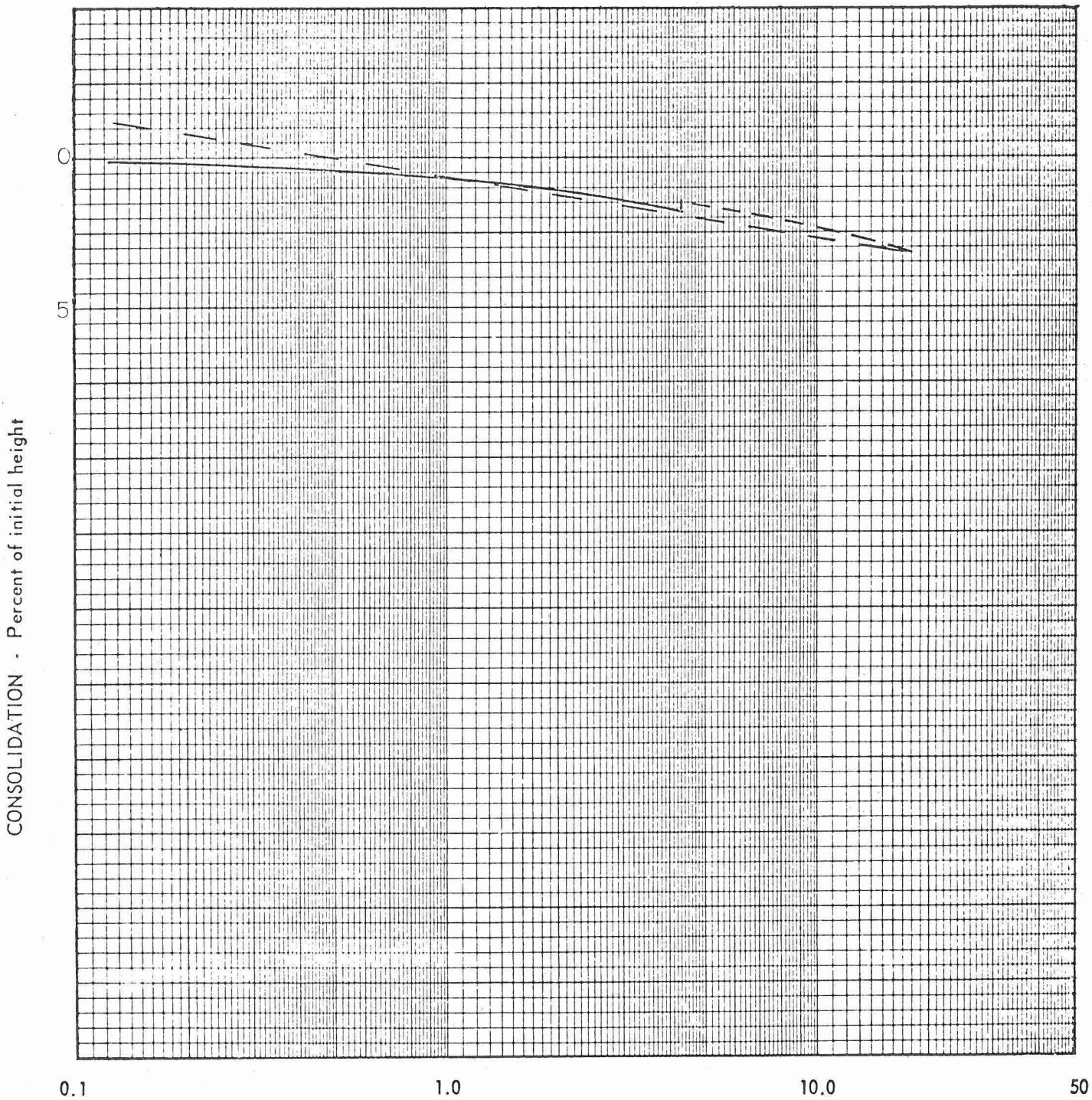
Material BORROW

Source

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	1/4	3/8	3/4	1	1 1/2	2	
1A	SEE SITE PLAN	1'-3'	GW		NP	2	3	5	14	22	39	46	54	72	81	89	97	2830-2
2A	SEE SITE PLAN	6'-11½'	CL	47	24	96	98	99	99	99	100							2830-9
3A	SEE SITE PLAN	2'-6'	GW-GM		NP	5	6	9	15	18	26	30	35	49	61	75	89	2830-12
4A	SEE SITE PLAN	0-2'	GM		NP	18	23	29	35	30	46	49	53	61	66	72	79	2830-15
4A	SEE SITE PLAN	2'-6'	GW-GM		NP	6	8	13	20	26	44	51	59	77	86	95	99	2830-16
5A	SEE SITE PLAN	4'-6'	GW-GM		NP	6	8	12	18	22	33	40	49	68	79	88	94	2830-20
5A	SEE SITE PLAN	6'-10'	CL	45	20	96	97	98	98	98	100							2830-21
6A	SEE SITE PLAN	2'-5'	GW		NP	4	6	10	17	20	25	28	33	47	54	65	79	2830-24
7A	SEE SITE PLAN	0-7'	SW-SM		NP	6	8	17	31	39	49	53	57	65	70	75	84	2830-27
7A	SEE SITE PLAN	7'-9'	CL	45	22	95	96	98	98	98	100							2830-28
8A	SEE SITE PLAN	0-6'	GW-GM		NP	7	10	16	26	32	41	45	50	59	63	70	80	2830-30
8A	SEE SITE PLAN	6'-9'	CH	55	38	78	83	87	90	93	100							2830-31
9A	SEE SITE PLAN	1'-3'	ML		NP	83	92	96	98	99	99	99	99	99	100			2830-34
9A	SEE SITE PLAN	3'-6'	GW-GM		NP	9	13	19	29	35	46	50	55	65	70	76	81	2830-35
10A	SEE SITE PLAN	0-11'	SW		NP	3	16	21	33	39	51	59	67	82	88	96	100	2587-32

SUMMARY OF CONSOLIDATION TESTS

PROJECT FOUNTAIN HILLS- STRUCTURE No. 4 JOB NO. E70-178



CURVE	SAMPLE	INITIAL DRY DENSITY LBS./CU. FT.	MOISTURE CONTENT % DRY WEIGHT		UNIFIED SOIL CLASSIFICATION
			INITIAL	FINAL	
A	BORING #2 AT 15'	104.8	16.9	22.0	CH

SOIL MOISTURE CONDITION

——— INSITU

– – – – SUBMERGED

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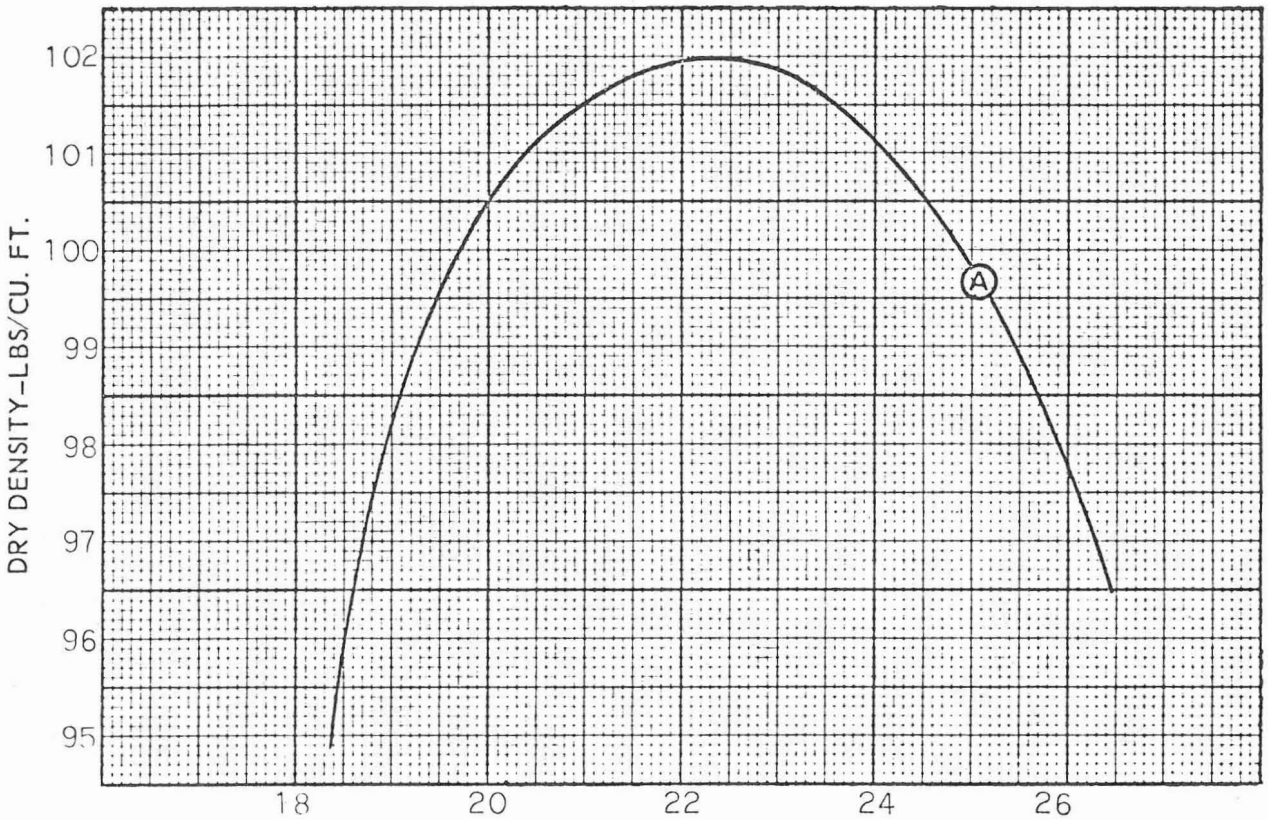
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT FOUNTAIN HILLS-STRUCTURE No. 4 **JOB NO.** E70-178



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
A	HOLE #7A @ 7'-9'	22.2	102.0	ASTM D698-66T	A	2830-28

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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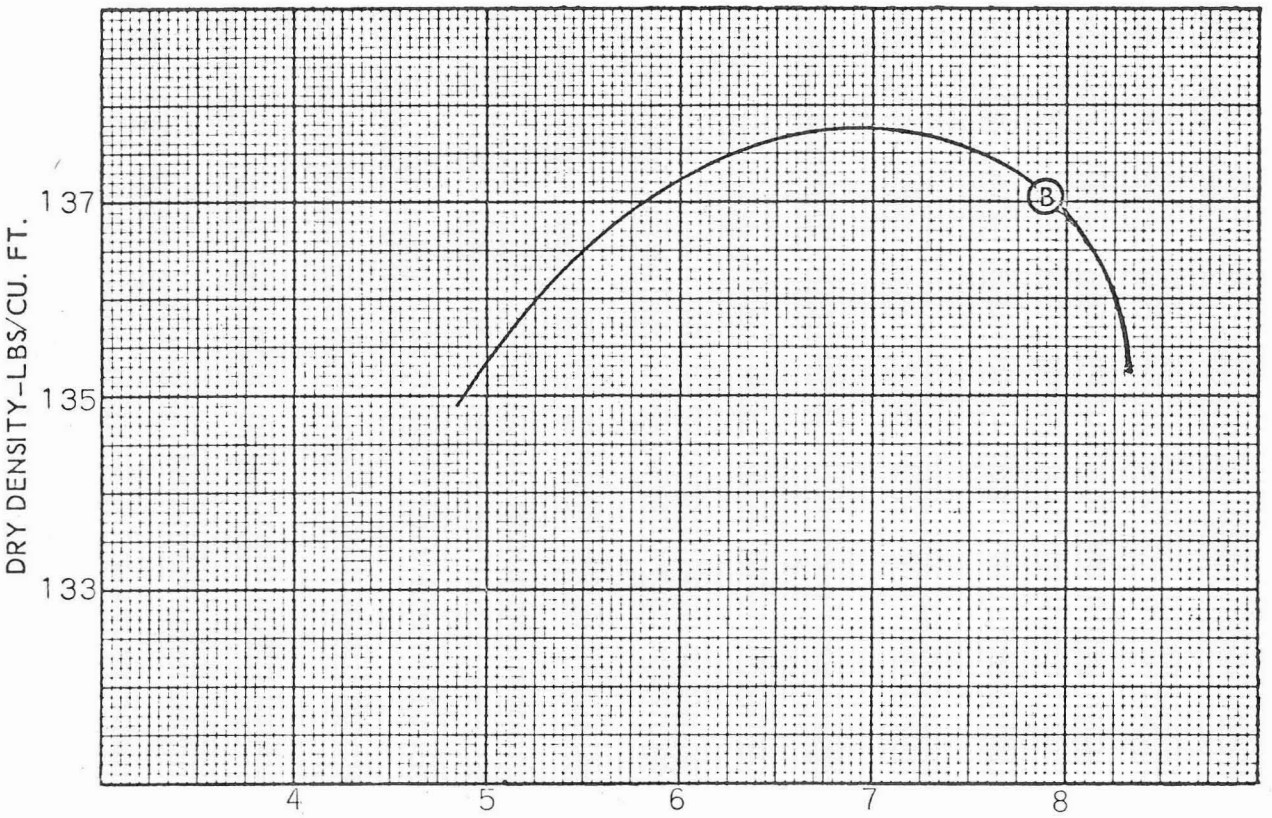
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT FOUNTAIN HILLS-STRUCTURE No. 4 **JOB NO.** E70-178



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
B	HOLE #5A @ 4'-6';	7.0	137.3	ASTM D698-66T	D	2830-20,
	HOLE #8A @ 0-6'					2830-30

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD DIAMETER	MOLD HEIGHT	NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD DIAMETER	MOLD HEIGHT	NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS CU. FT.
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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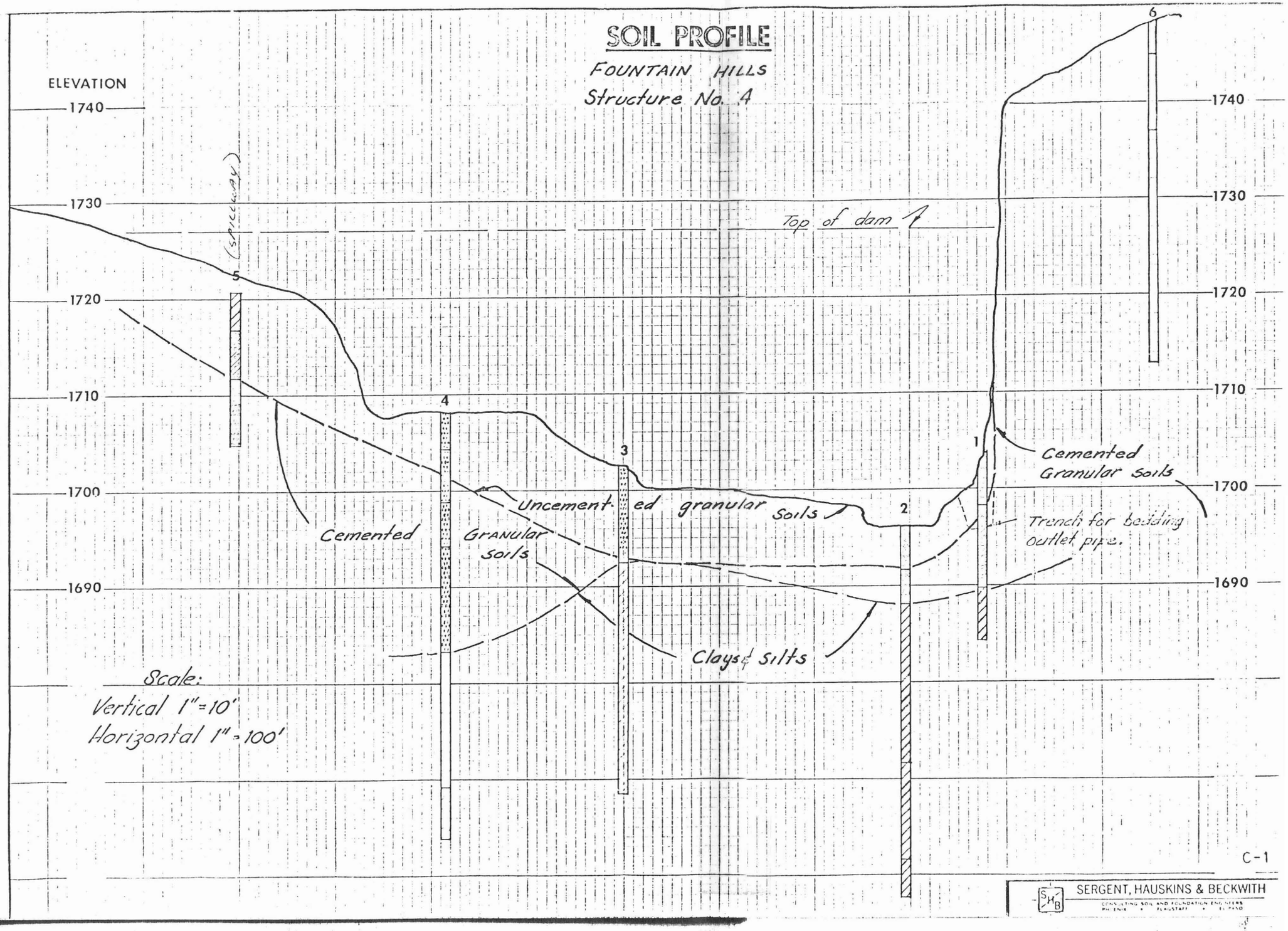
SOIL PROFILE
FOUNTAIN HILLS
Structure No. 4
ELEVATION
1740
1730
1720
1710
1700
1690
(Spillway)
Top of dam
Cemented
Granular soils
Uncemented granular soils
Cemented
Granular
soils
Trench for building
outlet pipe.
Clays & silts
Scale:
Vertical 1" = 10'
Horizontal 1" = 100'
1
2
3
4
5
6
C-1
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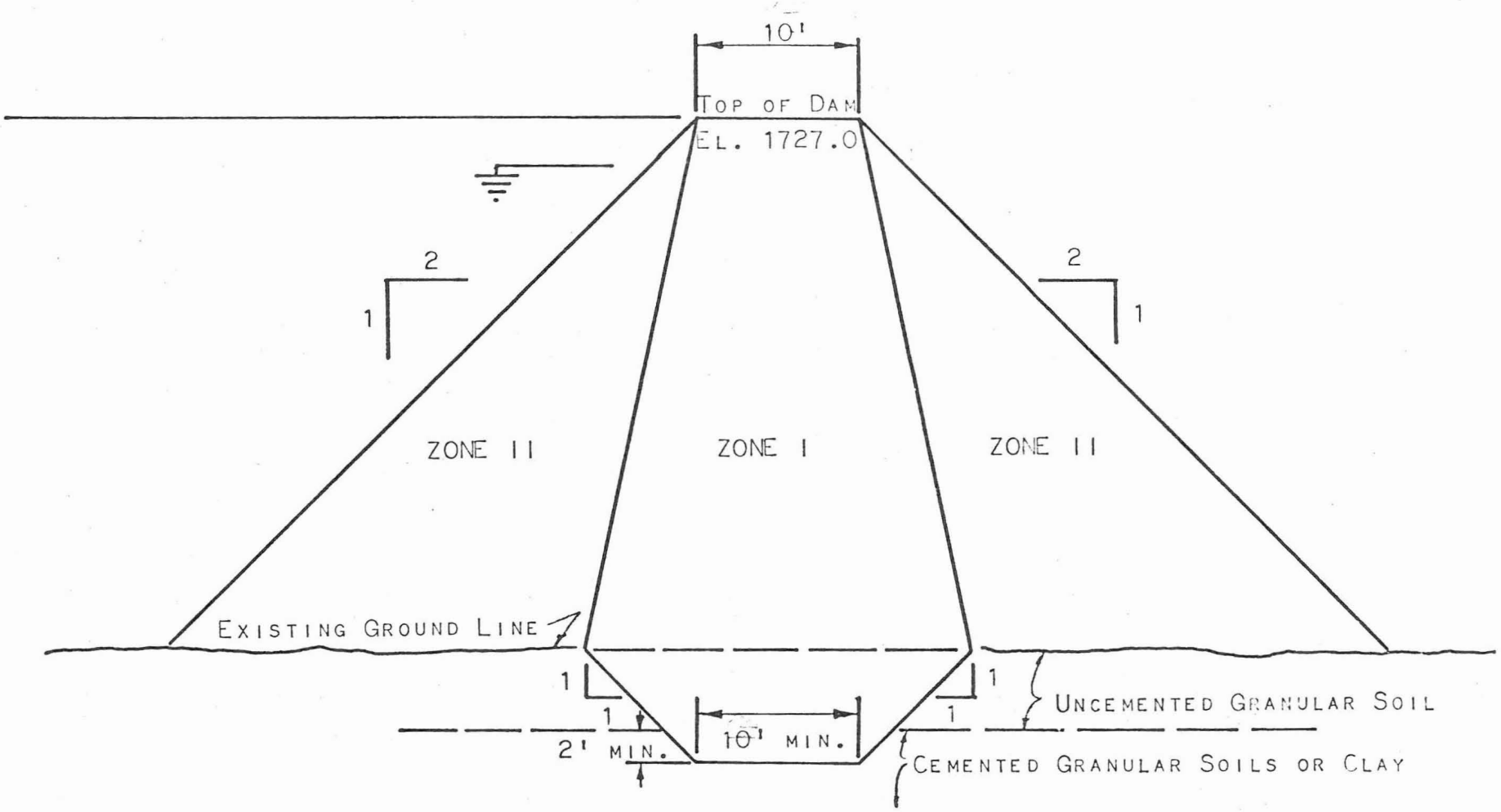
RECOMMENDED EMBANKMENT DETAILS

STRUCTURE NUMBER 4
FOUNTAIN HILLS, ARIZONA
JOB NO. E70-178



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GUIDE SPECIFICATIONS FOR EARTHWORK

SECTION I - GENERAL

THE ENGINEER SHALL ACT AS THE OWNER'S REPRESENTATIVE DURING CONSTRUCTION, SHALL PERFORM NECESSARY OBSERVATIONS AND TESTS TO VERIFY COMPLIANCE WITH SPECIFICATIONS AND SHALL APPROVE ALL ITEMS SPECIFIED.

SECTION II - CLEARING

(A) DESCRIPTION

CLEARING SHALL CONSIST OF REMOVING ALL TREES, STUMPS, BRUSH, CACTI, ROOTS, RUBBISH, DEBRIS AND OTHER OBJECTIONABLE MATTER FROM ALL AREAS TO RECEIVE EMBANKMENT IN THE RESERVOIR AREA AND THE BORROW AREAS AS DESIGNATED BY THE ENGINEER.

(B) DISPOSAL OF MATERIALS

MATERIALS FROM CLEARING OPERATIONS SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.

SECTION III - EXCAVATION

(A) DESCRIPTION

EXCAVATION SHALL CONSIST OF EXCAVATING ALL MATERIALS FROM THE CORE TRENCH, SPILLWAY AND OUTLET PIPE FOUNDATION TO THE LINES AND GRADES SHOWN ON THE PLANS OR DESIGNATED BY THE ENGINEER,

AND TRANSPORTING AND PLACING SAID MATERIALS IN STOCKPILE OR EMBANKMENT AREAS.

(B) CONSTRUCTION DETAILS

THE EXCAVATED SOILS SHALL BE INCORPORATED INTO DESIGNATED ZONES OF THE EMBANKMENT. EXCAVATED MATERIALS SHALL EITHER BE PLACED DIRECTLY IN EMBANKMENT ZONES OR INITIALLY PLACED IN DESIGNATED STOCKPILE AREAS. THE ENGINEER MAY REQUIRE EXCAVATION OF SOFTER MORE COMPRESSIBLE SOILS IN THE CORE TRENCH AND OUTLET PIPE FOUNDATION BEYOND THE LINES AND GRADES SHOWN ON THE PLANS TO SUCH AN ELEVATION WHERE FIRM CEMENTED SOIL IS EXPOSED THROUGHOUT.

SECTION IV - EMBANKMENT

(A) DESCRIPTION

EMBANKMENT SHALL CONSIST OF THE FOLLOWING ITEMS:

1. ROLLING AND WATERING OF ALL FILL AS HEREAFTER SPECIFIED.
2. EXCAVATION OF NECESSARY MATERIALS FROM DESIGNATED BORROW AREAS, AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN APPROPRIATE EMBANKMENT SECTIONS.
3. EXCAVATION OF NECESSARY MATERIALS FROM TEMPORARY STOCKPILE AREAS AND TRANSPORT TO AND PLACEMENT OF SAID MATERIALS IN DESIGNATED EMBANKMENT SECTIONS.

(B) PLACEMENT AND COMPACTION OF FILL

ALL FILL MATERIALS SHALL BE PLACED IN CONTINUOUS HORIZONTAL LIFTS, BROUGHT TO APPROXIMATELY THE OPTIMUM MOISTURE CONTENT AND PROPERLY COMPACTED. THE ROLLED SURFACES OF ALL LAYERS OF EARTH FILL SHALL BE SO CONSTRUCTED AS TO PROVIDE A FIRM BOND WITH THE OVERLYING LAYER AND PREVENT DEVELOPMENT OF A STRATIFIED STRUCTURE.

THE DIFFERENCE IN ELEVATION BETWEEN ADJACENT ZONES OF COMPACTED FILL MATERIALS SHALL NOT EXCEED 4 FEET AT ANY TIME DURING EMBANKMENT CONSTRUCTION.

(C) REQUIRED DEGREE OF COMPACTION

1. MAXIMUM DENSITY AND OPTIMUM MOISTURE CONTENT OF SOILS IN WHICH ACCURATE FIELD DENSITY TESTS CAN BE PERFORMED SHALL BE DETERMINED IN ACCORDANCE WITH ASTM D698-66T.

2. ALL EMBANKMENT MATERIALS IN ZONE I AND THOSE MATERIALS IN ZONE II CONTAINING MORE THAN 50 PERCENT PASSING THE NO. 4 SIEVE SHALL BE PLACED IN HORIZONTAL LIFTS AND COMPACTED TO A MINIMUM OF 95 PERCENT OF MAXIMUM DENSITY.

3. FOR PURPOSES OF ACCEPTANCE THE IN-PLACE DENSITY SHALL BE DEFINED AS THAT DETERMINED IN ACCORDANCE WITH ASTM D1556-64,

"DENSITY OF SOIL IN PLACE BY SAND-CONE METHOD". APPROPRIATE "ROCK CORRECTION" SHALL BE MADE TO ACCOUNT FOR THE FRACTION OF SOIL RETAINED ON THE NO. 4 SIEVE.

4. COMPACTION OF EMBANKMENT MATERIALS IN ZONE II WITH 50 PERCENT OR LESS PASSING THE NO. 4 SIEVE SHALL BE CONTROLLED ON A MINIMUM ROLLING BASIS AS FOLLOWS:

   A. LIFTS SHALL BE PLACED SO THEIR THICKNESS, WHEN COMPACTED, DOES NOT EXCEED 12 INCHES.

   B. COMPACTION SHALL BE ACCOMPLISHED BY A SPECIFIED NUMBER OF PASSES OF EQUIPMENT APPROVED BY THE SOILS ENGINEER. THE FOLLOWING TYPES OF PNEUMATIC ROLLERS WILL BE SATISFACTORY:

ROLLER TYPE	ROLLER RATING	WHEEL LOAD	TIRE INFLATION PRESSURE
A	45 TON MIN.	11 TON MIN.	140 PSI MIN.
B	45 TON MIN.	$5\frac{1}{2}$ TON MIN.	90 PSI MIN.

EACH LIFT SHALL BE COMPACTED WITH A MINIMUM OF 3 PASSES OF ROLLER A OR 5 PASSES WITH ROLLER B. OTHER TYPES OF ROLLERS CAN BE EVALUATED AS TO SUITABILITY AND REQUIRED COMPACTIVE EFFORT ESTABLISHED FOR THOSE WHICH ARE ACCEPTABLE BY THE ENGINEER.

   C. DURING COMPACTION THE MOISTURE CONTENT OF THE $-\frac{3}{4}$ FRACTION OF THE FILL SHALL BE MAINTAINED WITHIN 2 PERCENT OF THE OPTIMUM MOISTURE CONTENT AS DETERMINED IN ACCORDANCE WITH ASTM D698-66T, METHOD D.

(D) DESIGNATED EMBANKMENT MATERIALS

1. EMBANKMENT FILL MATERIALS SHALL COME FROM EXCAVATIONS FOR THE CORE TRENCH, SPILLWAY AND OUTLET PIPE AND FROM BORROW AREAS DESIGNATED BY THE ENGINEER. EMBANKMENT FILL MATERIALS SHOULD BE FREE OF VEGETATION AND DEBRIS AND OTHERWISE MEET THE FOLLOWING REQUIREMENTS:

(A) FILL IN ZONE I

PASSING 3 INCH SIEVE	- 100 PERCENT
PASSING NO. 4 SIEVE	- 60-100 PERCENT
PASSING NO. 200 SIEVE	- 15-35 PERCENT
PLASTICITY INDEX	- 5-25

(B) FILL IN ZONE II

PASSING 12 INCH SQUARE OPENING	- 100 PERCENT
PASSING NO. 200 SIEVE	- 0-20 PERCENT
PLASTICITY INDEX	- 5 MAXIMUM

SECTION V - CONCRETE

(A) DESCRIPTION

PORTLAND CEMENT CONCRETE SHALL CONSIST OF A MIXTURE OF CEMENT, FINE AGGREGATE, COARSE AGGREGATE, WATER, AN AIR-ENTRAINING ADMIXTURE, AND A WATER REDUCING ADMIXTURE.

(B) MATERIALS

1. THE CEMENT USED SHALL CONFORM TO THE

REQUIREMENTS FOR PORTLAND CEMENT AASHO M 85, TYPE II. THE CEMENT SHALL NOT CONTAIN MORE THAN 0.60 PERCENT TOTAL ALKALI. THE WORD "ALKALI" AS USED IN THESE SPECIFICATIONS SHALL BE TAKEN AS THE SUM OF SODIUM OXIDE (Na_2O) AND POTASSIUM OXIDE (K_2O) CALCULATED AS SODIUM OXIDE. THE DETERMINATION FOR TOTAL ALKALI SHALL BE MADE IN ACCORDANCE WITH ASTM C 114.

2. WATER FOR USE WITH CEMENT IN CONCRETE SHALL BE FREE FROM INJURIOUS AMOUNTS OF OIL, ACID, ALKALI, CLAY, VEGETABLE MATTER, SILT, SOLUBLE SALTS OR OTHER HARMFUL MATTER. WATER SHALL CONFORM TO AASHO T 26.

3. THE FINE AGGREGATE USED SHALL BE A NATURAL SAND OR OTHER APPROVED INERT MATERIAL WITH SIMILAR CHARACTERISTICS, COMPOSED OF CLEAN, HARD, STRONG, DURABLE, UNCOATED PARTICLES, FREE FROM LUMPS OF CLAY, SOFT OR FLAKY PARTICLES, LOAM, CALICHE, ICE, FROST OR ORGANIC MATTER. THE GRADING SHALL MEET THE FOLLOWING REQUIREMENTS:

PASSING NO. 4 SIEVE - 95-100%
PASSING NO. 16 SIEVE - 45-80%
PASSING NO. 50 SIEVE - 10-30%
PASSING NO. 100 SIEVE - 2-10%
PASSING NO. 200 SIEVE - 0-4%

FINE AGGREGATE SHALL HAVE A TOTAL LOSS NO GREATER THAN 10 PERCENT BY WEIGHT WHEN SUBJECTED TO 5 CYCLES OF THE SODIUM SULFATE SOUNDNESS TEST USING AASHO T 104.

4. THE COARSE AGGREGATE SHALL CONSIST OF CRUSHED STONE, GRAVEL OR OTHER APPROVED INERT MATERIAL OF SIMILAR CHARACTERISTICS HAVING HARD, STRONG, DURABLE, UNCOATED PIECES FREE FROM DELETERIOUS SUBSTANCES. IT SHALL CONFORM TO THE FOLLOWING GRADING REQUIREMENTS:

PASSING 1" SIEVE	- 100%
PASSING $\frac{3}{4}$" SIEVE	- 90-100%
PASSING 3/8" SIEVE	- 20-55%
PASSING NO. 4 SIEVE	- 0-10%
PASSING NO. 8 SIEVE	- 0-5%

IN ADDITION, THE PERCENTAGE OF COARSE AGGREGATE SHALL BE FROM 50% TO 60% OF THE TOTAL AGGREGATE BY WEIGHT.

5. AIR-ENTRAINING ADMIXTURES SHALL CONFORM TO THE REQUIREMENTS OF AASHO M 154 FOR 7 AND 28 DAY COMPRESSIVE AND FLEXURAL STRENGTH AND RESISTANCE TO FREEZING AND THAWING.

(c) <u>COMPOSITION OF MIX</u>

THE CONCRETE SHALL CONTAIN NO LESS THAN $5\frac{1}{2}$ BAGS OF CEMENT PER CUBIC YARD AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI. THE CONSISTENCY SLUMP RANGE SHALL BE 2 TO 5 INCHES.

IN ADDITION, THE CONCRETE SHALL CONTAIN NO LESS THAN 3 PERCENT OR MORE THAN 5 PERCENT ENTRAINED AIR AS DETERMINED BY AASHO T 152. THE WATER REDUCING ADMIXTURE SHALL CONFORM TO THE REQUIREMENTS OF MASTER BUILDERS POZZOLITH OR APPROVED EQUIVALENT, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

(D) COLD WEATHER CONCRETING

EXCEPT BY SPECIFIC WRITTEN AUTHORIZATION FROM THE ENGINEER, CONCRETING OPERATIONS SHALL NOT BE CONTINUED WHEN A DESCENDING AIR TEMPERATURE IN THE SHADE AND AWAY FROM ARTIFICIAL HEAT FALLS BELOW 40 DEGREES F, NOR SHALL OPERATIONS BE RESUMED UNTIL AN ASCENDING AIR TEMPERATURE IN THE SHADE AND AWAY FROM ARTIFICIAL HEAT REACHES 35 DEGREES F.

WHEN CONCRETE IS BEING PLACED DURING COLD WEATHER AND THE AIR TEMPERATURE MAY BE EXPECTED TO DROP BELOW 35 DEGREES F, THE AIR TEMPERATURE SURROUNDING THE CONCRETE SHALL BE MAINTAINED AT A TEMPERATURE OF FROM 60 DEGREES F TO 90 DEGREES F FOR AT LEAST 72 HOURS AND AT A TEMPERATURE OF NOT LESS THAN 40 DEGREES F FOR A PERIOD OF NOT LESS THAN 7 DAYS.

(E) VIBRATING CONCRETE

ALL CONCRETE SHALL BE COMPACTED BY MEANS OF APPROVED PNEUMATIC OR ELECTRIC VIBRATORS TOGETHER WITH ANY OTHER COMPACTION EQUIPMENT NECESSARY TO PERFORM THE WORK AS SPECIFIED

HEREIN. THE MINIMUM FREQUENCY OF THE VIBRATORS SHALL BE 4500 CYCLES PER MINUTE. THE VIBRATORS SHALL BE PLACED IN THE CONCRETE AND SHALL NOT BE ATTACHED TO THE FORMS OR THE REINFORCING STEEL, NOR SHALL THEY BE ALLOWED TO VIBRATE AGAINST THEM.

(F) CURING OF CONCRETE

CAREFUL ATTENTION SHALL BE GIVEN BY THE CONTRACTOR TO THE PROPER CURING OF ALL CONCRETE. THE CURING OF CONCRETE SHALL BE ACCOMPLISHED BY WATER OR MEMBRANE CURING AND SHALL BE CONTINUED FOR A PERIOD OF AT LEAST 7 DAYS AFTER PLACING.

ALL SURFACES NOT COVERED BY FORMS SHALL BE PROTECTED FROM THE SUN AND KEPT WET TO THE TOUCH FOR THE ENTIRE WATER CURING PERIOD.

IMPERVIOUS MEMBRANE CURING SHALL CONSIST OF A CLEAR CURING COMPOUND APPLIED UNIFORMLY IN ONE OR MORE APPLICATIONS TOTALING NOT LESS THAN ONE GALLON TO EACH 150 SQUARE FEET. THE LIQUID MEMBRANE SHALL CONFORM TO THE REQUIREMENTS OF AASHO M 148.

DENSITY

DETERMINATIONS

DENSITY DETERMINATIONS

SERGENT, HAUSKINS & BECKWITH CONSULTING SOIL AND FOUNDATION ENGINEERS

APPLIED SOIL MECHANICS • ENGINEERING GEOLOGY • MATERIALS ENGINEERING

B. DWAINE SERGENT, P.E. JOHN B. HAUSKINS, P.E. GEORGE H. BECKWITH, P.E.

DALE V. BEDENKOP, P.E. ROBERT D. BOOTH, P.E. BRUCE J. LEISER, P.E.

JUNE 27, 1972

MCCULLOCH PROPERTIES, INC.
C/O TRICO INTERNATIONAL, INC.
8718 EAST MCDOWELL ROAD
SCOTTSDALE, ARIZONA 85257

JOB NO. E72-41

ATTENTION: MR. ROGER TULK

RE: STRUCTURE NO. 4
RETENTION BASIN PROGRAM
FOUNTAIN HILLS, ARIZONA

GENTLEMEN,

SUBMITTED HEREWITH ARE THE RESULTS OF THE SIEVE ANALYSIS, MOISTURE DENSITY RELATIONSHIPS AND FIELD DENSITY TESTS PERFORMED AT THE ABOVE REFERENCED PROJECT DURING CONSTRUCTION.

NO FAILING DENSITY TESTS WERE ENCOUNTERED. THEREFORE, IT WAS VERIFIED THAT CONSTRUCTION SPECIFICATIONS WERE COMPLIED WITH.

RESPECTFULLY SUBMITTED,
SERGENT, HAUSKINS & BECKWITH ENGINEERS

BY _____
DALE S. PARKER

REVIEWED BY _____
GEORGE H. BECKWITH, P.E.

Registered Professional Engineer (Civil)
CERTIFICATE NO. 5633
GEORGE HENRY BECKWITH
Date Signed 6-27-72
ARIZONA, U.S.A.

COPIES: ADDRESSEE (3)
ARIZONA WATER COMMISSION
ATTN: MR. JOSEPH D. WALTERS (1)

REPLY TO: 3940 W. CLARENDON, PHOENIX, ARIZONA 85019

PHOENIX (602) 272-6848 FLAGSTAFF (602) 774-4433 EL PASO (915) 772-3088 ALBUQUERQUE (505) 344-9940

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 5-16-72

PROJECT STRUCTURE NO. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST MCDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-4-72	1	25½'-	STATION 1+00 - 22' LT OF ℄	3.4	144.0	101.0	C
		26'	SHELL OF ZONE 2				
4-4-72	2	25½'-	STATION 3+50 - 28' LT OF ℄	5.2	145.5	105.5	D
		26'					
4-7-72	3	25'-	STATION 2+00 - 18' RT OF ℄	4.4	141.0	102.1	D
		25½	SHELL OF ZONE 2				
4-7-72	4	21'-	STATION 4+00 - 15' RT OF ℄	3.0	138.0	100.0	D
		21½'					
4-10-72	5	35'-	STATION 5+50 ON ℄ OF CORE	10.0	127.8	95.5	E
		35½'					
4-10-72	6	34'-	STATION 5+50 - 2' LT OF ℄	8.0	131.3	98.0	E
		34½'					
4-10-72	7	36'-	STATION 0+50 - 3' RT OF ℄				
		36½'	OF CORE	7.5	132.4	99.0	E
4-11-72	8	32'-	STATION 5+70 ON ℄ OF CORE	6.0	137.0	102.5	E
		32½'					
4-11-72	9	35'-	STATION 0+50 ON ℄ OF CORE	5.6	135.5	101.5	E
		35½'					
4-11-72	10	31'-	STATION 2+50 - 2' LT OF ℄				
		31½'	OF CORE	5.9	135.0	101.0	E

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FIELD DENSITY TEST DATA

DATE 5-16-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-11-72	11	30'-	Station 5+25 - 3' Rt of ℄				
		30½'	of core	5.5	132.0	99.4	E
4-11-72	12	28'-	Station 5+90 - 2' Lt of ℄				
		28½'	of core	5.7	130.8	97.6	E
4-11-72	13	34'-	Station 0+40 - 2' Rt of ℄				
		34½'	of core	6.3	130.5	97.5	E
4-11-72	14	26'-	Station 6+00 - 2' Rt of ℄				
		26½'	of core	7.0	128.0	95.8	E
4-12-72	15	31½-	Station 1+50 on ℄ of core	5.2	133.7	100.0	E
		32'					
4-12-72	16	25'-	Station 3+00 - 3' Lt of ℄				
		25½'	of core	7.0	134.2	100.3	E
4-12-72	17	23'-	Station 4+50 - 3' Rt of ℄				
		23½'	of core	5.6	135.0	101.0	E
4-13-72	18	30'-	Station 1+50 - 6' Lt of ℄				
		30½'	of core	6.2	131.5	98.2	E
4-13-72	19	26'-	Station 3+00 - 7' Lt of ℄				
		26½'	of core	5.6	134.0	100.2	E
4-13-72	20	22½'-	Station 4+50 - 5' Lt of ℄				
		23'	of core	6.4	133.7	100.0	E

1/10

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MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 5-31-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST MCDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-13-72	21	18½'-	STATION 6+00 - 5' LT OF ℄				
		19'	OF CORE	6.0	132.0	101.2	E
4-13-72	22	27½'-	40' LT OF ℄ UNDER CRADLE	5.6	152.0	107.0	C
		28'					
4-13-72	23	27½'-	ON ℄ OF CORE UNDER CRADLE	7.0	131.7	98.5	E
		28'					
4-13-72	24	27½'-	38' RT OF ℄ UNDER CRADLE	4.2	148.0	104.0	C
		28'					
4-14-72	25	28'-	STATION 0+50 ON ℄ OF CORE	6.2	127.5	95.3	E
		28½					
4-14-72	26	28'-	STATION 1+50 ON ℄ OF CORE	8.0	128.0	95.8	E
		28½'					
4-14-72	27	22½'-	STATION 3+00 - 4' LT OF ℄				
		23	OF CORE	6.4	134.4	100.8	E
4-14-72	28	19'-	STATION 4+50 - 3' RT OF ℄				
		19½'	OF CORE	6.7	133.5	99.9	E
4-14-72	29	26'-	STATION 2+00 - 22' LT OF ℄	5.5	136.0	102.1	D
		26½'					
4-14-72	30	20'-	STATION 4+00 - 23' LT OF ℄	5.1	133.9	97.0	D
		20½'					

2/10

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MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 5-31-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-14-72	31	21'-	STATION 3+00 - 21' RT OF ℄	5.3	135.2	98.0	D
		21½'					
4-14-72	32	18'-	STATION 5+50 - 26' LT OF ℄	6.0	136.5	98.3	D
		18½'					
4-17-72	33	26'-	STATION 1+00 - 25' LT OF ℄	6.0	136.0	98.6	D
		26½'					
4-17-72	34	23'-	STATION 3+00 - 30' LT OF ℄	5.8	133.5	97.0	D
		23½'					
4-17-72	35	16½'-	STATION 5+50 - 27' LT OF ℄	3.8	131.8	95.5	D
		17'					
4-17-72	36	12'-	STATION 6+00 - 18' RT OF ℄	6.0	154.0	105.0	D
		13'					
4-17-72	37	19'-	STATION 4+00 - 22' LT OF ℄	4.2	135.2	98.0	D
		19½'					
4-17-72	38	21½'-	STATION 2+00 - 30' LT OF ℄	6.4	134.8	97.6	D
		22'					
4-17-72	39	16'-	STATION 5+50 ON ℄ OF CORE	7.0	130.2	97.5	E
		16½'					
4-17-72	40	19½'-	STATION 4+00 ON ℄ OF CORE	6.8	131.2	98.2	E
		20'					

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DATE 5-31-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-17-72	41	24'-	STATION 2+00 ON ℄ OF CORE	7.0	129.9	97.2	E
		24½'					
4-18-72	42	22'-	STATION 1+00 ON ℄ OF CORE	5.1	134.1	96.3	G
		22½'					
4-18-72	43	21½'-	STATION 3+00 ON ℄ OF CORE	5.3	134.7	96.6	G
		22'					
4-18-72	44	23'-	STATION 2+00 - 18' LT OF ℄	6.0	138.0	100.0	D
		23½'					
4-18-72	45	21½'-	STATION 3+00 - 20' LT OF ℄	5.8	137.0	99.2	D
		22'					
4-18-72	46	21½'-	STATION 1+25 - 8' LT OF ℄	5.0	134.2	97.4	D
		22'					
4-18-72	47	22½'-	STATION 1+00 - 12' RT OF ℄	6.5	134.8	97.6	D
		23'					
4-18-72	48	22'-	STATION 2+00 - 15' RT OF ℄	6.4	136.0	98.5	D
		22½'					
4-18-72	49	21'-	STATION 1+50 ON ℄ OF CORE	6.2	137.2	98.5	G
		21½'					
4-18-72	50	20'-	STATION 3+50 ON ℄ OF CORE	5.5	137.7	98.8	G
		20½'					

2/10

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FIELD DENSITY TEST DATA

DATE 5-31-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-19-72	51	18½'-	Station 3+50 - 3' Lt of ℄				
		19'	of core	6.5	139.0	100.0	G
4-19-72	52	21½'-	Station 1+00 - 3' Rt of ℄				
		22'	of core	4.6	136.9	98.2	G
4-19-72	53	19½'-	Station 1+00 - 10' Lt of ℄	8.4	142.5	103.5	D
		20'					
4-19-72	54	17'-	Station 3+00 - 12' Lt of ℄	6.2	138.6	100.3	D
		17½'					
4-19-72	55	21'-	Station 1+00 - 30' Rt of ℄	6.0	133.6	96.0	D
		21½'					
4-19-72	56	17'-	Station 4+00 - 15' Rt of ℄	6.2	137.5	99.6	D
		17½'					
4-19-72	57	19'-	Station 3+00 on ℄ of core	5.6	136.1	98.0	G
		19½'					
4-19-72	58	20'-	Station 1+00 - 1' Rt of ℄	6.0	135.5	97.5	G
		20½'					
4-19-72	59	16'-	Station 3+50 - 18' Lt of ℄	6.5	135.0	98.0	D
		16½'					
4-19-72	60	18½'-	Station 1+50 - 20' Lt of ℄	5.8	134.5	97.4	D
		19'					

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FIELD DENSITY TEST DATA

DATE 5-31-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-20-72	61	18'-	STATION 1+00 ON ℄ OF CORE	5.6	133.0	95.4	G
		18½'					
4-20-72	62	17'-	STATION 2+50 - 3' RT OF ℄				
		17½'	OF CORE	6.2	138.2	99.2	G
4-20-72	63	18'-	STATION 1+00 - 25' LT OF ℄	8.8	135.0	97.6	D
		18½'					
4-20-72	64	17'-	STATION 3+00 - 16' LT OF ℄	8.4	133.5	96.8	D
		17½'					
4-20-72	65	18'-	STATION 0+50 - 16' RT OF ℄	7.8	135.1	98.0	D
		18½'					
4-20-72	66	17'-	STATION 3+25 - 20' RT OF ℄	8.0	132.6	96.0	D
		17½'					
4-21-72	67	14½'-	STATION 5+50 ON ℄ OF CORE	6.0	134.1	96.4	G
		15'					
4-21-72	68	12½'-	STATION 3+00 ON ℄ OF CORE	6.4	137.4	98.8	G
		13'					
4-21-72	69	14½'-	STATION 5+50 - 18' LT OF ℄	7.0	134.5	97.5	D
		15'					
4-21-72	70	12½'-	STATION 3+00 - 12' RT OF ℄	6.8	136.0	98.5	D
		13'					

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MATERIALS TESTING ENGINEERS

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MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-21-72	71	14½'-	STATION 5+75 - 20' LT OF ℄	6.1	135.0	98.0	D
		15'					
4-21-72	72	12½'-	STATION 3+25 - 15' RT OF ℄	6.3	133.7	96.9	D
		13'					
4-24-72	73	13½'-	STATION 2+50 ON ℄ OF CORE	5.0	134.8	96.7	G
		14'					
4-24-72	74	13'-	STATION 4+00 ON ℄ OF CORE	5.7	133.1	95.7	G
		13½'					
4-24-72	75	12'-	STATION 5+50 - 3' RT OF ℄				
		12½'	OF CORE	6.4	134.5	96.5	G
4-24-72	76	12½'-	STATION 3+00 ON ℄ OF CORE	5.8	136.3	97.9	G
		13'					
4-24-72	77	11'-	STATION 5+00 ON ℄ OF CORE	6.2	135.4	97.2	G
		11½'					
4-25-72	78	13½'-	STATION 2+00 ON ℄ OF CORE	6.3	133.8	95.9	G
		14'					
4-25-72	79	10½'-	STATION 4+50 - 3' RT OF ℄	5.0	132.5	95.0	G
		11'					
4-25-72	80	10½'-	STATION 4+25 - 12' LT OF ℄	6.2	135.0	97.7	D
		11'					

6/10

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MATERIALS TESTING ENGINEERS
ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

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DATE 5-31-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-25-72	81	13½'-	STATION 2+50 - 13' RT OF ℄	5.5	133.5	96.9	D
		14'					
4-26-72	82	12'-	STATION 2+50 - 18' RT OF ℄	3.0	131.0	95.2	D
		12½'					
4-26-72	83	11½'-	STATION 3+00 - 20' LT OF ℄	5.5	140.0	101.2	D
		12'					
4-26-72	84	11'-	STATION 4+00 - 14' RT OF ℄	5.0	132.0	95.9	D
		11½'					
4-26-72	85	11'-	STATION 4+50 - 20' LT OF ℄	6.4	134.5	97.4	D
		11½'					
4-26-72	86	9½'-	STATION 5+50 - 12' LT OF ℄	6.8	139.0	100.5	D
		10'					
4-27-72	87	8½'-	STATION 6+00 ON ℄ OF CORE	7.0	129.5	97.0	E
		9'					
4-27-72	88	9½'-	STATION 4+00 - 2' RT OF ℄	5.9	129.5	97.0	E
		10'					
4-27-72	89	12½'-	STATION 2+00 ON ℄ OF CORE	6.6	131.5	98.4	E
		13'					
4-27-72	90		ZONE 2 - 33' RT OF ℄				
			BOTTOM OF CRADLE	6.0	148.0	107.0	D

3/10

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MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

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LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
4-27-72	91		ZONE 1 - ℄ OF CORE				
			BOTTOM OF CRADLE	5.8	130.9	98.0	E
4-27-72	92		ZONE 1 - 24' LT OF ℄				
			BOTTOM OF CRADLE	5.0	138.0	100.0	D

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MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 6-15-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
5-12-72	93	14'-	Beside outlet pipe on S side -				
		14½'	21' Rt of ℄	4.4	131.9	95.5	D
5-12-72	94	14'-	Between outlet pipe on ℄ of				
		14½'	core	10.8	126.8	94.8	E
5-12-72	95	14'-	Beside outlet pipe on N side -				
		14½'	18' Lt of ℄	6.2	137.9	100.0	D
5-12-72	96	13'-	1' over outlet pipe on S side -				
		13½'	18' Rt of ℄	5.2	133.1	96.4	D
5-12-72	97	13'-	1½' over outlet pipe on ℄ of				
		13½'	core	8.2	132.2	98.9	E
5-12-72	98	13'-	1½' over outlet pipe on N side				
		13½'	- 20' Lt of ℄	6.8	133.9	97.0	D
5-15-72	99	12'-	2½' over outlet pipe on N side				
		12½'	on ℄ of core	9.6	127.6	95.4	E
5-15-72	100	12'-	2½' over outlet pipe - 16' Lt				
		12½'	of ℄	5.6	134.3	97.3	D
5-31-72	101	9'-	Station 4+50 on ℄ of core	5.9	135.1	97.1	G
		9½'					
5-31-72	102	11'-	Station 2+50 on ℄ of core	6.2	135.6	97.4	G
		11½'					

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
MATERIALS TESTING ENGINEERS
ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 6-15-72

PROJECT STRUCTURE No. 4 JOB NO. E72-41

LOCATION FOUNTAIN HILLS, ARIZONA

CLIENT TRICO INTERNATIONAL, INC. ADDRESS 8718 EAST McDOWELL ROAD SCOTTSDALE, ARIZONA 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY ROGER TULK PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS./CU.FT.	% MAX DRY DENSITY	CURVE NO.
5-31-72	103	13½'-	STATION 1+00 ON ℄ OF CORE	5.4	135.2	97.1	G
		14'					
5-31-72	104	13'-	STATION 1+50 ON ℄ OF CORE	5.5	135.8	97.6	G
		13½'					
5-31-72	105	14'-	STATION 0+50 ON ℄ OF CORE	6.0	134.0	96.2	G
		14½'					
5-31-72	106	10'-	STATION 3+00 - 3' RT OF ℄	6.0	135.1	97.1	G
		10½'					
5-31-72	107	10'-	STATION 1+00 ON ℄ OF CORE	5.3	135.3	97.2	G
		10½'					
6-1-72	108	9½'-	STATION 0+50 ON ℄ OF CORE	5.9	135.6	97.3	G
		10'					
6-1-72	109	9½'-	STATION 2+00 ON ℄ OF CORE	5.5	136.2	97.9	G
		10'					
6-1-72	110	8½'-	STATION 4+00 ON ℄ OF CORE	5.5	134.9	98.6	G
		9'					
6-1-72	111	7½'-	STATION 5+50 ON ℄ OF CORE	6.0	135.4	97.3	G
		8'					
6-2-72	112	6½'-	STATION 6+00 - 3' RT OF ℄	5.4	135.2	97.2	G
		7'					

1/10

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MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 6-15-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
6-2-72	113	7½'-	Station 3+50 - 2' Lt of ℄	5.2	133.9	96.1	G
		8'					
6-2-72	114	9½'-	Station 1+00 on ℄ of core	6.2	135.9	97.5	G
		9'					
6-2-72	115	8'-	Station 1+00 - 3' Rt of ℄	5.5	135.4	97.3	G
		8½'					
6-2-72	116	7'-	Station 3+00 - 3' Lt of ℄	5.7	133.3	95.9	G
		7½'					
6-2-72	117	6'-	Station 5+00 on ℄ of core	6.2	135.1	97.1	G
		6½'					
6-5-72	118	7'-	Station 1+00 - 2' Rt of ℄	5.2	133.9	96.0	G
		7½'					
6-5-72	119	6½'-	Station 2+50 on ℄ of core	6.4	135.3	97.3	G
		7'					
6-5-72	120	5½'-	Station 4+00 - 3' Lt of ℄	5.8	134.8	96.8	G
		6'					
6-5-72	121	5'-	Station 6+50 - 4' Rt of ℄	6.2	136.0	97.7	G
		5½'					
6-5-72	122	5'-	Station 1+00 - 12' Rt of ℄	6.3	137.6	98.9	G
		5½'					

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MATERIALS TESTING ENGINEERS
ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 6-15-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
6-5-72	123	5½'-	Station 1+00 - 8' Lt of ℄	5.0	138.1	99.4	G
		6'					
6-6-72	124	4'-	Station 5+50 - 3' Rt of ℄	4.9	136.8	97.3	G
		4½'					
6-6-72	125	4'-	Station 3+50 - 5' Lt of ℄	4.7	135.1	97.0	G
		4½'					
6-6-72	126	4'-	Station 1+50 on ℄ of core	5.4	136.0	97.7	G
		4½'					
6-6-72	127	3½'-	Station 5+00 - 7' Rt of ℄	6.4	136.5	98.0	G
		4'					
6-6-72	128	3½'-	Station 3+00 - 5' Lt of ℄	5.8	135.0	97.0	G
		4'					
6-6-72	129	2½'-	Station 5+50 - 3' Rt of ℄	5.3	136.2	97.9	G
		3'					
6-6-72	130	2'-	Station 3+50 - 3' Lt of ℄	5.3	140.4	100.8	G
		2½'					
6-6-72	131	2'-	Station 1+00 - 4' Lt of ℄	5.9	137.0	98.4	G
		2½'					
6-7-72	132	1'-	Station 0+50 - 2' Lt of ℄	5.3	133.5	95.8	G
		1½'					

1/10

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CONSULTING SOIL AND FOUNDATION ENGINEERS
MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

FIELD DENSITY TEST DATA

DATE 6-15-72

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

ARCHITECT/ENGINEER CONTRACTOR

REQUESTED BY Roger Tulk PERFORMED BY SHB/GDS

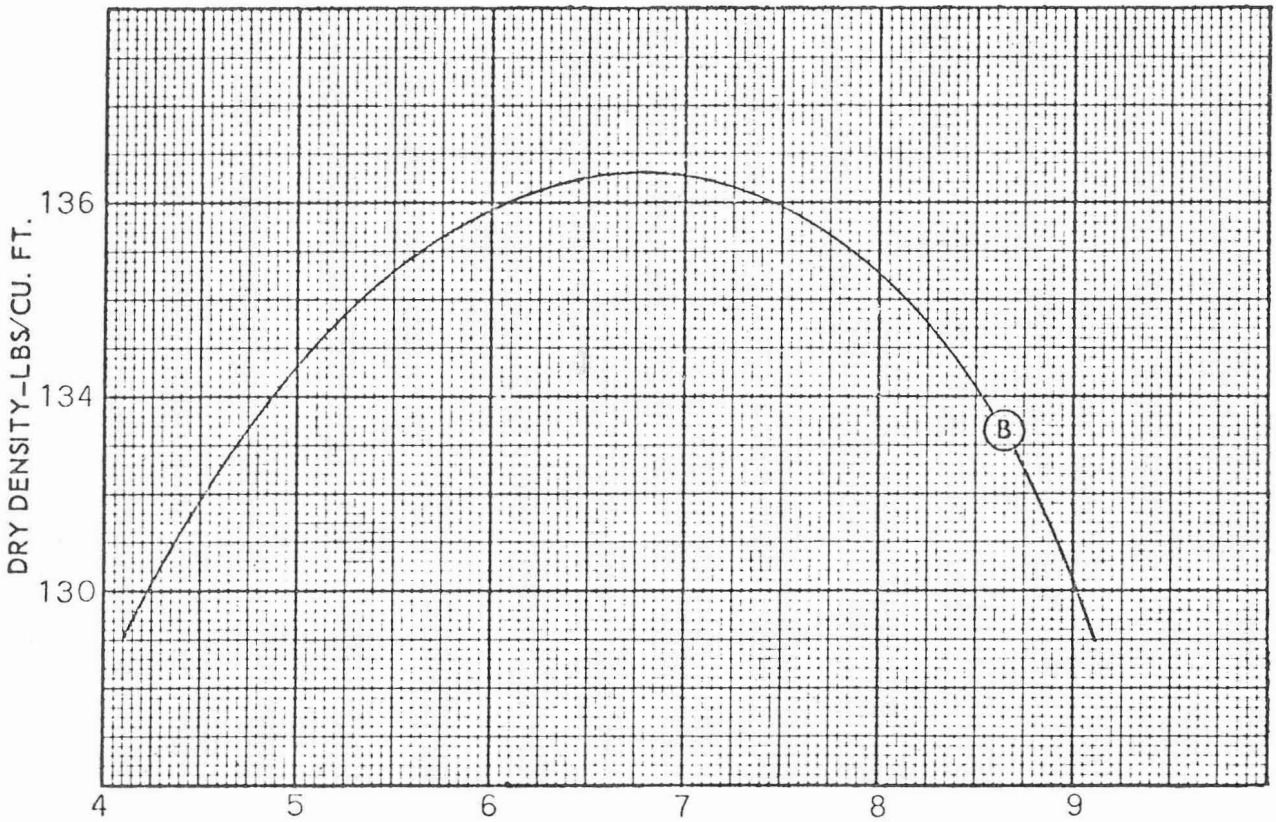
MATERIAL

DATE OF TEST	TEST NO.	DEPTH OF TEST	LOCATION	MOISTURE CONTENT % DRY WT.	DRY DENSITY LBS/CU.FT.	% MAX DRY DENSITY	CURVE NO.
6-7-72	133	1'-	Station 2+50 - 5' Rt of ℄	5.5	134.2	96.5	G
		1½'					
6-7-72	134	1'-	Station 5+00 - 3' Lt of ℄	6.5	134.0	96.2	G
		1½'					
6-8-72	135	0-6"	Station 1+50 - 2' Rt of ℄	5.8	139.5	100.2	G
6-8-72	136	0-6"	Station 3+50 on ℄ of core	5.5	137.2	98.7	G
6-8-72	137	0-6"	Station 5+50 - 3' Rt of ℄	6.2	137.5	98.8	G

2/5

SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT STRUCTURE No. 4 **JOB NO.** E72-41



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
B	CENTER RIDGE 0-3' & 3'-5'	6.8	136.3	ASTM D1557	D	72-41-2 & 3

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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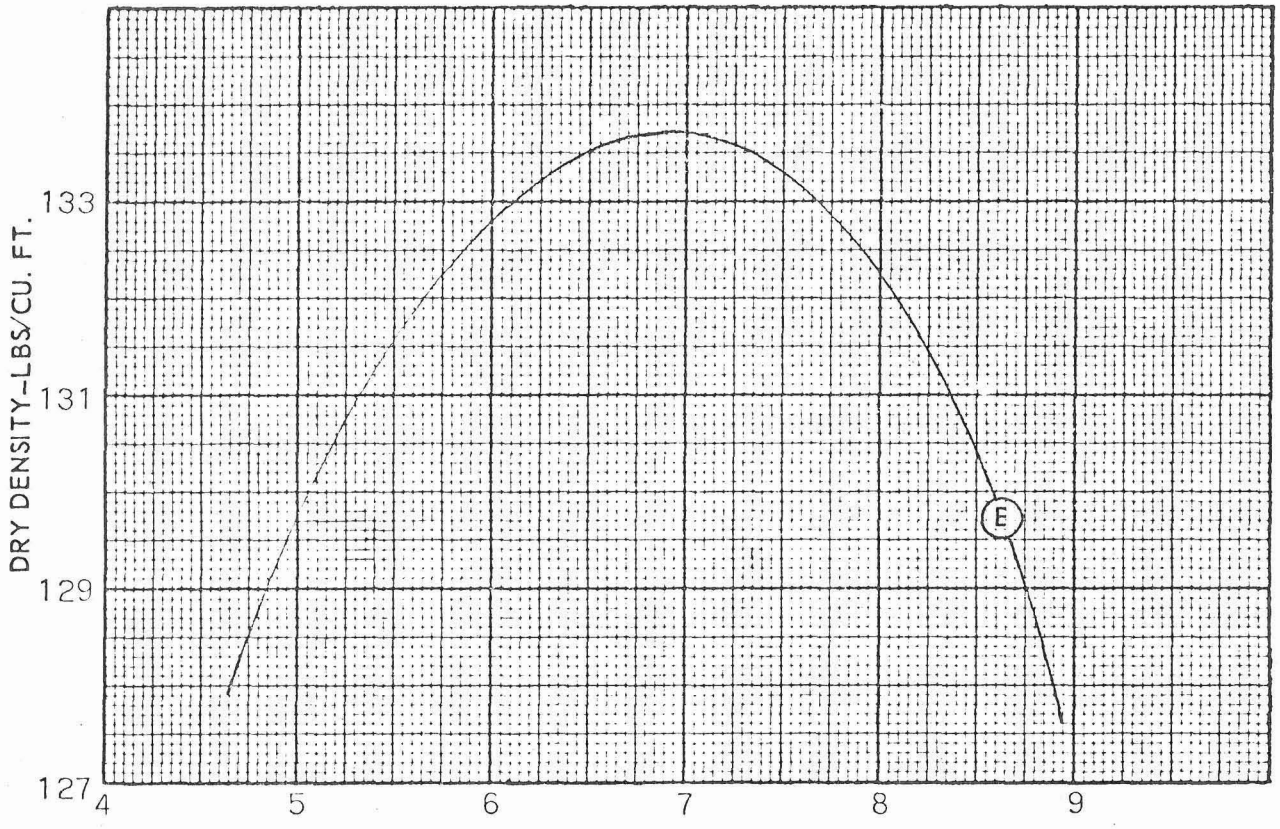
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT STRUCTURE No. 4 **JOB NO.** E72-41



MOISTURE CONTENT – % DRY WEIGHT

CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
E	EXCAVATION AREA WEST OF WASH	7.0	133.7	ASTM D1557	D	72-41-8

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

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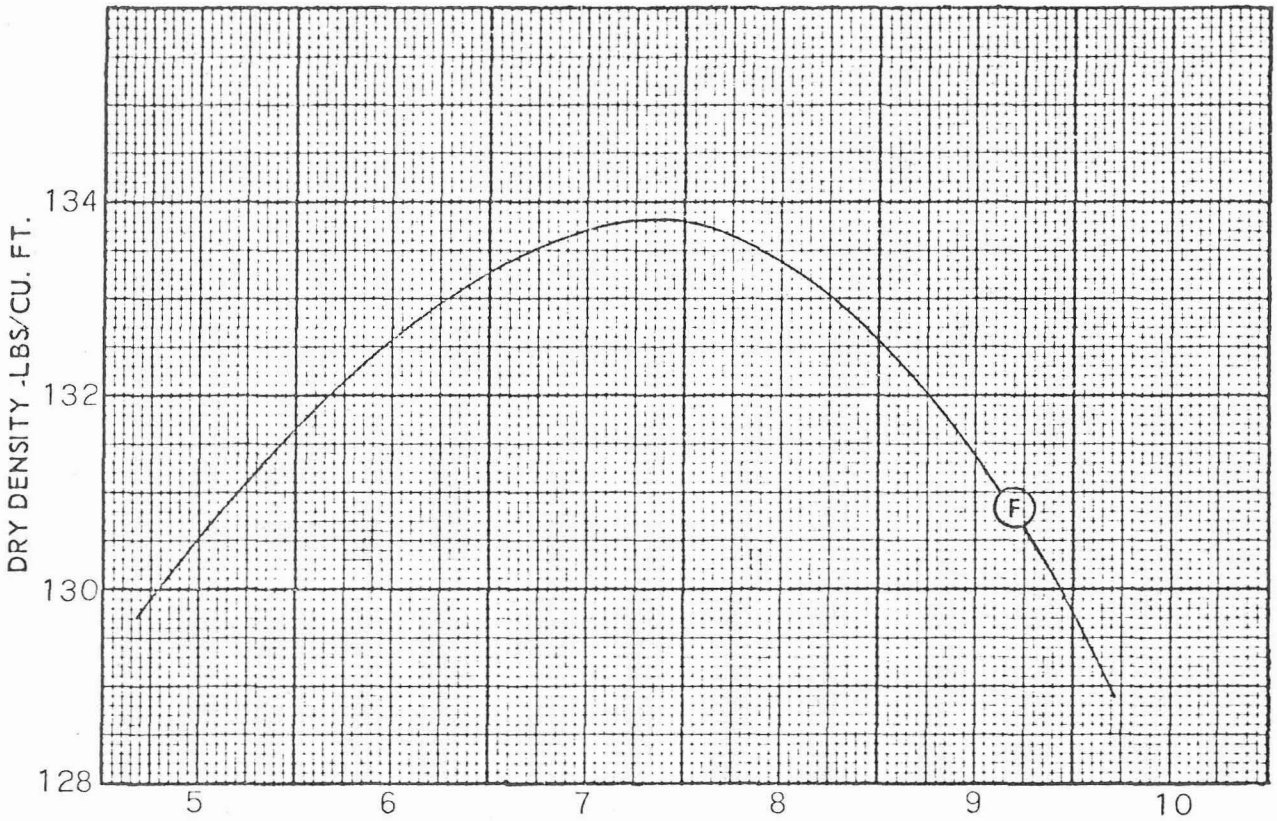
CONSULTING SOIL AND FOUNDATION ENGINEERS

SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT STRUCTURE No. 4 **JOB NO.** E72-41



CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
F	WASH AREA WEST OF DAM	7.5	133.8	ASTM D1557	D	72-41-9

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
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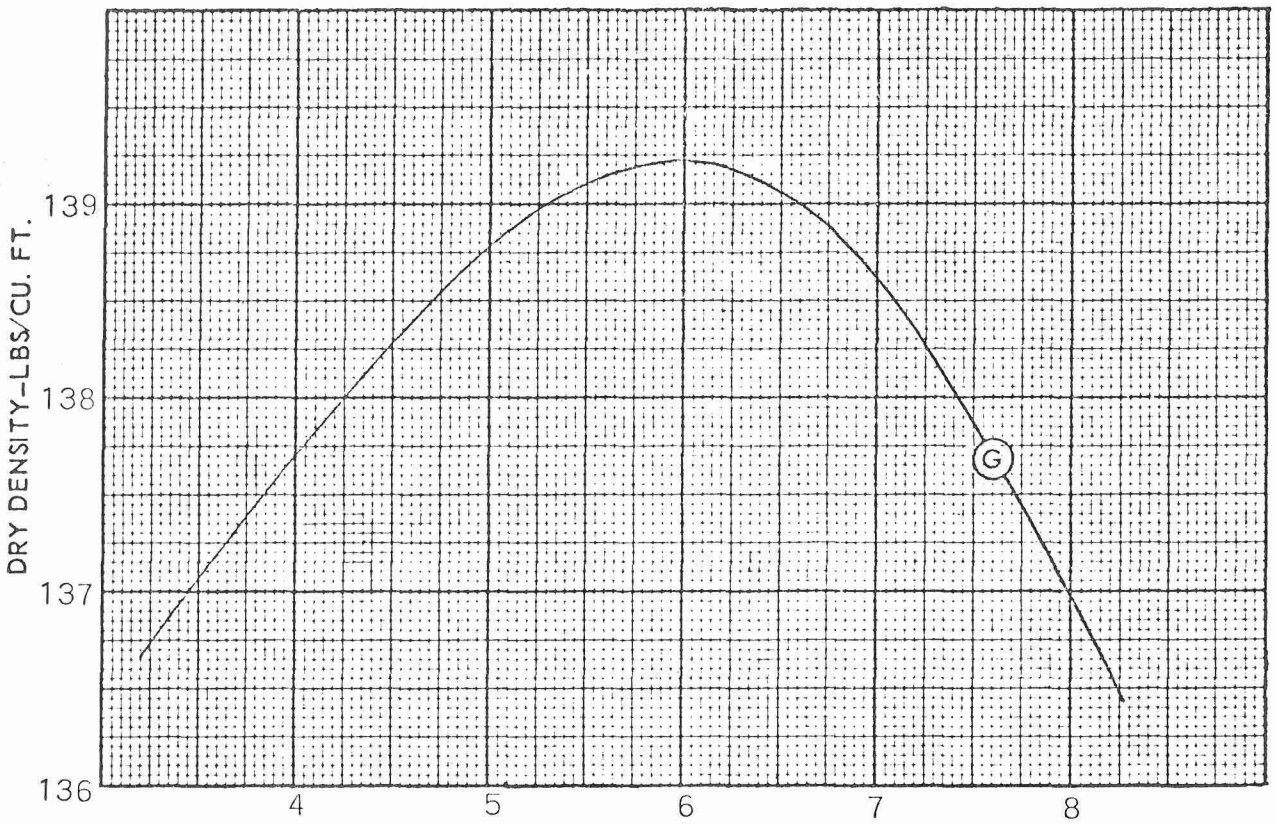
SUMMARY OF MOISTURE DENSITY RELATIONSHIP TESTS

PROJECT STRUCTURE No. 4 **JOB NO.** E72-41



MOISTURE CONTENT – % DRY WEIGHT

CURVE	SOURCE	OPTIMUM MOISTURE CONTENT % DRY WT.	MAXIMUM DRY DENSITY LBS./CU. FT.	TEST DESIGNATION	TEST METHOD	LAB NO.
G	BORROW PIT WEST OF DAM 2'-5'	6.0	139.2	ASTM D1557	C	72-41-10

MOISTURE-DENSITY RELATIONSHIP TEST METHOD DATA

AASHO T99-61 and ASTM D 698-66T (Standard Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
B	-#4	6"	4.58"	3	56	5.5 LBS.	12"	12,317
C	-3/4	4"	4.58"	3	25	5.5 LBS.	12"	12,375
D	-3/4	6"	4.58"	3	56	5.5 LBS.	12"	12,317

AASHO T180-61 and ASTM 1557-66T (Modified Proctor)

METHOD	MATERIAL	MOLD		NO. OF LAYERS	BLOWS PER LAYER	HAMMER WEIGHT	HEIGHT OF FALL	COMPACTIVE EFFORT FT. LBS/CU. FT.
		DIAMETER	HEIGHT					
A	-#4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
B	-#4	6"	4.58"	5	56	10.0 LBS.	18"	55,986
C	-3/4	4"	4.58"	5	25	10.0 LBS.	18"	56,250
D	-3/4	6"	4.58"	5	56	10.0 LBS.	18"	55,986

SERGENT, HAUSKINS & BECKWITH

CONSULTING SOIL AND FOUNDATION ENGINEERS
PHOENIX • FLAGSTAFF • EL PASO

TABULATION TEST RESULTS

Job No. E72-41

Date

Client:

Project STRUCTURE No. 4

FOUNTAIN HILLS, ARIZONA

Material

Source

HOLE NO.	LOCATION	DEPTH	UNIFIED CLASS.	LL	PI	SIEVE ANALYSIS – ACCUM. % PASSING												LAB. NO.
						200	100	40	16	10	4	1/4	3/8	3/4	1	1 1/2	2	
	DOZER TRENCH SOUTH RIDGE	0-4'	SM		NP	42	51	61	71	77	88	90	93	96	96	100		72-41-1
	CENTER RIDGE	0-3'	SM-SC	22	3	16	19	25	36	52	79	85	89	93	94	95	96	72-41-2
	CENTER RIDGE	3'+	SM-SC	25	6	42	49	58	70	76	90	93	96	98	100			72-41-3
	NORTH RIDGE		CL	44	27	81	85	88	90	91	94	94	95	98	100			72-41-4
	CUTOFF TRENCH NEAR ABUTMENT				NP	25	28	32	37	42	51	56	63	77	84	92	100	72-41-5
	AREA WEST OF DAM					20	25	34	50	59	76	82	86	92	95	98	99	72-41-9
	BORROW PIT WEST OF DAM	2'-5'			NP	22	27	35	48	57	74	80	83	90	92	93	95	72-41-10

SERGENT, HAUSKINS & BECKWITH

SERGENT, HAUSKINS & BECKWITH
CONSULTING SOIL AND FOUNDATION ENGINEERS
MATERIALS TESTING ENGINEERS

ENGINEERING ANALYSIS • PHYSICAL TESTING • QUALITY CONTROL • FIELD EXPLORATION

REPORT ON LABORATORY TESTS

DATE _____

PROJECT Structure No. 4 JOB NO. E72-41

LOCATION Fountain Hills, Arizona LAB NO. _____

CLIENT Trico International, Inc. ADDRESS 8718 East McDowell Road Scottsdale, Arizona 85257

SOURCE OF SAMPLE _____

MATERIAL _____ SAMPLED BY _____

SUBMITTED BY _____ REQUESTED BY _____

TESTED _____ DATE RECEIVED _____

TEST RESULTS

Field Density Check Point Curve	Maximum Density
C (coarse rock & sand)	142.2
D (sandy gravel)	137.0

TESTS

ON

CONCRETE CYLINDERS

ATL Testing Laboratories
A Division of R & D Engineering Associates, Inc.
817 West Madison • Phoenix, Arizona 85007 • Telephone 254-6181

June 15, 1972

For: Sergent, Hauskins & Beckwith
3940 West Clarendon
Phoenix, Arizona 85019

Date: May 25, 1972

Received:	5-19-72	Project:	Fountain Hills - Structure #4
Submitted by:	same	Address of Project:	
Contractor:	TRICO International Inc.	Source of Sample:	West Headwall of Outlet Pipe
Arch./Engr.:		Mix:	City Class "A"
Concrete Co.:	Union Rock & Materials	Admix:	
Truck No.:	336	Batch Size:	7½ cu. yds.
Ticket No.:	02-09084	Water Added:	
Time in Mixer:		Time Sampled:	2:30 PM

REPORT OF CONCRETE CYLINDER TESTS

Lab. No.	Ident. No.	Slump (In.)	Date Made	Date Tested	Age (Days)	lbs./sq. in.
	Set 17					
604			5-18-72	5-25-72	7	2330
605			5-18-72	6-15-72	28	3530
606			5-18-72	Hold	Hold	

Respectfully submitted,

ATL TESTING LABORATORIES

Richard H. Nelson

Richard H. Nelson

ATL Testing Laboratories
A Division of R & D Engineering Associates, Inc.
817 West Madison • Phoenix, Arizona 85007 • Telephone 254-6181

For: Sergent, Hauskins & Beckwith
3940 West Clarendon
Phoenix, Arizona 85019

Date: June 5, 1972
May 15, 1972

Received:	5-9-72	Project:	Fountain Hills - Structure #4
Submitted by:	same, Swindle	Address of Project:	
Contractor:	Trico International Inc.	Source of Sample:	Outlet Pipe Gradle
Arch./Engr.:		Mix:	2500
Concrete Co.:	Union Rock & Materials	Admix:	
Truck No.:	342	Batch Size:	9½ cu. yds.
Ticket No.:	02-08697	Water Added:	
Time in Mixer:		Time Sampled:	12:05 PM

REPORT OF CONCRETE CYLINDER TESTS

Lab. No.	Ident. No.	Slump (In.)	Date Made	Date Tested	Age (Days)	lbs./sq. in.
	Set 15					
497		6½	5-08-72	5-15-72	7	1940
498		6½	5-08-72	6-05-72	28	2740
499		6½	5-08-72	Hold	Hold	(discarded) 6-5-72

Respectfully submitted,

ATL TESTING LABORATORIES

Richard H. Nelson

Richard H. Nelson

LICENSE OF APPROVAL

State of Arizona
DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Title 45 - Waters, Chapter 6, Article 1, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to:

TOWN OF FOUNTAIN HILLS

Authorizing the use of: FOUNTAIN HILLS #4 *Dam and Reservoir, File Number:* 07.33

Located in Section 10 *, Twp.* 3N *, Rge.* 6E *, G. & S.R. B. & M.,* MARICOPA *County, State of Arizona, to impound water in accordance with and subject to the following conditions:*

1) Use shall be only as a flood retarding structure, limited to temporary storage during periods of flooding.

2) Temporary fence fabric which crosses the emergency spillway shall be attached to the fence poles no sooner than two hours prior to the football game.

3) Temporary fence fabric which crosses the emergency spillway shall be removed from the fence poles no later than two hours after the game is over.

This License of Approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

this 6th *day of* September *,* 1995

Herb Dishlip, Assistant Director
Surface Water Division

State of Arizona

DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Title 45-Waters, Chapter 6, Article 1, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to: TOWN OF FOUNTAIN HILLS

Authorizing the use of: FOUNTAIN HILLS #4 *Dam and Reservoir, File Number:* 07.33

Located in Section 10 *, Twp.* 3N *, Rge.* 6E *, G. & S.R. B. & M.,* MARICOPA *County, State of Arizona,*

to impound water in accordance with and subject to the following terms and conditions:

Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the floodwaters through the outlet conduits

This License of Approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

this 20th *day of* April *,* 1993

C. Laurence Linser, P.E. No. 9528
Deputy Director, Engineering

State of Arizona

DEPARTMENT OF WATER RESOURCES

LICENSE OF APPROVAL

Pursuant to Chapter 6, Title 45-Waters, of the Arizona Revised Statutes, the DIRECTOR, Department of Water Resources issues this License of Approval to: MCO Properties

authorizing the use of: Fountain Hills #4 Dam (07.33)

Located in Sec. 10 , *Tp.* 3N , *R.* 6E , *G. & S.R.B. & M.* Maricopa *County, State of Arizona to impound water in accordance with and subject to the following terms and conditions:*

Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduits.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and seal of the Arizona Department of Water Resources

22nd *day of* February , *19* 91 .

Doug Toy, P.E. No. 15154

Deputy Director, Engineering

State of Arizona
OFFICE OF THE STATE WATER ENGINEER
Supervision of Safety of Dams

License of Approval

Pursuant to Chapter 3, Title 45 (Waters), of the Arizona Revised Statutes, the STATE WATER ENGINEER has found that the FOUNTAIN HILLS DAM #4 *Dam and Reservoir, State Application Number* 7-33*, located in Sec.* 10*, Tp.* 3N*, R.* 6E*, G. & S. R. B & M,* Maricopa *County, State of Arizona, are safe to impound water; and the use of said dam and reservoir to impound water in accordance with and subject to the following terms and conditions is hereby authorized:* Use shall be only as a flood retarding structure, limited to temporary storage during periods of flood and for such additional time as may be required to completely evacuate the flood waters through the outlet conduit.

This license of approval supersedes every previous consent for use issued by the State of Arizona relative to said dam and reservoir.

Witness my hand and the seal of the Arizona Water Commission of the State of Arizona this 13th *day of* December*, 19*73

STATE WATER ENGINEER

Benson G. Scott

By Chief, Supervision of Safety of Dams

VOLUME II

COMPUTER CALCULATIONS

FOR

HYDROLOGY & HYDRAULIC

STRUCTURE NO. 4

HYDROLOGY PROGRAM FOR IBM 1130 - DATED JULY, 1971

FOUNTAIN HILLS STRUCTURE NUMBER 4 TR-20 ROUTING.

EXECUTIVE CONTROL CARD OPERATION LIST

FOUNTAIN HILLS STRUCTURE NUMBER 4

```
C TABLE          VELOCITY INCREMENT =  0.200

 8               0.0000    0.0800    0.1800    0.2500    0.3200
 8               0.3700    0.4100    0.4500    0.4900    0.5100
 8               0.5400    0.5700    0.5900    0.6100    0.6300
 8               0.6500    0.6600    0.6700    0.6900    0.7000
 8               0.7100    0.7200    0.7300    0.7400    0.7500
 8               0.7600    0.7700    0.7700    0.7800    0.7900
 8               0.7900    0.8000    0.8100    0.8100    0.8200
 8               0.8200    0.8300    0.8300    0.8400    0.8400
 8               0.8400    0.8500    0.8500    0.8600    0.8600
 8               0.8600    0.8600    0.8700    0.8700    0.8700
 8               0.8800    0.8800    0.8800    0.8900    0.8900
 8               0.8900    0.8900    0.8900    0.8900    0.9000
 8               0.9000    0.9000    0.9000    0.9000    0.9100
 8               0.9100    0.9100    0.9100    0.9100    0.9100
 8               0.9200    0.9200    0.9200    0.9200    0.9200
 8               0.9200    0.9200    0.9200    0.9300    0.9300
 9 ENDTBL

CROSS SECTION NO.  11     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2165.0004      0.0000      0.0000
 8                        2167.0004   1860.0002     30.0000
 8                        2169.0004   3030.0004    130.0000
 9 ENDTBL

CROSS SECTION NO.  12     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1970.0002      0.0000      0.0000
 8                        1972.0002    315.0000     40.0000
 8                        1974.0002   2500.0004    200.0000
 9 ENDTBL

CROSS SECTION NO.  13     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2225.0004      0.0000      0.0000
 8                        2227.0004   1860.0002     30.0000
 8                        2229.0004   3030.0004    180.0000
 9 ENDTBL

CROSS SECTION NO.  14     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1970.0002      0.0000      0.0000
 8                        1972.0002    390.0000     40.0000
 8                        1974.0002   3100.0004    200.0000
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 9 ENDTBL

CROSS SECTION NO.  15      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         1970.0002       0.0000       0.0000
 8                         1972.0002     340.0000      40.0000
 8                         1974.0002    2700.0004     200.0000
 9 ENDTBL

CROSS SECTION NO.  16      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         1814.0002       0.0000       0.0000
 8                         1816.0002     265.0000      40.0000
 8                         1818.0002    2100.0004     200.0000
 9 ENDTBL

CROSS SECTION NO.  21      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         2120.0004       0.0000       0.0000
 8                         2121.0004    1007.0001      73.0000
 8                         2122.0004    3245.0004     152.0000
 8                         2124.0004   10630.0019     328.0000
 9 ENDTBL

CROSS SECTION NO.  22      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         1890.0002       0.0000       0.0000
 8                         1891.0002    1133.0002      93.0000
 8                         1892.0002    3633.0004     192.0000
 8                         1894.0002   11809.0019   11809.0019
 9 ENDTBL

CROSS SECTION NO.  23      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         2190.0004       0.0000       0.0000
 8                         2191.0004     736.0001      43.0000
 8                         2192.0004    2402.0004      92.0000
 9 ENDTBL

CROSS SECTION NO.  24      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         1890.0002       0.0000       0.0000
 8                         1891.0002     835.0001      63.0000
 8                         1892.0002    2617.0004     132.0000
 8                         1894.0002    8628.0019     288.0000
 9 ENDTBL

CROSS SECTION NO.  25      DRAINAGE AREA =     1.00

                           ELEVATION    DISCHARGE     END AREA
 8                         1890.0002       0.0000       0.0000
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 8                        1891.0002   1156.0002    106.0000
 8                        1892.0002   3534.0004    212.0000
 8                        1894.0002  11456.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  26     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1784.0002      0.0000      0.0000
 8                        1785.0002   1156.0002    106.0000
 8                        1786.0002   3534.0004    212.0000
 8                        1788.0002  11456.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  27     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2000.0002      0.0000      0.0000
 8                        2001.0002    879.0001     43.0000
 8                        2002.0002   2866.0004     92.0000
 8                        2004.0002   9675.0019    208.0000
 9 ENDTBL

CROSS SECTION NO.  28     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1784.0002      0.0000      0.0000
 8                        1785.0002    709.0001     63.0000
 8                        1786.0002   2290.0004    132.0000
 8                        1788.0002   7549.0009    288.0000
 9 ENDTBL

CROSS SECTION NO.  29     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1940.0002      0.0000      0.0000
 8                        1941.0002    733.0001     43.0000
 8                        1942.0002   2390.0004     92.0000
 8                        1944.0002   8069.0009    208.0000
 9 ENDTBL

CROSS SECTION NO.  30     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1784.0002      0.0000      0.0000
 8                        1785.0002    673.0001     63.0000
 8                        1786.0002   2173.0004    132.0000
 8                        1788.0002   7164.0009    288.0000
 9 ENDTBL

CROSS SECTION NO.  31     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1784.0002      0.0000      0.0000
 8                        1785.0002    673.0001     63.0000
 8                        1786.0002   2173.0004    132.0000
 8                        1788.0002   7164.0009    288.0000
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 9 ENDTBL

CROSS SECTION NO.  32     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1784.0002      0.0000       0.0000
 8                         1785.0002    673.0001      63.0000
 8                         1786.0002   2173.0004     132.0000
 8                         1788.0002   7164.0009     288.0000
 9 ENDTBL

CROSS SECTION NO.  33     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1725.0002      0.0000       0.0000
 8                         1726.0002    389.0000      43.0000
 8                         1727.0002   1270.0002      92.0000
 8                         1729.0002   4283.0009     208.0000
 9 ENDTBL

CROSS SECTION NO.  34     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1795.0002      0.0000       0.0000
 8                         1796.0002    484.0000      53.0000
 8                         1797.0002   1566.0002     112.0000
 8                         1799.0002   5211.0009     248.0000
 9 ENDTBL

CROSS SECTION NO.  35     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1795.0002      0.0000       0.0000
 8                         1796.0002    623.0001      43.0000
 8                         1797.0002   2033.0002      92.0000
 8                         1799.0002   6859.0009     208.0000
 9 ENDTBL

CROSS SECTION NO.  36     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1795.0002      0.0000       0.0000
 8                         1796.0002    484.0000      53.0000
 8                         1797.0002   1566.0002     112.0000
 8                         1799.0002   5211.0009     248.0000
 9 ENDTBL

CROSS SECTION NO.  37     DRAINAGE AREA =    1.00

                           ELEVATION   DISCHARGE    END AREA
 8                         1795.0002      0.0000       0.0000
 8                         1796.0002    261.0000      33.0000
 8                         1797.0002    895.0001      72.0000
 8                         1799.0002   2977.0004     168.0000
 9 ENDTBL

CROSS SECTION NO.  38     DRAINAGE AREA =    1.00
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	ELEVATION	DISCHARGE	END AREA
8	1790.0002	0.0000	0.0000
8	1791.0002	704.0001	106.0000
8	1792.0002	2152.0004	212.0000
8	1794.0002	6976.0009	448.0000
9 ENDTBL			

CROSS SECTION NO. 39 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	1725.0002	0.0000	0.0000
8	1726.0002	1014.0001	106.0000
8	1727.0002	3098.0004	212.0000
8	1729.0002	10040.0019	448.0000
9 ENDTBL			

CROSS SECTION NO. 40 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	1725.0002	0.0000	0.0000
8	1726.0002	1443.0002	153.0000
8	1727.0002	4646.0009	312.0000
8	1729.0002	14852.0019	648.0001
9 ENDTBL			

CROSS SECTION NO. 41 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	2215.0004	0.0000	0.0000
8	2216.0004	604.0001	43.0000
8	2217.0004	1972.0002	92.0000
8	2219.0004	6656.0009	208.0000
9 ENDTBL			

CROSS SECTION NO. 42 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	2315.0004	0.0000	0.0000
8	2316.0004	1278.0002	73.0000
8	2317.0004	4119.0009	152.0000
8	2319.0004	13507.0019	328.0000
9 ENDTBL			

CROSS SECTION NO. 43 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	2215.0004	0.0000	0.0000
8	2216.0004	640.0001	73.0000
8	2217.0004	2063.0004	152.0000
8	2219.0004	6766.0009	328.0000
9 ENDTBL			

CROSS SECTION NO. 44 DRAINAGE AREA = 1.00

	ELEVATION	DISCHARGE	END AREA
8	2215.0004	0.0000	0.0000

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 8                        2216.0004    913.0001    103.0000
 8                        2217.0004   2922.0004    212.0000
 8                        2219.0004   9473.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  45     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2030.0002      0.0000      0.0000
 8                        2031.0002   1322.0002    103.0000
 8                        2032.0002   4233.0009    212.0000
 8                        2034.0002  13722.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  46     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2030.0002      0.0000      0.0000
 8                        2031.0002    435.0000     43.0000
 8                        2032.0002   1419.0002     92.0000
 8                        2034.0002   4786.0009    208.0000
 9 ENDTBL

CROSS SECTION NO.  47     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        2030.0002      0.0000      0.0000
 8                        2031.0002   1322.0002    103.0000
 8                        2032.0002   4233.0009    212.0000
 8                        2034.0002  13722.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  48     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1884.0002      0.0000      0.0000
 8                        1885.0002   1025.0002    103.0000
 8                        1886.0002   3280.0004    212.0000
 8                        1888.0002  10638.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  49     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1730.0002      0.0000      0.0000
 8                        1731.0002   1032.0002    103.0000
 8                        1732.0002   3303.0004    212.0000
 8                        1734.0002  10709.0019    448.0000
 9 ENDTBL

CROSS SECTION NO.  50     DRAINAGE AREA =    1.00

                          ELEVATION   DISCHARGE    END AREA
 8                        1730.0002      0.0000      0.0000
 8                        1731.0002    557.0001     43.0000
 8                        1732.0002   1818.0002     92.0000
 8                        1734.0002   6132.0009    208.0000
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 9 ENDTBL

CROSS SECTION NO.  51      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1730.0002       0.0000       0.0000
 8                          1731.0002    1032.0002     103.0000
 8                          1732.0002    3303.0004     212.0000
 8                          1734.0002   10709.0019     448.0000
 9 ENDTBL

CROSS SECTION NO.  52      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1695.0002       0.0000       0.0000
 8                          1696.0002    1439.0002     153.0000
 8                          1697.0002    4628.0009     312.0000
 8                          1699.0002   14797.0019     648.0001
 9 ENDTBL

CROSS SECTION NO.  53      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1695.0002       0.0000       0.0000
 8                          1696.0002     874.0001     103.0000
 8                          1697.0002    2796.0004     212.0000
 8                          1699.0002    9065.0019     448.0000
 9 ENDTBL

CROSS SECTION NO.  54      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1695.0002       0.0000       0.0000
 8                          1696.0002    1067.0002     153.0000
 8                          1697.0002    3432.0004     312.0000
 8                          1699.0002   10973.0019     648.0001
 9 ENDTBL

CROSS SECTION NO.  55      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1695.0002       0.0000       0.0000
 8                          1696.0002    1439.0002     153.0000
 8                          1697.0002    4628.0009     312.0000
 8                          1699.0002   14797.0019     648.0001
 9 ENDTBL

CROSS SECTION NO.  56      DRAINAGE AREA =     1.00

                            ELEVATION   DISCHARGE    END AREA
 8                          1695.0002       0.0000       0.0000
 8                          1696.0002    1439.0002     153.0000
 8                          1697.0002    4628.0009     312.0000
 8                          1699.0002   14797.0019     648.0001
 9 ENDTBL

STRUCTURE NO.  4
```

#6

	ELEVATION	DISCHARGE	STORAGE
8	1695.0002	0.0000	0.0000
8	1700.0002	310.0000	1.6999
8	1704.0002	497.0000	11.6999
8	1708.0002	630.0001	31.4999
8	1712.0002	744.0001	70.8999
8	1716.0002	840.0001	140.0000
8	1717.0002	1588.0002	164.0000
8	1718.0002	1989.0002	187.9999
8	1720.0002	6987.0009	236.0000
8	1723.0002	15550.0019	282.0000

9 ENDTBL

STRUCTURE NO. 6

	ELEVATION	DISCHARGE	STORAGE
8	1810.0002	0.0000	0.0000
8	1816.0002	183.0000	0.2999
8	1820.0002	268.0000	6.2999
8	1824.0002	331.0000	25.0999
8	1828.0002	385.0000	55.1999
8	1832.0002	431.0000	97.2999
8	1836.0002	474.0000	152.0999
8	1837.0002	485.0000	169.5999
8	1838.0002	1146.0002	187.0000
8	1839.0002	2391.0004	204.4999
8	1841.0002	5950.0009	241.9999
8	1843.0002	10666.0019	281.0000
8	1845.0002	16408.0039	320.0000
8	1847.0002	22966.0039	375.0000

9 ENDTBL

STRUCTURE NO. 7

	ELEVATION	DISCHARGE	STORAGE
8	1884.0002	0.0000	0.0000
8	1896.0002	198.0000	2.7999
8	1900.0002	233.0000	6.3999
8	1904.0002	265.0000	11.5999
8	1908.0002	293.0000	18.5999
8	1912.0002	319.0000	28.5999
8	1916.0002	343.0000	41.7999
8	1920.0002	365.0000	61.7999
8	1926.0002	395.0000	108.0000
8	1927.0002	829.0001	128.0999
8	1928.0002	1640.0002	148.1999
8	1930.0002	4033.0004	173.6999
8	1932.0002	7306.0009	203.6999
8	1934.0002	11384.0019	233.5999

9 ENDTBL

STRUCTURE NO. 11

	ELEVATION	DISCHARGE	STORAGE
8	1780.0002	0.0000	0.0000
8	1784.0002	88.0000	0.0000

```
8                    1788.0002    153.0000      3.0000
8                    1792.0002    198.0000     11.0000
8                    1796.0002    234.0000     23.0000
8                    1800.0002    265.0000     42.0000
8                    1804.0002    293.0000     73.0000
8                    1808.0002    319.0000    113.0000
8                    1812.0002    343.0000    165.0000
8                    1813.0002   1011.0001    182.0000
8                    1814.0002   2243.0004    197.9999
8                    1816.0002   5793.0009    231.0000
8                    1818.0002  10502.0019    270.0000
8                    1820.0002  16215.0019    308.0000
8                    1822.0002  22850.0039    353.0000
9 ENDTBL

DIMENSIONLESS HYDROGRAPH - DELTA T =  0.02

8          0.0000     0.0150     0.0750     0.1600     0.2800
8          0.4300     0.6000     0.7700     0.8900     0.9700
8          1.0000     0.9800     0.9200     0.8400     0.7500
8          0.6600     0.5650     0.4900     0.4200     0.3650
8          0.3200     0.2790     0.2400     0.2100     0.1800
8          0.1550     0.1300     0.1130     0.0980     0.0860
8          0.0750     0.0650     0.0560     0.0470     0.0410
8          0.0350     0.0300     0.0260     0.0220     0.0190
8          0.0170     0.0150     0.0130     0.0110     0.0090
8          0.0070     0.0050     0.0030     0.0020     0.0010
8          0.0000     0.0000     0.0000     0.0000     0.0000
9 ENDTBL

RAINFALL TABLE NO. 1     TIME INCREMENT =  0.50

8          0.0000     0.0050     0.0110     0.0160     0.0220
8          0.0280     0.0350     0.0410     0.0480     0.0560
8          0.0630     0.0710     0.0800     0.0890     0.0980
8          0.1090     0.1200     0.1330     0.1470     0.1630
8          0.1810     0.2040     0.2350     0.2830     0.6630
8          0.7350     0.7720     0.7990     0.8200     0.8380
8          0.8540     0.8680     0.8800     0.8910     0.9020
8          0.9120     0.9210     0.9290     0.9370     0.9450
8          0.9520     0.9590     0.9650     0.9720     0.9780
8          0.9840     0.9890     0.9950     1.0000     1.0000
9 ENDTBL

RAINFALL TABLE NO. 2     TIME INCREMENT =  0.02
8          0.0000     0.0100     0.0200     0.0200     0.0300
8          0.0400     0.0500     0.0600     0.0700     0.0800
8          0.1000     0.1100     0.1300     0.1400     0.1700
8          0.1900     0.2200     0.2300     0.3800     0.4400
8          0.5200     0.6000     0.6300     0.6600     0.6800
8          0.7000     0.7200     0.7400     0.7600     0.7700
8          0.7900     0.8000     0.8200     0.8300     0.8400
8          0.8500     0.8700     0.8800     0.8900     0.9000
8          0.9100     0.9200     0.9300     0.9400     0.9500
8          0.9567     0.9633     0.9700     0.9800     0.9900
8          1.0000     1.0000     1.0000     1.0000     1.0000
```

Type II - 24 hr.
Thunderstorm Distribution

Type B -

— must apply to rainfall ~~by~~ duration
i.e. 6 hr — interval
is 12 min.

9 ENDTBL

STANDARD CONTROL INSTRUCTIONS

SUBRTN	XSECTN	STRCT	HYDROGRAPHS IN1	IN2	OUT	DATA NO. 1	DATA NO. 2	DATA NO. 3	OUTPUT OPTIONS PK	H	E	V	PH	SM
RUNOFF	11	0	0	0	1	0.710	90.000	0.250	1	0	0	0	0	1
REACH	12	0	1	0	2	5500.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	12	0	0	0	1	0.440	90.000	0.350	1	0	0	0	0	0
ADDHYD	12	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	13	0	0	0	4	0.420	90.000	0.160	1	0	0	0	0	1
REACH	14	0	4	0	5	4600.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	14	0	0	0	6	0.220	90.000	0.250	1	0	0	0	0	0
ADDHYD	14	0	5	6	7	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	15	0	3	7	1	0.000	0.000	0.000	1	0	0	1	0	1
REACH	16	0	1	0	2	6500.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	16	0	0	0	1	0.480	90.000	0.460	1	0	0	0	0	0
ADDHYD	16	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
RESVOR	0	6	3	0	1	1810.000	0.000	0.000	1	1	1	1	0	1
REACH	52	0	7	0	2	4600.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	52	0	0	0	1	0.160	90.000	0.330	1	0	0	0	0	0
ADDHYD	52	0	1	2	5	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	21	0	0	0	1	0.270	90.000	0.210	1	0	0	0	0	1
REACH	22	0	1	0	2	5220.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	22	0	0	0	1	0.250	90.000	0.310	1	0	0	0	0	0
ADDHYD	22	0	1	2	7	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	23	0	0	0	1	0.210	90.000	0.160	1	0	0	0	0	1
REACH	24	0	1	0	2	4500.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	24	0	0	0	1	0.250	90.000	0.280	1	0	0	0	0	0
ADDHYD	24	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	25	0	3	7	1	0.000	0.000	0.000	1	0	0	1	0	1
REACH	26	0	1	0	2	3500.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	26	0	0	0	1	0.160	90.000	0.250	1	0	0	0	0	0
ADDHYD	26	0	1	2	7	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	27	0	0	0	1	0.240	90.000	0.120	1	0	0	0	0	1
REACH	28	0	1	0	2	5600.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	28	0	0	0	1	0.260	90.000	0.340	1	0	0	0	0	0
ADDHYD	28	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	31	0	3	7	6	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	29	0	0	0	1	0.260	90.000	0.120	1	0	0	0	0	0
REACH	30	0	1	0	2	4500.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	30	0	0	0	1	0.130	90.000	0.300	1	0	0	0	0	0
ADDHYD	30	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	32	0	3	6	7	0.000	0.000	0.000	1	0	0	1	0	1
RESVOR	0	11	7	0	6	1780.000	0.000	0.000	1	1	1	1	0	1
REACH	33	0	6	0	2	2300.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	33	0	0	0	1	0.120	90.000	0.200	1	0	0	0	0	0
ADDHYD	33	0	1	2	7	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	34	0	0	0	1	0.240	90.000	0.240	1	0	0	0	0	1
RUNOFF	35	0	0	0	2	0.230	90.000	0.180	1	0	0	0	0	1
ADDHYD	36	0	1	2	6	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	37	0	0	0	1	0.140	90.000	0.200	1	0	0	0	0	0
ADDHYD	38	0	1	6	3	0.000	0.000	0.000	1	0	0	1	0	1
REACH	39	0	3	0	2	0.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	39	0	0	0	1	0.130	90.000	0.220	1	0	0	0	0	0
ADDHYD	39	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	40	0	3	7	4	0.000	0.000	0.000	1	0	0	1	0	1
REACH	54	0	4	0	2	2100.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	54	0	0	0	1	0.060	90.000	0.250	1	0	0	0	0	0

ADDHYD	54	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	55	0	3	5	6	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	41	0	0	0	4	0.130	90.000	0.170	1	0	0	0	0	1
RUNOFF	42	0	0	0	1	0.560	90.000	0.200	1	0	0	0	0	1
REACH	43	0	1	0	2	2300.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	43	0	0	0	1	0.240	90.000	0.150	1	0	0	0	0	0
ADDHYD	43	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	44	0	3	4	1	0.000	0.000	0.000	1	0	0	1	0	1
REACH	45	0	1	0	2	3800.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	45	0	0	0	1	0.250	90.000	0.230	1	0	0	0	0	0
ADDHYD	45	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	46	0	0	0	1	0.200	90.000	0.230	1	0	0	0	0	0
ADDHYD	47	0	1	3	2	0.000	0.000	0.000	1	0	0	1	0	1
REACH	48	0	2	0	1	5000.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	48	0	0	0	2	0.290	90.000	0.330	1	0	0	0	0	0
ADDHYD	48	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
RESVOR	0	7	3	0	4	1884.000	0.000	0.000	1	1	1	1	0	1
REACH	49	0	4	0	2	5200.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	49	0	0	0	1	0.160	90.000	0.360	1	0	0	0	0	0
ADDHYD	49	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
RUNOFF	50	0	0	0	1	0.130	90.000	0.240	1	0	0	0	0	0
ADDHYD	51	0	1	3	2	0.000	0.000	0.000	1	0	0	1	0	1
REACH	53	0	2	0	1	1650.000	0.000	0.000	0	0	0	0	0	0
RUNOFF	53	0	0	0	2	0.060	90.000	0.200	1	0	0	0	0	0
ADDHYD	53	0	1	2	3	0.000	0.000	0.000	1	0	0	1	0	1
ADDHYD	56	0	3	6	4	0.000	0.000	0.000	1	0	0	1	0	1
RESVOR	0	4	4	0	5	1695.000	0.000	0.000	1	1	1	1	0	1

ENDATA

END OF LISTING

```
EXECUTIVE CONTROL CARD            OPERATION  INCREM,     MAIN TIME INCREMENT=  0.15
EXECUTIVE CONTROL CARD            OPERATION  COMPUT,     FROM XSECTN/STRUCT  11/  0     TO XSECTN/STRUCT   0/  4
        STARTING TIME=  0.00     RAIN DEPTH=  3.20     RAIN DURATION=  6.00     RAIN TABLE NO.= 2     SOIL CONDITION= 2
        ALTERNATE NO.= 1         STORM NO.= 1

SUBROUTINE RUNOFF    CROSS SECTION  11
           AREA=   0.71     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.51                        761.536                      (RUNOFF)
               3.85                        175.600                      (RUNOFF)
               4.42                        154.740                      (RUNOFF)
               5.17                        114.223                      (RUNOFF)
               5.95                        111.796                      (RUNOFF)

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1556        CFS-HRS=      987.72        ACRE-FT=      81.62

SUBROUTINE REACH     CROSS SECTION  12
           LENGTH=   5500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  10.118       AVERAGE ROUTING COEFF= 0.8561       NUMBER OF ROUTINGS=  0.86

SUBROUTINE RUNOFF    CROSS SECTION  12
           AREA=   0.44     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.35
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.55                        438.106                      (RUNOFF)
               4.49                         95.431                      (RUNOFF)
               5.99                         64.689                      (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  12
           INPUT HYDROGRAPHS= 1.2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.62                       1139.077                     1972.75
               4.52                        244.401                     1971.55
               6.05                        165.155                     1971.04

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1984        CFS-HRS=     1631.62        ACRE-FT=     134.83

SUBROUTINE RUNOFF    CROSS SECTION  13
           AREA=   0.42     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.29                        523.415                      (RUNOFF)
               2.49                        477.642                      (RUNOFF)
```

3.22	130.957	(RUNOFF)
3.88	111.089	(RUNOFF)
4.36	108.858	(RUNOFF)
5.17	68.411	(RUNOFF)
5.93	71.667	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.42

TIME											
1.04	DISCHG	0.00	7.98	13.97	28.57	38.94	65.26	89.72	129.61	499.79	421.03
2.55	DISCHG	463.40	250.75	176.38	132.94	128.34	128.66	109.44	104.07	85.55	110.80
4.05	DISCHG	73.74	67.02	108.63	78.31	68.06	66.73	66.81	66.94	67.07	55.96
5.55	DISCHG	46.01	48.01	64.20	67.07	22.46	2.70	0.15	0.00		

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1352 CFS-HRS= 578.77 ACRE-FT= 47.83

SUBROUTINE REACH CROSS SECTION 14
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.254 AVERAGE ROUTING COEFF= 0.8577 NUMBER OF ROUTINGS= 0.71

SUBROUTINE RUNOFF CROSS SECTION 14
AREA= 0.22 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	235.959	(RUNOFF)
3.85	54.414	(RUNOFF)
4.42	47.946	(RUNOFF)
5.17	35.391	(RUNOFF)
5.95	34.632	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 14
INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	698.851	1972.22
4.48	145.056	1970.74
5.17	102.686	1970.52
5.98	98.146	1970.50

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1900 CFS-HRS= 904.55 ACRE-FT= 74.75

SUBROUTINE ADDHYD CROSS SECTION 15
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.56	1794.008	1973.23
4.50	388.449	1972.04
6.01	261.707	1971.53

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1954 CFS-HRS= 2536.18 ACRE-FT= 209.58

SUBROUTINE REACH CROSS SECTION 16
LENGTH= 6500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.050 AVERAGE ROUTING COEFF= 0.8553 NUMBER OF ROUTINGS= 1.02

SUBROUTINE RUNOFF CROSS SECTION 16
AREA= 0.48 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.46
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.64	449.700	(RUNOFF)
4.51	100.637	(RUNOFF)
6.03	67.440	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 16
INPUT HYDROGRAPHS= 1.2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.72	2200.533	1818.10
4.64	475.396	1816.22
6.14	319.702	1816.05

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1866 CFS-HRS= 3203.37 ACRE-FT= 264.72

SUBROUTINE RESVOR STRUCTURE 6
SURFACE ELEVATION= 1810.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.39	449.542	1833.72
4.74	449.539	1833.72
10.36	19.864	1810.65
10.66	6.762	1810.22
10.96	2.277	1810.07
11.26	0.768	1810.02
11.56	0.259	1810.00
11.86	0.088	1810.00
12.16	0.029	1810.00
12.46	0.010	1810.00

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 2.26

TIME											
1.04	DISCHG	0.00	1.09	10.22	36.77	78.26	133.62	186.13	201.82	240.75	286.41
1.04	ELEV	1810.00	1810.03	1810.33	1811.20	1812.56	1814.38	1816.14	1816.88	1818.71	1821.16
2.55	DISCHG	335.20	373.63	401.73	420.75	432.53	437.93	441.49	444.17	446.16	447.51
2.55	ELEV	1824.31	1827.15	1829.45	1831.10	1832.14	1832.64	1832.97	1833.22	1833.41	1833.53
4.05	DISCHG	448.47	449.20	449.48	449.41	449.48	449.55	449.21	448.56	447.79	446.97
4.05	ELEV	1833.62	1833.69	1833.71	1833.71	1833.72	1833.72	1833.69	1833.63	1833.56	1833.48
5.55	DISCHG	446.07	444.92	443.45	441.90	440.56	439.22	437.15	434.05	430.02	424.45
5.55	ELEV	1833.40	1833.29	1833.15	1833.01	1832.89	1832.76	1832.57	1832.28	1831.91	1831.43
7.05	DISCHG	418.81	413.20	407.65	402.16	396.75	391.41	386.15	378.39	370.06	361.92

7.05	ELEV	1830.94	1830.45	1829.96	1829.49	1829.02	1828.55	1828.10	1827.51	1826.89	1826.29
8.55	DISCHG	353.96	346.18	338.56	331.11	317.74	304.81	292.41	280.51	269.09	228.89
8.55	ELEV	1825.70	1825.12	1824.56	1824.00	1823.15	1822.33	1821.55	1820.79	1820.06	1818.15
10.05	DISCHG	191.94	-32.97	19.18	-11.15	6.48	-3.77	2.19	-1.27	0.74	-0.43
10.05	ELEV	1816.42	1808.91	1810.62	1809.63	1810.21	1809.87	1810.07	1809.95	1810.02	1809.98
11.55	DISCHG	0.25	-0.14	0.08	-0.04	0.02	-0.01	0.00	-0.00	0.00	-0.00
11.55	ELEV	1810.00	1809.99	1810.00	1809.99	1810.00	1809.99	1810.00	1810.00	1810.00	1810.00
13.05	DISCHG	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00			
13.05	ELEV	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00			

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1834 CFS-HRS= 3198.80 ACRE-FT= 264.34

SUBROUTINE REACH CROSS SECTION 52
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.405 AVERAGE ROUTING COEFF= 0.8469 NUMBER OF ROUTINGS= 0.76

SUBROUTINE RUNOFF CROSS SECTION 52
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.54	161.790	(RUNOFF)
4.48	34.799	(RUNOFF)
5.98	23.787	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 52
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 5

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.64	528.567	1695.36
4.50	385.208	1695.26
6.00	365.515	1695.25
12.74	1.973	1695.00
13.34	1.937	1695.00
13.64	1.940	1695.00
14.24	1.935	1695.00
15.14	1.934	1695.00
15.44	1.935	1695.00
15.73	1.982	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.3160 CFS-HRS= 3260.95 ACRE-FT= 269.48

SUBROUTINE RUNOFF CROSS SECTION 21
AREA= 0.27 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.21
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	310.455	(RUNOFF)
2.50	299.033	(RUNOFF)
3.87	68.729	(RUNOFF)
4.38	62.642	(RUNOFF)
5.17	43.619	(RUNOFF)
5.94	43.938	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.27

TIME											
1.04	DISCHG	0.00	3.46	8.33	16.07	20.98	39.74	52.19	63.70	290.14	265.64
2.55	DISCHG	293.91	192.80	128.35	92.44	83.76	82.80	75.99	63.70	60.08	68.38
4.05	DISCHG	51.80	44.29	62.09	54.78	45.30	43.37	42.96	43.01	43.09	38.64
5.55	DISCHG	30.96	30.36	39.24	42.47	22.90	4.81	0.89	0.08	0.00	

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1430 CFS-HRS= 373.42 ACRE-FT= 30.86

SUBROUTINE REACH CROSS SECTION 22
LENGTH= 5220.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.182 AVERAGE ROUTING COEFF= 0.8775 NUMBER OF ROUTINGS= 0.69

SUBROUTINE RUNOFF CROSS SECTION 22
AREA= 0.25 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.31
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.53	257.057	(RUNOFF)
4.47	54.457	(RUNOFF)
5.98	37.656	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 22
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.52	531.617	1890.46
4.49	113.497	1890.10
6.00	77.315	1890.06

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1915 CFS-HRS= 735.47 ACRE-FT= 60.77

SUBROUTINE RUNOFF CROSS SECTION 23
AREA= 0.21 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.16
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	261.707	(RUNOFF)
2.49	238.821	(RUNOFF)
3.22	65.478	(RUNOFF)
3.88	55.544	(RUNOFF)
4.36	54.429	(RUNOFF)
5.17	34.205	(RUNOFF)

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            5.93                          35.833                        (RUNOFF)

  TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.21
  1.04    DISCHG        0.00      3.99      6.98     14.28     19.47     32.63     44.86     64.80    249.89    210.51
  2.55    DISCHG      231.70    125.37     88.19     66.47     64.17     64.33     54.72     52.03     42.77     55.40
  4.05    DISCHG       36.87     33.51     54.31     39.15     34.03     33.36     33.40     33.47     33.53     27.98
  5.55    DISCHG       23.00     24.00     32.10     33.53     11.23      1.35      0.07      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1352        CFS-HRS=      289.38        ACRE-FT=      23.91

SUBROUTINE REACH      CROSS SECTION  24
          LENGTH=   4500.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  13.253        AVERAGE ROUTING COEFF= 0.8863        NUMBER OF ROUTINGS=  0.55

SUBROUTINE RUNOFF     CROSS SECTION  24
          AREA=   0.25      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.28
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.52                        262.393                       (RUNOFF)
              3.83                         60.828                       (RUNOFF)
              4.45                         54.345                       (RUNOFF)
              5.97                         38.400                       (RUNOFF)

SUBROUTINE ADDHYD     CROSS SECTION  24
          INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.49                        487.734                       1890.58
              3.83                        109.266                       1890.13
              4.46                        101.975                       1890.12
              5.17                         73.928                       1890.08
              5.97                         71.026                       1890.08

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1807        CFS-HRS=      647.39        ACRE-FT=      53.50

SUBROUTINE ADDHYD     CROSS SECTION  25
          INPUT HYDROGRAPHS= 3,7      OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.50                       1018.527                       1890.88
              4.48                        215.193                       1890.18
              5.98                        148.147                       1890.12

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1864        CFS-HRS=     1382.86        ACRE-FT=     114.27

SUBROUTINE REACH      CROSS SECTION  26
          LENGTH=   3500.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  10.905        AVERAGE ROUTING COEFF= 0.8651        NUMBER OF ROUTINGS=  0.51
```

```
SUBROUTINE RUNOFF    CROSS SECTION  26
          AREA=   0.16     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.51                        171.597                     (RUNOFF)
              3.85                         39.570                     (RUNOFF)
              4.42                         34.875                     (RUNOFF)
              5.17                         25.743                     (RUNOFF)
              5.95                         25.194                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  26
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 7

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.58                       1162.173                    1785.00
              4.51                        237.006                    1784.20
              6.02                        161.828                    1784.14

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1854        CFS-HRS=     1607.84        ACRE-FT=     132.87

SUBROUTINE RUNOFF    CROSS SECTION  27
          AREA=   0.24     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.12
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.30                        290.453                     (RUNOFF)
              2.49                        276.492                     (RUNOFF)
              3.22                         75.747                     (RUNOFF)
              3.57                         65.219                     (RUNOFF)
              3.88                         62.805                     (RUNOFF)
              4.35                         67.620                     (RUNOFF)
              5.17                         39.440                     (RUNOFF)
              5.92                         42.372                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.24
   1.04    DISCHG        0.00      6.29      8.35     17.30     27.71     37.34     54.95    107.15    278.29    247.38
   2.55    DISCHG      264.25    122.85     90.19     73.64     73.12     73.63     55.25     64.77     45.07     62.71
   4.05    DISCHG       39.49     37.85     67.59     41.22     38.16     38.12     38.19     38.27     38.34     29.38
   5.55    DISCHG       25.65     28.84     37.87     38.60      6.41      0.29      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1437        CFS-HRS=      332.04        ACRE-FT=      27.44

SUBROUTINE REACH     CROSS SECTION  28
          LENGTH=   5600.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  11.253       AVERAGE ROUTING COEFF= 0.8687       NUMBER OF ROUTINGS=  0.80

SUBROUTINE RUNOFF    CROSS SECTION  28
```

```
AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.34
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
    2.54                        260.649                      (RUNOFF)
    4.48                         56.453                      (RUNOFF)
    5.99                         38.422                      (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  28
INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
    2.51                        513.558                      1784.72
    3.99                        117.444                      1784.16
    4.49                        116.995                      1784.16
    6.00                         75.728                      1784.10

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1932      CFS-HRS=      707.73      ACRE-FT=      58.48

SUBROUTINE ADDHYD    CROSS SECTION  31
INPUT HYDROGRAPHS= 3,7     OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
    2.57                       1671.070                      1785.66
    4.50                        353.769                      1784.52
    6.01                        237.413                      1784.35

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1878      CFS-HRS=     2315.58      ACRE-FT=     191.35

SUBROUTINE RUNOFF    CROSS SECTION  29
AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.12
COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
    2.30                        314.652                      (RUNOFF)
    2.49                        299.527                      (RUNOFF)
    3.22                         82.058                      (RUNOFF)
    3.57                         70.651                      (RUNOFF)
    3.88                         68.039                      (RUNOFF)
    4.35                         73.254                      (RUNOFF)
    5.17                         42.729                      (RUNOFF)
    5.92                         45.883                      (RUNOFF)

TIME                        HYDROGRAPH, TZERO=   1.04      DELTA T= 0.15      DRAINAGE AREA=   0.26
1.04   DISCHG      0.00      6.82      9.05     18.75     30.02     40.46     59.53    116.08    301.48    268.00
2.55   DISCHG    286.27    133.09     97.70     79.78     79.22     79.77     59.85     70.16     48.82     67.93
4.05   DISCHG     42.78     41.01     73.22     44.66     41.34     41.30     41.38     41.46     41.53     31.82
5.55   DISCHG     27.79     31.25     41.03     41.82      6.94      0.32      0.00
```

SUBROUTINE REACH CROSS SECTION 30
LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.682 AVERAGE ROUTING COEFF= 0.8627 NUMBER OF ROUTINGS= 0.67

SUBROUTINE RUNOFF CROSS SECTION 30
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.30
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.52	134.769	(RUNOFF)
4.47	28.352	(RUNOFF)
5.97	19.751	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 30
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.48	414.480	1784.61
3.98	89.841	1784.13
4.48	91.431	1784.13
5.17	62.687	1784.09
5.98	60.575	1784.09

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1874 CFS-HRS= 550.56 ACRE-FT= 45.49

SUBROUTINE ADDHYD CROSS SECTION 32
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.55	2077.058	1785.93
4.49	445.017	1784.66
6.00	297.732	1784.44

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1877 CFS-HRS= 2866.14 ACRE-FT= 236.85

SUBROUTINE RESVOR STRUCTURE 11
SURFACE ELEVATION= 1780.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
5.12	325.192	1809.03
12.29	22.706	1781.03
12.59	22.657	1781.03
13.49	22.716	1781.03
13.79	22.645	1781.02
14.39	22.631	1781.02
14.69	22.653	1781.02
14.99	22.739	1781.03
15.29	22.620	1781.02
15.59	22.647	1781.02

TIME HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 2.02

1.04	DISCHG	0.00	9.01	39.99	78.31	92.97	111.84	147.69	166.85	203.85	243.33
1.04	ELEV	1780.00	1780.41	1781.81	1783.56	1784.30	1785.46	1787.67	1789.23	1792.65	1797.20
2.55	DISCHG	272.11	291.23	302.34	308.95	313.06	316.03	318.52	320.08	321.18	322.11
2.55	ELEV	1801.01	1803.74	1805.43	1806.45	1807.08	1807.54	1807.92	1808.18	1808.36	1808.51
4.05	DISCHG	322.92	323.48	323.83	324.36	324.88	325.10	325.16	325.17	325.17	325.12
4.05	ELEV	1808.65	1808.74	1808.80	1808.89	1808.98	1809.01	1809.02	1809.02	1809.02	1809.02
5.55	DISCHG	324.92	324.51	324.07	323.81	323.56	322.83	321.47	319.80	317.62	315.08
5.55	ELEV	1808.98	1808.91	1808.84	1808.80	1808.76	1808.63	1808.41	1808.13	1807.78	1807.39
7.05	DISCHG	312.56	310.05	307.56	305.09	302.64	300.21	297.80	295.41	293.04	289.80
7.05	ELEV	1807.00	1806.62	1806.24	1805.86	1805.48	1805.11	1804.73	1804.37	1804.00	1803.54
8.55	DISCHG	286.57	283.38	280.23	277.11	274.02	270.97	267.95	264.95	259.64	254.44
8.55	ELEV	1803.08	1802.62	1802.17	1801.73	1801.28	1800.85	1800.42	1799.99	1799.30	1798.63
10.05	DISCHG	249.35	244.35	239.46	234.67	226.65	218.38	210.40	202.72	193.06	180.05
10.05	ELEV	1797.98	1797.33	1796.70	1796.08	1795.18	1794.26	1793.37	1792.52	1791.56	1790.40
11.55	DISCHG	167.92	156.60	128.58	98.13	-22.64	22.64	-22.64	22.64	-22.64	22.64
11.55	ELEV	1789.32	1788.32	1786.49	1784.62	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02
13.05	DISCHG	-22.64	22.64	-22.64	22.64	-22.64	22.64	-22.64	22.64	-22.64	22.64
13.05	ELEV	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02
14.55	DISCHG	-22.64	22.64	-22.64	22.64	-22.64	22.64	-22.64	22.64	-22.64	22.64
14.55	ELEV	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02	1778.97	1781.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.2113 CFS-HRS= 2897.02 ACRE-FT= 239.41

SUBROUTINE REACH CROSS SECTION 33
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.046 AVERAGE ROUTING COEFF= 0.8418 NUMBER OF ROUTINGS= 0.39

SUBROUTINE RUNOFF CROSS SECTION 33
AREA= 0.12 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	140.982	(RUNOFF)
2.50	133.111	(RUNOFF)
3.87	30.822	(RUNOFF)
4.37	28.459	(RUNOFF)
5.17	19.417	(RUNOFF)
5.94	19.758	(RUNOFF)

TIME HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.12

1.04	DISCHG	0.00	1.66	3.77	7.39	9.59	17.90	23.76	30.43	132.77	118.11
2.55	DISCHG	130.54	83.08	55.77	40.38	37.04	36.77	33.39	28.42	26.34	30.68

4.05	DISCHG	22.59	19.59	28.27	23.93	19.97	19.22	19.08	19.12	19.15	16.98
5.55	DISCHG	13.61	13.49	17.61	18.99	9.46	1.81	0.29	0.01	0.00	

SUBROUTINE ADDHYD CROSS SECTION 33
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 2 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.57	391.231	1726.00
3.34	351.765	1725.90
3.88	352.418	1725.90
4.38	352.257	1725.90
5.17	344.537	1725.88
5.93	343.778	1725.88
14.39	4.467	1725.01
14.69	4.492	1725.01
14.99	4.486	1725.01
15.29	4.473	1725.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1891 CFS-HRS= 3037.53 ACRE-FT= 251.02

SUBROUTINE RUNOFF CROSS SECTION 34
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.24
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	259.620	(RUNOFF)
3.86	59.881	(RUNOFF)
4.40	53.096	(RUNOFF)
5.17	38.645	(RUNOFF)
5.95	37.998	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1562 CFS-HRS= 333.97 ACRE-FT= 27.59

SUBROUTINE RUNOFF CROSS SECTION 35
AREA= 0.23 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.18
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	281.450	(RUNOFF)
2.50	259.201	(RUNOFF)
3.88	60.056	(RUNOFF)
4.36	57.012	(RUNOFF)
5.17	37.330	(RUNOFF)
5.93	38.590	(RUNOFF)

TIME HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.23

1.04	DISCHG	0.00	3.73	7.43	14.97	19.60	35.15	47.35	61.92	267.29	228.30
2.55	DISCHG	252.94	147.72	101.78	74.73	70.56	70.42	62.29	55.47	48.61	59.86

```
 4.05    DISCHG      41.89     37.00     56.79     44.46     37.74     36.66     36.58     36.65     36.72     31.65
 5.55    DISCHG      25.61     25.96     34.49     36.63     15.28      2.37      0.28      0.00

         TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1361        CFS-HRS=      317.08        ACRE-FT=      26.20

SUBROUTINE ADDHYD    CROSS SECTION  36
         INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 6

******************** WARNING MAIN TIME INCREMENT CHECK ********************

         PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
             2.31                       534.302                      1796.04
             2.50                       518.719                      1796.03
             3.87                       119.860                      1795.24
             4.37                       109.825                      1795.22
             5.17                        75.978                      1795.15
             5.94                        76.533                      1795.15

 TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.47
 1.04    DISCHG       0.00      6.20     14.38     28.12     37.13     68.61     91.52    117.46    498.85    461.84
 2.55    DISCHG     509.63    334.70    224.84    162.12    146.74    144.26    131.49    112.11    104.12    119.29
 4.05    DISCHG      90.04     77.42    109.00     94.78     78.95     75.54     74.91     74.87     75.01     66.96
 5.55    DISCHG      53.98     52.93     68.29     73.89     39.15      8.78      1.83      0.29      0.00      0.00

         TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1464        CFS-HRS=      651.05        ACRE-FT=      53.80

SUBROUTINE RUNOFF    CROSS SECTION  37
         AREA=   0.14     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.20
         COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

         PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
             2.30                       164.484                      (RUNOFF)
             2.50                       155.291                      (RUNOFF)
             3.87                        35.960                      (RUNOFF)
             4.37                        33.205                      (RUNOFF)
             5.17                        22.651                      (RUNOFF)
             5.94                        23.052                      (RUNOFF)

 TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.14
 1.04    DISCHG       0.00      1.93      4.40      8.62     11.19     20.89     27.72     35.50    154.90    137.79
 2.55    DISCHG     152.29     96.93     65.06     47.11     43.22     42.90     38.96     33.16     30.73     35.79
 4.05    DISCHG      26.35     22.86     32.99     27.92     23.29     22.42     22.26     22.30     22.34     19.81
 5.55    DISCHG      15.88     15.74     20.54     22.15     11.04      2.11      0.34      0.01      0.00

SUBROUTINE ADDHYD    CROSS SECTION  38
         INPUT HYDROGRAPHS= 1,6     OUTPUT HYDROGRAPH= 3

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

******************** WARNING MAIN TIME INCREMENT CHECK ********************

         PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
```

2.31	698.712	1790.99
2.50	673.989	1790.95
3.87	155.815	1790.22
4.37	143.025	1790.20
5.17	98.636	1790.14
5.94	99.587	1790.14

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.61

TIME											
1.04	DISCHG	0.00	8.14	18.79	36.74	48.33	89.50	119.24	152.96	653.76	599.64
2.55	DISCHG	661.93	431.63	289.91	209.24	189.96	187.17	170.46	145.28	134.86	155.09
4.05	DISCHG	116.40	100.29	141.99	122.70	102.25	97.97	97.18	97.18	97.36	86.78
5.55	DISCHG	69.87	68.68	88.84	96.05	50.19	10.90	2.17	0.31	0.00	0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1454 CFS-HRS= 844.62 ACRE-FT= 69.79

SUBROUTINE REACH CROSS SECTION 39
LENGTH= 0.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.566 AVERAGE ROUTING COEFF= 0.8491 NUMBER OF ROUTINGS= 0.00

SUBROUTINE RUNOFF CROSS SECTION 39
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.22
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	145.197	(RUNOFF)
2.50	142.971	(RUNOFF)
3.87	32.936	(RUNOFF)
4.38	29.590	(RUNOFF)
5.17	20.976	(RUNOFF)
5.94	20.944	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.13

TIME											
1.04	DISCHG	0.00	1.54	3.91	7.56	9.88	18.81	24.65	31.58	134.79	127.48
2.55	DISCHG	140.79	95.63	63.41	45.38	40.58	39.90	36.78	30.65	29.36	32.74
4.05	DISCHG	25.28	21.53	29.26	26.71	21.99	20.93	20.70	20.70	20.74	18.81
5.55	DISCHG	15.05	14.60	18.68	20.36	11.71	2.70	0.54	0.07	0.00	

SUBROUTINE ADDHYD CROSS SECTION 39
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	843.872	1725.83
2.50	816.992	1725.80
3.87	188.767	1725.18
4.37	172.606	1725.17
5.17	119.605	1725.11
5.94	120.548	1725.11

TIME HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.74

1.04	DISCHG	0.00	9.68	22.71	44.31	58.21	108.31	143.90	184.55	788.56	727.12
2.55	DISCHG	802.73	527.26	353.33	254.62	230.54	227.07	207.24	175.94	164.22	187.83
4.05	DISCHG	141.68	121.82	171.25	149.41	124.24	118.90	117.88	117.89	118.11	105.59
5.55	DISCHG	84.92	83.28	107.52	116.41	61.91	13.60	2.72	0.38	0.00	0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1462 CFS-HRS= 1024.99 ACRE-FT= 84.70

SUBROUTINE ADDHYD CROSS SECTION 40
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	1188.593	1725.82
2.51	1202.575	1725.83
3.87	541.109	1725.37
4.37	524.796	1725.36
5.17	464.179	1725.32
5.94	464.319	1725.32
14.39	4.467	1725.00
14.69	4.492	1725.00
14.99	4.486	1725.00
15.29	4.473	1725.00

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 2.88

TIME											
1.04	DISCHG	0.00	16.65	53.66	113.95	154.37	230.15	300.43	373.60	1109.79	1071.97
2.55	DISCHG	1193.16	893.42	706.68	601.13	578.90	578.62	558.11	523.78	511.29	540.24
4.05	DISCHG	486.86	464.66	523.21	497.48	468.88	463.13	462.11	462.18	462.44	447.72
5.55	DISCHG	423.54	421.47	449.40	459.33	395.05	338.55	325.06	320.90	318.54	316.15
7.05	DISCHG	313.62	311.10	308.61	306.13	303.67	301.24	298.82	296.42	294.04	291.16
8.55	DISCHG	287.93	284.73	281.56	278.42	275.32	272.25	269.22	266.21	261.85	256.63
10.05	DISCHG	251.50	246.46	241.52	236.69	230.00	221.86	213.76	205.96	197.11	185.49
11.55	DISCHG	173.03	161.38	140.21	110.93	27.30	5.24	-4.45	4.47	-4.47	4.47
13.05	DISCHG	-4.47	4.47	-4.47	4.47	-4.47	4.47	-4.47	4.47	-4.47	4.47
14.55	DISCHG	-4.47	4.47	-4.47	4.47	-4.47	4.47	-4.47	4.47	-4.47	-21.57

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1781 CFS-HRS= 4062.52 ACRE-FT= 335.72

SUBROUTINE REACH CROSS SECTION 54
LENGTH= 2100.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 7.070 AVERAGE ROUTING COEFF= 0.8061 NUMBER OF ROUTINGS= 0.44

SUBROUTINE RUNOFF CROSS SECTION 54
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	64.353	(RUNOFF)
3.85	14.839	(RUNOFF)
4.42	13.078	(RUNOFF)
5.17	9.652	(RUNOFF)

5.95	9.446	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 54
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.52	1201.663	1696.05
3.87	541.897	1695.50
4.47	521.799	1695.48
5.17	472.837	1695.44
5.98	463.700	1695.43
12.89	0.460	1695.00
13.19	0.458	1695.00
14.09	0.457	1695.00
14.99	0.459	1695.00
15.29	0.461	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1874 CFS-HRS= 4164.47 ACRE-FT= 344.15

SUBROUTINE ADDHYD CROSS SECTION 55
INPUT HYDROGRAPHS= 3,5 OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 5 WAS TRUNCATED HERE TO 100 VALUES.

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.55	1712.879	1696.08
3.87	928.298	1695.64
4.48	906.581	1695.63
5.17	842.793	1695.58
5.98	829.118	1695.57
12.74	1.532	1695.00
13.04	1.481	1695.00
13.34	1.480	1695.00
15.44	1.482	1695.00
15.71	1.876	1695.00

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 3.74

TIME											
1.04	DISCHG	0.00	10.27	52.41	131.50	220.07	318.73	428.13	544.06	1138.29	1592.56
2.55	DISCHG	1712.83	1604.01	1297.92	1102.35	1015.71	998.38	984.47	945.28	919.11	927.89
4.05	DISCHG	909.47	861.01	885.40	906.16	870.37	848.02	842.62	841.64	841.75	831.96
5.55	DISCHG	804.71	787.27	804.63	828.88	791.94	709.45	661.68	646.74	640.43	635.64
7.05	DISCHG	630.71	625.68	620.67	615.69	610.74	605.84	600.98	596.16	591.37	586.24
8.55	DISCHG	580.27	573.88	567.49	561.17	554.93	548.75	542.64	536.59	529.57	520.35
10.05	DISCHG	510.08	499.88	489.87	480.06	469.01	454.75	438.68	422.72	406.31	386.67
11.55	DISCHG	363.12	338.92	308.51	261.20	163.49	47.51	6.52	-0.99	1.52	-1.47
13.05	DISCHG	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47
14.55	DISCHG	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-7.67

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.0681 CFS-HRS= 7425.43 ACRE-FT= 613.63

SUBROUTINE RUNOFF CROSS SECTION 41
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.17

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          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              2.29                          161.029                      (RUNOFF)
              2.50                          147.080                      (RUNOFF)
              3.22                           40.458                      (RUNOFF)
              3.88                           34.173                      (RUNOFF)
              4.36                           32.902                      (RUNOFF)
              5.17                           21.138                      (RUNOFF)
              5.93                           21.973                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.13
   1.04    DISCHG        0.00      2.28      4.27      8.65     11.53     20.05     27.26     36.83    153.32    129.73
   2.55    DISCHG      143.08     80.46     56.06     41.67     39.79     39.81     34.58     31.70     27.02     34.07
   4.05    DISCHG       23.29     20.87     32.80     24.72     21.19     20.68     20.67     20.71     20.75     17.62
   5.55    DISCHG       14.35     14.76     19.69     20.71      7.84      1.07      0.09      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1343        CFS-HRS=      179.06        ACRE-FT=      14.79


SUBROUTINE RUNOFF    CROSS SECTION  42
          AREA=   0.56     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.20
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
              2.30                          657.937                      (RUNOFF)
              2.50                          621.164                      (RUNOFF)
              3.87                          143.841                      (RUNOFF)
              4.37                          132.821                      (RUNOFF)
              5.17                           90.607                      (RUNOFF)
              5.94                           92.208                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   1.04        DELTA T= 0.15        DRAINAGE AREA=   0.56
   1.04    DISCHG        0.00      7.75     17.63     34.48     44.79     83.56    110.89    142.01    619.63    551.18
   2.55    DISCHG      609.19    387.72    260.27    188.46    172.88    171.61    155.84    132.66    122.95    143.18
   4.05    DISCHG      105.43     91.46    131.97    111.68     93.19     89.70     89.06     89.22     89.39     79.25
   5.55    DISCHG       63.53     62.98     82.19     88.63     44.18      8.46      1.37      0.06      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   2.1424        CFS-HRS=      774.27        ACRE-FT=      63.98


SUBROUTINE REACH     CROSS SECTION  43
          LENGTH=   2300.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=   8.767       AVERAGE ROUTING COEFF= 0.8375       NUMBER OF ROUTINGS=  0.40


SUBROUTINE RUNOFF    CROSS SECTION  43
          AREA=   0.24     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.15
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************
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PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	301.111	(RUNOFF)
2.49	274.387	(RUNOFF)
3.22	74.990	(RUNOFF)
3.88	63.902	(RUNOFF)
4.35	63.657	(RUNOFF)
5.17	39.177	(RUNOFF)
5.93	41.396	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.24

TIME											
1.04	DISCHG	0.00	4.96	8.04	16.79	23.32	37.35	52.28	76.10	287.79	241.88
2.55	DISCHG	265.37	137.46	98.15	75.12	73.23	73.55	61.10	60.69	47.70	63.77
4.05	DISCHG	41.42	38.08	63.56	43.80	38.67	38.11	38.18	38.26	38.33	31.31
5.55	DISCHG	26.09	27.56	37.03	38.47	11.12	1.11	0.02	0.00		

SUBROUTINE ADDHYD CROSS SECTION 43
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.49	869.085	2216.16
3.88	198.840	2215.31
4.38	180.216	2215.28
5.17	129.164	2215.20
5.95	126.877	2215.19

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1668 CFS-HRS= 1118.74 ACRE-FT= 92.45

SUBROUTINE ADDHYD CROSS SECTION 44
INPUT HYDROGRAPHS= 3,4 OUTPUT HYDROGRAPH= 1

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.49	1016.073	2216.05
3.88	233.022	2215.25
4.38	212.971	2215.23
5.17	150.312	2215.16
5.95	148.736	2215.16

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1623 CFS-HRS= 1297.81 ACRE-FT= 107.25

SUBROUTINE REACH CROSS SECTION 45
LENGTH= 3800.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.834 AVERAGE ROUTING COEFF= 0.8830 NUMBER OF ROUTINGS= 0.48

SUBROUTINE RUNOFF CROSS SECTION 45
AREA= 0.25 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.23
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.32	271.757	(RUNOFF)
2.51	272.740	(RUNOFF)

3.86	62.629	(RUNOFF)
4.39	56.079	(RUNOFF)
5.17	40.300	(RUNOFF)
5.95	39.953	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.25

TIME											
1.04	DISCHG	0.00	2.75	7.37	14.13	18.52	35.55	46.54	59.64	249.94	244.47
2.55	DISCHG	269.09	189.30	125.15	89.01	78.63	76.81	71.29	58.99	57.24	62.19
4.05	DISCHG	49.42	41.69	55.30	51.94	42.62	40.38	39.87	39.82	39.89	36.48
5.55	DISCHG	29.24	28.03	35.59	39.00	23.75	5.94	1.32	0.21	0.00	

SUBROUTINE ADDHYD CROSS SECTION 45
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.52	1242.384	2030.93
3.84	281.567	2030.21
4.46	252.437	2030.19
5.17	189.539	2030.14
5.97	177.206	2030.13

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1807 CFS-HRS= 1660.69 ACRE-FT= 137.24

SUBROUTINE RUNOFF CROSS SECTION 46
AREA= 0.20 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.23
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.32	217.413	(RUNOFF)
2.51	218.188	(RUNOFF)
3.86	50.098	(RUNOFF)
4.39	44.861	(RUNOFF)
5.17	32.235	(RUNOFF)
5.95	31.959	(RUNOFF)

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 0.20

TIME											
1.04	DISCHG	0.00	2.20	5.89	11.30	14.82	28.44	37.23	47.71	199.95	195.57
2.55	DISCHG	215.27	151.44	100.12	71.21	62.91	61.45	57.03	47.19	45.79	49.75
4.05	DISCHG	39.54	33.35	44.24	41.55	34.09	32.30	31.89	31.85	31.91	29.18
5.55	DISCHG	23.39	22.42	28.47	31.20	19.00	4.75	1.05	0.17	0.00	

SUBROUTINE ADDHYD CROSS SECTION 47
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.52	1460.295	2031.04
3.85	331.610	2030.25
4.45	295.267	2030.22
5.17	221.807	2030.16
5.97	208.925	2030.15

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1767 CFS-HRS= 1938.59 ACRE-FT= 160.20

SUBROUTINE REACH CROSS SECTION 48
LENGTH= 5000.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.733 AVERAGE ROUTING COEFF= 0.8632 NUMBER OF ROUTINGS= 0.74

SUBROUTINE RUNOFF CROSS SECTION 48
AREA= 0.29 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.54	293.254	(RUNOFF)
4.48	63.063	(RUNOFF)
5.98	43.103	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 48
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.62	1679.205	1885.29
4.53	348.121	1884.33
6.07	233.299	1884.22

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1929 CFS-HRS= 2363.46 ACRE-FT= 195.31

SUBROUTINE RESVOR STRUCTURE 7
SURFACE ELEVATION= 1884.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.04	377.957	1922.59

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 1.66

TIME											
1.04	DISCHG	0.00	1.27	8.26	24.98	51.86	90.66	146.33	201.85	233.82	280.66
1.04	ELEV	1884.00	1884.07	1884.50	1885.51	1887.14	1889.49	1892.86	1896.44	1900.10	1906.23
2.55	DISCHG	321.42	347.67	362.85	369.67	373.02	374.91	376.17	377.07	377.60	377.84
2.55	ELEV	1912.40	1916.85	1919.61	1920.93	1921.60	1921.98	1922.23	1922.41	1922.52	1922.56
4.05	DISCHG	377.94	377.82	377.43	377.06	376.77	376.29	375.57	374.74	373.88	373.00
4.05	ELEV	1922.58	1922.56	1922.48	1922.41	1922.35	1922.25	1922.11	1921.94	1921.77	1921.60
5.55	DISCHG	372.01	370.80	369.48	368.25	367.14	365.74	362.79	358.47	353.79	349.04
5.55	ELEV	1921.40	1921.16	1920.89	1920.65	1920.42	1920.14	1919.59	1918.81	1917.96	1917.09
7.05	DISCHG	344.32	337.50	329.97	322.62	313.92	303.96	294.32	280.77	267.19	248.69
7.05	ELEV	1916.24	1915.08	1913.82	1912.60	1911.21	1909.68	1908.20	1906.25	1904.31	1901.96
8.55	DISCHG	229.00	202.97	100.97	39.43	15.39	6.01	2.34	0.91	0.35	0.13
8.55	ELEV	1699.54	1896.56	1890.11	1886.38	1884.93	1884.36	1884.14	1884.05	1884.02	1884.00
10.05	DISCHG	0.05	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10.05	ELEV	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1913 CFS-HRS= 2361.80 ACRE-FT= 195.17

SUBROUTINE REACH CROSS SECTION 49
LENGTH= 5200.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.019 AVERAGE ROUTING COEFF= 0.8549 NUMBER OF ROUTINGS= 0.82

SUBROUTINE RUNOFF CROSS SECTION 49
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.36
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.56	157.248	(RUNOFF)
4.49	34.615	(RUNOFF)
6.00	23.487	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 49
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.72	467.740	1730.45
4.48	412.031	1730.39
5.96	393.066	1730.38

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1893 CFS-HRS= 2585.64 ACRE-FT= 213.67

SUBROUTINE RUNOFF CROSS SECTION 50
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.24
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	140.621	(RUNOFF)
3.86	32.439	(RUNOFF)
4.40	28.763	(RUNOFF)
5.17	20.930	(RUNOFF)
5.95	20.583	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 51
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.60	584.485	1730.56
3.84	448.379	1730.43
4.45	439.878	1730.42
5.96	413.681	1730.40

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1871 CFS-HRS= 2766.54 ACRE-FT= 228.62

SUBROUTINE REACH CROSS SECTION 53
LENGTH= 1650.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 8.485 AVERAGE ROUTING COEFF= 0.8330 NUMBER OF ROUTINGS= 0.29

SUBROUTINE RUNOFF CROSS SECTION 53
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	70.491	(RUNOFF)
2.50	66.552	(RUNOFF)
3.87	15.411	(RUNOFF)
4.37	14.229	(RUNOFF)
5.17	9.708	(RUNOFF)
5.94	9.879	(RUNOFF)

HYDROGRAPH, TZERO= 1.20 DELTA T= 0.15 DRAINAGE AREA= 0.06

TIME											
1.20	DISCHG	0.00	1.88	3.69	4.79	8.95	11.88	15.21	66.38	59.05	65.27
2.70	DISCHG	41.54	27.88	20.19	18.52	18.38	16.69	14.21	13.17	15.34	11.29
4.20	DISCHG	9.79	14.13	11.96	9.98	9.61	9.54	9.56	9.57	8.49	6.80
5.70	DISCHG	6.74	8.80	9.49	4.73	0.90	0.14	0.00	0.00		

SUBROUTINE ADDHYD CROSS SECTION 53
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.61	628.928	1695.71
3.85	463.266	1695.53
4.44	451.114	1695.51
5.96	422.028	1695.48

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.1876 CFS-HRS= 2851.88 ACRE-FT= 235.67

SUBROUTINE ADDHYD CROSS SECTION 56
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.57	2337.051	1696.28
3.86	1391.672	1695.96
4.47	1357.517	1695.94
5.98	1250.933	1695.86
12.74	1.532	1695.00
13.04	1.481	1695.00
13.34	1.480	1695.00
15.14	1.478	1695.00
15.44	1.482	1695.00

15.71	1.876	1695.00

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 5.76

TIME											
1.04	DISCHG	0.00	11.33	61.12	154.29	264.42	404.51	567.11	750.04	1562.09	2131.44
2.55	DISCHG	2334.25	2216.93	1860.26	1618.69	1509.44	1484.07	1464.15	1412.02	1379.54	1390.65
4.05	DISCHG	1363.11	1303.76	1334.45	1356.71	1312.77	1284.04	1275.89	1273.52	1272.66	1259.18
5.55	DISCHG	1223.59	1200.79	1221.81	1250.39	1201.99	1097.67	1035.48	1012.87	1000.89	990.93
7.05	DISCHG	981.05	970.99	959.74	947.56	935.10	921.79	907.46	892.52	875.44	856.34
8.55	DISCHG	833.35	807.14	768.48	689.39	615.55	573.63	552.49	540.45	531.08	520.94
10.05	DISCHG	510.31	499.97	489.91	480.08	469.01	454.76	438.69	422.72	406.31	386.67
11.55	DISCHG	363.12	338.92	308.51	261.20	163.49	47.51	6.52	-0.99	1.52	-1.47
13.05	DISCHG	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47
14.55	DISCHG	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-1.47	1.47	-7.67

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.7599 CFS-HRS= 10277.30 ACRE-FT= 849.31

SUBROUTINE RESVOR STRUCTURE 4
SURFACE ELEVATION= 1695.00

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
4.78	1292.833	1716.60
5.92	1236.698	1716.53
13.71	2.379	1695.03

HYDROGRAPH, TZERO= 1.04 DELTA T= 0.15 DRAINAGE AREA= 5.76

TIME											
1.04	DISCHG	0.00	6.01	38.08	111.96	215.31	316.21	351.44	415.25	524.76	630.19
1.04	ELEV	1695.00	1695.09	1695.61	1696.80	1698.47	1700.13	1700.88	1702.25	1704.83	1708.00
2.55	DISCHG	686.67	742.65	765.47	782.11	795.46	807.43	818.82	829.39	839.06	999.12
2.55	ELEV	1709.98	1711.95	1712.89	1713.58	1714.14	1714.64	1715.11	1715.55	1715.96	1716.21
4.05	DISCHG	1121.44	1190.09	1231.87	1268.69	1290.08	1292.77	1288.62	1284.12	1280.55	1275.81
4.05	ELEV	1716.37	1716.46	1716.52	1716.57	1716.60	1716.60	1716.59	1716.59	1716.58	1716.58
5.55	DISCHG	1264.66	1247.67	1235.90	1235.96	1232.80	1205.93	1160.81	1116.56	1081.05	1053.48
5.55	ELEV	1716.56	1716.54	1716.52	1716.52	1716.52	1716.48	1716.42	1716.36	1716.32	1716.28
7.05	DISCHG	1031.62	1013.62	997.99	983.63	969.94	956.50	942.94	929.03	914.44	898.72
7.05	ELEV	1716.25	1716.23	1716.21	1716.19	1716.17	1716.15	1716.13	1716.11	1716.09	1716.07
8.55	DISCHG	881.28	861.51	839.87	837.98	834.81	830.71	826.14	821.36	816.48	811.52
8.55	ELEV	1716.05	1716.02	1715.99	1715.91	1715.78	1715.61	1715.42	1715.22	1715.02	1714.81
10.05	DISCHG	806.47	801.33	796.09	790.78	785.38	779.86	774.17	768.31	762.26	756.02
10.05	ELEV	1714.60	1714.38	1714.17	1713.94	1713.72	1713.49	1713.25	1713.01	1712.76	1712.50
11.55	DISCHG	749.51	741.34	726.62	711.05	693.48	672.76	650.01	623.66	573.82	527.95
11.55	ELEV	1712.22	1711.90	1711.39	1710.84	1710.22	1709.50	1708.70	1707.80	1706.31	1704.93
13.05	DISCHG	467.76	370.59	226.25	-13.83	0.84	-0.05	0.00	-0.00	0.00	
13.05	ELEV	1703.37	1701.29	1698.64	1694.77	1695.01	1694.99	1695.00	1695.00	1695.00	

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 2.7623 CFS-HRS= 10286.28 ACRE-FT= 850.05

ENDCMP 1

```
EXECUTIVE CONTROL CARD              OPERATION  INCREM,     MAIN TIME INCREMENT=  0.25
EXECUTIVE CONTROL CARD              OPERATION  COMPUT,     FROM XSECTN/STRUCT  11/  0     TO XSECTN/STRUCT   0/  4
        STARTING TIME=  0.00      RAIN DEPTH=  4.20     RAIN DURATION=  1.00     RAIN TABLE NO.= 1     SOIL CONDITION= 2
        ALTERNATE NO.= 1          STORM NO.= 2

SUBROUTINE RUNOFF    CROSS SECTION  11
           AREA=   0.71     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
           COMPUTED CURVE NO. =  90.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              11.96                       1251.390                      (RUNOFF)
              16.87                         40.686                      (RUNOFF)
              19.37                         29.802                      (RUNOFF)
              20.37                         26.173                      (RUNOFF)
              21.44                         25.833                      (RUNOFF)
              22.37                         22.512                      (RUNOFF)
              23.44                         22.198                      (RUNOFF)

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1548        CFS-HRS=     1445.61        ACRE-FT=     119.46

SUBROUTINE REACH     CROSS SECTION  12
           LENGTH=   5500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  11.136       AVERAGE ROUTING COEFF= 0.8675       NUMBER OF ROUTINGS=  0.47

SUBROUTINE RUNOFF    CROSS SECTION  12
           AREA=   0.44     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.35
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              12.02                        697.423                      (RUNOFF)
              19.37                         18.390                      (RUNOFF)
              21.50                         15.782                      (RUNOFF)
              23.50                         13.494                      (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  12
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              12.05                       1761.898                      1973.32
              19.37                         48.010                      1970.30
              21.52                         41.042                      1970.26
              23.52                         35.145                      1970.22

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1416        CFS-HRS=     2331.66        ACRE-FT=     192.68

SUBROUTINE RUNOFF    CROSS SECTION  13
           AREA=   0.42     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
```

11.91	804.123	(RUNOFF)
16.87	24.117	(RUNOFF)
19.37	17.689	(RUNOFF)
20.37	15.545	(RUNOFF)
21.39	15.475	(RUNOFF)
22.37	13.372	(RUNOFF)
23.39	13.335	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1269 CFS-HRS= 847.58 ACRE-FT= 70.04

SUBROUTINE REACH CROSS SECTION 14
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.028 AVERAGE ROUTING COEFF= 0.8761 NUMBER OF ROUTINGS= 0.37

SUBROUTINE RUNOFF CROSS SECTION 14
AREA= 0.22 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.96	387.578	(RUNOFF)
16.87	12.602	(RUNOFF)
19.37	9.235	(RUNOFF)
20.37	8.110	(RUNOFF)
21.44	7.997	(RUNOFF)
22.37	6.974	(RUNOFF)
23.44	6.883	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 14
INPUT HYDROGRAPHS= 5,6 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.98	1106.394	1972.52
16.87	36.627	1970.18
19.37	26.804	1970.13
20.37	23.542	1970.12
21.46	23.195	1970.11
22.37	20.253	1970.10
23.46	19.927	1970.10

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1356 CFS-HRS= 1295.15 ACRE-FT= 107.03

SUBROUTINE ADDHYD CROSS SECTION 15
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.02	2851.633	1974.12
19.37	74.848	1970.44
21.50	64.224	1970.37
23.50	55.076	1970.32

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1460 CFS-HRS= 3634.36 ACRE-FT= 300.34

SUBROUTINE REACH CROSS SECTION 16
LENGTH= 6500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.461 AVERAGE ROUTING COEFF= 0.8602 NUMBER OF ROUTINGS= 0.59

SUBROUTINE RUNOFF CROSS SECTION 16
AREA= 0.48 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.46
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.10	681.193	(RUNOFF)
21.56	16.974	(RUNOFF)
23.56	14.516	(RUNOFF)

HYDROGRAPH, TZERO= 5.00 DELTA T= 0.25 DRAINAGE AREA= 0.48

TIME											
5.00	DISCHG	0.00	1.15	1.74	2.41	3.16	3.83	4.44	5.02	5.58	6.53
7.50	DISCHG	7.84	8.76	9.50	10.74	12.38	13.80	15.23	16.96	19.07	21.19
10.00	DISCHG	23.59	27.20	32.09	38.39	46.67	59.49	78.93	281.55	647.63	610.49
12.50	DISCHG	324.64	195.57	123.03	91.58	73.24	63.84	55.41	50.54	46.27	43.44
15.00	DISCHG	40.73	38.41	35.82	33.53	30.94	29.34	27.91	27.44	27.31	26.58
17.50	DISCHG	25.40	24.29	22.99	21.83	20.53	20.08	19.95	19.92	19.92	19.22
20.00	DISCHG	18.03	17.62	17.50	16.75	15.57	15.87	16.92	16.59	15.54	15.16
22.50	DISCHG	15.04	14.29	13.09	13.39	14.46	14.13	13.03	9.07	3.05	0.89
25.00	DISCHG	0.23	0.04	0.00	0.00						

SUBROUTINE ADDHYD CROSS SECTION 16
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.19	3112.008	1819.10
19.37	94.471	1814.71
21.65	79.661	1814.60
23.65	68.024	1814.51

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1401 CFS-HRS= 4600.31 ACRE-FT= 380.17

SUBROUTINE RESVOR STRUCTURE 6
SURFACE ELEVATION= 1810.00

42

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
13.20	482.686	1836.78
21.97	80.422	1812.63
22.48	73.846	1812.42
23.62	68.150	1812.23
25.49	0.142	1810.00
26.01	0.073	1810.00
26.51	0.038	1810.00
27.01	0.020	1810.00
27.51	0.010	1810.00
28.01	0.005	1810.00

HYDROGRAPH, TZERO= 4.75 DELTA T= 0.25 DRAINAGE AREA= 2.26

TIME											
4.75	DISCHG	0.00	0.23	2.76	6.36	9.79	13.88	17.29	20.24	23.04	25.66
4.75	ELEV	1810.00	1810.00	1810.09	1810.20	1810.32	1810.45	1810.56	1810.66	1810.75	1810.84
7.25	DISCHG	29.47	35.21	40.39	44.06	48.95	56.22	63.51	70.18	77.83	87.26
7.25	ELEV	1810.96	1811.15	1811.32	1811.44	1811.60	1811.84	1812.08	1812.30	1812.55	1812.86
9.75	DISCHG	97.42	108.31	123.34	144.72	172.51	186.83	200.35	227.91	289.83	366.01
9.75	ELEV	1813.19	1813.55	1814.04	1814.74	1815.65	1816.18	1816.81	1818.11	1821.38	1826.59
12.25	DISCHG	429.12	462.82	477.91	482.16	482.71	481.63	479.71	477.24	474.38	470.59
12.25	ELEV	1831.83	1834.96	1836.35	1836.74	1836.79	1836.69	1836.51	1836.29	1836.03	1835.68
14.75	DISCHG	466.48	462.21	457.82	453.32	448.70	443.97	439.16	434.29	428.81	422.13
14.75	ELEV	1835.30	1834.90	1834.49	1834.07	1833.64	1833.20	1832.75	1832.30	1831.81	1831.22
17.25	DISCHG	415.56	409.05	402.57	396.10	389.65	382.10	371.71	361.63	351.90	342.52
17.25	ELEV	1830.65	1830.09	1829.52	1828.96	1828.40	1827.78	1827.01	1826.26	1825.54	1824.85
19.75	DISCHG	333.44	319.15	303.49	288.74	274.87	243.83	200.61	87.81	72.59	80.32
19.75	ELEV	1824.18	1823.24	1822.25	1821.31	1820.43	1818.86	1816.82	1812.87	1812.38	1812.63
22.25	DISCHG	68.30	73.78	66.92	65.14	61.28	67.35	67.31	63.95	49.41	23.46
22.25	ELEV	1812.23	1812.41	1812.19	1812.13	1812.00	1812.20	1812.20	1812.09	1811.62	1810.76
24.75	DISCHG	5.14	1.18	-0.07	0.14	-0.09	0.07	-0.05	0.03	-0.02	0.02
24.75	ELEV	1810.16	1810.03	1809.99	1810.00	1809.99	1810.00	1809.99	1810.00	1809.99	1810.00
27.25	DISCHG	-0.01	0.01	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
27.25	ELEV	1809.99	1810.00	1809.99	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1394 CFS-HRS= 4599.33 ACRE-FT= 380.08

SUBROUTINE REACH CROSS SECTION 52
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.405 AVERAGE ROUTING COEFF= 0.8469 NUMBER OF ROUTINGS= 0.46

SUBROUTINE RUNOFF CROSS SECTION 52
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.01	258.437	(RUNOFF)
19.37	6.690	(RUNOFF)
21.49	5.754	(RUNOFF)
23.49	4.926	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 52
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 5

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
7.71	380.336	1695.26

9.02	356.396	1695.24
9.83	357.525	1695.24
10.83	364.198	1695.25
12.01	603.000	1695.41
24.70	0.411	1695.00
25.24	0.332	1695.00
25.75	0.332	1695.00
26.25	0.332	1695.00
27.75	0.331	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 10.4286 CFS-HRS= 5384.28 ACRE-FT= 444.95

SUBROUTINE RUNOFF CROSS SECTION 21
AREA= 0.27 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.21
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.94	493.996	(RUNOFF)
16.87	15.476	(RUNOFF)
19.37	11.346	(RUNOFF)
20.37	9.972	(RUNOFF)
21.42	9.892	(RUNOFF)
23.42	8.497	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1597 CFS-HRS= 550.59 ACRE-FT= 45.50

SUBROUTINE REACH CROSS SECTION 22
LENGTH= 5220.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.182 AVERAGE ROUTING COEFF= 0.8775 NUMBER OF ROUTINGS= 0.41

SUBROUTINE RUNOFF CROSS SECTION 22
AREA= 0.25 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.31
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.00	412.432	(RUNOFF)
19.37	10.471	(RUNOFF)
21.47	9.021	(RUNOFF)
23.48	7.731	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 22
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.01	845.023	1890.74
19.37	21.750	1890.01
21.49	18.722	1890.01
23.49	16.013	1890.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1448 CFS-HRS= 1055.39 ACRE-FT= 87.21

```
SUBROUTINE RUNOFF    CROSS SECTION  23
          AREA=   0.21     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
             11.91                        402.061                     (RUNOFF)
             16.87                         12.058                     (RUNOFF)
             19.37                          8.844                     (RUNOFF)
             20.37                          7.772                     (RUNOFF)
             21.39                          7.737                     (RUNOFF)
             22.37                          6.686                     (RUNOFF)
             23.39                          6.667                     (RUNOFF)

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1719        CFS-HRS=      429.88        ACRE-FT=      35.52

SUBROUTINE REACH     CROSS SECTION  24
          LENGTH=   4500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  13.253       AVERAGE ROUTING COEFF= 0.8863       NUMBER OF ROUTINGS=  0.33

SUBROUTINE RUNOFF    CROSS SECTION  24
          AREA=   0.25     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.28
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
             11.98                        425.611                     (RUNOFF)
             19.37                         10.475                     (RUNOFF)
             21.46                          9.055                     (RUNOFF)
             23.46                          7.770                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  24
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
             11.98                        788.953                     1890.94
             16.87                         26.324                     1890.03
             19.37                         19.282                     1890.02
             21.46                         16.674                     1890.02
             23.46                         14.297                     1890.01

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1518        CFS-HRS=      935.70        ACRE-FT=      77.32

SUBROUTINE ADDHYD    CROSS SECTION  25
          INPUT HYDROGRAPHS= 3,7     OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
             11.99                       1630.847                     1891.19
             19.37                         41.036                     1890.03
             21.48                         35.404                     1890.03
             23.48                         30.359                     1890.02

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1481        CFS-HRS=     1991.09        ACRE-FT=     164.54
```

SUBROUTINE REACH CROSS SECTION 26
LENGTH= 3500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 11.545 AVERAGE ROUTING COEFF= 0.8716 NUMBER OF ROUTINGS= 0.29

SUBROUTINE RUNOFF CROSS SECTION 26
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.96	281.979	(RUNOFF)
16.87	9.162	(RUNOFF)
19.37	6.712	(RUNOFF)
20.37	5.898	(RUNOFF)
21.44	5.819	(RUNOFF)
22.37	5.073	(RUNOFF)
23.44	4.997	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 26
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.03	1730.273	1785.24
19.37	47.630	1784.04
21.51	40.604	1784.03
23.51	34.780	1784.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1442 CFS-HRS= 2313.27 ACRE-FT= 191.16

SUBROUTINE RUNOFF CROSS SECTION 27
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.12
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.90	472.910	(RUNOFF)
16.87	13.791	(RUNOFF)
19.37	10.114	(RUNOFF)
20.37	8.885	(RUNOFF)
21.38	8.890	(RUNOFF)
22.37	7.651	(RUNOFF)
23.38	7.648	(RUNOFF)

HYDROGRAPH, TZERO= 5.25 DELTA T= 0.25 DRAINAGE AREA= 0.24

TIME											
5.25	DISCHG	0.00	1.19	1.65	1.97	2.27	2.55	2.83	3.09	4.10	4.47
7.75	DISCHG	4.81	5.13	6.44	6.86	7.80	8.23	9.86	10.36	12.16	12.72
10.25	DISCHG	16.89	17.72	24.80	26.08	41.97	44.93	396.38	444.09	95.07	86.94
12.75	DISCHG	45.94	45.04	33.26	33.02	25.91	25.77	22.21	22.14	19.77	19.72
15.25	DISCHG	17.34	17.29	14.89	14.84	13.64	13.62	13.63	13.64	12.43	12.41
17.75	DISCHG	11.21	11.18	9.97	9.95	9.95	9.95	9.96	9.96	8.75	8.72
20.25	DISCHG	8.72	8.72	7.51	7.49	8.71	8.74	7.52	7.49	7.49	7.49

```
 22.75    DISCHG        6.28      6.25      7.47      7.50      6.28      6.25      0.14      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1890        CFS-HRS=      493.94        ACRE-FT=      40.81

SUBROUTINE REACH     CROSS SECTION  28
          LENGTH=   5600.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  11.253       AVERAGE ROUTING COEFF= 0.8687       NUMBER OF ROUTINGS=  0.48

SUBROUTINE RUNOFF    CROSS SECTION  28
          AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.34
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
             12.01                        415.659                      (RUNOFF)
             19.37                         10.869                      (RUNOFF)
             21.49                          9.324                      (RUNOFF)
             23.49                          7.990                      (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  28
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
             12.01                        831.681                      1785.07
             19.37                         20.916                      1784.02
             21.50                         18.048                      1784.02
             23.49                         15.473                      1784.02

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1539        CFS-HRS=     1017.74        ACRE-FT=      84.10

SUBROUTINE ADDHYD    CROSS SECTION  31
          INPUT HYDROGRAPHS= 3,7     OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
             12.03                       2560.086                      1786.15
             19.37                         68.544                      1784.10
             21.50                         58.679                      1784.08
             23.50                         50.254                      1784.07

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1472        CFS-HRS=     3331.02        ACRE-FT=     275.27

SUBROUTINE RUNOFF    CROSS SECTION  29
          AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.12
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
             11.90                        512.181                      (RUNOFF)
             16.87                         14.940                      (RUNOFF)
```

19.37	10.965	(RUNOFF)
20.37	9.626	(RUNOFF)
21.38	9.622	(RUNOFF)
22.37	8.289	(RUNOFF)
23.38	8.290	(RUNOFF)

TIME HYDROGRAPH, TZERO= 5.00 DELTA T= 0.25 DRAINAGE AREA= 0.26

5.00	DISCHG	0.00	1.00	1.29	1.79	2.13	2.46	2.77	3.06	3.35	4.45
7.50	DISCHG	4.85	5.21	5.56	6.98	7.43	8.45	8.92	10.68	11.23	13.17
10.00	DISCHG	13.78	18.30	19.20	26.87	28.26	45.47	48.68	429.41	481.10	102.99
12.50	DISCHG	94.19	49.77	48.79	36.03	35.77	28.07	27.92	24.06	23.99	21.41
15.00	DISCHG	21.36	18.78	18.73	16.13	16.08	14.78	14.76	14.77	14.77	13.47
17.50	DISCHG	13.44	12.14	12.11	10.80	10.78	10.78	10.78	10.79	10.79	9.48
20.00	DISCHG	9.45	9.45	9.45	8.14	8.11	9.43	9.46	8.15	8.12	8.12
22.50	DISCHG	8.12	6.80	6.77	8.10	8.13	6.81	6.77	0.16	0.00	

SUBROUTINE REACH CROSS SECTION 30
LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.682 AVERAGE ROUTING COEFF= 0.8627 NUMBER OF ROUTINGS= 0.40

SUBROUTINE RUNOFF CROSS SECTION 30
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.30
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.99	217.280	(RUNOFF)
19.37	5.442	(RUNOFF)
21.47	4.688	(RUNOFF)
23.47	4.021	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 30
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.99	673.763	1785.00
16.87	22.298	1784.03
19.37	16.325	1784.02
21.47	14.144	1784.02
23.47	12.154	1784.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1463 CFS-HRS= 791.91 ACRE-FT= 65.44

SUBROUTINE ADDHYD CROSS SECTION 32
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.02	3229.875	1786.42
19.37	84.966	1784.12
21.50	72.786	1784.10
23.50	62.302	1784.09

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1393 CFS-HRS= 4112.81 ACRE-FT= 339.88

SUBROUTINE RESVOR STRUCTURE 11
SURFACE ELEVATION= 1780.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
13.26	342.246	1811.87
24.99	42.417	1781.92
25.50	42.664	1781.93
25.99	42.175	1781.91
26.49	42.265	1781.92
26.99	42.136	1781.91
27.50	42.257	1781.92
27.99	42.414	1781.92
28.99	42.472	1781.93
29.49	42.265	1781.92

4.2"

HYDROGRAPH, TZERO= 5.00 DELTA T= 0.25 DRAINAGE AREA= 2.02

TIME											
5.00	DISCHG	0.00	0.58	5.33	9.54	13.69	17.37	19.89	22.28	24.57	29.85
5.00	ELEV	1780.00	1780.02	1780.24	1780.43	1780.62	1780.79	1780.90	1781.01	1781.11	1781.35
7.50	DISCHG	35.12	38.59	41.48	48.24	54.80	61.14	66.62	75.54	83.70	89.11
7.50	ELEV	1781.59	1781.75	1781.88	1782.19	1782.49	1782.77	1783.02	1783.43	1783.80	1784.06
10.00	DISCHG	92.61	100.23	112.19	129.59	152.69	163.11	180.11	238.28	292.00	323.05
10.00	ELEV	1784.28	1784.75	1785.48	1786.55	1787.98	1788.89	1790.41	1796.55	1803.85	1808.67
12.50	DISCHG	335.56	340.27	341.93	342.29	342.02	341.34	340.36	339.17	337.82	336.36
12.50	ELEV	1810.76	1811.54	1811.82	1811.88	1811.83	1811.72	1811.56	1811.36	1811.13	1810.89
15.00	DISCHG	334.82	333.19	331.48	329.68	327.81	325.88	323.91	321.94	319.98	317.61
15.00	ELEV	1810.63	1810.36	1810.08	1809.78	1809.46	1809.14	1808.81	1808.49	1808.16	1807.78
17.50	DISCHG	314.82	312.00	309.14	306.25	303.34	300.42	297.54	294.69	291.46	287.58
17.50	ELEV	1807.35	1806.92	1806.48	1806.03	1805.59	1805.14	1804.69	1804.26	1803.78	1803.22
20.00	DISCHG	283.69	279.82	276.01	272.23	268.43	264.45	258.03	251.82	245.68	239.66
20.00	ELEV	1802.67	1802.11	1801.57	1801.03	1800.49	1799.93	1799.10	1798.30	1797.50	1796.73
22.50	DISCHG	233.68	223.29	213.25	203.80	192.83	178.27	164.86	147.16	99.46	-41.68
22.50	ELEV	1795.96	1794.81	1793.69	1792.64	1791.54	1790.24	1789.05	1787.64	1784.70	1778.10
25.00	DISCHG	42.47	-42.42	42.42	-42.42	42.42	-42.42	42.42	-42.42	42.42	-42.42
25.00	ELEV	1781.93	1778.07	1781.92	1778.07	1781.92	1778.07	1781.92	1778.07	1781.92	1778.07
27.50	DISCHG	42.42	-42.42	42.42	-42.42	42.42	-42.42	42.42	-42.42	42.42	-42.42
27.50	ELEV	1781.92	1778.07	1781.92	1778.07	1781.92	1778.07	1781.92	1778.07	1781.92	1778.07

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.0901 CFS-HRS= 4048.43 ACRE-FT= 334.56

SUBROUTINE REACH CROSS SECTION 33
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.046 AVERAGE ROUTING COEFF= 0.8418 NUMBER OF ROUTINGS= 0.23

SUBROUTINE RUNOFF CROSS SECTION 33
AREA= 0.12 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.93	222.167	(RUNOFF)
16.87	6.882	(RUNOFF)
19.37	5.044	(RUNOFF)
20.37	4.428	(RUNOFF)
21.41	4.402	(RUNOFF)
23.41	3.789	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 33
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.99	495.449	1726.12
24.97	22.634	1725.05
25.49	22.191	1725.05
25.99	21.966	1725.05
26.49	22.031	1725.05
26.99	21.923	1725.05
27.49	22.109	1725.05
27.99	22.039	1725.05
28.49	22.017	1725.05
28.99	21.980	1725.05

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1212 CFS-HRS= 4330.82 ACRE-FT= 357.89

SUBROUTINE RUNOFF CROSS SECTION 34
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.24
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.95	427.076	(RUNOFF)
16.87	13.744	(RUNOFF)
19.37	10.065	(RUNOFF)
21.43	8.757	(RUNOFF)
22.37	7.606	(RUNOFF)
23.43	7.507	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1552 CFS-HRS= 488.71 ACRE-FT= 40.38

SUBROUTINE RUNOFF CROSS SECTION 35
AREA= 0.23 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.18
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.92	433.970	(RUNOFF)
16.87	13.197	(RUNOFF)
19.37	9.676	(RUNOFF)
20.37	8.501	(RUNOFF)

```
   21.40                          8.453                    (RUNOFF)
   23.40                          7.270                    (RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1680        CFS-HRS=      470.24        ACRE-FT=      38.86

SUBROUTINE ADDHYD    CROSS SECTION  36
INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 6

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   11.94                        859.726                     1796.34
   16.87                         26.940                     1795.05
   19.37                         19.735                     1795.04
   20.37                         17.351                     1795.03
   21.42                         17.210                     1795.03
   23.42                         14.806                     1795.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1615        CFS-HRS=      958.96        ACRE-FT=      79.24

SUBROUTINE RUNOFF    CROSS SECTION  37
AREA=   0.14     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.20
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   11.93                        259.211                     (RUNOFF)
   16.87                          8.021                     (RUNOFF)
   19.37                          5.887                     (RUNOFF)
   20.37                          5.166                     (RUNOFF)
   21.41                          5.138                     (RUNOFF)
   23.41                          4.412                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  38
INPUT HYDROGRAPHS= 1,6      OUTPUT HYDROGRAPH= 3

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   11.94                       1118.886                     1791.28
   16.87                         34.984                     1790.04
   19.37                         25.647                     1790.03
   20.37                         22.515                     1790.03
   21.42                         22.317                     1790.03
   23.42                         19.200                     1790.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1610        CFS-HRS=     1244.41        ACRE-FT=     102.83

SUBROUTINE REACH     CROSS SECTION  39
LENGTH=      0.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=   9.750       AVERAGE ROUTING COEFF= 0.8515       NUMBER OF ROUTINGS=  0.00

SUBROUTINE RUNOFF    CROSS SECTION  39
AREA=   0.13     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.22
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
```

11.94	235.892	(RUNOFF)
16.87	7.450	(RUNOFF)
19.37	5.460	(RUNOFF)
20.37	4.795	(RUNOFF)
21.42	4.751	(RUNOFF)
22.37	4.126	(RUNOFF)
23.42	4.086	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 39
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.94	1354.336	1726.16
16.87	42.457	1725.04
19.37	31.110	1725.03
20.37	27.305	1725.02
21.42	27.110	1725.02
23.42	23.283	1725.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1597 CFS-HRS= 1509.01 ACRE-FT= 124.70

SUBROUTINE ADDHYD CROSS SECTION 40
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 7 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.95	1845.531	1726.12
24.97	22.680	1725.01
25.49	22.191	1725.01
25.99	21.966	1725.01
26.49	22.031	1725.01
26.99	21.923	1725.01
27.49	22.109	1725.01
27.99	22.039	1725.01
28.49	22.017	1725.01
28.99	21.980	1725.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1206 CFS-HRS= 5820.29 ACRE-FT= 480.98

SUBROUTINE REACH CROSS SECTION 54
LENGTH= 2100.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 8.459 AVERAGE ROUTING COEFF= 0.8326 NUMBER OF ROUTINGS= 0.22

SUBROUTINE RUNOFF CROSS SECTION 54
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.96	105.710	(RUNOFF)
16.87	3.435	(RUNOFF)
19.37	2.518	(RUNOFF)

20.37	2.211	(RUNOFF)
21.44	2.184	(RUNOFF)
22.37	1.902	(RUNOFF)
23.44	1.876	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 54
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.99	1826.836	1696.32
25.49	11.818	1695.01
25.99	11.832	1695.01
26.50	11.888	1695.01
27.00	11.935	1695.01
27.49	11.831	1695.01
27.99	11.882	1695.01
28.50	11.927	1695.01
28.99	11.916	1695.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1297 CFS-HRS= 5958.52 ACRE-FT= 492.41

SUBROUTINE ADDHYD CROSS SECTION 55
INPUT HYDROGRAPHS= 3,5 OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 5 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
7.76	434.670	1695.30
11.99	2428.906	1696.31
25.49	11.571	1695.00
26.00	11.526	1695.00
26.50	11.531	1695.00
26.99	11.545	1695.00
27.50	11.547	1695.00
28.00	11.591	1695.00
28.49	11.498	1695.00
28.99	11.522	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 4.6868 CFS-HRS= 11342.81 ACRE-FT= 937.36

SUBROUTINE RUNOFF CROSS SECTION 41
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.17
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.92	246.813	(RUNOFF)
16.87	7.465	(RUNOFF)
19.37	5.472	(RUNOFF)
20.37	4.800	(RUNOFF)
21.40	4.784	(RUNOFF)
22.37	4.137	(RUNOFF)
23.40	4.119	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1654 CFS-HRS= 265.57 ACRE-FT= 21.94

SUBROUTINE RUNOFF CROSS SECTION 42
AREA= 0.56 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.93	1036.847	(RUNOFF)
16.87	32.086	(RUNOFF)
19.37	23.549	(RUNOFF)
20.37	20.667	(RUNOFF)
21.41	20.552	(RUNOFF)
23.41	17.651	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1654 CFS-HRS= 1144.00 ACRE-FT= 94.54

SUBROUTINE REACH CROSS SECTION 43
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.238 AVERAGE ROUTING COEFF= 0.8576 NUMBER OF ROUTINGS= 0.21

SUBROUTINE RUNOFF CROSS SECTION 43
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.15
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.91	463.845	(RUNOFF)
16.87	13.785	(RUNOFF)
19.37	10.107	(RUNOFF)
20.37	8.871	(RUNOFF)
21.39	8.862	(RUNOFF)
22.37	7.650	(RUNOFF)
23.39	7.629	(RUNOFF)

HYDROGRAPH, TZERO= 5.25 DELTA T= 0.25 DRAINAGE AREA= 0.24

TIME											
5.25	DISCHG	0.00	1.17	1.61	1.94	2.24	2.53	2.80	3.06	4.04	4.44
7.75	DISCHG	4.78	5.10	6.36	6.82	7.74	8.19	9.76	10.31	12.05	12.66
10.25	DISCHG	16.67	17.63	24.44	25.94	41.17	44.19	377.68	440.95	109.67	86.96
12.75	DISCHG	47.64	45.05	33.74	33.03	26.21	25.77	22.36	22.14	19.86	19.72
15.25	DISCHG	17.43	17.29	14.99	14.84	13.69	13.62	13.63	13.64	12.48	12.41
17.75	DISCHG	11.25	11.18	10.02	9.94	9.95	9.95	9.96	9.96	8.80	8.72
20.25	DISCHG	8.72	8.73	7.56	7.48	8.65	8.74	7.57	7.49	7.49	7.50
22.75	DISCHG	6.33	6.25	7.42	7.50	6.33	6.25	0.40	0.00		

SUBROUTINE ADDHYD CROSS SECTION 43
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.95	1420.601	2216.54
16.87	45.817	2215.07
19.37	33.579	2215.05
21.43	29.129	2215.04

```
   23.43                          25.032                          2215.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1623        CFS-HRS=     1632.73        ACRE-FT=     134.92

SUBROUTINE ADDHYD    CROSS SECTION  44
INPUT HYDROGRAPHS= 3,4     OUTPUT HYDROGRAPH= 1

PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
   11.95                        1665.687                       2216.37
   16.87                          53.314                       2215.05
   19.37                          39.068                       2215.04
   21.43                          33.935                       2215.03
   23.43                          29.155                       2215.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1628        CFS-HRS=     1898.30        ACRE-FT=     156.87

SUBROUTINE REACH     CROSS SECTION  45
LENGTH=   3800.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=  13.550       AVERAGE ROUTING COEFF= 0.8885       NUMBER OF ROUTINGS=  0.27

SUBROUTINE RUNOFF    CROSS SECTION  45
AREA=   0.25     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.23
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
   11.95                        448.595                        (RUNOFF)
   16.87                         14.321                        (RUNOFF)
   19.37                         10.511                        (RUNOFF)
   21.43                          9.129                        (RUNOFF)
   23.43                          7.838                        (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  45
INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
   11.98                       1962.148                       2031.21
   19.37                         49.441                       2030.03
   21.47                         42.576                       2030.03
   23.47                         36.493                       2030.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1539        CFS-HRS=     2401.81        ACRE-FT=     198.48

SUBROUTINE RUNOFF    CROSS SECTION  46
AREA=   0.20     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.23
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
   11.95                        358.766                        (RUNOFF)
   16.87                         11.458                        (RUNOFF)
   19.37                          8.408                        (RUNOFF)
   21.43                          7.298                        (RUNOFF)
```

23.43	6.270	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 47
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
11.98	2319.133	2031.34
19.37	57.859	2030.04
21.46	49.869	2030.03
23.46	42.800	2030.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1538 CFS-HRS= 2808.83 ACRE-FT= 232.12

SUBROUTINE REACH CROSS SECTION 48
LENGTH= 5000.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.304 AVERAGE ROUTING COEFF= 0.8786 NUMBER OF ROUTINGS= 0.39

SUBROUTINE RUNOFF CROSS SECTION 48
AREA= 0.29 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.01	468.578	(RUNOFF)
19.37	12.130	(RUNOFF)
21.49	10.417	(RUNOFF)
23.49	8.930	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 48
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.05	2485.602	1885.64
19.37	69.725	1884.06
21.53	59.286	1884.05
23.53	50.761	1884.04

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1453 CFS-HRS= 3390.00 ACRE-FT= 280.14

SUBROUTINE RESVOR STRUCTURE 7
SURFACE ELEVATION= 1884.00

4.2"

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.83	548.024	1926.35
21.69	58.149	1887.52
23.69	49.550	1887.00

HYDROGRAPH, TZERO= 4.75 DELTA T= 0.25 DRAINAGE AREA= 1.66

TIME											
4.75	DISCHG	0.00	0.17	0.70	2.46	5.52	8.84	11.88	14.41	16.56	18.54
4.75	ELEV	1884.00	1884.01	1884.04	1884.14	1884.33	1884.53	1884.72	1884.87	1885.00	1885.12
7.25	DISCHG	21.30	25.21	28.98	31.91	35.51	40.47	45.76	50.76	56.37	63.01

7.25	ELEV	1885.29	1885.52	1885.75	1885.93	1886.15	1886.45	1886.77	1887.07	1887.41	1887.81
9.75	DISCHG	70.41	78.28	89.15	103.82	123.81	149.09	187.32	207.30	277.16	348.11
9.75	ELEV	1888.26	1888.74	1889.40	1890.29	1891.50	1893.03	1895.35	1897.06	1905.73	1916.92
12.25	DISCHG	379.86	394.90	538.42	511.50	445.18	394.45	392.24	389.69	386.89	383.92
12.25	ELEV	1922.97	1925.98	1926.33	1926.26	1926.11	1925.89	1925.44	1924.93	1924.37	1923.78
14.75	DISCHG	380.85	377.70	374.47	371.18	367.81	363.96	358.10	352.26	346.50	339.47
14.75	ELEV	1923.17	1922.54	1921.89	1921.23	1920.56	1919.81	1918.74	1917.68	1916.63	1915.41
17.25	DISCHG	330.39	321.52	310.23	298.25	283.41	266.69	244.05	217.99	164.94	84.20
17.25	ELEV	1913.89	1912.42	1910.65	1908.80	1906.63	1904.24	1901.38	1898.28	1893.99	1889.10
19.75	DISCHG	70.20	65.04	62.14	61.06	59.36	56.10	54.93	57.12	58.05	55.84
19.75	ELEV	1888.25	1887.94	1887.76	1887.70	1887.59	1887.40	1887.32	1887.46	1887.51	1887.38
22.25	DISCHG	53.48	52.49	50.79	47.52	46.34	48.54	49.47	47.22	37.62	20.40
22.25	ELEV	1887.24	1887.18	1887.07	1886.88	1886.80	1886.94	1886.99	1886.86	1886.28	1885.23
24.75	DISCHG	6.97	1.64	0.30	0.04	0.00	0.00	0.00	0.00		
24.75	ELEV	1884.42	1884.09	1884.01	1884.00	1884.00	1884.00	1884.00	1884.00		

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1345 CFS-HRS= 3378.35 ACRE-FT= 279.18

SUBROUTINE REACH CROSS SECTION 49
LENGTH= 5200.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.019 AVERAGE ROUTING COEFF= 0.8549 NUMBER OF ROUTINGS= 0.49

SUBROUTINE RUNOFF CROSS SECTION 49
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.36
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.03	251.415	(RUNOFF)
19.37	6.680	(RUNOFF)
21.50	5.730	(RUNOFF)
23.50	4.900	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 49
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.10	577.461	1730.55
12.98	556.394	1730.53
21.76	62.908	1730.06
23.76	53.524	1730.05

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 3.1421 CFS-HRS= 3710.97 ACRE-FT= 306.67

SUBROUTINE RUNOFF CROSS SECTION 50

```
AREA=   0.13     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.24
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   11.95                        231.335                     (RUNOFF)
   16.87                          7.446                     (RUNOFF)
   19.37                          5.454                     (RUNOFF)
   21.43                          4.739                     (RUNOFF)
   22.37                          4.127                     (RUNOFF)
   23.43                          4.070                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  51
INPUT HYDROGRAPHS= 1,3     OUTPUT HYDROGRAPH= 2

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   12.03                        792.504                     1730.76
   12.97                        582.067                     1730.56
   21.72                         67.273                     1730.06
   23.72                         57.114                     1730.05

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1425      CFS-HRS=     3975.02      ACRE-FT=     328.49

SUBROUTINE REACH     CROSS SECTION  53
LENGTH=   1650.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=   8.485      AVERAGE ROUTING COEFF= 0.8330      NUMBER OF ROUTINGS=  0.17

SUBROUTINE RUNOFF    CROSS SECTION  53
AREA=   0.06     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.20
COMPUTED CURVE NO. =   90.0

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   11.93                        111.083                     (RUNOFF)
   16.87                          3.441                     (RUNOFF)
   19.37                          2.522                     (RUNOFF)
   20.37                          2.214                     (RUNOFF)
   21.41                          2.201                     (RUNOFF)
   23.41                          1.894                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  53
INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
   12.03                        856.586                     1695.98
   12.98                        586.569                     1695.67
   21.72                         69.053                     1695.07
   23.72                         58.713                     1695.06

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   3.1416      CFS-HRS=     4095.66      ACRE-FT=     338.46

SUBROUTINE ADDHYD    CROSS SECTION  56
INPUT HYDROGRAPHS= 3,6     OUTPUT HYDROGRAPH= 4
```

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
7.79	468.157	1695.32
12.00	3281.062	1696.57
25.49	11.919	1695.00
25.99	11.564	1695.00
26.49	11.520	1695.00
26.99	11.545	1695.00
27.50	11.547	1695.00
28.00	11.591	1695.00
28.49	11.498	1695.00
28.99	11.522	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 4.1596 CFS-HRS= 15489.61 ACRE-FT= 1280.06

SUBROUTINE RESVOR STRUCTURE 4
SURFACE ELEVATION= 1695.00

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
12.87	1499.405	1716.88
25.81	23.166	1695.37
26.31	2.163	1695.03
26.81	0.203	1695.00
27.31	0.019	1695.00

HYDROGRAPH, TZERO= 4.75 DELTA T= 0.25 DRAINAGE AREA= 5.76

TIME											
4.75	DISCHG	0.00	0.04	2.86	18.73	53.18	96.55	136.06	173.20	212.89	285.83
4.75	ELEV	1695.00	1695.00	1695.04	1695.30	1695.85	1696.55	1697.19	1697.79	1698.43	1699.61
7.25	DISCHG	326.72	357.97	390.37	414.01	429.28	442.25	455.99	470.82	486.31	499.22
7.25	ELEV	1700.35	1701.02	1701.71	1702.22	1702.55	1702.82	1703.12	1703.44	1703.77	1704.06
9.75	DISCHG	506.74	515.90	526.70	540.26	558.48	582.07	613.14	640.15	697.17	780.15
9.75	ELEV	1704.29	1704.56	1704.89	1705.30	1705.84	1706.55	1707.49	1708.35	1710.35	1713.50
12.25	DISCHG	837.70	1382.77	1496.32	1496.83	1469.31	1414.56	1348.02	1289.22	1246.73	1216.31
12.25	ELEV	1715.90	1716.72	1716.87	1716.87	1716.84	1716.76	1716.67	1716.60	1716.54	1716.50
14.75	DISCHG	1193.38	1174.65	1158.03	1142.39	1127.17	1112.07	1097.74	1083.87	1071.12	1059.41
14.75	ELEV	1716.47	1716.44	1716.42	1716.40	1716.38	1716.36	1716.34	1716.32	1716.30	1716.29
17.25	DISCHG	1046.69	1031.95	1015.25	996.83	976.73	954.80	931.59	906.37	875.99	839.62
17.25	ELEV	1716.27	1716.25	1716.23	1716.20	1716.18	1716.15	1716.12	1716.08	1716.04	1715.98
19.75	DISCHG	836.32	831.80	826.79	821.55	816.09	810.37	804.48	798.46	792.22	785.67
19.75	ELEV	1715.84	1715.65	1715.44	1715.23	1715.00	1714.76	1714.52	1714.26	1714.00	1713.73

4.2"

22.25	DISCHG	778.80	771.59	763.92	755.65	746.70	728.84	705.36	680.36	654.59	623.97
22.25	ELEV	1713.45	1713.14	1712.83	1712.48	1712.11	1711.46	1710.64	1709.76	1708.86	1707.81
24.75	DISCHG	555.45	472.52	321.43	-62.37	19.40	-5.89	1.81	-0.55	0.17	-0.05
24.75	ELEV	1705.75	1703.47	1700.24	1693.99	1695.31	1694.90	1695.02	1694.99	1695.00	1694.99
27.25	DISCHG	0.01	-0.00	0.00	-0.00	0.00	0.00				
27.25	ELEV	1695.00	1695.00	1695.00	1695.00	1695.00	1695.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 4.1522 CFS-HRS= 15462.16 ACRE-FT= 1277.79

ENDCMP 1

```
EXECUTIVE CONTROL CARD            OPERATION  INCREM,     MAIN TIME INCREMENT=  0.15
EXECUTIVE CONTROL CARD            OPERATION  COMPUT,     FROM XSECTN/STRUCT  11/  0     TO XSECTN/STRUCT   0/  4
        STARTING TIME=  0.00     RAIN DEPTH=  7.30     RAIN DURATION=  6.00     RAIN TABLE NO.= 2     SOIL CONDITION= 2
        ALTERNATE NO.= 1         STORM NO.= 3

SUBROUTINE RUNOFF    CROSS SECTION  11
           AREA=   0.71     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
           COMPUTED CURVE NO. =  90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.31                       2217.636                     (RUNOFF)
               2.49                       2099.810                     (RUNOFF)
               3.85                        435.199                     (RUNOFF)
               4.42                        380.218                     (RUNOFF)
               5.17                        278.284                     (RUNOFF)
               5.95                        270.765                     (RUNOFF)

   TIME                              HYDROGRAPH, TZERO=   0.44        DELTA T= 0.15        DRAINAGE AREA=   0.71
   0.44    DISCHG        0.00      2.06      22.74      53.61      82.60     137.14     193.98     246.98     271.64     436.02
   1.95    DISCHG      507.52    561.45    2055.33    1986.10    2050.81    1491.56     966.82     673.20     575.63     550.23
   3.45    DISCHG      514.00    419.25     412.28     431.10     357.35     296.63     371.49     369.58     301.60     282.37
   4.95    DISCHG      277.33    275.71     275.80     255.81     206.27     193.80     239.89     266.60     177.77      50.35
   6.45    DISCHG       13.08      2.79       0.18       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0755        CFS-HRS=     2783.91        ACRE-FT=     230.06

SUBROUTINE REACH     CROSS SECTION  12
           LENGTH=   5500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  12.150       AVERAGE ROUTING COEFF= 0.8772       NUMBER OF ROUTINGS=  0.73

SUBROUTINE RUNOFF    CROSS SECTION  12
           AREA=   0.44     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.35
           COMPUTED CURVE NO. =  90.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.51                       1232.831                     (RUNOFF)
               4.49                        234.469                     (RUNOFF)
               5.99                        156.768                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  12
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.51                       3233.809                     1974.67
               4.51                        602.188                     1972.26
               6.03                        402.585                     1972.08

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1914        CFS-HRS=     4595.11        ACRE-FT=     379.73
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SUBROUTINE RUNOFF    CROSS SECTION  13
          AREA=   0.42     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.28                        1553.159                    (RUNOFF)
              2.48                        1282.820                    (RUNOFF)
              3.88                         274.761                    (RUNOFF)
              4.36                         267.385                    (RUNOFF)
              5.17                         166.575                    (RUNOFF)
              5.93                         173.480                    (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.44        DELTA T= 0.15        DRAINAGE AREA=   0.42
   0.44    DISCHG        0.00      3.22     21.59     40.91     57.10    111.05    112.66    167.76    190.94    277.66
   1.95    DISCHG      340.49    444.11   1505.43   1173.70   1228.74    650.14    450.74    336.97    323.41    322.58
   3.45    DISCHG      273.27    258.90    212.22    273.99    181.93    165.02    266.84    192.00    166.55    163.04
   4.95    DISCHG      163.02    163.11    163.19    136.00    111.70    116.46    155.57    162.32     54.34      6.53
   6.45    DISCHG        0.38      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0177        CFS-HRS=     1631.13        ACRE-FT=     134.79

SUBROUTINE REACH     CROSS SECTION  14
          LENGTH=   4600.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  13.850       AVERAGE ROUTING COEFF= 0.8906       NUMBER OF ROUTINGS=  0.54

SUBROUTINE RUNOFF    CROSS SECTION  14
          AREA=   0.22     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.31                        687.151                     (RUNOFF)
              2.49                        650.624                     (RUNOFF)
              3.85                        134.859                     (RUNOFF)
              4.42                        117.789                     (RUNOFF)
              5.17                         86.237                     (RUNOFF)
              5.95                         83.904                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.60        DELTA T= 0.15        DRAINAGE AREA=   0.22
   0.60    DISCHG        0.00      7.04     16.61     25.59     42.49     60.10     76.53     84.17    135.10    157.26
   2.10    DISCHG      173.97    636.86    615.41    635.46    462.17    299.57    208.60    178.36    170.49    159.27
   3.60    DISCHG      129.91    127.75    133.58    110.72     91.91    115.11    114.52     93.45     87.49     85.93
   5.10    DISCHG       85.43     85.46     79.26     63.91     60.05     74.33     82.61     55.08     15.60      4.05
   6.60    DISCHG        0.86      0.05      0.00

SUBROUTINE ADDHYD    CROSS SECTION  14
          INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
```

2.44	1976.851	1973.17
3.85	375.489	1971.92
4.46	350.050	1971.79
5.17	250.813	1971.28
5.97	242.213	1971.24

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1447 CFS-HRS= 2537.99 ACRE-FT= 209.74

SUBROUTINE ADDHYD CROSS SECTION 15
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	5301.014	1976.20
4.49	948.500	1972.51
5.99	641.143	1972.25

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1747 CFS-HRS= 7133.10 ACRE-FT= 589.47

SUBROUTINE REACH CROSS SECTION 16
LENGTH= 6500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 10.939 AVERAGE ROUTING COEFF= 0.8655 NUMBER OF ROUTINGS= 0.95

SUBROUTINE RUNOFF CROSS SECTION 16
AREA= 0.48 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.46
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.60	1255.468	(RUNOFF)
4.50	247.569	(RUNOFF)
6.03	163.466	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 16
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.64	6293.106	1822.57
4.62	1167.356	1816.98
6.12	785.908	1816.56

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1755 CFS-HRS= 9047.06 ACRE-FT= 747.64

SUBROUTINE RESVOR STRUCTURE 6
SURFACE ELEVATION= 1810.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.91	5184.793	1840.57
12.31	3.256	1810.10
12.61	1.097	1810.03
12.91	0.372	1810.01

13.21	0.126	1810.00
13.51	0.042	1810.00
13.81	0.014	1810.00
14.11	0.004	1810.00

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 2.26

TIME											
0.44	DISCHG	0.00	0.06	6.50	42.47	117.30	186.05	203.96	243.89	276.92	297.38
0.44	ELEV	1810.00	1810.00	1810.21	1811.39	1813.84	1816.14	1816.98	1818.86	1820.56	1821.86
1.95	DISCHG	326.45	350.48	382.59	421.44	470.22	2477.67	4952.87	4719.63	3668.55	2746.45
1.95	ELEV	1823.71	1825.44	1827.82	1831.16	1835.64	1839.04	1840.43	1840.30	1839.71	1839.19
3.45	DISCHG	2221.26	1951.71	1736.90	1552.21	1427.47	1340.68	1227.84	1143.28	1139.84	1127.51
3.45	ELEV	1838.86	1838.64	1838.47	1838.32	1838.22	1838.15	1838.06	1837.99	1837.99	1837.97
4.95	DISCHG	1078.16	1019.78	972.70	939.00	907.43	859.51	797.95	756.69	753.68	740.04
4.95	ELEV	1837.89	1837.80	1837.73	1837.68	1837.63	1837.56	1837.47	1837.41	1837.40	1837.38
6.45	DISCHG	648.77	493.43	482.04	478.53	474.90	470.56	466.01	461.50	457.03	452.61
6.45	ELEV	1837.24	1837.01	1836.73	1836.41	1836.08	1835.68	1835.25	1834.83	1834.42	1834.01
7.95	DISCHG	448.23	443.89	439.59	435.34	431.12	425.37	419.65	414.00	408.43	402.94
7.95	ELEV	1833.60	1833.19	1832.79	1832.40	1832.01	1831.51	1831.01	1830.52	1830.03	1829.56
9.45	DISCHG	397.52	392.17	386.89	379.59	371.24	363.07	355.09	347.28	339.64	332.17
9.45	ELEV	1829.08	1828.62	1828.16	1827.59	1826.98	1826.37	1825.78	1825.20	1824.64	1824.08
10.95	DISCHG	319.64	306.64	294.16	282.18	270.70	235.02	197.08	9.26	-5.38	3.13
10.95	ELEV	1823.27	1822.45	1821.66	1820.90	1820.17	1818.44	1816.66	1810.30	1809.82	1810.10
12.45	DISCHG	-1.82	1.06	-0.61	0.35	-0.20	0.12	-0.07	0.04	-0.02	0.01
12.45	ELEV	1809.94	1810.03	1809.97	1810.01	1809.99	1810.00	1809.99	1810.00	1809.99	1810.00
13.95	DISCHG	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00	-0.00	0.00
13.95	ELEV	1809.99	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00	1810.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1680 CFS-HRS= 9036.09 ACRE-FT= 746.74

SUBROUTINE REACH CROSS SECTION 52
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 9.405 AVERAGE ROUTING COEFF= 0.8469 NUMBER OF ROUTINGS= 0.76

SUBROUTINE RUNOFF CROSS SECTION 52
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.50	454.235	(RUNOFF)
4.48	85.485	(RUNOFF)
5.98	57.618	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 52

INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 5

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	503.002	1695.34
4.79	528.788	1695.36
5.96	410.985	1695.28
12.54	13.396	1695.00
12.89	9.597	1695.00
13.49	9.598	1695.00
13.79	9.576	1695.00
14.09	9.559	1695.00
14.39	9.605	1695.00
14.99	9.571	1695.00

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 0.79

TIME											
0.44	DISCHG	0.00	0.09	4.48	14.12	24.80	38.64	57.14	69.75	81.61	111.81
1.95	DISCHG	135.73	160.31	383.48	480.06	500.69	441.68	326.33	255.25	224.12	217.64
3.45	DISCHG	214.86	200.29	205.63	215.19	227.95	234.44	259.44	322.35	469.92	528.60
4.95	DISCHG	457.40	439.11	428.38	423.22	410.17	403.30	405.72	410.68	398.94	370.28
6.45	DISCHG	354.55	347.48	343.18	340.36	337.57	335.38	333.05	330.98	329.00	326.87
7.95	DISCHG	324.16	321.27	318.06	314.99	311.71	308.69	305.77	302.88	299.97	296.62
9.45	DISCHG	292.53	288.55	284.68	280.75	276.57	272.74	268.80	263.04	256.48	250.23
10.95	DISCHG	244.17	237.37	227.76	217.85	208.38	197.22	183.41	168.48	145.13	89.78
12.45	DISCHG	8.74	11.66	-9.34	9.59	-9.56	9.57	-9.57	9.57	-9.57	9.57
13.95	DISCHG	-9.57	9.57	-9.57	9.57	-9.57	9.57	-9.57	9.57	-9.57	17.92

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.3198 CFS-HRS= 3262.92 ACRE-FT= 269.64

SUBROUTINE RUNOFF CROSS SECTION 21
AREA= 0.27 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.21
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	935.211	(RUNOFF)
2.49	814.501	(RUNOFF)
3.87	170.145	(RUNOFF)
4.38	153.900	(RUNOFF)
5.17	106.241	(RUNOFF)
5.94	106.430	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.0384 CFS-HRS= 1052.19 ACRE-FT= 86.95

SUBROUTINE REACH CROSS SECTION 22
LENGTH= 5220.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.182 AVERAGE ROUTING COEFF= 0.8775 NUMBER OF ROUTINGS= 0.69

SUBROUTINE RUNOFF CROSS SECTION 22
AREA= 0.25 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.31
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS

```
            2.49                    719.198                    (RUNOFF)
            4.47                    133.724                    (RUNOFF)
            5.98                     91.221                    (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  22
           INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 7

           PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
            2.46                     1565.571                      1891.17
            4.49                      278.773                      1890.24
            6.00                      187.303                      1890.16

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1788      CFS-HRS=     2073.58      ACRE-FT=     171.36

SUBROUTINE RUNOFF    CROSS SECTION  23
           AREA=   0.21     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
            2.28                      776.579                      (RUNOFF)
            2.48                      641.410                      (RUNOFF)
            3.88                      137.380                      (RUNOFF)
            4.36                      133.692                      (RUNOFF)
            5.17                       83.287                      (RUNOFF)
            5.93                       86.740                      (RUNOFF)

   TIME                            HYDROGRAPH, TZERO=   0.44      DELTA T= 0.15      DRAINAGE AREA=   0.21
   0.44    DISCHG        0.00      1.61     10.79     20.45     28.55     55.52     56.33     83.88     95.47    138.83
   1.95    DISCHG      170.24    222.05    752.71    586.85    614.37    325.07    225.37    168.48    161.70    161.29
   3.45    DISCHG      136.63    129.45    106.11    136.99     90.96     82.51    133.42     96.00     83.27     81.52
   4.95    DISCHG       81.51     81.55     81.59     68.00     55.85     58.23     77.78     81.16     27.17      3.26
   6.45    DISCHG        0.19      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0177      CFS-HRS=      815.56      ACRE-FT=      67.39

SUBROUTINE REACH     CROSS SECTION  24
           LENGTH=   4500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  13.253      AVERAGE ROUTING COEFF= 0.8863      NUMBER OF ROUTINGS=  0.55

SUBROUTINE RUNOFF    CROSS SECTION  24
           AREA=   0.25     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.28
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
            2.49                      729.360                      (RUNOFF)
            3.82                      150.937                      (RUNOFF)
            4.45                      133.477                      (RUNOFF)
            5.96                       92.998                      (RUNOFF)
```

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SUBROUTINE ADDHYD     CROSS SECTION  24
           INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.45                       1387.149                     1891.31
               3.82                        271.047                     1890.32
               4.46                        250.383                     1890.30
               5.97                        172.057                     1890.20

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1462      CFS-HRS=     1824.62      ACRE-FT=     150.78

SUBROUTINE ADDHYD     CROSS SECTION  25
           INPUT HYDROGRAPHS= 3,7      OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.46                       2951.729                     1891.75
               4.48                        528.511                     1890.45
               5.98                        358.873                     1890.31

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1635      CFS-HRS=     3898.20      ACRE-FT=     322.14

SUBROUTINE REACH      CROSS SECTION  26
           LENGTH=   3500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  14.534      AVERAGE ROUTING COEFF= 0.8952      NUMBER OF ROUTINGS=  0.39

SUBROUTINE RUNOFF     CROSS SECTION  26
           AREA=   0.16     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.31                        499.755                     (RUNOFF)
               2.49                        473.185                     (RUNOFF)
               3.85                         98.069                     (RUNOFF)
               4.42                         85.660                     (RUNOFF)
               5.17                         62.708                     (RUNOFF)
               5.95                         61.022                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.60      DELTA T= 0.15      DRAINAGE AREA=   0.16
   0.60    DISCHG        0.00      5.12     12.08     18.61     30.90     43.71     55.65     61.21     98.25    114.37
   2.10    DISCHG      126.52    463.17    447.57    462.15    336.12    217.87    151.70    129.71    123.99    115.83
   3.60    DISCHG       94.48     92.91     97.14     80.53     66.84     83.71     83.28     67.96     63.63     62.49
   5.10    DISCHG       62.13     62.15     57.64     46.48     43.67     54.06     60.08     40.06     11.34      2.94
   6.60    DISCHG        0.62      0.04      0.00

SUBROUTINE ADDHYD     CROSS SECTION  26
           INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
```

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          2.53                    3292.033                    1785.89
          4.50                     589.166                    1784.50
          6.00                     398.411                    1784.34

     TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1593      CFS-HRS=     4531.56      ACRE-FT=     374.48

SUBROUTINE RUNOFF    CROSS SECTION  27
     AREA=   0.24     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.12
     COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

     PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
          1.23                      76.952                     (RUNOFF)
          2.28                     843.880                     (RUNOFF)
          2.48                     735.884                     (RUNOFF)
          3.22                     190.103                     (RUNOFF)
          3.57                     162.187                     (RUNOFF)
          3.88                     155.215                     (RUNOFF)
          4.35                     166.013                     (RUNOFF)
          5.17                      95.995                     (RUNOFF)
          5.92                     102.565                     (RUNOFF)

  TIME                          HYDROGRAPH, TZERO=   0.44        DELTA T= 0.15        DRAINAGE AREA=   0.24
  0.44   DISCHG        0.00      3.05     14.90     25.73     34.55     75.22     61.86     97.38    131.82    154.93
  1.95   DISCHG      204.48    361.21    823.07    678.74    694.19    316.58    229.76    186.34    184.04    184.41
  3.45   DISCHG      137.83    161.00    111.72    154.97     97.38     93.16    165.95    101.02     93.35     93.11
  4.95   DISCHG       93.16     93.21     93.26     71.38     62.27     69.95     91.74     93.42     15.51      0.71
  6.45   DISCHG        0.00

     TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0509      CFS-HRS=      937.21      ACRE-FT=      77.45

SUBROUTINE REACH     CROSS SECTION  28
     LENGTH=   5600.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

     AVERAGE WATER VELOCITY=  11.538      AVERAGE ROUTING COEFF= 0.8715      NUMBER OF ROUTINGS=  0.78

SUBROUTINE RUNOFF    CROSS SECTION  28
     AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.34
     COMPUTED CURVE NO. =   90.0

     PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
          2.50                     734.049                     (RUNOFF)
          4.48                     138.710                     (RUNOFF)
          5.99                      93.111                     (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  28
     INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

     PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
          2.46                    1513.485                    1785.50
```

3.99	290.170	1784.40
4.49	286.733	1784.40
6.00	183.641	1784.25

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1809 CFS-HRS= 1994.50 ACRE-FT= 164.82

SUBROUTINE ADDHYD CROSS SECTION 31
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.51	4724.307	1787.02
4.49	875.819	1785.13
6.00	581.886	1784.86

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1659 CFS-HRS= 6526.07 ACRE-FT= 539.31

SUBROUTINE RUNOFF CROSS SECTION 29
AREA= 0.26 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.12
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
1.23	83.365	(RUNOFF)
2.28	914.225	(RUNOFF)
2.48	797.240	(RUNOFF)
3.22	205.939	(RUNOFF)
3.57	175.696	(RUNOFF)
3.88	168.166	(RUNOFF)
4.35	179.828	(RUNOFF)
5.17	103.976	(RUNOFF)
5.92	111.110	(RUNOFF)

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 0.26

TIME											
0.44	DISCHG	0.00	3.30	16.14	27.87	37.43	81.49	67.01	105.49	142.81	167.84
1.95	DISCHG	221.52	391.31	891.66	735.31	752.04	342.97	248.91	201.87	199.38	199.78
3.45	DISCHG	149.32	174.42	121.03	167.88	105.50	100.93	179.78	109.44	101.13	100.87
4.95	DISCHG	100.93	100.98	101.03	77.32	67.46	75.78	99.39	101.20	16.80	0.77
6.45	DISCHG	0.00									

SUBROUTINE REACH CROSS SECTION 30
LENGTH= 4500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 11.551 AVERAGE ROUTING COEFF= 0.8717 NUMBER OF ROUTINGS= 0.62

SUBROUTINE RUNOFF CROSS SECTION 30
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.30
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS

2.49	376.182	(RUNOFF)
4.47	69.629	(RUNOFF)
5.97	47.836	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 30
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.44	1197.907	1785.35
4.47	222.620	1784.33
5.97	147.419	1784.21

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1624 CFS-HRS= 1551.05 ACRE-FT= 128.17

SUBROUTINE ADDHYD CROSS SECTION 32
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.50	5871.574	1787.48
4.49	1097.814	1785.28
5.99	728.655	1785.03

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1652 CFS-HRS= 8077.12 ACRE-FT= 667.49

SUBROUTINE RESVOR STRUCTURE 11
SURFACE ELEVATION= 1780.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.75	4890.479	1815.49
4.57	1016.332	1813.00
6.07	682.318	1812.50
14.09	52.265	1782.37
14.39	52.125	1782.36
14.69	52.050	1782.36
14.99	51.839	1782.35

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 2.02

TIME											
0.44	DISCHG	0.00	2.37	39.68	91.34	107.19	144.27	168.63	194.68	214.29	237.17
0.44	ELEV	1780.00	1780.10	1781.80	1784.20	1785.18	1787.46	1789.39	1791.70	1793.81	1796.40
1.95	DISCHG	256.29	274.04	299.39	330.49	1983.53	4674.80	4289.21	3123.10	2263.45	1899.85
1.95	ELEV	1798.87	1801.29	1804.98	1809.91	1813.78	1815.37	1815.15	1814.49	1814.01	1813.72
3.45	DISCHG	1684.20	1507.29	1353.24	1251.67	1184.16	1082.92	1000.80	1014.54	1014.53	961.50
3.45	ELEV	1813.54	1813.40	1813.27	1813.19	1813.14	1813.05	1812.98	1813.00	1813.00	1812.92
4.95	DISCHG	904.92	862.24	834.06	809.62	766.01	704.33	664.30	670.10	672.32	586.08
4.95	ELEV	1812.84	1812.77	1812.73	1812.69	1812.63	1812.54	1812.48	1812.48	1812.49	1812.36
6.45	DISCHG	429.54	342.14	340.27	338.36	336.43	334.51	332.60	330.70	328.82	326.94
6.45	ELEV	1812.12	1811.85	1811.54	1811.22	1810.90	1810.58	1810.26	1809.95	1809.63	1809.32

7.95	DISCHG	325.08	323.22	321.38	319.54	317.20	314.66	312.13	309.63	307.14	304.68
7.95	ELEV	1809.01	1808.70	1808.39	1808.09	1807.72	1807.33	1806.94	1806.55	1806.17	1805.79
9.45	DISCHG	302.23	299.81	297.40	295.01	292.51	289.25	286.03	282.85	279.70	276.58
9.45	ELEV	1805.42	1805.04	1804.67	1804.31	1803.93	1803.46	1803.00	1802.55	1802.10	1801.65
10.95	DISCHG	273.50	270.46	267.45	264.05	258.76	253.58	248.50	243.52	238.65	233.77
10.95	ELEV	1801.21	1800.78	1800.35	1799.87	1799.19	1798.52	1797.87	1797.22	1796.60	1795.97
12.45	DISCHG	225.23	217.01	209.08	201.45	190.80	177.94	165.95	154.77	122.57	93.55
12.45	ELEV	1795.02	1794.11	1793.23	1792.38	1791.36	1790.21	1789.15	1788.15	1786.12	1784.34
13.95	DISCHG	-52.20	52.20	-52.20	52.20	-52.20	52.20	-52.20	52.20	-52.20	52.20
13.95	ELEV	1777.62	1782.37	1777.62	1782.37	1777.62	1782.37	1777.62	1782.37	1777.62	1782.37

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.2081 CFS-HRS= 8133.30 ACRE-FT= 672.13

SUBROUTINE REACH CROSS SECTION 33
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 20.224 AVERAGE ROUTING COEFF= 0.9224 NUMBER OF ROUTINGS= 0.19

SUBROUTINE RUNOFF CROSS SECTION 33
AREA= 0.12 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	423.723	(RUNOFF)
2.49	361.561	(RUNOFF)
3.87	76.289	(RUNOFF)
4.37	69.926	(RUNOFF)
5.17	47.273	(RUNOFF)
5.94	47.841	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 33
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	727.901	1726.38
2.79	4595.155	1729.20
5.92	717.419	1726.37
14.09	32.111	1725.08
14.39	32.074	1725.08
14.69	31.925	1725.08
14.99	31.806	1725.08

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1809 CFS-HRS= 8576.39 ACRE-FT= 708.75

SUBROUTINE RUNOFF CROSS SECTION 34
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.24
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	768.217	(RUNOFF)
2.49	713.748	(RUNOFF)
3.86	148.344	(RUNOFF)
4.40	130.474	(RUNOFF)
5.17	94.134	(RUNOFF)
5.95	92.042	(RUNOFF)

HYDROGRAPH, TZERO= 0.60 DELTA T= 0.15 DRAINAGE AREA= 0.24

TIME											
0.60	DISCHG	0.00	8.11	18.68	28.46	47.72	65.94	85.13	92.63	149.21	174.73
2.10	DISCHG	198.37	718.65	672.33	695.89	492.42	317.74	222.86	192.60	185.57	173.11
3.60	DISCHG	141.17	137.91	147.15	128.94	99.62	128.35	123.46	100.94	95.06	93.58
5.10	DISCHG	93.18	93.23	85.86	68.92	65.46	81.93	90.23	57.76	15.49	3.74
6.60	DISCHG	0.72	0.01	0.00							

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.2859 CFS-HRS= 973.62 ACRE-FT= 80.46

SUBROUTINE RUNOFF CROSS SECTION 35
AREA= 0.23 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.18
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	841.527	(RUNOFF)
2.49	699.936	(RUNOFF)
3.88	148.582	(RUNOFF)
4.36	140.019	(RUNOFF)
5.17	90.909	(RUNOFF)
5.93	93.466	(RUNOFF)

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 0.23

TIME											
0.44	DISCHG	0.00	1.37	10.68	21.26	30.30	56.32	62.56	89.87	97.87	151.36
1.95	DISCHG	181.56	214.26	811.72	641.75	674.25	384.30	260.64	189.63	177.91	176.66
3.45	DISCHG	155.61	138.06	120.63	148.07	103.38	91.14	139.52	109.04	92.38	89.60
4.95	DISCHG	89.26	89.31	89.36	76.94	62.18	62.97	83.58	88.67	36.97	5.75
6.45	DISCHG	0.68	0.00								

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.0188 CFS-HRS= 893.41 ACRE-FT= 73.83

SUBROUTINE ADDHYD CROSS SECTION 36
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 6

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	1606.572	1797.02
2.49	1413.738	1796.85
3.87	296.734	1795.61
4.37	269.819	1795.55
5.17	185.024	1795.38
5.94	185.325	1795.38

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.0485 CFS-HRS= 1834.67 ACRE-FT= 151.61

SUBROUTINE RUNOFF CROSS SECTION 37

```
AREA=    0.14      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.20
COMPUTED CURVE NO. =    90.0

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.29                          494.369                       (RUNOFF)
    2.49                          421.834                       (RUNOFF)
    3.87                           89.007                       (RUNOFF)
    4.37                           81.568                       (RUNOFF)
    5.17                           55.159                       (RUNOFF)
    5.94                           55.815                       (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  38
INPUT HYDROGRAPHS= 1,6      OUTPUT HYDROGRAPH= 3

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.29                         2100.683                       1791.96
    2.49                         1835.541                       1791.78
    3.87                          385.743                       1790.54
    4.37                          351.330                       1790.49
    5.17                          240.215                       1790.34
    5.94                          241.124                       1790.34

TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0456        CFS-HRS=      2380.04        ACRE-FT=      196.68

SUBROUTINE REACH     CROSS SECTION  39
LENGTH=       0.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=  11.817        AVERAGE ROUTING COEFF= 0.8742        NUMBER OF ROUTINGS=  0.00

SUBROUTINE RUNOFF    CROSS SECTION  39
AREA=    0.13      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.22
COMPUTED CURVE NO. =    90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.30                          437.888                       (RUNOFF)
    2.49                          390.614                       (RUNOFF)
    3.87                           81.561                       (RUNOFF)
    4.38                           72.702                       (RUNOFF)
    5.17                           51.088                       (RUNOFF)
    5.94                           50.737                       (RUNOFF)

TIME                          HYDROGRAPH, TZERO=   0.60        DELTA T= 0.15        DRAINAGE AREA=   0.13
0.60    DISCHG        0.00      4.89     10.73     15.99     27.51     35.76     47.68     51.23     82.90     96.56
2.10    DISCHG      111.61    415.41    364.21    379.43    250.84    163.20    115.50    102.49    100.21     91.97
3.60    DISCHG       76.37     72.91     81.04     62.44     53.05     71.92     65.53     53.85     51.18     50.54
5.10    DISCHG       50.47     50.50     45.73     36.55     35.43     45.29     49.29     28.35      6.54      1.33
6.60    DISCHG        0.17      0.00

SUBROUTINE ADDHYD    CROSS SECTION  39
INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
```

2.30	2538.355	1726.73
2.49	2226.133	1726.58
3.87	467.306	1725.46
4.37	423.969	1725.41
5.17	291.256	1725.28
5.94	291.787	1725.28

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.0479 CFS-HRS= 2888.32 ACRE-FT= 238.69

SUBROUTINE ADDHYD CROSS SECTION 40
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	3265.940	1726.56
2.74	5851.173	1727.23
4.34	1507.251	1726.02
5.94	1008.956	1725.69
14.09	32.111	1725.02
14.39	32.074	1725.02
14.69	31.925	1725.02
14.99	31.806	1725.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1469 CFS-HRS= 11464.70 ACRE-FT= 947.44

SUBROUTINE REACH CROSS SECTION 54
LENGTH= 2100.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.148 AVERAGE ROUTING COEFF= 0.8772 NUMBER OF ROUTINGS= 0.28

SUBROUTINE RUNOFF CROSS SECTION 54
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	187.406	(RUNOFF)
2.49	177.446	(RUNOFF)
3.85	36.777	(RUNOFF)
4.42	32.126	(RUNOFF)
5.17	23.513	(RUNOFF)
5.95	22.886	(RUNOFF)

HYDROGRAPH, TZERO= 0.60 DELTA T= 0.15 DRAINAGE AREA= 0.06

TIME											
0.60	DISCHG	0.00	1.92	4.53	6.98	11.58	16.39	20.87	22.95	36.84	42.88
2.10	DISCHG	47.44	173.69	167.84	173.30	126.04	81.70	56.89	48.64	46.49	43.43
3.60	DISCHG	35.43	34.84	36.43	30.19	25.06	31.39	31.23	25.48	23.86	23.43
5.10	DISCHG	23.29	23.30	21.61	17.43	16.37	20.27	22.53	15.02	4.25	1.10
6.60	DISCHG	0.23	0.01	0.00							

SUBROUTINE ADDHYD CROSS SECTION 54

INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.79	5672.872	1697.59
4.28	1525.905	1696.19
5.95	1020.260	1695.95
14.04	18.468	1695.01
14.39	13.924	1695.01
14.69	13.958	1695.01
14.99	13.817	1695.01

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 2.94

TIME											
0.44	DISCHG	0.00	2.35	50.89	134.35	202.67	306.41	395.67	500.13	567.49	757.62
1.95	DISCHG	913.62	1038.75	2700.50	3004.92	3935.12	5426.69	5590.56	4530.02	3437.58	2814.45
3.45	DISCHG	2458.04	2164.85	1946.49	1861.30	1692.42	1519.32	1522.78	1488.11	1412.87	1349.88
4.95	DISCHG	1290.51	1240.80	1205.74	1151.37	1059.21	985.36	988.84	1013.24	902.73	702.48
6.45	DISCHG	517.55	390.86	346.28	339.29	337.35	335.43	333.52	331.61	329.72	327.84
7.95	DISCHG	325.97	324.11	322.26	320.42	318.29	315.86	313.34	310.83	308.33	305.86
9.45	DISCHG	303.40	300.97	298.55	296.16	293.70	290.77	287.57	284.37	281.21	278.07
10.95	DISCHG	274.98	271.92	268.89	265.65	261.18	256.06	250.94	245.91	240.99	236.10
12.45	DISCHG	229.11	220.96	212.89	205.12	195.73	183.97	171.74	160.16	136.80	107.61
13.95	DISCHG	11.01	16.23	-13.88	13.89	-13.89	13.89	-13.89	13.89	-13.89	-31.70

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1599 CFS-HRS= 11727.49 ACRE-FT= 969.16

SUBROUTINE ADDHYD CROSS SECTION 55
INPUT HYDROGRAPHS= 3,5 OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 5 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.78	6041.323	1697.27
4.71	1890.365	1696.14
5.95	1430.753	1695.99
12.86	215.768	1695.15
13.15	195.538	1695.13
13.44	172.880	1695.12
14.07	26.798	1695.01
14.39	23.335	1695.01
14.69	23.514	1695.01
14.99	23.460	1695.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1940 CFS-HRS= 14990.42 ACRE-FT= 1238.80

SUBROUTINE RUNOFF CROSS SECTION 41
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.17
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	479.774	(RUNOFF)
2.48	396.200	(RUNOFF)

3.88	84.539	(RUNOFF)
4.36	80.809	(RUNOFF)
5.17	51.469	(RUNOFF)
5.93	53.207	(RUNOFF)

HYDROGRAPH, TZERO= 0.60 DELTA T= 0.15 DRAINAGE AREA= 0.13

TIME											
0.60	DISCHG	0.00	6.35	12.34	17.40	33.06	35.19	51.36	57.08	85.84	103.98
2.10	DISCHG	126.85	463.83	363.19	380.42	208.94	143.41	105.68	100.30	99.83	86.37
3.60	DISCHG	78.89	67.04	84.27	57.47	51.39	80.59	60.63	51.87	50.54	50.45
5.10	DISCHG	50.48	50.51	42.82	34.84	35.81	47.71	50.12	18.97	2.60	0.24
6.60	DISCHG	0.00									

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.3207 CFS-HRS= 530.29 ACRE-FT= 43.82

SUBROUTINE RUNOFF CROSS SECTION 42
AREA= 0.56 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	1977.478	(RUNOFF)
2.49	1687.337	(RUNOFF)
3.87	356.030	(RUNOFF)
4.37	326.272	(RUNOFF)
5.17	220.639	(RUNOFF)
5.94	223.260	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.0375 CFS-HRS= 2182.01 ACRE-FT= 180.32

SUBROUTINE REACH CROSS SECTION 43
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 12.353 AVERAGE ROUTING COEFF= 0.8790 NUMBER OF ROUTINGS= 0.30

SUBROUTINE RUNOFF CROSS SECTION 43
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.15
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
1.26	69.656	(RUNOFF)
2.28	889.961	(RUNOFF)
2.48	734.861	(RUNOFF)
3.88	158.028	(RUNOFF)
4.35	156.321	(RUNOFF)
5.17	95.388	(RUNOFF)
5.93	100.220	(RUNOFF)

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 0.24

TIME											
0.44	DISCHG	0.00	2.06	12.95	23.98	33.12	66.47	63.53	97.46	113.41	157.94
1.95	DISCHG	197.44	260.02	863.36	671.47	701.78	355.82	250.60	190.32	184.48	184.35
3.45	DISCHG	152.52	150.96	118.31	157.66	102.18	93.77	156.11	107.38	94.62	93.10
4.95	DISCHG	93.15	93.20	93.25	76.09	63.35	66.84	89.73	93.12	26.91	2.70
6.45	DISCHG	0.06	0.00								

```
SUBROUTINE ADDHYD    CROSS SECTION  43
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.34                     2335.149                     2217.11
               3.88                      498.157                     2215.77
               4.37                      453.357                     2215.70
               5.17                      315.036                     2215.49
               5.95                      311.801                     2215.48

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0872       CFS-HRS=     3142.80       ACRE-FT=     259.72


SUBROUTINE ADDHYD    CROSS SECTION  44
           INPUT HYDROGRAPHS= 3,4     OUTPUT HYDROGRAPH= 1

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.31                     3001.363                     2217.02
               3.88                      582.725                     2215.63
               4.37                      533.915                     2215.58
               5.17                      366.571                     2215.40
               5.94                      364.912                     2215.39

   TIME                              HYDROGRAPH, TZERO=   0.44       DELTA T= 0.15       DRAINAGE AREA=   0.92
   0.44    DISCHG        0.00       4.00      36.42      77.45     114.99     209.51     244.67     343.13     393.44     565.98
   1.95    DISCHG      710.65     863.16    2794.15    2696.81    2693.72    1767.28    1168.58     833.37     734.38     716.68
   3.45    DISCHG      641.04     578.37     498.35     581.22     448.65     381.33     530.74     457.23     388.76     365.71
   4.95    DISCHG      361.58     361.12     361.30     319.21     264.29     255.99     322.43     353.05     185.76      52.42
   6.45    DISCHG        9.02       1.14       0.04       0.00       0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.0766       CFS-HRS=     3647.15       ACRE-FT=     301.40


SUBROUTINE REACH     CROSS SECTION  45
           LENGTH=   3800.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  16.836       AVERAGE ROUTING COEFF= 0.9082       NUMBER OF ROUTINGS=  0.37


SUBROUTINE RUNOFF    CROSS SECTION  45
           AREA=   0.25     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.23
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                 PEAK DISCHARGES              PEAK ELEVATIONS
               2.30                      820.321                     (RUNOFF)
               2.49                      747.590                     (RUNOFF)
               3.86                      155.116                     (RUNOFF)
               4.39                      137.785                     (RUNOFF)
               5.17                       98.149                     (RUNOFF)
               5.95                       96.738                     (RUNOFF)

   TIME                              HYDROGRAPH, TZERO=   0.60       DELTA T= 0.15       DRAINAGE AREA=   0.25
```

0.60	DISCHG	0.00	8.92	20.04	30.20	51.26	68.68	90.26	97.04	157.64	183.27
2.10	DISCHG	211.76	773.04	701.14	727.31	497.54	322.55	226.78	198.70	192.98	178.30
3.60	DISCHG	146.99	142.18	153.95	122.07	102.76	135.95	127.45	104.38	98.73	97.33
5.10	DISCHG	97.07	97.12	88.71	71.02	68.02	86.27	94.44	57.48	14.38	3.20
6.60	DISCHG	0.53	0.00								

SUBROUTINE ADDHYD CROSS SECTION 45
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	3502.939	2031.74
3.86	706.283	2030.53
4.42	623.085	2030.47
5.96	439.492	2030.33

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1307 CFS-HRS= 4668.82 ACRE-FT= 385.83

SUBROUTINE RUNOFF CROSS SECTION 46
AREA= 0.20 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.23
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	656.250	(RUNOFF)
2.49	598.066	(RUNOFF)
3.86	124.098	(RUNOFF)
4.39	110.216	(RUNOFF)
5.17	78.531	(RUNOFF)
5.95	77.401	(RUNOFF)

HYDROGRAPH, TZERO= 0.60 DELTA T= 0.15 DRAINAGE AREA= 0.20

TIME											
0.60	DISCHG	0.00	7.14	16.03	24.16	41.00	54.94	72.21	77.63	126.11	146.61
2.10	DISCHG	169.40	618.43	560.91	581.85	398.03	258.04	181.43	158.96	154.38	142.64
3.60	DISCHG	117.59	113.74	123.16	97.65	82.21	108.76	101.96	83.50	78.98	77.86
5.10	DISCHG	77.65	77.69	70.97	56.82	54.41	69.01	75.55	45.98	11.51	2.56
6.60	DISCHG	0.42	0.00								

SUBROUTINE ADDHYD CROSS SECTION 47
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	4122.775	2031.96
3.86	830.367	2030.62
4.42	732.601	2030.55
5.17	541.151	2030.40
5.96	516.791	2030.39

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1216 CFS-HRS= 5452.03 ACRE-FT= 450.55

SUBROUTINE REACH CROSS SECTION 48
LENGTH= 5000.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 16.253 AVERAGE ROUTING COEFF= 0.9053 NUMBER OF ROUTINGS= 0.51

SUBROUTINE RUNOFF CROSS SECTION 48
AREA= 0.29 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.50	823.320	(RUNOFF)
4.48	154.947	(RUNOFF)
5.98	104.457	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 48
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.53	4813.911	1886.41
4.49	869.765	1884.84
6.00	583.922	1884.56

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1709 CFS-HRS= 6650.79 ACRE-FT= 549.62

SUBROUTINE RESVOR STRUCTURE 7
SURFACE ELEVATION= 1884.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.78	3677.759	1929.70

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 1.66

TIME											
0.44	DISCHG	0.00	0.35	8.48	36.85	86.49	157.26	208.34	233.85	257.31	281.94
0.44	ELEV	1884.00	1884.02	1884.51	1886.23	1889.24	1893.53	1897.18	1900.10	1903.03	1906.42
1.95	DISCHG	306.61	329.84	358.82	387.90	1439.18	3536.81	3600.67	2810.62	2055.10	1617.49
1.95	ELEV	1910.09	1913.80	1918.87	1924.58	1927.75	1929.58	1929.63	1928.97	1928.34	1927.97
3.45	DISCHG	1489.35	1367.42	1244.94	1143.52	1068.23	986.01	908.58	877.83	859.20	820.14
3.45	ELEV	1927.81	1927.66	1927.51	1927.38	1927.29	1927.19	1927.09	1927.06	1927.03	1926.97
4.95	DISCHG	787.17	756.24	731.15	708.91	680.00	640.97	606.38	592.03	582.91	541.05
4.95	ELEV	1926.90	1926.83	1926.77	1926.72	1926.65	1926.56	1926.48	1926.45	1926.43	1926.33
6.45	DISCHG	459.17	394.00	390.96	387.85	384.74	381.66	378.60	375.56	372.55	369.56
6.45	ELEV	1926.14	1925.80	1925.19	1924.57	1923.94	1923.33	1922.72	1922.11	1921.51	1920.91
7.95	DISCHG	366.60	362.74	357.83	352.98	348.20	343.49	336.15	328.66	321.33	312.13
7.95	ELEV	1920.32	1919.59	1918.69	1917.81	1916.94	1916.08	1914.85	1913.61	1912.38	1910.94
9.45	DISCHG	302.22	292.45	278.30	264.75	245.29	224.13	198.66	80.46	31.42	12.27
9.45	ELEV	1909.41	1907.92	1905.90	1903.96	1901.53	1898.98	1896.07	1888.87	1885.90	1884.74
10.95	DISCHG	4.79	1.87	0.73	0.28	0.11	0.04	0.01	0.00	0.00	0.00
10.95	ELEV	1884.29	1884.11	1884.04	1884.01	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00
12.45	DISCHG	0.00	0.00	0.00	0.00						
12.45	ELEV	1884.00	1884.00	1884.00	1884.00						

7.3"

```
          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1869        CFS-HRS=     6668.07        ACRE-FT=     551.04

SUBROUTINE REACH     CROSS SECTION  49
          LENGTH=   5200.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  15.201        AVERAGE ROUTING COEFF= 0.8994        NUMBER OF ROUTINGS=  0.56

SUBROUTINE RUNOFF    CROSS SECTION  49
          AREA=   0.16     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.36
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.51                        443.061                       (RUNOFF)
              4.48                         85.070                       (RUNOFF)
              6.00                         56.894                       (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  49
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.89                       3854.758                      1732.14

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1730        CFS-HRS=     7290.57        ACRE-FT=     602.49

SUBROUTINE RUNOFF    CROSS SECTION  50
          AREA=   0.13     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.24
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.31                        416.127                       (RUNOFF)
              2.49                        386.600                       (RUNOFF)
              3.86                         80.357                       (RUNOFF)
              4.40                         70.671                       (RUNOFF)
              5.17                         50.985                       (RUNOFF)
              5.95                         49.855                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.60        DELTA T= 0.15        DRAINAGE AREA=   0.13
   0.60    DISCHG        0.00      4.39     10.11     15.41     25.85     35.71     46.11     50.17     80.82     94.64
   2.10    DISCHG      107.45    389.27    364.17    376.94    266.73    172.11    120.71    104.32    100.51     93.76
   3.60    DISCHG       76.46     74.70     79.70     64.42     53.96     69.52     66.87     54.67     51.49     50.69
   5.10    DISCHG       50.47     50.50     46.50     37.33     35.45     44.38     48.87     31.28      8.39      2.03
   6.60    DISCHG        0.39      0.00      0.00

SUBROUTINE ADDHYD    CROSS SECTION  51
          INPUT HYDROGRAPHS= 1,3     OUTPUT HYDROGRAPH= 2

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.88                       4010.327                      1732.19

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1667        CFS-HRS=     7800.43        ACRE-FT=     644.62
```

```
SUBROUTINE REACH      CROSS SECTION  53
          LENGTH=   1650.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  13.851        AVERAGE ROUTING COEFF= 0.8906        NUMBER OF ROUTINGS=  0.19

SUBROUTINE RUNOFF     CROSS SECTION  53
          AREA=   0.06      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.20
          COMPUTED CURVE NO. =   90.0

          PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
              2.29                      211.861                      (RUNOFF)
              2.49                      180.780                      (RUNOFF)
              3.87                       38.144                      (RUNOFF)
              4.37                       34.963                      (RUNOFF)
              5.17                       23.636                      (RUNOFF)
              5.94                       23.920                      (RUNOFF)

SUBROUTINE ADDHYD     CROSS SECTION  53
          INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 3

          PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
              2.90                     3933.956                      1697.36

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1665        CFS-HRS=     8038.93        ACRE-FT=     664.33

SUBROUTINE ADDHYD     CROSS SECTION  56
          INPUT HYDROGRAPHS= 3,6      OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
              2.84                     9764.240                      1698.01
              4.61                     2917.821                      1696.46
              5.93                     2172.823                      1696.23
             12.86                      215.756                      1695.15
             13.15                      195.538                      1695.13
             13.44                      172.880                      1695.12
             14.07                       26.798                      1695.01
             14.39                       23.335                      1695.01
             14.69                       23.514                      1695.01
             14.99                       23.460                      1695.01

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=   6.1843        CFS-HRS=    23029.34        ACRE-FT=    1903.14

SUBROUTINE RESVOR    STRUCTURE    4
          SURFACE ELEVATION= 1695.00

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
```

7.3"

2.94	9285.884	1720.80
14.91	1.555	1695.02
15.07	2.478	1695.04

7.3"

HYDROGRAPH, TZERO= 0.44 DELTA T= 0.15 DRAINAGE AREA= 5.76

TIME											
0.44	DISCHG	0.00	1.36	36.68	132.37	257.08	331.49	388.42	473.40	526.33	577.70
0.44	ELEV	1695.00	1695.02	1695.59	1697.13	1699.14	1700.45	1701.67	1703.49	1704.88	1706.42
1.95	DISCHG	637.57	674.26	750.04	814.22	1745.67	5420.43	8916.13	9146.61	7456.03	6174.21
1.95	ELEV	1708.26	1709.55	1712.25	1714.92	1717.39	1719.37	1720.67	1720.75	1720.16	1719.67
3.45	DISCHG	5212.70	4506.69	4014.11	3696.26	3445.62	3174.41	2995.40	2932.24	2912.95	2897.66
3.45	ELEV	1719.29	1719.00	1718.81	1718.68	1718.58	1718.47	1718.40	1718.37	1718.36	1718.36
4.95	DISCHG	2809.90	2683.96	2586.88	2500.16	2386.63	2255.70	2173.23	2154.61	2091.01	1966.13
4.95	ELEV	1718.32	1718.27	1718.23	1718.20	1718.15	1718.10	1718.07	1718.06	1718.04	1717.94
6.45	DISCHG	1887.62	1777.34	1658.24	1522.63	1374.97	1272.54	1200.90	1150.13	1113.54	1086.55
6.45	ELEV	1717.74	1717.47	1717.17	1716.91	1716.71	1716.57	1716.48	1716.41	1716.36	1716.32
7.95	DISCHG	1065.94	1049.48	1035.56	1023.11	1011.47	1000.29	989.28	978.04	966.34	954.13
7.95	ELEV	1716.30	1716.28	1716.26	1716.24	1716.22	1716.21	1716.19	1716.18	1716.16	1716.15
9.45	DISCHG	941.08	927.10	912.18	896.06	878.37	858.60	839.80	838.13	835.15	830.94
9.45	ELEV	1716.13	1716.11	1716.09	1716.07	1716.05	1716.02	1715.99	1715.92	1715.79	1715.62
10.95	DISCHG	826.08	820.90	815.53	809.99	804.31	798.46	792.40	786.12	779.53	772.30
10.95	ELEV	1715.42	1715.20	1714.98	1714.75	1714.51	1714.26	1714.01	1713.75	1713.48	1713.17
12.45	DISCHG	763.92	754.90	745.73	728.67	710.05	691.72	673.62	655.73	637.85	606.60
12.45	ELEV	1712.83	1712.45	1712.07	1711.46	1710.80	1710.16	1709.53	1708.90	1708.27	1707.29
13.95	DISCHG	562.85	518.95	446.47	353.72	158.00	-9.66	0.59	-0.03	0.00	-19.76
13.95	ELEV	1705.98	1704.66	1702.91	1700.93	1697.54	1694.84	1695.00	1694.99	1695.00	1694.68

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 6.1950 CFS-HRS= 23068.94 ACRE-FT= 1906.41

ENDCMP 1

```
EXECUTIVE CONTROL CARD              OPERATION  COMPUT.     FROM XSECTN/STRUCT  11/  0     TO XSECTN/STRUCT   0/  4
        STARTING TIME=  0.00      RAIN DEPTH= 19.00    RAIN DURATION=  6.00     RAIN TABLE NO.= 2     SOIL CONDITION= 2
        ALTERNATE NO.= 1          STORM NO.= 4

SUBROUTINE RUNOFF    CROSS SECTION  11
           AREA=   0.71     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.31                       6398.258                      (RUNOFF)
               2.47                       5836.441                      (RUNOFF)
               3.85                       1159.270                      (RUNOFF)
               4.42                       1009.931                      (RUNOFF)
               5.95                        716.220                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.71
   0.15    DISCHG        0.00     27.45     49.60    197.48    340.22    438.95    505.84    684.60    851.33    976.73
   1.65    DISCHG      999.68   1496.04   1652.11   1747.61   5994.87   5612.02   5652.46   4062.69   2613.98   1811.22
   3.15    DISCHG     1543.83   1472.56   1373.48   1118.92   1099.12   1148.05    950.93    788.82    987.07    981.40
   4.65    DISCHG      800.42    749.00    735.28    730.64    730.58    677.36    546.00    512.85    634.60    705.05
   6.15    DISCHG      470.03    133.14     34.59      7.37      0.48      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.6177        CFS-HRS=     8072.67        ACRE-FT=     667.12

SUBROUTINE REACH     CROSS SECTION  12
           LENGTH=   5500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  13.076       AVERAGE ROUTING COEFF= 0.8849       NUMBER OF ROUTINGS=  0.68

SUBROUTINE RUNOFF    CROSS SECTION  12
           AREA=   0.44     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.35
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.48                       3466.717                      (RUNOFF)
               4.48                        622.940                      (RUNOFF)
               5.99                        414.668                      (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  12
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
               2.47                       9515.462                      1980.42
               4.51                       1601.230                      1973.17
               6.02                       1067.979                      1972.68

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.9286        CFS-HRS=    13306.20        ACRE-FT=    1099.62

SUBROUTINE RUNOFF    CROSS SECTION  13
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AREA=   0.42     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.16
COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
    1.24                      529.558                     (RUNOFF)
    2.28                     4439.190                     (RUNOFF)
    2.48                     3520.601                     (RUNOFF)
    3.88                      731.359                     (RUNOFF)
    4.36                      710.176                     (RUNOFF)
    5.17                      441.266                     (RUNOFF)
    5.93                      458.834                     (RUNOFF)

TIME                          HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.42
0.15   DISCHG        0.00     32.92     44.90    165.34    238.53    285.14    316.52    517.41    471.38    638.25
1.65   DISCHG      678.93    930.10   1083.80   1350.10   4325.55   3265.25   3351.65   1758.70   1213.04    904.29
3.15   DISCHG      866.20    862.51    729.68    690.49    565.47    729.32    483.92    438.66    708.78    509.67
4.65   DISCHG      441.87    432.35    432.10    432.14    432.19    360.05    295.63    308.14    411.48    429.21
6.15   DISCHG      143.65     17.28      1.01      0.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.4692        CFS-HRS=     4735.13        ACRE-FT=     391.31

SUBROUTINE REACH     CROSS SECTION  14
LENGTH=   4600.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=  15.682       AVERAGE ROUTING COEFF= 0.9022       NUMBER OF ROUTINGS=  0.49

SUBROUTINE RUNOFF    CROSS SECTION  14
AREA=   0.22     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.25
COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
    2.31                     1982.381                     (RUNOFF)
    2.47                     1808.440                     (RUNOFF)
    3.85                      359.164                     (RUNOFF)
    4.42                      312.898                     (RUNOFF)
    5.95                      221.836                     (RUNOFF)

TIME                          HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.22
0.15   DISCHG        0.00      8.50     15.36     61.19    105.42    136.01    156.73    212.13    263.79    302.65
1.65   DISCHG      309.76    463.56    511.92    541.51   1857.56   1738.94   1751.47   1258.86    309.96    561.22
3.15   DISCHG      478.37    456.28    425.58    346.71    340.57    355.73    294.65    244.42    305.85    304.09
4.65   DISCHG      248.01    232.08    227.83    226.39    226.37    209.88    169.18    158.91    196.63    218.46
6.15   DISCHG      145.64     41.25     10.72      2.28      0.15      0.00

SUBROUTINE ADDHYD    CROSS SECTION  14
INPUT HYDROGRAPHS= 5,6     OUTPUT HYDROGRAPH= 7

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
```

2.42	5519.312	1975.78
3.86	1008.651	1972.45
4.44	924.489	1972.39
5.17	665.044	1972.20
5.96	644.636	1972.18

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.7789 CFS-HRS= 7343.36 ACRE-FT= 606.85

SUBROUTINE ADDHYD CROSS SECTION 15
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.46	14981.576	1984.40
4.48	2513.295	1973.84
5.99	1703.093	1973.15

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8751 CFS-HRS= 20649.57 ACRE-FT= 1706.48

SUBROUTINE REACH CROSS SECTION 16
LENGTH= 6500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 11.274 AVERAGE ROUTING COEFF= 0.8689 NUMBER OF ROUTINGS= 0.92

SUBROUTINE RUNOFF CROSS SECTION 16
AREA= 0.48 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.46
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.58	3531.131	(RUNOFF)
4.50	657.942	(RUNOFF)
6.03	432.542	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 16
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.61	18023.839	1835.35
4.61	3095.755	1819.06
6.12	2085.010	1817.98

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.9066 CFS-HRS= 26233.05 ACRE-FT= 2167.89

SUBROUTINE RESVOR STRUCTURE 6
SURFACE ELEVATION= 1810.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.72	17285.746	1845.26
4.63	3006.130	1839.34
6.16	1948.292	1838.64
12.46	43.650	1811.43

19"

12.76	14.752	1810.48
13.06	4.970	1810.16
13.36	1.687	1810.05
13.66	0.574	1810.01
13.96	0.193	1810.00
14.26	0.065	1810.00

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 2.26

TIME											
0.15	DISCHG	0.00	5.85	49.74	156.38	207.01	271.90	304.37	340.56	371.91	402.11
0.15	ELEV	1810.00	1810.19	1811.63	1815.12	1817.13	1820.24	1822.30	1824.70	1827.03	1829.48
1.65	DISCHG	432.27	458.07	560.13	2711.73	5082.53	9116.28	14846.55	17224.82	16140.12	12622.67
1.65	ELEV	1832.11	1834.51	1837.11	1839.18	1840.51	1842.34	1844.45	1845.24	1844.90	1843.68
3.15	DISCHG	9122.25	6818.34	5574.92	4958.51	4434.26	3970.73	3687.05	3481.66	3164.65	2963.86
3.15	ELEV	1842.34	1841.36	1840.78	1840.44	1840.14	1839.88	1839.72	1839.61	1839.43	1839.32
4.65	DISCHG	3005.54	2946.41	2714.10	2515.40	2410.27	2364.83	2300.93	2150.50	1959.08	1880.96
4.65	ELEV	1839.34	1839.31	1839.18	1839.07	1839.01	1838.97	1838.92	1838.80	1838.65	1838.59
6.15	DISCHG	1947.47	1905.34	1522.34	1030.04	722.13	484.81	481.25	477.58	473.86	469.28
6.15	ELEV	1838.64	1838.61	1838.30	1837.82	1837.35	1836.98	1836.65	1836.32	1835.98	1835.56
7.65	DISCHG	464.73	460.23	455.78	451.37	447.00	442.67	438.38	434.14	429.53	423.75
7.65	ELEV	1835.13	1834.71	1834.30	1833.89	1833.48	1833.08	1832.68	1832.29	1831.87	1831.36
9.15	DISCHG	418.05	412.42	406.87	401.40	396.00	390.67	385.41	377.20	368.91	360.79
9.15	ELEV	1830.87	1830.38	1829.90	1829.42	1828.95	1828.49	1828.03	1827.42	1826.80	1826.20
10.65	DISCHG	352.86	345.09	337.50	329.30	315.90	303.05	290.71	278.88	266.15	223.18
10.65	ELEV	1825.61	1825.04	1824.48	1823.89	1823.04	1822.22	1821.44	1820.69	1819.91	1817.89
12.15	DISCHG	187.15	-72.29	42.05	-24.46	14.22	-8.27	4.81	-2.80	1.62	-0.94
12.15	ELEV	1816.19	1807.62	1811.37	1809.19	1810.46	1809.72	1810.15	1809.90	1810.05	1809.96
13.65	DISCHG	0.55	-0.32	0.18	-0.10	0.06	-0.03	0.02	-0.01	0.00	-0.00
13.65	ELEV	1810.01	1809.98	1810.00	1809.99	1810.00	1809.99	1810.00	1809.99	1810.00	1810.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8872 CFS-HRS= 26204.60 ACRE-FT= 2165.54

SUBROUTINE REACH CROSS SECTION 52
LENGTH= 4600.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 13.787 AVERAGE ROUTING COEFF= 0.8902 NUMBER OF ROUTINGS= 0.55

SUBROUTINE RUNOFF CROSS SECTION 52
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.48	1275.308	(RUNOFF)
4.48	227.046	(RUNOFF)
5.98	152.400	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 52
INPUT HYDROGRAPHS= 1.2 OUTPUT HYDROGRAPH= 5

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 2 WAS TRUNCATED HERE TO 100 VALUES.

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.58	5683.234	1697.20
4.29	1273.581	1695.88
5.79	842.805	1695.58
13.88	3.792	1695.00
14.24	2.988	1695.00
14.54	2.998	1695.00
14.79	5.283	1695.00

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.79

TIME											
0.15	DISCHG	0.00	4.14	26.54	92.12	166.33	226.84	284.06	348.24	425.68	482.77
1.65	DISCHG	545.58	658.18	864.52	1068.75	2261.43	4258.23	5637.52	5098.24	3781.29	2840.26
3.15	DISCHG	2351.49	2077.66	1868.27	1677.17	1568.26	1461.30	1358.12	1272.95	1273.32	1270.80
4.65	DISCHG	1187.07	1118.34	1072.77	1039.40	1000.30	941.28	868.42	835.40	840.41	809.34
6.15	DISCHG	672.57	475.88	373.99	347.62	340.36	336.58	334.10	332.18	330.29	328.40
7.65	DISCHG	326.53	324.67	322.81	320.97	318.96	316.61	314.10	311.58	309.08	306.60
9.15	DISCHG	304.14	301.70	299.27	296.87	294.44	291.69	288.54	285.33	282.15	279.01
10.65	DISCHG	275.90	272.83	269.79	266.64	262.63	257.62	252.47	247.41	242.46	237.57
12.15	DISCHG	231.40	223.43	215.29	207.43	198.70	187.65	175.38	163.58	144.93	116.46
13.65	DISCHG	46.20	2.70	3.17	-2.98	2.98	-2.98	2.98	-2.98	2.98	-29.88

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 20.1476 CFS-HRS= 10402.16 ACRE-FT= 859.63

SUBROUTINE RUNOFF CROSS SECTION 21
AREA= 0.27 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.21
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	2691.818	(RUNOFF)
2.48	2250.224	(RUNOFF)
3.87	453.059	(RUNOFF)
4.38	408.812	(RUNOFF)
5.17	281.460	(RUNOFF)
5.94	281.389	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.5150 CFS-HRS= 3051.99 ACRE-FT= 252.21

SUBROUTINE REACH CROSS SECTION 22
LENGTH= 5220.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 15.696 AVERAGE ROUTING COEFF= 0.9022 NUMBER OF ROUTINGS= 0.55

SUBROUTINE RUNOFF CROSS SECTION 22
AREA= 0.25 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.31

```
COMPUTED CURVE NO. =   90.0

PEAK TIMES                    PEAK DISCHARGES                PEAK ELEVATIONS
    2.47                          2015.086                       (RUNOFF)
    4.47                           355.247                       (RUNOFF)
    5.98                           241.269                       (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  22
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 7

           PEAK TIMES                 PEAK DISCHARGES                PEAK ELEVATIONS
               2.45                      4400.072                       1892.18
               4.48                       737.591                       1890.65
               5.99                       500.441                       1890.44

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.8558        CFS-HRS=      5992.27        ACRE-FT=      495.20

SUBROUTINE RUNOFF    CROSS SECTION  23
           AREA=    0.21      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.16
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                 PEAK DISCHARGES                PEAK ELEVATIONS
               1.24                       264.779                       (RUNOFF)
               2.28                      2219.595                       (RUNOFF)
               2.48                      1760.300                       (RUNOFF)
               3.88                       365.679                       (RUNOFF)
               4.36                       355.088                       (RUNOFF)
               5.17                       220.633                       (RUNOFF)
               5.93                       229.417                       (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.21
   0.15    DISCHG        0.00     16.46     22.45     82.67    119.26    142.57    158.26    258.70    235.69    319.12
   1.65    DISCHG      339.46    465.05    541.90    675.05   2162.77   1632.62   1675.82    879.35    606.52    452.14
   3.15    DISCHG      433.10    431.25    364.84    345.24    282.73    364.66    241.96    219.33    354.39    254.83
   4.65    DISCHG      220.93    216.17    216.05    216.07    216.09    180.02    147.81    154.07    205.74    214.60
   6.15    DISCHG       71.82      8.64      0.50      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.4692        CFS-HRS=      2367.56        ACRE-FT=      195.65

SUBROUTINE REACH     CROSS SECTION  24
           LENGTH=   4500.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  17.943        AVERAGE ROUTING COEFF= 0.9134        NUMBER OF ROUTINGS=  0.42

SUBROUTINE RUNOFF    CROSS SECTION  24
           AREA=    0.25      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.28
           COMPUTED CURVE NO. =   90.0

           PEAK TIMES                 PEAK DISCHARGES                PEAK ELEVATIONS
```

2.47	2036.198	(RUNOFF)
3.82	402.196	(RUNOFF)
4.45	354.553	(RUNOFF)
5.96	245.996	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 24
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.42	3842.956	1892.40
3.85	730.940	1890.87
4.44	658.307	1890.78
5.96	459.572	1890.55

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.7655 CFS-HRS= 5274.04 ACRE-FT= 435.84

SUBROUTINE ADDHYD CROSS SECTION 25
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 1

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.44	8237.349	1893.18
3.84	1550.528	1891.16
4.46	1393.154	1891.09
5.97	959.072	1890.82

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8134 CFS-HRS= 11266.32 ACRE-FT= 931.04

SUBROUTINE REACH CROSS SECTION 26
LENGTH= 3500.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 22.329 AVERAGE ROUTING COEFF= 0.9292 NUMBER OF ROUTINGS= 0.26

SUBROUTINE RUNOFF CROSS SECTION 26
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	1441.782	(RUNOFF)
2.47	1315.282	(RUNOFF)
3.85	261.274	(RUNOFF)
4.42	227.559	(RUNOFF)
5.95	161.375	(RUNOFF)

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.16

TIME											
0.15	DISCHG	0.00	6.18	11.17	44.50	76.67	98.92	113.99	154.27	191.84	220.10
1.65	DISCHG	225.28	337.13	372.30	393.82	1350.95	1264.68	1273.79	915.53	589.06	408.16
3.15	DISCHG	347.90	331.84	309.51	252.15	247.69	258.71	214.29	177.76	222.44	221.16
4.65	DISCHG	180.37	168.79	165.69	164.65	164.63	152.64	123.04	115.57	143.00	158.88
6.15	DISCHG	105.92	30.00	7.79	1.66	0.11	0.00				

```
SUBROUTINE ADDHYD     CROSS SECTION  26
           INPUT HYDROGRAPHS= 1,2      OUTPUT HYDROGRAPH= 7

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.48                       9295.351                     1787.45
               4.47                       1584.686                     1785.18
               5.98                       1081.517                     1784.93

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.8239        CFS-HRS=    13113.47        ACRE-FT=    1083.69

SUBROUTINE RUNOFF     CROSS SECTION  27
           AREA=   0.24      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.12
           COMPUTED CURVE NO. =  90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               1.22                        343.732                     (RUNOFF)
               2.28                       2390.595                     (RUNOFF)
               2.47                       2011.647                     (RUNOFF)
               3.22                        508.459                     (RUNOFF)
               3.57                        432.507                     (RUNOFF)
               3.88                        413.098                     (RUNOFF)
               4.35                        440.853                     (RUNOFF)
               5.17                        254.201                     (RUNOFF)
               5.92                        271.178                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.24
   0.15    DISCHG        0.00     22.79     37.99    107.15    144.31    168.00    184.39    341.34    252.89    364.80
   1.65    DISCHG      462.78    513.08    644.84   1089.57   2345.98   1875.58   1886.70    854.48    617.67    499.80
   3.15    DISCHG      492.72    492.90    367.93    429.29    297.63    412.42    258.99    247.62    440.72    268.13
   4.65    DISCHG      247.64    246.90    246.92    246.95    246.97    188.95    164.80    185.08    242.65    247.00
   6.15    DISCHG       41.00      1.88      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.5824        CFS-HRS=     2723.31        ACRE-FT=     225.05

SUBROUTINE REACH      CROSS SECTION  28
           LENGTH=   5600.00      INPUT COEFFICIENT=  0.0000      INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  16.836        AVERAGE ROUTING COEFF= 0.9082        NUMBER OF ROUTINGS=  0.55

SUBROUTINE RUNOFF     CROSS SECTION  28
           AREA=   0.26      INPUT RUNOFF CURVE=  90.0      TIME OF CONCENTRATION=  0.34
           COMPUTED CURVE NO. =  90.0

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.47                       2065.158                     (RUNOFF)
               4.48                        368.456                     (RUNOFF)
               5.99                        246.264                     (RUNOFF)
```

```
SUBROUTINE ADDHYD    CROSS SECTION  28
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.44                       4205.827                     1786.72
              4.47                        735.949                     1785.01
              5.97                        492.103                     1784.69

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.8617       CFS-HRS=     5763.72        ACRE-FT=     476.31


SUBROUTINE ADDHYD    CROSS SECTION  31
          INPUT HYDROGRAPHS= 3,7     OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              2.47                      13504.744                     1790.54
              4.47                       2320.453                     1786.05
              5.98                       1573.724                     1785.60

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.8354       CFS-HRS=    18877.20        ACRE-FT=    1560.01


SUBROUTINE RUNOFF    CROSS SECTION  29
          AREA=   0.26     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.12
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
              1.22                       372.378                     (RUNOFF)
              2.28                      2589.934                     (RUNOFF)
              2.47                      2179.297                     (RUNOFF)
              3.22                       550.825                     (RUNOFF)
              3.57                       468.533                     (RUNOFF)
              3.88                       447.515                     (RUNOFF)
              4.35                       477.576                     (RUNOFF)
              5.17                       275.414                     (RUNOFF)
              5.92                       293.822                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.26
   0.15   DISCHG        0.00     24.68     41.16    116.08    156.33    182.00    199.75    369.78    273.97    395.20
   1.65   DISCHG      501.34    555.84    698.58   1180.36   2541.48   2031.88   2043.93    925.69    669.15    541.45
   3.15   DISCHG      533.78    533.98    398.59    465.06    322.43    446.79    280.57    268.25    477.45    290.48
   4.65   DISCHG      268.27    267.47    267.50    267.53    267.55    204.70    178.53    200.50    262.87    267.58
   6.15   DISCHG       44.42      2.04      0.00


SUBROUTINE REACH     CROSS SECTION  30
          LENGTH=   4500.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

          AVERAGE WATER VELOCITY=  16.703       AVERAGE ROUTING COEFF= 0.9076       NUMBER OF ROUTINGS=  0.45
```

SUBROUTINE RUNOFF CROSS SECTION 30
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.30
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	1052.562	(RUNOFF)
4.47	184.926	(RUNOFF)
5.97	126.548	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 30
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.42	3292.458	1786.44
4.43	572.536	1784.85
5.96	397.702	1784.59

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8028 CFS-HRS= 4480.87 ACRE-FT= 370.29

SUBROUTINE ADDHYD CROSS SECTION 32
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.46	16774.265	1791.85
4.46	2888.789	1786.28
5.97	1969.787	1785.86

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8292 CFS-HRS= 23358.06 ACRE-FT= 1930.31

SUBROUTINE RESVOR STRUCTURE 11
SURFACE ELEVATION= 1780.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.55	16212.443	1819.99
4.52	2743.353	1814.28
6.05	1777.982	1813.62
14.39	25.058	1781.13
14.69	25.083	1781.14

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 2.02

TIME											
0.15	DISCHG	0.00	59.02	95.68	144.64	185.26	221.62	248.49	271.18	291.45	309.28
0.15	ELEV	1780.00	1782.68	1784.47	1787.48	1790.86	1794.62	1797.87	1800.88	1803.77	1806.50
1.65	DISCHG	326.29	406.21	2519.46	4561.78	8476.68	14189.54	16206.79	14605.01	10841.81	7640.35
1.65	ELEV	1809.21	1812.09	1814.15	1815.30	1817.13	1819.29	1819.99	1819.43	1818.11	1816.78
3.15	DISCHG	5618.66	4716.12	4247.64	3814.19	3420.88	3217.92	3070.59	2735.53	2574.49	2739.48
3.15	ELEV	1815.90	1815.39	1815.12	1814.88	1814.66	1814.54	1814.46	1814.27	1814.18	1814.27
4.65	DISCHG	2658.38	2366.09	2202.23	2139.82	2109.72	2054.51	1893.31	1691.38	1640.73	1768.83
4.65	ELEV	1814.23	1814.06	1813.96	1813.91	1813.89	1813.84	1813.71	1813.55	1813.51	1813.61

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6.15	DISCHG	1746.74	1302.94	834.14	554.23	350.00	341.15	339.21	337.27	335.35	333.44
6.15	ELEV	1813.59	1813.23	1812.73	1812.31	1812.01	1811.69	1811.36	1811.04	1810.72	1810.40
7.65	DISCHG	331.53	329.64	327.76	325.89	324.03	322.18	320.35	318.32	315.77	313.24
7.65	ELEV	1810.08	1809.77	1809.46	1809.14	1808.83	1808.53	1808.22	1807.89	1807.50	1807.11
9.15	DISCHG	310.72	308.23	305.75	303.30	300.87	298.45	296.06	293.68	290.67	287.44
9.15	ELEV	1806.72	1806.34	1805.96	1805.58	1805.21	1804.83	1804.47	1804.10	1803.66	1803.20
10.65	DISCHG	284.24	281.07	277.94	274.85	271.79	268.76	265.77	261.06	255.84	250.71
10.65	ELEV	1802.74	1802.29	1801.84	1801.40	1800.97	1800.53	1800.11	1799.49	1798.81	1798.15
12.15	DISCHG	245.69	240.77	235.95	228.95	220.59	212.54	204.78	196.71	183.46	171.09
12.15	ELEV	1797.50	1796.87	1796.25	1795.43	1794.51	1793.61	1792.75	1791.88	1790.70	1789.60
13.65	DISCHG	159.56	138.30	105.55	25.14	-25.14	25.14	-25.14	25.14	-25.14	25.14
13.65	ELEV	1788.58	1787.09	1785.08	1781.14	1778.85	1781.14	1778.85	1781.14	1778.85	1781.14

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8955 CFS-HRS= 23444.98 ACRE-FT= 1937.49

SUBROUTINE REACH CROSS SECTION 33
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 23.796 AVERAGE ROUTING COEFF= 0.9333 NUMBER OF ROUTINGS= 0.16

SUBROUTINE RUNOFF CROSS SECTION 33
AREA= 0.12 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	1218.105	(RUNOFF)
2.48	997.460	(RUNOFF)
3.87	203.151	(RUNOFF)
4.37	185.690	(RUNOFF)
5.17	125.262	(RUNOFF)
5.94	126.484	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 33
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 7

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 2 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.57	16879.480	1737.36
4.50	2868.136	1728.06
6.02	1870.835	1727.39
14.39	16.743	1725.04
14.69	16.725	1725.04

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8696 CFS-HRS= 24794.94 ACRE-FT= 2049.05

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SUBROUTINE RUNOFF    CROSS SECTION  34
          AREA=   0.24     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.24
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.30                       2215.682                      (RUNOFF)
              2.47                       1980.697                      (RUNOFF)
              3.86                        395.154                      (RUNOFF)
              4.40                        346.550                      (RUNOFF)
              5.17                        249.388                      (RUNOFF)
              5.95                        243.371                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.24
   0.15    DISCHG        0.00      9.78     16.93     69.48    117.48    150.16    172.28    236.16    287.88    335.09
   1.65    DISCHG      339.61    510.56    567.19    615.11   2093.02   1896.66   1915.62   1340.28    858.37    599.37
   3.15    DISCHG      516.45    496.58    462.53    376.73    367.63    391.85    316.49    264.90    341.03    327.83
   4.65    DISCHG      267.87    252.14    248.11    246.93    246.96    227.34    182.44    173.23    216.74    238.61
   6.15    DISCHG      152.72     40.96      9.91      1.91      0.04      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.6261        CFS-HRS=     2730.09        ACRE-FT=     225.61


SUBROUTINE RUNOFF    CROSS SECTION  35
          AREA=   0.23     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.18
          COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              1.27                        277.461                      (RUNOFF)
              2.28                       2413.056                      (RUNOFF)
              2.48                       1925.698                      (RUNOFF)
              3.88                        395.590                      (RUNOFF)
              4.36                        371.944                      (RUNOFF)
              5.17                        240.806                      (RUNOFF)
              5.93                        247.212                      (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.23
   0.15    DISCHG        0.00     15.60     21.20     84.36    126.39    153.41    171.49    266.14    264.73    344.67
   1.65    DISCHG      350.62    509.71    580.67    654.46   2340.82   1791.76   1843.10   1040.88    701.97    509.09
   3.15    DISCHG      476.62    472.46    415.57    368.26    321.46    394.17    275.02    242.30    370.63    289.47
   4.65    DISCHG      245.10    237.62    236.62    236.65    236.67    203.71    164.59    166.63    221.08    234.47
   6.15    DISCHG       97.73     15.21      1.80      0.00

          TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.4666        CFS-HRS=     2592.66        ACRE-FT=     214.25


SUBROUTINE ADDHYD    CROSS SECTION  36
          INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 6

          PEAK TIMES                  PEAK DISCHARGES                PEAK ELEVATIONS
              2.29                       4620.870                      1798.67
              2.48                       3906.285                      1798.28
              3.87                        790.136                      1796.28
              4.37                        716.684                      1796.21
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    5.17                    490.205                    1796.00
    5.94                    490.125                    1796.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.5479      CFS-HRS=     5322.71      ACRE-FT=     439.86

SUBROUTINE RUNOFF    CROSS SECTION  37
AREA=   0.14     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.20
COMPUTED CURVE NO. =   90.0

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
    2.29                      1421.107                    (RUNOFF)
    2.48                      1163.792                    (RUNOFF)
    3.87                       237.010                    (RUNOFF)
    4.37                       216.668                    (RUNOFF)
    5.17                       146.136                    (RUNOFF)
    5.94                       147.576                    (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  38
INPUT HYDROGRAPHS= 1,6     OUTPUT HYDROGRAPH= 3

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
    2.29                      6041.407                    1793.61
    2.48                      5069.964                    1793.20
    3.87                      1027.122                    1791.22
    4.37                       933.326                    1791.15
    5.17                       636.312                    1790.90
    5.94                       637.584                    1790.90

TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.5406      CFS-HRS=     6905.31      ACRE-FT=     570.65

SUBROUTINE REACH     CROSS SECTION  39
LENGTH=      0.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

AVERAGE WATER VELOCITY=  17.332      AVERAGE ROUTING COEFF= 0.9106      NUMBER OF ROUTINGS=  0.00

SUBROUTINE RUNOFF    CROSS SECTION  39
AREA=   0.13     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.22
COMPUTED CURVE NO. =   90.0

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
    2.29                      1261.292                    (RUNOFF)
    2.48                      1080.619                    (RUNOFF)
    3.87                       217.186                    (RUNOFF)
    4.38                       193.084                    (RUNOFF)
    5.17                       135.335                    (RUNOFF)
    5.94                       134.183                    (RUNOFF)

SUBROUTINE ADDHYD    CROSS SECTION  39
INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

PEAK TIMES                PEAK DISCHARGES              PEAK ELEVATIONS
```

2.29	7302.688	1728.21
2.48	6150.413	1727.87
3.87	1244.189	1726.11
4.37	1126.359	1726.05
5.17	771.791	1725.76
5.94	771.989	1725.76

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.5468 CFS-HRS= 8379.93 ACRE-FT= 692.51

SUBROUTINE ADDHYD CROSS SECTION 40
INPUT HYDROGRAPHS= 3,7 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 7 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.54	22758.371	1730.54
4.38	3911.602	1726.77
5.96	2627.533	1726.36
14.39	16.743	1725.01
14.69	16.725	1725.01

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.7870 CFS-HRS= 33174.85 ACRE-FT= 2741.56

SUBROUTINE REACH CROSS SECTION 54
LENGTH= 2100.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 18.735 AVERAGE ROUTING COEFF= 0.9168 NUMBER OF ROUTINGS= 0.19

SUBROUTINE RUNOFF CROSS SECTION 54
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.25
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.31	540.683	(RUNOFF)
2.47	493.228	(RUNOFF)
3.85	97.964	(RUNOFF)
4.42	85.325	(RUNOFF)
5.95	60.520	(RUNOFF)

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.06

TIME											
0.15	DISCHG	0.00	2.32	4.19	16.68	28.75	37.09	42.74	57.85	71.94	82.54
1.65	DISCHG	84.48	126.42	139.61	147.68	506.60	474.25	477.67	343.32	220.90	153.06
3.15	DISCHG	130.46	124.44	116.06	94.55	92.88	97.01	80.36	66.66	83.41	82.93
4.65	DISCHG	67.64	63.29	62.13	61.74	61.73	57.24	46.14	43.34	53.62	59.58
6.15	DISCHG	39.72	11.25	2.92	0.62	0.04	0.00				

SUBROUTINE ADDHYD CROSS SECTION 54
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 2 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS

2.55	22704.027	1702.11
4.39	3957.046	1697.13
5.97	2649.669	1696.66
14.39	10.399	1695.00
14.69	10.331	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8224 CFS-HRS= 33931.06 ACRE-FT= 2804.06

SUBROUTINE ADDHYD CROSS SECTION 55
INPUT HYDROGRAPHS= 3,5 OUTPUT HYDROGRAPH= 6

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 5 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.56	28367.867	1701.66
4.39	5230.724	1697.11
5.95	3476.006	1696.63
14.38	7.480	1695.00
14.69	7.328	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 18.3184 CFS-HRS= 44333.17 ACRE-FT= 3663.69

SUBROUTINE RUNOFF CROSS SECTION 41
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.17
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
1.25	160.091	(RUNOFF)
2.28	1373.815	(RUNOFF)
2.48	1088.744	(RUNOFF)
3.88	225.054	(RUNOFF)
4.36	214.641	(RUNOFF)
5.17	136.302	(RUNOFF)
5.93	140.694	(RUNOFF)

TIME HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.13

0.15	DISCHG	0.00	9.36	12.89	49.38	72.65	87.50	97.45	155.14	148.09	196.16
1.65	DISCHG	203.72	288.31	331.75	386.56	1335.29	1012.24	1038.83	565.53	386.11	283.67
3.15	DISCHG	268.68	266.97	230.66	210.42	178.64	224.34	152.87	136.61	214.08	160.95
4.65	DISCHG	137.63	134.03	133.74	133.75	133.77	113.38	92.22	94.76	126.20	132.54
6.15	DISCHG	50.16	6.87	0.63	0.00						

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.4538 CFS-HRS= 1464.34 ACRE-FT= 121.01

SUBROUTINE RUNOFF CROSS SECTION 42
AREA= 0.56 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	5684.428	(RUNOFF)
2.48	4655.170	(RUNOFF)
3.87	948.042	(RUNOFF)

4.37	866.675	(RUNOFF)
5.17	584.547	(RUNOFF)
5.94	590.305	(RUNOFF)

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.5160 CFS-HRS= 6330.41 ACRE-FT= 523.14

SUBROUTINE REACH CROSS SECTION 43
LENGTH= 2300.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 17.966 AVERAGE ROUTING COEFF= 0.9135 NUMBER OF ROUTINGS= 0.21

SUBROUTINE RUNOFF CROSS SECTION 43
AREA= 0.24 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.15
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
1.23	312.704	(RUNOFF)
2.28	2539.261	(RUNOFF)
2.48	2014.386	(RUNOFF)
3.88	420.585	(RUNOFF)
4.35	415.223	(RUNOFF)
5.17	252.602	(RUNOFF)
5.93	265.015	(RUNOFF)

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.24

TIME											
0.15	DISCHG	0.00	20.39	28.12	97.79	138.42	164.28	181.79	307.66	264.36	369.23
1.65	DISCHG	401.85	527.61	627.01	789.28	2476.28	1864.69	1912.21	961.95	674.22	510.66
3.15	DISCHG	494.05	492.88	407.24	402.59	315.23	419.65	271.77	249.25	414.65	285.05
4.65	DISCHG	251.04	246.89	246.92	246.94	246.96	201.44	167.67	176.87	237.33	246.22
6.15	DISCHG	71.16	7.15	0.16	0.00						

SUBROUTINE ADDHYD CROSS SECTION 43
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	7507.297	2219.31
3.88	1338.541	2216.49
4.37	1226.502	2216.41
5.17	835.404	2216.13
5.94	833.292	2216.13

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.79

TIME											
0.15	DISCHG	0.00	45.95	71.21	256.62	412.18	515.47	584.45	874.46	913.42	1154.38
1.65	DISCHG	1223.90	1670.69	1975.24	2284.07	7102.54	6480.99	6364.26	4083.08	2680.24	1908.54
3.15	DISCHG	1688.47	1648.69	1471.80	1318.32	1143.37	1334.72	1018.56	868.54	1219.28	1041.39
4.65	DISCHG	882.89	833.60	824.28	823.15	823.21	725.09	598.12	582.11	737.68	804.84
6.15	DISCHG	415.52	110.85	18.82	2.21	0.08	0.00				

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.6075 CFS-HRS= 9090.68 ACRE-FT= 751.25

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SUBROUTINE ADDHYD    CROSS SECTION  44
           INPUT HYDROGRAPHS= 3,4     OUTPUT HYDROGRAPH= 1

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.30                       8870.533                     2218.81
               3.88                       1563.489                     2216.32
               4.37                       1440.848                     2216.26
               5.17                        971.651                     2216.02
               5.94                        973.564                     2216.03

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.92
   0.15    DISCHG        0.00     55.32     84.10    306.01    484.84    602.98    681.91   1029.60   1061.52   1350.55
   1.65    DISCHG     1427.63   1959.00   2306.99   2670.64   8437.83   7493.24   7403.09   4648.62   3066.35   2192.21
   3.15    DISCHG     1957.15   1915.67   1702.47   1528.74   1322.02   1559.07   1171.44   1005.16   1433.36   1202.35
   4.65    DISCHG     1020.53    967.63    958.03    956.91    956.98    839.27    690.34    676.88    863.88    937.39
   6.15    DISCHG      465.69    117.72     19.46      2.21      0.08      0.00

           TOTAL WATER, IN INCHES ON DRAINAGE AREA=  17.5860        CFS-HRS=    10555.01        ACRE-FT=     872.26

SUBROUTINE REACH     CROSS SECTION  45
           LENGTH=   3800.00     INPUT COEFFICIENT=  0.0000     INPUT ROUTINGS=  0.00

           AVERAGE WATER VELOCITY=  24.645       AVERAGE ROUTING COEFF= 0.9354       NUMBER OF ROUTINGS=  0.26

SUBROUTINE RUNOFF    CROSS SECTION  45
           AREA=   0.25     INPUT RUNOFF CURVE=  90.0     TIME OF CONCENTRATION=  0.23
           COMPUTED CURVE NO. =   90.0

******************** WARNING MAIN TIME INCREMENT CHECK ********************

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.30                       2364.489                     (RUNOFF)
               2.48                       2071.582                     (RUNOFF)
               3.86                        413.113                     (RUNOFF)
               4.39                        365.969                     (RUNOFF)
               5.17                        260.038                     (RUNOFF)
               5.95                        253.860                     (RUNOFF)

   TIME                                HYDROGRAPH, TZERO=   0.15        DELTA T= 0.15        DRAINAGE AREA=   0.25
   0.15    DISCHG        0.00     11.31     18.42     75.36    124.95    158.22    180.75    251.63    298.36    353.65
   1.65    DISCHG      354.49    537.93    593.57    654.77   2247.84   1974.74   1999.59   1353.10    870.79    609.71
   3.15    DISCHG      532.70    516.35    476.37    392.25    378.99    409.95    324.80    273.24    361.19    338.41
   4.65    DISCHG      277.00    261.87    258.04    257.22    257.25    234.90    188.01    179.99    228.22    249.76
   6.15    DISCHG      151.98     38.03      8.46      1.40      0.00

SUBROUTINE ADDHYD    CROSS SECTION  45
           INPUT HYDROGRAPHS= 1,2     OUTPUT HYDROGRAPH= 3

           PEAK TIMES                  PEAK DISCHARGES              PEAK ELEVATIONS
               2.42                       9731.835                     2033.15
```

3.87	1912.314	2031.20
4.39	1702.402	2031.13
5.95	1187.586	2030.89

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.7122 CFS-HRS= 13488.49 ACRE-FT= 1114.68

SUBROUTINE RUNOFF CROSS SECTION 46
AREA= 0.20 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.23
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	1891.607	(RUNOFF)
2.48	1657.293	(RUNOFF)
3.86	330.513	(RUNOFF)
4.39	292.804	(RUNOFF)
5.17	208.024	(RUNOFF)
5.95	204.711	(RUNOFF)

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.20

TIME											
0.15	DISCHG	0.00	9.05	14.74	60.28	99.96	126.57	144.60	201.30	238.69	282.92
1.65	DISCHG	283.59	430.34	474.86	523.82	1798.28	1579.79	1599.67	1082.48	696.63	487.77
3.15	DISCHG	426.16	413.08	381.09	313.80	303.19	327.96	259.84	218.59	288.95	270.73
4.65	DISCHG	221.60	209.49	206.43	205.78	205.80	187.92	150.40	143.99	182.57	199.80
6.15	DISCHG	121.58	30.43	6.77	1.12	0.00					

SUBROUTINE ADDHYD CROSS SECTION 47
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.41	11301.310	2033.48
3.87	2242.901	2031.31
4.39	1995.609	2031.23
5.95	1392.545	2031.02

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.6962 CFS-HRS= 15760.45 ACRE-FT= 1302.44

SUBROUTINE REACH CROSS SECTION 48
LENGTH= 5000.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 23.449 AVERAGE ROUTING COEFF= 0.9324 NUMBER OF ROUTINGS= 0.36

SUBROUTINE RUNOFF CROSS SECTION 48
AREA= 0.29 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.33
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.48	2311.479	(RUNOFF)
4.48	411.567	(RUNOFF)
5.98	276.103	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 48
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.47	13822.421	1888.86
3.83	2645.663	1885.71
4.47	2326.088	1885.57
5.98	1592.959	1885.25

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8370 CFS-HRS= 19224.16 ACRE-FT= 1588.68

SUBROUTINE RESVOR STRUCTURE 7
SURFACE ELEVATION= 1884.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.57	13268.789	1934.92
4.52	2226.576	1928.49
6.05	1448.145	1927.76

19"

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 1.66

TIME											
0.15	DISCHG	0.00	13.51	51.75	156.39	229.98	270.65	302.67	329.93	353.13	371.17
0.15	ELEV	1884.00	1884.81	1887.13	1893.47	1899.65	1904.80	1909.48	1913.82	1917.84	1921.23
1.65	DISCHG	386.44	695.33	1715.36	3401.35	6406.78	11195.35	13222.19	12247.45	9407.30	6558.96
1.65	ELEV	1924.28	1926.69	1928.06	1929.47	1931.45	1933.90	1934.90	1934.42	1933.03	1931.54
3.15	DISCHG	4852.37	3940.91	3552.71	3214.54	2875.58	2686.63	2565.96	2307.51	2151.89	2225.04
3.15	ELEV	1930.50	1929.92	1929.59	1929.31	1929.03	1928.87	1928.77	1928.55	1928.42	1928.48
4.65	DISCHG	2187.44	1991.12	1833.18	1758.51	1730.88	1688.44	1595.07	1484.84	1417.34	1445.76
4.65	ELEV	1928.45	1928.29	1928.16	1928.09	1928.07	1928.04	1927.94	1927.80	1927.72	1927.76
6.15	DISCHG	1441.91	1241.38	900.68	684.93	529.19	405.40	392.10	388.96	385.84	382.75
6.15	ELEV	1927.75	1927.50	1927.08	1926.66	1926.30	1926.02	1925.42	1924.79	1924.16	1923.55
7.65	DISCHG	379.68	376.63	373.62	370.62	367.65	364.50	359.56	354.69	349.89	345.15
7.65	ELEV	1922.93	1922.32	1921.72	1921.12	1920.53	1919.90	1919.01	1918.12	1917.25	1916.39
9.15	DISCHG	338.84	331.29	323.91	315.71	305.70	296.00	283.26	269.55	252.11	233.58
9.15	ELEV	1915.30	1914.04	1912.81	1911.49	1909.95	1908.46	1906.60	1904.65	1902.38	1900.07
10.65	DISCHG	207.35	121.76	47.55	18.57	7.25	2.83	1.10	0.43	0.16	0.06
10.65	ELEV	1897.06	1891.38	1886.88	1885.12	1884.43	1884.17	1884.06	1884.02	1884.01	1884.00
12.15	DISCHG	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00		
12.15	ELEV	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00	1884.00		

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.9131 CFS-HRS= 19306.19 ACRE-FT= 1595.46

SUBROUTINE REACH CROSS SECTION 49
LENGTH= 5200.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 24.243 AVERAGE ROUTING COEFF= 0.9344 NUMBER OF ROUTINGS= 0.37

SUBROUTINE RUNOFF CROSS SECTION 49
AREA= 0.16 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.36
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.48	1247.193	(RUNOFF)
4.48	226.005	(RUNOFF)
6.00	150.519	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 49
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.62	14076.425	1734.90
4.46	2424.538	1731.61
6.00	1585.931	1731.24

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8971 CFS-HRS= 21137.04 ACRE-FT= 1746.76

SUBROUTINE RUNOFF CROSS SECTION 50
AREA= 0.13 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.24
COMPUTED CURVE NO. = 90.0

********** WARNING MAIN TIME INCREMENT CHECK **********

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.30	1200.132	(RUNOFF)
2.47	1072.890	(RUNOFF)
3.86	214.010	(RUNOFF)
4.40	187.699	(RUNOFF)
5.17	135.097	(RUNOFF)
5.95	131.827	(RUNOFF)

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 0.13

TIME											
0.15	DISCHG	0.00	5.30	9.17	37.63	63.63	81.33	93.32	127.92	155.93	181.51
1.65	DISCHG	183.95	276.55	307.23	333.18	1133.72	1027.35	1037.63	725.98	464.95	324.66
3.15	DISCHG	279.74	268.98	250.54	204.06	199.13	212.25	171.43	143.49	184.72	177.57
4.65	DISCHG	145.10	136.57	134.39	133.75	133.77	123.14	98.82	93.83	117.40	129.24
6.15	DISCHG	82.72	22.19	5.36	1.03	0.02	0.00				

SUBROUTINE ADDHYD CROSS SECTION 51
INPUT HYDROGRAPHS= 1,3 OUTPUT HYDROGRAPH= 2

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 1 AND 3 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.61	15013.584	1735.16
4.43	2607.677	1731.69
5.96	1717.185	1731.30

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8792 CFS-HRS= 22615.84 ACRE-FT= 1868.97

SUBROUTINE REACH CROSS SECTION 53
LENGTH= 1650.00 INPUT COEFFICIENT= 0.0000 INPUT ROUTINGS= 0.00

AVERAGE WATER VELOCITY= 21.425 AVERAGE ROUTING COEFF= 0.9264 NUMBER OF ROUTINGS= 0.13

SUBROUTINE RUNOFF CROSS SECTION 53
AREA= 0.06 INPUT RUNOFF CURVE= 90.0 TIME OF CONCENTRATION= 0.20
COMPUTED CURVE NO. = 90.0

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.29	609.052	(RUNOFF)
2.48	498.730	(RUNOFF)
3.87	101.575	(RUNOFF)
4.37	92.845	(RUNOFF)
5.17	62.631	(RUNOFF)
5.94	63.242	(RUNOFF)

SUBROUTINE ADDHYD CROSS SECTION 53
INPUT HYDROGRAPHS= 1,2 OUTPUT HYDROGRAPH= 3

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.62	15191.861	1700.95
5.95	1777.118	1696.46

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 17.8733 CFS-HRS= 23300.49 ACRE-FT= 1925.55

SUBROUTINE ADDHYD CROSS SECTION 56
INPUT HYDROGRAPHS= 3,6 OUTPUT HYDROGRAPH= 4

DUE TO STORAGE OVERFLOW, THE SUM OF HYDROGRAPHS 3 AND 6 WAS TRUNCATED HERE TO 100 VALUES.

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.58	43384.406	1704.62
5.95	5253.586	1697.12
14.38	7.480	1695.00
14.69	7.328	1695.00

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 18.1626 CFS-HRS= 67633.70 ACRE-FT= 5589.24

SUBROUTINE RESVOR STRUCTURE 4
SURFACE ELEVATION= 1695.00

PEAK TIMES	PEAK DISCHARGES	PEAK ELEVATIONS
2.65	42052.398	1732.28
5.93	5164.610	1719.27

19"

HYDROGRAPH, TZERO= 0.15 DELTA T= 0.15 DRAINAGE AREA= 5.76

TIME											
0.15	DISCHG	0.00	54.20	174.44	340.47	455.15	547.48	630.01	675.96	734.52	773.00
0.15	ELEV	1695.00	1695.87	1697.61	1700.65	1703.10	1705.51	1708.00	1709.61	1711.66	1713.20
1.65	DISCHG	810.72	1191.45	2755.23	7733.27	18287.96	30779.42	39933.21	41728.75	35359.21	26672.29
1.65	ELEV	1714.78	1716.46	1718.30	1720.26	1723.95	1728.33	1731.54	1732.17	1729.94	1726.89

3.15	DISCHG	19704.64	15511.75	13241.43	11724.95	10534.32	9810.19	9181.56	8355.91	7934.47	7908.77
3.15	ELEV	1724.45	1722.98	1722.19	1721.66	1721.24	1720.98	1720.76	1720.47	1720.33	1720.32
4.65	DISCHG	7689.33	7236.44	6819.64	6523.51	6305.57	6106.90	5779.22	5370.61	5137.53	5149.59
4.65	ELEV	1720.24	1720.08	1719.93	1719.81	1719.72	1719.64	1719.51	1719.35	1719.26	1719.26
6.15	DISCHG	5000.28	4309.41	3307.40	2418.03	1939.15	1813.63	1683.20	1553.73	1393.05	1282.06
6.15	ELEV	1719.20	1718.92	1718.52	1718.17	1717.87	1717.56	1717.23	1716.95	1716.73	1716.59
7.65	DISCHG	1204.79	1150.32	1111.29	1082.71	1061.19	1044.35	1030.41	1018.12	1006.72	995.86
7.65	ELEV	1716.48	1716.41	1716.36	1716.32	1716.29	1716.27	1716.25	1716.23	1716.22	1716.20
9.15	DISCHG	985.22	974.40	963.17	951.53	939.34	926.41	912.51	897.34	880.54	861.77
9.15	ELEV	1716.19	1716.17	1716.16	1716.14	1716.13	1716.11	1716.09	1716.07	1716.05	1716.02
10.65	DISCHG	840.48	838.46	835.69	831.77	827.20	822.31	817.27	812.13	806.90	801.58
10.65	ELEV	1716.00	1715.93	1715.82	1715.65	1715.46	1715.26	1715.05	1714.83	1714.62	1714.39
12.15	DISCHG	796.16	790.64	784.98	779.19	773.24	767.08	760.69	754.08	747.14	735.17
12.15	ELEV	1714.17	1713.94	1713.70	1713.46	1713.21	1712.96	1712.69	1712.42	1712.13	1711.69
13.65	DISCHG	718.11	699.12	679.21	658.26	635.88	592.69	545.30	501.71	405.02	315.27
13.65	ELEV	1711.09	1710.42	1709.72	1708.99	1708.20	1706.87	1705.45	1704.14	1702.03	1700.11

TOTAL WATER, IN INCHES ON DRAINAGE AREA= 18.2049 CFS-HRS= 67791.37 ACRE-FT= 5602.27

ENDCMP 1

SUMMARY TABLE 1

	ALT	STORM	ID	DA SQ-MI.	RAIN TBLE	AMC	DELTA-T HRS.	TZERO HRS.	PRECIP IN.	PRECIP DURATION	PEAK-Q CFS	PEAK-TIME	PEAK-ELEV	RUNOFF IN.	CSM
*	1	1	11X	0.71	2	2	0.15	0.00	3.20	6.00	761.53	2.51	0.00	2.15	1072.58
*	1	1	12X	1.15	2	2	0.15	0.00	3.20	6.00	1139.07	2.62	1972.75	2.19	990.50
*	1	1	13X	0.42	2	2	0.15	0.00	3.20	6.00	523.41	2.29	0.00	2.13	1246.22
*	1	1	14X	0.63	2	2	0.15	0.00	3.20	6.00	698.85	2.47	1972.22	2.19	1091.95
*	1	1	15X	1.78	2	2	0.15	0.00	3.20	6.00	1794.00	2.56	1973.23	2.19	1002.23
*	1	1	16X	2.26	2	2	0.15	0.00	3.20	6.00	2200.53	2.72	1818.10	2.18	969.39
*	1	1	6S	2.26	2	2	0.15	0.00	3.20	6.00	449.54	4.39	1833.72	2.18	198.03
*	1	1	52X	0.79	2	2	0.15	0.00	3.20	6.00	528.56	2.64	1695.36	6.31	660.70
*	1	1	21X	0.27	2	2	0.15	0.00	3.20	6.00	310.45	2.31	0.00	2.14	1149.83
*	1	1	22X	0.52	2	2	0.15	0.00	3.20	6.00	531.61	2.52	1890.46	2.19	1022.34
*	1	1	23X	0.21	2	2	0.15	0.00	3.20	6.00	261.70	2.29	0.00	2.13	1246.22
*	1	1	24X	0.46	2	2	0.15	0.00	3.20	6.00	487.73	2.49	1890.58	2.18	1060.29
*	1	1	25X	0.98	2	2	0.15	0.00	3.20	6.00	1018.52	2.50	1890.88	2.18	1039.31
*	1	1	26X	1.14	2	2	0.15	0.00	3.20	6.00	1162.17	2.58	1785.00	2.18	1019.45
*	1	1	27X	0.24	2	2	0.15	0.00	3.20	6.00	290.45	2.30	0.00	2.14	1210.22
*	1	1	28X	0.50	2	2	0.15	0.00	3.20	6.00	513.55	2.51	1784.72	2.19	1027.11
*	1	1	31X	1.63	2	2	0.15	0.00	3.20	6.00	1671.07	2.57	1785.66	2.18	1018.94
*	1	1	30X	0.39	2	2	0.15	0.00	3.20	6.00	414.48	2.48	1784.61	2.18	1062.76
*	1	1	32X	2.02	2	2	0.15	0.00	3.20	6.00	2077.05	2.55	1785.93	2.18	1023.18
*	1	1	11S	2.02	2	2	0.15	0.00	3.20	6.00	325.19	5.12	1809.03	2.21	160.19
*	1	1	33X	2.14	2	2	0.15	0.00	3.20	6.00	391.23	2.57	1726.00	2.18	181.96
*	1	1	34X	0.24	2	2	0.15	0.00	3.20	6.00	259.62	2.51	0.00	2.15	1081.75
*	1	1	35X	0.23	2	2	0.15	0.00	3.20	6.00	281.45	2.30	0.00	2.13	1223.69
*	1	1	36X	0.47	2	2	0.15	0.00	3.20	6.00	534.30	2.31	1796.04	2.14	1136.81
*	1	1	38X	0.61	2	2	0.15	0.00	3.20	6.00	698.71	2.31	1790.99	2.14	1145.43
*	1	1	39X	0.74	2	2	0.15	0.00	3.20	6.00	843.87	2.31	1725.83	2.14	1140.36
*	1	1	40X	2.88	2	2	0.15	0.00	3.20	6.00	1202.57	2.51	1725.83	2.17	416.11
*	1	1	54X	2.94	2	2	0.15	0.00	3.20	6.00	1201.66	2.52	1696.05	2.18	407.34
*	1	1	55X	3.74	2	2	0.15	0.00	3.20	6.00	1712.87	2.55	1696.08	3.06	456.76
*	1	1	41X	0.13	2	2	0.15	0.00	3.20	6.00	161.02	2.29	0.00	2.13	1238.68
*	1	1	42X	0.56	2	2	0.15	0.00	3.20	6.00	657.93	2.30	0.00	2.14	1174.88
*	1	1	43X	0.79	2	2	0.15	0.00	3.20	6.00	869.08	2.49	2216.16	2.16	1086.35
*	1	1	44X	0.92	2	2	0.15	0.00	3.20	6.00	1016.07	2.49	2216.05	2.16	1092.55
*	1	1	45X	1.18	2	2	0.15	0.00	3.20	6.00	1242.38	2.52	2030.93	2.18	1052.86
*	1	1	47X	1.37	2	2	0.15	0.00	3.20	6.00	1460.29	2.52	2031.04	2.17	1058.18
*	1	1	48X	1.66	2	2	0.15	0.00	3.20	6.00	1679.20	2.62	1885.29	2.19	1005.51
*	1	1	7S	1.66	2	2	0.15	0.00	3.20	6.00	377.95	4.04	1922.59	2.19	226.32
*	1	1	49X	1.82	2	2	0.15	0.00	3.20	6.00	467.74	2.72	1730.45	2.18	255.59
*	1	1	51X	1.95	2	2	0.15	0.00	3.20	6.00	584.48	2.60	1730.56	2.18	298.20
*	1	1	53X	2.01	2	2	0.15	0.00	3.20	6.00	628.92	2.61	1695.71	2.18	311.35
*	1	1	56X	5.76	2	2	0.15	0.00	3.20	6.00	2337.05	2.57	1696.28	2.75	405.03
*	1	1	4S	5.76	2	2	0.15	0.00	3.20	6.00	1292.83	4.78	1716.60	2.76	224.06
*	1	2	11X	0.71	1	2	0.25	0.00	4.20	24.50	1251.39	11.96	0.00	3.15	1762.52
*	1	2	12X	1.15	1	2	0.25	0.00	4.20	24.50	1761.89	12.05	1973.32	3.14	1532.08
*	1	2	13X	0.42	1	2	0.25	0.00	4.20	24.50	804.12	11.91	0.00	3.12	1914.57
*	1	2	14X	0.63	1	2	0.25	0.00	4.20	24.50	1106.39	11.98	1972.52	3.13	1728.74
*	1	2	15X	1.78	1	2	0.25	0.00	4.20	24.50	2851.63	12.02	1974.12	3.14	1593.09
*	1	2	16X	2.26	1	2	0.25	0.00	4.20	24.50	3112.00	12.19	1819.10	3.14	1370.92
*	1	2	6S	2.26	1	2	0.25	0.00	4.20	24.50	482.68	13.20	1836.78	3.13	212.63
*	1	2	52X	0.79	1	2	0.25	0.00	4.20	24.50	603.00	12.01	1695.41	10.42	753.75
*	1	2	21X	0.27	1	2	0.25	0.00	4.20	24.50	493.99	11.94	0.00	3.15	1829.61
*	1	2	22X	0.52	1	2	0.25	0.00	4.20	24.50	845.02	12.01	1890.74	3.14	1625.04
*	1	2	23X	0.21	1	2	0.25	0.00	4.20	24.50	402.06	11.91	0.00	3.17	1914.57

*	1	2	24X	0.46	1	2	0.25	0.00	4.20	24.50	788.95	11.98	1890.94	3.15	1715.11	
*	1	2	25X	0.98	1	2	0.25	0.00	4.20	24.50	1630.84	11.99	1891.19	3.14	1664.13	
*	1	2	26X	1.14	1	2	0.25	0.00	4.20	24.50	1730.27	12.03	1785.24	3.14	1517.78	
*	1	2	27X	0.24	1	2	0.25	0.00	4.20	24.50	472.91	11.90	0.00	3.18	1970.45	
*	1	2	28X	0.50	1	2	0.25	0.00	4.20	24.50	831.68	12.01	1785.07	3.15	1663.36	
*	1	2	31X	1.63	1	2	0.25	0.00	4.20	24.50	2560.08	12.03	1786.15	3.14	1561.02	
*	1	2	30X	0.39	1	2	0.25	0.00	4.20	24.50	673.76	11.99	1785.00	3.14	1727.59	
*	1	2	32X	2.02	1	2	0.25	0.00	4.20	24.50	3229.87	12.02	1786.42	3.13	1591.07	
*	1	2	11S	2.02	1	2	0.25	0.00	4.20	24.50	342.24	13.26	1811.87	3.09	168.59	
*	1	2	33X	2.14	1	2	0.25	0.00	4.20	24.50	495.44	11.99	1726.12	3.12	230.44	
*	1	2	34X	0.24	1	2	0.25	0.00	4.20	24.50	427.07	11.95	0.00	3.15	1779.48	
*	1	2	35X	0.23	1	2	0.25	0.00	4.20	24.50	433.97	11.92	0.00	3.16	1886.82	
*	1	2	36X	0.47	1	2	0.25	0.00	4.20	24.50	859.72	11.94	1796.34	3.16	1829.20	
*	1	2	38X	0.61	1	2	0.25	0.00	4.20	24.50	1118.88	11.94	1791.28	3.16	1834.24	
*	1	2	39X	0.74	1	2	0.25	0.00	4.20	24.50	1354.33	11.94	1726.16	3.15	1830.18	
*	1	2	40X	2.88	1	2	0.25	0.00	4.20	24.50	1845.53	11.95	1726.12	3.12	638.59	
*	1	2	54X	2.94	1	2	0.25	0.00	4.20	24.50	1826.83	11.99	1696.32	3.12	619.26	
*	1	2	55X	3.74	1	2	0.25	0.00	4.20	24.50	2428.90	11.99	1696.31	4.68	647.70	
*	1	2	41X	0.13	1	2	0.25	0.00	4.20	24.50	246.81	11.92	0.00	3.16	1898.56	
*	1	2	42X	0.56	1	2	0.25	0.00	4.20	24.50	1036.84	11.93	0.00	3.16	1851.51	
*	1	2	43X	0.79	1	2	0.25	0.00	4.20	24.50	1420.60	11.95	2216.54	3.16	1775.75	
*	1	2	44X	0.92	1	2	0.25	0.00	4.20	24.50	1665.68	11.95	2216.37	3.16	1791.06	
*	1	2	45X	1.18	1	2	0.25	0.00	4.20	24.50	1962.14	11.98	2031.21	3.15	1662.83	
*	1	2	47X	1.37	1	2	0.25	0.00	4.20	24.50	2319.13	11.98	2031.34	3.15	1680.53	
*	1	2	48X	1.66	1	2	0.25	0.00	4.20	24.50	2465.60	12.05	1885.64	3.14	1488.38	
*	1	2	7S	1.66	1	2	0.25	0.00	4.20	24.50	548.02	12.83	1926.35	3.13	328.15	
*	1	2	49X	1.82	1	2	0.25	0.00	4.20	24.50	577.46	12.10	1730.55	3.14	315.55	
*	1	2	51X	1.95	1	2	0.25	0.00	4.20	24.50	792.50	12.03	1730.76	3.14	404.33	
*	1	2	53X	2.01	1	2	0.25	0.00	4.20	24.50	856.58	12.03	1695.98	3.14	424.05	
*	1	2	56X	5.76	1	2	0.25	0.00	4.20	24.50	3281.06	12.00	1696.57	4.15	568.64	
*	1	2	4S	5.76	1	2	0.25	0.00	4.20	24.50	1499.40	12.87	1716.88	4.15	259.86	<100 yr
*	1	3	11X	0.71	2	2	0.15	0.00	7.30	6.00	2217.63	2.31	0.00	6.07	3123.43	
*	1	3	12X	1.15	2	2	0.15	0.00	7.30	6.00	3233.80	2.51	1974.67	6.19	2812.00	
*	1	3	13X	0.42	2	2	0.15	0.00	7.30	6.00	1553.15	2.28	0.00	6.01	3697.99	
*	1	3	14X	0.63	2	2	0.15	0.00	7.30	6.00	1976.85	2.44	1973.17	6.14	3088.83	
*	1	3	15X	1.78	2	2	0.15	0.00	7.30	6.00	5301.01	2.47	1976.20	6.17	2961.46	
*	1	3	16X	2.26	2	2	0.15	0.00	7.30	6.00	6293.10	2.64	1822.57	6.17	2772.29	
*	1	3	6S	2.26	2	2	0.15	0.00	7.30	6.00	5184.79	2.91	1840.57	6.16	2284.05	
*	1	3	52X	0.79	2	2	0.15	0.00	7.30	6.00	528.78	4.79	1695.36	6.31	660.98	
*	1	3	21X	0.27	2	2	0.15	0.00	7.30	6.00	935.21	2.29	0.00	6.03	3463.74	
*	1	3	22X	0.52	2	2	0.15	0.00	7.30	6.00	1565.57	2.46	1891.17	6.17	3010.71	
*	1	3	23X	0.21	2	2	0.15	0.00	7.30	6.00	776.57	2.28	0.00	6.01	3697.99	
*	1	3	24X	0.46	2	2	0.15	0.00	7.30	6.00	1387.14	2.45	1891.31	6.14	3015.54	
*	1	3	25X	0.98	2	2	0.15	0.00	7.30	6.00	2951.72	2.46	1891.75	6.16	3011.96	
*	1	3	26X	1.14	2	2	0.15	0.00	7.30	6.00	3292.03	2.53	1785.89	6.15	2887.74	
*	1	3	27X	0.24	2	2	0.15	0.00	7.30	6.00	843.88	2.28	0.00	6.05	3516.16	
*	1	3	28X	0.50	2	2	0.15	0.00	7.30	6.00	1513.48	2.46	1785.50	6.18	3026.97	
*	1	3	31X	1.63	2	2	0.15	0.00	7.30	6.00	4724.30	2.51	1787.02	6.16	2880.67	
*	1	3	30X	0.39	2	2	0.15	0.00	7.30	6.00	1197.90	2.44	1785.35	6.16	3071.55	
*	1	3	32X	2.02	2	2	0.15	0.00	7.30	6.00	5871.57	2.50	1787.48	6.16	2892.40	
*	1	3	11S	2.02	2	2	0.15	0.00	7.30	6.00	4890.47	2.75	1815.49	6.20	2409.10	
*	1	3	33X	2.14	2	2	0.15	0.00	7.30	6.00	4595.15	2.79	1729.20	6.18	2137.28	
*	1	3	34X	0.24	2	2	0.15	0.00	7.30	6.00	768.21	2.31	0.00	6.28	3200.90	
*	1	3	35X	0.23	2	2	0.15	0.00	7.30	6.00	841.52	2.29	0.00	6.01	3658.81	
*	1	3	36X	0.47	2	2	0.15	0.00	7.30	6.00	1606.57	2.30	1797.02	6.04	3418.23	
*	1	3	38X	0.61	2	2	0.15	0.00	7.30	6.00	2100.68	2.29	1791.96	6.04	3443.74	
*	1	3	39X	0.74	2	2	0.15	0.00	7.30	6.00	2538.35	2.30	1726.73	6.04	3430.21	

*	1	3	40X	2.88	2	2	0.15	0.00	7.30	6.00	5851.17	2.74	1727.23	6.14	2024.62
*	1	3	54X	2.94	2	2	0.15	0.00	7.30	6.00	5672.87	2.79	1697.59	6.15	1923.00
*	1	3	55X	3.74	2	2	0.15	0.00	7.30	6.00	6041.32	2.78	1697.27	6.19	1611.02
*	1	3	41X	0.13	2	2	0.15	0.00	7.30	6.00	479.77	2.29	0.00	6.32	3690.57
*	1	3	42X	0.56	2	2	0.15	0.00	7.30	6.00	1977.47	2.29	0.00	6.03	3531.21
*	1	3	43X	0.79	2	2	0.15	0.00	7.30	6.00	2335.14	2.34	2217.11	6.08	2918.93
*	1	3	44X	0.92	2	2	0.15	0.00	7.30	6.00	3001.36	2.31	2217.02	6.07	3227.27
*	1	3	45X	1.18	2	2	0.15	0.00	7.30	6.00	3502.93	2.47	2031.74	6.13	2968.59
*	1	3	47X	1.37	2	2	0.15	0.00	7.30	6.00	4122.77	2.47	2031.96	6.12	2987.51
*	1	3	48X	1.66	2	2	0.15	0.00	7.30	6.00	4813.91	2.53	1886.41	6.17	2882.58
*	1	3	7S	1.66	2	2	0.15	0.00	7.30	6.00	3677.75	2.78	1929.70	6.18	2202.25
*	1	3	49X	1.82	2	2	0.15	0.00	7.30	6.00	3854.75	2.89	1732.14	6.17	2106.42
*	1	3	51X	1.95	2	2	0.15	0.00	7.30	6.00	4010.32	2.88	1732.19	6.16	2046.08
*	1	3	53X	2.01	2	2	0.15	0.00	7.30	6.00	3933.95	2.90	1697.36	6.16	1947.50
*	1	3	56X	5.76	2	2	0.15	0.00	7.30	6.00	9764.24	2.84	1698.01	6.18	1692.24
*	1	3	4S	5.76	2	2	0.15	0.00	7.30	6.00	9285.88	2.94	1720.80	6.19	1609.33
*	1	4	11X	0.71	2	2	0.15	0.00	19.00	6.00	6398.25	2.31	0.00	17.61	9011.63
*	1	4	12X	1.15	2	2	0.15	0.00	19.00	6.00	9515.46	2.47	1980.42	17.92	8274.31
*	1	4	13X	0.42	2	2	0.15	0.00	19.00	6.00	4439.19	2.28	0.00	17.46	10569.50
*	1	4	14X	0.63	2	2	0.15	0.00	19.00	6.00	5519.31	2.42	1975.78	17.77	8623.92
*	1	4	15X	1.78	2	2	0.15	0.00	19.00	6.00	14981.57	2.46	1984.40	17.87	8369.59
*	1	4	16X	2.26	2	2	0.15	0.00	19.00	6.00	18023.83	2.61	1835.35	17.90	7940.01
*	1	4	6S	2.26	2	2	0.15	0.00	19.00	6.00	17285.74	2.72	1845.26	17.88	7614.86
*	1	4	52X	0.79	2	2	0.15	0.00	19.00	6.00	5683.23	2.58	1697.20	20.14	7104.04
*	1	4	21X	0.27	2	2	0.15	0.00	19.00	6.00	2691.81	2.29	0.00	17.51	9969.69
*	1	4	22X	0.52	2	2	0.15	0.00	19.00	6.00	4400.07	2.45	1892.18	17.85	8461.67
*	1	4	23X	0.21	2	2	0.15	0.00	19.00	6.00	2219.59	2.28	0.00	17.46	10569.50
*	1	4	24X	0.46	2	2	0.15	0.00	19.00	6.00	3842.95	2.42	1892.40	17.76	8354.25
*	1	4	25X	0.98	2	2	0.15	0.00	19.00	6.00	8237.34	2.44	1893.18	17.81	8405.45
*	1	4	26X	1.14	2	2	0.15	0.00	19.00	6.00	9295.35	2.48	1787.45	17.82	8153.81
*	1	4	27X	0.24	2	2	0.15	0.00	19.00	6.00	2390.59	2.28	0.00	17.58	9960.81
*	1	4	28X	0.50	2	2	0.15	0.00	19.00	6.00	4205.82	2.44	1786.72	17.86	8411.65
*	1	4	31X	1.63	2	2	0.15	0.00	19.00	6.00	13504.74	2.47	1790.54	17.83	8234.60
*	1	4	30X	0.39	2	2	0.15	0.00	19.00	6.00	3292.45	2.42	1786.44	17.80	8442.20
*	1	4	32X	2.02	2	2	0.15	0.00	19.00	6.00	16774.26	2.46	1791.85	17.82	8263.18
*	1	4	11S	2.02	2	2	0.15	0.00	19.00	6.00	16212.44	2.55	1819.99	17.89	7986.42
*	1	4	33X	2.14	2	2	0.15	0.00	19.00	6.00	16879.48	2.57	1737.36	17.86	7850.92
*	1	4	34X	0.24	2	2	0.15	0.00	19.00	6.00	2215.68	2.30	0.00	17.62	9232.00
*	1	4	35X	0.23	2	2	0.15	0.00	19.00	6.00	2413.05	2.28	0.00	17.46	10491.54
*	1	4	36X	0.47	2	2	0.15	0.00	19.00	6.00	4620.87	2.29	1798.67	17.54	9831.63
*	1	4	38X	0.61	2	2	0.15	0.00	19.00	6.00	6041.40	2.29	1793.61	17.54	9903.94
*	1	4	39X	0.74	2	2	0.15	0.00	19.00	6.00	7302.68	2.29	1728.21	17.54	9868.50
*	1	4	40X	2.88	2	2	0.15	0.00	19.00	6.00	22758.37	2.54	1730.54	17.78	7874.87
*	1	4	54X	2.94	2	2	0.15	0.00	19.00	6.00	22704.02	2.55	1702.11	17.82	7696.28
*	1	4	55X	3.74	2	2	0.15	0.00	19.00	6.00	28367.86	2.56	1701.66	18.31	7564.76
*	1	4	41X	0.13	2	2	0.15	0.00	19.00	6.00	1373.81	2.28	0.00	17.45	10567.80
*	1	4	42X	0.56	2	2	0.15	0.00	19.00	6.00	5684.42	2.29	0.00	17.51	10150.76
*	1	4	43X	0.79	2	2	0.15	0.00	19.00	6.00	7507.29	2.30	2219.31	17.60	9384.12
*	1	4	44X	0.92	2	2	0.15	0.00	19.00	6.00	8870.53	2.30	2218.81	17.58	9538.20
*	1	4	45X	1.18	2	2	0.15	0.00	19.00	6.00	9731.83	2.42	2033.15	17.71	8247.31
*	1	4	47X	1.37	2	2	0.15	0.00	19.00	6.00	11301.31	2.41	2033.48	17.69	8189.35
*	1	4	48X	1.66	2	2	0.15	0.00	19.00	6.00	13822.42	2.47	1888.86	17.83	8276.90
*	1	4	7S	1.66	2	2	0.15	0.00	19.00	6.00	13268.78	2.57	1934.92	17.91	7945.38
*	1	4	49X	1.82	2	2	0.15	0.00	19.00	6.00	14076.42	2.62	1734.90	17.89	7692.03
*	1	4	51X	1.95	2	2	0.15	0.00	19.00	6.00	15013.58	2.61	1735.16	17.87	7659.99
*	1	4	53X	2.01	2	2	0.15	0.00	19.00	6.00	15191.86	2.62	1700.95	17.87	7520.72
*	1	4	56X	5.76	2	2	0.15	0.00	19.00	6.00	43384.40	2.58	1704.62	18.16	7518.96

4 not listed!

TRRoom

*	1	4	4S	5.76	2	2	0.15	0.00	19.00	6.00	42052.39	2.65	1732.28	18.20	7288.11

'X' OR 'S' FOLLOWING THE ID REPRESENTS CROSS-SECTION OR STRUCTURE, RESPECTIVELY.

FOUNTAIN HILLS 4/10/75
DAM #4

SOFT MATERIAL, EMERGENCY SPILLWAY, LEFT SIDE

945

FOUNTAIN HILLS 4/10/75
DAM #4

EMERGENCY SPILLWAY RIGHT ABUTMENT IN BACKGROUND, LEVEL WITH MAN'S SHOULDERS

945

FOUNTAIN HILLS 4/10/75
DAM #4

LOOKING AT DOWNSTREAM SIDE OF DAM FROM EMERGENCY SPILLWAY

945

FOUNTAIN HILLS 4/10/75

DAM #4

SOFT MATERIL, EMERGENCY SPILL WAY, LEFT SIDE

945

FOUNTAIN HILLS 4/10/75

DAM #4

EMERGENCY SPILLWAY

RIGHT ABUTMENT IN BACKGROUND, LEVEL WITH MAN'S SHOULDERS

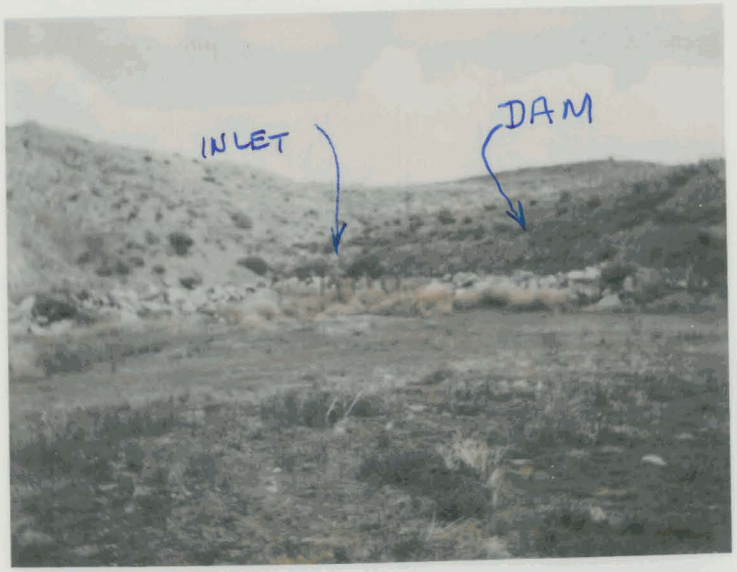
945

FOUNTAIN HILLS 4/10/75

DAM #4

LOOKING AT DOWNSTREAM SIDE OF DAM FROM EMERG. SPILLWAY

945


INLET
DAM

ABUT
TOP 5'
5'±

AN ORIGINAL POLAROID® LAND PHOTOGRAPH

SUBJECT FOUNTAIN HILLS DATE 3/13/75

NAME DAM #4

ADDRESS OUTLET BLOCKED BY TUMBLEWEEDS

For your convenience when ordering copies, indicate the number of copies desired in the appropriate box for the size(s) you select. You can get quality work by Polaroid Copy Service through your dealer or by mail.

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P558B-1 4/72 Printed in U.S.A.

AN ORIGINAL POLAROID® LAND PHOTOGRAPH

SUBJECT FOUNTAIN HILLS DATE 3/13/75

NAME DAM #4

ADDRESS EMERGENCY SPILLWAY, LOOKING S. FROM TOP DAM. ROAD AT SOUTH MARKS ELEV. OF S. ABUTMENT; A LARGE GULLEY BEYOND AND BETWEEN SKYLINE CREST

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AN ORIGINAL POLAROID® LAND PHOTOGRAPH

SUBJECT FOUNTAIN HILLS DATE 3/13/75

NAME DAM #4

ADDRESS BLOCKED INLET (TUMBLEWEED) AT TRASH STRUCTURE

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AN ORIGINAL POLAROID® LAND PHOTOGRAPH

SUBJECT FOUNTAIN HILLS DATE 3/13/75

NAME DAM #4

ADDRESS INLET BLOCKED BY TUMBLEWEEDS — POSTS DON'T STOP THIS TYPE TRASH

For your convenience when ordering copies, indicate the number of copies desired in the appropriate box for the size(s) you select. You can get quality work by Polaroid Copy Service through your dealer or by mail.

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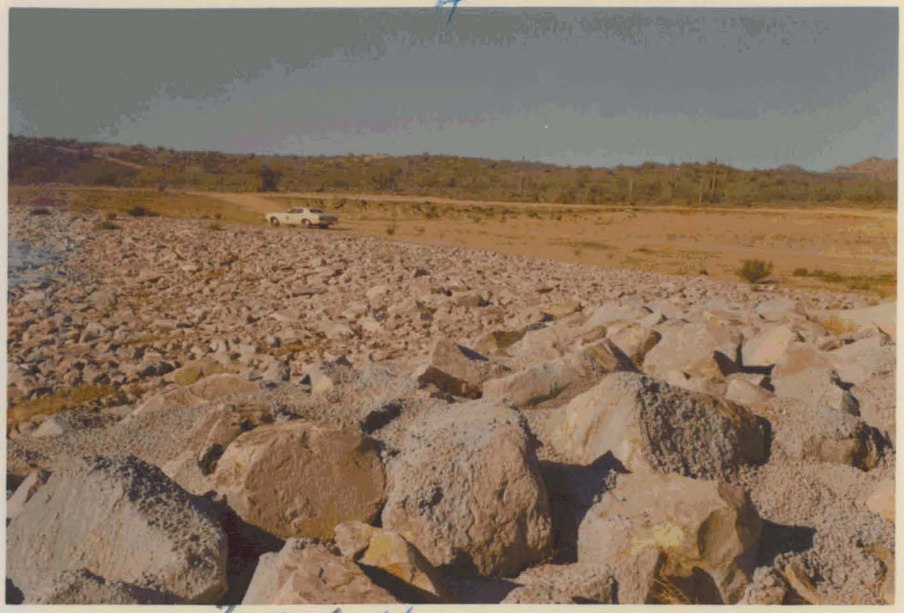
P558B-1 4/72 Printed in U.S.A.

4



Frame 16

4

Frame 15

Structure No. 4

Trash rack. Tumbleweed would seriously impede flow. Indicates how ineffective trash rack are.

Structure No. 4

Spillway. looking into reservoir. Concrete sill on upstream side of rock. Slopes (about 1.5') to right abutment. No protection on right slope. Could erode and cut channel around spillway.
Spillway located on right abutment.

AN ORIGINAL POLAROID® LAND PHOTOGRAPH

SUBJECT FOUNTAIN HILLS DATE 3/13/75

NAME DAM #4

ADDRESS OUTLET

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8 x 10 ENLARGEMENTS	
35mm SLIDES	

P558B-1 4/72

Printed in U.S.A.

MADE IN U.S.A.

STRUCTURE #4

spillway

4/75

6

MADE IN U.S.A.

STRUCTURE #4

spillway

4/75

8

MADE IN U.S.A.

STRUCTURE #4

spillway looking downstream

4/75

8

MADE IN U.S.A.

STRUCTURE #4

spillway

4/75

6

MADE IN U.S.A.

STRUCTURE #4

inlet - trash rack

4/75

10

MADE IN U.S.A.

STRUCTURE #4

inlet - trash rack

4/75

11

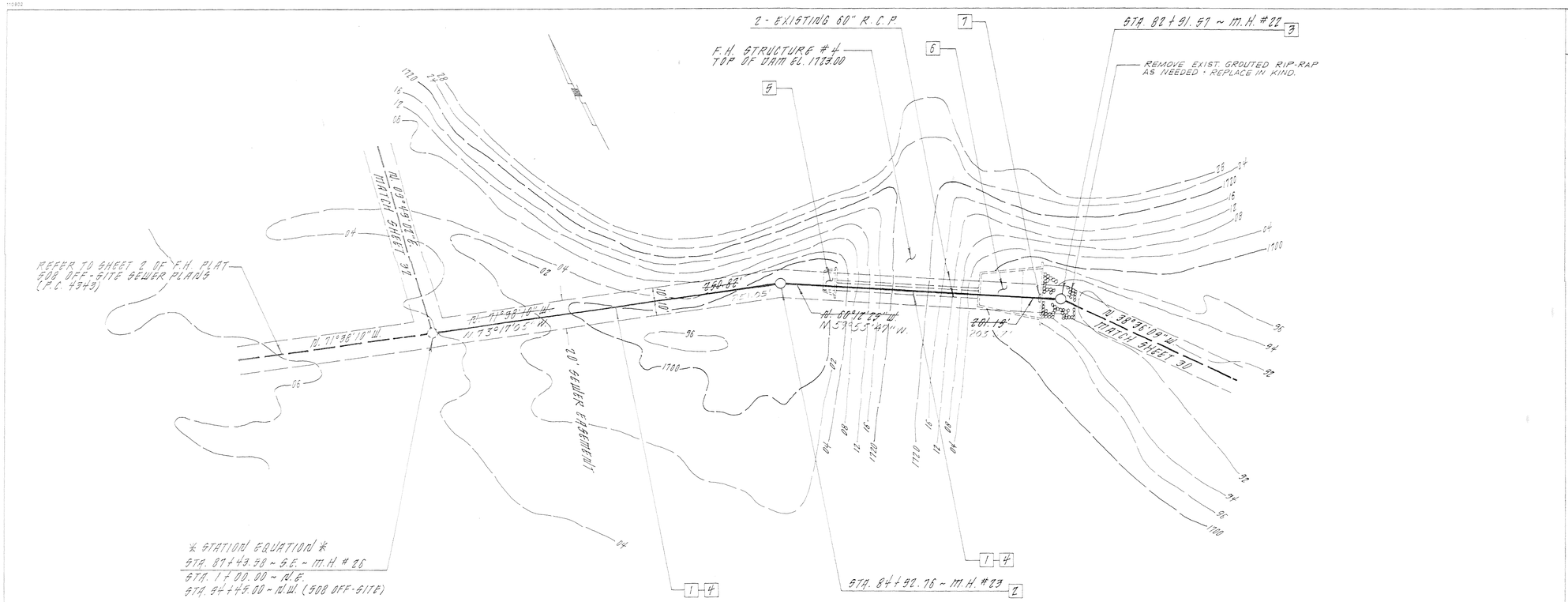
Fountain Hills

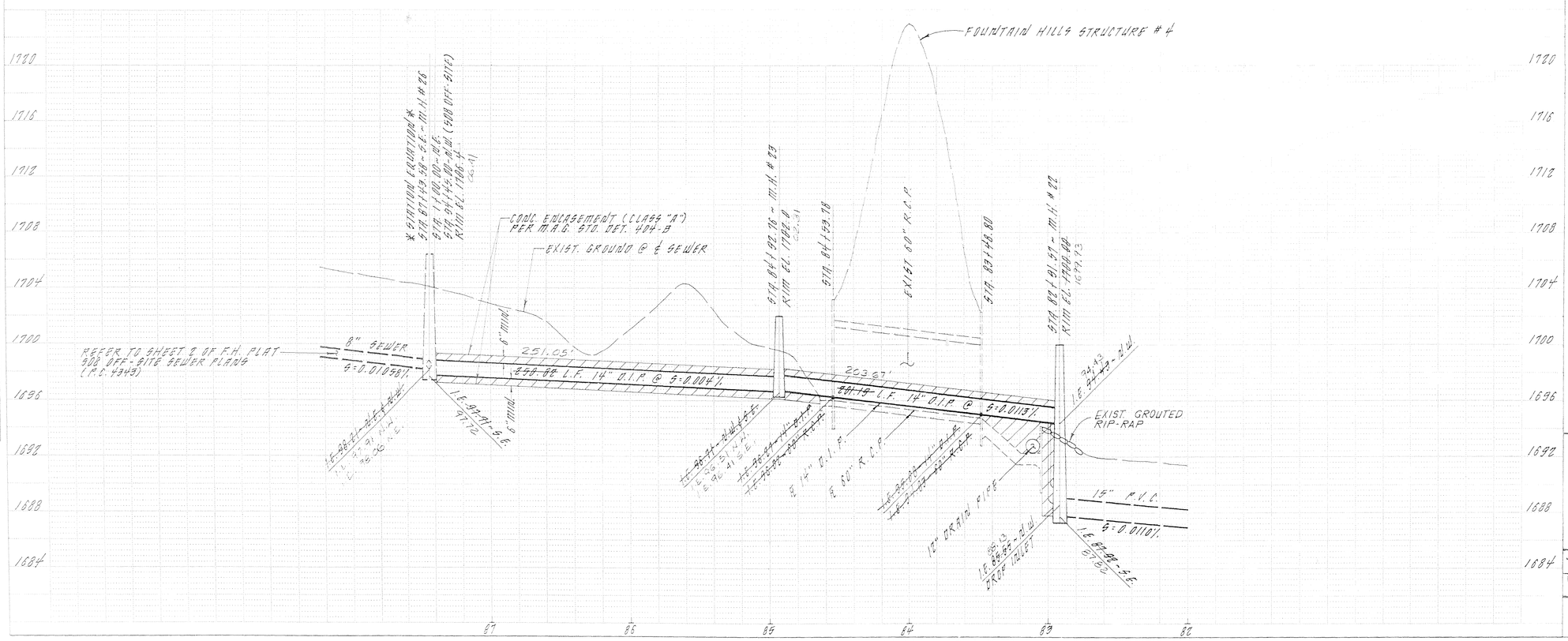
MADE IN U.S.A.

S-78

looking south

Structure #4





CONSTRUCTION NOTES

1. INSTALL 14" D.I.P. (M.J.) CLASS 50
2. CONSTRUCT SEWER MANHOLE PER M.A.G. STD. DTL. 420 W/PRESSURE (WATER TIGHT) LID PER M.A.G. STD. DTL. 523
3. CONSTRUCT SEWER MANHOLE PER M.A.G. STD. DTL. 420-B W/DROP INLET PER M.A.G. STD. DTL. 426-B AND PRESSURE (WATER TIGHT) LID PER M.A.G. STD. DTL. 523 (DTL 2 SHT 31-B)
4. ENCASE ENTIRE SEWER LINE PER M.A.G. STD. DTL. 404 TYPE "B". (MODIFIED PER DETAIL B-B SHT 31-B & DET. 1 SHT. 31-A)
5. SEE DETAIL # 1 FOR CONSTRUCTION AT INLET OF 60" R.C.P. (SHEET 31-B)
6. SEE DETAIL # 2 FOR CONSTRUCTION AT OUTLET OF 60" R.C.P. (SHEET 31-B)
7. INSTALL 3' L.F. 12" EQUALIZER DRAINAGE PIPE.

MANHOLE #	NORTH	EAST
22	33688.917	25584.046
23	33798.883	25409.445
26	33877.905	25171.357

PLAN: SURVEYED / PLOTTED / ALIGNMENT CHECKED / RT OF WAY CHECKED / NOTE BOOK NO. / BY / DATE

PROFILE: SURVEYED / PLOTTED / GRADES CHECKED / B.M. / STREET INFO. / NOTE BOOK NO. / BY / DATE

ENGINEERING DIV.

AS BUILT

REVISED 6-30-89 R.C.E.

FOUNTAIN HILLS SANITARY DISTRICT
SEWER IMPROVEMENTS
(DRAINAGE STRUCTURE # 4)
ASHBROOK WASH BETWEEN HAMPSTEAD & BAINBRIDGE

JOB NO. 4390	SCALE: HORIZ. 1"=40' VERT. 1"=4'	DESIGN BY: R.J.G. DRAWN BY: R.J.G.	SHEET 31 OF 40
DATE 5/89			

Anderson-Nelson, Inc.
CIVIL ENGINEERING, LAND PLANNING, CONSULTANTS
PHOENIX, ARIZONA (602) 273-1850

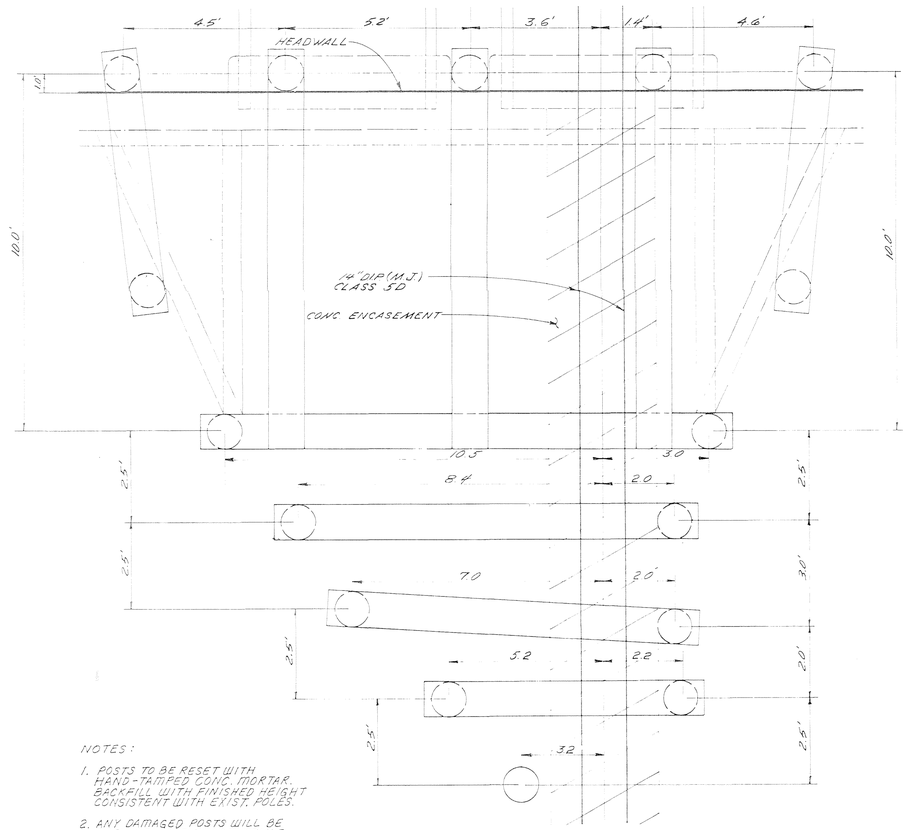
PLATE 1 SINGLE PLAN - PROFILE - DOTTED

MADE IN U.S.A.

07-33 LINE "Y"

FILM FILE E-2

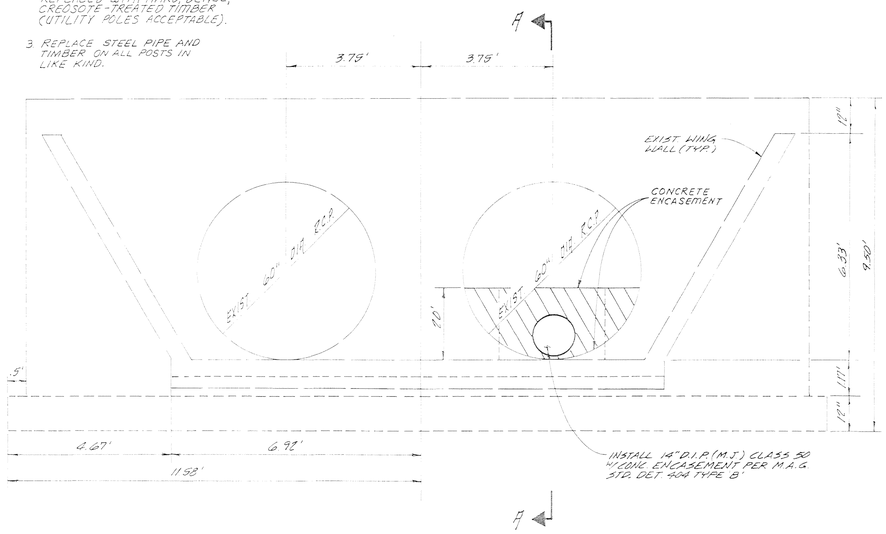
PLANVIEW



2 ADDED CROSS BRACING

NOTES:

1. POSTS TO BE RESET WITH HAND-TAMPED CONC. MORTAR. BACKFILL WITH FINISHED HEIGHT CONSISTENT WITH EXIST. POLES.
2. ANY DAMAGED POSTS WILL BE REPLACED WITH HARD, DENSE, CREOSOTE-TREATED TIMBER (UTILITY POLES ACCEPTABLE).
3. REPLACE STEEL PIPE AND TIMBER ON ALL POSTS IN LIKE KIND.

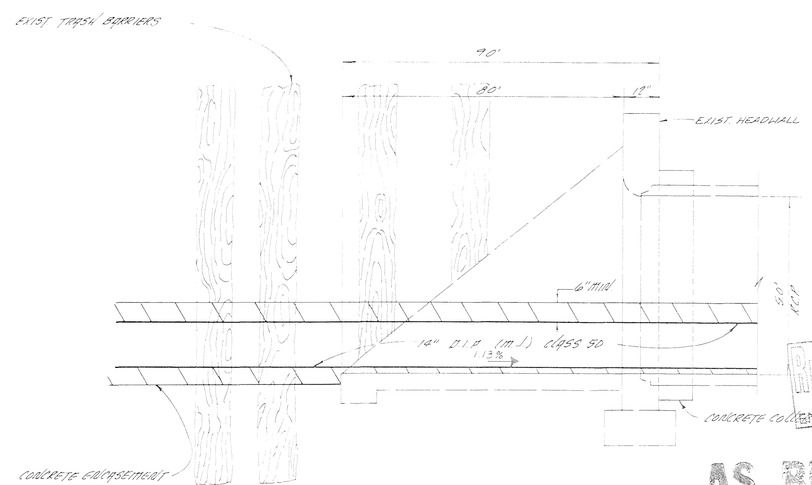


ELEVATION

DETAIL 1

2 NOTES:

1. THE OUTLET PIPE, INLET AND OUTLET CONCRETE APRONS, AND ALL GROUTED RIPRAP ADJACENT TO THE APRONS SHALL BE JETTED CLEAN BEFORE ENCASEMENT CONCRETE MAY BE POURED.
2. ALL EXISTING GROUTED RIPRAP DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED IN KIND.
3. PENCIL VIBRATORS SHALL BE USED WHEN POURING ENCASEMENT CONCRETE BETWEEN MANHOLES #22 AND #23. CARE SHOULD BE TAKEN SO THAT THE CONCRETE COMPLETELY ENCASES THE PIPE LEAVING NO VOIDS.
4. ALL CONCRETE ENCASEMENT PLACED WITHIN THE 60" DIA. OUTLET PIPE SHALL BE SMOOTH TROWELED TO A FINISH CONSISTANT WITH THAT OF THE INTERIOR SURFACE OF THE OUTLET PIPE.



SECTION A-A

FEB 1 2 '97
ENGINEERING DIV.
AS BUILT

(DRAINAGE STRUCTURE # 4)

FOUNTAIN HILLS SANITARY DISTRICT SEWER IMPROVEMENTS

Anderson-Nelson, Inc.
CIVIL ENGINEERING, LAND PLANNING, CONSULTANTS
PHOENIX, ARIZONA 273-1850

UPSTREAM DETAILS (INLET)

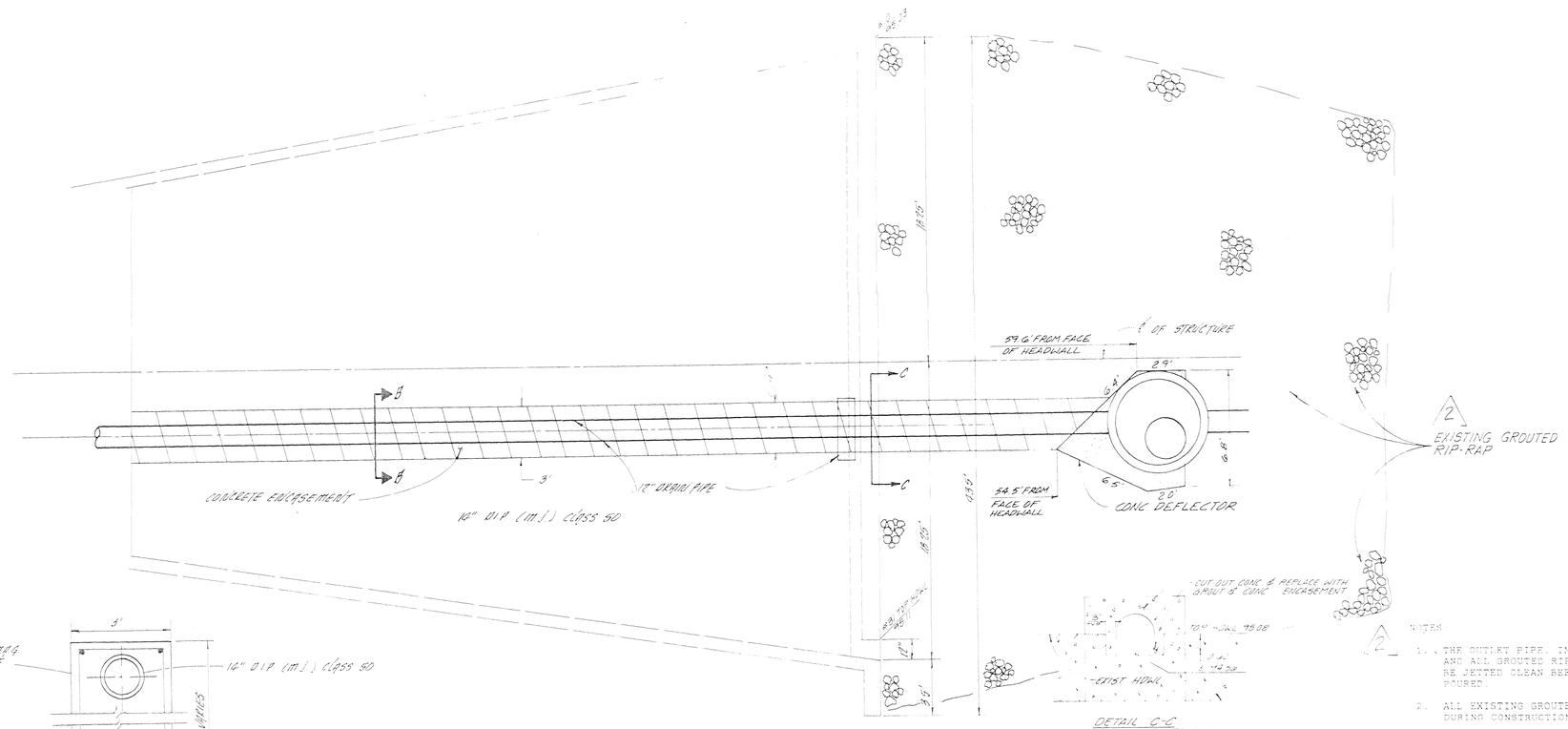
DRAWN BY	DJK	NO	DATE	BY	REVISIONS & REMARKS	SHT 31-A
SCALE	NONE	1	9/30/89	RC	REVISED	OF 40
DATE	8-89	2	7/20/89	RC	SEE △	
APPROVED						

11289 DON K. ANDERSON, JR. ARIZONA

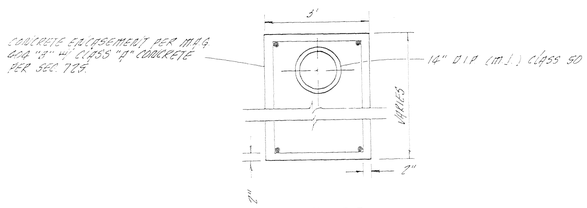
FLAT FILE 6-2

PC 4998

07-33

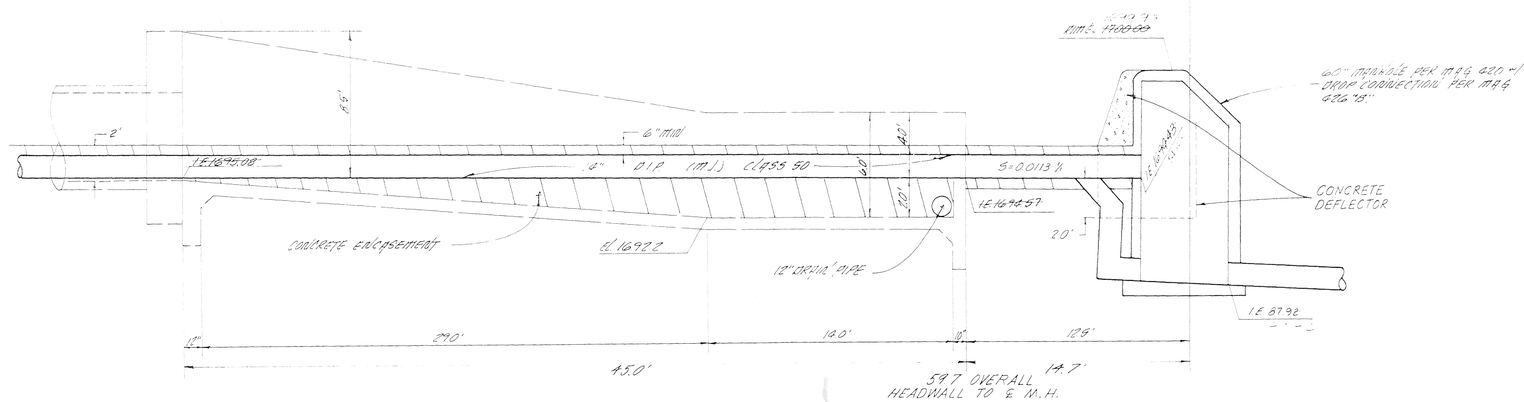


DETAIL C-C
CONCRETE ENCASEMENT
AT HEADWALL



DETAIL B-B
CONCRETE ENCASEMENT

PLAN VIEW



SECTION VIEW

DETAIL 2

NOTES:

1. THE OUTLET PIPE, INLET AND OUTLET CONCRETE APRONS, AND ALL GROUTED RIPRAP ADJACENT TO THE APRONS SHALL BE JETTED CLEAN BEFORE ENCASEMENT CONCRETE MAY BE POURED.
2. ALL EXISTING GROUTED RIPRAP DAMAGED OR REMOVED DURING CONSTRUCTION SHALL BE REPLACED IN KIND.
3. PENCIL VIBRATORS SHALL BE USED WHEN POURING ENCASEMENT CONCRETE BETWEEN MANHOLES #22 AND #23. CARE SHOULD BE TAKEN SO THAT THE CONCRETE COMPLETELY ENCASES THE PIPE LEAVING NO VOIDS.
4. ALL CONCRETE ENCASEMENT PLACED WITHIN THE 60" DIA. OUTLET PIPE SHALL BE SMOOTH TROWELED TO A FINISH CONSISTANT WITH THAT OF THE INTERIOR SURFACE OF THE OUTLET PIPE.

AS BUILT

RECEIVED ENGINEERING DIV.

(DRAINAGE STRUCTURE # 4)

FOUNTAIN HILLS SANITARY DISTRICT SEWER IMPROVEMENTS

Anderson-Nelson, Inc.
CIVIL ENGINEERING, LAND PLANNING, CONSULTANTS
PHOENIX, ARIZONA 273-1650

DOWNSTREAM DETAILS (OUTLET)

DRAWN BY	D.H.	NO	DATE	BY	REVISIONS & REMARKS
SCALE	1"=5'	1	5/1/99	R.E.	REVISED
DATE	5-89	2	7-14-99	R.C.	SEE ⚠
APPROVED					

SHT 31-B OF 40

PL 4392

07-33

FLAT FILE E-2

FOUNTAIN HILLS

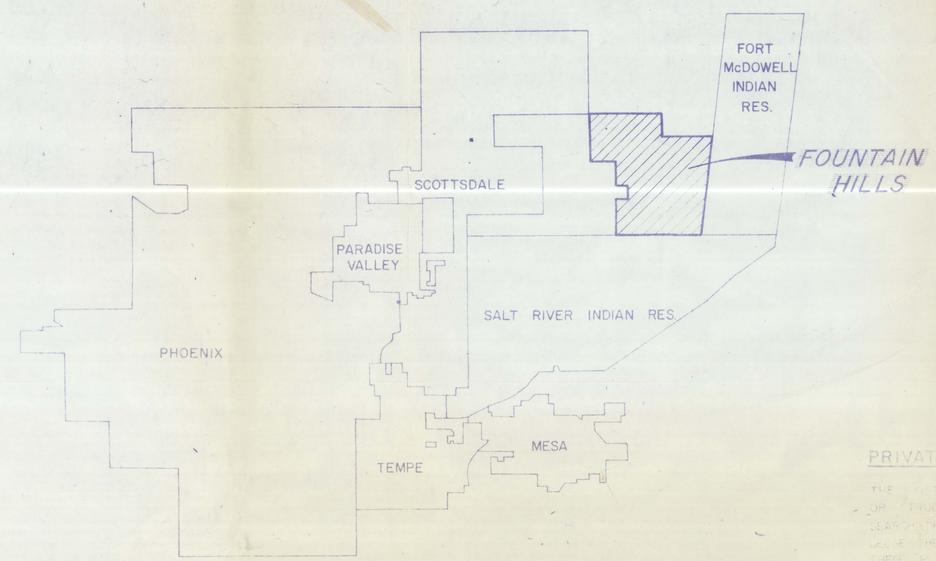
MARICOPA COUNTY, ARIZONA

3-5
10

STORM WATER RETARDATION BASIN NO. 4

Pond map on sheet 2

VICINITY MAP
NO SCALE



PHOENIX - SCOTTSDALE AREA
NO SCALE

INDEX TO DRAWINGS

SHEET	TITLE
1	VICINITY MAP
2	BASIN & DAM LOCATION MAP
3	SITE PLAN FOR BASIN & DAM
4	PLAN & PROFILE OF DAM
5	DAM CROSS SECTIONS & SPILLWAY PROFILE
6	INLET STRUCTURE DETAILS
7 & 8	OUTLET BASIN
9	DAM CORE BORINGS
10	HORIZONTAL CONTROL
11	MODIFICATION OF OUTLET BASIN

PRIVATE ENGINEER'S NOTICE TO CONTRACTOR

THE EXISTENCE & LOCATION OF ANY UNDERGROUND UTILITY PIPES OR STRUCTURES SHOWN ON THESE PLANS WERE OBTAINED BY A SEARCH OF THE AVAILABLE RECORDS. TO THE BEST OF OUR KNOWLEDGE THERE ARE NO EXISTING UTILITIES EXCEPT AS SHOWN ON THESE PLANS.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITY LINES SHOWN, AND ANY OTHER LINES NOT OF RECORD OR NOT SHOWN ON THESE PLANS.

GORDON F. FREIDOT, REGISTERED CIVIL ENGINEER
No. 5478

GENERAL NOTES

1. THE DAM CONSTRUCTION WILL BE INSPECTED BY CONSULTING SOIL AND FOUNDATION ENGINEERS.
2. THE DAM CONSTRUCTION TO BE IN ACCORDANCE WITH THE FOUNDATION & MATERIALS REPORT (STRUCTURE NO. 4) BY SERGENT, HAUSKINS & BECKWITH.

DESIGN CRITERIA

1. CREST ELEVATION IS BASED ON 100 YEAR STORM
2. EMERGENCY & FREEBOARD DESIGN BASED ON 6 HOUR P.M.P.
3. PRINCIPAL SPILLWAY DESIGN BASED ON A 10 DAY DRAW DOWN PERIOD
4. FLOOD WATER DAM'S FUNCTION IS TO RETARD RUNOFF

does not agree with hydrograph

ADWR # 7-33 AS BUILT

NO.	DATE	DESCRIPTION
1	7-1-74	J.P. AS BUILT

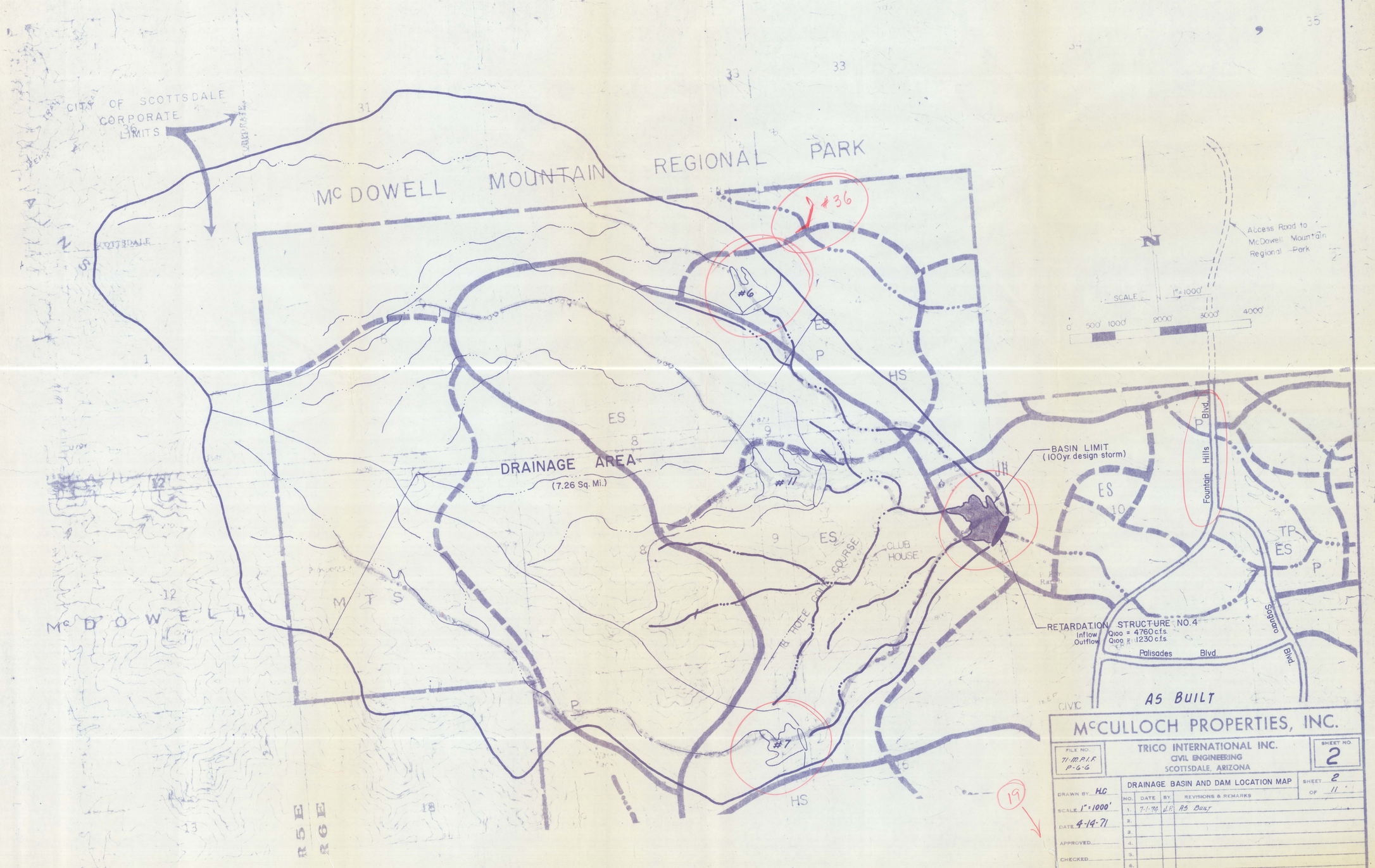
DWN. N.
SCALE
6-6-71
TIMPIF - P-6-6

TRICO INTERNATIONAL CORP.
CIVIL ENGINEERING

VICINITY MAP
STRUCTURE NUMBER 4

SHEET 1 OF 11 SHEETS

STR. # 4

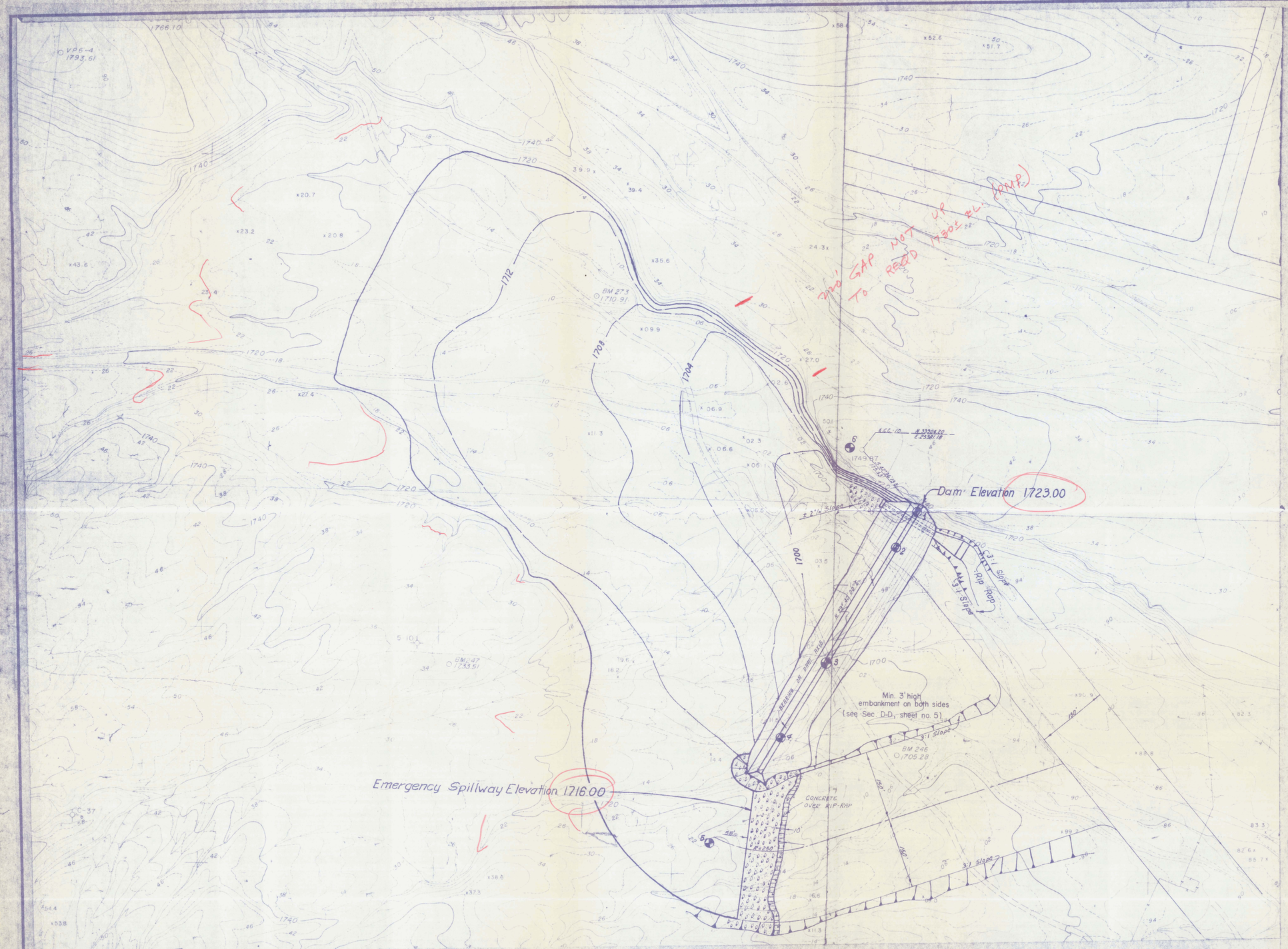


McCULLOCH PROPERTIES, INC.

FILE NO. 71-M.P.L.R. P-6-6	TRICO INTERNATIONAL INC. CIVIL ENGINEERING SCOTTSDALE, ARIZONA	SHEET NO. 2
DRAWN BY H.C.	DRAINAGE BASIN AND DAM LOCATION MAP	SHEET 2 OF 11
SCALE 1" = 1000'		
DATE 4-14-71		
APPROVED		
CHECKED		
F.B. REF.		

NO.	DATE	BY	REVISIONS & REMARKS
1.	7-1-76	J.P.	AS BUILT
2.			
3.			
4.			
5.			
6.			
7.			

STR. #4



SCALE: 1" = 100'

DENOTES EXPLORATORY BORING

AS BUILT

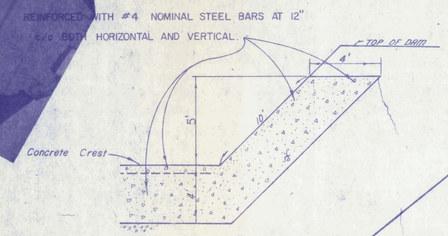
FILE NO. 71-M.P.I.F. P-6-6	TRICO INTERNATIONAL INC. CIVIL ENGINEERING SCOTTSDALE, ARIZONA	SHEET NO. 3

Site Plan For Basin and Dam

DRAWN BY HO
SCALE 1" = 100'
DATE April 16, 1971
APPROVED
CHECKED
F.B. REF.

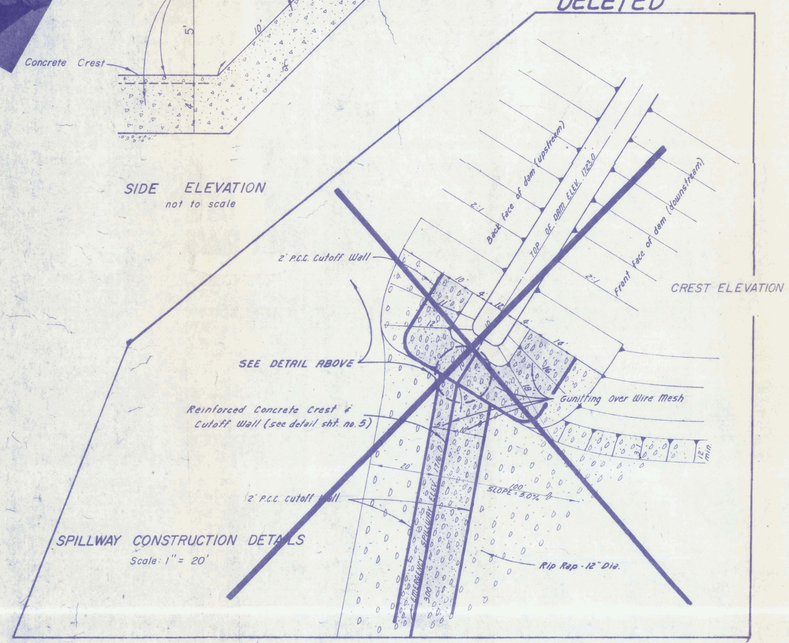
SHEET 3 OF 11

NO.	DATE	BY	REVISIONS & REMARKS
1.	7-1-74	JP	AS BUILT
2.			
3.			
4.			
5.			
6.			
7.			



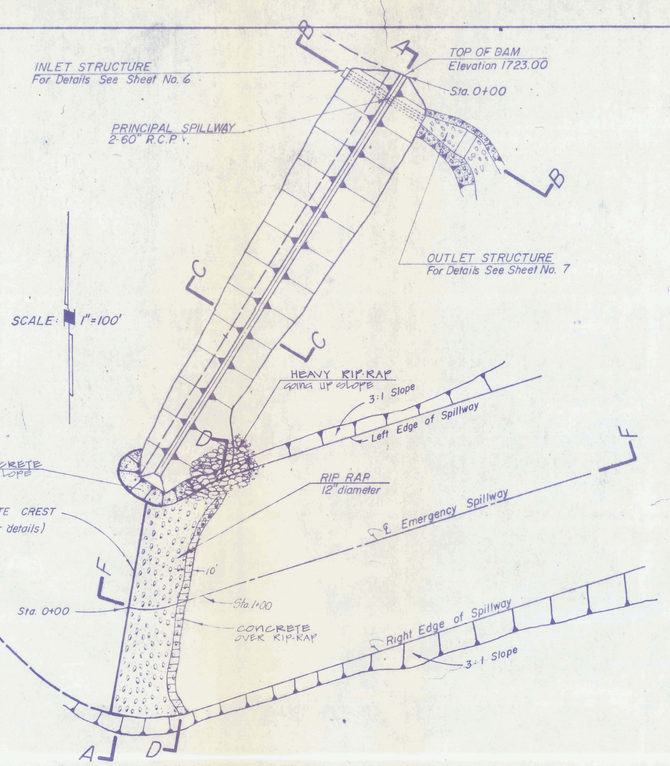
SIDE ELEVATION
not to scale

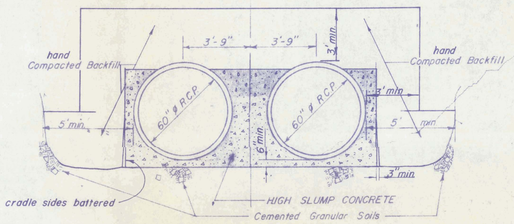
DELETED



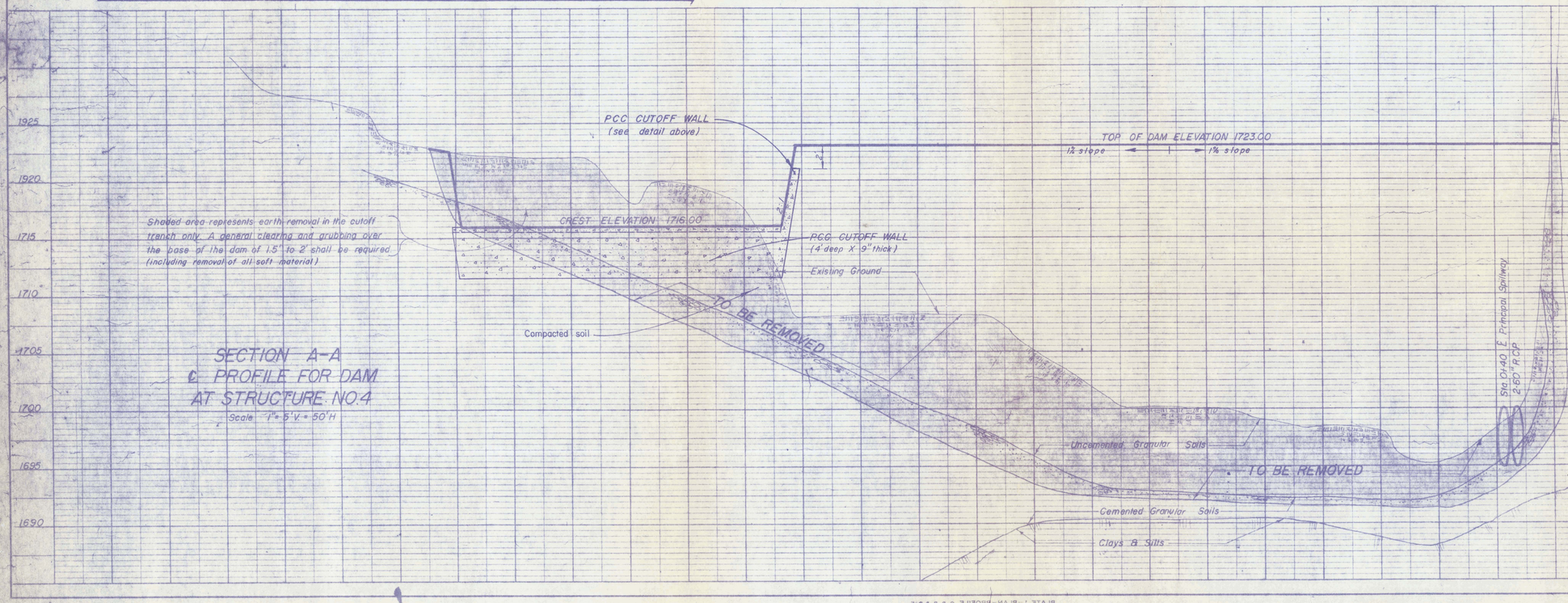
SPILLWAY CONSTRUCTION DETAILS
Scale: 1" = 20'

CREST ELEVATION 1716





CRADLE DETAIL
SCALE 1" = 4'
STA. 0+00 to STA. 1+04



SECTION A-A
℄ PROFILE FOR DAM
AT STRUCTURE NO. 4
Scale 1" = 5' V. = 50' H

AS BUILT

MO	SURVEYED
MOLE BOOK	DRAWN
	CHECKED
	ROLLED
	TRACED
	DATE

BLUELINE MOLE LAKE CO. KD
BY
DATE
BLUELITE

PLAN AND PROFILE OF DAM
RETARDATION STRUCTURE NO. 4

TRICO INTERNATIONAL INC.
CIVIL ENGINEERING
SCOTTSDALE, ARIZONA

FILE NO. 71-M.P.I.F. P-6-6

SHEET NO. 4

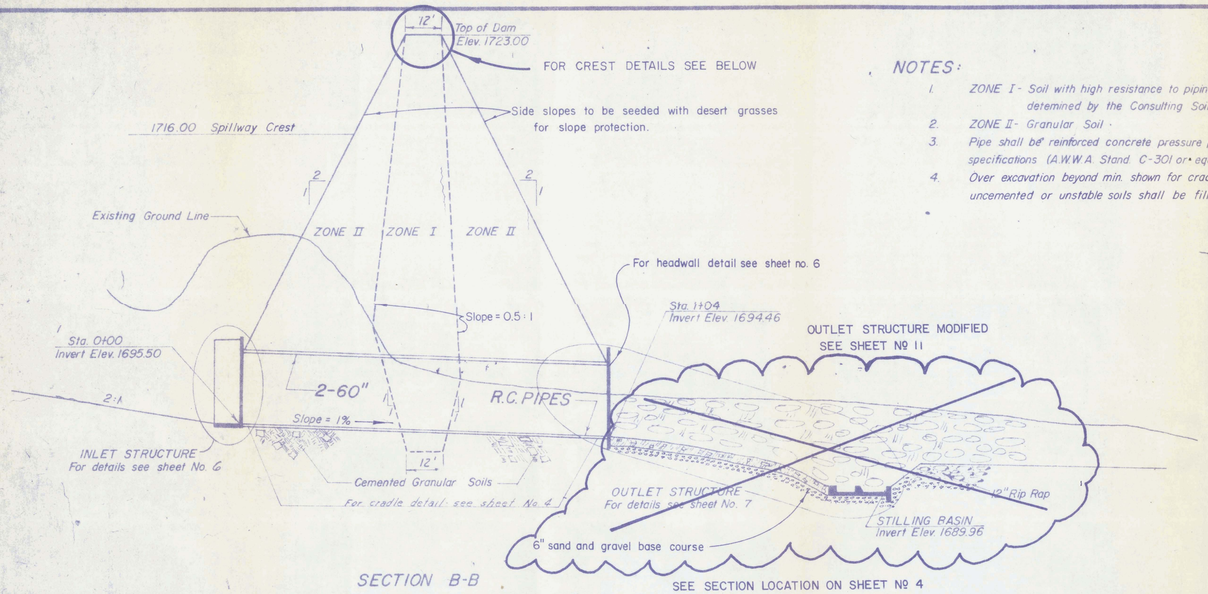
DRAWN BY HLC
SCALE As Shown
DATE 4-17-71
APPROVED
CHECKED
F.B. REF.

SHEET 4 OF 11

NO	DATE	BY	REVISIONS & REMARKS
1	7-1-74	J.P.	AS Built
2			
3			
4			
5			
6			
7			

1723
6 9 71
31

STR. # 4

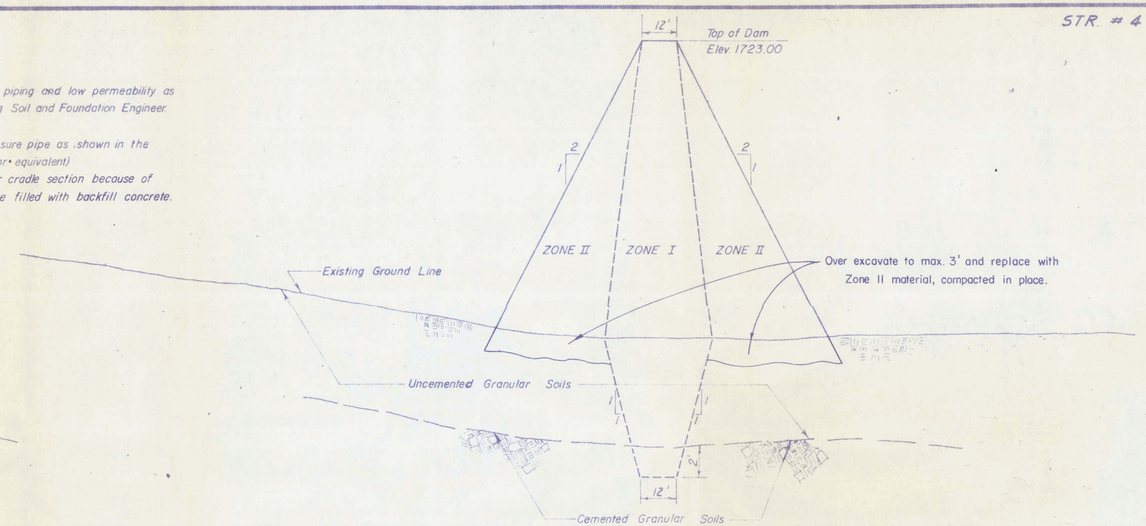


SEE SECTION LOCATION ON SHEET Nº 4

SECTION B-B
PRINCIPAL SPILLWAY
SCALE 1" = 5' V. = 20' H.

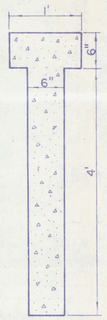
NOTES:

1. ZONE I - Soil with high resistance to piping and low permeability as determined by the Consulting Soil and Foundation Engineer.
2. ZONE II - Granular Soil.
3. Pipe shall be reinforced concrete pressure pipe as shown in the specifications (A.W.W.A. Stand. C-301 or equivalent)
4. Over excavation beyond min. shown for cradle section because of uncemented or unstable soils shall be filled with backfill concrete.

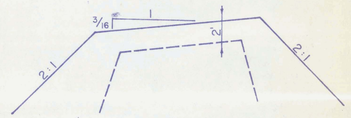


SEE SECTION LOCATION ON SHEET Nº 4

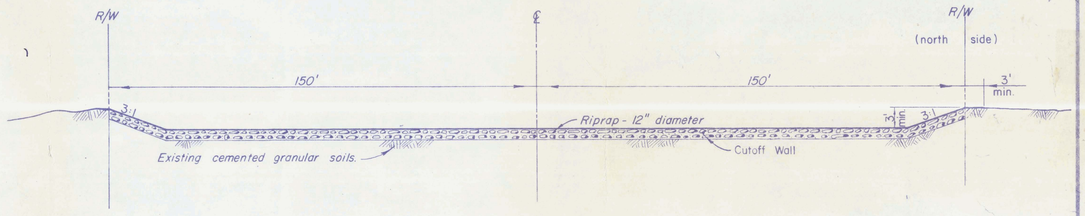
SECTION C-C
SCALE 1" = 5' V. = 20' H.



SPILLWAY CREST
NO SCALE

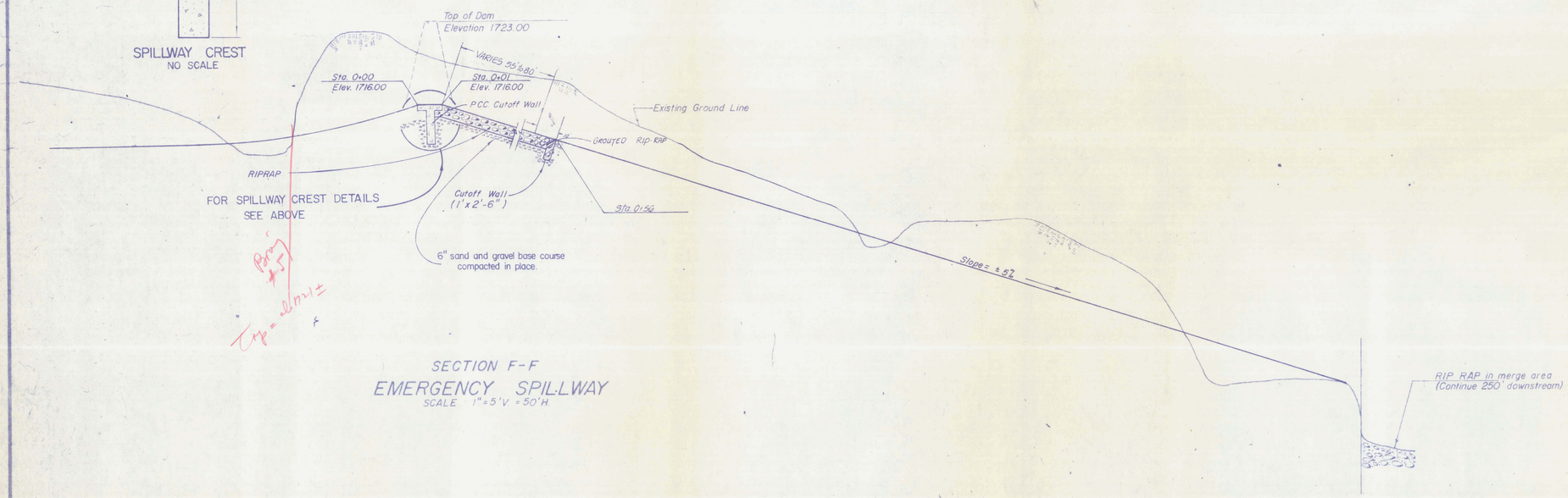


CREST DETAILS
NO SCALE



SECTION D-D
SCALE 1" = 25'

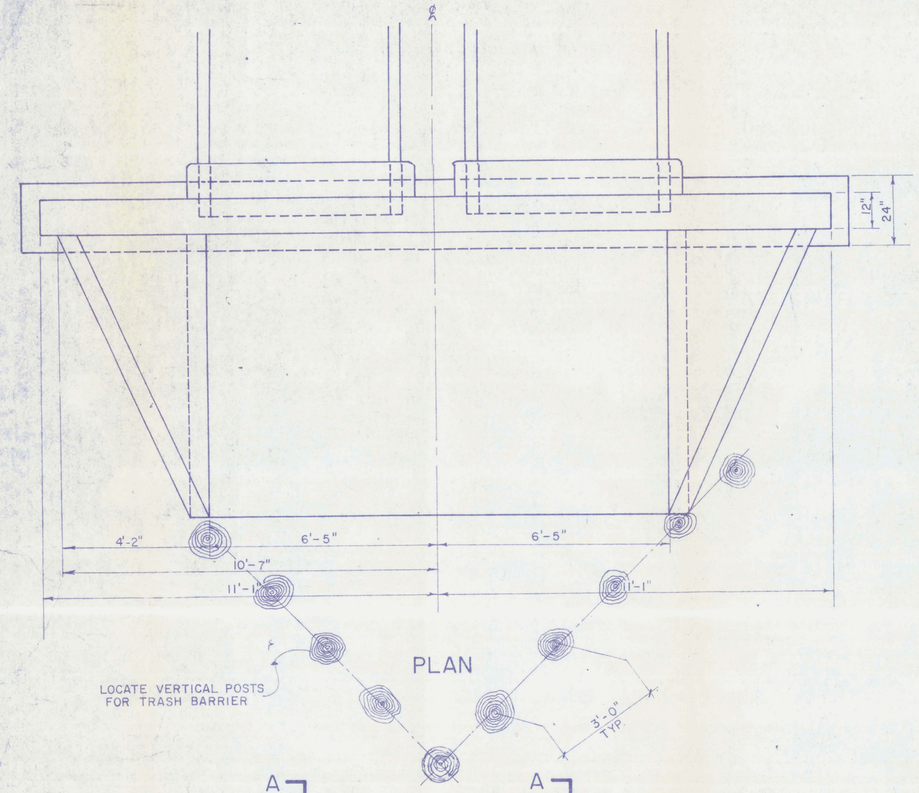
SEE SECTION LOCATION ON SHEET Nº 4



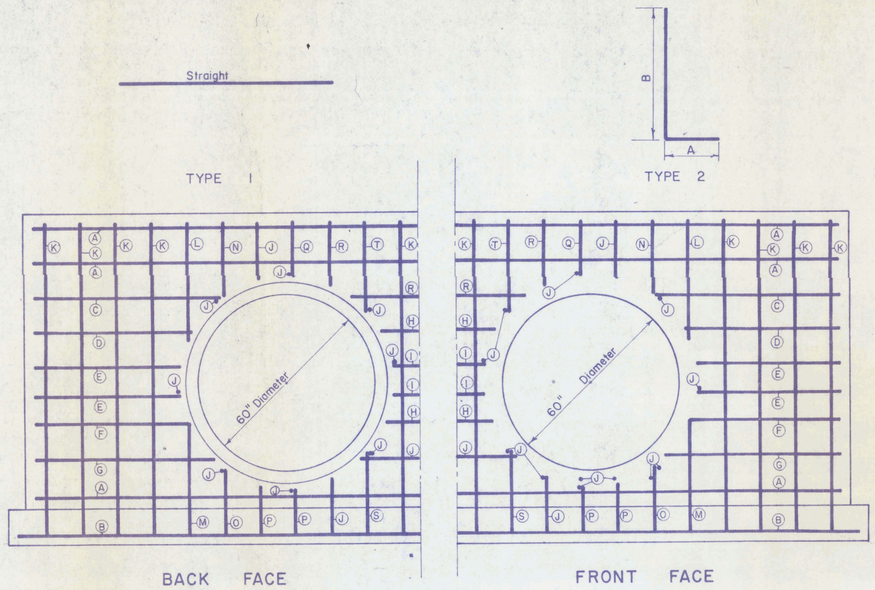
SECTION F-F
EMERGENCY SPILLWAY
SCALE 1" = 5' V. = 20' H.

AS BUILT

FILE NO. 71-17.P.1.1 P-6-6	TRICO INTERNATIONAL INC. CIVIL ENGINEERING SCOTTSDALE, ARIZONA	SHEET NO. 5
DRAWN BY HC	DAM CROSS SECTIONS & SPILLWAY PROFILE	SHEET 5 OF 11
SCALE As Shown	NO. / DATE / BY / REVISIONS & REMARKS	
DATE 4-18-71	1. 7-1-74 J.P. AS BUILT	
APPROVED	2.	
CHECKED	3.	
F.B. REF	4.	
	5.	
	6.	
	7.	

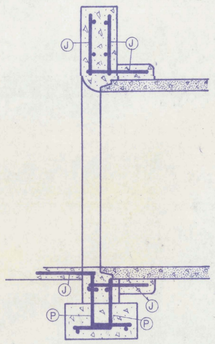


PLAN



BACK FACE

FRONT FACE



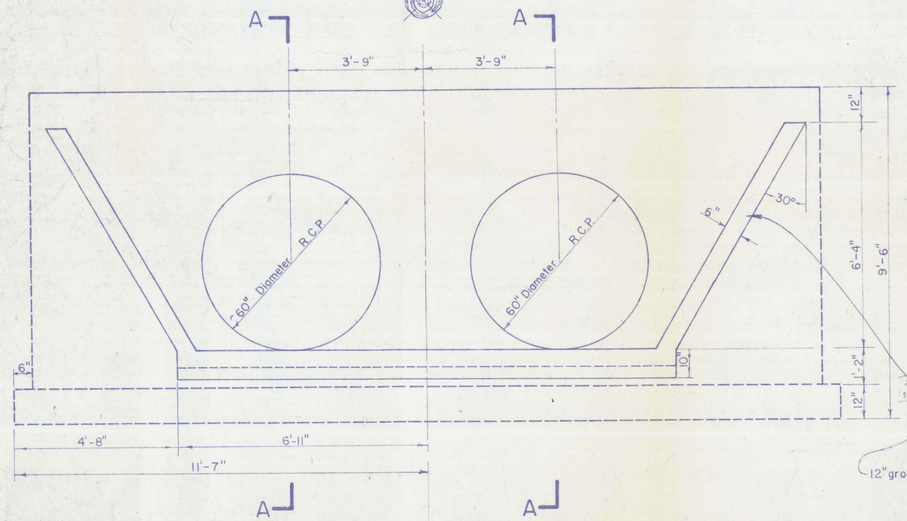
SECTION A-A

HEADWALL STEEL DETAILS

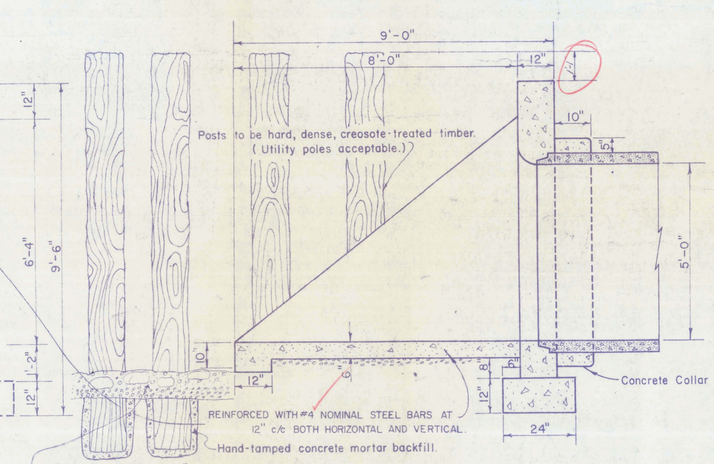
(FOR BOTH INLET AND OUTLET STRUCTURES)

BAR SCHEDULE FOR HEADWALL

MARK	SIZE	QUANTITY	LENGTH	TOTAL LENGTH	TYPE	A	B
A	4	6	21'-8"	130'-0"	1		
B	4	2	22'-8"	45'-4"	1		
C	4	4	5'-3"	21'-0"	1		
D	4	4	4'-6"	18'-0"	1		
E	4	8	4'-1"	32'-8"	1		
F	4	4	4'-4"	17'-4"	1		
G	4	4	5'-1"	20'-4"	1		
H	4	8	1'-1"	8'-8"	1		
I	4	8	0'-10"	6'-8"	1		
J	4	36	1'-8"	60'-0"	1		
K	4	10	9'-9"	97'-6"	2	1'	8'-9"
L	4	4	3'-4"	13'-4"	1		
M	4	4	4'-3"	17'-0"	2	1'	3'-4"
N	4	4	2'-1"	8'-4"	1		
O	4	4	2'-11"	11'-8"	2	1'	1'-11"
P	4	8	2'-4"	18'-8"	2	1'	1'-4"
Q	4	4	1'-7"	6'-4"	1		
R	4	8	1'-11"	15'-4"	1		
S	4	4	3'-4"	13'-4"	2	1'	2'-4"
T	4	4	1'-10"	7'-4"	1		



ELEVATION



SECTION A-A

SCALE: 1" = 2'

AS BUILT

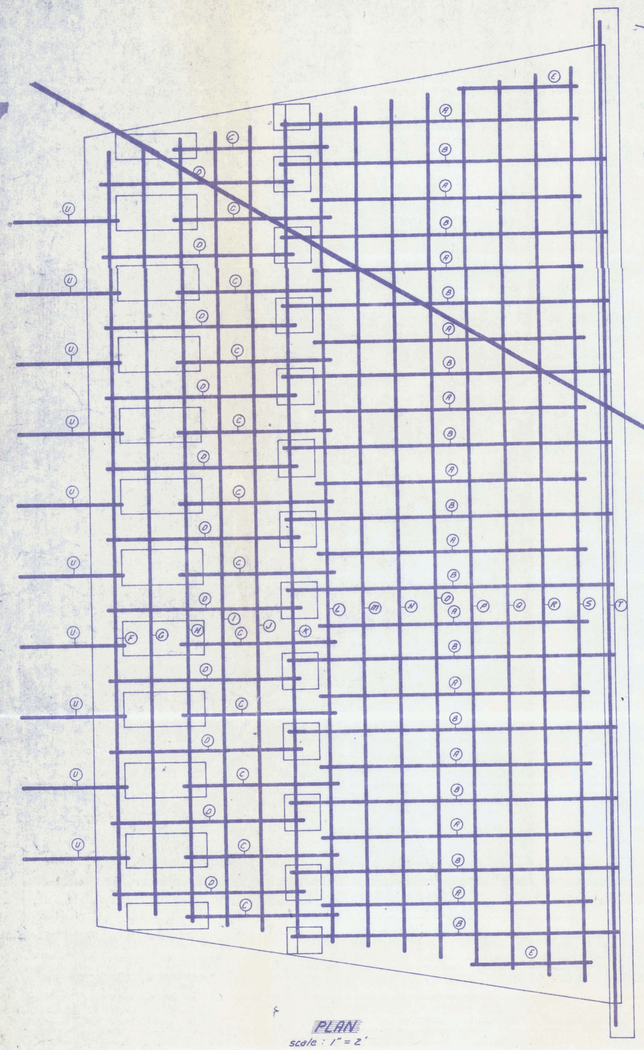
FILE NO.	TRICO INTERNATIONAL INC. CIVIL ENGINEERING SCOTTSDALE, ARIZONA	SHEET NO.
71 M.P.U. P-6-6		6

INLET STRUCTURE DETAILS
RETARDATION STRUCTURE NO 4

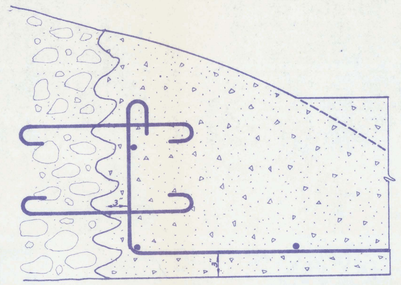
SHEET 6 OF 11

DRAWN BY J.C.
SCALE 1" = 2'
DATE 6-21-71
APPROVED
CHECKED
F.B. REF.

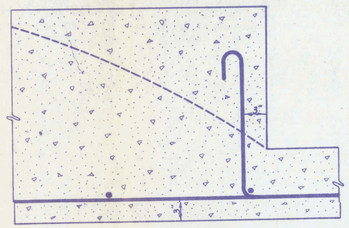
NO.	DATE	BY	REVISIONS & REMARKS
1.	5-29-74	B.S.	Replaced wire fence trash barrier with posts.
2.	7-1-74	J.P.	AS BUILT
3.			
4.			
5.			
6.			
7.			



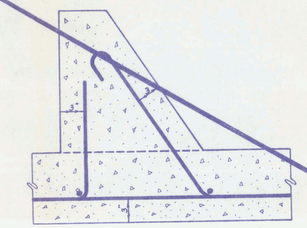
PLAN
scale: 1" = 2'



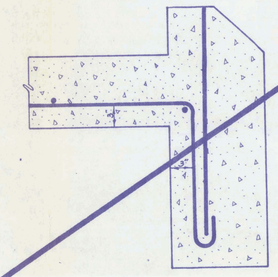
DETAIL A
no scale



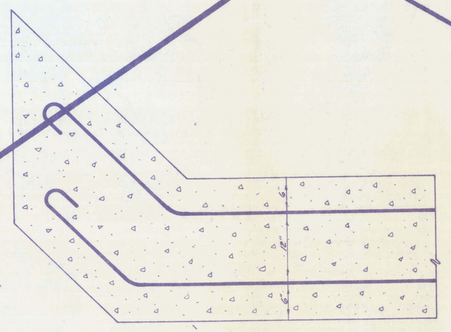
DETAIL B
no scale



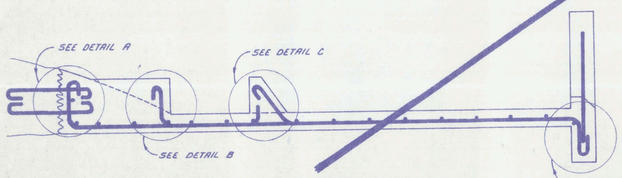
DETAIL C
no scale



DETAIL D
no scale



DETAIL E
no scale

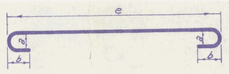


ELEVATION
scale: 1" = 2'

BAR SCHEDULE FOR SPILLWAY BASIN

MARK	QUANTITY	SIZE	LENGTH	TOTAL LENGTH	TYPE	a	b	c	d	e	f	g	h	i
A	12	4	7'-8"	92'-0"	1									
B	12	4	12'-0"	144'-0"	2	4"	6"	1'-0"	4"	8'-0"	1'-0"			
C	12	4	6'-6"	78'-0"	3	4"					1'-0"	4'-8"		
D	11	4	8'-0"	88'-0"	4	[illegible]	6"				1'-0"		5'-8"	6"
E	2	4	3'-8"	14'-8"	[illegible]									
F	2	4	21'-4"	42'-8"	1									
G	1	4	21'-8"	21'-8"	1									
H	1	4	22'-0"	22'-0"	1									
I	1	4	22'-4"	22'-4"	1									
J	1	4	22'-8"	22'-8"	1									
K	1	[illegible]	23'-0"	23'-0"	1									
L	1	4	23'-4"	23'-4"	1									
M	1	4	23'-8"	23'-8"	1									
N	1	4	24'-0"	24'-0"	1									
O	1	4	24'-4"	24'-4"	1									
P	1	4	24'-8"	24'-8"	1									
Q	1	4	25'-0"	25'-0"	1									
R	1	4	25'-4"	25'-4"	1									
S	1	4	25'-8"	25'-8"	1									
T	2	4	32'-8"	65'-8"	6	4"	6"	1'-6"	2'-6"	28"				
U	20	4	4'-10"	96'-8"	5	4"	6"			4"				

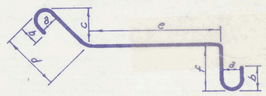
TYPE 5



TYPE 6

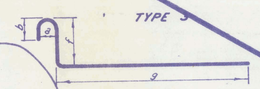
TYPE 1

TYPE 2

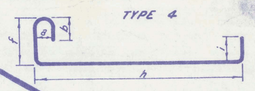


NOTE: All bends to be min 2" radius.

TYPE 3



TYPE 4



BAR TYPES
no scale

THIS STRUCTURE MODIFIED

SEE SHEET № 11

AS BUILT

DRAWN BY	JIM N.
SCALE	AS NOTED
DATE	8-4-71
CHECKED BY	
DRAWING NUMBER	P-6-6

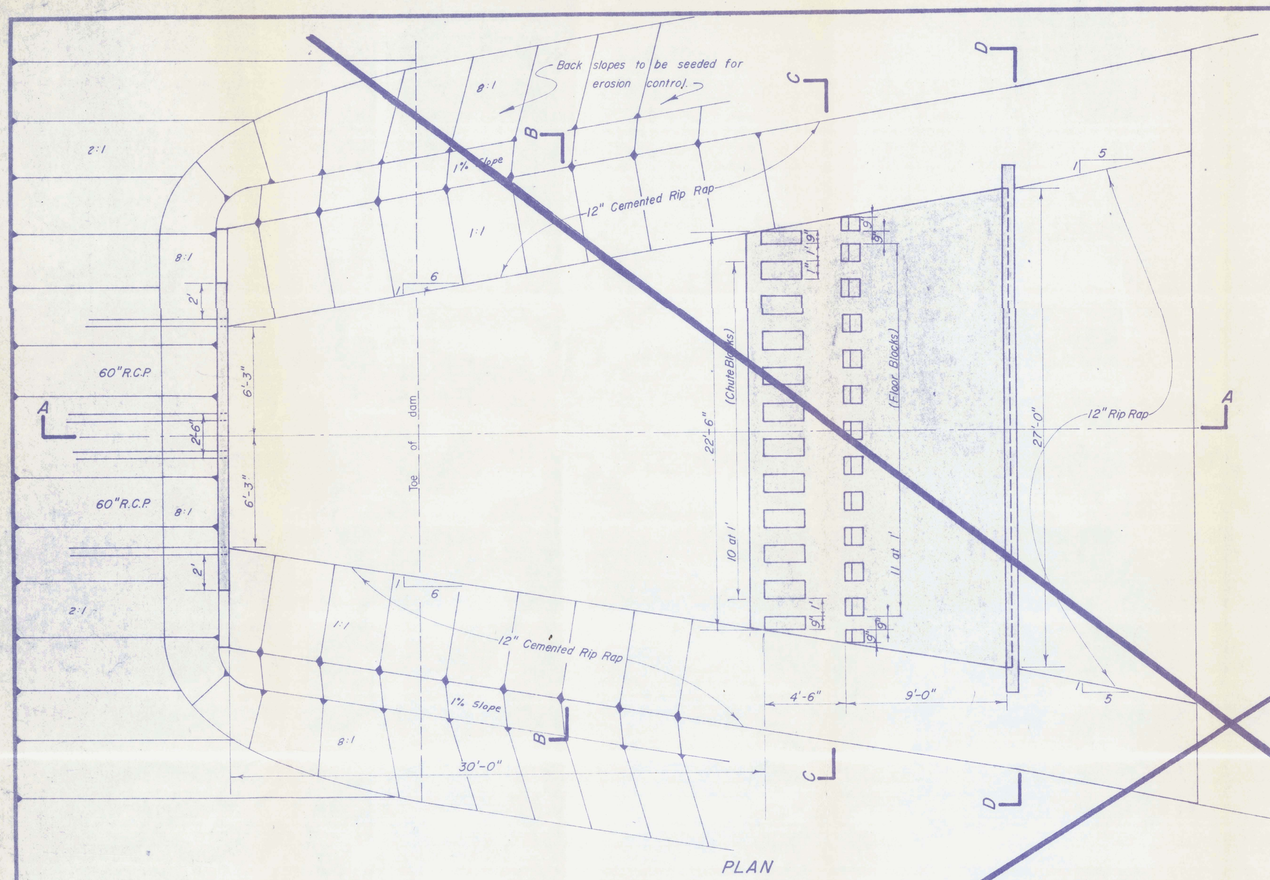
NO.	DATE	BY	REVISIONS & REMARKS
1	7-1-72	JJP	AS BUILT

TRICO INTERNATIONAL INC.

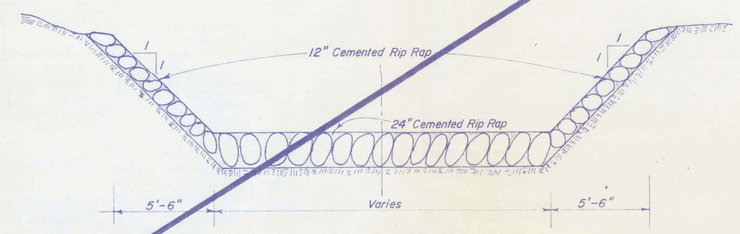
CIVIL ENGINEERING

STILLING BASIN REINFORCEMENT DETAILS
STRUCTURE NUMBER 4

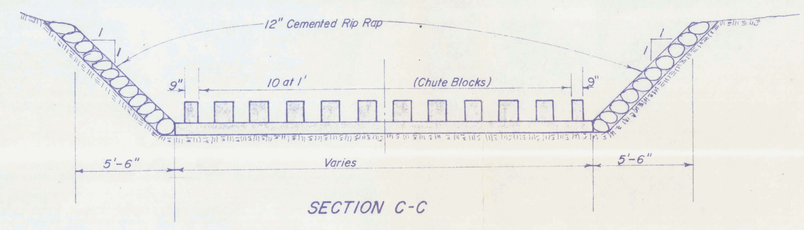
SHEET 7 OF 11 SHEETS



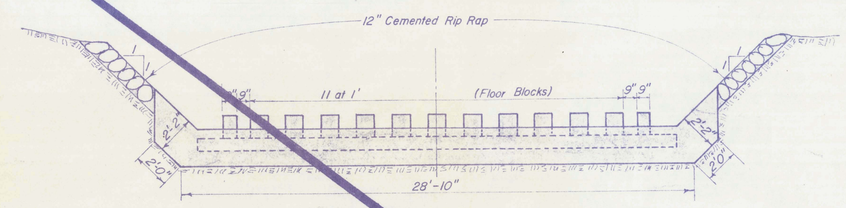
PLAN



SECTION B-B

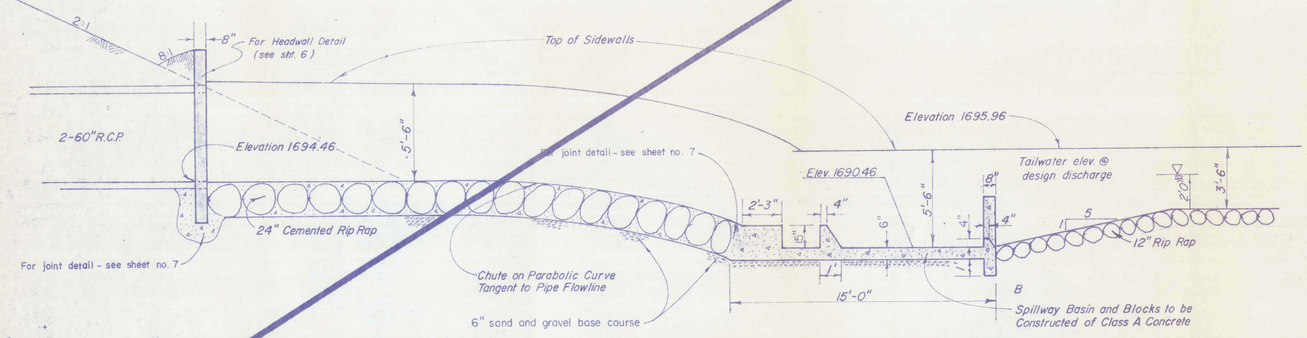


SECTION C-C



SECTION D-D

NOTE: all concrete to be poured in one operation forming monolithic structure.



SECTION A-A

NOTE.
The Stilling Basin design is based on the proceedure developed at Saint Anthony Falls for S.C.S. earth dams.

THIS STRUCTURE MODIFIED
SEE SHEET Nº 11

SCALE 1" = 4'

AS BUILT

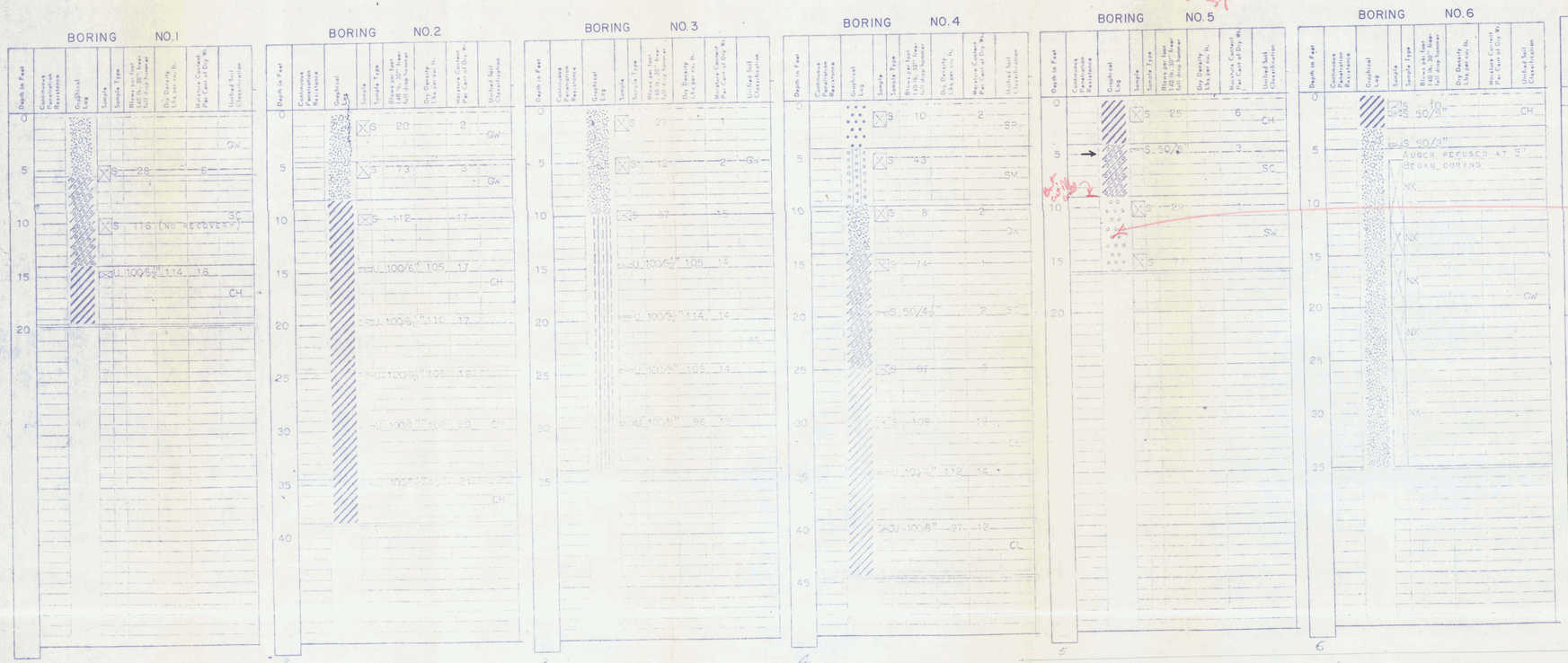
FILE NO. 71-M.P.I.F. P-6-6	TRICO INTERNATIONAL INC. CIVIL ENGINEERING SCOTTSDALE, ARIZONA	SHEET NO. 8

DRAWN BY HC
SCALE 1"=4'
DATE 4-19-71
APPROVED
CHECKED
F.B. REF.

OUTLET BASIN — SHEET 8 OF 11

NO.	DATE	BY	REVISIONS & REMARKS
1.	7-1-74	J.P.	As Built
2.			
3.			
4.			
5.			
6.			
7.			

STR. #4



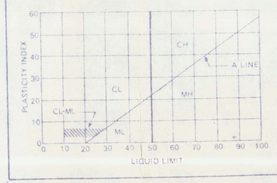
UNIFIED SOIL CLASSIFICATION SYSTEM

Soils are visually classified by the Unified Soil Classification system on the boring logs presented in this report. Grain-size analysis and Atterberg Limits Tests are often performed on selected samples to aid in classification. The classification system is briefly outlined on this chart. For a more detailed description of the system, see "The Unified Soil Classification System" Corp of Engineers, US Army Technical Memorandum No. 3-357 (Revised April 1960) or ASTM Designation: D2487-66T.

	MAJOR DIVISIONS		GRAPHIC SYMBOL	GROUP SYMBOL	TYPICAL NAMES
COARSE-GRAINED SOILS (Less than 50% passes No. 200 sieve)	GRAVELS (50% or more of coarse fraction passes No. 4 sieve)	CLEAN GRAVELS (Less than 5% passes No. 200 sieve)		GW	Well graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
				GP	Poorly graded gravels, gravel-sand mixtures, or sand-gravel-cobble mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve) — Limits plot below "A" line & hatched zone on plasticity chart		GM	Silty gravels, gravel-sand-silt mixtures.
		GRAVELS WITH FINES (More than 12% passes No. 200 sieve) — Limits plot above "A" line & hatched zone on plasticity chart		GC	Clayey gravels, gravel-sand-clay mixtures.
	SANDS (Less than 50% of coarse fraction passes No. 4 sieve)	CLEAN SANDS (Less than 5% passes No. 200 sieve)		SW	Well graded sands, gravelly sands.
				SP	Poorly graded sands, gravelly sands.
		SANDS WITH FINES (More than 12% passes No. 200 sieve) — Limits plot below "A" line & hatched zone on plasticity chart		SM	Silty sands, sand-silt mixtures.
		SANDS WITH FINES (More than 12% passes No. 200 sieve) — Limits plot above "A" line & hatched zone on plasticity chart		SC	Clayey sands, sand-clay mixtures.
FINE-GRAINED SOILS (50% or more passes No. 200 sieve)	SILTS AND CLAYS (Liquid limit less than 50)	SILTS OF LOW PLASTICITY (Liquid Limit Less Than 50)		ML	Inorganic silts, clayey silts with slight plasticity.
		SILTS OF HIGH PLASTICITY (Liquid Limit More Than 50)		MH	Inorganic silts, micaceous or diatomaceous silty soils, plastic silts.
		CLAYS OF LOW PLASTICITY (Liquid Limit Less Than 50)		CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
		CLAYS OF HIGH PLASTICITY (Liquid Limit More Than 50)		CH	Inorganic clays of high plasticity, fat clays, sandy clays of high plasticity.

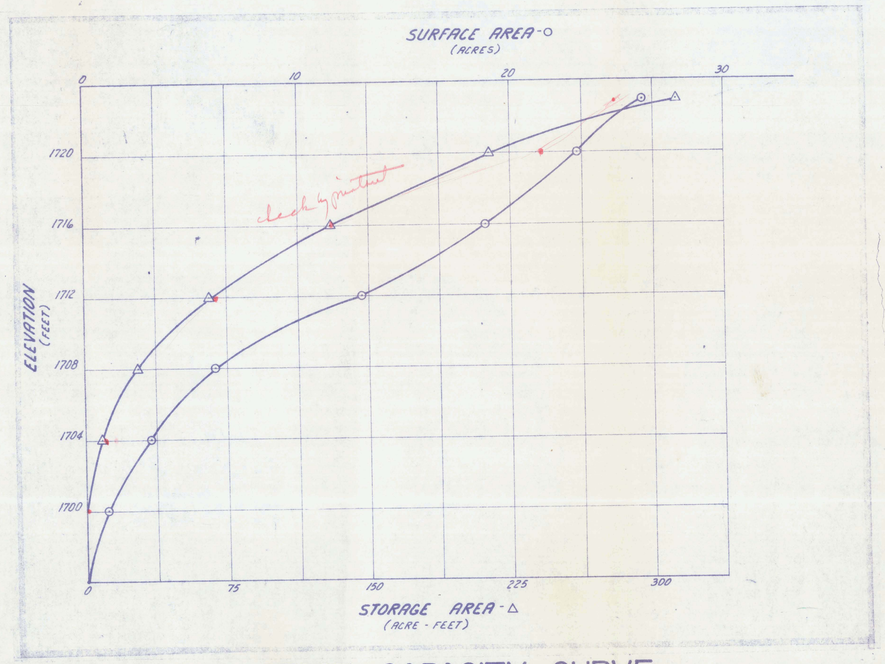
NOTE: Coarse grained soils with between 5% & 12% passing the No. 200 sieve and fine grained soils with limits plotting in the hatched zone on the plasticity chart to have double symbol.

PLASTICITY CHART

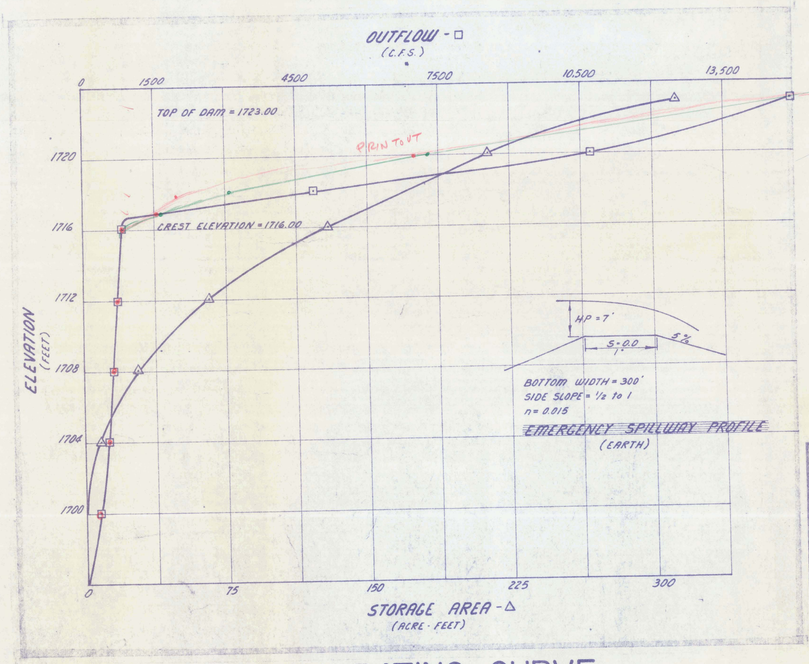


DEFINITIONS OF SOIL FRACTIONS

SOIL COMPONENT	PARTICLE SIZE RANGE
Cobbles	Above 3 in.
Gravel	3 in. to No. 4 sieve
Coarse gravel	3 in. to ¾ in.
Fine gravel	¾ in. to No. 4 sieve
Sand	No. 4 to No. 200
Coarse	No. 4 to No. 10
Medium	No. 10 to No. 40
Fine	No. 40 to No. 200
Fines (silt or clay)	Below No. 200 sieve



STAGE CAPACITY CURVE



SPILLWAY RATING CURVE

AS BUILT

McCULLOCH PROPERTIES, INC.

FILE NO. 71-M.P.I.F P-6-6

TRICO INTERNATIONAL INC.
CIVIL ENGINEERING
SCOTTSDALE, ARIZONA

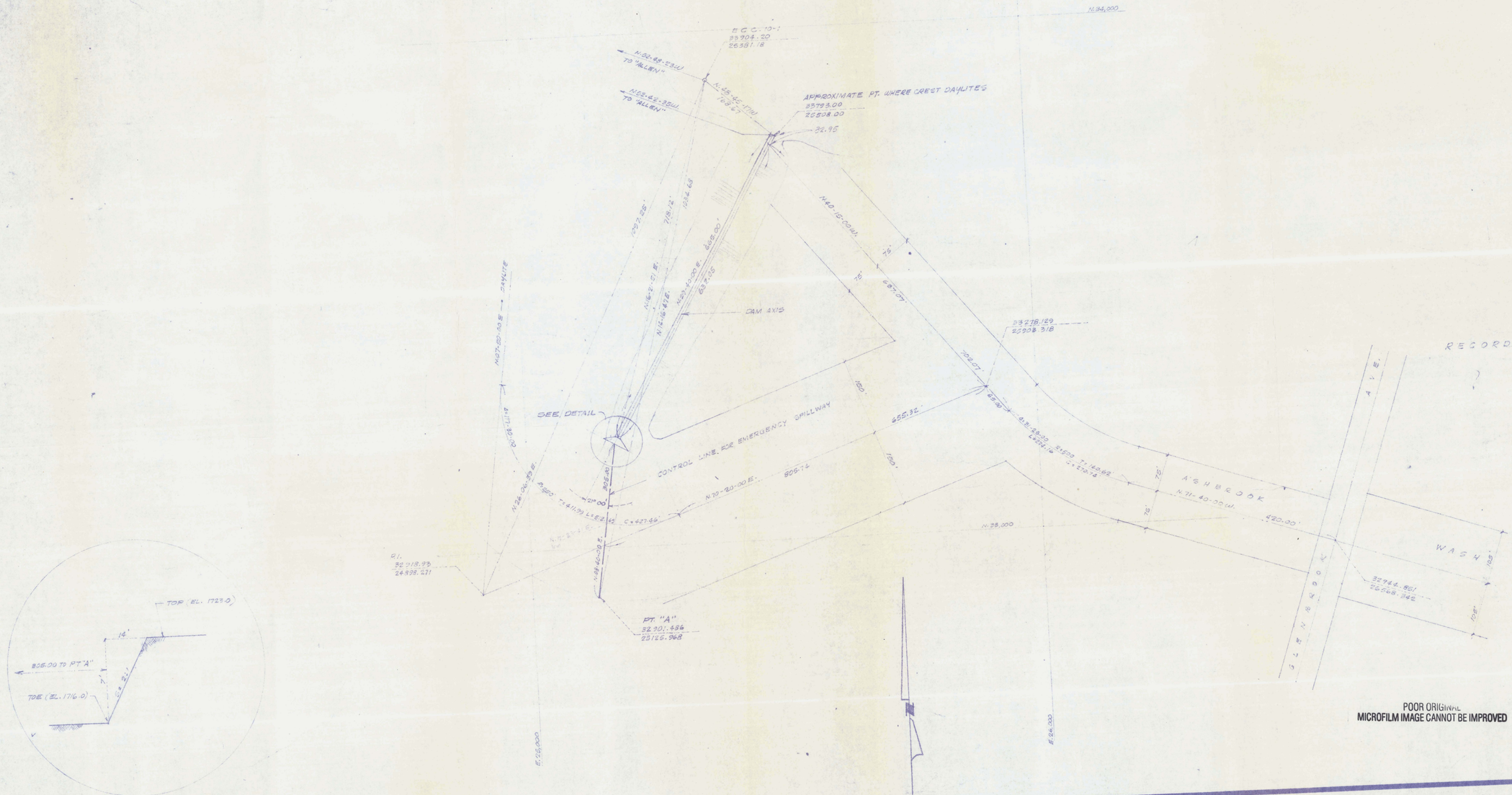
SHEET NO. 9

DAM CORE BORINGS

SHEET 9 OF 11

DRAWN BY JIM N.
SCALE NONE
DATE JUNE 16, 1971
APPROVED
CHECKED
F.B. REF.

NO.	DATE	BY	REVISIONS & REMARKS
1.	7-1-74	J.P.	AS BUILT
2.			
3.			
4.			
5.			
6.			
7.			



AS BUILT

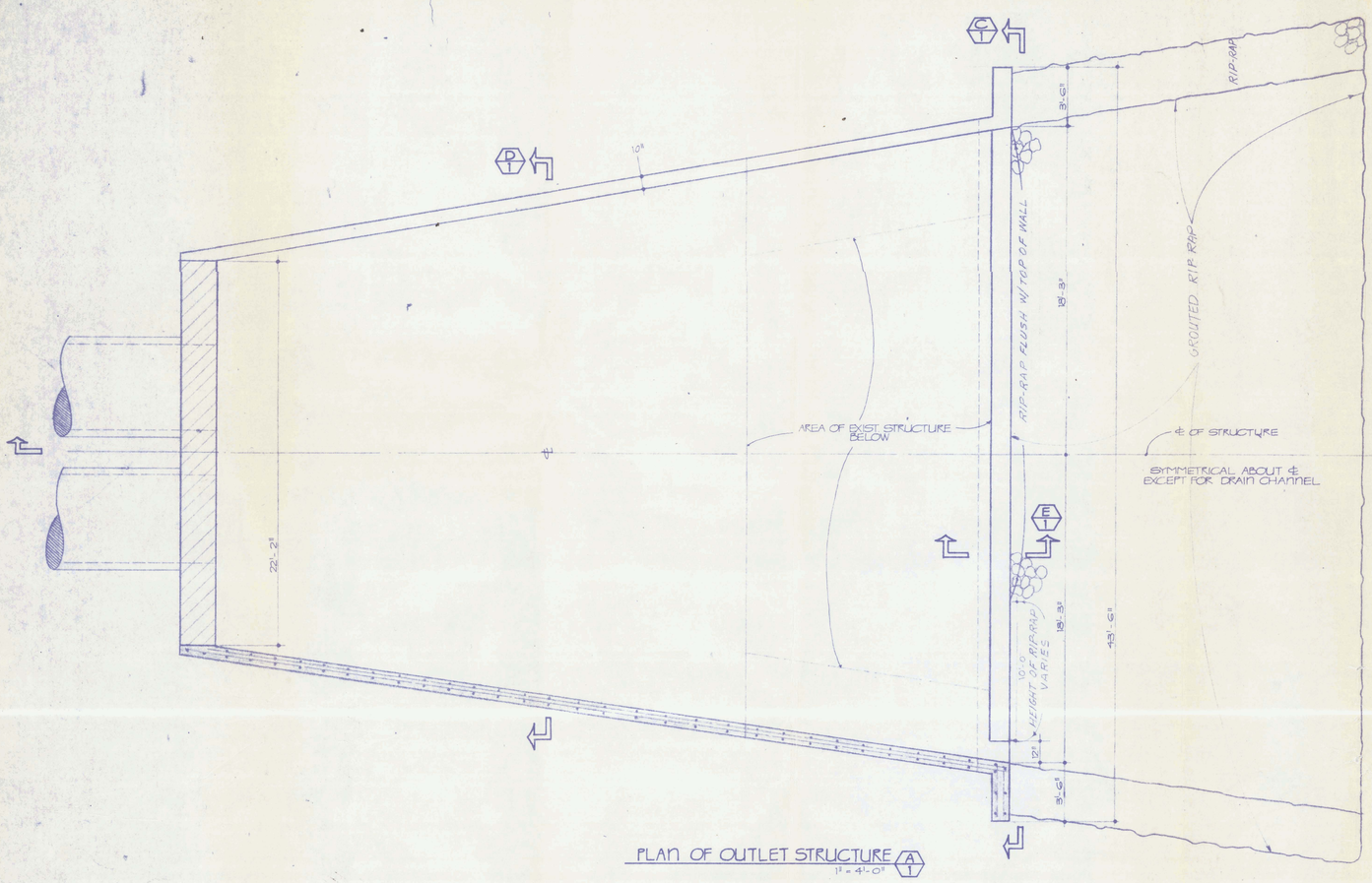
DRAWN BY R.R.	NO	DATE	BY	REVISIONS & REMARKS
SCALE				

ATRICO CIVIL ENGINEERING

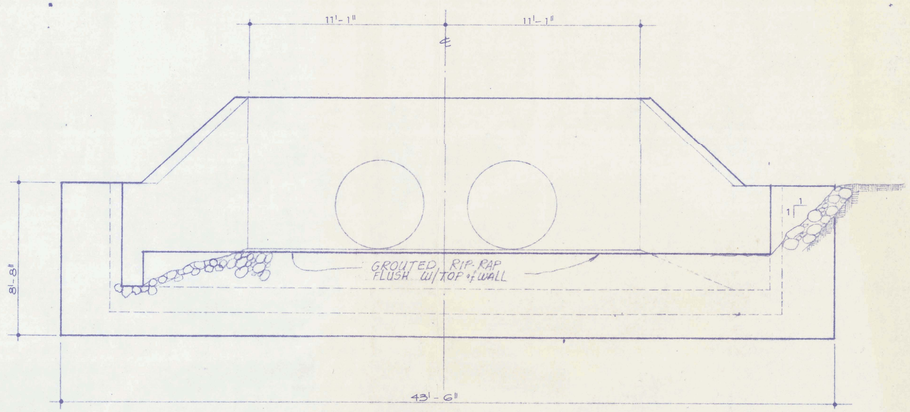
RETARDATION STRUCTURE Nº 4

HORIZONTAL CONTROL

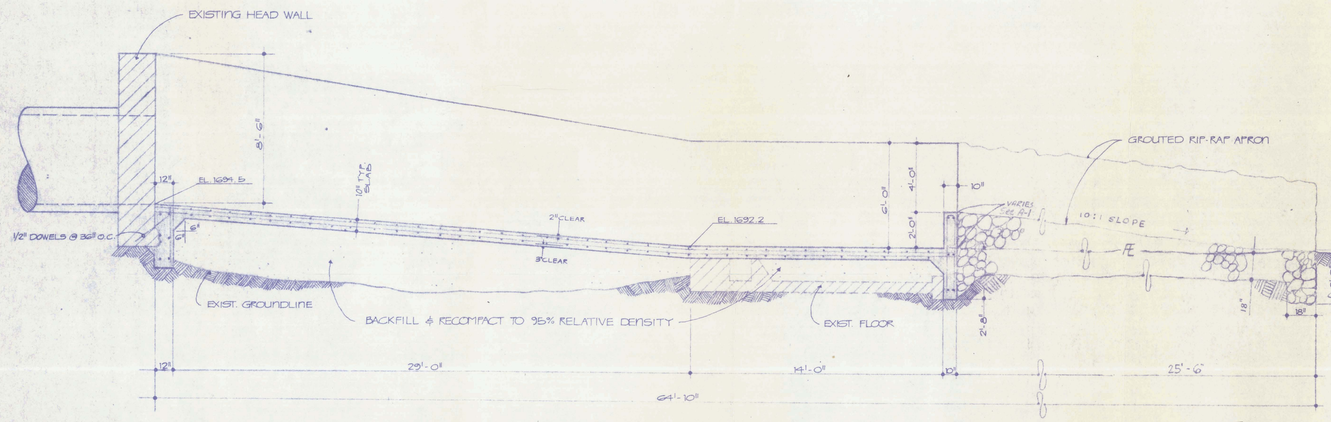
SHEET 10 OF 11 SHEETS



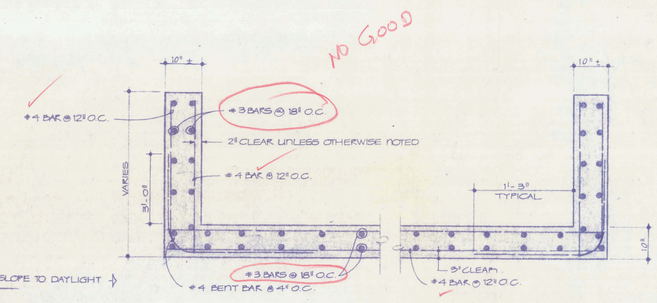
PLAN OF OUTLET STRUCTURE (A/1)
1" = 4'-0"



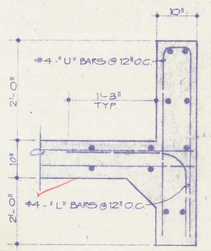
SECTION (C)
1" = 4'-0"



SECTION (B/1)
1" = 4'-0"



SECTION (D/1) NO SCALE



SECTION (E/1) NO SCALE

NOTES:

ALL REINFORCING STEEL TO BE #4 BARS @ 12" O.C. EACH WAY, UNLESS OTHERWISE NOTED

ALL REINFORCING STEEL TO BE EXTENDED INTO ADJOINING WALLS OR FLOORS

MIN. LAP TO BE 15" AND MIN. BENDING RADIUS OF 5".

AS BUILT

DRAWN BY	DM
SCALE	AS NOTED
DATE	8-7-73
CHECKED BY	
DRAWING NUMBER	

NO	DATE	BY	REVISIONS & REMARKS
1	7-1-74		AS BUILT

TRICO INTERNATIONAL INC.

TEMPE, ARIZONA
CIVIL ENGINEERING

Mc CULLOCH PROPERTIES INC.
FOUNTAIN HILLS, ARIZONA

MODIFICATION OF OUTLET BASIN
STRUCTURE NO. 4

SHEET 11 OF 11 SHEETS

BRUNING 40-105

See p. 7 of fndn. report = vel. that V in spillway not exceed 2.5'/sec!!!

Proved emerg. spillways? See sheet 3 of seepage on Emerg. Spillway

V = 7'/min.

probably much greater at lip.

~~Backfilling not to any compaction standard? Look at ASTM D 1556 reqd. 95% of Mod. Dens. — see page 4 of specs.~~

~~Foundation investigation says spillway will be 1716', or 2.5 (or 1'?) below top of dam embankment, check this!~~

~~The emerg. spillway shows 0 flow at el. 1716!!!~~

(Pg 1)

Seepage collars?

50
2
10.0

If water is more than
5' ± deep in energy,
spelling, it will
go over right about,

Dam #4 Drawings (cont'd)

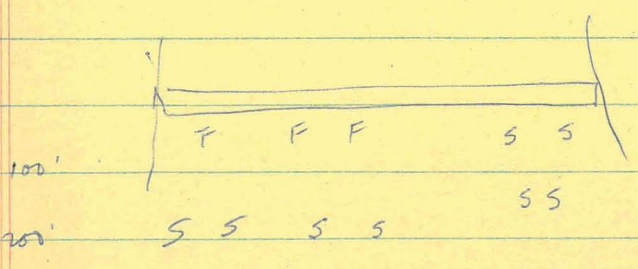
3. Using the elevation for required top of dam of 1730± (or as their data showed as 1732.3), there is a gap along the north side of the reservoir. The gap is 220' long, and with a low spot of 1727, is about 3' below max. water surface.

Field: would go down north and fill and over south

9. Boring No. 5 was located in the emergency spillway. ~~Bor~~ The design indicated a max. velocity in spillway stated to be 2.5 ft/sec. The boring log on sheet 9 supports this, for the materials at or below the spillway crest are ~~indicate~~ sands, gravelly sands, and clayey gravels. A careful check is required of the excavated spillway. If ~~these a~~ the exposed materials are not fully cemented and compact, the spillway might be lost in a large storm because the high velocities would cause rapid erosion.

check this in field — very little cementation — not good

4/10



where spillway was cut 3-4' deep, mtl is compact 6" down and firm (F). where ~~it~~ cut was shallow, material is soft (S) and doesn't get compact for 1' or more deeper.

Sheet #7 – Stilling basin apparently is out. What happened?
was abandoned

Sheet #9

Check capacities of reservoir and spillway against design requirements. Checked fairly well.

Sheet #11

Field – not desirable but structure looks ok. Spot stress – all justified

Sect. D/1 All longitudinal steel is #3 bars @ 18" centers!! In my opinion, main size should be bar #4, and main spacing 12". Check in field to see if there is reqmt. for strength.

Sheet 2

Hydrography shows that dam #4 data is based on dams #6, #7, and #11 in operation. However, dam #11 has not yet been constructed, now started.

Trico people feel that the probability of a PMP storm, or anything similar, is ~~so remote~~ such a ~~remote~~ remote contingency that a chance can be reasonably taken until construction is completed in a year or two.

I feel that when we consider this, plus the fact that the dam is 9.3' below the recommended crest elevation, the risk is not justified!!

Dam #4 Design

Sheet 1

El 1716.0 Spillway crest based on 100 year storm

El 1723.0 Dam crest

Statement "Emergency & freeboard based on 6 Hour Part Max Precip"
Spillway (pines) based on 10-day drawdown
However, this is not so. Hydrograph gives
an elev. which is 9.3' above crest of dam!

Sheet 2

(cont'd. next page)

Check to see that design is based on Dam #4
and #6 and #7 built, but #11 not built

Sheet 4

or profile
Energ. spillway cutoff wall on sheet 4 "4' deep × 9" thick
On plan concrete crest 12"
On sheet 5 shown as 12" at top, 6" on stem, 4'6" deep

~~Energ spillway cutoff wall conc to el 1721.0~~
~~Is this adequate to pass design spillway flood~~
~~(5' deep)?~~

Sheet 6

Trash rack is old utility poles. Question
durability (early maint. required).
Extend ~~1'1"~~ 1'1" above top of inlet
headwall. Field: See photo.
Inlet now blocked by tumbleweed

Dam #4 Design data (cont'd).

Velocity in emerg. spillway when 100 yr storm occurs. There is ~~not~~ supposed to be no flow. However, their hydrograph shows flow will be 0.9' deep over the crest.

$d = r = 0.9$

$$V = \frac{1.486}{n} r^{2/3} S^{1/2}$$

$n = .03$

$$= 49.53 \times 0.9^{2/3} \times .05^{1/2}$$

$$49.53 \times .932 \times .222 = 10.2 \text{ ft/sec.}$$

Even this is higher than recommended by the designer for foundations, mills, etc.

Dam #4 Design Data (cont'd)

Spec. Density reqd = 95%
1/2 must be 97% or better

Field tests of 137 embankment tests, 1 was at 94.8%. 33 or 24% were less than 97% density.

Concrete cyl. 3530#

Spec (p.7) Max "v" in spillway to be 2.5'/sec.
I feel sure that 42,000 cfs on a 5% slope will exceed this V.

Spillway L = 300' Q = 42,000
Then $V = \frac{Q}{A}$ A = L × d.

Assumed d	A	V
2'	600	70
3'	900	44
4'	1200	35
5'	1500	28
6'	1800	23
10'	3000	12.5

1720.8 W.S.
1716
4.8

r = d = 4.8 $r^{2/3} = 2.84$ S = .05 $S^{1/2} = .222$

$V = \frac{1.486}{.03} \times r^{2/3} \times S^{1/2}$

= 49.53 × 2.84 × .222 = 31 ft/sec.!

Check emerg. spillway in field

Item #4 Design data

Calcs. 2, 3. The computation of storage-capacity, and spillway capacity agrees with the printout. However, I cannot check the emergency spillway Q₀; my computations are higher. I can't find the reason offhand and didn't take time to study it in detail. This is because their computations are lower, which will result in a higher water ~~surf~~ surface, and a safer (higher) dam.

Hydrograph Storm (A) 4.2"

	Printout	Sheet 3 calc.	Sheet 4 plans
peak Q_0	1499.4	agrees.	
peak el.	1716.88	Emerg. spillway crest = 1716.0 = ok	1716.0

0.9' too low

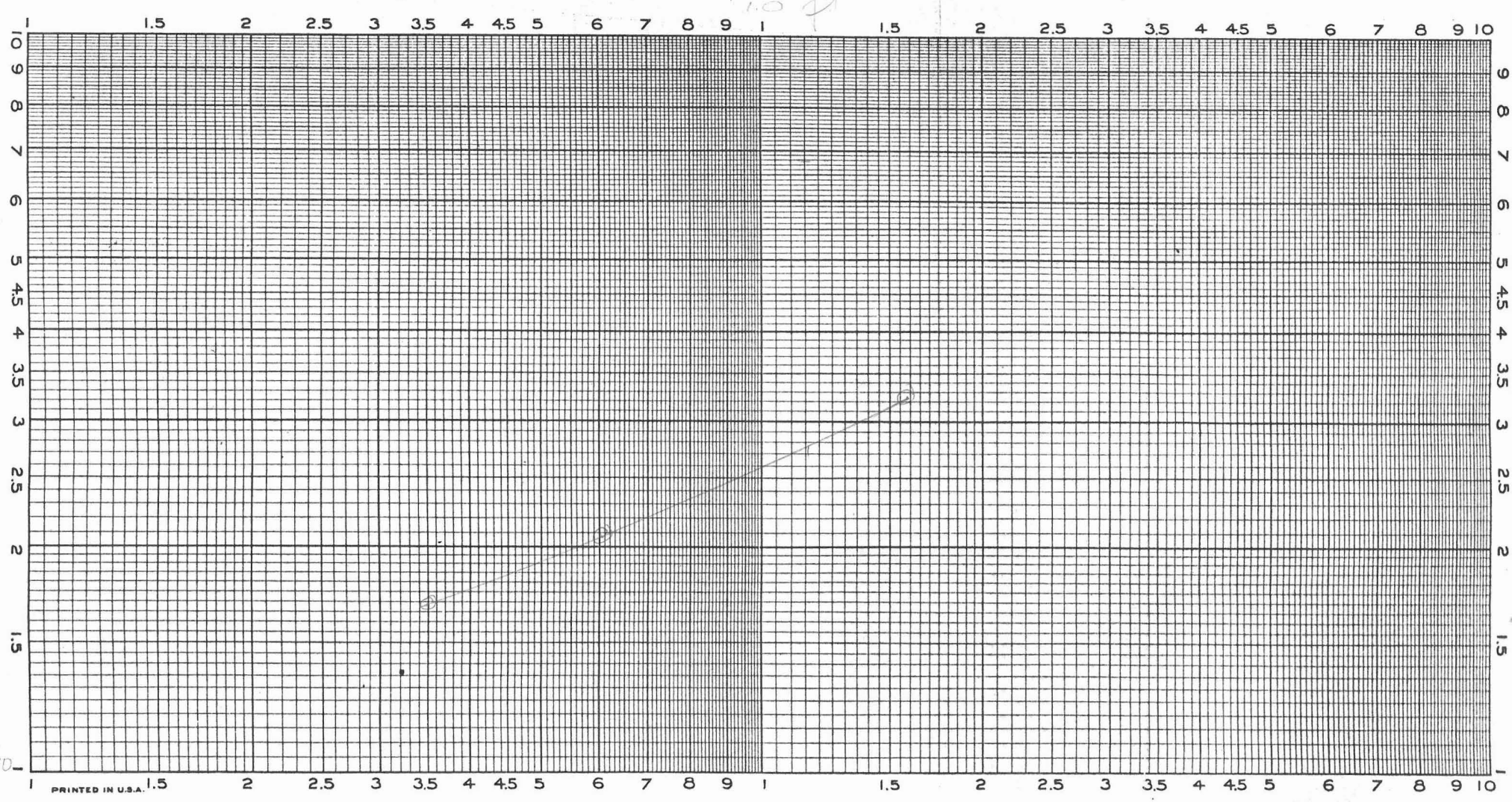
Storm (D) 19"

	Printout	Sheet 3 calc.	Sheet 4 plans
Peak Q_0	42 052.4	does not go this high *	
peak el	1732.28		dam crest 1723.0

My computations show that 42,000± Q_0 would be needed about El 1730±

	Storm (C) 7.3"	
Q_0	9285.8	1723.0
el.	1720.8	

NO. 551 LOGARITHMIC 2X1-5 INCH CYCLES THE FREDERICK POST CO., CHICAGO, ILL.

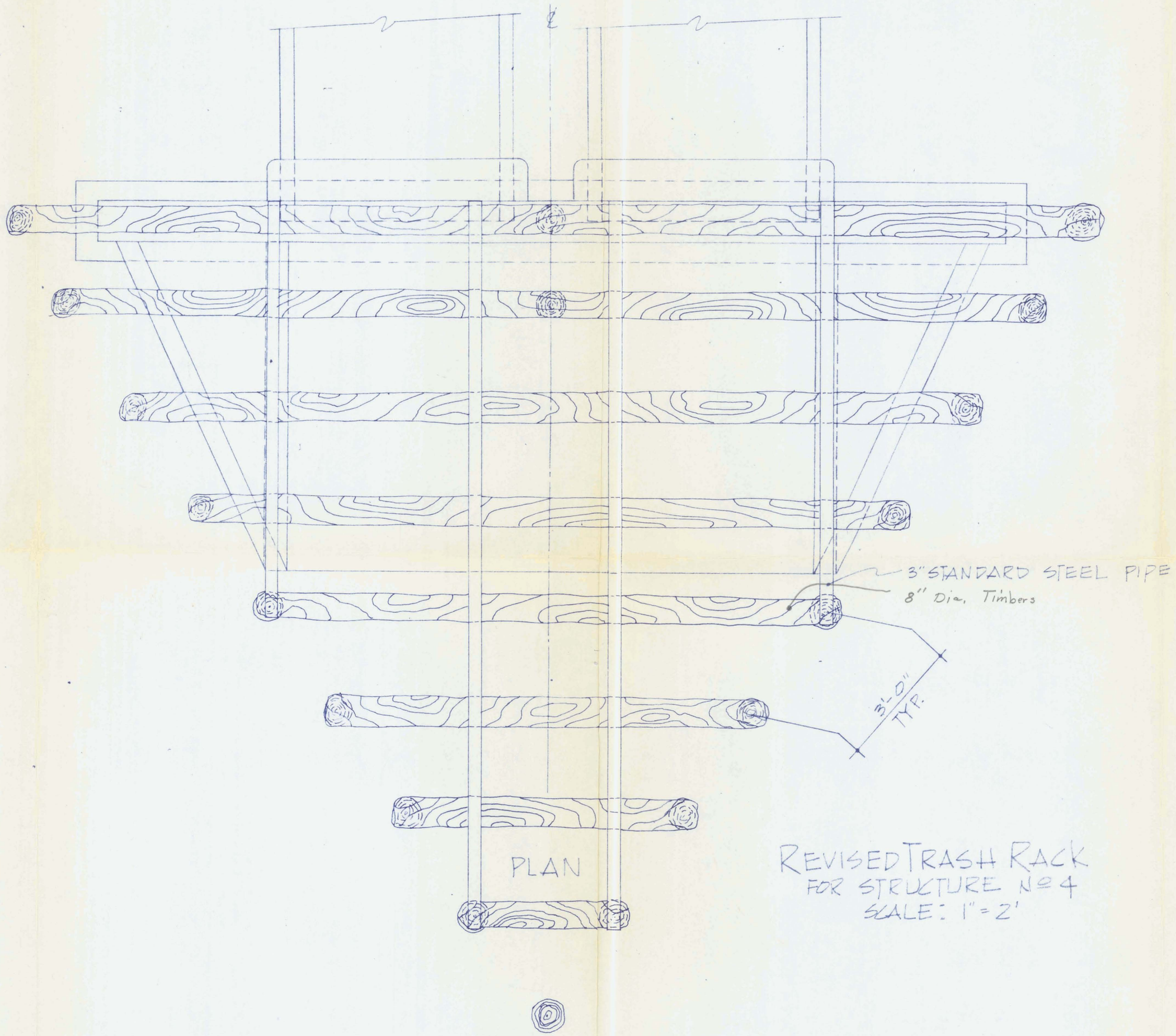


Stem #4

Rain ~~Sp~~ Q'	Qp	El
4.2	1499	1716.9
7.3	9286	1720.8
19"	42052	1732.3

Log plot

14" = 1727.7



REVISED TRASH RACK
FOR STRUCTURE Nº 4
SCALE: 1" = 2'