PROJECT SUMMARY MATRIX

PROJECT NAME: Hoover Dam Bypass
PROJECT NUMBER: HPP-93(1)

Arizona Approach

Wash	MP	Average channel	Length*	Impact	Basin Area	Flow Data (cfs)			Existing Drainage Structure			New Drainage Structure			Proposed	Previous Delineation?	
Name	(existing)	width (ft.)	(ft.)	(acres)	(sq. mi.)	10-Yr	50-Yr	100-Yr	Name	Size	Length (ft.)	Name	Size	Length (ft.)	Action	Yes	No
P	-	2	75	0.003	0.005	7	10	11	None	-	-	None	-	-	Outlet of new CBC 1 flows into top of Wash P	X	
Q	1.59	4	75	0.01	0.075	29	105	164	CBC 1	6 ft. X 5 ft.	210.0	CBC 1	6 ft. X 5 ft.	505	Remove and replace CBC	X	
R	-	2	362	0.02	0.011	12	29	42	None	-	-	CMP 201	36 in.	300	New CMP	X	
S	-	2	275	0.01	0.002	3	5	5	None	-	-	None	-	-	Filled by embankment	X	
T	-	2	275	0.01	0.004	6	9	10	None	-	-	None	-	-	Filled by embankment	X	
PP	-	15	1312	0.45	0.209	76	206	297	None	-	-	Channel 1	16 ft. bottom width	1225	Runoff will be diverted into Channel 1	X	
#253	1.88	15	625	0.22	0.163	45	156	240	CBC 2	6 ft. X 6 ft.	146.0	CBC 2	6 ft. X 6 ft.	403	Extend existing CBC		X
#258	1.97	15	587	0.20	0.611	96	306	459	CBC 3	10 ft. X 10 ft.	122.0	CBC 3	10 ft. X 10 ft.	485	Extend existing CBC		X
#263	2.05	15	700	0.24	0.917	121	376	560	CBC 4	10 ft. X 8 ft.	169.0	CBC 4	10 ft. X 8 ft.	422	Remove and replace CBC		X
#263	-	15	150	0.05	0.917	121	376	560	None	-	-	CBC 6	2-6 X 6 ft.	104	New CBC under realigned access road		X
#265	2.10	8	575	0.11	0.143	42	146	225	CBC 5	6 ft. X 6 ft.	95.5	Channel 3	10 ft. bottom width	1872	New CMPs in this area will convey median and pavement drainage only.		X
#272	2.22	4	762	0.07	0.012	10	41	67	CMP 105A	36 in.	94.0	Channel 3	10 ft. bottom width	1872	New CMPs in this area will convey median and pavement drainage only.		X
#279	2.36	3	887	0.06	0.016	12	47	76	CMP 105	36 in.	104.0	CMP 105	36 in.	159	Remove and replace CMP		X

Nevada Approach

Wash	MP	Average channel	Length*	Impact	Basin Area	Flow Data (cfs)			Existing Drainage Structure			New Drainage Structure			Proposed	Previous Delineation?	
Name	(existing)	width (ft.)	(ft.)	(acres)	(sq. mi.)	10-Yr	50-Yr	100-Yr	Name	Size	Length (ft.)	Name	Size	Length (ft.)	Action	Yes	No
A	3.06	1	70	0.002	0.005	8	17	23	CMP	24 in.	95	CMP	24 in.	35	Extend existing CMP Downstream	X	
AA	1.27	6	240	0.03	0.094	46	121	167	CMP	36 in.	NA	CBC	6 ft. x 5 ft.	225	New Concrete Box Culvert	X	
B	3.02	2	55	0.003	0.012	13	31	40	CMP	24 in.	121	CMP	24 in.	55	Extend existing CMP Downstream	X	
C	2.96	0.5	140	0.002	0.011	13	29	39	CMP	24 in.	55	CMP	24 in. & 36 in.	95	Extend existing CMP Upstream and Downstream	X	
D1	-	3	305	0.02	0.012	13	31	41	None	-	-	CMP	36 in.	470	New Culvert	X	
D2	2.77	3	700	0.05	0.039	27	67	91	CMP	36 in.	104	CMP	48 in.	290 & 140	Extend Existing CMP Downstream, Install Channel Under Bridge Structure & New Dual Culverts	X	
E	2.66	1	625	0.01	0.024	20	49	66	CMP	36 in.	106	CMP's	(2) 36 in.	94 & 285	(2) New Dual Culverts	X	
F	-	1	490	0.01	0.006	8	19	25	None	-	-	CMP	30 in.	472	(2) New Culverts and Median Channel	X	
G1	-	3	275	0.02	0.007	9	22	28	None	-	-	CMP	30 in.	80 & 236	New Culvert and Median Channel	X	
G2	-	5	400	0.05	0.013	13	32	42	None	-	-	CMP	42 in.	310	New Culvert	X	
H	-	2	250	0.01	0.016	16	37	50	None	-	-	CMP	48 in.	240	New Culvert	X	
I	-	2	290	0.01	0.007	9	21	28	None	-	-	CMP	30 in.	170	New Culvert	X	
J	2.14	2	300	0.01	0.007	9	21	27	CMP	24 in.	NA	CMP	30 in.	196	New Culvert	X	
GS-1	-	2	80	0.004	0.013	13	32	42	None	-	-	CHANNEL	Varies	80	Re-align Portion of Gold Strike Canyon	X	
GS-2	-	12	200	0.06	0.222	79	215	301	None	-	-	CBC	8 ft. x 5 ft.	195	New Concrete Box Culvert	X	

*Length of impacted channel - does not include length of existing culvert if present.
NA - Not available; survey required
TBD - To be determined during final design
CMP - Corrugated metal pipe
CBC - Concrete box culvert

Item 13

Wash	Name of Water Body
A	Unnamed ephemeral wash (Nevada)
AA	Unnamed ephemeral wash (Nevada)
B	Unnamed ephemeral wash (Nevada)
C	Unnamed ephemeral wash (Nevada)
D1	Unnamed ephemeral wash (Nevada)
D2	Unnamed ephemeral wash (Nevada)
E	Unnamed ephemeral wash (Nevada)
F	Unnamed ephemeral wash (Nevada)
G1	Unnamed ephemeral wash (Nevada)
G2	Unnamed ephemeral wash (Nevada)
GS-1	Gold Strike Canyon Wash
GS-2	Gold Strike Canyon Wash
H	Unnamed ephemeral wash (Nevada)
I	Unnamed ephemeral wash (Nevada)
J	Unnamed ephemeral wash (Nevada)
P	Unnamed ephemeral wash (Arizona)
Q	Unnamed ephemeral wash (Arizona)
R	Unnamed ephemeral wash (Arizona)
S	Unnamed ephemeral wash (Arizona)
T	Unnamed ephemeral wash (Arizona)
PP	Unnamed ephemeral wash (Arizona)
#253	Unnamed ephemeral wash (Arizona)
#258	Unnamed ephemeral wash (Arizona)
#263	Unnamed ephemeral wash (Arizona)
#265	Unnamed ephemeral wash (Arizona)
#272	Unnamed ephemeral wash (Arizona)
#279	Unnamed ephemeral wash (Arizona)

Item 16

Wash	Legal Description	MP of Existing Wash Crossing
P	Arizona: 30N, 23W, Section 10	-
Q	Arizona: 30N, 23W, Section 11	1.59
R	Arizona: 30N, 23W, Section 10	-
S	Arizona: 30N, 23W, Section 10	-
T	Arizona: 30N, 23W, Section 10	-
PP	Arizona: 30N, 23W, Sections 3 and 10	-
#253	Arizona: 30N, 23W, Section 11	1.88
#258	Arizona: 30N, 23W, Section 11	1.97
#263	Arizona: 30N, 23W, Section 11	2.05

Wash	Legal Description	MP of Existing Wash Crossing
#265	Arizona: 30N, 23W, Section 11	2.10
#272	Arizona: 30N, 23W, Section 11	2.22
#279	Arizona: 30N, 23W, Section 11	2.36
A	Nevada: T22S, R64E, Sect. 25	3.06
AA	Nevada: T22S, R64E, Sect. 25	1.27
B	Nevada: T22S, R64E, Sect. 25	3.02
C	Nevada: T22S, R64E, Sect. 25	2.96
D1	Nevada: T22S, R64E, Sect. 25	-
D2	Nevada: T22S, R64E, Sect. 25	2.77
E	Nevada: T22S, R64E, Sect. 25	2.66
F	Nevada: T22S, R64E, Sect. 25	-
G1	Nevada: T22S, R64E, Sect. 25	-
G2	Nevada: T22S, R64E, Sect. 25	-
H	Nevada: T22S, R64E, Sect. 25	-
I	Nevada: T22S, R64E, Sect. 25	-
J	Nevada: T22S, R64E, Sect. 25	2.14
GS-1	Nevada: T22S, R64E, Sect. 25	-
GS-2	Nevada: T22S, R64E, Sect. 25	-

Item 18

The proposed project consists of constructing the US 93/Hoover Dam Bypass on a new alignment that crosses the Colorado River approximately 1,500 feet downstream from Hoover Dam. A project vicinity map is provided in Attachment B. The proposed project includes the construction of approximately 2.2 miles of highway approach in Nevada, a new 1,900-foot bridge over the Colorado River, and a 1.6-mile highway approach in Arizona. The new roadway will consist of two 12-foot lanes in each direction, divided by a concrete median barrier. The roadway will have a 5-foot inside shoulder and 10-foot outside shoulder. Traffic interchanges will be constructed just east of the Hacienda Resort and Casino in Nevada and approximately 0.25 mile west of the Kingman Wash Access Road in Arizona. The project is divided into three main elements. Construction of the Arizona approach roadway and associated structures will begin in January 2003 and will conclude with paving of the approach roadway in conjunction with completion of the Colorado River Bridge construction in March 2007. Construction of the Nevada approach roadway and associated structures will commence in December 2003 and will be completed at the same time as the Arizona approach roadway. Construction of the new bridge across the Colorado River will begin in late 2003, with completion scheduled for early 2007.

The project begins just east of the Hacienda Casino, where the new 4-lane divided highway and interchange will be constructed south of the existing roadway on embankment. The new embankment will continue easterly until reaching a deep ravine near Nevada Milepost (MP) 1.7. At this point, a new bridge will be constructed and connect into a deep cut section through a high ridge. East of this point, the new roadway will again be constructed on embankment, with a new bridge over the Lower Dam Access Road and two bridges over US 93, immediately east of the

Bureau of Reclamation (BOR) warehouse and storage yard. The roadway will then continue toward the new Colorado River crossing on a combination of roadway fill and cut sections.

After crossing the Colorado River, the new roadway will pass through cut sections on the north side of Sugarloaf Mountain and the BOR sewage treatment ponds. Immediately east of the ponds, the bypass will cross a deep ravine on a 900-foot structure that will tie into a high roadway embankment that crosses to the north side of existing US 93 and continues to its southern terminus at Arizona MP 2.2, near the existing intersection with the Kingman Wash Access Road. A new interchange will be constructed north of US 93, approximately 0.25 west of that intersection, with the mainline roadway passing over a new road that will provide access to Hoover Dam and the relocated Kingman Wash Access Road to Lake Mead.

The project will primarily require the placement of roadway embankment fill in jurisdictional ephemeral washes in both Arizona and Nevada in order to install concrete box culverts (CBCs) and corrugated metal pipes (CMPs). Some excavation will also be required for culvert placement, installation of riprap and other erosion control measures, and the channelization of one wash each in Nevada and Arizona. Location maps of the jurisdictional washes in Arizona and Nevada are provided in Attachment B. A summary matrix, which describes the proposed construction activities in each wash affected by the project, is provided in Attachment C.

Attachment D contains plan and elevation views of the proposed roadway construction relative to each of the washes. Cross sections are also provided to illustrate the proposed culvert locations relative to each wash. Figures 1 through 9 address the wash crossings in Arizona. Figures 10 through 23 address the affected washes in Nevada.

In Arizona, Wash PP will be filled with embankment that will support the bypass approach to a new 900-ft ravine bridge as well as the new access road to Hoover Dam that will pass under that bridge. Wash PP will be replaced by a new channel (Channel 1), which will be located at the toe of the new roadway embankment. In order to construct this embankment and the eastern abutment for the ravine bridge, a temporary crossing of Wash PP will be required for a construction haul road across the ravine. This fill will eventually be incorporated into the permanent roadway embankment, but the area disturbed by the construction haul road along the ravine embankment will be restored to its pre-construction condition. The restoration effort will include revegetation with native plant species. CFLHD's Standard Specifications for Road and Bridge Construction will be followed and will be supplemented by adherence to Best Management Practices to protect water quality. These practices will include, but not be limited to, the use of silt fences and hay bale barriers. Jurisdictional Washes 265, 272, and 279, which are located north of existing US 93 and east of the proposed Arizona interchange, will be redirected into a new channel (Channel 3; see Figure 9 in Attachment D) that will connect into the new concrete box culvert for Wash 263. (Note: Channel 2, which is located north of the bypass and east of the Arizona ravine crossing, does not affect waters of the U.S.)

In Nevada, a portion of Gold Strike Canyon Wash (GS-1) will need to be rechannelized as part of the interchange construction project. This work may require some temporary fill in the wash in order to provide an access route for construction vehicles. This fill will also be removed after construction is completed and the disturbed area for the construction haul road and temporary fill will be restored to its pre-construction condition. CFLHD's Standard Specifications for Road and Bridge Construction will be followed and will be supplemented by adherence to Best

1. Safeguarding dam and power plant facilities and the waters of Lake Mead and the Colorado River from hazardous spills or explosions.
2. Protecting the dam and power plant facilities from interruptions in electricity and water delivery.
3. Providing improved conditions for operating and maintaining Hoover Dam facilities.

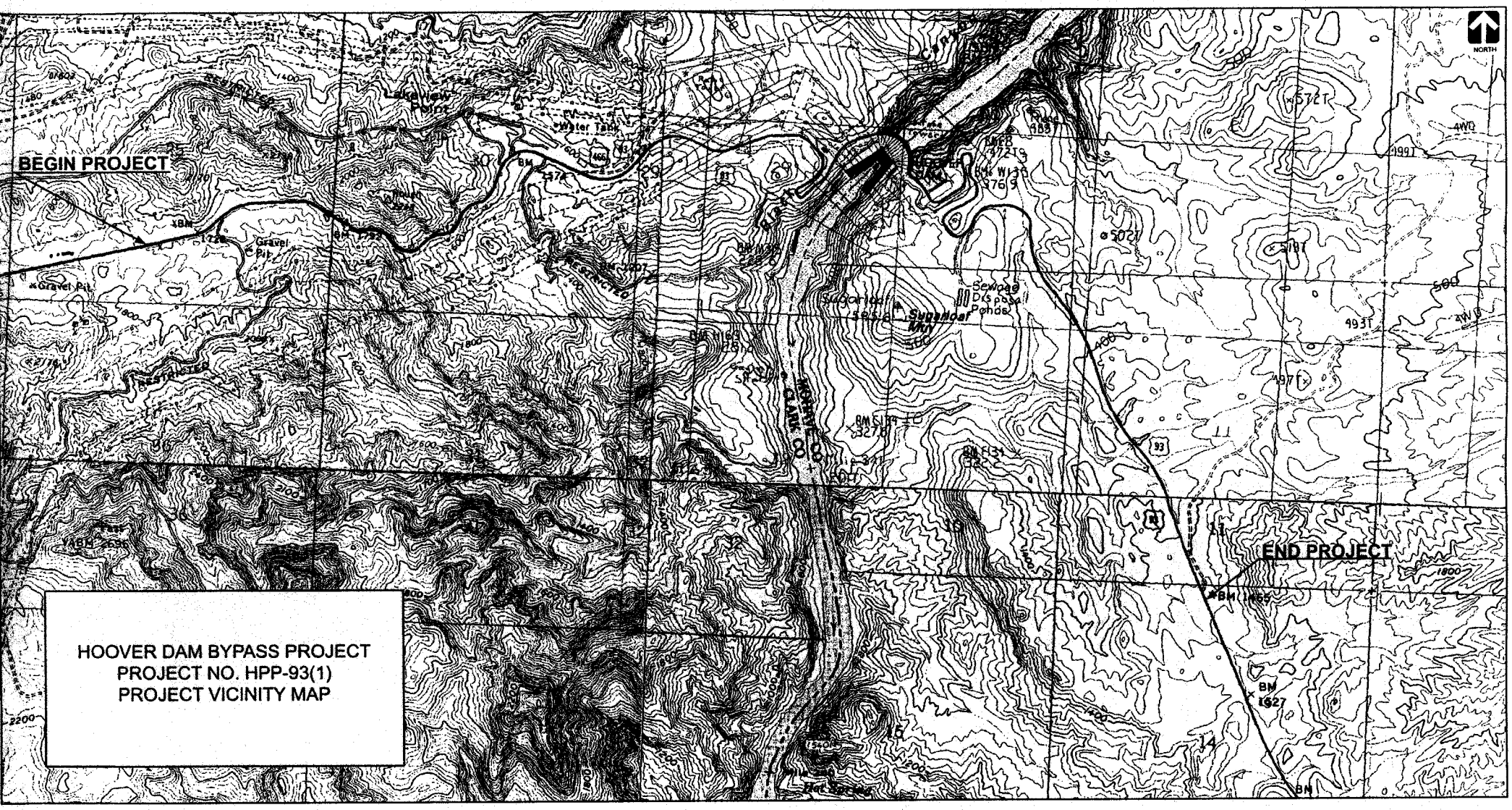
Item 21

Wash	Cubic Yards of Fill	Type of Fill
A	3	Backfill/local native material
AA	55	Backfill/local native material
B	3	Backfill/local native material
C	9	Backfill/local native material
D1	20	Backfill/local native material
D2	78	Backfill/local native material
E	49	Backfill/local native material
F	18	Backfill/local native material
G1	12	Backfill/local native material
G2	27	Backfill/local native material
GS-1	7	Backfill/local native material, riprap
GS-2	79	Backfill/local native material, riprap
H	15	Backfill/local native material
I	12	Backfill/local native material
J	36	Backfill/local native material
P	Included in estimate for Wash Q/CBC 1	Concrete, reinforcing steel, backfill/native material, riprap (CBC 1)
Q	Concrete: 526 Rebar (lbs.): 86,702 Backfill: 22,937 Riprap: 74	Concrete, reinforcing steel, backfill/native material, riprap (CBC 1)
R	Backfill: 2,602 Riprap: 11	Backfill/native material, riprap (CMP 201)
S	Backfill: 1,444	Backfill/native material (embankment)
T	Backfill: 1,467	Backfill/native material (embankment)
PP	Backfill: 510	Backfill/native material (Channel 1)
#253	Concrete: 349 Rebar (lbs.): 58,230 Backfill: 3,594 Riprap: 74	Concrete, reinforcing steel, backfill/native material, riprap (CBC 2)
#258	Concrete: 1,002 Rebar (lbs.): 133,644 Backfill: 6,682 Riprap: 104	Concrete, reinforcing steel, backfill/native material, riprap (CBC 3)
#263	Concrete: 818 Rebar (lbs.): 116,235 Backfill: 3,348 Riprap: 104	Concrete, reinforcing steel, backfill/native material, riprap (CBC 4)

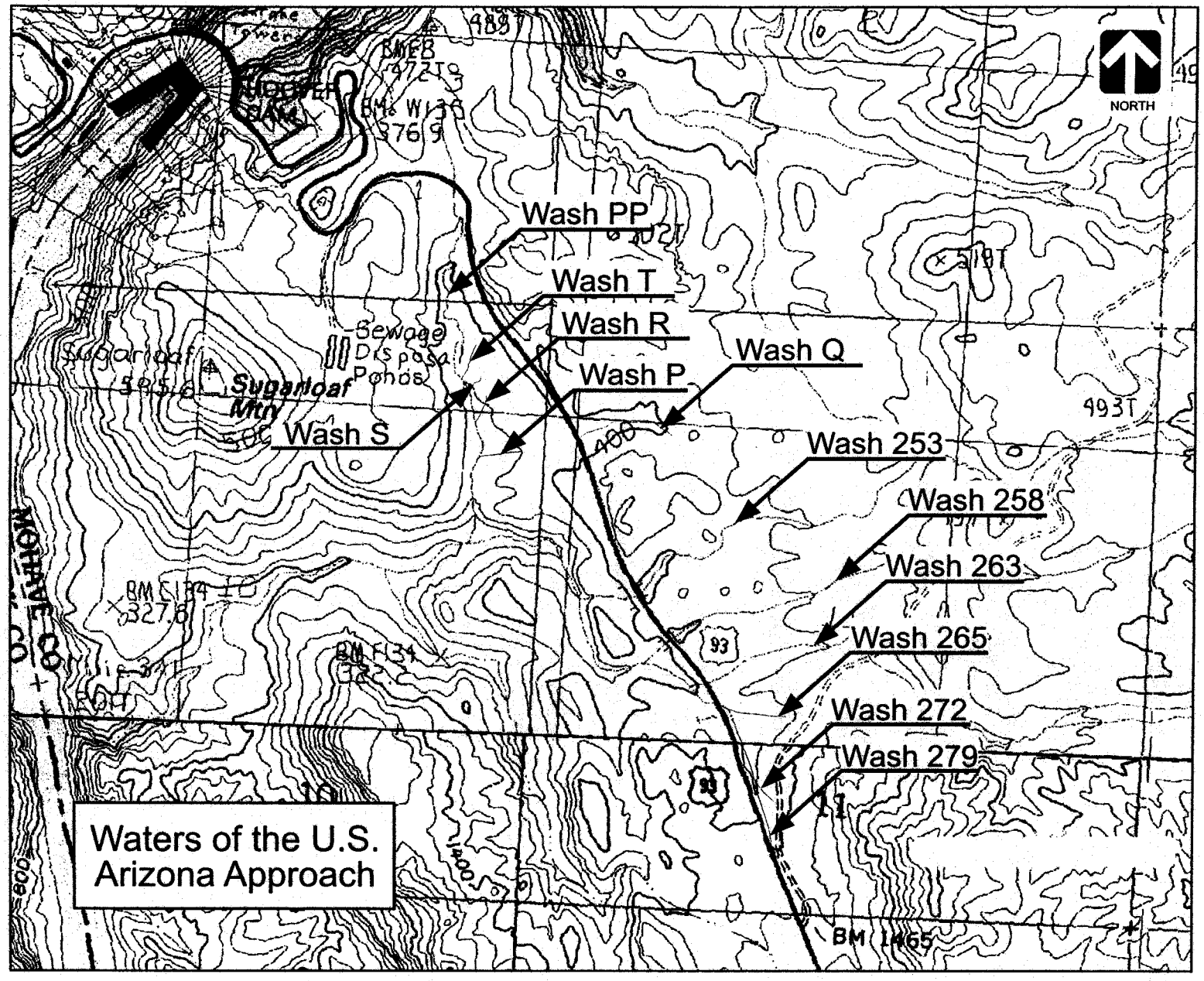
Wash	Cubic Yards of Fill	Type of Fill
	Concrete: 127 Rebar (lbs.): 21,180 Backfill: 314 Riprap: 74	Concrete, reinforcing steel, backfill/native material, riprap (CBC 6)
#265	Backfill: 1,305	Backfill/native material (Channel 3)
#272	Included above in estimate for Wash #265/Channel 3	Backfill/native material (Channel 3)
#279	Backfill: 184 Riprap: 11	Backfill/native material, riprap (CMP 105)

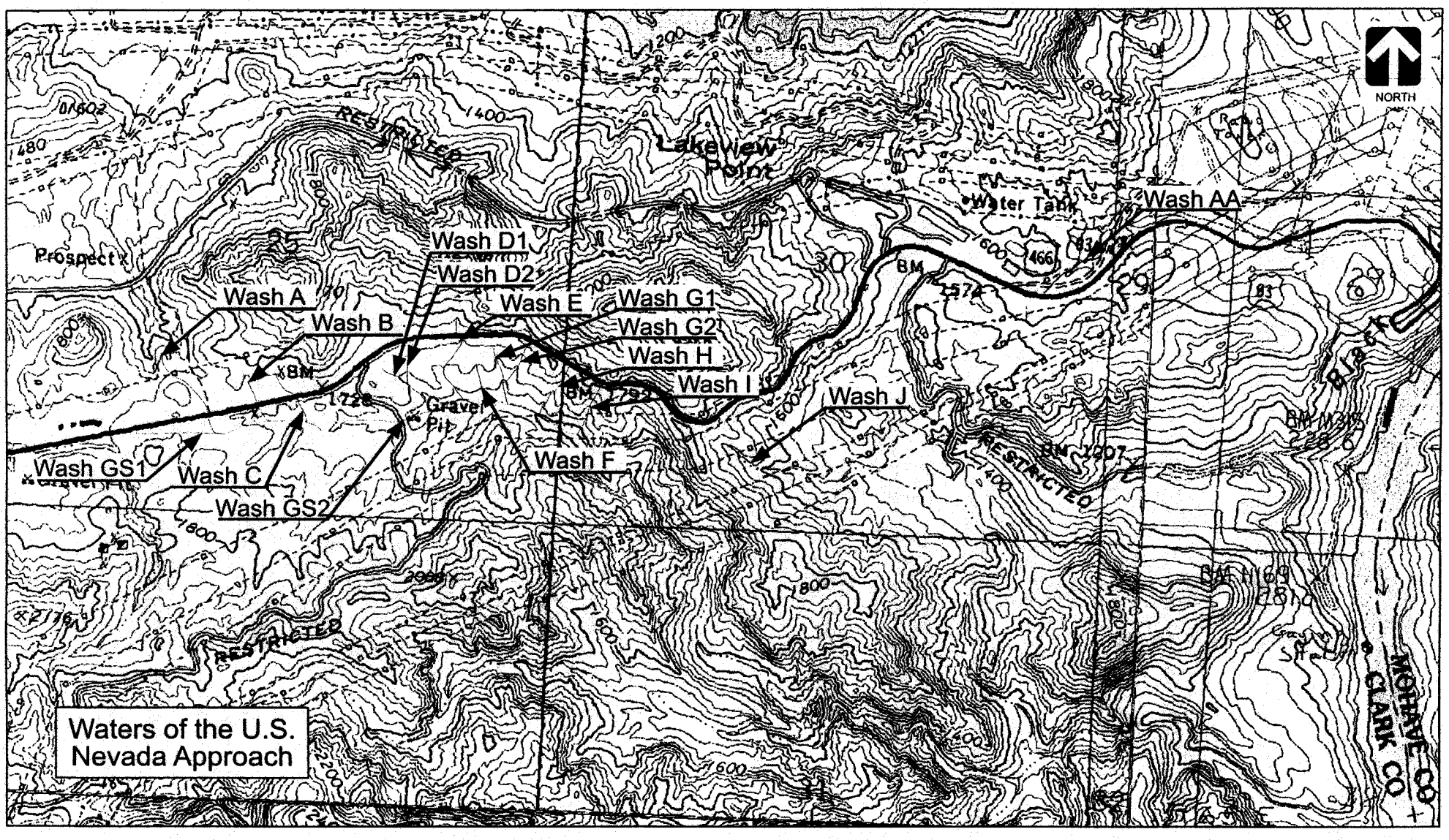
Item 22

Wash	Acres of Permanent Impact
A	0.002
AA	0.03
B	0.003
C	0.002
D1	0.02
D2	0.05
E	0.01
F	0.01
G1	0.02
G2	0.05
GS-1	0.004
GS-2	0.06
H	0.01
I	0.01
J	0.01
P	0.003
Q	0.01
R	0.02
S	0.01
T	0.01
PP	0.45
#253	0.22
#258	0.20
#263	0.24 at CBC 4; 0.05 at CBC 6
#265	0.11
#272	0.07
#279	0.06



HOOVER DAM BYPASS PROJECT
PROJECT NO. HPP-93(1)
PROJECT VICINITY MAP

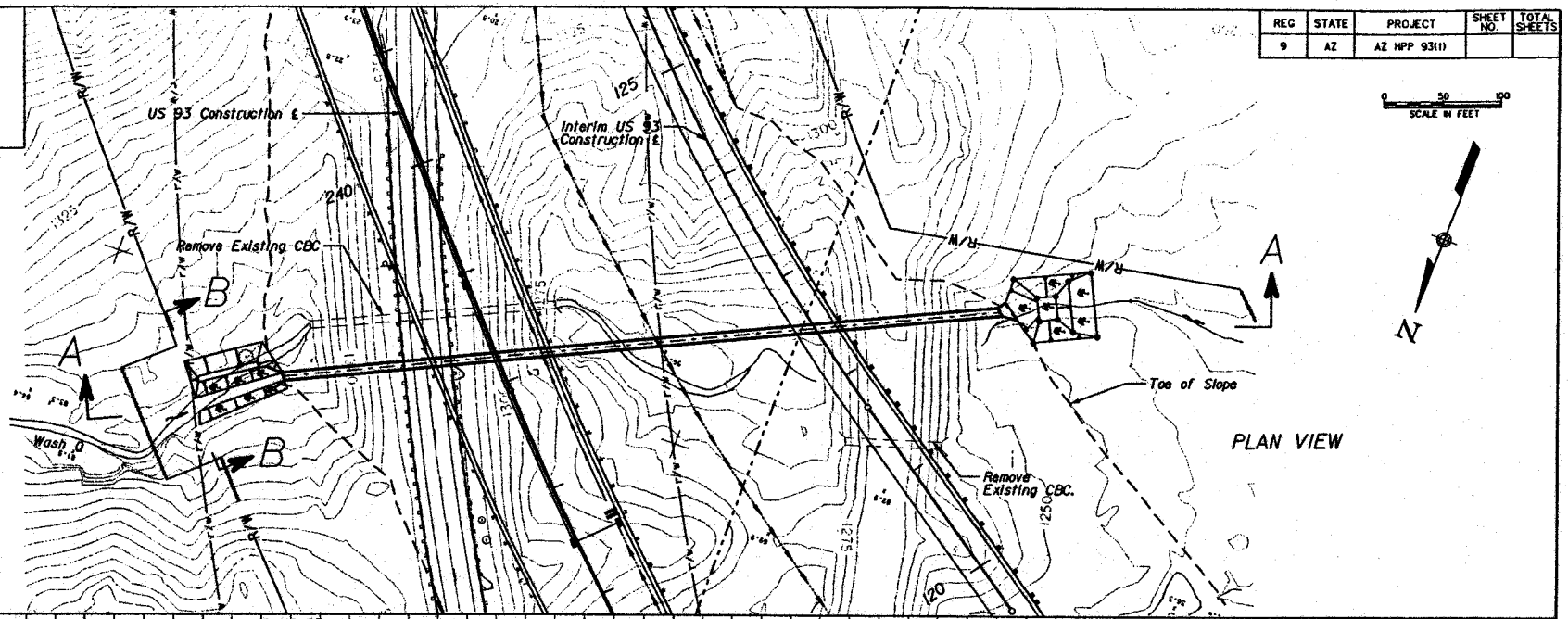

Wash PP
Wash T
Wash R
Wash Q
Wash P
Wash S
Wash 253
Wash 258
Wash 263
Wash 265
Wash 272
Wash 279
Sugarloaf Mtn
Sewage Disposal Ponds
HOOVER DAM
NORTH
93
BM 1465
Waters of the U.S.
Arizona Approach

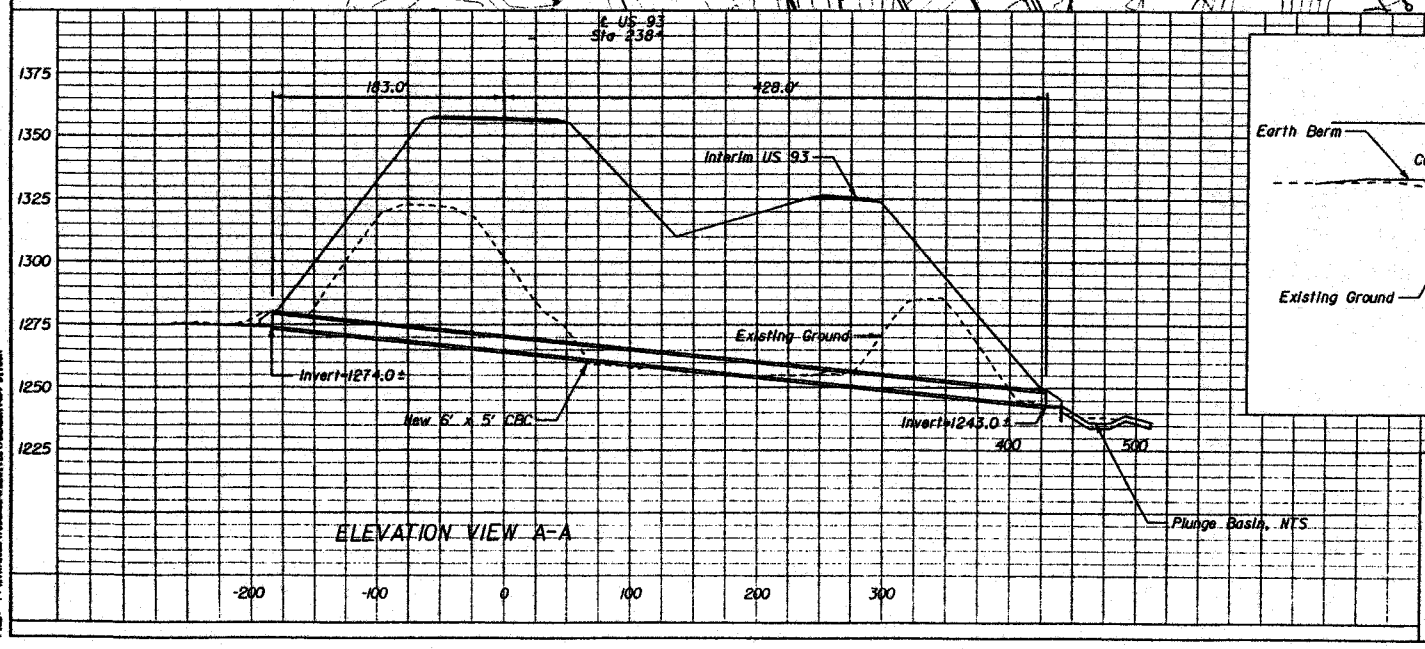

Waters of the U.S.
Nevada Approach
NORTH
Wash AA
Wash D1
Wash D2
Wash A
Wash B
Wash E
Wash G1
Wash G2
Wash H
Wash I
Wash J
Wash F
Wash C
Wash GS1
Wash GS2
Lakeview Point
Water Tank
Prospect
Gravel Pit
RESTRICTED
MOHAVE CO
CLARK CO

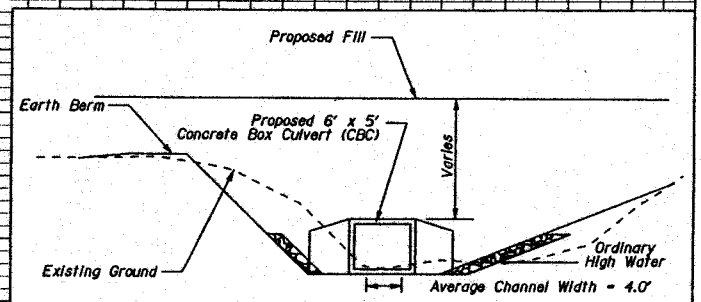
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		

HYDRAULIC DATA

Drainage area = 48 ac
Q_2 = 3 cfs
Q_{25} = 64 cfs
Q_{50} = 105 cfs
Q_{100} = 164 cfs







WASH "Q"
ELEVATION VIEW B-B
Not to Scale

USACOE INDIVIDUAL PERMIT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
ARIZONA WASH Q
Figure 1

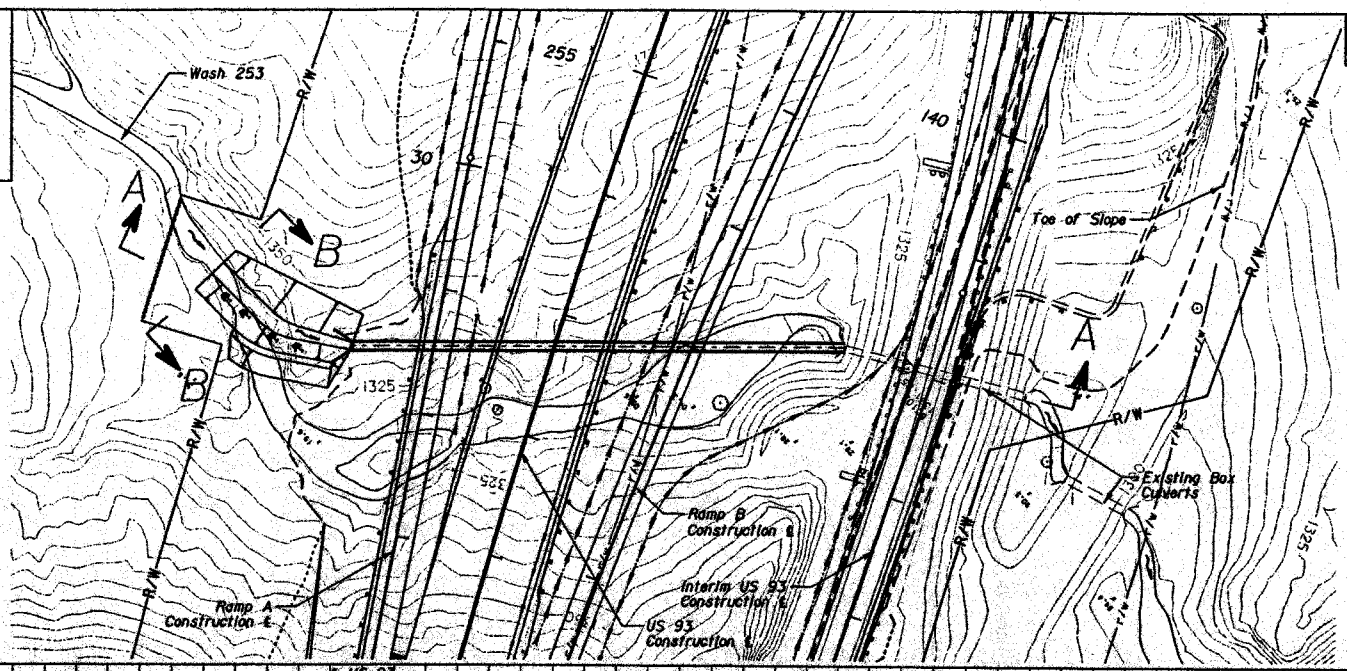
Sverdrup CIVIL INC

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

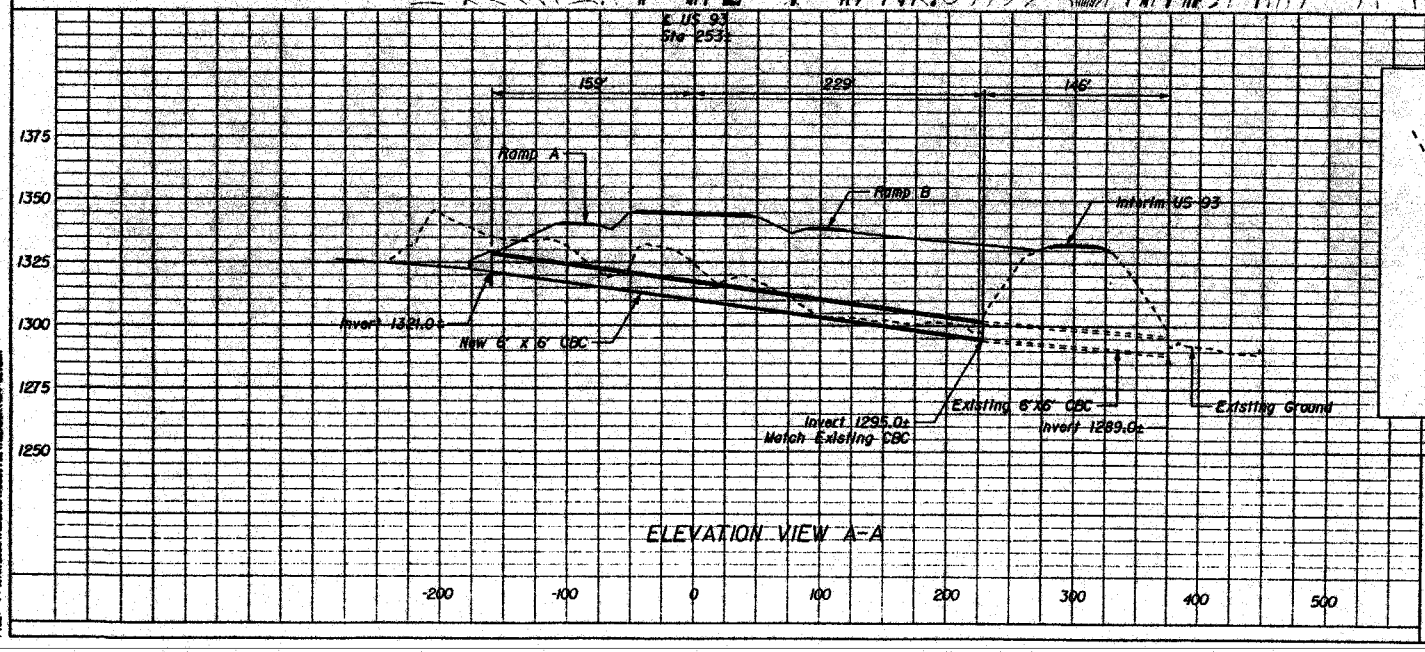
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		

HYDRAULIC DATA

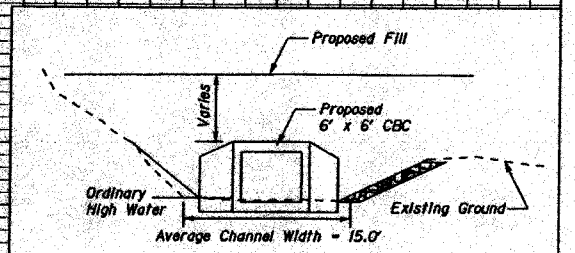
Drainage area = 104 ac
Q_2 = 6 cfs
Q_{25} = 96 cfs
Q_{50} = 156 cfs
Q_{100} = 240 cfs



PLAN VIEW



ELEVATION VIEW A-A



Wash 253
ELEVATION VIEW B-B
Not to Scale

USACOE INDIVIDUAL PERMIT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
ARIZONA WASH 253
Figure 2

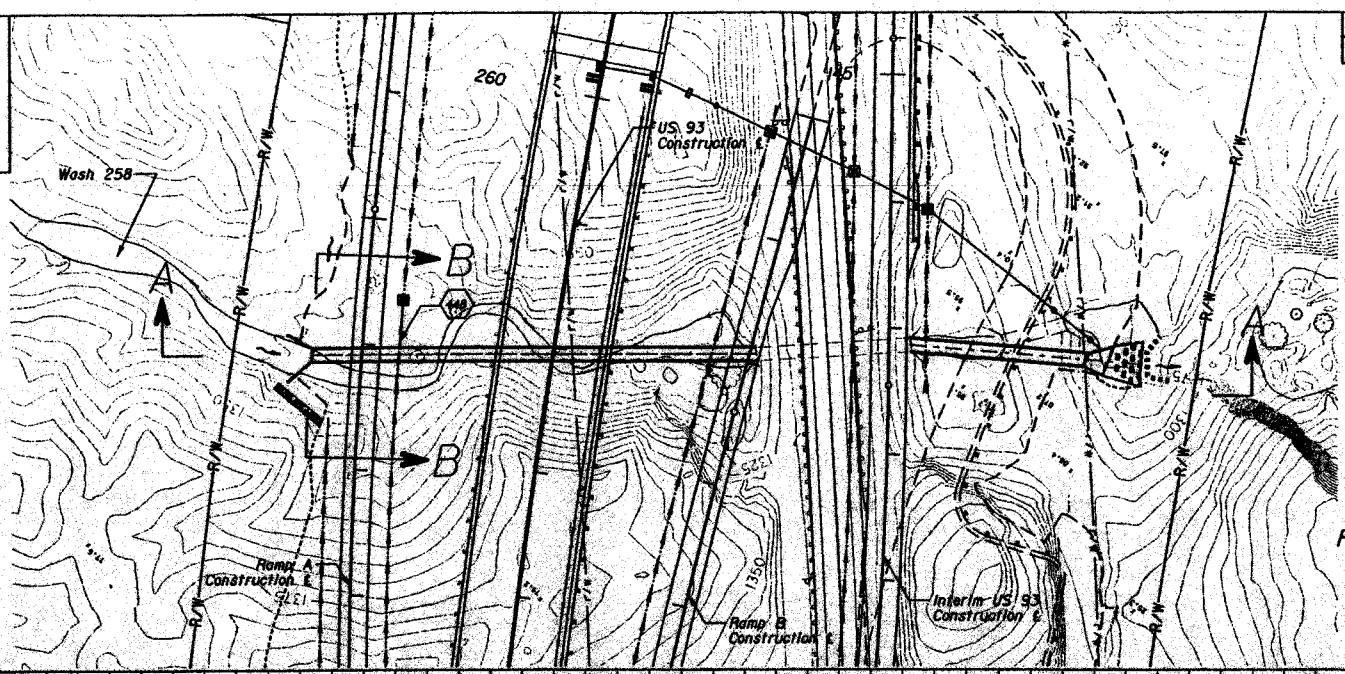
Sverdrup CIVIL INC

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		

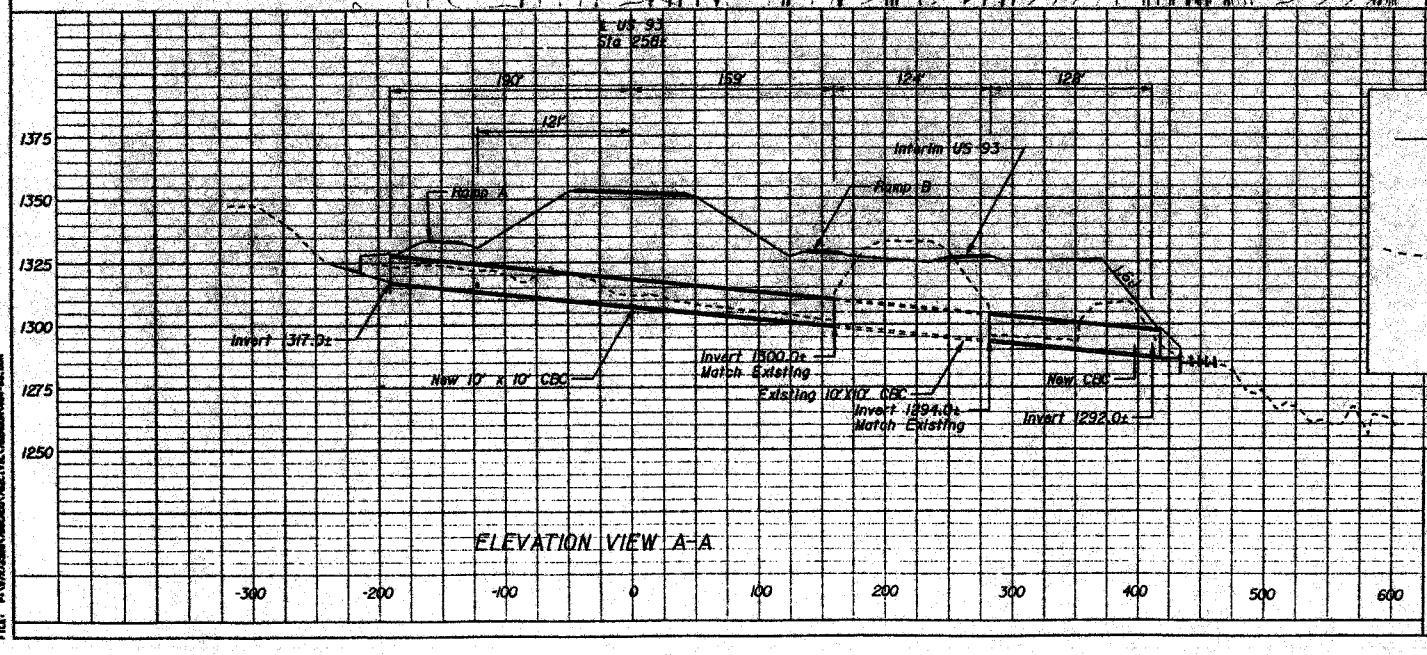
HYDRAULIC DATA

Drainage area = 391 ac
Q_2 = 14 cfs
Q_{25} = 194 cfs
Q_{50} = 306 cfs
Q_{100} = 459 cfs

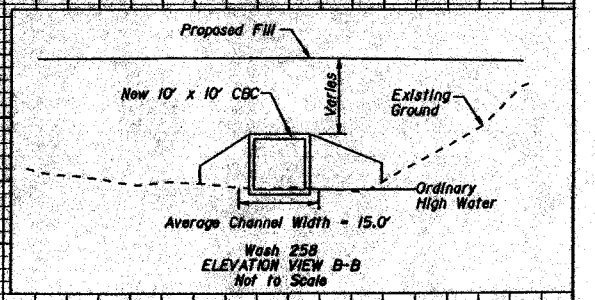


PLAN VIEW

SCALE IN FEET 0 50 100



ELEVATION VIEW A-A



Wash 258
ELEVATION VIEW B-B
Not to Scale

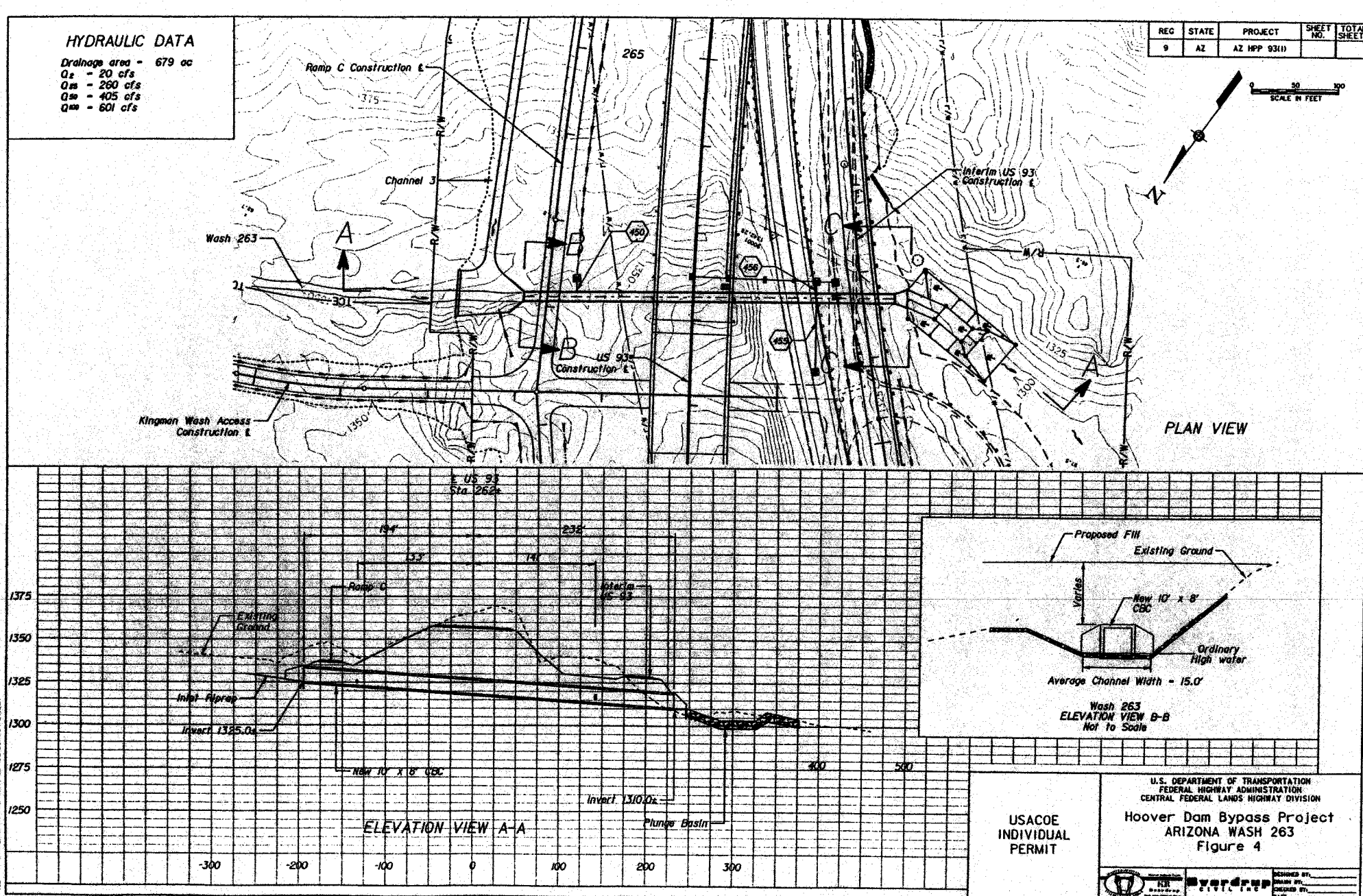
USACOE INDIVIDUAL PERMIT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
ARIZONA WASH 258
Figure 3

Sverdrup CIVIL INC

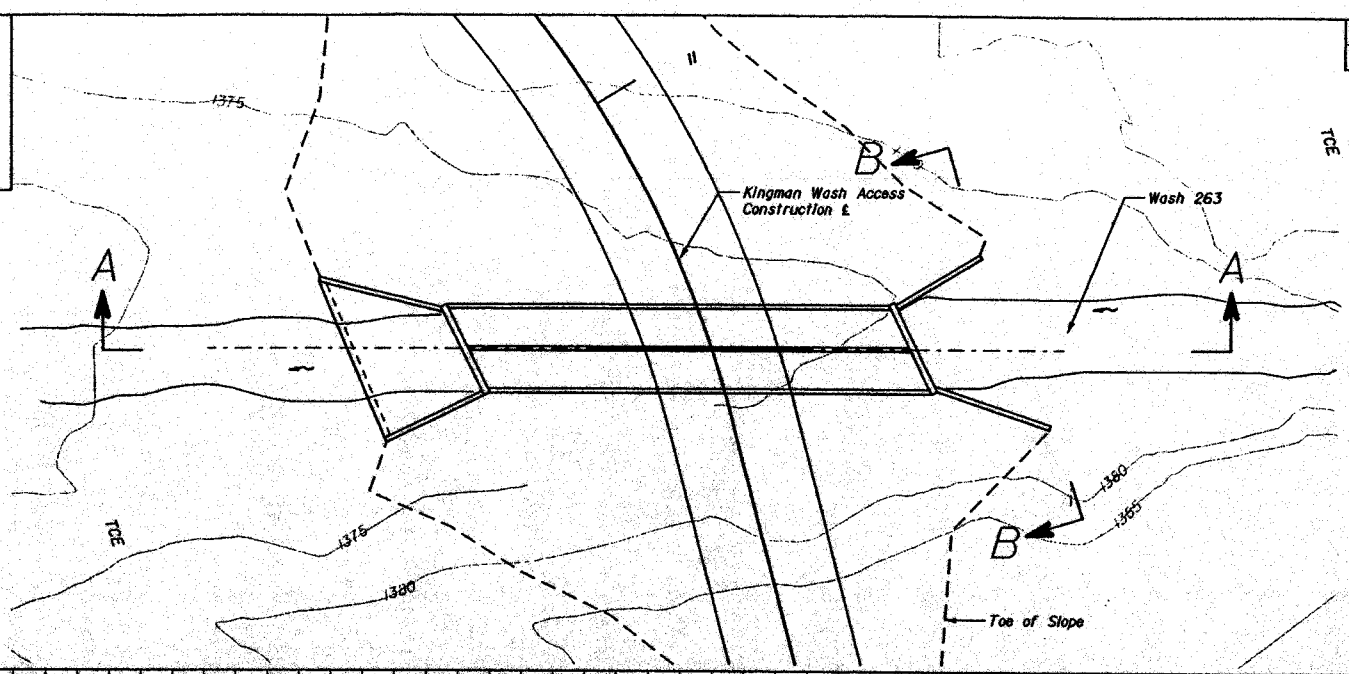
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:


HYDRAULIC DATA
Drainage area - 679 ac
Q2 - 20 cfs
Q25 - 260 cfs
Q50 - 405 cfs
Q100 - 601 cfs
REG 9
STATE AZ
PROJECT AZ HPP 93(1)
SHEET NO.
TOTAL SHEETS
SCALE IN FEET
Ramp C Construction ℄
Channel 3
Wash 263
Interim US 93 Construction ℄
US 93 Construction ℄
Kingman Wash Access Construction ℄
PLAN VIEW
℄ US 93 Sta 262±
Ramp C
Interim US 93
Existing Ground
Inlet Riprap
Invert 1325.0±
New 10' x 8' CBC
Invert 1310.0±
Plunge Basin
ELEVATION VIEW A-A
Proposed Fill
Existing Ground
Varies
New 10' x 8' CBC
Ordinary High water
Average Channel Width - 15.0'
Wash 263
ELEVATION VIEW B-B
Not to Scale
USACOE INDIVIDUAL PERMIT
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION
Hoover Dam Bypass Project
ARIZONA WASH 263
Figure 4
Sverdrup CIVIL INC
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

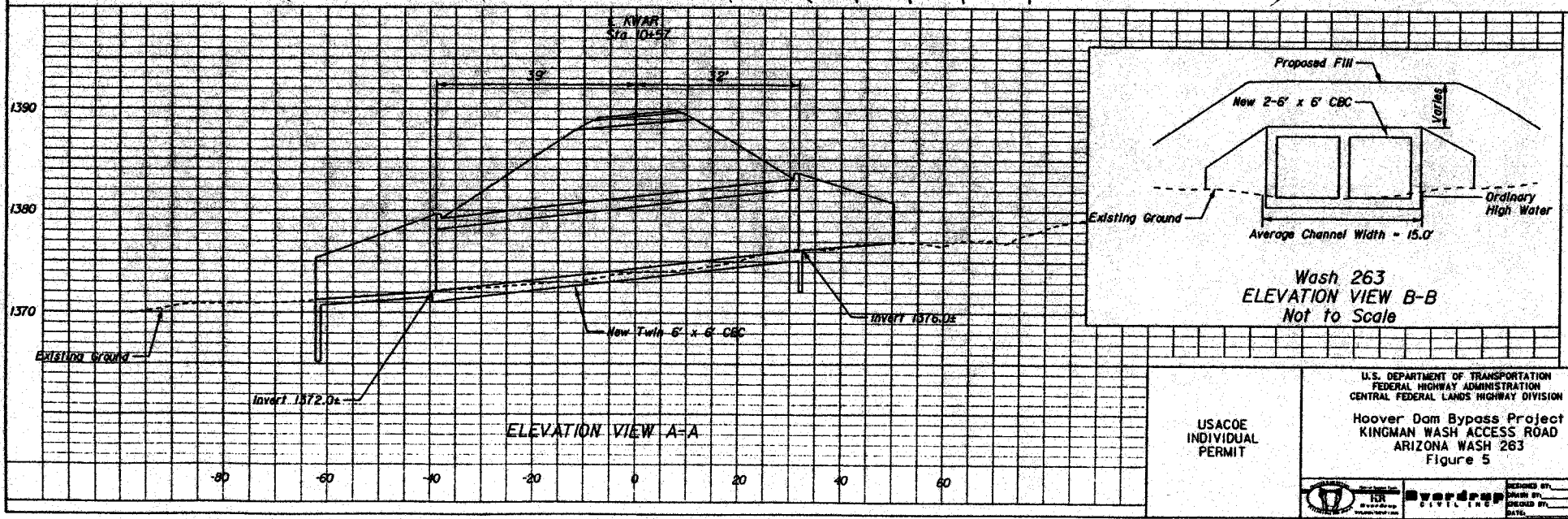
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		

HYDRAULIC DATA

Drainage area = 587 ac
Q_2 = 18 cfs
Q_{25} = 241 cfs
Q_{50} = 376 cfs
Q_{100} = 560 cfs



PLAN VIEW



ELEVATION VIEW A-A

Wash 263
ELEVATION VIEW B-B
Not to Scale

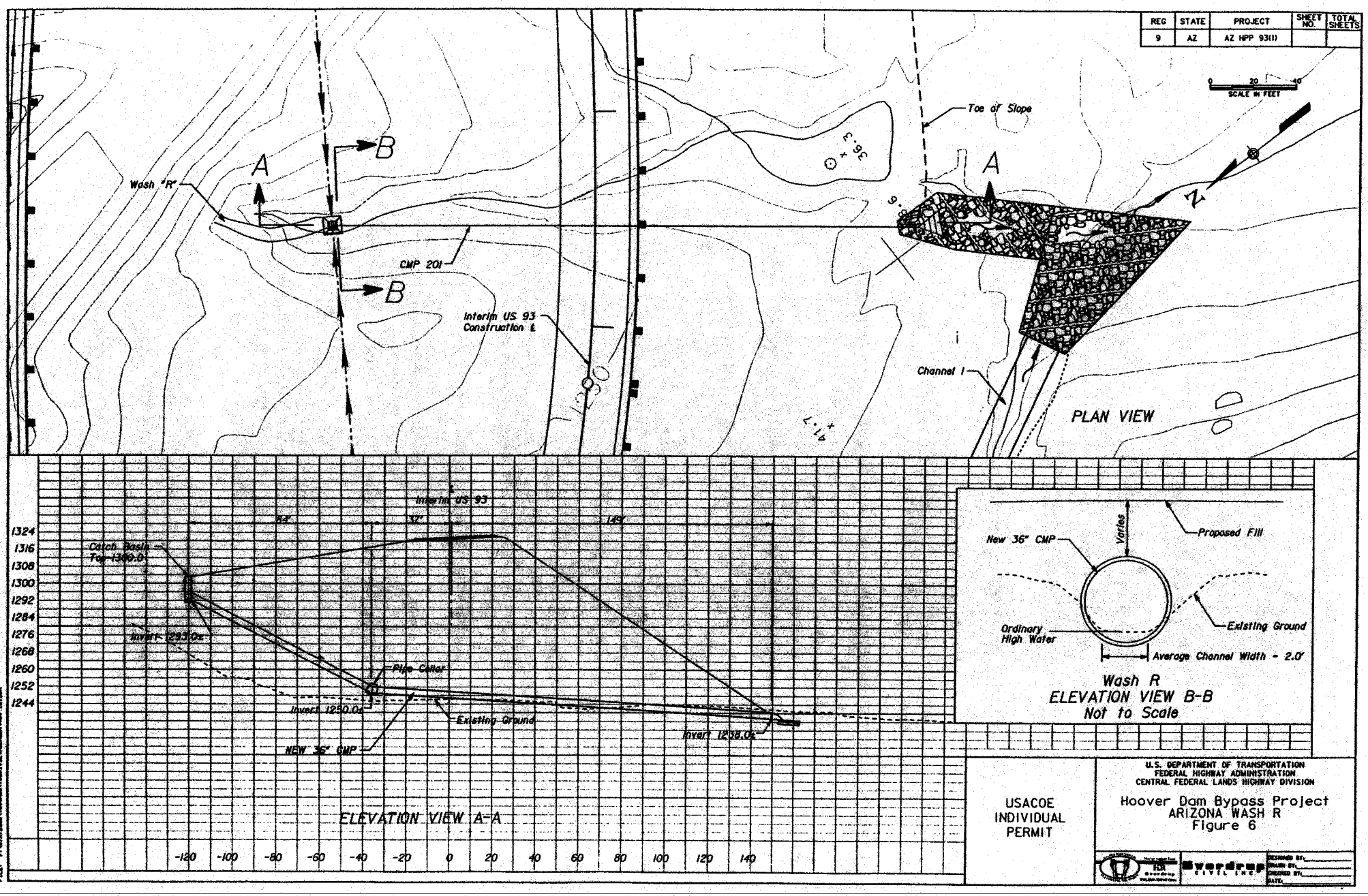
USACOE INDIVIDUAL PERMIT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
KINGMAN WASH ACCESS ROAD
ARIZONA WASH 263
Figure 5

Parsons Brinckerhoff CIVIL ENG

DESIGNED BY
DRAWN BY
CHECKED BY
DATE



USACOE INDIVIDUAL PERMIT

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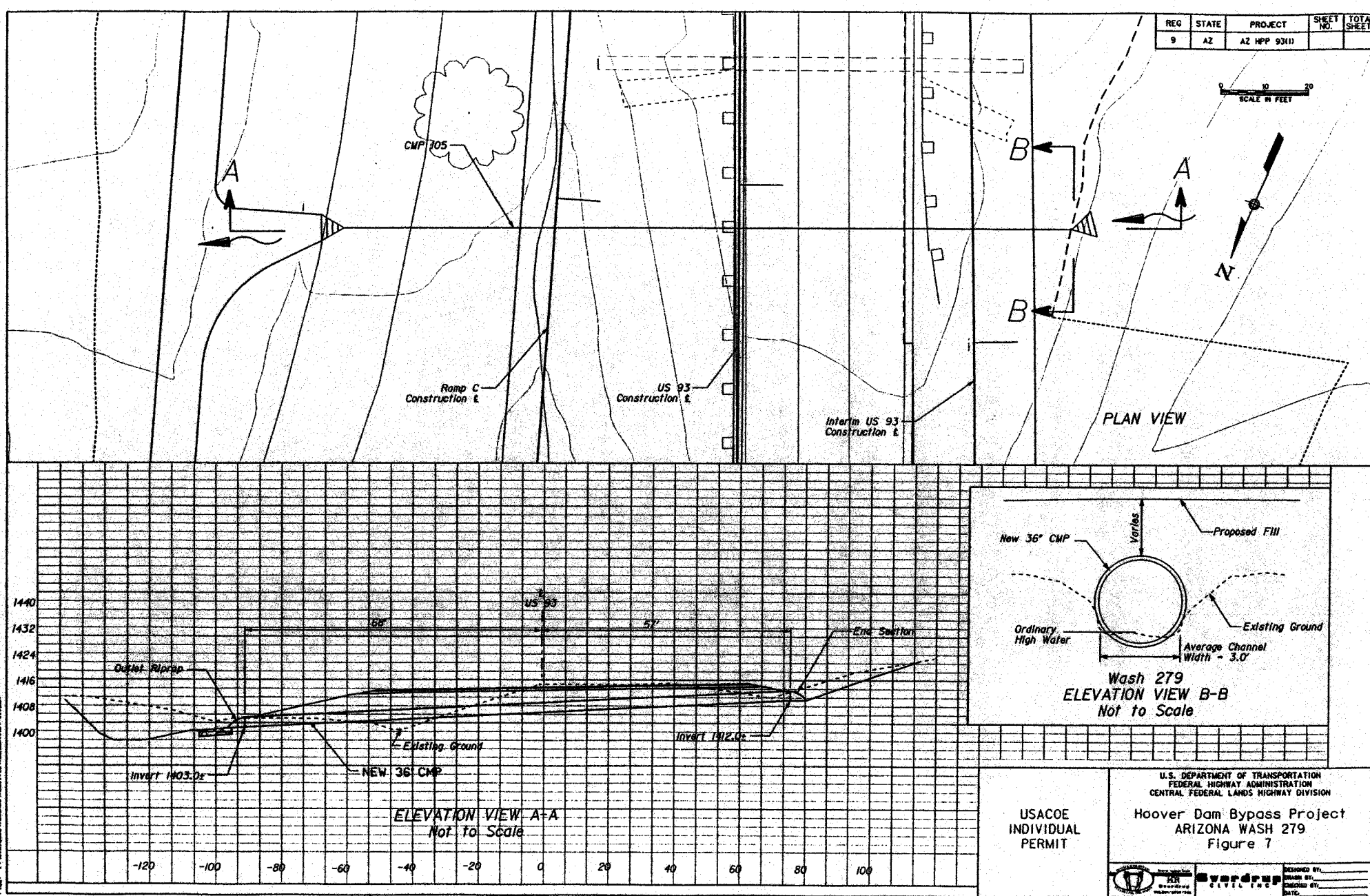
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
ARIZONA WASH R
Figure 6

Sverdrup CIVIL INC.



USACOE INDIVIDUAL PERMIT

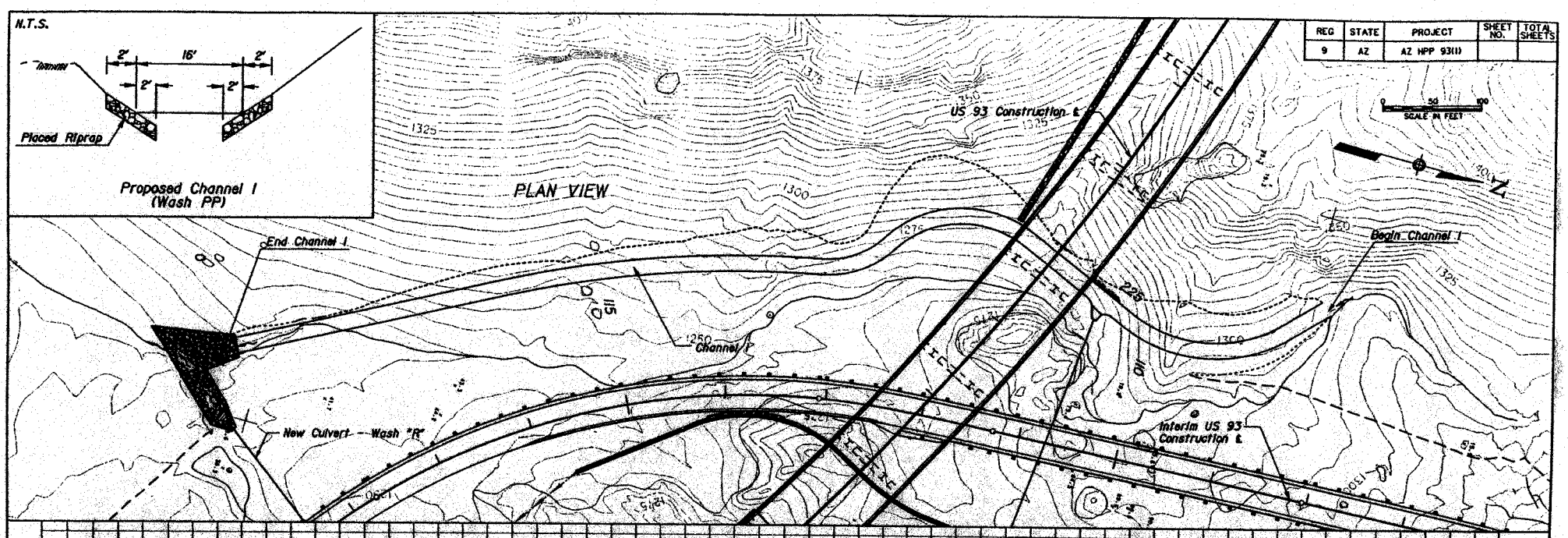
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

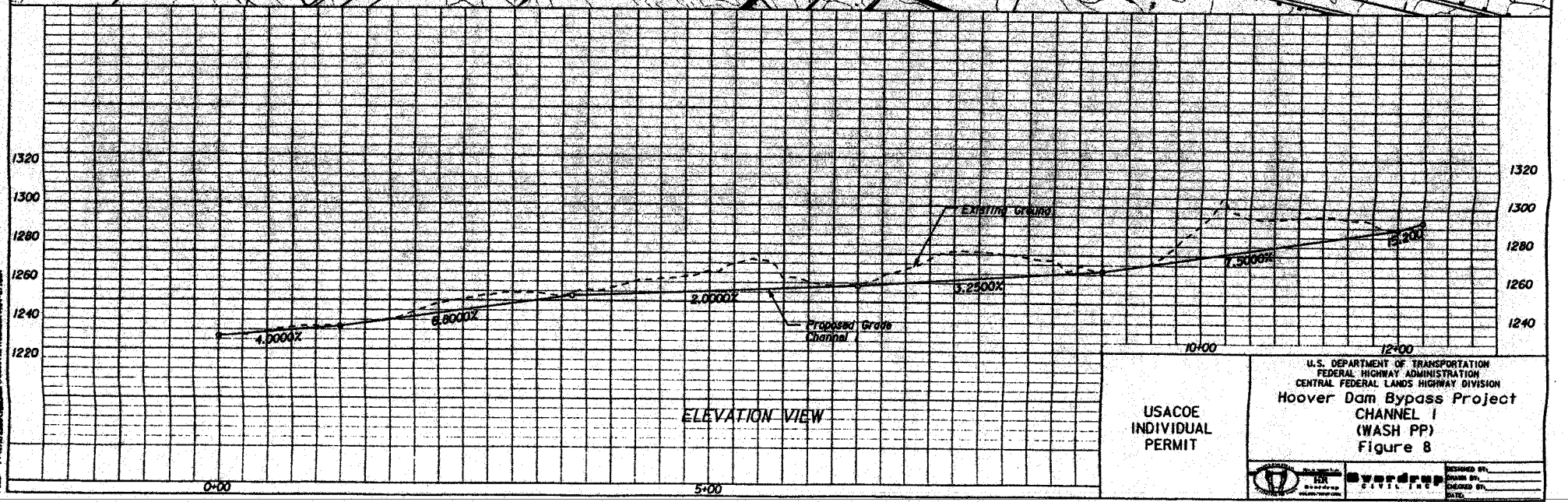
Hoover Dam Bypass Project
ARIZONA WASH 279
Figure 7

Sverdrup CIVIL INC

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		





USACOE
INDIVIDUAL
PERMIT

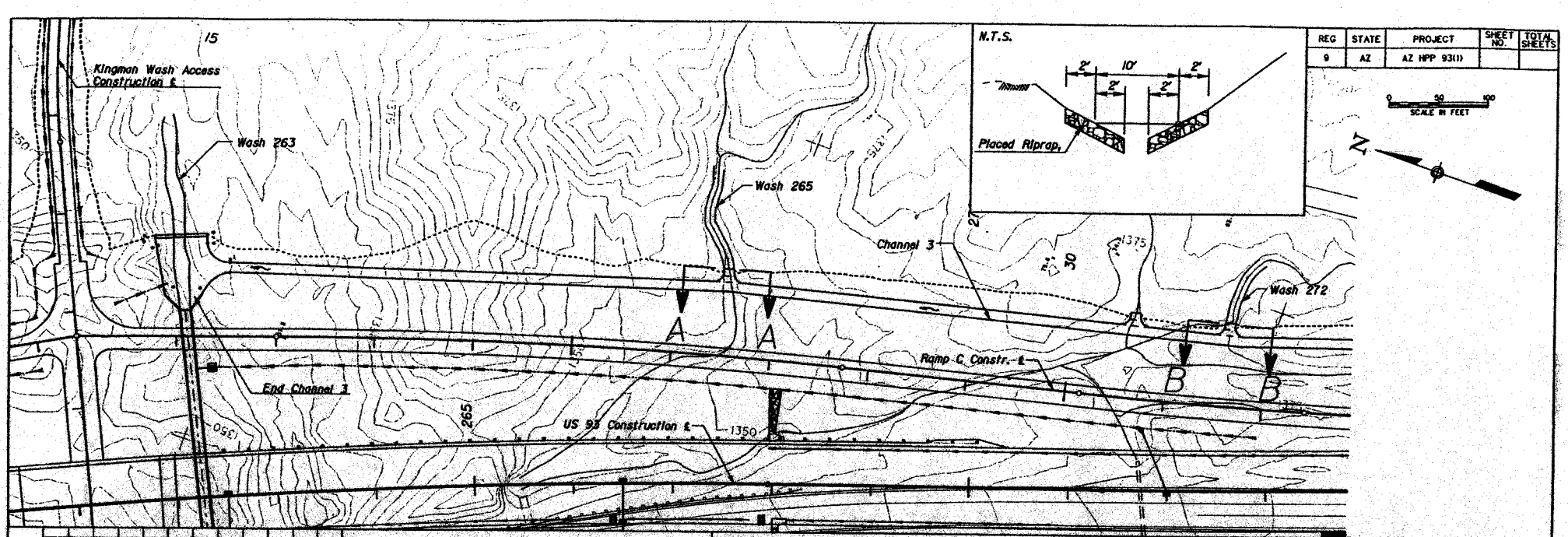
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

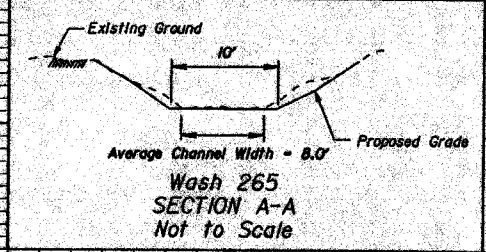
Hoover Dam Bypass Project
CHANNEL I
(WASH PP)
Figure 8

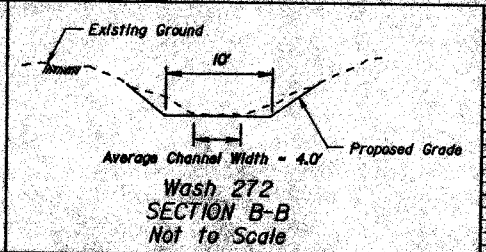
Sverdrup CIVIL INC.

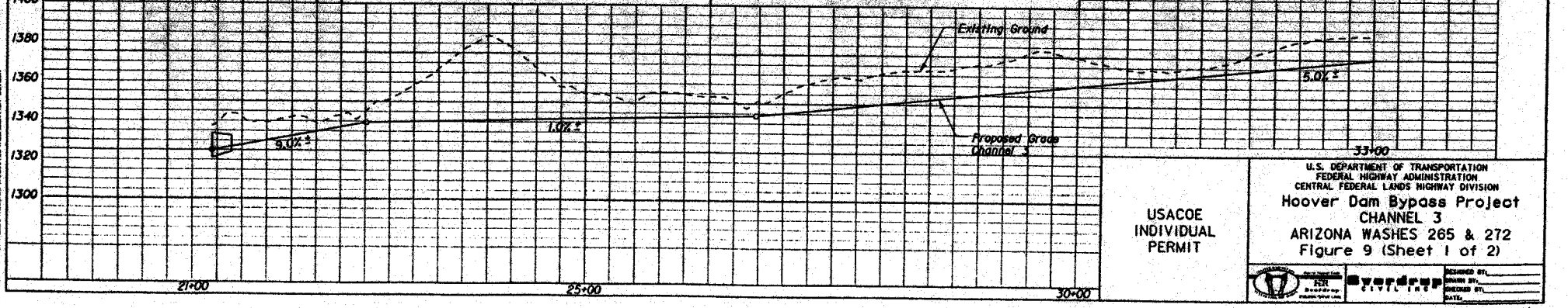
DESIGNED BY
DRAWN BY
CHECKED BY
DATE

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		









USACOE
INDIVIDUAL
PERMIT

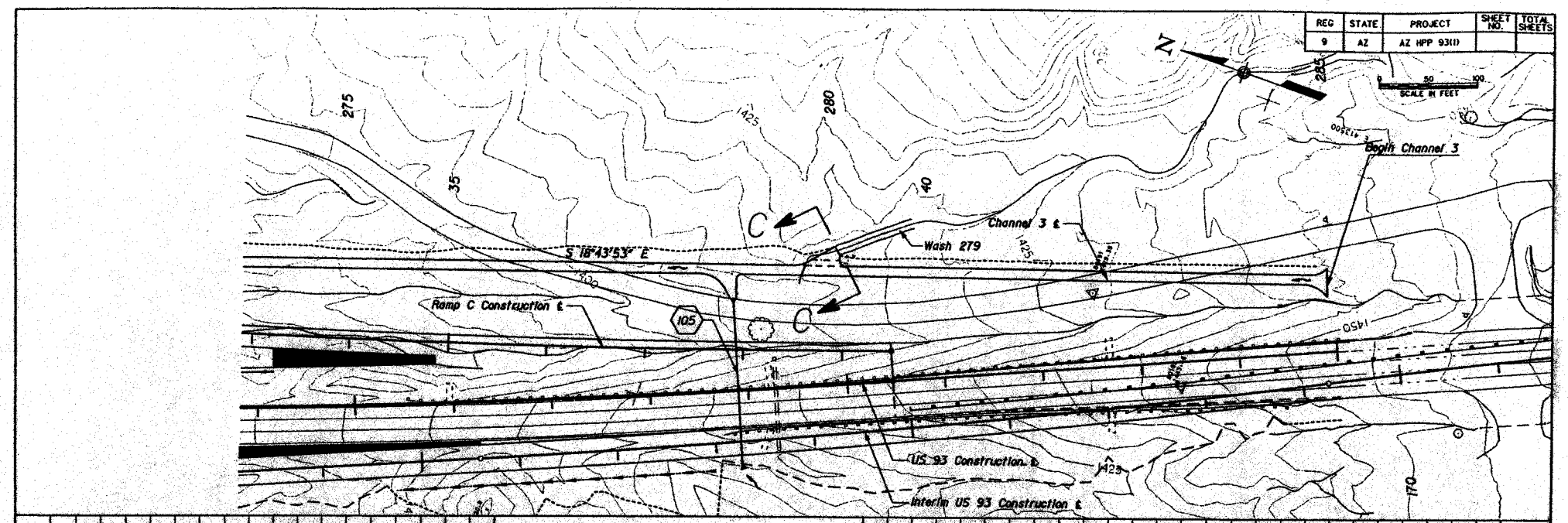
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

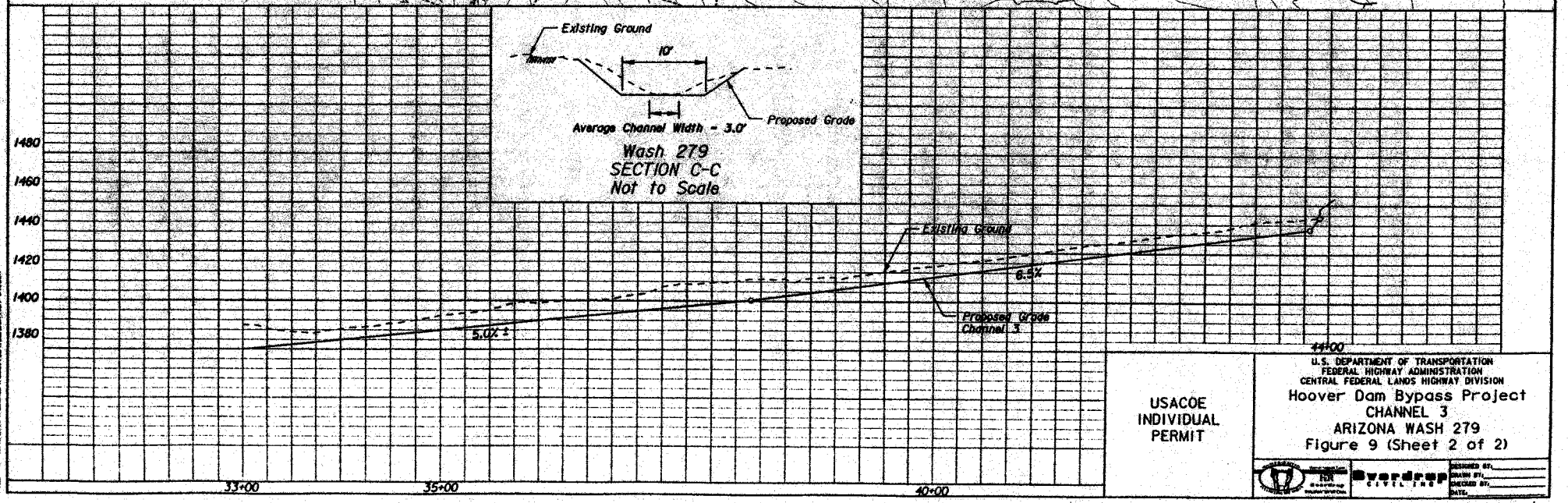
Hoover Dam Bypass Project
CHANNEL 3
ARIZONA WASHES 265 & 272
Figure 9 (Sheet 1 of 2)

Sverdrup CIVIL INC

DESIGNED BY
DRAWN BY
CHECKED BY
DATE

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		





USACOE
INDIVIDUAL
PERMIT

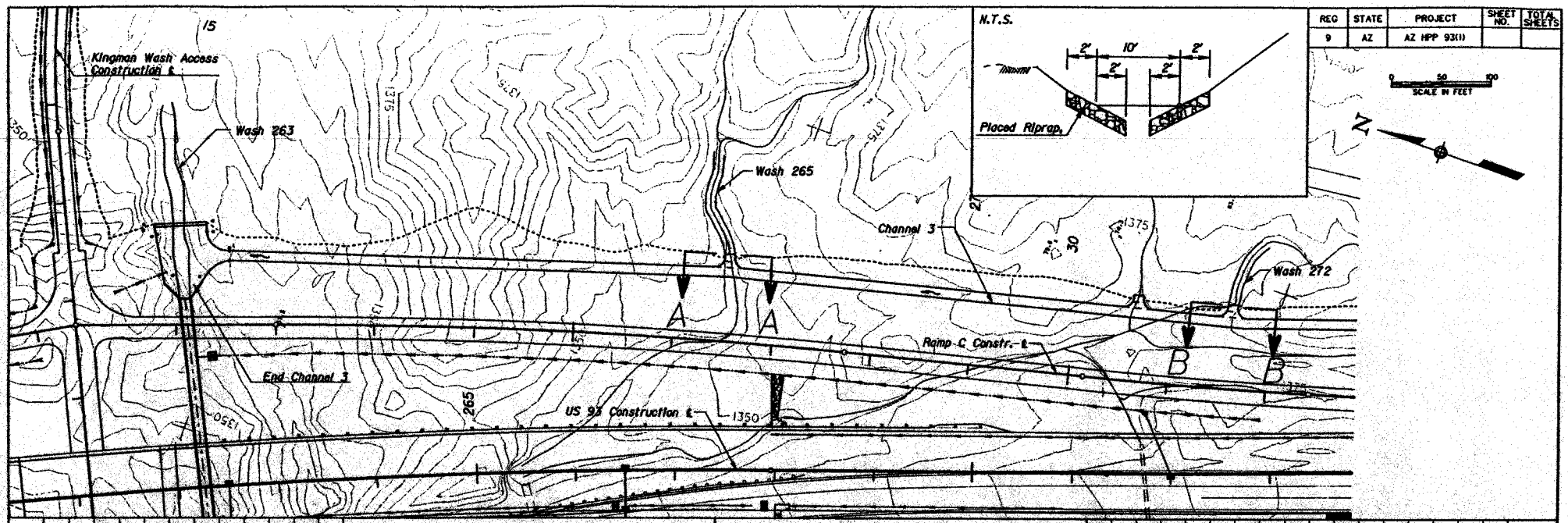
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

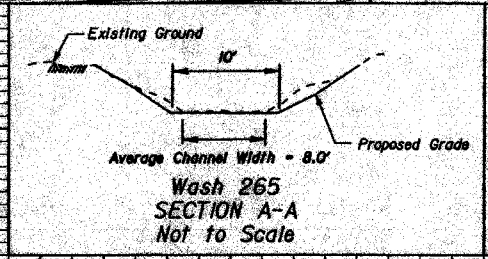
Hoover Dam Bypass Project
CHANNEL 3
ARIZONA WASH 279
Figure 9 (Sheet 2 of 2)

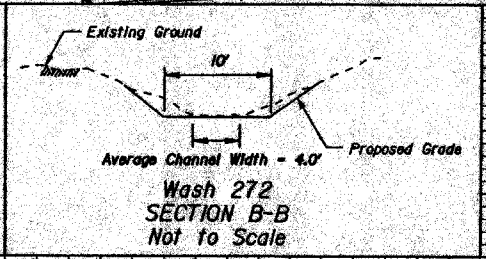
Sverdrup CIVIL INC

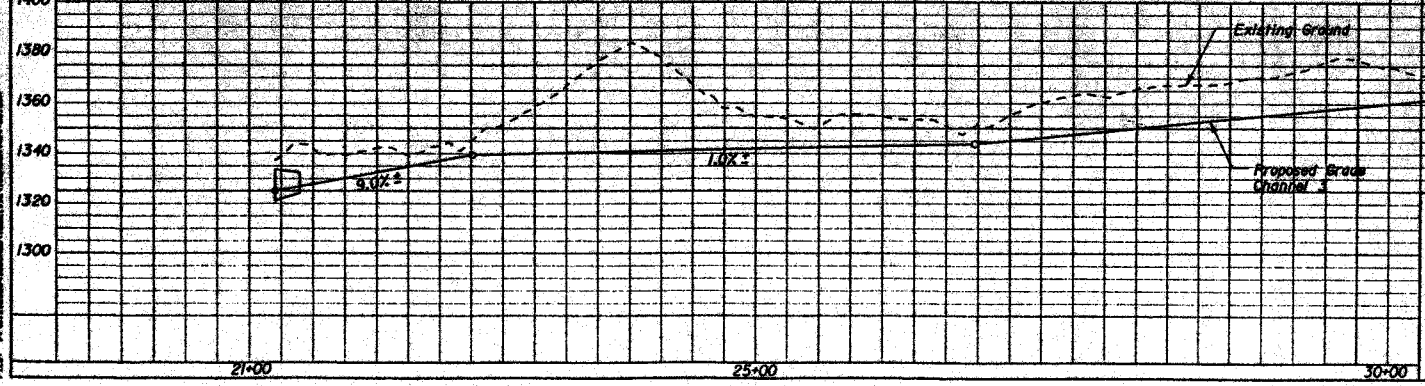
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
9	AZ	AZ HPP 93(1)		









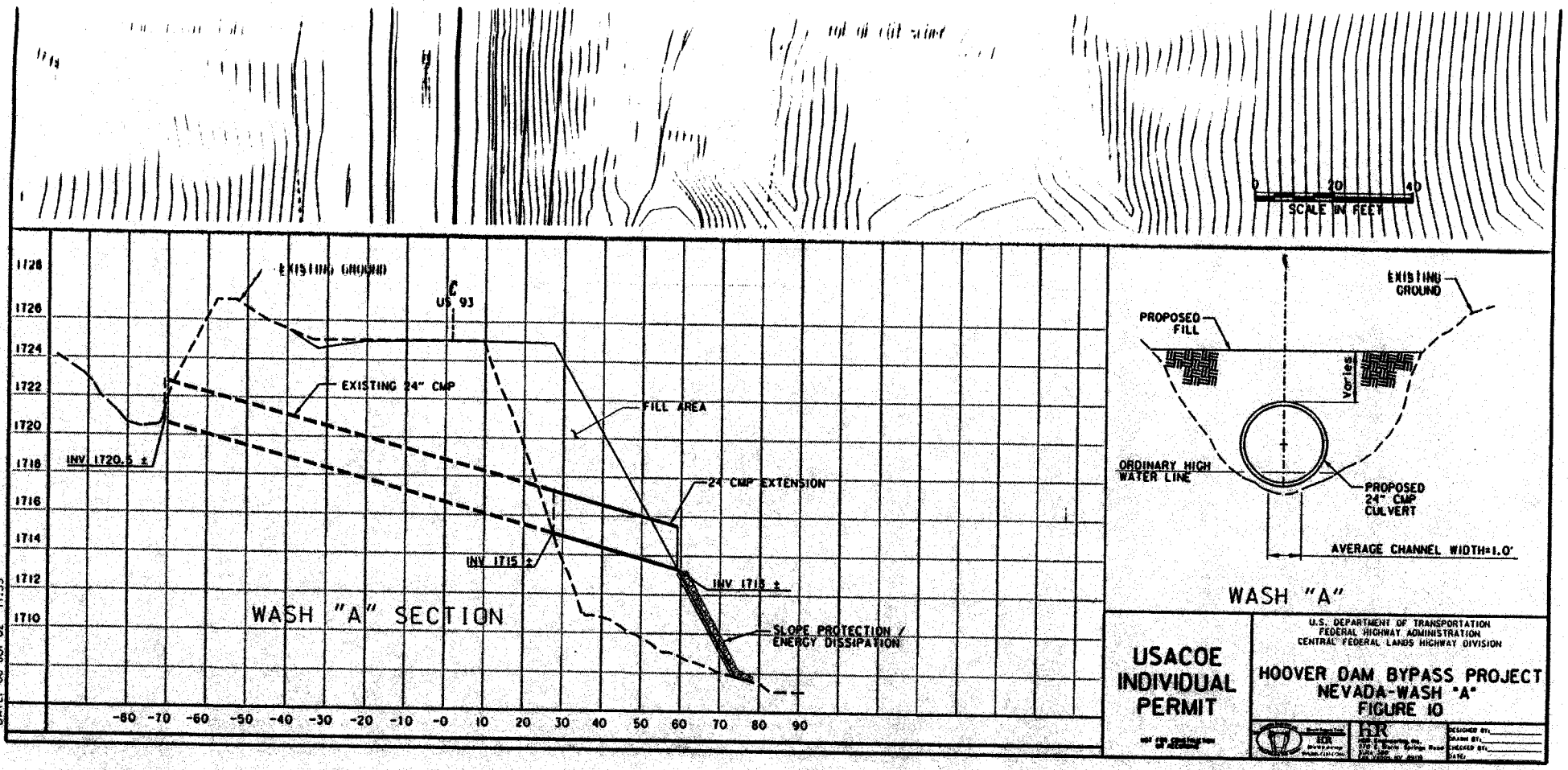
USACOE
INDIVIDUAL
PERMIT

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

Hoover Dam Bypass Project
CHANNEL 3
ARIZONA WASHES 265 & 272
Figure 9 (Sheet 1 of 2)

Sverdrup CIVIL INC

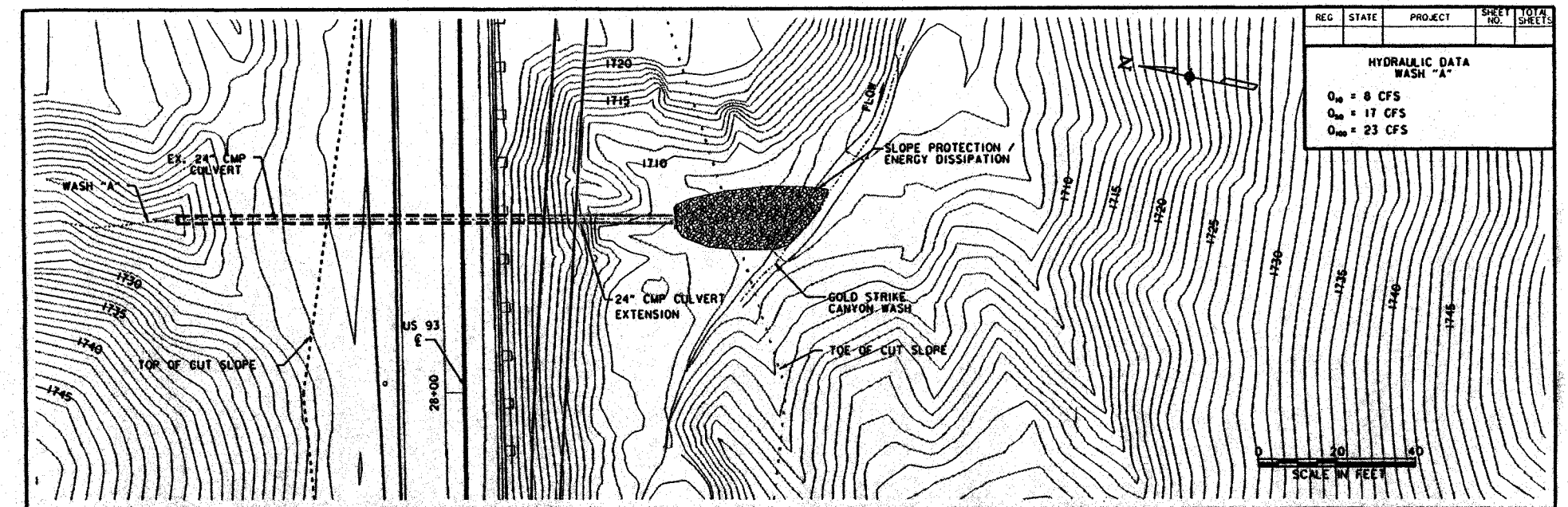
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

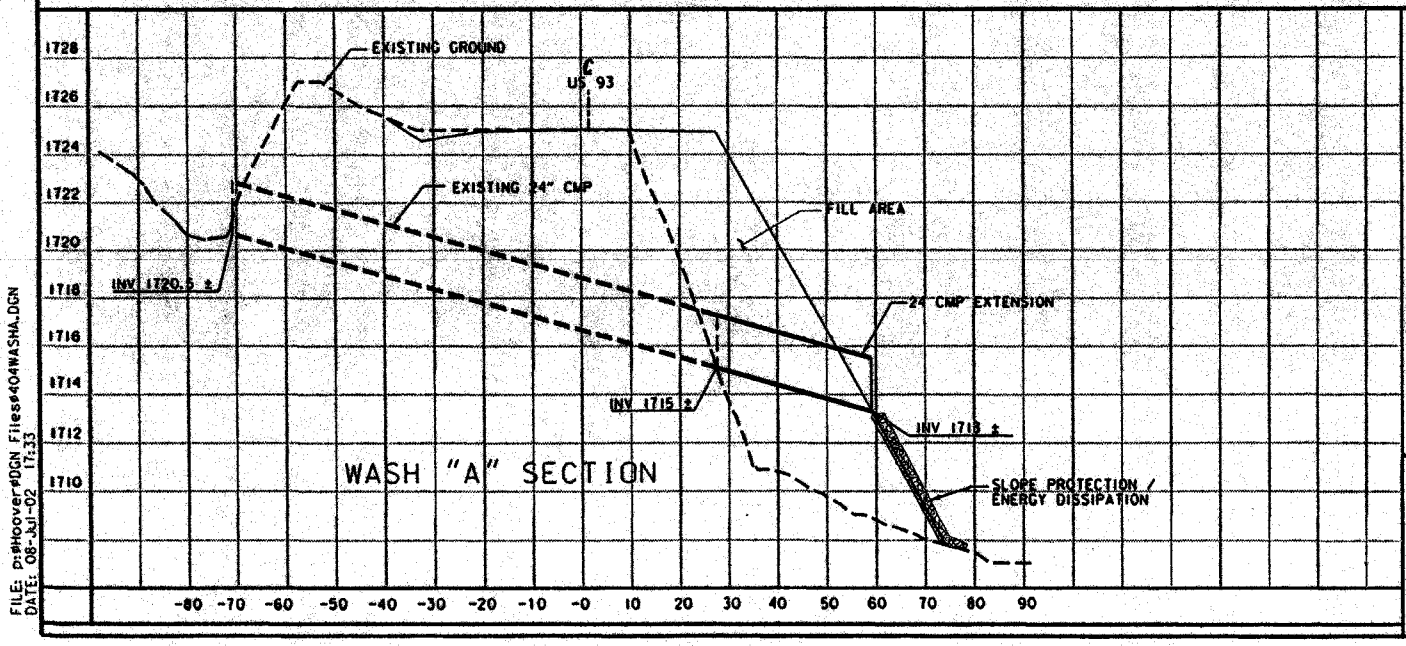

0 20 40
SCALE IN FEET
1728
1726
1724
1722
1720
1718
1716
1714
1712
1710
EXISTING GROUND
℄ US 93
EXISTING 24" CMP
FILL AREA
INV 1720.5 ±
24" CMP EXTENSION
INV 1715 ±
INV 1713 ±
SLOPE PROTECTION / ENERGY DISSIPATION
WASH "A" SECTION
-80 -70 -60 -50 -40 -30 -20 -10 -0 10 20 30 40 50 60 70 80 90
EXISTING GROUND
PROPOSED FILL
Varies
ORDINARY HIGH WATER LINE
PROPOSED 24" CMP CULVERT
AVERAGE CHANNEL WIDTH=1.0'
WASH "A"
USACOE INDIVIDUAL PERMIT
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION
HOOVER DAM BYPASS PROJECT
NEVADA-WASH "A"
FIGURE 10
HDR
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:
FILE: p:\Hoover\DGN Files\404WASHA.DGN
DATE: 08-Jul-02 17:33

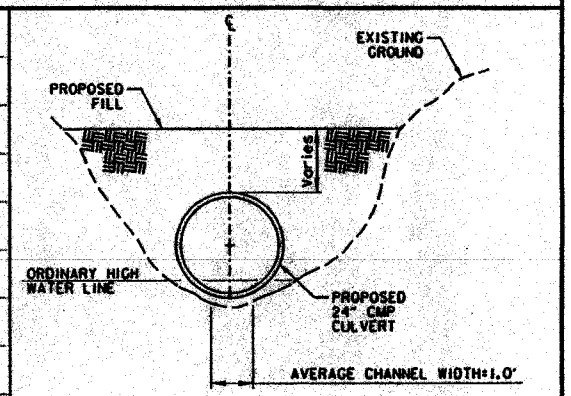
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
WASH "A"

Q_{10} = 8 CFS
Q_{50} = 17 CFS
Q_{100} = 23 CFS







WASH "A"

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NOT FOR CONSTRUCTION OR RECORDING

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASH "A"
FIGURE 10

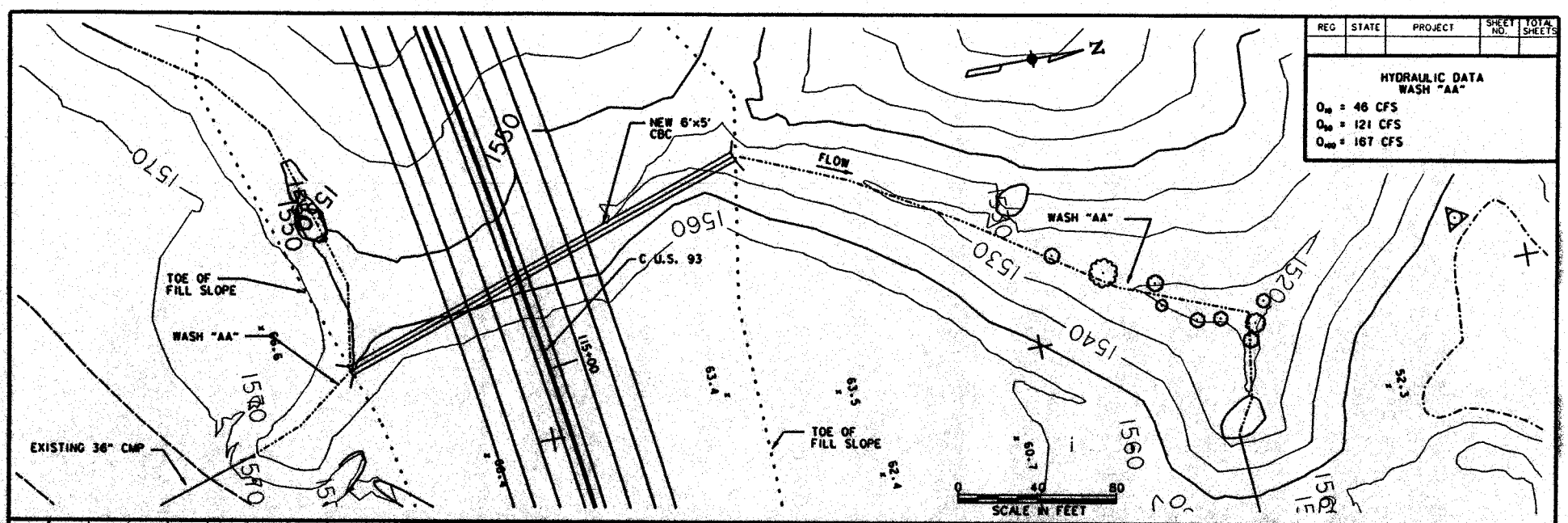
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

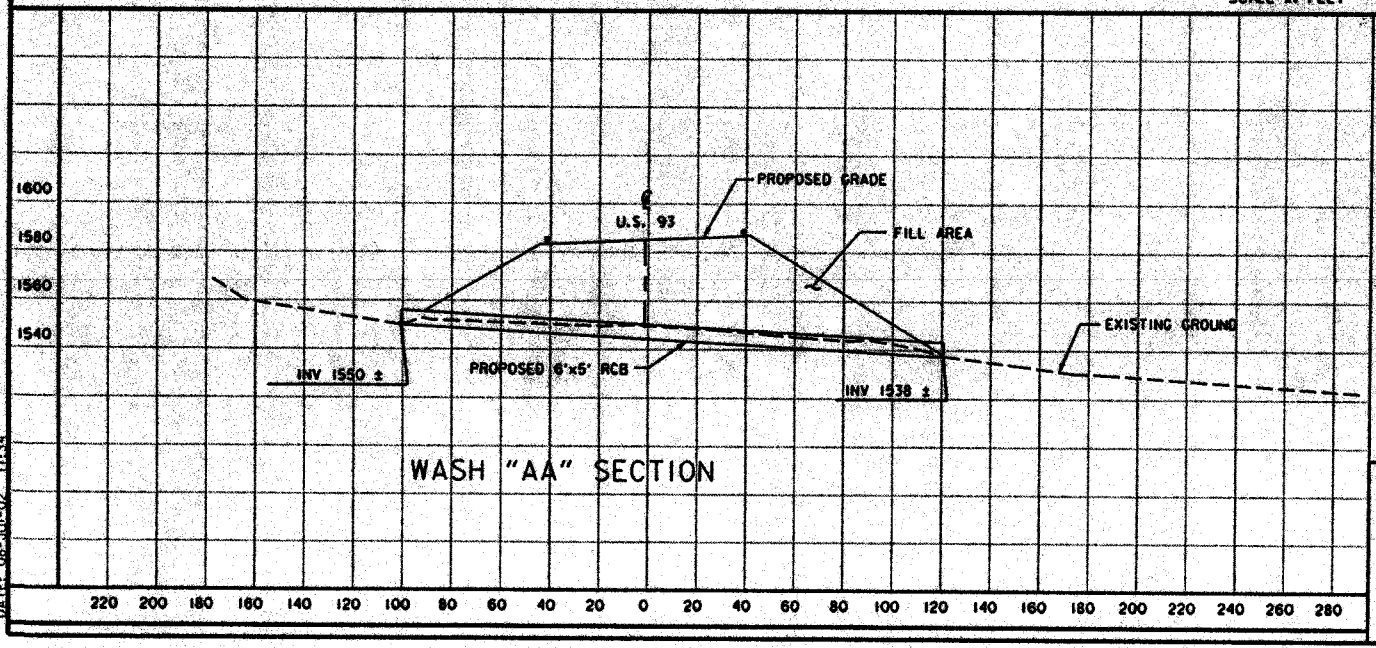
FILE: D:\Hoover\DGN Files\404WASHA.DGN
DATE: 08-Jul-02 17:33

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

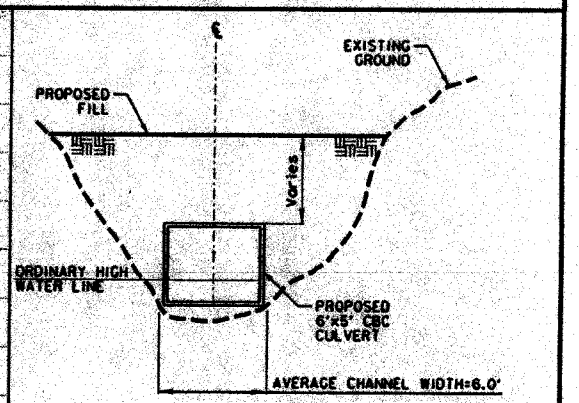
HYDRAULIC DATA
WASH "AA"

Q_{10} = 46 CFS
Q_{50} = 121 CFS
Q_{100} = 167 CFS





WASH "AA" SECTION



WASH "AA"

USACOE INDIVIDUAL PERMIT

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASH "AA"
FIGURE II

DESIGNED BY
DRAWN BY
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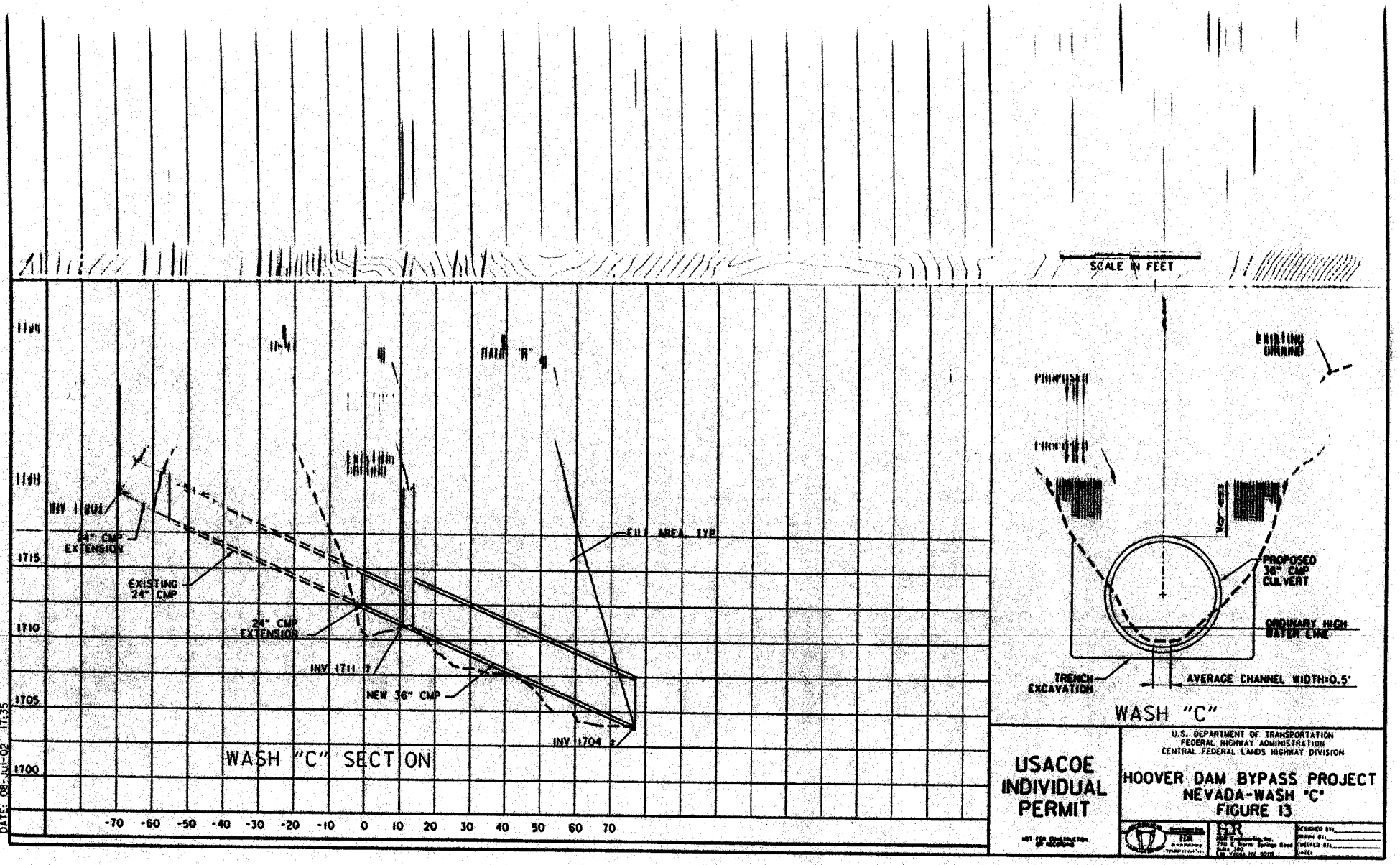
DATE

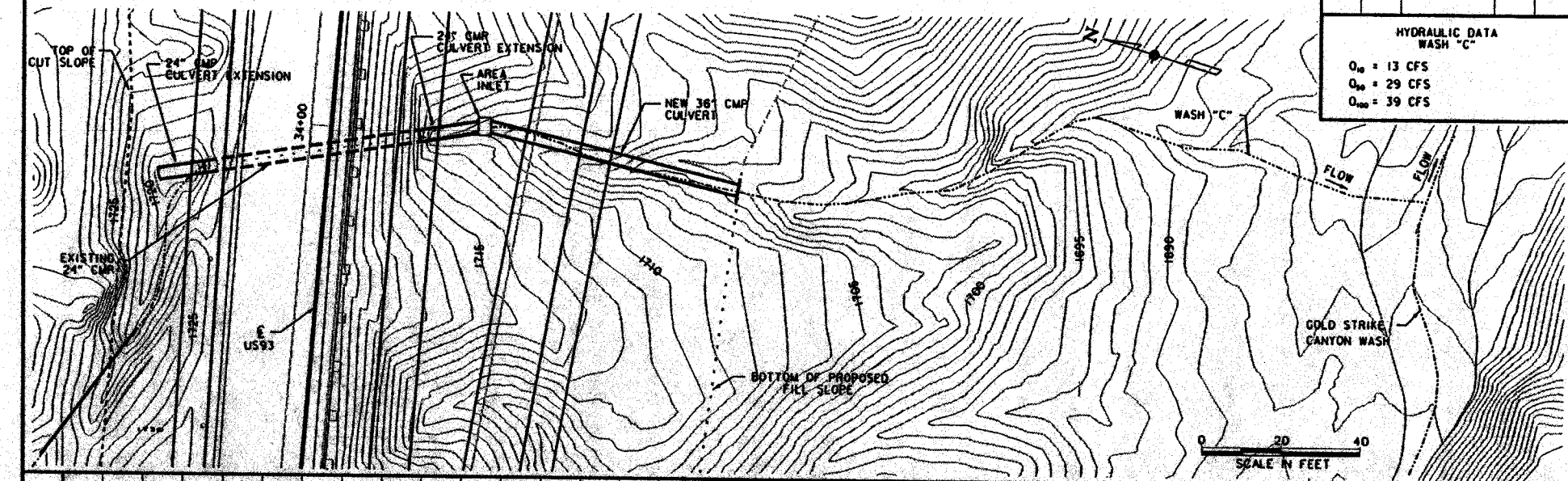
FILE: p:\Hoover\DGN Files\404WASHAA.DGN
DATE: 08-JUL-02 17:34

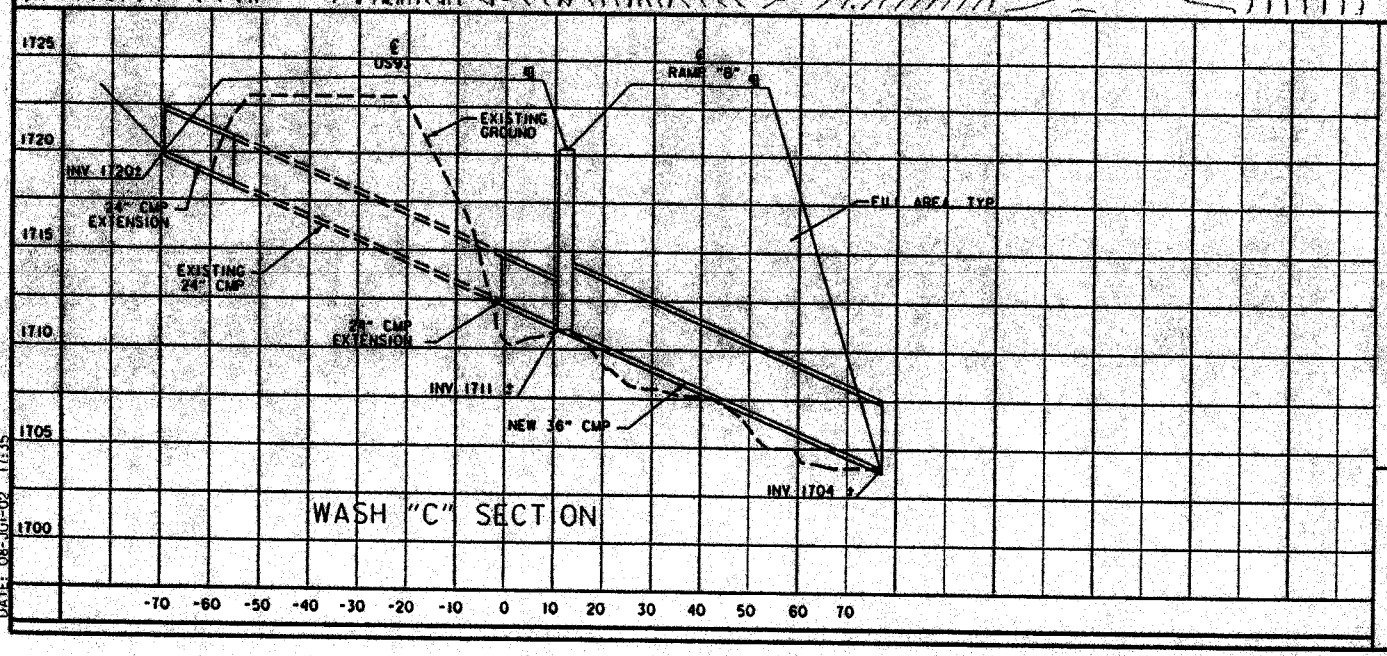

SCALE IN FEET
1720
1715
1710
1705
1700
24" CMP EXTENSION
EXISTING 24" CMP
24" CMP EXTENSION
INV 1711 ±
NEW 36" CMP
INV 1704 ±
FILL AREA, TYP
WASH "C" SECTION
-70 -60 -50 -40 -30 -20 -10 0 10 20 30 40 50 60 70
EXISTING GROUND
PROPOSED 36" CMP CULVERT
ORDINARY HIGH WATER LINE
TRENCH EXCAVATION
AVERAGE CHANNEL WIDTH=0.5'
WASH "C"
USACOE INDIVIDUAL PERMIT
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION
HOOVER DAM BYPASS PROJECT
NEVADA-WASH "C"
FIGURE 13
HR
DESIGNED BY
DRAWN BY
CHECKED BY
DATE
FILE: D:\Hoover\DGN Files\404WASHC.DGN
DATE: 08-JUL-02 13:35

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

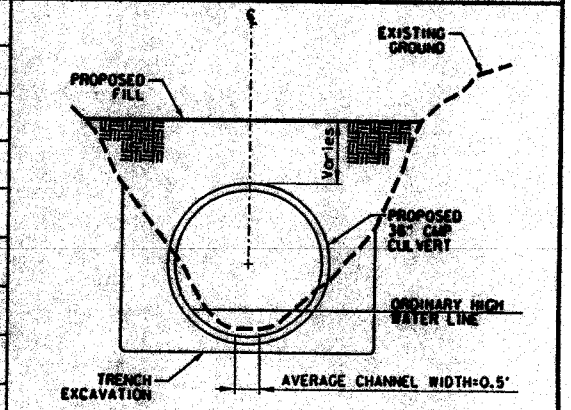
HYDRAULIC DATA
WASH "C"

Q_{10} = 13 CFS
Q_{50} = 29 CFS
Q_{100} = 39 CFS





WASH "C" SECTION



WASH "C"

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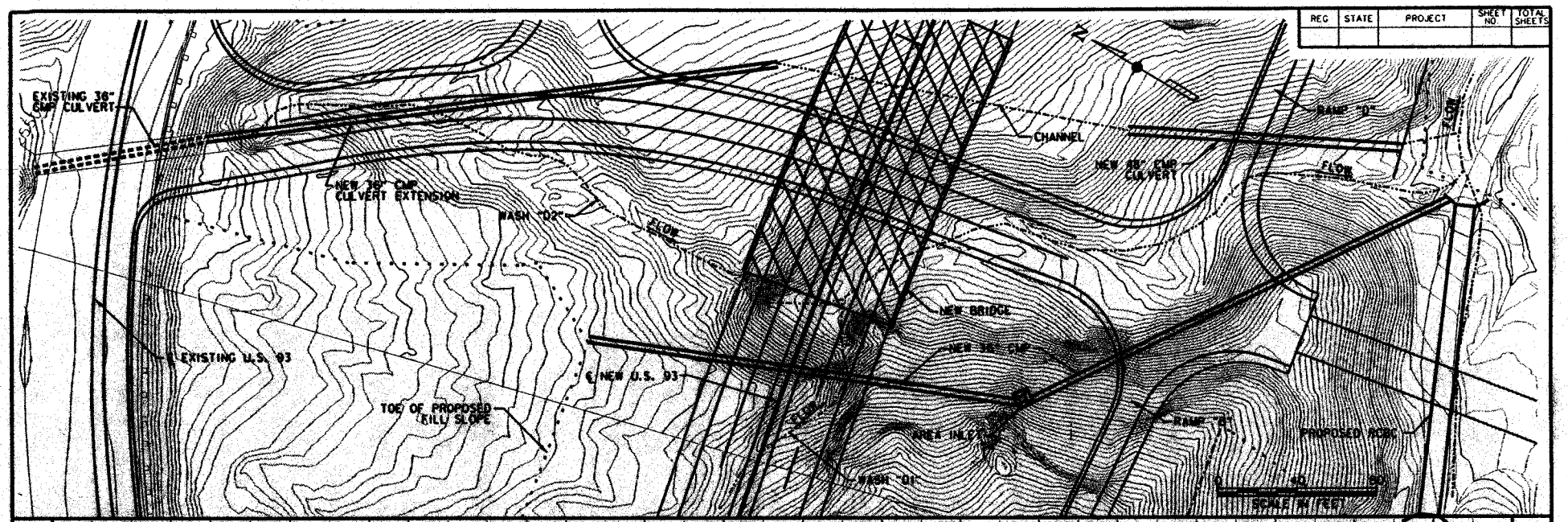
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

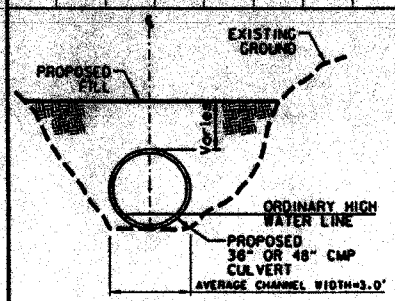
HOOVER DAM BYPASS PROJECT
NEVADA-WASH "C"
FIGURE 13

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

FILE: D:\Hoover\DGN Files\404WASHC.DGN
DATE: 08-JUL-02 17:35

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS





WASH "D1 & D2"

NOTES:

1. UNNAMED WASH "D1" WILL BE COMPLETELY FILLED WITH INTERCHANGE EMBANKMENT MATERIAL. FLOWS WILL BE DIRECTED TO GOLD STRIKE CANYON VIA NEW CULVERTS ASSOCIATED WITH THE NEVADA INTERCHANGE.

2. UNNAMED WASH "D2" WILL BE COMPLETELY FILLED WITH EMBANKMENT MATERIAL DOWNSTREAM OF THE EXISTING 36" CMP CULVERT CROSSING OF U.S. 93. FLOWS WILL BE DIRECTED TO GOLD STRIKE CANYON VIA NEW CULVERTS AND CHANNELS ASSOCIATED WITH THE NEVADA INTERCHANGE.

HYDRAULIC DATA
WASHES "D1" AND "D2"

"D1"	"D2"
Q_{10} = 13 CFS	Q_{10} = 27 CFS
Q_{50} = 31 CFS	Q_{50} = 67 CFS
Q_{100} = 41 CFS	Q_{100} = 91 CFS

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASHES "D1" AND "D2"
FIGURE 14

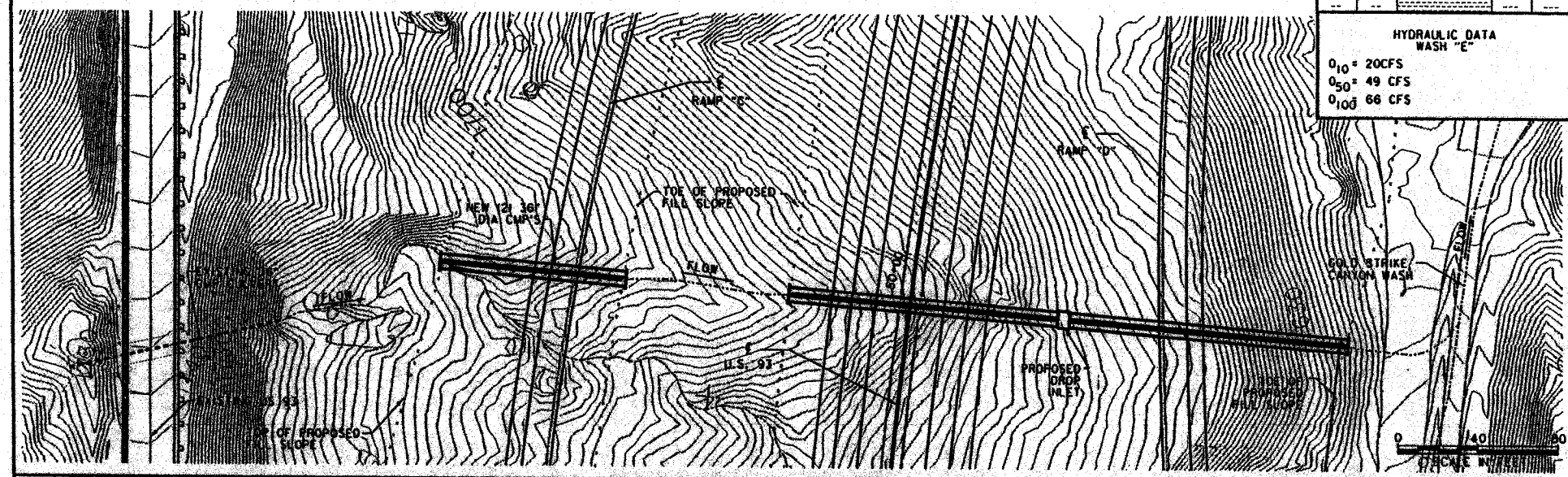
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

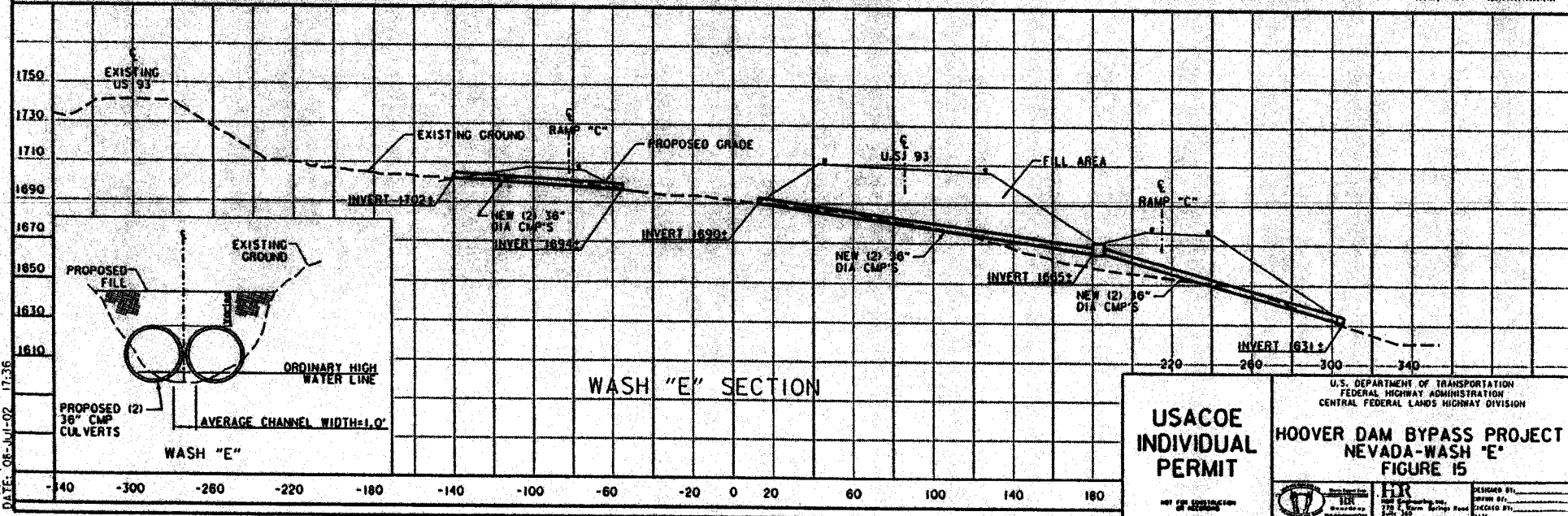
FILE: p:#Hoover#DGN Files#404WASHD2.DGN
DATE: 08-Jul-02 17:36

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS
--	--		---	---

HYDRAULIC DATA
WASH "E"

Q_{10} = 20CFS
Q_{50} = 49 CFS
Q_{100} = 66 CFS





WASH "E" SECTION

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U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASH "E"
FIGURE 15

HDR Engineering, Inc.
770 E. Warm Springs Road
Suite 340
Las Vegas, NV 89119

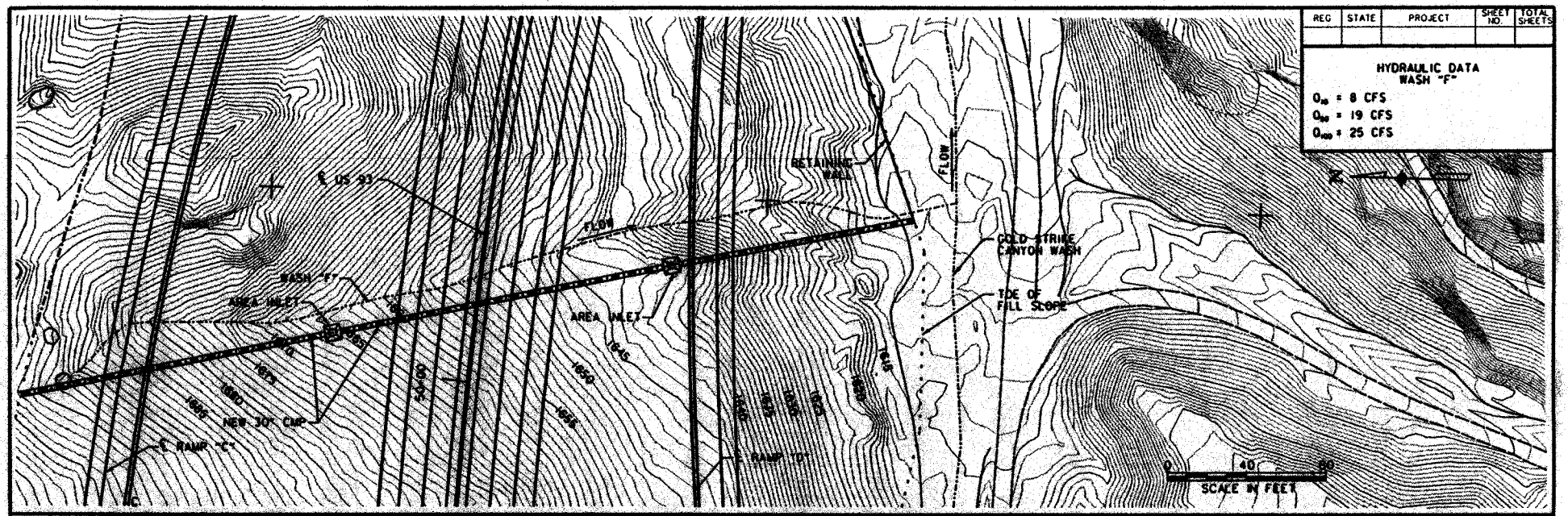
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

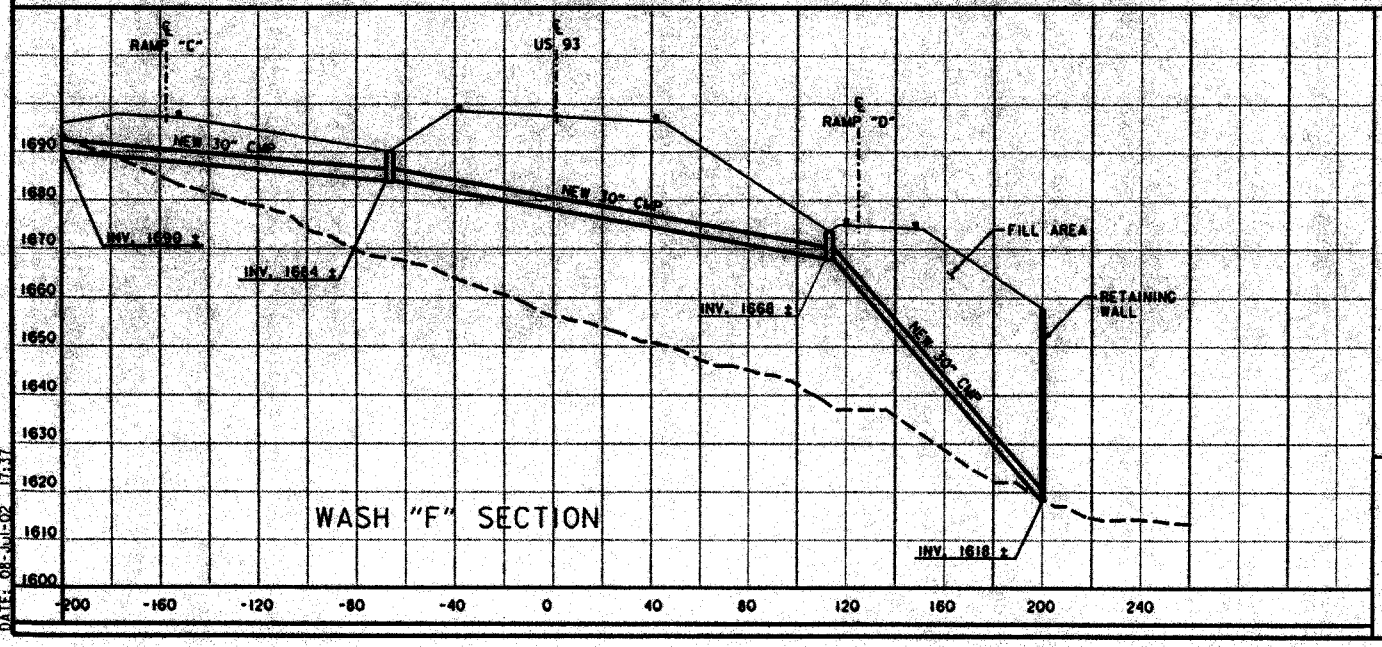
FILE: p:\Hoover\DGN Files\404WASHE.DGN
DATE: 08-JUL-02 17:36

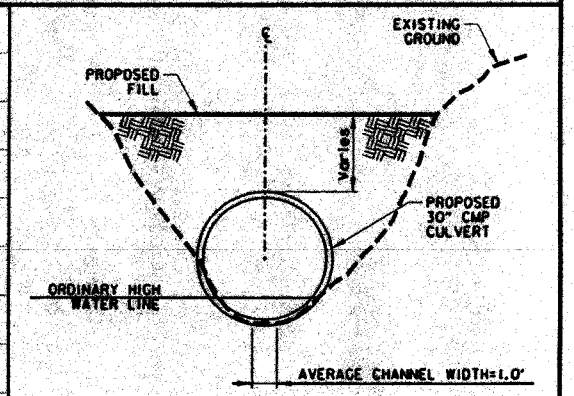
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
WASH "F"

Q_{10} = 8 CFS
Q_{50} = 19 CFS
Q_{100} = 25 CFS







WASH "F"

USACOE INDIVIDUAL PERMIT

NOT FOR CONSTRUCTION OR RECORDS

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA WASH "F"
FIGURE 16

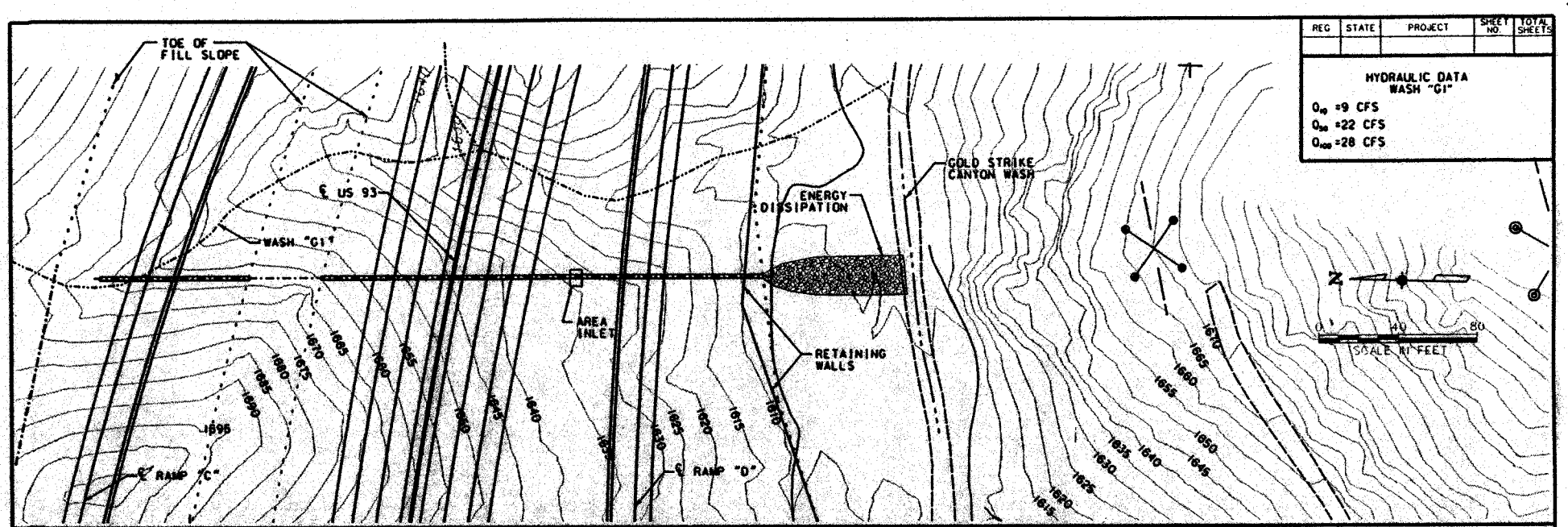
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

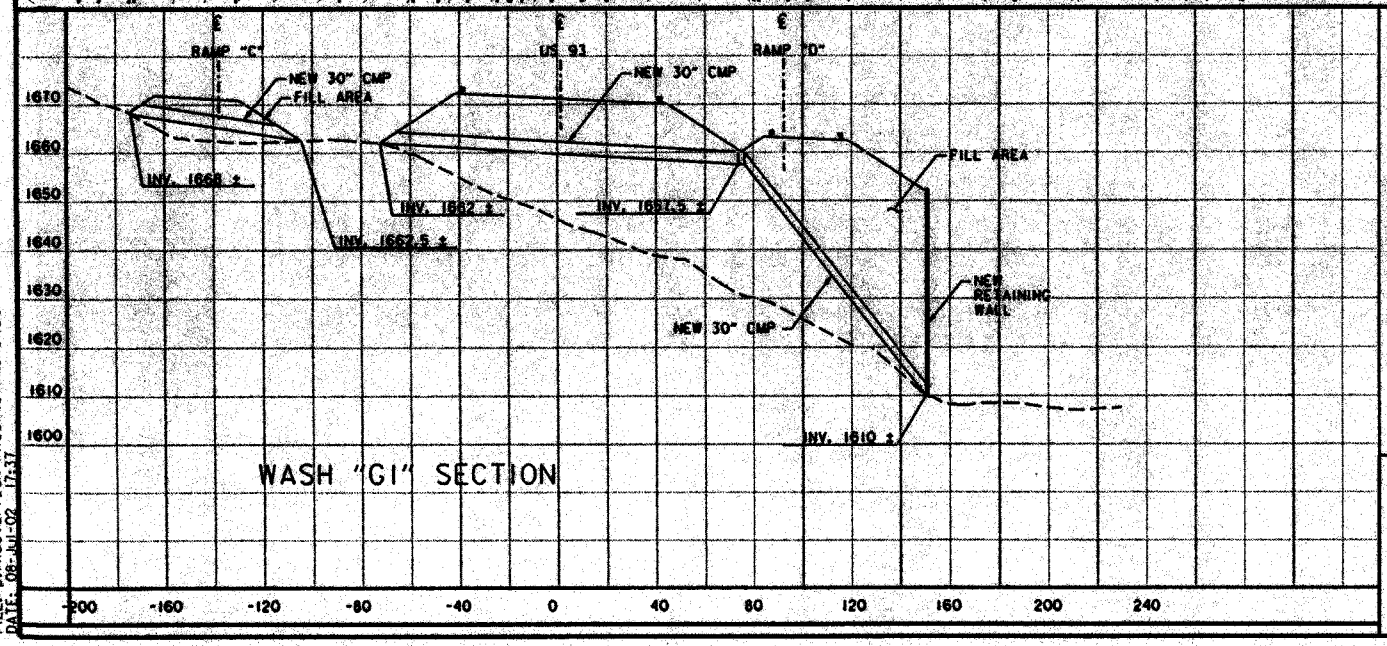
FILE: D:\Hoover\DGN Files\404WASHF.DGN
DATE: 08-Jul-02 17:37

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

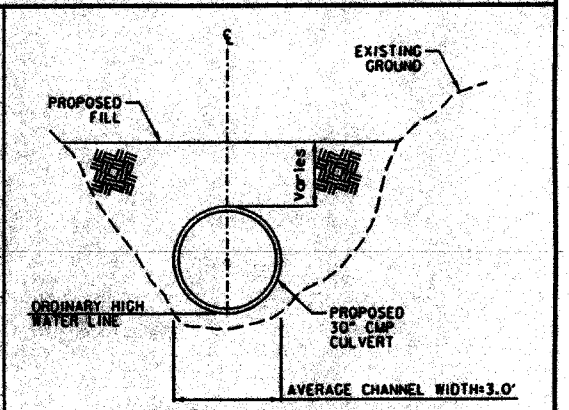
HYDRAULIC DATA
WASH "GI"

Q_{10} =9 CFS
Q_{50} =22 CFS
Q_{100} =28 CFS





WASH "GI" SECTION



WASH "GI"

USACOE INDIVIDUAL PERMIT

NOT FOR CONSTRUCTION

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASH "GI"
FIGURE 17

HJR Engineering, Inc.
791 E. Farm Springs Road
Fort Lee, VA
Certificate No. 0018

DESIGNED BY:
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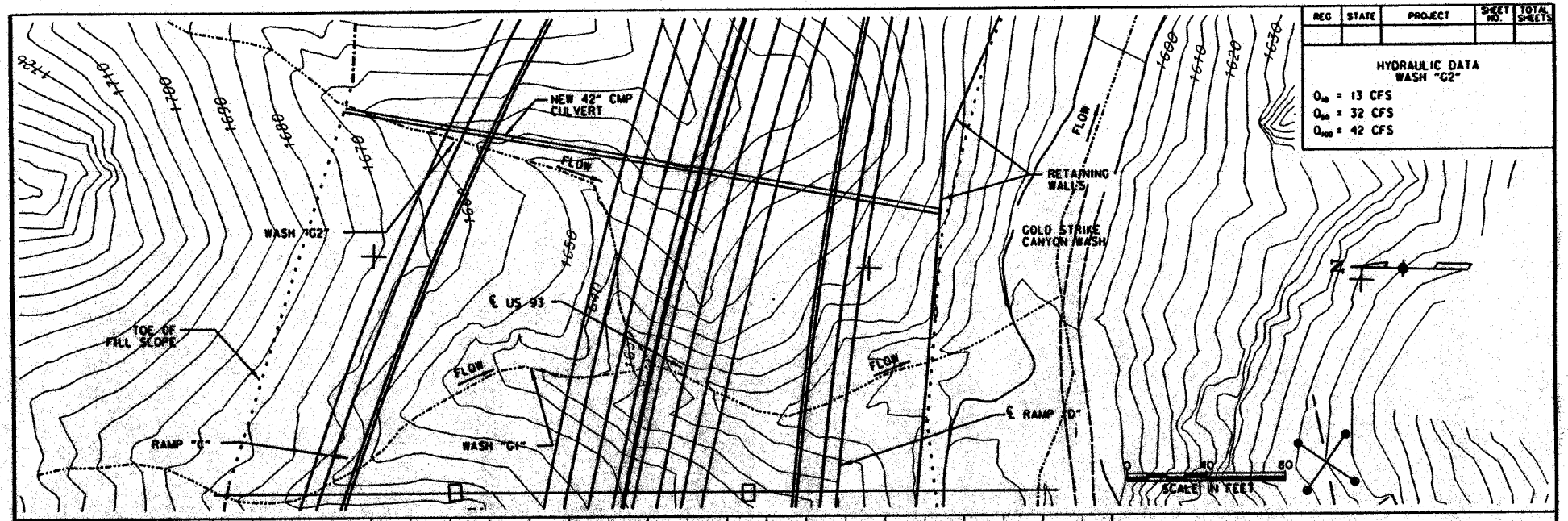
DATE:

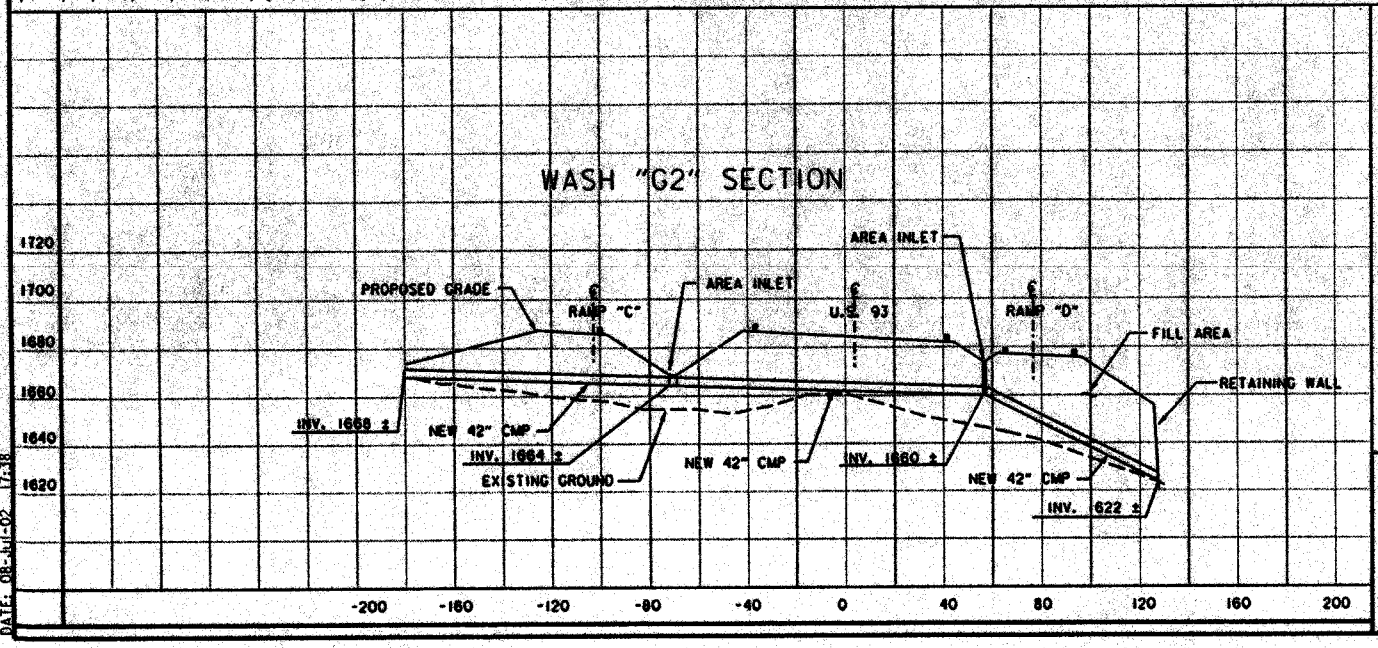
FILE: D:\Hoover\DGN Files\404WASHGI.DGN
DATE: 08-Jul-02 17:37

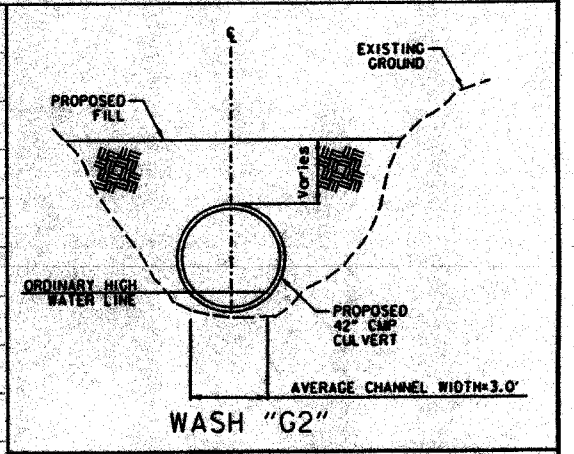


REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
WASH "G2"

Q_{10} = 13 CFS
Q_{50} = 32 CFS
Q_{100} = 42 CFS





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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

HOOVER DAM BYPASS PROJECT
NEVADA-WASH "G2"
FIGURE 18

DESIGNED BY:
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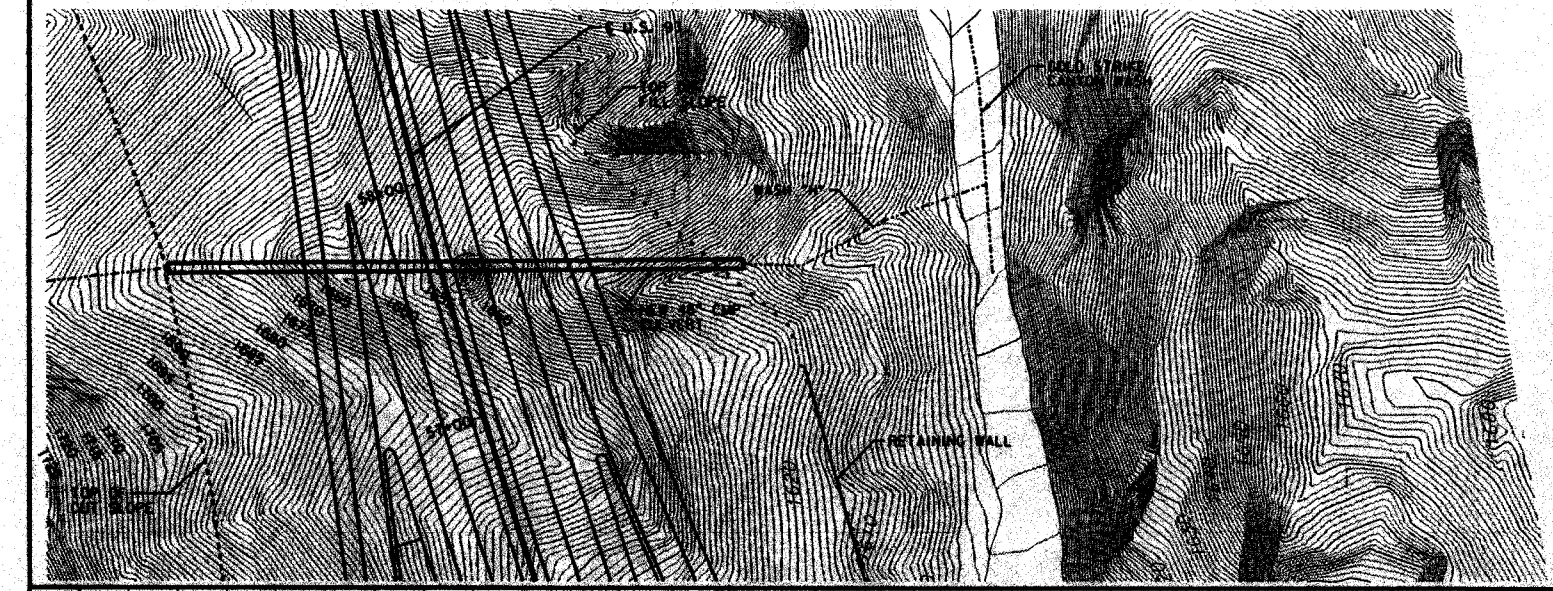
DATE:

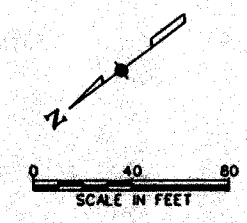
FILE: p:\Hoover\DGN Files\404WASHG2.DGN
DATE: 08-Jul-02 17:38

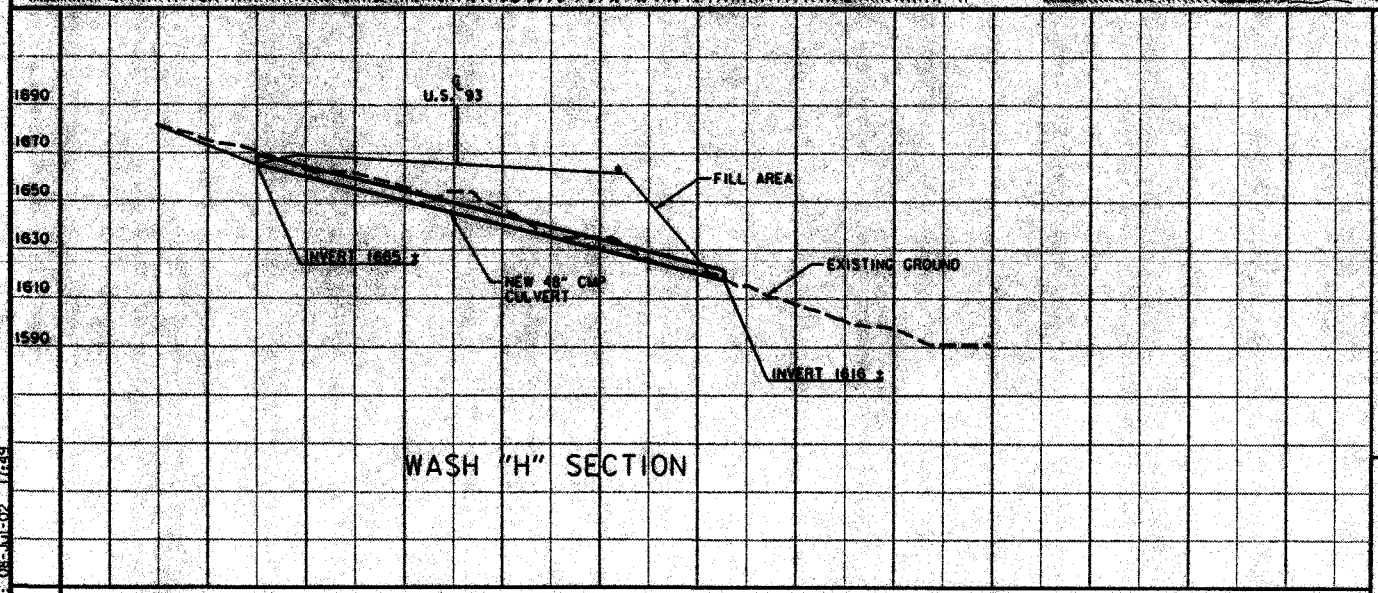
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
WASH "H"

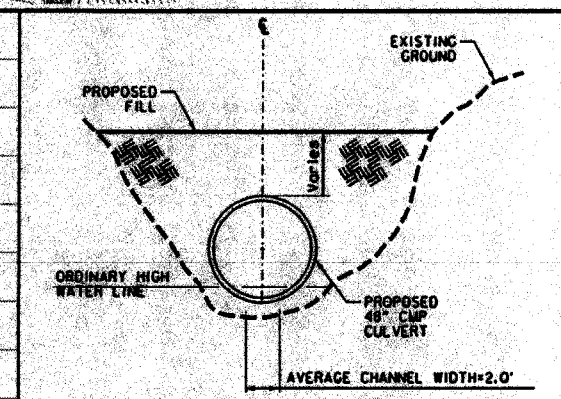
Q_{10} =16 CFS
Q_{50} =37 CFS
Q_{100} =50 CFS







WASH "H" SECTION



WASH "H"

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HOOVER DAM BYPASS PROJECT
NEVADA-WASH "H"
FIGURE 19

HR

DESIGNED BY:
DRAWN BY:
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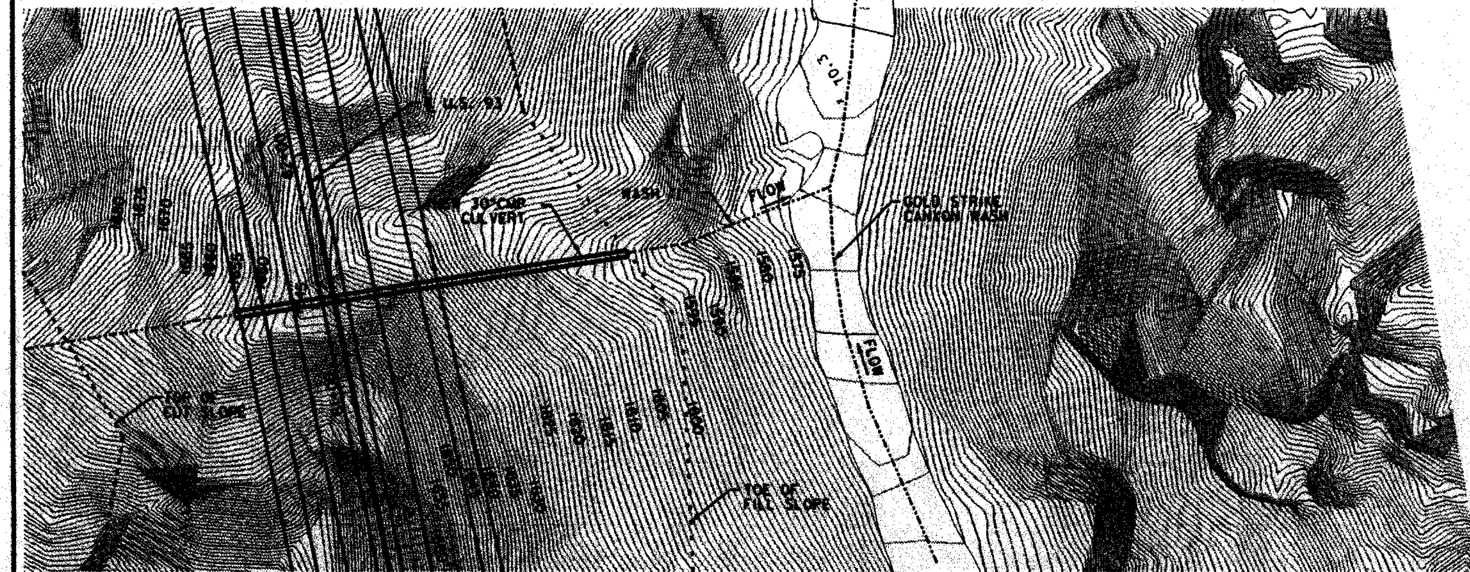
DATE:

FILE: p:\Hoover\DGN Files\404WASHH.DGN
DATE: 08-Jul-02 17:49

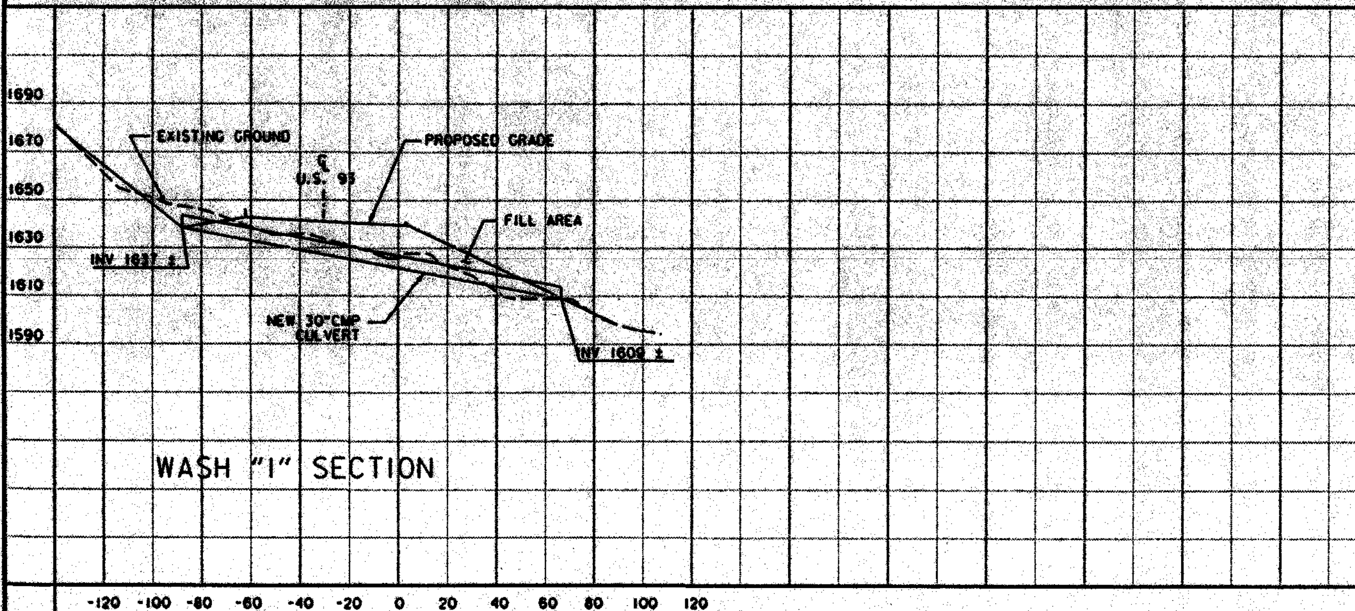
REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
WASH "I"

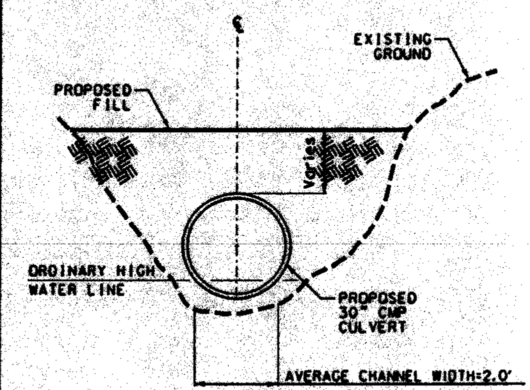
Q_{10} =9 CFS
Q_{50} =21 CFS
Q_{100} =28 CFS



E 398500



WASH "I" SECTION



WASH "I"

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HOOVER DAM BYPASS PROJECT
NEVADA-WASH "I"
FIGURE 20

HDR

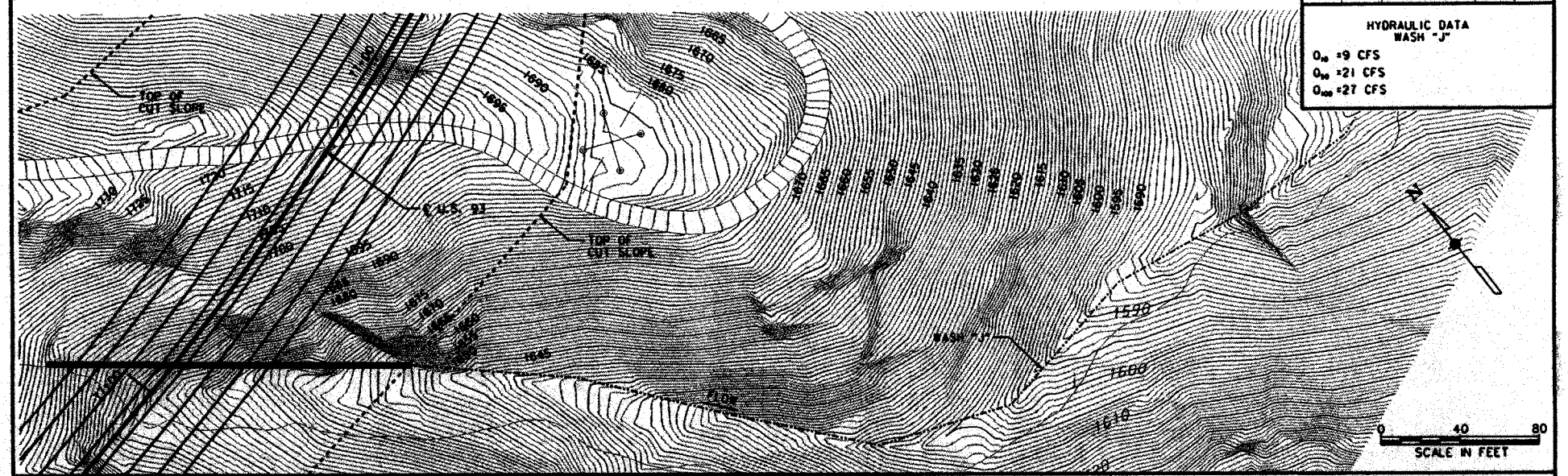
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

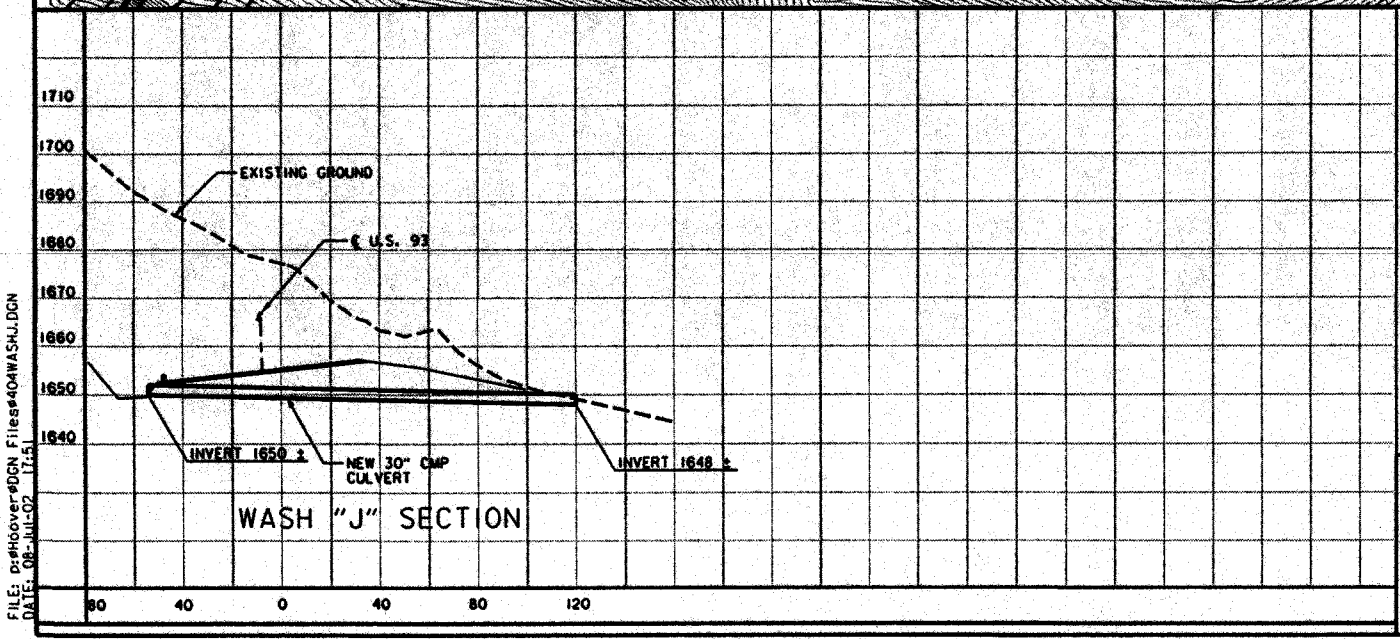
FILE: D:#Hoover#DGN Files#404WASHI.DGN
DATE: 08-Jul-02 17:50

REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

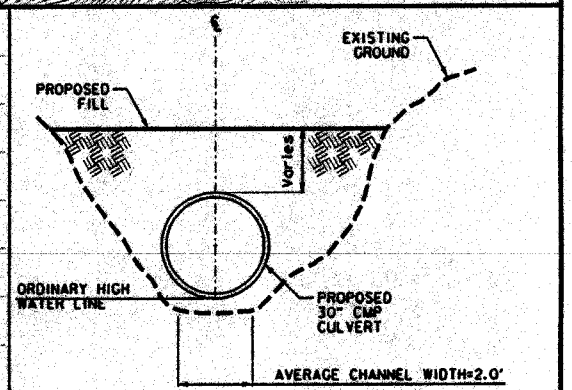
HYDRAULIC DATA
WASH "J"

Q_{10} = 9 CFS
Q_{50} = 21 CFS
Q_{100} = 27 CFS





WASH "J" SECTION



WASH "J"

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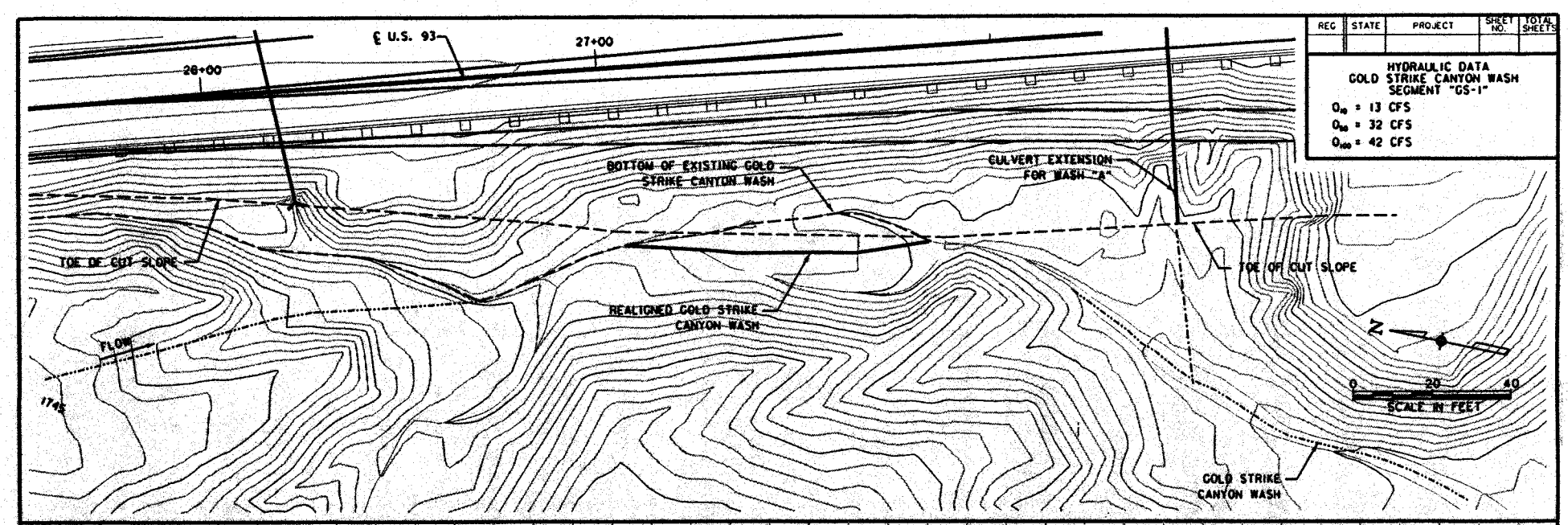
HOOVER DAM BYPASS PROJECT
NEVADA-WASH "J"
FIGURE 21

HDR Engineering, Inc.
730 E. Warm Springs Road
Las Vegas, NV 89119

DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:

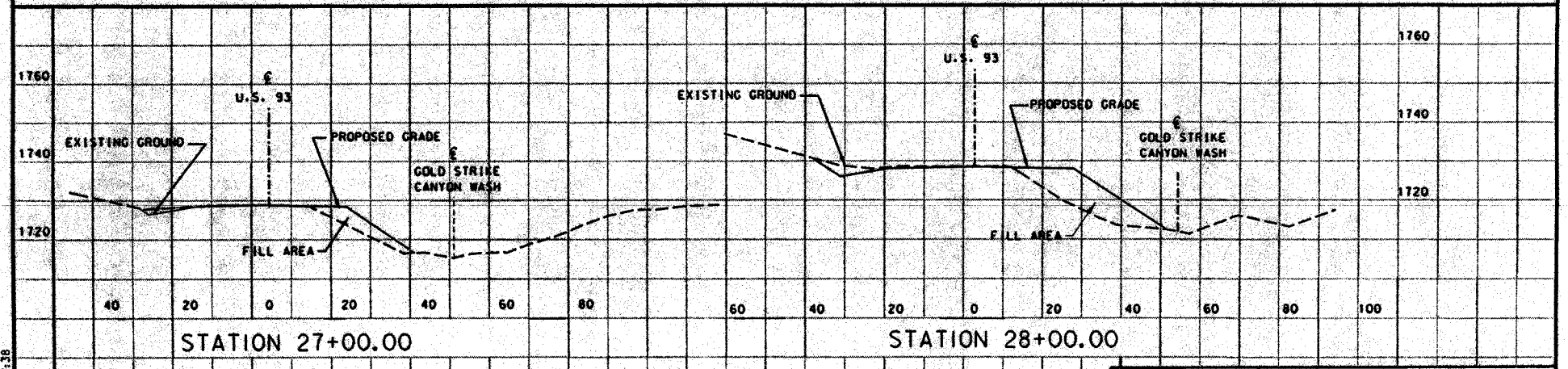
FILE: ps#Hoover#DGN Files#404WASHJ.DGN
DATE: 08-Jul-02 17:51



REG	STATE	PROJECT	SHEET NO.	TOTAL SHEETS

HYDRAULIC DATA
GOLD STRIKE CANYON WASH
SEGMENT "GS-1"

Q_{10} = 13 CFS
Q_{50} = 32 CFS
Q_{100} = 42 CFS



WASH "GS-1" SECTIONS

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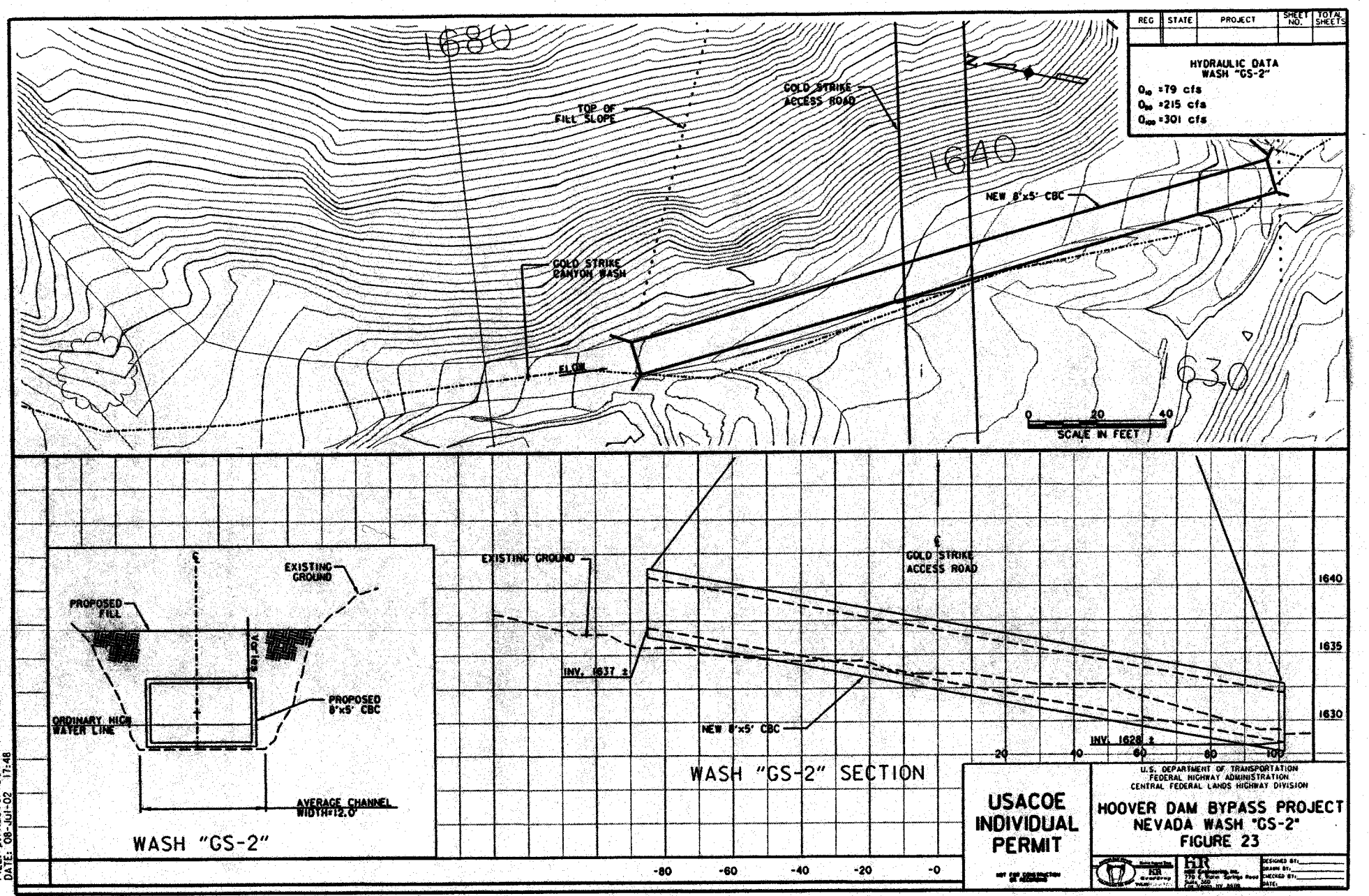
HOOVER DAM BYPASS PROJECT
NEVADA-WASH "GS-1"
FIGURE 22

FILE: p:\Hoover\DGN Files\404WASHGS1.DGN
DATE: 08-Jul-02 17:38



REG
STATE
PROJECT
SHEET NO.
TOTAL SHEETS
HYDRAULIC DATA
WASH "GS-2"
Q_{10} =79 cfs
Q_{50} =215 cfs
Q_{100} =301 cfs
1680
1640
1630
TOP OF FILL SLOPE
GOLD STRIKE ACCESS ROAD
NEW 8'x5' CBC
GOLD STRIKE CANYON WASH
FLOW
0 20 40
SCALE IN FEET
EXISTING GROUND
PROPOSED FILL
Varies
PROPOSED 8'x5' CBC
ORDINARY HIGH WATER LINE
AVERAGE CHANNEL WIDTH=12.0'
WASH "GS-2"
EXISTING GROUND
GOLD STRIKE ACCESS ROAD
INV. 1637 ±
NEW 8'x5' CBC
INV. 1628 ±
1640
1635
1630
20 40 60 80 100
-80 -60 -40 -20 -0
WASH "GS-2" SECTION
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HOOVER DAM BYPASS PROJECT
NEVADA WASH "GS-2"
FIGURE 23
DESIGNED BY:
DRAWN BY:
CHECKED BY:
DATE:
FILE: p:\Hoover\DGN Files\404WASHGS2.DGN
DATE: 08-Jul-02 17:48